

Fort Bliss, Texas and New Mexico, Mission and Master Plan

PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT



Volume II: Final Appendices A through K



United States Army



U.S. Army Training and
Doctrine Command

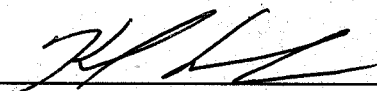


U.S. Army Air Defense Artillery Center
and Fort Bliss

December 2000

**Fort Bliss, Texas and New Mexico,
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Final
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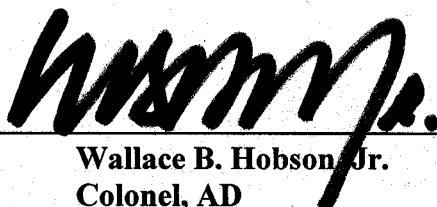
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Volume II Appendices

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Appendix **A**

APPENDIX A

**NATIONAL ENVIRONMENTAL POLICY ACT (NEPA)
TERM DEFINITIONS, CONTRIBUTING FACTORS, AND
MISSION, PROJECT, OR MANAGEMENT ACTION EVALUATION METHODOLOGY**

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A.0 NATIONAL ENVIRONMENTAL POLICY ACT (NEPA) TERM DEFINITIONS, CONTRIBUTING FACTORS, AND MISSION, PROJECT, OR MANAGEMENT ACTION EVALUATION METHODOLOGY

A.1 DEFINITION OF KEY TERMS

Activity. The terms “activity” and “activities” may refer to a mission activity such as a training exercise, a Master Plan project, or natural or cultural resource management practice. These terms are used throughout the *Fort Bliss Mission and Master Plan (MMP) Programmatic Environmental Impact Statement (PEIS)* and this Appendix.

Adverse Impact. A negative effect caused directly or indirectly by an action and may be long-term or short-term.

Beneficial Impact. A positive effect caused directly or indirectly by an action and may be long-term or short-term.

Categorical Exclusion (CX). The CX refers to those actions which do not individually or cumulatively have a significant effect/impact on the human environment and for which, therefore, neither an Environmental Assessment (EA) nor an Environmental Impact Statement (EIS) is required. Typically, excluded activities are small, routine undertakings with no potential significant environmental effect. For a list of CXs from Army Regulation (AR) 200-2, *Environmental Effects of Army Actions*, see Attachment 1.

Cumulative Impacts. In an EIS, cumulative impact is the effect on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions, regardless of what agency (federal or nonfederal, private industry, or individuals) undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time (40 Code of Federal Regulations [CFR] 1508.7).

Direct Impact. Direct effects which are caused by the action and occur at the same time and place.

Draft Environmental Impact Statement (DEIS). The DEIS is prepared after the scoping process has been completed. The DEIS is prepared in accordance with the scope decided upon in the scoping process, and is then circulated for comment.

Environmental Assessment. The EA is a concise public document prepared by the installation to evaluate a proposed action and its potential effects on the environment. The EA includes brief discussions of the need for the proposal or alternatives and of the environmental effects of the proposal or alternatives. Also included, is a listing of the agencies and persons consulted during document preparation.

Final Environmental Impact Statement (FEIS). The FEIS is the result of the analysis of comments concerning the DEIS. Comments are to be received from designated federal, tribal governments, state, and local agencies, any agency that has requested copies of impact statements, and the public, including interested or affected persons and organizations.

Finding of No Significant Impact (FONSI). When the environmental analyses in an EA demonstrate that an action, not otherwise excluded, does not require an environmental impact statement, a FONSI is prepared. The FONSI includes a summary of the conclusions of the EA and notes any environmental

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documents related to it. If the EA is attached to the FONSI, the FONSI need not repeat any EA discussion, but may incorporate it by reference. It is always signed by the decision-maker.

Impact. The terms “impacts” and “effects” are synonymous as used in the *National Environmental Policy Act (NEPA)* of 1969. Impacts may be beneficial or adverse, and may apply to the natural, aesthetic, historic, cultural, and socioeconomic resources of the installation and the surrounding communities. Where applicable, impacts may be classified as direct or indirect. The terms “impact” and “effect” are defined in 40 CFR 1508.8 and reproduced in AR 200-2, *Environmental Effects of Army Actions*.

Indirect Impact. An indirect impact is caused by a proposed activity but is later in time or farther removed in distance, but still reasonably foreseeable. Indirect impacts may include land use changes or population density changes and the related effects these changes will have on air, water, and other natural or social systems. Referring to the possible direct impacts mentioned above, the clearing of trees may have an indirect impact on area streams by increasing soil erosion. The term “indirect” is defined in 40 CFR 1508.8 and reproduced in AR 200-2, *Environmental Effects of Army Actions*.

Long-term Impacts. Long-term impacts are neither temporary nor reversible. They may occur either during the construction or operational phases of an activity. For example, the construction of a new building may create long-term impacts during both the construction and operational phases. Draining of a wetland for the construction of a new building will create long-term and permanent impacts on biological resources. Likewise, once operational, the new building may create additional long-term impacts such as increased population density, waste generation, etc.

Mitigation. The term “mitigation” is defined in 40 CFR 1508.20 and reproduced in AR 200-2, *Environmental Effects of Army Actions*. Mitigation generally includes:

- Avoiding the impact altogether by stopping or modifying the proposed action;
- Minimizing impacts by limiting the degree or magnitude of the action and its implementation;
- Rectifying the impact by repairing, rehabilitating, or restoring the affected environment;
- Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action; and
- Compensating for the impact by replacing or providing substitute resources or environments.

No Impact. “No impact” implies that a particular activity creates neither a direct nor indirect impact, does not have long- or short-term implications, and is neither beneficial nor negative.

Notice of Intent (NOI). When a decision has been made to prepare an EIS, a NOI is written. It will contain description(s) of the proposed action and possible alternatives, the proposed scoping process and schedule, and the name and address of the point-of-contact who can provide more information.

Programmatic Environmental Impact Statement. A legal document prepared in accordance with the requirements of Section 102(2)(C) of NEPA, which evaluates the environmental impacts of proposed federal actions that involve multiple decisions potentially affecting the environment at one or more sites.

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Record of Decision (ROD). The ROD is required after completion of an EIS. Generally, the purpose of the ROD is to state the decision for the proposal. In doing so, it identifies all alternatives considered, and specifies which alternative was environmentally preferable. It states if all practicable means have been taken to avoid or minimize environmental harm from the selected alternative, and if not, why not. It identifies the monitoring and mitigation program adopted (if needed); and may discuss preferences among alternatives based on nonenvironmental factors (i.e., economic and technological). The ROD is not considered an environmental document, since the decision-maker considers these other nonenvironmental factors in addition to environmental factors.

Record of Environmental Consideration (REC). A REC describes the proposed action and anticipated time frame, identifies the proponent, and explains why further environmental analysis and documentation is not required. It is a signed statement to be submitted with project documentation. It is used when the proposed action is exempt from the requirements of NEPA, or has been adequately assessed in existing documents and determined not to be environmentally significant. For a REC format adopted by Fort Bliss, see Attachment 2.

Scoping. The scoping process occurs when planning for an Army project action indicates a need for the preparation of an EIS. Scoping determines the range of issues to be addressed in the EIS and identifies the significant issues related to the proposed action. The parties involved identify the range of actions, alternatives, and impacts to consider in the EIS.

Short-term Impacts. Short-term impacts are temporary and either direct or indirect. Short-term impacts usually occur during the construction phase of the activity. For example, construction of a new bridge may be a multi-year endeavor but the short-term impacts may occur anytime during the multi-year construction.

Significance. The term “significance” is defined in 40 CFR 1508.27 and reproduced in AR 200-2, *Environmental Effects of Army Actions*. Significance requires consideration of the context, and intensity of the impact or effect under consideration. Significance can vary in relation to the context of the proposed action. At Fort Bliss, the significance of the proposed actions may include consideration of the effects on a national, regional, and local basis. Both short- and long-term effects may be relevant. Impacts may also be evaluated in terms of their intensity or severity. Factors contributing to the intensity of a project include:

- The degree to which the action affects public health or safety;
- The proximity of the action to resources that are legally protected by regulations and statutes, such as wetland provisions of the *Clean Water Act*, regulatory flood plains, properties included in or eligible for inclusion in the National Register of Historic Places (NRHP) (36 CFR 60.4), and federally listed threatened or endangered species;
- The degree to which the effects of the action on the quality of the human environment are likely to be highly uncertain or controversial;
- Whether the action is related to other actions with individually insignificant but cumulatively significant impacts; and
- Whether the action threatens to violate federal, state, or local law imposed for the protection of the environment.

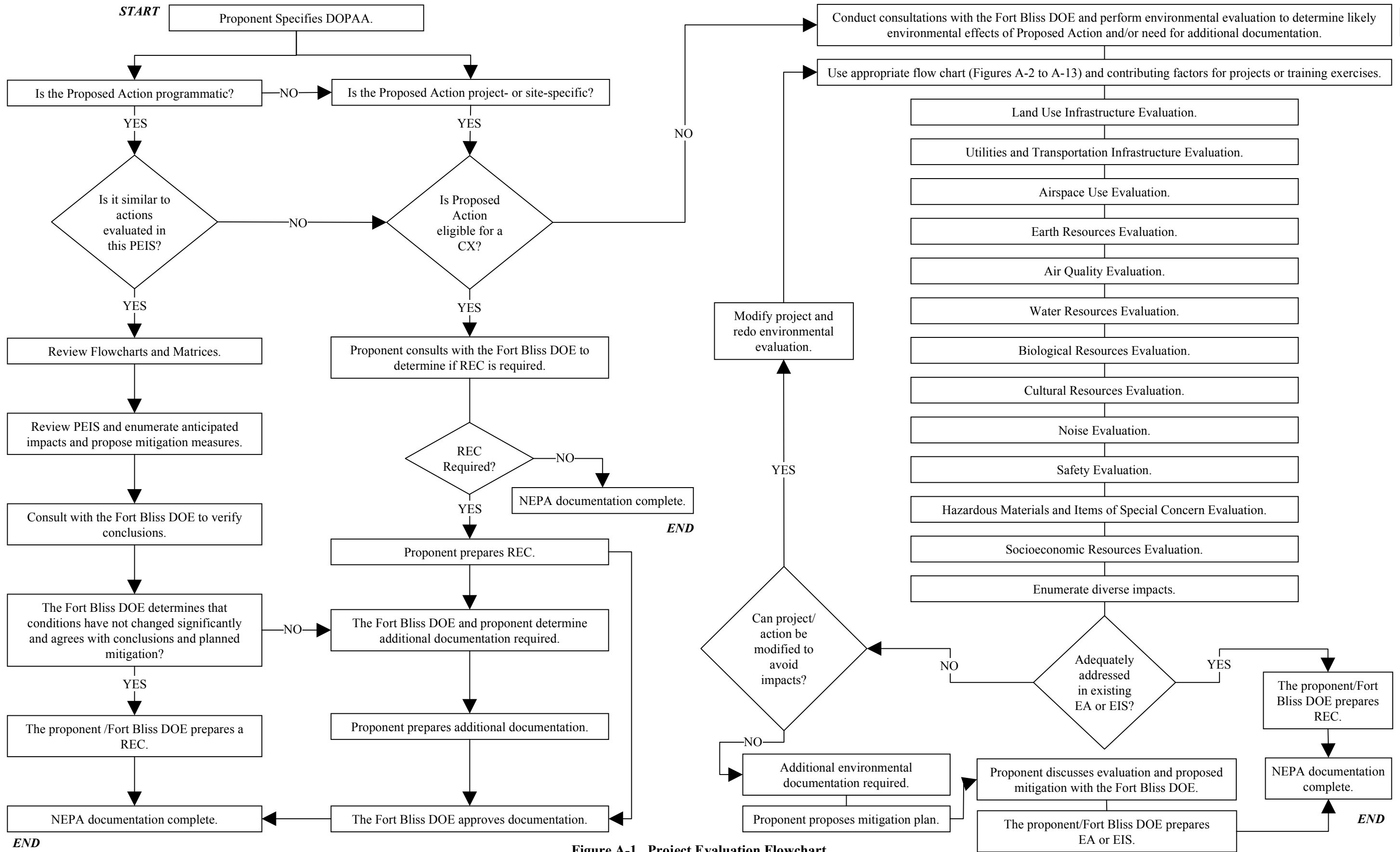


Figure A-1. Project Evaluation Flowchart.

Significant Adverse Impact. A negative effect that is caused directly or indirectly by an action, and meets the criteria for significance.

A.2 THE NEPA EVALUATION METHODOLOGY AND CONTRIBUTING FACTORS

The purpose of this document is to provide guidance and procedures for obtaining environmental clearance(s) and for allowing the time necessary for review of documentation of environmental impacts for proposed projects and actions. This process is required by the NEPA; ARs 200-1 and 200-2; applicable federal, state, and local environmental regulations; and other laws for which the Directorate of Environment (DOE) on Fort Bliss has management responsibility. NEPA requires federal agencies to incorporate into their planning and decision making an analysis of the effects, if any, certain proposed actions would have on the environment and the possibilities for mitigating, or avoiding completely, any adverse environmental effects.

The evaluation methodology described in this section indicates the steps to be taken by a project proponent, or reviewer, to determine the potential environmental impacts of a proposed action. The result of this screening methodology can also be used by the proponent to identify potential mitigation measures and additional environmental documentation that may be required to implement the proposed action. The evaluation methodology is depicted in Figure A-1 and described in the steps detailed below.

Contributing factors associated with each environmental resource area provided can be used as guidelines in determining the potential for significant adverse impact, adverse impact, no impact, or beneficial impact. The contributing factors can also be used as (1) a cursory screening tool for qualitative assessment of whether a project's potential impacts warrant more detailed evaluation, or (2) rigorous decision criteria for quantitative impact assessment.

Step 1. Develop the Description of Proposed Actions and Alternatives (DOPAA). Commanders of units proposing to conduct field training exercises (FTXs) shall consult with the DOE as early as possible to determine if their proposed training will require either an EA or EIS. The DOE has streamlined the NEPA review process for actions occurring on the ranges by incorporating pre-NEPA review into the Fort Bliss *Form 88 - Range and Maneuver Area Request* (Attachment 3). Units requesting use of training areas must fill out the reverse side of this form (*Environmental and Archaeological Assessment*).

A Form 88 does not bring all actions requiring NEPA to the attention of the DOE, and not all range environmental requirements are NEPA issues but may require another form of environmental regulatory review. For example, New Mexico requires a permit for the release of 2,000 gallons or more of gray water (shower or kitchen) at any location. Thus, a unit using the Doña Ana Range–North Training Areas, and planning to release this amount of gray water, must obtain a permit from the State of New Mexico. To ensure compliance with NEPA or other environmental regulatory requirements, proponents should ensure the DOE is aware of the proposed action.

Examples of actions that take place within the cantonment area that require a DOE NEPA review include construction work orders, U-Do-It projects, pest control actions, and landscaping in historic districts. Descriptions of each of these actions should be submitted through the Directorate of Public Works and Logistics (DPWL) to the DOE. After a work order is submitted to the DPWL, it will be released to the DOE for review for compliance with NEPA, hazardous materials, historic resources, and other environmental laws and regulations.

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Proponents of actions such as large or unusual training exercises, large or unique testing activities, or projects involving major construction must consult early in the planning process with the DOE NEPA Coordinator to determine if NEPA documentation is required.

If the DOE review determines NEPA action is required, the proponent of an action to occur on Fort Bliss must prepare a statement of the purpose and need for the proposed action and a detailed DOPAA to the action for use during the screening process. The DOPAA must specify details such as: what, where, when, and how. For example: (what) a new proposal for military training ranges and training areas; (where) South Training Areas, Doña Ana Range–North Training Areas, specifically the multi-purpose range areas 5 through 7; (when) once per quarter for 4 days; and (how) involving 30 personnel; 4-wheeled vehicles with trailers, and generators; the training will involve command and control exercises, field operations, and live firing of X rounds of munitions or missiles. In the case of a project that requires construction, demolition, or other ground-disturbing activities, answers to these four questions are equally required. In addition, the proponent must provide reasonable alternatives to the proposed action.

Step 2. Determine if Proposed Action is Eligible for a CX. The proponent will determine if it is subject to a CX as defined by AR 200-2 *Environmental Effects of Army Actions*. The U.S. Department of the Army (DA) has determined that actions covered by CXs (e.g., routine maintenance activities, construction that does not significantly alter land use, classroom training, routine movement of personnel) do not have an individual or cumulative impact on the environment and, therefore, do not require an EA or EIS. If a proposed action is covered by a CX, the proponent will consult with the Fort Bliss DOE to confirm that NEPA coverage by a CX is appropriate and determine if a REC is required. Attachment 1 of this appendix contains the list of actions that can be categorically excluded as defined by AR 200-2, *Environmental Effects of Army Actions*. Although the CX is intended to reduce paperwork and to eliminate or reduce extensive documentation, limitations do apply. A CX cannot cover all circumstances and each CX must be considered individually to meet certain criteria. The CX screening criteria as presented in AR 200-2 are as follows:

- A CX is a category of actions that do not individually or cumulatively have a significant effect on the human environment and for which, therefore, neither an EA nor an EIS is required.
- A CX may be used only when the criteria of paragraphs 4-1 and 4-2 of AR 200-2 have been met:

4-1. Introduction.

- a. *The use of CX is intended to reduce paperwork and delay and eliminate unnecessary EA and EIS preparation.*
- b. *The following criteria will be used to determine those categories of actions that normally do not require either an EIS or EA:*
 1. *Minimal or no individual or cumulative effect on environmental quality.*
 2. *No environmentally controversial change to existing environmental conditions.*
 3. *Similarity to actions previously examined and found to meet the above criteria.*

4-2. Determining when to use a CX. *In order to use the CX provision, the proponent must take the following actions:*

- a. *Determine whether the proposal is encompassed by one of the categories not normally requiring the preparation of an EA or EIS.*

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- b. *Determine if there are any extraordinary circumstances that may result in the proposed action having an impact on the human environment that would require an EA or EIS. These circumstances include:*
1. *Greater scope or size than normally experienced for a particular category of action.*
 2. *Potential for degradation, even though slight, of already existing poor environmental conditions. Also, initiation of a degrading influence, activity, effect in areas not already significantly modified from their natural condition.*
 3. *Employment of unproven technology.*
 4. *Presence of threatened or endangered species and their habitats, archaeological materials, historical places, or other protected resources.*
 5. *Use of hazardous or toxic substances that may come in contact with the surrounding natural environment. Nevertheless, a CX exists for use of hazardous and toxic substances under adequately controlled conditions within established laboratory buildings that are designed for, and in compliance with, regulatory standards. Adequately controlled conditions includes complying with AR 385-10 and all other applicable Army safety and preventive medicine regulations for the processing of hazardous and toxic substances, and complying with the Resource Conservation and Recovery Act (RCRA) for their disposal.*
 6. *Proposed actions affecting areas of critical environmental concern. These include, but are not limited to, prime or unique agricultural lands, wetlands, coastal zones, wilderness areas, aquifers, floodplains, or wild and scenic river areas.*
- c. *Determine whether **all** the project screening criteria from AR 200-2 listed below are true for the proposal, and **each** of the following is true:*
1. *This action is not a major federal action significantly affecting the quality of the human environment.*
 2. *There are minimal or no individual or cumulative effects on the environment as a result of this action.*
 3. *There is no environmentally controversial change to existing environmental conditions.*
 4. *There are no extraordinary conditions associated with this project.*
 5. *This project does not involve the use of unproven technology.*
 6. *This project involves no greater scope or size than is normal for this category of action.*
 7. *There is no potential of an already poor environment being further degraded.*
 8. *This action does not degrade an environment that remains close to its natural condition.*
 9. *There are no threatened or endangered species (or critical habitat), significant archaeological resources, National Register or National Register-eligible historical sites, or other statutorily protected resources.*
 10. *This action will not adversely affect prime or unique agricultural lands, coastal zones, wilderness areas, aquifers, floodplains, wild and scenic rivers, or other areas of critical environmental concern.*
- d. *If the proposed action qualifies for one of the CX, no analytical environmental document is necessary. However, if a REC is required by the CX listing, a REC*

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will be completed and signed by the proponent. Consultation between the proponent and the installation environmental coordinator is required.

The Army and the Fort Bliss DOE have developed a system that must be used to document this screening process. If, based on the foregoing screening criteria, the proposed action qualifies, the proponent must prepare the CX using U.S. Army Training and Doctrine Command (TRADOC) Form 161, (see Attachment 2). Additionally, in accordance with AR 200-2, some categories of actions will also require a REC (see Attachment 4), which will be prepared and used in conjunction with the CX. The REC describes the proposed action and anticipated timeframe, identifies the proponent, and explains why further environmental analysis and documentation is not required. It is signed by the Fort Bliss Director of Environment and proponent of the action and submitted with project documentation. It is used when the proposed action is exempt from the requirements of NEPA, or has been adequately assessed in existing documents and determined not to be environmentally significant. A REC is also used to document the use of those CXs that require such records (AR 200-2).

When real estate transactions with parties outside the Army are proposed, and if the proposal or project involves potential release of hazardous substances (see Section A2.3.12 and Figure A-12) into the environment or structures an Environmental Baseline Survey (EBS) will also be prepared. EBSs are prepared to determine the environmental conditions of properties being considered for acquisition, outgrants, and disposals. The EBS is used to identify the potential environmental contamination liabilities associated with real property transactions. The EBS serves as the basis for preparation of a Finding of Suitability to Lease, Environmental Condition of Property, or Finding of Suitability for Transfer as required for the transaction to proceed. Most property disposals divesting title are handled through the General Services Administration (GSA). Such disposal actions usually require an EBS accompanied by a REC. The GSA will complete the NEPA requirement in many of these cases. Where the Army completes the disposal or transfer action, the installation may be required to complete an EA or EIS. Easements, licenses, permits, reassignments with DA, disposal of buildings and improvements without the underlying land, and privatization of utilities via easement do not require an EBS. These actions require documentation of an environmental screening in a REC to show compliance with the criteria for CXs as provided for in AR 200-2. Although the EBS is not specifically a NEPA-related document, it can be used to support decisions regarding NEPA requirements. Samples of TRADOC Form 161 (CX), Form 88, a REC, and an EBS are included as Attachments 2, 3, 4, and 5, respectively, to this appendix. All CXs and supporting documentation must be approved by the Fort Bliss DOE prior to commencement of any project.

Step 3. Consult with Fort Bliss DOE to Determine if the Proposed Action Has Been Programmatically Evaluated. Sections 3.3 and 3.4 identify and describe a variety of known requirements for mission activities, master plan projects, resources management actions, and mobilization plans either underway or planned for Fort Bliss. In addition, Section 3.5 discusses the types of missions and installation capabilities that could be considered during the planning horizon but are not currently planned. Programs specifically analyzed in this PEIS are shown in Table A-1. When considering potential impacts of the proposed action, the proponent should review the environmental consequences of the programmatic actions listed in Table A-1 and described in Chapter 5 of the PEIS (*Environmental Consequences and Cumulative Effects*). This review should focus on determining if the proposed action's potential impacts have already been programmatically evaluated. Specific projects consistent with the capabilities in Section 3.4 and most of Section 3.5 will require additional NEPA documentation (CX, EA, EIS). The Fort Bliss DOE will confirm that the existing conditions and potential impacts have not changed, and that conclusions regarding the appropriate program or plan evaluated in this PEIS are valid in regard to the action being proposed.

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Table A-1. Summary of Projected Proposed Actions Evaluated in the Fort Bliss Mission and Master Plan

<i>No. Action Alternative</i>	
<i>Mission Activities, Section 3.2.3</i>	<i>Facility Construction and Demolition, Section 3.2.4</i>
<ul style="list-style-type: none"> • Table 3.2-4 describes routine mission support activities in detail. • The Training Area Development Concept (TADC) describes current training capabilities, land use, missions, organizations, and activities taking place on Fort Bliss ranges. • Mobilization. • FTX. • Fire Exercise (FIREX). • White Sands Missile Range (WSMR) Uses. • Current Training Area Land Use General Classification. • Main Cantonment Area Existing Land Use. • Land Use Patterns Under the Land Use Plan. 	<ul style="list-style-type: none"> • New construction, existing facility renovation/rehabilitation and related infrastructure improvements. • Table 3.2-7 describes Family Housing and other construction projects in detail. • Part of Army Layaway Program. • Includes family housing and other facilities. • Table 3.2-8 describes Facility Demolition Program in detail.
	<p style="text-align: center;"><i>Environmental Resource Management, Section 3.2.5</i></p> <ul style="list-style-type: none"> • Existing Environmental Resource Management Program (species-by-species basis). • Existing Cultural Resource Management Program (individual project basis). • Resource management utilizing standard Army mechanisms: Integrated Training Area Management (ITAM), Land Condition Trend Analysis (LCTA), Land Rehabilitation and Maintenance (LRAM), Training Requirements Integration (TRI), Geographic Information System (GIS), Resource Management Support System (RMSS).
	<p style="text-align: center;"><i>Real Estate Actions, Section 3.2.6</i></p> <ul style="list-style-type: none"> • On-going actions utilizing existing procedures for issuing leases, licenses, permits, and easements as authorized in AR 405-80.

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Table A-1. Summary of Projected Proposed Actions Evaluated in the Fort Bliss Mission and Master Plan (Continued)

<i>Alternative 1</i>			
<i>Mission Activities, Section 3.3.3</i>	<i>Facility Construction and Demolition, Section 3.3.4</i>	<i>Environmental Resource Management, Section 3.3.5</i>	<i>Real Estate Actions, Section 3.3.6</i>
<p>Same as described for No Action Alternative.</p>	<p>Same as described for No Action Alternative and:</p> <ul style="list-style-type: none"> • Incorporates Long-range Family Housing Plan requirements into programmed construction sequence. • Involves changes/revision to construction schedule, specific facility changes to construction actions, and land use changes. • Table 3.3-7 describes additional housing and other construction projects in detail. <p>Same as described for No Action Alternative and:</p> <ul style="list-style-type: none"> • Continues previous facility reduction program. • Involves changes/extensions in demolition schedule, specific facility changes to demolition actions, and possible land use changes. • Table 3.3-8 describes additional demolition projects in detail. 	<p>Same as described for No Action Alternative and:</p> <ul style="list-style-type: none"> • Implementation of the Integrated Natural Resources Management Plan (INRMP). • Implementation of the Integrated Cultural Resources Management Plan (ICRMP). • Table 3.3-9 describes cultural resources management plan programs affecting mission and master planning through Fiscal Year (FY) 00. • Section 3.3.5 identifies allowable actions under ITAM, INRMP, and ICRMP. 	<p>Same as described for No Action Alternative and:</p> <ul style="list-style-type: none"> • Implementation of the Fort Bliss Real Property Master Plan (RPMP). - Long-range Component (LRC) - Power Projection Platform (P²) Capital Investment Strategy (CIS) - Mobilization Component (MC) - Long-range Family Housing Plan • Implementation of the Main Cantonment Area Proposed Land Use Plan (part of LRC).
<i>Alternative 2</i>			
<i>Mission Activities, Section 3.4.3</i>	<i>Facility Construction and Demolition, Section 3.4.4</i>	<i>Environmental Resource Management, Section 3.4.5</i>	<i>Real Estate Actions, Section 3.4.6</i>
<p>Same as described for Alternative 1 and:</p> <ul style="list-style-type: none"> • Utilization of additional 13.5 sq. miles of terrain suitable for FTX locations on McGregor Range. • No training area land use classification changes. 	<p>Same as described for Alternative 1.</p>	<p>Same as described for Alternative 1.</p>	<p>Same as described for Alternative 1.</p>

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Table A-1. Summary of Projected Proposed Actions Evaluated in the Fort Bliss Mission and Master Plan (Continued)

<i>Alternative 3</i>		<i>Environmental Resource Management, Section 3.5.5</i>	<i>Real Estate Actions, Section 3.5.6</i>
<p><i>Mission Activities, Section 3.5.3</i></p> <p>Same as described for Alternative 2 and:</p> <ul style="list-style-type: none"> • The TADC describes potential future missions, activities, and land uses that could take place on the Fort Bliss Training Complex. • Develop Post-mobilization Unit Validation Training (Fort Bliss Training Complex). • Develop Heavy Division Training Center (Doña Ana Range-North Training Areas). • Develop National Guard Training Center (Doña Ana Range-North Training Areas). • Develop Helicopter Training Complex (McGregor Range). • Develop Combat Aviation Training (McGregor Range). • Test Support for Army Tactical Missile System (ATACMS) (McGregor Range). • Training Area Land Use Classification would change for Doña Ana Range-North Training Areas and McGregor Ranges. • Table 3.5-1 ranks likelihood of possible future mission activities. 	<p><i>Facility Construction and Demolition, Section 3.5.4</i></p> <p>Same as described for Alternative 2 and:</p> <ul style="list-style-type: none"> • See TADC for potential future mission-support construction projects that could take place on Fort Bliss ranges. • Construct Military Operations in Urbanized Terrain (MOUT) Complex (Doña Ana-North Training Areas, Biggs Army Airfield [AAF], or McGregor Range). • Construct New Water Well (Doña Ana Range-North Training Areas). • Construct new rail spur (Doña Ana Range-North Training Areas and/or McGregor Range). • Construct taxiway for joint Biggs AAF/El Paso International Airport (EPIA) use. • Construct geothermal binary generation/desalination plant on McGregor Range. • Table 3.5-1 ranks likelihood of possible future construction projects. 	<p>Same as described for Alternative 2.</p>	<p>Same as described for Alternative 2.</p>

Step 4. Review Flowcharts and Impact Evaluation Matrices. If the proposed action is not specifically evaluated in the PEIS and it is not subject to a CX, the proponent (in coordination with Fort Bliss DOE) will evaluate the potential environmental impacts associated with the action. Because the mission activities and Master Plan programs described in the PEIS are considered to broadly represent future proposed actions, it is anticipated that many of the environmental impacts on various resource categories (such as air quality, biology, and cultural resources) described in the PEIS will be similar to those expected for upcoming programs. Thus, the proponent will carefully review the activities described in the PEIS and determine if the proposed action is similar to any of the programs evaluated in the PEIS (i.e., is a proposed program of a similar type or scale as those described in the PEIS or will the proposed project or activity be site-specific and require additional NEPA documentation. Identification of project similarities may reduce the level of assessment required for evaluating potential environmental impacts. Prior to conducting a detailed evaluation, the proponent will consult with the Fort Bliss DOE. The impact assessment guidance provided in the PEIS is based on the use of the appropriate evaluation chart (i.e., for MMP activities and projects) and evaluation criteria. The proponent will identify and determine the type of impacts the proposed action will have on individual resource categories and group attributes.

Step 5. Enumerate Impacts and Propose Mitigation Measures. Following completion of the impact evaluation matrices, the proponent, in coordination with Fort Bliss DOE, will enumerate the categories and specific actions that are judged to result in potentially significant adverse impacts. At this point, the proponent consults with Fort Bliss DOE to evaluate possible mitigation actions that may be proposed to address potential impacts. If project modifications are proposed, the proponent will re-evaluate the impact of the project beginning at Step 4.

Step 6. Develop Additional Environmental Documentation. After enumerating the impacts, the proponent will consult with the Fort Bliss DOE regarding the results of the environmental evaluation and proposed mitigation measures. The Fort Bliss DOE will then review the environmental evaluation and proposed mitigation measures and make a determination as to whether any additional environmental documentation is required.

The type of environmental documentation required may depend on the findings resulting from the impact analysis. The primary guidance for determining the type of documentation required is AR 200-1, *Environmental Protection and Enhancement* and AR 200-2, *Environmental Effects of Army Actions*. Actions that are similar in nature to those described in the PEIS will probably require limited documentation in the form of a REC. More extensive environmental documentation takes the form of a separate EA and a related FONSI, or an EIS and a related ROD. If an EA or EIS is required, the Fort Bliss DOE will be able to assist the proponent in identifying appropriate information sources and procedures.

A.2.1 Resource Groups and Attributes

Fourteen resource groups and individual group attributes were established to provide a framework for the identification of baseline conditions and to facilitate identification of potential impacts. These resource groups are based on the similarity of attributes, a review of installation resources, related resource protection laws and regulations, and previous NEPA compliance documents. The resource groups and attributes are as follows:

A.2.1.1 Land Use

- Main Cantonment Area
- Fort Bliss Training Complex including Biggs AAF
- Aesthetics and Visual Resources

A.2.1.2 Main Cantonment Area Infrastructure

- Transportation
- Utilities
- Energy
- Communications

A.2.1.3 Training Area Infrastructure

- Transportation
- Utilities
- Energy
- Communications

A.2.1.4 Airspace Use

- Airports
- Controlled/Uncontrolled Airspace
- Restricted Airspace
- Military Training Routes (MTRs)

A.2.1.5 Earth Resources

- Geology, Mineral, and Energy Resources
- Soils

A.2.1.6 Air Quality

A.2.1.7 Water Resources

- Groundwater
- Surface Water

A.2.1.8 Biological Resources

- Vegetation
- Wetlands and Arroyo-Riparian Areas
- Biodiversity
- Ecosystem Integrity
- Special Protection Areas
- Sensitive Species
- Wildlife

A.2.1.9 Cultural Resources

- Historic and Prehistoric Archaeological Resources
- Architectural and Landscape Resources
- Traditional Cultural Properties (TCPs)

A.2.1.10 Noise

- Vehicle
- Aircraft
- Impulse-artillery/Missile Firing
- Industrial

A.2.1.11 Safety

- Ground Safety
- Flight Safety
- Ordnance and Explosive Safety

A.2.1.12 Hazardous Materials and Items of Special Concern

- Hazardous Materials
- Items of Special Concern
- Related Management Programs

A.2.1.13 Socioeconomic Resources

- Demographics
- Economic Development
- Housing
- Community Services and Facilities

A.2.1.14 Environmental Justice

A.2.2 Project Impact Evaluation Parameters

This section serves as guidance for performing Step 4 of the NEPA Evaluation Methodology described above, and outlines how the Proposed Action was analyzed for potential impacts. The flow charts and contributing factors were used as a framework to qualitatively evaluate the potential impacts of the Proposed Action on the resource groups and attributes, and to determine whether more extensive documentation, in the form of an EIS, was necessary. The flow charts guided the process of characterizing the baseline status and the impact potential for each resource group and related attributes. The contributing factors were used to screen project activities and assess the level of environmental impact. This process can also be followed by proponents of future actions. These matrices provide a ranking of potential impact for each resource group attribute (1) during siting, construction, and operation of Master Plan projects, and (2) during training activities.

In addition to the programmatic guidance described above, the Fort Bliss NEPA Coordinator will use various “local” environmental resource categories based on typical installation projects to evaluate impacts. The following is a general classification of this local evaluation framework. The lists are not exhaustive, but contain example projects likely to be proposed on Fort Bliss. Initially, proponents will consult this list to determine how their project would be evaluated under the programmatic framework.

A.2.2.1 Air Quality, Noise, Hazardous Materials, and Items of Special Concern

- Sandblasting;
- Spray painting (outdoors);
- Structural painting (outdoors);
- Road repair/reconstruction;
- Construction;
- Asphalt operations;
- Projects involving demolition, renovation, removal or repair of building materials (wall coverings, floor tile, base cover, roofing materials, building sidings, ceilings, paint) in any man-made structure;
- New source/increase in emissions (vehicles, paint booths, boilers, incinerators);
- Facility demolition;
- Ordnance demolition;
- Training activities or projects with potential for emitting hazardous air pollutants, volatile organic compounds, or ozone-depleting chemicals; and
- Projects with potential to generate significant noise, such as new industrial operations, changes in firing points, flight paths, or new flight paths.

A.2.2.2 Water Resources, Storage Tanks, and Environmental Restoration

- Oil/water separators;
- Replacement of exterior water lines;
- Projects impacting/installing wells;
- Projects near groundwater monitoring wells;
- Removal, repair or maintenance of underground storage tanks (USTs) or above ground storage tanks (ASTs);
- Moving ASTs;
- Projects involving installation of plumbing systems, upgrades, especially drinking water or sewage connections; and
- Projects near any known solid waste management unit (SWMU).

A.2.2.3 Biological Resources

- Projects that take place in or near reservoirs, creeks, drainages, Waters of the U.S., or other bodies of water;

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- Areas that may contain migratory bird nests;
- Downrange projects in previously undisturbed areas;
- Projects in or near prairie dog towns;
- Changes in aircraft/airspace use;
- Projects that involve potential effects on sensitive species or their habitats;
- Projects that involve disturbance or removal of natural vegetation;
- Projects that involve removal or control of animals or birds by any means (chemical, physical);
- Projects that disturb or impact wetlands or drainages, or areas where protected plants are found;
- Arroyo-riparian crossings;
- Threatened and endangered species;
- All ground-disturbing activities on ranges and undisturbed areas on post; and
- Renewals and grants of leases and rights-of-way (ROWS) for ranges and undisturbed areas on post.

A.2.2.4 Cultural Resources (Prehistoric and Historic Archaeological Resources, Architectural and Landscape Resources)

- Ground-altering activities;
- Cantonment construction in areas with potential historic archaeological sites;
- New leases or land transfers;
- Undertakings that will directly or indirectly affect facilities and landscapes (including rural ranges, and training areas) that are eligible for, or included in, the NRHP (historic facilities);
- All exterior work that can be seen from historic facilities or from which historic facilities can be seen;
- Landscapes, roads, walkways, etc., within historic districts or that can be seen from historic facilities;
- Cold War facilities and landscapes (including ranges and training areas) which retain integrity, including military missions or Research and Development (R&D) functions; and
- Demolition or relocation of properties eligible for inclusion in the NRHP, unevaluated properties that are more than 45 years old, and Cold War properties which retain integrity that included military mission or R&D functions.

A.2.2.5 Hazardous Materials and Items of Special Concern

- Projects involving disposal of possibly hazardous wastes;

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- Projects in motor pool, especially involving hazardous waste, or petroleum, oils, and lubricants (POLs) disposal or storage;
- Insect or plant control under *Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA)*;
- Any project involving a requirement for a spill plan by a contractor or use of hazardous materials;
- Standard Operating Procedures (SOPs) for hazardous wastes;
- Management of pesticides, polychlorinated biphenyls (PCBs), asbestos, and radon;
- Use of the open detonation pit;
- Projects built on or near closed landfills or other installation restoration projects;
- Projects involving the use or storage of hazardous materials;
- Projects with the potential to generate hazardous waste or hazardous materials;
- Landfill projects dealing with fill material, reclamation, and erosion;
- Contracting projects with the potential to generate solid waste or involve items of special concern; and
- Projects near active landfills.

A.2.2.6 Training Area Management

- Project management and control: training requirements identification, monitoring, data collection;
- Development and program use of GIS data layers and remote imagery: land use management, map production;
- Land maintenance: soil stabilization/protection, maneuver damage repair, erosion control range and training facility repair, maneuver corridor development, low water crossings, field work; and
- Awareness training: video; pamphlets/field cards, classroom instruction.

A.2.3 Contributing Factors for Projects or Training Exercises

The following section contains a summary of key issues related to potential impacts for each resource group described in Section A.2.1. In addition, a detailed description of some examples of contributing factors that can be used to rank impacts is provided. NEPA ranks these factors on a scale ranging from “significant adverse,” “adverse,” through “no impact” to “beneficial impact,” depending on the intensity of impact. The significance of the impact will vary with the context and intensity of the proposed action. Context means the action must be analyzed within the Region of Influence (ROI), affected interests, and site-specifically. The intensity of the impact refers to the severity of its environmental effect.

A.2.3.1 Land Use and Infrastructure

The land use resource group includes on-post and off-post land use, and aesthetics and visual resources (Figure A-2). Land use plans address the integration of the built and natural environments and the human

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**LAND USE AND INFRASTRUCTURE
(On-post and Off-post Land Use, and Aesthetics)**

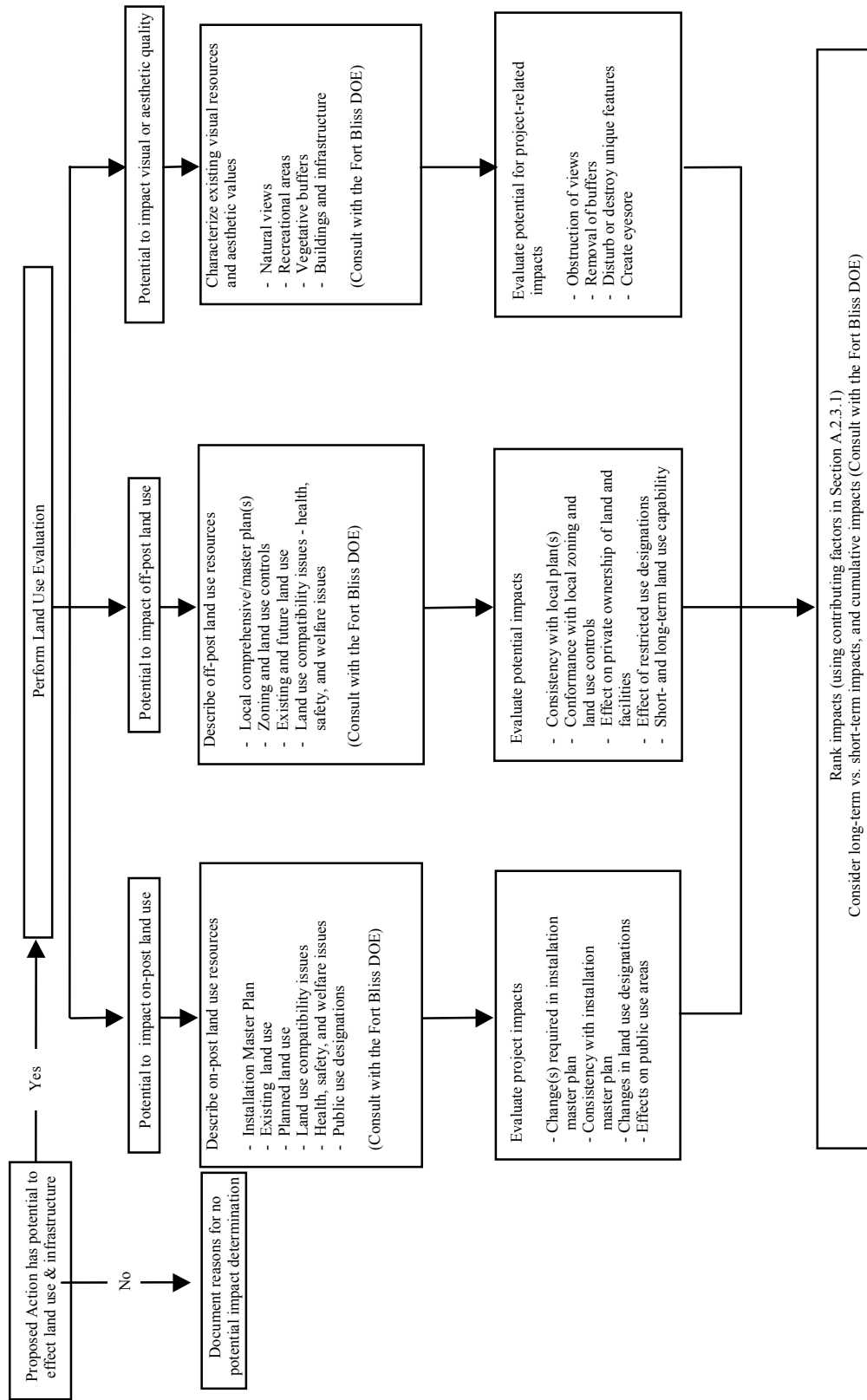


Figure A-2. Land Use and Infrastructure Evaluation Flowchart.

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activities occurring in a community. In general, a community land use plan is implemented to protect the health, safety, and welfare of the population. In recent years, land use plans have been used to address protection of environmental resources and aesthetics.

On-post Land Use. When evaluating the project, it is important to consider whether the project is consistent with the designated land use and compatible with neighboring land uses. If the project is not appropriate for and compatible with the designated land use then changes in the project or changes in zoning may be necessary. The contributing factors for ranking impacts associated with on-post land are presented below.

<u>Rank</u>	<u>Contributing Factors</u>
Significant Adverse	<ul style="list-style-type: none">• The activity is inconsistent with the installation Master Plan and has the potential to adversely effect the health, safety and welfare of the population or the quality of the environment.• The activity creates a direct conflict among neighboring land use activities, for example, residential areas and range/training areas.• The activity will permanently destroy the existing land use designation, for example, convert open space to commercial facilities.
Adverse	<ul style="list-style-type: none">• The activity is inconsistent with the Master Plan, but does not have the potential to adversely effect the health, safety, and welfare of the population or the quality of the environment.• The activity requires a change in a local land use plan.• The activity requires a change in local military zoning.
No Impact	<ul style="list-style-type: none">• The activity is consistent with the installation Master Plan and does not affect local land use planning or military zoning.
Beneficial Impact	<ul style="list-style-type: none">• The activity is consistent with all planning guidelines and has the potential to have positive effects on public welfare and environmental quality.

Off-post Land Use. When evaluating the activity for land use compatibility, it is also important to consider off-post land use plans. Contributing factors for ranking impacts associated with off-post land use are presented as follows.

<u>Rank</u>	<u>Contributing Factors</u>
Significant Adverse	<ul style="list-style-type: none">• The activity is inconsistent with off-post land use plans or incompatible with existing land uses and may adversely effect the health, safety, and welfare of the population or the quality of the environment.
Adverse	<ul style="list-style-type: none">• The activity is inconsistent with off-post land use plans or incompatible with existing off-post land uses, but will not adversely effect the health, safety, and welfare of the population or the quality of the environment.
No Impact	<ul style="list-style-type: none">• The activity is consistent with land use plans and compatible with existing land uses.
Beneficial Impact	<ul style="list-style-type: none">• The activity is consistent with all land use plans and existing uses and may positively effect public welfare and environmental quality.

Visual and Aesthetic Values. Aesthetics, in a broad sense, involve the visual, audio, and tactile environment and their emotional or psychological effect on people. Visual/aesthetic resources refer to the structures, landscapes, and spaces of an area that provide information for an individual to develop perceptions of the area. When considering a project or activity for development, it is important to determine if it will adversely effect the visual/aesthetic setting perceived by residents of the surrounding area. Contributing factors for ranking impacts associated with visual and aesthetic values are provided below.

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<u>Rank</u>	<u>Contributing Factors</u>
Significant Adverse	<ul style="list-style-type: none">• The activity will degrade the visual scene of the surrounding area, including interfering with natural views, destroying natural vegetative buffers, contributing smoke, causing odors and noise, or discoloring water bodies.• The activity will destroy, damage, or obscure scarce or unique geological features, landscapes, or other objects of particular aesthetic value.• The activity will deny accessibility to aesthetic resources, including recreational access.
Adverse	<ul style="list-style-type: none">• The activity will cause temporary disruption of the visual scene of the surrounding area, but will not disturb natural vegetative buffers.• The activity will degrade the visual scene of the surrounding area, but architectural and landscaping techniques are employed to minimize the impact.• The activity will limit accessibility to aesthetic resources, including restricted recreational access.
No Impact	<ul style="list-style-type: none">• The activity will not alter the visual or aesthetic character of the area.
Beneficial Impact	<ul style="list-style-type: none">• The activity will improve or enhance natural landscape views, vegetative buffers, and will improve the aesthetic character of the area.

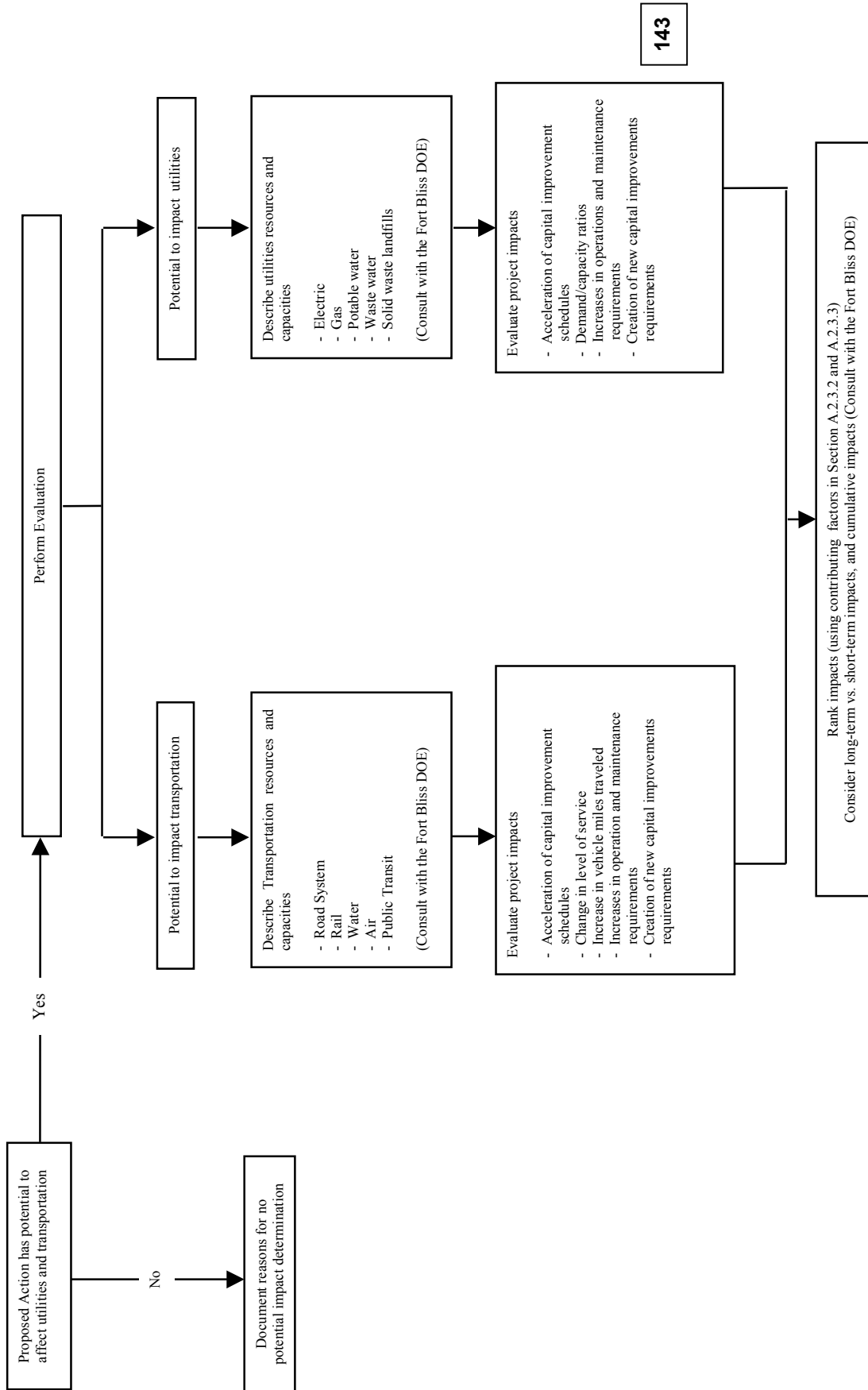
A.2.3.2 Main Cantonment Area Infrastructure

The infrastructure resource group includes transportation, utilities, energy, and communications (Figure A-3).

Transportation. Transportation networks include road systems, railroads, waterway transportation routes, and air transport. Transportation services facilitate the movement of people and goods. Transportation networks can have high social costs such as noise, safety hazards, and air pollution. The travel ways can cause aesthetic problems and create physical barriers to groundwater movement, and human and wildlife passage. When evaluating potential impacts associated with transportation, it is important to consider (1) the extent to which the project's transportation improvements are consistent with applicable local and regional transportation plans and (2) the level of service (LOS) resulting from the assignment of project-induced travel demand to the existing transportation network. Contributing factors for ranking impacts associated with transportation issues are presented as follows.

<u>Rank</u>	<u>Contributing Factors</u>
Significant Adverse	<ul style="list-style-type: none">• The activity requires transportation services and/or infrastructure that are nonexistent and will need to be constructed before construction of the project.• The activity is likely to result in increased use of a public road such that the LOS would decrease to an unacceptable level, as defined in county or local comprehensive plans.• The activity is likely to result in increased use of railways, water shipping lanes, and air space beyond existing or projected capacity.• The activity requires the acceleration of planned capacity improvements by more than 5 years.• The activity requires development of new or significantly expanded transportation services, which will cause cumulative impacts on air quality, water quality, and biological resources.

**MAIN CANTONMENT AREA INFRASTRUCTURE
(Utilities and Transportation)**



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Figure A-3. Main Cantonment Area Infrastructure Evaluation Flowchart.

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<u>Rank (Continued)</u>	<u>Contributing Factors</u>
Adverse	<ul style="list-style-type: none"> • The activity is likely to result in increased utilization of a public road which may cause a decrease in the LOS, but the LOS will remain equal to or better than the LOS planned in county or local comprehensive plans. • The activity is likely to result in increased utilization of railways, water shipping lanes, and air space; but is not projected to exceed existing or projected capacity. • The activity is likely to limit expanded transportation services, which are not projected to increase impacts on air quality, water quality, and biological resources. • The activity requires the acceleration of planned capacity improvements by 2 to 5 years.
No Impact	<ul style="list-style-type: none"> • The activity will not increase utilization of transportation services. • The activity requires related increases in transportation services that are not anticipated to decrease the LOS projected in county or local comprehensive plans. • The activity requires the acceleration of planned capacity improvements by 1 year or less.
Beneficial Impact	<ul style="list-style-type: none"> • The activity will enhance existing services and/or infrastructure.

Utilities. Utilities refer to the public services such as water and sanitation that are located in the areas that serve and are used by residents and installation activities. Utility services provided at Fort Bliss include: potable water, sewage collection and treatment, storm water collection, and trash collection and disposal. A key consideration in evaluating the impacts associated with a project is to compare the increased or decreased demand for public services with the unused capacity of the provider. Contributing factors for ranking impacts associated with utility issues regarding water, sewage, and storm water collection are provided below. Contributing factors for ranking impacts associated with solid waste and landfills will follow the factors for the other utilities.

<u>Rank</u>	<u>Contributing Factors</u>
Significant Adverse	<ul style="list-style-type: none"> • The activity will require utility services that are nonexistent. • The immediate and/or long-term utility needs of the activity have the potential to exceed the actual or projected capacity of the utility to provide service, without a major system modification such as additional generation capacity. • The activity requires the acceleration of planned capacity improvements by more than 5 years.
Adverse	<ul style="list-style-type: none"> • The activity is likely to increase immediate and or long-term demand for service of one or more utilities beyond current or projected capacity without minor system modifications such as increasing capacity to existing distribution systems or the extension of distribution systems. • The activity requires the acceleration of planned capacity improvements by 1 to 5 years.
No Impact	<ul style="list-style-type: none"> • The activity does not affect demand for any utilities. • The immediate and/or long-term increases in demand for service are not expected to warrant any system modification. • The activity requires the acceleration of planned capacity improvements by less than 1 year.
Beneficial Impact	<ul style="list-style-type: none"> • The activity will result in improved efficiencies or conservation.

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Solid Waste and Landfills. When considering the impact of a project on the generation of solid waste, it is important to determine the volume and rate of waste generation and the capacity of solid waste landfills and waste management practices, including recycling.

<u>Rank</u>	<u>Contributing Factors</u>
Significant Adverse	<ul style="list-style-type: none">• Recyclable solid wastes generated by the activity will not be recycled because the volume generated will exceed the capacity of recycling operations.• Accommodating the increased solid waste generated will cause a substantial increase in consumers cost of waste management.• Storage and handling of wastes increases the potential for spills or leaks and that may potentially contaminate soil, groundwater, or surface water.
Adverse	<ul style="list-style-type: none">• Solid waste volumes generated will reduce the life of existing waste management and disposal operations.• Accommodating the increased waste generated will cause a nominal increase in consumer costs of waste management.
No Impact	<ul style="list-style-type: none">• The activity will not increase the waste stream.
Beneficial Impact	<ul style="list-style-type: none">• The activity will reduce the economics and environmental costs and/or effects of solid waste management.

Energy. Energy refers to public services such as electricity and natural gas. A key consideration in evaluating the impacts associated with a project is to compare the increased or decreased demand for energy services with the unused capacity of the provider. Contributing factors for ranking impacts associated with energy issues are presented below.

<u>Rank</u>	<u>Contributing Factors</u>
Significant Adverse	<ul style="list-style-type: none">• The activity will require energy services that are nonexistent.• The immediate and/or long-term energy needs of the activity have the potential to exceed the actual or projected capacity of the energy supplier to provide service, without a major system modification such as additional generation capacity.• The activity requires the acceleration of planned capacity improvements by more than 5 years.
Adverse	<ul style="list-style-type: none">• The activity is likely to increase immediate and/or long-term demand for service of one or more energy utilities beyond current or projected capacity without minor system modifications such as increasing capacity to existing distribution systems.• The activity requires the acceleration of planned capacity improvements by 1 to 5 years.
No Impact	<ul style="list-style-type: none">• The activity does not affect demand for any energy utilities.• The immediate and/or long-term increases in demand for service are not expected to warrant any system modification.• The activity requires the acceleration of planned capacity improvements by less than 1 year.
Beneficial Impact	<ul style="list-style-type: none">• The activity will improve economic and/or environmental efficiencies associated with energy services.

Communications. This refers to public communication services that are located in the areas that serve and are used by residents and installation activities. A key consideration in evaluating the impacts

associated with a project is to compare the increased or decreased demand for public communication services with the unused capacity of the provider. In addition, radio frequency interference from radar, instrumentation, and communication transmitters can affect communications within the region. Contributing factors for ranking impacts that are associated with communication issues are provided below.

<u>Rank</u>	<u>Contributing Factors</u>
Significant Adverse	<ul style="list-style-type: none"> • The activity will require communication services that are nonexistent. • The action will stop activity of other regional users. • The immediate and/or long-term communication needs of the activity have the potential to exceed the actual or projected capacity of the system to provide service, without a major system modification such as additional capacity. • The activity requires the acceleration of planned capacity improvements by more than 5 years.
Adverse	<ul style="list-style-type: none"> • The activity is likely to increase immediate and/or long-term demand for service beyond current or projected capacity without minor system modifications such as increasing capacity to existing distribution systems or the extension of distribution systems. • The activity results in regional radio frequency interference that requires adaptation by other regional frequency users. • The activity requires the acceleration of planned capacity improvements by 1 to 5 years.
No Impact	<ul style="list-style-type: none"> • The activity does not affect demand for, or quality of, regional communications. • The immediate and/or long-term increases in demanded for service are not expected to warrant any system modification. • The activity requires the acceleration of planned capacity improvements by less than 1 year.
Beneficial Impact	<ul style="list-style-type: none"> • The activity will enhance the immediate and/or long-term communication needs or quality of the activity.

A.2.3.3 Training Area Infrastructure

The infrastructure resource group includes transportation, utilities, energy, and communications (see Figure A-3). The criteria for ranking these resources are the same for the training area as for the Main Cantonment Area described in A.2.3.2.

A.2.3.4 Airspace Use

Airspace must be managed and used in a manner that best serves the competing needs of commercial, general, and military aviation (Figure A-4). The Federal Aviation Administration (FAA) is responsible for the overall management of airspace and has established different airspace designations that are designed to protect aircraft during flights to or from an airport, transiting between airports, flying in the enroute airspace system, or operating within “special use” areas identified for defense-related purposes.

<u>Rank</u>	<u>Contributing Factors</u>
Significant Adverse	<ul style="list-style-type: none"> • Activities restrict, limit, or otherwise delay other air traffic in the region.

**AIRSPACE USE
(Airport Operations, Restricted Airspace, MTRs)**

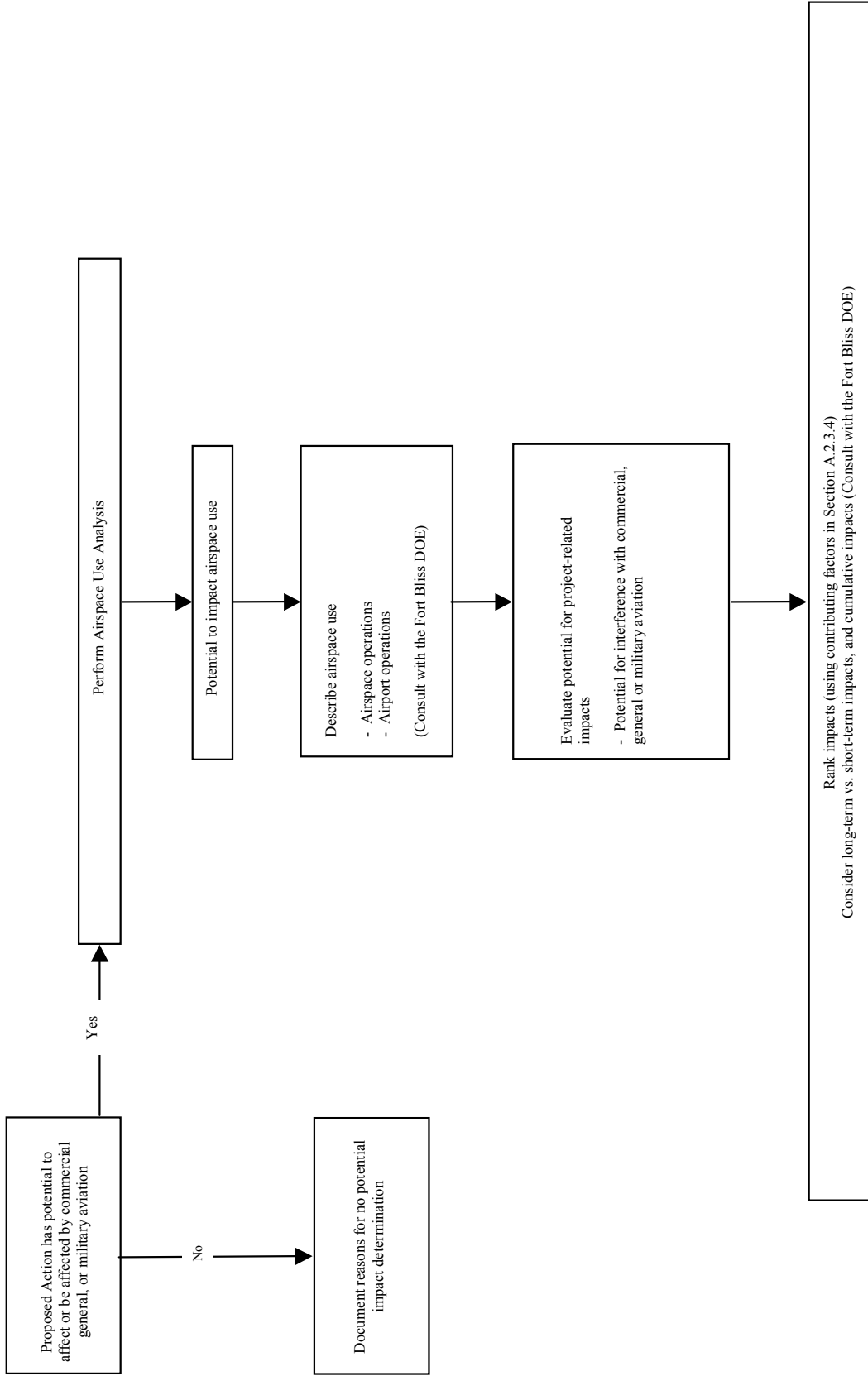


Figure A-4. Airspace Use Evaluation Flowchart.

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<u>Rank (Continued)</u>	<u>Contributing Factors</u>
Adverse	<ul style="list-style-type: none"> • Activities require major modifications to airspace or air traffic control systems and/or facilities. • Activities encroach on airspace designated for special use in the area. • Activities require airspace realignment or air traffic control procedural changes which does not disrupt the general flow of air traffic in an area. • Activities require temporary changes to air traffic operations that do not significantly delay or restrict aircraft movements.
No Impact	<ul style="list-style-type: none"> • Activities do not restrict enroute or airport air traffic operations; require airspace Air Traffic Control (ATC) or navigational modifications; encroach upon adjacent airspace; nor affect airport capacity.
Beneficial Impact	<ul style="list-style-type: none"> • Activities that improve/enhance ATC systems/facilities, or improve flow of air traffic.

A.2.3.5 Earth Resources

The geologic features (topography, stratigraphy, etc.) of an area can both impact and be impacted by Fort Bliss MMP activities. Geologic features include surface and subsurface formations like mineral reserves and fault lines (Figure A-5). Additional examples include unique surface formations with aesthetic value or fossils with paleontological value. A project can be impacted by changes in geologic features such as seismic activity along fault lines or structural failure due to slope instability. In addition, a project can have an impact on geologic resources by destroying features of aesthetic or scientific value or by precluding access to mineral resources of economic value. A listing of contributing factors used to evaluate potential impacts and their relative significance to geological resources is presented below.

<u>Rank</u>	<u>Contributing Factors</u>
Significant Adverse	<ul style="list-style-type: none"> • The activity results in irretrievable loss of important mineral or paleontological resources. • The activity will change local drainage patterns. • The activity will locate structures within a seismic impact zone, and the structures are not designed to withstand maximum recorded horizontal acceleration. • The activity is subject to or is likely to contribute to subsidence and subsidence is likely to cause loss of life or property. • The activity will locate structures in areas subject to slope instability and slope failure is likely to result in loss of life or property, or have an adverse impact on water or biological resources.
Adverse	<ul style="list-style-type: none"> • The activity is located within a seismic impact zone, but structures are designed to withstand the maximum recorded horizontal acceleration. • The activity is located in areas subject to slope instability, but the project has been designed to minimize the likelihood and/or impacts of slope failure. • The activity will reduce the extent of geological features of scientific, educational, and aesthetic interest.
No Impact	<ul style="list-style-type: none"> • The activity will create localized and temporary construction-related impacts. • The activity does not include construction of structures in seismic impact zones, on or near unstable slopes, in areas subject to subsidence. • The activity will not occur in areas with surface formations, mineral resources, or paleontological resources.

**EARTH RESOURCES
Geology, Soils)**

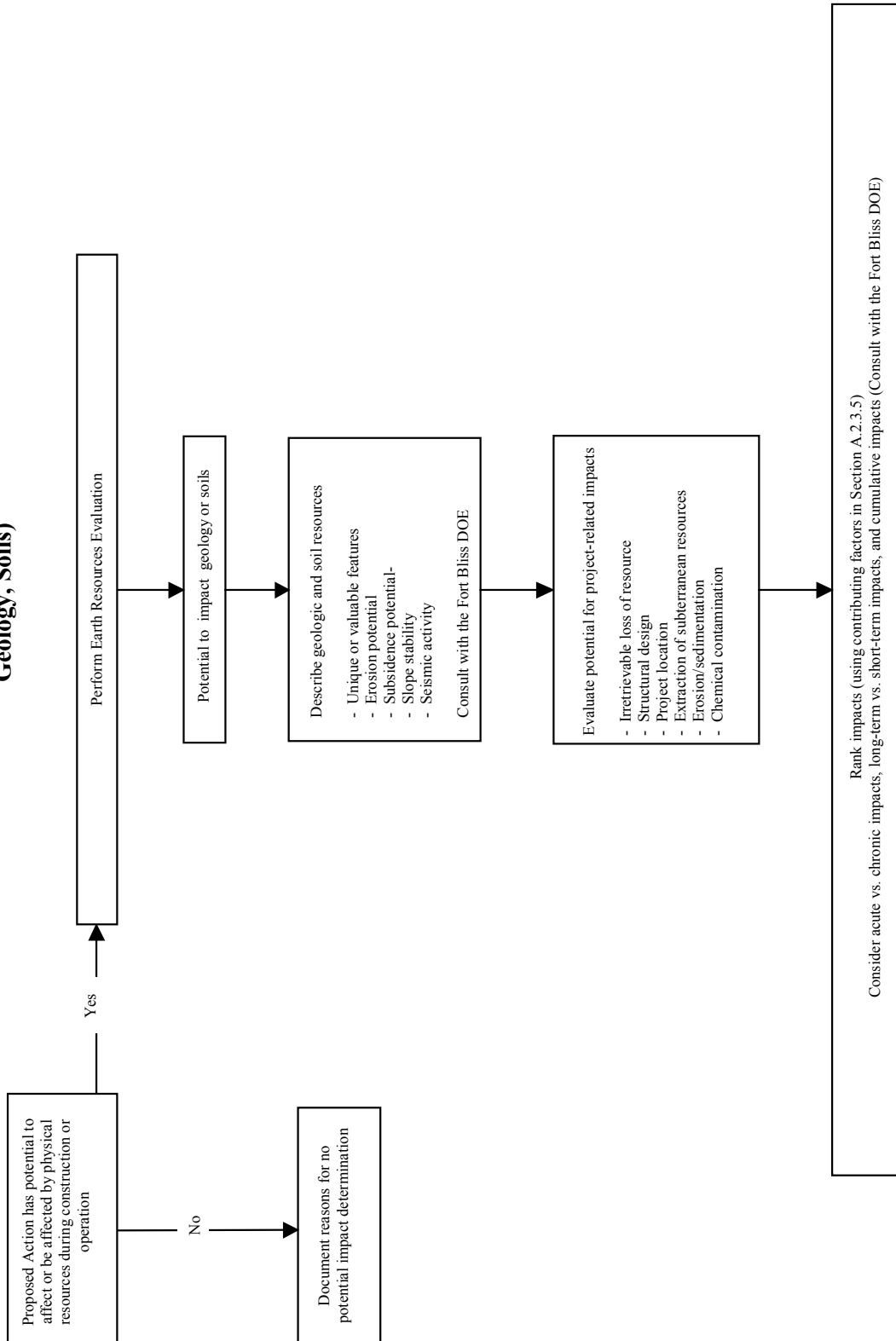


Figure A-5. Earth Resources Evaluation Flowchart.

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Rank (Continued)

Contributing Factors

- | | |
|-------------------|--|
| Beneficial Impact | <ul style="list-style-type: none">• The activity does not involve extraction of subsurface resources.• The activity improves/enhances geologic or paleontologic values, or access to mineral resources. |
|-------------------|--|

Soils. Soils are the thin layer of unconsolidated material on the land surface. Their properties result from the interaction of underlying geology, topography, local climate, microbial action, and vegetation. Soils can be altered by natural processes of weathering, water movement, and biological activity; and by human activities such as tilling, grazing, construction, compaction, and removal of vegetation. Key soil properties to consider in an EA include permeability, leachability, thickness, fertility, and erodibility (see Figure A-5). Construction and other activities on unsuitable soils can cause a variety of problems from groundwater contamination, erosion, sedimentation, landslides, and irretrievable loss of agricultural or rangeland. A listing of contributing factors used to evaluate potential soil impacts are presented below.

Rank

Contributing Factors

- | | |
|---------------------|--|
| Significant Adverse | <ul style="list-style-type: none">• The activity will locate structures in areas subject to slope instability, and slope failure likely to result in loss of life or property or have an adverse impact on water or biological resources.• The activity results in erosion, which would likely cause loss of sensitive species, loss of sensitive habitat, loss of cultural resources, loss of infrastructure or facilities, or loss of human life.• The activity results in sediment loading to stream courses, which will result in exceedances of state or federal standards.• Chemical contamination of soil resources is likely to cause contamination of groundwater or surface water resources.• The activity results in irretrievable loss of soils sustaining valuable grazing or forest lands. |
| Adverse | <ul style="list-style-type: none">• The activity results in erosion, which increases sediment loading to stream courses, but is not likely to result in exceedances of state or federal water quality standards or alteration of aquatic habitat.• The activity is likely to cause short-term erosion, but will not cause the loss of sensitive species, sensitive habitat, cultural resources, infrastructure, or human life.• The activity is located in areas subject to slope instability, but the project has been designed to minimize the likelihood and/or impacts of slope failure. |
| No Impact | <ul style="list-style-type: none">• The activity results in no erosion or in short-term, localized erosion that does not result in increased loadings to stream courses.• The activity does not have the potential to release chemicals onto soils. |
| Beneficial Impact | <ul style="list-style-type: none">• The activity reduces problems from groundwater contamination, erosion, sedimentation, landslides, or loss of grazing or forest lands. |

A.2.3.6 Air Quality

Air resources are impacted by releases of gases and particulates from stationary and mobile sources and is influenced by meteorological conditions such as prevailing wind, sunlight, and temperature inversions (Figure A-6). A proposed mission, project, or environmental-management activity can act as a source and/or receptor of air pollutants. Contributing factors used to evaluate potential impacts to air resources are presented below.

AIR QUALITY

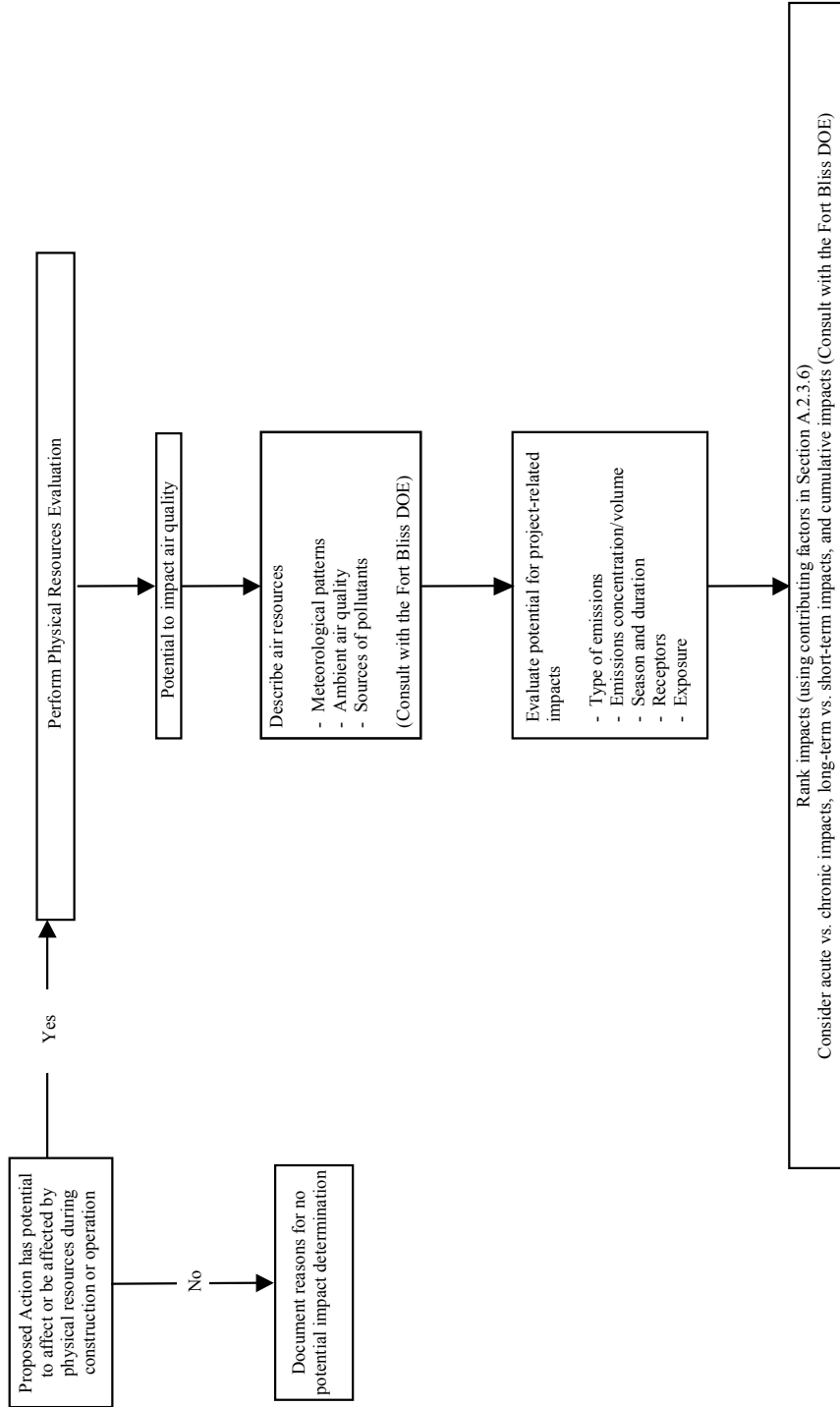


Figure A-6. Air Quality Evaluation Flowchart.

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<u>Rank</u>	<u>Contributing Factors</u>
Significant Adverse	<ul style="list-style-type: none">• The activity will introduce pollutants to the air that will cause ambient air quality to exceed levels established by the National Ambient Air Quality Standards (NAAQS) for carbon monoxide (CO), sulfur dioxide (SO₂), nitrogen dioxide (NO₂), lead, ozone, and particulates.• The activity will release air pollutants in levels that exceed the National Emission Standards for Hazardous Air Pollutants (NESHAP); for example, beryllium, mercury, arsenic, asbestos, benzene, radionuclides, and vinyl chloride.• The activity will introduce NAAQS pollutants to an area designated as a nonattainment area.• The activity will introduce pollutants to the air that, in combination with other sources, will contribute to exceedance of NAAQS.• The activity will introduce pollutants into indoor air that exceed <i>Occupational Safety and Health Act (OSHA)</i> (29 CFR 1910.95) exposure limits.• The activity is subject to New Source Performance Standards (NSPS) and is not expected to comply with NSPS upon commencement of operation.• Deposition of atmospheric pollutants (either directly to surface water or to land) is likely to contribute to ambient water quality problems (e.g., nutrient enrichment, acidification, toxic accumulation).
Adverse	<ul style="list-style-type: none">• The activity will introduce pollutants into indoor air that exceed OSHA exposure limits.• The activity will introduce NAAQS or NESHAP pollutants, but will not exceed limits either alone or in conjunction with other sources.• The activity will result in a temporary increase in ambient concentrations of pollutants, but will not violate NAAQS.
No Impact	<ul style="list-style-type: none">• The activity does not release pollutants into the air.
Beneficial Impact	<ul style="list-style-type: none">• The activity improves overall air quality and reduces pollutants.

A.2.3.7 Water Resources

Watershed resources that may be impacted by mission activities and master planning projects include groundwater, surface water, and floodplains (Figure A-7). Evaluating water resources includes an analysis of impacts to the physical, chemical, and biological properties of the water body. An evaluation of an activity's impact on water resources should consider short-, long-term, and cumulative impacts. Following, are general descriptions of water resources and factors to consider when evaluating the potential impacts of project activities to water resources.

Surface Water. Surface water includes streams, rivers, ponds, lakes, wetlands, estuaries, bays, and oceans. When evaluating project activities, it is important to consider physical and chemical impacts. Inputs that deteriorate water quality and impact aquatic life include nutrients, heat, changes in pH, sediments, oxygen-consuming substances, in addition to toxic compounds such as petroleum, PCBs, chlorinated pesticides, and heavy metals. Sources of contamination to surface water include point source discharges, non-point source runoff, marine vessels, and groundwater. Changes in the volume or velocity of water in a water body can erode stream banks, increase siltation/sedimentation, change salinity regimes, and ultimately modify or destroy habitat.

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**WATER RESOURCES
(Groundwater, Surface Water, Floodplains)**

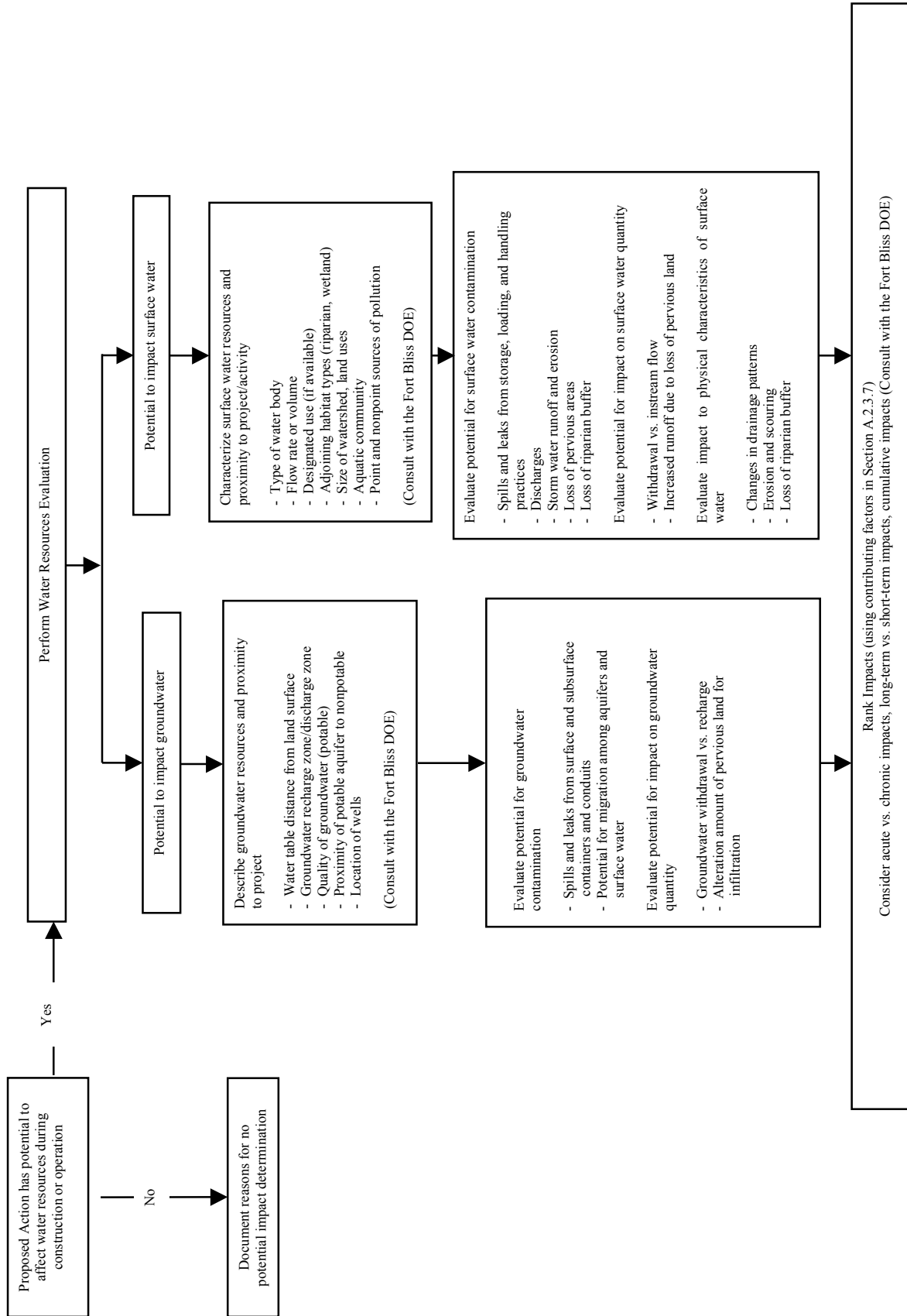


Figure A-7. Water Resources Evaluation Flowchart.

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Withdrawals from surface water bodies can reduce in-stream flows below critical levels that are necessary to maintain riparian and in-stream communities. Contributing factors for ranking potential impacts to surface water are presented below.

<u>Rank</u>	<u>Contributing Factors</u>
Significant Adverse	<ul style="list-style-type: none">• Activity results in introduction of pollutants (through contaminated discharge, contaminated runoff, or dredging of contaminated sediments) to surface water and is likely to cause exceedance of state ambient Water Quality Standards (WQS), including chemical specific standards and physical characteristics like turbidity, pH, dissolved oxygen.• Activity results in discharge that exceeds National Pollutant Discharge Elimination System (NPDES) permit limitations.• Activity results in modification to flow volume or velocity such that scouring occurs in the water body and is likely to result in modification of stream channel, bottom substrate, and/or bank stability.• Activity is likely to impede natural drainage patterns or the direction of flow of surface water body.• Activity results in point or nonpoint source discharge of sediments, nutrients, chemicals or other parameters that result in modification or destruction of critical habitat of threatened or endangered species.• Withdrawal of surface water or groundwater that supplies surface water results in disruption of riparian vegetation.• Introduction of pollutants, including sediment, that will contribute to exceedance of ambient WQS in combination with other sources.• Introduction of nutrients into a water body resulting in the occurrence of algal blooms more frequently, for extended time periods, or during critical intervals.• Withdrawal of surface water results in reduction of sufficient flow to support sensitive habitats, threatened or endangered species, or their habitats.
Adverse	<ul style="list-style-type: none">• Activity results in introduction of pollutants (through contaminated discharge, contaminated runoff, or dredging of contaminated sediments) to surface water, but introduction is not likely to cause exceedance of ambient WQS, including chemical-specific standards and physical characteristics like turbidity, pH, dissolved oxygen.• Pollutant discharges do not exceed NPDES permit limitations.• Activity results in point or nonpoint source discharge of sediments, nutrients, chemicals, or other parameters that result in modification or destruction of habitat of indigenous species.• Influx of nutrients that results in periodic algal blooms.• Withdrawal of surface water results in reduction of flow, but is not likely to impact riparian vegetation, aquatic life, sensitive habitats, or threatened or endangered species.
No Impact	<ul style="list-style-type: none">• Activity does not result in introduction of pollutants or withdrawal of surface water.
Beneficial Impact	<ul style="list-style-type: none">• Activity improves overall surface water quality/quantity, and reduces pollutants.

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Groundwater. Groundwater is water contained in a saturated zone at some depth below the ground surface. When evaluating the project activity, it is important to determine if either the quantity or quality of groundwater supplies will be impacted. Pollutants can be introduced to groundwater by seepage through soils and by injection through wells. It is also important to consider the interaction between surface water and groundwater to identify the potential for cross contamination. Contributing factors for ranking potential impacts to groundwater resources are presented below.

<u>Rank</u>	<u>Contributing Factors</u>
Significant Adverse	<ul style="list-style-type: none">• The activity results in introduction of pollutants to potable groundwater and is likely to cause groundwater to exceed maximum contaminant level (MCL).• Introduction of pollutants to potable groundwater will not exceed MCL, but will continue over life of project.• Introduction of pollutants to potable or nonpotable groundwater will contribute to exceedances of MCL and/or WQS in combination with other sources.• Withdrawal of surface water or groundwater that supplies surface water results in disruption of riparian vegetation.• Introduction of pollutants, including sediment, that will contribute to exceedance of ambient WQS in combination with other sources.• Introduction of nutrients into a water body resulting in the occurrence of algal blooms more frequently, for extended time periods, or during critical intervals.• Activity results in withdrawal of groundwater, reduction of infiltration, or change in groundwater flow direction such that it diminishes seepage or spring-water inflow into an ecologically significant habitat, such as wetlands, or that results in modification of threatened or endangered species habitat.• Withdrawal of groundwater is likely to result in salt water intrusion to potable aquifer.
Adverse	<ul style="list-style-type: none">• Introduction of pollutants to potable groundwater is not likely to cause groundwater to exceed MCL.• Introduction of pollutants to groundwater source that discharges to surface water is not likely to cause surface water to exceed ambient WQS.• Activity results in withdrawal of groundwater, reduction of infiltration, or change in groundwater flow direction that reduces or eliminates inflow to streams that are not ecologically significant habitat.• Withdrawal of groundwater or reduction in infiltration that lowers the depth of the groundwater table in unconfined aquifers, but does not impact vegetation or stream flow, or result in salt water intrusion.• Withdrawal of groundwater results in a reduction of the potentiometric surface (water-level elevations in wells tapping a confined aquifer).
No Impact	<ul style="list-style-type: none">• No introduction of pollutants to groundwater.• No withdrawal of groundwater.
Beneficial Impact	<ul style="list-style-type: none">• Increase in the quality, quantity, and availability of groundwater, and reduction of pollutants.

A.2.3.8 Biological Resources

Biological resources that may be impacted by military and nonmilitary activities include upland and riparian vegetation; wildlife and/or their habitat; and threatened and endangered species and/or their

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habitat (Figure A-8). Proper management of vegetation, habitat, wildlife, and threatened and endangered species contributes to the biodiversity and ecosystem integrity of Fort Bliss. Evaluating impacts to biological resources requires knowledge of the types of plant and animal species present and their distribution throughout the area, and an understanding of the relationships among species, populations, and habitat. The evaluation should consider short-, long-term, and cumulative impacts. Following are examples of factors that contribute to an activity's classification as significant adverse, adverse, or no impact to biological resources. In addition, if sensitive species are involved, biological consultation under Section 7 of the *Endangered Species Act* may be required. This involves communication with the U.S. Fish and Wildlife Service (USFWS) to obtain a listing of such species in the area. If the project or activity has the potential to affect a listed species, ongoing consultation may be necessary.

Vegetation. Vegetation provides food and shelter for animals. It also prevents erosion and protects water quality. Some plant species provide food or habitat during critical life history stages of invertebrate and vertebrate species. Impacts to vegetation result from clearing land, construction, disturbances associated with training activities such as off-road vehicle maneuvers and fire, and from nonmilitary activities such as livestock land grazing. Aquatic vegetation can be impacted directly through water-based construction and indirectly through increased sedimentation or pollutant loading from land-based activities. When evaluating the impacts of a project on vegetation, it is important to consider the value of the vegetation in terms of ecosystem function and its abundance and distribution. A listing of contributing factors used for evaluating impacts to vegetation is presented below.

<u>Rank</u>	<u>Contributing Factors</u>
Significant Adverse	<ul style="list-style-type: none">• The activity will result in reduced diversity of terrestrial or aquatic vegetation.• The activity reduces or eliminates native species or their habitat.• The activity will create conditions conducive to proliferation of non-native, invasive species.• The activity replaces native vegetation that served as food source or habitat with vegetation that does not provide food or habitat.• The activity is located in proximity to unique plant populations or communities or isolated plant populations of scientific interest.• The activity results in the removal of vegetation, which will likely cause erosion and transport of sediment to waterways, resulting in large-scale degradation to water resources including arroyo/riparian areas.• The activity involves introduction of pollutants, including sediments and nutrients, to water bodies that may in turn impact sensitive species habitat.
Adverse	<ul style="list-style-type: none">• The activity replaces native vegetation with non-native, but noninvasive species.• The activity replaces native vegetation that served as food source or habitat with vegetation that provides food or habitat of lesser value.• The activity requires removal of vegetation, which will likely cause erosion and transport of sediment to waterways, resulting in the degradation of a limited amount of water resources including arroyo/riparian areas.• The activity involves introduction of pollutants, including sediments and nutrients, to water bodies that may in turn impact aquatic vegetation that serves as habitat for nonsensitive indigenous species.
No Impact	<ul style="list-style-type: none">• The activity does not remove vegetation, or the project activity is restricted to a previously developed area of the cantonment that has already been disturbed.

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**BIOLOGICAL RESOURCES
(Vegetation, Wildlife, Threatened or Endangered Species, Habitat)**

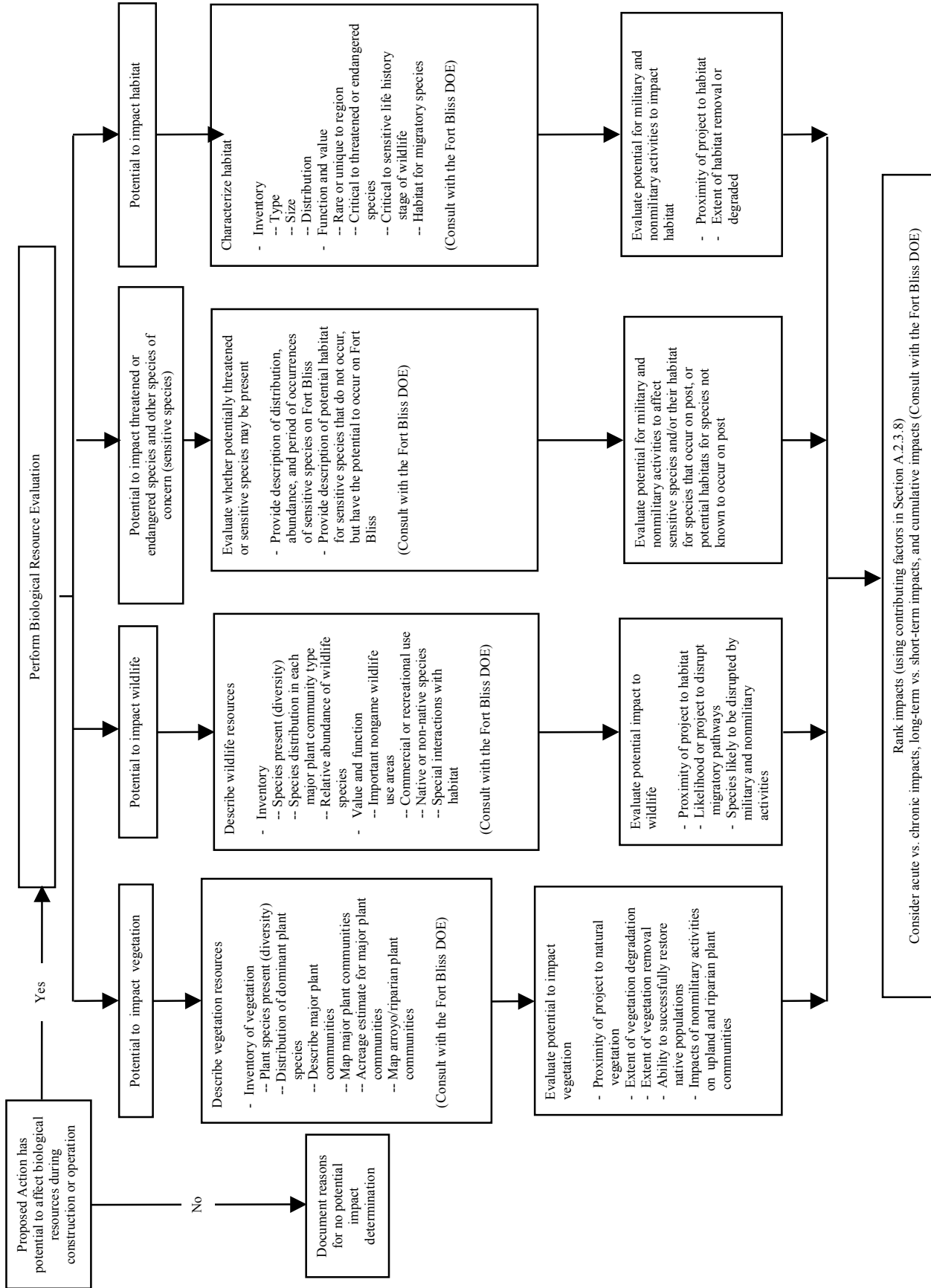


Figure A-8. Biological Resources Evaluation Flowchart.

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Rank (Continued)

Contributing Factors

- Beneficial Impact
- The activity improves/enhances vegetation communities, or biodiversity in the ecosystem.

Habitat. Habitat includes the biological community and the abiotic components within an area. The biological community is comprised of microbes, fungi, plants, and animals. The abiotic components consist of the geological features, soil, hydrology, climate and nutrient cycles. Habitat can be defined for an individual organism, a population, or for an entire biological community. Maintenance of the habitat is essential to maintenance of the community, population, and individual. When evaluating the impact of a project on habitat, it is important to consider the type and size of the habitat, the abundance and distribution of similar habitat types in the local area, and the importance of the habitat to the components of the biological community, including resident and migratory species. A listing of contributing factors used to rank habitat impacts is presented below.

Rank

Contributing Factors

- Significant Adverse
- The activity will destroy or damage rare or unique ecosystems (e.g., wetlands, arroyo/riparian habitat, conifer forests, pristine areas, important breeding or nesting grounds or important habitat used during migration).
 - The activity, alone or in combination with other activities, will impact the integrity of an ecological system by removing or degrading a large percent of an ecological association.
 - The activity will disrupt the flow of resources (e.g., nutrients, water) to or from unique ecosystems.
 - The activity will cause or contribute to the introduction of nuisance, invasive, or pest flora or fauna that may displace native species and alter existing habitat.
- Adverse
- The activity, alone or in combination with other activities, will impact the integrity of an ecological system by removing or degrading a relatively small percent of an ecological association.
 - The activity will exert a localized and temporary impact on rare or unique ecosystems.
- No Impact
- The activity is located within the cantonment area and will not modify or otherwise encroach on natural habitat.
 - There are no rare or unique ecosystems located at or near the proximity of activity.
- Beneficial Impact
- The activity improves/enhances the biological community and abiotic components within an area.

Wildlife. Wildlife includes the amphibians, reptiles, birds, and mammals that reside in the area. It also includes numerous bird species that migrate through and to the area. When evaluating the impact of a project on wildlife it is important to consider such factors as the species or species group distribution and abundance in the area of influence, the areas of use of important species or species groups, and potential affects of a project on wildlife diversity.

Rank

Contributing Factors

- Significant Adverse
- The activity will reduce or destroy food or habitat of importance to terrestrial, riparian, or aquatic wildlife.

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Adverse	<ul style="list-style-type: none"> • The activity eliminates or degrades important wildlife breeding areas and migratory routes. • The activity eliminates a native population. • The activity will result in a long- and/or short-term reduction in populations of wildlife over a relative large area. • The activity will result in the alteration of habitat structure resulting in a shift and/or reduction in wildlife species diversity. • The activity will create favorable conditions for nuisance, exotic, or pest species. • The activity will result in a short- and/or long-term reduction in populations of wildlife in a localized area. • The activity reduces aerial extent of wildlife breeding areas in a localized area, but does not eliminate them. • The activity results in temporary alteration of wildlife habitat, but not during critical stages of the species' life cycle. • The activity is located outside of the cantonment area, within a migratory pathway, but activities do not occur during migrations.
No Impact	<ul style="list-style-type: none"> • The activity is located within the cantonment area and does not disturb the habitat, food source, or migratory pathways of wildlife.
Beneficial Impact	<ul style="list-style-type: none"> • The activity improves or enhances the continued existence of wildlife and/or its habitat.

Threatened and Endangered Species (Sensitive Species). Sensitive species can either be plants or animals and can be listed by the federal and/or state governments. A list of federal threatened and endangered species is published in 50 CFR 17 (while the states of New Mexico and Texas maintain their own lists). To ensure the project will not impact federally listed threatened or endangered species or their habitat, consultation with the USFWS will take place. The results of this consultation process will be published in a separate document called a biological assessment. Contributing factors used to rank impacts to sensitive species follow.

<u>Rank</u>	<u>Contributing Factors</u>
Significant Adverse	<ul style="list-style-type: none"> • The activity is located in an area where sensitive species are present and these activities are known to have an adverse affect on these species. • The activity will destroy or degrade important habitat of sensitive species. • The activity fragments or encroaches over time on important habitat of sensitive species. • The activity, alone or in combination with other activities, is likely to inhibit a species' recovery or the recovery of its habitat.
Adverse	<ul style="list-style-type: none"> • The activity is likely to have a short-term direct or indirect affect on a very small percent of a sensitive species or its habitat, but not have a long-term effect. • The activity will result in temporary disturbance of habitat for sensitive species.
No Impact	<ul style="list-style-type: none"> • The activity is located in an area where sensitive species are present, but they are not sensitive to the actions associated with the activity.

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- Beneficial Impact
- There are no sensitive species or sensitive species habitat (including potential habitat) in the proximity of the activity.
 - The activity improves/enhances the continued existence of a sensitive species or its habitat.

A.2.3.9 Cultural Resources

Cultural resources address attributes that are considered important to the nation, state, and local populations' sense of history and well-being. Cultural resources may be historic and prehistoric archaeological sites, architectural and landscape sites, or TCPs (see breakdown in Figure A-9). These resources on installation training grounds are primarily affected by the siting and construction of new buildings and infrastructure. Sometimes they can be affected by changes in use of, or access to, resource areas. When evaluating the potential impact of a project on cultural resources, it is important to consider proximity of the project site, and the potential to discover previously unanticipated or undocumented cultural resources. These considerations must take place in accordance with Section 106 of the *National Historic Preservation Act (NHPA)*. In addition, NEPA-related actions will require consultation and review by the State Historic Preservation Office (SHPO) and the Advisory Council for Historic Preservation (ACHP). Contributing factors for ranking impacts associated with cultural resources are provided below.

Rank

Contributing Factors

- Significant Adverse
- The activity will destroy an archaeological, historical, or other cultural site that is listed on or eligible for inclusion in the NRHP.
 - The activity involves construction, repair, or maintenance affecting features that contribute to a historic property's significance that do not meet the Secretary of the Interior's standards.
 - The activity will permanently introduce visual, audible, or atmospheric elements that are out of character with the historic property or alter its setting when setting contributes to the property's qualifications for the NRHP.
 - The activity will permanently restrict access as appropriate to property type to an archaeological, historical, or other cultural site that is listed on or eligible for inclusion in the NRHP.
 - The activity will alter the landscape around an archaeological, historical, or other cultural site and degrade the aesthetic value of its existing setting.
 - The activity is located in an area where there is a high probability of finding artifacts of archaeological, historical, or other cultural value, and no plan exists for evaluating and recovering artifacts prior to the start of the project.
- Adverse
- The activity will temporarily restrict access or change the setting appropriate to the property type to an archaeological, historical, or other cultural site that is listed on or eligible for inclusion in the NRHP.
 - The activity involves construction, repair, or maintenance affecting features that contribute to a historic property's significance that meet the Secretary of Interior's standards.
 - The activity will alter the landscape around an archaeological, historical, or other cultural property, but measures are taken to protect the aesthetic value of its existing setting.

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CULTURAL RESOURCES

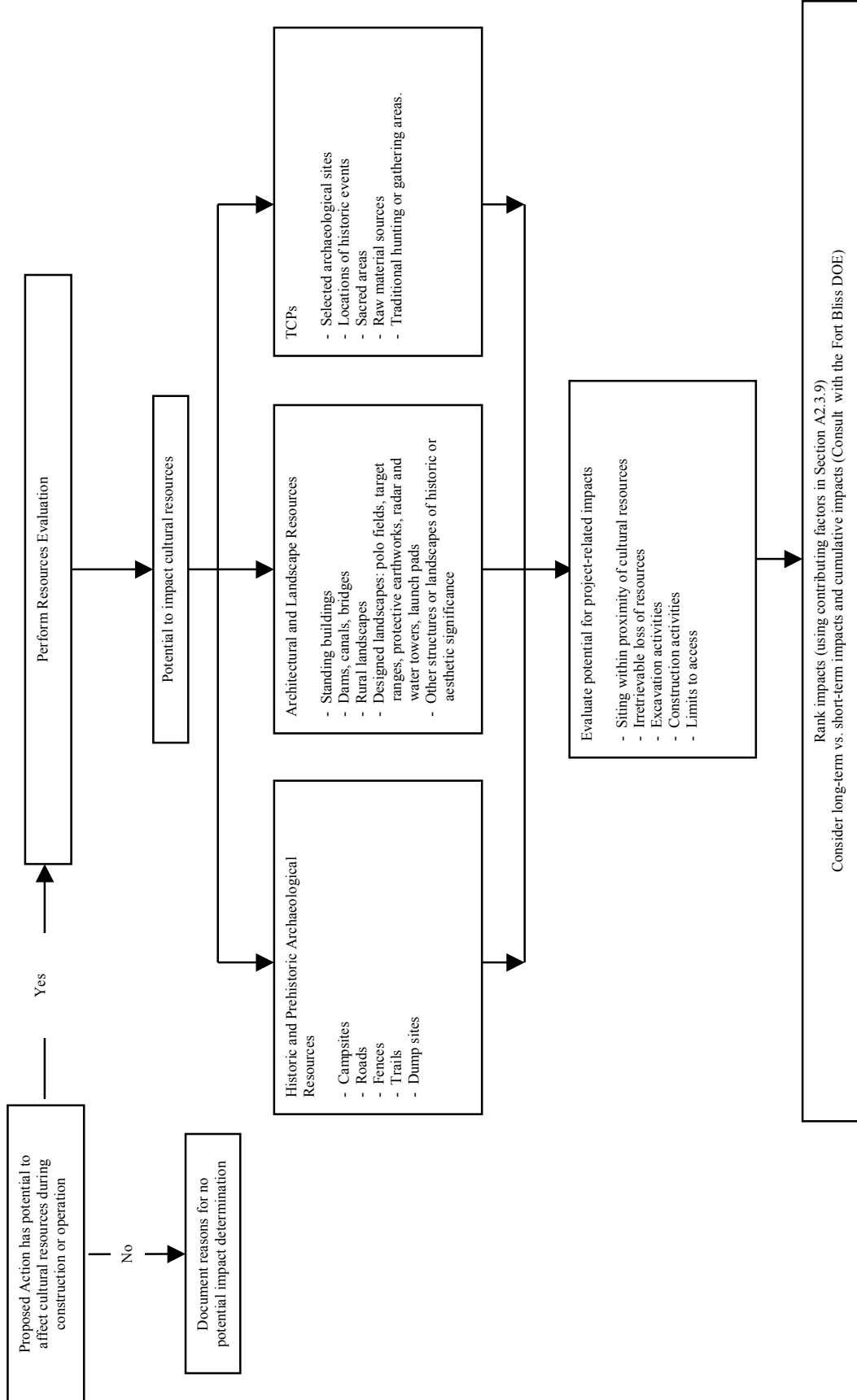


Figure A-9. Cultural Resources Evaluation Flowchart.

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<u>Rank (Continued)</u>	<u>Contributing Factors</u>
No Impact	<ul style="list-style-type: none"> • The activity is located in an area where there is a high probability of finding artifacts of archaeological, historical, or other cultural value, but a plan exists for evaluating and recovering artifacts prior to the start of the project. • The activity will not affect access as appropriate to property type to an archaeological, historical, or other cultural site that is listed on or eligible for inclusion in the NRHP. • The activity does not involve construction, repair, or maintenance affecting features that contribute to a historic property’s significance that meet the Secretary of Interior’s standards. • The activity will have no impact on the visual or audio setting of an archaeological, historical, or other cultural property. • The activity is not located in the vicinity of an archaeological, historic, or other cultural site listed on or eligible for inclusion in the NRHP. • The site of the activity has been surveyed and there has been a no properties determination by DOE of finding artifacts of archaeological, historical, or other cultural value.
Beneficial Impact	<ul style="list-style-type: none"> • The activity benefits/enhances an archaeological, historical or other cultural site that is listed or eligible for inclusion in the NRHP.

A.2.3.10 Noise

Transportation (aircraft, and land-based traffic) and construction activities are major sources of environmental noise. Besides damaging hearing of humans, noise also interferes with communication, interrupts sleep, causes stress, and generally impacts the quality of life. Noise can also have an adverse impact on domestic animals and wildlife. When considering the project, it is important to determine if the project will create unacceptable noise levels (Figure A-10). The review should evaluate both nonimpulsive (e.g., persistent traffic) and impulsive noise (sonic boom, explosion). Contributing factors for noise are provided below (Finegold et al., 1994).

<u>Rank</u>	<u>Contributing Factors</u>
Significant Adverse	<ul style="list-style-type: none"> • The activity will expose populated areas to day-night noise levels (nonimpulsive) of 75 decibels (dB) or greater. • The activity will expose populated areas to C-weighted day-night noise level (CDNL) (i.e., impulsive sonic boom) of 70 dB and greater. • The activity (e.g., artillery, munitions, blasting) will expose populated areas to a single peak sound pressure level (dBP) greater or equal to 139 dBP. • The activity will cause speech interference because indoor sound levels are expected to exceed 82 dB. • The activity results in substantial likelihood of hearing loss because indoor sound levels are above 84 dB. • Noise levels associated with the activity are expected to cause domestic animals and wildlife injury, abandonment of habitat, or mortality.
Adverse	<ul style="list-style-type: none"> • The activity will expose populated areas to day-night noise levels (nonimpulsive) between 65 and 75 dB. • The activity will expose populated areas to CDNL between 62 and 70 dB.

NOISE

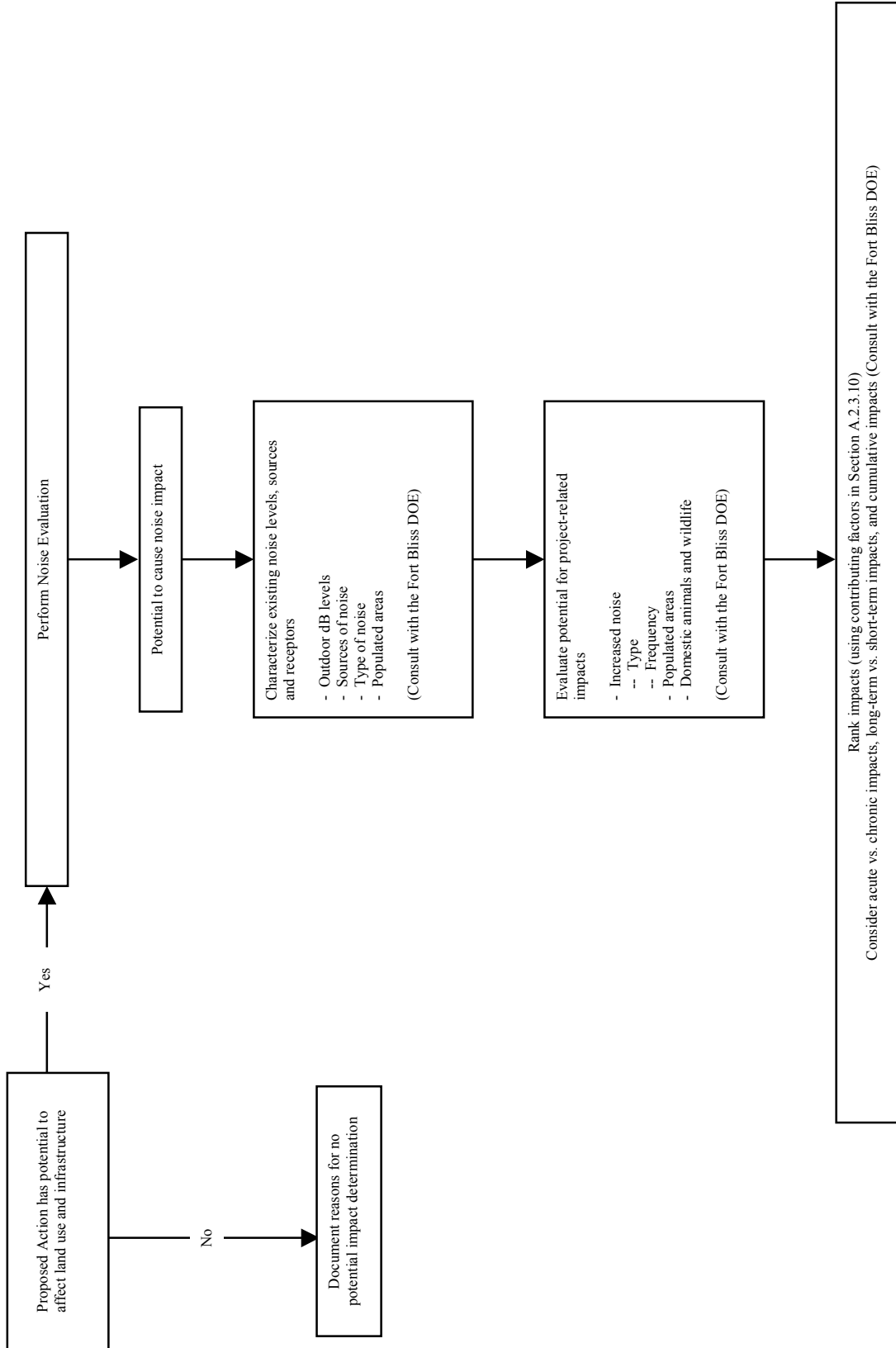


Figure A-10. Noise Evaluation Flowchart.

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Rank (Continued)

Contributing Factors

- | | |
|-----------|--|
| No Impact | <ul style="list-style-type: none"> • The activity (e.g., artillery, munitions, blasting) will expose populated areas to a single dBP between 115 and 138 dB. • The activity will cause speech interference because indoor sound levels are between 82 and 60 dB. • The activity creates a slight to moderate likelihood of hearing loss when indoor sound levels are between 75 and 80 dB. • The activity causes wildlife or domestic animals to display startle effects, including fleeing the area, alteration in productivity, reproduction, growth, or parenting behavior. • The activity will expose populated areas to day-night noise levels (non-impulsive) of 65 dB or less. • The activity will expose populated areas to CDNL of 62 dB or less. • The activity (e.g., artillery, munitions, blasting) will expose populated areas to a single dBP lower than or equal to 115 dB. |
|-----------|--|

A.2.3.11 Safety

For the proposed action and each alternative, the elements of the proposal that have the potential to affect safety are evaluated relative to the degree to which the activity increases or decreases safety risks to military personnel, the public, and property (Figure A-11). Ground and fire safety are assessed for the potential to increase risk, and the unit's capability to manage that risk by limiting exposure, respond to emergencies, and suppress fires.

In considering explosive safety, projected changed uses and handling requirements are compared to current issues and practices. If a unique situation is anticipated to develop as a result of a proposal, the capability to manage that situation is assessed. Analysis of aircraft flight risks correlates projected Class A mishap rates with current use of the airspace to consider the magnitude of change in risk associated with the proposal. Finally, when the changes in risk arising from the proposals are considered in individually and collectively, assessments can be made about the adequacy of disaster response planning, and the need for new or modified procedures and requirements that may be necessary as a result of the action. Contribution factors for ranking safety impacts are presented below.

Rank

Contributing Factors

- | | |
|---------------------|---|
| Significant Adverse | <ul style="list-style-type: none"> • Fire protection/fire response requirements exceed existing infrastructure capability. • Explosive storage locations and capacities exceed levels that are applicable or suitable for waivers. • Ordnance or missile use potentially exposes land areas beyond reservation boundaries to either projectile, overflight, or ground impact. |
| Adverse | <ul style="list-style-type: none"> • Activities associated with proposals create needs for waivers to surface danger zone (SDZ) safety requirements. • Activities associated with proposals create needs for waivers to SDZ safety requirements. • Activities associated with proposals increase aviation activities to the extent that airspace congestion results or projected Class A mishaps indicate a substantially increased risk to public safety. |

SAFETY

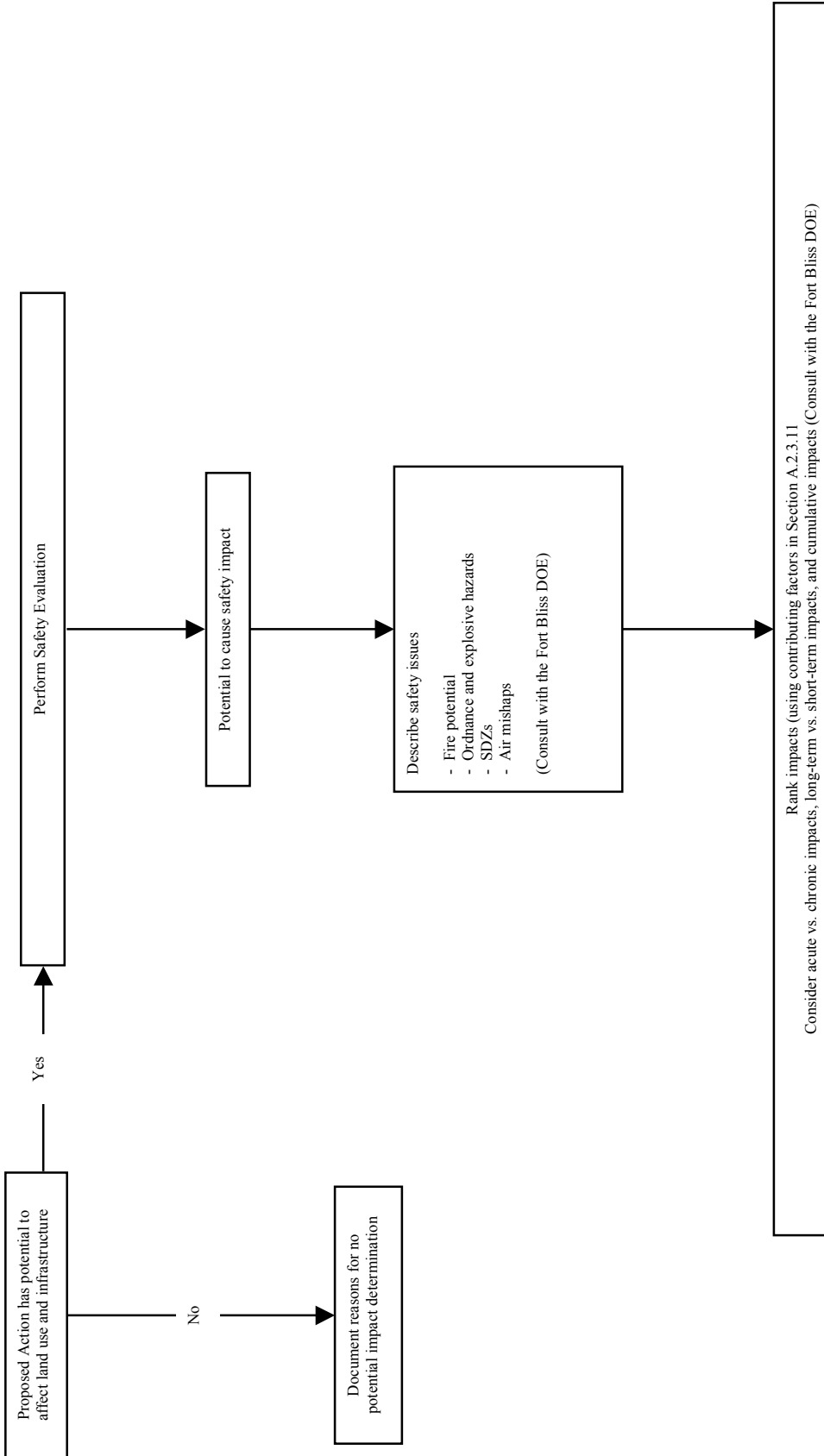


Figure A-11. Safety Evaluation Flowchart.

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<u>Rank (Continued)</u>	<u>Contributing Factors</u>
No Impact	<ul style="list-style-type: none">• All fire safety standards remain satisfied.• All explosive safety standards remain satisfied.• Adequate safety buffers (SDZs) exist for use of all ordnance and missiles.• Although levels of aviation may change, projected Class A mishaps associated with these changed levels do not reflect any significant increased risk.
Beneficial Impact	<ul style="list-style-type: none">• The activity decreases or eliminates a safety risk to military personnel, the public, and/or property.

A.2.3.12 Hazardous Materials and Items of Special Concern

When considering the impact of an activity on the management of hazardous materials and items of special concern (Figure A-12), it is important to evaluate the usage and storage of hazardous material in addition to the storage and disposal requirements for ranking impacts associated with hazardous waste. Items of special concern include: medical and biohazardous waste, low-level radioactive waste, radon, asbestos, lead-based paint, pesticides, PCBs, and petroleum storage tanks. Contributing factors for ranking impacts from hazardous materials and items of special concern are:

<u>Rank</u>	<u>Contributing Factors</u>
Significant Adverse	<ul style="list-style-type: none">• Permanent or temporary storage tanks at the activity site are not equipped with leak detection mechanisms, secondary containment systems, spill and overfill protection, or other safety services.• Hazardous material or hazardous wastes handling, storage, or disposal systems or practice pose a threat of release to the environment and to public health.
Adverse	<ul style="list-style-type: none">• The activity involves exceptions to approved long-term generation, storage, and/or disposal of large quantities of hazardous wastes.• The activity involves exceptions to approved long-term management of large quantities of hazardous materials.• The activity requires exceptions to approved removal and disposal of structural materials that contain hazardous materials (e.g., lead-based paints, asbestos).• The activity requires exceptions to the management of hazardous materials, approved handling, storage, and use.
No Impact	<ul style="list-style-type: none">• The activity will not generate hazardous waste.• The activity will not require hazardous materials management.
Beneficial Impact	<ul style="list-style-type: none">• The activity will reduce or eliminate the use, generation, storage, or disposal of hazardous materials and items of special concern.

A.2.3.13 Socioeconomic Resources

This resource group includes demographics, economic development, housing, and community services and facilities (Figure A-13).

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**HAZARDOUS MATERIALS AND ITEMS OF SPECIAL CONCERN
(Hazardous Chemicals, Hazardous Waste and Items of Special Concern)**

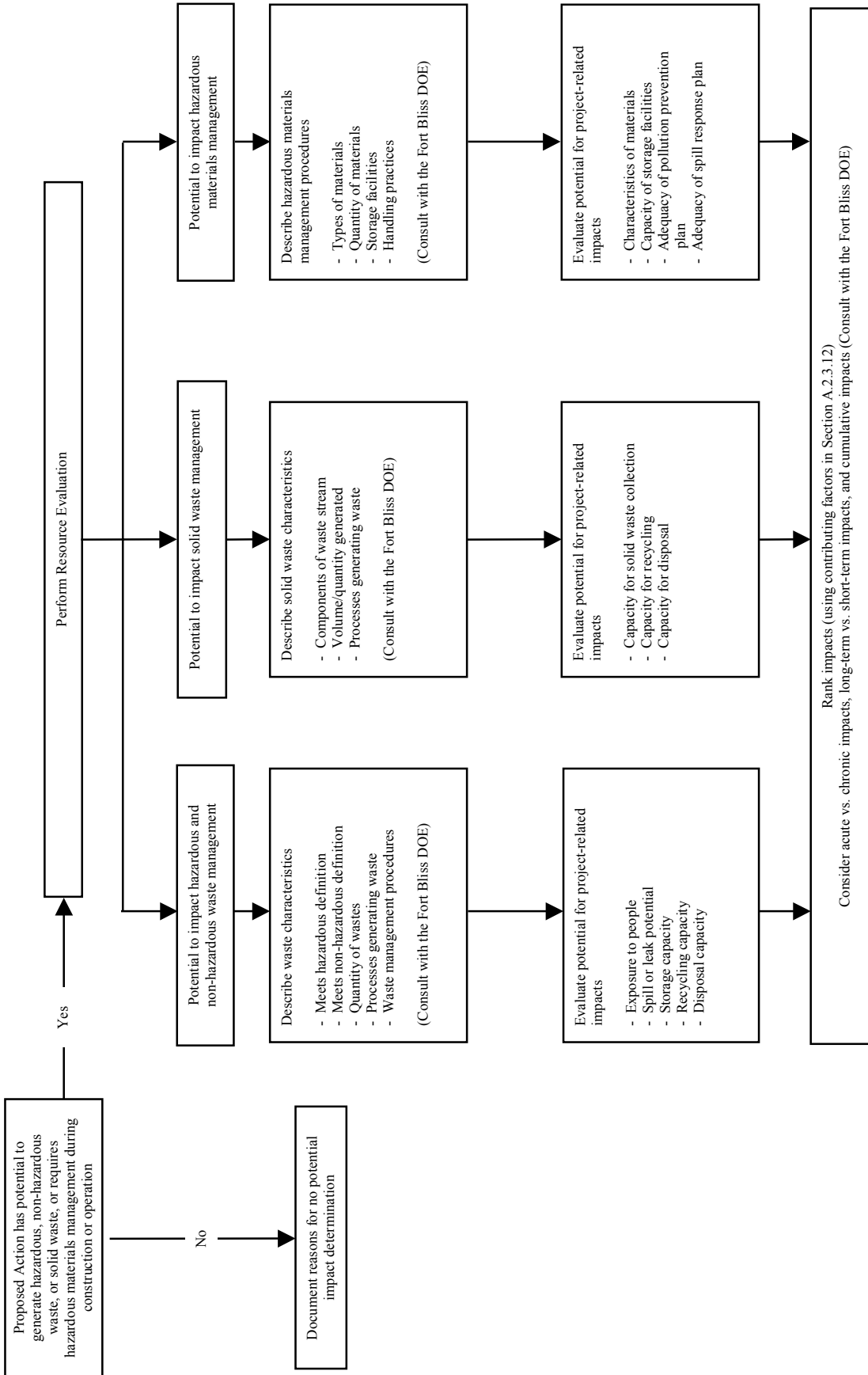


Figure A-12. Hazardous Materials and Items of Special Concern Evaluation Flowchart.

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**SOCIOECONOMIC RESOURCES
(Demographics, Housing, and Community Services, and Economic Development)**

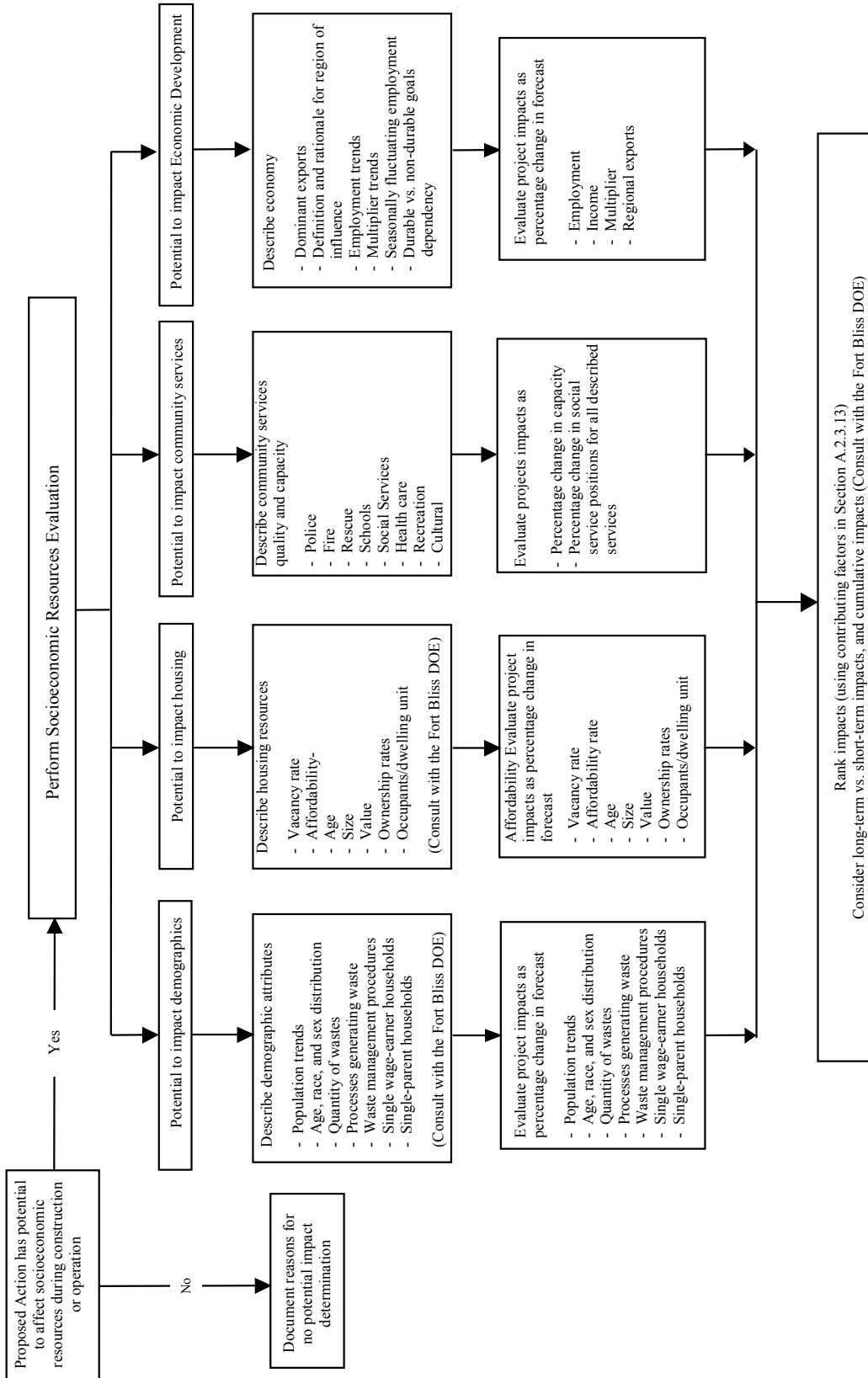


Figure A-13 . Socioeconomic Resources Evaluation Flowchart.

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Demographics. An environmental assessment typically includes an evaluation of potential impacts of the project on population demographics. This information contributes to the evaluation of the other elements of socioeconomic resources. Important information includes employment rates, migration rates, birth and death rates. When evaluating impacts to a local population, it may be appropriate to characterize changes in the age, sex, and ethnic composition of the population; as well as education attainment, income, and residential stability. Contributing factors for ranking impacts pertaining to population changes are presented as follows.

<u>Rank</u>	<u>Contributing Factors</u>
Significant Adverse	<ul style="list-style-type: none">• Within the economic ROI, the activity will create or contribute to an excursion above or below the existing forecasted population beyond a community's historic ability to accommodate change.• The activity will cause a change in the population demographics that could potentially disrupt employment patterns or provision of services.• The activity will result in the dislocation of portions of the local population due to loss of jobs or increases in property values.
Adverse	<ul style="list-style-type: none">• Within the economic ROI, the activity will create or contribute an excursion above or below the existing forecasted population by approaching a community's historic ability to accommodate change.• The activity will result in a short-term influx of workers.
No Impact.	<ul style="list-style-type: none">• Within the economic ROI, the activity will create or contribute to an excursion above or below the existing forecasted population by less than a community's historic ability to accommodate change.• The activity does not require additional people to be permanently or temporarily introduced to the area.
Beneficial Impact	<ul style="list-style-type: none">• The activity will enhance, or improve education attainment, household income, residential stability, and related demographic factors.

Economic Development. The effects of a project on the economy depend on the size of the project, in terms of project expenditure and employment, and the duration of the project. In evaluating the potential economic impacts of the project, it is important to quantify any direct impacts associated with the project and to evaluate the ability of the region of concern to accommodate such changes. In general, a more rigorous analysis of economic impacts is required for larger, more complex projects. Contributing factors for ranking impacts associated with economic issues are presented below.

<u>Rank</u>	<u>Contributing Factors</u>
Significant Adverse	<ul style="list-style-type: none">• The activity will cause unemployment to increase beyond a community's historic ability to accommodate change.• The activity will cause household income to decrease beyond a community's historic ability to accommodate change.• The activity will reduce the bond rating of local municipalities.• The multiplier effect of direct unemployment associated with the activity will dampen the economic activity.• Reduced economic activity associated with the unemployment caused by the activity will cause secondary unemployment.• The activity will cause a permanent reduction in military personnel which will significantly reduce expenditures in the local economy causing reduced economic growth and secondary unemployment.

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Adverse	<ul style="list-style-type: none"> • The activity will cause unemployment to increase to a degree approaching a community's historic ability to accommodate change. • The activity will cause household income to decrease to a degree approaching a community's historic ability to accommodate change.
No Impact	<ul style="list-style-type: none"> • The activity does not result in changes to employment or income.
Beneficial Impact	<ul style="list-style-type: none"> • The activity will increase employment/income, economic growth, and secondary employment.

Housing. When evaluating the potential impact of the project on housing, it is important to consider the availability of housing and the cost of housing relative to demand and income. It is also important to identify whether existing housing meets Army regulation standards or if the project has the potential to impact the value of residential property. Contributing factors for ranking impacts associated with housing issues are presented below.

<u>Rank</u>	<u>Contributing Factors</u>
Significant Adverse	<ul style="list-style-type: none"> • The activity will create a shortage of affordable housing or will increase housing prices. • The activity results in housing that does not meet Army standards. • The activity will cause property values to decline. • The activity will adversely affect the availability of mortgages or mortgage insurance. • The activity will cause forecasted vacancy rates to increase or decrease beyond a community's historic ability to accommodate change.
Adverse	<ul style="list-style-type: none"> • The activity will cause forecasted vacancy rates to increase or decrease by approaching a community's historic ability to accommodate change.
No Impact	<ul style="list-style-type: none"> • The activity does not impact property values. • The activity does not require an influx of new inhabitants or relocation of existing ones, therefore the housing resource is not impacted. • The activity will cause forecasted vacancy rates to increase, yet remain below a community's historic ability to accommodate change.
Beneficial Income	<ul style="list-style-type: none"> • The activity will improve property values, increase availability of affordable housing, and improve the community's ability to accommodate growth/change.

Community Services and Facilities. Community services refer to both public and private services on- and off-post that serve area residents. Community services include primary, secondary, and adult education; health care; social services; police, fire and rescue; and recreational and cultural activities. When evaluating a project, it is important to consider existing and projected capacity to provide services, current and future changes in demand, and access to community services. Contributing factors for ranking impacts associated with community service issues are presented as follows.

<u>Rank</u>	<u>Contributing Factors</u>
Significant Adverse	<ul style="list-style-type: none"> • Changes caused by the activity will result in a shortage of community services. • Changes caused by the activity will result in long-term unused capacity of community services. • The activity provides redundant services and will result in long-term excess capacity for community services.

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- | | |
|-------------------|---|
| Adverse | <ul style="list-style-type: none">• The activity will require the number of service positions for any category (e.g., teachers, fire, police) to increase beyond a community's historic ability to accommodate change.• Changes caused by the activity will result in short-term changes in demand, either increased or decreased, for community services.• The activity provides redundant services, but any unused capacity is expected to be temporary.• The activity will require the number of service positions for any category (e.g., teacher, fire, police) approaching a community's historic ability to accommodate change. |
| No Impact | <ul style="list-style-type: none">• The activity does not impact demand for community services.• The activity will require the number of service positions for any category (e.g., teacher, fire, police) to remain below a community's historic ability to accommodate change. |
| Beneficial Impact | <ul style="list-style-type: none">• The activity will improve/enhance services such as education, health care, police/fire protection, and recreational and cultural activities. |

A.2.3.14 Environmental Justice

Executive Order (EO)12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-income Populations* provides that each federal agency address, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations. Guidance for implementing this EO has not been finalized by the Council on Environmental Quality (CEQ). Methodologies for evaluating environmental justice are generally developed on a project-specific basis and reviewed by federal agencies as part of the NEPA documentation process.

Significance criteria are not utilized for Environmental Justice in this PEIS. However, factors to be considered in determining disproportionately high and adverse effects on minority or low-income populations include the following: whether potential health and environmental effects are significant or above generally accepted norms; whether the risk or rate of exposure or the impact to minority or low-income populations appreciably exceeds or is likely to appreciably exceed that of the general population; how ecological, cultural, human health, economic, or social impacts are interrelated to impacts on the natural or physical environment; and whether the effects would occur in populations affected by cumulative or multiple adverse exposures from environmental hazards.

A.2.4 Impact Evaluation

Evaluation of the environmental impacts associated with Alternatives 1, 2, or 3 of the PEIS is based on the contributing factors defined for each of the resource groups described in Section A.2.0. The following describes how implementation of planning, construction, and demolition programs, and continuation of ongoing and possible future mission activities were evaluated for potential impacts. Similarly, the following sections guide future program and project development.

Mission Activities. Training impacts are based on similar resource group assessments as those described below for Master Plan projects. However, instead of evaluating phases of construction/operation, impacts are assessed for the major military units' activities and training exercises that are conducted. It is important to note that not all group attributes are impacted by mission activities occurring at Fort Bliss. The rankings used for the training and exercise activities' section are based on ranks and parameters described in the DA Training Circular 5-400, *Unit Leaders' Handbook for Environmental Stewardship*.

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Master Plan Projects. When evaluating Master Plan projects, the potential impacts to each resource group and group attributes are evaluated for project siting, construction and operation phases. The Master Plan projects evaluated in the PEIS represent the types of projects that would typically occur at Fort Bliss. The evaluation of the cumulative impact of the Master Plan, and its projects, is performed using Table A-2. This table summarizes the impacts of the Master Plan projects being evaluated. For example, a project that is ranked for significant adverse impact during operations, and adverse impact during construction, receives an overall rank of significant adverse impact.

Table A-2. Project Evaluation Matrix

Project Title:					
<i>Environmental Resource Category</i>		<i>Mission Activity</i>	<i>Facility Construction and Demolition</i>	<i>Environmental Resource Management</i>	<i>Real Estate Action</i>
Land Use, Infrastructure, and Aesthetics	Land Use Evaluation				
	Fort Bliss Land Use				
	• Main Cantonment				
	• Training Complex				
	Off-post Land Use				
	Infrastructure (Transportation, Utilities, Energy, Communications)				
	Visual/Aesthetics				
Airspace Use	Airspace Use				
	• Airports				
	• Controlled/Uncontrolled Airspace				
	• Restricted Airspace				
	• MTRs				
Earth Resources	Geology				
	Minerals and Energy				
	Soils				
Air Quality	Air				
Water Resources	Groundwater				
	Surface Water				
Biological Resources	Vegetation				
	Wetlands and Arroyo-riparian Areas				
	Wildlife				
	Sensitive Species				
Cultural Resources	Archaeological Sites, Historic and Prehistoric Archaeological Resources				
	Architectural and Landscape Resources				
	TCPs				
Noise	Vehicles				
	Aircraft				
	Impulse-artillery/Missile Firing				
	Industrial				
Safety	Ground Safety				
	Flight Safety				
	Ordnance and Explosive Safety				

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Table A-2. Project Evaluation Matrix (Continued)

Project Title:		Mission Activity	Facility Construction and Demolition	Environmental Resource Management	Real Estate Action
Environmental Resource Category					
Hazardous Materials and Items of Special Concern	Hazardous Materials				
	Items of Special Concern				
Socioeconomic Resources	Population/Demographics				
	Economic Development				
	Housing				
	Community Services and Facilities				
	Economy				
Environmental Justice	Environmental Justice				
Operations	Ability to Meet Mission				
Totals	●				
	○				
	'				
	N				

LEGEND: ● = Significant Adverse Impact. ○ = Adverse Impact. ' = No Impact (no effect on resource attribute, or attribute not present). N = Beneficial Impact: S = Short-term, L = Long-term.

A.2.5 Fort Bliss Environmental Management Programs

The Fort Bliss environmental management programs are directly applicable to all lands on the Main Cantonment Area (including Biggs AAF), the South Training Areas, the Doña Ana Range–North Training Areas, and military activities on McGregor Range. The environmental management program on McGregor Range interfaces with the Bureau of Land Management’s (BLM) *White Sands Resource Management Plan (RMP)* (BLM, 1988b) through the *McGregor Range Resource Management Plan Amendment (RMPA)* (BLM, 1990a). The responsibilities of Fort Bliss and the BLM are specified in a 1990 Memorandum of Understanding (MOU) concerning policies, procedures, and responsibilities related to land use planning and resource management of McGregor Range (Appendix D). Agency responsibilities are summarized in Table A-3.

The BLM recognizes Fort Bliss missions have priority use of McGregor Range and will secure Fort Bliss concurrence before authorizing any nonmilitary uses. BLM has managerial responsibilities for the public uses of the withdrawn land as enumerated in Public Law (PL) 99-606. However, the daily uses are subordinate to the military missions and uses of McGregor Range. Fort Bliss must concur with and/or provide stipulations or approval modifications to BLM managed actions prior to BLM approval of the action.

A cooperative agreement exists for management of the ACEC between the BLM, Fort Bliss, and NMSU, as referenced in the MOU. Similarly, the BLM and Fort Bliss recognize the New Mexico Department of Game and Fish (NMDGF) as the agency responsible for wildlife (including game species) population management.

In a combined effort, the Fort Bliss ITAM team developed the SiteRep system as a means to identify and prioritize degraded training sites/areas for potential rehabilitation based on the requirements of the training mission, environmental influences, and resources available. This system is based upon two Army regulations:

- a. AR 200-3, Chap. 3, *Natural Resources-Land, Forest and Wildlife Management*, 28 February 1995 and,

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Table A-3. Agency Responsibilities for Environmental Resource Management of McGregor Range

	<i>Withdrawn Lands</i>	<i>Army Fee-owned Lands</i>
Lands		
NEPA compliance lead agency		
• Nonmilitary and third party activity	BLM	BLM
• Military activity	Fort Bliss	Fort Bliss
Nonmilitary demand leases	BLM	Fort Bliss
Minerals		
Salable (sand, gravel, fill dirt, borrows, caliche, and building stone)	BLM	BLM
Leasable (oil and gas, geothermal)	BLM	BLM
Locatable (precious metals, etc.)	BLM	BLM
Vegetation Management		
Area of Critical Environmental Concern (ACEC)	BLM/Fort Bliss/ New Mexico State University (NMSU)	N/A
Rangeland Management		
Livestock grazing	BLM	BLM
Rangeland improvements	BLM	BLM
• Wildlife and livestock water	BLM/Fort Bliss	BLM/Fort Bliss
• Maintenance and construction of livestock control fences, water pipelines, tanks, tubs, wells, windmills, wildlife waters	BLM	BLM
Outside impact and military use areas	BLM	BLM
Inside impact and military use areas	Fort Bliss	Fort Bliss
• Fire breaks along McGregor Range boundary where appropriate	Fort Bliss	Fort Bliss
Wildlife		
Game species population management	NMDGF/BLM	NMDGF/BLM/ Fort Bliss
Habitat Management		
Wildlife habitat management activities	BLM	Fort Bliss
Wildlife and habitat monitoring	BLM	Fort Bliss/BLM
Special Status Species Management		
Compliance with federal and state laws affecting endangered, threatened, candidate, or sensitive plants and animals		
Nonmilitary actions	BLM	Fort Bliss
Military actions	Fort Bliss	Fort Bliss
Recovery plans	BLM	Fort Bliss
<i>Sikes Act</i> Stamp Program	NMDGF/BLM/ Fort Bliss	NMDGF/BLM/ Fort Bliss
Animal damage control	BLM	BLM
Activities administered by BLM	BLM	BLM
Military activities	Fort Bliss	Fort Bliss
Recreation		
General	BLM	BLM/Fort Bliss
Hunting	NMDGF/BLM/ Fort Bliss	NMDGF/BLM/ Fort Bliss

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Table A-3. Agency Responsibilities for Environmental Resource Management of McGregor Range (Continued)

Cultural Resources		
Compliance or third party undertakings	BLM	BLM/Fort Bliss
Military undertakings	Fort Bliss	Fort Bliss
Mitigation		
Wilderness Study Area Management		
Management	BLM/Fort Bliss	N/A
Compliance	BLM/Fort Bliss	N/A
Watershed		
	BLM	Fort Bliss
Fire		
Nonmilitary fire suppression	BLM	BLM
Military fire suppression	Fort Bliss	Fort Bliss
Prescribed burns	BLM	BLM/Fort Bliss
Law Enforcement		
Nonmilitary activities/personnel	BLM	Fort Bliss/BLM
Military activities/personnel	Fort Bliss/BLM	Fort Bliss
Roads		
Maintenance	BLM/Fort Bliss	BLM/Fort Bliss
Planning	BLM/Fort Bliss	BLM/Fort Bliss

b. AR 350-XX (Draft), *Integrated Training Area Management (ITAM)*, 20 January 1997.

The following describes the Fort Bliss SiteRep process and the basic steps involved its implementation.

1. Upon observing degradation of a training area, an assessor completes the data survey sheet, SiteRep Form A (Attachment 6) and sends the form to the ITAM Coordinator.
2. After receiving SiteRep Form A, the ITAM team will investigate the site and complete SiteRep Form B (Attachment 7). The data will be entered into digital format using Microsoft Office - Access data forms. The permanent digital record of the observation, known as the SiteRep file can be used later in other applications such as assessment of cumulative impact. A high score for a given site is an indicator of a potential need for rehabilitation.
3. The ITAM team will use a GIS to evaluate the digital data. The GIS will analyze the SiteRep data for locational relationships with threatened, endangered, or sensitive species, Waters of the U.S., wetlands, riparian, soils, vegetation, precipitation, terrain, regulatory conflicts, and national historic register issues. The sensitivity of protected locational data will be respected.
4. After the GIS analysis is complete, the SiteRep data will be returned to the ITAM Coordinator for potential inclusion as a rehabilitation project. For those projects assigned high priority for action, the ITAM team, working with available expertise and resources, will develop a proposed rehabilitation prescription.
5. The DOE NEPA team will review all proposed rehabilitation prescriptions to determine concurrence or further requirements. Concurred rehabilitation prescriptions will be briefed to the Commander, U.S. Army Combined Arms Support Battalion (USACASB) for input/feedback, and prioritized by the Director of Plans, Training, Mobilization, and Security (DPTMS) for potential implementation (resource dependent).

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**Attachment 1:
Project Screening Criteria and List of Categorical
Exclusions (CX) From AR-200-2**

Project Screening Criteria

1. This action is not a major federal action significantly affecting the quality of the human environment.
2. There are minimal or no individual or cumulative effects on the environment as a result of this action.
3. There is no environmentally controversial change to existing environmental conditions.
4. There are no extraordinary conditions associated with this project.
5. This project does not involve the use of unproven technology.
6. This project involves no greater scope or size than is normal for this category of action.
7. There is no potential of an already poor environment being further degraded.
8. This action does not degrade an environment that remains close to its natural condition.
9. There are no threatened or endangered species (or critical habitat), significant archaeological resources, National Register or National Register-eligible historical sites, or other statutorily protected resources.
10. This action will not adversely affect prime or unique agricultural lands, coastal zones, wilderness areas, aquifers, floodplains, wild and scenic rivers, or other areas of critical environmental concern.

List of Categorical Exclusions (CX)

- A-1.** Normal personnel, fiscal, and administrative activities involving military and civilian personnel (recruiting processing, paying, and records keeping).
- A-2.** Law and order activities performed by military police and physical plan protection and security personnel, excluding formulation and/or enforcement of hunting and fishing policies or regulations that differ substantively from those in effect on surrounding non-Army lands.
- A-3.** Recreation and welfare activities not involving off-road recreational vehicle management.
- A-4.** Commissary and Post Exchange (PX) operations, except where hazardous material is stored or disposed.
- A-5.** Routine repair and maintenance of buildings, roads, airfields, grounds, equipment, and other facilities, to include the layaway of facilities, except when requiring application or disposal of hazardous or contaminated materials.
- A-6.** Routine procurement of goods and services, including routine utility services.
- A-7.** Construction that does not significantly alter land use, provided the operation of the project, when completed, would not of itself have a significant environmental impact; this includes grant to private lessees for similar construction (REC required).
- A-8.** Simulated war games and other tactical and logistical exercises without troops.
- A-9.** Training entirely of an administrative classroom nature.
- A-10.** Storage of materials, other than ammunition, explosives, pyrotechnics, nuclear, and other hazardous or toxic materials.

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- A-11.** Operations conducted by established laboratories within enclosed facilities where:
- a. All airborne emissions, waterborne effluents, external radiation levels, outdoor noise, and solid bulk waste disposal practices are in compliance with existing federal, state, local laws and regulations.
 - b. No animals that must be captured from the wild are used as research subjects, excluding reintroduction projects (REC required).
- A-12.** Developmental and operational testing on a military installation, where the tests are conducted in conjunction with normal military training and maintenance activities so that the tests produce only incremental impacts, if any, and provided that the training and maintenance activities have been adequately assessed, where required, in other Army environmental documents (REC required).
- A-13.** Routine movement of personnel; routine handling and distribution of nonhazardous and hazardous materials in conformance with DA, U.S. Environmental Protection Agency (EPA), U.S. Department of Transportation (DOT), and state regulations.
- A-14.** Reduction and realignment of civilian and/or military personnel that fall below the thresholds for reportable actions as prescribed by statute or AR 5-10 (REC required).
- A-15.** Conversion of commercial activities (CA) to contract performance of services from in-house performance under the provisions of U.S. Department of Defense (DoD) Directive 4100.15.
- A-16.** Preparation of regulations, procedures, manuals and other guidance documents that implement, without substantive change, the applicable Headquarters (HQ), DA, or other federal agency regulations, procedures, manuals, and other guidance documents that have been environmentally evaluated.
- A-17.** Acquisition, installation, and operation of utility and communication systems, data processing, cable, and similarly electronic equipment that use existing ROWs, easements, distribution systems, and facilities.
- A-18.** Activities that identify or grant permits to identify the state of the existing environment (for example, inspections, surveys, and investigations) without alteration of that environment or capture of wild animals.
- A-19.** Deployment of military units on a temporary duty (TDY) basis where existing facilities are used and the activities to be performed have no significant impact on the environment (REC required).
- A-20.** Grants of easements for the use of existing rights-of-way for use by vehicles; electrical, telephone, and other transmission and communication lines; transmitter and relay facilities; water, waste water, storm water, and irrigation pipelines, pumping stations, and facilities; and for similarly public utility and transportation uses (REC required).
- A-21.** Grants of leases, licenses, and permits to use existing Army-controlled property for non-Army activities, provided there is an existing land use plan that has been environmentally assessed and the activity will be consistent with that plan (REC required).

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- A-22.** Grants of consent agreements to use a government-owned easement in a manner consistent with existing Army use of the easement; disposal of excess easement areas to the underlying fee owner (REC required).
- A-23.** Grants of licenses for the operation of telephone, gas, water electricity, community television antenna, and other distribution systems normally considered as public utilities (REC required).
- A-24.** Transfer of real property administrative control within the Army, to another military department, or other federal agency, including the return of public domain lands to the U.S. Department of the Interior (DOI) and reporting of property available for outgranting; and grants of leases, licenses, permits, and easements for use of excess or surplus property without significant changes in land use (REC required).
- A-25.** Disposal of uncontaminated buildings and other improvements for removal off-site (REC required).
- A-26.** Studies that involve no commitment of resources other than manpower (REC required).
- A-27.** Study and test activities within the procurement program for Military Adaptation of Commercial Items for items manufactured in the U.S. (REC required).
- A-28.** Development of table organization and equipment documents, no fixed location or site.
- A-29.** Grants of leases, licenses, and permits to use DA property for or by another governmental entity when such permission is predicated upon compliance with the NEPA (REC required).

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Attachment 2: TRADOC Form 161 (Categorical Exclusion – CX)

CATEGORICAL EXCLUSION (CX) (40CFR1500-1508)		
TO: (Environmental Office)	FROM: (Proponent Action Officer & Phone Number)	
I. IDENTIFICATION		
Project Number	Project Title	
Brief Description (A copy of DD Form 1391. Military Construction Project Data, or another description prepared to meet another requirement may be attached as appropriate.)		
Applicable Categorical Exclusion(s) (CX)		
Reasons for Categorically Excluding Proposal		
Name and Signature of the Proponent of Action	Phone Number	Date
II. CONCURRENCE/NONCONCURRENCE		
Concur	Nonconcur	
Reasons for Nonconcurrency		
Name and Signature of Environmental Coordinator	Phone Number	Date

TRADOC FORM **161-R** Replaces TRADOC Form 161-R, Jan 77, which is obsolete.
Apr 80

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Attachment 3: Fort Bliss Form 88

RANGE AND MANEUVER AREA REQUEST								
TO: USAADACENFB ATTN: ATZC-B-C Range Scheduling		Cdr, THRU:	FROM:		DATE: RCVD:			
ARMY ___ USAF ___ USMC ___ USN ___ RESERVE ___ NG ___ OTHER								
DATE	OCCUPATION TIMES	RANGE AREAS	WEAPON	PURPOSE	FIRING TIMES	ILLUM	MAX ORD FOR ART	# OF PERS
REMARKS: (Aerial Targets, Special Target Requirements, Area & Time of Target Presentation, etc.)								
PYROTECHNICS:(Grid/Date/Time)				BLACKOUT MARCH: (Grid/Date/Time)				
POC: (Rank/Name/Date)				SIGNATURE:			DATE:	
CO-USE INFORMATION								
POC: (PRINT/NAME/PHONE) (SIGNATURE)			UNIT	# PERS	DATE	AREA	VEHICLES	

FB Form 88

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Attachment 3: Fort Bliss Form 88 (Continued)

Environmental and Archaeological Assessment			
TO: Cdr USAADACENFB ATTN: ATZC-B-C Range Scheduling	THRU: Cdr, USAADACENFB ATTN: ATZC-DOE Fort Bliss, TX 79916	FROM:	
Request the location for action described below be evaluated for environmental and archaeological impact. Request approvals, changes, and restrictions be noted as appropriate.			
Signature		Date	
Type of Operation: Start Date: _____ End Date: _____ Number of Personnel: Number of Vehicles: Total: _____ Track: _____ Wheel: _____			
MANEUVER AREA	ACTIVITY	GRID COORDINATES	CHANGE/ RESTRICTION
REMARKS:		LOCATION FOR OPERATION/ACTION IS: <input type="checkbox"/> Recommend approval <input type="checkbox"/> Recommend approval w/changes DPTMS Representative DATE	
Requesting unit agrees with and will implement the evaluation action with noted restrictions/changes Signature of Unit Representative		LOCATION FOR OPERATION/ACTION IS: <input type="checkbox"/> Recommend approval <input type="checkbox"/> Recommend approval w/changes DOE Representative DATE	

FB Form 88

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**Attachment 4: Format for Record of Environmental Consideration – REC (AR 200-2)*,
Modified for Fort Bliss**

To: *(Environmental Officer)*

From: *(Proponent)*

Project Title:

Brief Description:

Anticipated date/or duration of proposed action: *(Month/year)*

Reason for using record of environmental consideration (choose one):

a. Adequately covered in an (EA, EIS) entitled *(name)*, *(dated)*. The EA/EIS may be reviewed at *(location)*.

OR,

b. Is categorically excluded under the provisions of CX _____, AR 200-2, Appendix A, and no extraordinary circumstances exist as defined in paragraph 4-3, because:

(Date)

Project Proponent - Commander or Decision Maker

(Date)

Director of Environment or Formally Designated Representative

*Variation from this format is acceptable provided basic information and approvals are included in any modified document

Attachment 5

SAMPLE ENVIRONMENTAL BASELINE SURVEY

PROPOSED CAR WASH FACILITY

**Prepared for:
DPWL – REAL PROPERTY**

Prepared by: _____ Date _____
Clyde S. Durham, REM 7619

SJA Review: _____ Date _____

Approving Official: _____ Date _____
Keith Landreth, Director, DOE

ENVIRONMENTAL BASELINE SURVEY

PROJECT NAME

I. Executive Summary and Recommendations

II. Property Identification

III. Review of Government Records and Maps

IV. Current and Past Site Activities

V. Review of Adjacent Site Activities

VI. Review of Hazardous Substance Management Activities At and Adjacent to Site

VII. Visual Inspection

VIII. Review of Title

IX. References

ENVIRONMENTAL BASELINE SURVEY

PROPOSED CAR WASH FACILITY

I. Executive Summary and Recommendations

A portion of property on the Fort Bliss main cantonment area has been identified as the site for a car washing facility. The site is located in a vacant area between two existing Army Air Force Exchange Service (AAFES) facilities (map enclosed). One of the facilities is primarily engaged in dispensing gasoline. The underground tanks at this site were discovered to be leaking in 1991. The tanks were repaired at that time and continue to be in service. A sub-surface investigation conducted at the service station in 1994 indicates contamination from the leak was migrating away from the proposed car wash site. The soil borings nearest the proposed site were free from contamination. A utility pole, serving the service station, on the northern edge of the proposed site, is supporting three transformers that are clearly labeled “No PCBs”. A pole on the western edge of the property is supporting a single transformer that is labeled as having been tested and certified PCB-free. A review of aerial photographs and interviews with Fort Bliss Archeology and Historical Architect personnel indicate the property was acquired for Fort Bliss in the 1890s. Prior to that time the property was undeveloped rangeland. The only structures known to occupy the site are horse stables, probably between 1925 and 1950. No industrial activity is known, or suspected to have taken place at the site. A site visit indicated no evidence of dumping, petroleum contamination, or hazardous waste contamination. The proposed site is adjacent to the Fort Bliss Main Post Historic District and, as such, is included in the Fort Bliss Post Historic District Viewshed. The Fort Bliss Historical Architect shall review plans for visual conformity prior to any construction in this area.

II. Property Identification

The site is identified on a map, supplied to Fort Bliss DOE personnel by DPWL – Real Property, as a parcel of land bounded by Custer Road on the east, Doniphan Road to the west and being 115 feet north to south, between the lots occupied by Building 198 and Building 199.

III. Review of Government Records and Maps

Fort Bliss records indicate the property was obtained in the 1890s. Aerial photographs in the possession of DOE, Historical Architect personnel show stables on the site in the mid-1940s. A review of historical maps indicates the stables were constructed after 1925. Available records do not indicate when the stables were demolished. According to historical maps, no other structures have occupied the site during Fort Bliss’s ownership of the property.

IV. Current and Past Site Activities

Prior to Fort Bliss ownership the proposed site was vacant rangeland. The only know past use of the site was for stables and associated equine activities. The site is currently vacant land covered with a blanket of gravel. The site could possibly be used occasionally for vehicle parking, however, there was no evidence to indicate that this has been the case.

V. Review of Adjacent Site Activities

Review of available records indicate the historic use for the adjacent property to be the same as the proposed site, i.e. stables and associated equine activities. Presently, adjacent property uses are as follows:

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North – Building 199, AAFES Auto Detailing Shop and Retail Gasoline sales and vacant land
East – Custer Road and vacant land
South – Building 198, AAFES Equipment and Furniture Rental and vacant land
West – vacant land

VI. Review of Hazardous Substance Management Activities at and Adjacent to Site

There is no history or record of industrial activity or hazardous materials activity at the proposed site. The AAFES Retail Gasoline station, north of the proposed site, currently has six, 10,000-gallon gasoline tanks. In January 1991, a gasoline release occurred from one of the tanks. Base personnel repaired the tanks, contaminated soil in the immediate vicinity of the tanks removed, and fueling operations resumed. Subsequent investigations (soil borings and soil vapor test), between 1991 and 1994, indicate limited migration of contamination to the northwest of the tank site (away from proposed car wash site). An application for site closer is currently pending with Texas Natural Resource Conservation Commission (TNRCC). The AFFES Equipment and Furniture Rental facility, south of the proposed site appears to present little concern in regards to hazardous materials.

VII. Visual Inspection

Mr. Clyde S. Durham, Fort Bliss DOE, on 12 February 1998, conducted a site visit. The site was to be a vacant lot covered with a gravel blanket. A utility pole, on the north lot line, was observed to be supporting three transformers bearing labels reading “No PCBs”. A pole on the western edge of the property is supporting a single transformer that is labeled as having been tested and certified PCB-free. No evidence of dumping, petroleum contamination, or hazardous waste contamination was observed on the proposed site or adjacent properties.

VIII. Review of Title

A formal review of title was not conducted. The property is known to have been owned by Fort Bliss since the 1890s.

IX. References

The following Fort Bliss personnel were interviewed pursuant to this report:

- Mr. Campbell Ingram, NEPA Coordinator, Jones Technologies, Inc.
- Mr. Larry Schoeder, Historic Resources Team, Fort Bliss DOE
- Ms. Vicki Hamilton, Historic Resources Team, Fort Bliss DOE
- Ms. Dana Potter, Archeological Resources Team, Fort Bliss DOE
- Mr. Syed Shahriyar, RCRA Compliance Team, Fort Bliss DOE
- Mr. Bob Lenhart, Ph.D., Tank /POL Management Team, Fort Bliss DOE

References consulted (available on request):

- Site Map furnished by Fort Bliss DPWL – Real Property
- Aerial photographs form Historic Resources Team, Fort Bliss DOE
- Historical resource maps from Archeological Resources Team, Fort Bliss DOE
- Revised Final Site Investigation Report For Underground Storage Tanks, Texas Sites, Fort Bliss Texas from Tank /POL Management Team, Fort Bliss DOE

Site photographs on file at Fort Bliss DOE.

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Attachment 6

SITE REHABILITATION PRIORITIZATION (SiteRep) FORM A			
OBSERVATION GRID (UTM):		MAP DATUM:	
TRAINING AREA:		DATE:	
OBSERVER:		PHONE #:	
CIRCLE APPROPRIATE RESPONSES.			
DO YOU WISH TO KNOW THE FINAL PROJECT ASSESSMENT?		YES	NO
MILITARY LAND TRAINING USE CATEGORY			
LOW WATER CROSSING		ROADS/ROAD SHOULDERS	
RS ADA SITE, BUVOUAC		MANEUVER TRAINING	
SMALL ARMS RANGE		MISSILE/ARTILLERY FIRING POINTS	
OBSERVER/COMMO/RADAR POINTS		IMPACT AREAS	
OTHER:			
ENVIRONMENTAL IMPACTS			
EXTENT OF DAMAGE:			
ESTIMATED (ACRES):			
RISK ASSESSMENT			
THE OBSERVED DEGRADATION WILL IMPACT TRAINING:		YES	NO
VISIBILITY/ACCESSIBILITY OF SITE:		HIGH	MODERATE
COMMENTS			
DESCRIPTION OF THE SITE LOCATION:			
DESCRIPTION OF THE DEGRADATION OR PROBLEM:			

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Attachment 7

SITE REHABILITATION PRIORITIZATION (SiteRep) FORM B					
Observation Grid (UTM):			Map Datum:		
Training Area:			Date:		
Observer:			Phone #:		
<i>CIRCLE APPROPRIATE RESPONSES.</i>					
MILITARY LAND TRAINING USE CATEGORY					
Low Water Crossing (3)			Roads/Road Shoulders (3)		
Rs Ada Site, Buvouac (2)			Maneuver Training (2)		
Small Arms Range (2)			Missile/Artillery Firing Points (2)		
Observer/Commo/Radar Points (1)			Impact Areas (1)		
Other (1):					
ENVIRONMENTAL IMPACTS					
EXTENT OF DAMAGE		Estimated (Acres):		Or Gps File Name:	
SOIL TYPE			SITE IS LOCATED IN		
Silt (3)		Gravelly Silt (3)		Upland Slopes (2)	
Clay (2)		Gravelly Clay (2)		Basins (1)	
Sand (2)		Gravelly Sand (2)			
Exposed Rock (1)		Other			
SITE DRAINAGE PATTERN			EROSION TYPE		
Primary Drainage (4)			Sheet Erosion (1)		
Secondary Drainage (3)			Rill Erosion (2)		
Culvert/Rd Drainage (2)			Gully Erosion (3)		
Flat Vegetation Area (1)			Other:		
THREATENED ENDANGERED OR SENSITIVE SPECIES CONCERNS					
Yes:				No	Unknown
RISK ASSESSMENT					
The Observed Degradation Will Impact Training			Yes (2)	No (1)	
Visibility/Accessibility Of Site		High (3)	Moderate (2)	LOW (1)	
Potential For Rehabilitation Success		High (3)	Moderate (2)	LOW (1)	
If Site Is A Road	Na (0)	Dirt (3)	GRADED (2)	GRAVEL (1)	PAVED (0)
COVER TYPE					
Plains Mesa Grassland (3)			Desert Grassland (3)		
Woodlands (3)			Montane Shrub (3)		
Barren (3)			Mixed Shrub (2)		
Mobile Dunes (2)			Mesquite Dunes (1)		
REHABILITATION REQUIRED					
Reseed		Culvert	Clean Fill	Dams	
Rock		Concrete	Synthetic Soil Retention	Contour	
Earth Moving		Other:			
Total Score From Values Of Answers Circled:					
Description Of Site Location:					
Description Of The Degradation Or Problem:					

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Appendix **B**

**APPENDIX B
CUMULATIVE IMPACTS ANALYSIS BACKGROUND**

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B.0 CUMULATIVE IMPACTS ANALYSIS BACKGROUND

The CEQ regulations require the scope of an EIS to consider cumulative actions which, when viewed with the proposed action, may have cumulatively significant impacts. Cumulative impacts are defined as impacts on the environment which result from the incremental impact of the proposed action when added to other past, present, and reasonably foreseeable future actions.

The ROI defined for the Army activities in this PEIS varies by resource area and represents the geographic area established for the cumulative effects analysis.

For the purpose of this PEIS, two types of activities have been identified that, in combination with the proposed action, have the potential for contributing to cumulative impacts. They are:

- Ongoing or projected military activities in the ROI, including activities at WSMR and Holloman Air Force Base (HAFB).
- Nonmilitary activities and plans that affect areas or resources affected by proposed actions.

Sections B.1 through B.3 describe activities in each of these areas that are included in the cumulative impact analysis from a regional viewpoint. Section B.4 describes changes in vegetation cover on Fort Bliss using June 1986 and June 1996 remote sensing reconnaissance scans. This is an installation program in its infancy, intended to develop methodologies for LCTA. Discussion of work to date is limited to available data covering only two observations from which conclusions cannot be drawn.

B.1 MILITARY ACTIVITIES AT WSMR

The WSMR is part of the DoD's Major Range and Test Facility Base and has, as its primary mission, the support of research, development, test and evaluation (RDT&E) of Army missile and rocket systems. The WSMR also supports RDT&E programs by the U.S. Air Force (USAF), Navy, and National Aeronautics and Space Administration (NASA), and commercial testing concerns. The WSMR has a land area approximately 100 miles long and 40 miles wide that includes numerous laboratories, facilities, test areas, and missile launch sites (Figure B-1).

The *White Sands Missile Range Range-Wide Environmental Impact Statement* (U.S. Army, 1998f) identified ongoing and projected test programs and other missions anticipated at WSMR and within WSMR airspace. During the 5-year period from 1989 to 1993, WSMR completed an average of 4,366 scheduled missions per year. These include the following:

- Air-to-air and air-to-surface missile programs. These include projects that test missiles such as the Advanced Medium-range Air-to-Air Missile (AMRAAM), launched from aircraft against targets in the air or on the ground. On average, about 200 missions are conducted annually. Typical tests include captive carry, during which the missile remains attached to a carrier aircraft, and hot firings.
- Surface-to-air missile programs. On average, about 700 surface-to-air missile missions are conducted at WSMR annually. These include development and flight testing of the Extended Range Intercept Technology (ERINT) interceptor missile, testing of Forward Area Air Defense System (FAADS) such as Stinger missiles, and test firing and tracking of Patriot missiles. Theater High-altitude Air Defense (THAAD) missile program test activities are also conducted.

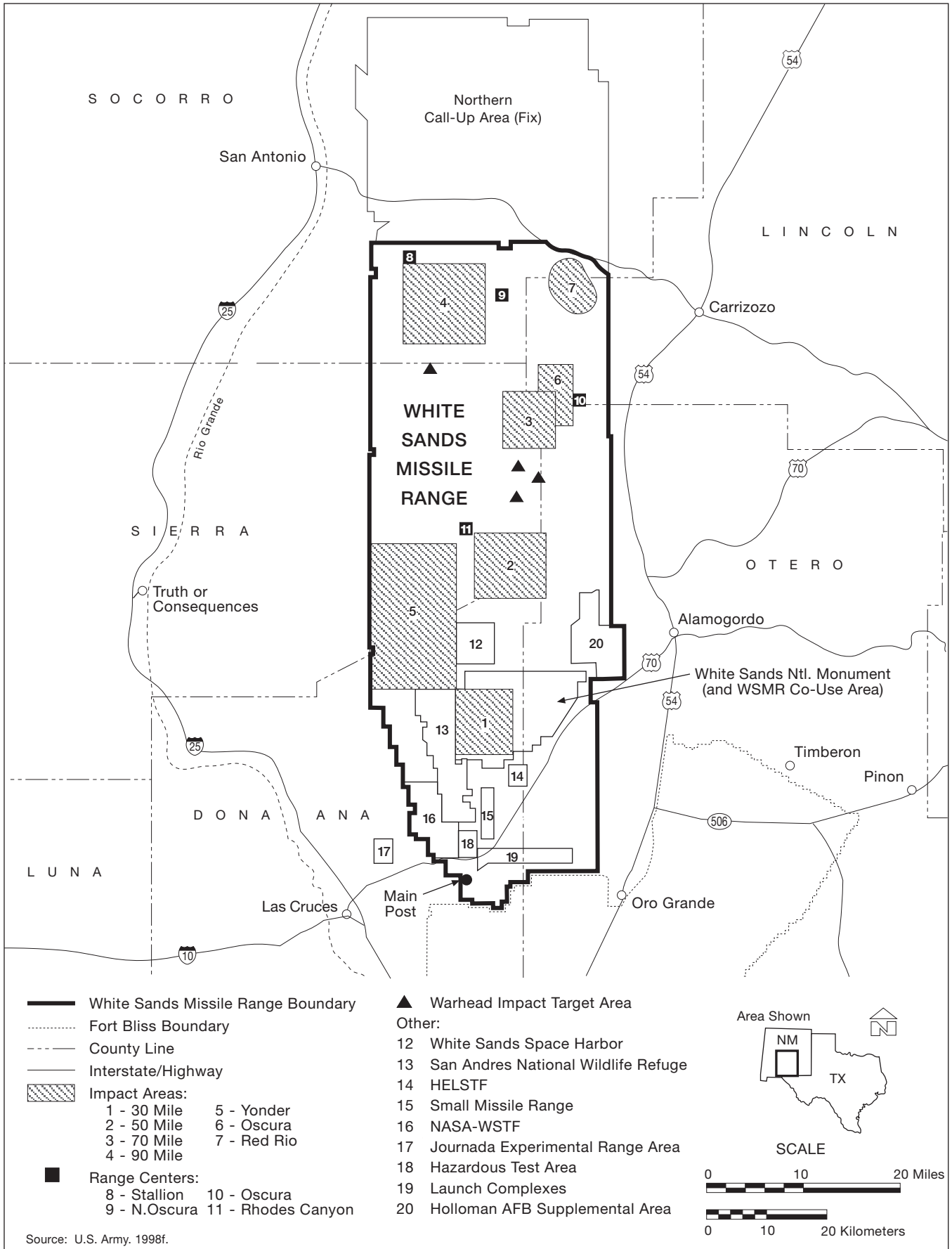


Figure B-1. White Sands Missile Range Operations and Land Use Area.

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- Surface-to-surface missile programs. On average, 250 surface-to-surface missions are conducted at WSMR annually. These include test launches of the ATACMS solid-propellant missiles from Multiple Launch Rocket System (MLRS) launchers (including high explosives tests in approved areas), flight tests and fire control tests of the solid-propellant Line-of-Sight Anti-tank (LOSAT) missile, and testing of new propulsion systems for 13 cm and 20 cm guns.
- Testing of drone target systems. On average, 400 missions are conducted annually of target systems for Stinger, Chaparral, and Hawk missile programs.
- Meteorological and upper atmosphere probes. On average, 15 meteorological and upper atmosphere probes missions have been conducted each year.
- NASA and space program support. On average, 400 NASA and space program missions are conducted annually at WSMR, including the Space Shuttle program, shuttle training aircraft, and Single Stage Rocket Test program. The WSMR is an alternate landing site for the space shuttle. Laboratories at NASA's White Sands Test Facility (WSTF) test the compatibility of materials being considered for use in aerospace applications. The WSTF's tracking and data relay system station provides satellite data relay services to spacecraft such as the shuttle. NASA operates and maintains a shuttle training aircraft that provides a realistic simulation of the shuttle landing from 35,000 feet to touchdown. The Single Stage Rocket Test Program is a U.S. Army Ballistic Missile Defense Organization program to develop a vertically-launched and recoverable suborbital rocket capable of lifting up to a 3,000 pound payload and returning to the launch site for a precise soft vertical landing. The WSMR is providing preflight static testing, hover flight, and rotation flight tests for this program.
- Equipment components and subsystem tests. On average, 300 such tests are performed at WSMR annually, and typically include flight testing on helicopter or fixed-wing aircraft.
- High-energy laser missions. On average, 100 high-energy laser missions are conducted annually at various approved locations on WSMR.
- Research and development programs. Research and development programs are primarily in the fields of nuclear effects (conducted in simulated environments) and research rockets (e.g., sounding rockets).
- Special tasks. These special tasks normally consist of small-scale training exercises, indoor testing, field tests, and explosives ordnance disposal.

In addition, WSMR supports air-to-ground training at Red Rio and Oscura Target Complexes and air-to-air training in its Restricted Areas.

These WSMR mission activities in the southern portion of the installation are coincident with Fort Bliss mission activities on regional water resources and ecosystems that transcend the boundary between the two installations. For example, water is pumped from the Soledad well field on the Doña Ana Range–North Training Areas from an aquifer that serves both installations. Hydraulic conductivity for two wells completed in alluvial-fan deposits of Soledad Canyon is estimated at 50 to 60 feet per day, and in the WSMR Post Headquarters area, estimates range from 1 to 210 feet per day (Orr and Risser, 1992). Groundwater withdrawals by the City of El Paso from the Hueco Bolson in 1996 were 56,702 acre feet (af), more than 10 times the amount pumped by Fort Bliss (see Section 4.7.4.2). As much as 100,000 af of water may have been pumped by neighboring Ciudad Juarez, Mexico. The cumulative water usage of Fort Bliss and WSMR from the Soledad well field on the Doña Ana Range–North Training Areas will have little effect on either forestalling or hastening the eventual depletion of fresh water in the aquifer.

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The major vegetation communities along the southern border of WSMR with the Doña Ana Range–North Training Areas are mesquite coppice dunes and sandscrub, creosote and tarbush shrublands, and basin and foothills grasslands. Actions taken by either installation in this border area could result in cumulative impacts to the vegetation communities that span the boundary.

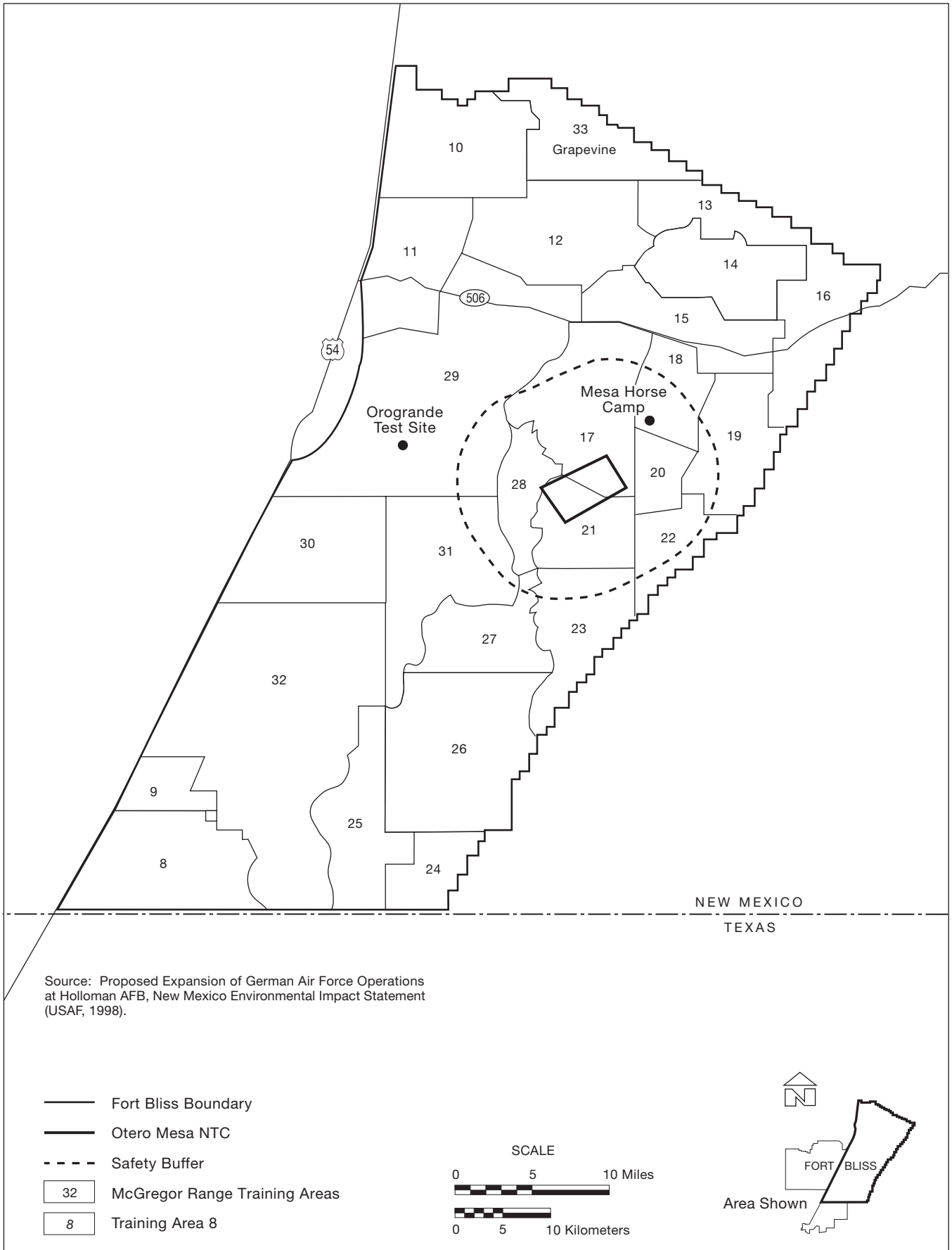
B.2 MILITARY ACTIVITIES AT HAFB

HAFB is located approximately 7 miles west of Alamogordo in Otero County, New Mexico, and 85 miles northeast of El Paso, Texas. Ongoing and projected mission changes at HAFB that will affect airspace over and land use on Fort Bliss include the following:

- Completion of the Taiwanese Air Force Training program at HAFB and deactivation of the 435th Fighter Squadron. This action was analyzed in the *Final Environmental Assessment for The Drawdown of AT-38 Aircraft and Deactivation of the 435 Fighter Squadron at Holloman Air Force Base, New Mexico* (USAF, 1997j). This action occurred in FY 97 and reduced T-38 operations at HAFB, McGregor Range (use of the existing Class C air-to-ground, unscored, inert bombing circle), WSMR, Beak and Talon Military Operations Areas (MOAs), and several MTRs, including IR-133, IR-134, IR-195, and VR-125.
- The USAF, Air Combat Command (ACC) prepared an EIS on a proposal to expand German Air Force (GAF) operations at HAFB, New Mexico (USAF, 1998), through the beddown of an additional 30 PA-200 Tornado aircraft at the base. The Tornado aircraft must operate within 180 miles of HAFB. The proposed action includes construction of various facilities at HAFB and the establishment of a new air-to-ground tactical target complex for use by USAF and GAF units. Two of the three options for the proposed new air-to-ground target complex are located on land that is part of the Fort Bliss Training Complex on McGregor Range. On May 29, 1998, the USAF selected the McGregor Range Otero Mesa option site (Figure B-2). The EIS also evaluated the Tularosa Basin option site (Figure B-3).

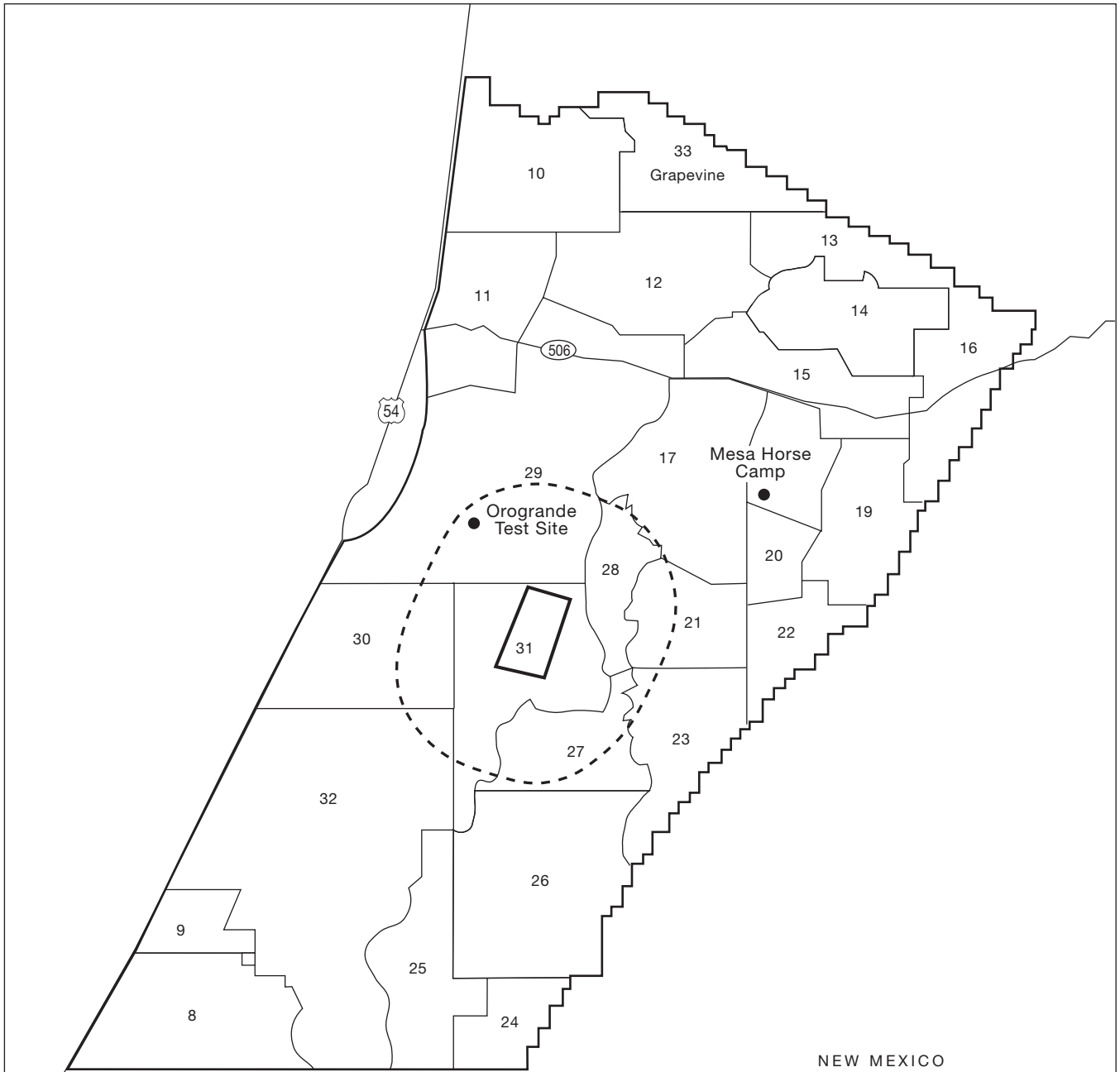
The tactical target complex, would include an impact area measuring 2 by 4 statute miles (SM) within a 12 by 15 SM safety area. Construction could begin following issuance of the ROD, and could be completed for the Otero Mesa site, during 1999 or 2000. It is assumed that the entire impact area would be disturbed by construction. This construction would include a 16-foot firebreak road around the perimeter, installation of a barbed wire fence along the full length of the firebreak road centerline, and construction of individual target arrays. These target arrays would include simulated airfield complex, industrial complex, rail yard, air defense sites, forward edge of the battle area (FEBA) arrays, and convoy. Figure B-4 illustrates a typical impact area configuration.

The ROD regarding this action follows Figures B-2 through B-4.



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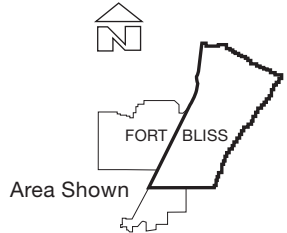
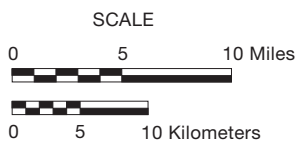
Figure B-2. Otero Mesa Selected Site.



NEW MEXICO
TEXAS

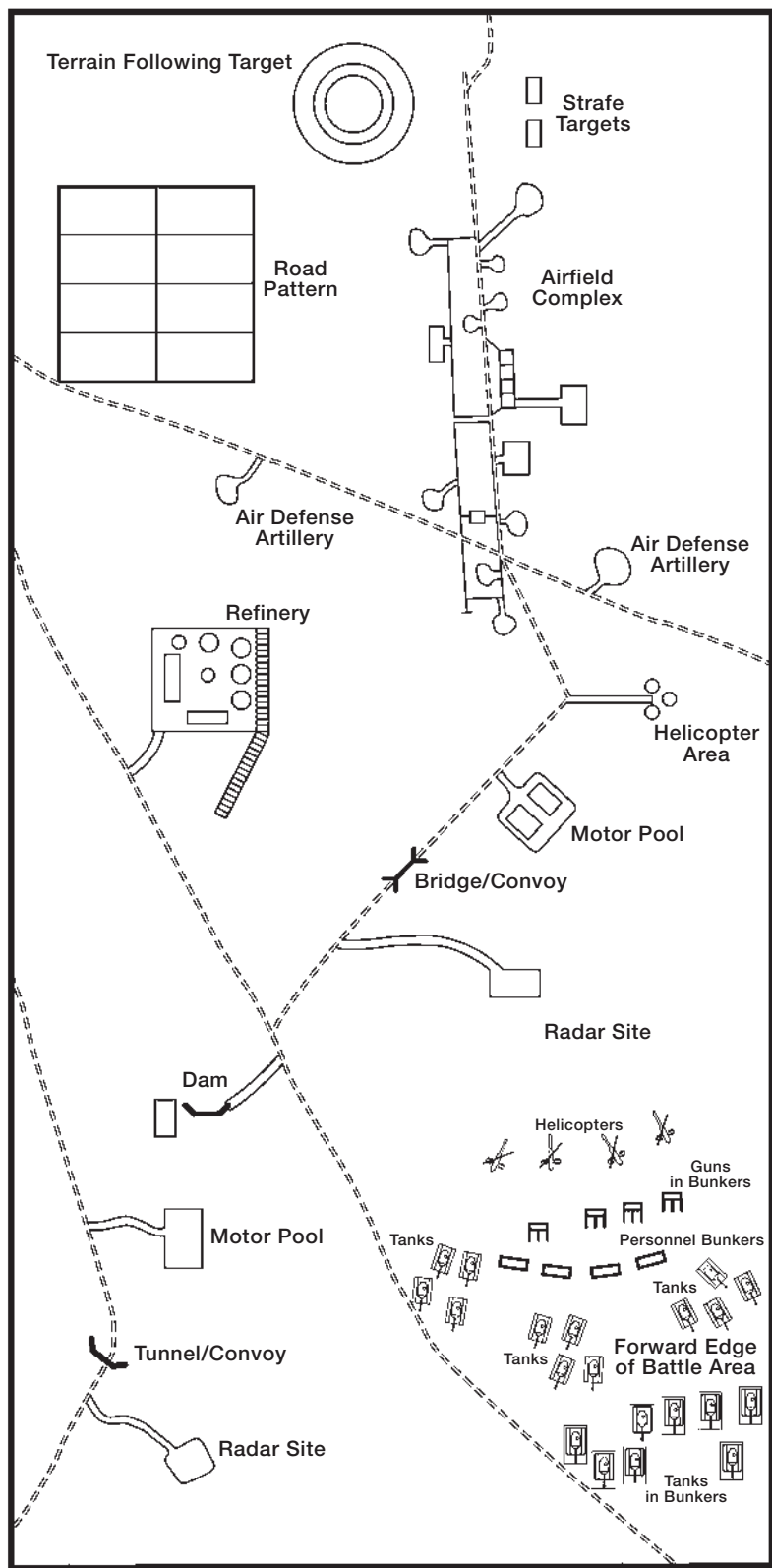
Source: Proposed Expansion of German Air Force Operations at Holloman AFB, New Mexico Environmental Impact Statement (USAF, 1998).

- Fort Bliss Boundary
- Tularosa Basin NTC
- - - Safety Buffer
- 32 McGregor Range Training Areas
- 8 Training Area 8

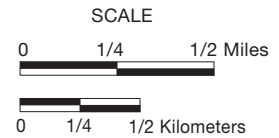


FBMMFEIS 062.vb.8.28.98

Figure B-3. Tularosa Basin Option Site.



Source: Proposed Expansion of German Air Force Operations at Holloman AFB, New Mexico Environmental Impact Statement (USAF, 1998).



FBMMFEIS 061.vb.7.8.98

Figure B-4. Typical Impact Area Configuration.

RECORD OF DECISION

PROPOSED EXPANSION OF GERMAN AIR FORCE (GAF) OPERATIONS AT HOLLOMAN AIR FORCE BASE (AFB), NEW MEXICO

INTRODUCTION

Pursuant to Section 102(2)(C) of the National Environmental Policy Act (NEPA) of 1969 and regulations promulgated by the President's Council on Environmental Quality (CEQ) at Title 40 Code of Federal Regulations (CFR) Part 1500 et seq., and Air Force Instruction (AFI) 32-7061, Environmental Impact Analysis Process, the United States Air Force has prepared an Environmental Impact Statement (EIS) evaluating the potential environmental effects of the proposed expansion of German Air Force Operations at Holloman Air Force Base, New Mexico. This Record of Decision (ROD) identifies my decisions for this proposed action. These decisions have been made in consideration of the information contained in the EIS which was filed with the United States Environmental Protection Agency (US EPA) and made available to the public by announcement in the Federal Register on April 17, 1998.

PUBLIC PARTICIPATION

Public participation is one of the cornerstones of NEPA and is reflected in CEQ NEPA regulations, which require an early and open process for determining the scope of issues to be addressed in the EIS. The objective of the scoping process is to determine the range of issues to be addressed and to identify significant issues related to the proposed action.

The first step of scoping for this EIS was publication of the Notice of Intent (NOI) in the Federal Register on May 8, 1996. The NOI announced the dates, times, and locations of the proposed scoping meetings and alerted the public of the Air Force's intent to publish an EIS.

The scoping period was from May 8 to August 15, 1996. The Air Force placed announcements in local and state newspapers to advertise scoping meetings and solicit public comments. The scoping meetings were held between July 7 and 12, 1996 in El Paso, Texas and Carlsbad, Carizozo, Las Cruces, and Alamogordo New Mexico. In addition, public comments were accepted throughout the public scoping period, as well as during preparation of the Draft EIS (DEIS), the public comment period following the release of the DEIS, and the preparation of the Final EIS (FEIS).

A Notice of Availability for the Draft EIS was published in the Federal Register on June 20, 1997. The notice started the 45-day public review and comment period, which concluded on August 4, 1997. Announcements were placed in local and state newspapers to notify the public of the Draft EIS availability and to solicit comments on the document. Copies of the Draft EIS were mailed to agencies, organizations, and individuals on the mailing list for their review and comment. In addition, copies of the Draft EIS were placed in several libraries in the area for public review. Comments received during the public review and comment period were considered in preparation of the Final EIS (FEIS). Modifications were made to the Final EIS based upon the input received during the public review and comment period for the Draft EIS to provide further clarification of the proposed action, alternatives, impact assessment, and proposed mitigation measures.

BACKGROUND

Changes in international requirements and in the United States military budgets have established a need to foster combined action capabilities for the military forces of many nations to work together to meet specific threats. Combined action capabilities permit each nation to substantially reduce their military force, while concurrently creating the larger force necessary to permit response to international requirements. The current U.S. National Military Strategy emphasizes peacetime engagement by way of military-to-military contacts through international training and military exchanges. This strategy requires military personnel from different nations to achieve a uniformly high standard of training and proficiency, and forge the strongest possible team. The goal is to build mutual trust, effective communications, interoperability, and doctrinal familiarity.

Germany is an important ally of the United States and has provided aircrews to support recent combined force missions. The United States government, following discussions with the German government, recognized a need to provide training with enhanced realism and quality for German Air Force (GAF) Tornado aircrews. Holloman AFB had the capacity, Military Training Routes (MTRs), Military Operations Areas (MOAs), and ranges to provide the requested training. A Memorandum of Agreement was signed between the United States and German governments in May 1994, establishing the GAF Tactical Training Establishment (TTE) at Holloman AFB. The potential environmental effects of that action were assessed under NEPA and U.S. Air Force Regulations (Air Force, 1993. Proposed Beddown of the German Air Force PA-200 and an Additional AT-38 Training Unit at Holloman Air Force Base, New Mexico).

In May 1996, 12 Tornado aircraft were relocated to Holloman AFB. This action resulted in economies of scale, logistics, and cross training since it resulted in collocation of the German Tornados and the German F-4 training (conducted by the U.S. Air Force 20th Fighter Squadron) at Holloman AFB.

In 1995, two years after the beddown decision on the original 12 Tornados, discussions were held between the two countries about the potential expansion of GAF Tornado training in the United States. Because of the need to optimize use of previous infrastructure investments (e.g., maintenance facilities and aircraft hangars), Holloman AFB was considered to be the only feasible location for the Tornado beddown. On this basis, the U.S. Air Force is considering a proposed action under which the GAF TTE for GAF Tornado aircrews would be expanded at Holloman AFB.

PURPOSE AND NEED

In the international arena, the purpose of the proposed action is to further support a bilateral agreement between the governments of the United States and Germany. The proposed action demonstrates continued U.S. commitment to NATO allies, which is crucial as the U.S. military presence is reduced in Europe. The proposed GAF military training would serve to maintain cooperation between our countries and interoperability among our military forces. It provides a desert/mountainous terrain training location not otherwise available to GAF aircrews in Germany. The implementation of this action for the GAF capitalizes on the substantial infrastructure investments the GAF has already made at Holloman AFB. Collocating the initial, continuation, and advanced training programs at one location will allow Tornado expertise to be shared among students in different courses, which would enhance the training environment and produce better-trained students.

Implementation of the proposed action would serve to meet the need to protect U.S./German post-Cold War bilateral relations from possible degradation as a result of U.S. military force reductions in Europe. The proposed action would serve to meet the need to promote international agreements and demonstrate U.S. resolve to support internationally cooperative defense initiatives. The proposed action would provide GAF a consolidated Tornado training establishment capable of supporting needed new training, continuation of existing training requirements, and desert/mountainous terrain training. It would also provide means to improve logistics efficiency and enable economy of scale for the GAF by collocating these additional aircraft with existing GAF operations at Holloman AFB.

PROPOSED ACTION

A Final Environmental Impact Statement (FEIS) entitled "Proposed Expansion of German Air Force Operations at Holloman AFB, New Mexico" was prepared by the Air Force to analyze the potential impacts and aid in the decision of expanding the TTE to include the beddown of 30 additional GAF Tornado aircraft with associated operations and support personnel at Holloman AFB.

Expansion of the TTE would involve the beddown of an additional 30 Tornado aircraft and 640 personnel at Holloman AFB. Under the TTE expansion at Holloman AFB, five different training courses ranging from basic conversion training to the Fighter Weapon Instructor Course would be conducted. The Tornado aircrews would receive training in takeoffs and landings, the use of terrain-following radar for low-level navigation on Military Training Routes (MTRs), air-to-ground training on air-to-ground ranges, air-intercept training in Military Operations Areas (MOAs) and restricted airspace, and aerial refueling. Existing ranges and airspace would be used to achieve a majority of the training; however, current range capacity and capabilities provide a minimally acceptable level of training. These limitations led to three "training options" being considered as part of this action.

To support this beddown, construction affecting approximately 96 acres at the base would be required. The proposed action would result in changes in use of airspace and munitions. Airspace use would increase in most affected airspace. The training, would require installing a Television Ordnance Scoring Systems (TOSS) at the Oscura and Red Rio target complexes on White Sands Missile Range (WSMR) and also at the selected training option site (see Training Options and Decision discussions below). Live munitions deliveries would be restricted to the existing Red Rio Live Drop Target (LDT). Supersonic operations, limited to approximately 24 sorties per year for "maintenance check" purposes, would be conducted in designated WSMR supersonic airspace (above 10,000 feet mean sea level [MSL]). The proposed action would make use of the airspace modifications to the existing Air Launched Cruise Missile (ALCM) routes, the Talon MOA expansion, and the aerial refueling anchor, AR-X652, in southern New Mexico and west Texas if these modifications are approved by the Federal Aviation Administration (FAA). If these airspace modifications are not implemented, existing airspace would be used. Differences in airspace availability and use are taken into account in the FEIS which analyzes the environmental impacts of using the proposed modified airspace, as well as the impacts of using existing airspace if the proposed modifications are not approved by the FAA.

TRAINING OPTIONS

Under the proposed action, three training options were considered and evaluated in the FEIS:

West Otero Mesa Training Option. Under this, the preferred training option, a new target complex (NTC) would be established on the West Otero Mesa portion of McGregor Range. The NTC would be used for air-to-ground training in the delivery of inert/subscale munitions. This option would include the installation of a TOSS at the NTC.

Tularosa Basin Training Option. Under this option, an NTC would be established in the Tularosa Basin portion of McGregor Range. This NTC would be used for air-to-ground training in the delivery of inert/subscale munitions. This option would also include the installation of a TOSS at the NTC.

Existing Range Training Option. Under this option, all air-to-ground training would occur on existing ranges.

NO ACTION ALTERNATIVE.

Under the no action alternative, no change in TTE aircraft and personnel at Holloman AFB would occur. No construction would be required to support this alternative. In addition, no change in airspace use or munitions use would occur.

DECISION

The CEQ regulations implementing NEPA require RODs to specify the alternative or alternatives considered to be environmentally preferable. As between the proposed action and the no action alternative, the no action alternative is environmentally preferable in the sense that the no action alternative would result in no environmental impacts beyond the baseline conditions. However, pursuant to the CEQ regulations, this ROD also identifies and discusses preferences among alternatives based on relevant factors including economic and technical considerations and, agency statutory missions, including any essential considerations of national policy balanced by the agency in making its decision. After considering the preferences associated with the proposed action and its training options, as well as the no action alternative, and their potential environmental consequences, I have decided to implement the proposed action with the preferred West Otero Mesa training option (this combination is referred to hereafter as the selected action). In making this decision, I have considered the economic and technical factors associated with the proposed action, the various training options, and the no action alternative, the mission of the U.S. Air Force and the national policy matters discussed above. I have also considered the opinions and suggestions that were offered by the public, state and federal agencies and other government representatives from the affected communities in making this decision. I decided on this selected action for a number of operational and environmental reasons.

The West Otero Mesa training option provides the maximum training opportunity for both the GAF and U.S. Air Force. In addition to the greater opportunity for training, this option also provides for the greatest training versatility and efficiency. Finally, NTC construction on the West Otero Mesa will disturb a significantly smaller geographical area compared to the Tularosa Basin training option and will involve a fraction of the cost.

The Tularosa Basin training option was not selected because the layout of the terrain would result in a 20 percent reduction in training efficiency compared to the West Otero Mesa training option. This alternative would also require extensive site disturbance to prepare for and construct the NTC, which would increase costs by several million dollars.

The Existing Range training option provides only minimally adequate training for GAF aircrews and does not have the training benefits and efficiencies of the other options. In addition, the increased range use from this option has the potential to significantly degrade current U.S. Air Force operations and training.

The No Action alternative would not provide the training, proficiency, and combined action capabilities needed to achieve the military-to-military strategy and goals.

The FEIS provides analyses of the potential environmental consequences of the proposed action and the training options considered, as well as the No Action alternative. All practical means to avoid or minimize environmental harm from the alternative selected have been evaluated and are being adopted. The findings, as discussed below, indicate that potential environmental impacts would include increased aircraft-related noise in some portions of the affected airspace, overflight disturbance to land use, and slight to moderate impacts to biological resources. I believe the FEIS-specified mitigation measures will avoid or adequately minimize these potential impacts.

SELECTED ACTION IMPACTS

The following summarizes the anticipated impacts from the selected action:

Airspace Use and Management: The selected action does not require any modifications to existing airspace. However, the training would use the airspace modifications considered under the previously assessed ALCM/Talon action, if approved by the FAA. Overall, assessment of each affected airspace unit found that the projected number of sorties will result in little change to the FY00 daily average sortie levels for each area. Implementation of the selected action will have little effect on use and will not affect management of this airspace.

Noise: Implementation of the selected action will result in an increase in noise levels in the vicinity of Holloman AFB, compared to the FY00 projected baseline. The area contained within the 65 decibel (dB) day-night average sound level contour around the base will increase by about 12 percent. The average noise levels in areas underlying MTRs and MOAs will range from 35 dB to 59 dB. Higher average noise levels will prevail beneath restricted airspace, particularly in the vicinity of target complexes within WSMR, McGregor, and Melrose Range. Overall average noise levels in these areas will be 63 dB or less, although average noise levels will reach 80 dB at the individual target complexes. Average noise levels will be 62 dB along the centerline of flight patterns used during routine training on the target complexes. Noise levels will drop off rapidly with distance from the centerline of these flight patterns, falling to levels under 45 dB within one mile of the centerline.

In most areas, average noise levels will change by 2 dB or less from the baseline levels that would otherwise prevail in FY00. This difference will not be perceptible to most people. Noticeable changes in average noise levels between 5 and 7 dB will be limited to areas under IR-192/194, portions of IR-134/195, and in a portion of IR-113 underlying Pecos MOA.

Land Use: Land use patterns at Holloman AFB and the surrounding vicinity will remain unchanged under the selected action. Projected increases in noise exposure at the base will not result in an appreciable increase in noise exposure for on-base housing and community services. The use of surrounding off-base areas that are undeveloped or used for livestock grazing will be unaffected. The White Sands National Monument area exposed to 65 dB or higher will increase less than two square miles.

In general, areas under the affected airspace will receive less than one additional sortie a day, resulting in imperceptible or minor increases in day-night average sound levels of 1 to 3 dB. Some areas (in Eddy and Otero counties in New Mexico, and Hudspeth County in west Texas) will experience noticeable increases in sound levels of 5 to 7 dB. Average noise levels will not exceed 62 dB outside of restricted airspace. Typical low-level overflights will be short in duration. Some wilderness users may be startled by aircraft noise. These projected changes in the noise environment are not expected to result in any changes in land use.

The 5,120-acre NTC will be located on the currently withdrawn public land on McGregor Range. Construction of the NTC will disturb 1,104 acres. 1,024 of those acres will remain disturbed through continued use of the NTC (i.e., bombing and maintenance). Portions of McGregor Range are currently open to the public for grazing and recreation. However, under the selected action the 5,120 acres comprising the impact area of the NTC will no longer be accessible to the general public. In addition, training activities on the NTC will require that portions of areas south of State Road 506 be closed to the public for approximately 60 hours per week, from Monday through Friday. State Road 506 itself would not be closed. Access by ranchers to grazing area and by the public for recreation will generally be unconstrained by air-to-ground activity from Friday afternoon through Sunday each week and early mornings on weekdays. Licensed deer and antelope hunting will continue to be scheduled on the Range through coordination between New Mexico Department of Game and Fish and the U.S. Army. Establishment of the NTC on West Otero Mesa will reduce available grazing land by about two percent. Noise levels in areas beyond the NTC impact area are considered compatible with existing grazing activities on McGregor Range. Noise levels at the nearest residence, which is east of the NTC, will be about 43 dB, a level compatible with residential use.

Air Quality: Implementation of the selected action will result in temporary, construction-related emissions at Holloman AFB, the Red Rio target complex on WSMR, and the West Otero Mesa NTC on McGregor Range. The annual cleanup and routine maintenance operations at the existing ranges and at the selected NTC will result in emissions related to temporary, construction-type activities. These emissions will be short-term and controlled through common construction practices. Changes will occur in emissions from vehicle operations and stationary sources at Holloman AFB, but are not expected to result in significant air quality impacts. The proposed increase in airspace use for the selected action will result in increased emissions; however these increases will be well below criteria pollutant limit levels. None of these air emission changes will lead to nonconformance with the U.S. Environmental Protection Agency's (EPA's) Conformity Rule or noncompliance with the Clean Air Act.

Biological Resources: Implementation of the selected action will affect biological resources through facilities construction, changes in aircraft operations in affected airspace, and delivery of ordnance against existing and proposed targets.

On-base facility construction will result in the disturbance of 96 acres within or immediately adjacent to the developed area of Holloman AFB. Most of this area has been previously disturbed. About 15 acres of relatively undisturbed habitat immediately adjacent to the existing munitions area will be disturbed. This area has burrows that may be used by burrowing owls for nesting. Burrowing owl nests are also present in areas that will be disturbed by construction near the runway apron. No impact to jurisdictional wetlands will occur at Holloman AFB. Waters of the U.S. on Holloman AFB may be disturbed during improvement of the stormwater drainage system.

Construction of the TOSS at Red Rio and Oscura impact areas and use of Red Rio, Oscura, and Melrose Range will result in low adverse impact to biological resources. Less than 10 acres will be disturbed on Red Rio from installation of the TOSS components and fiber-optic cable. Most of this area will be a narrow linear disturbance for the fiber-optic cable immediately adjacent to existing roads. Therefore, a narrow strip of vegetation will be lost; much of which has been previously modified from construction, use, and maintenance of the existing roads. Once construction is complete, animal use of the area should be similar to pre-construction levels. Use of the existing targets and ranges will result in loss of an additional 3.4 acres of vegetation on Red Rio and a very limited amount of vegetation on Oscura and Melrose Range. Overflights, ordnance use, and flare use on Red Rio, Oscura, and Melrose Range will result in continued low impact to wildlife. No impacts to protected and sensitive species or to wetlands are expected from use of the existing ranges.

Construction and use of the selected NTC under the West Otero Mesa training option will likely result in impacts to some biological resources and habitat due to the disturbance of 1,104 acres of shortgrass and desert scrub habitat. Habitat in the immediate vicinity of the NTC may be reduced due to startle from ordnance delivery and overflights. Protected and sensitive species may be affected by construction and use of the West Otero Mesa NTC. The U.S. Fish and Wildlife Service issued a Biological Opinion on 8 May 1998 relating to threatened or endangered species impacts from the proposed action. The Biological Opinion determined that the action is not likely to adversely affect or will have no effect on the Interior least tern, Piping plover, Whooping crane, Swift fox, Mexican gray wolf, Jaguar, and Black footed ferret. In addition the Opinion specified that the proposed action may adversely affect the American peregrine falcon, the Mexican spotted owl, the southwestern willow flycatcher, the Northern aplomado falcon, and the bald eagle. A non-jeopardy opinion was issued contingent upon the U.S. Air Force implementing reasonable and prudent measures. These measures are outlined in the Mitigations Section of the ROD. The Air Force is committed to implementing these measures to ensure that potential adverse impacts will be minimized.

Up to 46,000 linear feet of dry streambeds tentatively delineated by the Corps of Engineers as Waters of the U.S. could be disturbed by construction or ordnance delivery on the NTC. Some water developments, which support domestic animals grazing on Otero Mesa as well as wildlife, exist within the NTC impact area. Final design of the NTC would include moving these water developments out of the impact area avoiding potential Waters of the U.S. as much as possible. If necessary, permitting under Section 404 of the Clean Water Act would be accomplished.

Archaeological, Cultural, and Historical Resources: One archaeological resource, a prehistoric artifact scatter with features (HAR-361), has been identified in the selected action on-base construction. This resource has not been determined to be potentially eligible for listing on the National Register of Historic Places. No prehistoric or historic archaeological resources have been identified within the remainder of the disturbed area on Holloman AFB. No Native American traditional cultural properties (e.g., sacred sites) have been identified on Holloman AFB, and no potentially significant historic buildings on Holloman AFB will be adversely affected by the selected action.

Installation of TOSS components at the Red Rio target complex will require earth disturbance. The U.S. Air Force is in the process of completing a cultural resources survey in the potentially affected area. Preliminary observations suggest that cultural resources may exist in the affected area, but that these resources could be avoided through project redesign.

The West Otero Mesa NTC construction area contains a total of nine archaeological sites that are considered eligible for listing on the National Register or have undetermined eligibility. No historic architectural resources or Native American traditional cultural properties have been identified within the West Otero Mesa NTC area.

Noise-induced vibration as a result of the increased number of subsonic flights within the affected airspace is unlikely to result in significant physical damage to cultural resources. It is highly unlikely that surface or subsurface prehistoric and historic archaeological sites will be adversely affected. Physical damage to historic architectural resources also is not expected.

The U.S. Air Force has consulted with Native American groups who live beneath the affected airspace. This consultation is intended to elicit the tribes' concerns and comments regarding potential adverse impacts that would result from subsonic flights associated with the selected action. This consultation is continuing as part of Air Force government to government relationship with those group.

Supersonic flight will be conducted for "maintenance check" flights, and confined to supersonic airspace within White Sands Missile Range restricted airspace. The number of additional supersonic flights (approximately 24 per year, all above 10,000 feet MSL) is small compared to existing use of this airspace, and is unlikely to result in any impact to archaeological, cultural, or historic resources.

Water Resources: Project-related construction will result in earth disturbance that could affect water resources. Increased use of inert munitions on the existing ranges will not substantially increase soil disturbance. Increased use of live munitions at the Red Rio live drop target (LDT) will result in additional soil disturbance in that area. The potential for impact is limited due to the small amount of surface water in this area. The use of inert/subscale munitions, and periodic maintenance of the target areas, firebreak roads, and access roads will result in continuing soil disturbance at the NTC. Past experience on existing ranges is that soil disturbance from the use of inert/subscale munitions is small, and localized around individual targets. The ephemeral washes draining the selected NTC site are not significant contributors to local surface water supply. As a result, no effect on surface water quality is expected to result from implementation of the selected action.

Hazardous Materials and Waste Management: Implementation of the selected action will result in increased use of hazardous materials, as well as increased medical and hazardous waste disposal requirements at Holloman AFB. The only hazardous materials generated by range operations will be spent batteries from the proposed TOSS components and batteries removed from target vehicles. Batteries will be recycled by the Defense Reutilization and Marketing Office (DRMO) at Holloman AFB. No significant impact on hazardous materials and waste management practices is expected.

Implementation of the selected action will result in soil disturbances in the vicinity of a site at Holloman AFB which has been identified under the Installation Restoration Program (IRP). Past activities in the vicinity of this site (IRP Site 59) have resulted in soil contamination from spilled fuel. Prior to construction, the specific work area will be over-excavated and backfilled with clean soil. The excavated soil will be contained and transported to an off-base, permitted disposal facility.

Munitions use will increase at the Oscura, Red Rio, McGregor, and Melrose Ranges. Nonhazardous ordnance residue and target area scrap will be collected and recycled through

DRMO at Holloman AFB. Approximately 150,000 additional pounds of nonhazardous ordnance residue and target area scrap generated each year will be disposed by DRMO.

Socioeconomics: Increases in personnel levels and construction expenditures will have a generally positive impact on local socioeconomic conditions by increasing the number of households and reducing the unemployment rate. It is anticipated that after construction is complete, Otero County will have increased employment by an estimated 730 jobs, with 640 direct GAF personnel and 90 additional secondary jobs. The GAF jobs will be at Holloman AFB. Consistent with existing location patterns; it is anticipated that almost all of the secondary job growth would be in Alamogordo.

In accordance with Executive Order 12,898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, February 11, 1994, the FEIS identifies and analyzes the effects of the proposed action and alternatives on minority and low-income populations. The selected action will not result in disproportionately high and adverse environmental effects on minority or low-income populations.

Under the selected action, cattle grazing will be excluded from 5,120-acre impact area on the West Otero Mesa. It is estimated that this loss represents a decline in annual agricultural production of approximately \$50,000, with a loss of employment of about 0.5 jobs annually.

A broad area beyond Holloman AFB will experience changes in overflight due to implementation of the selected action. These changes in overflight will not directly affect socioeconomic resources. Given the rural nature of the areas and the relatively sporadic nature of overflights, the changes in overflight frequency that will result under the selected action are not expected to produce measurable impacts on the economic value of the underlying land.

Transportation: Implementation of the selected action will result in increased traffic near Holloman AFB and the City of Alamogordo. However, the level of service for all roadway segments will be unchanged.

Utilities: Under the selected action, the demand on water supply, wastewater treatment, solid waste disposal, electrical supply, and natural gas supply will be within existing levels of service.

Soils: Impacts to soils will arise primarily through earth disturbance during construction at Holloman AFB, the Red Rio target complex, and at the selected action West Otero Mesa NTC. The on-base existing munitions storage area addition will disturb 15 acres of previously undisturbed soils. Construction associated with the other on-base areas and the Red Rio target complex will occur in previously disturbed soils; therefore, little additional impact to soils is expected.

The increase in use of inert/subscale munitions at existing target complexes (Red Rio and Oscura on WSMR, and the target complex on Melrose Range) will be a fraction of existing use. Increased inert/subscale munitions use at these locations will not substantially increase soil disturbance. Use of the Red Rio LDT will increase substantially, and is expected to increase the area of vegetation loss. This will increase soil erosion in the area. Also, past use of the LDT has led to trace amounts of residue from uncombusted explosive ordnance. The increased use of live ordnance on the LDT could lead to additional trace amounts of soil contamination.

Use of the selected NTC will disturb soil by the use of inert/subscale munitions, as well as periodic maintenance of the surface. During construction, the net combined wind and water soil loss, in the

absence of mitigation measures, could reach 14 tons/acre/year at the West Otero Mesa NTC site, depending on erosion-control measures that may be applied. Following site development and stabilization, net soil loss is projected to be approximately six tons per year.

Safety: Implementation of the selected action will not adversely affect safety. The increased number of flying hours associated with the selected action will not result in a statistically significant increase in the overall risk of an aircraft mishap. Data on bird-aircraft strike hazards indicate no significant change in bird-aircraft strike risk. There will be an increase in munition use and handling over current conditions. Range operating procedures that have ensured safe operation in the past will continue to do so in the future, and no significant impact to safety is expected to occur due to implementation of the selected action.

CUMULATIVE IMPACTS

The Air Force evaluated the potential net environmental impacts due to the incremental impacts of the action when added to other past, present, currently planned and reasonably foreseeable future actions that overlap the selected action geographically and temporally. Training flight activities associated with the selected action are expected to commence in the first quarter of FY00, and thus, FY00 is used as the projected "baseline" from which to analyze environmental impacts. However, because Holloman AFB is an active military installation that undergoes continuous change in mission and in training requirements, and because changes in U.S. Air Force missions unrelated to the selected action are anticipated to occur in the region of influence (ROI) between FY 95 and FY00, FY95 conditions were used as a point of reference for purposes of analyzing cumulative impacts. The FY95 point of reference represents a "snapshot" of the environmental resources associated with Holloman AFB and areas affected by activities and training flights from the base. This comparison indicates that for most resources, no significant cumulative impacts are expected following implementation of the proposed action. These resources are: airspace management, air quality, archaeological, cultural and historical resources, water resources, hazardous material and waste management, safety, utilities, transportation, and soils. The comparison indicates that cumulative impacts are expected for noise, land use, biological resources, and socioeconomic resources. These impacts include a cumulative increase in aircraft overflights and increased noise levels on coincident route IR-178. This will in turn, increase the chance of disturbance and annoyance in residential and recreational areas underlying affected airspace. It will also increase potential for overflight of federally listed species and other sensitive resources. Positive cumulative socioeconomic impacts will arise from various deployment projects being considered for Otero County. The local economy is expected to be able to provide for and benefit from the services needed for the construction personnel and the level of growth associated with these projects.

MITIGATION MEASURES

The Air Force is committed to implementing all practicable means to avoid or minimize environmental harm resulting from the TTE expansion at Holloman AFB. For the selected action, the following mitigations have been identified:

Noise

a) FAA, U.S. Air Force, and GAF regulations specify minimum altitudes and avoidance distances aircraft must adhere to when flying over specific types of structures, settlements, or categories of land. For example, U.S. Air Force regulations require aircrews flying over sparsely populated areas to avoid persons, vessels, vehicles and structures by at least 500 feet. GAF regulations increase some of these avoidance distances further. Even with these avoidance distances, it is

possible that there may be perceptible increases in noise levels for some rural residents. Typical low-level overflights will be short in duration, and in accordance with applicable regulations.

b) The Air Force maintains a process to identify and avoid noise-sensitive areas as identified by affected individuals. Areas identified under this process are avoided by greater distances than the prescribed minimum avoidance criteria to minimize noise levels. These avoidance areas include those currently agreed to involving National Park Service lands.

Biological Resources

a) Field evaluations of the specific site construction areas will be performed to avoid or minimize impacts.

b) The Air Force will evaluate the location of the existing and potential burrowing owl nest sites in relation to construction activities and implement appropriate mitigations (e.g., construct artificial nest burrows).

c) Water developments on the NTC will be moved to an area immediately outside of the impact area to ensure continuity of water supply for grazing stock and wildlife.

d) In addition, construction and operational restrictions identified and mitigations agreed to during the Endangered Species Act consultation with the U.S. Fish and Wildlife Service (USFWS) will be implemented to ensure that potential adverse impacts will be minimized. These mitigations are outlined in detail in the Final Biological Opinion, issued by the U.S. Fish and Wildlife Service on 8 May 1998.

1. Over a ten-year period, the Air Force will coordinate an endangered species interagency survey and monitoring team. The team will focus its attentions on the lands overflowed by MTRs, VR 176, IR-134/195, IR-192/194, and IR-102/141. Not all lands under the subject MTRs will necessarily be field surveyed, but will be initially considered by the interagency team to determine which locations require what level of survey/monitoring effort (if any) for the subject species. The interagency team will reevaluate and redirect (as necessary) the project every two years, and refocus the survey and monitoring effort (as necessary) to accommodate changing conditions and new information.
2. The U. S. Air Force will restrict aircraft operations from March 1 to July 1 each year on specific portions of VR 176 to a single reduced-width corridor laid out within the MTR's existing lateral boundaries. During this time, aircraft will not fly lower than 500 feet AGL within this corridor. In addition, known peregrine falcon and bald eagle nest sites that are within the reduced-width corridor will be avoided 1 mile laterally and 1600 feet AGL. Outside of this corridor and within all other MTRs identified in the USFWS biological opinion, threatened and endangered species habitat will be avoided as described in the Terms and Conditions of the biological opinion and listed herein.
 - a) The Air Force will restrict Low-level flights over peregrine falcon nest sites from March 1 - August 15 of each year. All known nest habitat will be avoided by 1 mile laterally and 1600 feet AGL during the March 1 - August 15 breeding season
 - b) The Air Force will restrict low-level overflights during the Mexican spotted owl breeding season (March 1 - August 31 of each year) over known PACs and identified

nest/roost habitat. All known PACs and owl nest sites once they are adequately surveyed and defined, will be avoided by 2900 feet laterally (which is equivalent to 600 acres) and 1600 feet AGL.

- c) The Air Force will restrict low-level overflights over known bald eagle nest sites, roost and wintering sites by (a) re-routing aircraft on MTRs 1 mile laterally or 2000 feet AGL during the bald eagle breeding season; (b) avoiding large water bodies and bald eagle winter concentration areas by 2000 feet AGL from October 1 through March 1 of each year; (c) avoid known roost sites by a minimum of 1000 feet AGL from October 1 through March 1 of each year.
 - d) The Air Force will restrict low-level overflights over known flycatcher sites and critical habitat from April 15 through September 1 of each year.
3. The Air Force will participate in a study to monitor the occupancy of a sufficient number of Mexican spotted owl protected activity centers (PAC) under VR-176. The purpose of this study will be to determine if occupancy by owls or nest success of PACs is adversely impacted by overflights.
4. The Air Force will, within one year of construction of the new target complex) survey the NTC site, including the safety area to determine the presence of Aplomado falcons.

It is understood that the restrictions described in the Biological Opinion's Terms and conditions will be applied to new sites if discovered, or removed if the characterization of existing sites change. If these restrictions combine to impose unacceptable mission constraints, the U.S. Air Force reserves the right to re-approach the U.S. Fish and Wildlife service to seek resolution.

Archaeological, Cultural, and Historical Resources.

- a) If the proposed construction at Holloman AFB cannot avoid the archaeological resource identified, the resource's significance will be formally evaluated. If the resource is eligible for listing on the National Register of Historic Places, appropriate mitigation will be performed, in consultation with the New Mexico State Historic Preservation Office (SHPO) and in accordance with the National Historic Preservation Act (NHPA).
- b) For any off-base sites eligible for listing on the National Register that would be impacted by the selected action, mitigation will be implemented in accordance with the NHPA, in consultation with the New Mexico SHPO, and in accordance with a Memorandum of Understanding between the U.S. Air Force and Fort Bliss.
- c) Although no Native American traditional cultural properties have been identified within the West Otero Mesa NTC area, the U.S. Air Force will continue to conduct government-to-government communication with the Mescalero Apache.
- d) The Air Force will continue to conduct government-to-government communication with the Mescalero Apache, Acoma, Ramah Navajo, Alamo Navajo, Laguna, and Zuni concerning the effects of aircraft overflights on traditional cultural properties of concern to these Native American reservations.

Soils and Water Resources

- a) Construction activities at Holloman AFB, the Red Rio impact area, and the selected NTC will employ standard practices for control of runoff and infiltration as required by Federal and State

laws, regulations, and permits. Appropriate erosion control measures will be used to minimize sediment loading in the vicinity of the LDT and NTC.

b) Portions of the existing wildlife and livestock water supply distribution system at the West Otero Mesa NTC site will be relocated. This will facilitate construction and avoid negative impacts on this water resource. Any relocation will be coordinated with the Bureau of Land Management.

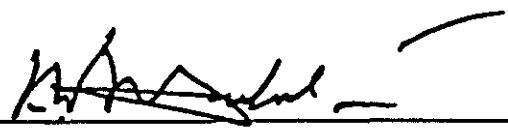
In addition to above the Air Force is committed to cooperation and coordination with the Bureau of Land Management (BLM) as set for the in the May 26, 1998, Memorandum of Understanding (MOU) between the BLM and the Air Force with regard to activities and impacts associated with the West Otero Mesa training option.

CONCLUSION:

I have considered the potential environmental consequences of the proposed action, the No Action alternative, and cumulative effects that overlap with the proposal in schedule and geography. I have taken into consideration these environmental factors as well as economic and technical considerations, national policy, and the U. S. Air Force mission in reaching my decision to proceed with the TTE expansion at Holloman AFB.

This record of decision is made in consideration of the matters discussed herein, the Final Environmental Impact Statement for the Proposed Expansion of German Air Force (GAF) Operations at Holloman Air Force Base (AFB), New Mexico, and the Council on Environmental Quality National Environmental Policy Act Regulations, 40 CFR Part 1505.

5/29/98
DATE



PHILLIP P. UPSCHULTE
Acting Assistant Secretary
(Manpower, Reserve Affairs,
Installations & Environment)

B.3 ACTIVITIES AND PLANS IN AREAS AFFECTED BY THE PROPOSED ACTION

B.3.1 U.S. Bureau of Land Management

The Fort Bliss ROI is within the New Mexico State Office of the BLM (that includes New Mexico, Texas, Oklahoma, and Kansas). Within the New Mexico State Office are two relevant BLM Field Offices (FOs): the Las Cruces FO in New Mexico and the Tulsa FO that includes Texas. Although the Main Cantonment Area and the South Training Areas are within the Tulsa FO, there are no BLM public lands in Texas adjacent to Fort Bliss boundaries.

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The DOI's overall philosophy is to manage public lands under a multiple-use and sustained-yield concept. *The Classification and Multiple Use Act of September 19, 1964* (43 U.S. Code [USC] 1411-1418) is referenced in 43 CFR 2300. No overall priority is assigned by the *Classification and Multiple Use Act* or by the Secretary of the Interior to any specific use. Section 1 of the *Classification and Multiple Use Act* lists ten objectives of public land and specifies that the methods for management of the public lands will be governed by the provision of existing laws (43 USC 1725.3-3). The listed objectives as interpreted by the Secretary of Interior are as follows:

- Domestic livestock grazing;
- Fish and wildlife development and utilization;
- Industrial development;
- Mineral production;
- Occupancy;
- Outdoor recreation;
- Timber production;
- Watershed protection;
- Wilderness preservation; and
- Preservation of public values.

Approximately 1,000 to 1,700 recreation permits are issued annually for purposes such as livestock management, hunting, hiking, nature conservation interests, and guided nature tours. The Secretary of the Interior or his delegate such as the BLM will authorize, under applicable authority, the use or combination of uses that will best achieve the objectives of multiple use, taking into consideration all pertinent factors. These factors include, but are not limited to, ecology, existing uses, and the relative values of the various resources in particular areas (43 USC 1725.3-1). The BLM may place special emphasis on specific requirements for Special Management Areas and ACECs. Land use and rangeland improvements are thoroughly analyzed to restrict new surface disturbance, reduce resource conflicts, and aid in the management of all resources. All proposals are subject to the NEPA process and especially to the mitigation of impacts.

The Las Cruces FO encompasses portions of the Fort Bliss Training Area Complex, the Doña Ana Range–North Training Areas, and McGregor Range. Two RMPs have been published that describe the agency's activities that could contribute to cumulative effects in this region. The RMPs (Mimbres Resource Area [RA] RMP and White Sands RA RMP) have also had EISs developed in conjunction with them to identify possible impacts to the human environment from the planned actions.

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The Mimbres RA RMP encompasses over 3 million acres of public land in Doña Ana, Luna, Hidalgo, and Grant counties, New Mexico. Doña Ana County is the only county of the Mimbres RA in the ROI of this PEIS. Within Doña Ana County's 2,441,190 acres, the Las Cruces FO manages 1,126,270 acres of public land. Other agencies manage the following acres of public land within Doña Ana County: Forest Service – 0; National Park Service (NPS) – 52,600; DoD (military withdrawal) – 503,560; other

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withdrawn lands – 155,840; State Trust lands – 287,500; and private lands – 315,420 (BLM, 1993). The Mimbres RMP (BLM, 1993) addresses the following resource programs used to manage activities on the BLM portions of land within the area covered by the BLM Mimbres RMP: minerals, lands, access, livestock grazing, vegetation, soil, air, and water resources, fire management, wildlife, cultural and paleontological resources, recreation, wilderness, visual resources, riparian and arroyo habitat, and special status species. Planning issues, criteria, and management concerns are described in Appendix A of the Mimbres RMP for each of these resource programs. Issues that may contribute to cumulative impacts as evaluated in this PEIS include:

- The Mimbres RA (Las Cruces FO) is generally characterized as rural open space, with sparse population. However, a large and expanding population exists along the Rio Grande and Mesilla valleys from Las Cruces, New Mexico to El Paso, Texas. This urban population places demands on nearby public land to provide for the needs of the growing communities. Access to public lands for recreation and off-road vehicle use is of particular concern.
- While the BLM policy is to keep the public land open for public use, conditions warrant the removal or withdrawal of certain public land from multiple use such as public safety or protection of special uses and resources. For withdrawals where BLM presently has management responsibility, all RMP decisions covering those areas apply. Thirteen of the 29 withdrawals in Mimbres RA are in the Doña Ana County portion. The four largest of these illustrate the variety of withdrawals. They are: the WSMR (506,540 acres that include portions of the Doña Ana Range–North Training Areas of Fort Bliss), the Jornada Experimental Station and Range (213,699 acres of which 104,221 are within the WSMR withdrawal boundary), the San Andres Wildlife Refuge (57,215 acres), and the Animal Science Ranch of NMSU (52,000 acres) (BLM, 1993).
- The objective of the access program is to enhance access to and across public land in a manner that is compatible with the protection of sensitive resource values. Access concerns have steadily increased over recent years as the demand for access and use of public land has increased. Access to 19 locations in the resource area are being pursued through the RMP, including one in the Organ Mountains to acquire legal public access for vehicular use south of Soledad Canyon through private properties. Appendix C-4 of the RMP (BLM, 1986) describes land tenure adjustment decisions carried forward from the *Southern Rio Grande Plan Amendment of 1986*. This section describes lands recommended for disposal, retention, and acquisition within Doña Ana County. Each category includes lands in the Organ Mountains adjacent to the Doña Ana Range–North Training Areas of Fort Bliss. The possible return to the public domain of 9,794 acres of Fort Bliss withdrawn land north of Soledad Canyon in the Organ Mountains was cited as an acquisition pursuit.

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The Las Cruces FO's White Sands Resource Area (WSRA) RMP (BLM, 1986) encompasses approximately 1.8 million acres of public lands in Otero and Sierra counties, New Mexico, as well as small portions of Lincoln, Chaves, Eddy, Doña Ana, Socorro, and Luna counties. Only Otero County is in the ROI of this PEIS. Within Otero County's 4,248,320 acres, the FO manages 929,578 acres of public land. Other entities manage the following acres of public land within this part of the FO: withdrawn lands including DoD (military withdrawal) – 1,459,752 (includes that portion of McGregor Range co-managed by the Army and the BLM, which is approximately 608,385 acres), other federal lands (U.S. Forest Service [USFS] and NPS) – 497,296; Indian lands – 460,225; State lands – 449,908; and private lands – 451,531 (BLM, 1986). The *White Sands Resource Management Plan* (BLM, 1986) addresses the following resource programs used to manage activities on the BLM portions of lands within the area covered by the WSRA RMP: lands, access, minerals and rangeland management, wild burros, wildlife, soils and water resources, vegetation, air quality, cultural resources, visual resources, recreation, wilderness, and fire management. Implementation, monitoring, evaluation, and maintenance of the Plan are discussed in Section 3 of the RMP. In addition to the WSRA RMP, the RMPA, McGregor Range

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(BLM, 1990a), specifically addresses the cooperative management with the Army of approximately 608,385 acres of withdrawn public land on McGregor Range.

Issues that may contribute to cumulative impacts as evaluated under the appropriate section of Chapter 5 in this PEIS include:

- Grazing on McGregor Range;
- Access to public lands for recreation and off-road vehicle use;
- Current drilling activities for oil and gas exploration;
- Potential requirements for saleable minerals such as sand and gravel used in road construction or improvement;
- Maintenance of BLM assets (pipelines, fences, tanks); and
- Natural and cultural resource management on McGregor Range.

B.3.2 U.S. Forest Service

The USFS manages lands of the Lincoln National Forest that are adjacent to the northeastern boundary of Fort Bliss (McGregor Range) encompassing Training Area (TA) 33. This area, known as the Grapevine, is within the Cloudcroft Ranger District and consists of mixed conifer timber and pinyon-juniper woodland. These forest lands are currently managed under the *Lincoln National Forest Plan* (USFS, 1986) with broad, multiple-use objectives. There are no currently known new actions on these lands that would add to cumulative effects of the actions described in this PEIS. Activities currently occurring in this area include grazing, fuel wood gathering, hunting, and recreation.

B.3.3 State of New Mexico

The New Mexico State Highway Department is evaluating plans to widen U.S. Highway 54 through portions of Otero County that pass through Fort Bliss. The demand for aggregate to support this activity could increase cumulative impact, if any, on this resource in the vicinity of Fort Bliss.

B.3.4 State of Texas

The Texas State Land Office and other state agencies administer nonprivate lands adjacent to Fort Bliss in Texas. There are no currently known actions on these lands that would contribute to cumulative effects of the proposed action.

B.3.5 Doña Ana County, New Mexico

The *Doña Ana County Comprehensive Plan* (Doña Ana County, 1994) provides a combination of goals, policies, and actions the county will use to make responsible decisions through the year 2015. Planning areas adjacent to the Fort Bliss boundaries include the eastern portions of the Border Planning Area and the South Planning Area, and the southeastern portion of the Central Planning Area. There are no currently known actions on these lands that would contribute to cumulative effects of the proposed action. However, there are communities and private developments located within these planning areas of Doña Ana County where issues have been raised that may contribute to the cumulative effects analysis. These include Talavera Subdivision, located on the western edge of the Doña Ana Range–North Training Areas,

and Chaparral, a community adjacent to the southern boundary of the Doña Ana Range–North Training Areas. Potential issues include growth concerns such as development of mobile homes along the western edge of the Doña Ana Range–North Training Areas, groundwater availability, and noise.

B.3.6 Otero County, New Mexico

Otero County adopted an *Interim Land Use Policy Plan* in 1993, and is now developing a *Comprehensive Land Use Plan* (Otero County, n.d.). The primary goal of the plan is to guide the use of public lands and resources in the county and to protect the rights of private land owners. The draft plan identifies areas of historic and customary use of value to county residents, including the use of water, agriculture, livestock grazing, timber and wood production, mineral production, cultural resources, recreation, hunting, federal and military activities, transportation and access, wilderness, wildlife and threatened and endangered species. No specific management actions or priorities for land resource allocation have been identified at this time.

Therefore, there are no currently known actions on these lands that would contribute to cumulative effects of the proposed action. However, there are communities and private developments located within these planning areas of Doña Ana County where issues have been raised that may contribute to the cumulative effects analysis. These include water supply issues in Oro Grande and Timberon, as well as road development from communities on the northern to those on the eastern side of McGregor Range. Otero County has a program in place that addresses the cumulative impacts (expansion) of noxious weeds and exotic plant species. Fort Bliss has initiated a 2-year study of exotic plant species on the installation that complements the county program.

B.3.7 El Paso County, Texas, and Ciudad Juarez, Mexico

The rate of pumping from the Hueco Bolson by water users in El Paso and Ciudad Juarez exceeds the rate of recharge, which means that the aquifer is in overdraft condition and is experiencing accelerated rates of water level decline (see Section 4.7.5.1). The largest declines have occurred adjacent to municipal well fields. Historically, from 1903 through 1989, declines of as much as 150 feet have occurred in the downtown areas of El Paso and Ciudad Juarez. Under a current-trends scenario with no increased surface-water supply, two independent studies made in the 1990's concluded that the Hueco Bolson would be exhausted of recoverable fresh water by 2013 or 2025. This would result in a massive water-supply shortage to the area. For this reason, El Paso and the El Paso County Water Improvement District (EPCWID) are working together on the long-range water resource management plan, outlined in Section 4.7.5.1, that will address the predicted depletion of the Hueco Bolson aquifer. Successful implementation of the plan should extend the life of the aquifer and largely compensate for the reduced supply from that source.

The lowering of water levels and the deteriorating water quality in the Hueco Bolson aquifer resulting from cumulative groundwater production are due overwhelmingly to nonmilitary activities. The lowering of water levels has permitted the infiltration of salt water into fresh-water zones in those areas. Downward leakage of brackish water from shallow zones and possible upcoming of brackish water from below due to pumpage has increased dissolved solids concentrations in fresh-water zones of the aquifer (see Section 4.7.5.2). Groundwater analyses from the Hueco Bolson show an average annual increase in dissolved solids of about 10 milligrams per liter (mg/l) since the 1950s and 1960s in Texas, and about 30 mg/l since the 1970s in Ciudad Juarez. The dissolved solids concentration in groundwater has increased at rates of 40 to 60 mg/l per year in parts of downtown El Paso and Ciudad Juarez during these periods. Future declines of water levels in the Hueco Bolson can be expected to result in increasing salinity of groundwater in the Fort Bliss area. The aquifer further north in the McGregor and Doña Ana

ranges will experience similar effects, but to a lesser degree. However, groundwater underlying McGregor Range generally is too saline for potable use.

B.4 COMPREHENSIVE LANDSCAPE MONITORING

The Fort Bliss Training Complex landscape will be monitored to assess training, grazing, and natural impacts on natural and cultural resources. Monitoring will be a four-part process consisting of remote sensing reconnaissance, site inspections, plot sampling, and GIS analysis. Remote sensing reconnaissance will scan entire land base to monitor seasonal trends, detect impacts, and focus field investigations on high priority areas. Field investigation will quantify intensity of impacts on natural and cultural resources. Distribution, frequency, and intensity of impacts will be stored in a GIS database. This process will support enforcement of environmental laws and NEPA provisions, provide data for ITAM, record cumulative impacts, and provide information to adjust training operations as needed (Adaptive Management Strategy).

B.4.1 Components of the Monitoring System

The monitoring systems used in the vicinity of the Fort Bliss Training Complex are described in this section. The monitoring systems discussed include Advanced Very High Resolution Radiometer (AVHRR) Time Series Imagery, mission specific monitoring, LANDSAT Thematic Mapper (TM) satellite imagery, and plot data collection.

B.4.1.1 AVHRR Time Series Imagery

NASA's AVHRR is a satellite-mounted sensing system that has been used to monitor environmental conditions on a global scale. AVHRR normalized vegetation index has proved to be a very robust measure of vegetation health, phenology, and production. AVHRR thermal and visible bands have been used to monitor temperature, cloud cover, soil moisture, transpiration, forest fires, and fuel build-up. AVHRR provides regional context to environmental conditions on the Fort Bliss Training Complex. Therefore, plot data can be related to regional environmental conditions such as soil moisture, phenological status, and temperature. This capability will provide the ability to compare plots from different time periods. Fort Bliss is obtaining AVHRR satellite data on a daily basis from the Army Research Laboratory at WSMR.

B.4.1.2 Mission Specific Monitoring

Major training actions such as Roving Sands require on-the-ground monitoring to ensure compliance with NEPA provisions for monitoring and mitigation activities. Fort Bliss has a system of on-site monitoring that uses Global Positioning System (GPS) and field data collection to develop a GIS database for each training exercise. This consists of on-site visits to training units to ensure compliance with NEPA guidelines, recording the units position and "footprint" with GPS, and recording environmental damage in the SiteRep database. The end result is a site-specific database for each proponent's training exercise.

B.4.1.3 LANDSAT TM Imagery

NASA LANDSAT Thematic Imagery will be used to monitor the entire landscape of the Fort Bliss Training Complex at high spatial resolution to capture variability in land cover on training areas. This capability will allow positioning of monitoring plots to provide an accurate sample of impacts on the training landscape. Additional post-sampling analysis using plot data, monitoring data, and GIS themes will allow analysts to map the extent and impact of training activities on a landscape scale.

B.4.1.4 Plot Data Collection

The objective of plot data collection is to record changes in species composition and ground cover at the observer level. The distribution of plots is designed to provide the highest level of confidence in data at the lowest cost. LANDSAT imagery and on-site monitoring are critical elements in the sampling procedure. On-site monitoring ensures that monitoring plots are located in areas that have received training impacts and LANDSAT image analysis ensures that control plots are positioned in areas that represent undisturbed conditions typical of the training area.

B.4.2 Methods of Analysis

The monitoring systems previously discussed provide the following types of information.

B.4.2.1 Training Impacts

Coordinated analysis of on-site monitoring data, field plots, and satellite imagery provides a synopsis of training impact intensity and extent.

B.4.2.2 Environmental Trends

Time series analysis of satellite imagery and control plot data provides baseline data on the response of plant communities to climatic variation and natural disturbance. Further development of this technique will be a valuable source of baseline data for future NEPA analysis.

B.4.2.3 Cumulative Impacts

Environmental health of training lands is a product of training impacts, naturally occurring events, and environmental trends. Time series analysis of training impacts and environmental trends provides data on ecosystem response. The GIS system provides a method to record impacts and analyze their effects over time.

B.4.3 Monitoring Cover Change Using TM Satellite Imagery

B.4.3.1 General Approach

The general approach is to estimate actual cover values for the total vegetative cover area, using the Gram-Schmidt process to produce optimal perspective for separation of land cover classes from multi spectral satellite imagery (Crist and Kauth, 1986; Jackson, 1983). The fundamental basis of the Gram-Schmidt process involves finding data structures inherent to a particular sensor and land cover classes, and adjusting the axes of observation in multispectral viewing space such that the land cover classes can be most easily and completely observed. After the Gram-Schmidt procedure, correlation analysis with ground truth data is implemented to produce a cover estimate based on a linear regression model. The cover estimate then becomes a thematic layer in the GIS system. This method allows comparison of land cover change over time by subtracting cover estimates made from imagery acquired from different dates. The use of correlation analysis and regression models provides statistical confidence estimates and error estimates for each thematic layer. This method makes it possible to assess the condition of the landscape synoptically and track changes in landscape condition over time.

B.4.3.2 Methods

Overview. There are four major steps involved in converting digital values obtained from satellite imagery to vegetation cover maps: geographic coding, image calibration, feature extraction, and cover modeling. Geographic coding ties the pixels in the satellite image to geographic coordinates. The satellite image becomes a map with scale, projection, and a coordinate grid. This allows direct comparisons between conventional maps and other geographically coded images. Image calibration converts the digital numbers recorded by satellite sensors into numbers with physical meaning, such as radiance and reflectance. Feature extraction uses spectral profiles of elements in a pixel to identify the composition of a pixel through statistical analysis. Cover modeling uses linear regression to establish relationship between ground plot data and spectral features.

Imagery. Two images were selected for use in this comparison: *LT503303703886163*, a LANDSAT TM 5 image, acquired June 12, 1986; and *LT50330370389696175*, a LANDSAT TM 5 image, acquired June 23, 1996.

Geographic Coding. Image-to-image registration was accomplished by selecting corresponding points on each image and performing a first-order polynomial transformation to Universal Transverse Mercator (UTM) zone 13 row S NAD27 coordinates. The accuracy obtained through this process is within one half of one pixel.

B.4.4 Image Calibration

LANDSAT TM digital images are commonly analyzed by using the digital numbers for each pixel. Although this procedure may be satisfactory for a single image used, it may produce incorrect results when more than one image is used in time sequence overlays. The digital numbers for each pixel should be converted to their dimensional equivalents; numbers with physical meaning. Radiance and reflectance are two values commonly used for time sequence analysis of imagery. These values vary depending on sensor calibration, sun angle, earth-sun distance, the state of the atmosphere, slope and angle of terrain, and surface cover. Radiance is measured at the satellite in milliwatts per square centimeter, per steradian. Reflectance is the ratio of radiant energy reflected by a surface to incident energy and is calculated as a percentage of radiance at the sensor (Robinove, 1982). This conversion corrects for sun angle differences, sensor variability, and earth-sun distance. Calibration allows images from different dates to be compared directly. Reflectance values were used for this study because reflectance for various surfaces has been measured and catalogued by the U.S. Geological Survey (USGS) Spectral Laboratory, and is the standard parameter for use in image spectrometry and other methods used for identifying the composition of surfaces from remotely sensed imagery.

B.4.5 Feature Extraction

Vegetation indices, such as normalized vegetation index (NDVI), which are commonly used to measure vegetation biomass, leaf area index, or fractional cover in agricultural fields, grasslands, and forests, do not perform well in measuring cover in semi-arid range land. Brightness indices, or linear combinations of spectral bands, are more closely related to vegetative cover in semi-arid range land (Yang and Prince, 1997). The two-dimensional perpendicular vegetation index (PVI) and six-dimensional greenness index for TM satellite imagery are examples. The method used here relies on the Gram-Schmidt (Jackson, 1983) procedure to produce brightness indices based on image measured soil reflectance, albedo, and the spectral profiles of dry grass and calcite acquired from the USGS Spectral Laboratory. This process mathematically reduces variation in a cover feature, from multiple spectral variables (bands) to one band. These bands represent variation in cover, but at this point, they are not expressed in meaningful units. Linear equations based on least squares regression are used to convert raw cover values

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to percent cover. These methods have been used extensively to measure cover in dry land situations (Duncan et al., 1993; Griffiths and Collins, 1983; Larson, 1993; Olson 1984).

Roads, military cantonment, and other highly disturbed areas were digitized and masked out (these areas were not sampled and therefore had no spectral class representing their distribution). Contiguous pixels are affected by the diverse reflection (Lambertian reflection) from these areas, therefore, a buffer area was assigned to compensate for these conditions. However, some military disturbance sites were sampled in the field and those were included in the classification process (U.S. Army, 1996j).

B.4.6 Cover Modeling

Thirty step-toe transects were established in grassland and shrub sites at sites selected for use in the northern aplomado falcon habitat evaluation. Percent cover for grasses, shrubs, litter, and soil were calculated using methods described in *Aplomado Falcon Survey and Habitat Evaluation on Fort Bliss Military Reservation 1995-1996, Draft* (U.S. Army, 1997p). The transects were converted to raster thematic maps using field collected GPS data to accurately position the plots in UTM zone 13 row S NAD27 coordinates. Cover values obtained from these transects were compared with spectral feature layers from satellite imagery using Pearson Product Moment correlation. This analysis indicated a strong linear relationship between plot data and spectral feature layers (Table B-1).

Table B-1. Correlation of Plot Data and Spectral Indices

<i>Basal Area Measure Spectral Index</i>	<i>Grass</i>	<i>Litter</i>	<i>Forb</i>	<i>Shrub</i>	<i>Soil</i>	<i>Total Vegetation</i>
Albedo	0.31	-0.62	-0.45	-0.69	0.71	-0.73
Greenness	-0.19	-0.03	0.01	-0.05	0.16	-0.16
NDVI	0.05	-0.08	-0.25	-0.12	0.12	-0.14
Dry Grass	-0.47	0.48	0.39	0.77	-0.58	0.74
Soil	-0.04	-0.22	-0.42	-0.23	0.32	-0.34
Calcite	-0.19	-0.03	0.01	-0.05	0.19	-0.16

Albedo and Dry Grass Index had the best correlation with basal area measurements on the northern aplomado falcon transects. Results indicate that acceptable cover maps of shrub basal area, soil basal area, and total vegetation basal area can be created by developing linear regression models using these indices. Total vegetation basal area was selected as an indicator of ecological condition (shown in Figure B-5), and maps of vegetation cover were created using formulas derived from least squares regression analysis. The coefficient of correlation for this model is 0.79. This model allows prediction of vegetation basal area (in percent) with a confidence interval of error of 3.27 percent at the .01 level.

B.4.7 Description of Changes Between 1986 and 1996

Maps and data produced by linear multiple regression models provide a valuable tool for extrapolation of plot data to the landscape scale. However, the results must be interpreted with some qualifications. The model was generated from plot data in grassland and desert shrub communities where vegetation cover area ranged from 15 percent to 53 percent of the total cover area. Extrapolation of the model to other vegetation types, or to cover area, outside of the range of the model cannot be evaluated for accuracy. Therefore, comparisons made in other vegetation types or outside of the model's range should be viewed

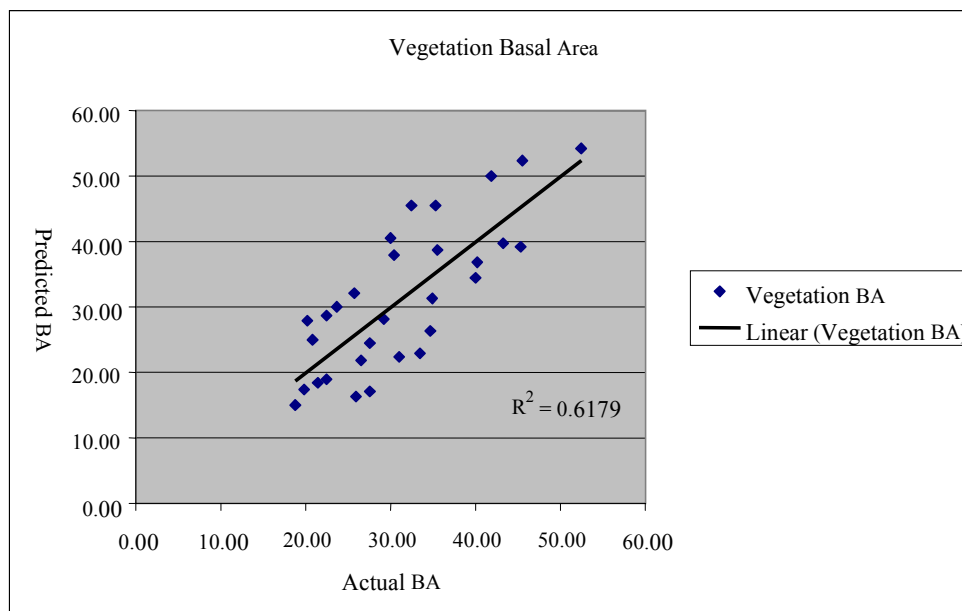


Figure B-5. Vegetation Basal Area and Linear Multiple Regression Model Prediction.

as preliminary comparisons. The images used in the analysis represent a snapshot view of conditions for two days ten years apart, and do not represent trends in vegetation cover area. Observational variations represent changes that occur in both short- and long-term timeframes. Trend analysis is used to separate long-term change from short-term variation. The number of observations over time correlates to the reliability of the trend analysis. This analysis is an example of the process being implemented at Fort Bliss to evaluate cumulative impacts of military training, grazing, and natural events on training lands. To this end, Fort Bliss has acquired satellite imagery from 1972 to 1997. These images will be used to establish long-term trends in landscape change on Fort Bliss.

B.4.7.1 Environmental Setting

Precipitation and fires are significant factors affecting vegetation basal area. These factors can produce change in short- and long-term timeframes, depending on their duration and intensity. Knowledge of environmental conditions that affect vegetative condition is necessary for interpretation of satellite derived vegetation cover maps. A summary of conditions from January 1984 to January 1986, and January 1994 to June 1996, is provided to aid in interpretation of the results (Tables B-2 and B-3).

Data from Table B-2 indicate there were 33.15 inches of precipitation in the 30 months preceding the 1986 image. There were only 16.69 inches in the thirty months preceding the 1996 image.

Data from Table B-3 indicate low fire frequency prior to the 1986 image and relatively high fire frequency prior to the 1996 image. There were significant fires in the Organ Mountains in 1993 and 1994, and on Otero Mesa in 1993 and 1994. Natural causes were responsible for 31 fires, and 7 fires were attributed to man-made causes. These data suggest that vegetation cover areas would generally decline from 1994 to 1996 as a result of below normal precipitation, and that cover would be drastically reduced in areas that were affected by fires. Results from change analysis of cover maps suggest that there was generally less vegetative cover in 1996 than there was in 1986, and that areas impacted by fire suffered greater losses in cover than relatively undisturbed areas.

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Table B-2. Precipitation in Inches during 30 Months Preceding Image Dates

<i>Station</i>	<i>Year</i>	<i>Jan</i>	<i>Feb</i>	<i>Mar</i>	<i>Apr</i>	<i>May</i>	<i>Jun</i>	<i>Jul</i>	<i>Aug</i>	<i>Sep</i>	<i>Oct</i>	<i>Nov</i>	<i>Dec</i>	
296435 Oro Grande, New Mexico	1984	0.75	0	0	0	1.31	4.72	1.08	6.38	0.48	3.1	0.87	2.16	30-month Total prior to July 86 37.6
	1985	1.13	0.34	0.29	0.42	0.8	0.83	0.82	2.75	3.45	3.45	0.05	0.07	
	1986	0.05	0.35	0.33	0	0.26	2.08							
	1994	0.61	0.38	0.27	0.32	0.92	0.09	2.67	2.58	1.01	0.77	0.79	1.1	30-month Total prior to July 96 27.55
	1995	0.76	0.69	0.26	0	0	5.57	1.46	0.87	2.8	0	0	0.29	
	1996	0.49	0.13	0	0.15	0	2.57							
299686 White Sands National Monument, New Mexico	1984	0.31	0	0.32	0	0.86	3.82	1.58	2.94	0.24	2.03	11.3	2.77	30-month Total prior to July 86 33.15
	1985	1.26	0.42	0.34	0.82	0.5	0.85	1.82	2.69	1.42	4.13	0.05	0.05	
	1986	0.02	0.57	0.35	0.01	0.37	1.48							
	1994	0.27	0	0.17	0.27	0.75	0.02	1.09	0.65	0.2	0.54	0.77	0.99	30-month Total prior to July 96 16.69
	1995	0.77	0.56	0.08	0	0	0.8	1.58	1.52	2.88	0	0.06	0.15	
	1996	0.45	0.06	0	0.31	0	1.75							
412797 EPIA, Texas	1984	0.31	0	0.44	0.01	0.59	3.18	0.69	5.57	0.58	3.12	0.51	1.17	30-month Total prior to July 86 29
	1985	0.95	0.19	0.59	0.07	0.01	0.1	1.32	1.46	1.47	1.82	0.13	0.05	
	1986	0.01	0.39	0.39	0	0.83	3.05							
	1994	0.03	0.23	0.37	0.65	0.8	0.67	0.18	0.02	0.03	0.35	0.54	1.61	30-month Total prior to July 96 16.69
	1995	0.26	0.88	0.42	0.04	0.01	1.74	0.28	0.76	3.18	0	0.26	0.23	
	1996	0.11	0.19	0	0.49	0	2.36							

Note: Missing data estimated by interpolation among months surrounding the data point over the 3-year period.
Source: National Oceanic and Atmospheric Administration (NOAA), n.d.

B.4.7.2 Interpretation

The data should be interpreted with some qualifications because two data points are not sufficient to establish a trend and environmental conditions prior to the image dates that were significantly different. There were 37.6 inches of precipitation at Oro Grande, 33.15 inches at WSMR, and 29.0 inches at EPIA in the 30 months preceding the 1986 image. There were only 27.55 inches at Oro Grande, 16.69 inches at WSMR, and EPIA, respectively in the 30 months before the 1996 image. Desert areas are known for having highly variable precipitation and frequent droughts. Cover response to drought depends on plant physiognomic characteristics. Annual plants avoid drought by seed dormancy; germination will not occur until there is adequate moisture. Perennial plants respond to drought by reducing their leaf area. These effects would result in lower annual plant cover and reduced leaf areas in perennial vegetation.

Fires are another contributing factor. Twenty-five of 28 fires recorded on Fort Bliss from 1982 to 1996 occurred between 1986 and 1996. Vegetation cover would be severely reduced in these areas. Despite these qualifications, some general observations can be made:

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Table B-3. Fires on Fort Bliss: 1982 to 1996

<i>Fire Name</i>	<i>Discovery Date</i>	<i>Stated Cause</i>	<i>Total Acreage</i>
Aguirre Sprigs	8/8/82	Natural	1.0
Ladrone	6/17/85	Natural	10.0
South	1/14/86	Man-made	0.1
Oingo	6/21/89	Natural	50.0
Cli	6/21/89	Natural	7.5
Dry Peak	6/21/89	Natural	250.0
Cooper	6/22/89	Natural	40.0
Triangle	6/22/89	Natural	340.0
Hoot	7/9/89	Natural	650.0
Horse Camp	7/18/89	Natural	25.0
Mary Toy	6/21/90	Natural	750.0
Charlie R	5/14/92	Natural	0.5
Haymeadow	10/1/92	Man-made	1.2
Mackdraw	10/7/92	Man-made	100.0
Oterrell	5/24/93	Natural	40.0
Chatfield	5/31/93	Natural	350.0
Wind Mountain	5/31/93	Natural	2.0
Escondido	6/1/93	Natural	8.9
Mashed O	6/1/93	Natural	1.4
Martin	6/1/93	Natural	4.1
Cockleburr	6/1/93	Natural	1.0
West Mesa	6/1/93	Natural	66.0
Wildcat	6/1/93	Natural	75.0
Cristo Rey	6/14/93	Natural	0.3
Charlie	4/4/94	Man-made	5.0
Impact	4/20/94	Natural	80.0
Martin	4/22/94	Natural	3.0
Savage	4/22/94	Natural	3.0
Hat	6/29/94	Natural	9.0
Corner	6/29/94	Natural	20.0
Prather	6/30/94	Natural	3.0
Mw	7/13/94	Natural	0.5
Littledraw	8/21/94	Natural	2.0
Blacktank	9/27/94	Natural	5.0
Horsecamp	10/3/94	Natural	350.0
Unit 9	11/7/94	Man-made	6.0
West Tank	11/9/94	Man-made	6.0
Horse Mesa	5/10/95	Man-made	5.5

Source: BLM, Las Cruces FO.

- Woody vegetation at high elevations was not affected as severely by drought, and most cover loss was associated with fires in these vegetation types;
- The most severe drought effects were at lower elevations in mesquite coppice dune and sandscrub vegetation;

- Vegetation cover in grazed grasslands is significantly lower than in ungrazed grasslands for both dates; and
- The average percent change between 1986 to 1996 in vegetation cover on McGregor Range where existing FTX sites are located (Table B-10) and where grazing has occurred (Table B-8) is not significantly different. This is true for all vegetation cover types except one. The only significant difference between these areas is within the Foothills Grasslands vegetation type. In these areas, cover on FTX sites decreased 22 percent, while cover on grazed areas decreased 10 percent.

Two observations are not sufficient for a trend analysis although they provide an indication of differences between the images. More data are needed to assess plant cover response to drought years and moist years in desert environments. This would require analysis of long-term data sets that represent a series of wet and dry years. The cumulative changes in vegetation cover from June 12, 1986, to June 23, 1996, are depicted on Figure B-6. Changes in the two LANDSAT TM images of Fort Bliss are portrayed in terms of percentage loss and percentage gain, as shown by the legend of Figure B-6.

Tables B-4 through B-10 present the percent of total vegetation cover area or cover and dynamics between the two years for Fort Bliss. Vegetation cover is described for various vegetation communities and developed or barren areas. Histograms portraying the data in each table are shown along with the tabular data.

B.4.7.3 Future Evaluations

The methods for estimating vegetation cover area from TM Imagery provide a robust means for estimating land condition and trend. The method could be improved by establishing plots in a wider variety of vegetation types and a greater range of cover. Current results indicate the method will be valuable in identifying impacted and undisturbed areas. Field plot sampling is crucial for providing the information needed to drive the cover models. The maps produced by the models will provide a sound basis for sample design in biological studies. Vegetation cover area maps are a valuable tool for land managers and scientists because they provide dynamic information at the landscape scale. The *Landscape Monitoring Plan* will provide a synoptic, repeatable method for identifying and recording impacts to training lands.

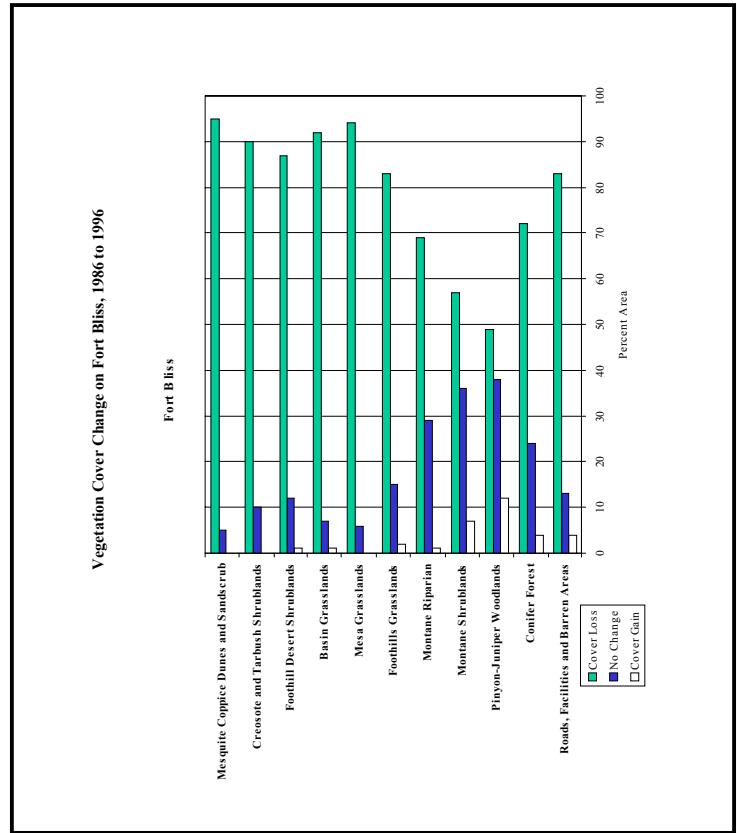
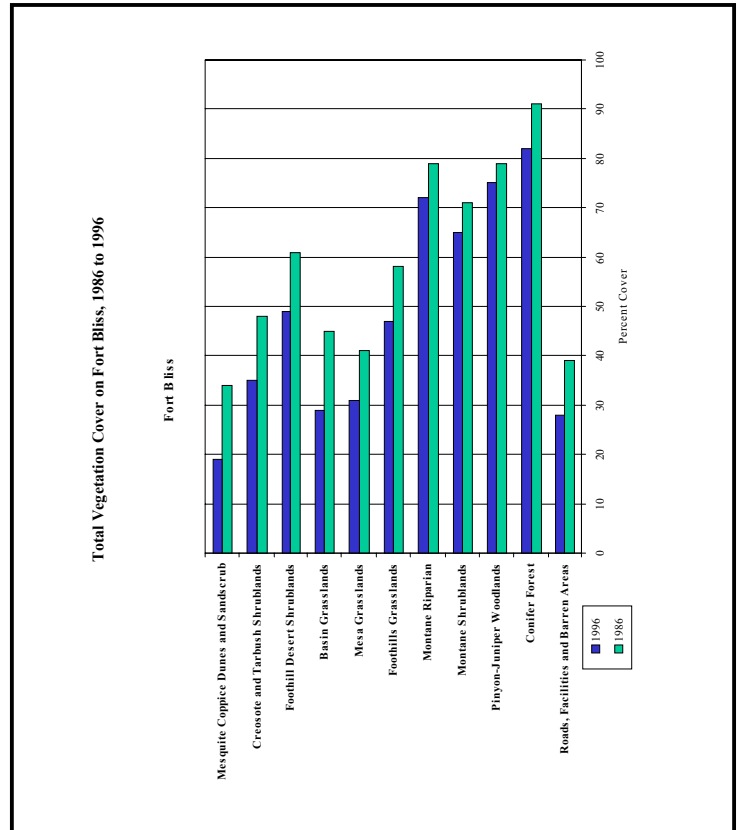
Impact data will provide the basis for assessing training land readiness, scheduling training, and identifying rehabilitation needs. Portions of the plan are in place at the present time. Fort Bliss is archiving AVHRR satellite imagery for time-series analysis of vegetation phenology and soil moisture. The installation has coordinated on-site monitoring, field plots, and satellite imagery to measure training impact and extent for Roving Sands since 1996. Fort Bliss has developed methods and acquired imagery for cumulative impact assessment that can track changes in vegetation cover over time. A database is being developed for training and natural impacts that can be used to evaluate the effects of these factors on the natural environment.

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Table B-4. Vegetation Cover and Dynamics on Fort Bliss, 1986 to 1996 (with Histograms)

Fort Bliss	Percentage of Total Cover Area		Avg. Percent Change	Fort Bliss	Area Percent		
	1986	1996			Cover Loss	No Change	Cover Gain
Mesquite Coppice Dunes and Sandscrub	34	19	-15.00%	Mesquite Coppice Dunes and Sandscrub	95	5	0
Creosote and Tarbush Shrublands	48	35	-13.00%	Creosote and Tarbush Shrublands	90	10	0
Foothill Desert Shrublands	61	49	-12.00%	Foothill Desert Shrublands	87	12	1
Basin Grasslands	45	29	-16.00%	Basin Grasslands	92	7	1
Mesa Grasslands	41	31	-10.00%	Mesa Grasslands	94	6	0
Foothills Grasslands	58	47	-11.00%	Foothills Grasslands	83	15	2
Montane Riparian	79	72	-7.00%	Montane Riparian	69	29	1
Montane Shrublands	71	65	-6.00%	Montane Shrublands	57	36	7
Pinyon-Juniper Woodlands	79	75	-4.00%	Pinyon-Juniper Woodlands	49	38	12
Comifer Forest	91	82	-9.00%	Comifer Forest	72	24	4
Roads, Facilities, and Barren Areas	39	28	-11.00%	Roads, Facilities, and Barren Areas	83	13	4

Note: Total cover area is the indicator of ecological condition used in the vegetation cover modeling.

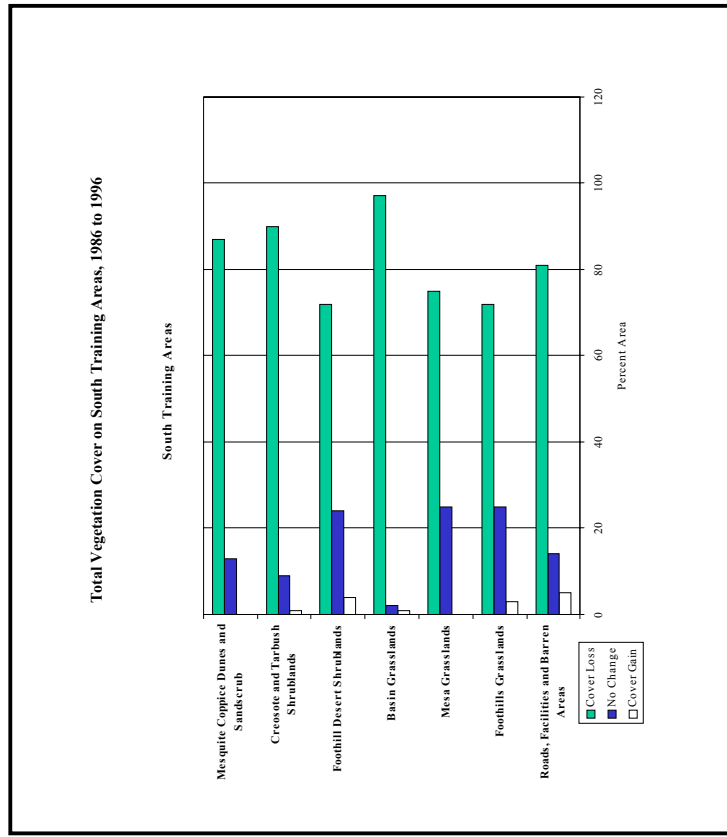
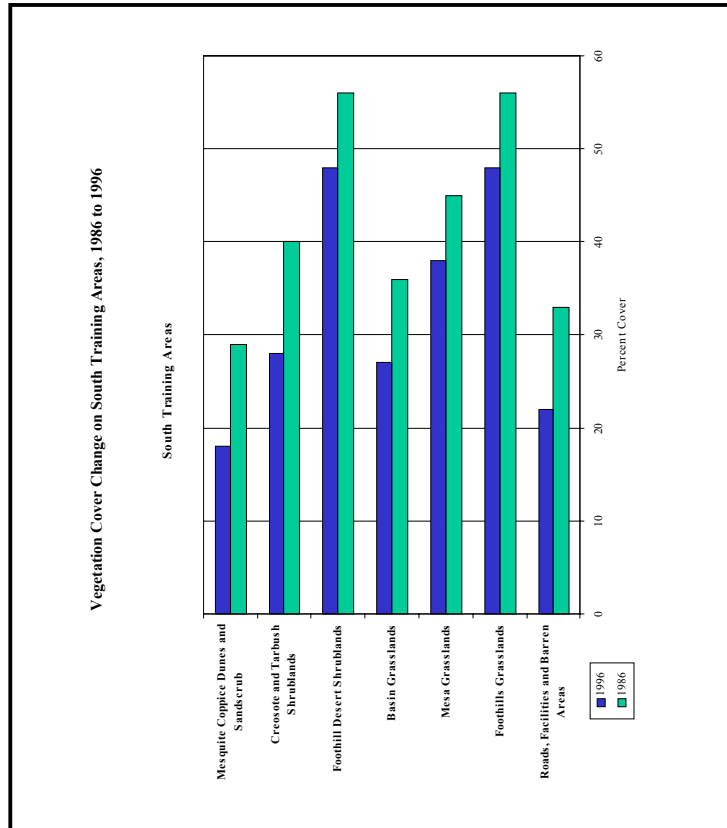


**Fort Bliss Mission and Master Plan
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Table B-5. Vegetation Cover and Dynamics on the South Training Areas, 1986 to 1996 (with Histograms)

South Training Areas	Percentage of Total Cover Area		Avg. Percent Change	South Training Areas		Area Percent		
	1986	1996		Cover Loss	No Change	Cover Gain		
Mesquite Coppice Dunes and Sandscrub	29	18	-11.00%	Mesquite Coppice Dunes and Sandscrub	87	13	0	
Creosote and Tarbush Shrublands	40	28	-12.00%	Creosote and Tarbush Shrublands	90	9	1	
Foothill Desert Shrublands	56	48	-8.00%	Foothill Desert Shrublands	72	24	4	
Basin Grasslands	36	27	-9.00%	Basin Grasslands	97	2	1	
Mesa Grasslands	45	38	-7.00%	Mesa Grasslands	75	25	0	
Foothills Grasslands	56	48	-8.00%	Foothills Grasslands	72	25	3	
Roads, Facilities, and Barren Areas	33	22	-11.00%	Roads, Facilities, and Barren Areas	81	14	5	

Note: Total cover area is the indicator of ecological condition used in the vegetation cover modeling.

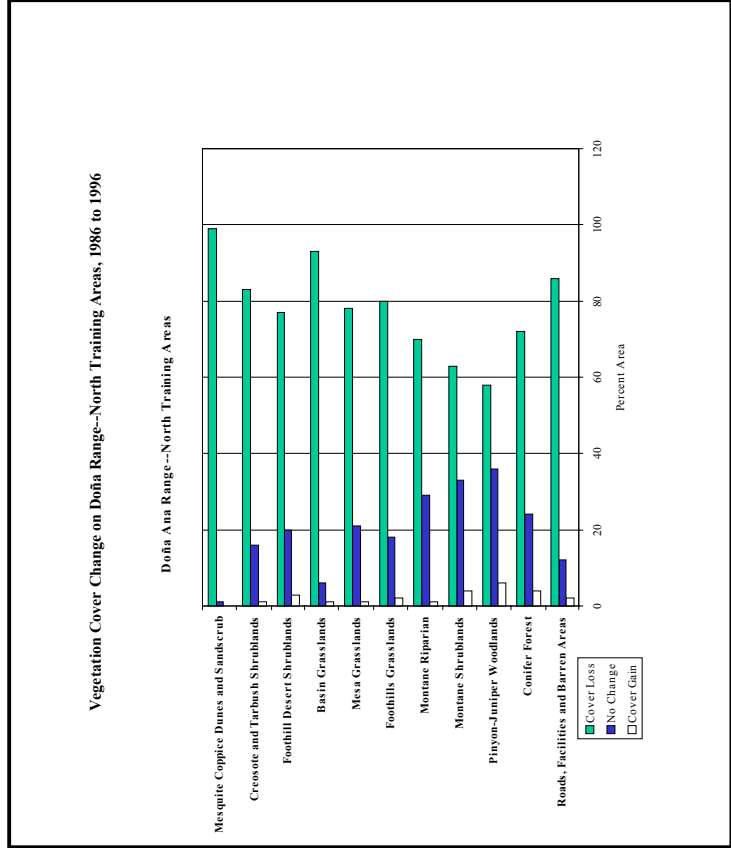
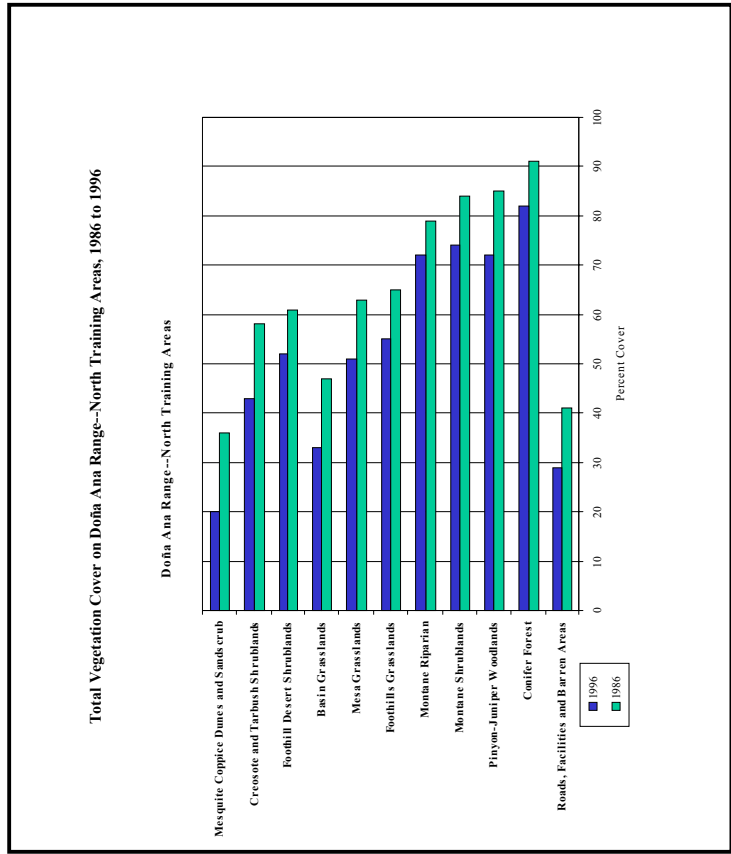


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Table B-6. Vegetation Cover and Dynamics on the Doña Ana Range--North Training Areas, 1986 to 1996 (with Histograms)

Doña Ana Range--North Training Areas	Percentage of Total Cover Area		Avg. Percent Change	Doña Ana Range--North Training Areas	Area Percent		
	1986	1996			Cover Loss	No Change	Cover Gain
Mesquite Coppice Dunes and Sandscrub	36	20	-16.00%	Mesquite Coppice Dunes and Sandscrub	99	1	0
Creosote and Tarbush Shrublands	58	43	-15.00%	Creosote and Tarbush Shrublands	83	16	1
Foothill Desert Shrublands	61	52	-9.00%	Foothill Desert Shrublands	77	20	3
Basin Grasslands	47	33	-14.00%	Basin Grasslands	93	6	1
Mesa Grasslands	63	51	-12.00%	Mesa Grasslands	78	21	1
Foothills Grasslands	65	55	-10.00%	Foothills Grasslands	80	18	2
Montane Riparian	79	72	-7.00%	Montane Riparian	70	29	1
Montane Shrublands	84	74	-10.00%	Montane Shrublands	63	33	4
Pinyon-Juniper Woodlands	85	72	-13.00%	Pinyon-Juniper Woodlands	58	36	6
Conifer Forest	91	82	-9.00%	Conifer Forest	72	24	4
Roads, Facilities, and Barren Areas	41	29	-12.00%	Roads, Facilities, and Barren Areas	86	12	2

Note: Total cover area is the indicator of ecological condition used in vegetation cover modeling.



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Table B-7. Vegetation Cover and Dynamics on McGregor Range, 1986 to 1996 (with Histograms)

McGregor Range	Percentage of Total Cover Area		Avg. Percent Change	McGregor Range		Area Percent	
	1986	1996		Cover Loss	No Change	Cover Gain	
Mesquite Coppice Dunes and Sandscrub	35	19	-16.14%	Mesquite Coppice Dunes and Sandscrub	94	6	0
Creosote and Tarbush Shrublands	48	34	-14.00%	Creosote and Tarbush Shrublands	91	8	1
Foothill Desert Shrublands	61	49	-12.00%	Foothill Desert Shrublands	90	10	0
Basin Grasslands	45	29	-15.82%	Basin Grasslands	94	6	0
Mesa Grasslands	46	31	-15.00%	Mesa Grasslands	94	6	0
Foothills Grasslands	57	44	-12.57%	Foothills Grasslands	84	14	2
Montane Shrublands	67	57	-10.20%	Montane Shrublands	55	37	8
Pinyon-Juniper Woodlands	73	71	-2.00%	Pinyon-Juniper Woodlands	38	41	17
Roads, Facilities, and Barren Areas	40	27	-13.00%	Roads, Facilities, and Barren Areas	85	13	2

Note: Total cover area is the indicator of ecological condition used in vegetation cover modeling.

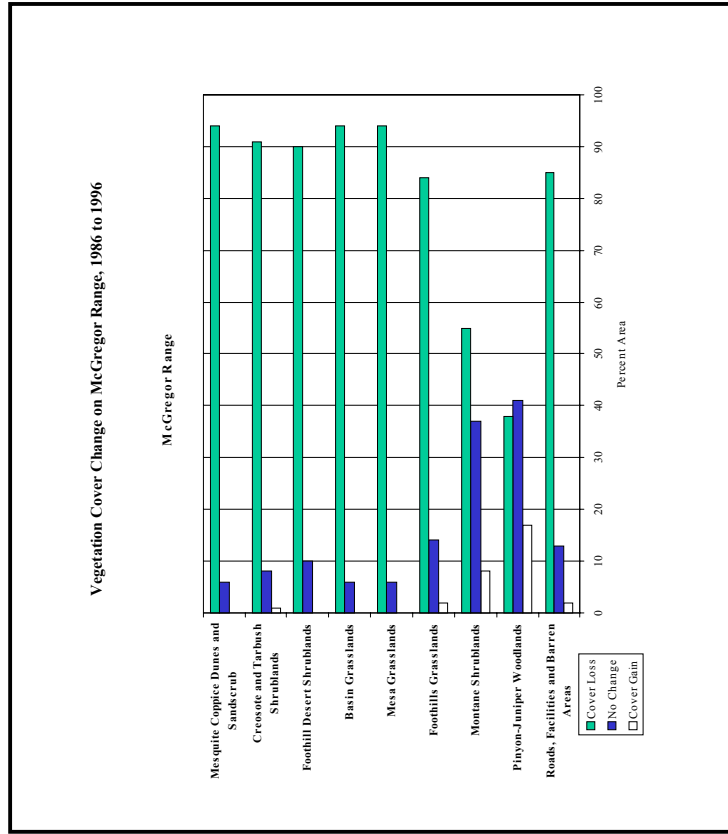
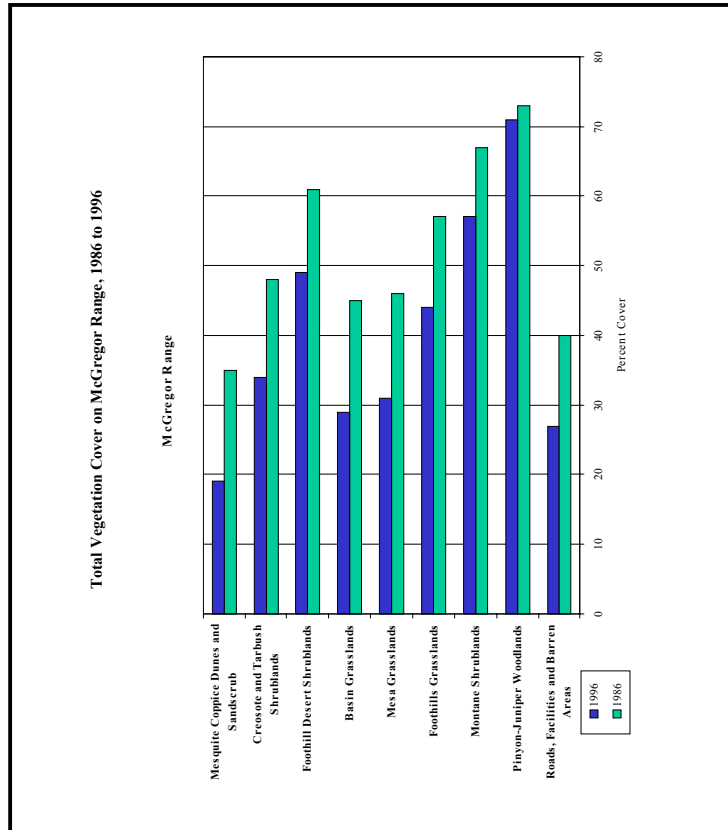
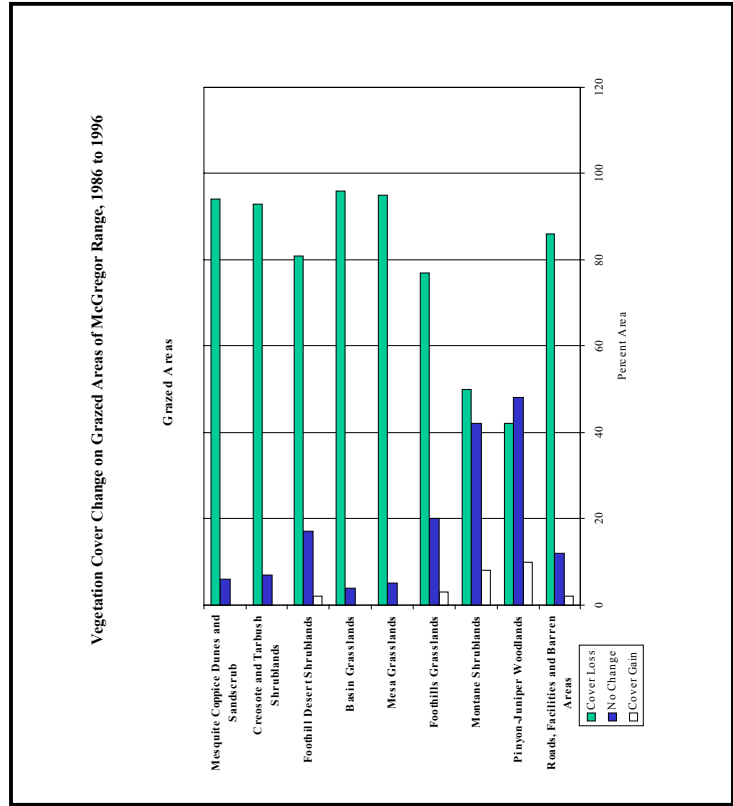
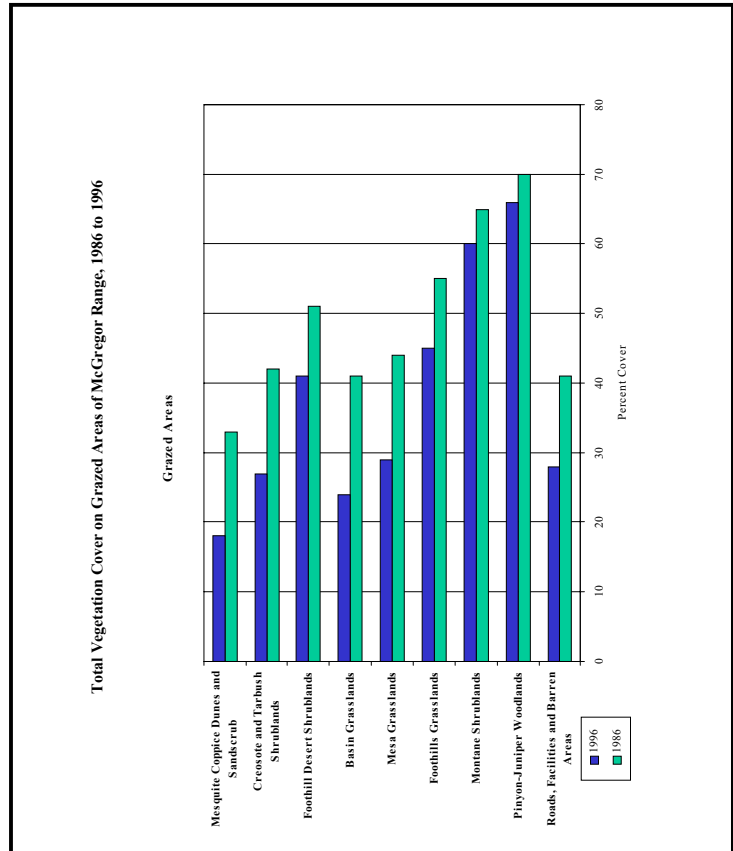


Table B-8. Vegetation Cover and Dynamics of Grazed Areas on McGregor Range, 1986 to 1996

Grazed Areas	Percentage of Total Cover Area		Avg. Percent Change	Grazed Areas	Area Percent	
	1986	1996			Cover Loss	No Change
Mesquite Coppice Dunes and Sandscrub	33	18	-15.00%	Mesquite Coppice Dunes and Sandscrub	94	6
Creosote and Tarbush Shrublands	42	27	-15.00%	Creosote and Tarbush Shrublands	93	7
Foothill Desert Shrublands	51	41	-10.00%	Foothill Desert Shrublands	81	17
Basin Grasslands	41	24	-17.00%	Basin Grasslands	96	4
Mesa Grasslands	44	29	-15.00%	Mesa Grasslands	95	5
Foothills Grasslands	55	45	-10.00%	Foothills Grasslands	77	20
Montane Shrublands	65	60	-5.00%	Montane Shrublands	50	42
Pinyon-Juniper Woodlands	70	66	-4.00%	Pinyon-Juniper Woodlands	42	48
Roads, Facilities, and Barren Areas	41	28	-13.00%	Roads, Facilities, and Barren Areas	86	12
						2

Note: Total cover area is the indicator of ecological condition used in vegetation cover modeling.



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Table B-9. Vegetation Cover and Dynamics of Ungrazed Areas on McGregor Range, 1986 to 1996

Ungrazed Areas	Percentage of Total Cover Area		Avg. Percent Change	Ungrazed Areas			Area Percent		
	1986	1996		Cover Loss	No Change	Cover Gain	Cover Loss	No Change	Cover Gain
Mesquite Coppice Dunes and Sandscrub	36	20	-16.00%	Mesquite Coppice Dunes and Sandscrub	98	2	0		
Creosote and Tarbush Shrublands	50	36	-14.00%	Creosote and Tarbush Shrublands	90	9	1		
Foothill Desert Shrublands	61	49	-12.00%	Foothill Desert Shrublands	90	9	1		
Basin Grasslands	51	35	-16.00%	Basin Grasslands	92	7	1		
Mesa Grasslands	52	36	-16.00%	Mesa Grasslands	91	7	2		
Foothills Grasslands	58	44	-14.00%	Foothills Grasslands	88	10	2		
Montane Shrublands	74	64	-10.00%	Montane Shrublands	67	25	8		
Pinyon-Juniper Woodlands	75	76	1.00%	Pinyon-Juniper Woodlands	33	34	32		
Roads, Facilities, and Barren Areas	43	29	-14.00%	Roads, Facilities, and Barren Areas	89	9	2		

Note: Total cover area is the indicator of ecological condition used in vegetation cover modeling.

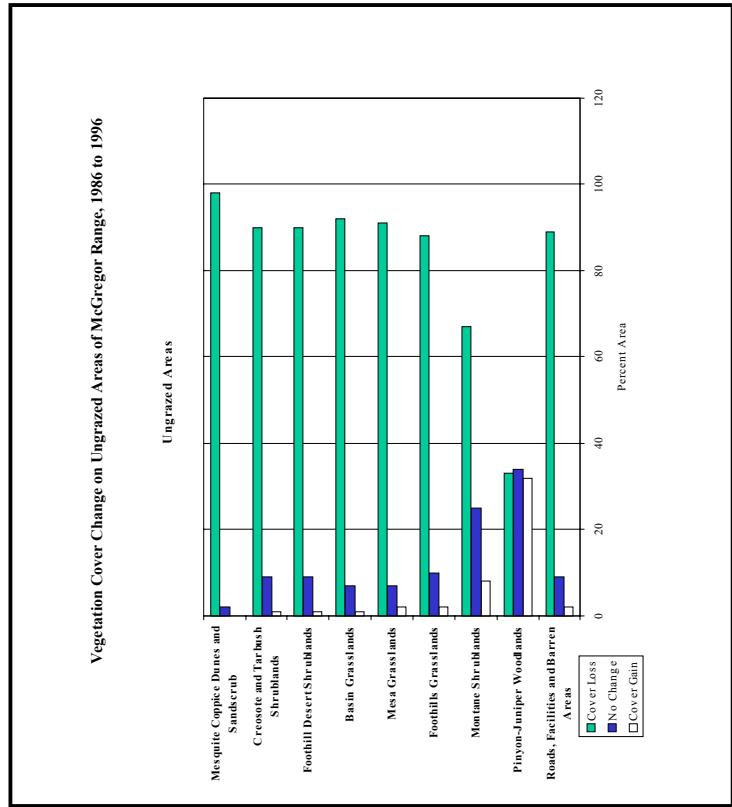
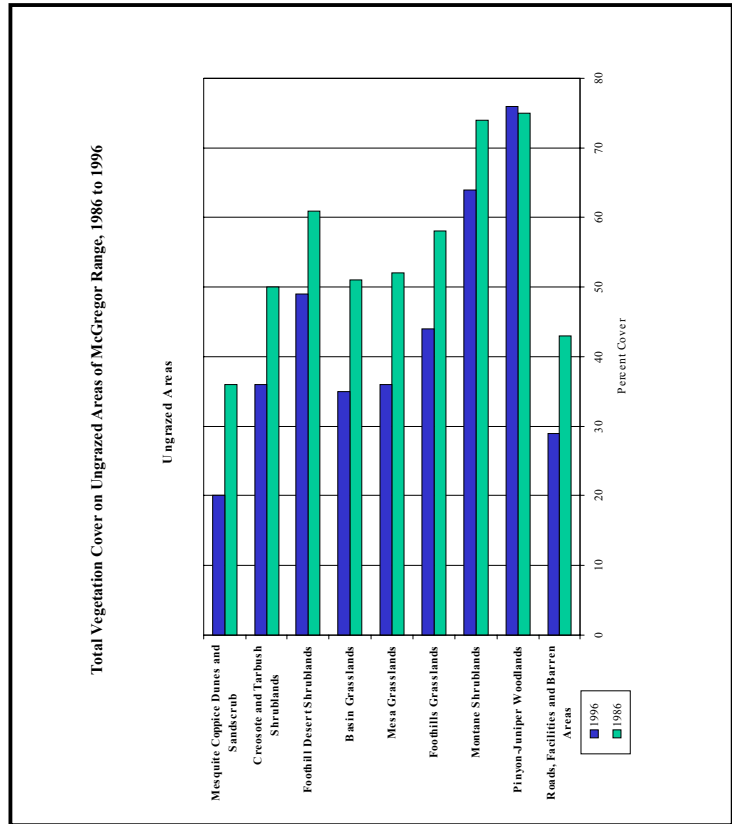
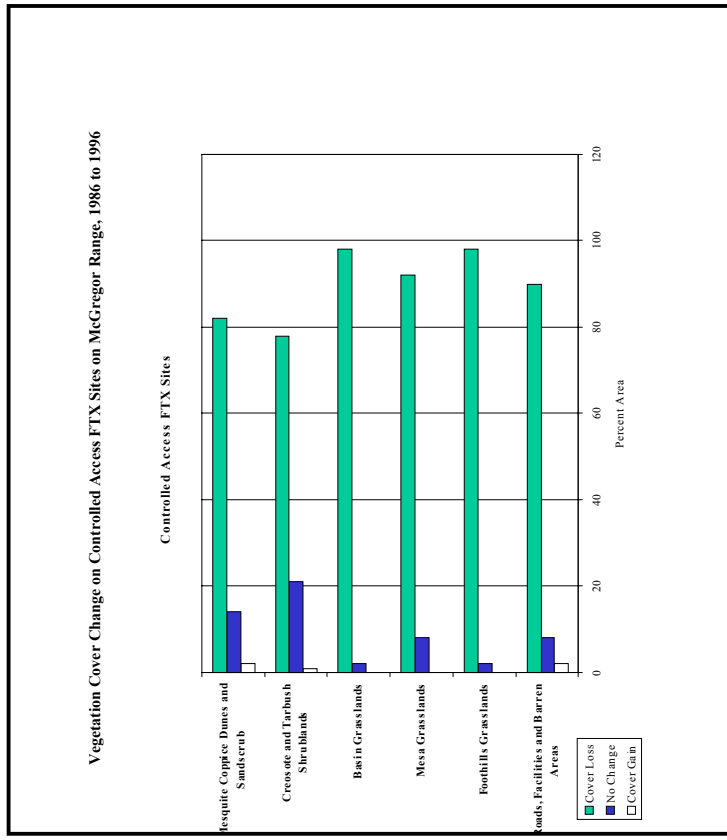
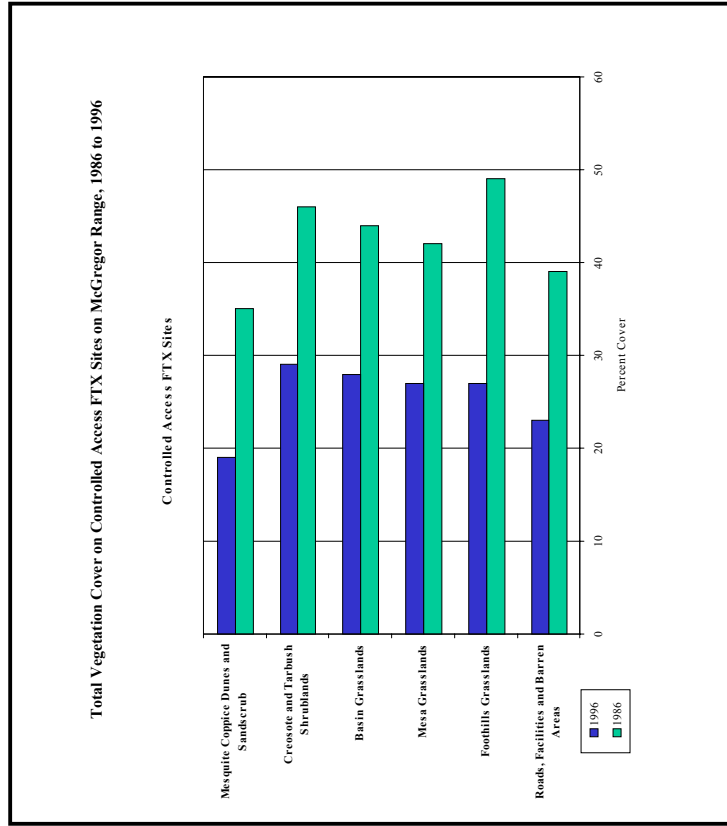


Table B-10. Vegetation Cover and Dynamics of Controlled Access Field Training Exercise Sites on McGregor Range, 1986 to 1996 (with Histograms)

Controlled Access FTX Sites	Percentage of Total Cover Area		Avg. Percent Change	Controlled Access FTX Sites			Area Percent		
	1986	1996		Cover Loss	No Change	Cover Gain	Cover Loss	No Change	Cover Gain
Mesquite Coppice Dunes and Sandscrub	35	19	-16.00%	82	14	2			
Creosote and Tarbush Shrublands	46	29	-17.00%	78	21	1			
Basin Grasslands	44	28	-16.00%	98	2	0			
Mesa Grasslands	42	27	-15.00%	92	8	0			
Foothills Grasslands	49	27	-22.00%	98	2	0			
Roads, Facilities, and Barren Areas	39	23	-16.00%	90	8	2			

Note: Total cover area is the indicator of ecological condition used in vegetation cover modeling.



Appendix C

APPENDIX C

**SUMMARY
OF
FORT BLISS, TEXAS AND NEW MEXICO
EVALUATION IN
*The Army Basing Study Base Closure and Realignment, 1995***

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**C.0 SUMMARY OF FORT BLISS, TEXAS AND NEW MEXICO EVALUATION IN
THE ARMY BASING STUDY BASE CLOSURE AND REALIGNMENT, 1995**

The Base Realignment and Closure (BRAC) process undertaken by the DA through 1995 supports the vision of a 21st Century Army; that is, a power projection Army, sufficiently robust and versatile to accommodate the needs of the national strategy. The BRAC process provides a means of divesting unneeded infrastructure and bases, many of which are vestiges of the Cold War era. The Army also recognizes the complementary nature of the need to reshape and resource Army forces with the need to reduce installation operating costs (DoD, 1995). The Army evaluated its installations, based upon these objectives, as a part of *The Army Basing Study Base Closure and Realignment, 1995* (US Army, 1995d). The DoD gave priority to the first of those criteria, military value, in selecting military installations for closure or realignment.

- Military Value.
 - The current and future mission requirements and the impact on operational readiness of DoD's total force.
 - The availability and condition of land and facilities at both the existing and potential receiving locations.
 - The ability to accommodate contingency, mobilization, and future requirements at both the existing and potential receiving locations.
 - The cost and manpower implications.
- Return on Investment.
 - The extent and timing of potential cost savings, including the number of years, beginning with the date of completion of the closure or realignment, for the savings to exceed the costs.
- Community Impacts.
 - The economic impact on communities.
 - The ability of both the existing and potential receiving communities' infrastructure to support forces, missions, and personnel.
 - The environmental impact.

The Army's 97 primary installations and a number of lease sites were categorized into training areas, command and control/administration support, training schools, professional schools, ammunition production, ammunition storage, commodity storage, ports, proving grounds, medical centers, industrial facilities, and depots. Fort Bliss was evaluated as one of 14 training schools (DoD, 1995). The attributes used for evaluation included:

- Mission requirements and operational readiness measure of the ability of training school installations to generate, project, and sustain combat power.
 - Training Areas. The total acreage of the installation available for training.
 - Ranges. The total number of firing points equipped with the Remote Target System, the number of Multi-purpose Range Complexes, and the availability of a standard design MOUT range.

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- Deployment Network. The distance from the installation to its critical deployment structure; airfields, ports, railheads, and interstate highways.
- Reserve Training. Measure of support provided by an installation to the reserve components, including individual and unit training.
- Impact Acres. The size and capability of the land used by the installation for range impact areas.
- Mechanized Training Areas. The largest contiguous acreage of the installation available for training of mechanized formations.
- General Instructional Facilities. Total square footage of permanent, general training and instructional facilities on the installation.
- Applied Instructional Facilities. Total square footage of permanent, specialized training and instructional facilities on the installation.
- Information Mission Area. The telephone switching system, outside cable plant, computers, telecommunications center, local area network, defense data network node, and video teleconferencing capability.
- Special Airspace. Total cubic area of special use airspace operated by the installation.

There are four significant attributes identified that measure mission requirements and operational readiness. They are training areas, general instructional buildings, applied instructional buildings and special airspace. Mechanized training acres and impact range areas are essential for providing and performing soldier training and field exercises. Training areas are important when stationing and training land forces. Impact areas are required to support the conduct of weapons familiarization, qualification, crew gunnery, and combined arms live-fire training.

- Land and Facilities. These attributes provided an overall assessment of the availability and condition of land and facilities.
 - Barracks. Total permanent on-post spaces available for unaccompanied officers and enlisted personnel.
 - Family Housing. Number of permanent, adequate family dwelling units (on- and off-post).
 - Work Space. Total permanent square footage of maintenance (aviation and vehicle) facilities and operational/administrative facilities on the installation.
 - Percent Permanent Facilities. A quality measure to reflect construction investment and World War II wood structure elimination.
 - Average Age of Facilities. Average age of all existing facilities on the installation.
 - Infrastructure. Capacity of water, sewage treatment, electrical distribution, and cost of landfill.
 - Environmental Carrying Capacity. A composite consideration of various environmental factors that measures the Army's ability to conduct current missions, receive additional units, and expand operations in light of environmental constraints. The composite index includes the following factors: Archaeology and Historic Buildings, Endangered Species, Wetlands, Water Quality, Noise Quality (extending off-post), and Contaminated Sites.
- Contingency, Mobilization, and Operational Readiness. These attributes measured the installation's capacity to train, equip, and deploy units.
 - Mobilization Capability. Capability of an installation to support reconstitution of forces through the ability to billet, train, and deploy soldiers.

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- Buildable Acres. A measure of an installation's ability to expand within its current property line, in accordance with accepted master planning policy and guidance as reflected in the LRC of the approved installation master plan. The result is the total acres available for construction of additional facilities on the installation.
- Encroachment. Population density of area surrounding the installation.
- Cost and Manpower.
 - Cost of Living Index. A measure of the cost of living at each installation.
 - Housing Cost per Dwelling Unit. Measure of the cost to maintain one set of family quarters at each installation.
 - Variable Housing Allowance Factor. Measure of the cost of variable housing allowance for military personnel living off-post.
 - Locality Pay Factor. The relative differences in cost of the civilian work force at each installation.
 - Base Operations (BASOPS)/Mission Population. Measure of the BASOPs cost required to support the mission population.
 - Military Construction, Army (MCA) Cost Factor. Measure of the relative cost factor for construction at an installation.

Among the Army's 14 training school installations, Fort Bliss was ranked number one (U.S. Army, 1995d). Because of its high military value, Fort Bliss was not selected for further realignment or closure study (U.S. Army, 1995e).

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Appendix **D**

APPENDIX D

**MEMORANDUMS OF AGREEMENT
and
MEMORANDUMS OF UNDERSTANDING**

**Fort Bliss Mission and Master Plan
Final Programmatic Environmental Impact Statement**

U.S. Department of Agriculture, Forest Service
and
U.S. Department of the Army, Corps of Engineers
November 1971

U.S. Department of Agriculture
and
U.S. Department of the Army
September 1988

U.S. Department of the Interior, Bureau of Land Management
New Mexico
and
U.S. Department of the Army, Headquarters, U.S. Army Air Defense Center and Fort Bliss
February 1990

The Department of the Interior
and
The Department of the Army
March 1966

Proposed Agreed upon Changes to the June 7, 1974, Memorandum of Understanding Between the
Department of the Interior and the Department of the Army to Provide for Co-Use Grazing on the
McGregor Range in New Mexico

Cooperative Plan-Agreement for Conservation and Development of Fish and Wildlife Resources on the
McGregor Range (Fort Bliss)
September 1972

Cooperative Plan-Agreement for Conservation and Development of Fish and Wildlife Resources on the
McGregor Range (Fort Bliss)
June 1974

U.S. Department of the Interior
Bureau of Land Management
New Mexico
and
U.S. Department of the Air Force
Headquarters, U.S. Air Combat Command
May 1998

MEMORANDUM OF UNDERSTANDING
Between
UNITED STATES DEPARTMENT OF AGRICULTURE
FOREST SERVICE
And
DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS

This memorandum of understanding is made by and between the United States Department of Agriculture, Forest Service, acting through the Regional Forester, Southwestern Region, hereinafter called the SERVICE and the United States Department of Defense, Corps of Army Engineers, acting for the United States Army Air Defense Center, hereinafter called the CENTER.

WHEREAS, Public Land Order No. 1470, dated August 21, 1957, as amended by Public Land Order No. 1547, dated November 7, 1957, issued under the provisions of Executive Order 10355, withdrew certain lands, hereinafter called the LANDS, within the Lincoln National Forest from all forms of entry, for use by the Department of the Army as a part of the McGregor Missile Range, and

WHEREAS, the Department of the Army and the Department of Agriculture on July 3, 1951, entered into a Joint Policy Statement relating to use of National Forest lands for defense purposes, and

WHEREAS, Public Land Orders 1470 and 1547 expired August 21, 1967, except that application for renewal was timely made, and publication of an Extension Order in the Federal Register has not been done, and

WHEREAS, the laws, regulations, and policies governing the multiple use management of National Forests contemplates use of the lands and resources to produce the greatest benefits in goods and services to the people, and

WHEREAS, it has been mutually determined that grazing use by livestock and wildlife is compatible with the use of the land for missile training purposes, and

WHEREAS, it is desirable that the Service continue to administer all National Forest resources in keeping with the Center's requirements for its missile program,

NOW, THEREFORE, the Service and the Center mutually agree as follows:

Section A. The Center agrees:

1. The Service will administer the Lands for all non-defense purposes and all activities which are not related to the use of the Lands for missile range purposes, HOWEVER, the Service will coordinate all uses and activities on the lands with the Center in a manner consistent with the needs of the Center.

2. The Lands will be open to all Forest users on days when no firing is scheduled.

3. The Service will not authorize uses of those lands purchased by the Army within the area without the concurrence of the Center, EXCEPT, for those uses not separable from the area as a whole.

There are approximately 1,360 acres of purchased and 18,004 acres of withdrawn Lands out of the total of 19,364 acres of missile range within the National Forest boundary. Uses such as livestock

grazing will be authorized on the area as a whole and the Service will issue a permit for all Government owned lands with fees to be handled as specified in Subsection 4, below.

4. All fees for use of National Forest lands shall be assessed and collected by the Service in accordance with the regulations of the Secretary of Agriculture and deposited into the National Forest Fund, miscellaneous receipts, EXCEPT, those fees earned on lands purchased by the Defense Department shall be transferred to the U. S. Corps of Engineers for deposit where such fees are collected by the Service.

The basis for apportioning fees between the Service and the Center will be the proportion of use attributable to the purchased lands to the proportion of use attributable to the withdrawn lands.

The collection of use fees does not pertain to licenses or permits required by State law.

5. That management of wildlife and its habitat shall conform to the regulations of the Secretary of Agriculture; to all applicable laws, and to existing agreements between the Service and the New Mexico Department of Game and Fish.

Harvest of wildlife will be accomplished in a manner covered by the proclamations and regulations of the New Mexico Department of Game and Fish, EXCEPT, the harvest will not conflict with public safety or the firing schedules set by the Center.

6. That improvements constructed and maintained by the Service, its contractors, or permittees, for resources management purposes will remain in the Lands unless the sites so used are needed for missile range installations. These improvements include, but are not limited to livestock control fences, range and wildlife water catchments, and watershed structures.

7. The Service will administer all archeological and paleontological activities on the Lands in conformance with the Uniform Rules and Regulations prescribed by the Secretaries of the Interior, Agriculture, and Army; and the Antiquities Act (34 Stat. 225; 16 U.S.C. 432-433).

Section B. The Center will therefore:

1. Take action to prevent and suppress fires resulting from the Center's operations and also suppress any fire on the Lands; check for fires after completion of each daily scheduled firing; and report all fires to the Service as soon as possible.

2. Furnish the Service with firing schedules on a regular basis so that the Service may keep its employees, contractors, and permittees advised when entry to the Lands is allowed or denied. The Center will also furnish the Service with the names, addresses, and telephone numbers of the Commanding General and his designated representatives.

3. Take all necessary precautions to minimize damage to soil and vegetative resources in connection with the conduct of defense oriented activities. The Center will coordinate with the Service the development of launching sites, fire towers, radar sites, and other similar construction within the Lands.

4. Submit to the Forest Supervisor, Lincoln National Forest, for his concurrence all proposals for constructing roads prior to undertaking construction.

5. Assume the responsibility for the actions of its employees and contractors in the conduct of Center Activities on the Lands.

The Center will require said personnel to leave gates as found (open or closed) and will not be responsible should gates or fences be left as found.

Section C. The Service agrees:

1. The Center will administer the Lands for all defense purposes and all activities which are directly related to the use of the Lands for missile range purposes, HOWEVER, the Center will coordinate those activities having a permanent impact on the soil and vegetative resource with the Service.

2. That personnel of the Center, in pursuit of their official functions, will continue to have unlimited access to the Lands. Said personnel may open gates, and if necessary, lower fences in order to accomplish their assigned missions or duties. Gates will be left as found (open or closed) and lowered fences will be repositioned by the Center.

3. That the Center reserves the right to deny access to the Lands to anyone should security or safety considerations of the assignment of any mission require such action. The Center may exercise this right without prior notice to the Service, EXCEPT, that the Service will be notified at the earliest opportunity when such a closure is in conflict with previously announced firing schedules. Under no circumstances will persons be granted permission to enter or remain on McGregor Range during periods when firing is being conducted, or scheduled, even should they be willing to assume any and all risks inherent in such activities.

coordinate construction of such facilities with the Service.

Section D. The Service will therefore:

1. Furnish the Commanding General of the Center as to the name of the District Ranger who is currently responsible to the Service for the management of the Lands, and the names and addresses of all permittees and contractors, if any.
2. Assume the responsibility for the actions of its employees, permittees, and contractors authorized by the Service to conduct business on the Lands.
3. In pursuit of range management objectives, issue grazing permits for livestock numbers limited to the grazing capacity as determined by the Service.
4. Coordinate all uses and activities on the Lands in a manner consistent with the needs of the Center.
5. Refrain from touching, tampering with, or disturbing any shell, casing, missile, target, or components thereof which may be found upon the Lands. Upon discovery of any of these items, Service employees, permittees, or contractors will report said discovery to the Commanding General, United States Army Air Defense Center, or his designated agent.
6. Issue all permits and contracts for uses and activities which are not related to defense purposes. Said permits and contracts will contain stipulations consistent with the needs of the Center. Permits may be terminated by the Service, and by request of the Center, should

permittees breach any of the terms or conditions outlined in this MEMORANDUM OF UNDERSTANDING.

7. Protect the Lands and resources from destruction by fire and other forms of depredation including trespass, not incident to military use.

Section E. General

1. This Memorandum of Understanding shall serve to guide the administration of the Lands herein described under the proposed new Public Land Order and shall remain in full force and effect until terminated by mutual agreement or expiration of the new Land Order.

2. The Forest Supervisor, Lincoln National Forest, or his designated representative, will represent the Forest Service in the administration of this Memorandum of Understanding.

3. If amendments to this agreement are needed, a meeting may be called by either party.

4. The legal description of National Forest lands contained within the McGregor Missile Range are shown on Exhibit 1, attached hereto.

UNITED STATES ARMY AIR DEFENSE CENTER
and FORT BLISS, TEXAS

11 Nov. 1971
(Date)

By: L. P. Luenther
Chief, Real Estate Division,
Albuquerque District, Corps of
Engineers, Department of the Army

UNITED STATES DEPARTMENT OF AGRICULTURE
FOREST SERVICE

11/5/71
(Date)

By: W. D. Hunt
Regional Forester

EXHIBIT I

Acres within Lincoln National Forest, McGregor Range, N.M.

New Mexico Principal Meridian

PLO 1547

Acres

T. 19 S., R. 10 E:

Section 1 - SW $\frac{1}{4}$, W $\frac{1}{2}$ W $\frac{1}{2}$ SE $\frac{1}{4}$
 *Section 12 - W $\frac{1}{2}$ W $\frac{1}{2}$ E $\frac{1}{2}$

200.00 (Called S $\frac{1}{2}$ sec. 1 in Ord
 80.00 (Probably E $\frac{1}{2}$)

PLO 1470

T. 19 S., R. 11 E:

Section 6 - Lots 6,7, E $\frac{1}{2}$ SW $\frac{1}{4}$, SE $\frac{1}{4}$	324.56
Section 7 - Lots 1,2,3,4, E $\frac{1}{2}$ W $\frac{1}{2}$, E $\frac{1}{2}$	648.00
Section 8 - All	640.00
Section 9 - S $\frac{1}{2}$	320.00
Section 14 - SW $\frac{1}{4}$	160.00
Section 15 - All	640.00
Section 16 - All	640.00
Section 17 - All	640.00
Section 18 - Lots 1,2,3,4, E $\frac{1}{2}$, E $\frac{1}{2}$ W $\frac{1}{2}$	647.60
Section 19 - Lots 1,2,3,4, E $\frac{1}{2}$, E $\frac{1}{2}$ W $\frac{1}{2}$	647.20
Section 20 - All	640.00
Section 21 - All	640.00
Section 22 - All	640.00
Section 23 - All	640.00
Section 24 - S $\frac{1}{2}$	320.00
Section 25 - E $\frac{1}{2}$, NW $\frac{1}{4}$, NW $\frac{1}{4}$ SW $\frac{1}{4}$, S $\frac{1}{2}$ SW $\frac{1}{4}$	600.00
Section 26 - All	640.00
Section 27 - All	640.00
Section 28 - All	640.00
Section 29 - All	640.00
Section 30 - Lots 1,2,3,4, E $\frac{1}{2}$, E $\frac{1}{2}$ W $\frac{1}{2}$	645.12
Section 31 - Lots 1,2,3,4, E $\frac{1}{2}$, E $\frac{1}{2}$ W $\frac{1}{2}$	644.32
Section 32 - All	640.00
Section 33 - All	640.00
Section 34 - N $\frac{1}{2}$	320.00
Section 35 - E $\frac{1}{2}$, NW $\frac{1}{4}$, NW $\frac{1}{4}$ SW $\frac{1}{4}$, S $\frac{1}{2}$ SW $\frac{1}{4}$	600.00
Section 36 - All	640.00

T. 19 S., R. 12 E:

Section 29 - S $\frac{1}{2}$	320.00
Section 30 - Lots 1,2,3,4, E $\frac{1}{2}$, E $\frac{1}{2}$ W $\frac{1}{2}$	642.08
Section 31 - Lots 1,2,3,4, E $\frac{1}{2}$, E $\frac{1}{2}$ W $\frac{1}{2}$	645.18
Section 32 - All	640.00

Acres in Withdrawals	17,924.00
*Not in withdrawals	- 80
Total	18,004.00

*PLO 1470 withdrew only W $\frac{1}{2}$ of sec. 12 on Public Domain. No reference to these 80 acres of National Forest land in either of the PLO's

**MASTER AGREEMENT
BETWEEN
DEPARTMENT OF DEFENSE
AND
DEPARTMENT OF AGRICULTURE**

CONCERNING

THE USE OF NATIONAL FOREST SYSTEM LANDS FOR MILITARY ACTIVITY

I. PREFACE

A. National Forest System lands provide for the use and enjoyment of the public and are managed under multiple use and sustained yield concepts. The use of these lands for military training activities is within the statutory authority of the Act of June 4, 1897.

B. The availability of National Forest System lands to the Department of Defense provides a variety of geographic and topographic settings to conduct training activities. This is an important resource for developing a strong National defense.

C. Therefore, training activities on National Forest System lands will be authorized when compatible with other uses and in conformity with applicable forest plan(s), provided the Department of Defense determines and substantiates that lands under its administration are unsuitable or unavailable.

D. This agreement does not apply to the use of airspace over National Forest System lands unless directly associated with the land based training.

II. PURPOSE

The purpose of this Master Agreement is to establish procedures for planning, scheduling and conducting authorized military activities on National Forest System lands. It also establishes policies and procedures for supplemental agreements and special use authorizations which are required for all Department of Defense activities (including National Guard and Reserve activities) using National Forest System lands. This agreement replaces the Joint Policy Statements between the Department of Agriculture and (a) the Department of the Army signed July 3, 1951; the Department of the Navy, signed February 19, 1952; and the Department of the Air Force, signed September 12, 1951, which are hereby rescinded.

III. COORDINATION AND COOPERATION

To facilitate the orderly development, management, and administration of National Forest System lands and to provide suitable and appropriate lands to further the National defense effort, the Department of Defense and the Department of Agriculture jointly agree:

A. Availability of Department of Defense Lands - Prior to requesting use of National Forest System lands, the Department of Defense will determine if lands administered by the Department of Defense are available and suitable. In all cases where a special use authorization or supplemental agreement to use National Forest System lands is proposed, Department of Defense will forward its analysis and determination as to the unsuitability or unavailability of DoD land to the affected Forest Supervisor.

B. Planning For the Use of National Forest System Lands - Military training activities on National Forest System lands are actions which require the analysis of environmental impact in conformance with the National Environmental Policy Act (NEPA) and other statutory and regulatory requirements. The Department of Defense and the Department of Agriculture, Forest Service, will cooperate to accomplish appropriate NEPA compliance. The lead agency concept in 40 CFR 1501.5 will be applied to the process except in cases involving classified activities. In such cases, the Department of Defense Component will be the lead agency.

C. Management

1. Periodically conduct joint reviews of selected activities for the purpose of: (a) determining the effectiveness of supplemental agreements so that the management and mission of both agencies are accomplished; (b) identifying and recommending solutions to existing and potential problems; and (c) monitoring the implementation and effectiveness of environmental mitigation measures.
2. Jointly identify rights-of-way or other authorizations required to implement supplemental agreements or special use authorizations.
3. Have their respective agents mutually refer unresolved points of disagreement to the next higher management level for resolution.

IV. DEPARTMENT RESPONSIBILITIES

IT IS AGREED THAT:

A. The Department of Defense Components will:

1. Provide to the affected Forest Supervisor the analysis and determination as to the unsuitability or unavailability of Department of Defense lands.
2. Involve the Forest Service designated representative in the initial planning stages of activities proposed on National Forest System lands.
3. During initial planning, provide an unclassified description of proposed activities to the affected Forest Supervisor and cooperate in fulfilling requirements of the National Environmental Policy Act and conducting appropriate environmental analyses.
4. For each training activity, identify a representative of the Department of Defense to serve as liaison to the Forest Service.

5. Cooperate with Forest Service representatives to comply with the terms of this Master Agreement, supplemental agreements, and special use authorizations.

6. Reimburse the Forest Service for costs directly attributable to military training activities, subject to the availability of appropriated funds. This may include, but is not limited to, the preparation and processing of applications, preparation of environmental documents, administration of special use authorizations, and Forest Service liaison officers' time.

7. Explore land interchange as an alternative or mitigating measure when military training activities are not in conformance with the affected Forest Plan.

8. Make every effort to avoid degradation of National Forests and provide for restoration as agreed in the special use authorization.

9. Provide for mitigation measures identified in the environmental analysis and agreed in the special use authorization.

B. The Department of Agriculture, Forest Service will:

1. Make National Forest System lands available for military training activities when such activities can be made compatible with other uses and conform with applicable forest management plans, provided the Department of Defense determines and substantiates that lands under its administration are unsuitable or unavailable.

2. Cooperate with the Department of Defense to expedite decisions associated with military training activities on National Forest System lands.

3. Fully consider all proposals and, when necessary, develop alternatives that may meet the needs of the Department of Defense and the Department of Agriculture, Forest Service.

4. Ensure that applicable forest management plans include military training activities. Requirements for these activities should be coordinated with the Department of Defense during formulation and development of those plans.

V. SPECIAL USE AUTHORIZATION

The special use authorization for a Department of Defense activity on National Forest System lands requires, but need not be limited to, the following:

1. Identification of National Forest System lands required for the activity.

2. Duties and responsibilities of each agency in the planning process.

3. Procedures for resolving issues, misunderstandings, or disputes.

4. Identification of rights-of-way and other authorizations which may be needed outside the activity area.

5. Incorporate, develop, or reference a basic plan covering monitoring, fire protection and control, public health and safety, recreation, watershed, minerals, timber, grazing, fish, wildlife, public notification, and other appropriate features.

6. Assign responsibilities for restoration of the site. Restoration shall be subject to the availability of appropriated funds.

7. Provide procedures for emergency cessation of military activities where necessary to protect public health, safety or the environment.

VI. SUPPLEMENTAL AGREEMENTS

For recurring Department of Defense activities on Forest Service lands, supplemental agreements to this master agreement may be developed. Within 12 months following the effective date of this agreement, representatives of the Departments of Defense and Agriculture, Forest Service, shall agree upon a schedule for the revision of any existing supplemental agreement which requires modification to conform with this master agreement.

VII. DELEGATION

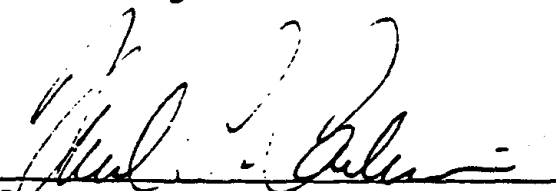
Authorized representatives of the Forest Service and the Department of Defense may execute special use authorizations and enter into supplemental agreements within the scope of this document.

VIII. MODIFICATION AND TERMINATION

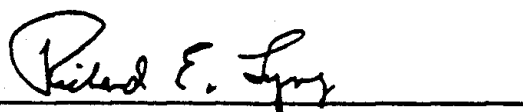
This agreement may be modified or amended upon request of either Department and the concurrence of the other. This agreement may be terminated with 60-day notice of either party.

IX. IMPLEMENTATION

This agreement becomes effective when signed by both parties.



Secretary of Defense



Secretary of Agriculture

Date: 22 SEP 1988

Date: Sept 30, 1988

MEMORANDUM OF UNDERSTANDING

BETWEEN

U.S. DEPARTMENT OF THE INTERIOR - BUREAU OF LAND MANAGEMENT

NEW MEXICO

AND

U.S. DEPARTMENT OF THE ARMY

HEADQUARTERS, US ARMY AIR DEFENSE ARTILLERY CENTER
AND FORT BLISS

FORT BLISS, TEXAS

CONCERNING

POLICIES, PROCEDURES, AND RESPONSIBILITIES RELATED TO LAND USE
PLANNING AND RESOURCE MANAGEMENT OF MCGREGOR RANGE

I. PURPOSE

This Memorandum of Agreement (MOU) establishes the basic principles and responsibilities of the Department of the Interior, Bureau of Land Management (BLM) and Department of the Army, Fort Bliss (Ft Bliss) for implementation of BLM's 1990 Resource Management Plan for the McGregor Range (Range) as mandated by Public Law 99-606. The plan was developed by BLM in consultation with Ft Bliss.

II. AUTHORITIES

Public Law 99-606, Military Lands Withdrawal Act of 1986
National Environmental Policy Act (P.L. 91-90, 42 U.S.C. Section 4321 et seq.).
Federal Land Policy and Management Act (P.L. 94-579, 43 U.S.C. Section 1701 et seq.).

III. PROCEDURES

A. GENERAL OPERATING PRINCIPLES

BLM will recognize Ft Bliss missions have priority of use on the Range and will secure Ft Bliss concurrence before authorizing any nonmilitary uses. At all times, the Army, through Fort Bliss,

reserves the right to close any or all of McGregor Range in accordance with Section 3(b), Public Law 99-606.

1. NATIONAL ENVIRONMENTAL POLICY ACT (NEPA)

COMPLIANCE

Both agencies are responsible for complying with the NEPA of 1969. As a part of the environmental assessment process, each Agency shall provide the other Agency the opportunity to comment on all proposed actions on the Range that require an environmental assessment or environmental statement.

2. COMMENT

When one Agency requests the review and comment by the other Agency, the requesting Agency will state a requested time period for review, depending on the urgency of the action. Upon receipt of a review request, the reviewing Agency will make every effort possible to meet the other's requested time frame.

3. ACCESS

a. BLM ACCESS TO THE RANGE. BLM employees may have access to portions of the Range that are not hazardous. To avoid interference with Ft Bliss missions and to ensure safety, BLM employees will call the Range Commander or his designee for a clearance. Prior to entry into a hazardous area, BLM employees will notify the Range Commander to make escort and other safety arrangements.

b. PUBLIC ACCESS TO THE RANGE. With the exception of State Road 506 and associated County Roads F052, F037, and E001 north of 506, when not closed by the military, the Range is closed to public use except for authorized activities.

BLM will serve as the processing agency and lead agency for public use of the withdrawn public land on the Range. BLM will provide a description of the activity to the Range Commander, the installation commander's designee for range activities for Ft Bliss. No authorizations will be granted by BLM if Ft Bliss determines they conflict with Ft Bliss use of the Range. Providing the activity is approved, the BLM will require authorized users to comply with Ft Bliss security and safety procedures and regulations when gaining access to the range.

4. MILITARY USE OF THE RANGE. The Range Commander or the appointed representative will serve as BLM's primary point

of contact for coordination involving military use of the Range. It is understood that the military has primary authority of the Range. It is understood that the BLM has managerial responsibilities for the public uses as enumerated in Public Law 99-606 of the withdrawn land, but that the daily uses are subordinate to military missions and uses of the Range.

5. INCOME RECEIVED FROM PUBLIC USE OF THE RANGE.

When BLM receives income from the use of the Range, the income will be placed in a fund which can be drawn upon for management of the Range unless otherwise directed by law.

When BLM authorizes an activity that will occur on both withdrawn public land and Army fee-owned land, cost of administration will be allocated to BLM from the Army fee-owned land portion. Ft Bliss will be provided the opportunity to direct the use of the net income in proportion to the amount of income generated from Army fee-owned land for the specific activity that generated the funds.

6. REAL PROPERTY. Within two years, jointly the agencies will develop an inventory of real property (rangeland improvements, buildings, and structures) on the grazing area of the Range. The inventory will identify Army property, BLM property, and jointly owned property. In cases where no records are available showing the ownership of the real property, ownership will be determined by the Ft Bliss Real Property Management Branch and the Area Manager. Unless otherwise agreed to, Ft Bliss will be responsible for the maintenance of its real property and BLM will be responsible for maintenance of its real property irrespective of the location.

In cases where rangeland improvements, buildings, and structures are no longer useable or beyond repair, they may be removed or reconstructed with mutual concurrence unless otherwise directed by law or regulations.

B. SPECIFIC ACTIVITY COORDINATION

1. LANDS

a. BLM RESPONSIBILITIES. BLM will be the lead agency for NEPA compliance for proposed projects that involve both withdrawn public land and Army fee-owned land that meet the criteria for the designation of lead agency defined in Council of Environmental Quality (CEQ) Regulation 1505.1. The BLM will issue all public demand nonmilitary leases, easements, rights-of-way, and other land use authorizations on withdrawn public land. (Nonmilitary is defined as projects that are not owned by the

U.S. Government, not under administration or under contract to, a military agency.) The BLM will send a copy of the land use application to the Ft Bliss Real Property Management Branch for a review and concurrence of the proposed action.

b. FT BLISS RESPONSIBILITIES. Ft Bliss will review all land use applications submitted by BLM and determine if the applications conflict with military uses of, and responsibilities to, the Range.

Ft Bliss will issue all land use authorizations needed on or across Army fee-owned land.

2. MINERALS

a. SALABLE MINERALS (sand, gravel, fill dirt, borrow, caliche, and building stone).

(1) BLM RESPONSIBILITIES. The BLM is responsible for authorizing and managing salable materials for the Range, but all activities will be with the concurrence of Ft Bliss. Sales will be limited to those areas that are identified in the Proposed Resource Management Plan Amendment/Final EIS for McGregor Range, May 19, 1989, page 3 (hereinafter referred to as BLM's Proposed 1989 Resource Management Plan). Upon receiving an application for materials, BLM will provide the Ft Bliss Real Property Management Branch, a description of the proposal and request Ft Bliss review for consistency with military missions and public safety. If Ft Bliss does not concur with the application, BLM will not authorize or approve such a request.

(2) FT BLISS RESPONSIBILITIES. Ft Bliss will review applications for consistency with military missions, safety, and security requirements. Upon completion of the review and concurrence with Ft Bliss, Ft Bliss, will notify BLM if it concurs with the application and provide stipulations or modifications required.

b. LEASABLE MINERALS

(1) BLM RESPONSIBILITIES. The BLM will manage the oil and gas, and geothermal programs for the Range. Oil and gas, and geothermal programs will be limited to those areas identified as suitable in BLM's Proposed 1989 Resource Management Plan. Prior to offering a parcel or parcels for lease, BLM will provide Ft Bliss Real Property Management Branch a description of each parcel and request the appropriate surface management stipulations. The description of each parcel will include a real estate map showing range, township, and section(s).

Prior to processing pre-lease notices/permits or lease operations, BLM, in consultation with Ft Bliss and applicants, will schedule a field examination for each action.

In concurrence with Ft Bliss, BLM will determine every five years which land on the Range is suitable for opening. If areas are found to be suitable for opening to leasable minerals, BLM will comply with Section 12 of Public Law 99-606.

(2) FT BLISS RESPONSIBILITIES. Ft Bliss, through the Albuquerque District, Corps of Engineers, will provide stipulations to BLM for oil and gas, geothermal exploration and leasing operations. Ft Bliss will notify BLM of changes in security and safety requirements. Ft Bliss will assist BLM with inspection and enforcement and field examinations access, times of entry, and safety and security requirements. Additional administrative costs if necessary will be paid by BLM or the lessee.

Every five years, Ft Bliss will review military programs and determine which areas would be compatible with opening for leasable minerals.

c. LOCATABLE MINERALS

(1) BLM RESPONSIBILITIES. The BLM will conduct inventories for locatable minerals. In concurrence with Ft Bliss, BLM will determine every five years which land on the Range is suitable for opening for locatable minerals. If areas are found to be suitable for opening, BLM will comply with Section 12 of Public Law 99-606.

(2) FT BLISS RESPONSIBILITIES. Every five years, Ft Bliss will review military programs and determine which areas would be compatible for locatable minerals.

3. VEGETATION MANAGEMENT

a. BLM RESPONSIBILITIES. BLM will be responsible for vegetation on the withdrawn public land on the Range and will coordinate management with Ft Bliss. The special status species section of this MOU discusses management of special status plant species.

The BLM will be the lead agency for management of the Black Grama Area of Critical Environmental Concern (ACEC), sales of plant products, and prescribed burns. The actions will be limited to those areas identified in BLM's Proposed 1989 Resource Management Plan. Prior to authorizing activities, BLM will provide Ft Bliss with a description of the proposal and

request a Ft Bliss review for compatibility with military missions, security, and safety. If Ft Bliss does not concur, BLM will not authorize such an activity. Administrative costs will be paid by BLM or the contractor/lessee.

The ACEC will be managed according to the existing cooperative agreement between the BLM, Ft Bliss, and New Mexico State University.

The BLM will be responsible for monitoring vegetation conditions on withdrawn public land and may assist on Army fee-owned land on the Range. The BLM will develop and implement a monitoring plan in consultation with Ft Bliss. BLM will coordinate monitoring methodology and results with Ft Bliss Environmental Management Office so that 1) data can be collected, if possible, in a way usable in natural resources/NEPA programs; and 2) monitoring activities are not duplicated by both agencies.

b. FT BLISS RESPONSIBILITIES. Ft Bliss will be responsible for vegetation management on Army fee-owned land.

Ft Bliss will review BLM proposals for vegetation management for consistency with military missions, safety, and security requirements. Upon completion of the review, Ft Bliss will notify BLM if Ft Bliss concurs with the proposal and provide stipulation or modifications.

4. RANGELAND MANAGEMENT

a. LIVESTOCK GRAZING

(1) BLM RESPONSIBILITIES. The BLM is responsible for management of the livestock grazing program on the Range and will continue the existing livestock grazing program on McGregor Range. Livestock grazing will be limited to the grazing area identified in the Draft White Sands Resource Management Plan and EIS, McGregor Range, September 88, page 3-15 and map 3-4, incorporated in BLM's Proposed 1989 Resource Management Plan.

Livestock grazing levels will be established annually and based on the principles of multiple use and sustained yield. BLM will continue to utilize the existing stipulations as needed by Ft Bliss and if changes are proposed, they will be coordinated with Ft Bliss. The current stipulations are attached as Appendix A.

Livestock use will be authorized through contracts and based on competitive bidding at public auction. Minimum bids will be established as a result of feasibility cost studies which will

determine the cost for continuing operation of the grazing program. The contracts will contain the terms and conditions as necessary to meet the requirements of BLM's Proposed 1989 Resource Management Plan and Ft Bliss requirements.

The revenues from livestock grazing contracts will be placed in a special account and generally be used for the management of the livestock grazing program which includes all administrative costs, construction, and maintenance of rangeland improvements. Ft Bliss will be provided the opportunity to direct expenditure of 10 percent of the revenues based on 10 percent Army fee-owned land within the withdrawn area. However, BLM may use a portion of the 10 percent revenue, with Army concurrence, for maintenance of rangeland improvements that are owned by Ft Bliss and where BLM has accepted maintenance responsibility. BLM will provide Ft Bliss an annual accounting of the revenues and expenditures generated from the livestock contracts.

BLM will ensure grazing use will be limited to cattle and horses and is responsible for livestock trespass abatement in nonimpact areas.

The BLM will keep Ft Bliss Provost Marshal's Office and Range Commander informed as to the name and address of each grazing contractor and will ensure the grazing contractors comply with Ft Bliss security and safety requirements.

(2) FT BLISS RESPONSIBILITIES. The Range Commander is responsible for issuing appropriate passes for grazing contractors. Additionally, Ft Bliss will provide firing schedules to BLM and a check out system to ensure grazing contractors comply with Ft Bliss security and safety requirements.

Ft Bliss will gather and remove livestock from impact areas at the request of BLM or for trespass abatement.

b. RANGELAND IMPROVEMENTS

(1) BLM RESPONSIBILITIES. The BLM will be responsible for the construction and maintenance of livestock control fences within and bordering the livestock grazing area with the exception of fences in impact areas.

The BLM will be responsible for providing livestock and wildlife water on the Range in concurrence with Ft Bliss. The primary source of water for the wildlife will be the Ft Bliss owned water rights out of the Sacramento River and Carrizo Spring. The Army, in cooperation with BLM, will retain and exercise complete

control of distribution and use of allocated water rights from the Sacramento River and Carrizo Spring. It is understood by both parties that the use of the water is for the benefit of wildlife.

The BLM has maintenance and construction responsibility to maintain and improve pipelines, tanks, tubs, wells, windmills, wildlife waters, etc, necessary to provide for wildlife and rangeland management. Prior to the construction of new rangeland improvements, maintenance of Ft Bliss owned improvements, or changes that affect water resources on the Range, BLM will submit the construction or maintenance plans and specifications to the Range Commander for concurrence.

(2) FT BLISS RESPONSIBILITIES. Ft Bliss will control construction and maintenance of rangeland improvements in impact and military use areas. Ft Bliss will construct and maintain firebreaks on those parts of the McGregor Range boundary which enclose land upon which grazing use will be authorized and at such other locations as may be determined to be necessary by Ft Bliss.

Firebreaks will usually be maintained contiguous with perimeter fences.

Personnel of Ft Bliss, in pursuit of their official functions, or other authorized purposes, will continue to have unlimited access to the land covered by this agreement. Ft Bliss may open gates and, if necessary, lower fences in order to accomplish missions or duties. However, Ft Bliss will leave gates as found (open or closed) and reposition any fences lowered, but Ft Bliss assumes no responsibility with a third party should gates not be left as found or should fences not be re-positioned. If routine utilization and/or modification of rangeland improvements are needed to accomplish military operations, Ft Bliss will coordinate with BLM, in advance when possible and practicable.

The Range Commander will review BLM's rangeland improvement plans on withdrawn land for consistency with military missions, safety, security requirements, and for approval. Upon completion of the review, Ft Bliss will notify BLM if Ft Bliss concurs with the proposal and provide stipulations or modifications it requires.

5. WILDLIFE

a. GAME SPECIES POPULATION MANAGEMENT

(1) BLM RESPONSIBILITIES. BLM recognizes New Mexico Department of Game and Fish (NMDGF) as the agency

responsible for game species population management on all land on the Range.

BLM will be the lead agency in coordination of all recommendations with NMDGF on matters concerning wildlife population management as they affect BLM resource management and protection of wildlife on withdrawn public land on the Range.

Prior to making a recommendation to the NMDGF on game species population management, BLM will consult with Ft Bliss to coordinate respective management objectives for withdrawn public land and Army fee-owned land to ensure its activities are consistent with military missions, safety and security requirements.

(2) FT BLISS RESPONSIBILITIES. Ft Bliss recognizes NMDGF as the agency responsible for game species population management on all land on the Range.

Prior to making a recommendation to the NMDGF on game species population management, Ft Bliss will consult with BLM to coordinate respective management objectives for Army fee-owned land and withdrawn public land.

b. HABITAT MANAGEMENT.

(1) BLM RESPONSIBILITIES. The BLM will be responsible for wildlife habitat management on withdrawn public land and will coordinate such monitoring on Army fee-owned land.

The BLM will establish and conduct wildlife habitat management activities in accordance with BLM planning decisions, applicable laws and regulations.

The BLM will coordinate all habitat management activities with the Range Commander for consistency with military missions, safety and security requirements to obtain Ft Bliss concurrence.

The BLM is responsible for monitoring wildlife and wildlife habitat on withdrawn public land. BLM may conduct such activity on Army fee-owned land with the concurrence of the Range Commander. The BLM will develop and implement a monitoring plan in coordination with Ft Bliss. The monitoring studies would include coordination with Ft Bliss for annual field trips, flights, use of approved aerial photography, and Ft Bliss objectives for Army fee-owned land. BLM will coordinate monitoring, methodology and results with Ft Bliss Environmental Management Office so that, when possible, data can be collected in a way usable in Ft Bliss Natural Resources/NEPA Programs. The

objective of both agencies is to avoid duplicating each other's efforts.

(2) FT BLISS RESPONSIBILITIES. Ft Bliss will be responsible for wildlife habitat management on Army fee-owned land to the extent of resource availability.

Ft Bliss will establish and conduct wildlife habitat management activities in accordance with applicable laws and regulations.

Ft Bliss will coordinate all habitat management activities with BLM to ensure harmony in management direction for the Range as a whole.

c. SPECIAL STATUS SPECIES MANAGEMENT

(1) BLM RESPONSIBILITIES. The BLM will be responsible for compliance with the Federal and State laws affecting endangered, threatened, candidate or sensitive plants and animals with regard to all actions on withdrawn public land.

The BLM will also manage federal candidate and proposed species, state-listed species, and BLM sensitive species on withdrawn public land according to BLM policy.

The BLM will be responsible for implementation of recovery plans on withdrawn public land on the Range. Prior to implementation of recovery plans, BLM will request concurrence from the Range Commander to ensure consistency with military missions, safety, and security requirements.

The BLM will provide Ft Bliss data on inventories, consultation proceedings, and other information with regard to special status species on McGregor Range.

(2) FT BLISS RESPONSIBILITIES. Ft Bliss will be responsible for compliance with the Endangered Species Act and New Mexico endangered plant and animal laws with regard to its actions on withdrawn public land and for Army fee-owned land on the Range.

Ft Bliss will be responsible for implementation of recovery plans on Army fee-owned land on the Range. Prior to implementation of recovery plans, Ft Bliss will coordinate with BLM to ensure consistent management direction for the Range.

Where possible and practicable, Ft Bliss will support BLM management programs for federal candidate, proposed, state-listed, and BLM sensitive species on the Range.

Ft Bliss will provide BLM data on inventories, consultation proceedings, and other information with regard to special status species on the Range.

d. SIKES ACT STAMP PROGRAM

A Sikes Act Stamp Program will be established under Section 1 (military reservations) of the Sikes Act as amended (16 U.S.C. Title 670). Stamp fees and program specifics will be set by an additional Memorandum of Agreement between NMDGF, Ft Bliss, and BLM.

e. ANIMAL DAMAGE CONTROL

(1) BLM RESPONSIBILITIES. The BLM will be responsible for authorizing animal damage control (ADC) activities on withdrawn public land and Army fee-owned land.

Each year when the New Mexico ADC Program presents BLM with a proposed district wide ADC Plan, BLM will provide the Range Commander an opportunity to review and approve the draft to coordinate respective management objectives for withdrawn public land, Army fee-owned land, and to ensure consistency with military missions, safety, and security requirements prior to approval. The BLM will be responsible for monitoring predator populations, and other potentially damaging species as required by BLM planning decisions.

Requests from grazing contractors for ADC will be handled by the New Mexico ADC Program. Routine requests for control work received by ADC from the grazing contractors will be incorporated into the annual ADC plan. Requests for emergency control work received by ADC from the grazing contractors will be authorized by BLM on a case-by-case basis.

(2) FT BLISS RESPONSIBILITIES. Ft Bliss will review and comment on the draft district ADC plan for consistency with military missions, safety, and security requirements.

Ft Bliss will request ADC activities needed (except in the vicinity of military structures) on withdrawn public land through BLM prior to development of the district ADC plan. Ft Bliss will coordinate all Army initiated ADC activities on Army fee-owned land with the BLM to ensure consistent management direction for the Range.

6. CULTURAL RESOURCES:

a. The term "cultural resources" is understood to

have the same meaning as the term "historic resources" used in the Historic Preservation Act and in its implementing regulation 36 C.F.R. Section 800.

b. BLM's RESPONSIBILITIES:

(1) The BLM will comply with Section 106 of the Historic Preservation Act and 36 C.F.R. Section 800 for undertakings for which the BLM or third parties are the proponent.

(2) The BLM will be the lead agency for permits required by the Archaeological Resources Protection Act (ARPA) for survey, research, excavation, data recovery, and other cultural resources projects for which the BLM is the proponent and for all third party activities on withdrawn public lands.

(3) The BLM will mitigate the effects caused to cultural resources for activities conducted under BLM's administration.

(4) The BLM may be a consulting party in military undertakings involving cultural resources on withdrawn public lands. The BLM and Ft Bliss jointly will identify classes of undertakings for which the BLM will be a consulting party.

(5) Upon request, the BLM will provide Ft Bliss with draft, review copies of research proposals, survey and other field project reports, and with the results of analytical studies for which the BLM is the proponent. Additionally, the BLM will provide Ft Bliss with final copies of such proposals, reports, and studies.

(6) The BLM will meet with Ft Bliss on an annual basis, or more frequently as appropriate, to share information about planned cultural resources projects. Other topics to be discussed will include means to:

(a) Standardize field survey, recording techniques, and artifact classification criteria and codes to the maximum practical extent.

(b) Identify ways to make site and artifact file data compatible for interagency use to the maximum practical extent.

(c) Develop procedures to permit review of the design(s) of cultural resources projects and to incorporate

Ft Bliss analytical needs into those designs to the maximum practical extent.

c. FT BLISS RESPONSIBILITIES:

(1) Ft Bliss will comply with Section 106 of the Historic Preservation Act and 36 C.F.R. Section 800 for those undertakings for which the military is the proponent.

(2) Ft Bliss will be the lead agency for permits required by the Archaeological Resources Protection Act (ARPA) for survey, for research/excavation/data recovery, and for other cultural resources for which the military is the proponent on withdrawn public lands and all activities on Army fee-owned land.

(3) Ft Bliss will mitigate the effects caused to historic resources by military activities.

(4) Ft Bliss may be a consulting party in the BLM's undertakings involving cultural resources. Ft Bliss and the BLM jointly will identify classes of undertakings for which Ft Bliss will be a consulting party.

(5) Upon request, Ft Bliss will provide the BLM with draft, review copies of research proposals, survey and other field project reports, and with the results of analytical studies for which Ft Bliss is the proponent. Additionally, Ft Bliss will provide the BLM with final copies of such proposals, reports, and studies.

(6) Ft Bliss will meet with the BLM on an annual basis, or more frequently as appropriate, to share information about planned cultural resources projects. Other topics to be discussed include means to:

(a) Standardize field survey, recording techniques, and artifact classification criteria and codes to the maximum practical extent.

(b) Identify ways to make site and artifact file data compatible for interagency use to the maximum practical extent.

(c) Develop procedures to permit review of the design(s) of cultural resources projects and to incorporate BLM's analytical needs into those designs to the maximum practical extent.

7. RECREATION

a. GENERAL

(1) BLM RESPONSIBILITIES. The BLM is responsible for managing recreational use of the withdrawn public land on the Range.

Prior to authorizing a recreational use on the Range, BLM will provide the Range Commander with a description of the proposed action for review for consistency with military missions, safety, and security requirements, and obtain Ft Bliss concurrence.

The BLM will be responsible for developing a sign location plan and information plan that will provide the public reasonable information on locations and restrictions. Prior to approval of the plan, BLM will provide the Range Comander with a draft for approval so that the plan will be consistent with military missions, safety, and security requirements.

The BLM will limit recreational vehicle use on withdrawn public land to designated roads and trails. BLM will identify designated roads on a case-by-case basis with Ft Bliss concurrence. The designation will consider the need for access for the activity involved.

(2) FT BLISS RESPONSIBILITES. Ft Bliss will be responsible for establishing a safety and security program needed to provide for military security and public safety.

Ft Bliss will install and maintain signs for areas that are hazardous because of unexploded ordnance.

b. HUNTING

(1) BLM RESPONSIBILITIES. The BLM will be responsible for managing the recreational use of the Range by hunters in accordance with the Resource Management Plan requirements. Each year BLM, in concurrence with the Range Commander and the NMDGF, will develop a McGregor Range hunting plan that will prescribe proposed recreational use of the Range by hunters. The plan shall be consistent with guidelines from the BLM's 1989 Proposed Resource Management Plan, recreation management capability of the agencies, multiple use mandates, and natural resource management objectives. Prior to approval of the plan, BLM will provide the Range Commander with a draft for review for consistency with military missions, safety, and security requirements. If the plan is not consistent with military missions, safety, and security, then BLM will not adopt

it as its hunting plan and will then so modify the plan to make it consistent with military missions.

(2) FT BLISS RESPONSIBILITIES. Ft Bliss will be responsible for providing BLM with information concerning the Ft Bliss Safety and Security Program prior to BLM approval of the Annual Hunting Plan. Hazardous areas and those areas that the public are not allowed to enter will be identified on maps. This in no way affects the Range Commander's right to later deny access to an area that has become a hazardous area.

8. WILDERNESS STUDY AREA MANAGEMENT

a. BLM RESPONSIBILITIES. The BLM will manage the Culp Canyon Wilderness Study Area (WSA) under the Interim Management Policy and Guidelines Under Wilderness Review (1987) until the area is either added to the National Wilderness Preservation System or removed from further wilderness consideration.

b. FT BLISS RESPONSIBILITIES. Ft Bliss will be responsible for compliance with the Interim Management Policy and Guidelines for Lands Under Wilderness Review (1987) until area is either added to the National Wilderness Preservation System or removed from further wilderness consideration.

Ft Bliss will generally limit surface use of the WSA to ground forces military maneuvers. All military activities which cause impairment to wilderness values will require reclamation prior to September 30, 1990. All vehicles should utilize existing vehicle ways. Ft Bliss will notify the Las Cruces District Manager 30 days prior to conducting any activities within the WSA whenever possible or immediately following the activity.

9. WATERSHED

a. BLM RESPONSIBILITIES. The BLM will be responsible for management of watershed resources on withdrawn public land on the Range. The BLM will develop and implement a monitoring plan in coordination with Ft Bliss. Monitoring studies for watershed will be conducted on withdrawn public land over the entire McGregor Range in coordination and concurrence with Ft Bliss. The monitoring studies will include coordination with Ft Bliss for annual field trips and use of approved ground and aerial photography.

The BLM will cooperatively develop and implement watershed management plans for the Grapevine, El Paso Canyon, and Cockleburr Watershed areas. Prior to approval of the watershed management plans, BLM will provide Ft Bliss with a draft for

concurrence for consistency with Army fee-owned land management objectives, military missions, safety, and security requirements.

b. FT BLISS RESPONSIBILITIES. Fort Bliss will be responsible for the management of watershed resources on Army fee-owned land.

10. FIRE

a. BLM RESPONSIBILITIES. The BLM will be responsible for monitoring and suppressing all nonmilitary fires on withdrawn public land and Army fee-owned land.

The BLM will initiate the most cost effective suppression or modified suppression tactics available on all nonmilitary fires except those designated as impact or military use areas.

Upon receiving a report of a fire and prior to beginning suppression actions, BLM will notify the Ft Bliss Fire Chief to establish fire control responsibility and hazards that may restrict control measures.

Agency jurisdiction will be assigned upon determining the ignition source. The BLM may initiate aerial suppression (air tanker/helicopter drops) on those military fires deemed threatening to life upon completion of an escaped fire analysis and coordination with the Ft Bliss Fire Chief. The BLM may, at its own expense, initiate aerial suppression on the military fires which are not deemed threatening to life.

The BLM will notify the Ft Bliss Fire Chief of its suppression actions within 24 hours of suppression actions being taken on the Range. Such notification will include when possible, but not be limited to, the following:

Date and time of action
 Location and size of fire
 Type and extent of suppression activities
 Resources/structures damaged (if any)

1. Facilities
2. Structures (livestock, wildlife, or cultural)
3. Private or State property
4. Cultural resources
5. Livestock
6. Endangered species/habitat
7. Critical natural resource area

The BLM may use prescribed burning to improve rangeland condition and wildfire habitat on areas identified in the BLM's 1989

Proposed Resource Management Plan. The prescribed burn plans will meet all required BLM formats and regulations. Prior to approval of the plans, BLM will provide Ft Bliss Real Property Management Branch, for staffing to appropriate Ft Bliss activities) with a draft for concurrence for consistency with Army fee-owned land management objectives, military missions, safety, and security requirements.

b. FT BLISS RESPONSIBILITIES. Ft Bliss will have responsibility for suppressing and monitoring fires caused by military activities on withdrawn public land and Army fee-owned land.

Ft Bliss will serve as lead agency for monitoring or suppressing all fires in the impact and military use areas. Each year Ft Bliss will update BLM of the hazardous areas at the annual coordination meetings.

Ft Bliss will initiate suppression or modified suppression (monitoring) tactics on all fires caused by military actions on McGregor Range.

Consistent with P.L. 99-606, Section 3(d) Ft Bliss will request a transfer of funds from the Department of Army to the Bureau of Land Management as compensation for assistance on fire suppression actions of fires that resulted from a military activity.

Upon receiving a report of a fire, the Ft Bliss Fire Chief will notify the BLM of the fire. The Fire Chief will provide BLM with as much information as available at that time and of its suppression actions. Within 24 hours of suppression actions being taken on the Range, the Fire Chief will provide additional information if available. Such final report will include, when possible, but not be limited to, the following:

Date and time of report
 Location and size of fire
 Type and extent of suppression activities
 Resources/Structures damaged (if any)

1. Facilities
2. Structures (livestock, wildlife or cultural)
3. Private or State property
4. Cultural resources
5. Livestock
6. Endangered species/habitat
7. Critical natural resource area

11. LAW ENFORCEMENT.

a. BLM RESPONSIBILITIES. The BLM will be responsible for enforcement of the federal laws that pertain to the use, management, and development of withdrawn public land on the Range.

Law enforcement personnel may exercise their enforcement authority over nonmilitary activities within the Range to the extent that such activities are consistent with BLM's 1989 Proposed Resource Management Plan. The BLM will exercise its enforcement authority over military personnel on the Range in coordination with the Provost Marshal's Office.

After BLM takes enforcement action on the Range, it will notify the Ft Bliss Provost Marshal's Office.

BLM will notify the Ft Bliss Provost Marshal's Office if persons are found on the Range with Ft Bliss authorizations but not conducting authorized activities.

b. FT BLISS RESPONSIBILITIES. Ft Bliss will be responsible for enforcing laws pertaining to military activities, public safety, and security on the Range.

Ft Bliss will notify the BLM if persons not on a military mission are found causing resource damage.

12. ROADS

a. BLM RESPONSIBILITIES. The BLM will share road maintenance responsibilities with Ft Bliss. Roads will be maintained to a standard that is consistent with levels of use, environmental factors, safety requirements, level of funding, and resource conditions.

The BLM will develop a road plan for the Range in consultation with the Range Commander. The plan will specify agency responsibilities for maintenance and maintenance standards. Prior to approval of the plan by Ft Bliss, BLM will provide the Range Commander with a draft for review for consistency with military missions, safety, security requirements, and Army fee-owned land management objectives.

b. FT BLISS RESPONSIBILITIES. Ft Bliss will share road maintenance responsibilities. Roads will be maintained to the standard that is consistent with levels of use, environmental factors, safety requirements, level of funding, and resource conditions.

Ft Bliss will assist in the development of a Road Plan for the Range.

IV. GENERAL PROVISIONS

A. TERMS OF AGREEMENT. The need for this MOU is expected to continue for 15 years from the date of enactment of the Military Lands Withdrawal Act of 1986 (November 6, 1986 until November 6, 2001). At the end of this period, the MOU will expire, unless it is cancelled or renewed before then.

B. DEFINITIONS.

1. CONCURRENCE. As utilized in this MOU, concurrence is the agreement of the other party involved. If there is no such agreement then no authorization can be given for such activity.

2. NONMILITARY USE. As utilized in this MOU, a nonmilitary use of the range is one which is an activity, not under administration of, or under contract to, a military agency.

3. RANGE COMMANDER. Wherever Range Commander is used in this MOU, Range Commander serves as the installation commander's designee and primary point of contact.

C. PERIODIC REVIEW. In addition to the reviews required under Section 12 of Public Law 99-606, the participants will review this MOU at least once every five years to determine its adequacy, effectiveness, and need for updating.

D. AMENDMENTS. Either participant may propose changes to this MOU during its term. Any change will be in the form of an amendment and will not take effect until both participants have agreed and signed the amendment. Any amendment must be within the framework of Public Law 99-606.

E. RENEWAL. Section 8(a) paragraphs (1) and (2) and Section 5(b) of Public Law 99-606 establish guidelines for renewal and continued use of the withdrawal as follows:

No later than three years prior to the termination of the withdrawal, Ft Bliss shall advise the BLM as to whether Ft Bliss will have a continuing military need for any of the land withdrawn after the termination date.

- If Ft Bliss concludes that there will be a continuing military need for any such land after the termination date, Ft Bliss shall

file an application for extension of the withdrawal and reservation of such needed land in accordance with regulations and procedures of the Department of the Interior applicable to the extension of withdrawal of land for military uses.

- No later than 12 years after the date of enactment of Public Law 99-606, Ft Bliss shall publish a draft Environmental-Impact Statement (EIS) concerning continued or renewed withdrawal of any portion of the land withdrawn on the Range for which Ft Bliss intends to seek such continued or renewed withdrawal. Section 5(b) (1) of Public Law 99-606 establishes the guidelines for preparation of the EIS.

F. CANCELLATIONS. Section 8(2)(3) of Public Law 99-606 establishes guidelines for cancellation or relinquishment of the withdrawal as follows:

- If during the period of withdrawal and reservation, Ft Bliss decides to relinquish any or all of the land withdrawn and reserved by Public Law 99-606, Ft Bliss shall file a notice of intention to relinquish with the BLM following the procedures set forth in Section 8(b) through (f) of Public Law 99-606.

- In addition to the above, Section 12(e) of Public Law 99-606 provides that in the event of a national emergency or for purpose of national defense or security, the BLM at the request of Ft Bliss, shall close any land that has been opened to mining or to mineral or geothermal leasing. If the closure becomes necessary, a determination of the effect on any ongoing operations will be made at that time.

G. DECONTAMINATION. Decontamination of withdrawn public land on the Range will be in accordance with Section 7 and 8 of Public Law 99-606.

H. MEETINGS AND COORDINATION. The agencies shall meet at least annually prior to August 1 to review the MOU and expected issues. The meeting host shall alternate between the agencies.

The topics discussed at the meeting should include:

1. Enforcement issues
2. Fire
3. NEPA documents
4. BLM activities planned for next period
5. Army activities planned for next period
6. Setting hunting and recreation dates
7. Cultural resource reports during past period
8. Problems

9. Monitoring
10. Budget/accounting
11. Natural resources management projects
12. Water/water management/water monitoring

I. EFFECT ON OTHER MOU'S. Unless a specific provision of an existing MOU is specifically superseded by any part of this MOU, the remaining terms of the MOU's are still in effect until that MOU is wholly superseded. These MOU's are dynamic documents and both parties agree to work together to reach new updated MOU's.

- WO-19 MOU between the Departments of the Interior and Army dated September 9, 1966, which provides co-use grazing on the Range, New Mexico.

- NMSO-30 MOU dated July 22, 1976, on the proposed agreed upon changes to the MOU between the Departments of Interior and Army to provide for co-use grazing on the Range, New Mexico.

- NMSO-36 MOU signed in October 1972, is a Cooperative Plan Agreement for conservation and development of fish and wildlife resources on the Range (Ft Bliss) between BLM, Ft Bliss, New Mexico Department of Game and Fish and Wildlife Service. Also includes the July 22, 1976 MOU between BLM and Ft Bliss on proposed changes to the October 1972 MOU.

In order to fully implement the MOU required by Public Law 99-606 between BLM and Ft Bliss, it is anticipated that additional MOU'S will be required to implement specific resource management programs on the Range. Both BLM and Ft Bliss will sign these MOU'S along with the cooperating agency(ies).

J. PRINCIPAL CONTACTS

- BLM Caballo Resource Area Manager, (505) 525-8228, 1800 Marquess, Las Cruces, NM 88005

- Ft Bliss McGregor Range Commander, (915) 569-9206, ATZC-B-CO, Ft Bliss 79916-7400

K. DISPUTE RESOLUTION. In any and all disputes, the participants in this MOU shall exercise good faith and shall endeavor to resolve all problems amicably and quickly. In the event of any unresolved conflicts the next higher agency/headquarters shall attempt resolution. Final resolution rests with the Secretary of Interior and Secretary of Army.

L. RESERVATION OF RIGHTS. This MOU does not waive any rights or responsibilities the BLM or Ft Bliss may have except as provided by this MOU.

M. BINDING EFFECTS. This MOU is binding on BLM and Ft Bliss and their agents, successors, and assigns.

N. NONDISCRIMINATION. During the performance of this MOU, participants agree to abide by the terms of Executive Order 11246 and will not discriminate against any person because of race, color, religion, sex, or national origin. The participants will take affirmative action to ensure that applicants are employed without regard to race, color, religion, sex or national origin.

O. OFFICIALS. No member or delegate to Congress or Resident Commissioner shall be admitted to any share or part of this agreement, or to any benefit that may arise therefrom, but this provision shall not be construed to extend to this MOU if made with a corporation for its general benefit.

P. EFFECTIVE DATE. This MOU shall take effect on the date when all parties have signed and will continue until November 6, 2001, unless terminated as described in Section E of this MOU.

APPROVED:

By Larry L. Woodard Date 2-22-90
 Larry L. Woodard
 State Director, New Mexico
 Bureau of Land Management

APPROVED:

By Richard J. Galliers Date 22 February 1990
 Richard J. Galliers
 Colonel, U.S. Army
 Chief of Staff

APPROVED:

By Donald N. Satz Date 3-1-90
 Donald N. Satz
 Chief, Real Estate Division
 Albuquerque District, Corp of Engineers
 Albuquerque, New Mexico

APPENDIX A

MCGREGOR RANGE GRAZING TERMS AND CONDITIONS

The following are made a part of this invitation and of the contract and are fully binding on the successful bidder.

Bidding Grazing Contracts and Payment

1. An individual may bid on and be awarded more than one grazing unit. If a bidder bids high on more than one unit and wishes to default; i.e., decline to graze the unit, he may do so on the date of sale; however, the Terms and Conditions in No. 4 below shall apply.

BLM reserves the right to reject any or all bids or to withdraw any unit from consideration.

2. Successful bidders will be required to furnish a deposit of 15 percent of total bid price of each unit successfully bid on at the conclusion of the bidding. Personal checks will be acceptable.

3. The successful bidder will be required to furnish, within 10 days from the date of sale, acceptable surety in the amount of 20 percent of the total bid/bids as a guarantee of faithful performance under the terms of the contract. The performance bond or bonds may be: bond of a corporate surety shown on the approved list of the U.S. Treasury Department and executed on approved standard form, cash, cashiers check, money order, certified. The bond or bonds will be released following an inspection of the unit at the termination of the grazing period.

4. Failure of a bidder to furnish required bonds or other acceptable surety will result in forfeiture to the BLM, as liquidated damages, the deposit submitted at the bidding. The award of grazing use will be made to the next highest bidder.

5. If the bidder is a group, association, or corporation, evidence of the authority of the individual signing for the group must accompany the deposit. Failure to include this evidence of authority will result in disqualification of the bid.

6. Payment for grazing use will be made in full by cash, certified check, cashier's check, personal check, or postal money order payable to the BLM within 10 days from receipt of the notice of award.

The full use of purchased AUMs is the sole responsibility of the successful bidder. Refunds for unused AUMs will not be made, except in cases where the loss is required by the Bureau of Land Management (BLM).

7. The purchaser, on the performance of the contract, will not discriminate against any employee or applicant for employment because of sex, age, race, creed, or national origin.

8. If the purchaser should default in the performance or observance of any of the terms, conditions, or stipulations contained in the contract and attachments, then the BLM may terminate the contract and the rental paid will be considered as liquidated damages.

9. The purchaser may not assign any contract or any interest therein without the written approval of the Authorized Officer. An assignment shall contain all the terms and conditions agreed upon by the parties thereto. No extension of grazing use period or increase in set numbers of livestock will be approved if an assignment of a grazing contract is approved.

10. Only cattle that are owned or controlled by the purchaser will be authorized on the Range. All brands used on the livestock must be recorded with BLM.

11. Covenant against contingent fees: The purchaser warrants that no person or selling agency has been employed or retained to solicit or secure this contract upon an agreement of understanding for a commission, percentage, brokerage, or contingent fee, except bonafide employees or bonafide agencies maintained by the purchaser for the purpose of securing business.

COORDINATION WITH FT. BLISS

The primary use of the McGregor Range is for the use of the military to carry out missions. A secondary use of certain portions of the Range is livestock grazing. Grazing contracts will not prevent Ft. Bliss from establishing launching sites, erecting fire towers, radar sites, or other similar construction and fencing of same when required by any military actions.

Personnel of Ft. Bliss, in pursuit of their official functions or other authorized purposes, will have unlimited access to the land covered by this contract.

Purchaser Access

1. A Range Pass for all successful bidders and their employees, who will be caring for the livestock through the season, must be

obtained from the Provost Marshal's Office. All vehicles are required to be registered, proof of vehicle registration and insurance will be required.

2. Each time prior to entry upon McGregor Range for any reason, each purchaser, his family, agents, or guests, must obtain permission from the Commanding General, United States Army Air Defense Center (Ft. Bliss), or his designated agent. Such persons may remain on McGregor Range only during the hours and/or days which permission to enter has been so granted. Under no circumstances will they be granted permission to enter or remain on McGregor Range when their access will interfere with military activities.

3. Contacts with Ft. Bliss regarding access and firing schedules should be made by writing the Provost Marshal, Bldg. 116, Attn: Pete Atkins, Ft. Bliss, Texas, 79916, or by phone at (915) 568-1898, 568-4103, or 568-5433.

4. Projected increases in missile firings over the next several years means an increase in the number of days the range will be closed off to public access. During these times, the range could be closed for several days straight per week.

5. Should security or safety considerations or the assignment of any particular mission require such action, Ft. Bliss reserves the right to deny access for an extended period of time. Ft. Bliss may exercise this right without prior notice to the purchaser.

Safety

Purchaser, his family, agents, or guests are prohibited from touching, tampering with, or disturbing any shell, shell casing, missile target or components thereof which may be found on the lands covered by this contract. Upon discovery of such items, purchaser will report the discovery to the Provost Marshal's Office, Ft. Bliss.

Impact Area

Portions of grazing Unit 9 and grazing Unit 13 are an impact area for laser explosive ordinance and may contain highly dangerous unexploded ordinance. The impact area is identified by a firebreak road with bilingual danger warning signs placed at 200-meter intervals. Entrance into the impact area by purchasers and their representatives is prohibited.

FIRES

Natural and military caused fires occur on the Range.

Firefighting is hazardous and is the responsibility of the US Government. Purchasers should report fires that they see to BLM but purchasers must not attempt to control them. The grazing purchaser waives any and all rights of action which might accrue due to damage to persons or property resulting from fires.

RANGE IMPROVEMENTS

Wells and Pipelines

1. Rights for water which flows through pipelines from the Sacramento River and Carrizo Springs is retained by Ft. Bliss. The Bureau of Land Management (BLM) will manage the day-to-day use and distribution of the water.
2. Wells and pipeline systems are maintained by BLM. The BLM will attempt to make repairs as soon as possible, but in the event of a delay in securing a well contractor, repair parts, or equipment, the provisions of the Terms and Conditions below in No.1. Liability/BLM will apply.
3. It will be the purchaser's responsibility to check the troughs and pipelines periodically and to inform BLM if problems are found. To prevent pipeline breaks, freezeups, etc., the purchaser will refrain from regulating or tampering with water valves and the pipeline system in any way. Minor cleansing of watering troughs, such as removal of trash, weeds, and dead animals will be the responsibility of the purchaser.
4. Grazing Unit 8. In the event that Dagger Tank dries up prior to the end of the grazing season, it will be necessary for the purchaser to haul or otherwise provide water in the upper Sacramento and Chatfield areas of Unit 8.

When water is hauled, drinking troughs may be requested from BLM.

Fences

All fences will be maintained by the purchaser, except in impact areas. In impact areas, the BLM will maintain the fences. Fences are expected to be maintained by the purchaser at no expense to the government, in as good a condition as when received. In maintenance of the fences, the purchaser is expected to use due care to prevent soil erosion, fire, and other damage.

Cattle Handling Facilities

1. Corrals, portable chutes, and portable loading ramps are available for purchaser use. They are expected to be maintained

by the purchaser in as good a condition as when received. The BLM may supply material for needed repairs.

2. Arrangements will also be made at least 3 days in advance for the use of the portable loading chutes and portable squeeze chutes. When the purchaser has completed use of the portable squeeze chutes and loading chute(s), they shall be immediately returned to McGregor Range Camp (old Prather Ranch) unless other arrangements have been made with the BLM representative. Purchasers using pastures with inadequate loading and branding facilities will receive priority for use of the portable chutes.

Purchaser Constructed Range Improvements

1. The grazing purchaser may construct range improvements necessary for the proper care and management of livestock for which this contract is issued. Authorization will be issued under a Cooperative Agreement. Temporary range improvements must be removed by purchaser within 60 days after his grazing contract has expired or within 60 days of the written notice that the contract has been cancelled for other cause. The purchaser, will restore the area to such condition as existed prior to the improvement. Failure to remove an improvement will result in the improvement being removed by the government at the expense of the purchaser with no claim for damages against the BLM or any agent thereof.

2. With the approval of BLM, the purchaser may leave authorized improvements intact. The U.S. Government will gain title to any permanent improvement authorized to be left on the range.

Removal or Use of Resources on the Range

1. The awarding of this livestock grazing contract does not allow the purchaser to remove either by mechanical means or manual labor any forage, seed, firewood, trees, soil, sand, gravel, etc., from the McGregor Range. Specific written authorization must be obtained from the BLM for the removal of such material.

2. The removal and/or use of materials, supplies or equipment such as posts, wire, gates, pipe, signs, etc., without authorization from BLM, is prohibited.

Movement of Livestock

1. Cattle may be moved on or off McGregor Range only during hours authorized by BLM, normally between dawn and dusk, and only when permission for access is granted by Ft. Bliss.

All livestock will be counted on and off the grazing units on McGregor Range by BLM representatives. The Unit purchaser must notify the representatives as specified on the contract by telephone or letter at least 3 days prior to moving cattle on or off the range, specifying the time and place on McGregor Range when cattle will be loaded or unloaded.

2. Contact the BLM by letter at 1800 Marquess Street, Las Cruces, New Mexico, 88005, or phone at (505) 525-8228.

Contact with Ft. Bliss regarding access and firing schedules should be made by writing the Provost Marshal, Bldg. 116, Attn: Pete Atkins, Ft. Bliss, Texas, 79916, or by phone at (915) 568-1898, 568-4103, or 568-5433.

Contact with the NM Livestock Board should be made with the District Livestock Inspector, Bruce McLaughlin. He may be contacted at Route 1, Box 212, Alamogordo, New Mexico, 88310, telephone. (505) 434-2447.

3. Under no circumstances will livestock be turned out on grazing units with out being counted by BLM. Under emergency situations, livestock may be placed in corrals while waiting to be counted by BLM.

4. Holding traps will be used only when cattle are being gathered or worked. Use will be allowed for no more than 1 week at a time. At all other times, traps will not have any cattle or horses in them and gates will be kept closed. Traps are not part of the grazing units.

Dead livestock will be moved at least 300 yards from corrals and watering troughs.

Arrangements will also be made at least 3 days in advance for the use of the portable loading chutes and portable squeeze chutes.

GRAZING MANAGEMENT

Five Year Contracts

All 5 year contracts, have deferment built into the grazing season schedules. Livestock must be removed from the units during their scheduled periods of nonuse.

On all 5 year contracts, the BLM reserves the right to make adjustments on livestock numbers prior to the start of the next grazing season. Coordination with the contractor will be made before any adjustments are made.

All Contracts

1. In order that proper utilization of forage be obtained, BLM reserves the right to designate the periods of time and areas to be grazed within each unit (such as moving cattle to dirt tanks for trampling purposes and placing of supplemental feed and salt). BLM reserves the right to require salt or supplemental feed to be placed away from the waters as needed. If certain areas of a unit show obvious overgrazing, the purchaser may be asked to relocate their cattle to other areas within the unit as specified by BLM. Failure to keep cattle scattered (away from the overgrazed area) may result in an automatic reduction in stocking rate.
2. Holding traps are not part of the grazing units. Traps may be used only when cattle are being gathered or worked. Use must be for no more than 1 week at a time. At all other times, traps must not have any cattle or horses in them and gates must be kept closed.
3. The grazing period for the units shown in the Specifications and Bid Schedule will be strictly adhered to. A refund will not be made for AUMs not utilized.
4. Purchasers are authorized to remove livestock for a period of 7 days following termination dates as long as animal unit months (AUMs) of forage consumed are not in excess of the contracted number of AUMs.
5. At no time during the term of the contract, will livestock numbers exceed those shown on the bid information sheet, unless written approval is obtained from BLM. With written authorization, purchasers may receive a 10 percent increase in numbers in order to utilize AUMs purchased; however, AUMs of forage utilized may not exceed contracted numbers.
6. Contractors may be required to remove livestock prior to termination of grazing season in order to insure that utilization does not exceed the AUMs of forage purchase.

Class of Livestock

Those Units specified as cattle or yearlings may be stocked with either one or the other, but not in combination of the two.

Cattle

- a. Cow with suckling calf that is less than 6 months of age. Suckling calves born on a 9-month unit will be considered to be less than 6 months of age.

b. Suckling calves born prior to the date of arrival on any unit when they have been on the unit for 6 months.

c. Weaned animal.

Yearling

a. Weaned animal weighing less than 550 pounds upon entering the Unit. The Contractor must provide BLM with a written copy of the scale weights to receive the conversion.

b. A conversion factor of .8 to 1 AU will be allowed on yearlings provided yearling weights do not exceed 550 lbs. upon entering McGregor Range.

If the maximum authorized number of AUs is exceeded, as a result of calves becoming AUs, the excess must be removed within 4 nonfiring days upon receipt of written notification.

Adjustment of Livestock Numbers

BLM reserves the right to reduce stocking rate on any unit when it is deemed necessary due to natural disaster, such as fire or drought, or due to obvious overgrazing.

In the event such a reduction in livestock numbers is necessary, the contractor will be given a least 3 weeks notice to arrange for removal of cattle.

A refund will be made for AUMs not utilized.

Ear Tagging

Should two or more units be successfully bid on by an individual and these units are contiguous, ear tagging of all cattle by unit will be required. BLM will provide ear tags.

Horse Use

Horse grazing use on the units will be allowed only upon written request of the purchaser. No more than three horses per unit will be allowed. Only saddle horses used for operation of the unit will be authorized. If horses are grazed on the unit, the cattle usage authorized must be reduced by the number of horses grazed.

UNAUTHORIZED USE

Unauthorized livestock shall be defined as those animals in excess of authorized numbers or AUMs whichever is the greater,

animals ear tagged or branded other than with purchasers tag or brand or a brand which the purchaser has no written authorization to use.

BLM reserves the right to gather and impound any unauthorized livestock within any grazing unit on McGregor Range. Purchaser shall bear all expenses incurred by BLM including those incurred in gathering, impounding, caring for, and disposing of livestock in cases which necessitate impoundment.

If livestock stray into adjoining units, the purchaser will be notified in writing by BLM and allowed 4 nonfiring days from receipt of such notice to remove livestock before unauthorized use action shall be initiated.

OFF ROAD VEHICLE USE

No driving off established roads will be allowed. Any type of livestock gathering or checking away from established roads will be by horseback.

VIOLATIONS

The excavation of archaeological sites and gathering of objects of antiquity upon lands subject to this contract is prohibited.

Violators will be subject to prosecution with potential fines of up to \$10,000.00 and cancellation of their grazing contract.

Discovery of any such sites or items will be reported to the BLM.

LIABILITY/U.S. GOVERNMENT

1. The U.S. Government assumes no obligation whatsoever with respect to the security of livestock or other property of the purchaser from theft, loss, or damage of any kind.
2. BLM will not be liable for any damage from loss of livestock or inconvenience to the purchaser in the event water is not available through the pipeline systems, wells, or tanks.
3. Ft. Bliss will not be responsible for damage to any improvement or for any injury to persons or livestock caused directly or indirectly by military activities impact or fallout of missiles, targets, or components thereof.
4. Military personnel may open gates, and if necessary, lower fences in order to accomplish their assigned mission or duty. Ft. Bliss will require personnel to leave gates as found (opened

or closed) and to reposition fences lowered. However, Ft. Bliss assumes no responsibility should gates not be left as found or should fences not be repositioned.

PREDATOR CONTROL

All requests for animal damage control (coyotes) will be made to the APHIS/NMADA Program. APHIS/NMADA will coordinate predator control with Ft. Bliss and the BLM.

NEW MEXICO LIVESTOCK BOARD

This grazing contract is subject to all New Mexico State laws and regulations. These regulations are to be strictly adhered to and failure to comply may be considered a breach of contract. Under normal circumstances, cattle will not be quarantined on McGregor Range. In addition, all livestock leaving McGregor Range will generally require inspection by the New Mexico State Livestock Board.

Contact with the NM Livestock Board should be made with the District Livestock Inspector, Bruce McLaughlin. He may be contacted at Route 1, Box 212, Alamogordo, New Mexico, 88310, telephone (505) 434-2447.

CONTRACT TERMINATION

This grazing contract may be terminated should the purchaser breach any of the terms or conditions stated herein.

This grazing contract may be terminated after thirty (30) days written notice by the BLM, should Ft. Bliss be assigned new, additional, or different missions which, in the opinion of the Commanding General, Ft. Bliss, cannot be accomplished while such grazing contract is in effect.

Any purchaser who is convicted of violating on the McGregor Range any Federal Endangered Species Rules and Regulations may be subject to prosecution and cancellation of their contract. Endangered species on McGregor Range include but are not limited to eagles.

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MEMORANDUM OF UNDERSTANDING

Between

THE DEPARTMENT OF THE INTERIOR

and

THE DEPARTMENT OF THE ARMY

To Provide For

CO-USE GRAZING ON THE MCGREGOR RANGE IN NEW MEXICO

WHEREAS Public Land Order No. 1470 of August 21, 1957 withdrew public lands in McGregor Range for use by the Department of the Army as a missile testing range and whereas Section 4(e) of said Public Land Order provided that grazing use of the lands, if determined by the Controlling Officer in charge to be compatible with their use for military purposes, shall be administered by the Department of the Interior, Bureau of Land Management, hereinafter referred to as BLM, under the provisions of the Taylor Grazing Act of June 28, 1934 (48 Stat. 1269, 43 U.S.C. 315, et. seq.), as amended.

Whereas there are intermingled with the withdrawn public domain lands tracts of lands acquired by the Department of the Army aggregating approximately 22,000 acres which are subject to the provisions of law and policy governing the Secretary of the Army leasing within military reservations, and

WHEREAS the Secretary of the Army has determined that grazing use can be allowed on McGregor Range, provided such grazing use is authorized subject to certain provisions as set forth in this Memorandum of Understanding and

Final 13

whereas the Department of the Interior, BLM, has indicated its willingness to assume responsibility for administration of such grazing use subject to such provisions.

WHEREAS the law and policy which governs the administration for grazing purposes of lands acquired within military areas contemplates that such lands will be offered for use by competitive bid leasing at not less than fair value in reasonably economical tracts or areas and for periods and under conditions which will assure the ready availability of such lands for required military purposes.

It is agreed that the grazing program to be administered hereunder by the Bureau of Land Management will be consistent insofar as practicable with the Army leasing laws and policies. To this end the grazing procedure to be prescribed by the BLM will be submitted to the Chief of Engineers, Department of the Army, for prior concurrence and major changes therein found necessary in the public interest, including special rules of the Department of the Interior will be likewise coordinated.

Therefore, it is mutually agreed that:

SECTION A. The Department of the Army agrees to the following:

(1) Subject to special stipulations expressed herein, the BLM will license grazing use on lands withdrawn by Public Land Order 1470, excluding lands in the Lincoln National Forest and lands in the southern part of McClellan Range generally referred to as the former Maple, Hagar, Davis, Simmons and Gray allotments, but including the aforesaid Army acquired lands.

(1) The Department of the Army will continue fire control responsibilities in accordance with Section 4(f) of Public Law 100-107.

(2) All grazing fees collected by the BLM will be subject to BLM accountability. A division of grazing funds receipts from the BLM administration of the McGregor lands will be made on the basis of the proportion which the "acquired" Army lands in the Range bear to the "withdrawn public domain lands" in the area. This agreement presently includes approximately 52,000 acres of "acquired land" out of the total of 915,000 acres covered by the agreement. The portion of such funds represented by Army acquired lands will be transferred by the BLM to the U. S. Army District Engineer, Albuquerque, in accordance with established fiscal procedures on an annual basis. *John*

(3) The Department of the Army will allow 60 days following written notice or agreement for the removal of any range improvement placed on the lands by any grazing licensee pursuant to a range improvement permit issued by the BLM for such range improvement.

(4) The Department of the Army acting through the United States Army Air Defense Center, hereinafter referred to as the Center, in cooperation with the BLM, will retain and exercise complete control over distribution and use of water which flows through pipelines from the Sacramento River and Carrizo Springs. *John*

(5) The Center will upon request furnish firing schedules in order that grazing licensees authorized to use lands in McGregor Range for grazing can be timely advised when entry to the Range is allowed or denied.

(1) BLM agrees it is responsible for control and restriction relative to livestock trespass; however, that the Center will be responsible for the control of trespass committed by any person into the area.

SECTION E. The BLM agrees to the following conditions for licensing grazing use on lands in McGregor Range:

(1) Personnel of the Center, in pursuit of their official functions or other authorized purposes, will continue to have unlimited access to the land covered by this agreement. Said personnel may open gates, and, if necessary, lower fences in order to accomplish their assigned missions or duties. The Center will require said personnel to leave gates as found (open or closed) and to re-position any fences lowered. However, the Center assumes no responsibility should gates not be left as found or should fences not be re-positioned.

(2) Each grazing license which authorizes grazing use of lands in McGregor Range shall contain and be subject to the stipulations listed below in Section C.

(3) Grazing use of lands in McGregor Range will be limited to cattle and horses, and the numbers of these animals will also be so limited as to assure proper use of the land. No one will be authorized to graze sheep and/or goats on any land in McGregor Range.

(4) Range improvements will include but not be limited to:

(a) The construction and maintenance by the BLM of a livestock control fence on those parts of the McGregor Range boundary which enclose land covered by grazing licenses. Prior to the construction of livestock control fences, the BLM will submit the construction plans and specifications

to the Commanding General of the Center for his approval. Provision for placing fence along practical fence lines shall be worked out and agreed to in writing by the BLM and the Center.

(b) The construction and maintenance by the BLM of firebreaks on those parts of McGregor Range boundary which enclose land upon which grazing use will be authorized and at such other locations as may be determined to be necessary by the Center. Prior to the construction of firebreaks, the BLM will submit the construction plans and specifications to the Commanding General of the Center for his approval. Firebreaks will usually be constructed contiguous with perimeter fences.

(c) The maintenance and improvement by the BLM of the pipelines which bring water from the Sacramento River and Carrizo Springs to McGregor Range. The BLM will also construct, maintain and improve from such grazing revenues as can possibly be made available, tanks, tubs, wells, windmills, etc., necessary to provide water for range management. Prior to new construction or making any major improvement or change that affects water resources on McGregor Range, the BLM will submit the construction plans and specifications to the Commanding General of the Center for his approval. *water*

(5) The Center, in cooperation with the BLM, will retain and exercise complete control of distribution and use of water which flows through pipelines from the Sacramento River and Carrizo Springs. *water*

(6) Any range improvement constructed with Government funds will remain on the property.

(2) No grazing license issued under this agreement shall in any way affect the existing agreement between the Center and the Department of Fish and Game, State of New Mexico, concerning the control, conservation and maintenance of wildlife on McGregor Range. Each grazing licensee is bound by all terms and conditions of said agreement to the same extent that the Center is bound. BLM will establish grazing capacity limits annually to determine numbers of domestic livestock to be grazed on the range and will reserve adequate forage for wildlife, especially big game animals now on the range or subsequently to be released on the range. Therefore, Center will cooperate with the BLM for development and maintenance of wildlife habitat on the McGregor Range, including the determination of specific areas, if any, on which domestic livestock grazing will be excluded in favor of wildlife.

(3) The District Manager, BLM, will keep the Commanding General of the Center currently informed as to the name and address of each grazing licensee.

SECTION C. STIPULATIONS: The following stipulations will be attached to and made a part of each grazing license issued by the BLM to authorize grazing use of lands in McGregor Range under this co-use agreement between the Department of the Army and the Department of the Interior:

(1) Prior to entry upon McGregor Range for any reason, each licensee, his family, agents, or guests must obtain permission from the Commanding General, United States Army Air Defense Center, or his assigned agent. Such persons may remain on McGregor Range only during the hours and/or days during which permission to enter has been so granted. Permission to

enter McGregor Range will be granted when firing is not being conducted or scheduled; however, under no circumstances will the licensee, his family, agents, or guests be granted permission to enter or remain on McGregor Range during periods when firing is being conducted, or scheduled, even should they be willing to assume any and all risks inherent in such activities.

(2) Should security or safety considerations or the assignment of any particular mission require such action, the Center reserves the right to deny access to McGregor Range to licensee, his family, agents, or guests for extended periods of time. The Center may exercise this right without prior notice to licensee.

(3) Personnel of the Center, in pursuit of their official functions or other authorized purposes, will have unlimited access to the land covered by this license. Said personnel may open gates, and, if necessary, lower fences in order to accomplish their assigned mission or duty. The Center will require said personnel to leave gates as found (opened or closed) and to re-position fences lowered. However, the Center assumes no responsibility should gates not be left as found or should fences not be re-positioned.

(4) The Center is responsible for fire control as set forth in Section 4(f) of Public Land Order 1470, and will suppress fires after completion of the daily or other scheduled firing program. Grazing licensee waives any and all rights of action which might accrue due to damage to persons or property if said damages are directly or indirectly caused by fire resulting from military operations or other causes on McGregor Range.

(5) The United States will not be responsible for damage to any improvement or for any injury to persons or livestock caused directly or indirectly by impact or fallout of missiles, targets or components thereof.

(6) Licensee, his family, agents, or guests are prohibited from touching, tampering with, or disturbing any shell, shell casing, missile, target, or components thereof which may be found upon the lands covered by this license. Upon discovery of any of the items mentioned in the preceding sentence, licensee will report said discovery to the Commanding General, United States Army Air Defense Center, or his designated agent.

(7) This grazing license may be terminated after thirty (30) days written notice should the United States Army Air Defense Center be assigned new, additional, or different missions which, in the opinion of the Commanding General, United States Army Air Defense Center, cannot be accomplished while such grazing license is in effect.

(8) This grazing license may be summarily terminated should the licensee breach any of the terms or conditions stated herein.

(9) This grazing license is subject to all New Mexico State Game laws and regulations.

(10) Complete control of distribution and use of water which flows through pipelines from the Sacramento River and Carrizo Springs is retained and exercised by the United States Army Air Defense Center, in cooperation with the Bureau of Land Management.

(11) Grazing licensee may construct temporary range improvements necessary for the proper care and management of livestock for which this

License is issued, after approval of the United States Army Air Defense Center and subsequent to the issuance of an improvement permit by the Bureau of Land Management. Such temporary range improvements must be removed by licensee within 60 days after his grazing license has expired and may not be renewed or within 60 days of the written notice that the license has been cancelled for other cause.

(12) This grazing license will in no way prevent the United States Army Air Defense Center from establishing launching sites, erecting fire towers, radar sites, and other similar construction and fencing of same, when required by military necessity.

(13) This grazing license will in no way affect the existing right of the Secretary of the Army to grant permits for the examination of ruins, the excavation of archaeological sites, and the gathering of objects of antiquity upon land subject to this license. The licensee, his family, agents, or guests will refrain from the excavation of archaeological sites and gathering of objects of antiquity upon lands subject to this license. Discovery of any such sites or items will be reported to Commanding General, U. S. Army Air Defense Center, or his designated agent.

SECTION 1. GENERAL. This Memorandum of Understanding shall remain in full force and effect until terminated by mutual agreement between the parties hereto, or upon ninety-day written notice served by either party on the other.

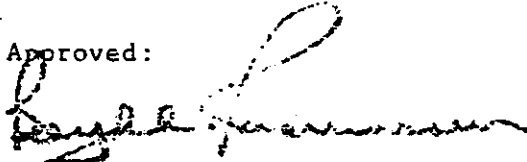
If terminated by mutual agreement, the then current and existing grazing licenses will be allowed to extend to expiration of existing billing period shown on such existing grazing licenses.

This Memorandum of Understanding is subject to immediate termination if, in the opinion of the Commanding General of the Center, military operations make such termination imperative.

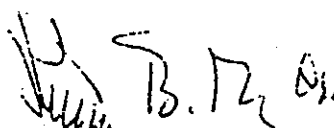
If amendments are needed to this agreement, a meeting may be called by either party, preferably 60 days or more prior to expiration date of grazing licenses in effect, so that necessary changes can be incorporated in any new offers for grazing licenses.

In witness whereof I have hereunto set my hand by direction of the Assistant Secretary of the Army (I&L) this 18 day of March, 1966.

Approved:



Director
Bureau of Land Management


Sherry B. Myers
Staff Asst (Real Property)
Mil Const and Real
Property, OASA(I&L)

SEP 9 1966

W. H. ...

PROPOSED AGREED UPON CHANGES TO THE
 JUNE 7, 1974 MEMORANDUM OF UNDERSTANDING
 BETWEEN THE DEPARTMENT OF THE INTERIOR AND THE
 DEPARTMENT OF THE ARMY TO PROVIDE FOR CO-USE GRAZING
 ON THE MCGREGOR RANGE IN NEW MEXICO

Section A

(2) The DOA will have fire control responsibility on McGregor Range. DOA will take reasonable fire suppression measures immediately upon discovery of fires on Otero Mesa or contiguous areas, where such fire threatens Otero Mesa and related grazing units. BLM will be notified immediately upon detection of fire on/or threatening Otero Mesa as well as other designated grazing units.

(3) All grazing contract fees collected by BLM will be subject to BLM accountability.

The portion of such funds being a ratio of Army acquired lands to total grazing lands will be maintained by the BLM to support projects on that portion of McGregor Range covered by this Memorandum of Understanding. These funds will be maintained in a 1920 reimbursable funds account by the BLM and used to support the programs as approved by the Commanding Officer for which the BLM has responsibility on McGregor Range. These programs are livestock forage, wildlife habitat and maintenance of range improvements but do not include maintenance or project work outside the grazing program on McGregor Range. Projects developed with the contributed funds normally will be limited to fence repair, firebreak maintenance, road maintenance relating to grazing use, perimeter signs, wildlife habitat and water developments. These projects will be performed in-house or contracted by BLM for Fort Bliss at the discretion of BLM. A maximum of 20% of Army contributed funds can be used for BLM overhead and administration costs. It is understood that this agreement is subject to the availability of BLM funds and manpower to perform the duties set forth herein.

(4) The Bureau of Land Management will at their discretion ascertain whether improvements constructed by grazing contractors under range improvement permits should be removed or left for future management needs on livestock grazing units. The Bureau of Land Management will have approving authority for all projects constructed by grazing contractors on grazing units within McGregor Range. The DOA will have approving authority for all projects outside grazing units on McGregor Range, and shall have authority to have BLM remove such range improvements anywhere on McGregor Range where mission requirements dictate and alternatives to removal are not feasible.

(8) The BLM recognizes and will comply with all cultural resource statutes and regulations for all BLM initiated or participating projects, wherever situated. The DOA recognizes and will comply with all cultural resource statutes and regulations for all DOA initiated or participating projects, wherever situated. Additionally, the BLM will have primary cultural resource management responsibility over Otero Mesa and other grazing areas as shown on Exhibit ____, attached. The DOA will retain primary cultural resource management responsibility over all other withdrawn lands, with the exception of National Forest lands which shall be managed by the Forest Service.

(9) Any new grazing units developed within the co-use area will be coordinated with, and subject to, the approval of the commanding General of the Center.

(10) The Department of the Army shall prohibit vehicular traffic off existing roads on Otero Mesa, and grazing units except in case of emergencies. No field training exercises utilizing vehicular traffic will be conducted on grazing units.

Section B

(4) Range improvements will include but not be limited to:

- (b) Maintenance of exterior fire breaks for McGregor Range grazing units will be the joint responsibility of the center and BLM. Maintenance of fire breaks will be coordinated between the center and BLM during February of each year. Interior fire breaks for McGregor Range Grazing units will be maintained by the Bureau of Land Management. Coordination will be initiated by BLM.

Section C. Stipulations

(4) DOA will have fire control responsibility on McGregor Range. DOA will take reasonable fire suppression measures immediately upon discovery of fires on Otero Mesa or contiguous areas, where such fire threatens Otero Mesa and related grazing units. Grazing contractors waive any and all rights of action which might accrue due to damage to persons or property if said damages are directly or indirectly caused by fire resulting from military operations or other causes on McGregor Range.

(7) Delete in total.

(11) Any range improvements constructed by grazing contractors will require approval by the Bureau of Land Management in the form of a range improvement permit. Prior to termination of the grazing contract the Bureau of Land Management will at their discretion ascertain whether improvements constructed should be removed or left for future management needs on grazing units.

(12) This grazing license will in no way prevent the United States Army Air Defense Center from establishing launching sites, erecting fire

towers, radar sites, and other similar construction and fencing of same, when required by military necessity. Any such necessity will be coordinated with BLM.

William A. Anderson

Colonel William A. Anderson
Director of Facilities Engineering
Fort Bliss

22 July 76
(Date)

Arthur W. Zimmerman

Mr. Arthur Zimmerman
New Mexico State Director
Bureau of Land Management

22 July 76
(Date)

NM 50-36
OUT 32
(Handwritten)

COOPERATIVE PLAN-AGREEMENT FOR CONSERVATION
AND DEVELOPMENT OF FISH AND WILDLIFE RESOURCES
ON THE MCGREGOR RANGE (FORT BLISS)

Preamble. In accordance with the authority contained in Title 10, United States Code, Section 2671; approved February 23, 1953, and in Public Law 86-797, approved September 15, 1960, the Department of Defense, the Department of Interior, and the State of New Mexico, through their duly designated representatives whose signatures appear below, approve the following Cooperative Plan-Agreement for the protection, development and management of fish and wildlife resources on that portion of the McGregor Range (Fort Bliss) in the State of New Mexico.

This Cooperative Plan-Agreement does not include land in McGregor Range (Fort Bliss) covered under a Memorandum of Understanding dated November 11, 1971, between The United States Department of Agriculture, Forest Service and Department of The Army, Corps of Engineers.

B. Definitions. Hereafter in the agreement the following will apply:

1. The Commanding General, United States Army Air Defense Center, Fort Bliss, Texas, representing the Department of Defense and the military authority for portions of the Fort Bliss military reservation in the State of New Mexico, will be referred to as the "Center."

2. The Bureau of Sport Fisheries and Wildlife, acting for the Department of Interior, will be referred to as the "Bureau."

3. The Department of Game and Fish of the State of New Mexico, represented by the Director of said Department, will be referred to as the "Department."

4. The Bureau of Land Management acting for the Secretary of the Interior under Paragraphs C. 2. d. and C. 8. below will be referred to as "BLM."

C. Provisions. Whereas the United States Government has acquired possession of water rights on certain lands located in the State of New Mexico, delineated in a map heretofore furnished the parties to this agreement and hereinafter referred to as McGregor Range (Fort Bliss).

Whereas the Center, the Bureau, BLM, and the Department have a mutual desire and interest that the wildlife populations of the said McGregor Range (Fort Bliss) in the State of New Mexico be properly managed; and

Whereas it is necessary that the Center, the Bureau, BLM, and the Department agree upon certain matters to the end that this area may best be managed from the standpoint of wildlife management consistent with the military mission and the responsibilities of the BLM on those lands in McGregor Range (Fort Bliss) (PLD 1470) contained in the Memorandum of Understanding between the Department of Interior and the Department of the Army, dated 18 March 1966, now, for and in consideration of the mutual promises of one party to the other, it is agreed:

2. That an annual wildlife program for management, development and/or research be developed.

a. That an annual survey be made to determine range condition and trend and wildlife abundance between March 1 and May 1. The Department will, each spring, initiate this survey and establish dates satisfactory to those parties wishing to attend.

b. An annual meeting of all parties to the agreement shall be held subsequent to the survey each year for the purpose of developing the annual program of research and future development and management of wildlife resources. The BLM will be responsible for calling said meeting.

c. All appropriate parties to this agreement will be advised of proposals, plans, and expenditures involving any of the above matters by any single party to this agreement.

d. Nothing herein will operate to interfere with the responsibilities of BLM on those lands in McGregor Range (Fort Bliss) (PLO 1470) under the Memorandum of Understanding between the Department of the Interior and the Department of the Army, dated 18 March 1966. With respect to those lands, BLM will exercise the authority of the Secretary of the Interior under P. L. 86-797 with liaison between BLM and the Bureau.

3. That hereafter during the term of this agreement the Center will furnish the Department at the specified time below a statement of dates during which it appears that portions of McGregor Range (Fort Bliss) can be opened for the following activity.

Statement by	Activity	Normal Season Occurs:
May 1	Antelope	October
May 1	Deer	November
May 1	Game Birds	Oct. - Jan.
May 1	Non-game Animals Management Program	Year round

4. The Center and the Department may open portions of McGregor Range (Fort Bliss) through mutual agreement to regulated hunting to military and public license holders provided that the open dates are authorized for federally regulated species. In the event the Center should cancel through necessity a hunting and fishing period, a new period, if possible, will be scheduled by mutual agreement.

5. The Department will determine annual regulations pertaining to taking of all wildlife species consistent with Federal regulations for migratory species.

6. It is mutually to the benefit of the Center and the Department to harvest annually the surplus wildlife crop; therefore, the following conditions shall herein become a condition for the hunts held on that portion of McGregor Range (Fort Bliss) lying within the State of New Mexico.

b. Check stations will be jointly maintained by the Center and Department if a check station shall be deemed necessary for these parties. When a check station is designated, each person entering or leaving the hunting area for any purpose must check in and out in person at the location so designated. The Center and the Department representatives at the check station shall have authority and shall assign hunters to specified hunting areas and areas where camping may be allowed. Hunters shall hunt only on the area designated by the permit and shall not in any case trespass upon or enter into prohibited areas designated by the Center. Maps showing such prohibited areas shall be posted for the information of all concerned at each check station.

c. For the purpose of license purchase while hunting that portion of McGregor Range (Fort Bliss) lying in the State of New Mexico any military personnel officially assigned to Fort Bliss shall be recognized as a resident and subject to purchase of a resident hunting and/or fishing license.

d. No portion of McGregor Range (Fort Bliss) will be kept open for hunting or fishing at a time when it will interfere with the military mission. During the time that the portions of McGregor Range are open for hunting or fishing such portions and places which are not open for hunting or fishing for military or security reasons shall be posted or restricted by the Center. Further, nothing herein shall be construed as giving representatives of the Department or Bureau, or BLM the right to be on the portions of McGregor Range at any time or place which shall interfere with the military missions thereof nor as granting them authority to be in the prohibited areas.

7. No property of the United States shall be subject to forfeit by laws of the State of New Mexico.

8. Any questions concerning cooperation in wildlife management shall be resolved by conference between the representatives of the Center and the Department and by BLM representatives on those lands in McGregor Range contained in the Memorandum of Understanding between the Department of Interior and the Department of the Army, dated 18 March 1966, and by Bureau representatives on military lands under Fort Bliss jurisdiction in the State of New Mexico exclusive of the lands specified in PLO 1470 and referenced Memorandum of Understanding, when responsibilities of the Department of Interior are involved.

9. No rodent or predator control programs will be initiated on these lands where BLM has responsibilities without the concurrence of the Las Cruces BLM District Office, the Bureau, the Center and the Department.

10. This cooperative plan will be in full force upon its adoption until such time that any one member of the cooperative group shall render it terminated by so stating to the other members in writing thirty (30) days in advance of the date of desired termination. This plan is subject to amendment or revision which shall be accomplished by written proposal to the parties for their mutual agreement. Request for amendment, change or termination may originate with any one party.

William D. Galtrey
WASPTON J. GALTREY, COY, CS, 010
U. S. Army Air Defense Center - Fort Bliss
Fort Bliss, Texas 79916
Representing the Department of Defense

17 NOV 1972

Date

W.D. Wilson
Regional Director
Bureau of Sport Fisheries and Wildlife
Fish and Wildlife Service
Department of the Interior

10/25/72

Date

H.J. Brudersman
State Director
Bureau of Land Management
Department of the Interior

October 11, 1972

Date

9-21-72
Director
Department of Game and Fish
State of New Mexico

Arvid A. Gordon
Date

Approved as to form and legal sufficiency this 19th day of September, 1972.

OFFICE OF THE ATTORNEY GENERAL
STATE OF NEW MEXICO

By: James H. Russell, Jr.
James H. Russell, Jr.
Assistant Attorney General

COOPERATIVE PLAN-AGREEMENT FOR CONSERVATION
AND DEVELOPMENT OF FISH AND WILDLIFE RESOURCES
ON THE MCGREGOR RANGE (FORT BLISS)

OCT 74

78. Preamble: In accordance with the authority contained in Title 10, United States Code, Section 2671, approved February 28, 1958, and in Public Law 86-797, approved September 15, 1960, the Department of Defense, the Department of Interior, and the State of New Mexico, through their duly designated representatives whose signatures appear below, approve the following Cooperative Plan-Agreement for the protection, development, and management of fish and wildlife resources on that portion of the McGregor Range (Fort Bliss) in the State of New Mexico.

This Cooperative Plan-Agreement does not include land in McGregor Range (Fort Bliss) covered under a Memorandum of Understanding dated November 11, 1971, between The United States Department of Agriculture, Forest Service and Department of The Army, Corps of Engineers.

B. Definitions. Hereafter in the agreement the following will apply:

1. The Commanding General, United States Army Air Defense Center, Fort Bliss, Texas, representing the Department of Defense and the military authority for portions of the Fort Bliss military reservation in the State of New Mexico, will be referred to as the "Center."

➤ 2. The Bureau of Sport Fisheries and Wildlife, acting for the Department of Interior, will be referred to as the "Bureau."

3. The Department of Game and Fish of the State of New Mexico, represented by the Director of said Department, will be referred to as the "Department."

4. The Bureau of Land Management acting for the Secretary of the Interior under Paragraphs C. 2. d. and C. 8. below will be referred to as "BLM."

C. Provisions. Whereas the United States Government has acquired possession of water rights on certain lands located in the State of New Mexico, delineated in a map heretofore furnished the parties to this agreement and hereinafter referred to as McGregor Range (Fort Bliss).

Whereas the Center, the Bureau, BLM, and the Department have a mutual desire and interest that the wildlife populations of the said McGregor Range (Fort Bliss) in the State of New Mexico be properly managed; and

Whereas it is necessary that the Center, the Bureau, BLM, and the Department agree upon certain matters to the end that this area may best be managed from the standpoint of wildlife management consistent with the military mission and the responsibilities of the BLM on those lands in McGregor Range (Fort Bliss) (PLO 1470) contained in the Memorandum of Understanding between the Department of Interior and the Department of the Army, dated 18 March 1956, now, for and in consideration of the mutual promises of one party to the other, it is agreed:

→ 1. The Bureau, BLM, and the Department will provide the Center with technical advice and assistance in matters pertaining to fish and wildlife management in their respective areas of responsibility as outlined herein.

2. That an annual wildlife program for management, development, and/or research be developed.

a. That an annual survey be made to determine range condition and trend and wildlife abundance between March 1 and May 1. The Department will, each spring, initiate this survey and establish dates satisfactory to those parties wishing to attend.

→ b. An annual meeting of all parties to the agreement shall be held subsequent to the survey each year for the purpose of developing the annual program of research and future development and management of wildlife resources. The BLM will be responsible for calling said meeting.

c. All appropriate parties to this agreement will be advised of proposals, plans, and expenditures involving any of the above matters by any single party to this agreement.

→ d. Nothing herein will operate to interfere with the responsibilities of BLM on those lands in McGregor Range (Fort Bliss) (PLO 1470) under the Memorandum of Understanding between the Department of the Interior and the Department of the Army, dated 18 March 1966. With respect to those lands, BLM will exercise the authority of the Secretary of the Interior under P. L. 86-797 with liaison between BLM and the Bureau.

3. That hereafter during the term of this agreement the Center will furnish the Department at the specified time below a statement of dates during which it appears that portions of McGregor Range (Fort Bliss) can be opened for the following activity.

Statement by	Activity	Normal Season Occurs:
May 1	Antelope	October
May 1	Deer	November
May 1	Game Birds	Oct. - Jan.
May 1	Non-game Animals Management Program	Year round

4. The Center and the Department may open portions of McGregor Range (Fort Bliss) through mutual agreement to regulated hunting to military and public license holders provided that the open dates are authorized for federally regulated species. In the event the Center should cancel through necessity a hunting and fishing period, a new period, if possible, will be scheduled by mutual agreement.

5. The Department will determine annual regulations pertaining to taking of all wildlife species consistent with Federal regulations for migratory species.

→ 6. It is mutually to the benefit of the Center and the Department to harvest annually the surplus wildlife crop; therefore, the following conditions shall herein become a condition for the hunts held on that portion of McGregor Range (Fort Bliss) lying within the State of New Mexico.

a. During the season both civilian and military personnel will adhere to military regulations, regulations of the State Game Commission, and Federal Game Laws.

b. Check stations will be jointly maintained by the Center and Department if a check station shall be deemed necessary for these parties. When a check station is designated, each person entering or leaving the hunting area for any purpose must check in and out in person at the location so designated. The Center and the Department representatives at the check station shall have authority and shall assign hunters to specified hunting areas and areas where camping may be allowed. Hunters shall hunt only on the area designated by the permit and shall not in any case trespass upon or enter into prohibited areas designated by the Center. Maps showing such prohibited areas shall be posted for the information of all concerned at each check station.

→ c. For the purpose of license purchase while hunting that portion of McGregor Range (Fort Bliss) lying in the State of New Mexico any military personnel residing on McGregor Range 90 days prior to purchasing a license shall be recognized as a resident and subject to purchase of a resident hunting and/or fishing license. *new*

Personnel not residing on the McGregor Range (Fort Bliss) 90 days prior to purchasing a license can purchase the military license good only on McGregor Range only, or a non-resident hunting or fishing license that would be valid state-wide. *spec*

d. No portion of McGregor Range (Fort Bliss) will be kept open for hunting or fishing at a time when it will interfere with the military mission. During the time that the portions of McGregor Range are open for hunting or fishing such portions and places which are not open for hunting or fishing for military or security reasons shall be designated by the Center. Further, nothing herein shall be construed as giving representatives of the Department or Bureau, or BLM the right to be on the portions of McGregor Range at any time or place which shall interfere with the military missions thereof nor as granting them authority to be in the prohibited areas.

7. No property of the United States shall be subject to forfeit by laws of the State of New Mexico.

→ 8. Any questions concerning cooperation in wildlife management shall be resolved by conference between the representatives of the Center and the Department and by BLM representatives on those lands in McGregor Range contained in the Memorandum of Understanding between the Department of Interior and the Department of the Army, dated 18 March 1965, and by Bureau representatives on military lands under Fort Bliss jurisdiction in the State of New Mexico exclusive of the lands specified in PLO 1470 and referenced Memorandum of Understanding, when responsibilities of the Department of Interior are involved.

➤9. No rodent or predator control programs will be initiated on those lands where BLM has responsibilities without the concurrence of the Las Alamos BLM District Office, the Bureau, the Center, and the Department.

➤10. This cooperative plan will be in full force upon its adoption until the time that any one member of the cooperative group shall render it terminated by so stating to the other members in writing thirty (30) days in advance of the date of desired termination. This plan is subject to amendment or revision which shall be accomplished by written proposal to the parties by their mutual agreement. Request for amendment, change, or termination shall originate with any one party.

John G. Gaddie
JOHN G. GADDIE CO., ES, D/O

8 OCT 1974
Date

5. Army Air Defense Center & Fort Bliss
El Paso, Texas 79916
representing the Department of Defense

William M. White

JUN 26 1974
Date

Regional Director
Bureau of Sport Fisheries & Wildlife
Wildlife Service
Department of the Interior

R. B. Huntington

5-30-74
Date

Deputy Director
Bureau of Land Management
Department of the Interior

W. A. Gordon

6/7/74
Date

Director
Department of Game and Fish
State of New Mexico

Approved as to form and legal sufficiency this 7th day of June, 1974.

OFFICE OF THE ATTORNEY GENERAL
STATE OF NEW MEXICO

By: James H. Russell
Special Assistant Attorney General

**MEMORANDUM OF UNDERSTANDING
BETWEEN
THE BUREAU OF LAND MANAGEMENT
AND THE
UNITED STATES AIR FORCE AIR COMBAT COMMAND**

It is the desire of the Bureau of Land Management and the United States Air Force Air Combat Command that this Memorandum serve as the basis for and beginning of a cooperative and coordinated effort to maintain and enhance the environment and resources in which they share a joint interest. In particular, this Memorandum focuses on the activities related to the Air Force's Proposed Expansion of German Air Force Operations at Holloman AFB, New Mexico on the United States Army's McGregor Range, New Mexico. This memorandum documents the commitment of both agencies to a continued and productive relationship with respect to activities on the range. Its purpose is to describe and provide greater focus and detail to those commitments generally described in the Environmental Impact Statement and subsequently discussed by agency representatives.

Both parties understand and agree that the terms of this agreement are contingent on a number of events. First, a Record of Decision in the Air Force Proposed Expansion of German Air Force Operations at Holloman AFB, New Mexico which selects the West Otero Training Option for implementation. Second, to the degree that any of the terms included herein are inconsistent with current ARMY/BLM MOU, US Fish and Wildlife Service Biological Opinions or any other current Agency to Agency or Government to Government agreements the terms of the current agreement shall prevail and be considered incorporated by reference into this agreement. Further it is understood that any agreement contained herein applies only to the United States Air Force and its proposed operations under the referenced EIS and that the Air Force is without authority to bind or speak for the United States Army or in any way limit Army operations on McGregor Range.

Additionally, both parties agree that in the event any of the terms of this agreement lead to or would result in, a violation of federal law those terms would be void and not binding on either agency.

1. **Public Access:** The Air Force and BLM are resolved to protect public access for multiple use activities. Air Combat Command agrees to the following:

a. Provide routine public access on weekends from 1:00 p.m. Friday through Sunday 9:00 p.m.

b. Provide access 24 hours before and after New Mexico Fish and Game scheduled big game hunts.

c. Provide BLM with a tentative 30-day schedule of operations and final two-week schedule to facilitate scheduling of BLM administrative access. (This might be included as part of the Fort Bliss Master Range Schedule.)

d. Discuss with the U.S Army at Fort Bliss and the BLM the possibility of coordinating a 1-800 number and/or a joint website that will post hours of public access and other range notes of public interest.

e. Comply with existing access permitting procedures in accordance with the existing Memorandum of Understanding (MOU) between the U.S Army at Fort Bliss and the BLM.

f. Once the impact area design is completed, the exact target location determined, and the accompanying weapons safety footprints, discuss the possibility of using existing roads for the safety buffer boundary, particularly along the eastern side.

2. Grazing Program Management: The Air Force and BLM will work together to ensure continuation of an effective grazing program. Air Combat Command agrees to the following:

a. Move the existing pipelines and stock tanks to outside of the impact area.

b. Relocate existing range improvements (fences, traps, etc.) from inside to outside the safety buffer where necessary.

c. Coordinate range closing for cleanup/cattle work. Restrict operations as necessary to meet BLM maintenance requirements.

d. Provide support in the form of forty man-hours per week to perform routine range management tasks.

e. Reimburse, replace, repair BLM range improvements damaged as a result of USAF activities on the range.

f. Agree to discuss the possibility of additional technology devices which may be added if needed, including such items as trough water-heaters, monitor cameras, pressure sensors, etc.

3. Wildlife: The BLM and the Air Force desire to continue to facilitate an effective wildlife management program. Air Combat Command agrees to:

a. Ensure water availability by moving existing infrastructure outside impact area.

b. Discuss expanding the charter of the multi-agency threatened and endangered species working group to include working cooperatively with other federal and state agencies with surveys and studies on big game and other natural resource issues.

c. Work cooperatively with other federal and state agencies with surveys and studies on the habitat/recovery of the Aplomado falcon.

4. Cultural Resources: The BLM and the Air Force are concerned about National Historic and Cultural Preservation. Air Combat Command will:

a. Continue good faith government to government consultations with the Mescalero Apache in face to face meetings with the goal of ascertaining impacts of the proposed action to Traditional Cultural Properties and Resources (to include view studies etc.).

b. Make inventory reports and mitigation plans available to the BLM so their comments may be considered in the course of consultations with the State Historic Preservation Office.

c. Discuss necessity of mitigations, if any, of potential historic landscape, if and when it is designated as such by the SHPO.

5. Areas of Critical Environmental Concern (ACEC): The Air Force and BLM desire to protect the resources within the ACECs. Air Combat Command will:

a. Allow for scheduled activities consistent with the Memorandum of Understanding (MOU) with New Mexico State University (NMSU).

b. In accordance with the Fort Bliss Integrated Natural Resources Management Plan monitor the impacts to the ACECs within the safety buffer.

6. Culp Canyon Wilderness Study Area (WSA): The Air Force and BLM are concerned about the natural aesthetic value of WSA. Air Combat Command will:

a. Design flight patterns to avoid overflights of the Culp Canyon WSA.

b. It is the Air Force intent to avoid low level (below 2000 feet AGL) overflight of Culp Canyon WSA. Exceptions would include events such as aircraft emergencies.

7. Fire: The Air Force and BLM are concerned with the impacts of fires caused by military flight operations. Air Combat Command will:

a. Cease military operations, on range, to allow for fire suppression.

b. Arrange for air-space use for fire suppression aircraft during a fire emergency.

c. Repair fire damage in accordance with the Integrated Natural Resource Management Plan (to include re-vegetation of indigenous plants).

Signed this 26th Day of May 1998,



MICHELLE J. CHAVEZ,
State Director,
Bureau of Land Management,
New Mexico



RONALD G. OHOLENDT, Colonel
Chief, Airfield, Airspace and Range
Management Division

Appendix **E**

APPENDIX E

TECHNICAL RESOURCES DOCUMENT

SOILS

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E.0 TECHNICAL RESOURCES DOCUMENT - SOILS

E.1 WIND EROSION CALCULATIONS AND ASSUMPTIONS

The equation used to calculate soil loss by wind erosion was the Wind Erosion Prediction Equation (Fuller, 1987). The equation is expressed as:

$$E=(CIVKL)$$

Where E, the predicted soil loss expressed in tons per acre per year, is a function of:

- C* = climate
- I* = soil erodibility
- V* = vegetative production
- K* = surface roughness
- L* = the unsheltered distance across a field.

Assumptions:

1. Current conditions at Fort Bliss reflect the soil and vegetative data found in the Natural Resource Conservation Service's (NRCS) Map Unit Interpretation Record (MUIR) databases for the three soil surveys covering the Fort Bliss area.
2. Moderate impact areas consist of 50 percent of the area being undisturbed and having vegetative cover similar to that in the MUIR database. Of the remaining area, 17 percent would have unsheltered distances of 1,000 feet, 17 percent would have unsheltered distances of 100 feet, and 16 percent would have unsheltered distances of 10 feet. These unsheltered distances would reflect disturbances created by staging/tank training areas, roads, and bomb craters, respectively. These disturbances would be denuded of vegetative production.
3. High impact areas would have soil data similar to that reported in the MUIR databases for the Fort Bliss area; however, these areas would have no vegetative production.
4. Small grain equivalents were calculated as described in Fuller (1987) for the production amounts in the MUIR database for range sites. Litter amounts were considered to be 20 percent of the total production for the site.

Tables E-1, E-2, and E-3 present the PHB association (Pintura-Tome-Doña Ana Complex) for current conditions, moderate impacts, and high impacts, respectively.

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Table E-1. Example of Calculations for Current Conditions for the PHB Association

<i>PHB Pintura-Tome-Doña Ana Complex, 0 to 5 Percent Slopes. 60,017.19 Acres</i>								
<i>Series</i>	<i>Percent of Area</i>	<i>C</i>	<i>I</i>	<i>V</i>	<i>K</i>	<i>L</i>	<i>E¹</i>	<i>E-weighted²</i>
Pintura	30	150	134	1,790.0	1	10,000	31.6	9.480
Tome	25	150	86	1,157.5	1	10,000	33.7	8.425
Doña Ana	20	150	86	1,417.5	1	10,000	19.5	3.900
Berino	8	150	86	1,790.0	1	10,000	11.6	0.928
Holloman	8	150	86	1,417.5	1	10,000	19.5	1.560
Wink	9	150	86	1,157.5	1	10,000	33.7	3.033
<i>Total (tons/acre/year)</i>								<i>27.326</i>

¹ E reflects total wind erosion for that soil series as if it occupied 100% of the soil association.

² E-weighted reflects the soil erosion estimate for the series based on the percent of total area occupied by the respective series.

Table E-2. Example of PHB Association with Moderate Impacts

<i>PHB Pintura-Tome-Doña Ana Complex, 0 to 5 Percent Slopes</i>										
<i>Series</i>	<i>Percent of Area</i>	<i>C</i>	<i>I</i>	<i>V</i>	<i>K</i>	<i>L</i>	<i>Percentage of Disturbance</i>	<i>E¹</i>	<i>Corrected E²</i>	<i>E-weighted³</i>
Pintura	30	150	134	1,790	1	10,000	50	31.6	15.800	4.74000
	30	150	134	0	1	1,000	17	192.4	32.708	9.81240
	30	150	134	0	1	100	17	133.6	22.712	6.81360
	30	150	134	0	1	10	16	60.2	9.632	2.88960
Tome	25	150	86	1,157.5	1	10,000	50	33.7	16.850	4.21250
	25	150	86	0	1	1,000	17	115.7	19.669	4.91725
	25	150	86	0	1	100	17	69.1	11.747	2.93675
	25	150	86	0	1	10	16	22.4	3.584	0.89600
Doña Ana	20	150	86	1,417.5	1	10,000	50	19.5	9.750	1.95000
	20	150	86	0	1	1,000	17	115.7	19.669	3.93380
	20	150	86	0	1	100	17	69.1	11.747	2.34940
	20	150	86	0	1	10	16	22.4	3.584	0.71680
Berino	8	150	86	1,790	1	10,000	50	11.6	5.800	0.46400
	8	150	86	0	1	1,000	17	115.7	9.669	1.57352
	8	150	86	0	1	100	17	69.1	11.747	0.93976
	8	150	86	0	1	10	16	22.4	3.584	0.28672
Holloman	8	150	86	1,417.5	1	10,000	50	19.5	9.750	0.78000
	8	150	86	0	1	1,000	17	115.7	19.669	1.57352
	8	150	86	0	1	100	17	69.1	11.747	0.93976
	8	150	86	0	1	10	16	22.4	3.584	0.28672
Wink	9	150	86	1,157.5	1	10,000	50	33.7	16.850	1.51650
	9	150	86	0	1	1,000	17	115.7	19.669	1.77021
	9	150	86	0	1	100	17	69.1	11.747	1.05723
	9	150	86	0	1	10	16	22.4	3.584	0.32256
<i>Total (tons/acre/year)</i>										<i>57.67860</i>

¹ E reflects total wind erosion for that soil series as if it occupied 100% of the soil association.

² Corrected E reflects total wind erosion estimate corrected for the percentage of area having disturbances resulting in varying lengths of field (L).

³ E-weighted reflects the soil erosion estimate for the series based on the percent of total area occupied by the respective series.

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Table E-3. Example of PHB Association with High Impacts

<i>PHB Pintura-Tome-Dona Ana Complex, 0 to 5 percent slopes</i>								
<i>Series</i>	<i>Percent of Area</i>	<i>C</i>	<i>I</i>	<i>V</i>	<i>K</i>	<i>L</i>	<i>E¹</i>	<i>E-weighted²</i>
Pintura	30	150	134	0	1	10,000	201	60.30
Tome	25	150	86	0	1	10,000	129	32.25
Doña Ana	20	150	86	0	1	10,000	129	25.80
Berino	8	150	86	0	1	10,000	129	10.32
Holloman	8	150	86	0	1	10,000	129	10.32
Wink	9	150	86	0	1	10,000	129	11.61
<i>Total (tons/acre/year)</i>								<i>150.60</i>

¹ E reflects total wind erosion for that soil series as if it occupied 100% of the soil association.

² E-weighted reflects the soil erosion estimate for the series based on the percent of total area occupied by the respective series.

E.2 WATER EROSION CALCULATIONS AND ASSUMPTIONS

The equation used to calculate soil loss by water erosion was the Revised Universal Loss Equation (RUSLE), version 1.04 (Soil and Water Conservation Society, 1995). The equation is expressed as:

$$A = RK(LS)CP$$

Where *A*, the predicted soil loss expressed in tons per acre per year, is the product of:

- R* = climatic erosivity (rainfall and runoff)
- K* = soil erodibility
- L* = slope length
- S* = slope gradient or steepness
- C* = soil cover and management
- P* = erosion-control practice.

Assumptions:

1. The *R* factor variable was estimated separately for the Doña Ana Range–North Training Areas, McGregor Range, and El Paso County, Texas, based on *R* factor isopleth maps from the NRCS and the Soil and Water Conservation Society (1995).
2. Data for the variables *K*, *S*, and *C* (specifically vegetative production in lbs./acre/year) were taken from the NRCS national MUIR database.
3. The average slope percentage for the soil association was used. The slope length variable (*L*) was assumed to be 50 feet for all soils, since this length is usually the maximum length for most rangeland sites.
4. The *P* variable was held at 1 for all soil loss predictions, since no erosion-control practices were anticipated.
5. Soil losses were calculated for the top soil horizon only.

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6. The three disturbance severity scenarios; no disturbance, moderate impact, and maximum impact, were calculated by changing values for vegetative cover, vegetative litter, and surface rock cover or pavement. These inputs were also used for calculation of the *C* variable.
7. These soils were assumed to produce grasslands, since the soil survey production data indicated that the most abundant species were grass species for a large percentage of the soils. The grass cover was assumed to be 35 percent for all soils, with a litter cover of 20 percent for the no disturbance scenario.
8. Percent rock cover varied across soils and was based on the percentage of the soil that was comprised of rocks greater than 0.25 inches.
9. The moderate impact scenario used 50 percent of the vegetative, litter, and rock cover of the no disturbance scenario.
10. The maximum impact scenario used 0 percent cover values for vegetation, litter, and rock.

Table E-4 presents the calculations for the Berino-Bucklebar Association under current conditions.

**Table E-4. Example of Calculations for the Berino-Bucklebar (BJ)
Association under Current Conditions**

<i>Map Unit</i>	<i>Component Name</i>	<i>R</i>	<i>K</i>	<i>LS</i>	<i>C</i>	<i>P</i>	<i>A</i>	<i>Component Percent</i>	<i>Extended A - (A*Component percent)</i>
BJ	Berino	40	0.17	0.33	0.0333	1	0.07	35	.024
BJ	Bucklebar	40	0.28	0.33	0.0319	1	0.12	25	.030
BJ	Doña Ana	40	0.24	0.33	0.0400	1	0.13	25	.032
BJ	Onite	40	0.17	0.33	0.0550	1	0.12	5	.006
BJ	Pajarito	40	0.24	0.28	0.0550	1	0.15	5	.008
BJ	Pintura	40	0.20	0.28	0.0560	1	0.13	5	.007
<i>Total soil loss (tons/acre/year)</i>									<i>0.110</i>

Appendix **F**

**APPENDIX F
BIOLOGY**

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F.0 BIOLOGY

This appendix provides more detailed information for some of the topics covered in Section 4.8, *Biological Resources*, of this PEIS. It provides a summary of some of the ecological studies conducted that describe existing biological resources on Fort Bliss. These studies are being conducted to support the INRMP currently being prepared by the Army and to fulfill NEPA compliance requirements of Fort Bliss (U.S. Army, 1998c). An adequate description of baseline biological resources on Fort Bliss is required to implement the ecosystem management strategy in the INRMP, and to adequately describe environmental impacts of ongoing and future activities on post (U.S. Army, 1998c). This PEIS provides an impact assessment of implementing the INRMP, as well as ongoing and some potential future activities on Fort Bliss. The information in this appendix is used in the impacts analysis for biological resources in Section 5.8.

The major focus of this appendix is to provide wildlife data (especially tabular data) that is too extensive to include in Section 4.8. The discussions of wildlife biological resources in Section 4.8 of the PEIS are summaries of the information presented in this appendix. The description of plant communities on Fort Bliss including vegetation maps appears in Section 4.8, and there is not an expanded discussion of these resources in this appendix. There is a discussion of riparian plant communities in this appendix that is summarized in Section 4.8. The analysis of sensitive species on Fort Bliss is in Section 4.8, and there are no expanded discussions of these species in this appendix.

F.1 VEGETATION

A description of plant communities on Fort Bliss, including the number of acres of each type, and vegetation maps appear in Section 4.8. The description of riparian areas below is summarized in Section 4.8.

F.1.1 Riparian Areas

Wetlands and arroyo-riparian drainages have been studied on Fort Bliss. The U.S. Army Corps of Engineers (USACE) Waterways Experiment Station is currently mapping and characterizing all Waters of the U.S., including wetlands on Fort Bliss (U.S. Army, 1998h). Wetlands delineation follows the USACE protocol in the *Army Corps of Engineers Wetlands Delineation Manual* (U.S. Army, 1987). To qualify as a USACE jurisdictional wetland, it must have hydric soil, be saturated to within 12 inches of the surface sometime during the growing season, and contain wetland plant species (U.S. Army, 1987). Waters of the U.S. include “water such as intrastate lakes, rivers, streams (including intermittent streams)” (33 CFR 328.3[a][3]). Probable Waters of the U.S. have been mapped on the South Training Areas, McGregor Range, and Doña Ana Range–North Training Areas (see Figure 4.8-4 in Section 4.8) and are being mapped on the remainder of Fort Bliss. These inventories of wetlands and Waters of the U.S. are provided for planning purposes and the boundaries of the wetlands and Waters of the U.S. have not been determined. The boundaries of wetlands and Waters of the U.S. will be delineated for site-specific projects and a final determination by the USACE district engineer is needed before a delineation is confirmed. Actively maintained man-made features such as stock tanks are not regulated by the USACE, because they are not considered jurisdictional wetlands. However, abandoned stock tanks and other man-made features may be regulated if they conduct and/or hold surface water (U.S. Army, 1998h).

Observations were made at 226 locations on McGregor Range and the South Training Areas, including dry washes, stock tanks, and other water resources. Data such as major plant species, and depth and width of channel, were recorded. A total of 49 sites were analyzed in greater detail, including the

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collection of data on plant species and percent cover, hydrology, soils, and surrounding upland vegetation. Based on this analysis, the Waters of the U.S. on McGregor Range and the South Training Areas included 1,228 dry washes with distinct stream beds and stream banks covering 1,874 miles. In addition, 11 natural dry lakes with distinct ordinary high water marks totaling 127 acres, and 79 artificial bodies of water such as sewage treatment ponds, storm water retention basins, and stock tanks totaling 802 acres were mapped (U.S. Army, 1998h). Data were collected from 117 observation points and 21 sample locations on Doña Ana Range–North Training Areas and based on this, 142 dry washes with distinct stream beds and stream banks comprising 645 miles were mapped. Seventeen dry lakes and ponds with distinct ordinary high water marks totaling 212 acres were also mapped. In addition, 26 artificial water resources including sewage treatment ponds, storm water retention basins, and stock tanks comprising 16 acres were mapped (U.S. Army, 1998h).

The vast majority of arroyo-riparian drainages on Fort Bliss do not qualify as USACE jurisdictional wetlands but, as indicted above, thousands of miles of these waterways are probable Waters of the U.S. Perennial riparian corridors of the western U.S. have been studied extensively and the density and diversity of flora and fauna in many of these areas have been determined. However, the flora and fauna of arroyo-riparian drainages on Fort Bliss and elsewhere have not been fully studied (Cockman, 1996; Kozma, 1995).

Cockman (1996) studied four arroyo-riparian drainages on McGregor Range in Culp Canyon; two were in the desert shrublands of the Sacramento Mountains foothills, at elevations ranging from 5,900 feet at the head waters to 5,480 feet at the tailwaters. The other two drainages were also in the desert shrublands in the submesa, at elevations ranging from 4,920 feet (headwaters) to 4,500 feet (tailwaters). The dominant shrubs in the foothill drainages were skeletonleaf goldeneye (*Viguiera stenoloba*), little leaf sumac (*Rhus microphylla*), largeleaf sumac (*R. trilobata*), and Apache plume (*Fallugia paradoxa*). Cutleaf bristlebush (*Brickella laciniata*), Mexican silktassel (*Garrya ovata*) and desert willow (*Chilopsis linearis*) were found only in the main channel (obligate species). The dominant shrubs in the submesa drainages were desert willow, Apache plume, four-winged saltbush (*Atriplex canescens*), little and big leaf sumac, and honey mesquite (*Prosopis glandulosa*). Creosotebush (*Larrea tridentata*), skeletonleaf goldeneye, and tarbush (*Flourensia cernua*) were also common. Desert willow and Apache plume were obligate in the main channel.

In the desert shrub plant communities at and near the Sacramento Mountains foothills, Cockman (1996) determined that the following vegetation parameters characterize ephemeral drainages on Fort Bliss:

- Shrub, tree, and forb cover are higher on the main channel than the surrounding area.
- Species richness of shrubs, trees, grasses, and forbs are higher in the main channel than all other locations.
- Heights of shrubs along the main channel are nearly twice that of shrubs in the uplands.
- Obligate species such as desert willow tended to be taller than nondrainage species.
- Obligate species at one elevation may occur outside of the drainage at another elevation. For example, Apache plume is obligate in the submesa drainages but occurs outside the drainages in the foothills. Species such as little and big sumac occur at many locations in the foothills and submesa drainages. Little sumac occurs most often in deep sandy soil in arroyo-riparian drainages in the Tularosa Basin on McGregor Range; it also occurs in sandy soil areas not associated with drainages.

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Army (1991a) studied the vegetation of the arroyo-riparian drainages and surrounding uplands in eight locations on the Doña Ana Range–North Training Areas. Preliminary results of the study agree with Cockman’s work in that there was greater species richness and plant height in the arroyos. Nineteen species of shrubs were obligates to arroyos and soapberry (*Sapindus saponaria*), little sumac, and desert willow were typically the tallest shrubs along the arroyos. The study also found that the percentage of bare ground tended to be less in arroyos than uplands. For example, the percent of bare ground in some arroyos was 12 percent versus 54 percent in the uplands.

Montane riparian plant communities cover 395 acres in the Organ Mountains and include forested and shrub-dominated types. Forested riparian areas are dominated by trees such as box elder (*Acer negundo*) and velvet ash (*Fraxinus velutina*) in riparian areas along Fillmore and Soledad canyons. A second forested riparian type is dominated by netleaf hackberry (*Celtis reticulata*) and river walnut (*Juglans microcarpa*), and occurs in Long Canyon. Netleaf hackberry is the dominant overstory tree, while river walnut along with New Mexico buckeye (*Ungnadia speciosa*) and Texas mulberry (*Morus microphylla*) dominate the understory. This type occurs among the large boulders in the canyon bottom (U.S. Army, 1994b).

Shrub-dominated montane riparian plant communities in the Organ Mountains include coyote willow (*Salix exigua*) dominated type along the perennial streams in Rucker Canyon. Deer grass (*Muhlenbergia rigens*) forms large tussocks along the stream in this type. The coyote willow/bulb panicgrass (*Panicum bulbosum*) type also occurs along the stream in Rucker Canyon, but at a higher elevation than the previous type. A third riparian shrub plant community is dominated by black cherry (*Prunus serotina*) and mountain leaftail (*Pericome caudata*), and occurs on rock-covered slopes in North Canyon. Arizona Grape (*Vitis arizonica*), netleaf hackberry, and New Mexico locust (*Robinia neomexicana*) are also common in this type (U.S. Army, 1994b).

F.2 WILDLIFE

F.2.1 Amphibians and Reptiles

A total of 8 species of amphibians and 39 species of reptiles have been observed on Fort Bliss; an additional 19 species of amphibians and reptiles have the potential to occur (U.S. Army, 1997h, k, 1996l) (Table F-1). Seven of the amphibian species are toads and the eighth species is the barred tiger salamander (*Ambystoma tigrinum mavortium*), which is found in stock tanks on the Otero Mesa and in the Tularosa Basin. Numerous Great Plains toads (*Bufo cognatus*), New Mexico spadefoot (*Spea multiplicata*), and Couch’s spadefoot (*Scaphiopus couchii*) were observed at stock tanks on Otero Mesa (U.S. Army, 1997k). A few red-spotted toads (*Bufo punctatus*) were also observed on Otero Mesa (U.S. Army, 1997k); this species has also been observed in the Organ Mountains and the desert shrub habitat of the Tularosa Basin (U.S. Army, 1997h, 1996l). Sampling at 20 sites in the Chihuahuan Desert in the Tularosa Basin on McGregor Range yielded 428 toad captures and the New Mexico spadefoot was the most common with 278 captures (65 percent of total), followed by Couch’s spadefoot with 103 captures (24 percent). All but one of the New Mexico spadefoot were from one sampling location, while the Couch’s spadefoot was much more widespread, being captured at all 20 sampling sites. The Great Plains toad and western green toad (*Bufo debilis*) were each captured 18 times (4 percent) and occurred at over one-half of the sample locations. The red-spotted toad and plains spadefoot (*Spea bombifrons*) were captured infrequently (5 and 2 times, respectively) (U.S. Army, 1996l).

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Table F-1. Amphibians and Reptiles that Occur and Could Occur on Fort Bliss, Otero and Doña Ana Counties, New Mexico; and El Paso County, Texas

<i>Species</i>		<i>Occurrence on Fort Bliss</i>	
<i>Common Name</i>	<i>Scientific Name</i>	<i>Known</i>	<i>Possible</i>
Barred tiger salamander	<i>Ambystoma tigrinum mavortium</i>	●	
Great plains toad	<i>Bufo cognatus</i>	●	
Western green toad	<i>Bufo debilis insidiator</i>	●	
Red spotted toad	<i>Bufo punctatus</i>	●	
Woodhouse's toad	<i>Bufo woodhousii</i>		●
Southern woodhouse's toad	<i>B. w. australis</i>		
Woodhouse's toad	<i>B. w. woodhousii</i>	●	
Canyon tree frog	<i>Hyla arenicolor</i>		●
Bullfrog	<i>Rana catesbeiana</i>		●
Couch's spadefoot	<i>Scaphiopus couchii</i>	●	
Plains spadefoot	<i>Spea bombifrons</i>	●	
New Mexico spadefoot	<i>Spea multiplicata</i>	●	
Western painted turtle	<i>Chrysemys picta bellii</i>		●
Yellow mud turtle	<i>Kinosternon flavescens flavescens</i>		●
Box turtle	<i>Tarapene ornata</i>		
Desert box turtle	<i>T. o. luteola</i>	●	
Ornate box turtle	<i>T. o. ornata</i>	●	
Chihuahuan spotted whiptail	<i>Cnemidophorus exanguis</i>	●	
Trans-Pecos striped whiptail	<i>Cnemidophorus inornatus heptagrammus</i>	●	
Western marbled whiptail	<i>Cnemidophorus marmoratus marmoratus</i>	●	
New Mexico whiptail	<i>Cnemidophorus neomexicanus</i>	●	
Colorado checkered whiptail	<i>Cnemidophorus tesselatus</i>	●	
Desert grassland whiptail	<i>Cnemidophorus uniparens</i>	●	
Texas banded gecko	<i>Coleonyx brevis</i>	●	
Greater earless lizard	<i>Cophosaurus texanus scitulus</i>	●	
Chihuahuan collared lizard	<i>Crotaphytus collaris fuscus</i>	●	
Great Plains skink	<i>Eumeces obsoletus</i>	●	
Longnose leopard lizard	<i>Gambelia wislizenii wislizenii</i>	●	
Mediterranean gecko	<i>Hemidactylus turcicus</i>	●	
Earless lizard	<i>Holbrookia maculata</i>		
Speckled earless lizard	<i>H. m. approximans</i>		●
Northern earless lizard	<i>H. m. maculata</i>	●	
Texas horned lizard	<i>Phrynosoma cornutum</i>	●	
Desert short-horned lizard	<i>Phrynosoma douglasii ornatissimum</i>	●	
Roundtail horned lizard	<i>Phrynosoma modestum</i>	●	
Twin-spotted spiny lizard	<i>Sceloporus magister bimaculosus</i>	●	
Crevice spiny lizard	<i>Sceloporus poinsettii poinsettii</i>		●
Southern prairie lizard	<i>Sceloporus undulatus consobrinus</i>	●	
Tree lizard	<i>Urosaurus ornatus</i>		
Lined tree lizard	<i>U. o. linearis</i>	●	
Big bend tree lizard	<i>U. o. schmidti</i>		●
Northern tree lizard	<i>U. o. wrighti</i>		●

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Table F-1. Amphibians and Reptiles that Occur and Could Occur on Fort Bliss; Otero and Doña Ana Counties, New Mexico; and El Paso County, Texas (Continued)

<i>Species</i>		<i>Occurrence on Fort Bliss</i>	
<i>Common Name</i>	<i>Scientific Name</i>	<i>Known</i>	<i>Possible</i>
Desert side-blotched lizard	<i>Uta stansburiana stejnegeri</i>	●	
Kansas glossy snake	<i>Arizona elegans elegans</i>	●	
Trans-Pecos rat snake	<i>Bogertophis subocularis</i>		●
Mexican racer	<i>Coluber constrictor oaxaca</i>		●
Western diamondback rattlesnake	<i>Crotalus atrox</i>	●	
Rock rattlesnake	<i>Crotalus lepidus</i>		
Banded rock rattlesnake	<i>C. l. klauberi</i>	●	
Mottled rock rattlesnake	<i>C. l. lepidus</i>		●
Blacktail rattlesnake	<i>Crotalus molossus molossus</i>		●
Mojave rattlesnake	<i>Crotalus scutulatus</i>	●	
Prairie rattlesnake	<i>Crotalus viridis viridis</i>	●	
Regal ringneck snake	<i>Diadophis punctatus regalis</i>	●	
Great Plains rat snake	<i>Elaphe gutatta emoryi</i>		●
Western hooknose snake	<i>Gyalopion canum</i>	●	
Hognose snake	<i>Heterodon nasicus</i>		
Mexican hognose snake	<i>H. n. kennerlyi</i>		●
Plains hognose snake	<i>H. n. nasicus</i>		●
Texas night snake	<i>Hypsiglena torquata jani</i>	●	
Gray-banded kingsnake	<i>Lampropeltis alterna</i>		●
Desert kingsnake	<i>Lampropeltis getula splendida</i>	●	
New Mexico milksnake	<i>Lampropeltis triangulum celaenops</i>		●
New Mexico blind snake	<i>Leptotyphlops dulcis dissectus</i>	●	
Trans-Pecos blind snake	<i>Leptotyphlops humilis segregus</i>		●
Western coachwhip	<i>Masticophis flagellum testaceus</i>	●	
Striped whipsnake	<i>Masticophis taeniatus</i>	●	
Gopher snake	<i>Pituophis catenifer</i>		
Sonoran gopher snake	<i>P. c. affinis</i>	●	
Bullsnake	<i>P. c. sayi</i>	●	
Texas longnose snake	<i>Rhinocheilus lecontei tessellatus</i>	●	
Big bend patchnose snake	<i>Salvadora deserticola</i>		●
Mountain patchnose snake	<i>Salvadora grahamiae grahamiae</i>	●	
Desert massasauga	<i>Sistrurus catenatus edwardsii</i>		●
Ground snake	<i>Sonora semiannulata</i>	●	
Southwestern blackhead snake	<i>Tantilla hobartsmithi</i>		●
Plains blackhead snake	<i>Tantilla nigriceps</i>	●	
Western blackneck garter snake	<i>Thamnophis cyrtopsis cyrtopsis</i>		●
Checkered garter snake	<i>Thamnophis marcianus marcianus</i>		●
New Mexico garter snake	<i>Thamnophis sirtalis dorsalis</i>		●
Texas lyre snake	<i>Trimorphodon biscutatus wilkinsonii</i>	●	
* <i>Total Species</i>		47	19

Source: U.S. Army 1996l, m 1997h, k. If a species occurs as a subspecies under the known category and a different subspecies under the possible category, it is only included in the total species under the known category.

* Totals represent total number of species, but do not include sub-species. If a species occurs as a subspecies under the known category and a different subspecies under the possible category, it only included in the total species under the known category.

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The box turtle (*Terrapene ornata*) is the only species of turtle observed on Fort Bliss and is most common in the grassland plant communities on Otero Mesa, although it has been regularly observed in the desert shrubland communities in the Tularosa Basin (U.S. Army, 1997h, k, 1996l, m). This species was recorded 11 times on Otero Mesa during baseline amphibian and reptile surveys in 1997 (U.S. Army, 1997k) (Table F-2). It was also recorded 11 times at 9 of 20 sample plots in the desert shrublands habitat in the Tularosa Basin (U.S. Army, 1996l).

Table F-2. Amphibians and Reptiles Observed at Six Sampling Sites, Along Arroyos, Roads, and at Stock Tanks on Otero Mesa in 1997

Species ^a	Sampling Site						Arroyo	Tanks	Roads	Total
	1	2	3	4	5	6				
New Mexico spadefoot	0	1	0	0	15	7	1	N ^b	0	N(24) ^c
Great Plains toad	0	0	0	0	0	0	0	N	0	N
Couch's spadefoot	0	0	0	0	0	0	0	N	1	N(1) ^c
Southern prairie lizard	15	1	4	41	0	22	6	0	0	89
Northern earless lizard	7	33	17	8	14	6	0	0	0	85
Striped whiptail	8	17	21	12	0	2	3	0	2	65
Short-horned lizard	0	10	3	0	2	1	2	0	2	20
Collared lizard	7	4	0	0	0	1	1	0	1	14
Western box turtle	0	0	0	0	1	0	0	2	8	11
Checkered whiptail	3	0	0	0	0	0	4	0	0	7
Western diamondback rattlesnake	1	0	0	0	0	0	4	0	2	7
Western coachwhip	0	0	0	0	0	0	2	0	3	5
Texas horned lizard	0	1	1	0	0	0	0	0	2	4
Sonoran gopher snake	0	1	0	0	0	0	0	0	2	3
Red-spotted toad	0	0	0	0	0	0	0	0	3	3
Round-tailed horned lizard	0	2	0	0	0	0	0	0	0	2
Hooknose snake	0	0	1	0	1	0	0	0	0	2
Greater earless lizard	0	0	0	0	0	0	0	0	2	2
Spotted whiptail	1	0	0	0	0	0	0	0	0	1
Kansas glossy snake	0	0	0	1	0	0	0	0	0	1
Side-blotched lizard	0	0	0	0	0	0	1	0	0	1
Prairie rattlesnake	0	0	0	0	0	0	0	0	1	1
Garter snake species	0	0	0	0	0	0	0	0	1	1
<i>Totals</i>										
<i>Number of species</i>	7	9	6	4	5	6	9	4	13	23
<i>Number of individuals</i>	42	70	47	62	33	39	24	2 ^d	30	349

^a See Table F-1 for scientific names.

^b "N" = numerous.

^c Number observed at locations other than tanks.

^d Numerous toads also observed.

Source: U.S. Army, 1997k.

The most diverse group of reptiles is the lizards; 20 species have been recorded from Fort Bliss, including 6 species of whiptails (Table F-1). The largest number of lizard species occurs in the grassland habitat

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(17 species), followed by the desert shrublands (13), Sacramento Mountains foothills (10), and Organ Mountains (6) (U.S. Army, 1997h). Some species such as the western marbled whiptail (*Cnemidophorus marmoratus*) and Texas horned lizard (*Phrynosoma cornutum*) are found in essentially all areas on Fort Bliss, while others such as the leopard lizard (*Gambelia wislizenii*) have been reported only from the desert shrubland habitat, and the lined tree lizard (*Urosaurus ornatus*) only in the wooded habitat of the foothills of the Sacramento and Organ mountains (U.S. Army, 1997h). Eleven species of lizards were recorded 290 times in grassland habitat on Otero Mesa; the most common species were the southern prairie lizard (*Sceloporus undulatus*), which was captured 89 times (31 percent of total lizard captures), and the northern earless lizard (*Holbrookia maculata*), which was captured 85 times (29 percent). The side-blotched lizard (*Uta stansburiana*) and spotted whiptail (*Cnemidophorus exanguis*) were each recorded only once (U.S. Army, 1997k) (Table F-2). The most common lizards captured in the desert shrubland habitat were the striped whiptail (5,500 captures), side-blotched lizard (3,163 captures), and marbled whiptail (845 captures) (U.S. Army, 1996l). Jorgensen and Demarais (U.S. Army, 1996m) studied amphibians and reptiles in eight arroyos and adjacent upland sites in the Chihuahuan Desert shrubland plant communities on McGregor Range, and found there was no statistical difference in the amphibian and reptile species richness and abundance between arroyo and upland habitats. The most common species captured were the side-blotched lizard (captured 249 times), the marbled whiptail (191 captures), and little striped whiptail (78 captures).

Eighteen species of snakes have been recorded from Fort Bliss (U.S. Army, 1996l, 1997h) (Table F-1). The largest number of species occur in the grassland habitat on Otero Mesa (13 species), followed by the desert shrubland and Sacramento Mountains foothills (11) and the Organ Mountains (6). Species such as the western diamondback rattlesnake (*Crotalus atrox*) and gopher snake (*Pituophis catenifer*) are common and widespread throughout Fort Bliss. Other species such as the Mojave (*C. scutulatus*) and prairie (*C. viridis*) rattlesnakes have been reported only from the grassland habitat on Otero Mesa, and the Texas long-nosed snake (*Rhinocheilus lecontei*) was observed only in the Sacramento Mountains foothills (U.S. Army, 1997h) and the desert shrubland habitat of the Tularosa Basin (U.S. Army 1996l). Surveys on Otero Mesa in 1997, yielded seven species of snakes (Table F-2). The western diamondback rattlesnake and western coachwhip (*Masticophis flagellum*) were the most common species observed. Other species observed include the hooknosed snake (*Gyalopion canum*), Kansas glossy snake (*Arizona elegans*), and prairie rattlesnake (U.S. Army, 1997k). In the desert shrubland habitat in the Tularosa Basin, the night snake (*Hypsiglena torquata*) (59 captures), plains black-headed snake (*Tantilla nigriceps*) (58 captures), and ground snake (*Sonora semiannulata*) (43 captures) were the most common species captured (U.S. Army, 1996l). Five species were recorded fewer times, including the western hooknosed snake (18 captures), long-nosed snake (8 captures), desert kingsnake (*Lampropeltis gelula*) (3 captures), and gopher snake and western coachwhip (1 capture each) (U.S. Army, 1996l).

F.2.2 Avifauna

A total of 334 species of birds have been recorded from Fort Bliss (Table F-3). Eighty species occur throughout the year, 129 species are seen only during migration, 42 species are spring and summer residents, and the remaining species occur principally during the winter. Thirty-two species are common, 89 fairly common, 72 uncommon, and 141 rare to very rare.

In recent years, detailed studies of the bird life in various habitats on Fort Bliss have been initiated and some of these studies are still in progress. These studies have centered on determining existing conditions, and have concentrated on documenting breeding bird communities in various habitats, the occurrence of neotropical migrants, and the status of sensitive species. This section emphasizes bird life in various habitats on McGregor Range and the Organ Mountains on Doña Ana Range–North Training Areas, because that is where most of the current research has been focused and where the majority of the

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**Table F-3. Birds Observed on Fort Bliss, Otero and Doña Ana Counties,
New Mexico; and El Paso County, Texas**

<i>Species</i>		<i>Relative Abundance^a</i>				
<i>Common Name</i>	<i>Scientific Name</i>	<i>A</i>	<i>C</i>	<i>FC</i>	<i>UC</i>	<i>R</i>
Common loon	<i>Gavia immer</i>					●
Pied-billed grebe	<i>Podilymbus podiceps</i>			●		
Horned grebe	<i>Podiceps auritus</i>					●
Eared grebe	<i>Podiceps nigricollis</i>			●		
Western grebe	<i>Aechmophorus occidentalis</i>				●	
Clark's grebe	<i>Aechmophorus clarkii</i>					●
American white pelican	<i>Pelecanus erythrorhynchus</i>					●
Double-crested cormorant	<i>Phalacrocorax auritus</i>				●	
Neotropic cormorant	<i>Phalacrocorax brasilianus</i>				●	
Least bittern	<i>Ixobrychus exilis</i>					●
Great blue heron	<i>Ardea herodias</i>			●		
Great egret	<i>Ardea alba</i>				●	
Snowy egret	<i>Egretta thula</i>				●	
Little blue heron	<i>Egretta caerulea</i>					●
Reddish egret	<i>Egretta rufescens</i>					●
Cattle egret	<i>Bubulcus ibis</i>				●	
Green heron	<i>Butorides virescens</i>				●	
Black-crowned night-heron	<i>Nycticorax nycticorax</i>				●	
Yellow-crowned night-heron	<i>Nyctanassa violacea</i>					●
Glossy ibis	<i>Plegadis falcinellus</i>					●
White-faced ibis	<i>Plegadis chihi</i>			●		
Turkey vulture	<i>Cathartes aura</i>		●			
Greater white-fronted goose	<i>Anser albifrons</i>					●
Snow goose	<i>Chen caerulescens</i>			●		
Ross's goose	<i>Chen rossii</i>					●
Canada goose	<i>Branta canadensis</i>					●
Wood duck	<i>Aix sponsa</i>				●	
Gadwall	<i>Anas strepera</i>			●		
Eurasian wigeon	<i>Anas penelope</i>					●
American wigeon	<i>Anas americana</i>			●		
Mallard	<i>Anas platyrhynchos</i>			●		
Blue-winged teal	<i>Anas discors</i>			●		
Cinnamon teal	<i>Anas cyanoptera</i>			●		
Northern shoveler	<i>Anas clypeata</i>		●			
Northern pintail	<i>Anas acuta</i>			●		
Green-winged teal	<i>Anas crecca</i>		●			
Canvasback	<i>Aythya valisineria</i>			●		
Redhead	<i>Aythya americana</i>			●		
Ring-necked duck	<i>Aythya collaris</i>			●		
Greater scaup	<i>Aythya marila</i>					●
Lesser scaup	<i>Aythya affinis</i>			●		
Surf scoter	<i>Melanitta perspicillata</i>					●
White-winged scoter	<i>Melanitta fusca</i>					●
Bufflehead	<i>Bucephala albeola</i>				●	
Common goldeneye	<i>Bucephala clangula</i>				●	
Hooded merganser	<i>Lophodytes cucullatus</i>					●
Common merganser	<i>Mergus merganser</i>				●	
Red-breasted merganser	<i>Mergus serrator</i>					●

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**Table F-3. Birds Observed on Fort Bliss, Otero and Doña Ana Counties,
New Mexico; and El Paso County, Texas (Continued)**

<i>Species</i>		<i>Relative Abundance^a</i>				
<i>Common Name</i>	<i>Scientific Name</i>	<i>A</i>	<i>C</i>	<i>FC</i>	<i>UC</i>	<i>R</i>
Masked duck	<i>Nomonyx dominicus</i>					●
Ruddy duck	<i>Oxyura jamaicensis</i>			●		
Osprey	<i>Pandion haliaetus</i>			●		
White-tailed kite	<i>Elanus leucurus</i>					●
Mississippi kite	<i>Ictinia mississippiensis</i>					●
Bald eagle	<i>Haliaeetus leucocephalus</i>				●	
Northern harrier	<i>Circus cyaneus</i>			●		
Sharp-shinned hawk	<i>Accipiter striatus</i>				●	
Cooper's hawk	<i>Accipiter cooperii</i>			●		
Northern goshawk	<i>Accipiter gentilis</i>					●
Gray hawk	<i>Asturina nitidus</i>					●
Common black-hawk	<i>Buteogallus anthracinus</i>					●
Harris's hawk	<i>Parabuteo unicinctus</i>					●
Swainson's hawk	<i>Buteo swainsoni</i>		●			
Red-tailed hawk	<i>Buteo jamaicensis</i>		●			
Rough-legged hawk	<i>Buteo lagopus</i>					●
Ferruginous hawk	<i>Buteo regalis</i>			●		
Zone-tailed hawk	<i>Buteo albonotatus</i>					●
Golden eagle	<i>Aquila chrysaetos</i>			●		
American kestrel	<i>Falco sparverius</i>		●			
Merlin	<i>Falco columbarius</i>					●
Prairie falcon	<i>Falco mexicanus</i>				●	
Peregrine falcon	<i>Falco peregrinus</i>					●
Wild turkey	<i>Meleagris gallopavo</i>				●	
Montezuma quail	<i>Cyrtonyx montezumae</i>				●	
Scaled quail	<i>Callipepla squamata</i>		●			
Gambel's quail	<i>Callipepla gambelii</i>		●			
Virginia rail	<i>Rallus limicola</i>					●
Sora	<i>Porzana carolina</i>					●
Common moorhen	<i>Gallinula chloropus</i>					●
American coot	<i>Fulica americana</i>			●		
Sandhill crane	<i>Grus canadensis</i>				●	
Black-bellied plover	<i>Pluvialis squatarola</i>					●
American golden-plover	<i>Pluvialis dominica</i>					●
Snowy plover	<i>Charadrius alexandrinus</i>				●	
Semipalmated plover	<i>Charadrius semipalmatus</i>				●	
Piping plover	<i>Charadrius melodus</i>					●
Killdeer	<i>Charadrius vociferus</i>		●			
Black-necked stilt	<i>Himantopus mexicanus</i>				●	
American avocet	<i>Recurvirostra americana</i>				●	
Greater yellowlegs	<i>Tringa melanoleuca</i>				●	
Lesser yellowlegs	<i>Tringa flavipes</i>				●	
Solitary sandpiper	<i>Tringa solitaria</i>				●	
Willet	<i>Catoptrophorus semipalmatus</i>				●	
Spotted sandpiper	<i>Actitis macularia</i>				●	
Upland sandpiper	<i>Bartramia longicauda</i>					●

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<i>Species</i>		<i>Relative Abundance^a</i>				
<i>Common Name</i>	<i>Scientific Name</i>	<i>A</i>	<i>C</i>	<i>FC</i>	<i>UC</i>	<i>R</i>
Whimbrel	<i>Numenius phaeopus</i>					●
Long-billed curlew	<i>Numenius americanus</i>					●
Marbled godwit	<i>Limosa fedoa</i>					●
Ruddy turnstone	<i>Arenaria interpres</i>					●
Red knot	<i>Calidris canutus</i>					●
Sanderling	<i>Calidris alba</i>					●
Semipalmated sandpiper	<i>Calidris pusilla</i>					●
Western sandpiper	<i>Calidris mauri</i>			●		
Least sandpiper	<i>Calidris minutilla</i>			●		
White-rumped sandpiper	<i>Calidris fuscicollis</i>					●
Baird's sandpiper	<i>Calidris bairdii</i>			●		
Pectoral sandpiper	<i>Calidris melanotos</i>				●	
Dunlin	<i>Calidris alpina</i>					●
Stilt sandpiper	<i>Calidris himantopus</i>				●	
Ruff	<i>Philomachus pugnax</i>					●
Short-billed dowitcher	<i>Limnodromus griseus</i>					●
Long-billed dowitcher	<i>Limnodromus scolopaceus</i>			●		
Common snipe	<i>Gallinago gallinago</i>			●		
Wilson's phalarope	<i>Phalaropus tricolor</i>			●		
Red-necked phalarope	<i>Phalaropus lobatus</i>			●		
Red phalarope	<i>Phalaropus fulicarius</i>					●
Laughing gull	<i>Larus atricilla</i>					●
Franklin's gull	<i>Larus pipixcan</i>					●
Bonaparte's gull	<i>Larus philadelphia</i>				●	
Ring-billed gull	<i>Larus delawarensis</i>				●	
California gull	<i>Larus californicus</i>					●
Herring gull	<i>Larus argentatus</i>					●
Western gull	<i>Larus occidentalis</i>					●
Sabine's gull	<i>Xema sabini</i>					●
Caspian tern	<i>Sterna caspia</i>					●
Common tern	<i>Sterna hirundo</i>					●
Forster's tern	<i>Sterna forsteri</i>				●	
Black tern	<i>Chlidonias niger</i>				●	
Rock dove	<i>Columba livia</i>		●			
Band-tailed pigeon	<i>Columba fasciata</i>					●
White-winged dove	<i>Zenaida asiatica</i>			●		
Mourning dove	<i>Zenaida macroura</i>		●			
Inca dove	<i>Columbina inca</i>					●
Yellow-billed cuckoo	<i>Coccyzus americanus</i>				●	
Greater roadrunner	<i>Geococcyx californicus</i>			●		
Groove-billed ani	<i>Crotophaga sulcirostris</i>					●
Barn owl	<i>Tyto alba</i>				●	
Western screech-owl	<i>Otus kennicotti</i>				●	
Great horned owl	<i>Bubo virginianus</i>			●		
Northern pygmy-owl	<i>Glaucidium gnoma</i>					●
Burrowing owl	<i>Athene cunicularia</i>			●		

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<i>Species</i>		<i>Relative Abundance^a</i>				
<i>Common Name</i>	<i>Scientific Name</i>	<i>A</i>	<i>C</i>	<i>FC</i>	<i>UC</i>	<i>R</i>
Spotted owl	<i>Strix occidentalis</i>					●
Long-eared owl	<i>Asio otus</i>				●	
Short-eared owl	<i>Asio flammeus</i>					●
Lesser nighthawk	<i>Chordeiles acutipennis</i>			●		
Common nighthawk	<i>Chordeiles minor</i>				●	
Common poorwill	<i>Phalaenoptila nuttallii</i>			●		
Whip-poor-will	<i>Caprimulgus vociferus</i>					●
Black swift	<i>Cypseloides niger</i>					●
White-throated swift	<i>Aeronautes saxatilis</i>			●		
Black-chinned hummingbird	<i>Archilochus alexandrinus</i>		●			
Costa's hummingbird	<i>Calypte costae</i>					●
Calliope hummingbird	<i>Stellula calliope</i>					●
Broad-tailed hummingbird	<i>Selasphorus platycercus</i>				●	
Rufous hummingbird	<i>Selasphorus rufus</i>				●	
Belted kingfisher	<i>Ceryle alcyon</i>					●
Lewis woodpecker	<i>Melanerpes lewis</i>					●
Acorn woodpecker	<i>Melanerpes formicivorus</i>					●
Yellow-bellied sapsucker	<i>Sphyrapicus varius</i>					●
Red-naped sapsucker	<i>Sphyrapicus nuchalis</i>				●	
Williamson's sapsucker	<i>Sphyrapicus thyroideus</i>					●
Ladder-backed woodpecker	<i>Picoides scalaris</i>			●		
Downy woodpecker	<i>Picoides pubescens</i>					●
Hairy woodpecker	<i>Picoides villosus</i>				●	
Northern flicker	<i>Colaptes auratus</i>				●	
Olive-sided flycatcher	<i>Contopus cooperi</i>					●
Western wood-pewee	<i>Contopus sordidulus</i>				●	
Willow flycatcher	<i>Empidonax traillii</i>					●
Least flycatcher	<i>Empidonax minimus</i>					●
Hammond's flycatcher	<i>Empidonax hammondii</i>					●
Dusky flycatcher	<i>Empidonax oberholseri</i>			●		
Gray flycatcher	<i>Empidonax wrightii</i>					●
Cordilleran flycatcher	<i>Empidonax occidentalis</i>				●	
Black phoebe	<i>Sayornis nigricans</i>			●		
Eastern phoebe	<i>Sayornis phoebe</i>					●
Say's phoebe	<i>Sayornis saya</i>			●		
Ash-throated flycatcher	<i>Myiarchus cinerascens</i>			●		
Cassin's kingbird	<i>Tyrannus vociferans</i>					●
Western kingbird	<i>Tyrannus verticalis</i>		●			
Eastern kingbird	<i>Tyrannus tyrannus</i>					●
Northern shrike	<i>Lanius excubitor</i>					●
Loggerhead shrike	<i>Lanius ludovicianus</i>		●			
Bell's vireo	<i>Vireo bellii</i>					●
Gray vireo	<i>Vireo vicinior</i>				●	
Hutton's vireo	<i>Vireo huttoni</i>					●
Warbling vireo	<i>Vireo gilvus</i>					●
Philadelphia vireo	<i>Vireo philadelphicus</i>					●

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<i>Species</i>		<i>Relative Abundance^a</i>				
<i>Common Name</i>	<i>Scientific Name</i>	<i>A</i>	<i>C</i>	<i>FC</i>	<i>UC</i>	<i>R</i>
Red-eyed vireo	<i>Vireo olivaceus</i>					●
Cassin's vireo	<i>Vireo cassinii</i>			●		
Plumbeous vireo	<i>Vireo plumbeus</i>					●
Steller's jay	<i>Cyanocitta stelleri</i>					●
Western scrub-jay	<i>Aphelocoma californica</i>				●	
Pinyon jay	<i>Gymnorhinus cyanocephalus</i>				●	
American crow	<i>Corvus brachyrhynchos</i>					●
Chihuahuan raven	<i>Corvus cryptoleucus</i>			●		
Common raven	<i>Corvus corax</i>				●	
Horned lark	<i>Eremophila alpestris</i>		●			
Purple martin	<i>Progne subis</i>					●
Tree swallow	<i>Tachycineta bicolor</i>					●
Violet-green swallow	<i>Tachycineta thalassina</i>				●	
Northern rough-winged swallow	<i>Stelgidopteryx serripennis</i>			●		
Bank swallow	<i>Riparia riparia</i>			●		
Barn swallow	<i>Hirundo rustica</i>		●			
Cliff swallow	<i>Petrochelidon pyrrhonota</i>			●		
Cave swallow	<i>Petrochelidon fulva</i>					●
Mountain chickadee	<i>Poecile gambeli</i>				●	
Juniper titmouse	<i>Baeolophus ridgwayi</i>				●	
Verdin	<i>Auriparus flaviceps</i>			●		
Bushtit	<i>Psaltiriparus minimus</i>				●	
Red-breasted nuthatch	<i>Sitta canadensis</i>			●		
White-breasted nuthatch	<i>Sitta carolinensis</i>			●		
Pygmy nuthatch	<i>Sitta pygmaea</i>					●
Brown creeper	<i>Certhia americana</i>					●
Cactus wren	<i>Campylorhynchus brunneicapillus</i>			●		
Rock wren	<i>Salpinctes obsoletus</i>		●			
Canyon wren	<i>Catherpes mexicanus</i>			●		
Bewick's wren	<i>Thryomanes bewickii</i>		●			
House wren	<i>Troglodytes aedon</i>				●	
Marsh wren	<i>Cistothorus palustris</i>					●
American dipper	<i>Cinclus mexicanus</i>					●
Golden-crowned kinglet	<i>Regulus satrapa</i>				●	
Ruby-crowned kinglet	<i>Regulus calendula</i>			●		
Black-tailed gnatcatcher	<i>Polioptila melanura</i>		●			
Blue-gray gnatcatcher	<i>Polioptila caerulea</i>			●		
Eastern bluebird	<i>Sialia sialis</i>					●
Western bluebird	<i>Sialia mexicana</i>			●		
Mountain bluebird	<i>Sialia currucoides</i>		●			
Townsend's solitaire	<i>Myadestes townsendi</i>			●		
Swainson's thrush	<i>Catharus ustulatus</i>					●
Hermit thrush	<i>Catharus guttatus</i>			●		
American robin	<i>Turdus migratorius</i>			●		
Northern mockingbird	<i>Mimus polyglottos</i>		●			
Sage thrasher	<i>Oreoscoptes montanus</i>				●	

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<i>Species</i>		<i>Relative Abundance^a</i>				
<i>Common Name</i>	<i>Scientific Name</i>	<i>A</i>	<i>C</i>	<i>FC</i>	<i>UC</i>	<i>R</i>
Brown thrasher	<i>Toxostoma rufum</i>					●
Curve-billed thrasher	<i>Toxostoma curvirostre</i>				●	
Crissal thrasher	<i>Toxostoma dorsalis</i>			●		
European starling	<i>Sturnus vulgaris</i>			●		
American pipit	<i>Anthus rubescens</i>			●		
Sprague's pipit	<i>Anthus spraguei</i>				●	
Cedar waxwing	<i>Bombycilla cedrorum</i>			●		
Phainopepla	<i>Phainopepla nitens</i>				●	
Golden-winged warbler	<i>Vermivora chrysoptera</i>					●
Tennessee warbler	<i>Vermivora peregrina</i>					●
Orange-crowned warbler	<i>Vermivora celata</i>			●		
Nashville warbler	<i>Vermivora ruficapilla</i>					●
Virginia's warbler	<i>Vermivora virginiae</i>				●	
Lucy's warbler	<i>Vermivora luciae</i>					●
Northern parula	<i>Parula americana</i>					●
Yellow warbler	<i>Dendroica petechia</i>				●	
Chestnut-sided warbler	<i>Dendroica pensylvanica</i>					●
Yellow-rumped warbler	<i>Dendroica coronata</i>			●		
Black-throated gray warbler	<i>Dendroica nigrescens</i>				●	
Townsend's warbler	<i>Dendroica townsendi</i>				●	
Hermit warbler	<i>Dendroica occidentalis</i>					●
Black-throated green warbler	<i>Dendroica virens</i>					●
Blackburnian warbler	<i>Dendroica fusca</i>					●
Grace's warbler	<i>Dendroica graciae</i>					●
Palm warbler	<i>Dendroica palmarum</i>					●
Red-faced warbler	<i>Cardellina rubrifrons</i>					●
Blackpoll warbler	<i>Dendroica striata</i>					●
Black-and-white warbler	<i>Mniotilta varia</i>					●
Painted redstart	<i>Myioborus pictus</i>					●
American redstart	<i>Setophaga ruticilla</i>					●
Prothonotary warbler	<i>Protonotaria citrea</i>					●
Northern waterthrush	<i>Seiurus noveboracensis</i>			●		
MacGillivray's warbler	<i>Oporornis tolmei</i>			●		
Common yellowthroat	<i>Geothlypis trichas</i>			●		
Hooded warbler	<i>Wilsonia citrina</i>					●
Wilson's warbler	<i>Wilsonia pusilla</i>		●			
Yellow-breasted chat	<i>Icteria virens</i>					●
Hepatic tanager	<i>Piranga flava</i>				●	
Summer tanager	<i>Piranga rubra</i>					●
Western tanager	<i>Piranga ludoviciana</i>				●	
Green-tailed towhee	<i>Pipilo chlorurus</i>			●		
Eastern towhee	<i>Pipilo erythrophthalmus</i>					●
Spotted towhee	<i>Pipilo maculatus</i>			●		
Canyon towhee	<i>Pipilo fuscus</i>		●			
Cassin's sparrow	<i>Aimophila cassinii</i>				●	
Rufous-crowned sparrow	<i>Aimophila ruficeps</i>		●			

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<i>Species</i>		<i>Relative Abundance^a</i>				
<i>Common Name</i>	<i>Scientific Name</i>	<i>A</i>	<i>C</i>	<i>FC</i>	<i>UC</i>	<i>R</i>
Chipping sparrow	<i>Spizella passerina</i>			●		
Clay-colored sparrow	<i>Spizella pallida</i>			●		
Brewer's sparrow	<i>Spizella breweri</i>			●		
Black-chinned sparrow	<i>Spizella atrogularis</i>				●	
Vesper sparrow	<i>Poocetes gramineus</i>			●		
Lark sparrow	<i>Chondestes grammacus</i>			●		
Black-throated sparrow	<i>Amphispiza bilineata</i>		●			
Sage sparrow	<i>Amphispiza belli</i>				●	
Lark bunting	<i>Calamospiza melanocorys</i>			●		
Savannah sparrow	<i>Passerculus sandwichensis</i>			●		
Baird's sparrow	<i>Ammodramus bairdii</i>				●	
Grasshopper sparrow	<i>Ammodramus savannarum</i>					●
Fox sparrow	<i>Passerella iliaca</i>					●
Song sparrow	<i>Melospiza melodia</i>			●		
Lincoln's sparrow	<i>Melospiza lincolni</i>			●		
Swamp sparrow	<i>Melospiza georgiana</i>				●	
White-throated sparrow	<i>Zonotrichia albicollis</i>					●
Harris's sparrow	<i>Zonotrichia querula</i>					●
White-crowned sparrow	<i>Zonotrichia leucophrys</i>		●			
Dark-eyed junco	<i>Junco hyemalis</i>		●			
McCown's longspur	<i>Calcarius mccownii</i>					●
Lapland longspur	<i>Calcarius lapponicus</i>					●
Chestnut-collared longspur	<i>Calcarius ornatus</i>		●			
Pyrrhuloxia	<i>Cardinalis sinuatus</i>			●		
Rose-breasted grosbeak	<i>Pheucticus ludovicianus</i>					●
Black-headed grosbeak	<i>Pheucticus melanocephalus</i>			●		
Blue grosbeak	<i>Guiraca caerulea</i>			●		
Lazuli bunting	<i>Passerina amoena</i>			●		
Indigo bunting	<i>Passerina cyanea</i>					●
Varied bunting	<i>Passerina versicolor</i>					●
Painted bunting	<i>Passerina ciris</i>					●
Dickcissel	<i>Spiza americana</i>				●	
Bobolink	<i>Dolichonyx oryzivorus</i>					●
Red-winged blackbird	<i>Agelaius phoeniceus</i>			●		
Eastern meadowlark	<i>Sturnella magna</i>		●			
Western meadowlark	<i>Sturnella neglecta</i>			●		
Yellow-headed blackbird	<i>Xanthocephalus xanthocephalus</i>			●		
Rusty blackbird	<i>Euphagus carolinus</i>					●
Brewer's blackbird	<i>Euphagus cyanocephalus</i>			●		
Great-tailed grackle	<i>Quiscalus mexicanus</i>			●		
Bronzed cowbird	<i>Molothus aeneus</i>					●
Brown-headed cowbird	<i>Molothrus ater</i>			●		
Hooded oriole	<i>Icterus cucullatus</i>					●
Baltimore oriole	<i>Icterus galbula</i>					●
Bullock's oriole	<i>Icterus bullockii</i>			●		
Scott's oriole	<i>Icterus parisorum</i>		●			

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Table F-3. Birds Observed on Fort Bliss, Otero and Doña Ana Counties, New Mexico; and El Paso County, Texas (Continued)

<i>Species</i>		<i>Relative Abundance^a</i>				
<i>Common Name</i>	<i>Scientific Name</i>	<i>A</i>	<i>C</i>	<i>FC</i>	<i>UC</i>	<i>R</i>
Purple finch	<i>Carpodacus purpureus</i>					●
House finch	<i>Carpodacus mexicanus</i>		●			
Cassin's finch	<i>Carpodacus cassinii</i>					●
Pine siskin	<i>Carduelis pinus</i>			●		
Red crossbill	<i>Loxia curvirostra</i>					●
Lawrence's goldfinch	<i>Carduelis lawrencei</i>					●
American goldfinch	<i>Carduelis tristis</i>					●
Lesser goldfinch	<i>Carduelis psaltria</i>				●	
House sparrow	<i>Passer domesticus</i>		●			
Evening grosbeak	<i>Coccothraustes vespertinus</i>					●
<i>Total</i>		0	32	89	72	141

^a A = abundant, C = common, FC = fairly common, UC = uncommon, R = rare.

The most abundant category is chosen for each species. For example, if a species is common in the summer but rare in the winter, it is given a "C" delineation on this table.

Source: U.S. Army, 1994b, 1996 o, u, 1997j.

more diverse bird habitat is located on Fort Bliss. The plant communities in the desert habitat on the South Training Areas and Doña Ana Range–North Training Areas are similar to the Chihuahuan Desert shrublands sampled for breeding birds on McGregor Range. Castner Range is dominated by habitats similar to those found in the Organ Mountains. Therefore, it is assumed that the breeding birds in the desert portions of the South Training Areas and Doña Ana Range–North Training Areas are similar to breeding birds recorded in shrubland habitat on McGregor Range, and the breeding birds on Castner Range are similar to those recorded in the Organ Mountains. Bird life in the built-up cantonment area is typical for such areas, and species such as the house sparrow (*Passer domesticus*), great-tailed grackle (*Quiscalus mexicanus*), and house finch (*Carpodacus mexicanus*) are common.

The El Paso Oxidation Ponds occur near the cantonment area and many of the 101 species of diving birds, wading birds, waterfowl, shorebirds, gulls, and terns observed on Fort Bliss have been observed at these ponds, as well as on playa lakes and stock tanks on McGregor Range and Doña Ana Range–North Training Areas, and the South Training Areas.

Data regarding migrant and breeding birds in desert habitats on McGregor Range are available in studies of neotropical migrant and nesting birds in arroyo-riparian and upland habitats on McGregor Range (Kozma and Mathews, 1997; U.S. Army, 1997j; Kozma 1995), and in studies of avian productivity and diversity in seven habitats within the Chihuahuan Desert on McGregor Range (U.S. Army, 1996n, 1997i). Migratory and breeding bird data for the pinyon pine-juniper habitat on the Sacramento Mountains foothills and the woodlands and conifer forests of the Organ Mountains appear in Pidgeon and Mathews (U.S. Army, 1996n, 1997i) and New Mexico Natural Heritage Program (NMNHP) (U.S. Army, 1994b), respectively.

Tularosa Basin

Breeding Birds. In 1996 and 1997, 24 sites were sampled for breeding birds in the Tularosa Basin in desert shrub habitats dominated by sandsage (*Artemisia filifolia*), mesquite, creosote, and Viscid acacia (*Acacia noevernicosa*) (U.S. Army, 1996n, 1997i). The total number of birds recorded at these four habitats increased 1.7 times from 6,092 in 1996 to 10,077 in 1997 (Table F-4). The number of species

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Table F-4. Number of Birds Observed in 24 Study Plots in Four Desert Shrublands Habitat Types on McGregor Range, Otero County, New Mexico

Species	Plant community type							
	Sandsage		Mesquite		Creosote		Viscid acacia	
	1996	1997	1996	1997	1996	1997	1996	1997
Black-throated sparrow	599	900	827	832	529	708	417	773
Western kingbird	106	215	159	206	47	81	48	56
Scott's oriole	84	185	118	142	91	152	128	157
Mourning dove	72	128	83	65	34	203	69	223
Northern mockingbird	45	29	64	40	43	48	102	388
Pyrrhuloxia	44	129	108	264	25	40	1	4
Cactus wren	40	139	74	169	62	171	61	87
Ash-throated flycatcher	33	125	85	100	82	118	126	146
Crissal thrasher	31	61	37	77	2	19	9	18
Brewers sparrow	28	26	9	52	3	53	6	7
House finch	27	18	39	34	45	48	91	163
Loggerhead shrike	21	51	7	8	17	17	9	7
Chihuahuan raven	17	57	9	26	28	38	0	2
Verdin	16	46	41	95	48	62	78	155
Scaled quail	14	61	15	51	8	79	14	133
Swainson's hawk	10	9	6	9	6	3	1	0
Green-tailed towhee	9	3	13	2	3	3	2	36
Black-tailed gnatcatcher	7	23	38	97	9	6	16	35
Brown-headed cowbird	7	16	41	108	13	30	36	86
Turkey vulture	7	11	1	6	2	6	9	13
Barn swallow	6	0	2	0	5	0	0	0
Cliff swallow	6	2	0	0	4	0	1	0
Eastern meadowlark	5	7	0	1	26	81	18	20
Bullock's oriole	5	5	4	2	0	5	0	0
Gambel's quail	5	9	15	13	4	11	4	7
Blue grosbeak	4	9	7	14	22	39	13	11
Lark bunting	4	0	0	0	0	0	0	3
Blue-gray gnatcatcher	3	0	3	5	0	1	0	0
Cassin's sparrow	3	3	0	0	20	353	0	24
Northern rough-winged swallow	3	2	0	0	0	0	0	0
Common nighthawk	2	3	4	6	36	64	63	81
Greater roadrunner	2	2	6	0	1	8	0	9
Lesser nighthawk	2	3	9	13	13	32	8	5
Pine siskin	2	0	2	2	0	1	0	0
Audubon's warbler	2	2	6	9	0	2	0	0
Black-chinned hummingbird	1	0	1	0	0	1	1	0
Burrowing owl	1	0	0	0	0	0	0	0
Cassin's kingbird	1	0	0	0	2	0	1	0
Common poorwill	1	0	2	2	0	1	0	0
Curved billed thrasher	1	1	3	21	2	2	3	12
House wren	1	0	0	0	0	0	0	3
MacGillivray's warbler	1	0	3	3	0	0	0	0
Northern flicker	1	0	1	4	0	0	0	0
Northern harrier	1	1	1	0	0	1	0	0
Red-tailed hawk	1	1	5	3	0	2	1	1
Say's phoebe	1	4	3	1	1	1	1	2
Cassin's vireo	1	1	0	0	0	1	0	0

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Table F-4. Number of Birds Observed in 24 Study Plots in Four Desert Shrublands Habitat Types on McGregor Range, Otero County, New Mexico (Continued)

<i>Species</i>	<i>Plant community type</i>							
	<i>Sandsage</i>		<i>Mesquite</i>		<i>Creosote</i>		<i>Viscid acacia</i>	
	<i>1996</i>	<i>1997</i>	<i>1996</i>	<i>1997</i>	<i>1996</i>	<i>1997</i>	<i>1996</i>	<i>1997</i>
Song sparrow	1	0	2	0	0	0	0	0
Spotted towhee	1	0	3	0	1	0	1	1
Western flycatcher	1	0	3	0	0	0	0	0
Ladder-backed woodpecker	0	6	10	14	0	1	5	1
Brewer's blackbird	0	0	8	1	3	0	13	0
Vesper sparrow	0	0	4	0	0	0	0	0
Chipping sparrow	0	7	2	1	0	0	2	6
Western tanager	0	0	2	2	1	0	0	0
Lark sparrow	0	0	2	0	0	0	2	6
Bewick's wren	0	1	1	0	0	0	0	10
Wilson's warbler	0	2	2	3	0	0	2	1
Black-throated gray warbler	0	0	1	0	0	0	0	0
Orange crowned warbler	0	0	1	0	0	0	1	0
Western bluebird	0	0	1	0	0	0	2	0
Prairie falcon	0	0	1	0	0	0	0	0
White-crowned sparrow	0	0	0	2	8	0	0	0
American kestrel	0	0	0	1	1	0	5	4
White-throated swift	0	0	0	0	2	0	0	0
Hermit thrush	0	0	0	0	1	0	0	1
Horned lark	0	1	0	0	1	4	1	0
Virginia's warbler	0	0	0	0	1	0	0	0
Canyon towhee	0	0	0	0	0	1	8	11
Rufous-crowned sparrow	0	0	0	0	0	0	2	14
White-winged dove	0	0	0	0	0	0	2	2
Black-headed grosbeak	0	0	0	0	0	0	1	0
Great horned owl	0	1	0	0	0	0	1	0
Rock wren	0	0	0	0	0	0	1	5
Western meadowlark	0	0	0	0	0	0	1	2
Common raven	0	3	0	0	0	0	0	0
Western wood-pewee	0	0	0	0	0	0	0	10
Golden eagle	0	0	0	0	0	1	0	0
Sharp-shinned hawk	0	0	0	0	0	0	0	1
Broad-tailed hummingbird	0	7	0	5	0	3	0	1
Common yellow-throat	0	0	0	2	0	1	0	0
Ruby-crowned kinglet	0	0	0	1	0	0	0	0
Lesser goldfinch	0	0	0	3	0	0	0	0
Unidentified bird	77	0	49	0	85	0	62	0
<i>Locations sampled</i>	6	6	6	6	6	6	6	6
<i>Number of species</i>	50	44	53	46	46	44	47	47
<i>Number of individuals</i>	1,363	2,315	1,943	2,517	1,337	2,502	1,449	2,743

Source: U.S. Army, 1996n, 1997i.

decreased from 75 in 1996 to 70 in 1997. Overall, 83 species have been recorded from these four habitats over the 2-year period. In 1996, the mesquite habitat had the largest number of species (53) and individuals (1,943) and the creosotebush habitat of the least number of species (46) and individuals (1,337). In 1997, the viscid acacia habitat had the largest number of species (47) and individuals (2,743),

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while the creosotebush habitat had the least number of species (44) and the sandsage habitat the least number of individuals (2,315). The black-throated sparrow (*Amphispiza bilineata*) was by far the most common species recorded in all four habitats both years (2,372 in 1996 and 3,213 in 1997). In 1996, it ranged from 29 percent of the birds in the viscid acacia habitat to 44 percent of the birds in the sandsage habitat and 28 percent of the birds in the creosote and acacia habitat to 39 percent of the birds in the sandsage habitat in 1997. Other common species were Scott's oriole (*Icterus parisorum*), western kingbird (*Tyrannus verticalis*), ash-throated flycatcher (*Myiarchus cinerascens*), mourning dove (*Zenaida macroura*), northern mockingbird (*Mimus polyglottes*), pyrrhuloxia (*Cardinalis sinuatus*), cactus wren (*Campylorhynchus brunneicapillus*), house finch (*Carpodacus mexicanus*), and verdin (*Auriparus flaviceps*). All these species showed substantial increases ranging from 1.3 to 2.4 times more birds in 1997 than 1996. Cassin's sparrow showed the greatest increase from 23 birds in 1996 to 380 in 1997 or 16.5 times more birds in 1997; most of this increase took place in the creosote habitat (Table F-4).

In 1997, 718 nests of 43 species were observed compared to 453 nests of 34 species in 1996 (U.S. Army 1996n, 1997i). In the desert shrublands habitats, the largest number of nests found were for the black-throated sparrow followed by the western kingbird, cactus wren, and crissal thrasher (*Toxostoma dorsalis*). During both years, the greatest number of nests were found in the mesquite habitat which had almost twice as many nests as the next most abundant habitat in 1996, and 1.5 times more in 1997.

Breeding bird studies at eight sample locations in arroyo-riparian habitat and surrounding uplands in the Chihuahuan Desert biome have shown that black-throated sparrow, northern mockingbird, verdin, brown-headed cowbird (*Molothrus ater*), mourning dove, and ash-throated flycatcher are the most common species. During the first 3 years of this study (1993 through 1995), more species were detected in arroyos than uplands. The black-throated sparrow and Scott's oriole were detected more frequently in the uplands, while the remaining species were detected more frequently in the arroyos. Data collected in 1996 showed that slightly more species were detected in the uplands than in the arroyos (U.S. Army, 1996o, 1997j; Kozma, 1995). In 1997, more birds and species were detected in the arroyo-riparian habitat (U.S. Army, 1997z). A total of 1,214 nests of 32 species were detected from 1993 through 1997 (U.S. Army, 1997j). Northern mockingbirds, rock wrens (*Salpinctes obsoletus*), and verdins nested more in arroyos, and black-throated sparrows and Scott's oriole nested more frequently in uplands. Nest density was about twice as high in arroyo habitat, and Torrey yucca, javelina bush (*Condalia warnockii*), and little-leaf sumac were most frequently used for nesting, even though these shrubs were among the lowest in density (Kozma and Mathews, 1997).

Breeding bird surveys were conducted in 1997 along transects at four arroyo/upland sites (a total of eight transects) in the Chihuahuan Desert below the Otero Mesa escarpment (USAF, 1997a, b). A total of 40 species of birds comprising 689 individuals were recorded (Table F-5). For the combined transects, 16 percent more species and 41 percent more individuals were recorded in the arroyos than the uplands. For combined results, the black-throated sparrow accounted for 25 percent of the birds recorded, followed by the northern mockingbird (8 percent), turkey vulture (8 percent), ash-throated flycatcher (7 percent), mourning dove (6 percent), cactus wren (5 percent), Scott's oriole (5 percent), and western kingbird (5 percent). The black-throated sparrow was the most abundant species in the arroyo (18 percent of total birds recorded from the arroyos) and upland (35 percent) habitats. The only other common species that was more abundant in the uplands was Scott's oriole (4 percent of the total birds in the arroyos and 7 percent of the birds in the uplands). The cactus wren was almost equally abundant in the two habitats, while the mourning dove, ash-throated flycatcher, western kingbird, and northern mockingbird were more abundant in the arroyos.

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Table F-5. Birds Recorded during Breeding Bird Surveys in Arroyo and Upland Habitats in the Chihuahuan Desert Plant Communities on Fort Bliss, Otero County, New Mexico

Species	Little Mack Tank		Middle Tank		Javelina Wash		Upper Middle Tank		Total	
	A ^a	U ^b	A	U	A	U	A	U	A	U
Mourning dove	8	4	2	0	4	0	15	8	29	12
Black-throated sparrow	26	42	12	24	13	14	22	21	73	101
Turkey vulture	16	1	2	1	15	1	10	7	43	10
Ash-throated flycatcher	17	3	7	6	2	3	5	7	31	19
Black-tailed gnatcatcher	5	3	0	0	0	0	0	0	5	3
Lesser nighthawk	6	0	2	1	0	1	0	0	8	2
Spotted towhee	1	0	0	0	0	0	0	0	1	0
Cactus wren	7	6	8	4	3	3	2	5	20	18
Western kingbird	6	7	13	2	5	0	0	1	24	10
Scaled quail	4	5	0	0	0	1	10	2	14	8
Gambel's quail	1	0	0	0	1	0	0	2	2	2
Brown-headed cowbird	9	5	5	1	1	0	3	0	18	6
Northern mockingbird	11	4	1	3	8	2	19	10	39	19
Northern harrier	1	0	0	0	0	0	0	0	1	0
Eastern meadowlark	8	7	0	2	1	3	7	1	16	13
Western meadowlark	1	0	0	1	0	1	1	0	2	2
Bullock's oriole	2	0	0	2	0	0	0	1	2	3
Brewer's sparrow	5	0	0	0	0	0	0	0	5	0
Scott's oriole	2	5	7	9	2	2	5	4	16	20
House finch	2	1	0	3	1	0	12	3	15	7
Vesper sparrow	1	0	0	0	0	0	0	0	1	0
Crissal thrasher	1	0	1	0	0	0	1	0	3	0
Chihuahuan raven	0	3	0	0	0	0	0	0	0	3
Bewick's wren	0	1	0	0	0	0	0	0	0	1
Pyrrhuloxia	0	1	1	9	0	0	0	1	1	11
MacGillivray's warbler	0	0	0	0	0	0	1	0	1	0
Rock wren	0	0	0	0	0	0	2	0	2	0
Say's phoebe	0	0	0	0	0	0	2	1	2	1
Rufous-crowned sparrow	0	0	0	1	0	0	2	0	2	1
Canyon towhee	0	0	0	0	0	0	7	1	7	1
Green-tailed towhee	0	0	0	0	1	1	1	0	2	1
Verdin	0	1	0	0	0	0	1	0	1	1
Greater roadrunner	0	0	2	0	0	0	0	1	2	1
Loggerhead shrike	0	0	0	1	0	3	0	0	0	4
Ladderback woodpecker	0	0	1	0	0	0	0	0	1	0
Swainson's hawk	0	0	0	0	0	1	0	0	0	1
Cassin's sparrow	2	0	0	0	0	0	0	0	2	0
Common nighthawk	4	1	1	1	1	1	0	0	6	3

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Table F-5. Birds Recorded during Breeding Bird Surveys in Arroyo and Upland Habitats in the Chihuahuan Desert Plant Communities on Fort Bliss, Otero County, New Mexico (Continued)

Species	Little Mack Tank		Middle Tank		Javelina Wash		Upper Middle Tank		Total	
	A ^a	U ^b	A	U	A	U	A	U	A	U
Virginia warbler	0	0	0	1	0	0	0	0	0	1
Flycatcher sp.	0	0	0	0	1	0	0	0	1	0
Unknown species	0	0	1	0	0	0	0	0	1	0
<i>Total Number of species</i>	25	18	15	18	15	14	21	18	36	31
<i>Total Number of individuals</i>	147	100	66	72	59	37	131	77	403	286

^a A = arroyo.

^b U = upland.

Source: USAF 1997a, b.

Neotropical Migrants. Many bird species breed in North America then winter in Central and South America (called neotropical migrants). Breeding bird survey data for a 26-year period from 1966 through 1991 indicate that the population levels of the majority of neotropical migrants have remained stable or increased; some have declined throughout this period, and many other species started to decline in the early 1980s (Robbins et al., 1993). Fragmentation of the forest on the breeding grounds and the elimination of optimum tropical wintering habitat are likely the two major reasons for these declines (Flather and Saure, 1996; Sheery and Holmes, 1996). In addition, the loss of important stop-over habitat used during migration may affect the survival of neotropical migrants (Moore et al., 1993).

In the west, over 60 percent of the neotropical migrants use riparian areas for stop-over habitat during migration or for breeding (Krueper, 1993), and the importance of riparian habitat for breeding birds has been well documented (Brown and Johnson, 1985; Knopf, 1985; Knopf et al., 1988; Krueper, 1993; Szaro and Jakle, 1985). Most of these and other studies have taken place in mesic riparian areas dominated by species such as willow and cottonwoods. This type of habitat is very limited on Fort Bliss; 395 acres of montane riparian plant communities occur in the Organ Mountains. Most riparian areas consist of arroyo-riparian habitat along dry washes (see Section F.1.1 for a description of these habitat types). Previous to recent studies currently under way at Fort Bliss, little was known about the importance of arroyo-riparian habitat for neotropical migrants and breeding birds in the Chihuahuan Desert (Kozma, 1995).

A recent study of neotropical migrants in the Chihuahuan Desert on Fort Bliss, using mist nets, has shown that the number of individuals and species using the arroyo-riparian habitat is substantially greater than in the surrounding upland habitats (Kozma, 1995; U.S. Army, 1996o; 1997j). During a 5-year mist-netting study, 290 neotropical migrants comprising 24 species were captured in arroyos and 52 neotropical migrants comprising 14 species were captured in upland habitat. Neotropical migrants captured all 5 years included the Virginia's orange-crowned (*Vermivora celata*), and Wilson's warbler (*Wilsonia pusilla*) along with the green-tailed towhee (*Pipilo chlorurus*) and hermit thrush (*Catharus guttatus*). The most frequently captured neotropical migrants were the green-tailed towhee (58 captures in arroyos and 3 in upland), Wilson's warbler (41 and 1), ruby-crowned kinglet (25 and 1), Virginia's warbler (22 and 5), and MacGillivray's warbler (13 and 1).

These studies of nesting and migratory birds at Fort Bliss have demonstrated that arroyo-riparian areas are consistently used more than upland habitats for nesting and stop-over areas for neotropical migrants passing through the Chihuahuan Desert. As indicated in Section 4.8.2, approximately 2,486 and 530 miles of arroyos with well-developed channels and sides occur on the South Training Areas, McGregor Range, and the Doña Ana Range–North Training Areas. Many of these arroyos, as well as

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similar areas on other parts of Fort Bliss such as the Castner Range, likely provide habitat that is consistently used by more nesting and neotropical migrants than upland areas.

Raptors. Data collected at 24 breeding bird sample locations in 1996 showed that the Swainson's hawk (*Buteo swainsonii*) and turkey vulture (*Cathartes aura*) were the most common raptors observed in the desert shrublands during the spring and summer of 1996 (Table F-6) (U.S. Army, 1996n). Other species observed were the red-tailed hawk (*Buteo jamaicensis*), American kestrel (*Falco sparverius*), northern harrier (*Circus cyaneus*), and prairie falcon (*Falco mexicanus*). During surveys of the Otero Mesa escarpment in March and May 1997, one breeding pair of falcons consisting of a prairie falcon and a possible prairie/peregrine falcon (*Falco peregrinus*) hybrid was reported along the escarpment in the area of Rough Canyon (USAF, 1997c, d). Observations of this pair in May 1997 indicated that the nesting attempt was apparently unsuccessful. In 1997, numerous stick nests and a number of golden eagles (*Aquila chrysaetos*) were also observed, but nesting was not confirmed. However, raptor surveys in 1998 along additional segments of the Otero Mesa escarpment, as well as in the Hueco Mountains, resulted in the observation of an active golden eagle nest along the Otero Mesa escarpment just north of Pendejo Wash, and eagles but no nest along the Hueco Mountains escarpment (U.S. Army, 1998i). In 1997, the red-tailed hawk, American kestrel, great horned owl (*Bubo virginianus*), and barn owl (*Tyto alba*) nested in the area of the escarpment (USAF, 1997e, f). During the raptor surveys, one ferruginous hawk (*Buteo regalis*) was reported soaring over Otero Mesa above the escarpment south of Martin Canyon on March 28, 1997 (USAF, 1997c), and one immature northern aplomado falcon (*Falco femoralis*) was reported in the basin and foothill grassland habitat, also south of Martin Canyon on May 23, 1997 (USAF, 1997d); these species are discussed in more detail in Section 4.8.4 of the EIS. The northern aplomado falcon was not seen in the area during subsequent surveys (USAF, 1997b) and it is assumed that the bird was no longer in the area. Data from 9 surveys during the winter of 1994 to 1995 and 18 surveys during the winter of 1995 to 1996, along a 14.9-mile route in the desert shrubland habitat, showed that the golden eagle and red-tailed hawk were the most common wintering species in the Tularosa Basin (Table F-7).

Table F-6. Raptors Observed during Breeding Bird Surveys on McGregor Range in 1996

Species	Location			Total
	Tularosa Basin (24 sampling sites)	Sacramento Mountain Foothills (6 sampling sites)	Otero Mesa (12 sampling sites)	
Turkey vulture	19 (0.8) ^a	103 (17.2)	21(1.8)	143 (3.40)
Swainson's hawk	23 (1.0)	0 (0.0)	4 (0.3)	27 (0.60)
Red-tailed hawk	7 (0.3)	6 (1.0)	8 (0.7)	21 (0.50)
American kestrel	6 (0.3)	0 (0.0)	2 (0.2)	8 (0.20)
Northern harrier	2 (0.1)	0 (0.0)	1 (0.1)	3 (0.10)
Prairie falcon	1 (0.04)	0 (0.0)	1 (0.1)	2 (0.10)
Golden eagle	0 (0.0)	1 (0.2)	0 (0.0)	1 (0.02)
Sharp-shinned hawk	0 (0.0)	1 (0.2)	0 (0.0)	1 (0.02)

^a Number observed per sampling site.

Source: U.S. Army, 1996n.

Otero Mesa

Breeding birds. In 1996 and 1997, two sites were sampled for breeding birds in the black grama grasslands and six sites in the mesa grasslands (dominated by blue grama grass) on Otero Mesa (U.S. Army, 1996n, 1997i). An additional four sites were sampled in the black grama grasslands in the

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**Table F-7. Raptors Observed during Wintering Bald Eagle Surveys along Four Routes on
McGregor Range during the Winters of 1994-95 and 1995-96**

Species	Winter					
	1994-95 (9 surveys along each route)			1995-96 (18 surveys along each route) ^a		
	Tularosa Basin (14.9 mi) ^b	Sacramento Mountains Foothills (29.8 mi) ^c	Otero Mesa (34.8 mi) ^d	Tularosa Basin (14.9 mi) ^b	Sacramento Mountain Foothills (28.9 mi) ^c	Otero Mesa (34.8 mi) ^d
Golden eagle	35 (2.3) ^e	134 (4.5)	25 (0.7)	28 (1.9)	108 (3.7)	33 (0.9)
Red-tailed hawk	25 (1.7)	26 (0.9)	48 (1.4)	23 (1.5)	71 (2.5)	101 (2.9)
American kestrel	12 (0.8)	16 (0.5)	20 (0.6)	7 (0.5)	14 (0.5)	8 (0.2)
Bald eagle	1 (0.1)	26 (0.9)	1 (0.02)	0 (0.0)	13 (0.4)	1 (0.03)
Northern harrier	2 (0.1)	9 (0.3)	5 (0.1)	2 (0.1)	4 (0.1)	4 (0.1)
Prairie falcon	0 (0.0)	4 (0.1)	0 (0.0)	0 (0.0)	1 (0.03)	3 (0.1)
Sharp shinned hawk	0 (0.0)	4 (0.1)	0 (0.0)	1 (0.1)	5 (0.2)	0 (0.0)
Merlin	0 (0.0)	2 (0.1)	1(0.02)	0 (0.0)	0 (0.0)	0 (0.0)
Cooper's hawk	0 (0.0)	0 (0.0)	0 (0.0)	1 (0.1)	0 (0.0)	0 (0.0)

^a 17 surveys along the El Paso Route, 18 along the remainder.

^b Grapevine Canyon route.

^c El Paso and Culp Canyon routes.

^d Mesa grassland route.

^e Number seen per mile.

Source: U.S. Army, 1995f, 1996p.

Tularosa Basin below the Otero Mesa. Results from these four sites are included in this section. In 1996, 36 species totaling 1,361 birds were tallied in the black grama grasslands and 40 species totaling 1,658 individuals were recorded from the mesa grasslands (Table F-8). As in the desert shrublands habitat, there was a substantial increase in the number of birds tallied in 1997 but a reduction in the number of species; approximately twice as many birds were recorded in 1997 than 1996. In 1996, the horned lark (*Eremophila alpestris*) was the most abundant species in the mesa grassland while the eastern meadowlark (*Sturnella magna*) was the most common species observed in the black grama grasslands (Table F-8). In 1997, the eastern meadowlark was the most common species in both grassland habitats. Other common breeding bird species were the black-throated sparrow, mourning dove, and northern mockingbird. Cassin's sparrow exhibited a large increase in numbers in 1997 as it did in the desert shrubland habitat. It more than doubled in the mesa grasslands and increased from 3 to 289 in the black grama grasslands.

Breeding bird surveys were conducted twice along transects at 4 swale/upland sites (total of eight transects) in the grassland habitat of Otero Mesa in 1997 (USAF, 1997a, b). Forty-five species comprising 720 individuals were recorded (Table F-9). To compare total birds recorded, only three arroyo/upland transect sets were used; the East Arroyo was excluded because the upland transect was surveyed only once. A total of 345 and 262 birds were recorded on the arroyos and uplands respectively; there were 32 percent more birds in the arroyos. For the combined results of all 8 transects, the eastern meadowlark was the most abundant species (17 percent of the total), followed by the northern mockingbird (13 percent), mourning dove (13 percent), black-throated sparrow (10 percent), horned lark (7 percent), lark sparrow (5 percent), and the cactus wren (5 percent). The eastern meadowlark, northern mockingbird, mourning dove, and cactus wren were more abundant in the arroyos, while the black-throated sparrow, horned lark and lark sparrow were more abundant in the uplands (Table F-9).

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**Table F-8. Number of Birds Observed in 12 Study Plots in Two Grassland Habitat Types on
McGregor Range, Otero County, New Mexico**

Species	Plant Communities			
	Mesa grassland		Black grama grassland ^a	
	1996	1997	1996	1997
Horned lark	277	347	173	365
Eastern meadowlark	216	660	404	844
Black-throated sparrow	193	305	178	322
Mourning dove	191	487	41	201
Northern mockingbird	140	283	105	267
Ash-throated flycatcher	69	76	38	44
Scott's oriole	66	75	48	38
Lark sparrow	60	77	16	41
Common nighthawk	55	67	60	71
Cactus wren	45	105	25	56
Western meadowlark	45	9	2	12
Cassin's sparrow	43	112	3	289
Western kingbird	38	55	40	60
Loggerhead shrike	27	39	26	22
Brewers sparrow	15	17	8	1
Turkey vulture	15	3	6	1
Chihuahuan raven	14	10	2	6
House finch	11	26	10	11
Lark bunting	9	18	44	4
Barn swallow	7	4	1	0
Curved billed thrasher	6	11	0	7
Cliff swallow	5	2	2	0
Red-tailed hawk	5	9	3	1
Swainson's hawk	3	4	1	1
Audubon's warbler	3	0	0	0
Crissal thrasher	2	4	0	1
Bullock's oriole	2	0	0	0
Northern rough-winged swallow	2	0	1	0
Violet-green swallow	2	0	0	0
Pyrrhuloxia	1	0	1	0
Green-tailed towhee	1	0	1	0
Brown-headed cowbird	1	16	0	10
Cassin's' kingbird	1	1	1	0
Northern harrier	1	0	0	0
Say's phoebe	1	6	0	0
Spotted towhee	1	0	0	0
Prairie falcon	1	0	0	0
American kestrel	1	2	1	1
Common raven	1	6	0	0
Coopers hawk	1	0	0	0
Scaled quail	0	8	2	41
Black-tailed gnatcatcher	0	1	1	0
Gambel's quail	0	1	1	6
Lesser nighthawk	0	0	2	0
Song sparrow	0	0	1	0
Ladder-backed woodpecker	0	4	4	2
Vesper sparrow	0	3	3	0

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**Table F-8. Number of Birds Observed in 12 Study Plots in Two Grassland Habitat Types on
McGregor Range, Otero County, New Mexico (Continued)**

Species	Plant Communities			
	Mesa grassland		Black grama grassland ^a	
	1996	1997	1996	1997
Chipping sparrow	0	0	7	1
Wilson's warbler	0	0	0	1
Canyon towhee	0	0	0	1
Common bushtit	0	0	0	0
Broad-tailed hummingbird	0	9	0	1
Killdeer	0	2	0	0
Unidentified bird	81	0	99	0
<i>Locations sampled</i>	6	6	6	6
<i>Number of species</i>	40	37	36	32
<i>Number of individuals</i>	1,658	2,864	1,361	2,729

^a Two sampling sites on Otero Mesa and four below Otero Mesa in the Tularosa Basin.
Source: U.S. Army, 1996n, 1997i.

Raptors. Data collected at 12 breeding bird sampling sites in 1996 on the Otero Mesa indicate that the turkey vulture was the most common species of raptor observed. Other species observed include the red-tailed hawk, Swainson's hawk, American kestrel, northern harrier, and prairie falcon (see Table F-6) (U.S. Army, 1996n). Additional species observed on Otero Mesa during the spring and summer were the golden eagle, merlin (*Falco columbarius*), burrowing owl (*Speotyto cunicularia*), and great horned owl. Two active red-tailed hawk nests were observed in 1997 (USAF, 1997e, f). The ferruginous hawk has been observed on the mesa in the winter and spring (U.S. Army, 1994c). During surveys for wintering bald eagles (*Haliaeetus leucocephalus*), along a 34.8-mile route on Otero Mesa, the red-tailed hawk was the most common of the raptors observed (U.S. Army, 1995f, 1996p) (see Table F-8). The golden eagle and American kestrel were also fairly common wintering species.

Hueco Mountains

Breeding birds. Reconnaissance surveys for breeding birds were conducted in the Hueco Mountains on McGregor Range in June 1997 (U.S. Army, 1997m). Six routes totaling about 28 miles were traversed along arroyos and in uplands within an approximate 6,700-acre area. The habitat traversed consisted primarily of foothill desert shrub dominated by viscid acacia, creosotebush, agave (*Agave lechuguilla*), and grama grass (U.S. Army, 1996j). Desert willow was common along the larger washes, while little sumac, tarbush, mesquite, creosotebush, prickly pear, yucca, viscid acacia, and Apache plume were frequently observed along narrower drainages. No pinyon pine/juniper habitat or other tree dominated areas were in the areas surveyed.

A total of 40 species comprising 737 individuals were recorded during 6 surveys on June 10 and 12, 1997 (Table F-10). Almost 200 black-throated sparrows (27 percent of total) were recorded, and this was the most common species encountered. Other common species were the northern mockingbird (10 percent), cactus wren (7 percent), canyon towhee (6 percent), house finch (6 percent), mourning dove (6 percent), scaled quail (*Callipepla squamata*) (5 percent), Scott's oriole (4 percent), and ash-throated flycatcher (4 percent). Scaled and Gambel's quail (*Callipepla gambelli*) were fairly common and were most frequently associated with the larger washes (U.S. Army, 1997m).

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Table F-9. Birds Recorded during Breeding Bird Surveys in Swale and Upland Habitats in the Otero Mesa Grassland Plant Communities on Fort Bliss, Otero County, New Mexico

<i>Species</i>	<i>South Swale</i>		<i>North Swale</i>		<i>East Swale</i>		<i>Lower South Swale</i>		<i>Total</i>	
	<i>S^a</i>	<i>U^b</i>	<i>S</i>	<i>U</i>	<i>S</i>	<i>U</i>	<i>S</i>	<i>U</i>	<i>S</i>	<i>U</i>
Mourning dove	11	10	18	14	16	4	7	4	52	38
Black-throated sparrow	5	15	7	28	5	2	3	4	20	49
Turkey vulture	0	0	0	0	2	0	0	1	2	1
Ash-throated flycatcher	2	5	3	3	4	1	5	0	14	9
Spotted towhee	0	0	1	0	0	0	0	0	1	0
Cactus wren	7	0	8	5	4	1	7	5	26	11
Western kingbird	4	1	6	0	4	1	6	1	20	3
Scaled quail	0	0	11	4	0	0	0	0	11	4
Brown-headed cowbird	0	0	11	1	6	0	1	0	18	1
Northern mockingbird	29	4	18	10	14	5	7	5	68	24
Eastern meadowlark	33	19	26	13	4	4	12	14	75	50
Western meadowlark	0	0	0	0	0	0	0	1	0	1
Brewer's sparrow	0	0	6	0	6	0	0	1	12	1
Scott's oriole	0	1	0	2	1	0	2	1	3	4
House finch	0	0	6	0	6	0	0	0	12	0
Crissal thrasher	1	0	1	0	0	0	1	1	3	1
Pyrrhuloxia	0	0	0	0	0	1	0	0	0	1
Rock wren	0	0	1	0	0	0	0	0	1	0
Say's phoebe	0	0	1	0	1	0	2	1	4	1
Rufous-crowned sparrow	0	0	0	0	1	0	0	0	1	0
Canyon towhee	0	0	0	0	2	0	0	0	2	0
Green-tailed towhee	0	0	0	0	1	0	0	0	1	0
Dusky flycatcher	1	0	0	0	0	0	0	0	1	0
Killdeer	1	0	0	0	0	0	0	0	1	0
Hermit thrush	1	0	0	0	0	0	0	0	1	0
Lark sparrow	6	16	3	0	0	0	8	5	17	21
Western wood pewee	2	0	1	0	3	0	0	0	6	0
Sage thrasher	1	0	0	0	0	0	0	0	1	0
Curve-billed thrasher	0	0	2	0	0	0	3	0	5	0
Loggerhead shrike	2	0	4	0	2	0	0	2	8	2
Ladderback woodpecker	2	0	0	1	0	0	0	0	2	1
Lark bunting	2	0	0	0	0	0	0	0	2	0
Horned lark	2	38	0	0	0	0	4	9	6	47
Broad-tailed hummingbird	0	1	0	0	0	0	0	0	0	1
White-crowned sparrow	0	0	1	0	0	0	0	0	1	0
Red-tailed hawk	0	0	2	0	0	1	0	0	2	1
Swainson's hawk	0	0	1	0	0	0	0	0	1	0
Cassin's sparrow	4	1	5	1	0	0	0	0	9	2
Common nighthawk	6	1	5	9	2	3	1	0	14	13
Eastern kingbird	1	0	0	0	0	0	0	0	1	0
Brewers' blackbird	0	0	0	0	0	0	2	0	2	0

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Table F-9. Birds Recorded during Breeding Bird Surveys in Arroyo and Upland Habitats in the Otero Mesa Grassland Plant Communities on Fort Bliss, Otero County, New Mexico (Continued)

Species	South Swale		North Swale		East Swale		Lower South Swale		Total	
	S ^a	U ^b	S	U	S	U	S	U	S	U
American kestrel	0	0	0	0	0	0	1	0	1	0
Meadowlark sp.	0	0	0	0	0	2	2	0	2	2
Black-headed grosbeak	0	0	0	0	1	0	0	0	1	0
Violet-green swallow	0	0	0	0	1	0	0	0	1	0
Cassin's kingbird	0	0	0	0	1	0	0	0	1	0
Unknown species	0	4	0	0	1	0	0	0	1	4
<i>Number of species</i>	21	11	24	12	22	10	17	14	42	23
<i>Number of individuals</i>	123	116	148	91	88	25	74	55	433	287

^a S = Swale.

^b U = Upland.

Source: USAF, 1997a, b.

Sacramento Mountains

Breeding birds. The Sacramento Mountains foothills occur on McGregor Range, and breeding birds were sampled in the pinyon pine/juniper woods. In 1996 and 1997, six locations were sampled for nesting birds in this habitat; 2,240 birds comprised of 65 species were recorded in 1996 and 2,986 birds from 62 species were recorded in 1997 (Table F-11). Although more birds were observed in 1997, the increase was less than observed in the desert shrublands and grasslands in 1997. The most common birds recorded in 1996 were the northern mockingbird, common bushtit (*Psaltriparus minimus*), spotted towhee (*Pipilo maculatus*), black-chinned sparrow (*Spizella atrogularis*), black-headed grosbeak (*Pheucticus melanocephalus*), mourning dove, and western scrub jay (*Aphelocoma californica*). In 1997, the spotted towhee was clearly the most common species followed by the common nighthawk (*Chordeiles minor*), and the other species listed above for 1996 (U.S. Army, 1996n, 1997i) (Table F-11).

Raptors. Data collected from six breeding bird sampling locations in 1996, in the pinyon pine-juniper dominated Sacramento Mountains foothills, indicated the turkey vulture was by far the most common species of raptor observed. The red-tailed hawk was observed occasionally, while the golden eagle and sharp-shinned hawk (*Accipiter striatus*) were seen once (see Table F-6) (U.S. Army, 1996n). The bald eagle winters in small numbers in the foothills (Table F-8) (U.S. Army, 1995g, 1996p) (see Section 4.8.4 in the PEIS for more details on the bald eagle). During the wintering bald eagle surveys, the golden eagle was the most common species observed both winters. The red-tailed hawk was also commonly observed, especially during the winter of 1995 to 1996; the American kestrel was also a fairly common wintering species (see Table F-8) (U.S. Army, 1996p). The northern harrier, sharp-shinned hawk, prairie falcon, merlin, and Cooper's hawk (*Accipiter cooperii*), were also observed. The great horned owl and western screech owl (*Otus kennicotti*) were detected during spotted owl (*Strix occidentalis*) surveys during the winter of 1995 to 1996; no spotted owls were observed. (U.S. Army, 1996q).

Organ Mountains

Breeding Birds. Detailed studies of breeding birds in various wooded habitat types were conducted in the Organ Mountains in 1991 and 1992 (U.S. Army, 1994b). Breeding birds were counted along transects, and in most cases multiple surveys were conducted. The maximum number of individuals encountered

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**Table F-10. Birds Recorded during Breeding Bird Surveys in the Hueco Mountains,
on Fort Bliss, Otero County, New Mexico, June 1977**

<i>Species</i>	<i>June 10</i>				<i>June 12</i>				<i>Grand Total</i>
	<i>S-1^a</i>	<i>S-2</i>	<i>S-3</i>	<i>Total</i>	<i>S-1</i>	<i>S-2</i>	<i>S-3</i>	<i>Total</i>	
Black-throated sparrow	31	48	22	101	34	51	13	98	199
Northern mockingbird	18	16	18	52	8	4	7	19	71
Cactus wren	12	1	7	20	17	3	10	30	50
Canyon towhee	7	10	11	28	5	6	4	15	43
House finch	17	7	2	26	10	6	0	16	42
Mourning dove	6	5	6	17	10	4	10	24	41
Scaled quail	5	10	15	30	1	3	5	9	39
Scott's oriole	6	3	4	13	9	6	1	16	29
Ash-throated flycatcher	3	5	7	15	8	5	0	13	28
Rock wren	1	0	11	12	2	7	1	10	22
Ladderback woodpecker	8	5	0	13	4	3	0	7	20
Rufous crowned sparrow	2	0	8	10	0	9	1	10	20
Gambel's quail	3	1	6	10	0	4	3	7	17
Pyrrhuloxia	4	3	3	10	2	1	0	3	13
Blue grosbeak	0	4	1	5	2	2	2	6	11
Turkey vulture	1	5	2	8	0	2	0	2	10
Loggerhead shrike	0	2	1	3	1	0	4	5	8
Red-tailed hawk	3	1	1	5	0	2	0	2	7
Crissal thrasher	3	1	1	5	0	1	0	1	6
Verdin	0	5	0	5	0	0	1	1	6
Say's phoebe	0	2	0	2	0	4	0	4	6
Hummingbird sp. ^b	1	0	4	5	0	0	0	0	5
Western kingbird	0	1	0	1	3	1	0	4	5
Black-tailed gnatcatcher	0	4	0	4	0	0	0	0	4
Common nighthawk	0	1	1	2	0	2	0	2	4
Broad-tailed hummingbird	0	3	0	3	0	0	0	0	3
Lesser goldfinch	0	3	0	3	0	0	0	0	3
Brown-headed cowbird	2	0	0	2	1	0	0	1	3
Greater roadrunner	0	0	1	1	0	1	1	2	3
Lesser nighthawk	0	0	0	0	0	1	2	3	3
Common poorwill	1	0	1	2	0	0	0	0	2
White-winged dove	0	0	2	2	0	0	0	0	2
Swift sp.	0	0	1	1	0	1	0	1	2
<i>Empidonax</i> sp.	0	0	0	0	0	0	2	2	2
Thrasher sp. ^b	1	0	0	1	0	0	0	0	1
Black-chinned sparrow	1	0	0	1	0	0	0	0	1
Curve-billed thrasher	0	1	0	1	0	0	0	0	1
American kestrel	0	1	0	1	0	0	0	0	1
Black-chinned hummingbird	0	0	1	1	0	0	0	0	1
Eastern meadowlark	0	0	0	0	0	0	1	1	1
Swainson's hawk	0	0	0	0	0	0	1	1	1
Bunting species ^c									1
Number of species	22	26	24	35	16	24	18	30	40
Number of individuals	136	148	137	421	117	129	69	315	737

^a "S-1" refers to survey number.

^b Not counted as separate species.

^c Hybrid bunting observed at New Tank in the Hueco Mountains on June 9, 1997.

Source: U.S. Army, 1997m.

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Table F-11. Number of Birds Observed in Six Study Plots in the Pinyon/Juniper Habitat Type on McGregor Range, Otero County, New Mexico

<i>Species</i>	<i>Pinyon pine/juniper plant community</i>	
	<i>1996</i>	<i>1997</i>
Northern mockingbird	250	220
Common bushtit	222	203
Spotted towhee	209	431
Black-chinned sparrow	185	166
Black-headed grosbeak	156	275
Mourning dove	111	58
Scrub jay	107	115
Turkey vulture	103	32
House finch	94	69
Ash-throated flycatcher	78	91
Bewick's wren	78	183
Pinyon jay	77	169
Common nighthawk	50	300
Cassin's kingbird	40	122
Juniper titmouse	39	36
Rufous-crowned sparrow	30	103
Scott's oriole	22	25
Black-chinned hummingbird	22	6
Brown-headed cowbird	20	51
Green-tailed towhee	17	3
Western tanager	16	43
Common raven	12	22
Townsend's solitaire	12	0
Black-throated gray warbler	11	0
Audubon's warbler	10	5
Canyon towhee	10	20
Gray-headed junco	10	1
Western wood-pewee	10	10
Western kingbird	8	4
Cliff swallow	8	3
Red-tailed hawk	6	1
Plumbeous vireo	6	15
Hermit thrush	6	0
Chihuahuan raven	5	33
Wilson's warbler	5	2
Mountain chickadee	5	18
Gambel's quail	4	1
Northern flicker	4	2
White-crowned sparrow	4	0
American robin	4	3
Eastern meadowlark	3	10
Pine siskin	3	3
Virginia's warbler	3	3
Violet-green swallow	3	5
Cedar waxwing	3	0
Golden-crowned kinglet	3	0
Gray flycatcher	3	2
MacGillivray's warbler	2	1

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Table F-11. Number of Birds Observed in Six Study Plots in the Pinyon/Juniper Habitat Type on McGregor Range, Otero County, New Mexico (Continued)

<i>Species</i>	<i>Pinyon pine/juniper plant community</i>	
	<i>1996</i>	<i>1997</i>
Western bluebird	2	3
Brewers sparrow	1	0
Loggerhead shrike	1	0
Barn swallow	1	0
Blue-gray gnatcatcher	1	1
Curved billed thrasher	1	5
Say's phoebe	1	12
Orange crowned warbler	1	1
White-throated swift	1	0
Rock wren	1	10
Coopers hawk	1	0
Golden eagle	1	0
Hairy woodpecker	1	0
Hepatic tanager	1	3
Rose-breasted grosbeak	1	0
Olive-sided flycatcher	1	0
Sharp-shinned hawk	1	0
Black-throated sparrow	0	4
Ruby-crowned kinglet	0	8
Crissal thrasher	0	1
Black-tailed gnatcatcher	0	7
Cassin's sparrow	0	1
Greater roadrunner	0	1
House wren	0	8
Ladder-backed woodpecker	0	19
Brewer's blackbird	0	1
Chipping sparrow	0	8
Lark sparrow	0	2
White-winged dove	0	3
Warbling vireo	0	4
Broad-tailed hummingbird	0	17
Summer tanager	0	1
Lesser goldfinch	0	1
Unidentified bird	133	0
<i>Locations sampled</i>	<i>6</i>	<i>6</i>
<i>Number of species</i>	<i>65</i>	<i>62</i>
<i>Number of individuals</i>	<i>2,240</i>	<i>2,986</i>

Source: U.S. Army, 1996n, 1997i.

for each species in six habitat types appears in Table F-12. A total of 53 species were recorded from the 6 habitat types and, based on Finch's analysis (Finch, 1991), 23 of these are neotropical migrants. The oak/juniper woods were sampled in 1991 and 1992 and the mourning dove was the most common species in 1991. Other commonly encountered species were the house finch, bushtit, Bewick's wren, canyon wren (*Catherpes mexicanus*), canyon towhee (*Pipilo fuscus*), spotted towhee, Virginia's warbler, and western wood-pewee (*Contopus sordidulus*). In 1992, the common species in the oak/juniper habitat were the house finch, Scott's oriole, rufous-crowned sparrow (*Aimophila ruficeps*), Gambel's quail,

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Table F-12. Birds Recorded during Breeding Bird Surveys in 1991 and 1992 in Wooded Habitat in the Organ Mountains, Fort Bliss, Otero County, New Mexico

<i>Species</i>	<i>Habitat Types</i>						
	<i>Oak/juniper</i>		<i>Riparian Shrub</i>	<i>Riparian Forest</i>	<i>Mixed Conifer</i>	<i>Ponderosa Pine</i>	<i>Oak, Box Elder, Aspen</i>
	<i>1991</i>	<i>1992</i>	<i>1992</i>	<i>1992</i>	<i>1992</i>	<i>1991</i>	<i>1991</i>
Mourning dove	26	4	4	2	0	3	1
House finch	16	8	6	2	1	11	8
Bushtit	12	3	0	1	0	11	10
Bewick's wren	10	5	3	3	1	5	5
Canyon wren	10	6	10	1	0	9	7
Canyon towhee	8	2	4	0	1	4	3
Spotted towhee	8	4	0	1	5	6	7
Virginia's warbler	7	4	1	3	5	2	13
Western wood pewee	7	4	2	4	3	5	5
Rock wren	6	3	6	0	1	5	2
Black-chinned sparrow	5	4	4	4	1	2	5
Rufous-crowned sparrow	5	7	5	2	1	3	2
Black-chinned hummingbird	4	3	3	4	0	1	0
Hepatic tanager	4	3	1	2	2	4	2
Ladder-backed woodpecker	4	5	1	2	0	0	3
Scott's oriole	4	8	3	3	0	2	3
Plumbeous vireo	4	2	0	5	5	5	5
Black-headed grosbeak	3	5	1	5	3	3	4
Broad-tailed hummingbird	3	2	0	1	2	2	3
Brown-headed cowbird	3	6	1	1	0	0	0
Grace's warbler	3	0	0	0	0	1	2
Mountain chickadee	3	0	0	0	0	0	5
Violet-green swallow	3	1	0	0	2	3	4
Warbling vireo	3	0	1	0	0	4	1
Yellow-rumped warbler	3	2	0	0	2	2	1
American kestrel	2	0	1	0	0	1	0
Ash-throated flycatcher	2	3	1	1	2	1	0
Cordilleran flycatcher	2	2	0	1	1	1	5
Golden eagle	2	1	0	0	0	2	1
Lesser goldfinch	2	1	2	0	0	0	0
Phainopepla	2	1	0	0	0	0	0
Prairie falcon	2	0	0	0	0	0	0
Red-tailed hawk	2	0	0	0	0	2	1
Say's phoebe	2	1	3	0	0	1	0
Western tanager	2	4	1	1	0	1	2
White-breasted nuthatch	2	1	0	1	0	1	5
Acorn woodpecker	1	0	0	0	1	0	1
Hairy woodpecker	1	0	0	0	0	1	2
Northern flicker	1	0	0	0	1	0	0
Band-tailed pigeon	0	0	0	0	0	2	2
Black-throated sparrow	0	0	2	0	0	0	0
Cooper's hawk	0	0	0	0	0	1	0
Curve-billed thrasher	0	0	1	0	0	0	0
Gambel's quail	0	7	0	0	0	0	0
Gray vireo	0	1	0	0	0	0	0
House wren	0	1	0	0	0	0	0

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Table F-12. Birds Recorded during Breeding Bird Surveys in 1991 and 1992 in Wooded Habitat in the Organ Mountains, Fort Bliss, Otero County, New Mexico (Continued)

Species	Habitat Types						
	Oak/juniper		Riparian Shrub	Riparian Forest	Mixed Conifer	Ponderosa Pine	Oak, Box Elder, Aspen
	1991	1992	1992	1992	1992	1991	1991
Hutton's vireo	0	3	0	1	0	0	0
Northern mockingbird	0	2	0	0	0	0	0
Juniper titmouse	0	2	0	1	0	3	2
Scaled quail	0	0	1	0	0	0	0
Scrub jay	0	1	0	0	0	0	0
Sharp-shinned hawk	0	0	0	0	0	1	2
White-winged dove	0	1	0	1	0	0	0
<i>Number of species</i>	39	38	25	25	19	35	33
<i>Number of individuals</i>	189	123	68	53	40	111	124

Source: U.S. Army, 1994b.

canyon wren, and brown-headed cowbird. The gray vireo (*Vireo vicinior*), a State of New Mexico threatened species, was also observed in this habitat type (see Section 4.8.4 for more details).

The mixed conifer forest is dominated by Douglas fir and ponderosa pine, and the spotted towhee, Virginia's warbler, and plumbeous vireo (*Vireo plumbeus*) were the most common species. Within the ponderosa pine forest, the house finch and bushtit were common. Other common species were the canyon wren, spotted towhee, Bewick's wren, western wood-pewee, rock wren, and plumbeous vireo.

Raptors. A survey of all potential peregrine falcon habitats in the Organ Mountains resulted in the identification of 4 prairie falcon and 3 golden eagle eyries; no peregrine falcon nest sites were observed (U.S. Army, 1980a). Other raptor species observed included the American kestrel, red-tailed hawk, and Cooper's hawk. All these species, as well as the turkey vulture and sharp-shinned hawk were observed during breeding bird surveys in 1991 and 1992 (U.S. Army, 1994b). Skaggs (U.S. Army, 1991b) documented the occurrence of territorial great-horned owls and western screech owls in the Organ Mountains, and also observed the turkey vulture, red-tailed hawk, golden eagle, and prairie falcon.

F.2.3 Mammals

A total of 58 mammal species are known to occur, and an additional 20 species have the potential to occur on Fort Bliss (Table F-13). Seventeen species of bats occur or have the potential to occur on Fort Bliss. However, there have been few studies of bats on Fort Bliss. A maternity colony of pallid bats (*Antrozous pallidus*) currently resides at the Orogrande Range Camp, and two maternity colonies of the fringed myotis (*Myotis thysanodes*) were observed in the pinyon-juniper habitat in the Sacramento Mountains foothills on McGregor Range in 1979 (Howell, 1997; Smartt, 1980). The California myotis (*Myotis californicus*) was observed in the pinyon/juniper habitat in the Sacramento Mountains foothills and the creosotebush and the grassland habitats on Otero Mesa; this species was most common in the grassland habitat (Smartt, 1980). Surveys for bats were conducted along the Otero Mesa escarpment and nearby stock tanks that contained water in May and August 1997 (USAF, 1997g, h). During the May 1997 survey, numerous cracks, crevices, and caves were searched for bats with negative results. However, during August, surveys of selected cliff areas along the escarpment yielded small numbers of bats exiting the cliff face in numerous areas. The bats along the escarpment appear to roost in small scattered groups and no large roost sites were observed. Western pipistrelles (*Pipistrellus hesperus*), *Myotis*, and

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Table F-13. Mammals Known to Occur and Could Possibly Occur on Fort Bliss, Otero and Doña Ana Counties, New Mexico and El Paso County, Texas

<i>Species</i>		<i>Occurrence on Fort Bliss</i>	
<i>Common Name</i>	<i>Scientific Name</i>	<i>Known</i>	<i>Possible</i>
Virginia opossum	<i>Didelphis virginianus</i>		●
Desert shrew	<i>Notiosorex crawfordi</i>	●	
Yuma myotis	<i>Myotis yumanensis</i>		●
Cave myotis	<i>Myotis velifera</i>		●
Little brown myotis	<i>Myotis lucifugus</i>		●
Long-legged myotis	<i>Myotis volans</i>		●
Fringed myotis	<i>Myotis thysanodes</i>	●	
California myotis	<i>Myotis californicus</i>	●	
Small-footed myotis	<i>Myotis leibii</i>		●
Spotted bat	<i>Euderma maculatum</i>		●
Silver-haired bat	<i>Lasionycteris noctivagans</i>	●	
Hoary bat	<i>Lasiurus cinereus</i>	●	
Western pipistrelle	<i>Pipistrellus hesperus</i>	●	
Big brown bat	<i>Eptesicus fuscus</i>	●	
Townsend's big-eared bat	<i>Corynorhinus townsendii</i>		●
Pallid bat	<i>Antrozous pallidus</i>	●	
Brazilian free-tailed bat	<i>Tadarida brasiliensis</i>	●	
Pocketed free-tailed bat	<i>Tadarida femorosacca</i>		●
Big free-tailed bat	<i>Nyctinomops macrotis</i>		●
Desert cottontail	<i>Sylvilagus audubonii</i>	●	
Eastern cottontail	<i>Sylvilagus floridanus</i>		●
Black-tailed jack rabbit	<i>Lepus californicus</i>	●	
Least chipmunk	<i>Tamias minimus</i>		●
Gray-footed chipmunk	<i>Tamias canipes</i>	●	
Gray-collared chipmunk	<i>Tamias cinereicollis</i>	●	
Organ Mountain Colorado chipmunk	<i>Tamias quadrivittatus australis</i>	●	
Texas antelope squirrel	<i>Ammospermophilus interpres</i>	●	
Spotted ground squirrel	<i>Spermophilus spilosoma</i>	●	
Thirteen-lined ground squirrel	<i>Spermophilus tridecemlineatus</i>		●
Rock squirrel	<i>Spermophilus variegatus</i>	●	
Mexican ground squirrel	<i>Spermophilus mexicanus</i>		●
Black-tailed prairie dog	<i>Cynomys ludovicianus</i>	●	
Yellow-faced pocket gopher	<i>Cratogeomys castanops</i>	●	
Botta's pocket gopher	<i>Thomomys bottae</i>	●	
Plains pocket gopher	<i>Geomys bursarius aernarius</i>		●
Silky pocket mouse	<i>Perognathus flavus</i>	●	
Plains pocket mouse	<i>Perognathus flavescens</i>	●	
Apache pocket mouse	<i>Perognathus apache</i>		●
Chihuahuan pocket mouse	<i>Chaetodipus eremicus</i>	●	

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Table F-13. Mammals Known to Occur and Could Possibly Occur on Fort Bliss, Otero and Doña Ana Counties, New Mexico and El Paso County, Texas (Continued)

<i>Species</i>		<i>Occurrence on Fort Bliss</i>	
<i>Common Name</i>	<i>Scientific Name</i>	<i>Known</i>	<i>Possible</i>
Hispid pocket mouse	<i>Chaetodipus hispidus</i>	●	
Desert pocket mouse	<i>Chaetodipus penicillatus</i>	●	
Rock pocket mouse	<i>Chaetodipus intermedius</i>	●	
Banner-tailed kangaroo rat	<i>Dipodomys spectabilis</i>	●	
Ord's kangaroo rat	<i>Dipodomys ordii</i>	●	
Merriam's kangaroo rat	<i>Dipodomys merriami</i>	●	
Plains harvest mouse	<i>Reithrodontomys montanus</i>	●	
Western harvest mouse	<i>Reithrodontomys megalotis</i>	●	
Cactus mouse	<i>Peromyscus eremicus</i>	●	
Deer mouse	<i>Peromyscus maniculatus</i>	●	
White-footed mouse	<i>Peromyscus leucopus</i>	●	
Brush mouse	<i>Peromyscus boylii</i>	●	
Northern rock mouse	<i>Peromyscus nasutus</i>		●
Mearn's grasshopper mouse	<i>Onychomys arenicola</i>	●	
Northern short-tailed grasshopper mouse	<i>Onychomys leucogaster</i>	●	
Hispid cotton rat	<i>Sigmodon hispidus</i>	●	
Gray wood rat	<i>Neotoma micropus</i>	●	
White-throated wood rat	<i>Neotoma albigula</i>	●	
Mexican meadow mouse	<i>Microtus mexicanus</i>	●	
House mouse	<i>Mus musculus</i>	●	
Porcupine	<i>Erethizon dorsatum</i>	●	
Coyote	<i>Canis latrans</i>	●	
Kit fox	<i>Vulpes macrotis</i>	●	
Red fox	<i>Vulpes vulpes</i>		●
Gray fox	<i>Urocyon cinereoargenteus</i>	●	
Black bear	<i>Ursus americanus</i>	●	
Ringtail	<i>Bassariscus astutus</i>	●	
Raccoon	<i>Procyon lotor</i>		●
Long-tailed weasel	<i>Mustela frenata</i>	●	
Badger	<i>Taxidea taxus</i>	●	
Western spotted skunk	<i>Spilogale gracilis</i>	●	
Striped skunk	<i>Mephitis mephitis</i>	●	
Mountain lion	<i>Puma concolor</i>	●	
Bobcat	<i>Lynx rufus</i>	●	
Javelina or Collared peccary	<i>Dicotyles tajacu</i>	●	
Mule deer	<i>Odocoileus hemionus</i>	●	
Pronghorn antelope	<i>Antilocapra americana</i>	●	

Sources: U.S. Army, 1997I; Smartt, 1980.

free-tailed bats (*Tadarida*) were observed emerging from the escarpment. Observation at four tanks in the area of the escarpment showed relatively high bat activity at Mack and Double tanks, and low activity at

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Martin and West Mesa Rim tanks. Various species were noted, including pipistrells, *Myotis*, and free-tail bats.

Fort Bliss conducted rodent surveys at 24 sampling sites in 12 habitat types on McGregor Range in 1997 and 1998. In 1997, trapping took place from May 12 through June 8, and 19 species comprising 941 animals were trapped during 3,600 census line trapnights (26 percent trap success) (U.S. Army, 1997) (Table F-14). The number trapped at the two census locations for each habitat were combined in Table F-14. The most abundant species were the silky pocket mouse (*Perognathus flavus*), which was captured 189 times (20 percent of total), and Merriam's kangaroo rat (*Dipodomys merriami*), 138 times (15 percent of total). Both these species were recorded from all but one habitat type and the silky pocket mouse was most common in the grassland habitats, while Merriam's kangaroo rat was more common in the desert scrub and arroyo habitats. Other common species were the deer mouse (*Peromyscus maniculatus*), hispid cotton rat (*Sigmodon hispidus*), white-footed mouse (*Peromyscus leucopus*), cactus mouse (*Peromyscus eremicus*), western harvest mouse (*Reithrodontomys megalotis*), and Ord's kangaroo rat (*Dipodomys ordii*). The deer mouse and white-footed mouse were found in 10 of the 12 habitats; the deer mouse was most common in the acacia scrub habitat, while the white-footed mouse was most common in the swale. The hispid cotton rat and western harvest mouse were also common in the swale, where 57 of 75 and 34 of 61 of the animals captured were in this area, respectively. Like deer mouse, the cactus mouse was most common in the acacia scrub (27 of 62 captured in this area).

The largest number of animals were captured in the swale (151) and the acacia scrub (123). The largest number of species were in the sandy arroyo scrub (14), *Chilopsis* arroyo (14), mixed desert scrub (13), acacia scrub (13), and creosote grassland (13). The lowest number of individuals (15) and species (7) were recorded in the mesquite coppice dunes. A relatively small number of individuals (41) and species (8) were also recorded in the grama grasslands (Table F-14) (U.S. Army, 1997).

Other rodents observed were the Texas antelope squirrel (*Ammospermophilus interpres*), rock squirrel (*Spermophilus variegatus*), Botta's pocket gopher (*Thomomys bottae*), and yellow-faced pocket gopher (*Cratogeomys castanops*). The porcupine (*Erethizon dorsatum*), coyote (*Canis latrans*), badger (*Taxidea taxus*), and bobcat (*Felis rufus*) were observed (U.S. Army, 1997). Jorgensen and Demarais (U.S. Army, 1996) studied rodents in eight locations in arroyos and associated upland habitats in the Chihuahuan Desert for 2 years on McGregor Range. Sampling took place along an elevation gradient in the upper, middle, and lower zones of the arroyos. A total of 5,127 individuals representing 18 species of nocturnal rodents were captured during the 69,120 trap nights.

The relative abundance of rodents was greater in the arroyos than in the uplands, and at the lower elevation sites than the upper elevation sites. The white-footed mouse, deer mouse, western harvest mouse, white-throated woodrat (*Neotoma albigula*), hispid cotton rat, rock pocket mouse (*Chaetodipus intermedius*), and desert pocket mouse (*C. penicillatus*) had higher relative abundance in the arroyos than in the uplands. Merriam's kangaroo rat and the desert plains pocket mouse (*Perognathus flavescens*) were more abundant in the uplands than the arroyos. The relative abundance of rodents was over six times greater in the lower elevation arroyos than in the uplands. The pattern of higher rodent species richness and abundance was consistent for both study years, even though the number of rodents captured was 34 percent less in 1994 than 1993 (U.S. Army, 1996).

Small mammals trapping took place at 27 sampling locations on TA 9 on the Doña Ana Range–North Training Areas, and 21 species were recorded (U.S. Army, 1992). Ten sampling sites were in upland grassland habitat and the remaining were in arroyo/upland habitats. The banner-tailed kangaroo rat (*Dipodomys spectabilis*), Merriam's kangaroo rat, plains pocket mouse, silky pocket mouse, and spotted ground squirrel (*Spermophilus pilosoma*) showed a strong preference for grasslands and uplands.

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**Table F-14. Mammals Recorded from 12 Habitat Types on Fort Bliss,
Otero County, New Mexico**

Species	Habitat Type												Total
	Desert Shrub					Grassland				Arroyo/Swale			
	DS1	DS2	DS3	DS4	DS5	G1	G2	G3	G4	A1	A2	A3	
Spotted ground squirrel	0	0	0 ^a	0	0	1	1	0	0	0	0	0	2
Plains pocket mouse	0	0 ^a	0 ^a	0	0	0	0	0	0	1	0	0	1
Silky pocket mouse	16	10	0 ^a	3	3	32	38	45	20	1	8	13	189
Chihuahuan pocket mouse	0	9	0 ^a	5	13	0	0	0	2	7	0	2	38
Hispid pocket mouse	0	0	0	0	0 ^a	2	2	7	0	0	0	0	11
Rock pocket mouse	0	1	0	1	24	0	0	0	19	11	3	0	59
Merriam's kangaroo rat	19	29	11	8	16	0	14	0	5	10	21	5	138
Ord's kangaroo rat	0	0 ^a	3	42	0	0 ^a	3	4	0	1	3	1	57
Banner-tailed kangaroo rat	0	0	0	0	0	0	2	0 ^a	0	0	0	0	2
Western harvest mouse	7	0 ^a	0	0 ^a	1	0	2	7	0	1	9	34	61
Plains harvest mouse	0	0	0	0	0	0 ^a	0	0 ^a	0	0	12	3	15
Cactus mouse	1	7	0	6	27	0	0	0	10	9	2	0	62
White-footed mouse	7	0 ^a	0	2	2	0	9	7	3	4	8	21	63
Deer mouse	8	10	0	9	27	0	4	2	4	9	5	13	91
Mearn's grasshopper mouse	3	0	0	0	1	3	5	0 ^a	0	0	2	2	16
Short-tailed grasshopper mouse	0	2	0	9	0	3	1	0	2	1	1	0	19
Hispid cotton rat	11	0	0	0	1	0 ^a	1	3	0	0 ^a	2	57	75
White-throated wood rat	0	0 ^a	1	4	7	0	0	0 ^a	3	13	3	0	31
Gray wood rat	3	1	0	0	1	0	2	0	0	3	1	0	11
<i>Total species</i>	9	13	7	11	13	8	13	11	9	14	14	10	19
<i>Total individuals</i>	75	69	15	89	123	41	84	75	68	71	80	151	941

Notes: See Table F-11 for scientific names. Habitat types are as follows: DS1 = creosote-tarbrush scrub, DS2 = mixed desert scrub, DS3 = coppice dunes, DS4 = non-stabilized sand dune, DS5 = acacia scrub, G1 = grama grassland, G2 = creosote grassland, G3 = yucca grassland, G4 = yucca-nolina-sotol, A1 = sandy arroyo scrub, A2 = *chilopsis* arroyo, A3 = swale.

^a Species not taken along census line but observed in habitat and, therefore, are part total species.

Source: U.S. Army, 1997l.

The white-throated woodrat, cactus mouse, white-footed mouse, and hispid cotton rat were more common in arroyos (U.S. Army, 1992).

Two lagomorphs, the desert cottontail (*Sylvilagus audubonii*) and black-tailed jackrabbit (*Lepus californicus*) are common on post. Smartt (1980) found these species to be more common in the desert shrubland habitat than the grassland habitat on Otero Mesa. The density of lagomorphs was estimated on McGregor Range from 85 transect lines totaling 141 miles in 1994, and 88 transect lines totaling 148 miles in 1995. Estimated density in 1994 was 22 lagomorphs per square mile, and 13 per square mile in 1995. The reduction from 1994 to 1995 was not statistically significant (U.S. Army, 1996r).

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The coyote, kit fox (*Vulpes macrotis*), badger, and bobcat are predators in the desert shrubland and grassland habitats. The mountain lion (*Puma concolor*) was observed in the Sacramento Mountains foothills and along the Otero Mesa escarpment in 1979 (Smartt, 1980), and in Rough Canyon along the Otero Mesa escarpment in 1996 (U.S. Army, 1997n).

The kit fox on Fort Bliss is morphologically indistinguishable from its close relative the swift fox (*Vulpes velox*); Fort Bliss is within the area where the ranges of these two species overlap. Genetic studies are currently underway to determine which species or hybrid species occurs on Fort Bliss (U.S. Army, 1996r). In 1994 and 1995, 20 kit foxes were captured and the average home range size based on radio telemetry was 795 acres in 1994 and 1,390 acres in 1995. During the study, 10 animals died and the cause of death for 3 of these was a mammalian predator (probably coyote); the remaining cause(s) were unknown. Coyote tracks were observed around all carcasses. Coyotes have been reported as a major predator on the swift fox (USFWS, 1990). The largest number of kit fox dens were in the creosotebush habitat followed by grassland/tarbrush and mesquite. Arthropods comprised the largest percent of the diet followed by mammals. The highest density of arthropods was sampled in the mesquite and sandsage/saltbush dune plant communities (U.S. Army, 1996r). Although the population densities of the coyote and kit fox on McGregor Range are not known, the coyote appears to be more common, based on the collections of 1,812 canid scats during surveys of 1,525 miles of roads. Coyote scats were 2.2 and 3.6 times more common than foxes during 1994 and 1995, respectively (U.S. Army, 1996r).

The mule deer (*Odocoileus hemionus*) occurs throughout Fort Bliss and is most common in the mountainous portions, including the foothills of the Sacramento and Organ mountains. Surveys in the Sacramento Mountains foothills on McGregor Range have occurred almost annually, and from 1983 through 1995, the number of deer ranged from a high of 587 in 1984 to a low of 206 in 1995 (Table F-15) (NMDGF, 1997). During this period, there was a general decline in the mule deer population. The average number from 1983 through 1987 was 458, while the average number between 1989 and 1995 was 276. During the 1987 and 1992 surveys, the number observed north and south of New Mexico Highway 506 was determined; 79 and 90 percent of the deer recorded were north and south of New Mexico Highway 506, respectively. This indicates that the mule deer is more common in the Sacramento Mountains foothills than in the grasslands and shrublands to the south. Data from aerial surveys of the Hueco Mountains in Texas, from 1985 through 1990, indicate that the number of mule deer ranged from 1.2 to 6.1 per 1,000 acres, except for 1986 when there were an estimated 23.1 per 1,000 acres (Cantu, 1990).

The pronghorn antelope (*Antilocapra americana*) occurs mostly in the grassland communities of the Otero Mesa and adjoining grasslands below the mesa. Pronghorns occasionally use the desert shrubland habitat in the Tularosa Basin. An estimated 500 to 700 pronghorn inhabit Otero Mesa on Fort Bliss. The oryx (*Oryx gazella*) is fairly common in the desert shrubland communities and was observed in the area of Mack Tanks in the Tularosa Basin, while sign was common at New Tank in the Hueco Mountains (USAF, 1997h; U.S. Army, 1997m). The javelina (*Dicotyles tajacu*) is uncommon on Fort Bliss and observations include one animal in an arroyo about 3 miles east of Hay Meadow Tank, and sign about 1 mile east of Martin Canyon (USAF, 1997e, f).

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**Table F-15. Mule Deer Census Data from the Sacramento Mountains Foothills
(North of New Mexico Highway 506) and the Otero Mesa Grasslands and Desert Shrublands
(South of New Mexico Highway 506) on McGregor Range, Otero County, New Mexico**

<i>Year</i>	<i>Number of Mule Deer</i>		
	<i>North of New Mexico Highway 506</i>	<i>South of New Mexico Highway 506</i>	<i>Total</i>
1983	544	-	544
1984	587	-	587
1985	308	-	308
1986	442	-	442
1987	323	87	410
1988	226	-	226
1989	222	-	222
1990	350	-	350
1991	319	33	352
1992	249	-	249
1993	No Survey	No Survey	No Survey
1994	No Survey	No Survey	No Survey
1995	206	-	206

Note: "-" = Survey data not provided for below New Mexico Highway 506.

Source: NMDGF, 1997.

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Appendix **G**

**APPENDIX G
NOISE ANALYSIS**

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G.0 NOISE ANALYSIS

G.1 AIRCRAFT NOISE ANALYSIS

This appendix presents a detailed discussion of noise and its effects on people and the environment. An assessment of aircraft noise requires a general understanding of how sound is measured and how it affects people in the natural environment. The purpose of this appendix is to address public concerns regarding aircraft noise impacts.

Section G.1.1 is a general discussion on the properties of noise. Section G.1.2 summarizes the noise metrics discussed throughout this PEIS. Section G.1.3 provides federal land-use compatibility guidelines that are used in analyzing aircraft noise impacts. Section G.2 addresses public concerns on potential impacts such as hearing loss, nonauditory health effects, annoyance, speech interference, sleep interference, and noise effects on domestic animals and wildlife. Section G.3 addresses noise impacts associated with the detonation of high explosives.

G.1.1 General

Noise, often defined as unwanted sound, is one of the most common environmental issues associated with aircraft operations. Of course, aircraft are not the only sources of noise in an urban or suburban surrounding, where interstate and local roadway traffic, rail, industrial, and neighborhood sources also intrude on the everyday quality of life. Nevertheless, aircraft are readily identifiable to those affected by their noise and are typically singled out for special attention and criticism. Consequently, aircraft noise problems often dominate analyses of environmental impacts.

Sound is a physical phenomenon consisting of minute vibrations that travel through a medium, such as air, and are sensed by the human ear. Whether that sound is interpreted as pleasant (for example, music) or unpleasant (for example, aircraft noise) depends largely on the listener's current activity, past experience, and attitude toward the source of that sound. It is often true that one person's music is another person's noise.

The measurement and human perception of sound involves two basic physical characteristics: intensity and frequency. Intensity is a measure of the acoustic energy of the sound vibrations and is expressed in terms of sound pressure. The higher the sound pressure, the more energy carried by the sound and the louder the perception of that sound. The second important physical characteristic is sound frequency, which is the number of times per second the air vibrates or oscillates. Low-frequency sounds are characterized as rumbles or roars, while high-frequency sounds are typified by sirens or screeches.

The loudest sounds that can be detected comfortably by the human ear have intensities, which are 1 trillion times larger than those of sounds that can just be detected. Because of this vast range, any attempt to represent the intensity of sound using a linear scale becomes very unwieldy. As a result, the dB (a logarithmic unit) is used to represent the intensity of a sound. Such a representation is called a sound level.

A sound level of 0 dB is approximately the threshold of human hearing and is barely audible under extremely quiet listening conditions. Normal speech has a sound level of approximately 60 dB. Sound levels above about 120 dB begin to be felt inside the human ear as discomfort and eventually pain at still higher levels.

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Because of the logarithmic nature of the dB unit, sound levels cannot be added or subtracted directly and are somewhat cumbersome to handle mathematically. However, some simple rules of thumb are useful in dealing with sound levels. First, if a sound's intensity is doubled, the sound level increases by 3 dB, regardless of the initial sound level. Thus, for example:

$$60 \text{ dB} + 60 \text{ dB} = 63 \text{ dB, and}$$

$$80 \text{ dB} + 80 \text{ dB} = 83 \text{ dB.}$$

The total sound level produced by two sounds of different levels is usually only slightly more than the higher of the two. For example:

$$60.0 \text{ dB} + 70.0 \text{ dB} = 70.4 \text{ dB.}$$

Because the addition of sound levels behaves differently than that of ordinary numbers, such addition is often referred to as "decibel addition" or "energy addition." The latter term arises from the fact that what we are really doing when we add dB values is first converting each dB value to its corresponding acoustic energy, then adding the energies using the normal rules of addition, and finally converting the total energy back to its dB equivalent.

An important facet of sound level addition arises later when the concept of time-average sound levels is introduced to explain Day-Night Average Sound Level (L_{dn}). Because of the logarithmic units, the time-average sound level is dominated by the louder levels, which occur during the averaging period. As a simple example, consider a sound level, which is 100 dB and lasts for 30 seconds, followed by a sound level of 50 dB which also lasts for 30 seconds. The time-average sound level over the total 60-second period is 97 dB, not 75 dB.

The minimum change in the time-average sound level of individual events, which an average human ear can detect is about 3 dB. A change in sound level of about 10 dB is usually perceived by the average person as a doubling (or halving) of the sound's loudness, and this relation holds true for loud sounds and for quieter sounds. A decrease in sound level of 10 dB actually represents a 90 percent decrease in sound intensity but only a 50 percent decrease in perceived loudness because of the nonlinear response of the human ear (similar to most human senses).

Sound frequency is measured in terms of cycles per second (cps), or hertz (Hz), which is the preferred scientific unit for cps. The normal human ear can detect sounds, which range in frequency from about 20 Hz to about 15,000 Hz. All sounds in this wide range of frequencies, however, are not heard equally well by the human ear, which is most sensitive to frequencies in the 1,000 to 4,000 Hz range. In measuring community noise, this frequency dependence is taken into account by adjusting the very high and very low frequencies to approximate the human ear's lower sensitivity to those frequencies. This is called "A-weighting" and is commonly used in measurements of community environmental noise.

Sound levels measured using A-weighting are most properly called A-weighted sound levels while sound levels measured without any frequency weighting are most properly called sound levels. However, since most environmental impact analysis documents deal only with A-weighted sound levels, the adjective "A-weighted" is often omitted, and A-weighted sound levels are referred to simply as sound levels. In some instances, the author will indicate that the levels have been A-weighted by using the abbreviation dBA or dB(A), rather than the abbreviation dB, for decibel. As long as the use of A-weighting is understood to be used, there is no difference implied by the terms "sound level" and "A-weighted sound level" or by the units dB, dBA, and dB(A). In this document, all levels are A-weighted and are reported in dB, unless otherwise indicated.

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Sound levels do not represent instantaneous measurements, but rather averages over short periods of time. Two measurement time periods are most common – one second and one-eighth of a second. A measured sound level averaged over one second is called a slow response sound level; one averaged over one-eighth of a second is called a fast response sound level. Most environmental noise studies use slow response measurements, and the adjective “slow response” is usually omitted. It is easy to understand why the proper descriptor “slow response A-weighted sound level” is usually shortened to “sound level” in environmental impact analysis documents.

G.1.2 Noise Metrics

A “metric” is defined as something “involving, or used in measurement.” As used in environmental noise analyses, a metric refers to the unit or quantity, which quantitatively measures the effect of noise on the environment. Noise studies have typically involved a confusing proliferation of noise metrics as individual researchers have attempted to understand and represent the effects of noise. As a result, past literature describing environmental noise or environmental noise abatement has included many different metrics. Recently, however, various federal agencies involved in environmental noise mitigation have agreed on common metrics for environmental impact analysis documents, and both the DoD and the FAA have specified those which should be used for federal aviation noise assessments. These metrics are as follows.

G.1.2.1 Maximum Sound Level

The highest A-weighted sound level measured during a single event in which the sound level changes value as time goes on (e.g., an aircraft overflight) is called the maximum A-weighted sound level or maximum sound level (L_{max}). The L_{max} of typical events are shown in Figure G-1. The L_{max} is important in judging the interference caused by a noise event with conversation, television or radio listening, sleep, or other common activities.

G.1.2.2 Sound Exposure Level (SEL)

Individual time-varying noise events have two main characteristics – a sound level which changes throughout the event and a period of time during which the event is heard. Although the maximum sound level, described above, provides some measure of the intrusiveness of the event, it alone does not completely describe the total event. The period of time during which the sound is heard is also significant. SEL combines both of these characteristics into a single metric.

SEL is a logarithmic measure of the total acoustic energy transmitted to the listener during the event. Mathematically, it represents the sound level of the constant sound that would, in one second, generate the same acoustic energy, as did the actual time-varying noise event. Since aircraft overflights usually last longer than one second, the SEL of an overflight is usually greater than the L_{max} of the overflight.

SEL is a composite metric, which represents both the intensity of a sound and its duration. It does not directly represent the sound level heard at any given time, but rather provides a measure of the net impact of the entire acoustic event. It has been well established in the scientific community that SEL measures this impact much more reliably than just the L_{max} .

Because the SEL and the L_{max} are both A-weighted sound levels expressed in dBs, there is sometimes confusion between the two, so the specific metric used should be clearly stated.

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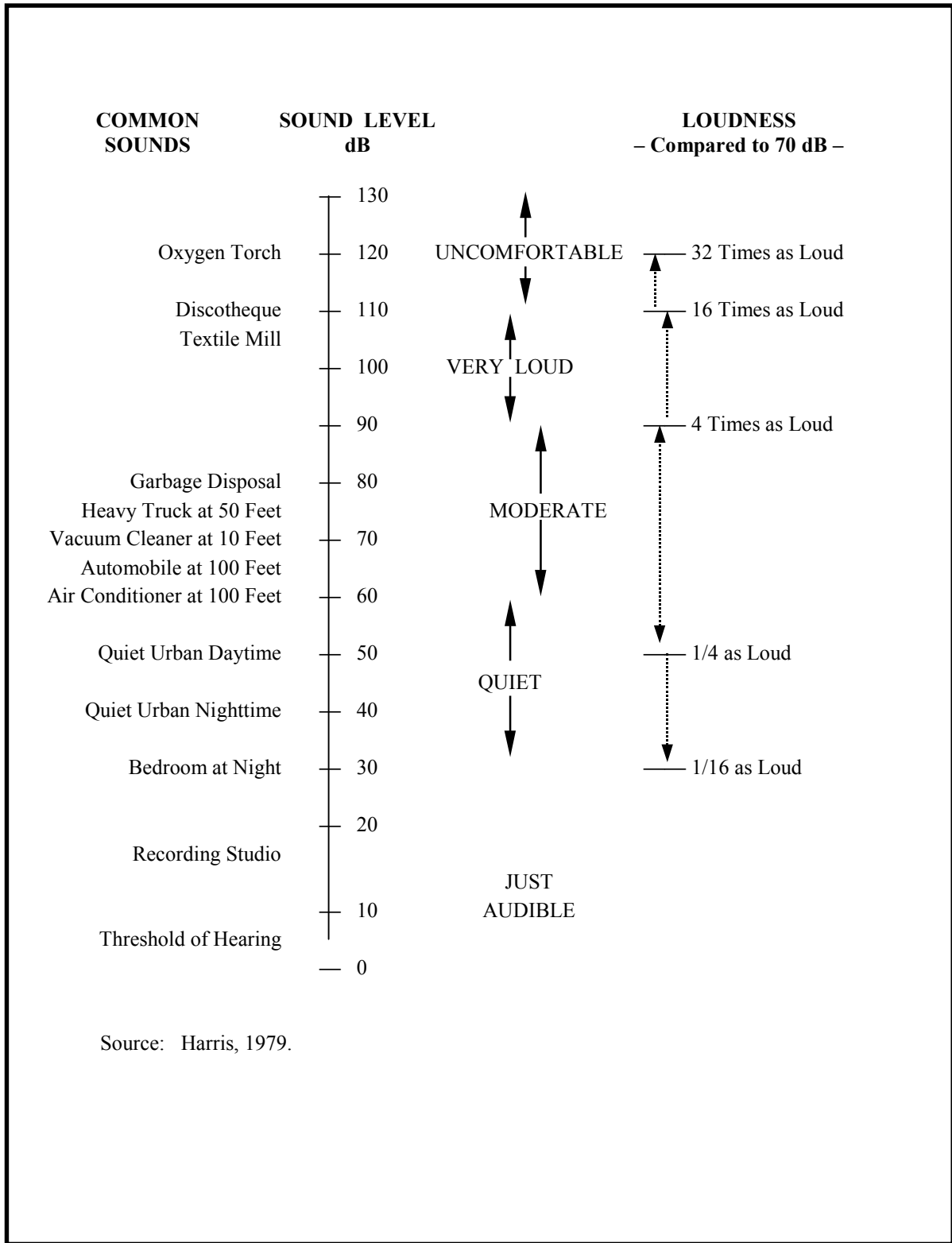


Figure G-1. Typical A-weighted Sound Levels of Common Sounds.

G.1.2.3 Day-night Average Sound Level

Time-average sound levels are the measurements of sound levels, which are averaged over a specified length of time. These levels provide a measure of the average sound energy during the measurement period.

For the evaluation of community noise effects, and particularly aircraft noise effects, the L_{dn} is used. L_{dn} averages aircraft sound levels at a location over a complete 24-hour period, with a 10-dB adjustment added to those noise events, which take place between 10:00 P.M. and 7:00 A.M. (local time) the following morning. This 10-dB “penalty” represents the added intrusiveness of sounds which occur during normal sleeping hours, both because of the increased sensitivity to noise during those hours and because ambient sound levels during nighttime are typically about 10 dB lower than during daytime hours.

Ignoring the 10-dB nighttime adjustment for the moment, L_{dn} may be thought of as the continuous A-weighted Sound Level which would be present if all of the variations in sound level which occur over a 24-hour period were smoothed out so as to contain the same total sound energy.

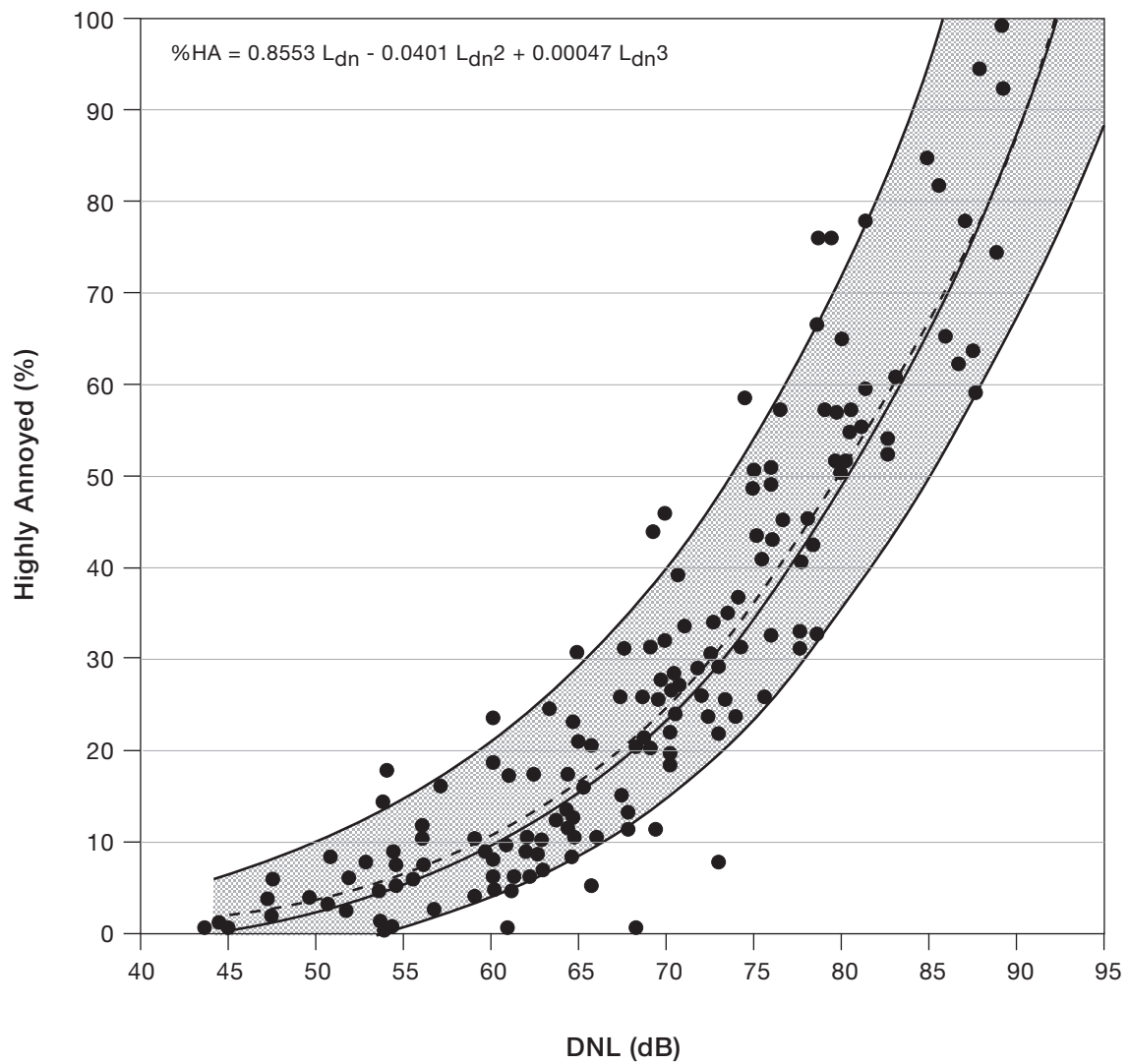
L_{dn} provides a single measure of overall noise impact, but does not provide specific information on the number of noise events or the individual sound levels, which occur during the day. For example, a L_{dn} of 65 dB could result from a very few noisy events, or a large number of quieter events

As noted earlier for SEL, L_{dn} does not represent the sound level heard at any particular time, but rather represents the total sound exposure. Scientific studies and social surveys, which have been conducted to appraise community annoyance to all types of environmental noise, have found the L_{dn} to be the best measure of that annoyance. Its use is endorsed by the scientific community (American National Standards Institute [ANSI], 1980, 1988; EPA, 1974; Federal Interagency Committee on Urban Noise [FICUN], 1980; Federal Interagency Committee on Noise [FICON], 1992).

There is, in fact, a remarkable consistency in the results of attitudinal surveys about aircraft noise conducted in different countries to find the percentages of groups of people who express various degrees of annoyance when exposed to different levels of L_{dn} . This is illustrated in Figure G-2, which summarizes the results of a large number of social surveys relating community responses to various types of noises, measured in L_{dn} .

Figure G-2 was taken from a 1978 publication (Schultz, 1978), and shows the original curve fit. A more recent study has reaffirmed this relationship (Fidell et al., 1991). Figure G-3 (FICON, 1992) shows an updated form of the curve fit (Finegold et al., 1994) in comparison with the original. The updated fit, which does not differ substantially from the original, is the current preferred form. In general, correlation coefficients of 0.85 to 0.95 are found between the percentages of groups of people highly annoyed and the level of average noise exposure. The correlation coefficients for the annoyance of individuals are relatively low, however, on the order of 0.5 or less. This is not surprising, considering the varying personal factors, which influence the manner in which individuals react to noise. Nevertheless, findings substantiate that community annoyance to aircraft noise is represented quite reliably using L_{dn} .

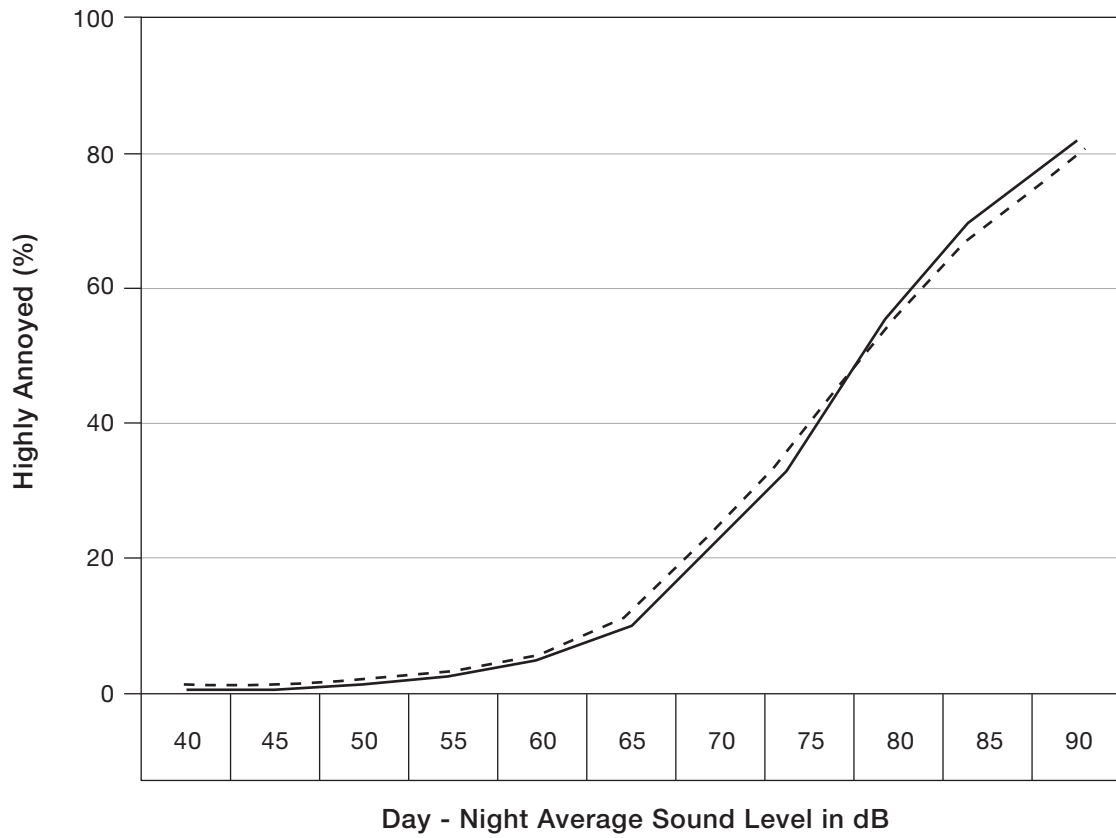
This relation between community annoyance and time-average sound level has been confirmed, even for infrequent aircraft noise events. A NASA study (Fields and Powell, 1985) reported the reactions of individuals in a community to daily helicopter overflights, ranging from one to 32 per day. The stated reactions to infrequent helicopter overflights correlated quite well with the daily time-average sound levels over this range of numbers of daily noise events.



- - - - All 161 Data Points Given Equal Weight
- All Surveys Given Equal Weight
- ▨ 90 Percent of the Data Points

Source: Schultz, 1978.

Figure G-2. Community Surveys of Noise Annoyance.



	40	45	50	55	60	65	70	75	80	85	90
USAF	0.41	0.831	1.66	3.31	6.48	12.29	22.1	36.47	53.74	70.16	82.64
Schultz	0.576	1.11	2.12	4.03	7.52	13.59	23.32	37.05	53.25	68.78	81

Calculated %HA Points

— USAF (Finogold et al, 1994) Data 400 Points
 $\%HA = 100 / (1 + \text{Exp}(11.13 - .141 \text{ LDN}))$
 - - - Schultz Data 161 Points
 $\%HA = 100 / (1 + \text{Exp}(10.43 - .132 \text{ LDN}))$

Figure G-3. Response of Communities to Noise; Comparison of Original (Schultz, 1978) and Current (Finogold et al., 1994) Curve Fits.

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The use of L_{dn} has been criticized recently as not accurately representing community annoyance and land-use compatibility with aircraft noise. Much of that criticism stems from a lack of understanding of the basis for the measurement or calculation of L_{dn} . One frequent criticism is based on the inherent feeling that people react more to single noise events and not as much to “meaningless” time-average sound levels.

In fact, a time-average noise metric, such as L_{dn} , takes into account both the noise levels of all individual events which occur during a 24-hour period, and the number of times those events occur. As described briefly above, the logarithmic nature of the dB unit causes the noise levels of the loudest events to control the 24-hour average.

As a simple example of this characteristic, consider a case in which only one aircraft overflight occurs in daytime during a 24-hour period, creating a sound level of 100 dB for 30 seconds. During the remaining 23 hours, 59 minutes, and 30 seconds of the day, the ambient sound level is 50 dB. The L_{dn} for this 24-hour period is 65.5 dB. Assume, as a second example, that ten such 30-second overflights occur in daytime hours during the next 24-hour period, with the same ambient sound level of 50 dB during the remaining 23 hours and 55 minutes of the day. The L_{dn} for this 24-hour period is 75.4 dB. Clearly, the averaging of noise over a 24-hour period does not ignore the louder single events and tends to emphasize both the sound levels and number of those events. This is the basic concept of a time-average sound metric, and specifically the L_{dn} .

G.1.2.4 Onset-Rate Adjusted L_{dn}

Aircraft operations along low-altitude MTRs generate a noise environment somewhat different from other community noise environments. Overflights are highly sporadic, ranging from five or ten per day to less than five per week. This situation differs from most community noise environments, in which noise tends to be continuous or patterned. Individual military overflight events also differ from typical community noise events, because of the low-altitude and high-air-speed characteristics of military aircraft operating on MTRs.

To represent these differences, the conventional L_{dn} metric is adjusted to account for the “surprise” effect of the sudden onset of aircraft noise events on humans (Plotkin et al., 1991; Stusnick et al., 1992, 1993). For aircraft exhibiting a rate of increase in sound level (called onset rate) of 15 to 30 dB per second, an adjustment or penalty ranging from 0 to 5 dB is added to the normal SEL. Onset rates above 30 dB per second require a 5 dB penalty, while onset rates below 15 dB per second require no adjustment. The L_{dn} is then determined in the same manner as for conventional aircraft noise events and is designated as Onset Rate-adjusted Day-night Average Sound Level (L_{dnr}). Because of the sporadic occurrences of aircraft overflights along MTRs, the number of average daily operations is determined by using the calendar month with the highest number of operations along the MTR. The monthly average is denoted L_{dnmr} .

G.1.3 Land-use Compatibility

As noted above, the inherent variability between individuals makes it impossible to predict accurately how any individual will react to a given noise event. Nevertheless, when a community is considered as a whole, its overall reaction to noise can be represented with a high degree of confidence. As described above, the best noise exposure metric for this correlation is the L_{dn} or L_{dnr} for military overflights.

In June 1980, an ad hoc FICUN published guidelines (FICUN, 1980) relating L_{dn} to compatible land uses. This committee was composed of representatives from the DoD, DOT, and U.S. Department of Housing and Urban Development (HUD), EPA, and the Veteran’s Administration (VA). Since the issuance of these guidelines, federal agencies have generally adopted these guidelines for their noise analyses.

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Following the lead of the committee, the DoD and the FAA adopted the concept of land-use compatibility as the accepted measure of aircraft noise effect. The FAA included the committee's guidelines in the Federal Aviation Regulations (DOT, 1982). These guidelines are reprinted in Table G-1, along with the explanatory notes included in the regulation. Although these guidelines are not mandatory (note the footnote "*" in the table), they provide the best means for determining noise impact in airport communities. In general, residential land uses normally are not compatible with outdoor L_{dn} values above 65 dB, and the extent of land areas and populations exposed to L_{dn} of 65 dB and higher provides the best means for assessing the noise impacts of alternative aircraft actions.

In 1990, a new FICON was formed to review the manner in which aviation noise effects are assessed and presented. This group released its report in 1992 and reaffirmed the use of L_{dn} as the best metric for this purpose (FICON, 1992).

Analyses of aircraft noise impacts and compatible land uses around DoD facilities and airspaces are normally made using NOISEMAP (USAF, 1990b) and/or MOARange NOISEMAP(MRNMAP) (Lucas and Calamia, 1994). These computer-based simulation programs calculate L_{dn} at many points on the ground around an airfield or military operating area, and draw contours of equal level for overlay onto land-use maps of the same scale. Each program mathematically calculates the SEL of all aircraft operations for a 24-hour period, taking into consideration the number and types of aircraft, their flight paths and engine thrust settings, the time of day (daytime or nighttime) that each operation occurs, and the onset rate, as appropriate. NOISEMAP and ROUTEMAP utilize the same physical models and aircraft performance data and are collectively referred to as "NOISEMAP technology" or simply "NOISEMAP."

L_{dn} may also be measured directly around an airfield, rather than calculated with NOISEMAP; however, the direct measurement of annualized L_{dn} is difficult and costly since it requires year-round monitoring or careful seasonal sampling.

NOISEMAP provides an accurate projection of aircraft noise around airfields. NOISEMAP also has the flexibility of calculating sound levels at any specified ground location so that noise levels at representative points under flight paths can be ascertained. NOISEMAP is most accurate for comparing "before and after" noise impacts which would result from proposed airfield changes or alternative noise control actions, so long as the various impacts are calculated in a consistent manner.

G.2 NOISE EFFECTS

G.2.1 Hearing Loss

Noise-induced hearing loss is probably the best defined of the potential effects of human exposure to excessive noise. Federal workplace standards for protection from hearing loss allow a time-average level of 90 dB over an 8-hour work period, or 85 dB averaged over a 16-hour period. Even the most protective criterion (no measurable hearing loss for the most sensitive portion of the population at the ear's most sensitive frequency, 4,000 Hz, after a 40-year exposure) suggests a time-average sound level of 70 dB over a 24-hour period (EPA, 1974). Since it is unlikely that airport neighbors will remain outside their homes 24 hours per day for extended periods of time, there is little possibility of hearing loss below a L_{dn} of 75 dB, and this level is extremely conservative.

G.2.2 Nonauditory Health Effects

Nonauditory health effects of long-term noise exposure, where noise may act as a risk factor, have never been found to occur at levels below those protective against noise-induced hearing loss, described above.

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Table G-1. Land Use Compatibility with Yearly Day-Night Average Sound Levels

Land Use	Yearly L_{dn} in dBs					
	Below 65	65 to 70	70 to 75	75 to 80	80 to 85	Over 85
<i>Residential</i>						
Residential, other than mobile homes and transient lodgings	Y	N ¹	N ¹	N	N	N
Mobile home parks	Y	N	N	N	N	N
Transient lodgings	Y	N ¹	N ¹	N	N	N
<i>Public Use</i>						
Schools	Y	N ¹	N ¹	N	N	N
Hospitals and nursing homes	Y	25	30	N	N	N
Churches, auditoria, and concert halls	Y	25	30	N	N	N
Governmental services	Y	Y	25	30	N	N
Transportation	Y	Y	Y ²	Y ³	Y ⁴	Y ⁴
Parking	Y	Y	Y ²	Y ³	Y ⁴	N
<i>Commercial Use</i>						
Office, business and professional	Y	Y	25	30	N	N
Wholesale and retail—building materials, hardware, and farm equipment	Y	Y	Y ²	Y ³	Y ⁴	N
Retail trade—general	Y	Y	25	30	N	N
Utilities	Y	Y	Y ²	Y ³	Y ⁴	N
Communication	Y	Y	25	30	N	N
<i>Manufacturing and Production</i>						
Manufacturing, general	Y	Y	Y ²	Y ³	Y ⁴	N
Photographic and optical	Y	Y	25	30	H	N
Agriculture (except livestock) and forestry	Y	Y ⁶	Y ⁷	Y ⁸	Y ⁸	Y ⁸
Livestock farming and breeding	Y	Y ⁶	Y ⁷	N	N	N
Mining and fishing, resource production and extraction	Y	Y	Y	Y	Y	Y
<i>Recreational</i>						
Outdoor sports arenas and spectator sports	Y	Y ⁵	Y ⁵	N	N	N
Outdoor music shells, amphitheaters	Y	N	N	N	N	N
Nature exhibits and zoos	Y	Y	N	N	N	N
Amusements, parks, resorts, and camps	Y	Y	Y	N	N	N
Gold courses, riding stables, and water recreation	Y	Y	25	30	N	N

The designations contained in this table do not constitute a federal determination that any use of land covered by the program is acceptable under federal, state, or local law. The responsibility for determining the acceptable and permissible land uses and the relationship between specific properties and specific noise contours rests with the local authorities. FAA determinations under Part 150 are not intended to substitute federally determined land uses for those determined to be appropriate by local authorities in response to locally determined needs and values in achieving noise-compatible land uses.

1. Where the community determines that residential or school uses must be allowed, measures to achieve outdoor-to-indoor Noise Level Reduction (NLR) of at least 25 dB and 30dB should be incorporated into building codes and be considered in individual approvals. Normal residential construction can be expected to provide an NLR of 20 dB; thus the reduction requirements are often stated as 5, 10, or 15 dB over standard construction and normally assume mechanical ventilation and closed windows year-round. However, the use of NLR criteria will not eliminate outdoor noise problems.
2. Measures to achieve NLR 25 dB must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise-sensitive areas, or where the normal noise level is low.
3. Measures to achieve NLR 30 dB must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise-sensitive areas, or where the normal noise level is low.
4. Measures to achieve NLR 35 dB must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise-sensitive areas, or where the normal noise level is low.
5. Land-use compatible provided special sound reinforcement systems are installed.
6. Residential buildings require an NLR of 25.
7. Residential buildings require an NLR of 30.
8. Residential buildings not permitted.

Note: SLUCM = Standard Land Use Coding Manual; Y (Yes) = Land Use and related structures compatible without restrictions; N (No) = Land Use and related structures are not compatible and should be prohibited; NLR = Noise Level Reduction (outdoor to indoor) to be achieved through incorporation of noise attenuation into the design and construction of the structure; 25, 30, or 35 = Land Use and related structures generally compatible; measures to achieve NLR of 25, 30, or 35 dB must be incorporated into design and construction of structures

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Most studies attempting to clarify such health effects have found that noise exposure levels established for hearing protection will also protect against any potential nonauditory health effects, at least in workplace conditions. The best scientific summary of these findings is contained in the lead paper at the National Institutes of Health Conference on Noise and Hearing Loss, held on January 22–24, 1990 in Washington, D.C., which states the following:

The nonauditory effects of chronic noise exposure, when noise is suspected to act as one of the risk factors in the development of hypertension, cardiovascular disease, and other nervous disorders, have never been proven to occur as chronic manifestations at levels below these criteria (an average of 75 dBA for complete protection against hearing loss for an 8-hour day). At the 1988 International Congress on Noise as a Public Health Problem, most studies attempting to clarify such health effects did not find them at levels below the criteria protective of noise-induced hearing loss, and even above these criteria, results regarding such health effects were ambiguous. Consequently, one comes to the conclusion that establishing and enforcing exposure levels protecting against noise-induced hearing loss would not only solve the noise-induced hearing loss problem but also any potential nonauditory health effects in the work place (von Gierke 1990; parenthetical wording added for clarification).

Although these findings were directed specifically at noise effects in the work place, they are equally applicable to aircraft noise effects in the community environment. Research studies regarding the nonauditory health effects of aircraft noise are ambiguous, at best, and often contradictory. Yet, even those studies which purport to find such health effects use time-average noise levels of 75 dB and higher for their research.

For example, in an often-quoted paper, two University of California Los Angeles (UCLA) researchers apparently found a relation between aircraft noise levels under the approach path to Los Angeles International Airport (LAX) and increased mortality rates among the exposed residents by using an average noise exposure level greater than 75 dB for the “noise-exposed” population (Meacham and Shaw, 1979). Nevertheless, three other UCLA professors analyzed those same data and found no relation between noise exposure and mortality rates (Frerichs, 1980).

As a second example, two other UCLA researchers used this same population near LAX to show a higher rate of birth defects during the period of 1970 to 1972 when compared with a control group residing away from the airport (Jones and Tauscher, 1978). Based on this report, a separate group at the U.S. Centers for Disease Control performed a more thorough study of populations near Atlanta’s Hartsfield International Airport for 1970 to 1972 and found no relation in their study of 17 identified categories of birth defects to aircraft noise levels above 65 dB (Edmonds, 1979).

A recent review of health effects, prepared by a Committee of the Health Council of The Netherlands (CHCN, 1996) reviewed currently available published information on this topic. They concluded that the threshold for possible long-term health effects was a 16-hour (0600 to 2200) time-average sound level of 70 dB. Projecting this to 24 hours and applying the 10 dB nighttime penalty used with L_{dn} , this corresponds to L_{dn} of about 75 dB. The study also affirmed the risk threshold for hearing loss, as discussed earlier.

In summary, there is no scientific basis for a claim that potential health effects exist for aircraft time-average sound levels below 75 dB.

G.2.3 Annoyance

The primary effect of aircraft noise on exposed communities is one of annoyance. Noise annoyance is defined by the EPA as any negative subjective reaction on the part of an individual or group (EPA, 1974). As noted in the discussion of L_{dn} above, community annoyance is best measured by that metric.

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Because the EPA Levels Document (EPA, 1974) identified L_{dn} of 55 dB as “. . .requisite to protect public health and welfare with an adequate margin of safety,” it is commonly assumed that 55 dB should be adopted as a criterion for community noise analysis. From a noise exposure perspective, that would be an ideal selection. However, financial and technical resources are generally not available to achieve that goal. Most agencies have identified L_{dn} of 65 dB as a criterion which protects those most impacted by noise, and which can often be achieved on a practical basis (FICON, 1992). This corresponds to about 13 percent of the exposed population being highly annoyed.

Although L_{dn} of 65 dB is widely used as a benchmark for significant noise impact, and is often an acceptable compromise, it is not a statutory limit and it is appropriate to consider other thresholds in particular cases. In this PEIS, no specific threshold is used. The noise in each affected area is evaluated on the basis of the information presented in this appendix and in the body of the PEIS. Particular attention is given to the ideal 55 dB identified by EPA.

G.2.4 Speech Interference

Speech interference associated with aircraft noise is a primary cause of annoyance to individuals on the ground. The disruption of routine activities such as radio or television listening, telephone use, or family conversation gives rise to frustration and irritation. The quality of speech communication is also important in classrooms, offices, and industrial settings and can cause fatigue and vocal strain in those who attempt to communicate over the noise. Research has shown that the use of the SEL metric will measure speech interference successfully, and that a SEL exceeding 65 dB will begin to interfere with speech communication.

G.2.5 Sleep Interference

Sleep interference is another source of annoyance associated with aircraft noise. This is especially true because of the intermittent nature and content of aircraft noise, which is more disturbing than continuous noise of equal energy and neutral meaning.

Sleep interference may be measured in either of two ways. “Arousal” represents actual awakening from sleep, while a change in “sleep stage” represents a shift from one of four sleep stages to another stage of lighter sleep without actual awakening. In general, arousal requires a somewhat higher noise level than does a change in sleep stage.

A recent analysis sponsored by the USAF summarized 21 published studies concerning the effects of noise on sleep (USAF, 1989). The analysis concluded that a lack of reliable studies in homes, combined with large differences among the results from the various laboratory studies and the limited in-home studies, did not permit development of an acceptably accurate assessment procedure. The noise events used in the laboratory studies and in contrived in-home studies were presented at much higher rates of occurrence than would normally be experienced in the home. None of the laboratory studies were of sufficiently long duration to determine any effects of habituation, such as that which would occur under normal community conditions.

Nevertheless, some guidance is available in judging sleep interference. The EPA identified an indoor L_{dn} of 45 dB as necessary to protect against sleep interference (EPA, 1974). Assuming a very conservative structural noise insulation of 20 dB for typical dwelling units, this corresponds to an outdoor L_{dn} of 65 dB as minimizing sleep interference.

A 1984 publication reviewed the probability of arousal or behavioral awakening in terms of SEL (Kryter, 1984). Figure G-4, extracted from Figure 10.37 of Kryter, 1984, indicates that an indoor SEL of 65 dB or lower should awaken less than 5 percent of those exposed. These results do not include any habituation over time by sleeping subjects. Nevertheless, this provides a reasonable guideline for assessing sleep interference and corresponds to similar guidance for speech interference, as noted above.

G.2.6 Noise Effects on Domestic Animals and Wildlife

Animal species differ greatly in their responses to noise. Each species has adapted, physically and behaviorally, to fill its ecological role in nature, and its hearing ability usually reflects that role. Animals rely on their hearing to avoid predators, obtain food, and communicate with and attract other members of their species. Aircraft noise may mask or interfere with these functions. Secondary effects may include nonauditory effects similar to those exhibited by humans – stress, hypertension, and other nervous disorders. Tertiary effects may include interference with mating and resultant population declines.

Many scientific studies are available regarding the effects of noise on wildlife and some anecdotal reports of wildlife “flight” due to noise. Few of these studies or reports include any reliable measures of the actual noise levels involved. However, in the absence of definitive data on the effect of noise on animals, the Committee on Hearing, Bioacoustics, and Biomechanics of the National Research Council has proposed that protective noise criteria for animals be taken to be the same as for humans (National Academy of Sciences [NAS], 1977).

G.2.7 Noise Effects on Structures

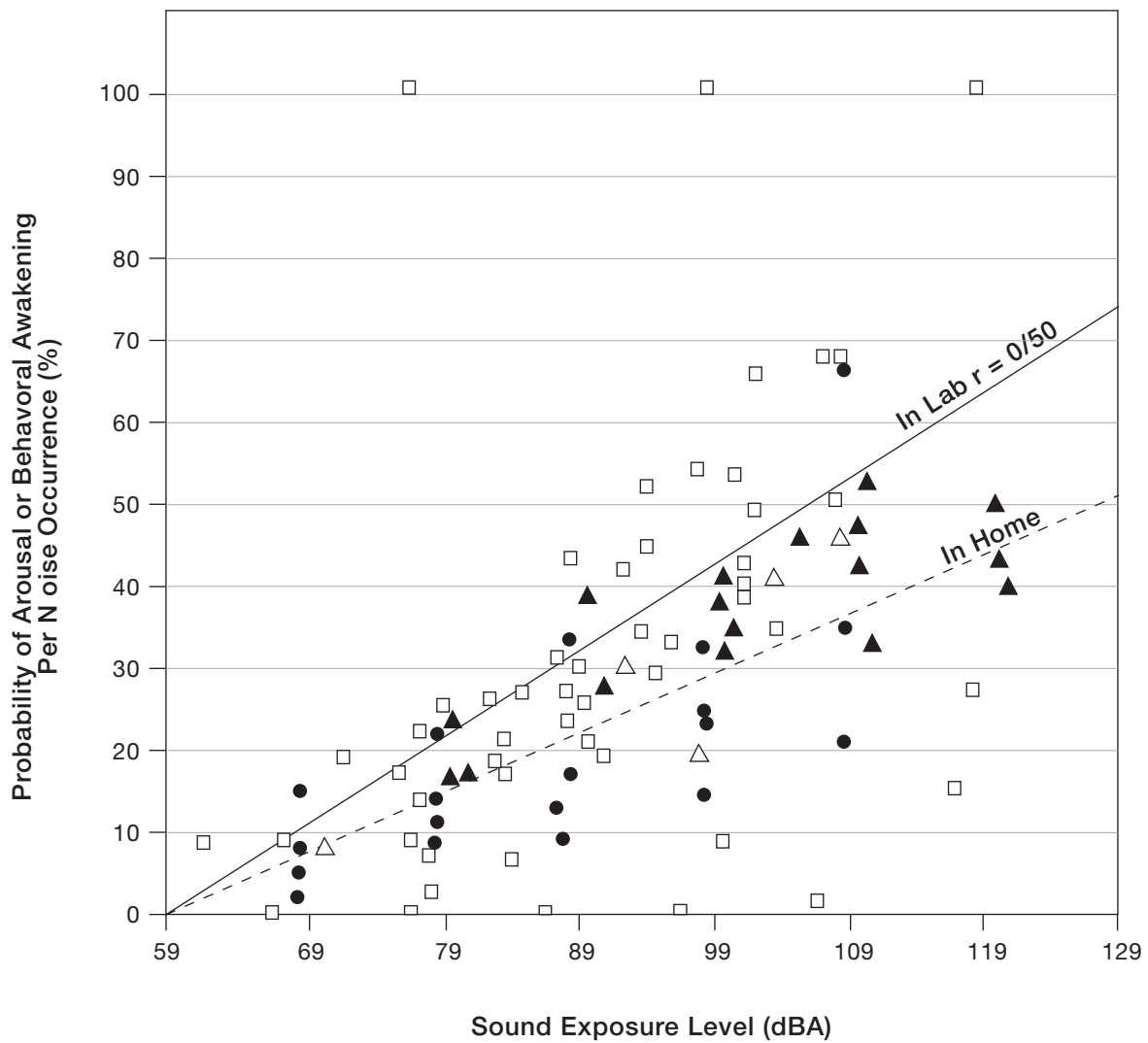
Normally, the most sensitive components of a structure to airborne noise are the windows and, infrequently, the plastered walls and ceilings. An evaluation of the peak sound pressures impinging on the structure is normally sufficient to determine the possibility of damage. In general, at sound levels above 130 dB, there is the possibility of the excitation of structural component resonances. While certain frequencies (such as 30 Hz for window breakage) may be of more concern than other frequencies, conservatively, only sounds lasting more than one second above a sound level of 130 dB are potentially damaging to structural components (NAS, 1977).

A recent study, directed specifically at low-altitude, high-speed aircraft on MTRs, showed that there is little probability of structural damage from such operations (Sutherland, 1990). One finding in that study is that sound levels at damaging frequencies (e.g., 30 Hz for window breakage or 15 to 25 Hz for whole-house response) are rarely above 130 dB.

Noise-induced structural vibration may also cause annoyance to dwelling occupants because of induced secondary vibrations, or “rattle,” of objects within the dwelling – hanging pictures, dishes, plaques, and bric-a-brac. Windowpanes may also vibrate noticeably when exposed to high levels of airborne noise, causing homeowners to fear of breakage. In general, such noise-induced vibrations occur at sound levels above those considered normally incompatible with residential land use. Thus, assessments of noise exposure levels for compatible land use should also be protective of noise-induced secondary vibrations.

G.2.8 Noise Effects on Historical and Archaeological Sites

Because of the potential for increased fragility of structural components of historical sites and buildings, aircraft noise may affect such sites more severely than newer, modern structures. Again, there are few scientific studies of such effects to provide guidance for their assessment.



Source: Kryter, 1984

Figure G-4. Probability of Arousal or Behavioral Awakening in Terms of Sound Exposure Level.

FBMMFEIS 137.dg.7.8.98

G.2.9 Noise Effects on Terrain

Members of the public often perceive that noise from low-flying aircraft can cause avalanches or landslides by disturbing fragile soil or snow structures, especially in mountainous areas, causing landslides or avalanches. There are no known instances of such effects, and it is considered improbable that such effects will result from routine, subsonic aircraft operations.

One study involved the measurements of sound levels and structural vibration levels in a superbly restored plantation house, originally built in 1795, and now situated approximately 1,500 feet from the centerline at the departure end of Runway 19L at Washington Dulles International Airport (IAD). These measurements were made in connection with the proposed scheduled operation of the supersonic Concorde airplane at Dulles (Wesler, 1977). There was special concern for the building's windows, since roughly half of the 324 panes were original. No instances of structural damage were found. Interestingly, despite the high levels of noise during Concorde takeoffs, the induced structural vibration levels were actually less than those induced by touring groups and vacuum cleaning within the building itself.

As noted above for the noise effects of noise-induced vibrations of normal structures, assessments of noise exposure levels for normally compatible land uses should also be protective of historic and archaeological sites.

G.3 IMPULSIVE NOISE ASSOCIATED WITH THE DETONATION OF HIGH EXPLOSIVES

Many targets on Fort Bliss are capable of supporting the delivery of live ordnance. This section discusses the methodology used to quantify these acoustic effects, and develop capacity assessments for these targets, which indicate the levels of ordnance use they can support without creating environmental acoustic impacts outside the boundaries of Fort Bliss.

The noise associated with the detonation of high explosives is impulsive in nature, and its main components emphasize very low frequencies, often equal to or less than 100 cps Hz. Since the noise is impulsive, it is measured on the "C-weighted" scale.

The noise model used for this impact assessment is the Noise Assessment and Prediction System (NAPS) developed for the U.S. Army's Atmospheric Sciences Laboratory, WSMR, New Mexico. The NAPS model is a single-event model that generates sound intensity contours based on meteorological conditions that influence the speed of sound and the propagation of sound. NAPS calculates sound pressure levels (SPL) in dBP (unweighted maximum sound pressure level, in dBs) based on the amount of explosive material normalized to an equivalent weight of trinitrotoluene (TNT). The model uses a ray trace approach that takes into account spherical spreading, atmospheric absorption, and refraction (U.S. Army, 1991d).

SPLs spread spherically in the absence of wind. This spreading is normally calculated so that for each doubling of distance from the noise source, the SPL decreases by 6 dB (U.S. Army, 1995j).

The atmosphere absorbs sound energy. However, this absorption is not a significant factor for sounds with frequencies of 500 Hz or less. For example, at 10 Hz, approximately 0.04 dB is lost to atmospheric absorption over a 6.2-mile distance, and for a sound at 100 Hz, about 3.5 dB is attenuated over the same distance. Conversely, for a sound at 1,000 Hz, approximately 100 dB would be lost over the same 6.2 miles. What is important is that when sound created by the detonation of high explosives is considered, since these sounds normally occur in the 5 to 10 Hz range or less, atmospheric absorption has little effect (U.S. Army, 1995j).

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Ground impedance is a measurement of the extent to which an acoustic wave traveling through the atmosphere would be absorbed into the ground upon contact, or reflected back into the atmosphere. Soft sands, such as those found on beaches, and fresh, powdery snow are examples of ground with low impedance, where most of the acoustic energy is absorbed, and little is reflected. Medium impedance surfaces reflect a majority of the acoustic energy, and most lands within the United States are classified as medium impedance surfaces for sounds of 200 Hz or less. Surfaces such as water, concrete, and mountains with rock outcroppings are illustrative of high impedance surfaces which will reflect all, or almost all of the acoustic energy (U.S. Army, 1995j).

As previously discussed, actual SPLs are usually “weighted” to more closely approximate the response of the human ear to the sound. The most commonly used metrics for characterizing impulsive noise are based on the “C-weighting” protocol, which represses SPLs under 100 and over 3,000 Hz. Field measurements suggest that unweighted SPLs are 22 to 25 dB higher than C-weighted SPLs for high explosive events (Kerry and Ford, 1994).

The dBP metric utilized by the NAPS model does not reflect the cumulative effects from multiple noise events over time. The preferred metric for assessing the annoyance level associated with multiple impulsive noise events associated with use of high explosives is the C-weighted L_{dn} (L_{Cdn}). L_{Cdn} is calculated:

$$L_{Cdn} = CSEL + \left(10 \log_{10} (N_D + 10N_N)\right) - 49.4 \quad \text{Equation 1}$$

Where:

CSEL = C-weighted Sound Exposure Level for a single event.

N_D = Number of events per 24-hour period occurring between 7:00 a.m. and 10:00 p.m. (daytime)

N_N = Number of events per 24-hour period occurring between 10:01 p.m. and 6:59 a.m. (nighttime).

Multiplying the events by 10 assigns a 10 dB penalty for noise events at night.

49.4 = $10 \log_{10}$ times 86,400 (the number of seconds in a 24-hour period).

Source: U.S Army, 1986b

Further, the relationship between dBP and CSEL is given by the following:

$$CSEL \cong dBP - 25 \quad \text{Equation 2}$$

Source: Kerry and Ford, 1994

Therefore, a dBP-dependent equation for L_{Cdn} may be written as follows, and, based on substitution:

$$L_{Cdn} \cong dBP - 25 + \left(10 \log_{10} (N_D + 10N_N)\right) - 49.4 \quad \text{Equation 3a}$$

and

$$L_{Cdn} \cong dBP + \left(10 \log_{10} (N_D + 10N_N)\right) - 74.4 \quad \text{Equation 3b}$$

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For land use planning purposes, L_{Cdn} 62 is generally considered to be equivalent to L_{dn} 65. That is, residential development is normally compatible with noise levels below L_{Cdn} 62.

Although the NAPS model outputs contours in unweighted SPL, this output can be used to represent L_{Cdn} values. As shown above, if one noise event occurred during daytime in a 24-hour period, then the L_{Cdn} value would be 74.4 dB lower than the NAPS calculated SPL (Equations 3a and 3b). Therefore:

$$L_{Cdn} 62 = 136.4dB \quad \text{Equation 4}$$

As the number of events from the same source increases above one per 24-hour period, the value of:

$$10\text{Log}_{10}(N_D + 10N_N)$$

may be subtracted from 136.4 to obtain the SPL contour value from NAPS that is equivalent to L_{Cdn} 62. For multiple sources contributing different sound levels at given distances, source specific L_{Cdn} values would be summed logarithmically to obtain total cumulative L_{Cdn} .

Alternatively, if it is desired to keep exposure of a given location at or below a specific L_{Cdn} value, and the unweighted SPL value is known for that location, the number of permissible day-equivalent events that can occur may be calculated by:

$$\text{AntiLog}_{10}(136.4 - SPL) = N_{DE} \quad \text{Equation 5}$$

As indicated, Equation 5 provides the number of day-equivalent events. Dividing the result by ten would provide the number of night-permissible events. Mixed day and night events may be determined using a ratio of one night event to ten day events. For example, 30 day events would equal 3 night events, or 10 day events and 2 night events.

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Appendix **H**

APPENDIX H

ENVIRONMENTAL JUSTICE OUTREACH CONTACT LIST

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H.0 Environmental Justice Outreach Contact List

El Paso, Texas

Border Agricultural Workers Union (UTAF)	Border Environmental Network
Centro de Salud Familiar La Fe Inc.	City of El Paso Housing Authority
City of El Paso Senior Citizen Centers	El Paso City-County Health District
El Paso County General Assistance Agency	El Paso Hispanic Chamber of Commerce
El Paso Hispanic, c/o Diario de Juarez	EPISO
Fort Bliss Monitor	Hispanic and Business Alliance for Education
International Environmental Alliance of the Bravo	KBNA and KAMA Radio
KINT TV, Channel 26	KSVE Que Suave Radio and La Caliente Tejano Radio
LULAC National Office	NAACP
National Association for Hispanic Elderly	State of Texas Department of Human Services
Ysleta del Sur Pueblo	

Las Cruces, New Mexico

City of Las Cruces Housing Authority	City of Las Cruces Senior Nutrition Center
Community Action Agency, of Southern New Mexico	Doña Ana Community Center
Hispano Chamber of Commerce de Las Cruces	Las Cruces Sun-News, Voz del Valle
NAACP	New Mexico Border Health Office
Piro-Manso-Tiwa Tribe, Las Cruces, New Mexico	Southern New Mexico Legal Services
State of New Mexico Health Department Las Cruces Public Health Office	The Salvation Army, Las Cruces Corps
United Way	West Picacho Association

Alamogordo, New Mexico

American Red Cross	City of Alamogordo Housing Authority
NAACP	Otero County Community Action Agency
Otero County Hispano Chamber of Commerce	Otero Public Health Office
United Way of Otero County	

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Other Locations

AYUDA, San Elizario, Texas	Concerned Citizens of Sunland Park, Sunland Park, New Mexico
Fort Sill Apache Tribe, Apache, Oklahoma	Mescalero Apache Tribe, Mescalero, New Mexico
Mexican American Legal Defense and Education Fund (MALDEF) San Antonio	Postmaster, Anthony, New Mexico
Postmaster, Canutillo, Texas	Postmaster, Chaparral, New Mexico
Postmaster, Clint, Texas	Postmaster, Cloudcroft, New Mexico
Postmaster, High Rolls, New Mexico	Postmaster, La Mesa, New Mexico
Postmaster, Mayhill, New Mexico	Postmaster, Mesquite, New Mexico
Postmaster, Organ, New Mexico	Postmaster, Oro Grande, New Mexico
Postmaster, Pinon, New Mexico	Postmaster, Sacramento, New Mexico
Postmaster, San Elizario, Texas	Postmaster, Sunspot, New Mexico
Postmaster, Timberon, New Mexico	Postmaster, Weed, New Mexico
San Jose Community Awareness Council Inc., Albuquerque, New Mexico	Southwest Network for Environmental and Economic Justice, Albuquerque, New Mexico
Southwest Organizing Project, Albuquerque, New Mexico	Southwest Public Workers' Union, San Antonio, Texas
Southwest Research and Information Center, Albuquerque, New Mexico	Texas Center for Policy Studies, Austin, Texas
Texas Rural Legal Aid, Inc., San Antonio, Texas	Tonantzin Land Institute, Albuquerque, New Mexico



DEPARTMENT OF THE ARMY
HEADQUARTERS, U. S. ARMY AIR DEFENSE ARTILLERY CENTER AND FORT BLISS
1733 PLEASANTON ROAD
FORT BLISS, TEXAS 79916-6816
June 26, 1997

REPLY TO
ATTENTION OF:
ATZC-DOE-C (PEIS Comment)

Dear Community Member:

The purpose of this letter is to inform you of the Army's continuing effort to ensure that issues important to our entire community are addressed in *Fort Bliss Mission and Master Plan Programmatic Environmental Impact Statement* (PEIS) being prepared by the Army in compliance with the National Environmental Policy Act. This Programmatic Environmental Impact Statement will examine existing and reasonably foreseeable mission activities and program management changes projected for Fort Bliss, as it considers implementing actions in three developing plans and a preplanning document: the revised Real Property Master Plan, the Integrated Natural Resources Management Plan, the Integrated Cultural Resources Management Plan, and the Training Area Development Concept.

Activities supported by Fort Bliss include air defense and air-to-ground training, troop and equipment maneuvers, and air defense systems testing. The revised Real Property Master Plan includes support of four air defense brigades. The Integrated Natural Resources Management Plan and Integrated Cultural Resources Management Plan will incorporate processes and procedures for the accomplishment of mission activities while maintaining effective stewardship of the installation's natural and cultural resources. The Training Area Development Concept considers future uses of Fort Bliss training areas based upon the installation's capability and potential Army training requirements.

The Army has identified your organization or tribal government as part of the outreach effort under *Presidential Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*. Executive Order 12898 provides that "each Federal agency shall make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations." Along with other environmental analysis, the PEIS will include identification of potential adverse impacts to minority populations and low-income populations resulting from the proposed activities. We invite your comments and concerns regarding the proposed action and related alternatives so that they can be considered in the PEIS. In addition, if you are familiar with any other organizations that should be included in the outreach efforts, please contact the Army at the number listed below.

To ensure sufficient time to adequately consider public comments during preparation of the PEIS, the Army requests that comments be forwarded to the address listed below by July 15, 1997. The Army will, however, accept additional comments at any time during the environmental impact analysis process. The Army anticipates issuing a draft version of the PEIS in January 1998 and will hold public hearings to receive comments on the Draft PEIS during the subsequent comment period. The Army will then review public comments received on the Draft PEIS and a Final PEIS will be prepared. The accompanying fact sheet, called *Preparation of the Fort Bliss Programmatic Environmental Impact Statement*, provides additional information on the alternatives that will be considered in the PEIS and the milestones that are part of the PEIS process.

Please direct written comments or request a copy of the PEIS by contacting Ms. Vicki Hamilton, PEIS Project Manager, Directorate of Environment, U.S. Army Air Defense Center and Fort Bliss, Attn.: ATZC-DOE-C (PEIS Comment), Fort Bliss, Texas 79912. If you have questions or require additional information, please contact Vicki Hamilton (English) at (915) 568-2774 or Rafael Corral (Spanish) at (915) 568-6977.

Sincerely,

A handwritten signature in black ink, appearing to read "Carl G. Roe".

Carl G. Roe
Colonel, U.S. Army
Garrison Commander



DEPARTMENT OF THE ARMY

HEADQUARTERS, U. S. ARMY AIR DEFENSE ARTILLERY CENTER AND FORT BLISS
1733 PLEASANTON ROAD
FORT BLISS, TEXAS 79916-6816
Junio 26, 1997

REPLY TO
ATTENTION OF:

ATZC-DOE-C (PEIS, Comentario)

Estimado Miembro de esta Comunidad:

El propósito de esta carta es el de informar a usted del esfuerzo continuo del Ejército para asegurar que los asuntos de importancia para toda nuestra comunidad sean incluidos en la Declaración de la Misión y Plan Maestro Programático de Impacto Ambiental (abreviado PEIS por sus siglas en Inglés) de Fort Bliss que está preparando el Ejército en cumplimiento de el Acta de la Política Ambiental Nacional. Esta Declaración Programática de Impacto Ambiental examinará las actividades actuales y las razonablemente previsibles, así como los cambios en el manejo de los programas proyectados para Fort Bliss, mientras considera implementar las acciones de tres planes de desarrollo y un documento de preplaneación: el Plan Maestro Enmendado de Bienes Raíces, el Plan Integral de Manejo de Recursos Naturales, el Plan Integral de Manejo de Recursos Culturales y el Concepto de Desarrollo de Area de Entrenamiento.

Las actividades apoyadas por Fort Bliss incluyen defensa aérea y entrenamiento de combate aire-a-tierra, maniobras de tropas y equipo y pruebas de sistemas de defensa aérea. El Plan Maestro Enmendado de Bienes Raíces incluye el apoyo a cuatro brigadas de defensa aérea. El Plan Integral de Manejo de Recursos Naturales y el Plan Integral de Manejo de Recursos Culturales incorporarán procesos y procedimientos para la realización de las actividades ya mencionadas mientras mantiene un control efectivo de los recursos naturales y culturales de esta instalación militar. El Concepto de Desarrollo de Area de Entrenamiento considera usos futuros de estas áreas de Fort Bliss basándose en la capacidad de las instalaciones y los posibles requerimientos de entrenamiento del Ejército.

Su organización o gobierno comunitario ha sido identificado por el Ejército como beneficiario de asistencia bajo la *Orden Ejecutiva Presidencial 12898, que legisla Acciones Federales para Impartir Justicia Ambiental en Poblaciones Minoritarias y de Bajos Recursos*. Esta Orden Ejecutiva 12898 prevé que "cada agencia Federal tenga como meta el lograr justicia ambiental como parte de su misión, mediante la identificación y consideración, de acuerdo al caso, de efectos ambientales altamente desproporcionados y adversos para la salud humana, de los programas, políticas y actividades en poblaciones minoritarias y de bajos recursos." Conjuntamente con otro análisis ambiental, el PEIS incluirá la identificación de impactos adversos potenciales a poblaciones minoritarias y de bajos recursos que resulten de las actividades propuestas. Le invitamos a que participe con sus comentarios sobre las acciones propuestas y sus alternativas. Así, estos comentarios podrán ser considerados en el PEIS. Además, si usted sabe de otras organizaciones que deban incluirse para este fin, favor de llamar al Ejército al los números que aparecen más adelante.

Con el objeto de tener tiempo suficiente para considerar adecuadamente todos los comentarios del público durante la preparación del PEIS, el Ejército pide que estos comentarios sean remitidos a la dirección que aparece abajo antes del 15 de Julio, de 1997. Sin embargo, el Ejército aceptará comentarios adicionales en cualquier momento durante el proceso de análisis de impacto ambiental. El Ejército anticipa la publicación inicial del PEIS para Enero de 1998 y programará audiencias públicas para recibir comentarios sobre este documento. El Ejército revisará entonces los comentarios del público recibidos sobre el PEIS inicial y preparará un PEIS Final. La hoja evidencial adjunta, titulada Preparación de la Declaración Programática de Impacto Ambiental de Fort Bliss, provee información adicional sobre las alternativas que se considerarán en el PEIS y las metas que son parte del proceso del PEIS.

Para enviar sus comentarios por escrito o solicitar una copia del PEIS favor de dirigirse a Ms. Vicki Hamilton, PEIS Project Manager, Directorate of Environment, U.S. Army Air Defense Center and Fort Bliss, Attn: ATZC-DOE-C (PEIS, Comentarios), Fort Bliss, Texas 79912. Si tiene preguntas o necesita más informes, favor de comunicarse con Vicki Hamilton (en Inglés) al teléfono (915) 568-2773 ó con Rafael Corral (en Español) en el (915) 568-6977.

Sinceramente,

Carl G. Roe
Coronel del Ejército de los EE.UU.
Comandante de Guarnición

**Fort Bliss Mission and Master Plan
Final Programmatic Environmental Impact Statement**

**Preparation of the Fort Bliss
Programmatic Environmental Impact Statement**

The end of the Cold War and resulting shift in United States defense strategy has required significant changes in the way in which the Army accomplishes its mission. In response to this new strategic direction, the Army's Fort Bliss is preparing a PEIS, which will examine its existing mission activities, reasonably foreseeable mission activities, and planned changes.

A PEIS analyzes environmental effects of adopting actions in a broad program; in this case, management programs that support existing and reasonably foreseeable missions of Fort Bliss, Texas and New Mexico, as distinguished from an environmental analysis of a specific potential project, such as construction of a new facility.

Changes to Fort Bliss Mission and Operations:

Over the last decade, the changing global political environment has resulted in a strategic shift in the way in which the U.S. deploys its forces. Today, most U.S. armed forces are based in the continental U.S. and deployed overseas. The role of Fort Bliss in supporting this new military strategy now focuses on the U.S.-based force with rapid deployment capabilities to hot spots overseas, rather than on a forward deployed force, which called for troops permanently stationed around the globe.

Fort Bliss must now be ready and capable of bringing in additional active Army, Reserve and National Guard units with as little as 24 hours notice and deploy them within 72 hours. Recent examples of the key role Fort Bliss played in the Army's rapid response capabilities to trouble spots overseas include troop deployment to Kuwait in September 1996, and Operation Desert Storm in 1991.

However, the primary mission of Fort Bliss is to maintain the operational readiness of U.S. forces. It is one of the largest Army posts in the U.S. and plays a central role in the nation's National Military and National Security Strategies. Fort Bliss provides air defense weapons training in the Patriot Missile system and a series of FAADS weapons, such as the Stinger. Fort Bliss also supports troop and equipment maneuvers, air defense systems testing, and air defense and air-to-ground training for active U.S. forces, national guard and reserve units, and allied forces.

Alternatives Under Consideration:

The NEPA, which establishes policies and goals for the protection of the environment, requires the Army to follow a process before implementing the broad actions contained in the programmatic plans. It also provides opportunities for the public to provide comments. The information the Army gathers through its environmental analyses and comments provided by the public will assist in the decision-making process.

The NEPA requires the Army to study alternative actions. One alternative the Army will examine in the PEIS is the "No Action" alternative. This alternative describes impacts of continuing operation of Fort Bliss under current management practices and serves as the baseline, or standard, from which alternatives are measured. Management approaches to land use, as reflected in the current RPMP, as well as current cultural resources and natural resource management practices would continue to be used.

The second alternative addresses the challenges of rapid deployment, and training at Fort Bliss. To meet these challenges, Fort Bliss is updating and developing several programs to be contained in the installation's RPMP and contributing plans. These include a land use management program that contains a number of short-range and long-range construction projects, and resource management practices that

Fort Bliss Mission and Master Plan
Final Programmatic Environmental Impact Statement

could have the potential to affect the installation's environment. Areas of program management change fall into the following broad categories:

- aligning installation support capabilities with new unit stationing and mobilization requirements, as contained in the RPMP and its component revisions;
- ensuring environmental responsibility and stewardship through implementation of an INRMP; and
- identifying, evaluating and managing historic and archaeological properties as presented in the ICRMP.

A third alternative considers not only known mission requirements and revisions to management practices, but also pre-planning efforts by Fort Bliss to improve installation capabilities to support weapons, fighting, and training systems requirements and emerging technologies, as described in the TADC.

Other alternatives based on public comment may be considered for inclusion in the PEIS. The Army is scheduled to make a final decision about the actions proposed in the PEIS in September 1998.

About Fort Bliss:

Fort Bliss, with its history that dates from 1847, now comprises 1.12 million acres of land in west Texas and southern New Mexico. It is among the largest Army posts in the Continental United States (CONUS) and is the only troop training installation in CONUS capable of supporting long-range missile firings. The installation is home to nearly 20,000 military and civilian employees. The population expands temporarily to accomplish large and small training exercises. Fort Bliss is composed of a complex of facilities and ranges designed to support Army training and test activities. Key areas include the Main Cantonment Area (which houses most support facilities and includes Biggs AAF), and three military training ranges, South Training Areas, Doña Ana Range–North Training Areas, and McGregor Range.

Among major organizations currently located on the installation:

Army Air Defense Artillery Center;
Army Air Defense Artillery School;
Army Sergeants Major Academy;
William Beaumont Army Medical Center;
Four Army Air Defense Artillery Brigades;
German Air Force Command in the United States and Canada; and the
German Air Force Air Defense School.

For More Information:

To help the Army fulfill the goals of the NEPA and make better decisions, please direct questions or comments about the PEIS to:

Ms. Vicki Hamilton,
PEIS Project Manager,
Directorate of the Environment,
Army Air Defense Artillery Center and Fort Bliss,
Attn: ATZC-DOE-C (PEIS Comments), Fort Bliss, Texas 79916
Telephone: (915) 568-2774 or in Spanish: Rafael Corral (915) 568-6977.

**Preparación de la
Declaración Programática de Impacto Ambiental de Fort Bliss**

El fin de la guerra Fría y sus resultantes modificaciones en la estrategia de la defensa de los EE. UU. han requerido cambios importantes en la manera en que el Ejército realiza su misión. En respuesta a esta nueva estrategia, el Ejército en Fort Bliss preparará una declaración programática de impacto ambiental que examinará sus actividades militares existentes, las razonablemente previsibles y otros cambios ya planeados.

Una declaración programática de impacto ambiental (PEIS) analiza los efectos ambientales causados por acciones adoptivas de un programa extenso, en este caso, programa de control que apoye misiones existentes y razonablemente previsibles en Fort Bliss, Texas y Nuevo México, a diferencia de un análisis ambiental de un proyecto específico, tal como la construcción de un nuevo edificio.

Cambios en la Misión y Operación de Fort Bliss

Durante la última década, el ambiente político global cambiante ha resultado en un giro estratégico en la manera en que los EE.UU. despliega sus fuerzas militares. Hoy en día, la mayoría de las fuerzas armadas de los EE.UU. tienen su base en el espacio continental con destacamentos en el extranjero. El papel que desempeñará Fort Bliss en apoyo de esta nueva estrategia militar será enfocarse en las fuerzas con base en los EE. UU. con capacidades de rápido despliegue a puntos específicos en el extranjero, en lugar de preocuparse por fuerzas de avanzada, que requerían tropas permanentemente estacionadas alrededor del mundo.

Fort Bliss debe ser capaz y estar preparado ahora para reunir unidades del Ejército Activas, de la Reserva y de la Guardia Nacional en menos de 24 horas, y desplegarlas a su destino en no más de 72 horas. Ejemplos recientes de la participación clave de Fort Bliss en la capacidad del Ejército para responder inmediatamente a situaciones de peligro en el extranjero incluyen el despliegue de tropas a Kuwait en Septiembre de 1996 y la Operación Tormenta en el Desierto en 1991.

La misión primaria sin embargo de Fort Bliss, está en mantener la prontitud operacional de las fuerzas militares en los EE.UU.. Es una de las instalaciones militares más extensas del Ejército y juega un papel central en las Estrategias Militar y de Seguridad Nacionales. Fort Bliss provee entrenamiento en armas de defensa aérea del sistema de proyectiles Patriota (Patriot) y una serie de armas de defensa aérea para la Zona de Avanzada, tal como la Púa (Stinger). Fort Bliss también respalda maniobras de tropas y equipo, pruebas de sistemas de defensa aérea, y entrenamiento en defensa aérea y combate de aire-a-tierra para unidades Activas, de Reserva y de la Guardia Nacional de las fuerzas armadas de los EE.UU. y sus aliados.

Alternativas Consideradas

El Acta de Política Nacional Ambiental, que establece normas y metas para la protección del medio-ambiente, requiere que el Ejército siga un proceso antes de cumplir las extensas acciones contenidas en los planos programáticos. También provee oportunidades para que el público contribuya con sus comentarios. La información reunida por el Ejército mediante un análisis ambiental y los comentarios del público apoyarán el proceso de decisión.

Esta Acta requiere que el Ejército estudie acciones alternativas. Una de estas alternativas que el Ejército examinará en el PEIS es la alternativa de "no acción". Esta alternativa describe el impacto de un funcionamiento continuo de Fort Bliss bajo la dirección actual y sirve como base, o patrón, para evaluar

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otras alternativas. El enfoque en la administración de las tierras reflejado en el Plan Maestro de Bienes Raíces actual así como las prácticas actuales para el manejo de los recursos culturales y naturales continuarían usándose.

Una segunda alternativa considera las dificultades de un despliegue de tropas rápido, y su entrenamiento en Fort Bliss. Para resolver estas dificultades, Fort Bliss esta actualizando y desarrollando varios programas para ser incluidos en el Plan Maestro de Bienes Raíces y planos adjuntos de esta instalación. Estos incluyen un programa de administración de tierras que contiene un número de proyectos de construcción a corto y largo plazo y prácticas para el manejo de recursos que pudieran potencialmente afectar el medio-ambiente de esta instalación. Las áreas de cambio en el programa administrativo se dividen en las siguientes categorías:

Alinear la capacidad de respaldo de esta instalación con los nuevos requisitos para estacionar y movilizar unidades militares, de acuerdo a lo contenido en el Plan Maestro de Bienes Raíces y sus modificaciones; Asegurar la supervisión responsable del medio-ambiente mediante la implementación de un Plan Integral de Recursos Naturales; y
Identificar, evolver y manejar lugares históricos y arqueológicos de acuerdo a lo presentando en el Plan Integral para el Manejo de Recursos Culturales.

Una tercera alternativa considera no solamente requisitos conocidos de misiones militares y modificaciones en las prácticas administrativas de Fort Bliss sino también esfuerzos de pre-planeación para mejorar su capacidad de respaldar nuevas tecnologías y requerimientos de los sistemas de armas, combate, y entrenamiento, descritos en el Concepto de Desarrollo de Area de Entrenamiento.

Otras alternativas con base en los comentarios del público pueden considerarse para su inclusión en el PEIS. El Ejército tiene previsto hacer una decisión definitiva sobre las acciones propuestas en el PEIS para Septiembre de 1998.

Con Respecto a Fort Bliss

Fort Bliss, con su historia que data desde 1847, comprende en la actualidad 1.1 millones de acres en el oeste de Texas y sur de Nuevo México. Está entre las instalaciones militares más extensas del Ejército en el espacio continental de los Estados Unidos (abreviado CONUS por sus siglas en Inglés) y es la única instalación en CONUS para el entrenamiento de tropas capaz de respaldar el lanzamiento de proyectiles de largo alcance. Esta instalación aloja aproximadamente 20,000 empleados militares y civiles. La población flotante depende de lo extenso de el o los ejercicios de entrenamiento en turno. Fort Bliss se compone de un complejo de instalaciones y campos de tiro diseñados para apoyar actividades de entrenamiento y pruebas militares del Ejército. Las áreas claves incluyen el Area Principal para Alojamiento de tropas (que constituye la mayoría de las instalaciones de apoyo incluyendo el Campo Aéreo Militar Biggs), y tres campos militares de tiro y áreas de maniobras, Area de Maniobras del Sur de Fort Bliss, Campo de Tiro de Doña Ana, el Complejo de Maniobras del Norte, y el Campo de Tiro de McGregor.

Entre las organizaciones importantes actualmente ubicadas en esta instalación se encuentran:

El Centro de Artillería de Defensa Aérea del Ejército de los EE. UU.;
La Escuela de Artillería de Defensa Aérea del Ejército de los EE. UU.;
La Academia de Sargentos Mayores del Ejército de los EE. UU.;
El Centro Médico William Beaumont del Ejército;
Cuatro Brigadas de Artillería de Defensa Aérea del Ejército de los EE. UU.;

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El Comando de la Fuerza Aerea Alemana en los EE. UU. y Canadá y la Escuela de Defensa Aerea de la Fuerza Aerea Alemana.

Para más información

Para ayudar al Ejército a cumplir con las metas del Acta de Política Ambiental Nacional y tomar mejores decisiones, favor de dirigir sus preguntas o comentarios sobre el PEIS a: Ms. Vicki Hamilton, PEIS Project Manager, Directorate of the Environment, Army Air Defense Artillery Center and Fort Bliss, Atención: ATZC-DOE-C (PEIS Comentarios), Fort Bliss, Texas 79916. Teléfono: (915) 568-2774 ó en Español con Rafael Corral (915) 568-6977.

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Appendix I

APPENDIX I

**1996 ROAD CLOSURES ON DOÑA ANA RANGE–NORTH TRAINING AREAS
AND
McGREGOR RANGE**

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**I.0 1996 ROAD CLOSURES ON DOÑA ANA RANGE–NORTH TRAINING AREAS
AND McGREGOR RANGE**

Access to these areas is provided by U.S. Highway 54, War Highway 11, and New Mexico Highway 506 (Dell City Cutoff). Access may be restricted during certain times of the year and/or at certain times of the day because of road closures implemented to protect public safety during military operations, exercises, or other training events. Tables I-1, I-2, and I-3 detail Fort Bliss road closures based on available 1996 data. Closures of War Highway 11 (Table I-1) on Doña Ana Range–North Training Areas, occurred on 15 days. Closures of New Mexico Highway 506 at the Dell City Cutoff (Table I-2), on McGregor Range, were in place on 57 days. Closures of Highway 54 (Table I-3), which is the boundary between Doña Ana Range–North Training Areas and McGregor Range, were in effect on 8 days. These data indicate that 1996 road closure were never in effect for an entire 24-hour period. The number of closure hours for all areas ranged from 1 hour on Highway 54 and War Highway 11, to 14 hours on New Mexico Highway 506-Dell City Cutoff.

When the new tactical target complex on McGregor Range is operational, training activities on the USAF-selected Otero Mesa target complex will require that access to areas south of New Mexico Highway 506 be closed for nonmilitary personnel for approximately 60 additional hours each week. New Mexico Highway 506 would not be closed for any period due to use of the tactical target complex (USAF, 1998).

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**Table I-1. 1996 Fort Bliss Road Closures: War Highway 11 on
Doña Ana Range–North Training Areas**

<i>Dates Open</i>	<i>Dates Closed</i>	<i>Hours Open</i>	<i>Times Closed</i>	<i>Hours Closed</i>	<i>% Time Closed</i>
1-7 Jan 96	none	168		0	
8-14 Jan 96	none	168		0	
15-21 Jan 96	none	168		0	
22-28 Jan 96	none	168		0	
29 Jan - 4 Feb 96	none	168		0	
5-11 Feb 96	none	168		0	
12-18-Feb 96	none	168		0	
19-25 Feb 96	none	168		0	
26 Feb - 3 Mar 96	none	168		0	
4-10 Mar 96	none	168		0	
Total		1,680		0	0.00%
11-17 Mar 96	14-Mar-96		1500-1600/1730-2100	4.5	
	15-Mar-96		0800-0930	1.5	
Total		162		6	3.57%
18-24 Mar 96	none	168		0	
25-31 Mar 96	none	168		0	
1-7 Apr 96	none	168		0	
8-14 Apr 96	none	168		0	
15-21 Apr 96	none	168		0	
Total		840		0	0.00%
22-28 Apr 96	24-26 Apr 96		1000-1500/1900-2400	10	
	27-Apr-96		1000-1500	5	
Total		153		15	8.93%
29 Apr - 5 May 96	2-3 May 96	161	1000-1500/2100-2300	7	4.17%
6-12 May 96	8-May-96		1300-1400	1	
	9-May-96		0100-0300/0800-1000/1400/1900-2100	8	
	10-May-96		0800-1000	2	
Total		157		11	6.55%
13-19 May 96	none	168		0	
20-26 May 96	none	168		0	
27 May-2 June 96	none	168		0	
3 - 9 June 96	none	168		0	
10-16 June 96	none	168		0	
17-23 June 96	none	168		0	
24-30 June 96	none	168		0	
1-7 July 96	none	168		0	
8-14 July 96	none	168		0	
15-21 July 96	none	168		0	
22-28 July 96	none	168		0	
29 July - 4 Aug 96	none	168		0	
5-11 Aug 96	none	168		0	
12-18 Aug 96	none	168		0	
19-25 Aug 96	none	168		0	
26 Aug - 1 Sep 96	none	168		0	
2-8 Sep 96	none	168		0	
Total		2,856		0	0.00%
9-15 Sep 96	10-Sep-96		1000-1400/1900-2400	9	
	11-Sep-96		0200-0500/0930-1430/1830-2400	5.5	

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**Table I-1. 1996 Fort Bliss Road Closures: War Highway 11 on
Doña Ana Range–North Training Areas (Continued)**

<i>Dates Open</i>	<i>Dates Closed</i>	<i>Hours Open</i>	<i>Times Closed</i>	<i>Hours Closed</i>	<i>% Time Closed</i>
	14-Sep-96		1800-2400	6	
	15-Sep-96		0300-0530/1000-1400/1900-2400	11.5	
Total		136		32	19.05%
16-22 Sep 96	16-Sep-96	157.5	0930-1430/1830-2400	10.5	6.25%
23-29 Sep 96	none	168		0	
30 Sep-6 Oct 96	none	168		0	
7-13 Oct 96	none	168		0	
14-20 Oct 96	none	168		0	
21-27 Oct 96	none	168		0	
28 Oct - 3 Nov 96	none	168		0	
Total		1,008		0	0.00%
4-10 Nov 96	4-Nov-96		0830-1200/1300-1600/1700-2400	13.5	
	5-Nov-96		0830-1200/1300-1600/1700-2400	13.5	
Total		141		27	16.07%
11-17 Nov 96	none	168		0	
20-24 Nov 96	none	168		0	
25 Nov - 1 Dec 96	none	168		0	
2-8 Dec 96	none	168		0	
9-15 Dec 96	none	168		0	
16-22 Dec 96	none	168		0	
23-29 Dec 96	none	168		0	
Total		1,176		0	0.0%
Grand Total		8,627.5		108.5	1.26%

**Table I-2. 1996 Fort Bliss Road Closures: Dell City Cutoff and
New Mexico Highway 506**

<i>Dates Open</i>	<i>Dates Closed</i>	<i>Hours Open</i>	<i>Times Closed</i>	<i>Hours Closed</i>	<i>% Time Closed</i>
9-15 July 90	none	168		0	
1-7 Jan 96	none	168		0	
8-14 Jan 96	none	168		0	
15-21 Jan 96	none	168		0	
22-28 Jan 96	none	168		0	
29 Jan - 4 Feb 96	none	168		0	
5-11 Feb 96	none	168		0	
12-18-Feb 96	none	168		0	
19-25 Feb 96	none	168		0	
26 Feb - 3 Mar 96	none	168		0	
4-10 Mar 96	none	168		0	
11-17 Mar 96	none	168		0	
18-24 Mar 96	none	168		0	
25-31 Mar 96	none	168		0	
1-7 Apr 96	none	168		0	
8-14 Apr 96	none	168		0	
15-21 Apr 96	none	168		0	
22-28 Apr 96	none	168		0	

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**Table I-2. 1996 Fort Bliss Road Closures: Dell City Cutoff and
New Mexico Highway 506 (Continued)**

<i>Dates Open</i>	<i>Dates Closed</i>	<i>Hours Open</i>	<i>Times Closed</i>	<i>Hours Closed</i>	<i>% Time Closed</i>
29 Apr - 5 May 96	none	168		0	
6-12 May 96	none	168		0	
13-19 May 96	none	168		0	
20-26 May 96	none	168		0	
27 May-2 June 96	none	168		0	
3 - 9 June 96	none	168		0	
10-16 June 96	none	168		0	
Total		4,200		0	0.00%
17-23 June 96	17-Jun-96		0900-1600	7	
	19-Jun-96		1130-2000	8.5	
	20-Jun-96		0700-2100	14	
Total		138.5		29.5	17.56%
24-30 June 96	24-Jun-96	160	0700-1500	8	4.76%
1-7 July 96	none	168		0	
8-14 July 96	none	168		0	
15-21 July 96	none	168		0	
Total		504		0	0.00%
22-28 July 96	24-Jul-96	158.5	0730-1700	9.5	5.65%
29 July - 4 Aug 96	none	168		0	
5-11 Aug 96	none	168		0	
12-18 Aug 96	none	168		0	
19-25 Aug 96	none	168		0	
Total		672		0	0.00%
26 Aug - 1 Sep 96	26-Aug-96		1200-1800	6	
	27-Aug-96		1200-1800	6	
	28-Aug-96		1200-1800	6	
	29-Aug-96		1200-1800	6	
Total		144		24	14.29%
2-8 Sep 96	3-Sep-96		1200-1800	6	
	4-Sep-96		0900-1800	8	
	5-Sep-96		0900-1800	8	
	6-Sep-96		1200-1800	6	
Total		140		28	16.67%
9-15 Sep 96	9-Sep-96		1200-1800	6	
	10-Sep-96		1200-1800	6	
	11-Sep-96		0900-1800	9	
	12-Sep-96		0900-1800	9	
Total		138		30	17.86%
16-22 Sep 96	16-Sep-96		1200-1800	6	
	17-Sep-96		1200-1800	6	
	18-Sep-96		0900-1800	9	
	19-Sep-96		0900-1800	9	
Total		138		30	17.86%
23-29 Sep 96	23-Sep-96		1200-1800	6	
	24-Sep-96		1200-1800	6	
	25-Sep-96		0900-1800	9	
	26-Sep-96		0900-1800	9	
Total		138		30	17.86%
30 Sep - 6 Oct 96	30-Sep-96		1200-1800	6	

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**Table I-2. 1996 Fort Bliss Road Closures: Dell City Cutoff and
New Mexico Highway 506 (Continued)**

<i>Dates Open</i>	<i>Dates Closed</i>	<i>Hours Open</i>	<i>Times Closed</i>	<i>Hours Closed</i>	<i>% Time Closed</i>
	1-Oct-96		1200-1800	6	
	2-Oct-96		0900-1800	9	
	3-Oct-96		0900-1800	9	
Total		138		30	17.86%
7-13 Oct 96	9-Oct-96		0900-1700	8	
	10-Oct-96		0900-1700	8	
Total		152		16	9.52%
14-20 Oct 96	14-Oct-96		1200-1800	6	
	15-Oct-96		1200-1800	6	
	16-Oct-96		0900-1800	8	
	17-Oct-96		0900-1800	8	
Total		140		28	16.67%
21-27 Oct 96	21-Oct-96		1200-1800	6	
	22-Oct-96		1200-1800	6	
	23-Oct-96		0900-1800	9	
	24-Oct-96		0900-1800	9	
	25-Oct-96		0900-1700	8	
	26-Oct-96		0900-1700	8	
Total		122		46	27.38%
28 Oct - 3 Nov 96	28-Oct-96		1200-1800	6	
	29-Oct-96		1200-1800	6	
	30-Oct-96		0900-1800	9	
	31-Oct-96		0900-1800	9	
Total		138		30	17.86%
4-10 Nov 96	4-Nov-96		1200-1800	6	
	5-Nov-96		1200-1800	6	
	6-Nov-96		0900-1800	9	
	7-Nov-96		0900-1800	9	
Total		138		30	17.86%
11-17 Nov 96	11-Nov-96		1200-1800	6	
	12-Nov-96		1000-1800	8	
	13-Nov-96		0900-1800	9	
	14-Nov-96		1200-1800	6	
	15-Nov-96		1200-1800	6	
	16-Nov-96		1200-1800	6	
Total		127		41	24.40%
18-24 Nov 96	18-Nov-96		1200-1800	6	
	19-Nov-96		1200-1800	6	
Total		156		12	7.14%
25 Nov - 1 Dec 96		168		0	
2-8 Dec 96		168		0	
9-15 Dec 96		168		0	
16-22 Dec 96		168		0	
23-29 Dec 96		168		0	
Total		840		0	0.00%
Grand Total		8,482		422	4.97%

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**Table I-3. 1996 Fort Bliss Road Closures: Doña Ana Range–North Training Areas
and McGregor Range**

<i>Dates Open</i>	<i>Dates Closed</i>	<i>Hours Open</i>	<i>Times Closed</i>	<i>Hrs Closed</i>	<i>% Time Closed</i>
5-11 Feb 96	8-Feb-96	166	0800-1000	2	1.19%
12-18-Feb 96	none	168		0	
19-25 Feb 96	none	168		0	
26 Feb - 3 Mar 96	none	168		0	
Total		504		0	0.00%
4-10 Mar 96	7-Mar-96	166	0800-1000	2	1.19%
11-17 Mar 96	none	168		0	
18-24 Mar 96	none	168		0	
25-31 Mar 96	none	168		0	
1-7 Apr 96	none	168		0	
8-14 Apr 96	none	168		0	
15-21 Apr 96	none	168		0	
22-28 Apr 96	none	168		0	
29 Apr - 5 May 96	none	168		0	
Total		1,344		0	0.00%
6-12 May 96	10-May-96	166	0800-1000	2	1.19%
13-19 May 96	16-May-96	167	0800-0900	1	0.60%
20-26 May 96	none	168		0	
27 May-2 June 96	none	168		0	
3 - 9 June 96	none	168		0	
10-16 June 96	none	168		0	
17-23 June 96	none	168		0	
24-30 June 96	none	168		0	
1-7 July 96	none	168		0	
8-14 July 96	none	168		0	
15-21 July 96	none	168		0	
22-28 July 96	none	168		0	
Total		1,680		3	0.00%
29 July - 4 Aug 96	1-Aug-96		0800-0930	1.5	
	2-Aug-96		0800-0930	1.5	
Total		165		3	0.00%
5-11 Aug 96	none	168		0	
12-18 Aug 96	none	168		0	
19-25 Aug 96	none	168		0	
26 Aug - 1 Sep 96	none	168		0	
2-8 Sep 96	none	168		0	
9-15 Sep 96	none	168		0	
Total		1,008		0	0.00%
16-22 Sep 96	19-Sep-96	166	0800-1000	2	1.19%
23-29 Sep 96	26-Sep-96	166	0800-1000	2	1.19%
30 Sep - 6 Oct 96	none	168		0	
7-13 Oct 96	none	168		0	
14-20 Oct 96	none	168		0	
21-27 Oct 96	none	168		0	
28 Oct - 3 Nov 96	none	168		0	
4-10 Nov 96	none	168		0	
11-17 Nov 96	none	168		0	
18-24 Nov 96	none	168		0	
25 Nov - 1 Dec 96	none	168		0	

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**Table I-3. 1996 Fort Bliss Road Closures: Doña Ana Range–North Training Areas
and McGregor Range (Continued)**

<i>Dates Open</i>	<i>Dates Closed</i>	<i>Hours Open</i>	<i>Times Closed</i>	<i>Hrs Closed</i>	<i>% Time Closed</i>
2-8 Dec 96	none	168		0	
9-15 Dec 96	none	168		0	
16-22 Dec 96	none	168		0	
23-29 Dec 96	none	168		0	
<i>Total</i>		<i>2,184</i>		<i>0</i>	<i>0.00%</i>
<i>Grand Total</i>		<i>7,882</i>		<i>14</i>	<i>0.18%</i>

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Appendix **J**

**APPENDIX J
AGREED FINAL JUDGMENT FOR AIR QUALITY**

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IN THE UNITED STATES DISTRICT COURT
FOR THE WESTERN DISTRICT OF TEXAS
EL PASO DIVISION

STATE OF TEXAS,	§	
Plaintiff,	§	
	§	
V.	§	CIVIL ACTION NO. _____
	§	
U.S. ARMY AIR DEFENSE ARTILLERY	§	
CENTER AND FORT BLISS, and ARMY	§	
AIR FORCE EXCHANGE SYSTEM,	§	
Defendant.	§	

AGREED FINAL JUDGMENT

BE IT REMEMBERED that on this day, the State of Texas ("State"), by and through Texas Attorney General Dan Morales, on behalf of the people of Texas and the Texas Natural Resource Conservation Commission ("TNRCC"), Plaintiff in the above-referenced cause, and the U.S. Army Air Defense Artillery Center and Fort Bliss ("Army"), and the Army Air Force Exchange System ("AAFES"), Defendants herein, presented to the Court this proposed Agreed Final Judgment ("Judgment"). By and through their duly authorized signatures, the parties represented to the Court the following: that they understand the terms of this Judgment; that they agree to the terms of this Judgment; that they have waived all rights of appeal with regard to the alleged violations raised in the notices of violation; that they acknowledge receipt of copies of this Judgment; that they actively participated in the negotiations leading up to this Judgment and are well aware of the duties placed upon them by it and are desirous and capable of carrying out those duties in full; that it represents a compromise and settlement of all matters arising out of facts alleged by the State of Texas in this

cause and all matters arising out of facts alleged by the TNRCC (and its predecessor agency the Texas Air Control Board) as set forth in Notices of Violation issued to Defendant under the Texas Clean Air Act, Chapter 382 of the Texas Health & Safety Code; that it is the intention of the parties to fully settle, compromise and resolve these matters through the date of entry of this Judgment by the Court; that no party agrees to this Judgment as a result of duress; that all parties waive any claims of duress that might be made; that notwithstanding the jurisdictional admissions made above, the Defendant does not admit or deny any of the facts or law as alleged in the notices of violation or other allegations underlying this Judgment, but enters into this agreement because of the uncertainty and costs of litigation; and that the injunction contained in this Judgment is sufficiently detailed and specific so as to be enforceable by the Court.

As used in this Judgment, the parties understand that "Fort Bliss" shall mean all facilities provided, operated, maintained or managed by the Army at Fort Bliss, Biggs Army Air Field, William Beaumont Army Medical Centers, and any other entity operating on Fort Bliss under the Department of Defense.

No provision of this decree shall be interpreted as or constitute a commitment or requirement that Defendants obligate funds in contravention of the Anti-Deficiency Act, 31 U.S.C. Section 1341.

Defendants' obligation to comply with the terms set forth in the injunction contained in this Judgment may be delayed or excused only to the extent that noncompliance is caused by force majeure. Force majeure shall mean any event arising from causes beyond the control of the Defendants that causes a delay or prevents the performance of any obligation under the Judgment, including acts of God, fire, war, insurrection, civil disturbance, explosion, unanticipated damage to equipment despite diligent maintenance, adverse weather conditions that were not anticipated,

unusual delay in transportation, and restraint by court order or order of public authority. In the event of a force majeure which impedes or delays compliance with a requirement contained in this Judgment, Defendants shall notify the Office of the Attorney General and the Texas Natural Resource Conservation Commission within twenty-four (24) hours of the delay or anticipated delay. The notice shall be in writing and shall describe in detail the injunctive requirement involved, the precise cause(s) of the delay, the anticipated length of the delay, the measures taken and to be taken by the Defendants to prevent or minimize the delay, and the timetable by which those measures will be implemented. Defendants shall adopt all reasonable measures to avoid or minimize any delay or noncompliance. Failure of Defendants to comply with the notice requirements of this paragraph shall render this paragraph void and of no effect as to the particular incident involved, and shall constitute a waiver of Defendants' right to request an extension of time to comply with the particular injunctive requirement.

Notwithstanding the entry by the Army and Air Force Exchange Service (AAFES) into this Agreed Final Judgment for the purpose of resolving alleged previous violations of the Texas Clean Air Act, AAFES reserves the right to contest, at any future time, whether, as a Non-Appropriated Fund Instrumentality of the United States, it is a covered person under the provisions of 30 TAC 3.2. The parties agree that the participation by AAFES in this Agreed Final Judgment shall have no precedential value for any purpose other than to enforce the terms of this Judgment, subject to this reservation of rights to contest the applicability of State rule in this case.

The Court, having reviewed the recommended Agreed Final Judgment, determines that all matters between the parties as alleged in the petition have been settled and compromised; finds that it is proper under the Texas Clean Air Act; and approves this Judgment.

I.
Asbestos Management

IT IS THEREFORE ORDERED, ADJUDGED, AND DECREED, that Defendant Army, its officers, agents, contractors, and employees, are enjoined to comply with the following prohibitions and requirements at Fort Bliss located in El Paso County, Texas:

A. Defendant shall hire and keep on staff at all times an Installation Asbestos Program Manager (“APM”), or interim replacement assigned to the Directorate of Environment (“DOE”), whose duties and authority shall include:

- i) acting as the primary point of contact for all asbestos related projects at Fort Bliss;
- ii) managing communications with any employee, manager, commander (to include senior commanders at Fort Bliss), or contractor about any asbestos related issue;
- iii) maintaining certification records of all employees who are involved in asbestos related projects at Fort Bliss and ensuring that all such employees receive and maintain proper certification;
- iv) conducting annual asbestos awareness training for all Fort Bliss employees who work in construction, demolition, repair or renovation projects at Fort Bliss; and
- v) chairing the Asbestos Management Team of the Environmental Quality Control Committee, which includes representatives from the Fort Bliss Safety Office, the Staff Judge Advocate, the Preventative Medicine Service of William Beaumont Army Medical Center, the Directorate of Public Works and Logistics, the Directorate of Contracting, the Directorate of Civilian Personnel, and the Public Affairs Office.

vi) maintaining the facilities' constant and continuous compliance with all applicable rules under the National Emission Standard for Hazardous Air Pollutants ("NESHAP"), 40 C.F.R. Part 61, Subpart M.

B. The APM shall continue to be certified in all areas of asbestos management, including inspection, design and contract supervision.

C. The APM shall have authority to stop any activities that he considers to be in violation of applicable asbestos requirements, 40 C.F.R. Part 61, Subpart M. No demolition, renovation or other potential disturbance of asbestos will take place on Fort Bliss without prior notification to, and approval in writing from, the APM.

D. For any renovation, demolition, repair, or construction of a structure that possibly contains asbestos, whether accomplished by in-house staff, the U.S. Army Corps of Engineers, the Job Order Contractor, or a general construction contractor through the Directorate of Contracting, the APM shall be invited to all pre-construction conferences. The APM shall notify the Asbestos Management Team about any conferences that involve asbestos management. At the conference, the APM shall notify the contractor and engineering staff of any statutory or regulatory requirements regarding asbestos abatement, and advise regarding procedures to be followed should potential asbestos be uncovered or discovered during the renovation or repair process.

E. The APM shall have authority to inspect any project involving renovation, demolition, repair or construction of a facility at any time, with or without notice. Final clearance of any containment or work area and review of air test results regarding compliance with applicable asbestos statutory and regulatory requirements will be the sole responsibility of the APM or his designated representative, who shall be certified in all applicable areas.

F. The APM shall be advised of the time and location of the transportation and disposal activities and shall be provided a copy of the disposal form after completion of disposal.

G. Authorized representatives from the State of Texas and the El Paso City-County Health District shall have the right to inspect the facility in accordance with Sections 382.015 and 382.022 of the Texas Health & Safety Code. The APM shall make a reasonable effort to accompany the representatives to any site on Fort Bliss.

H. The APM is responsible to ensure that Fort Bliss complies with all federal, state, and local regulations concerning notification to federal and state agencies about asbestos related projects.

I. All buildings and structures at Fort Bliss shall be considered as asbestos-containing structures until certified otherwise in writing by the Directorate of Environment, Asbestos Program.

J. Activities considered 'custodial and housekeeping operations' under Fort Bliss asbestos policies shall explicitly be stated in such policies to exclude any activities covered under NESHAP, 40 CFR Part 61, Subpart M. Defendant acknowledges its obligation to comply with the asbestos NESHAP.

K. The Installation Safety Officer shall notify the APM of each asbestos-related complaint and include the APM in the investigation process. The APM shall approve the final resolution of each such complaint.

II. Dust Control

IT IS FURTHER ORDERED, ADJUDGED, AND DECREED, that Defendant Army, its officers, agents, contractors, and employees, are enjoined to comply with the following prohibitions and requirements at Fort Bliss located in El Paso County, Texas:

- A. Defendant shall at all times comply with the requirements of 30 TAC Section 101.4 along Landfill Road and within the Fort Bliss landfill.
- B. Defendant shall establish dust reduction zones along Landfill Road. Within these zones, off-road vehicles shall be limited to 10 miles per hour.
- C. Defendant shall apply water and/or dust suppressant chemicals to all unpaved roads (including the shoulder of Landfill Road) at Fort Bliss as necessary to prevent a violation of 30 TAC Sections 101.4 and 111.147.
- D. Defendant shall ensure that tarps are installed on all trucks transporting construction debris, dirt, or other materials, and shall ensure that the tarps fully cover the load being transported to ensure compliance with 30 TAC Section 111.143 (3).
- E. Defendant shall at all times comply with 30 TAC Section 111.101 regarding control of visible emissions and particulate matter along Landfill Road and within the Fort Bliss landfill.
- F. Whenever vehicles and/or equipment are utilized within the landfill, Fort Bliss shall apply water and/or dust suppressant chemicals to the affected areas to ensure compliance with 30 TAC Section 101.4 and Chapter 111.

**III.
Gasoline Truck Inspections**

IT IS FURTHER ORDERED, ADJUDGED, AND DECREED, that Defendant Army and AAFES, their officers, agents, contractors, and employees, are enjoined to comply with the following prohibitions and requirements at Fort Bliss located in El Paso County, Texas:

- A. All gasoline trucks with capacities of 1,000 gallons or more shall have valid leak tight test stickers and supporting documentation as required by 30 TAC Sections 115.234 - 115.239. Fuel shall

not be loaded or unloaded from tank trucks that are not in compliance with 30 TAC Sections 115.234 - 115.239.

B. The Army Air Force Exchange Service, Fort Bliss convenience stores, the Directorate of Public Works and Logistics, and the Directorate in charge of the General Services Administration motor pools shall record the leak test certificate number in log books when gasoline is delivered to satisfy 30 TAC Sections 115.234 - 115.239.

IV. Oxygenated Fuel

IT IS FURTHER ORDERED, ADJUDGED, AND DECREED, that Defendant Army and AAFES, their officers, agents, contractors, and employees, are enjoined to comply with the following prohibitions and requirements at Fort Bliss located in El Paso County, Texas:

A. Gasoline dispensed at Fort Bliss between October 1 and March 31 each year must be oxygenated gasoline containing at least 2.7 weight percent oxygen.

B. Labels shall be applied to the pumps to notify employees and users that only oxygenated fuel will be dispensed at the pumps between October 1 and March 31 of each year.

C. Between September 16 and September 30 of each year, the Directorate of Environment shall take and have analyzed samples of gasoline to ensure that gasoline being dispensed contains at least 2.7 weight percent oxygen.

V. Court Costs

IT IS FURTHER ORDERED, ADJUDGED AND DECREED that each party shall pay its respective costs of Court.

VI.
Termination of Injunction

Upon the passage of five (5) years from the date this Judgment is signed by the Court, Defendants may petition the Court for termination of the injunction contained in this Judgment if the Defendants have been in compliance with the injunction during the proceeding two (2) years. Defendants shall serve a copy of the petition for termination of the injunction upon the Office of the Attorney General at least thirty (30) days prior to submission to the Court. If the Plaintiff objects to the petition, and there is a hearing before the Court, the burden of proving compliance shall be upon the Defendants. If the Plaintiff objects to the petition, any objection shall be stated specifically so as to provide sufficient detail to enable Defendants to address the objections of the Plaintiff.

VII.
Continuing Jurisdiction

Until this Judgment is terminated by the Court, the Court will retain continuing jurisdiction to enforce and/or modify the terms of this Judgment.

VIII.
Other Claims

All claims for relief not expressly granted herein are denied.

SIGNED this _____ day of _____, 1998

JUDGE PRESIDING

J-11

APPROVED AS TO FORM AND SUBSTANCE AND ENTRY REQUESTED:

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Attorney General of Texas

JORGE VEGA
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DEPARTMENT OF THE ARMY
HEADQUARTERS, U.S. ARMY AIR DEFENSE ARTILLERY CENTER AND FORT BLISS
1733 PLEASANTON ROAD
FORT BLISS, TEXAS 79916-6816

REPLY TO
ATTENTION OF

ATZC-CG

MEMORANDUM FOR DISTRIBUTION

SUBJECT: Dust Control in Fort Bliss Activities

1. Fugitive dust emissions are a serious concern to Fort Bliss and the City of El Paso. This memorandum prescribes policies for the management of Fort Bliss activities that may cause fugitive dust emissions.
2. This policy applies to all military, civilian and contractor personnel who are involved in activities that may cause fugitive dust emissions, including construction, training and transportation. This policy applies to all Fort Bliss activities, both contractor and DoD personnel. This policy does not apply to training activities in areas outside those areas identified in paragraph 3a(4) below.
3. Policy
 - a. Statement of Policy
 - (1) Fort Bliss will minimize fugitive dust emissions from Fort Bliss activities.
 - (2) Any truck transporting construction debris, dirt, or other materials, will be covered.
 - (3) Supervisors in charge of construction projects will ensure that when earth disturbing activities are involved, appropriate watering will be done to control dust.
 - (4) During training, unit commanders will observe the following dust control requirements:
 - (a) When crossing Fred Wilson Road, units will ensure that sufficient water or other dust suppressant is applied to unpaved areas to control dust.
 - (b) All off-road traffic will observe the dust reduction zone along Landfill Road by traveling at the posted speed limit and ensuring that sufficient water is applied when necessary to control dust emissions.
 - (5) Fort Bliss military police have authority to stop and correct any activities in

ATZC-CG

SUBJECT: Dust Control in Fort Bliss Activities

violation of this policy. Uncovered trucks carrying materials that may cause fugitive dust emissions will be denied access to Fort Bliss.

b. Expiration of Policy

- (1) This policy is exempt from normal administrative review requirements.
- (2) This policy will remain active and in force indefinitely.

JOHN COSTELLO
Major General, U.S. Army
Commanding

DISTRIBUTION:

A



DEPARTMENT OF THE ARMY
HEADQUARTERS, U.S. ARMY AIR DEFENSE ARTILLERY CENTER AND FORT BLISS
1733 PLEASANTON ROAD
FORT BLISS, TEXAS 79916-6816



REPLY TO
ATTENTION OF

ATZC-DOE (200)

MEMORANDUM FOR DISTRIBUTION

SUBJECT: Asbestos Management in Fort Bliss Facilities

1. This memorandum prescribes policies, assigns responsibilities, and establishes procedures for the management of Fort Bliss facilities that may contain asbestos materials.
2. This policy letter applies to all military, civilian, and contractor personnel who occupy, maintain, renovate, or demolish facilities provided, operated, maintained or managed by the Army at Fort Bliss, Biggs Army Airfield, William Beaumont Army Medical Center and any other entity operating on Fort Bliss under the Department of Defense.
3. Asbestos is a mineral that was used in the building trades and their industries due to its outstanding physical properties. Asbestos is termed as either friable or nonfriable based on its ability to be crumbled by hand pressure. Many buildings at Fort Bliss were built or renovated between 1940-1975 when the use of asbestos was still the industry norm. The majority of this asbestos was in the form of pipe insulation, most of which has been removed and replaced with non-hazardous materials. Several other types of asbestos containing materials, such as floor tile, cement siding and wall/ceiling coverings, etc. remain in place throughout Fort Bliss facilities. This, in itself, does not present a health hazard to personnel as such materials are relatively stable and do not produce friable asbestos under normal conditions.
4. Policy
 - a. Statement of Policy

(1) The Directorate of Environment, Asbestos Program Manager, is the primary contact for all asbestos related projects at Ft. Bliss. He has express authority to communicate with any employee, manager, commander (to include the Command Group at Ft. Bliss), or contractor about any asbestos related issues. He has express authority to review, inspect and investigate all asbestos related activities and take any action necessary to prevent any potential violation of federal, state and local regulations. He chairs the Asbestos Management Team of the Environmental Quality Control Council, which will include representatives from the Ft. Bliss Safety Office, the Staff Judge Advocate, Preventive Medicine Service of WBAMC, Directorate of Contracting, Directorate of Public Works and Logistics, Civilian Personnel and Public Affairs.

ATZC-DOE (200)

SUBJECT: Asbestos Management in Fort Bliss Facilities

(2) All buildings and structures at Fort Bliss are considered as asbestos containing structures until certified otherwise in writing by the Directorate of Environment, Asbestos Program Manager.

(3) No renovation, demolition, or rehabilitation work will be performed on or within an asbestos bearing structure or building until coordination and concurrence has been obtained from the Directorate of Environment, Asbestos Program Manager.

(4) No communications, ADP, cable TV, or other similar work will be performed on or within an asbestos bearing structure or building, if such work will disturb existing walls, ceilings, floors, or HVAC systems until coordination and concurrence has been obtained from the Directorate of Environment, Asbestos Program Manager.

(5) Repair and maintenance operations which involve the intentional disturbance of asbestos containing materials (ACM) or presumed asbestos containing materials (PACM) will not be performed until coordination and concurrence has been obtained from the Directorate of Environment, Asbestos Program Manager.

(6) All emergency work which will impact any ACM or PACM is limited to minimizing or preventing health risk, property loss or damage. THERE WILL BE NO EXCEPTIONS TO THIS REQUIREMENT.

(7) Custodial and housekeeping operations (vacuuming, waste disposal, care of asbestos-containing material flooring material and dusting) where there is minimal contact with asbestos containing materials are covered under the Asbestos Management Plan in accordance with OSHA's 29 CFR 1926.1101, Asbestos. NESHAP Subpart M will be followed as applicable.

b. Scope of Policy.

(1) This policy applies to all Ft. Bliss activities, both contractor and DOD personnel.

(2) This policy does not apply to new construction or buildings certified as asbestos free by an accredited asbestos inspector. An asbestos free building is a building which does not contain any regulated asbestos containing material.

5. Policy Implementation and Responsibilities

a. Commanding General (CG) will:

(1) Enforce and execute the adopted Fort Bliss Facilities' Asbestos Management Policy.

ATZC-DOE (200)

SUBJECT: Asbestos Management in Fort Bliss Facilities

b. The Director of Environment (DOE) will:

(1) Designate in writing an Asbestos Program Manager (APM) to administer this policy. This individual can be reached at (DOE, 568-0931).

(2) Transmit all completed Demolition/Renovation Notification Forms (dated 10/10/94) to the Texas Department of Health and provide a copy to the El Paso City-County Health & Environment District no later than ten working days prior to commencement of work in accordance with National Emission Standard for Hazardous Air Pollutants (NESHAP) 40 C.F.R. Part 61, Subpart M. All notices must be received by DOE no less than 15 working days prior to a project start date.

(3) Transmit all completed Asbestos Demolition/Renovation Notification (date 6/10/91) to the New Mexico Environment Department in accordance with National Emission Standard for Hazardous Air Pollutants (NESHAP) 40 C.F.R. Part 61, Subpart M.. All notices must be received by DOE no less than 15 working days prior to a project start date.

(4) The APM is the designated representative of the facility owner and will be the signatory on all asbestos notifications.

(5) Provide for quality control/quality assurance on all asbestos remediation and disposal actions.

(6) Coordinate, execute and enforce the adopted Fort Bliss Facilities' Asbestos Management Policy.

(7) The APM shall review and approve all plans and specifications, and changes or modifications thereto, for all asbestos abatement projects.

(8) The APM has the authority to stop any asbestos related activity which is in violation or has the potential for a violation with any applicable federal, state or local regulations.

c. The Directorate of Public Works and Logistics (DPW&L) will:

(1) Coordinate with the APM for concurrence on any step taken to manage to asbestos, including approval of contracts dealing with management, removal, disposal of asbestos containing materials, asbestos surveys, inspection results, master planning documents, and plans and specifications for asbestos abatement projects.

(2) Program and budget adequate resources to identify, manage, and control exposure to asbestos.

ATZC-DOE (200)

SUBJECT: Asbestos Management in Fort Bliss Facilities

(3) Maintain records of asbestos surveys and inspection results and plans, and update the records as changes occur.

(4) Annotate master planning documents and record drawings to indicate real property that contains asbestos materials.

(5) Designate a Contracting Officer's Representative and supervise all asbestos remediation and disposal actions.

(6) Review all plans and specifications for asbestos abatement projects on the installation.

(7) Sign as the facility owner/operator of the sanitary landfill for receipt of asbestos containing material on all Uniform Hazardous Waste Manifests.

(8) Designate an individual to coordinate with the APM all DPW&L asbestos related activities, inspections, work orders, delivery orders and work approval processes.

d. Preventive Medicine, WBAMC will:

(1) Provide guidance, assistance, and recommendations in the areas of asbestos surveys, sampling, exposure control, and risk assessments in accordance with TB MED 513 Guidelines for the Evaluation and Control of Asbestos Exposure.

(2) Maintain health records of all employees and former employees involved in working with asbestos, as required by all applicable laws and regulations.

(3) Monitor all work areas occupied by government employees where there is a potential for asbestos exposure.

e. The Installation Safety Officer will:

(1) Support DOE, DPW&L, and Preventive Medicine, WBAMC in all safety matters relating to asbestos management.

(2) Receive and investigate asbestos related complaints of unsafe working conditions.

(3) Provide expertise in complying with asbestos related worker safety Federal, State, and local requirements under 29 CFR Part 1926.

(4) Will notify the APM of each asbestos related complaint, and is included in the investigative loop, and approves the final resolution of each asbestos related complaint.

ATZC-DOE (200)

SUBJECT: Asbestos Management in Fort Bliss Facilities

f. Work Performed by Fort Bliss Organizations.

(1) Includes but is not limited to shop personnel, self-help, u-do-it, prisoner labor and military personnel.

(2) The procedures shown for Work Approval are effective immediately see Attachment A.

(3) These procedures apply to all work which disturbs or modifies existing ceilings, walls, floors, HVAC systems, or any part of an existing building/structure, no matter how minimal or brief or otherwise comes within the National Emission Standards for Hazardous Air Pollutants (NESHAP) 40 C.F.R. Part 61, Subpart M.

(4) The individual initiating the work order where the work is to be performed is designated the "Responsible Individual" for compliance with the requirements established by the Work Approval Process for Asbestos Clearance, Attachment A.

g. Work Performed by DPW&L Managed Contractors

(1) The procedures for Work Approval for Asbestos Clearance are effective immediately see Attachment A.

(2) The DPW&L has the option of pre-notifying its contractors of potential asbestos presence or contamination and requiring the contractor to mitigate such presence as part of the contract, or DPWL may perform such mitigation using government personnel or other contractors prior to the contractors beginning work.

(3) The DPW&L division or office chief responsible for work accomplishment is the Responsible Individual for compliance with the requirements established by the Work Approval Process for Asbestos Clearance, Attachment A.. The DPW&L action officer or individual overseeing a project may be delegated responsibility for compliance with Attachment A. However, the DPWL division or office chief will remain the Responsible Individual for accountability purposes.

h. Work Performed by Tenant Activities, Other Organizations and Liaisons.

(1) DPW&L and the APM will be advised of any work conducted on existing facilities that will intentionally disturb asbestos or presumed asbestos containing material.

(2) Tenant Activities, etc. have the option of pre-notifying their contractors of potential asbestos presence or contamination and requiring the contractor to mitigate such presence as part of the contract, or DPW&L may perform such mitigation using the Fort Bliss asbestos

ATZC-DOE (200)

SUBJECT: Asbestos Management in Fort Bliss Facilities

requirements contract in accordance with Fort Bliss Asbestos Specifications.

(3) Tenant Activities, etc. may design asbestos abatement specifications or may use Fort Bliss's Asbestos Specifications; however, all specifications will be coordinated through DPW&L and DOE Asbestos Program Manager for final review and approval. The specifications must comply with Subpart M.

(4) The Contracting Officer's Representative (COR) must provide the contractor a copy of this policy within 5 days after the date of publication.

(5) The COR is designated as the Responsible Individual for assuring compliance with the requirements established by this policy. Tenants activities are ultimately responsible and accountable with compliance of all applicable federal, state and local regulations. The APM will have final review and approval of asbestos related activities.

(6) Tenant Activities, etc., are required to report any suspected problem with asbestos to the Asbestos Program Manager.

6. Expiration of Policy

- a. This policy is exempt from normal administrative review requirements.
- b. This policy will remain active and in-force until further notice.

JOHN COSTELLO
Major General , U.S. Army
Commanding

DISTRIBUTION:

A

ATZC-DOE (200)

SUBJECT: Asbestos Management in Fort Bliss Facilities

Attachment A

WORK APPROVAL PROCESS FOR ASBESTOS CLEARANCE

1. WORK APPROVAL PROCESS

a. The normal DA Form 4283-1 Work Order process will be used to obtain asbestos clearance for all work. A separate DA Form 4283-1 does not have to be processed for asbestos clearance if the requested work would normally require a DA Form 4283-1 to be processed through DPWL. The information required would normally be annotated on the Work Order.

b. The responsible individual will prepare a DA 4283-1 Work Order for the proposed work and attach a short description of the proposed work locations, the work performance method, and a copy of the "asbestos free" certification (if available). The DA 4283-1 will then be submitted to the DPWL Engineering Work Reception Office for entry into the IFS-M databank at least two weeks in advance of the proposed work start date. In the event of an emergency, the DA 4283-1 may be hand carried to the DPWL Work Reception Office for special handling--BUT IT MUST BE SIGNED OR COUNTERSIGNED BY THE DIRECTOR/OFFICE CHIEF OR TENANT COMMANDER AND INCLUDE A STATEMENT DECLARING THE NATURE OF THE EMERGENCY. The activity head MAY NOT delegate this responsibility to subordinate personnel.

c. The DPW&L Engineering Work Reception Office will process the work order in accordance with standard procedures. The Chief, Engineering Work Reception has the authority to issue an asbestos clearance of work when it does not impact asbestos containing materials or presumed asbestos containing materials. The Chief, Engineering Work Reception will provide advance notice to the APM all the projects certified as having no impact on asbestos containing material to insure compliance with NESHAP 40 CFR Subpart M. Those work orders which have been determined to require asbestos clearance will be forwarded to the Asbestos Program Manager, Directorate of Environment who will:

(1) review the request against available records from the installation asbestos inspections;
and

(2) review the request against "asbestos free" certification on file; and/or

(3) schedule an on-site inspection to determine if asbestos is present; if no survey data is available for subject facility; and

(4) notify the Responsible Individual telephonically or via e-mail of the course of action, approved or disapproved.

ATZC-DOE (200)

SUBJECT: Asbestos Management in Fort Facilities

(a) based on favorable findings (no asbestos or work does not require disturbance of asbestos) the APM will approve the DA 4283-1 and return it to DPWL Engineering Work Reception Office for recording of real property data. One copy of the DA 4283-1 will be forwarded to the Responsible Individual upon receipt. The Responsible Individual will use this copy as approval for work to begin. The DPWL will use the approved DA 4283-1 as authority to proceed with either self-help, in-house or contract work.

(b) Based on unfavorable findings (asbestos requiring stabilization or removal) the APM will contact the Responsible Individual and assist in determining the best course of action prior to continuing the work approval process.

(c) If asbestos inspection and analysis, removal or stabilization is required, the cost of such work must be charged against the proposed project and funded from within the activity's approved RPMA funding account.

(d) The proposed work WILL NOT begin until all asbestos related actions have been completed to the satisfaction of the State of Texas, Texas Department of Health, as determined by a review performed by APM , Directorate of Environment.

2. Proponency and Compliance Reviews

a. The Director of Environment and the Director of Public Works and Logistics are the proponents for this policy and its implementing procedures. All changes and updates to this Appendix will be approved by both organizations.

b. The Inspector General's Office will audit compliance with this policy and implementing procedures.

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Appendix **K**

APPENDIX K

FORT BLISS RESIDENTIAL WATER CONSERVATION POLICY

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<h1>POLICY</h1>		NUMBER: D-6
SUBJECT: Water Conservation Policy		DATE: 3 April 1998
<p>POLICY:</p> <p>1. As a good steward of our resources, Fort Bliss must conserve water. Guidance is provided to support our conservation efforts as we take care of our grounds and lawns. The following policy is effective immediately:</p> <ul style="list-style-type: none"> a. No watering on Mondays. b. For May through September, limit watering to twice a week for a maximum of 45 minutes in any one area of the lawn. Watering times are 0500-0900 and 1800-2200 on authorized days (Tuesday, Thursday, and Saturday for even numbered addresses, and Wednesday , Friday, and Sunday for odd numbered addresses). c. During April and October only, limit watering to the above days and times, but only once per week. d. During November through March, water lawns once per month when the temperature is above freezing. e. Plants must be watered from a container on days when watering is restricted. f. To cut grass, set the cutting height of lawn mower to two or two and a half inches. g. Private car washing is permitted, using an automatic shut-off nozzle. Fund raising car washes are permitted only at reimbursable metered facilities and only with automatic shut-off nozzles. For information on metered facilities, contact the Energy Conservation Office at 568-3107/6627. h. Hosing driveways, sidewalks, and walls, etc., for cleaning is prohibited. <p>2. This memorandum supersedes memorandum HQ, USAADACENFB, ATZC-ISE-P, 20 March 1997, Subject: Water Conservation Policy.</p> <p style="text-align: right;">JOHN COSTELLO Major General, USA Commanding</p>		
ORIGINATING OFFICE Directorate of Public Works and Logistics		



DEPARTMENT OF THE ARMY
HEADQUARTERS, U.S. ARMY AIR DEFENSE ARTILLERY CENTER AND FORT BLISS
1733 PLEASANTON ROAD
FORT BLISS, TEXAS 79916-6816



REPLY TO
ATTENTION OF


ATZC-ISE-P (310-2d)

20 March 1997

MEMORANDUM FOR SEE DISTRIBUTION

SUBJECT: Water Conservation Policy

1. As a good steward of our natural resources, Fort Bliss must conserve water.
2. The following policy is effective 1 April 1997 and will remain in effect until rescinded or superseded:
 - a. No watering on Mondays.
 - b. For May through September, limit watering to twice per week for a maximum of 45 minutes in any one area of the lawn. Watering times are 0500 - 0900 and 1830 - 2200 on authorized days (even calendar numbered days for even numbered addresses and odd calendar numbered days for odd numbered addresses).
 - c. For April and October only, limit watering to the schedule above, but watering may be once per week.
 - d. For November through March, water lawns once per month when the temperature is above freezing.
 - e. Plants must be watered from a container on days when watering is restricted.
 - f. Set the cutting height of lawn mower to cut grass to a height of 2 - 2 ½ inches.
 - g. Private car washing is permitted, using an automatic shut-off nozzle. Fund raising car washes are permitted only at reimbursable metered facilities and only with automatic shut-off nozzles. For information on metered facilities, contact the Energy Office at 568-3107/6627.
 - h. Hosing driveways, sidewalks, walls, etc., for cleaning is prohibited.
3. This memorandum supersedes memorandum HQ, USAADACENFB, ATZC-ISE-WM, 30 August 1995, Subject: Water Conservation Policy.


JOHN COSTELLO
Major General, U.S. Army
Commanding

DISTRIBUTION: A

K-4

WATER CONSERVATION MEASURES FOR FORT BLISS

1. All new family housing construction specifies ground source heat pumps for the HVAC system. This saves approximately 13,000 gallons of water per cooler per season.
2. All new housing construction specifies 1.6 gallons per flush toilets, low flow showerheads, and faucet aerators with restrictors on all sinks and lavatories.
3. All new housing construction specifies desert (xeriscape) landscaping in the front yard, with water thrifty or native plants and shrubs.
4. Requested funding for a waterless urinal retrofit for all major buildings.
5. A no-heat/no-cool policy is in effect for the months of May and October each year. During these two months, no cooling is authorized which saves the water normally used for evaporative cooling.
6. A frequency modulated (FM) control system is in use on all family housing quarters having evaporative coolers, all barracks, and most training buildings. This system limits the operating hours of the evaporative coolers to 0900 - 0200 daily. It also cycles off the coolers for 2.5 minutes out of every 20 minutes during the operating time each day. This results in a reduction in the amount of water used for evaporative cooling.
7. Several projects to replace water mains and laterals have been completed in the last few years. These projects eliminated a significant amount of leakage due to old piping.
8. The installation cooling policy forbids operation of the cooling systems (primarily evaporative) before 0900 or after 2200 each day. It also requires the shut off of coolers in administrative areas 1/2 hour before quitting.
9. Only air cooled ice machines are allowed. Water cooled machines circulate water through the heat exchanger one time then waste it down the drain.
10. The installation watering policy (attached) is in effect which limits turf watering times and days, restricts car washes, prohibits washing down pavement areas, etc.

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Attachment 1

ATTACHMENT 1

REFERENCES

**Fort Bliss Mission and Master Plan
Final Programmatic Environmental Impact Statement**

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**Fort Bliss Mission and Master Plan
Final Programmatic Environmental Impact Statement**

ATTACHMENT 1

REFERENCES

References are included in Chapter 11 of Volume I.

**Fort Bliss Mission and Master Plan
Final Programmatic Environmental Impact Statement**

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**ATTACHMENT 2
INDEX OF THE APPENDICES**

**Fort Bliss Mission and Master Plan
Final Programmatic Environmental Impact Statement**

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**Fort Bliss Mission and Master Plan
Final Programmatic Environmental Impact Statement**

ATTACHMENT 2

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LIST OF ACRONYMS IN THE APPENDICES

AAF	Army Airfield	EBS	Environmental Baseline Survey
AAFES	Army Air Force Exchange Service	EIS	Environmental Impact Statement
ACC	Air Combat Command	EO	Executive Order
ACEC	Area of Critical Environmental Concern	EPA	U.S. Environmental Protection Agency
ACHP	Advisory Council on Historic Preservation	EPCWID	El Paso County Water Improvement District #1
af	Acre Feet	EPIA	El Paso International Airport
AMRAAM	Advanced Medium-range Air-to-Air Missile	ERINT	Extended Range Intercept Technology
ANSI	American National Standards Institute	FAA	Federal Aviation Administration
AR	U.S. Army Regulation	FAADS	Forward Area Air Defense System
AST	Above Ground Storage Tank	FEBA	Forward Edge of the Battle Area
ATACMS	Army Tactical Missile System	FEIS	Final Environmental Impact Statement
ATC	Air Traffic Control	FICON	Federal Interagency Committee on Noise
AVHRR	Advanced Very High Resolution Radiometer	FICUN	Federal Interagency Committee on Urban Noise
BASOPS	Base Operations	FIFRA	Federal Insecticide, Fungicide, and Rodenticide Act
BLM	Bureau of Land Management	FIREX	Fire Exercise
BRAC	Base Realignment and Closure	FO	Field Office
CA	Commercial Activities	FONSI	Finding of No Significant Impact
CDNL	C-weighted Day-Night Noise Level	FTX	Field Training Exercise
CEQ	Council on Environmental Quality	FY	Fiscal Year
CFR	Code of Federal Regulations	GAF	German Air Force
CHCN	Committee of the Health Council of the Netherlands	GIS	Geographical Information System
CIS	Capital Investment Strategy	GSA	General Services Administration
CO	Carbon Monoxide	GPS	Global Positioning System
CONUS	Continental United States	HAFB	Holloman Air Force Base
cps	Cycles per Second	HQ	Headquarters
CSEL	C-weighted Sound Exposure Level	HUD	U.S. Department of Housing and Urban Development
CX	Categorical Exclusion	Hz	Hertz
DA	U.S. Department of the Army	IAD	Washington Dulles International Airport
dB	Decibels	ICRMP	Integrated Cultural Resources Management Plan
dba	A-weighted Sound Level	INRMP	Integrated Natural Resources Management Plan
dBp	Peak Sound Pressure Level	ITAM	Integrated Training Area Management
DEIS	Draft Environmental Impact Statement	LAX	Los Angeles International Airport
DoD	U.S. Department of Defense	L _{Cdn}	C-weighted L _{dn}
DOE	Directorate of Environment	LCTA	Land Condition Trend Analysis
DOI	U.S. Department of the Interior	L _{dn}	Day-Night Average Sound Level
DOPAA	Description of Proposed Actions and Alternatives	L _{dnmr}	Monthly Average of L _{dnr}
DOT	U.S. Department of Transportation	L _{dnr}	Onset Rate-adjusted Day-Night Average Sound Level
DPTMS	Director of Plans, Training, Mobilization, and Security		
DPWL	Directorate of Public Works and Logistics		
EA	Environmental Assessment		

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L _{max}	Maximum Sound Level	R&D	Research and Development
LOS	Level of Service	RA	Resource Area
LOSAT	Line-of-Sight Anti-tank	RCRA	Resource Conservation and Recovery Act
LRAM	Land Rehabilitation and Maintenance		
LRC	Long-range Component	RDT&E	Research, Development, Test and Evaluation
MC	Mobilization Component		
MCA	Military Construction, Army	REC	Record of Environmental Consideration
MCL	Maximum Contaminant Level		
mg/l	Milligrams per Liter	RMP	Resource Management Plan
MLRS	Multiple-launch Rocket System	RMPA	Resource Management Plan Amendment
MMP	Mission and Master Plan		
MOA	Military Operations Area	RMSS	Resource Management Support System
MOU	Memorandum of Understanding		
MOUT	Military Operations Urbanized Terrain	ROD	Record of Decision
		ROI	Region of Influence
MRNMAP	MOA/Range NOISEMAP	ROW	Right-of-Way
MTRs	Military Training Routes	RPMP	Real Property Master Plan
MUIR	Map Unit Interpretation Record	RUSLE	Revised Universal Loss Equation
NAAQS	National Ambient Air Quality Standards	SDZ	Surface Danger Zone
		SEL	Sound Exposure Level
NAPS	Noise Assessment and Prediction System	SHPO	State Historic Preservation Office(r)
		SLUCM	Standard Land Use Coding Manual
NAS	National Academy of Sciences	SM	Statute Mile
NASA	National Aeronautics and Space Administration	SO ₂	Sulfur Dioxide
		SOP	Standard Operating Procedure
NDVI	Normalized Vegetation Index	SPL	Sound Pressure Level
NEPA	National Environmental Policy Act	SWMU	Solid Waste Management Unit
NESHAP	National Emission Standards for Hazardous Air Pollutants	TA	Training Area
		TADC	Training Area Development Concept
NHPA	National Historic Preservation Act	TCPs	Traditional Cultural Properties
NLR	Noise Level Reduction	TDY	Temporary Duty
NMDGF	New Mexico Department of Game and Fish	THAAD	Theater High-altitude Air Defense
		TM	Thematic Mapper
NMNHP	New Mexico Natural Heritage Program	TNRCC	Texas Natural Resource Conservation Commission
NMSU	New Mexico State University	TNT	Trinitrotoluene
NO ₂	Nitrogen Dioxide	TRADOC	U.S. Army Training and Doctrine Command
NOAA	National Oceanic and Atmospheric Administration		
		TRI	Training Requirements Integration
NOI	Notice of Intent	UCLA	University of California Los Angeles
NPDES	National Pollutant Discharge Elimination System	USACASB	U.S. Army Combined Arms Support Battalion
NPS	National Park Service	USACE	U.S. Army Corps of Engineers
NRCS	Natural Resource Conservation Service	USAF	U.S. Air Force
		USC	U.S. Code
NRHP	National Register of Historic Places	USFS	U.S. Forest Service
NSPS	New Source Performance Standards	USFWS	U.S. Fish and Wildlife Service
OSHA	Occupational Safety and Health Act	USGS	U.S. Geological Survey
P ³	Power Projection Platform	UST	Underground Storage Tank
PCBs	Polychlorinated Biphenyls	UTM	Universal Transverse Mercator
PEIS	Programmatic Environmental Impact Statement	VA	Veteran's Administration
		WQS	Water Quality Standards
PL	Public Law	WSMR	White Sands Missile Range
POL	Petroleum, Oils, and Lubricants	WSRA	White Sands Resource Area
PVI	Perpendicular Vegetation Index	WSTF	White Sands Test Facility
PX	Post Exchange		