

Fort Bliss

Texas and New Mexico

Mission and Master Plan



FINAL

SUPPLEMENTAL PROGRAMMATIC

ENVIRONMENTAL IMPACT STATEMENT

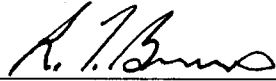
VOLUME I: CHAPTERS 1 THROUGH 11

March 2007

Fort Bliss, Texas and New Mexico
Mission and Master Plan

Final Supplemental Environmental Impact Statement

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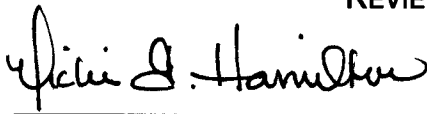


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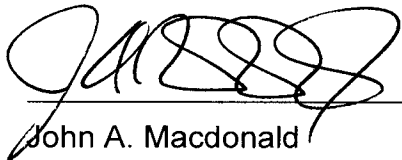


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COVER SHEET

Lead Agency: U.S. Army, Installation Management Agency

Title of Proposed Action: Changes to the Fort Bliss, Texas and New Mexico, Mission and Master Plan

Location: Fort Bliss is located in El Paso County, Texas and Doña Ana and Otero Counties, New Mexico

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Designation: Final Supplemental Programmatic Environmental Impact Statement (FEIS)

Abstract: The U.S. Army proposes to make changes to land use in the Main Cantonment Area and Fort Bliss Training Complex and develop infrastructure and facilities, including live-fire and qualification ranges, to support Base Realignment and Closure (BRAC) and Integrated Global Presence Basing Strategy (IGPBS) decisions. The purpose of the proposed land use changes is to more fully utilize the installation's capability and flexibility to support Army training and testing requirements; the evolving force structure; potential future missions; and Joint, Interagency, Intergovernmental, and Multinational agencies. As a result of BRAC and Army Transformation, Fort Bliss will receive a Heavy Armor Division comprised of four Heavy Brigade Combat Teams (BCTs), a Combat Aviation Brigade, an Artillery Brigade, and various other supporting units. One Heavy BCT, the 4th BCT of the 1st Cavalry Division, was relocated to Fort Bliss in 2006 and subsequently deployed to southwest Asia. The Air Defense Artillery (ADA) School and some of the ADA Brigades currently at Fort Bliss will be relocated to other installations.

The net effect of these changes will be an increase of approximately 20,000 military personnel assigned to Fort Bliss by 2011. New and upgraded facilities and infrastructure are needed to support the additional personnel, their dependents, additional vehicles and equipment, and operations of the incoming units. The stationing of an Armor Division and Heavy BCTs at Fort Bliss will change training requirements to more off-road vehicle maneuvers involving both tracked and wheeled vehicles such as M1A tanks, Bradley fighting vehicles, and High Mobility Multipurpose Wheeled Vehicles (HMMWVs). In addition, helicopter training will increase with the addition of the Combat Aviation Brigade and its 110 helicopters. The Fort Bliss Training Complex will also continue to support missile firings and other ongoing training, as well as the installation's mobilization mission as a Power Projection Platform.

The Army is considering four action alternatives for meeting the additional infrastructure and training needs of the new units. Each action alternative involves expanding the Main Cantonment Area and providing the capability to conduct off-road vehicle maneuver training on portions of McGregor Range in the Tularosa Basin. Off-road vehicle maneuvers are already conducted on approximately 335,000 acres in the North Training Areas, South Training Areas, and a small portion of McGregor Range.

Alternative 1 would provide approximately 216,000 additional acres of off-road vehicle maneuver space in the Tularosa Basin portion of McGregor Range, south of New Mexico Highway 506. Alternative 2

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

would include land in the Tularosa Basin portion of McGregor Range north of Highway 506, increasing the amount of available off-road vehicle maneuver space by approximately 280,000 acres. Alternative 3 would provide approximately 287,000 acres of additional off-road vehicle maneuver space in the south and southeast Tularosa Basin portions of McGregor Range. Alternative 4 (the Proposed Action), would include all of the changes considered in the other three alternatives, providing approximately 352,000 acres of additional off-road vehicle maneuver space which, when combined with the existing maneuver areas, would provide a total of 687,000 acres of off-road vehicle maneuver training capability at the installation. Alternative 4 is the Army's preferred alternative. None of the alternatives would involve off-road vehicle maneuvers on Otero Mesa or in the Sacramento Mountain foothills on McGregor Range.

In addition, this FEIS includes the No Action Alternative, which would limit off-road vehicle maneuver training to the areas currently approved for that use and only support one Heavy BCT at Fort Bliss. The No Action Alternative is not considered feasible because it would not adequately support the requirements of BRAC.

The FEIS assesses the direct, indirect, and cumulative environmental and socioeconomic effects of the alternatives. It describes impacts on land use, both within the installation and in the surrounding area; infrastructure, including transportation, utilities, and energy; airspace management and use; earth resources including soils; air quality; water resources; biological resources; cultural resources; noise from weapons firing, helicopter operations, and vehicle maneuvers; safety; and hazardous materials and items of special interest. Socioeconomic effects addressed in the document include population increases; economic benefits; housing; public services including schools, law enforcement, fire protection, and medical services; and quality of life. In addition, the analysis evaluates whether the proposed activities would result in disproportionately high and adverse impact on minority or low-income populations. The FEIS also identifies mitigation measures for reducing the environmental impacts of the Proposed Action and other alternatives.

The Draft SEIS was distributed for public comment from October 6 through December 12, 2006. Three public meetings were held in El Paso, Texas and Alamogordo and Las Cruces, New Mexico during the public comment period. Transcripts from these meetings and copies of written comments on the Draft SEIS are included in the FEIS.

Fort Bliss, Texas and New Mexico Mission and Master Plan

FINAL SUPPLEMENTAL PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT

Volume I: Chapters 1 through 11

Prepared for:

**U.S. Army Air Defense Artillery Center and Fort Bliss
Fort Bliss, Texas and New Mexico**

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Technical Assistance:

**Science Applications International Corporation
Albuquerque, New Mexico**

March 2007

Printed on Recycled Paper



Table of Contents

VOLUME I

SUMMARY	S-1
Purpose of and Need for Action	S-1
Scope of the SEIS	S-4
Alternatives Considered in the SEIS	S-5
No Action Alternative	S-5
Alternative 1	S-6
Alternative 2	S-6
Alternative 3	S-7
Alternative 4 — Proposed Action	S-7
Affected Environment.....	S-9
Environmental Consequences.....	S-10
Changes Between the Draft and Final SEIS	S-10
1.0 PURPOSE OF AND NEED FOR ACTION	1-1
1.1 Background	1-1
1.2 Purpose of the Proposed Action	1-4
1.3 Need for the Proposed Action	1-5
1.3.1 Change in Fort Bliss Mission.....	1-5
1.3.2 Organizational Changes	1-5
1.3.3 Personnel.....	1-8
1.3.4 Equipment	1-9
1.3.5 Training Requirements.....	1-10
1.4 Decision to Be Made	1-11
1.5 Scope of the SEIS.....	1-12
1.6 Changes Between the Draft and Final SEIS	1-13
2.0 PLANNING AND ENVIRONMENTAL IMPACT ANALYSIS PROCESSES	2-1
2.1 Regulatory and Management Framework	2-1
2.1.1 Real Property Master Plan	2-2
2.1.2 Training Area Development Concept.....	2-3
2.1.3 Integrated Cultural Resources Management Plan.....	2-3
2.1.4 Integrated Natural Resources Management Plan.....	2-9
2.1.5 Integrated Training Area Management.....	2-13
2.1.6 Environmental Compliance Plans.....	2-13
2.2 Programmatic Environmental Impact Analysis Process	2-20
2.3 Related Environmental Documents	2-22
2.4 Cooperating Agencies	2-23
2.5 Public Involvement.....	2-23
2.5.1 Scoping	2-23
2.5.2 Public Review of the Draft SEIS	2-24
3.0 DESCRIPTION OF THE PROPOSED ACTION AND ALTERNATIVES	3.0-1
3.1 Introduction to Land Use.....	3.1-1
3.2 Identification of Alternatives.....	3.2-1
3.3 No Action Alternative	3.3-1
3.3.1 Main Cantonment Area.....	3.3-1
3.3.2 Fort Bliss Training Complex.....	3.3-4

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

3.4	Alternative 1	3.4-1
3.4.1	Main Cantonment Area.....	3.4-1
3.4.2	Fort Bliss Training Complex.....	3.4-5
3.5	Alternative 2	3.5-1
3.5.1	Main Cantonment Area.....	3.5-1
3.5.2	Fort Bliss Training Complex.....	3.5-1
3.6	Alternative 3	3.6-1
3.6.1	Main Cantonment Area.....	3.6-1
3.6.2	Fort Bliss Training Complex.....	3.6-1
3.7	Alternative 4 – Proposed Action	3.7-1
3.7.1	Main Cantonment Area.....	3.7-1
3.7.2	Fort Bliss Training Complex.....	3.7-1
3.8	Alternatives Considered But Not Carried Forward For Full Analysis	3.8-1
3.8.1	Off-Road Vehicle Maneuver on Otero Mesa	3.8-1
3.8.2	Off-Road Vehicle Maneuver in Sacramento Mountains.....	3.8-1
3.8.3	Off-Road Vehicle Maneuver on Off-Post Land.....	3.8-1
3.8.4	No Increase in Maneuver Capability to Support BRAC and IGPBS Changes	3.8-1
3.8.5	Conducting Off-Road Vehicle Maneuvers at White Sands Missile Range	3.8-2
3.9	Comparison of Alternatives.....	3.9-1
4.0	AFFECTED ENVIRONMENT	4.0-1
4.1	Land Use	4.1-1
4.1.1	Fort Bliss Existing Land Use	4.1-1
4.1.2	Land Use in Surrounding Areas.....	4.1-9
4.1.3	Visual Resources.....	4.1-13
4.2	Main Cantonment Area Infrastructure.....	4.2-1
4.2.1	Ground Transportation.....	4.2-1
4.2.2	Utilities.....	4.2-7
4.2.3	Energy	4.2-8
4.2.4	Communications	4.2-9
4.3	Training Area Infrastructure.....	4.3-1
4.3.1	South Training Areas	4.3-1
4.3.2	Doña Ana Range-North Training Areas	4.3-1
4.3.3	McGregor Range.....	4.3-3
4.4	Airspace Use and Management.....	4.4-1
4.4.1	Terminal Airspace.....	4.4-3
4.4.2	Training Airspace.....	4.4-3
4.5	Earth Resources.....	4.5-1
4.5.1	General Setting.....	4.5-1
4.5.2	Soils on Fort Bliss.....	4.5-1
4.5.3	Ecological Conditions.....	4.5-11
4.6	Air Quality.....	4.6-1
4.6.1	Applicable Regulations and Standards	4.6-1
4.6.2	Regional Climate	4.6-3
4.6.3	Regional Air Quality.....	4.6-4
4.6.4	Current Air Emissions at Fort Bliss	4.6-7
4.6.5	Current Status of Air Quality Permits for Fort Bliss.....	4.6-8
4.7	Water Resources.....	4.7-1
4.7.1	Surface Water.....	4.7-1
4.7.2	Groundwater	4.7-5

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

4.8	Biological Resources	4.8-1
4.8.1	Vegetation	4.8-1
4.8.2	Wetlands and Arroyo-Riparian Drainages	4.8-7
4.8.3	Wildlife	4.8-8
4.8.4	Sensitive Species	4.8-10
4.9	Cultural Resources	4.9-1
4.9.1	Applicable Regulations and Standards	4.9-2
4.9.2	Existing Management Plans, Agreements, and Procedures	4.9-4
4.9.3	Historic Resource Inventories	4.9-5
4.9.4	Summary of Cultural Resources on Fort Bliss	4.9-9
4.10	Noise	4.10-1
4.10.1	Noise Metrics	4.10-1
4.10.2	Noise Levels at Fort Bliss	4.10-4
4.11	Safety	4.11-1
4.11.1	Ground Safety	4.11-1
4.11.2	Flight Safety	4.11-2
4.11.3	Explosive Safety	4.11-2
4.11.4	Installation Compatible Use	4.11-3
4.12	Hazardous Materials and Items of Special Concern	4.12-1
4.12.1	Hazardous Materials	4.12-1
4.12.2	Items of Special Concern	4.12-4
4.12.3	Related Management Programs	4.12-7
4.13	Socioeconomics	4.13-1
4.13.1	Population	4.13-1
4.13.2	Economic Development	4.13-6
4.13.3	Housing	4.13-12
4.13.4	Public Schools	4.13-18
4.13.5	Law Enforcement	4.13-19
4.13.6	Fire Protection	4.13-20
4.13.7	Public Finance	4.13-21
4.13.8	Government Structure	4.13-22
4.13.9	Medical Services	4.13-23
4.13.10	Quality of Life	4.13-25
4.14	Environmental Justice	4.14-1
5.0	ENVIRONMENTAL CONSEQUENCES	5.0-1
5.1	Land Use	5.1-1
5.1.1	Introduction	5.1-1
5.1.2	No Action Alternative	5.1-1
5.1.3	Alternative 1	5.1-3
5.1.4	Alternative 2	5.1-5
5.1.5	Alternative 3	5.1-7
5.1.6	Alternative 4 – Proposed Action	5.1-7
5.2	Main Cantonment Area Infrastructure	5.2-1
5.2.1	Introduction	5.2-1
5.2.2	No Action Alternative	5.2-2
5.2.3	Alternative 1	5.2-5
5.2.4	Alternative 2	5.2-7
5.2.5	Alternative 3	5.2-8
5.2.6	Alternative 4 – Proposed Action	5.2-9

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

5.3	Training Area Infrastructure.....	5.3-1
5.3.1	Introduction.....	5.3-1
5.3.2	No Action Alternative.....	5.3-1
5.3.3	Alternative 1.....	5.3-1
5.3.4	Alternative 2.....	5.3-4
5.3.5	Alternative 3.....	5.3-5
5.3.6	Alternative 4 – Proposed Action.....	5.3-5
5.4	Airspace Use and Management.....	5.4-1
5.4.1	Introduction.....	5.4-1
5.4.2	No Action Alternative.....	5.4-1
5.4.3	Alternative 1.....	5.4-1
5.4.4	Alternative 2.....	5.4-1
5.4.5	Alternative 3.....	5.4-2
5.4.6	Alternative 4 – Proposed Action.....	5.4-2
5.5	Earth Resources.....	5.5-1
5.5.1	Introduction.....	5.5-1
5.5.2	No Action Alternative.....	5.5-4
5.5.3	Alternative 1.....	5.5-5
5.5.4	Alternative 2.....	5.5-7
5.5.5	Alternative 3.....	5.5-8
5.5.6	Alternative 4 – Proposed Action.....	5.5-8
5.6	Air Quality.....	5.6-1
5.6.1	Introduction.....	5.6-1
5.6.2	No Action Alternative.....	5.6-3
5.6.3	Alternative 1.....	5.6-5
5.6.4	Alternative 2.....	5.6-7
5.6.5	Alternative 3.....	5.6-9
5.6.6	Alternative 4 – Proposed Action.....	5.6-10
5.7	Water Resources.....	5.7-1
5.7.1	Introduction.....	5.7-1
5.7.2	No Action Alternative.....	5.7-3
5.7.3	Alternative 1.....	5.7-3
5.7.4	Alternative 2.....	5.7-4
5.7.5	Alternative 3.....	5.7-5
5.7.6	Alternative 4 – Proposed Action.....	5.7-5
5.8	Biological Resources.....	5.8-1
5.8.1	Introduction.....	5.8-1
5.8.2	No Action Alternative.....	5.8-3
5.8.3	Alternative 1.....	5.8-4
5.8.4	Alternative 2.....	5.8-8
5.8.5	Alternative 3.....	5.8-9
5.8.6	Alternative 4 – Proposed Action.....	5.8-11
5.9	Cultural Resources.....	5.9-1
5.9.1	Introduction.....	5.9-1
5.9.2	No Action Alternative.....	5.9-4
5.9.3	Alternative 1.....	5.9-5
5.9.4	Alternative 2.....	5.9-6
5.9.5	Alternative 3.....	5.9-6
5.9.6	Alternative 4 – Proposed Action.....	5.9-7
5.10	Noise.....	5.10-1
5.10.1	Introduction.....	5.10-1

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

5.10.2	No Action Alternative	5.10-2
5.10.3	Alternative 1	5.10-6
5.10.4	Alternative 2	5.10-12
5.10.5	Alternative 3	5.10-14
5.10.6	Alternative 4 – Proposed Action	5.10-14
5.11	Safety	5.11-1
5.11.1	Introduction	5.11-1
5.11.2	No Action Alternative	5.11-1
5.11.3	Alternative 1	5.11-2
5.11.4	Alternative 2	5.11-3
5.11.5	Alternative 3	5.11-4
5.11.6	Alternative 4 – Proposed Action	5.11-4
5.12	Hazardous Materials and Items of Special Concern	5.12-1
5.12.1	Introduction	5.12-1
5.12.2	No Action Alternative	5.12-1
5.12.3	Alternative 1	5.12-3
5.12.4	Alternative 2	5.12-4
5.12.5	Alternative 3	5.12-5
5.12.6	Alternative 4 – Proposed Action	5.12-5
5.13	Socioeconomics	5.13-1
5.13.1	Introduction	5.13-1
5.13.2	No Action Alternative	5.13-5
5.13.3	Alternative 1	5.13-11
5.13.4	Alternative 2	5.13-16
5.13.5	Alternative 3	5.13-19
5.13.6	Alternative 4 – Proposed Action	5.13-19
5.14	Environmental Justice	5.14-1
5.14.1	Introduction	5.14-1
5.14.2	No Action Alternative	5.14-2
5.14.3	Alternative 1	5.14-2
5.14.4	Alternative 2	5.14-2
5.14.5	Alternative 3	5.14-2
5.14.6	Alternative 4 – Proposed Action	5.14-2
5.15	Cumulative Impacts	5.15-1
5.15.1	Process for Identification of Cumulative Impacts	5.15-1
5.15.2	Cumulative Impacts by Resource	5.15-5
5.16	Summary of Irreversible and Irretrievable Commitments of Resources	5.16-1
5.17	Summary of Relationship Between Short-Term Use of the Environment and Long-Term Productivity	5.17-1
5.18	Summary of Probable Adverse Impacts That Cannot Be Avoided	5.18-1
6.0	MITIGATION AND MONITORING	6-1
6.1	Mitigation Measures Incorporated in the Alternatives	6-1
6.1.1	Siting, Design, and Construction Mitigations	6-1
6.1.2	Real Property Master Plan and Other Plans	6-2
6.1.3	Environmental Compliance Program	6-3
6.1.4	Range Management	6-3
6.1.5	Environmental Impact Analysis Process	6-4
6.2	Other Possible Mitigation Measures	6-4
6.3	Monitoring	6-9
7.0	REFERENCES	7-1

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

8.0	GLOSSARY.....	8-1
9.0	LIST OF PREPARERS.....	9-1
10.0	DISTRIBUTION LIST	10-1
11.0	INDEX.....	11-1
	FORT BLISS TRAINING AREA LAND USE CATEGORIES.....	End of Volume
	ACRONYM LIST.....	End of Volume

List of Tables

Table S-1.	Comparison of Alternatives	S-8
Table S-2.	Summary Comparison of the Environmental Consequences of the Alternatives	S-11
Table 1-1.	Primary Units Assigned to Fort Bliss – FY 2010 and Beyond	1-8
Table 1-2.	Estimated Personnel Strength at Fort Bliss.....	1-9
Table 1-3.	Estimated Net Equipment Changes at Fort Bliss	1-9
Table 1-4.	Off-Road Vehicle Maneuver Training Requirements.....	1-11
Table 2-1.	Fort Bliss ICRMP Activity Summary.....	2-7
Table 2-2.	Fort Bliss INRMP Activity Summary.....	2-10
Table 2-3.	ITAM Efforts	2-14
Table 2-4.	Summary of Public Scoping Issues and SEIS Sections Addressing Those Issues	2-23
Table 3.1-1.	Army Land Use Categories.....	3.1-1
Table 3.1-2.	Fort Bliss Training Categories	3.1-3
Table 3.1-3.	Fort Bliss Training Complex Land Use Categories	3.1-4
Table 3.1-4.	Estimated Training Area Scheduled Use in 2004	3.1-7
Table 3.2-1.	Training Area Groupings	3.2-6
Table 3.2-2.	Off-Road Vehicle Maneuver Training Capability by Alternative	3.2-7
Table 3.3-1.	Main Cantonment Area Projects – No Action Alternative	3.3-3
Table 3.3-2.	Estimated Training Area Use – No Action Alternative	3.3-5
Table 3.4-1.	Main Cantonment Area Projects – Alternative 1	3.4-4
Table 3.4-2.	Estimated Training Area Use – Alternative 1	3.4-7
Table 3.4-3.	Doña Ana Range Construction – Alternative 1	3.4-11
Table 3.4-4.	McGregor Range Construction – Alternative 1	3.4-12
Table 3.5-1.	Estimated Training Area Use – Alternative 2.....	3.5-3
Table 3.6-1.	Estimated Training Area Use – Alternative 3.....	3.6-3
Table 3.7-1.	Estimated Training Area Use – Proposed Action	3.7-3
Table 3.9-1.	Key Attributes of the Alternatives	3.9-1
Table 3.9-2.	Summary Comparison of the Environmental Consequences of the Alternatives	3.9-2
Table 4.1-1.	Fort Bliss Installation Components.....	4.1-1
Table 4.1-2.	Animal Unit Months (AUMs) for Grazing Units on McGregor Range.....	4.1-8
Table 4.2-1.	Roadway Levels of Service	4.2-2
Table 4.2-2.	Capacity Analysis of Area Roadways, 2006.....	4.2-5
Table 4.2-3.	Average Weekday Entering Traffic at Installation Gates	4.2-6
Table 4.4-1.	Military Training Routes in the ROI.....	4.4-4
Table 4.5-1.	Summary of Major Land Resource Areas on Fort Bliss	4.5-2
Table 4.5-2.	Characteristics of General Soil Map Units	4.5-5
Table 4.5-3.	Soil Limitations for Use on Fort Bliss	4.5-6
Table 4.5-4.	Dominant Ecological Sites in the Fort Bliss Training Complex.....	4.5-12
Table 4.5-5.	Dominant Ecosites and Brief Descriptions, in Order of Occurrence	4.5-13
Table 4.6-1.	National and State Ambient Air Quality Standards	4.6-2

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

Table 4.6-2.	Air Quality Monitoring Data for El Paso, Texas	4.6-5
Table 4.6-3.	Air Quality Monitoring Data for South-Central New Mexico.....	4.6-6
Table 4.6-4.	Baseline Air Emission Inventory for Portions of Fort Bliss in Texas (CY 2004)	4.6-7
Table 4.6-5.	Baseline Air Emission Inventory for Portions of Fort Bliss in New Mexico (CY 2004)	4.6-8
Table 4.8-1.	General Land Cover Types on Fort Bliss	4.8-2
Table 4.8-2.	General Land Cover Type Distribution Across Areas of Fort Bliss	4.8-6
Table 4.8-3.	Sensitive Species Known or Having the Potential to Occur on Fort Bliss	4.8-11
Table 4.8-4.	Northern Aplomado Falcon Sightings and Survey Summary on Fort Bliss	4.8-14
Table 4.9-1.	Fort Bliss Historic Properties Database Summary – Archaeological Sites.....	4.9-5
Table 4.9-2.	Summary of Archaeological Resource Density at Fort Bliss	4.9-6
Table 4.10-1.	Acoustic Thresholds for Impulsive Noise Events.....	4.10-2
Table 4.10-2.	Assessment of Risk of Public Complaints	4.10-3
Table 4.10-3.	DNL-Based Noise Zones	4.10-4
Table 4.10-4.	Land Use Recommendations in Noise Zones	4.10-4
Table 4.12-1.	Waste Streams Considered for Annual Re-Analysis	4.12-3
Table 4.12-2.	P-2 Program Goals.....	4.12-9
Table 4.13-1.	Fort Bliss Personnel and Dependents, Fiscal Years 1996 and 2000-2005.....	4.13-2
Table 4.13-2.	Population of Region of Influence, Counties, States, and Nation (1980 to 2004).....	4.13-5
Table 4.13-3.	Population Projections, 2000 to 2030	4.13-5
Table 4.13-4.	El Paso MPO Demographic Projections	4.13-6
Table 4.13-5.	El Paso MPO Projected Planning Area Population Share	4.13-6
Table 4.13-6.	Employment and Income in the Three-County ROI.....	4.13-7
Table 4.13-7.	Regional Non-Government Employment by Sector in 2004	4.13-8
Table 4.13-8.	Fort Bliss Expenditures (\$million).....	4.13-10
Table 4.13-9.	Earnings in El Paso County	4.13-10
Table 4.13-10.	Comparison of Fort Bliss Economic Impact Indicators for 1989 and 2002	4.13-11
Table 4.13-11.	Housing Units by County and Region of Influence, 1990 and 2000	4.13-13
Table 4.13-12.	Housing Characteristics of Communities in the Region of Influence, 2000.....	4.13-14
Table 4.13-13.	Housing Units by Type, El Paso County, 2000-2004	4.13-16
Table 4.13-14.	New Private Housing Units in the ROI Authorized by Building Permit, 1990 to 2004	4.13-17
Table 4.13-15.	School District Enrollment and Staffing, 1999/00 to 2004/05 School Years	4.13-18
Table 4.13-16.	El Paso County, Texas Budgeted Revenues and Expenditures, Fiscal Year 2005	4.13-21
Table 4.13-17.	City of El Paso, Texas Revenues and Expenditures, Fiscal Year 2005	4.13-22
Table 4.13-18.	Medical Facilities in the El Paso County 2004.....	4.13-24
Table 4.13-19.	Quality of Life Survey Results	4.13-26
Table 4.14-1.	Minority and Low-Income Populations by Census Tract	4.14-2
Table 5.2-1.	Comparison of Military and ITE Land Uses.....	5.2-1
Table 5.2-2.	Estimated Main Cantonment Area Trip Generation	5.2-2
Table 5.2-3.	Level of Service for Area Roadways in 2016.....	5.2-3
Table 5.2-4.	Level of Service for Area Roadways in 2021	5.2-3
Table 5.5-1.	Segments in the Fort Bliss Training Complex with Sandy Soils Susceptible to Change from Off-Road Vehicle Maneuver.....	5.5-4
Table 5.6-1.	Construction Emissions – No Action Alternative.....	5.6-3
Table 5.6-2.	Increase in Facility Operational Emissions – No Action Alternative	5.6-4
Table 5.6-3.	Increase in Combustion Emissions – No Action Alternative	5.6-4

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

Table 5.6-4.	Geographical Distribution of Emissions from Training Activities – No Action Alternative.....	5.6-4
Table 5.6-5.	Distribution of PM ₁₀ Emissions From Fugitive Dust Due to Off-Road Vehicle Maneuver Training.....	5.6-5
Table 5.6-6.	Estimated Induced Population Vehicle Emissions.....	5.6-5
Table 5.6-7.	Construction Emissions – Alternative 1	5.6-5
Table 5.6-8.	Increase in Facility Operational Emissions – Alternative 1.....	5.6-6
Table 5.6-9.	Increase in Combustion Emissions – Alternative 1	5.6-6
Table 5.6-10.	Geographical Distribution of Emissions from Training Activities – Alternative 1	5.6-6
Table 5.6-11.	Construction Emissions – Alternative 2	5.6-7
Table 5.6-12.	Increase in Facility Operational Emissions – Alternative 2.....	5.6-8
Table 5.6-13.	Increase in Combustion Emissions – Alternative 2	5.6-8
Table 5.6-14.	Geographical Distribution of Emissions from Training Activities – Alternative 2	5.6-8
Table 5.6-15.	Increase in Combustion Emissions – Alternative 3	5.6-9
Table 5.6-16.	Geographical Distribution of Emissions from Training Activities – Alternative 3	5.6-10
Table 5.6-17.	Construction Emissions – Alternative 4	5.6-10
Table 5.6-18.	Increase in Facility Operational Emissions – Alternative 4.....	5.6-11
Table 5.6-19.	Increase in Combustion Emissions – Alternative 4	5.6-11
Table 5.6-20.	Geographical Distribution of Emissions from Training Activities – Alternative 4	5.6-11
Table 5.7-1.	Estimated Municipal Water Demand for El Paso County	5.7-1
Table 5.8-1.	Dominant Vegetation in Areas Proposed for Off-Road Vehicle Maneuvers.....	5.8-6
Table 5.10-1.	Sound Levels of Selected Army Tracked Vehicles	5.10-2
Table 5.10-2.	Acres Affected by Noise from Large Caliber Weapons – No Action Alternative.....	5.10-4
Table 5.10-3.	Area Affected by Peak Noise Levels from Large Caliber Firing – No Action Alternative.....	5.10-4
Table 5.10-4.	Maximum Noise Levels of Helicopters at Various Altitudes	5.10-6
Table 5.10-5.	Acres Affected by Noise From Large Caliber Weapons – Alternative 1	5.10-10
Table 5.10-6.	Maximum Sound Level of a Representative Vehicle at Various Distances From the Perimeter of a Maneuver Box	5.10-12
Table 5.10-7.	Acres Affected by Noise from Large Caliber Weapons – Alternative 4	5.10-16
Table 5.13-1.	Population Impacts – No Action Alternative.....	5.13-5
Table 5.13-2.	Projected Changes in Economic Activity – No Action Alternative.....	5.13-6
Table 5.13-3.	Increases in On- and Off-Post Housing Demands by Alternative	5.13-6
Table 5.13-4.	Estimated Increase in Tax Revenues of El Paso County and City of El Paso – No Action Alternative.....	5.13-7
Table 5.13-5.	Fort Bliss-Related Student Population – No Action Alternative	5.13-8
Table 5.13-6.	Law Enforcement Effects by Alternative.....	5.13-8
Table 5.13-7.	Fire Protection Effects by Alternative	5.13-9
Table 5.13-8.	Medical Services Effects by Alternative.....	5.13-9
Table 5.13-9.	Population Increases by Year – Alternative 1.....	5.13-11
Table 5.13-10.	Fort Bliss-Related Population Impacts – Alternative 1	5.13-12
Table 5.13-11.	Projected Changes in Economic Activity – Alternative 1	5.13-12
Table 5.13-12.	Estimated Increase in Tax Revenues of El Paso County and City of El Paso – Alternative 1	5.13-14
Table 5.13-13.	Fort Bliss-Related Student Population – Alternative 1	5.13-14
Table 5.13-14.	Fort Bliss-Related Population Impacts for Alternative 2.....	5.13-17

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

Table 5.13-15.	Estimated Increase in Tax Revenues of El Paso County and City of El Paso – Alternative 2	5.13-18
Table 5.13-16.	Fort Bliss-Related Student Population – Alternative 2	5.13-18
Table 5.13-17.	Fort Bliss-Related Population Impacts for Alternative 4	5.13-20
Table 5.13-18.	Estimated Increase in Tax Revenues of El Paso County and City of El Paso – Alternative 4	5.13-21
Table 5.13-19.	Fort Bliss-Related Student Population – Alternative 4	5.13-21
Table 6-1.	Summary of Possible Mitigation Measures	6-4

List of Figures

Figure S-1.	Planned Unit Changes at Fort Bliss	S-3
Figure 1-1.	Location of Fort Bliss	1-2
Figure 1-2.	Fort Bliss, Texas and New Mexico	1-3
Figure 1-3.	Planned Unit Changes at Fort Bliss	1-7
Figure 2-1.	Relationship of the PEIS and SEIS	2-21
Figure 3.1-1.	Fort Bliss Main Cantonment Area	3.1-2
Figure 3.1-2.	Fort Bliss Training Complex Current Land Use	3.1-5
Figure 3.1-3.	Restricted Area Airspace at Fort Bliss	3.1-6
Figure 3.2-1.	Nominal Battalion Maneuver Box Capability of the Fort Bliss Training Complex	3.2-3
Figure 3.2-2.	Groupings of TAs in the Fort Bliss Training Complex	3.2-5
Figure 3.3-1.	Current Main Cantonment Area Land Use Plan	3.3-2
Figure 3.4-1.	Main Cantonment Area Land Use – Alternative 1	3.4-2
Figure 3.4-2.	Fort Bliss Training Complex Land Use – Alternative 1	3.4-6
Figure 3.4-3.	Training Area Land Use in the South Training Areas – Alternative 1	3.4-9
Figure 3.4-4.	Training Area Land Use in the Doña Ana Range-North Training Areas – Alternative 1	3.4-10
Figure 3.4-5.	Training Area Land Use in McGregor Range – Alternative 1	3.4-14
Figure 3.5-1.	Fort Bliss Training Complex Land Use – Alternative 2	3.5-2
Figure 3.6-1.	Fort Bliss Training Complex Land Use – Alternative 3	3.6-2
Figure 3.7-1.	Fort Bliss Training Complex Land Use – Alternative 4 (Proposed Action)	3.7-2
Figure 4.1-1.	Land Use and Mission Facilities in the South Training Areas	4.1-3
Figure 4.1-2.	Land Use and Mission Facilities on Doña Ana Range-North Training Areas	4.1-4
Figure 4.1-3.	Land Use and Mission Facilities on McGregor Range	4.1-5
Figure 4.1-4.	Public Access Areas on Fort Bliss	4.1-6
Figure 4.1-5.	Land Ownership in the ROI	4.1-10
Figure 4.1-6.	Zoning in the City of El Paso	4.1-11
Figure 4.2-1.	Major Roadways Around the Main Cantonment Area of Fort Bliss	4.2-3
Figure 4.2-2.	Transportation Network in the Fort Bliss Main Cantonment Area	4.2-4
Figure 4.4-1.	Airspace in the Region of Influence	4.4-2
Figure 4.5-1.	Major Land Resource Areas on Fort Bliss	4.5-3
Figure 4.5-2.	General Soil Map Units on Fort Bliss	4.5-4
Figure 4.5-3.	Soils on Fort Bliss Susceptible to Wind Erosion	4.5-9
Figure 4.5-4.	Soils on Fort Bliss Susceptible to Water Erosion	4.5-10
Figure 4.7-1.	Basins in the Region of Influence	4.7-2
Figure 4.7-2.	Surface Water Drainages in the Fort Bliss Training Complex	4.7-3
Figure 4.7-3.	Water Pipelines and Storage Areas on McGregor Range	4.7-4
Figure 4.7-4.	Sources of Water Supplied by EPWU Since 1967	4.7-6
Figure 4.8-1.	South Training Areas Vegetation	4.8-3
Figure 4.8-2.	Doña Ana Range-North Training Areas Vegetation	4.8-4

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

Figure 4.8-3.	McGregor Range Vegetation	4.8-5
Figure 4.8-4.	Current Grassland Conditions with Habitat Potential for Aplomado Falcons	4.8-16
Figure 4.8-5.	Potential Habitat for Northern Aplomado Falcon on Fort Bliss Identified by Various Screening Models	4.8-17
Figure 4.10-1.	Existing Biggs Army Airfield Noise Contours	4.10-6
Figure 4.10-2.	2004 EPIA Noise Contours.....	4.10-7
Figure 4.10-3.	Existing Small Arms Noise Contours at Fort Bliss.....	4.10-8
Figure 4.10-4.	Existing Large Caliber Weapons Noise Contours at Fort Bliss	4.10-9
Figure 4.10-5.	Existing Large Caliber Weapons Peak Noise Contours at Fort Bliss	4.10-10
Figure 4.11-1.	Airfield Safety Zones at Biggs AAF and EPIA	4.11-4
Figure 4.13-1.	Fort Bliss Population Changes from 1990 to 2005	4.13-3
Figure 4.14-1.	Census Tracts with Minority and Low-Income Population Percentages Exceeding the ROI Average	4.14-7
Figure 4.14-2.	Detail of Census Tracts in El Paso, Alamogordo, and Las Cruces	4.14-8
Figure 5.10-1.	Day-Night Average Sound Levels for Large Caliber Weapons – No Action Alternative.....	5.10-3
Figure 5.10-2.	Projected Peak Level Noise Contours for Large Caliber Weapons	5.10-5
Figure 5.10-3.	Day-Night Average Sound Levels at Biggs AAF With One CAB	5.10-7
Figure 5.10-4.	Helicopter Flight Track and Noise Buffer From Orogrande Range Camp	5.10-8
Figure 5.10-5.	Nap-of-the Earth Flight Track and Noise Buffer	5.10-9
Figure 5.10-6.	Day-Night Average Sound Levels for Large Caliber Weapons – Alternative 1	5.10-11
Figure 5.10-7.	Day-Night Average Sound Levels for Two CABs at Biggs AAF	5.10-13
Figure 5.10-8.	Day-Night Average Sound Levels for Large Caliber Weapons – Alternative 4	5.10-15

VOLUME II

APPENDIX A	National Environmental Policy Act Terms and Definitions, Contributing Factors, and Methodology for Evaluating Mission Activities, Projects, and Environmental Management Actions	A-1
APPENDIX B	Programmatic Agreement for the Management of Historic Properties on Fort Bliss.....	B-1
APPENDIX C	Hazardous and Universal Waste Generated at Fort Bliss	C-1
APPENDIX D	Comments and Responses	D-1
ACRONYM LIST	End of Volume

SUMMARY

1
2 This Supplemental Environmental Impact Statement (SEIS) supplements the *Final Fort Bliss, Texas and*
3 *New Mexico, Mission and Master Plan Programmatic Environmental Impact Statement* (Mission and
4 Master Plan PEIS) dated December 2000 and associated Record of Decision (ROD) signed in 2001. It
5 identifies the potential environmental effects that would result from modifying land and airspace use at
6 Fort Bliss to continue supporting evolving changes in missions and units, associated facilities and
7 infrastructure, and training activities.

8 Fort Bliss is a multi-mission United States (U.S.) Army installation located on approximately 1.12 million
9 acres in Texas and New Mexico. It consists of the Main Cantonment Area and the Fort Bliss Training
10 Complex, which is comprised of three large geographic segments: (1) the South Training Areas, (2) Doña
11 Ana Range-North Training Areas, and (3) McGregor Range.

12 The SEIS differs from the 2000 Mission and Master Plan PEIS in that part of the purpose of the PEIS was
13 to enhance management of Fort Bliss land, airspace, and infrastructure through adoption of the Real
14 Property Management Plan (RPMP), Training Area Development Concept (TADC), Integrated Natural
15 Resources Management Plan (INRMP), Integrated Cultural Resources Management Plan (ICRMP), and
16 related management plans and procedures. Those plans and procedures are now in place, and the purpose
17 of this SEIS is to modify land use to continue supporting Fort Bliss' evolving missions. The land use
18 changes adopted after completion of the SEIS will be used to amend those and other plans and procedures
19 as needed to incorporate the selected alternative.

20 The SEIS has been prepared in compliance with the National Environmental Policy Act (NEPA) (42
21 United States Code [U.S.C.] 4321-4347, as amended), Council on Environmental Quality (CEQ)
22 Regulations for Implementing the Procedural Provisions of NEPA (40 Code of Federal Regulations
23 [CFR] 1500-1508), and 32 CFR Part 651, Environmental Effects of Army Actions.

Purpose of and Need for Action

24 The purpose of the proposed action is to:

- 25
26 • Modify current land use on Fort Bliss to more fully realize the installation's capability and
27 flexibility to support Army training and testing requirements; the evolving force structure;
28 potential future missions; and Joint, Interagency, Intergovernmental, and Multinational agencies,
29 without compromising the commitment to stewardship of natural and cultural resources.
- 30 • Construct additional facilities and infrastructure in the Main Cantonment Area necessary to
31 support Base Realignment and Closure (BRAC) and Integrated Global Presence Basing Strategy
32 (IGPBS) (also known as the Global Defense Posture Realignment) stationing decisions.
- 33 • Develop live-fire, qualification, and testing ranges required to support the requirements of units
34 stationed at Fort Bliss.
- 35 • Develop range camps, auxiliary facilities, and other improvements.

36 In April 2002, the Deputy Chief of Staff of the Army for Operations and Plans announced the decision to
37 proceed with the proposed 30-year, phased implementation of Army Transformation. Fort Bliss was one
38 of 25 Army "force projection" installations described and analyzed in the Army Transformation PEIS.
39 Continued strategic planning and lessons learned from the Global War on Terrorism and Army operations
40 in Iraq and Afghanistan resulted in the development of the Army Campaign Plan (ACP) to support Army
41 Transformation.

42 The need for the proposed action is to support Army Transformation and the ACP by more fully realizing
43 the capability of Fort Bliss lands and facilities, including off-road vehicle maneuver lands, airspace, and

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

44 firing ranges. Recent BRAC and IGPBS stationing decisions define the known future missions of Fort
45 Bliss and create the near-term requirements for off-road vehicle maneuver space and facilities and
46 infrastructure improvements. Over the long term, Fort Bliss needs to be able to continue supporting the
47 evolving operational, infrastructure, training, and testing requirements of the Army.

48 As Army restructuring and realignment evolve, there is a potential need to utilize fully the training
49 capability at any given installation. Furthermore, it is reasonable to assume that installations with
50 additional training capability could receive new missions in the future.

51 Transformation to a modular force will result in changes in fighting unit structure, higher intensity levels
52 of training activity, use of new types of equipment, and construction or upgrade of live-fire ranges using
53 digital technology. New weapons systems and ranges using digital technology will expand the size
54 requirements for live-fire ranges. There will also be a need for new types of live-fire ranges such as those
55 required to train soldiers for urban combat and convoy protection. These changes, combined with
56 changes in training doctrine to support highly mobile, self-contained units, will involve use of larger areas
57 of the available training land. In addition, the new brigades and the realignment of the force will require
58 increased use at existing live-fire ranges, training areas, and airspace.

59 The primary unit changes expected to occur at Fort Bliss between fiscal years (FY) 2006 and 2010 are
60 shown in **Figure S-1** and include the following additions:

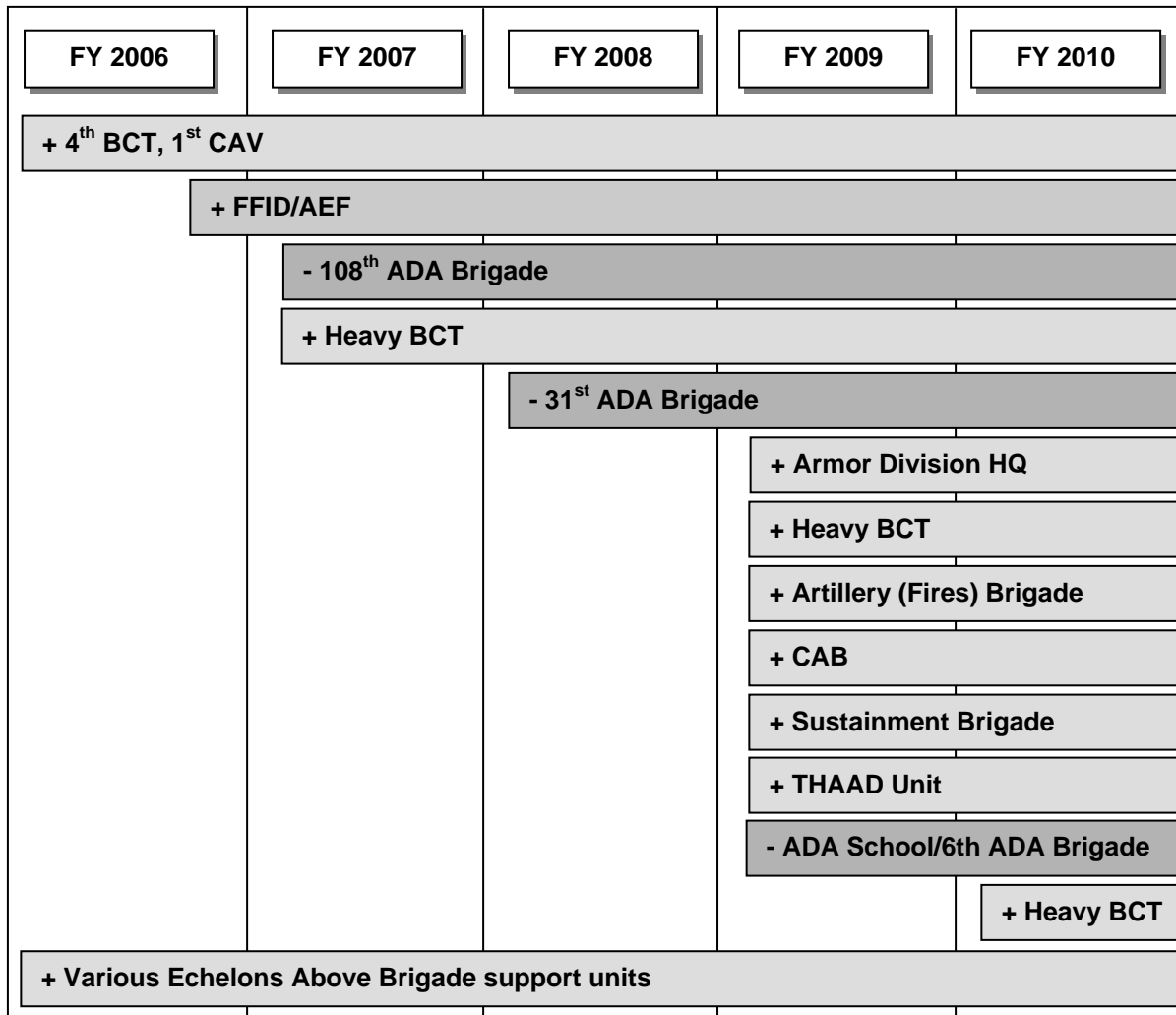
- 61 • Four Heavy Brigade Combat teams (BCTs), self-contained brigades that provide combat power
62 needed to deploy and fight. Each Heavy BCT will include four tank companies, four mechanized
63 infantry companies, three reconnaissance troops (company size), and one surveillance troop.
64 Typically, a Heavy BCT is comprised of approximately 3,800 military personnel and is equipped
65 with approximately 360 tracked vehicles and 900 wheeled vehicles.

66 The first Heavy BCT, the 4th BCT of the 1st Cavalry Division (CAV) was moved to Fort Bliss in
67 2006. A Future Force Integration Directorate (FFID) and Army Evaluation Force (AEF) were
68 also established at Fort Bliss.

- 69 • An Armor Division Headquarters (HQ), a self-contained modular headquarters that commands
70 and controls up to six maneuver BCTs engaged in combat operations. It may direct and control
71 additional brigades depending on the operational environment. There are approximately 700-800
72 military personnel assigned to the Armor Division Headquarters.
- 73 • An Artillery (Fires) Brigade that plans, prepares, executes and assesses combined arms operations
74 to provide close support and precision strikes for BCTs and support brigades using artillery,
75 rockets, and missiles. It includes two Multiple Launch Rocket System battalions and signal,
76 target acquisition, and forward support companies with a total of approximately 1,600 military
77 personnel, 423 wheeled vehicles, and 36 tracked vehicles.
- 78 • A Combat Aviation Brigade (CAB) that plans, prepares, executes, and assesses aviation and
79 combined arms operations to support division and maneuver brigades to find, fix, and destroy
80 enemy forces at a decisive time and place. It is organized with two attack battalions, an assault
81 battalion, a general support battalion, and an aviation support battalion, with a total of
82 approximately 2,700-2,800 military personnel and 110 helicopters.
- 83 • A Sustainment Brigade that plans, coordinates, synchronizes, monitors, and controls sustainment
84 (administration, medical, ammunition, transportation, maintenance, and supply) functions. This
85 brigade includes approximately 400-500 military personnel and 140 wheeled vehicles.
- 86 • Echelons Above Brigade (EAB) and other units may include Military Police Battalion, Military
87 Police Combat Support Companies, Motor Transportation Battalion, Mobility Augmentation
88 Companies, Signal Support Network, Support Maintenance Company, Operating Force Band,
89 Personnel Services Battalion, Movement Control Team, Quartermaster Supply Company, Truck

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

90 Company-Cargo, Engineer Battalion, Terminal High-Altitude Area Defense (THAAD) Battalion,
91 and Survey and Design Team. These units include approximately 2,500 military personnel.



Note: As of January 2007. Subject to change.

Figure S-1. Planned Unit Changes at Fort Bliss

94 The BRAC Commission also recommended, and the President accepted the recommendation, to relocate
95 the Air Defense Artillery (ADA) School and 6th and 31st ADA Brigades out of Fort Bliss.

96 In addition, elements of the 108th ADA Brigade have also been identified to move from Fort Bliss as a
97 discretionary move in support of the ACP. A National Guard and Reserves Joint Training Center
98 complex is being established at Fort Bliss in FY 2008 to support units in the Texas Army and Air
99 National Guard and Army Reserves in the El Paso area. The complex includes an Armed Forces Reserve
100 Center and consolidated vehicle maintenance facility. The center will have approximately 140 permanent
101 personnel, more than 90 wheeled vehicles, 25 tracked vehicles, and 170 other pieces of equipment. It will
102 provide training for 1,200-1,300 National Guard and Reserve personnel in 2-day sessions two to three
103 times per month and 2-week sessions during the summer.

104 In total, the Army Transformation and BRAC changes at Fort Bliss will result in a net increase of
105 approximately 20,000 military personnel and 2,700 Government civilian personnel, 1,440 tracked
106 vehicles, 3,600 wheeled vehicles, and 110 helicopters at Fort Bliss.

107 With the stationing of four Heavy BCTs at Fort Bliss, training requirements will increase substantially
108 and focus more on live-fire qualification training and off-road vehicle maneuvers. Emerging Army
109 doctrine, operational experience in Afghanistan and Iraq, and new equipment capabilities are changing
110 Army training concepts and training space requirements. Training in the current operational environment
111 requires large off-road vehicle maneuver/training areas of varying characteristics with complex terrain
112 and urban environments. Units should train in the same maneuver space conditions for live-fire, tactical
113 movement, and resupply as they would encounter in combat. Ground forces need large contiguous off-
114 road vehicle maneuver/training areas to support “free-flowing exercises.” Tactical maneuver wins battles
115 and engagements. By keeping the enemy off balance, it also protects the force. A training environment
116 that restricts unit training and does not properly reflect varied and complex battlefield conditions will not
117 adequately prepare units for combat.

118 Training requirements for the units moving to Fort Bliss are defined in Training Circular (TC) 25-1. TC
119 25-1 identifies both the spatial requirements (in terms of maneuver “boxes”) and frequency and duration
120 of training events required for each unit to achieve and maintain proficiency. These maneuver “boxes”
121 range from about 10 square kilometers (km²) for some platoon-level exercises to about 250 km² for
122 battalion-level exercises, up to almost 500 km² for BCT-level exercises. The combination of space and
123 time requirements can be measured in “square kilometer days” (km²d); for example, a battalion-level
124 exercise that is conducted twice a year for 14 days uses approximately 7,000 km²d (250 km² x 2 x 14).
125 The stationing of four Heavy BCTs and other units identified through Army Transformation and BRAC,
126 along with Fort Bliss’ mobilization mission and other existing units, will generate an annual requirement
127 for approximately 528,000 km²d of off-road vehicle maneuver. Based on a standard 242 training days per
128 year (excluding weekends and holidays), the areas of Fort Bliss currently approved for off-road vehicle
129 maneuver (North and South Training Areas and a small portion of McGregor Range) have an annual
130 capacity of only 328,000 km²d. Even if those areas were used 365 days out of the year, their capacity
131 (495,000 km²d) would be inadequate to meet the defined need. Therefore, additional off-road vehicle
132 maneuver training area is needed to meet the demand. Also, it is reasonable to assume that future
133 demands for use of the Fort Bliss Training Complex will increase further, placing additional pressure on
134 the installation to offer more and more varied training capability.

135 ***Scope of the SEIS***

136 The scope of this SEIS is to provide compliance with NEPA for the following actions:

- 137 • Changes in land use designations in the Main Cantonment Area and the Fort Bliss Training
138 Complex.
- 139 • Development of facilities and infrastructure to support projected changes in unit stationing at Fort
140 Bliss and associated operational and training activities.
- 141 • Amendments and updates to existing plans and programs to reflect the land use changes in the
142 Main Cantonment Area and Fort Bliss Training Complex analyzed in this document.
- 143 • Future actions that are consistent with the selected land use alternative and within the scope of the
144 umbrella analysis, providing a foundation for tiered environmental documentation to ensure
145 consistent future analysis and documentation of environmental effects.

146 To understand the reasonably foreseeable consequences of the land use decision to be made, the SEIS
147 qualitatively and quantitatively evaluates the environmental impacts of potential personnel changes,
148 facilities construction, and training activities on Fort Bliss associated with the land use alternatives
149 analyzed.

150 Fort Bliss has a closed range, Castner Range, located in Texas. It is not currently used for any Army
151 activities and the Army has no plans for its future use. Castner Range is not addressed in this SEIS except
152 as part of the cumulative impacts analysis.

153 **Alternatives Considered in the SEIS**

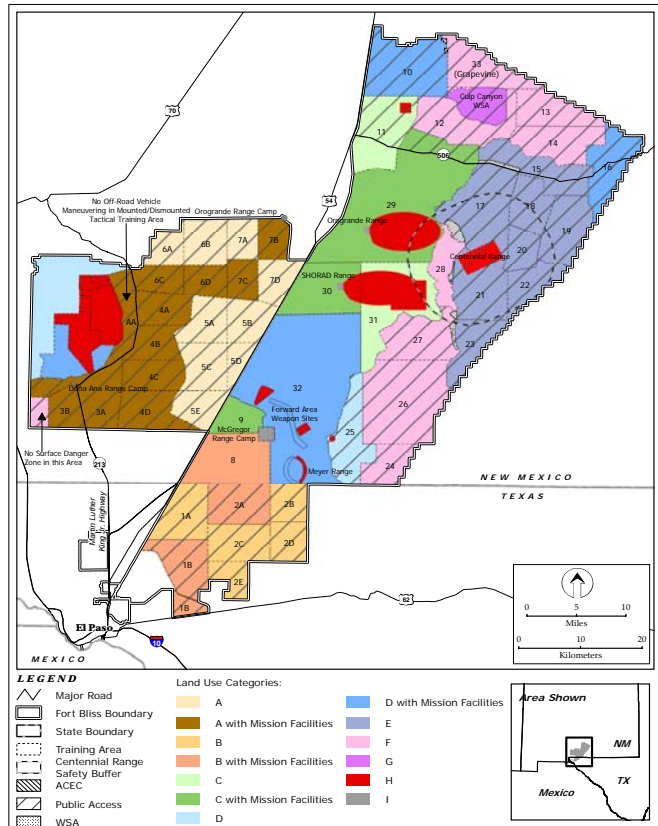
154 Existing facilities, infrastructure, and land use in the Main Cantonment Area of Fort Bliss were evaluated
 155 to identify alternatives for accommodating the facility and adjacency requirements of the new units and
 156 maximizing use of existing resources. An operational analysis was conducted to identify and evaluate
 157 options for providing the additional training capability needed. In addition to providing expanded off-
 158 road vehicle maneuver capacity, the operational analysis identified alternatives satisfying the following
 159 criteria:

- 160 • Ability to conduct realistic, battalion-level “movement-to-contact” training.
- 161 • Provide a variety of terrain and environments for off-road vehicle maneuvers, including various
 162 types of terrain that could be encountered in various regions and environments of the world where
 163 Army units may be deployed. Fort Bliss not only provides desert conditions and large expanses
 164 of flat terrain often encountered in the Middle East, but also has ridges and valleys that replicate
 165 terrain conditions in other regions.
- 166 • Provide simultaneous maneuver capacity for a minimum of three Heavy BCTs (assuming one of
 167 the four BCTs stationed at Fort Bliss is deployed or ready for deployment at any one time), all
 168 other units identified in BRAC for stationing at Fort Bliss, and the installation’s mobilization
 169 mission.
- 170 • Provide adequate capacity to support other missions that use Fort Bliss and the flexibility to
 171 accommodate changing missions and training needs in the future.

172 The redevelopment planning process and operational analysis resulted in identification of five
 173 alternatives, described below, for consideration in this SEIS. The map next to each alternative description
 174 shows the Fort Bliss Training Complex land use designations associated with that alternative (see the
 175 fold-out of Fort Bliss Training Area Land Use
 176 Categories at the back of this document for an
 177 explanation of the color-coding).

178 **No Action Alternative**

179 The No Action Alternative would continue the
 180 current land uses as adopted in the 2001 ROD
 181 for the Fort Bliss Mission and Master Plan
 182 PEIS, defined in the RPMP and TADC, and
 183 analyzed in documents tiering from the PEIS.
 184 Although this alternative would not change
 185 land use, facilities are being constructed in the
 186 Main Cantonment Area to support stationing
 187 of one Heavy BCT, in accordance with a
 188 completed Record of Environmental
 189 Consideration (REC). In addition, existing
 190 live-fire ranges are being upgraded and new
 191 live-fire ranges constructed, within current
 192 land use designations and/or on existing range
 193 footprints, to support the BCT. Additional
 194 mission support facilities will be constructed
 195 in areas currently designated for such
 196 facilities.



No Action Alternative Land Use

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

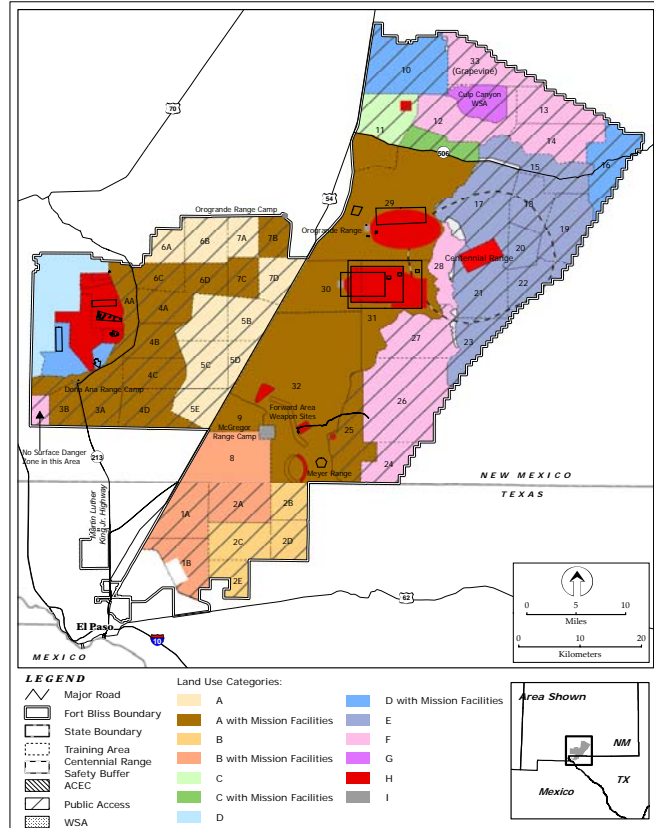
197 Authorized training activities will continue in
 198 the Fort Bliss Training Complex. Off-road
 199 vehicle maneuver training will continue on
 200 approximately 335,000 acres (1,356 km²) of
 201 the South Training Areas, North Training
 202 Areas, and Training Area (TA) 8 on
 203 McGregor Range. No off-road vehicle
 204 maneuver or live-fire would occur in
 205 McGregor Range training areas beyond what
 206 is currently designated in the TADC and as
 207 analyzed in the PEIS and subsequent NEPA
 208 documentation.

209 Alternative 1

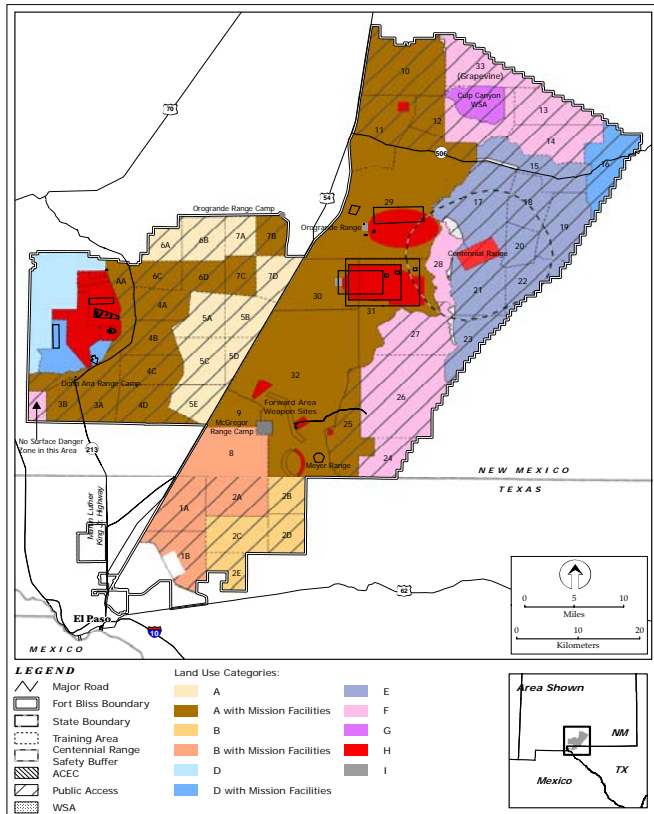
210 Alternative 1 would include all development
 211 described in the No Action Alternative and
 212 also involve land use changes in the Main
 213 Cantonment Area and the Fort Bliss Training
 214 Complex to accommodate personnel, facility
 215 requirements, and training activities
 216 associated with locating an Armor Division, a
 217 total of four Heavy BCTs, and other units
 218 shown on Figure S-1 at Fort Bliss as part of
 219 Army Transformation and BRAC. The Main
 220 Cantonment Area of Fort Bliss would be
 221 expanded to the north and east, additional
 222 mission support facilities would be
 223 constructed on the Fort Bliss Training
 224 Complex, additional firing ranges and training
 225 facilities would be constructed on Doña Ana
 226 and McGregor Ranges, and approximately
 227 216,000 additional acres (875 km²) of training
 228 land in the Tularosa Basin portion of
 229 McGregor Range south of New Mexico
 230 Highway 506 would be opened to off-road
 231 vehicle maneuver training. These changes
 232 would increase the total off-road vehicle
 233 training capability of the Fort Bliss Training
 234 Complex to a total of approximately 540,000
 235 km²d, minimally meeting the defined need for
 236 that training.

237 Alternative 2

238 Alternative 2 would include all changes
 239 described in the No Action Alternative and
 240 Alternative 1 and considers the personnel and
 241 equipment, facilities development, operations,
 242 and training associated with stationing a
 243 second CAB at Fort Bliss. This alternative
 244 would also add off-road vehicle maneuver



Land Use – Alternative 1



Land Use – Alternative 2

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

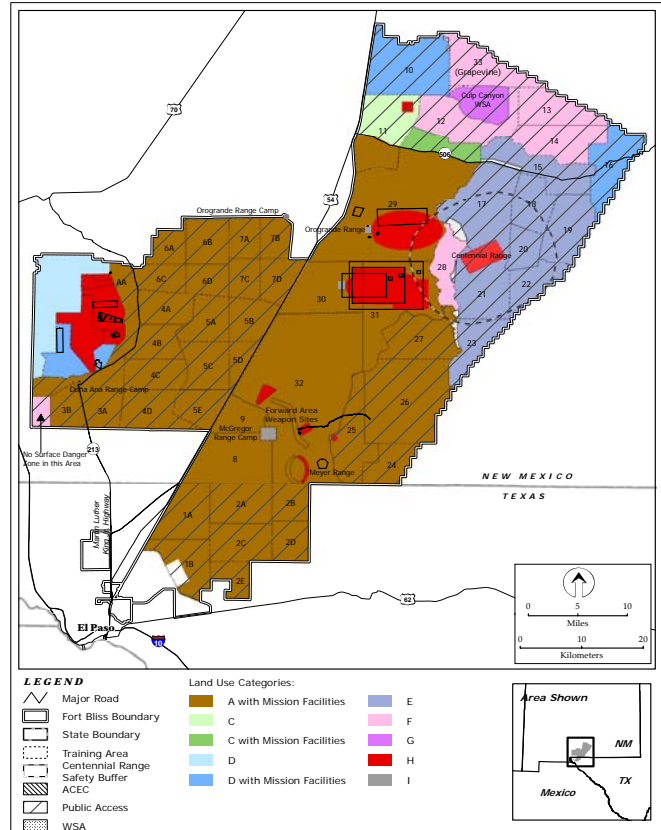
245 training in training areas within the Tularosa Basin
 246 Basin portion of McGregor Range north of
 247 Highway 506, providing approximately 280,000
 248 additional acres (1,135 km²) of off-road vehicle
 249 maneuver area above the existing capability.
 250 These changes would increase the total off-road
 251 vehicle training capability of the Fort Bliss
 252 Training Complex to approximately 603,000
 253 km²d. In addition to increasing the capacity of
 254 the installation to support off-road vehicle
 255 maneuvers, this alternative would provide the
 256 ability to conduct battalion-on-battalion and
 257 movement-to-contact exercises.

258 Alternative 3

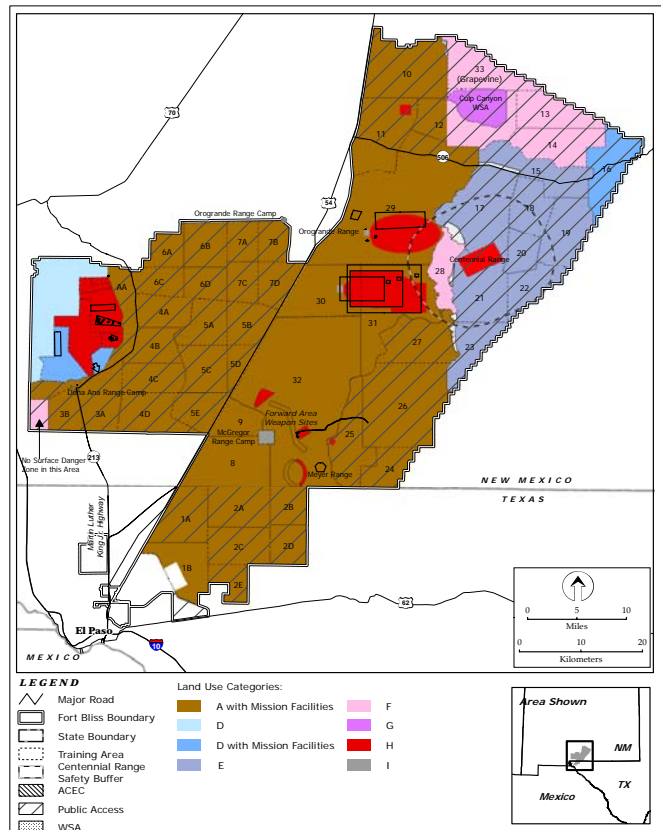
259 Alternative 3 would include all changes
 260 described in the No Action Alternative and
 261 Alternative 1 and incorporate a second CAB
 262 like Alternative 2. It would not extend off-road
 263 vehicle maneuver training north of Highway
 264 506; instead, it would add that capability to
 265 three training areas in the southeastern portion
 266 of McGregor Range below Otero Mesa,
 267 providing approximately 287,000 additional
 268 acres (1,163 km²) of off-road vehicle maneuver
 269 capability. These changes would increase the
 270 total off-road vehicle training capability of the
 271 Fort Bliss Training Complex to approximately
 272 610,000 km²d. In addition to increasing the
 273 capacity for off-road vehicle maneuvers, this
 274 alternative would offer more varied terrain and a
 275 training environment that is different from the
 276 other training areas available for that use.

277 Alternative 4 — Proposed Action

278 This alternative would include all changes
 279 described in Alternatives 1, 2, and 3, providing
 280 approximately 352,000 additional acres (1,424
 281 km²) of off-road vehicle maneuver training area
 282 in the Tularosa Basin portion of McGregor
 283 Range. This alternative was selected as the
 284 Proposed Action because it would provide all
 285 the training benefits of the other alternatives,
 286 including battalion-level movement-to-contact
 287 exercise capability and a variety of terrain
 288 environments, and offer the most capacity and
 289 flexibility to accommodate future mission
 290 changes and training requirements. These
 291 changes would increase the total off-road
 292 vehicle training capability of the Fort Bliss



Land Use – Alternative 3



Land Use –Alternative 4

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

293 Training Complex to approximately 673,000 km²d and provide the capacity to support up to six BCTs.

294 Alternative 4 is the Army's preferred alternative.

295 **Table S-1** presents key attributes of the five alternatives in comparative form.

296

Table S-1. Comparison of Alternatives

<i>Attribute</i>	<i>No Action Alternative</i>	<i>Alternative 1</i>	<i>Alternative 2</i>	<i>Alternative 3</i>	<i>Alternative 4 - Proposed Action</i>
Military personnel ¹	13,800	30,000	32,700	32,700	40,300
Total personnel ²	30,000	47,500	50,200	50,200	57,800
Military dependents	22,800	49,500	54,000	54,000	66,500
Primary additional equipment	900 wheeled and 360 tracked vehicles	3,900 wheeled and 1,640 tracked vehicles; 110 helicopters	4,460 wheeled and 1,640 tracked vehicles; 220 helicopters	4,460 wheeled and 1,640 tracked vehicles; 220 helicopters	6,260 wheeled and 2,360 tracked vehicles; 220 helicopters
Area of additional development in Main Cantonment Area	1,500 acres	4,000 acres	4,300 acres	4,300 acres	4,900 acres
Additional building construction in Main Cantonment Area	6.5 million square feet (SF)	21.9 million SF	23.2 million SF	23.2 million SF	25.8 million SF
Area of disturbance for construction in Main Cantonment Area	1,000 acres	3,400 acres	3,700 acres	3,700 acres	4,300 acres
Additional impervious surface in Main Cantonment Area	330 acres	1,300 acres	1,450 acres	1,450 acres	1,600 acres
Additional Off-Road Vehicle Maneuver area	0	216,000 acres (875 km ²)	280,000 acres (1,135 km ²)	287,00 acres (1,163 km ²)	352,000 acres (1,424 km ²)
Total Off-Road Vehicle Maneuver area	335,000 acres (1,356 km ²)	551,000 acres (2,230 km ²)	615,000 acres (2,491 km ²)	622,000 acres (2,519 km ²)	687,000 acres (2,780 km ²)
Total annual Off-Road Vehicle Maneuver training capability (military standard)	328,000 km ² days	540,000 km ² days	603,000 km ² days	610,000 km ² days	673,000 km ² days

Note: All numbers are approximate.

¹ Active duty, permanent party U.S. military assigned to Fort Bliss.

² Includes non-U.S. military, civilian employees, students, and temporary duty personnel.

297 Other alternatives considered and eliminated from detailed analysis include opening the Otero Mesa and
 298 Sacramento Mountains foothills portions of McGregor Range for off-road vehicle maneuvers, acquisition
 299 and/or use of off-post land for off-road vehicle maneuver training, supporting the BRAC and IGPBS
 300 without providing additional off-road vehicle maneuver capability, and conducting off-road vehicle
 301 maneuver training at White Sands Missile Range.

302 ***Affected Environment***

303 The SEIS analyzes impacts from the five alternatives in 14 resource areas: land use, Main Cantonment
304 Area infrastructure, training area infrastructure, airspace use and management, earth resources, air quality,
305 water resources, biological resources, cultural resources, noise, safety, hazardous materials and items of
306 special concern, socioeconomics, and environmental justice. The affected environment includes the Fort
307 Bliss Main Cantonment Area, the Fort Bliss Training Complex, and adjacent off-post areas that may be
308 affected by the proposed changes on Fort Bliss. The region of influence (ROI) varies among resource
309 topics but generally consists of a three-county area comprised of El Paso County in Texas and Doña Ana
310 and Otero Counties in New Mexico.

311 The physical environment of the ROI has not changed substantially since 2000. Therefore, the SEIS
312 incorporates information contained in the Mission and Master Plan PEIS by reference and updates and
313 augments the data as needed to reflect changes that have occurred since 2000. In general, updated data
314 are for the 2004-2005 timeframe or represent the most recent data available. Recent activities that have
315 been reviewed through the NEPA process, such as the relocation of the 4th BCT, 1st CAV to Fort Bliss,
316 are included in the No Action Alternative as part of the baseline for comparison with the other
317 alternatives.

318 Since 2001 when the ROD for the Mission and Master Plan PEIS was signed, activities at Fort Bliss have
319 been conducted in accordance with the land use guidelines contained in the RPMP, TADC, and other
320 adopted plans and procedures. Demolition and construction projects identified in the Mission and Master
321 Plan PEIS and similar to those identified in the PEIS have been implemented in accordance with the
322 evaluation guidelines for complying with NEPA that were defined in Appendix A of the PEIS.

323 Most of the ADA training that has dominated use of the Fort Bliss Training Complex in recent years has
324 primarily involved wheeled ADA units driving on existing roads to set locations, setting up equipment,
325 and performing their training in a largely static position. There was relatively little movement of
326 personnel or equipment. The engagements in Afghanistan and Iraq increased the training load associated
327 with Fort Bliss' mobilization mission, as more Army Reserve and National Guard personnel received
328 qualification training prior to deployment overseas. The relocation of the 4th BCT, 1st CAV to Fort Bliss
329 introduced the first locally based heavy maneuver brigade stationed at Fort Bliss since the 3rd Armored
330 Cavalry Regiment (ACR) was moved from Fort Bliss to Fort Carson in 1995. The off-road maneuver
331 training conducted at Fort Bliss by the 4th BCT, 1st CAV is similar to past training conducted by the 3rd
332 ACR.

333 The McGregor Range segment of the Fort Bliss Training Complex is primarily comprised of public land
334 withdrawn from the public domain for military use. The withdrawal was renewed in 1999 by Public Law
335 106-65. Since the completion of the Mission and Master Plan PEIS, the U.S. Air Force has constructed
336 Centennial Range, an air-to-ground training range, on Otero Mesa within McGregor Range. Because of
337 its withdrawal status, McGregor Range is co-managed by Fort Bliss and the Bureau of Land Management
338 (BLM). Portions of the range are leased by BLM to individuals for grazing. In addition, McGregor
339 Range includes the Culp Canyon Wilderness Study Area and the McGregor Black Grama Grassland Area
340 of Critical Environmental Concern, which is managed to protect valuable biological resources and to
341 study the ecology of undisturbed grassland.

342 The BLM conducts its management responsibilities for McGregor Range in accordance with the *Resource*
343 *Management Plan Amendment (RMPA) for McGregor Range* (May 2006). The RMPA describes
344 management strategies for the withdrawn public lands on McGregor Range. Actions incorporated in the
345 RMPA include establishing two utility right-of-way corridors, creating right-of-way exclusion areas
346 (where rights-of-way would not be allowed), and designating new Areas of Critical Environmental
347 Concern, including the Escondido Pueblo. The RMPA reflects changes in the mission and uses of Fort
348 Bliss based on the 2000 Mission and Master Plan PEIS and the construction and use of Centennial Range.

349 The population in the ROI grew by 5 percent between 2000 and 2004. The highest rate of growth was in
350 Doña Ana County (6.5 percent), followed by El Paso County (5 percent), with Otero County experiencing
351 the least growth (1.6 percent). Development in the City of El Paso has extended to the north and east, in
352 areas close to Fort Bliss. Areas of Doña Ana County just north of the New Mexico state boundary have
353 experienced substantial growth, especially in the communities of Chaparral and Anthony south of the
354 Doña Ana Range portion of Fort Bliss.

355 Increased traffic in the City of El Paso associated with the population growth has resulted in some
356 roadways degrading to unacceptable levels of service, especially along segments of Interstate Highway 10
357 and Montana Avenue. In response to the increased traffic congestion, the Texas Department of
358 Transportation has planned some improvements on I-10, Montana Avenue, the Inner Loop through the
359 Fort Bliss Main Cantonment Area, and the Northeast Parkway bypassing I-10 through the city.

360 Population growth has also increased the demand for potable water in the region. Fort Bliss, the City of
361 El Paso, and Ciudad Juárez obtain the majority of their drinking water from wells that pump fresh water
362 out of the Hueco Bolson aquifer. Currently, withdrawals from the bolson exceed the aquifer's recharge
363 rate. A desalination plant to be operated by the City of El Paso Water Utilities (EPWU) is being
364 constructed on Fort Bliss land in the South Training Areas to treat brackish water from the Hueco Bolson
365 and decrease freshwater withdrawals. The desalination plant is one of several projects planned by EPWU
366 to obtain new water sources to accommodate increased demands.

367 ***Environmental Consequences***

368 The No Action Alternative involves construction of new facilities and infrastructure in the Main
369 Cantonment Area to accommodate one Heavy BCT, upgrades and enhancements to live-fire ranges in the
370 Fort Bliss Training Complex, increased off-road vehicle maneuver training in the North and South
371 Training Areas and TA 8 on McGregor Range that are currently approved for that use, and increased
372 traffic and demand for utilities, housing, and community services due to the influx of approximately
373 23,000 new people into the region. None of these impacts of the No Action Alternative are expected to
374 be significant.

375 The other alternatives are anticipated to generate substantial economic benefits and significantly affect
376 population growth and development, traffic, utility demands, and demand for public and medical services
377 in the region. Expansion of off-road vehicle maneuver training into the Tularosa Basin portion of
378 McGregor Range, along with increased maneuvers in the North and South Training Areas, is expected to
379 increase wind and water erosion significantly and will likely result in long-term changes in vegetation
380 communities in the more intensely used training areas. Training related noise is also expected to increase
381 in areas adjacent to Doña Ana Range and portions of McGregor Range. **Table S-2** summarizes and
382 compares the environmental consequences of the five alternatives.

383 ***Changes Between the Draft and Final SEIS***

384 A Draft SEIS was distributed for public review and comment on October 6, 2006. The Final SEIS
385 contains public comments received on the Draft SEIS during the public review period, which ended
386 December 12, 2006, along with responses to those comments. Changes made to the SEIS in response to
387 public comments include providing additional information and analysis concerning transportation, water
388 resources, biological resources, safety, hazardous materials, socioeconomics, and cumulative impacts. A
389 new Chapter 6.0 has been added to consolidate the discussion of mitigation measures and monitoring
390 activities to reduce the environmental effects of the Proposed Action and other alternatives.

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

391

Table S-2. Summary Comparison of the Environmental Consequences of the Alternatives

<i>Resource</i>	<i>No Action</i>	<i>Alternative 1</i>	<i>Alternative 2</i>	<i>Alternative 3</i>	<i>Alternative 4 - Proposed Action</i>
Land Use	<p>No change in land use designations on Fort Bliss or in non-military use of training areas.</p> <p>Off-post areas adjacent to North and South Training Areas could be exposed to increased noise and dust.</p> <p>Development for one Heavy BCT will make Biggs Army Airfield (AAF) appear more urbanized.</p>	<p>Main Cantonment Area land use changed to mixed use designation. Major new development on about 4,000 acres of the Main Cantonment Area.</p> <p>Change in land use designation of south Tularosa Basin portion of McGregor Range and more visible development of ranges. Non-military uses not expected to be greatly affected.</p> <p>Additional personnel and related population increase would increase development in the City of El Paso. Open space would be converted to more urban use. Rural communities in El Paso and Doña Ana Counties likely to become more developed.</p>	<p>Main Cantonment Area effects similar to Alternative 1.</p> <p>Development for a second CAB consistent with existing land use and visual character of Biggs AAF.</p> <p>Off-road vehicle maneuvers on McGregor Range north of Highway 506 would affect visual character of landscape and, depending on level of use, may eventually affect productivity of the land to support grazing.</p>	<p>Main Cantonment Area effects same as Alternatives 1 and 2.</p> <p>Off-road vehicle maneuvers in southeast training areas of McGregor Range would affect visual character of landscape.</p>	<p>Same as Alternatives 1, 2, and 3 combined. In addition, Main Cantonment Area could become more developed, and population growth associated with the potential stationing of two additional Heavy BCTs could further increase development and urbanization of surrounding off-post communities.</p>
Main Cantonment Area Infrastructure	<p>Increased traffic in vicinity of Main Cantonment Area not expected to significantly affect level of service on roadways.</p> <p>Utilities and energy demand well within the capacity of service providers.</p>	<p>Increased traffic in vicinity of Main Cantonment Area would reduce level of service on some roadways, but only one segment of U.S. Highway (US) 54 would degrade to unacceptable level by 2021.</p> <p>Population increase would represent 20 percent of EPWU's demand for potable water. Additional wastewater generation by increased population in combination with baseline population growth in El Paso estimated to exceed existing treatment capacity by approximately 7 percent. If new on-post landfill is</p>	<p>Same as Alternative 1 with marginal increase in traffic and utilities and energy demand associated with second CAB. Roadway level of service would decline to unacceptable level on two additional roadway segments by 2021.</p> <p>Population increase would represent 22 percent of EPWU's demand for potable water. Increased</p>	<p>Same as Alternative 2.</p>	<p>Same as Alternatives 1, 2, and 3. Level of service on another segment of US 54 would decline to unacceptable level. Population increase would represent 28 percent of EPWU's demand for potable water. Increased wastewater generation in El Paso estimated to exceed existing capacity by approximately 13</p>

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

<i>Resource</i>	<i>No Action</i>	<i>Alternative 1</i>	<i>Alternative 2</i>	<i>Alternative 3</i>	<i>Alternative 4 - Proposed Action</i>
		constructed, solid waste generation from new family housing and increased off-post population is estimated to shorten life of Clint Landfill by about 1.4 years. If new on-post construction is not constructed, increase in solid waste is estimated to shorten life of Clint Landfill by about 1.7 years.	wastewater generation in El Paso estimated to exceed existing treatment capacity by approximately 8 percent. Increased solid waste generation estimated to shorten life of Clint Landfill by about 1.6 years if new on-post landfill is constructed and 1.9 years if new on-post landfill is not constructed. Increased capacity needed in natural gas feeders to Main Cantonment Area.		percent. Additional population increase estimated to reduce the life of the Clint Landfill by about 2.2 years if new on-post landfill is constructed and 2.6 years if new on-post landfill is not constructed.
Training Area Infrastructure	Wastewater treatment facilities at Doña Ana and McGregor Range Camps require expansion and upgrading, including lining, to increase capacity. Size of four culverts at Orogrande Range Camp needs to be increased.	Same improvements needed as No Action Alternative. Military convoys to Doña Ana Range-North Training Areas would reduce level of service on Martin Luther King, Jr. Boulevard/New Mexico Highway 213. Military convoy traffic on US 54 not expected to affect level of service. More frequent solid waste collection and delivery of liquefied petroleum gas needed due to increased use of range camps.	Same as Alternative 1. Highway 506 would be occasionally and temporarily closed for military vehicle crossings; delays expected to last 15 minutes or less. Orogrande pipeline in north McGregor Range would need to be protected from damage by heavy tracked vehicles.	Same as Alternative 1.	Same as Alternative 2.

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

<i>Resource</i>	<i>No Action</i>	<i>Alternative 1</i>	<i>Alternative 2</i>	<i>Alternative 3</i>	<i>Alternative 4 - Proposed Action</i>
Airspace Use and Management	No impact.	Increase in helicopter and unmanned aerial vehicle operations not expected to affect airspace use or management.	Same as Alternative 1. Additional helicopter operations not expected to affect airspace use or management.	Same as Alternative 2.	Same as Alternative 2.
Earth Resource	Minor, temporary increase in soil erosion potential from construction in Main Cantonment Area. Off-road vehicle maneuvers not expected to change soil conditions significantly in North and South Training Areas and TA 8.	Temporary increase in soil erosion from construction in Main Cantonment Area. Significant increase in wind erosion potential in south Tularosa Basin portion of McGregor Range from range construction and off-road vehicle maneuvers. Heavily used areas would be vulnerable to down-wind soil transport. Down-wind vegetation could become covered, leading to further desertification. Vegetation cover in less heavily used areas likely to become patchy.	Same as Alternative 1, with extension of off-road vehicle maneuvers, and resulting increase in soil erosion, into training areas north of Highway 506.	Same as Alternative 1, with extension of off-road vehicle maneuvers, and resulting increase in soil erosion, into TAs 24, 26, and 27 on McGregor Range, which are also susceptible to moderate to severe water erosion.	Same as Alternatives 1, 2, and 3 combined.
Air Quality	Emissions from construction, vehicle combustion, and training not expected to significantly affect air quality.	Higher emissions from construction, vehicle combustion, and training operations than No Action Alternative; resulting air pollutant concentrations not expected to exceed National Ambient Air Quality Standards. Increase in off-road vehicle maneuvers would result in increased fugitive dust generation. Particulate levels at installation boundary would be well below air quality standards.	Similar to Alternative 1 with slight increase in emissions.	Similar to Alternative 2.	Similar to Alternative 1, 2, and 3 with increased emissions and fugitive dust associated with additional BCTs and associated off-road vehicle maneuver training.

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

<i>Resource</i>	<i>No Action</i>	<i>Alternative 1</i>	<i>Alternative 2</i>	<i>Alternative 3</i>	<i>Alternative 4 - Proposed Action</i>
Water Resources	Additional water demand within existing planned capacity of water purveyors.	Increase in demand for potable water in combination with baseline population growth in El Paso area estimated to consume 97 percent of EPWU's available resources by 2015. Potential short-term increase in pumpage of groundwater from the Hueco Bolson to meet need while EPWU plans for alternative sources are put in place. Tularosa Basin not expected to be adversely affected.	Increase in demand for potable water in combination with baseline population growth in El Paso area estimated to consume 99 percent of EPWU's available resources by 2015.	Same as Alternative 2.	Increase in demand for potable water in combination with baseline population growth in El Paso area estimated to exceed EPWU's available resources by 3 percent, requiring acceleration of EPWU plans to obtain additional supplies.
Biological Resources	No significant impacts expected. Some loss of breeding bird habitat in Main Cantonment Area.	Construction in Main Cantonment Area would reduce breeding bird habitat and likely to affect nests and displace birds. Off-road vehicle maneuvers in south Tularosa Basin portion of McGregor Range would have moderate impact on vegetation and wildlife. Areas affected are dominated by mesquite coppice dunes and other shrubland vegetation communities, which are common on Fort Bliss. Vegetation cover likely to become more patchy with herbaceous species, which could lead to less wildlife density. A small portion of the affected area susceptible to additional coppice dune formation. Impacts on sensitive species not anticipated to jeopardize regional populations.	Similar to Alternative 1 with impacts extended to eastern portion of Main Cantonment Area and areas north of Highway 506.	Same as Alternative 1 for Main Cantonment Area, North and South Training Areas, and south Tularosa Basin portion of McGregor Range. Habitat in southeast training areas of McGregor Range (TAs 24, 26, and 27) dominated by grasslands with higher species richness. Intensive off-road vehicle maneuver training could ultimately change vegetative cover and ecological state of those TAs. Sensitive species not expected to be significantly affected.	Same as Alternatives 1, 2, and 3 combined.

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

<i>Resource</i>	<i>No Action</i>	<i>Alternative 1</i>	<i>Alternative 2</i>	<i>Alternative 3</i>	<i>Alternative 4 - Proposed Action</i>
Cultural Resources	Significant impacts reduced or mitigated in accordance with Programmatic Agreement and ICRMP.	Significant impacts reduced or mitigated in accordance with Programmatic Agreement and ICRMP. Some loss of archaeological resources in training areas likely but would be managed as provided for in the Programmatic Agreement. Increased risk of uncovering previously unknown cultural resources during construction.	Same as Alternative 1 with potential for loss of archaeological resources in the north Tularosa Basin portion of McGregor Range.	Same as Alternative 1 with potential for loss of archaeological resources in southeast training areas of McGregor Range.	Same as Alternatives 1, 2 and 3 combined.
Noise	Increase in noise from large caliber weapons firing at Doña Ana Range and southern end of McGregor Range.	Expansion of noise contours associated with large caliber weapons firing at Doña Ana Range and McGregor Range, including new Orogrande Range Complex. No significant impact from increased helicopter operations at Biggs AAF. Additional noise from helicopters crossing US 54 from Orogrande Range Camp to McGregor Range. Off-road vehicle maneuvers would generate elevated noise levels near maneuver areas during use. Elevated noise from military vehicle convoys could extend out approximately 2,000 feet from roadways.	Same as Alternative 1.	Same as Alternative 1.	Further expansion of noise contours associated with large caliber weapons firing at Doña Ana and McGregor Ranges.

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

<i>Resource</i>	<i>No Action</i>	<i>Alternative 1</i>	<i>Alternative 2</i>	<i>Alternative 3</i>	<i>Alternative 4 - Proposed Action</i>
Safety	Negligible increase in chance of Class A mishap.	Minor increase in chance of Class A mishap. Slight potential increased risk of wildfires not significant due to low fuel load in the Tularosa Basin and prevention, detection, and response procedures in Range SOP.	Same as Alternative 1 with slight increased risk of Class A mishaps with second CAB.	Same as Alternatives 1 and 2. Higher risk of wildfires in grasslands of the southeast training areas.	Same as Alternatives 1, 2, and 3. Additional increase in chance of Class A mishap but probability still low. Risk of wildfires highest in southeast training areas.
Hazardous Materials and Items of Special Interest	Minor increase in hazardous waste generation and risk of release of hazardous materials or waste.	Additional increase of hazardous waste generation and risk of release of hazardous materials or waste manageable through existing procedures.	Same as Alternative 1 with slightly higher generation of hazardous waste with second CAB.	Same as Alternative 2.	Same as Alternative 1 with somewhat higher generation of hazardous waste with second CAB and two additional BCTs.
Socioeconomics	Minor increase in population, economic activity, and demand for housing and community services.	Significant increase in population growth in El Paso County. Annual population growth rate estimated to increase from less than 3 percent to more than 4 percent over next five years. Significant beneficial impact on economic activity and tax revenues in the City of El Paso and El Paso County. Short-term significant increase in military construction may create a risk of “boom-bust” effects. Demand for additional housing may out pace ability of local market to respond, resulting in increased housing prices. El Paso school districts, law enforcement and fire protection, and	Same as Alternative 1 with potential for additional socioeconomic effects from construction and population increase with second CAB. Additional population could further stress housing market and community services.	Same as Alternative 2.	In addition to impacts described for Alternative 2, potential for extended socioeconomic effects from construction and population increase with two additional BCTs. Additional military construction could reduce or defer risk of “bust” effect. Additional population growth could further stress housing market and community services.

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

<i>Resource</i>	<i>No Action</i>	<i>Alternative 1</i>	<i>Alternative 2</i>	<i>Alternative 3</i>	<i>Alternative 4 - Proposed Action</i>
		<p>medical services would require substantial personnel increases and new facilities in some cases. Medical service impacts especially significant due to already existing shortfalls in the community.</p> <p>Quality of life in El Paso would be affected by increased urbanization and probable cost of living increases.</p>			
Environmental Justice	No disproportionately high and adverse impacts on minority or low-income populations expected.	Noise from large caliber weapons firing at Doña Ana Range would affect the community of Chaparral, which has a higher percent of low-income population than the average for the region of influence.	Same as Alternative 1	Same as Alternative 1.	Additional areas in Doña Ana, El Paso, and Otero Counties with higher than average low-income population would be affected by large caliber weapons firing at Doña Ana and McGregor Ranges.

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1.0 PURPOSE OF AND NEED FOR ACTION

This Supplemental Environmental Impact Statement (SEIS) supplements the *Final Fort Bliss, Texas and New Mexico, Mission and Master Plan Programmatic Environmental Impact Statement* (Mission and Master Plan PEIS) dated December 2000 and associated Record of Decision (ROD) signed in 2001. It identifies the potential environmental effects that would result from modifying land and airspace use at Fort Bliss to continue supporting evolving changes in missions and units, associated facilities and infrastructure, and training activities.

The changes in land and airspace use adopted pursuant to this SEIS will subsequently be incorporated in updates and amendments to the Fort Bliss Master Plan and related management programs, including the Real Property Master Plan (RPMP), Integrated Cultural Resources Management Plan (ICRMP), Integrated Natural Resources Management Plan (INRMP), Training Area Development Concept (TADC), Integrated Training Area Management (ITAM) Program Work Plan, and Range Complex Master Plan (RCMP).

The SEIS has been prepared in compliance with the National Environmental Policy Act (NEPA) (Public Law [PL] 91-190, 42 United States Code [U.S.C.] 4321-4347, as amended), Council on Environmental Quality (CEQ) Regulations for Implementing the Procedural Provisions of NEPA (40 Code of Federal Regulations [CFR] 1500-1508), and 32 CFR Part 651, “Environmental Effects of Army Actions.”

This chapter provides background information leading to the preparation of the SEIS; describes the purpose of and need for the proposed action, including changes in organizations, personnel, equipment, and training requirements at Fort Bliss; identifies the decision to be made; summarizes the scope of the SEIS; and describes changes between the Draft SEIS and Final SEIS.

1.1 BACKGROUND

Fort Bliss is a multi-mission United States (U.S.) Army installation located on approximately 1.12 million acres in Texas and New Mexico (**Figure 1-1**). It consists of the Main Cantonment Area, which is comprised of the Main Post, William Beaumont Army Medical Center (WBAMC), Logan Heights, and Biggs Army Airfield (AAF); Castner Range; and the Fort Bliss Training Complex, which is comprised of three large geographic segments: (1) the South Training Areas, (2) Doña Ana Range-North Training Areas, and (3) McGregor Range (**Figure 1-2**).

Fort Bliss was first established in 1849. Since 1957, the installation has been the home of the U.S. Army Air Defense Artillery Center and Fort Bliss (USAADACENFB). Its primary mission in the 21st century has been to support the Army’s Air Defense Artillery (ADA) training and serve as a Power Projection Platform for regular Army, Army Reserve, and Army National Guard troops mobilizing for deployment.

In April 2002, the Deputy Chief of Staff of the Army for Operations and Plans announced the decision to proceed with the proposed 30-year, phased implementation of Army Transformation. Fort Bliss was one of 25 Army “force projection” installations described and analyzed in the Army Transformation PEIS (Ref# 143). Continued strategic planning and lessons learned from the Global War on Terrorism (GWOT) and Army operations in Iraq and Afghanistan resulted in the development of the Army Campaign Plan (ACP) to support Army Transformation.

The ACP was approved in April 2004 to implement Army Transformation to a modular force. It restructures the Army from a division-oriented force to a “brigade-based” or modular force able to efficiently respond to Regional Combatant Commanders, support joint operations, facilitate force packaging (grouping units and equipment to accomplish a specific mission or achieve a desired capability) and rapid deployment, and fight as self-contained units. Each self-contained unit is a brigade-sized building block of combat power. The new brigade modules replicate the capabilities of a former division only in a smaller unit size.

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

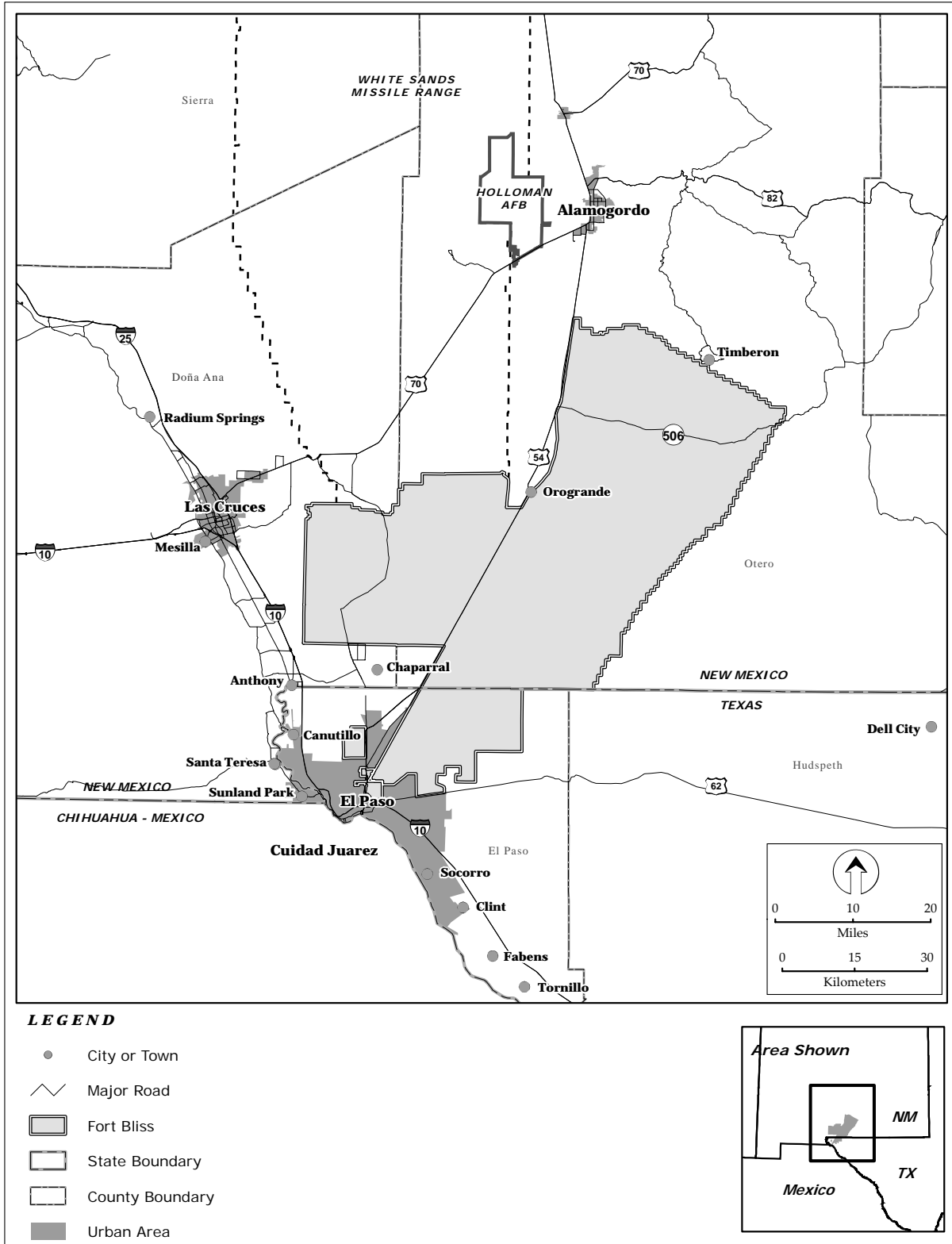


Figure 1-1. Location of Fort Bliss

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

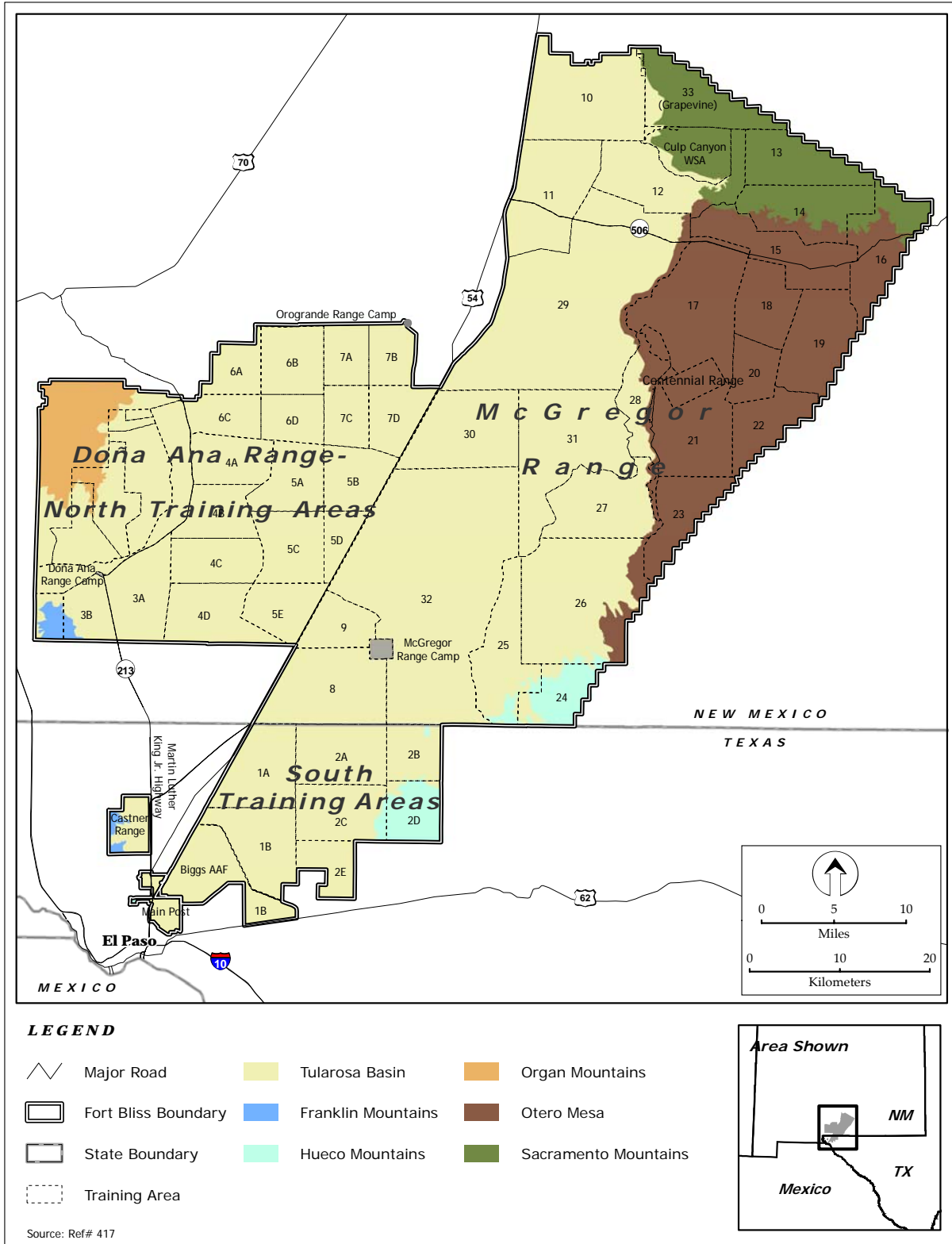


Figure 1-2. Fort Bliss, Texas and New Mexico

48
49

50 Of primary importance is the objective to transform Army structure. The plan is to convert all Active
51 Component and Reserve Component units to modular units by fiscal year (FY) 2007. As part of the
52 modular force transformation, the Army is activating 10 new combat arms brigades for a total of 43
53 Active Component Brigade Combat Teams (BCTs). As a result, the number of BCTs stationed in the
54 U.S. will rise from 26 to 40. At Fort Bliss, the transformation to a modular force has initially involved
55 relocating the 4th BCT, 1st Cavalry Division (CAV) to Fort Bliss in 2006 and will involve bringing in
56 other units between 2007 and 2011 to support the transformation of Fort Bliss to a heavy mounted
57 maneuver installation, while continuing to support power projection and mobilization/demobilization
58 mission requirements. In addition, as part of an Integrated Global Presence Basing Strategy (IGPBS)
59 (also known as Global Defense Posture Realignment), three more Heavy BCTs and the 1st Armor
60 Division Headquarters (HQ) will be brought back from Germany and stationed at Fort Bliss between
61 2007 and 2010.

62 These relocations were endorsed by the Base Realignment and Closure (BRAC) Commission, which also
63 approved a Department of Defense (DoD) proposal to move the ADA Center, including the ADA School,
64 6th ADA Brigade, and 31st ADA Brigade, from Fort Bliss to Fort Sill, Oklahoma and relocate an
65 Artillery (Fires) Brigade from Fort Sill to Fort Bliss. Moving this Artillery Brigade collocates the
66 artillery with the maneuver units at Fort Bliss. Further, the Commission endorsed moving aviation units
67 from Fort Hood, Texas to Fort Bliss to support the activation of a Combat Aviation Brigade (CAB) and
68 bringing in a Terminal High-Altitude Area Air Defense (THAAD) unit. Finally, the Commission
69 supported a DoD proposal to establish a Joint Pre-Deployment/Mobilization Platform at Fort Bliss. These
70 recommendations became law in December 2005. In addition to the BRAC decisions, the Army plans to
71 relocate the 108th ADA Brigade from Fort Bliss to Fort Bragg, North Carolina, as a discretionary move in
72 support of the ACP and has established a Future Force Integration Directorate at Fort Bliss to support
73 evaluation of future combat systems.

74 **1.2 PURPOSE OF THE PROPOSED ACTION**

75 The purpose of the proposed action is to:

- 76 • Modify current land use on Fort Bliss to more fully realize the installation's capability and
77 flexibility to support Army training and testing requirements; the evolving force structure;
78 potential future missions; and Joint, Interagency, Intergovernmental, and Multinational agencies,
79 without compromising the commitment to stewardship of natural and cultural resources.
- 80 • Construct additional facilities and infrastructure in the Main Cantonment Area necessary to
81 support BRAC and IGPBS stationing decisions.
- 82 • Develop live-fire, qualification, and testing ranges required to support the requirements of units
83 stationed at Fort Bliss.
- 84 • Develop range camps, auxiliary facilities, and other improvements.

85 The SEIS differs from the 2000 Mission and Master Plan PEIS in that part of the purpose of the PEIS was
86 to enhance management of Fort Bliss land, airspace, and infrastructure through adoption of the RPMP,
87 TADC, ICRMP, and INRMP and related management procedures. Those plans and procedures are now
88 in place, and the purpose of this SEIS is to modify land use to continue supporting Fort Bliss' evolving
89 missions. The land use changes adopted after completion of the SEIS will be used to amend those plans
90 and procedures as needed to incorporate the selected alternative.

91 **1.3 NEED FOR THE PROPOSED ACTION**

92 The need for the proposed action is to support Army Transformation and the ACP by more fully realizing
93 the capability of Fort Bliss lands and facilities, including off-road vehicle maneuver lands, airspace, and
94 firing ranges. Recent BRAC and IGPBS stationing decisions define the known future missions of Fort
95 Bliss and create the near-term requirements for off-road vehicle maneuver space and facilities and
96 infrastructure improvements. Over the long term, Fort Bliss needs to be able to continue supporting the
97 evolving operational, infrastructure, training, and testing requirements of the Army.

98 This section describes the mission and organizational changes and resulting personnel, equipment, and
99 training requirements at Fort Bliss that drive the need to modify land use at the installation.

100 **1.3.1 Change in Fort Bliss Mission**

101 As Army restructuring and realignment evolve, there is a potential need to utilize fully the training
102 capability at any given installation. Furthermore, it is reasonable to assume that installations with
103 additional training capability could receive new missions in the future.

104 Transformation to a modular force will result in changes in fighting unit structure, higher intensity levels
105 of training activity, use of new types of equipment, and construction or upgrade of live-fire ranges using
106 digital technology. New weapons systems and ranges using digital technology will expand the size
107 requirements for live-fire ranges. There will also be a need for new types of live-fire ranges such as those
108 required to train soldiers for urban combat and convoy protection. These changes, combined with
109 changes in training doctrine to support highly mobile, self-contained units, will involve use of larger areas
110 of the available training land. In addition, the new brigades and the realignment of the force will require
111 increased use at existing live-fire ranges, training areas, and airspace.

112 **1.3.2 Organizational Changes**

113 Currently, Fort Bliss is the home of the USAADACENFB, the U.S. Army ADA School, and over 30
114 partner units and organizations. The ADA School educates and trains U.S. military students (Active and
115 Reserve Components), civilians, and selected allied forces students in air defense artillery and other
116 subjects that support the air defense mission. The main operational units currently stationed at Fort Bliss
117 are the 11th, 31st, and 108th ADA Brigades. The 4th BCT, 1st CAV located to Fort Bliss in 2006 and
118 subsequently deployed to southwest Asia.

119 A Future Force Integration Directorate (FFID) with an Army Evaluation Force (AEF) is currently being
120 established on Fort Bliss. The AEF will test and evaluate a network of weaponry and technology under
121 development for Future Combat Systems (FCS). FCS consists of 18 manned and unmanned systems that
122 are connected by a network. Through the network, soldiers and leaders are linked to combat technologies
123 that allow them to maneuver quickly and conduct various missions in complex scenarios. The systems
124 include ground sensors, intelligent munitions, unmanned aerial vehicles, unmanned ground vehicles, an
125 armed robotic vehicle, medical treatment and evacuation, and other equipment.

126 Biggs AAF provides full airfield services for all U.S. military services, Department of Justice, and other
127 government flight detachments. As an integral part of the ability of Fort Bliss to support national power
128 projection, Biggs AAF is an aerial departure point for all deployable units at Fort Bliss, approximately
129 115 Army Reserve/National Guard units, and civilian government and contract employees.

130 Other major organizations currently located on the installation include:

- 131
 - The Test and Experimentation Command's (TEXCOM) ADA Test Directorate, which provides
- 132 the ADA Center with an independent organization capable of conducting air defense weapons
- 133 experimentation, force development, and operational testing.

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

- 134 • Joint Task Force (JTF) North, a military command stationed at Fort Bliss that provides support to
135 various law enforcement agencies.
- 136 • The U.S. Army Sergeants Major Academy (USASMA), which prepares Army Noncommissioned
137 Officers (NCOs) for assignments as battalion, brigade, and division staff NCOs and First
138 Sergeants. Selected NCOs from the Army, other U.S. services, and international forces attend
139 courses in preparation for assignments as Sergeants Major and Command Sergeants Major.
- 140 • WBAMC, a part of the U.S. Army Medical Command, which provides full-service (inpatient and
141 outpatient) medical treatment for all military personnel in the El Paso area. Medical air
142 evacuation services throughout its service area are provided from Biggs AAF.
- 143 • Joint, Interagency, Intergovernmental, and Multinational agencies, including Allied Liaison
144 Officers from Canada, Germany, Japan, and the Netherlands. Fort Bliss is the home station for
145 the German Air Force Command in the United States and Canada and the German Air Defense
146 School.

147 Fort Bliss Garrison Command oversees, maintains, and operates the multi-mission installation. Fort Bliss
148 Garrison Command accomplishes this through its public works, logistics, master planning and
149 engineering, material maintenance, supply and services support, transportation, and environmental
150 management activities. The U.S. Army Combined Arms Support Battalion (USACAS) provides
151 management, control, maintenance, and operation of the Fort Bliss Training Complex.

152 **Figure 1-3** graphically illustrates the unit changes expected to occur at Fort Bliss between FY 2006 and
153 2010 as a result of IGPBS, BRAC, and other actions. They include the following additions:

- 154 • Four Heavy BCTs, self-contained brigades that provide combat power needed to deploy and
155 fight. Each BCT is organized with two Combined Arms Battalions and one Armed
156 Reconnaissance Battalion, a Fires Battalion, Brigade Troops Battalion, and a Support Battalion.
157 The Combined Arms and Armed Reconnaissance Battalions are comprised of four tank
158 companies, four mechanized infantry companies, three reconnaissance troops (company size),
159 and one surveillance troop. Each BCT includes approximately 3,800 military personnel and is
160 equipped with more than 360 tracked vehicles, including M1 tanks, Bradley fighting vehicles,
161 Howitzers, 120 millimeter (mm) mortar carriers, and nearly 900 High Mobility Multipurpose
162 Wheeled Vehicles (HMMWVs) and other wheeled vehicles.
- 163 • An Armor Division HQ, a self-contained modular headquarters that commands and controls up to
164 six maneuver BCTs engaged in combat operations. It combines the functions of the current
165 Division HQ with the tactical responsibilities of the corps. It may direct and control additional
166 brigades depending on the operational environment. There are approximately 700-800 military
167 personnel assigned to the Division HQ.
- 168 • An Artillery (Fires) Brigade that plans, prepares, executes and assesses combined arms operations
169 to provide close support and precision strikes for BCTs and support brigades using artillery,
170 rockets, and missiles. It enables integrated employment of surface-to-surface and air-to-surface
171 lethal and non-lethal fires. It conducts close support, counterfires, and precision strikes to
172 destroy, fix, or isolate enemy forces or capabilities. It provides precision strike capabilities
173 throughout the depth of an area of operations that is normally larger than that of a single
174 maneuver brigade. It includes two Multiple Launch Rocket System (MLRS) battalions and
175 signal, target acquisition, and forward support companies with a total of approximately 1,600
176 military personnel, 423 wheeled vehicles, and 36 tracked vehicles.
- 177 • A CAB that plans, prepares, executes, and assesses aviation and combined arms operations to
178 support division and maneuver brigades to find, fix, and destroy enemy forces at a decisive time
179 and place. The structure of the CAB is tailored to the type of division or BCTs supported, and
180 can support up to five BCTs. It is organized with two Attack Battalions, an Assault Battalion, a

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

181 General Support Battalion, and an Aviation Support Battalion, with a total of approximately
 182 2,700-2,800 military personnel. Each Attack Battalion has 24 attack helicopters (AH) (total 48),
 183 the Assault Battalion has 30 utility helicopters (UH), and the General Support Battalion has 8
 184 UHs, 12 cargo helicopters (CH), and 12 medivac heavy helicopters (HH).

FY 2006	FY 2007	FY 2008	FY 2009	FY 2010
+ 4th BCT, 1st CAV				
+ FFID/AEF				
- 108th ADA Brigade				
+ Heavy BCT				
- 31st ADA Brigade				
+ Armor Division HQ				
+ Heavy BCT				
+ Artillery (Fires) Brigade				
+ CAB				
+ Sustainment Brigade				
+ THAAD Unit				
- ADA School/6th ADA Brigade				
+ Heavy BCT				
+ Various Echelons Above Brigade support units				

Note: As of January 2007. Subject to change.

Figure 1-3. Planned Unit Changes at Fort Bliss

- A Sustainment Brigade that plans, coordinates, synchronizes, monitors, and controls sustainment within an assigned area of operations. It augments or reinforces the Support Battalions within the BCTs and controls sustainment (administration, medical, ammunition, transportation, maintenance, and supply). It consists of one Brigade Troops Battalion and supports between one and 10 brigades based on requirements and operational needs. The sustainment brigade is augmented with assigned finance and human resources (personnel) support; provides ammunition, transportation, maintenance, and supply support; and additional medical support (brigade or less) can also be attached. It is designed as a multi-functional headquarters and can provide Host Nation support and contracting, as well as support to joint, interagency, and multinational agencies on order. This brigade includes approximately 400-500 military personnel and 140 wheeled vehicles.

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

- 198 • Echelons Above Brigade (EAB) and other units may include Military Police Battalion, Military
199 Police Combat Support Companies, Motor Transportation Battalion, Mobility Augmentation
200 Companies, Signal Support Network, Support Maintenance Company, Operating Force Band,
201 Personnel Services Battalion, Movement Control Team, Quartermaster Supply Company, Truck
202 Company-Cargo, Engineer Battalion, THAAD Battalion, and Survey and Design Team. These
203 units include approximately 2,500 military personnel.

204 In addition, a National Guard and Reserves Joint Training Center complex is being established at Fort
205 Bliss in FY 2008 to support units in the Texas Army and Air National Guard and Army Reserves in the El
206 Paso area. The complex includes an Armed Forces Reserve Center and consolidated vehicle maintenance
207 facility. The center will have approximately 140 permanent personnel, more than 90 wheeled vehicles, 25
208 tracked vehicles, and 170 other pieces of equipment. It will provide training for 1,200-1,300 National
209 Guard and Reserve personnel in 2-day sessions two to three times per month and 2-week sessions during
210 the summer.

211 **Table 1-1** summarizes the main units that will be assigned to Fort Bliss after all the relocations have been
212 completed.

Table 1-1. Primary Units Assigned to Fort Bliss – FY 2010 and Beyond

1st Armor Division HQ
Four Heavy BCTs
Sustainment Brigade
Artillery (Fires) Brigade
CAB
FFID and AEF
32nd Army Air Missile Defense Command
11th ADA Brigade
TEXCOM ADA Test Directorate
Sergeants Major Academy
JTF-North
WBAMC
German Air Force Command
German Air Defense School
EAB support units
Joint Training Center
Garrison Command

214 **1.3.3 Personnel**

215 The relocation of the units described in Section 1.3.2 to Fort Bliss will result in an increase of
216 approximately 23,500 military personnel and 3,100 new Government civilian workers at Fort Bliss
217 between FY 2006 and 2010. Conversely, the actions recommended by the BRAC Commission will result
218 in a reduction of approximately 3,500 military and 400 civilian personnel in FY 2007-2009, for a net
219 increase of approximately 20,000 military and 2,700 Government civilian personnel. Other units not
220 affected by the Army Transformation or BRAC movements, including students attending the Sergeants
221 Major Academy and temporary duty (TDY) personnel who come to Fort Bliss for training, would
222 continue to be part of the installation population. **Table 1-2** shows the approximate personnel strength at
223 Fort Bliss in FY 2000, 2005 (prior to the relocations and realignments), 2006 (start of IGPBS and BRAC
224 relocations), and net personnel strength projected through FY 2011.

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

225

Table 1-2. Estimated Personnel Strength at Fort Bliss

<i>Type of Personnel</i>	<i>FY00¹</i>	<i>FY05</i>	<i>FY06</i>	<i>FY07</i>	<i>FY08</i>	<i>FY09</i>	<i>FY10</i>	<i>FY11</i>
Officers	1,510	1,300	1,700	1,700	2,000	2,750	3,100	3,300
Warrant Officers	240	200	300	300	400	750	900	900
Enlisted	9,440	8,500	11,800	12,000	14,000	21,500	25,000	25,800
Total U.S. Military	11,190	10,000	13,800	14,000	16,400	25,000	29,000	30,000
Non-U.S. Military	NA ²	200	200	200	200	200	200	200
Government Civilians	7,400	5,300	5,800	6,500	6,600	7,500	8,000	8,000
Students (TDY)	NA ²	2,800	2,800	2,800	2,800	1,000	1,000	1,000
Other TDY ³	7,780	4,900	5,000	5,000	5,000	5,000	5,000	5,000
Contract Civilians	NA ⁴	2,200	2,400	2,700	2,800	3,100	3,200	3,300
Total Personnel	26,370	25,400	30,000	31,200	33,800	41,800	46,400	47,500
Military Dependents ⁵	18,000	16,500	22,800	23,100	27,100	41,300	47,900	49,500

1. From Mission and Master Plan PEIS.
2. Assumed to be included in Military numbers.
3. Includes mobilization and other off-post units training at Fort Bliss. Estimated as full-time equivalents.
4. Assumed to be included in Government Civilian numbers.
5. Estimated as a ratio of U.S. military personnel, assuming 53 percent of military is accompanied with an average of 3.1 dependents.

NA = Not Available; TDY = Temporary Duty

Source: Ref# 468, 469, 470

226 **1.3.4 Equipment**

227 After the relocation of the 3rd ACR to Fort Carson, the primary equipment at Fort Bliss consisted of
 228 wheeled vehicles (e.g., Patriot missile transporters). With the relocation of Heavy BCTs to Fort Bliss, the
 229 number of tracked vehicles will increase substantially. Typically, a Heavy BCT includes approximately
 230 360 tracked vehicles (e.g., M1 tanks, Bradley fighting vehicles), 900 wheeled vehicles (such as
 231 HMMWVs), 165 generator sets, and other incidental equipment. In addition, the stationing of the CAB at
 232 Biggs AAF will add 110 helicopters at the installation. **Table 1-3** lists the main equipment located at Fort
 233 Bliss in FY 2000 and 2005 and projected net equipment changes between FY 2006 and 2010.

234 **Table 1-3. Estimated Net Equipment Changes at Fort Bliss**

<i>Type of Equipment</i>	<i>FY00¹</i>	<i>FY05</i>	<i>FY06</i>	<i>FY07</i>	<i>FY08</i>	<i>FY09</i>	<i>FY10</i>	<i>Total</i>
Wheeled Vehicles	3,250	4,200	+900	+500	-400	+2,000	+900	8,100
Tracked Vehicles	7	2	+360	+360	+143	+415	+360	1,640
Generator Sets	580	45	+165	+165	+55	+190	+165	7850
Helicopters	2	0				+110		110
Fixed-Wing Aircraft	13	8						8
Unmanned Aerial Vehicles	NA	NA	+16		+16	+16	+16	64

Note: Equipment would be phased in and not necessarily arrive at the same time as the personnel.

1. Based on Mission and Master Plan PEIS

NA=Not Available

235 Some M1 tanks have armor containing depleted uranium (DU) in the turret. The DU is encased and
236 therefore not exposed to the environment. AR 385-65 prohibits firing of DU ammunition in the
237 continental U.S. from tanks and A-10 aircraft unless approved by the Chief of Staff of the Army or the
238 Commandant of the Marine Corps. No exception has been provided to Fort Bliss, nor is one anticipated.

239 **1.3.5 Training Requirements**

240 Emerging Army doctrine, operational experience in Afghanistan and Iraq, and new equipment capabilities
241 are changing Army training concepts and training space requirements. Training in the current operational
242 environment requires large off-road vehicle maneuver/training areas of varying characteristics with
243 complex terrain and urban environments. Units should train in the same maneuver space conditions for
244 live-fire, tactical movement, and resupply as they would in combat. Ground forces need large contiguous
245 off-road vehicle maneuver/training areas to support “free-flowing exercises.” Tactical maneuver wins
246 battles and engagements. By keeping the enemy off balance, it also protects the force. A training
247 environment that restricts unit training and does not properly reflect varied and complex battlefield
248 conditions will not adequately prepare units for combat.

249 Another important dimension for maneuver training is the ability to conduct operations at night.
250 Providing realistic training at night without interference from point source light pollution is especially
251 important since the Army fights at night and uses night capabilities to its advantage. Operating at night is
252 a critical task for both ground maneuver and aviation units. It is especially critical for aviation units
253 flying at night using night vision equipment. Night exercises require large areas away from light sources.

254 With the stationing of four Heavy BCTs at Fort Bliss, training requirements will increase substantially
255 and focus more on live-fire qualification training and off-road vehicle maneuvers. The ADA training that
256 has dominated range use in the recent past primarily involved wheeled ADA units driving on existing
257 roads to set locations, setting up equipment, and performing their training in a largely static position.
258 There was relatively little movement of personnel or equipment. The Heavy BCTs will train in a vastly
259 more dynamic fashion, moving relatively constantly cross country in tanks and other tracked vehicles.

260 Training Circulars (TC) 25-1, “Training Land,” and 25-8, “Training Ranges,” define the training
261 requirements for different types and sizes of units, including armor divisions at the crew (typically 4-10
262 soldiers), platoon (16-44 soldiers), company (62-190 soldiers), and battalion (300-1,000 soldiers) levels.
263 (The actual size of specific units depends on their particular function.) These requirements include
264 individual qualification at live-fire ranges (e.g., small arms), range complexes for training crews (e.g.,
265 gunnery range for crew-served weapons), and off-road vehicle maneuver areas. The number of individual
266 ranges and range complexes needed is a function of the throughput capabilities and requirements of each
267 range/complex. To train one modular Heavy BCT to standard and to qualify soldiers on individual
268 weapons requires a set of ranges as determined by TC 25-8.

269 The annual maneuver requirements outlined in TC 25-1 were adapted for the new Heavy BCTs by the 4th
270 BCT, 1st CAV. The duration of each training event varies from 1 to 14 days and is required to be
271 conducted annually, semiannually, or quarterly. In aggregate, these requirements result in approximately
272 109,000 “square kilometer days” of off-road vehicle maneuver training per year for each BCT, including
273 the following basic requirements (Ref# 380):

- 274 • Platoon-level (total of 32-33 combat platoons per BCT) – requires training areas generally
275 ranging from approximately 20 km² to 30 km² and up to 120 km² depending on the unit’s
276 mission.
- 277 • Company level (total of 11 companies per BCT) – requires training areas generally ranging from
278 approximately 30 km² to 100 km².
- 279 • Battalion level (total of 3 per BCT) – requires training areas of approximately 250 km².
- 280 • BCT level exercise – requires a training area of approximately 500 km².

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

281 A square kilometer day (km²d) is a measurement combining the area used (km²) by each training event
282 and the duration of the event in days. For example, a battalion-level exercise that is conducted twice a
283 year for 14 days uses approximately 7,000 km²d (250 km² x 2 x 14).

284 The other units being stationed at Fort Bliss (Artillery Brigade, Sustainment Brigade, CAB, and EAB)
285 also have training requirements defined in TC 25-1. In addition, Fort Bliss will continue to support
286 training by the existing units remaining at Fort Bliss, as well as other students and Active, Reserve, and
287 National Guard Components training at Fort Bliss on a TDY basis or during mobilization. These uses can
288 also be measured in terms of km²d and bring the total training requirement at Fort Bliss to about 528,000
289 km²d per year. **Table 1-4** summarizes the components that make up this requirement.

Table 1-4. Off-Road Vehicle Maneuver Training Requirements

<i>Unit</i>	<i>No. of Units/ BCT</i>	<i>Total No. of Units</i>	<i>Size of Maneuver Box¹</i>	<i>Duration</i>	<i>Times per Year</i>	<i>Total Days/Year</i>	<i>Total Km²d²</i>
Heavy BCTs³							
Platoon Level Exercises	33	99	9-120 km ²	4-10 days	2-4	2,964	115,920
Company Level Exercises	11	33	10-102 km ²	5-12 days	2	810	78,786
Battalion Level Exercises	3	9	248-465 km ²	14 days	2	375	111,132
BCT Level Exercise	1	3	496 km ²	14 days	1	42	20,832
<i>Total Heavy BCTs</i>							326,670
Artillery, Sustainment, Combat Aviation Brigades and EAB ⁴							147,150
Mobilization Units ⁵							54,500
Total Training Requirement							528,320

1. Varies by unit function and component of the exercise.
2. Incorporates varying maneuver box sizes.
3. Based on three Heavy BCTs training in any given year.
4. Estimated to be equivalent to 1.35 Heavy BCTs based on Army Ranges and Training Land Program Requirement Model calculations.
5. Estimate based on historic experience.

291
292 Maneuver training requirements for the units identified for relocation to Fort Bliss under BRAC were
293 defined by the Army Transformation Support Center using the Army Range and Training Land Program
294 Requirement Model. This model calculated a total annual requirement of approximately 158,000 km²d to
295 train each Heavy BCT. It also calculated the annual maneuver training requirements for the other units to
296 be approximately 214,000 km²d, which equates to 1.35 times the requirements of a Heavy BCT.
297 Subsequently, the Heavy BCT requirements were refined to approximately 109,000 km²d based on
298 practical experience of the 4th BCT, 1st CAV. This smaller number was used for the analysis in this SEIS.
299 The estimate of other unit requirements was kept as a ratio of 1.35 times the lower Heavy BCT estimate
300 (1.35 x 109,000 km²d = 147,150 km²d).

1.4 DECISION TO BE MADE

301
302 The Army decision to be made is whether or not to execute the proposed changes in land use to support
303 anticipated and other future changes in the mission and stationing of units at Fort Bliss. In making the
304 decision, the Army will select among the following five alternatives:

305 **No Action Alternative.** This alternative would continue the current land uses as adopted in the 2001
306 ROD for the Fort Bliss Mission and Master Plan PEIS, defined in the RPMP and TADC, and analyzed in

307 documents tiering from the PEIS. Although this alternative would not change land use, facilities are
308 being constructed in the Main Cantonment Area to support stationing of one BCT, in accordance with a
309 completed Record of Environmental Consideration (REC). In addition, existing live-fire ranges are being
310 upgraded and new live-fire ranges constructed within current land use designations and/or on existing
311 range footprints. Additional mission support facilities will be constructed in areas currently designated
312 for such facilities. Authorized training activities will continue in the Fort Bliss Training Complex. No
313 off-road vehicle maneuver or live-fire would occur in McGregor Range training areas beyond what is
314 currently designated in the TADC and as analyzed in the PEIS and subsequent NEPA documentation.
315 The No Action Alternative is not considered feasible because it would not adequately support the
316 requirements of BRAC.

317 **Alternative 1.** This alternative would include all development described in the No Action Alternative
318 and also involve land use changes in the Main Cantonment Area and the Fort Bliss Training Complex to
319 accommodate personnel, facility requirements, and training activities associated with locating an Armor
320 Division and other units at Fort Bliss as part of Army Transformation and BRAC. The Main Cantonment
321 Area of Fort Bliss would be expanded to the north and east, additional mission support facilities would be
322 constructed in the Fort Bliss Training Complex, additional firing ranges and training facilities would be
323 constructed on Doña Ana and McGregor Ranges, and approximately 216,000 additional acres (875 km²)
324 of training land in the Tularosa Basin portion of McGregor Range would be opened to off-road vehicle
325 maneuver training. Land use changes on McGregor Range would include adding off-road vehicle
326 maneuver in Training Areas (TAs) 9, 25, 30, 31, and 32 and portions of TAs 11 and 29 south of Highway
327 506 (see Figure 1-2).

328 **Alternative 2.** This alternative would include all changes described in the No Action Alternative and
329 Alternative 1 and add off-road vehicle maneuver training in TAs 10, 11, 12, and 29 north of Highway
330 506, providing approximately 280,000 additional acres (1,135 km²) of off-road vehicle maneuver
331 capability in the Tularosa Basin portion of McGregor Range. This alternative would also support
332 stationing a second CAB at Fort Bliss.

333 **Alternative 3.** This alternative would include all changes described in the No Action Alternative and
334 Alternative 1, support stationing of a second CAB, and add off-road vehicle maneuver training in TAs 24,
335 26, and 27, providing approximately 287,000 additional acres (1,163 km²) of off-road vehicle maneuver
336 in the Tularosa Basin portion of McGregor Range.

337 **Alternative 4 – Proposed Action.** This alternative would include all changes described in
338 Alternatives 1, 2, and 3 and provide approximately 352,000 additional acres (1,424 km²) of off-road
339 vehicle maneuver training area in the Tularosa Basin portion of McGregor Range. This would provide
340 training capability for up to six BCTs or their equivalent in km²d.

341 Alternative 4 – Proposed Action is the Army’s preferred alternative.

342 **1.5 SCOPE OF THE SEIS**

343 The scope of this SEIS is to provide compliance with NEPA for the following actions:

- 344 • Changes in land use designations in the Main Cantonment Area and the Fort Bliss Training
345 Complex.
- 346 • Development of facilities and infrastructure to support projected changes in unit stationing at Fort
347 Bliss and associated operational and training activities.
- 348 • Amendments and updates to existing plans and programs to reflect the land use changes in the
349 Main Cantonment Area and Fort Bliss Training Complex analyzed in this document.

- 350 • Future actions that are consistent with the selected land use alternative and within the scope of the
351 umbrella analysis, providing a foundation for tiered environmental documentation to ensure
352 consistent future analysis and documentation of environmental effects.

353 To understand the reasonably foreseeable consequences of the land use decision to be made, the SEIS
354 qualitatively and quantitatively evaluates the environmental impacts of potential personnel changes,
355 facilities construction, and training activities on Fort Bliss associated with the land use alternatives
356 analyzed.

357 Fort Bliss has a closed range, Castner Range, located in Texas. It is not currently used for any Army
358 activities and the Army has no plans for its future use. Castner Range is not addressed in this SEIS except
359 as part of the cumulative impacts analysis.

360 **1.6 CHANGES BETWEEN THE DRAFT AND FINAL SEIS**

361 The Draft SEIS was distributed for public review and comment between October 6 and December 12,
362 2006. Section 2.5.2 describes public meetings and other activities undertaken during the public review
363 period. The following changes and additions have been made to the Draft SEIS in response to the public
364 comments:

- 365 • A new appendix (Appendix D Comments and Responses) has been added. It contains transcripts
366 of the public meetings held to accept comments on the Draft SEIS and copies of all written
367 comments received during the review period. It also contains responses to those comments.
- 368 • A new Chapter 6.0 Mitigation and Monitoring has been added to consolidate the discussion on
369 potential mitigation measures for reducing impacts from the Proposed Action and other
370 alternatives. Chapters 6.0, 7.0, 8.0, 9.0, and 10.0 of the Draft SEIS have been changed to
371 Chapters 7.0, 8.0, 9.0, 10.0, and 11.0, respectively, in the Final SEIS.
- 372 • Additional information has been added to Sections 1.3, 2.5, 3.8, 4.8, 4.11, 4.13, 5.2, 5.5, 5.7, 5.8,
373 5.11, 5.12, 5.13, and 5.15 to clarify or expand upon training requirements, transportation costs,
374 water resources, biological resources, wildfire hazards, hazardous materials, cost of public
375 services, and cumulative impacts. Minor additions and corrections have been made in various
376 parts of the document.

377 In addition, as part of the refinement of Army Transformation plans, recent organizational changes
378 affecting Fort Bliss are reflected in Section 1.3.2. These changes are largely administrative and not
379 expected to measurably affect the analysis of environmental and socioeconomic effect presented in the
380 Draft SEIS.

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2.0 PLANNING AND ENVIRONMENTAL IMPACT ANALYSIS PROCESSES

This chapter describes the regulatory and management framework established by the Mission and Master Plan PEIS and its underlying laws and regulations (Section 2.1). The plans and procedures adopted pursuant to the PEIS continue to form the foundation of land use management at Fort Bliss and are common to all the alternatives considered in this SEIS. This chapter (Section 2.2) also describes the programmatic environmental impact analysis process and how the SEIS supplements and is used in concert with the original PEIS to guide that process. Section 2.3 discusses other environmental impact statements that are related to the analyses presented in the SEIS. Section 2.4 identifies cooperating agencies involved in preparing the SEIS, and Section 2.5 describes public involvement activities performed in connection with the SEIS.

2.1 REGULATORY AND MANAGEMENT FRAMEWORK

The Mission and Master Plan PEIS describes the overall NEPA process, the Army master planning process, and other statutes, regulations, and Executive Orders (EO) applicable to federal projects. That general information is incorporated by reference and not repeated here.

This section focuses on the existing land use planning and management framework established by the Fort Bliss RPMP, TADC, and related plans and programs that were adopted by the ROD for the Mission and Master Plan PEIS. The RPMP and TADC guide the development and use of facilities and live-fire ranges and training areas in accordance with the assigned missions, policies, goals, and objectives of the installation. These plans and their current counterparts (e.g., RCMP) would be updated based on the alternative selected by the decision-maker in an amended ROD culminating from this SEIS. Two management plans that contribute to planning and land management activities at Fort Bliss would also be amended as needed to support the updated RPMP and TADC:

- The ICRMP, which establish routine procedures for managing historic properties and other cultural resources on Fort Bliss.
- The INRMP, which implements the natural resources program on Fort Bliss.

In addition, Fort Bliss has an active environmental management program aimed at ensuring that operations, physical development, and training activities are performed in compliance with all applicable laws and regulations and managed to provide a sustainable training base to support national security. Fort Bliss is implementing an Environmental Management System based on International Organization for Standardization (ISO) 14001 Standards.

Fort Bliss manages the environmental effects of military training by applying natural and cultural resource conservation and rehabilitation programs while providing public access to these resources as appropriate and consistent with the military mission. The objectives for natural and cultural resource protection at Fort Bliss are to manage installation resources to provide the optimum environment that sustains the military mission; develop, initiate, and maintain progressive programs for land management and utilization; and maintain, protect, and improve environmental quality, aesthetic values, and ecological relationships.

A result of these objectives is reduced environmental damage and effective land rehabilitation, reduced costs for land management and environmental compliance, and enhanced land stewardship. Environmental resource management is coordinated with all planning efforts on Fort Bliss, including the RPMP, TADC, ICRMP, INRMP, ITAM, and other compliance plans and agreements. All these elements facilitate land and resource management decisions on the installation.

44 **2.1.1 Real Property Master Plan**

45 The Fort Bliss RPMP was developed pursuant to Army Regulation (AR) 210-20, “Real Property Master
46 Planning for Army Installations.” It describes the current physical composition of Fort Bliss and the
47 plans for its orderly long-range development of facilities, especially those in the Main Cantonment Area.
48 There are several components to the RPMP: the Long Range Component (LRC), Capital Investment
49 Strategy (CIS), and Short-Range Component (SRC). The LRC establishes goals and objectives for future
50 development of the installation. The CIS and SRC are continuously evolving mechanisms for
51 implementing the overall objectives of the LRC. Chapter 3 of this SEIS describes specific projects that
52 would bring the CIS and SRC in line with the installation’s new mission requirements. While these
53 changes will ultimately result in updates to the LRC, the basic goals of the Fort Bliss RPMP remain as
54 established in the PEIS:

- 55 • Improve functional efficiency by locating interrelated activities in proximity to one another and
56 separating incompatible activities from one another.
- 57 • Improve morale, recruitment, and retention by providing an attractively built environment, both
58 indoors and out, in work, living, and recreation areas.
- 59 • Develop and operate the installation in harmony with the surrounding community.
- 60 • Coordinate the on-post natural and cultural environment in a manner consistent with effective
61 military training and adherence to environmental guidance and laws.
- 62 • Ensure that facility and land uses can adapt and expand to accommodate new missions, weapons
63 systems, and training.
- 64 • Lay out facilities and land uses so as to preserve and enhance areas suitable for ceremonies,
65 distinguished visitors, allied nation liaisons, and other external relations.
- 66 • Improve traffic circulation and functional effectiveness by rationalizing and improving the
67 roadway network, reducing intra-cantonment travel, and encouraging pedestrian circulation.
- 68 • Eliminate, replace, or upgrade the remaining World War II temporary mobilization facilities.
- 69 • Explore and capitalize on opportunities for regional cooperation on infrastructure systems.
- 70 • Improve power projection capabilities (the ability to project land forces from the U.S. to augment
71 forward-deployed forces or establish a U.S. presence in a theater of operations) by providing
72 adequate air and rail deployment facilities.

73 The Fort Bliss CIS is undergoing revision as a result of the Army Transformation and BRAC changes
74 occurring at the installation. It includes 13 general goals:

- 75 1. Expand, modernize, and increase the efficiency of Biggs AAF.
- 76 2. Construct a Heavy BCT campus.
- 77 3. Increase non-DoD revenues.
- 78 4. Expand and modernize training lands and capacities.
- 79 5. Modernize and update the USASMA campus.
- 80 6. Increase quality of life and community support to meet projected population increases.
- 81 7. Improve transportation networks.
- 82 8. Develop a utility improvement process.
- 83 9. Provide high-quality barracks, lodging, and military family housing.
- 84 10. Modernize and expand logistical and maintenance support facilities.
- 85 11. Reduce long-term energy and operations and maintenance inefficiencies.
- 86 12. Improve land utilization and minimize encroachment.

87 13. Integrate important environmental needs into all planning and construction projects.

88 **2.1.2 Training Area Development Concept**

89 The TADC was developed to provide a process for determining facilities, planning, management, and
90 direction for the short- and long-term development of training areas in the Fort Bliss Training Complex
91 relative to the needs of range complex users. It is a dynamic planning document focused on mission
92 capabilities of the Training Complex in a land use context. It describes the current training activities and
93 capabilities supported by existing land uses in the training areas, as well as potential future projects that
94 will enhance training capabilities. The TADC, which has served as the “range plan” for the installation, is
95 being replaced with the RCMP.

96 The primary changes to the TADC being considered in this SEIS concern land use designations and
97 training activities in the Tularosa Basin portion of McGregor Range. Land use changes would focus on
98 land use categories by training area and could include addition of the Off-Road Vehicle Maneuver
99 training category in specific training areas, as described in detail in Chapter 3. In addition, the TADC
100 would be amended by the RCMP to include additional live-fire ranges and changes in airspace.

101 **2.1.3 Integrated Cultural Resources Management Plan**

102 The goal of cultural resources management at Fort Bliss is to protect and manage the installation’s
103 cultural resources in compliance with various federal laws and regulations that govern cultural resources
104 and in support of the overall Fort Bliss mission of military training and readiness. Compliance with the
105 various laws and regulations are integrated with planning and conducting military training, construction,
106 maintenance, real property, land use decisions, and other undertakings. Management of Fort Bliss’
107 historic properties as required by the National Historic Preservation Act (NHPA) of 1966 (as amended) is
108 governed by the Programmatic Agreement (PA) executed between the Army, the Advisory Council on
109 Historic Preservation (ACHP), and the New Mexico and Texas State Historic Preservation Officers
110 (SHPO). Fort Bliss’ ICRMP is being revised to incorporate the PA and will reflect the ROD from this
111 SEIS. The revised ICRMP will set forth how Fort Bliss will manage cultural resources under federal laws
112 and regulations that govern cultural resources other than NHPA and its implementing regulation 36 CFR
113 Part 800.

114 Section 110 of NHPA requires federal agencies to have a cultural resources program and to identify
115 historic properties that may be under its management. Section 106 of NHPA requires federal agencies to
116 consider what effect its actions may have on historic properties. The implementing regulations (36 CFR
117 Part 800) for Section 106 outline a process to guide federal agencies in addressing what effects their
118 actions may have on historic properties. This regulation also provides the opportunity for federal
119 agencies to develop PAs, Program Comments, or Alternative Procedures to 36 CFR Part 800 to
120 streamline the Section 106 process. Fort Bliss has exercised the option to execute a PA to guide
121 compliance with Section 106. This PA consists of a series of Standard Operating Procedures (SOP),
122 defined by the process outlined in 36 CFR Part 800, that direct Fort Bliss on addressing how its actions
123 may affect historic properties. Following is a summary of the SOPs; the full text of the SOPs can be
124 found in the PA in **Appendix B**.

125 SOP 1: IDENTIFYING UNDERTAKINGS. This SOP directs how Fort Bliss will determine if an
126 action is an undertaking as defined by 36 CFR Part 800. If the action is determined not to be
127 an undertaking the action will receive no further attention. If it is determined that the action
128 is an undertaking, then it will be further evaluated under SOP 2.

129 SOP 2: EXEMPTED UNDERTAKINGS. Fort Bliss will determine if the proposed undertaking is
130 exempt from further Section 106 review as defined by the PA. Exempted undertakings have
131 been defined in consultation with the ACHP and the New Mexico and Texas SHPOs. If a
132 proposed action is an exempted undertaking, no further review is required under the PA. If it
133 is not an exempted undertaking, then it is further evaluated under SOP 3.

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

- 134 SOP 3: DEFINING OF AREA OF POTENTIAL EFFECT (APE). Each action will be evaluated to
135 determine its APE. Once this is defined, further evaluation will occur under SOP 4.
- 136 SOP 4: IDENTIFYING AND EVALUATING HISTORIC PROPERTIES. Identification, possibly
137 including necessary surveys, will be conducted within the defined APE to determine if
138 historic properties may exist. Those properties identified in the survey process will be
139 evaluated in accordance with the criteria for eligibility for inclusion in the National Register
140 of Historic Places (NRHP). Findings of determinations of eligibility are submitted to the
141 appropriate SHPO for review and concurrence. If it is determined that historic properties
142 (those eligible for inclusion in the NRHP) are present, further evaluation will occur under
143 SOP 5. If no historic properties are present, no further action is required under the PA.
- 144 SOP 5: SURVEY STRATEGY FOR CHANGING MISSION ON FORT BLISS AND THE
145 CHANGE IN LAND USE ON TRAINING LANDS. The objective of this SOP is to provide
146 an appropriate program by which archeological survey and site evaluation will be conducted
147 to accommodate the change in the military mission on Fort Bliss. Fort Bliss will implement a
148 survey sampling strategy of 30 percent of all unsurveyed land where land use is to change to
149 allow off-road vehicle maneuvers. Fort Bliss will survey and evaluate historic properties in
150 accordance with SOP 5. Once the 30 percent survey level has been met, the area will be
151 made available for maneuvers. Presently, 57 percent (396,347 acres) of McGregor Range has
152 been surveyed. The additional 30 percent survey required by the PA equals an additional
153 93,000 acres of unsurveyed land within the alternatives being analyzed. The PA also
154 provides for an additional 10,000 acres/year to be surveyed depending on the availability of
155 funds.
- 156 SOP 6: ASSESSING EFFECTS. Fort Bliss will assess effects that undertakings may have on historic
157 properties as directed by this SOP. Assessment of project effects will fulfill 36 CFR Part
158 800.5. Fort Bliss will document findings of No Historic Properties Affected or No Historic
159 Properties Adversely Affected and no further action on that undertaking is required. If Fort
160 Bliss determines an undertaking will have a finding of Historic Properties Adversely
161 Affected, further evaluation of the undertaking will occur under SOP 7.
- 162 SOP 7: RESOLUTION OF ADVERSE EFFECTS. It is Fort Bliss' policy to avoid adverse effects to
163 historic properties under its management, to the extent possible while meeting mission needs.
164 If adverse effects occur, Fort Bliss will apply best management practices to consider all
165 options to avoid or limit impacts to historic properties. If, after applying best management
166 practices, avoidance is not an option, Fort Bliss will address mitigation of the effect as
167 provided for under this SOP. If mitigation is not feasible, the Fort Bliss Historic Preservation
168 Officer (HPO) will document this under SOP 8. The SHPOs' ability to comment on findings
169 of effects is through the NEPA process (SOP 9). Further opportunities for review will occur
170 in the Annual Report (SOP 13).
- 171 SOP 8: DOCUMENTING ACCEPTABLE LOSS. This SOP provides for Fort Bliss to accept loss of
172 a historic property without mitigation under rare circumstances, requiring only documentation
173 of how that decision was reached. This decision is conditioned by fulfillment of 36 CFR Part
174 800 and other SOPs of this PA. Unless these have been met, documenting acceptable loss
175 cannot be undertaken. Prior to implementing this SOP, Fort Bliss must document why
176 treatment of adverse effects cannot be achieved. Use of this SOP should be rare, as other
177 mechanisms for compliance with Section 106 under this PA will reduce the need to make
178 acceptable loss determinations. A cost associated with mitigation is not justification for use
179 of this SOP.
- 180 SOP 9: REVIEWING AND MONITORING THROUGH NEPA. The New Mexico and Texas
181 SHPOs, federally recognized Tribes, and interested members of the public (as defined by

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

182 NHPA) will participate in the process of reviewing and commenting on Fort Bliss
183 undertakings with the potential to affect historic properties in accordance with the NEPA
184 process. Where no NEPA public review has occurred, and when an action will have an
185 adverse effect on a historic property and mitigation is required, review will occur through the
186 availability of the Record of Historic Properties Consideration. Review of all actions that
187 have No Effect or No Adverse Effect is provided through the Annual Report (SOP 13).

188 SOP 10: ACCIDENTAL DISCOVERY OF HISTORIC PROPERTIES. This SOP provides the
189 procedures to be followed in the event of accidental discovery of archeological materials
190 during implementation of an action. This can apply to both previously recorded and new
191 sites and to archeological sites in any part of Fort Bliss.

192 SOP 11: REPORTING DAMAGE TO HISTORIC PROPERTIES: BUILDINGS, SITES,
193 LANDSCAPES, DISTRICTS, OBJECTS, ETC. Routine military training activities at Fort
194 Bliss and the operation and maintenance of Fort Bliss facilities pose a risk of unintentional
195 damage to properties that are or may be eligible for inclusion in the NRHP. SOP 11 provides
196 direction on how Fort Bliss will address reporting and treatment of such damage.

197 SOP 12: PUBLIC INVOLVEMENT IN THE FORT BLISS CULTURAL RESOURCES
198 MANAGEMENT PROGRAM. This SOP provides guidance for Fort Bliss to involve the
199 general public (as defined by NHPA) in the management of cultural resources under its
200 management.

201 SOP 13: ANNUAL REPORT. Fort Bliss will provide an annual report on how it has applied SOPs of
202 the PA to the management of cultural resources on Fort Bliss to interested members of the
203 public (as defined by NHPA), the New Mexico and Texas SHPOs, federally recognized
204 Tribes, and the ACHP.

205 SOP 14: DISPUTE RESOLUTION. It is Fort Bliss policy to address all disputes in a professional
206 manner and with the objective of reaching mutual agreement on dispute resolutions through
207 meaningful consultation with objecting parties. If a dispute occurs between the signatories of
208 the PA, this SOP provides the process for resolution.

209 SOP 15: MILITARY ACTIVITIES IN ANTICIPATION OF IMMEDIATE DEPLOYMENT,
210 MOBILIZATION, OR ARMED CONFLICT. This SOP provides Fort Bliss the ability to
211 proceed with undertakings required to support mobilization and training required in
212 anticipation of immediate deployment, mobilization, or armed conflict without prior review
213 of these activities by the SHPOs or the ACHP. Fort Bliss cultural resources professionals
214 with appropriate security clearance will conduct an internal review following the guidance of
215 SOP 15 to assure historic properties are appropriately addressed.

216 Since the initiation of the Fort Bliss cultural resources management program in 1976, inventory,
217 evaluation, and data recovery efforts have focused on the South Training Areas, Doña Ana Range-North
218 Training Areas, and the Main Cantonment Area. Major achievements include:

- 219 • Establishing restricted areas, which are defined based upon the density and significance of
220 archaeological sites. Restricted areas are off-limits to all military and public entry and travel,
221 except for through-traffic on existing roads.
- 222 • Delineating limited-use areas with dense concentrations of sites for limited use where only roll-
223 through activity is allowed and no digging or bivouac sites are permitted.
- 224 • Identifying the William Beaumont General Hospital Historic District (determined eligible for
225 listing in the NRHP), the Fort Bliss Main Post Historic District (listed in the NRHP), and other
226 historic properties on the installation. Fort Bliss currently has eight properties listed in the
227 NRHP.

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

228 Since completion of the Mission and Master Plan PEIS in 2000, Fort Bliss cultural resources have been
229 actively managed and many advances have been made, including the following:

- 230 • The number of recorded archaeological sites has reached over 17,000.
- 231 • Archaeological surveys have been completed on over 300,000 acres at the South Training Areas
232 and Doña Ana Range-North Training Areas.
- 233 • Archaeological surveys have been completed on over 395,000 acres of McGregor Range.
- 234 • The largest curatorial facility in the region meeting federal standards was established. It is
235 capable of storing more than 35,000 cubic feet of materials.
- 236 • Restricted areas and some limited-use areas have been inventoried and the identified sites have
237 been evaluated for NRHP eligibility. Data recovery is nearly completed at the Drop Zones.
- 238 • Pre-1956 buildings and structures at the range camps and pre-1963 buildings and structures in the
239 Main Cantonment Area were identified and evaluated for NRHP eligibility.
- 240 • On the Main Post, Cold War era (1946-1991) buildings have been identified and evaluated for
241 eligibility for inclusion in the NRHP under the Exceptional Importance criteria (Criterion
242 Consideration G).
- 243 • Restricted and limited-use areas boundaries have been reevaluated and in some cases redefined.
- 244 • A number of manuals and handbooks for managing cultural resources have been developed.

245 The following activities are planned for 2006-2010:

- 246 • Implement the PA among the ACHP, New Mexico and Texas SHPOs, and Fort Bliss.
- 247 • Finalize redrafting of the ICRMP to reflect the PA and the ROD from this SEIS.
- 248 • Design a relational database for site data following Spatial Data Standards for Facilities,
249 Infrastructure, and Environment (SDSFIE) data standards and data migration.
- 250 • Continue to identify and evaluate sites and mitigate effects under the PA.
- 251 • Continue to develop and revise operational manuals as may be required.

252 Some actions are ongoing and will continue to be a part of the Fort Bliss cultural resources program.
253 These include consultation with the SHPOs, ACHP, and federally recognized Tribes as outlined in the
254 PA; survey and evaluation as outlined in the PA; artifact curation; data maintenance; and review and
255 amendment of the PA as may be required based on its annual review. Additional, specific year-by-year
256 goals are summarized in **Table 2-1**. Actions that will be described in the revised ICRMP for the long term
257 are more general and dependent on what may be accomplished in the near term, as well as on funding.

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

259

Table 2-1. Fort Bliss ICRMP Activity Summary

<i>Management Category</i>	<i>1976-2000</i>	<i>2001-2005</i>	<i>2006</i>	<i>2007</i>	<i>2008</i>	<i>2009</i>	<i>2010</i>
Program actions	1976-hired professional Cultural Resources Manager 1977-Withdrawal EIS 1982-Historic Preservation Plan 1982-Restricted areas Late 1980s-Limited-use areas 2000-ICRMP begun	Developed manuals and handbooks Developed management processes 2005-finalized ICRMP Developed SOPs for survey, evaluation, data recovery, and curation	Developed Programmatic Agreement with SHPOs and ACHP Begin ICRMP update to reflect PA Revise Fort Bliss significance standards	Continue manual and handbook development and revision Complete ICRMP update Review and amend PA as may be required	Continue manual and handbook development and revision Review and amend PA as may be required	Continue manual and handbook development and revision Review and amend PA as may be required	Begin review of PA and ICRMP to identify scope of changes required in 2011
Archaeological Sites: identification, evaluation, mitigation	Over 10,000 sites identified 700,000 acres surveyed 6,121 sites evaluated Impacts mitigated at 172 sites	Approximately 7,000 sites identified 73,000 acres surveyed 2,179 sites evaluated Impacts mitigated at 156 sites	30,550 acres surveyed 128 sites to be evaluated Impacts to be mitigated at 27 sites	Survey 10,000 acres Evaluate, as funds available, in highest risk areas Mitigate impacts as funds available/as potentially damaging impacts arise/follow PA	Survey 10,000 acres Evaluate, as funds available, in highest risk areas Mitigate impacts as funds available/as potentially damaging impacts arise/follow PA	Survey 10,000 acres Evaluate, as funds available, in highest risk areas Mitigate impacts as funds available/as potentially damaging impacts arise/follow PA	Survey 10,000 acres Evaluate, as funds available, in highest risk areas Mitigate impacts as funds available/as potentially damaging impacts arise/follow PA

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

<i>Management Category</i>	<i>1976-2000</i>	<i>2001-2005</i>	<i>2006</i>	<i>2007</i>	<i>2008</i>	<i>2009</i>	<i>2010</i>
Architectural/ Landscape resources		Pre-1956 evaluations complete At Main Post, 1946-1989 eligible buildings identified meeting “exceptional importance” Criterion Consideration G	Post-1956 Base Operations facilities Continue with post-1960s Base Operations facilities Evaluate previously inventoried buildings in Main Cantonment Area dating from 1951-1963 Inventory Biggs AAF buildings dating from 1948-1966 Mitigate impacts to Residential Communities Initiative (RCI) buildings	Mitigate impacts to NRHP eligible buildings in Main Cantonment Area Develop context and evaluate NRHP eligibility for Biggs AAF buildings dating from 1948-1966 Mitigate impacts to RCI buildings and William Beaumont General Hospital Historic District (WBGHHD)	Mitigate impacts to NRHP eligible buildings in Main Cantonment Area Mitigate adverse impacts to NRHP eligible buildings at Biggs AAF Mitigate impacts to RCI buildings and WBGHHD and Main Post historic districts	Mitigate impacts to NRHP eligible buildings in Main Cantonment Area Mitigate adverse impacts to NRHP eligible buildings at Biggs AAF Mitigate impacts to RCI buildings and WBGHHD and Main Post historic districts	
BCT support (new ranges, new facilities)		11,485 acres surveyed (with site evaluations and data recovery)	986 acres surveyed (with site evaluations)	Survey/evaluate/mitigate impacts as needed	Survey/evaluate/mitigate impacts as needed	Survey/evaluate/mitigate impacts as needed	Survey/evaluate/mitigate impacts as needed

EIS = Environmental Impact Statement; ICRMP = Integrated Cultural Resources Management Plan; PA = Programmatic Agreement; SOP = Standard Operating Procedure;

261 **2.1.4 Integrated Natural Resources Management Plan**

262 AR 200-3, “Natural Resources–Land, Forest, and Wildlife Management,” and the Sikes Act as amended
263 in 1997 (PL 105-85) require Army installations to develop and maintain an INRMP. The Fort Bliss
264 INRMP is a tool for achieving the Army’s environmental vision statement: “The Army will be a national
265 leader in environmental and natural resource stewardship for present and future generations as an integral
266 part of our mission.”

267 The objective of the Fort Bliss INRMP is to ensure the conservation of Fort Bliss natural resources, as
268 well as compliance with related environmental laws and regulations, while maintaining quality training
269 lands upon which to accomplish training and testing missions. This plan is an integral part of the Fort
270 Bliss mission and master planning activities to maximize both environmental conservation efforts and
271 range use. The INRMP emphasizes an ecosystem management approach to natural resources
272 management.

273 The Fort Bliss natural resource monitoring program is modeled after the 10-step process outlined by Noss
274 (Ref# 229). The current INRMP developed for Fort Bliss (Ref# 23) identifies data gaps that are essential
275 to filling the void in baseline information. Monitoring existing ecosystems through surveys, identifying
276 sensitive areas (limited-use areas), and fully utilizing technology (e.g., geographic information system
277 [GIS], modeling, remote sensing) while integrating the mission will allow managers to move toward
278 improving the installation’s natural resources program. Since the INRMP was published in 2001, Fort
279 Bliss has worked toward implementing the specific management goals and recommendations identified in
280 the plan, including:

- 281 • Implementing planning surveys for both flora and fauna, in an effort to better understand the
282 spatial distribution of the resources on the installation.
- 283 • Identifying and implementing mitigation measures for raptor interaction with transformers.
- 284 • Increasing the quantity and quality of GIS data for the installation.
- 285 • Improving the quality of vegetation through riparian and wetland management, forest
286 management (fuel reduction and habitat improvement), and invasive weed monitoring and
287 control.

288 **Table 2-2** summarizes the achievements since the finalization of the Mission and Master Plan PEIS and
289 primarily focuses on the current INRMP and future goals of the natural resource program at Fort Bliss.
290 Fort Bliss’ natural resource program is on a 5-year cycle, with the current INRMP at the end of this cycle.
291 The INRMP update will reflect the decisions made pursuant to this SEIS. Future management of natural
292 resources is expected to maintain the existing program. Monitoring and planning surveys will continue
293 contingent on funding levels and the Army’s mission. Priority will be given to the Army’s mission while
294 maintaining a balance with the environmental vision. Federally protected resources will be addressed
295 with a corresponding level of priority. Status changes in other resources will be identified and addressed
296 as they arise. Overall, the breadth of data will continue to grow, which will improve the tools available
297 for resource management at Fort Bliss.

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

299

Table 2-2. Fort Bliss INRMP Activity Summary

<i>Project</i>	<i>FY 01</i>	<i>FY 02</i>	<i>FY 03</i>	<i>FY 04</i>	<i>FY 05</i>	<i>FY 06</i>	<i>FY 07</i>	<i>FY 08</i>	<i>FY 09</i>	<i>FY 10</i>	<i>Comments</i>
PLANNING SURVEYS											
Routine survey (trend analysis through remote sensing)	X		X	X	X	X	X	X	X	X	Ongoing effort
Routine survey (fauna)	X		X	X	X	X	X	X	X	X	Ongoing effort, updated herpafauna, raptor surveys (aplomado falcon report), prairie dog reports
Routine survey (Oryx)	X		X	X	X	X	X	X	X	X	Frequency of surveys based on overall program requirements
Routine survey (riparian areas)	X					X					
Routine survey (plant diversity)					X	X	X				Surveys accomplished based on overall program requirements
Routine survey (vegetation communities)					X	X	X	X	X	X	Started 2005, will be ongoing, threatened and endangered plant surveys
Routine survey (succulent communities)			X								Completed with GIS in 2003
Routine survey (determine status of grassland areas in Eolian Ecological Management Unit)			X	X	X	X	X	X	X	X	Grassland studying is not a separate project but part of the vegetation community-transition studies
PLANS IMPLEMENTED											
Complete Endangered Species Management Plan and continue monitoring for listed and other sensitive species	X		X	X	X	X	X	X	X	X	Ongoing effort
Continue monitoring and control of invasive species	X		X	X	X	X	X	X	X	X	Ongoing effort
INRMP (raptor-proofing transformers)			X	X	X	X	X	X	X	X	Ongoing effort
INRMP (forest management)			X	X	X	X	X	X	X	X	Ongoing effort, deer habitat, fire lines

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

<i>Project</i>	<i>FY 01</i>	<i>FY 02</i>	<i>FY 03</i>	<i>FY 04</i>	<i>FY 05</i>	<i>FY 06</i>	<i>FY 07</i>	<i>FY 08</i>	<i>FY 09</i>	<i>FY 10</i>	<i>Comments</i>
INRMP (develop and maintain GIS metadata)	X		X	X	X	X	X	X	X	X	Ongoing effort
INRMP to protect wetlands and wildlife waters			X	X	X	X	X	X	X	X	Ongoing effort with projects, but no improvements
PLAN REVIEWS AND UPDATES											
Prepare/update INRMP	X		X	X	X	X	X	X	X	X	The life of the current INRMP expiring
Revise/update the installation Pest Management Plan	X		X	X	X	X	X	X	X	X	
OTHER ACTIONS											
Implement Main Cantonment Area vegetation management for dust suppression, water conservation, and minimize herbicide use	X		X				X	X	X	X	Ongoing effort, implemented with the INRMP (2001)
Monitor condition of selected firing ranges	X		X	X	X	X	X	X	X	X	
ADDITIONAL GOALS (FY 06-FY 10)											
Collaborative relationship with the Fort Bliss ITAM program						X	X	X	X	X	Additional funding due to installation status change should allow for the development of a more robust ITAM program
Continue with routine survey						X	X	X	X	X	
Add more vegetation monitoring plots for satellite image analysis and calibration						X	X	X	X	X	
Update habitat maps						X	X	X	X	X	Emphasis on listed and endemic species of particular conservation concern
Update range Ecological Management Unit acreages						X	X	X	X	X	Update Tables 8.1 & 8.3 from the INRMP

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

<i>Project</i>	<i>FY 01</i>	<i>FY 02</i>	<i>FY 03</i>	<i>FY 04</i>	<i>FY 05</i>	<i>FY 06</i>	<i>FY 07</i>	<i>FY 08</i>	<i>FY 09</i>	<i>FY 10</i>	<i>Comments</i>
Create disturbance projections within the Ecological Management Units on ranges corresponding to the alternatives for the troop and off-road vehicle maneuver activities proposed in the SEIS						X	X	X	X	X	Look at areas of heavy impacts and project potential vegetation community transitions
Identify areas for limited-use areas						X	X	X	X	X	Base on vegetation survey updates

Note: X = achieved or planning to achieve in the future dependent upon funding.

GIS = Geographic Information System; INRMP = Integrated Natural Resources Management Plan; ITAM = Integrated Training Area Management

301 **2.1.5 Integrated Training Area Management**

302 ITAM is part of the Army’s Sustainable Range Program and is responsible for maintaining the land to
303 help the Army meet its training requirements. A primary function of ITAM is to establish policies and
304 procedures to achieve optimum, sustainable use of military training and testing lands. Key components of
305 the program include the following (excerpted from AR 350-19):

- 306 • Assessing land quality, monitoring land conditions, and recommending land rehabilitation
307 options.
- 308 • Integrating training and testing requirements with training land carrying capacity.
- 309 • Educating land users to minimize adverse impacts.
- 310 • Rehabilitating and maintaining training land.

311 The Mission and Master Plan PEIS describes ITAM as a means to monitor vegetative cover impacts from
312 mission activities and to provide information about land condition trends. The ITAM program assesses
313 land quality and monitors land condition through vegetation surveys and soil erosion impact surveys, as
314 well as providing input to future range development to mitigate potential erosion problems through
315 appropriate design. It recommends, designs, and implements land rehabilitation and maintenance projects
316 on training lands to repair damage caused by maneuver training. ITAM is an important part of overall
317 environmental resource management programs and plans that integrate with mission requirements, the
318 RPMP, ICRMP, INRMP, and RCMP.

319 Recent ITAM tasks at Fort Bliss have focused on responding to immediate problems such as erosion on
320 roads and ranges that directly affect access to training locations. AR 350-19 identifies ITAM as a core
321 part of the Sustainable Range Program, which has as its goal “to maximize the capability, availability, and
322 accessibility of ranges and training lands to support doctrinal requirements, mobilization, and
323 deployments under normal and surge conditions.” ITAM provides Army range officers with the
324 capability to manage and maintain training and testing land by integrating mission requirements and
325 sound land management practices. Efforts are underway at Fort Bliss to establish transects to monitor
326 vegetative cover, especially in areas where heavy training use is anticipated in the future, as part of
327 implementing a Sustainable Range Program in compliance with AR 350-19. **Table 2-3** lists ITAM
328 efforts planned at Fort Bliss over the next five years.

329 **2.1.6 Environmental Compliance Plans**

330 Fort Bliss maintains a number of plans for complying with various environmental laws and regulations.
331 These plans, along with environmental permits and SOPs, are updated when needed to reflect changes in
332 mission and/or regulatory requirements. Key compliance plans are described in the following
333 subsections.

334 **2.1.6.1 Solid Waste Management Plan**

335 Army solid waste policy is based on the concept of Integrated Solid Waste Management (ISWM)
336 planning. ISWM is designed to minimize the initial input into the waste stream. The Fort Bliss ISWM
337 Plan was most recently updated in December 2003. The Fort Bliss Directorate of Environment (DOE)
338 coordinates solid waste management and planning with the Directorate of Public Works (DPW),
339 Directorate of Community Activities (DCA), Defense Reutilization and Marketing Office (DRMO),
340 Directorate of Contracting (DOC), Directorate of Resource Management (DRM), Residential
341 Communities Initiative (RCI), and other installation organizations, tenants, and activities as required.
342 Since 2000, recycling, selling, and diverting of solid wastes has increased at Fort Bliss. Recyclable
343 materials are sold or reused.

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

344

Table 2-3. ITAM Efforts

<i>Activities</i>	<i>FY 07</i>	<i>FY 08</i>	<i>FY 09</i>	<i>FY 10</i>	<i>FY 11</i>	<i>Comments</i>
LAND REHABILITATION AND MAINTENANCE (LRAM) ACTIVITIES						
PLAN REVIEWS AND UPDATES						
Routine LRAM Project Database	X	X	X	X	X	Ongoing effort to recognize and repair problem areas within the training areas
Routine surveys for damage and potential erosion work	X	X	X	X	X	Ongoing effort to recognize and repair problem areas within the training areas
OTHER ACTIONS						
Routine maintenance of completed projects	X	X	X	X	X	This will occur every year due to various weather conditions and military impacts
Land/soil stabilization, general damage repair	X	X	X	X	X	Ongoing effort to recognize and repair problem areas within the training areas
Check dams	X	X	X	X	X	Ongoing effort
Hardstands (bivouac, heavy equipment transporter sites, staging areas)	X	X	X	X	X	Ongoing effort
Trail repair	X	X	X	X	X	Ongoing effort
Siber stakes, marking off limits zones	X	X	X	X	X	Ongoing effort
Hardened crossings/low water crossings	X	X	X	X	X	Ongoing effort
Project design	X	X	X	X	X	As needed, based on project type; plan to develop a library of applicable designs in house.
Erosion control	X	X	X	X	X	Ongoing effort
Dust control	X	X	X	X	X	Ongoing effort
Training Area range improvement	X	X	X	X	X	Ongoing effort
Seed collection		X	X	X	X	Varying, depending on wet versus dry year
Revegetation		X	X	X	X	As needed; depending on success of revegetation pilot study, may only occur in wet years
ADDITIONAL GOALS (FY 06-FY 11)						
Increase size and capability of LRAM crew	X	X	X			Require at least one full time Range and Training Land Assessment (RTLA) field technician or equipment operator
Purchase LRAM equipment to increase in-house capability	X	X	X	X	X	Depending on funding
GIS ACTIVITIES						
Imagery acquisition - LIDAR	X			X		Every three years
Gully identification/monitoring	X	X	X	X	X	Ongoing

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

<i>Activities</i>	<i>FY 07</i>	<i>FY 08</i>	<i>FY 09</i>	<i>FY 10</i>	<i>FY 11</i>	<i>Comments</i>
Image processing	X			X		As new data are acquired
Develop and maintain GIS layers	X	X	X	X	X	Ongoing
Develop and maintain metadata	X	X	X	X	X	Ongoing
Image analysis		X	X	X	X	Dependent upon purchase of image analysis software
LRAM/RTLA geodatabase development and maintenance	X	X	X	X	X	Supports LRAM/RTLA database development
GIS support to range staff	X	X	X	X	X	Ongoing
Impact area contaminant study		X	X	X		Dependent upon purchase of image analysis software and availability of imagery
Range Facility Management Support System (RFMSS) maintenance	X	X	X	X	X	Update data as necessary
RTLA ACTIVITIES						
PLAN REVIEWS and UPDATES						
Gully characterization/ mapping	X	X	X	X	X	New effort
Delineate/survey high dust and potential high dust areas	X	X	X	X	X	New effort
Delineate/survey bare ground	X	X	X	X	X	Ongoing
Tank trail characterization/erosion mapping	X	X	X	X	X	Ongoing
LRAM Support	X	X	X	X	X	Ongoing
Delineate/survey grasslands and shrub-invaded grasslands within open maneuver training areas	X	X	X	X	X	Ongoing
Delineate/survey concentrated use sites (bivouac, assembly sites, etc.)		X	X	X	X	New effort
Seed cultivation study		X	X	X	X	New effort
OTHER ACTIONS						
Tank trails evaluation surveys (erosion)		X	X	X	X	New effort
Gully evaluation surveys		X	X	X	X	New effort
LRAM mitigation monitoring		X	X	X	X	New effort
Create/maintain database of LRAM projects and mitigation efforts		X	X	X	X	New effort
Special use plots (survey bare ground)			X	X	X	New effort

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

<i>Activities</i>	<i>FY 07</i>	<i>FY 08</i>	<i>FY 09</i>	<i>FY 10</i>	<i>FY 11</i>	<i>Comments</i>
Special use plots (survey existing and probable powder (high dust areas)			X	X	X	New effort
Special use plots (survey grasslands and shrub-invaded grasslands in dune-land matrix)			X	X	X	New effort
Special use plots (survey concentrated use areas; monitor/prioritize LRAM mitigation)			X	X	X	New effort

345

346 The landfill on Fort Bliss is operated by contract under the oversight of DPW. The landfill's refuse cell
347 (Type 1) is estimated to reach its capacity in 2008. An application for a new refuse cell on post is being
348 submitted to the State of Texas, and Fort Bliss continues to investigate privatization options both on and
349 off post.

350 The construction and demolition waste cell had an estimated lifespan of 10 years. Deconstruction is used
351 to reduce construction and demolition waste disposal and increase the amount of waste material recovered
352 for reuse or recycling. DPW no longer allows contractors to use the construction and demolition cell.

353 The ISWM Plan is updated annually.

354 **2.1.6.2 Storm Water Management Plan**

355 Fort Bliss maintains a Multi-Sector General Storm Water Permit for industrial activities at the post and
356 will apply to the Texas Commission on Environmental Quality (TCEQ) for a Phase II small municipal
357 separate storm sewer system (MS4) general permit when the state has received its programmatic permit.
358 The Main Cantonment Area of Fort Bliss is designated a regulated MS4, based on 2000 census data,
359 under the United States Environmental Protection Agency (USEPA) Storm Water Phase II Rule. The
360 Phase II Rule extends the requirements for National Pollutant Discharge Elimination System (NPDES)
361 permits to storm water discharge from "small" MS4s that serve populations of less than 100,000 in an
362 urbanized area. In addition, the rule regulates construction activities that disturb between 1 and 5 acres of
363 land on all of Fort Bliss.

364 Under the Fort Bliss Multi-Sector General Storm Water Permit, the Phase II Storm Water Management
365 Plan Team is responsible for developing, implementing, modifying, and providing required reports and
366 inspections associated with Best Management Practices as listed in the plan.

367 The current Draft Fort Bliss Storm Water Management Plan (SWMP) incorporates specific Texas
368 Pollutant Discharge Elimination System permit rules as they apply to MS4 operations within the Texas
369 portion of Fort Bliss. The Fort Bliss SWMP may be revised substantially once the Phase II MS4 general
370 permit requirements have been issued by TCEQ.

371 **2.1.6.3 Waste Analysis Plan**

372 The Fort Bliss Waste Analysis Plan (2005) documents procedures for USEPA classification and
373 identification of hazardous wastes to ensure compliant management of all waste streams generated at Fort
374 Bliss. It is intended to ensure compliance with 40 CFR, "Protection of Environment;" 30 Texas
375 Administrative Code (TAC) 335, "Industrial Solid Waste and Municipal Hazardous Waste;" and DoD
376 rules.

377 Hazardous wastes are generated by various military and civilian activities at Fort Bliss. Prior to being
378 transferred to the permitted storage facility, some wastes are accumulated in 90-day temporary storage
379 areas. The Fort Bliss Hazardous Waste Storage Facility (HWSF) is located at the Building 11614 area of
380 Biggs AAF and is currently managed by DOE and DRMO. DOE inspects containers of waste before the
381 waste is removed from waste accumulation points and taken to the HWSF. Once containers are
382 transferred to the HWSF, DOE inspects the waste to determine if it can be classified as a material that can
383 be reissued (e.g., unopened containers, expired shelf-life items). If it is determined that the substance is a
384 waste, DOE characterizes the waste stream based on documented process knowledge, Material Safety
385 Data Sheet (MSDS) information, or by obtaining a chemical analysis of a sample of the waste. Wastes
386 must be identified as hazardous or non-hazardous and characterized to determine proper disposition.

387 Wastes generated throughout Fort Bliss, including the McGregor, Doña Ana, and Orogrande Range
388 Camps, are brought to the Building 11614 area for classification, labeling, and storage. Waste processing
389 at the facility is continual, resulting in a turnaround time of approximately 90 days and ensuring that
390 storage capacity is available for wastes generated during training exercises or spill releases. Several times

391 a month, or more often if needs dictate, wastes are transported to an off-site Treatment, Storage, Disposal
392 Facility (TSDF).

393 The Waste Analysis Plan is updated annually or more frequently if there is a change in the waste stream.

394 **2.1.6.4 Spill Prevention, Control, and Countermeasures Plan**

395 The purpose of the Spill Prevention, Control, and Countermeasures Plan (SPCCP) (September 2004) is to
396 form a comprehensive federal/state spill prevention program that minimizes the potential for discharges.
397 Fort Bliss has supplemented the SPCCP with an Installation Spill Contingency Plan (ISCP). The ISCP is
398 attached to the SPCCP as Appendix A and establishes responsibilities, duties, procedures, and resources
399 to be employed to contain, mitigate, and clean up oil and hazardous substance spills. DOE is the primary
400 point of contact for matters pertaining to the SPCCP.

401 For spills or suspected spills that occur in New Mexico, spills of “any amount of any materials in such
402 quantity as may with reasonable probability injure or be detrimental to human health, animal or plant life,
403 or property, or may unreasonably interfere with the public welfare or the use of property” must be
404 reported to the New Mexico Environment Department (NMED) by verbal notification. Spills that occur
405 within Texas must be reported to the State Emergency Response Center. Notification must be made upon
406 determination that a reportable discharge or spill of oil, petroleum product, used oil, hazardous substance,
407 industrial solid waste, or other substances into the environment in a quantity equal to or greater than the
408 reportable quantity listed in 30 TAC Part 327.4 in any 24-hour period.

409 The SPCCP is considered a “living document” and may be amended by the USEPA Regional
410 Administrator or Fort Bliss. After review by the USEPA Regional Administrator of the information
411 provided during a spill notification requirement or after on-site review of the plan, the USEPA Regional
412 Administrator may require that the plan be amended if found that it does not meet the requirements of 40
413 CFR 112 or that an amendment is necessary to prevent and contain discharges from Fort Bliss. In
414 addition, the SPCCP will be amended by the Army when there is a change in a facility’s design,
415 construction, operation, or maintenance that materially affects its potential for discharge. A review and
416 evaluation of the SPCCP is conducted at least once every five years.

417 **2.1.6.5 Asbestos Management Plan**

418 The Asbestos Management Plan (AMP) (September 2000) is the mechanism by which the requirements
419 set forth in AR 200-1 and AR 420-70 regarding handling asbestos containing material (ACM) are met.
420 The objective of the AMP is to control the release of asbestos from both friable and non-friable ACM and
421 to minimize, to the extent practicable, releases of asbestos dust and their consequent human exposure.
422 This plan is also intended to control and minimize exposure to airborne asbestos by regulating asbestos
423 disturbance activities in any federally owned building. The AMP prescribes policies, assigns
424 responsibilities, and establishes procedures for the management of Fort Bliss facilities that may contain
425 asbestos materials. The AMP applies to all military, civilian, and contractor personnel who occupy,
426 maintain, renovate, or demolish facilities provided, operated, maintained, or managed by the Army at Fort
427 Bliss, including Army Reserve and National Guard facilities located on Fort Bliss.

428 The Fort Bliss Garrison Commander is responsible for implementation of the AMP and determines the
429 responsibilities of the various individuals on the Asbestos Management Team (AMT). AR 200-1
430 provides guidance on the assignment of these responsibilities. The AMT includes representatives from
431 DOE, Fort Bliss Safety Office, Staff Judge Advocate, WBAMC Preventive Medicine, DOC, and DPW.

432 Many buildings at Fort Bliss were built or renovated between 1940 and 1975 when the use of asbestos
433 was commonplace. The majority of this asbestos was in the form of pipe insulation, most of which has
434 been removed and replaced with non-hazardous materials. Several other types of ACM, such as floor
435 tiles, cement siding, and wall/ceiling coverings, are managed in place throughout Fort Bliss facilities.
436 Prior to any renovation or demolition, asbestos surveys are performed and abatement is conducted as

437 required. The AMT is notified of any construction activity that may result in a change in ACM status and
438 maintains a current database.

439 The AMP is updated every five years.

440 **2.1.6.6 *Lead Hazard Management Plan***

441 Lead-based paint is regulated at the state level by the Texas Department of State Health Services and at
442 the federal level by the USEPA, the Occupational Health and Safety Administration (OSHA) in the U.S.
443 Department of Labor, and the Centers for Disease Control and Prevention in the U.S. Department of
444 Health and Human Services. Other federal agencies, as well as state and local governments, may also
445 issue regulations and other directives pertaining to housing under their jurisdictions. Regulations
446 generally specify minimum requirements for removing lead-based paint, minimum training and
447 certification requirements for those conducting the work, and certain basic standards as to how work must
448 be done.

449 The Army policy is to follow the most stringent federal, state, or local lead regulation. Fort Bliss has
450 established a lead hazard management team to ensure communication between its members and residents,
451 tenants, and workers on Fort Bliss. It is Fort Bliss policy to provide a lead-hazard-free living and
452 working environment for soldiers and their families.

453 Currently, Fort Bliss has 3,070 military housing units with 2,303 of these constructed prior to 1978. In
454 1998, Fort Bliss conducted a lead-based paint inspection of its housing units. Five major groups of
455 houses built before 1978 were identified. A total of 104 homes had inspections and risk assessments
456 done.

457 As of July 2005, all housing at Fort Bliss was turned over to a private contractor who is responsible for
458 identifying areas of deteriorated paint and dust accumulation and providing recommendations to the
459 Family Child Care Office for either in-place management measures or lead-based paint abatement. The
460 contractor is also responsible for managing lead-based paint during renovations and operations and
461 maintenance of Fort Bliss housing.

462 Other facilities at Fort Bliss include administrative buildings, warehouses, storage, and water towers.
463 DOE has instituted an SOP for the review of any type of work that may disturb lead-based paint. In
464 addition, an SOP for compliance with OSHA standard is attached to any work order reviewed. This
465 ensures that OSHA's standard for Lead in Construction is adhered to during any operation that is covered
466 by this standard.

467 **2.1.6.7 *Pollution Prevention Plan***

468 Pollution prevention (P2) encompasses activities which reduce the quantity of hazardous, toxic, or
469 industrial pollutants at the source by changing production, industrial, or other waste generating processes.
470 P2 is not limited to hazardous pollutants released to air, water, and land, but also includes activities to
471 reduce the amounts of non-hazardous commercial and household wastes. The basic philosophy is to
472 prevent pollution through source reduction rather than "end-of-pipe" treatment. The goal is to reduce the
473 future release and disposal of hazardous pollutants "to near zero" by significantly reducing the use of
474 products containing hazardous material compounds.

475 The Fort Bliss Pollution Prevention Plan (July 2005) establishes Fort Bliss' roadmap for achieving
476 federal, state, Army, and installation P2 goals. It provides the installation's approach to the P2 process, a
477 summary of the current program, goals, and management actions necessary for identifying and
478 implementing projects to meet P2 goals. As part of the Fort Bliss P2 Program, pollution prevention
479 opportunity assessments (PPOAs) are periodically conducted on various processes across the installation.
480 The P2 Plan also contains listings of hazardous waste generating activities and Toxic Release Inventory
481 (TRI) activities at Fort Bliss, along with current inventories.

482 Fort Bliss manages its P2 program as a component of its overall environmental management program.
483 All organizations integrate pollution prevention into their management control. The Fort Bliss P2 Plan is
484 revised every five years or when warranted by a change in function or process at Fort Bliss.

485 **2.2 PROGRAMMATIC ENVIRONMENTAL IMPACT ANALYSIS** 486 **PROCESS**

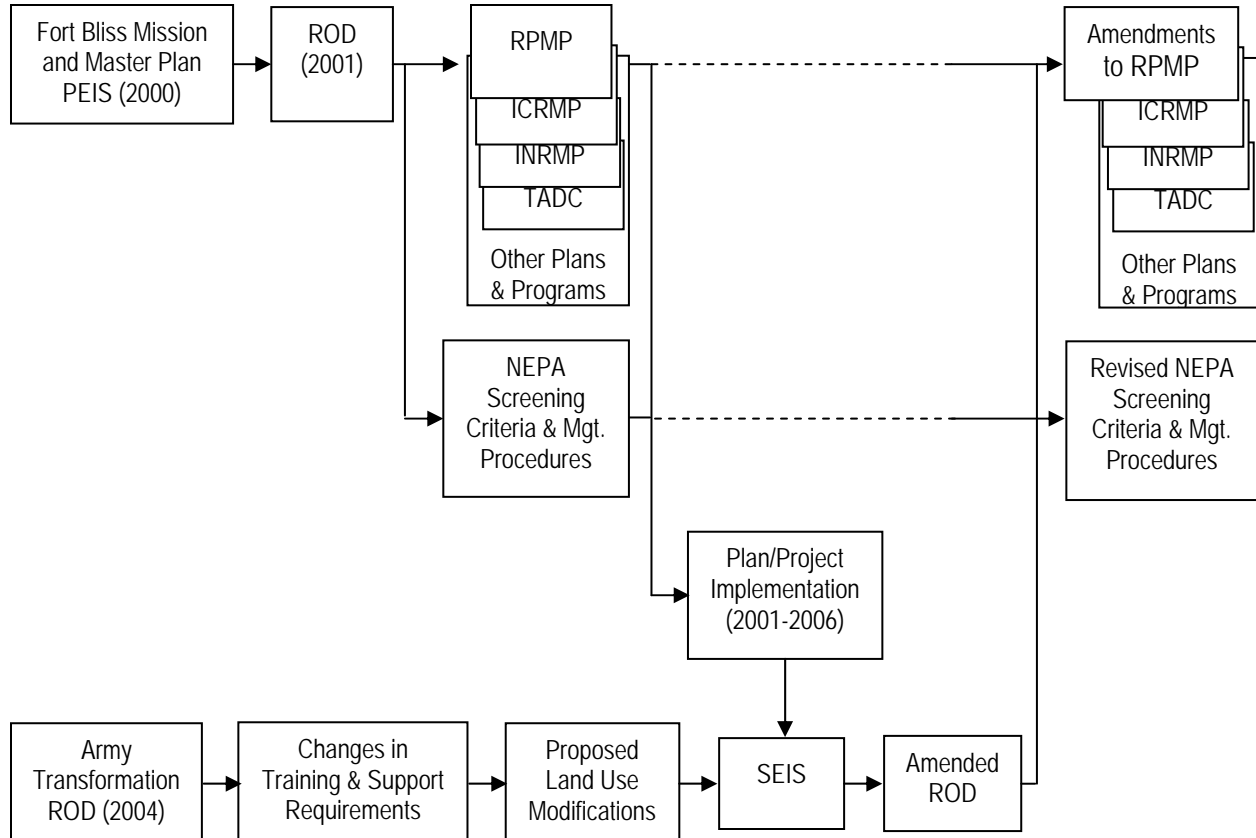
487 The ROD for the Mission and Master Plan PEIS, signed in September 2001, announced the Army's
488 decision to implement revisions to the RPMP, ICRMP, INRMP, and TADC and a number of mission
489 support improvements. These plans have provided a mechanism for promoting land use compatibility
490 and avoiding or minimizing adverse environmental impacts from mission support and training activities.

491 The PEIS introduced and described a land use screening process designed to guide future planning and
492 NEPA compliance for projects and actions that tier from the PEIS. "Tiering" is a procedure provided in
493 CEQ Regulations implementing NEPA that enables general matters to be covered in broader
494 environmental impact statements, such as the PEIS, with subsequent narrower analyses incorporating the
495 broader statement by reference and focusing on the specifics of a particular project or activity. The land
496 use screening measures included in the PEIS help Fort Bliss create a blueprint to respond to future Army
497 missions and community aspirations while providing the capability to train, project, and sustain the
498 Army's evolving force structure.

499 The PEIS also outlined a screening process for determining the required level of NEPA documentation of
500 future proposed projects, as required by AR 200-2 (currently 32 CFR Part 651), first by defining the
501 projects and types of actions specifically covered in the PEIS itself, and then by providing criteria for
502 evaluating other proposed actions to determine whether they fit within the broad programs analyzed in the
503 PEIS. The process consists of six steps for evaluating proposals to determine the required level of
504 analysis and developing additional documentation if needed. A key step in the process, Step 3, involves
505 determining whether the proposed action has been programmatically evaluated in the PEIS. Programs
506 that have been analyzed were listed in Appendix A of the PEIS. If an action is determined to be
507 adequately addressed through its similarity to the programs described in the PEIS, a REC may be
508 developed, which describes the proposed action and explains why no additional environmental analysis or
509 documentation is required. The REC pulls from the environmental information in the PEIS to support its
510 conclusion for the decision-maker's consideration. Projects that do not meet the criteria for a REC may
511 require preparation of a more extensive environmental assessment (EA) or, in some cases, an EIS.
512 Appendix A of the PEIS provides detailed guidance and procedures for implementing the tiering process
513 and conducting environmental analysis of proposed projects and actions.

514 The planning and NEPA management process described in the PEIS continues to be used at Fort Bliss.
515 This SEIS tiers from the PEIS by focusing on land use changes proposed to respond to the evolving
516 mission and training requirements imposed by Army Transformation, BRAC, and IGPBS. **Figure 2-1**
517 shows how the findings of the SEIS will be used to amend the RPMP and other components of the Fort
518 Bliss Master Plan and revise the NEPA screening criteria to reflect the selected land use changes.
519 Modified guidelines and criteria are included in an updated Appendix A.

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



520 Note: Dashed lines reflect changes that have been made since the PEIS was completed.

521 **Figure 2-1. Relationship of the PEIS and SEIS**

522 **2.3 RELATED ENVIRONMENTAL DOCUMENTS**

523 This section briefly describes EISs completed since the Mission and Master Plan PEIS that are relevant to
524 the issues, geographic area, or actions considered in the SEIS. Information from those documents has
525 been incorporated by reference as appropriate.

526 Army EISs:

- 527 • *Proposed Leasing of Lands at Fort Bliss, Texas for the Proposed Siting, Construction, and*
528 *Operation by the City of El Paso of a Brackish Water Desalination Plant and Support Facilities*
529 *Final Environmental Impact Statement* (December 2004). This EIS addresses the impacts from a
530 proposal to construct and operate a desalination plant and associated facilities, including wells
531 and disposals sites, in the South Training Areas of Fort Bliss. The ROD was signed in March
532 2005 approving a site for the desalination plant adjacent to El Paso International Airport (EPIA)
533 in TA 1B. The ROD also approved easements for deep-well injection disposal sites in TA 2B and
534 pipelines across the South Training Areas.
- 535 • *Final Programmatic Environmental Impact Statement for Army Transformation* (February 2002).
536 This EIS addresses the Army's proposal to undertake a multiyear, phased, and synchronized
537 transformation affecting doctrine, training, leadership development, organizations, installations,
538 materiel, and soldiers. The consequences anticipated by the analysis include effects on
539 installation land use and airspace use.

540 Other EISs:

- 541 • *Final Resource Management Plan Amendment (RMPA)/EIS for McGregor Range* (January 2006)
542 and Record of Decision (May 2006). Prepared by the Bureau of Land Management (BLM) Las
543 Cruces Field Office, the RMPA/EIS describes management strategies for the withdrawn public
544 lands on McGregor Range. Actions incorporated in the RMPA include establishing two utility
545 right-of-way corridors, creating right-of-way exclusion areas (where rights-of-way would not be
546 allowed), and designating new Areas of Critical Environmental Concern, including the Escondido
547 Pueblo. The document updates existing conditions on McGregor Range and in the surrounding
548 region. It also reflects changes in the mission and uses of Fort Bliss based on the 2000 Mission
549 and Master Plan PEIS and the construction and use of Centennial Range.
- 550 • *Draft Programmatic Environmental Impact Statement for DTRA Activities on White Sands*
551 *Missile Range, New Mexico* (January 2006). Prepared by the Defense Threat Reduction Agency
552 (DTRA), this EIS addresses the agency's proposed tactical activities at White Sands Missile
553 Range. Although it does not overlap with any proposed activities at Fort Bliss, DTRA's
554 proposals are considered in the cumulative impacts analysis in this SEIS.
- 555 • *Final Environmental Impact Statement, River Management Alternatives for the Rio Grande*
556 *Canalization Project* (June 2004). This EIS was prepared by the United States Section
557 International Boundary and Water Commission in cooperation with the U.S. Department of the
558 Interior, Bureau of Reclamation to evaluate long-term river management alternatives for the Rio
559 Grande Canalization Project, a 105.4-mile narrow river corridor that extends from below Percha
560 Dam in Sierra County, New Mexico to the American Dam in El Paso, Texas. This document was
561 considered in the analysis of potential cumulative impacts on water resources.
- 562 • *Upper Rio Grande Basin Water Operations Review Draft Environmental Impact Statement*
563 (January 2006). Prepared by the U.S. Army Corps of Engineers, Bureau of Reclamation, and
564 New Mexico Interstate Stream Commission, this EIS considers the effects of adopting an
565 integrated plan for water operations in the Rio Grande basin from its headwaters in Colorado to

566 Fort Quitman, Texas. This project was considered for the analysis of cumulative impacts on
567 water resources.

568 **2.4 COOPERATING AGENCIES**

569 The BLM, Las Cruces Area Office, is a cooperating agency on this SEIS as defined in 40 CFR Part
570 1501.6. BLM has joint responsibility for managing public lands on McGregor Range that have been
571 withdrawn for military use. BLM also provides expertise in resource management and livestock grazing
572 on McGregor Range.

573 Otero County is a coordinating agency on the SEIS and has contributed information on socioeconomics
574 and other topics.

575 **2.5 PUBLIC INVOLVEMENT**

576 **2.5.1 Scoping**

577 On November 14, 2005, the U.S. Army published in the Federal Register a Notice of Intent (NOI) to
578 prepare this SEIS. The NOI initiated scoping, during which agencies, organizations, and individuals were
579 invited to submit comments on the scope of the SEIS, environmental issues to be addressed, and
580 alternatives to be considered. The formal scoping period extended through January 6, 2006, although the
581 Army continues to accept inputs throughout the SEIS process.

582 Public scoping meetings were held in Las Cruces, New Mexico; El Paso, Texas; and Alamogordo, New
583 Mexico on the 12th, 13th, and 14th of December, respectively. Notifications of the scoping meetings
584 were published in the El Paso Times, El Diario, Las Cruces Sun-News, and Alamogordo Daily News on
585 November 27; Hudspeth County Herald on November 25; and Fort Bliss Monitor on December 1, 2005.
586 Notification letters were mailed to agencies and interest groups on December 1, 2005. A press release
587 and public service announcements of the scoping meetings were distributed to local media on December
588 5, 2005.

589 During the scoping meetings, the Army presented the purpose and need for the SEIS, described the
590 alternatives identified for detailed analysis, and reviewed the SEIS process and schedule. Public
591 information displays and handouts were available providing information to facilitate public comment.
592 After the presentation, comments were accepted from attendees.

593 A total of 53 individuals attended the public scoping meetings and 13 provided oral comments. In
594 addition, 13 written comments were received during the scoping period. **Table 2-4** lists the issues
595 identified in those comments and indicates the SEIS sections that address these issues.

596 **Table 2-4. Summary of Public Scoping Issues and SEIS Sections Addressing Those Issues**

<i>Issue</i>	<i>SEIS Section</i>
Dust generated by increased off-road vehicle maneuvers.	Earth Resources (Sections 4.5 and 5.5) and Air Quality (4.6 and 5.6)
Damage to soils, vegetation, and habitat and impacts on wildlife and sensitive species from off-road vehicle maneuvers on McGregor Range.	Earth Resources (4.5 and 5.5) and Biological Resources (4.8 and 5.8)
Impact of proposed land use changes at McGregor Range on cattle grazing.	Land Use (4.1 and 5.1)
Access to Grapevine Canyon.	Training Area Infrastructure (4.3 and 5.3)
Impacts on cultural resources from off-road vehicle maneuver training.	Cultural Resources (4.9 and 5.9)

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

<i>Issue</i>	<i>SEIS Section</i>
Transportation impacts, including increased congestion due to population increases and effects of off-road vehicle maneuver training on access along Highway 506.	Main Cantonment Area Infrastructure (4.2 and 5.2) and Training Area Infrastructure (4.3 and 5.3)
Impacts on Otero Mesa.	Land Use (4.1 and 5.1)
Increased wind and water erosion due to off-road vehicle maneuvers.	Earth Resources (4.5 and 5.5)
Impacts on recreation use of Fort Bliss lands.	Land Use (4.1 and 5.1)
Impacts on Culp Canyon Wilderness Study Area and Grapevine Canyon.	Land Use (4.1 and 5.1)
Impacts of increased population on public services, education, utility costs, and quality of life.	Socioeconomics (4.13 and 5.13)
Impacts of increased population on water supply.	Water Resources (4.7 and 5.7)
Compatibility with BLM management of McGregor Range.	Land Use (4.1 and 5.1)
Analysis of impacts from future plans for Castner Range.	Scope of the SEIS (1.5) and Cumulative Impacts (5.15)
Cumulative impacts of military training in combination with effects of drought.	Cumulative Impacts (5.15)
Cumulative impacts of Army actions in combination with other plans, uses, and development.	Cumulative Impacts (5.15)

597

598 **2.5.2 Public Review of the Draft SEIS**

599 The Draft SEIS was distributed to individuals and organizations on the Distribution List and submitted to
600 USEPA on October 6, 2006. A Notice of Availability (NOA) was published by the Army in the Federal
601 Register on October 16 and in the El Paso Times, El Dario, Las Cruces Sun-News, Alamogordo Daily
602 News, Hudspeth County Herald, and Fort Bliss Monitor between October 12 and 15, 2006. Copies of the
603 Draft SEIS were made available for public review at seven libraries in the region and on the Fort Bliss
604 website. Copies of the 2000 Mission and Master Plan PEIS, incorporated by reference, were distributed
605 with all copies of the Draft SEIS.

606 In addition, the Army made numerous source documents concerning cultural and natural resources
607 available at regional libraries prior to and during the public comment period for the Draft SEIS. The
608 availability of these documents was announced in a letter to interested parties mailed to all addressees on
609 the Distribution List on August 25, 2006.

610 The public comment period for the Draft SEIS ended December 12, 2006. During the comment period,
611 Fort Bliss conducted two field visits and held three public meetings. Individuals and organizations on the
612 Distribution List were sent letters of notification for the first field visit and the public meetings, and
613 notices were placed in the above-mentioned newspapers. The field visit, conducted on October 28,
614 provided interested members of the public an opportunity to tour the Fort Bliss Training Complex and
615 specifically areas of McGregor Range proposed for off-road vehicle maneuver. A second field visit was
616 conducted on November 20 for selected non-governmental organizations.

617 The public meetings were held in Las Cruces, New Mexico on November 6, 2006; Alamogordo, New
618 Mexico on November 8, 2006; and El Paso, Texas on November 9, 2006. During each meeting, the
619 Army provided displays and handouts summarizing the Proposed Action and other alternatives and their
620 environmental consequences, and conducted a short presentation. Following the presentation, members
621 of the public were provided the opportunity to make comments on the Draft SEIS. These comments were
622 recorded for the record by a court reporter. Verbatim transcripts of the proceedings are included in
623 Appendix D of the Final SEIS.

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

624 A total of nine individuals submitted oral comments at the public meetings. In addition, 15 individuals
625 and organizations submitted written comments during the public comment period. USEPA rated the
626 Draft SEIS as LO, Lack of Objections. All comments, along with responses to the relevant questions and
627 concerns, are provided in Appendix D. Additions and modifications have also been made to the Final
628 SEIS as indicated in the responses to some public comments.

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1 **3.0 DESCRIPTION OF THE PROPOSED ACTION AND**
2 **ALTERNATIVES**

3 This chapter describes the alternatives analyzed in detail in the SEIS. The chapter begins with an
4 introduction to the land use categories applied to Fort Bliss lands (Section 3.1), followed by a description
5 of the process used to identify alternatives that meet the purpose and need defined in Chapter 1.0 (Section
6 3.2). Sections 3.3-3.7 provide detailed descriptions of five alternatives developed in that process. Each
7 of those sections describes land use changes, construction plans, and training and other operations, first,
8 in the Main Cantonment Area and, second, in the Fort Bliss Training Complex.

9 The intent of the alternatives is to provide land use capable of supporting training for units assigned to
10 Fort Bliss and other requirements resulting from Army Transformation, BRAC, and IGPBS
11 implementation of the ACP. Each alternative provides a level of capability based on an operational
12 analysis (described in Section 3.2) that considers the availability of land, facilities, and infrastructure;
13 training areas able to support specific types of training (e.g., off-road vehicle maneuver); the number of
14 days available for training in a year (training cycle); the dimensions of training areas and maneuver
15 “boxes” required by Heavy BCTs; and live-fire and qualification ranges doctrinally required to support
16 various types and numbers of units.

17 Section 3.8 briefly describes alternatives considered but not carried forward for full analysis, explaining
18 the reason for their elimination from further consideration. Finally, Section 3.9 compares the five
19 alternatives analyzed in detail.

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3.1 INTRODUCTION TO LAND USE

Fort Bliss, Texas and New Mexico is comprised of a Main Cantonment Area and the Fort Bliss Training Complex. The Main Cantonment Area (**Figure 3.1-1**) is located in Texas adjacent to the City of El Paso. It includes the Main Post, WBAMC, Logan Heights, and Biggs AAF. All four areas have a mixture of land uses, including administrative, industrial, community, and residential areas. The Main Post houses the headquarters, Garrison Command, ADA School and ADA Brigades, and mobilization functions. WBAMC houses the medical center and supporting functions and includes family housing and associated community facilities. Logan Heights contains primarily family housing, community, and recreation land uses. Biggs AAF is dominated by the airfield and aviation facilities, but it also includes munitions storage, houses the USASMA and supporting functions, and contains some family housing.

Since the 2001 ROD for the Fort Bliss Mission and Master Plan PEIS, land use in the Main Cantonment Area has been guided by the RPMP (specifically the Long-Range Component). Land use designations in the Main Cantonment Area are established by AR 210-20, Master Planning for Army Installations, which defines the 12 land use categories listed in **Table 3.1-1**.

Table 3.1-1. Army Land Use Categories

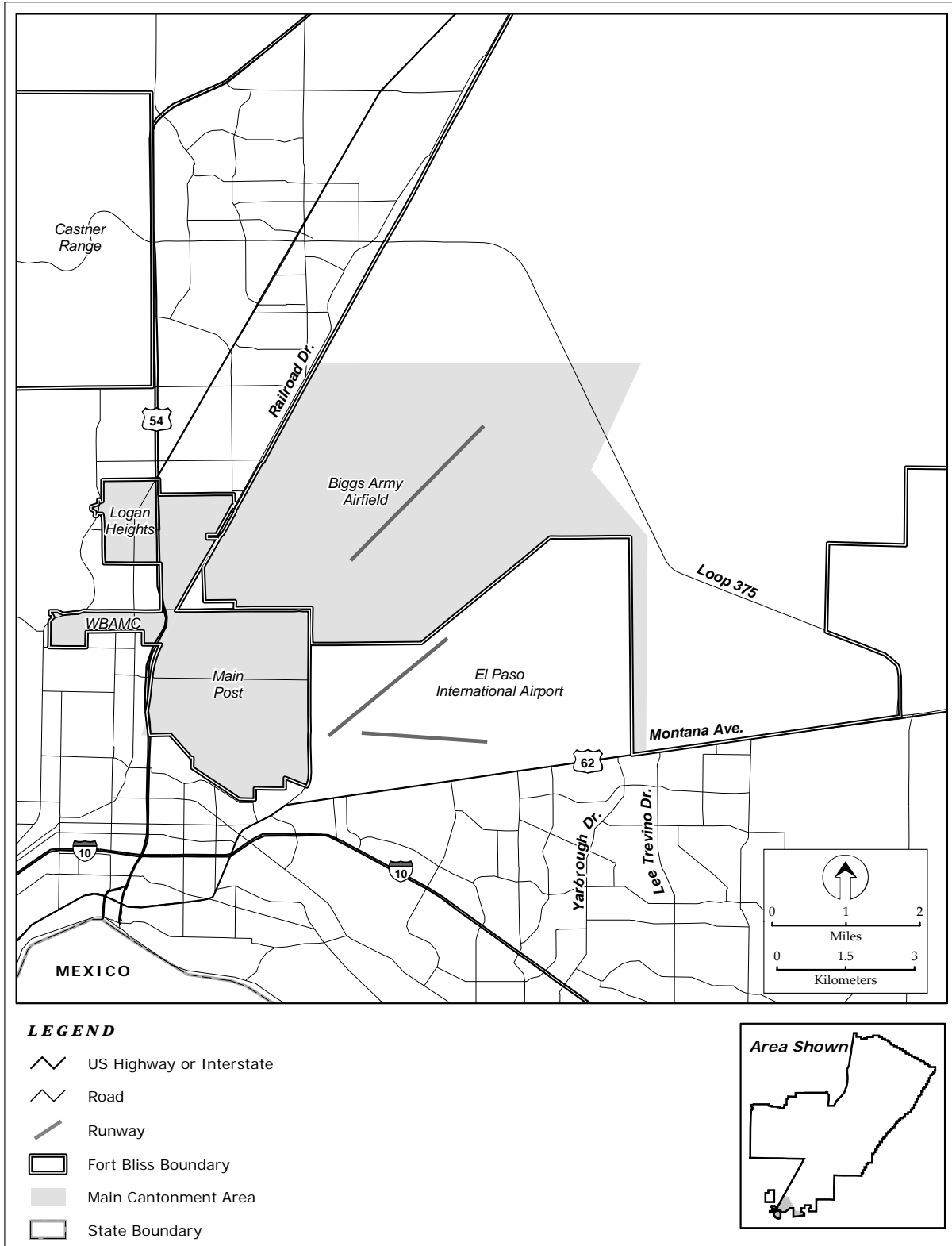
I	Airfield
II	Maintenance
III	Service/Industrial
IV	Supply/Storage
V	Administration
VI	Training/Ranges
VII	Troop Housing
VIII	Family Housing
IX	Community Facilities
X	Medical
XI	Outdoor Recreation
XII	Open Space/Reserved/Buffer

The Fort Bliss Training Complex is comprised of three segments: the South Training Areas in El Paso County, Texas; the Doña Ana Range-North Training Areas in Doña Ana and Otero Counties, New Mexico; and McGregor Range in Otero County, New Mexico. Each segment of the Fort Bliss Training Complex is divided into TAs, as shown on Figure 1-2.

The Fort Bliss Training Complex supports a wide variety of training and testing activities by both on-post units and off-post users. These include ADA training by both U.S. and allied units; ADA missile firings; live-fire training with the full range of weapons from small arms to crew-served weapons such as tanks; on- and off-road maneuvers by both wheeled and tracked vehicles; dismounted training; and training with obscurants and other countermeasures. Training is conducted at Fort Bliss by Active, Reserve, and National Guard units; other military services; other DoD and law enforcement agencies; and allied services. In the recent past, Fort Bliss has supported qualification and other training by Army Reserve and National Guard units deploying to Southwest Asia.

Since the 2001 ROD for the Fort Bliss Mission and Master Plan PEIS, land use in the Fort Bliss Training Complex has been guided by the TADC. The TADC identifies training area land use categories based on permitted training activities as described in **Table 3.1-2**. The color-coded land use categories listed in **Table 3.1-3** define the land use designations in the Fort Bliss Training Complex shown in **Figure 3.1-2** and throughout this chapter.

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



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Figure 3.1-1. Fort Bliss Main Cantonment Area

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Table 3.1-2. Fort Bliss Training Categories

<i>Training Category/Other Uses</i>	<i>Activities</i>
1. Mission Support Facility	Test facilities; landing zones/pads; drop zones; radar facilities; etc.
2. Weapons Firing	Firing areas for short range and HIMAD, surface-to-surface, surface-to-air, and air-to-surface weapons, launch sites; firing points; laser certified ranges; small arms ranges
3. Surface Impact	Live artillery; live fire surface-to-surface missile impact areas; air-to-surface target areas; munitions and missiles
4. SDZ/Safety Footprint	Target debris areas and safety footprint for weapons and laser use
5. Off-Road Vehicle Maneuver	Use of track or wheeled vehicles that is not confined to roads
6. On-Road Vehicle Maneuver	Use of wheeled or tracked vehicles on existing roads
7. Controlled Access FTX Areas	Air Defense training sites; FTX assembly; training; communication, command, and control
8. Dismounted Training	Dismounted training; pyrotechnics
9. Aircraft Operations	Fixed-wing and rotary-wing overflights and air-to-air training
10. Built-up Areas	Range Camps
ENV. Environmental Management	Environmental management activities; conservation efforts conducted on Fort Bliss (i.e., ITAM, INRMP, ICRMP)
PA. Public Access	Areas available for public use for recreation and/or grazing

HIMAD = High-to-Medium Altitude Air Defense; SDZ = Surface Danger Zone; FTX = Field Training Exercise

36 Currently, the South Training Areas are used primarily for on- and off-road vehicle maneuvers; Doña Ana
 37 Range for live-fire training; the North Training Areas for on- and off-road vehicle maneuvers; and
 38 McGregor Range for small arms training, on-road ADA and dismounted maneuvers, controlled access
 39 field training exercises (FTX), and missile firings with their associated Surface Danger Zones (SDZs).
 40 McGregor Range also contains the Centennial Range, an air-to-ground target complex used primarily by
 41 the U.S. and allied Air Forces. Figure 3.1-2 indicates areas of the Fort Bliss Training Complex that are
 42 open for public access, with permission and on a non-interference basis with military training and other
 43 missions.

44 McGregor Range is co-managed by Fort Bliss and BLM under a Congressional withdrawal for military
 45 use. Portions of McGregor Range (TAs 10 through 23 and part of TA 33) are leased for grazing. In
 46 addition, McGregor Range includes Culp Canyon Wilderness Study Area (WSA) and the McGregor
 47 Black Grama Grassland Area of Critical Environmental Concern (ACEC), which is managed to protect
 48 valuable biological resources and to study the ecology of undisturbed grassland.

49 As Figure 3.1-2 shows, the Fort Bliss Training Complex also includes three support centers: Doña Ana
 50 Range Camp, Orogrande Range Camp, and McGregor Range Camp.

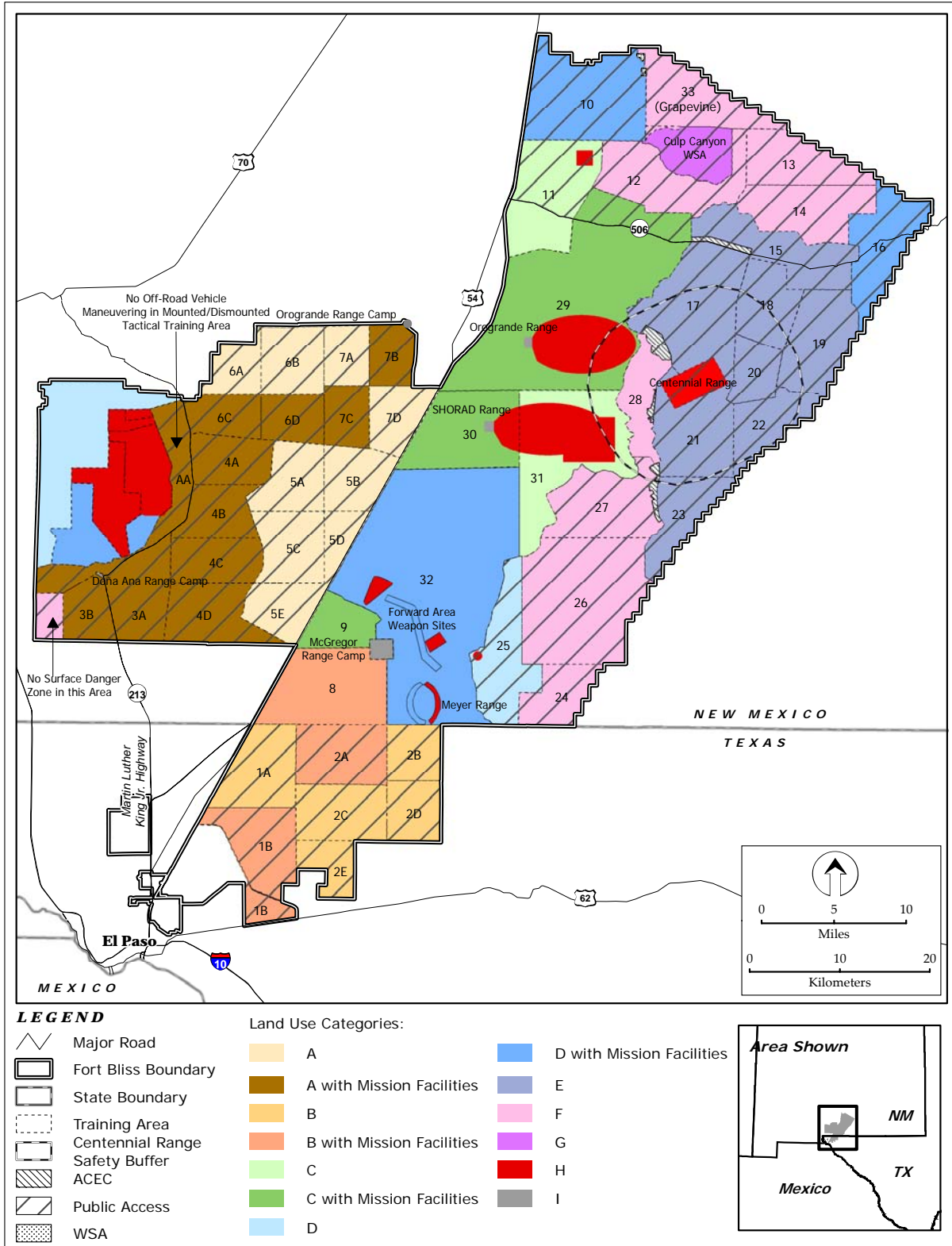
51 Doña Ana Range-North Training Areas and McGregor Range have overlying Restricted Area airspace
 52 that is scheduled for military aircraft operations and during some weapons firing. The Doña Ana Range-
 53 North Training Areas are overlain by Restricted Area R-5107A and McGregor Range by R-5103 A, B,
 54 and C (**Figure 3.1-3**).

Table 3.1-3. Fort Bliss Training Complex Land Use Categories

<i>Training Area Land Use Category</i>	<i>Fort Bliss Training Categories (see Table 3.1-2)</i>											
	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>	<i>6</i>	<i>7</i>	<i>8</i>	<i>9</i>	<i>10</i>	<i>ENV</i>	<i>PA</i>
	Mission Support Facility	Weapons Firing	Surface Impact	SDZ/Safety Footprint	Off-Road Vehicle Maneuver	On-Road Vehicle Maneuver	Controlled Access FTX	Dismounted Training	Aircraft Operations	Built-Up Areas	Environmental Management	Public Access
A		●		●	●	●		●	●		●	○
A with Mission Facilities	●	●		●	●	●		●	●		●	○
B					●	●		●	●		●	○
B with Mission Facilities	●				●	●		●	●		●	○
C		●		●		●	●	●	●		●	○
C with Mission Facilities	●	●		●		●	●	●	●		●	○
D		●		●		●		●	●		●	○
D with Mission Facilities	●	●		●		●		●	●		●	○
E				●		●	●	●	●		●	○
F				●		●		●	●		●	○
G				●				●	●		●	●
H			●						●			
I	●			●		●			●	●	●	○

● Training Category occurs in Land Use Category – uses may be concurrent.
 ○ Public access in some areas. Fort Bliss Training Complex permit required.
 ENV = Environmental Management; PA = Public Access; SDZ = Surface Danger Zone; FTX = Field Training Exercise

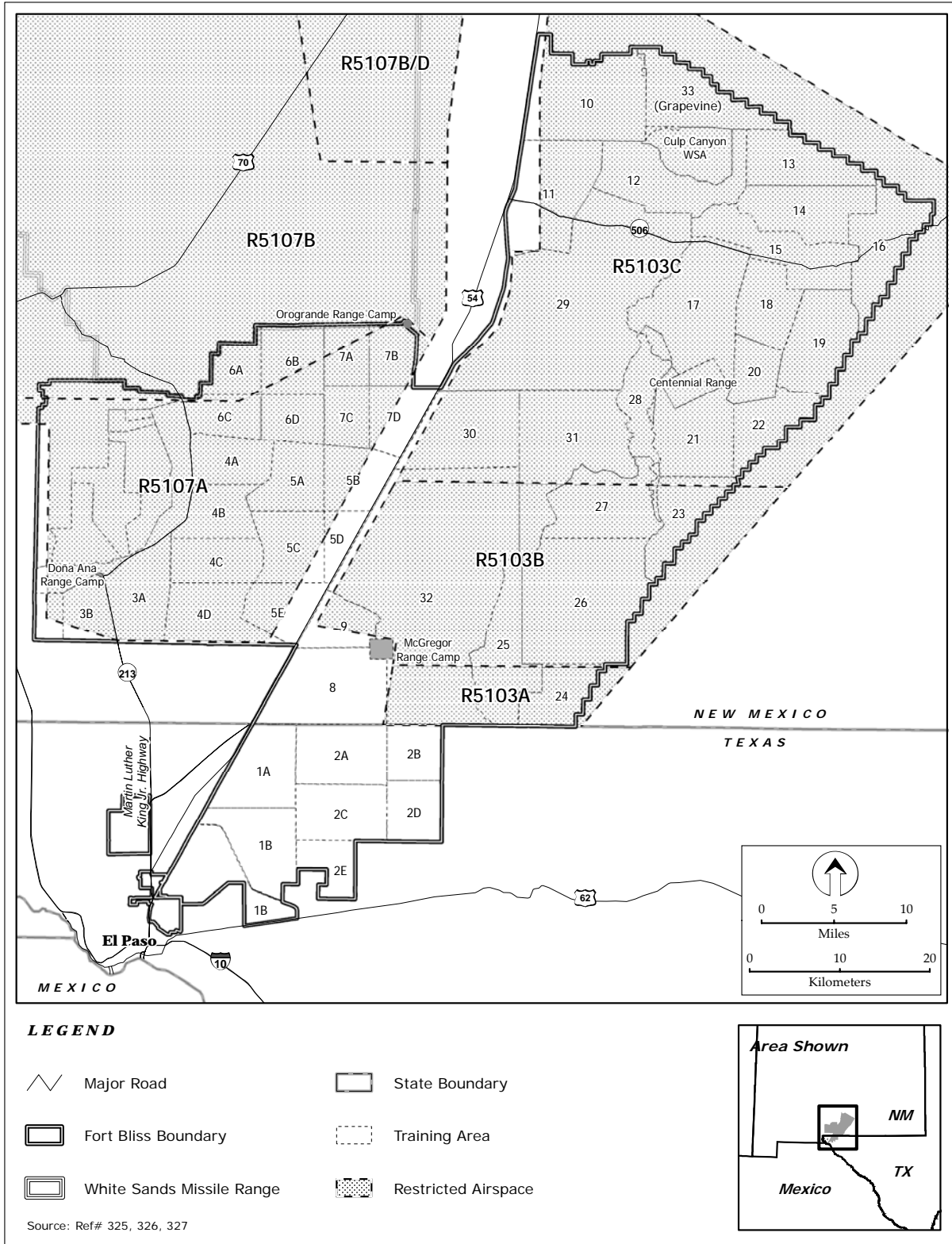
**Fort Bliss Mission and Master Plan Supplemental Programmatic Environmental Impact Statement
Final SEIS**



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Figure 3.1-2. Fort Bliss Training Complex Current Land Use

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



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Figure 3.1-3. Restricted Area Airspace at Fort Bliss

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

61 **Table 3.1-4** presents the estimated level of use that the training areas received in 2004 for off-road
 62 vehicle maneuver and for other training uses. Level of use in this table is defined as the estimated percent
 63 of days (based on a total of 365 days per year) that training was conducted in that training area. Table
 64 3.1-4 likely over-estimates actual level of use because it presents scheduled days, and not all scheduled
 65 times are actually used. In addition, these numbers include potential concurrent training in multiple
 66 training categories. Some uses do not require the entire training area or the entire day, but because
 67 scheduling and use are monitored at the TA level, there is some double counting of smaller and/or shorter
 68 activities. For example, TA 8 is frequently used for smaller exercises that do not need the entire TA and
 69 therefore can be scheduled simultaneously, as is reflected in a use level that is over 100 percent.

70

Table 3.1-4. Estimated Training Area Scheduled Use in 2004

<i>TA</i>	<i>Percent Scheduled Use¹</i>		
	<i>Off-Road Vehicle Maneuver</i>	<i>Other²</i>	<i>Total³</i>
South Training Areas			
1A	24%	6%	30%
1B	50%	12%	62%
2A	81%	20%	101%
2B	38%	9%	47%
2C	61%	15%	76%
2D	22%	6%	28%
2E	25%	6%	31%
North Training Areas			
3A	47%	12%	58%
3B	44%	11%	56%
4A	25%	6%	31%
4B	27%	12%	39%
4C	19%	10%	29%
4D	56%	14%	71%
5A	31%	13%	44%
5B	37%	14%	51%
5C	30%	12%	42%
5D	15%	8%	23%
5E	40%	15%	55%
6A	37%	14%	51%
6B	47%	17%	64%
6C	37%	14%	51%
6D	49%	17%	67%
7A	45%	16%	61%
7B	55%	19%	74%
7C	40%	15%	55%
7D	33%	13%	46%
AA	NA	34%	34%
McGregor Range			
8	178%	44%	222%
9	NA	19%	19%
10	NA	17%	17%
11	NA	17%	17%
12	NA	17%	17%
13	NA	17%	17%
14	NA	17%	17%

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

<i>TA</i>	<i>Percent Scheduled Use¹</i>		
	<i>Off-Road Vehicle Maneuver</i>	<i>Other²</i>	<i>Total³</i>
15	NA	19%	19%
16	NA	17%	17%
17	NA	38%	38%
18	NA	21%	21%
19	NA	22%	22%
20	NA	20%	20%
21	NA	38%	38%
22	NA	18%	18%
23	NA	19%	19%
24	NA	49%	49%
25	NA	48%	48%
26	NA	48%	48%
27	NA	39%	39%
28	NA	38%	38%
29	NA	41%	41%
30	NA	37%	37%
31	NA	37%	37%
32	NA	66%	66%
33 (Grapevine)	NA	19%	19%

Notes:

1. Percent of days scheduled out of 365 days per year.
 2. Other uses include Weapons Firing, Surface Impact, SDZ/Safety Footprint, On-Road Vehicle Maneuver, Controlled Access FTX, and Dismounted Training. Does not include operations in Centennial Range.
 3. Includes concurrent use, so total for TA can be greater than 100 percent.
- AA= Assembly Area west of War Highway; NA=Not Authorized

Source: Ref# 389

3.2 IDENTIFICATION OF ALTERNATIVES

The Army Transformation, BRAC, and the associated modifications in the mission of Fort Bliss, as described in Chapter 1.0, are changing the training requirements that Fort Bliss will be supporting. Responding to those changes requires the Army to make some land use modifications in both the Main Cantonment Area and the Fort Bliss Training Complex.

Existing facilities, infrastructure, and land use in the Main Cantonment Area were evaluated to identify alternatives for accommodating the facility and adjacency requirements of the new units and maximizing use of existing resources.

In order to identify feasible and practical alternatives for making the Fort Bliss Training Complex more responsive to the new requirements, an operational analysis was conducted of the training and support needs of units scheduled for stationing at Fort Bliss, as well as other on- and off-post users of the Fort Bliss Training Complex. The operational analysis considered the required number of live-fire ranges and available off-road vehicle maneuver space based on the training requirements described in Section 1.3.5, physical and scheduling factors limiting their availability, and the ability to sustain current training requirements.

Under the concept of sustained global engagement and Forces Command (FORSCOM) Sustained Engagement Strategy, the Heavy BCTs to be stationed at Fort Bliss will rotate from their base of operations to deployment locations on a regular schedule. In accordance with the Army Force Generation model for operational readiness, each BCT will follow a nominal 36-month cycle consisting of a training phase, a ready/deployable phase, and a reset phase. The cycle starts with a 3-month reset phase, followed by 10 months of training to standard for a new mission. This is followed by a 23-month ready/deployable phase during which the BCT maintains proficiency through continued training. The BCT may deploy during that phase; deployments are typically for 12 months. The 36-month cycle for a single BCT results in one deployment in three years. Consequently, if four BCTs are stationed at Fort Bliss, at least one would be deployed and a maximum of three would be training at home station in a given year.

The operational analysis identified the number and types of live-fire and qualification ranges required to train the units to be stationed at Fort Bliss, based on TC 25-8. Although some of the required ranges already exist on Fort Bliss, it was determined that others would have to be constructed. Locations for those additional ranges were identified to maximize synergies with existing facilities. The following criteria were used in siting the additional ranges:

- Accommodate simultaneous training by multiple units.
- Maximize efficiency of range use.
- Minimize conflicts with other ranges.
- Maximize range availability.
- Overlay on existing ranges where possible.
- Enable key live-fire ranges to be used in combination with off-road vehicle maneuver areas.

These criteria suggest that ranges should be grouped into complexes, both for efficiency and to minimize impact on maneuver areas, with care taken in their arrangement so as to avoid conflict. Small arms individual qualification ranges should be clustered around the range camps for the same reasons.

In meeting off-road vehicle maneuver requirements, the primary objective of the operational analysis was providing the capability to train as many units as possible to full doctrinal standards for realistic training. Effective live training, carried out to a high doctrinal standard, is the cornerstone of operational success.

Department of Army conducted a Future Range Mission Analysis Planning (FRMAP) exercise at Fort Bliss in October 2004. The exercise identified areas on Fort Bliss where training could be conducted by

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

45 Heavy BCTs using the new organizational structure, training doctrine, and equipment mandated by Army
46 Transformation. The exercise concluded that multiple battalion task force maneuver “boxes” could be
47 placed on the North and South Training Areas. Based on TC 25-1, a battalion-size maneuver box
48 nominally measures 8 km by 31 km (approximately 61,000 acres), which may be adjusted depending on
49 terrain and configuration. Additional boxes could be accommodated if portions of McGregor Range in
50 the Tularosa Basin were made available for off-road maneuver training. Other portions of McGregor
51 Range, specifically the Sacramento Mountains foothills and Otero Mesa, were considered less suitable
52 due to excessively steep slopes or land use conflicts. **Figure 3.2-1** shows that six battalion-size maneuver
53 boxes fit within the Tularosa Basin portion of the Fort Bliss Training Complex, and six simultaneous
54 battalion-level exercises could occur if the entire area shown were approved for off-road vehicle
55 maneuvers. Six maneuver battalions comprise two Heavy BCTs.

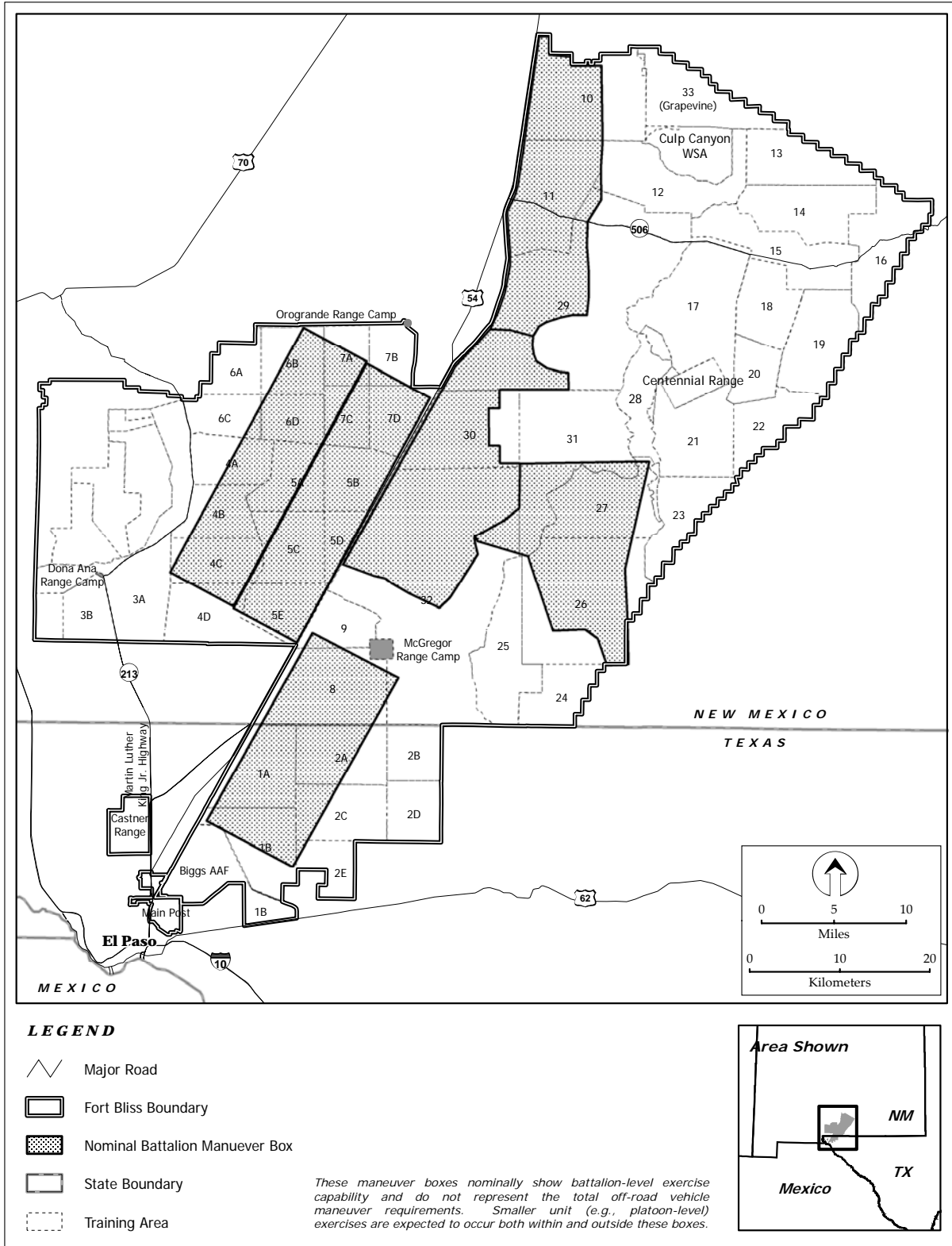
56 Once the BRAC decision was made to station an Armor Division with four Heavy BCTs and the other
57 related units at Fort Bliss, alternatives for providing the total maneuver capability needed were identified
58 based on the following criteria:

- 59 1. Provide the capability to conduct battalion-level “movement-to-contact” training for the Heavy
60 BCTs stationed at Fort Bliss. The battalion task force is the lowest echelon at which all elements
61 of the combined arms team fight together. This requires multiple battalion maneuver boxes that
62 can be used together in a configuration consistent with training doctrine.
- 63 2. Provide a variety of terrain and environments for off-road vehicle maneuvers. Effective and
64 realistic training requires various types of terrain that could be encountered in various regions and
65 environments of the world where Army units may be deployed. Variety in terrain conditions also
66 prevents soldiers from becoming used to training in one type of environment. Fort Bliss not only
67 provides desert conditions and large expanses of flat terrain often encountered in the Middle East,
68 but also has ridges and valleys that replicate terrain conditions in other regions. In addition, the
69 vast distances and rugged terrain provide real-world training for logistical units that must operate
70 in similar overseas areas to support ground maneuver forces.
- 71 3. Provide maneuver capacity for a minimum of three Heavy BCTs (assuming one of the four BCTs
72 stationed at Fort Bliss is deployed or ready for deployment at any one time), all other units listed
73 in the BRAC decisions to be stationed at Fort Bliss, and any BCTs training prior to deployment
74 as part of Fort Bliss’ Power Projection Platform mobilization mission. Combined, these units are
75 estimated to require a minimum of 528,000 km²d for defined missions (see Section 1.3.5 for the
76 definition of km²d), including 328,000 km²d for three Heavy BCTs and approximately 200,000
77 km²d for the other units.
- 78 4. Provide adequate capacity to support other missions that use Fort Bliss and the flexibility to
79 accommodate changing missions and training needs in the future.

80 To apply the first criterion, the nominal battalion maneuver box, adjusted for terrain and other constraints
81 where necessary, was applied using GIS to demonstrate potential areas within the Fort Bliss Training
82 Complex where heavy battalion training could be accommodated (see Figure 3.2-1). Placement of these
83 maneuver boxes merely demonstrates the significant training potential at Fort Bliss, and neither constrains
84 the formulation of any particular training exercise, nor defines the limits of off-road vehicle maneuver on
85 the installation.

86 To meet the second criterion, training areas with terrain and environments that are different from the
87 North and South Training Areas were identified. The southeast portion of McGregor Range (TAs 24, 26,
88 and 27) has ridges and mesas that run generally in a southeast to northwest direction with valleys of
89 various lengths and widths in between. This type of rugged terrain replicates various terrain conditions in
90 other parts of the world, such as the Middle and Far East, to which units may have to deploy and operate.

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



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Figure 3.2-1. Nominal Battalion Maneuver Box Capability of the Fort Bliss Training Complex

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

93 The application of the third criterion examined the quantity of off-road maneuver area currently available
94 at Fort Bliss, which is limited to the South Training Areas, North Training Areas, and TA 8 on McGregor
95 Range. These areas comprise a total of approximately 1,356 km². The Army Training Support Center
96 (ATSC) planning standard for use of maneuver land is 242 training days in a year, allowing time off for
97 range maintenance, holidays, and weekends. This translates into an existing maneuver capacity at Fort
98 Bliss of approximately 328,000 km²d, which is substantially less than the 528,000 km²d maneuver
99 requirement of the units identified for stationing at Fort Bliss. Even if the TAs were scheduled 365 days
100 per year, the total capacity, 495,000 km²d, would not be adequate to meet the defined need. Therefore,
101 additional potential off-road vehicle maneuver area was identified on McGregor Range. Based on a
102 standard of 242 training days per year (excluding weekends and holidays and adjusting for maintenance
103 activities), the minimum additional area needed for off-road vehicle maneuver is approximately 826 km²
104 or 204,000 acres, not including other uses such as missile firings.

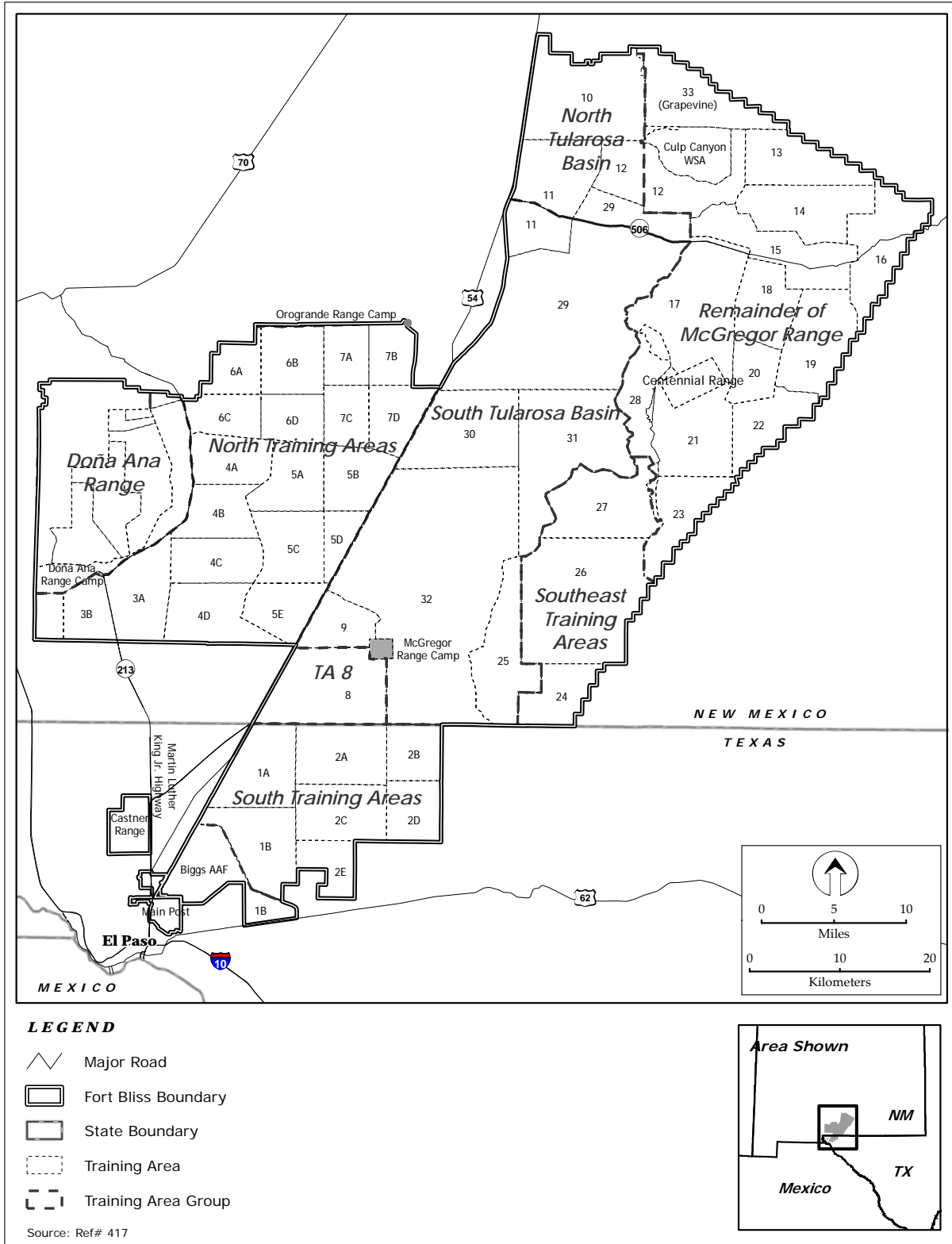
105 For the fourth criterion, additional capability was incorporated in some of the alternatives in order to meet
106 both existing needs, including weapons firings, and the potential for future testing and training needs. For
107 example, there were 127 large SDZ and 594 smaller SDZ missile firings in 2004. As another example,
108 the mission of the EBCT being stationed at Fort Bliss is to develop new training doctrine for, and evaluate
109 the integration of, new weapons and systems such as FCS into the active forces. Testing and training for
110 FCS will require a battle space that extends as far as 300 km at the brigade level and 150 km at the
111 battalion level.

112 For planning purposes, the following assumptions were also incorporated in the operational analysis:

- 113 • ADA training and mobilization and deployment of Reserve and National Guard Components
114 would continue.
- 115 • Other facilities needed to support units and troops would be constructed in the Main Cantonment
116 Area and at the range camps.
- 117 • Fort Bliss could accommodate light units (infantry and special forces) in addition to Heavy BCTs.
- 118 • No off-road vehicle maneuver would occur on Otero Mesa or Sacramento Mountains portion of
119 McGregor Range.

120 To complete the analysis and identify reasonable alternatives, the Fort Bliss Training Complex was
121 divided into seven groupings shown on **Figure 3.2-2**. The South Training Areas, North Training Areas,
122 and TA 8, which are already used for off-road vehicle maneuvers, comprise three of the groupings.
123 McGregor Range is further subdivided into the south Tularosa Basin portion south of Highway 506, the
124 north Tularosa Basin portion north of Highway 506, the southeast TAs (24, 26, and 27) that transition
125 between the Tularosa Basin and Otero Mesa, and the remainder of McGregor Range comprised of Otero
126 Mesa and the Sacramento Mountains foothills.

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



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Figure 3.2-2. Groupings of TAs in the Fort Bliss Training Complex

129 **Table 3.2-1** provides the acreage and km² in each grouping shown on Figure 3.2-2 and identifies the TAs
130 included in each grouping.

131 **Table 3.2-1. Training Area Groupings**

<i>Grouping</i>	<i>Training Areas</i>	<i>Acre</i> s	<i>Km²</i>
South Training Areas	1A, 1B, 2A, 2B, 2C, 2D, 2E	99,813	404.1
North Training Areas	3A, 3B, 4A, 4B, 4C, 4D, 5A, 5B, 5C, 5D, 5E, 6A, 6B, 6C, 6D, 7A, 7B, 7C, 7D, AA ¹	223,476	904.7
TA 8	8	25,925	105.0
McGregor Range, South Tularosa Basin	9, 25, 30, 31, 32, 11 and 29 south of Highway 506	274,020	1,109.4
McGregor Range, North Tularosa Basin	10, 11 and 29 north of Highway 506, west half of 12	65,733	266.1
McGregor Range, Southeast TAs	24, 26, 27	76,636	310.3
Remainder of McGregor Range	13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 28, 33, east half of 12	225,157	1,033.0

1. AA is the unnumbered Assembly Area.

132 The operational analysis resulted in identification of four land use alternatives focused on providing
133 additional off-road vehicle maneuver capability in the Fort Bliss Training Complex, in addition to No
134 Action:

- 135 • Alternative 1 would expand the land designated for Off-Road Vehicle Maneuver into the south
136 Tularosa Basin portion of McGregor Range (see Figure 3.2-2), increasing the installation's
137 capability in that training category to approximately 540,000 km²d. This would meet the
138 currently defined requirement for 528,000 km²d but leaves little flexibility to accommodate other
139 users (e.g., missile firings) or future demands. The south Tularosa Basin portion of McGregor
140 Range was selected for this expansion because of proximity to McGregor Range Camp and the
141 Meyer Range Complex, the ability to locate additional live-fire and qualification ranges on and
142 adjacent to existing Forward Area Weapons (FAW) sites, and the availability of infrastructure at
143 Orogrande Range and the Wilde Benton airstrip to be incorporated into the development of new
144 range capabilities needed to support the Heavy BCTs.
- 145 • Alternative 2 would include the land use changes of Alternative 1 and also expand the land
146 designated for Off-Road Vehicle Maneuver into the north Tularosa Basin portion of McGregor
147 Range (see Figure 3.2-2), increasing Fort Bliss' capability in that training category to
148 approximately 603,000 km²d. This would meet the currently defined requirement for 528,000
149 km²d, incorporate the flexibility to accommodate other users, and provide the ability to absorb up
150 to an additional 75,000 km²d of off-road vehicle maneuver, which is approximately equivalent to
151 two-thirds of a BCT in training load. The north Tularosa Basin portion of McGregor Range was
152 selected for the additional expansion because it is adjacent to the south Tularosa Basin portion of
153 the range and would provide a continuous maneuver space capable of supporting force-on-force,
154 movement-to-contact exercises at the battalion level. As shown in Figure 3.2-1, this is the only
155 area in the Fort Bliss Training Complex where two battalion maneuver boxes can be arrayed end
156 to end, allowing two battalions to oppose each other in an exercise.
- 157 • Alternative 3 would include the land use changes of Alternative 1 and also expand the land
158 designated for Off-Road Vehicle Maneuver into the southeast training areas of McGregor Range

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

159 (see Figure 3.2-2), increasing Fort Bliss' capability in that training category to approximately
 160 610,000 km²d. This alternative provides approximately the same level of capability in km²d as
 161 Alternative 2 but in a different configuration which incorporates terrain that is different from the
 162 North and South Training Areas and south Tularosa Basin portion of McGregor Range, and
 163 therefore offers more variety in training environments.

- 164 • Alternative 4 – Proposed Action would include all the land use changes of Alternatives 1, 2, and
 165 3, increasing Fort Bliss' capability in the Off-Road Vehicle Maneuver training category to
 166 approximately 673,000 km²d. This alternative was selected as the Proposed Action because it
 167 provides the most flexibility to accommodate missile firings while managing the ground-based
 168 mission and is the only alternative that provides both the force-on-force, movement-to-contact
 169 capability of Alternative 2 and the terrain variety of Alternative 3, as well as the additional
 170 capacity to accommodate potential future changes in missions, units, and training requirements.

171 **Table 3.2-2** summarizes the area designated for Off-Road Vehicle Maneuver under each alternative and
 172 the off-road vehicle training capability of each alternative in km²d, not including other uses such as
 173 missile firings.

174 **Table 3.2-2. Off-Road Vehicle Maneuver Training Capability by Alternative**

<i>Alternative</i>	<i>Off-Road Vehicle Maneuver Training Areas</i>	<i>Km²d¹</i>
No Action	South Training Areas North Training Areas TA 8	328,000
Alternative 1	South Training Areas North Training Areas South Tularosa Basin portion of McGregor Range (TAs 8, 9, 25, 30, 31, 32, and 11 and 29 south of Highway 506)	539,700
Alternative 2	South Training Areas North Training Areas North and south Tularosa Basin portions of McGregor Range (TAs 8, 9, 10, 11, 25, 29, 30, 31, 32, and western half of 12)	602,800
Alternative 3	South Training Areas North Training Areas South and southeast Tularosa Basin portions of McGregor Range (TAs 8, 9, 10, 24, 25, 26, 27, 30, 31, 32, and 11 and 29 south of Highway 506)	609,600
Alternative 4 – Proposed Action	South Training Areas North Training Areas Tularosa Basin portion of McGregor Range (TAs 8, 9, 10, 11, 24, 25, 26, 27, 29, 30, 31, 32, and western half of 12)	672,700

1. Based on 242 training days per year. Does not include other uses such as missile firings.

175 The following sections describe proposed land use in the Main Cantonment Area and Fort Bliss Training
 176 Complex for each alternative, including No Action, and identify reasonably foreseeable construction,
 177 personnel, operations, and training associated with the land use alternatives.

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1 **3.3 NO ACTION ALTERNATIVE**

2 Under the No Action Alternative, land use on Fort Bliss would remain as established in the 2001 ROD for
3 the Mission and Master Plan PEIS, as modified through incremental projects and changes evaluated in
4 accordance with the NEPA screening criteria and management process described in the PEIS and in
5 Chapter 2 above. Temporary stationing of the 4th BCT, 1st CAV at Fort Bliss was approved to take place
6 in FY 2006 and assessed in a REC (Ref# 153). Construction of permanent facilities and infrastructure for
7 the BCT was assessed in a second REC (Ref# 427). Comprised of tanks and other tracked fighting
8 vehicles, this unit is similar to the 3rd ACR that was located at Fort Bliss up until 1995 when it was
9 moved to Fort Carson, Colorado. Therefore, the No Action Alternative includes changes in land use,
10 facilities, and training associated with the location of one Heavy BCT at Fort Bliss. These changes have
11 been evaluated for compliance with NEPA. The primary changes include the following:

- 12 • Development of approximately 500 acres of previously disturbed land for a temporary and a
13 permanent complex on the Biggs AAF portion of the Main Cantonment Area to accommodate
14 approximately 3,800 assigned personnel and 1,400 pieces of equipment, including M1 tanks,
15 Bradley fighting vehicles, mortar carriers, and various wheeled vehicles.
- 16 • Upgrades to several existing firing ranges and development of new firing ranges on Doña Ana
17 Range and McGregor Range within current land use designations and/or on existing range
18 footprints.
- 19 • Increase in off-road vehicle maneuvers in TAs currently approved for that use.
- 20 • Upgrades and new construction at McGregor, Doña Ana, and Orogrande Range Camps to
21 accommodate mobilization requirements.
- 22 • Other incremental land use changes that have occurred since the 2000 PEIS.

23 The No Action Alternative is addressed in this SEIS as required by CEQ Regulations, but it is not a
24 reasonable alternative because it does not satisfy the requirements of the BRAC decision.

25 **3.3.1 MAIN CANTONMENT AREA**

26 **Figure 3.3-1** shows the land use plan for the Main Cantonment Area as reflected in the RPMP adopted in
27 the 2001 ROD for the Mission and Master Plan PEIS. This plan defines land use in the 12 categories
28 established by AR 210-20 and listed in Table 3.1-1. These categories provide a general framework for
29 organizing and siting development to maintain or achieve efficient and compatible functional
30 relationships. Some modifications have been made to land use in the Main Cantonment Area, consistent
31 with AR 210-20, to accommodate incremental mission requirements and evaluated in accordance with the
32 NEPA screening criteria and management process established in the PEIS. The main modification is the
33 change in land use in the area between Biggs AAF and EPIA to accommodate a multi-use complex to
34 house the 4th BCT, 1st CAV, initially in a temporary area while the permanent area is being constructed.
35 This project was reviewed in a REC (Ref# 153). The complex includes administrative and headquarters
36 space, barracks, dining, storage, vehicle maintenance shops, and open paved yards for vehicles.

37 Several other projects are planned for the Main Cantonment Area, including renovation and upgrades to
38 existing facilities to reconfigure barracks, classroom facilities, administrative space, and mission support
39 facilities to meet current needs; construction of new facilities; and development of family housing through
40 the RCI. **Table 3.3-1** lists projects currently programmed for the Main Cantonment Area in the Five-Year
41 Defense Plan and sample long-range projects expected under the No Action Alternative. These projects
42 are consistent with the RPMP and the overall analysis of the Mission and Master Plan PEIS. Plans for
43 these projects are evolving and may change depending on design requirements, funding, and other factors.
44 The following paragraphs describe the main development plans in each part of the Main Cantonment
45 Area.

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

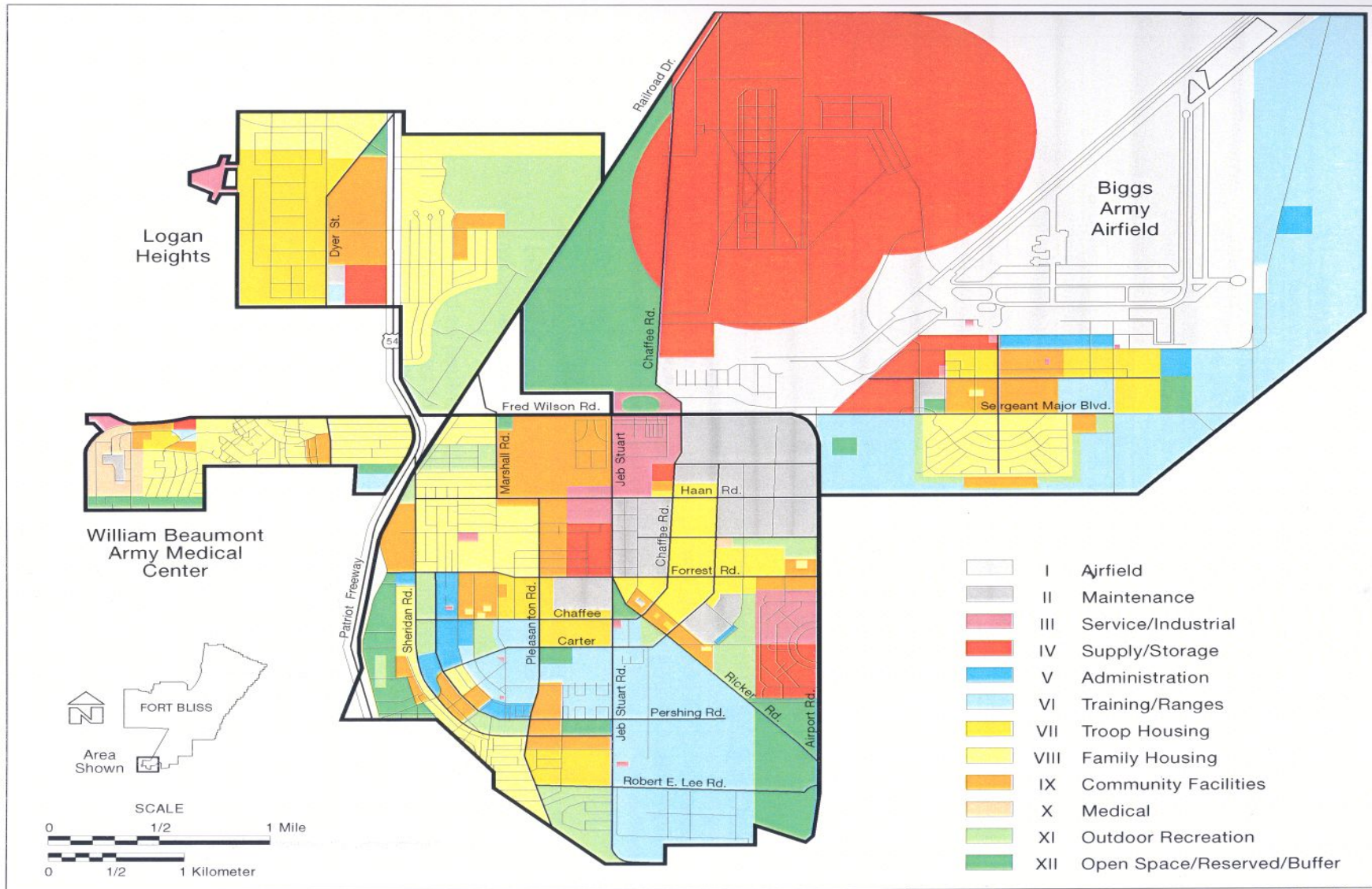


Figure 3.3-1. Current Main Cantonment Area Land Use Plan

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Table 3.3-1. Main Cantonment Area Projects – No Action Alternative

<i>Project</i>	<i>Renovation</i>	<i>Demolition</i>	<i>New/Add</i>
5-Year Defense Plan (FY2007-2011)			
RCI housing (859 units net increase)	X	X	X
Heavy BCT Complex and Infrastructure	X	X	X
Expand Logan Heights Youth Center		X	X
North Overpass, US 54			X
South Overpass, US 54			X
Tactical Equipment Shops (6)	X		X
Tactical Vehicle Overpass			X
Physical Fitness Facility			X
Chapel, Biggs AAF			X
Criminal Investigation Division Command Building			X
Brigade HQ			X
Battery HQ			X
Fire/Military Police Station			X
Staging and Marshalling Area			X
General Instruction Facility			X
Brigade Set, Doña Ana Range Camp			X
Brigade Set, Orogrande Range Camp			X
Sample Long-Range Sustainment, Restoration, and Modernization Projects			
Airfield Upgrades	X	X	X
Road Construction and Repair	X	X	X
Barracks Renewal	X	X	X
HQ and Administration Facilities	X	X	X
Warehousing	X	X	X
Recreational Facilities			X
Gate Upgrades	X		X
Pavements			X
Railroad Extensions			X
Maintenance Facilities			X
Depot Facilities			X
Unaccompanied Housing			X
Community Facilities			X

Source: Ref# 3, 164, 433

49 **Main Post.** A number of renovations, additions, and new construction projects are programmed for the
 50 Main Post. These projects are similar to and consistent with the land use and type of development
 51 described in the PEIS and adopted in the RPMP. They include administrative; industrial and mission
 52 support; service; and morale, welfare, and recreation facilities.

53 **WBAMC.** Recent projects occurring on the WBAMC parcel include a new Bio/Safety Laboratory,
 54 renovation of the Emergency Department, and a new multi-level parking garage. An area of about 90
 55 acres in the middle of the WBAMC parcel is being developed for Enhanced Use Leasing (EUL). This
 56 project will include a mix of commercial (offices and retail), residential, and possibly research and
 57 development space. Construction of up to 1,010 residential units is part of the EUL. This development
 58 has been assessed in a REC (Ref# 99).

59 **Logan Heights.** Land use at Logan Heights has historically been primarily family housing. As
 60 projected in the PEIS, much of the old, substandard housing in Logan Heights has been demolished. The

61 area is planned for development of future military family housing under the RCI (see below). The only
62 other project currently programmed for the area is an expansion of the Youth Center.

63 **Biggs AAF.** Approximately 500 acres of previously disturbed, open land between Biggs AAF and EPIA
64 is being developed to support the first Heavy BCT. During 2005, temporary facilities for the 4th BCT,
65 1st CAV were moved onto 300 acres immediately east of Biggs AAF. This involved surface clearing and
66 grading, pouring concrete pads, extending utility lines, and installing equipment and over 600 temporary
67 structures. Some existing facilities in the Aero Vista housing area of Biggs AAF are being used for troop
68 housing. Permanent BCT facilities are being constructed on a 200-acre site adjacent to the temporary
69 area, west of Loop 375. These include about 1,320,000 square feet (SF) of facility space and 2,039,000
70 SF of new pavement. WBAMC is also constructing temporary medical and dental facilities on Biggs
71 AAF to support the BCT.

72 **Traffic Management.** Some road segments will be improved within the Main Cantonment Area to
73 alleviate traffic congestion, provide access to new facilities, and provide tank vehicle access to the
74 training areas. Entry gates to the Main Cantonment Area are being upgraded to meet new anti-terrorism
75 and force protection standards and to accommodate additional traffic. Two U.S. Highway (US) 54
76 overpasses will be constructed to provide safer access to the Doña Ana Range-North Training Areas. In
77 addition, Texas Department of Transportation (TXDOT) traffic management projects include construction
78 of a new vehicle overpass between the Main Post and Biggs AAF, as well as the Inner Loop and
79 Northeast Parkway (see Section 4.2 for descriptions of those projects).

80 **Residential Community Initiative.** RCI is a program to demolish 1,215 substandard housing units,
81 build 1,850 new homes, rehabilitate 206 historical homes, and renovate 1,331 other existing homes for
82 military families on Fort Bliss. This ongoing initiative was assessed in a REC (Ref# 223) and is projected
83 to continue through 2010. It will integrate new swimming pools, community centers, parks, walking
84 trails, bike paths, and playgrounds in the residential areas. With the possible construction of another 224
85 homes, the end-state will achieve up to 3,611 homes for military families on post to meet current needs of
86 Fort Bliss, including the BCT. The new housing and paved driveways and roadways will occupy about
87 500 acres of land distributed over multiple parcels in the Main Cantonment Area. Some of the new
88 housing will be located where old housing has been demolished.

89 Overall, the construction planned for the Main Cantonment Area over the next five years under this
90 alternative is estimated to involve approximately 1,500 acres, with approximately 1,000 acres directly
91 affected by ground disturbance and construction activities and approximately 330 acres of additional
92 impervious surface.

93 **3.3.2 FORT BLISS TRAINING COMPLEX**

94 Land use designations in the Fort Bliss Training Complex under the No Action Alternative (see Figure
95 3.1-2) are based on the TADC and described in the Mission and Master Plan PEIS. Land use in two
96 training areas, TAs 1B and 16, has been modified to include the Mission Support Facility training
97 category (see Table 3.1-2) to allow for development of mission facilities and infrastructure improvements.

98 Range upgrades and enhancements have been completed or are underway to support the BCT, including
99 upgrades to existing ranges and development of new weapons firing ranges and training facilities. Seven
100 ranges are being developed in areas of Doña Ana and McGregor Ranges that are approved for weapons
101 firing and ordnance impact in the TADC. A REC was prepared for these ranges (Ref# 148), in
102 accordance with the criteria and procedures described in the PEIS. In addition, ongoing maintenance and
103 repair activities will continue at Doña Ana, Orogrande, and McGregor Range Camps, existing firing
104 ranges, and on range roads.

105 At 242 training days per year, the No Action Alternative provides a total of approximately 328,000
106 km²/year. With the addition of one BCT, the training requirement under the No Action Alternative is
107 estimated at approximately 218,000 km²/year. For analysis purposes, **Table 3.3-2** presents a range of

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

108 potential off-road vehicle maneuver and other uses in each grouping of TAs listed in Table 3.2-1 and
 109 shown on Figure 3.2-2. Unlike Table 3.1-4, these projections do not double count for concurrent use and
 110 represent estimated actual versus scheduled time. The lower end of the range reflects the requirements of
 111 one BCT in combination with the mobilization mission. The upper end of the range represents the full
 112 capability of Fort Bliss lands approved for the Off-Road Vehicle Maneuver training category, based on
 113 242 training days per year. The utilization levels reflect the percent of days in the year out of a total of
 114 365. The Fort Bliss Training Complex would also continue to support other training, including weapons
 115 firings, dismounted training, on-road vehicle maneuvers, air operations, and field training exercises like
 116 Roving Sands, consistent with land use designations in the TADC.

117 **Table 3.3-2. Estimated Training Area Use – No Action Alternative**

<i>Grouping</i>	<i>Training Areas¹</i>	<i>Percent of Use²</i>	
		<i>Off-Road Vehicle Maneuver³</i>	<i>Other Uses⁴</i>
South Training Areas	1A, 1B, 2A, 2B, 2C, 2D, 2E	50-66%	5-10%
North Training Areas	3A, 3B, 4A, 4B, 4C, 4D, 5A, 5B, 5C, 5D, 5E, 6A, 6B, 6C, 6D, 7A, 7B, 7C, 7D, AA ⁵	50-66%	10-20%
TA 8	8	50-66%	10-20%
McGregor Range, South Tularosa Basin	9, 25, 30, 31, 32, 11 and 29 south of Highway 506	0	20-66%
McGregor Range, North Tularosa Basin	10, 11 and 29 north of Highway 506, west half of 12	0	20-66%
McGregor Range, Southeast TAs	24, 26, 27	0	20-66%
Remainder of McGregor Range	13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 28, 33, east half of 12	0	20-66% ⁶

1. See Figure 3.1-2
2. Percent of days out of a total of 365. Does not account for concurrent, non-exclusive use of the training area.
3. Ranges from the training requirements of one Heavy BCT plus mobilization mission, up to standard full military use at 242 training days per year.
4. Other uses include Weapons Firing, Surface Impact, SDZ/Safety Footprint, On-Road Vehicle Maneuver, Controlled Access FTX, and Dismounted Training.
5. AA is the unnumbered Assembly Area.
6. Does not include Centennial Range, which is used on an intermittent basis.

118 The No Action Alternative does not provide sufficient area designated for Off-Road Vehicle Maneuver to
 119 accommodate the units identified by BRAC to be relocated to Fort Bliss and continue to support other
 120 users of the Fort Bliss Training Complex. If all training areas were scheduled 365 days of the year, they
 121 would only meet the training requirements of the four Heavy BCTs (with one deployed) and be
 122 insufficient to accommodate other users and the mobilization mission. In addition to forcing troops to
 123 train on weekends and holidays, this would not leave sufficient time to perform road maintenance or
 124 conduct environmental and other activities required to sustain the land base. Even with 365 training days
 125 per year, there would not be sufficient capacity to accommodate off-post users or to sustain the
 126 installation's mobilization mission. Therefore, this alternative would result in degraded training that does
 127 not meet doctrinal standards.

128 The following subsections describe land use and ongoing improvements in the three segments of the Fort
 129 Bliss Training Complex.

130 **3.3.2.1 South Training Areas**

131 Under the No Action Alternative, land use in most of the South Training Areas will remain as defined in
132 the PEIS (see Figure 3.1-2). The one exception is in TA 1B, which has been changed to include the
133 training category of Mission Support Facility in addition to On- and Off-Road Vehicle Maneuver,
134 Dismounted Training, and Aircraft Operations. Mission support facilities will be developed in the
135 southern portion of TA 1B near Loop 375 for the Army National Guard and Reserve Joint Training
136 Center. Construction for the center will involve approximately 275,000 SF of facilities and 918,000 SF of
137 pavement (Ref# 490). The City of El Paso, El Paso Water Utilities (EPWU) is constructing a desalination
138 plant and supporting facilities north of Montana Boulevard adjacent to EPIA and along Loop 375 (Ref#
139 222).

140 **3.3.2.2 Doña Ana Range-North Training Areas**

141 Under the No Action Alternative, land use in the Doña Ana Range-North Training Areas will remain as
142 defined in the TADC and Mission and Master Plan PEIS/ROD. The Doña Ana Range Complex contains
143 live-fire ranges for small arms and crew-served weapons qualification (M1 tanks and Bradley fighting
144 vehicles). Upgrades and enhancements have been made or are underway at Doña Ana firing ranges,
145 including development of a Multi-Purpose Machine Gun (MPMG) range, a Combat Pistol Qualification
146 (CPQC) range, an Infantry Platoon Battle Course (IPBC), and an Urban Assault Course (UAC) (Ref#
147 148). They are being developed within current land use designations and/or on existing range footprints.

148 **3.3.2.3 McGregor Range**

149 Under the No Action Alternative, land use in McGregor Range will remain the same as defined in the
150 TADC and Mission and Master Plan PEIS/ROD, with the change previously made to TA 16 to include
151 the Mission Support Facility training category. Off-Road Vehicle Maneuver will be limited to TA 8.
152 Vehicle maneuvers will continue to be conducted on roads as described in the PEIS. Dismounted training
153 will continue to be permitted throughout McGregor Range, except in impact areas. Range upgrades and
154 enhancements have been completed or are under way within the Tularosa Basin portion of McGregor
155 Range. Most of these are upgrades to existing ranges within the Meyer Range complex and FAW sites.
156 A Demolition Range and two Live-Fire Shoothouses are being developed in TAs 29 and 32, consistent
157 with the land use designations for those TAs (Ref# 148).

158 Improvements within McGregor Range Camp will be made to support the increased range use, and new
159 barracks are being built to increase the range camp's troop support capability from approximately 3,000
160 beds to approximately 5,000 beds.

161

1 **3.4 ALTERNATIVE 1**

2 Under Alternative 1, land use in the Main Cantonment Area and the Fort Bliss Training Complex would
3 be modified to accommodate facilities and infrastructure, personnel, equipment, operations, and training
4 associated with a Heavy Armor Division, including four Heavy BCTs (three in addition to the No Action
5 Alternative), a CAB, and other units as described in Section 1.3.1. The primary land use changes include
6 the following:

- 7 • Addition of the Off-Road Vehicle Maneuver training category, as well as Mission Support
8 Facility, Weapons Firing, and SDZ/Safety Footprint, in TAs 9, 11, 25, 29, 30, 31, and 32 in the
9 Tularosa Basin portion of McGregor Range south of Highway 506. This would add
10 approximately 216,000 acres (875 km²) of Off-Road Vehicle Maneuver area in the Fort Bliss
11 Training Complex, for a total of approximately 551,000 acres (2,230 km²).
- 12 • Addition of the Mission Support Facility category to TA 1A in the South Training Areas.
- 13 • Expansion of the Main Cantonment Area to the north and east and development of additional
14 facilities to accommodate a net increase of approximately 22,000 personnel and 9,000 dependents
15 living on post; 1,440 additional tracked vehicles, 3,600 additional wheeled vehicles, 110
16 helicopters, and other equipment; and operations associated with the new units.
- 17 • Establishment of a new range complex in TA 29 near the Wilde Benton airstrip and Orogrande
18 Range, called the Orogrande Range Complex.
- 19 • Construction of new live-fire and qualification ranges at Doña Ana and McGregor Ranges.

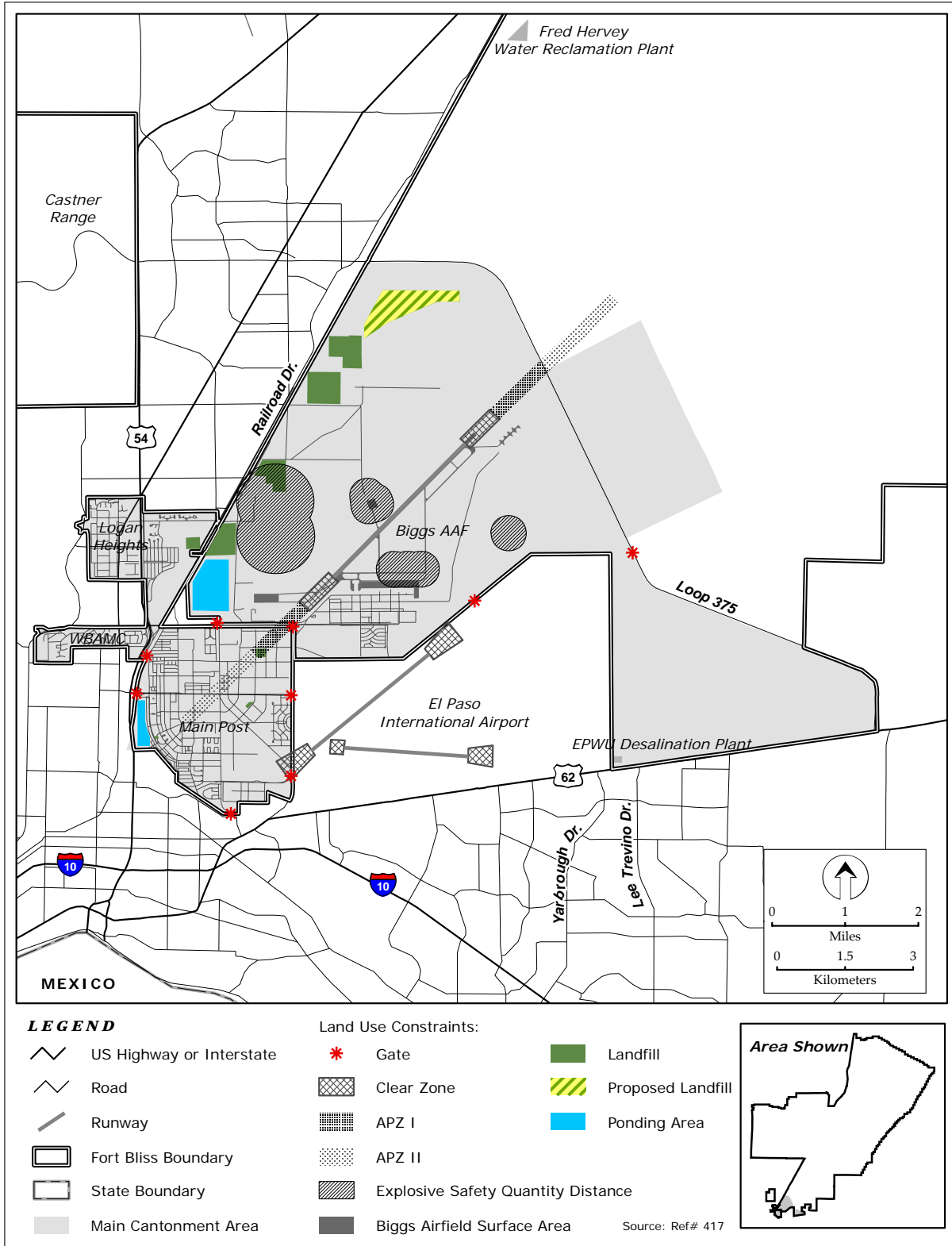
20 In accordance with the recommendations of the BRAC Commission, the ADA School, 6th ADA Brigade,
21 and 31st ADA Brigade would relocate out of Fort Bliss to Fort Sill. In addition, the 108th ADA Brigade
22 may relocate to Fort Bragg. However, it is assumed that the ADA Brigades would continue to conduct
23 live-fire training on the Fort Bliss Training Complex.

24 **3.4.1 MAIN CANTONMENT AREA**

25 Alternative 1 would extend the Main Cantonment Area to the north and east, in order to accommodate the
26 facility requirements of three additional Heavy BCTs, a CAB, and the other units and support
27 requirements. It would also apply a new approach to land use within the Main Cantonment Area. Instead
28 of identifying specific areas for each of the 12 land use categories listed in Table 3.1-1, the entire Main
29 Cantonment Area would be designated for mixed-use land use. Within this land use, siting and
30 development of facilities would follow Army land use compatibility criteria. This move to a single
31 mixed-use land use designation supports the Army's Transformation to a modular force by enabling each
32 BCT's facilities to be planned as an integrated enclave, thereby improving the layout of related functions
33 and increasing the unit's operational efficiency. It also provides greater flexibility to respond to evolving
34 mission and facility requirements in the future. **Figure 3.4-1** shows the expanded Main Cantonment Area
35 and the main factors and constraints that will influence facility siting, including existing infrastructure
36 such as the Biggs AAF airfield and associated Accident Potential Zones (see Section 4.11), explosive
37 safety quantity distance areas, SDZs, easements and outleasements such as the desalination plant operated by
38 EPWU, and traffic access points (gates).

39 Development in the Main Cantonment Area under Alternative 1 would focus on facilities to support the
40 new Heavy Armor Division. Section 1.3 describes the sequence of units scheduled to arrive at Fort Bliss
41 over the next four years. The overall land use concept for this expansion is to develop mission enclaves
42 for each of the BCTs in and around Biggs AAF and out to Loop 375 and beyond, and to renovate and
43 upgrade existing facilities on the Main Post for reuse. The size of the Main Cantonment Area would be
44 expanded from approximately 15,194 acres to 23,632 acres.

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



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Figure 3.4-1. Main Cantonment Area Land Use – Alternative 1

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

47 Over the next four years, about 4,000 acres of land in the Main Cantonment Area would experience some
48 level of development or redevelopment. Over half of that (approximately 2,100 acres) would convert
49 open space into developed land. The uses would be varied, including administrative, barracks/housing,
50 troop training, industrial, commercial, and community functions. Development would disturb an
51 estimated 3,400 acres and increase impervious surfaces by about 1,300 acres, with most of this in the east
52 part of Biggs AAF. Some areas would not be developable due to safety constraints around the airfield
53 and munitions storage facilities and for environmental and other reasons. A certain amount of land would
54 remain open to support large-scale deployment and for soldier training areas. Most of the construction
55 activity is expected to take place between 2007 and 2011. As much as half of it could be concentrated in
56 2008.

57 Alternative 1 construction would include all the projects listed for the No Action Alternative (see Table
58 3.3-1). **Table 3.4-1** lists additional construction programmed for the Main Cantonment Area for
59 Alternative 1. Several projects involve renovating, upgrading, or converting existing facilities for reuse.
60 An estimated 2,000,000 SF may be available for reuse and could reduce the total estimated physical
61 development under Alternative 1 by about 10 percent.

62 **Main Post.** Some of the facility requirements are expected to be met by reconfiguring existing facilities
63 that would be vacated by troops scheduled to leave Fort Bliss. For example, the Artillery (Fires) Brigade
64 and EAB functions would be located on the Main Post. The main facilities there would be new and
65 upgraded tactical equipment shops, motor pools, and barracks. The Armor Division Headquarters could
66 be located on the Main Post or Biggs AAF. In addition, Garrison Command functions such as fire
67 stations, law enforcement, engineering, and grounds and facility maintenance would be expanded to meet
68 the needs of the new Armor Division.

69 **WBAMC.** Additional facilities would be constructed to support the increase in military population,
70 including a dental clinic and an addition and alterations to the hospital.

71 **Biggs AAF.** The majority of the new construction would occur on/adjacent to Biggs AAF and in the
72 expansion area between EPIA and Loop 375. In addition to construction for the 4th BCT, 1st CAV that is
73 described for the No Action Alternative, construction for three more Heavy BCTs would occur in this
74 area. As part of the modularity concept, each BCT is conceived as a unit with similar facility
75 requirements.

76 The master planning concept for this expansion is to create a new “tactical campus” where the BCT sites
77 would be clustered. Between Biggs AAF and the Main Cantonment Area expansion, there are large areas
78 of open space suitable for new development. Proximity to the South Training Areas is desirable because
79 it would reduce travel distance for training brigades and minimize intrusion of BCT vehicular activity in
80 the rest of the Main Cantonment Area. Final siting decisions would consider access, utility connections,
81 and other constraints. Each brigade would be housed in existing temporary BCT facilities while
82 permanent facilities are being constructed. Infrastructure would be extended to each of the BCT enclaves
83 as they are developed.

84 The total facility allowance for a Heavy BCT is 1,320,000 SF, comprised of about 35 percent
85 headquarters and administrative facilities, almost 50 percent troop housing and dining, and the remainder
86 for vehicular maintenance and storage. Each unit is also allocated 2,039,250 SF of pavement for vehicle
87 parking and equipment. A site area of about 300 acres accommodates these allowances.

88 Some mission facilities, such as a new fueling area and wash racks, are expected to be constructed on the
89 east side of Loop 375. A tank vehicle roadway and new vehicle crossings would link directly between the
90 BCT enclaves around Biggs AAF and the fueling area and training areas.

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

91

Table 3.4-1. Main Cantonment Area Projects – Alternative 1

<i>Project</i>	<i>Renovation</i>	<i>Demolition</i>	<i>New/Add</i>
Army Reserves/National Guard Center			X
Gates/Overpasses Loop 375			X
Division HQ Complex			X
Sustainment Brigade Complex			X
Fuel Storage and Fueling Facility			X
Ammunition Storage Facilities (2)			X
Central Issue Facility			X
Centralized Vehicle Wash Facility			X
Deployment Storage Facility			X
Fire/Military Police Station – Biggs			X
Community Services Center			X
Dental Clinic			X
Shopping Center Expansion	X	X	X
Soldier Service Center			X
Mini Malls and Shoppettes, Biggs AAF			X
Youth Center Expansion, Logan Heights	X		X
Widen Haan Road		X	X
Upgrade and Repair Main Post Facilities and Roads	X	X	X
Tactical Equipment Shops (6)	X		X
Upgrade FIRES Tactical Shops and Motor Pools (3)	X		X
Heavy BCT Complex and Infrastructure			X
CAB Facilities and Infrastructure		X	X
Child and Youth Services School Age Sites (2)			X
Child and Youth Services Child Development Centers (3)	X		X
Headquarters Building Reconfiguration	X		
Explosive Ordnance Disposal Facility			X
Battle Command Training Center			X
Alert Holding Area			X
Communications Facility			X
Barracks			X
Hospital Addition			X
Consolidated Medical Center			X
Modernize Officers’ Club	X		
Junior Enlisted Club			X
Library Replacement			X
Multi-Purpose Sports Fields			X
Physical Fitness Facility			X
Community Activities Center			X
Youth Activity Center			X
Chapel Center			X
Chapel Family Life Center			X
Heavy BCT Complex and Infrastructure			X
RCI Housing			X
Close Combat Tactical Trainer Facility			X
Training Support Center Upgrade	X		
General Services Maintenance Facility			X
Two Four-Field Softball Complexes			X
Defense Reutilization and Marketing Office Facility			X

92 The CAB is expected to arrive in 2009. The most likely location for this brigade is along the south side
93 of the east-west taxiway at Biggs AAF. Using this site would require removal of about 400,000 SF of
94 pavement and facilities and construction of about 1,310,000 SF of new facilities and 5,100,000 SF of new
95 pavement.

96 In addition to the BCT and CAB enclaves, some supporting/sustainment functions would also be located
97 on Biggs AAF, including medical facilities, ammunition storage, maintenance areas, and staging areas.

98 **Community Facilities.** Additional community support facilities include youth development centers,
99 recreational facilities, sports fields, chapels, day care centers, libraries, and commercial facilities needed
100 to support the increased post population. They would be distributed among multiple parts of the Main
101 Cantonment Area, including the Main Post and Biggs AAF. An estimated 100 acres are needed for up to
102 1,500,000 SF of new commercial and community buildings.

103 **Traffic Management.** New gates would be constructed to provide access off Loop 375 to the BCT
104 enclaves. A new gate between Biggs AAF and EPIA is also proposed. Figure 3.4-1 shows the
105 approximate locations of the new gates. The new vehicle overpass (constructed by TXDOT) described
106 under the No Action Alternative would provide access to tank trails along the perimeter of Biggs AAF
107 and connect to the South Training Areas. Other improvements include widening roads and constructing
108 tank trails.

109 **Military Family Housing.** The additional military personnel and dependents associated with the new
110 units would increase the demand for military family housing. Approximately 1,750 additional military
111 family housing units, over and above those described for the No Action Alternative, would be developed
112 by RCI in the expanded Main Cantonment Area east of EPIA.

113 Alternative 1 includes potential construction of a new on-post landfill in the expanded Main Cantonment
114 Area (see Figure 3.4-1). The current landfill is anticipated to reach capacity before 2008. The new
115 landfill would comprise approximately 200 acres and have an estimated life of approximately 63 years
116 (Ref# 478). If it is not constructed, refuse from Fort Bliss would be taken off post for disposal.

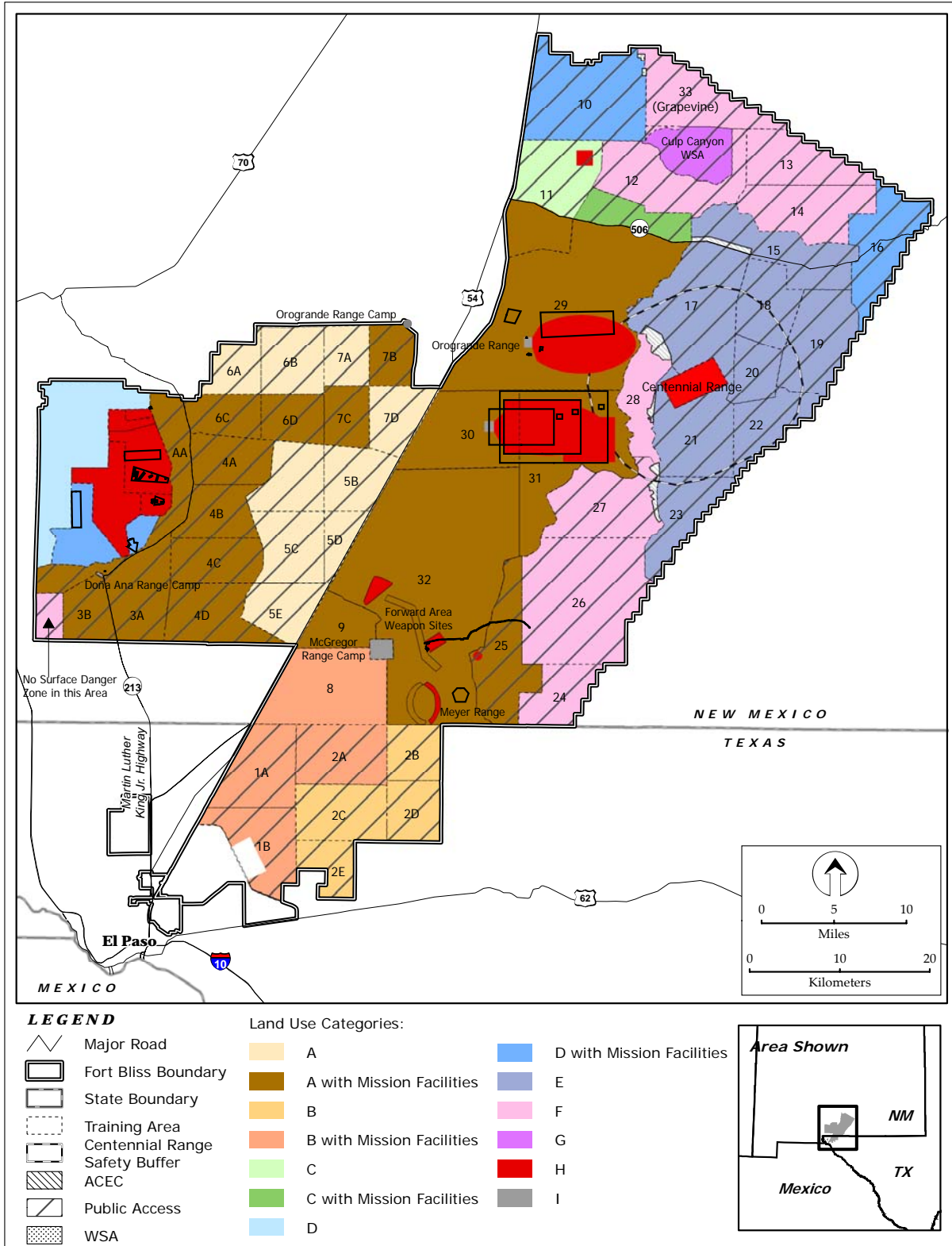
117 **3.4.2 FORT BLISS TRAINING COMPLEX**

118 Land use changes in the Fort Bliss Training Complex under Alternative 1 would include reconfiguration
119 of the South Training Areas to accommodate the expanded Main Cantonment Area and other mission
120 facilities, addition of the Off-Road Vehicle Maneuver training category to TAs in the Tularosa Basin
121 portion of McGregor Range south of Highway 506, and development of additional tactical and firing
122 ranges. **Figure 3.4-2** shows land use designations in the Fort Bliss Training Complex for Alternative 1.

123 This alternative includes development of several new and upgraded live-fire and qualification ranges.
124 The locations for these facilities were selected to maximize the use of existing range capabilities and the
125 functional integration of both existing and new ranges, and considering their supportability from the
126 existing range camps. Thus, many of the new facilities are proposed to be located on Doña Ana Range
127 and in the southern part of TA 32 near Meyer Range, the FAW sites, and McGregor Range Camp. These
128 areas do not provide adequate space for all the required facilities, so a new range complex is proposed in
129 TA 29 near the existing Orogrande Range. This location was selected because of the existing
130 infrastructure and the proximity to Wilde Benton airstrip, which provides needed aviation capability
131 related to some of the training facilities. In addition, this location allows for a battalion maneuver box to
132 be located between it and the facilities in the southern portion of TA 32 (see Figure 3.2-1), which could
133 then be used in conjunction with either set of ranges.

134 Once the proposed development has been completed, the Fort Bliss Training Complex would have four
135 main centers of training activity. One would be the South Training Areas, which would be developed
136 with more mission support facilities. This would be supported primarily from the Main Cantonment

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



137
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Figure 3.4-2. Fort Bliss Training Complex Land Use – Alternative 1

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

139 Area. The second would be the Doña Ana Range-North Training Areas and expanded ranges and
140 facilities there. That segment would be supported primarily from Doña Ana Range Camp.

141 A third would include Meyer Range and the FAW sites in southern McGregor Range and would be
142 supported from McGregor Range Camp. The fourth would be the new Orogrande Range Complex in TA
143 29. It would be supported primarily from Orogrande Range Camp.

144 With the addition of 875 km² of area designated for Off-Road Vehicle Maneuver on McGregor Range,
145 the capacity of the Fort Bliss Training Complex would be increased to approximately 540,000 km²d per
146 year. Based on the requirements in TC 25-1, as described in Section 1.3.5, more than 80 percent of the
147 off-road vehicle training time conducted by a BCT is in platoon- and company-level exercises. While
148 these exercises collectively take up the most time in the course of a year, they generally require less
149 maneuver area per exercise. Therefore, it is expected that most of the platoon- and company-level
150 training would likely be conducted in areas closest to the Main Cantonment Area, specifically the South
151 Training Areas and TAs 8 and 9 of McGregor Range, followed by the North Training Areas. Alternative
152 1 minimally meets the maneuver requirements of the units locating at Fort Bliss, so it is expected that all
153 TAs available for off-road vehicle maneuver would be fully used for vehicle maneuver training under this
154 alternative. **Table 3.4-2** presents the estimated level of use in various TAs under Alternative 1. The
155 percent of use reflects the days in the year that the TAs would be used out of a total of 365. Standard full
156 military use is 242 days, which is 66 percent of the time.

157 **Table 3.4-2. Estimated Training Area Use – Alternative 1**

<i>Grouping</i>	<i>Training Areas¹</i>	<i>Percent of Use²</i>	
		<i>Off-Road Vehicle Maneuver³</i>	<i>Other Uses⁴</i>
South Training Areas	1A, 1B, 2A, 2B, 2C, 2D, 2E	65-66%	5-20%
North Training Areas	3A, 3B, 4A, 4B, 4C, 4D, 5A, 5B, 5C, 5D, 5E, 6A, 6B, 6C, 6D, 7A, 7B, 7C, 7D, AA ⁵	65-66%	5-20%
TA 8	8	65-66%	5-20%
McGregor Range, South Tularosa Basin	9, 25, 30, 31, 32, 11 and 29 south of Highway 506	60-66%	5-30%
McGregor Range, North Tularosa Basin	10, 11 and 29 north of Highway 506, west half of 12	0	15-66%
McGregor Range, Southeast TAs	24, 26, 27	0	40-66%
Remainder of McGregor Range	13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 28, 33, east half of 12	0	15-66% ⁶

1. See Figure 3.4-2
2. Percent of days out of a total of 365. Does not account for concurrent, non-exclusive use of the training area.
3. Ranges from the training requirements of four Heavy BCTs, other BRAC units, and mobilization mission, up to standard full military use at 242 training days per year.
4. Other uses include Weapons Firing, Surface Impact, SDZ/Safety Footprint, On-Road Vehicle Maneuver, 5. Controlled Access FTX, and Dismounted Training.
5. AA is the unnumbered Assembly Area.
6. Does not include Centennial Range, which is used on an intermittent basis.

158 The demand for off-road vehicle maneuver training would leave approximately 13 days per year for
159 missile firings on McGregor Range. For comparison, a total of 76 days for large missile firings and 100
160 days for small missile firings were used in 2004. Therefore, missile firings and other uses would have to
161 be scheduled around the BCT training. Large missile firings which have historically scheduled up to two

162 days for a single event would need to be scheduled more efficiently. Small missiles (e.g., Stingers) have
163 smaller SDZs, and the SDZs associated with firings at FAW 10 extend into the southeast TAs of
164 McGregor Range, allowing for other, concurrent use of portions of the south Tularosa Basin outside the
165 SDZ. Therefore, other uses in the southeast TAs would likely be higher than other areas of McGregor
166 Range, as reflected in Table 3.4-2. Even so, it is unlikely that the historical volume of missile firings
167 would be accommodated, and it is highly likely that additional days beyond the standard 242 days per
168 year would need to be scheduled on the Fort Bliss Training Complex in order to accommodate all users.

169 The following subsections describe proposed land use and construction in the three segments of the Fort
170 Bliss Training Complex under this alternative.

171 **3.4.2.1 South Training Areas**

172 **Land Use.** Land use in most of the South Training Areas would remain the same as under the No
173 Action Alternative, with two changes:

- 174 • The western boundary of TA 1B would be modified to accommodate the expansion of the Main
175 Cantonment Area, which would encompass the BCT complex, National Guard and Reserve Joint
176 Training Complex, and new RCI housing. Land use in TA 1B would continue to be Category B
177 with Mission Facilities. Bulk fuel storage, vehicle fueling and wash racks, and other facilities
178 supporting the BCTs could be located in that training area.
- 179 • Land use in TA 1A would be changed to category B with Mission Facilities.

180 **Figure 3.4-3** shows land use in the South Training Areas under Alternative 1.

181 **Construction.** A Tank Crew Proficiency Course is planned to be located in the South Training Areas.
182 There is no live fire associated with this course. Roads in the training areas would be constructed or
183 improved.

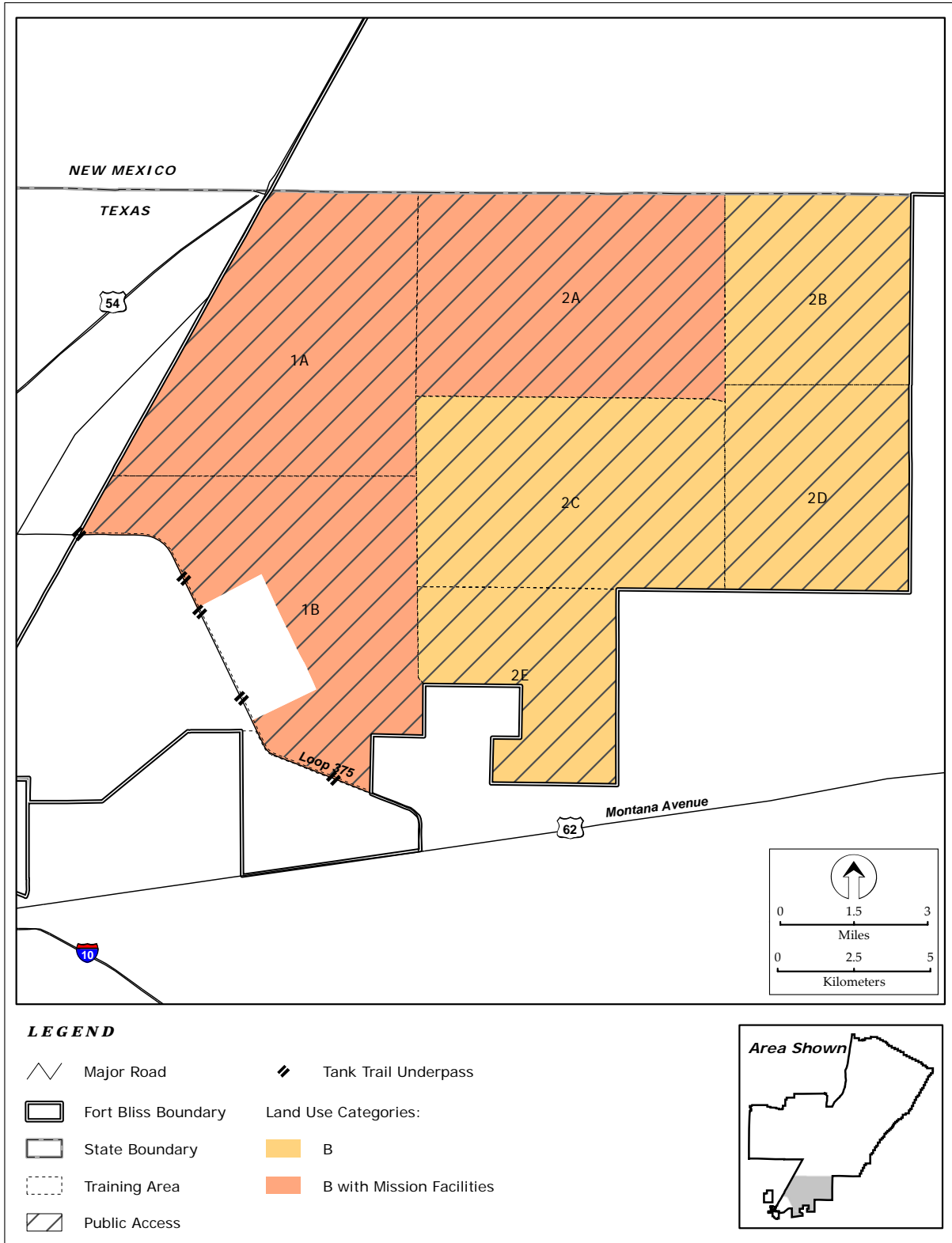
184 **3.4.2.2 Doña Ana Range-North Training Areas**

185 **Land Use.** Under Alternative 1, land use in the Doña Ana Range-North Training Areas would be the
186 same as the No Action Alternative, except the Assembly Area west of War Highway would be extended
187 north to the installation boundary and designated for Off-Road Vehicle Maneuver to allow units to
188 approach the Doña Ana Ranges tactically. **Figure 3.4-4** shows land use in the Doña Ana Range-North
189 Training Areas under Alternative 1.

190 **Construction.** New and upgraded live-fire ranges would be constructed on Doña Ana Range,
191 consistent with existing land use designations, to accommodate the training needs associated with the
192 additional BCTs and to upgrade and modernize training capabilities (**Table 3.4-3**). These ranges would
193 be similar to the existing facilities at Doña Ana Range. About 35 miles of roads within the Main Supply
194 Route network and other roads in the training areas would be upgraded or constructed, and other auxiliary
195 facilities and improvements would be made. War Highway may be widened to support increased
196 movement of heavy equipment transporters. Additional facilities and living quarters would be
197 constructed at Orogrande Range Camp. The range camp historically supported more than 1,100
198 personnel during training operations (Ref# 302) but currently only has quarters for 350 that are fit for
199 occupancy. Additional quarters for approximately 1,350 personnel would be constructed, and the range
200 camp would provide infrastructure to support up to 3,800 daytime soldiers during BCT-level exercises.

201 The existing airstrip at Orogrande Range Camp would be hardened to support helicopter operations by the
202 CAB. Fuel and maintenance facilities would be constructed to enable the CAB to use the airstrip as a
203 staging area and Forward Area Refuel Point (FARP) for training operations on McGregor Range (see
204 Section 3.4.2.3). The FARP would include bermed areas for fuel bladders with the capacity to contain
205 110 percent of the fuel in the event of a breach in the bladder.

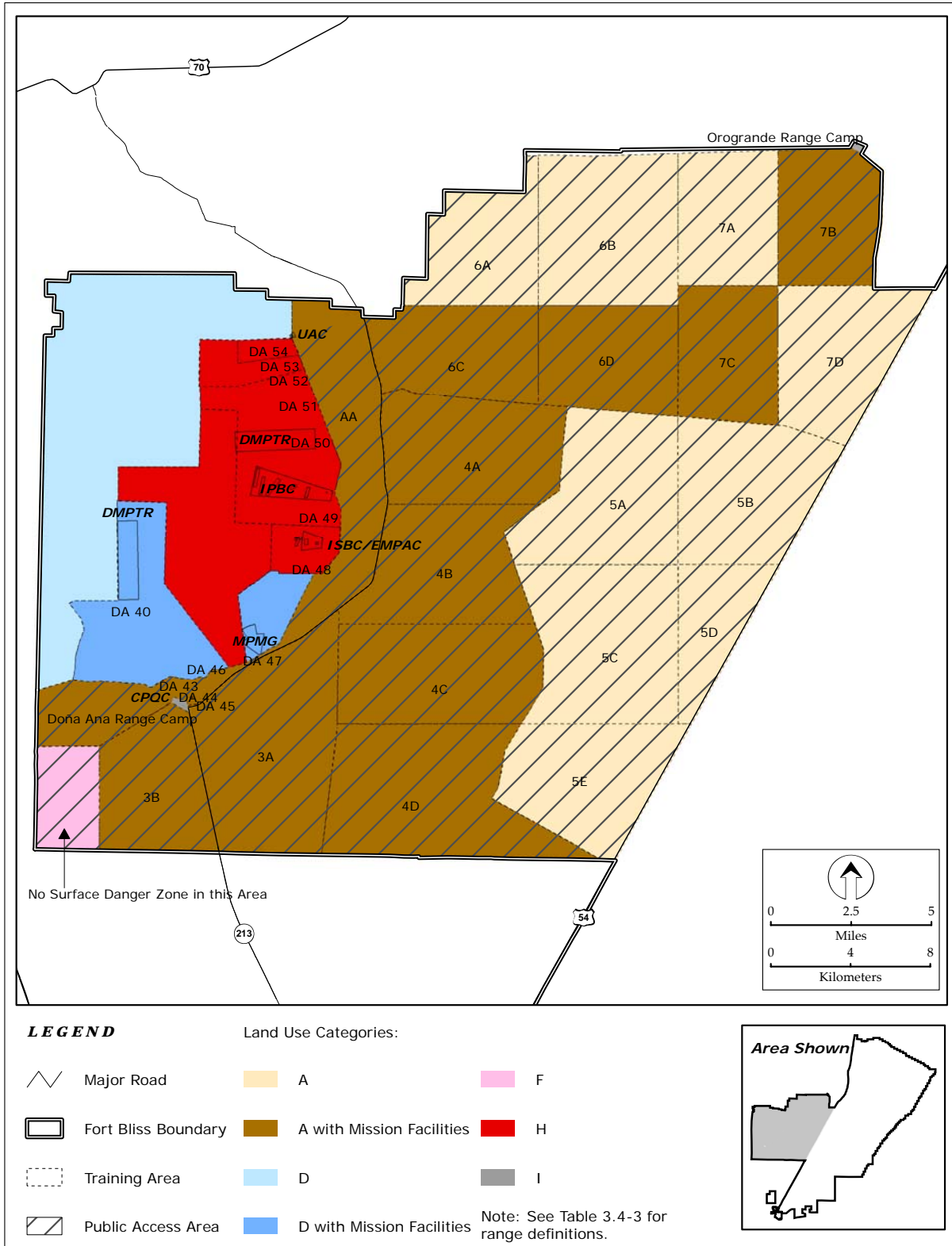
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Figure 3.4-3. Training Area Land Use in the South Training Areas – Alternative 1

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



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Figure 3.4-4. Training Area Land Use in the Doña Ana Range-North Training Areas — Alternative 1

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Table 3.4-3. Doña Ana Range Construction – Alternative 1

<i>Proposed Facility</i>	<i>Location</i>	<i>Approximate Size</i>	<i>Purpose</i>
Digital Multi-Purpose Training Range (DMPTR)	DA 40	1 km by 4 km	Train and test crews and dismounted infantry squads on the skills necessary to detect, identify, engage and defeat stationary infantry and armor targets in a tactical array with live-fire, sub-caliber, and/or laser training devices.
Infantry Squad Battle Course (ISBC)	DA 48	1 km by 1 km	Train and test infantry squads on the skills necessary to conduct tactical movement techniques, detect, identify, engage and defeat stationary and moving infantry and armor targets in a tactical array.
Engineer Multi-Purpose Assault Course (EMPAC)	DA 48	Collocated with Infantry Squad Battle Course	Train and test combat engineer units to conduct unexploded ordnance clearance, demolition, breaching, urban entry, improvised explosive device clearance, route clearing, and squad fire and maneuver.
DMPTR	DA 50	1 km by 4 km	Train and test crews and dismounted infantry squads on the skills necessary to detect, identify, engage and defeat stationary infantry and armor targets in a tactical array with live-fire, sub-caliber, and/or laser training devices.

213 **3.4.2.3 McGreggor Range**

214 **Land Use.** Figure 3.4-5 shows land use on McGreggor Range under Alternative 1. As it shows, changes
215 would occur in the following training areas:

- 216 • TA 9 would be changed from land use category C with Mission Facilities to land use category A
217 with Mission Facilities. This would add the training category of Off-Road Vehicle Maneuver to
218 this training area.
- 219 • TAs 11 and 29 south of Highway 506, TA 30, and TA 31 would be changed from land use
220 category C or C with Mission Facilities to land use category A with Mission Facilities to add the
221 training categories of Off-Road Vehicle Maneuver, and in some cases Mission Support Facility,
222 to those training areas.
- 223 • TAs 25 and 32 would be changed from land use category D or D with Mission Facilities to A
224 with Mission Facilities to add the training category of Off-Road Vehicle Maneuver to these
225 training areas, as well as Mission Support Facility in TA 25 (the other TAs already include the
226 Mission Support Facility category).

227 In addition, dismounted training would be permitted in the McGreggor Range ACEC.

228 **Construction.** Several new facilities would be constructed on McGreggor Range in the Meyer
229 Range/FAW area and new Orogrande Range Complex, and a new Digital Air Ground Integration Range
230 (DAGIR) would be developed in the area of the old Short Range Air Defense System (SHORAD) Range
231 (Table 3.4-4).

232 At 96 km², the DAGIR would be the largest new range constructed on the Fort Bliss Training Complex.
233 It would consist of target arrays with service roads, range support buildings, parking area, range tower,
234 convoy live-fire route, urban centers, and an area for service rocket training. Most of the target arrays, the
235 convoy live fire route, and the urban facilities would be concentrated in a 9 km-by-6 km area within the
236 range. The DAGIR would support aerial target engagements with onboard weapons, aerial
237 reconnaissance, joint tactical engagements, door gunnery training, convoy operations, and training against
238 targets located in an urban environment. Urban village centers and adjacent rural areas would be

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

239 configured to permit simultaneous, integrated operations by aircrews and ground-based forces. It would
240 be used for both day and night training and may be used to fire rocket flares for night illumination.

241 McGregor Range Camp would be expanded to meet the needs of the additional brigades. New facilities
242 would include command and control, operational facilities, roads, parking, staging, ammunition storage,
243 communication lines, utilities, and vehicle and ammunition staging areas. About 22 miles of roads within
244 the Main Supply Route network and other roads in the training areas would be upgraded or constructed,
245 and control towers, assembly areas, latrines, and utilities would be provided.

246 **Table 3.4-4. McGregor Range Construction – Alternative 1**

<i>Proposed Facility</i>	<i>Location</i>	<i>Approximate Size</i>	<i>Purpose</i>
Convoy Live Fire Course/Entry Control Point	FAW 10 Area	300 m by 10 km	Train tactics, techniques, and procedures for organizing and protecting convoys, detecting and neutralizing improvised explosive devices, organizing and defending forward operating bases and forward arming and refueling points, and defending against mortar, rocket, and suicide bombs.
Combined Arms Collective Training Facility	Orogrande Range Complex	1.5 km by 1.5 km	Train and tests skills and unit cohesiveness necessary to conduct clearing, breaching, offensive and defensive operations in a small city and urban setting. Designed to conduct multi-echelon, full spectrum operations training up to battalion task force level. Supports blank fire, Multi-Integrated Laser Engagement System/Tactical Engagement System, Special Effects Small-Arms Marking System, situational training exercises, and field training exercises.
Digital Multi-Purpose Range Complex	Orogrande Range Complex	2.5 km by 8 km	Train and test armor, infantry, and aviation platoons on skills necessary to detect, identify, engage and defeat stationary and moving infantry and armor targets in a tactical array. Company Combined Arms Live Fire Exercises may also be conducted on this facility. Accommodates training with sub-caliber and/or laser training devices.
Urban Assault Course (2)	FAW 10 Area; Orogrande Range Complex	120 m by 150 m	Train individual soldiers, squads, and platoons on tasks necessary to operate within a built-up/urban area.
Digital Air Ground Integration Range	SHORAD	8 km by 12 km	Support air/ground integration training dictated by current operational environment and accomplish effective, relevant crew qualification. Attack helicopters and other air assets conduct hover engagements and diving attacks using HELLFIRE missiles, 2.75 inch rockets, and the 30 mm chain gun. Designed to train combined arms platoon and company size units to engage infantry and armor targets utilizing overhead aviation support.

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

<i>Proposed Facility</i>	<i>Location</i>	<i>Approximate Size</i>	<i>Purpose</i>
Zero M-16/Machine Gun Range	Orogrande Range Complex	25 m by 100 m	Train individual soldiers on skills necessary to align the sights and practice basic marksmanship against stationary targets and zeroing M16 and M4 rifles and crew-served machine guns.
Modified Record Fire (MRF) Range	Orogrande Range Complex	3 m by 320 m	Train and test individual soldiers on the skills necessary to identify, engage, and defeat stationary infantry targets for day/night qualification requirements with the M16 and M4 rifles.
Combat Pistol Qualification Course	Orogrande Range Complex	31 m by 120 m	Train and test soldiers on the skills necessary to detect, identify, engage, and defeat stationary targets in a tactical array using the 9 mm, .38 caliber, or .45 caliber pistols.
Hand Grenade Familiarization Range	Meyer Range	25 m by 50 m	Train and test individual soldiers in the employment of live fragmentation hand grenades.
Multi-Purpose Machine Gun Range	Orogrande Range Complex	8 m by 1 km	Train and test soldiers on the skills necessary to zero M249 SAW, M60 MG, M240B MG, and M2 MG weapon systems. Soldiers learn to detect, identify, engage, and defeat stationary infantry targets in a tactical array.
Upgrade Davis Dome Airstrip	Meyer Range/Davis Dome Area		Upgrade Davis Dome airstrip for unmanned aerial vehicle operations.

247

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

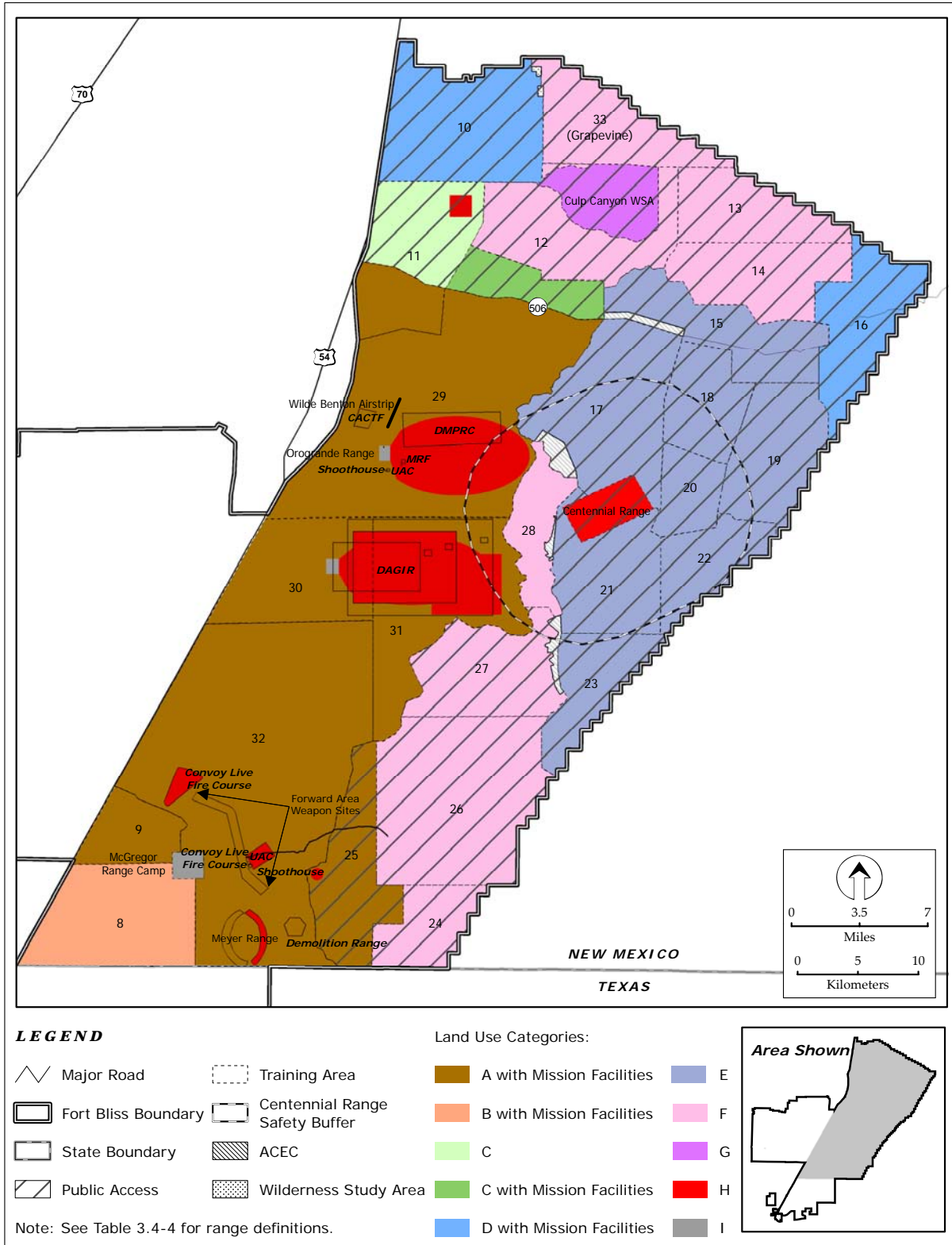


Figure 3.4-5. Training Area Land Use in McGregor Range – Alternative 1

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1 **3.5 ALTERNATIVE 2**

2 Alternative 2 would include the land use changes and associated construction and operations described for
3 No Action and Alternative 1 and further modify land use on McGregor Range to include the Off-Road
4 Vehicle Maneuver training category in TAs 10, 11, part of 12, and 29 north of Highway 506. This would
5 add approximately 280,000 acres (1,135 km²) of area designated for Off-Road Vehicle Maneuver to land
6 in the Fort Bliss Training Complex currently approved for that use, for a total of over 615,000 acres
7 (2,491 km²).

8 In addition, the analysis of this alternative considers the impacts associated with locating a second CAB at
9 Biggs AAF. Although there are currently no plans for moving a second CAB to Fort Bliss, there is
10 sufficient infrastructure and ramp space available along the Biggs AAF flightline to accommodate two
11 CABs.

12 **3.5.1 MAIN CANTONMENT AREA**

13 Alternative 2 would include the land use changes and construction described for the No Action
14 Alternative and Alternative 1. In addition, facilities would be constructed on Biggs AAF for a second
15 CAB. This is estimated to involve approximately 1,310,000 SF of additional facilities over and above
16 Alternative 1. The 5.1 million SF of pavement constructed for the first CAB would provide adequate
17 ramp space for the second CAB. Other supporting facilities, including community services and housing,
18 may also be developed.

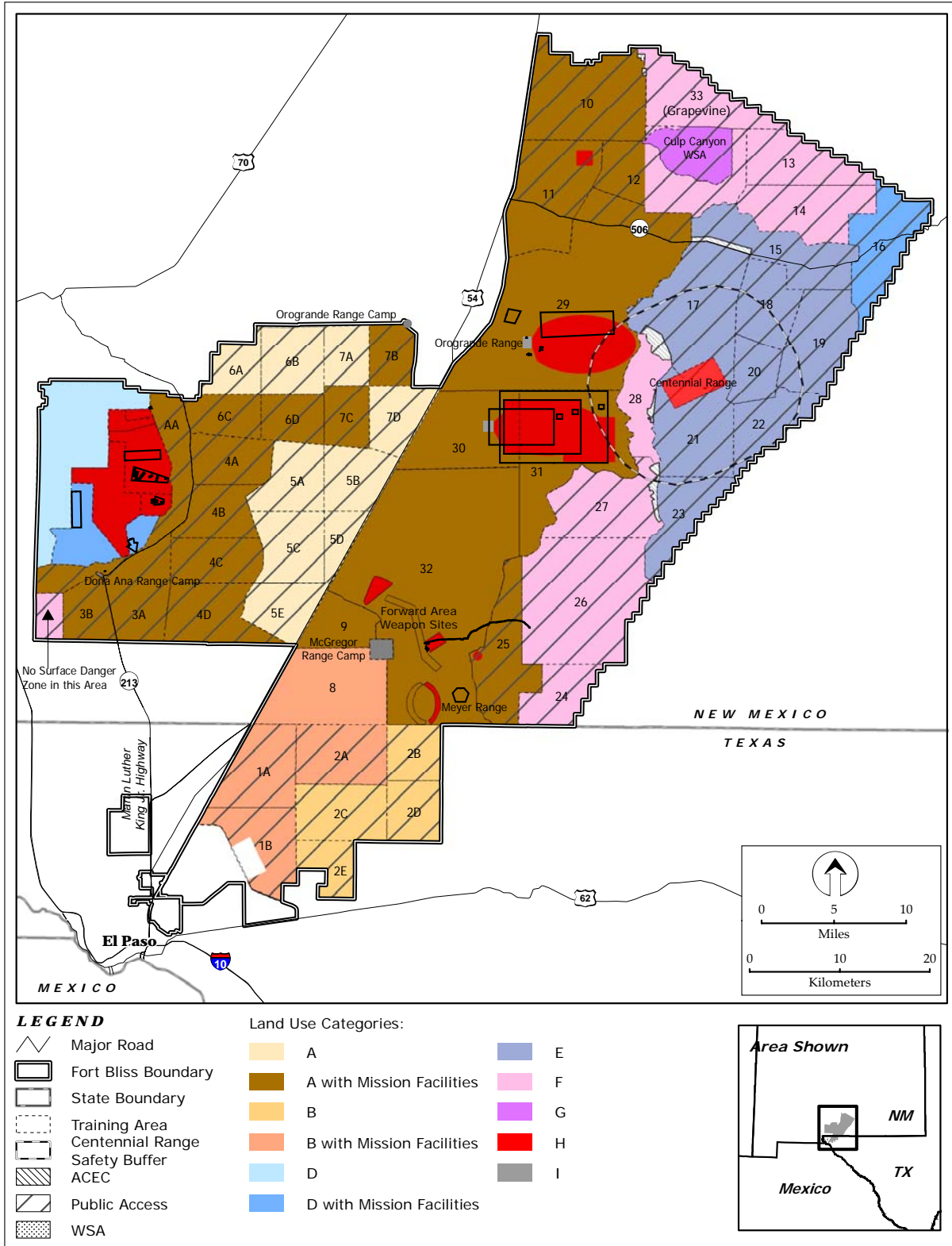
19 **3.5.2 FORT BLISS TRAINING COMPLEX**

20 **Figure 3.5-1** shows land use in the Fort Bliss Training Complex under Alternative 2. Land use in the
21 South Training Areas and Doña Ana Range-North Training Areas would be the same under Alternative 2
22 as under Alternative 1. The following changes would be made to the land use of the training areas on
23 McGregor Range:

- 24 • As under Alternative 1, TA 9 would be changed from land use category C with Mission Facilities
25 to land use category A with Mission Facilities. This would add the training category of Off-Road
26 Vehicle Maneuver to this training area.
- 27 • Land use in TA 10 would be changed from category D with Mission Facilities to category A with
28 Mission Facilities to add Off-Road Vehicle Maneuver.
- 29 • TAs 11, 29, 30, and 31 both south and north of Highway 506 would be changed from land use
30 category C or C with Mission Facilities to land use category A with Mission Facilities to add the
31 training categories of Off-Road Vehicle Maneuver, and in some cases Mission Support Facility,
32 to those training areas.
- 33 • Land Use in the western portion of TA 12 would change from category F to category A with
34 Mission Facilities, adding the training categories of Off-Road Vehicle Maneuver, Mission
35 Support Facility, and Weapons Firing to this area.
- 36 • As under Alternative 1, TAs 25 and 32 would be changed from land use category D or D with
37 Mission Facilities to A with Mission Facilities to add the training category of Off-Road Vehicle
38 Maneuver to those training areas, as well as Mission Support Facility in TA 25.

39 Enabling off-road vehicle maneuvers in the north Tularosa Basin portion of McGregor Range would
40 provide the capability to perform movement-to-contact, force-on-force training not otherwise available on
41 the Fort Bliss Training Complex, in addition to increasing maneuver capacity. With the addition of
42 approximately 1,135 km² of area designated for Off-Road Vehicle Maneuver on McGregor Range, total
43 off-road vehicle maneuver training capability would be increased to approximately 603,000 km²d.

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



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Figure 3.5-1. Fort Bliss Training Complex Land Use – Alternative 2

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

46 As noted for Alternative 1, most platoon- and company-level training would likely occur in the TAs
47 closest to the Main Cantonment Area, in the North and South Training Areas and TAs 8 and 9 of
48 McGregor Range.

49 Those areas would therefore be expected to experience somewhat heavier use than TAs 29, 30, 31, and
50 32. Maneuver and live-fire range training are frequently combined, so it can be expected that more of the
51 off-road vehicle maneuvers would be concentrated around and near the range complexes and range camps
52 than in more remote training areas.

53 Thus, the entire south Tularosa Basin portion of McGregor Range can be expected to experience
54 relatively constant use near McGregor Range Camp and the Orogrande Range Complex, compared to the
55 more remote TAs in the north Tularosa Basin portion of the range. As training demand increases,
56 however, utilization levels would also increase in the northern TAs.

57 **Table 3.5-1** presents the estimated level of use in various TAs under Alternative 2, considering both
58 currently defined requirements and full capability. The percent of use reflects the days in the year that the
59 TAs would be used out of a total of 365. Full military use assumes 242 training days per year, which is
60 66 percent of 365 days. These estimates are based on general expectations of training preferences.
61 Actual use would vary depending on numerous influences, such as demand from on-post and off-post
62 units, deployment schedules, competition from other uses such as missile firings and dismounted training,
63 changes in training doctrine, and other factors.

64 **Table 3.5-1. Estimated Training Area Use – Alternative 2**

<i>Grouping</i>	<i>Training Areas¹</i>	<i>Percent of Use²</i>	
		<i>Off-Road Vehicle Maneuver³</i>	<i>Other Uses⁴</i>
South Training Areas	1A, 1B, 2A, 2B, 2C, 2D, 2E	65-66%	5-20%
North Training Areas	3A, 3B, 4A, 4B, 4C, 4D, 5A, 5B, 5C, 5D, 5E, 6A, 6B, 6C, 6D, 7A, 7B, 7C, 7D, AA ⁵	65-66%	5-20%
TA 8	8	65-66%	5-20%
McGregor Range, South Tularosa Basin	9, 25, 30, 31, 32, 11 and 29 south of Highway 506	55-66%	10-30%
McGregor Range, North Tularosa Basin	10, 11 and 29 north of Highway 506, west half of 12	25-45%	20-30%
McGregor Range, Southeast TAs	24, 26, 27	0	45-66%
Remainder of McGregor Range	13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 28, 33, east half of 12	0	20-66% ⁶

1. See Figure 3.5-1.

2. Percent of days out of a total of 365. Does not account for concurrent, non-exclusive use of the training area.

3. Ranges from the training requirements of four Heavy BCTs, other BRAC units, and mobilization mission, up to standard full military use at 242 training days per year.

4. Other uses include Weapons Firing, Surface Impact, SDZ/Safety Footprint, On-Road Vehicle Maneuver, Controlled Access FTX, and Dismounted Training.

5. AA is the unnumbered Assembly Area.

6. Does not include Centennial Range, which is used on an intermittent basis.

65 Use of the training areas north of Highway 506 would require tanks and other military vehicles to cross
66 the highway. Sections of the highway would be hardened to support heavy tracked vehicles, and these
67 hardened sections would become crossing locations for military convoys. Highway 506 could be
68 temporarily closed to public through traffic at the crossing points during training exercises. Military

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

69 vehicles in a convoy move in “march units” of about 20-25 vehicles, with a gap of approximately 5
70 minutes between units. Therefore, the length of time that traveling on Highway 506 may be detained
71 would typically be 15 minutes or less before they would be cleared to pass during the gap between march
72 unit crossings. Soldiers would provide traffic control to ensure safety during any crossings of Highway
73 506. Fort Bliss would notify the Otero County Administrator of any closures of Highway 506.

74 The demand for vehicle maneuver training would leave about 42 days of the standard 242 days for large
75 missile firings and other uses. For comparison, large missile firings alone used 76 days in 2004.
76 Therefore, these other uses would have to be scheduled around the BCT training or outside the standard
77 242 days. Small missile firings would be less constrained because of the ability to limit the extent of the
78 SDZ to a portion of TA 32 and the southeast TAs.

79 It is reasonable to assume that conducting off-road vehicle maneuver training in the TAs north of
80 Highway 506 and in the vicinity of the new ranges in the Orogrande Range Complex, which are relatively
81 remote from the Main Cantonment Area, could create a need for additional support facilities in those
82 areas and at Orogrande Range Camp. Range camps provide temporary housing, maintenance,
83 operational, and command facilities for units training in the field and serve as staging areas for movement
84 to the training areas.

1 **3.6 ALTERNATIVE 3**

2 Alternative 3 would include the land use changes and associated construction and operations described for
3 the No Action Alternative and Alternative 1 and further modify land use on McGregor Range to include
4 the Off-Road Vehicle Maneuver training category in TAs 24, 26, and 27. These changes, including those
5 indicated for Alternative 1, would add approximately 287,000 acres (1,163 km²) of area designated for
6 Off-Road Vehicle Maneuver to land in the Fort Bliss Training Complex currently approved for that use,
7 for a total of over 622,000 acres (2,519 km²). In addition, land use in all TAs that include Off-Road
8 Vehicle Maneuver would be modified to also include Mission Support Facility, Weapons Firing, and
9 SDZ/Safety Footprint.

10 **3.6.1 MAIN CANTONMENT AREA**

11 In the Main Cantonment Area, Alternative 3 would include the land use changes and construction
12 described for the No Action Alternative and Alternatives 1 and 2, including development for a second
13 CAB at Biggs AAF and additional supporting facilities such as community services and housing.

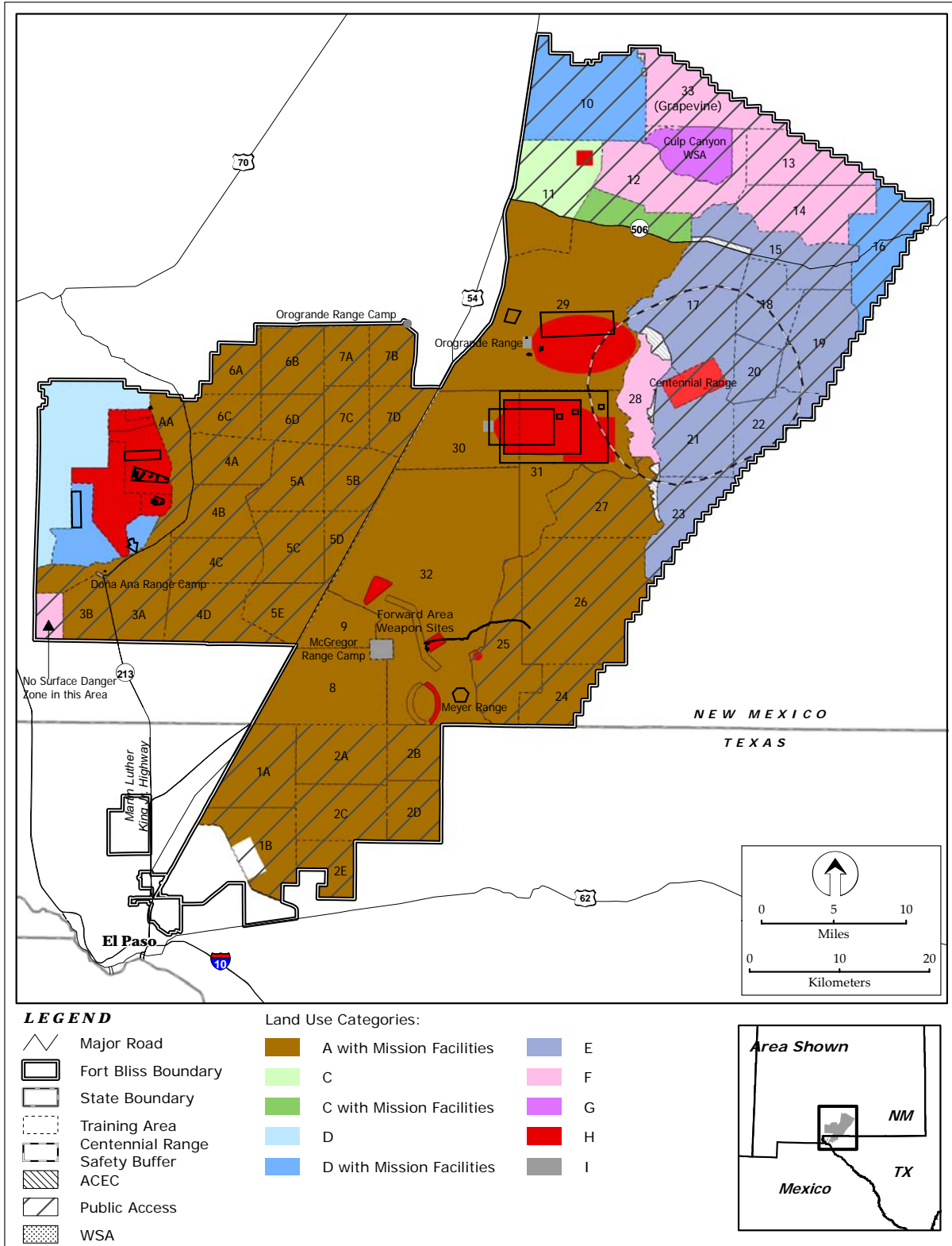
14 **3.6.2 FORT BLISS TRAINING COMPLEX**

15 **Figure 3.6-1** shows land use in the Fort Bliss Training Complex under Alternative 3. This alternative
16 includes the following land use changes:

- 17 • The land use of all TAs in the South Training Areas would be changed from categories B and B
18 with Mission Facilities to category A with Mission Facilities, adding the training categories of
19 Weapons Firing and SDZ/Safety Footprint, and in some cases Mission Support Facility, to those
20 TAs. Any firing ranges developed in the TAs would be located in accordance with safety criteria.
- 21 • The Mission Support Facility category would be also added to TAs 5A, 5B, 5C, 5D, 5E, 6A, 6B,
22 7A, and 7D in the North Training Areas.
- 23 • As under Alternatives 1 and 2, TA 9 would be changed from land use category C with Mission
24 Facilities to land use category A with Mission Facilities.
- 25 • As under Alternative 1, TAs 11 and 29 south of Highway 506, TA 30, and TA 31 would be
26 changed from land use category C or C with Mission Facilities to land use category A with
27 Mission Facilities.
- 28 • Also as under Alternative 1, TAs 25 and 32 would be changed from land use category D or D
29 with Mission Facilities to A with Mission Facilities.
- 30 • TAs 24, 26, and 27 would be changed from category F to category A with Mission Facilities.

31 Enabling off-road vehicle maneuver training in the southeast TAs would provide more varied training
32 opportunities than available in other parts of the Fort Bliss Training Complex, in addition to increasing
33 maneuver capacity. With the addition of approximately 1,163 km² of area designated for Off-Road
34 Vehicle Maneuver on McGregor Range, total off-road vehicle maneuver training capability would be
35 increased to approximately 610,000 km²d. As noted for Alternatives 1 and 2, most platoon- and
36 company-level training would likely occur in the TAs closest to the Main Cantonment Area, in the North
37 and South Training Areas and TAs 8 and 9 of McGregor Range. TAs 29, 30, 31, and 32 would also likely
38 receive relatively high use due to the proximity of McGregor Range Camp and the Orogrande Range
39 Complex. The more remote southeast training areas of McGregor Range (TAs 24, 26, and 27) would
40 likely receive less use, although as training demand increases, utilization levels would also increase in
41 those TAs.

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



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Figure 3.6-1. Fort Bliss Training Complex Land Use – Alternative 3

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

44 **Table 3.6-1** presents the range in level of use in various TAs under Alternative 3, considering both
 45 currently defined requirements and full capability. The percent of use reflects the days in the year that the
 46 TAs would be used out of a total of 365. Standard full military use assumes 242 training days per year,
 47 which is 66 percent of 365 days. As noted for Alternative 2, these estimates are based on general
 48 expectations of training preferences. Actual use would vary depending on numerous influences, such as
 49 demand from on-post and off-post units, deployment schedules, competition from other uses such as
 50 missile firings and dismounted training, changes in training doctrine, and other factors.

51 **Table 3.6-1. Estimated Training Area Use – Alternative 3**

<i>Grouping</i>	<i>Training Areas¹</i>	<i>Percent of Use²</i>	
		<i>Off-Road Vehicle Maneuver³</i>	<i>Other Uses⁴</i>
South Training Areas	1A, 1B, 2A, 2B, 2C, 2D, 2E	65-66%	5-20%
North Training Areas	3A, 3B, 4A, 4B, 4C, 4D, 5A, 5B, 5C, 5D, 5E, 6A, 6B, 6C, 6D, 7A, 7B, 7C, 7D, AA ⁵	65-66%	5-20%
TA 8	8	65-66%	5-20%
McGregor Range, South Tularosa Basin	9, 25, 30, 31, 32, 11 and 29 south of Highway 506	55-66%	10-30%
McGregor Range, North Tularosa Basin	10, 11 and 29 north of Highway 506, west half of 12	0	20-66%
McGregor Range, Southeast TAs	24, 26, 27	20-40%	35-45%
Remainder of McGregor Range	13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 28, 33, east half of 12	0	20-66% ⁶

1. See Figure 3.6-1.
2. Percent of days out of a total of 365. Does not account for concurrent, non-exclusive use of the training area.
3. Ranges from the training requirements of four Heavy BCTs, other BRAC units, and mobilization mission, up to standard full military use at 242 training days per year.
4. Other uses include Weapons Firing, Surface Impact, SDZ/Safety Footprint, On-Road Vehicle Maneuver, Controlled Access FTX, and Dismounted Training.
5. AA is the unnumbered Assembly Area.
6. Does not include Centennial Range, which is used on an intermittent basis.

52 The demand for vehicle maneuver training would leave about 42 days of the standard 242 days for missile
 53 firings and other uses. These other uses would have to be scheduled around the BCT training or outside
 54 the standard 242 days.

55 It is reasonable to assume that conducting off-road vehicle maneuver training in TAs 24, 26, and 27,
 56 which are relatively remote from the Main Cantonment Area, could create a need for additional support
 57 facilities at McGregor Range Camp.

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1 **3.7 ALTERNATIVE 4 – PROPOSED ACTION**

2 Alternative 4, the Proposed Action, would include all the land use changes of Alternatives 1, 2, and 3,
3 adding a total of approximately 352,000 acres (1,424 km²) designated for Off-Road Vehicle Maneuver to
4 land in the Fort Bliss Training Complex already approved for that use, for a total capability of almost
5 687,000 acres (2,780 km²). In addition, land use in all TAs that include Off-Road Vehicle Maneuver
6 would be modified to also include Mission Support Facility, Weapons Firing, and SDZ/Safety Footprint.

7 For this SEIS, the Proposed Action considers the possibility that two additional BCTs could be located at
8 Fort Bliss some time in the future. The Army does not currently have plans to station more units at Fort
9 Bliss other than those identified in Chapter 1, but the possibility of additional units coming to Fort Bliss is
10 a reasonably foreseeable consequence of providing the proposed increased training capability at the
11 installation. Therefore, the personnel, equipment, and facilities development associated with a total of six
12 BCTs have been incorporated in the analysis of the Proposed Action, assuming that two of the BCTs
13 would likely be deployed at any given time, and only four would be training at Fort Bliss. Training by
14 other units stationed at Fort Bliss and in support of the mobilization mission would also continue.

15 **3.7.1 MAIN CANTONMENT AREA**

16 Under Alternative 4, development in the Main Cantonment Area would include all facilities listed for the
17 No Action Alternative and Alternatives 1, 2, and 3. In addition, for analysis purposes, it is assumed that
18 the facilities and infrastructure associated with two additional BCTs would be developed some time in the
19 future beyond 2010, after the currently planned construction has been completed.

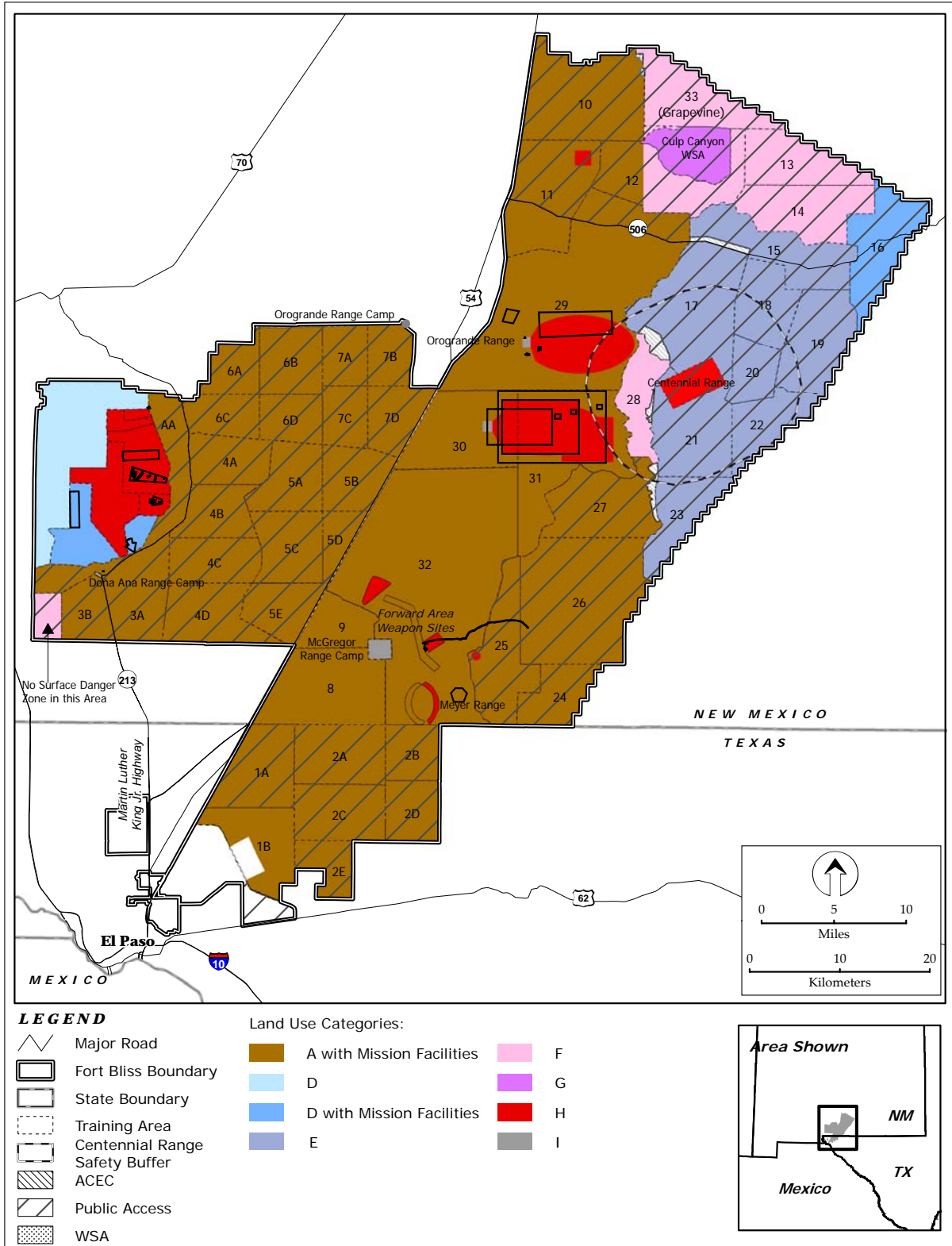
20 Because there are currently no plans for two additional BCTs at Fort Bliss, no specific projects have been
21 identified for this expansion. For analysis purposes, the additional future construction is assumed to be
22 east of Loop 375 and comparable to the development currently planned for each BCT. This would
23 involve an area of approximately 600 acres, 2.6 million SF of facilities, and 4 million SF of pavement.
24 Additional family housing and community support facilities might also be constructed, likely in the same
25 general area as the currently planned RCI development.

26 **3.7.2 FORT BLISS TRAINING COMPLEX**

27 Alternative 4 would include all the land use changes, range enhancements, and utilization projected for
28 Alternatives 1, 2, and 3. **Figure 3.7-1** presents land use in the Fort Bliss Training Complex for the
29 Proposed Action.

30 With the addition of a total of 1,424 km² of area designated for Off-Road Vehicle Maneuver on
31 McGregor Range to land already approved for that use, the Fort Bliss Training Complex would provide
32 the capability for almost 673,000 km²d, based on 242 training days per year. As noted for Alternative 1,
33 most platoon-level training would likely occur in the TAs closest to the Main Cantonment Area, in the
34 North and South Training Areas and TAs 8 and 9 of McGregor Range. TAs 29, 30, 31, and 32 can also
35 be expected to experience relatively constant use because of the proximity of McGregor Range Camp and
36 the Orogrande Range Complex. The more remote TAs in the north Tularosa Basin portion of the range
37 and in the southeast TAs would likely experience relatively less use, although as training demand
38 increases, utilization levels would also increase in those TAs. In particular, if two additional BCTs were
39 to be stationed at Fort Bliss, the need for off-road vehicle maneuver training could bring the use of all the
40 TAs approved for that training category closer to full capability.

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



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Figure 3.7-1. Fort Bliss Training Complex Land Use – Alternative 4 (Proposed Action)

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

43 **Table 3.7-1** presents the range in level of use in various TAs under Alternative 4, considering both
 44 currently defined requirements and full capability. The percent of use reflects the days in the year that the
 45 TAs would be used out of a total of 365. Standard full military use assumes 242 training days per year,
 46 which is 66 percent of 365 days. As noted for Alternatives 2 and 3, these estimates are based on general
 47 expectations of training preferences. Actual use would vary depending on numerous influences, such as
 48 demand from on-post and off-post units, deployment schedules, competition from other uses such as
 49 missile firings and dismounted training, changes in training doctrine, and other factors.

50 **Table 3.7-1. Estimated Training Area Use – Proposed Action**

<i>Grouping</i>	<i>Training Areas¹</i>	<i>Percent of Use²</i>	
		<i>Off-Road Vehicle Maneuver³</i>	<i>Other Uses⁴</i>
South Training Areas	1A, 1B, 2A, 2B, 2C, 2D, 2E	65-66%	5-20%
North Training Areas	3A, 3B, 4A, 4B, 4C, 4D, 5A, 5B, 5C, 5D, 5E, 6A, 6B, 6C, 6D, 7A, 7B, 7C, 7D, AA ⁵	65-66%	10-20%
TA 8	8	65-66%	10-20%
McGregor Range, South Tularosa Basin	9, 25, 30, 31, 32, 11 and 29 south of Highway 506	50-66%	15-30%
McGregor Range, North Tularosa Basin	10, 11 and 29 north of Highway 506, west half of 12	20-50%	25-45%
McGregor Range, Southeast TAs	24, 26, 27	20-50%	40-45%
Remainder of McGregor Range	13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 28, 33, east half of 12	0	25-66% ⁶

1. See Figure 3.7-1.
2. Percent of days out of a total of 365. Does not account for concurrent, non-exclusive use of the training area.
3. Ranges from the training requirements of four Heavy BCTs, other BRAC units, and mobilization mission, up to six Heavy BCTs or standard full military use at 242 training days per year.
4. Other uses include Weapons Firing, Surface Impact, SDZ/Safety Footprint, On-Road Vehicle Maneuver, Controlled Access FTX, and Dismounted Training.
5. AA is the unnumbered Assembly Area.
6. Does not include Centennial Range, which is used on an intermittent basis.

51 The off-road vehicle training demand of just the four Heavy BCTs, other BRAC units, and mobilization
 52 mission would leave about 60 days for large missile firings and other uses. In addition to providing
 53 additional off-road vehicle maneuver capability, capacity, and variety, the Proposed Action would
 54 maximize opportunities for both large and small missile firings and other uses.

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1 **3.8 ALTERNATIVES CONSIDERED BUT NOT CARRIED**
2 **FORWARD FOR FULL ANALYSIS**

3 This section briefly summarizes alternatives that were considered and eliminated from the scope and
4 decision-making of this document.

5 **3.8.1 OFF-ROAD VEHICLE MANEUVER ON OTERO MESA**

6 This alternative was eliminated from further consideration in this SEIS because of constraints posed by
7 the Centennial Range and potential impacts on public use of Otero Mesa, including grazing and
8 recreation. From a training perspective, Otero Mesa would not offer appreciably different terrain
9 conditions from the Tularosa Basin area of McGregor Range. The additional capability that would be
10 provided by opening the training areas in the Tularosa Basin portion of the range to off-road vehicle
11 maneuver would be adequate to meet current and currently foreseeable training requirements without also
12 expanding off-road vehicle maneuver training to Otero Mesa. Furthermore, during times that Centennial
13 Range is in use, the associated safety buffer would present a barrier to ground maneuvers and
14 substantially reduce the availability of some or all of TAs 17, 18, 19, 20, 21, 22, and 28.

15 **3.8.2 OFF-ROAD VEHICLE MANEUVER IN SACRAMENTO MOUNTAINS**

16 This alternative was eliminated from further consideration in this SEIS because of the terrain conditions
17 in the Sacramento Mountains. The slopes are generally too steep to support off-road vehicle maneuver
18 training by heavy tracked vehicles.

19 **3.8.3 OFF-ROAD VEHICLE MANEUVER ON OFF-POST LAND**

20 Use of off-post land for maneuver training, through acquisition, withdrawal, or other means, was not
21 considered reasonable, given the availability of land in the Fort Bliss Training Complex. In addition, the
22 time required to obtain access to sufficient off-post areas would not support the BRAC relocation
23 schedule of the Heavy BCTs and other units coming to Fort Bliss. Although meeting a large proportion
24 of the additional off-road vehicle maneuver training requirement through acquisition of additional land is
25 not considered reasonable, the Army continues to consider smaller land exchanges to improve the utility
26 and efficiency of the Fort Bliss Training Complex. For example, Fort Bliss is discussing a land exchange
27 in the South Training Areas to prevent encroachment and ensure that areas adjacent to maneuver training
28 are not developed with incompatible land uses.

29 **3.8.4 NO INCREASE IN MANEUVER CAPABILITY TO SUPPORT BRAC AND**
30 **IGPBS CHANGES**

31 The No Action Alternative analyzed in this SEIS does not include the stationing changes mandated by the
32 BRAC and IGPBS decisions that were not previously assessed under NEPA. It includes development and
33 training for one Heavy BCT because those actions have been previously assessed. An alternative that
34 would bring the four Heavy BCTs and other BRAC-mandated units to Fort Bliss without making any land
35 use changes to accommodate them was eliminated from consideration as unreasonable because it would
36 not be able to meet the minimum infrastructure or training requirements of those units. As described in
37 Section 1.3.5, Army training requirements for these units generate a need for approximately 528,000
38 km²d of off-road vehicle maneuver capability. The areas of Fort Bliss currently approved for off-road
39 vehicle maneuver in the South Training Areas, North Training Areas, and TA 8 provide a total of about
40 328,000 km²d of standard full military use (242 days per year). Even if they were scheduled 365 days per
41 year, the total capacity, less than 495,000 km²d, would fall short of the need. This alternative was
42 therefore determined to be unreasonable because it would not meet the Army's needs.

43 **3.8.5 CONDUCTING OFF-ROAD VEHICLE MANEUVERS AT WHITE SANDS**
44 **MISSILE RANGE**

45 This alternative is not considered reasonable. White Sands Missile Range (WSMR) has no area approved
46 for off-road vehicle maneuver training. The installation's priority mission is Research, Development,
47 Test, and Evaluation. Training of the magnitude and intensity needed to support units at Fort Bliss would
48 interfere with that mission.

3.9 COMPARISON OF ALTERNATIVES

Table 3.9-1 presents key attributes of the five alternatives in comparative form. The environmental consequences of the five alternatives are summarized in comparative form in **Table 3.9-2**.

Table 3.9-1. Key Attributes of the Alternatives

<i>Attribute</i>	<i>No Action Alternative</i>	<i>Alternative 1</i>	<i>Alternative 2</i>	<i>Alternative 3</i>	<i>Alternative 4 – Proposed Action</i>
Military personnel ¹	13,800	30,000	32,700	32,700	40,300
Total personnel ²	30,000	47,500	50,200	50,200	57,800
Military dependents	22,800	49,500	54,000	54,000	66,500
Primary additional equipment	900 wheeled and 360 tracked vehicles	3,900 wheeled and 1,640 tracked vehicles; 110 helicopters	4,460 wheeled and 1,640 tracked vehicles; 220 helicopters	4,460 wheeled and 1,640 tracked vehicles; 220 helicopters	6,260 wheeled and 2,360 tracked vehicles; 220 helicopters
Area of additional development in Main Cantonment Area	1,500 acres	4,000 acres	4,300 acres	4,300 acres	4,900 acres
Additional building construction in Main Cantonment Area	6.5 million SF	21.9 million SF	23.2 million SF	23.2 million SF	25.8 million SF
Area of disturbance for construction in Main Cantonment Area	1,000 acres	3,400 acres	3,700 acres	3,700 acres	4,300 acres
Additional impervious surface in Main Cantonment Area	330 acres	1,300 acres	1,450 acres	1,450 acres	1,600 acres
Additional Off-Road Vehicle Maneuver area	0	216,000 acres (875 km ²)	280,000 acres (1,135 km ²)	287,000 acres (1,163 km ²)	352,000 acres (1,424 km ²)
Total Off-Road Vehicle Maneuver area	335,000 acres (1,356 km ²)	551,000 acres (2,230 km ²)	615,000 acres (2,491 km ²)	622,000 acres (2,519 km ²)	687,000 acres (2,780 km ²)
Total Annual Off-Road Vehicle Maneuver training capability (military standard)	328,000 km ² days	540,000 km ² days	603,000 km ² days	610,000 km ² days	673,000 km ² days

Note: All numbers are approximate.

1. Active duty, permanent party U.S. military assigned to Fort Bliss.

2. includes non-U.S. military, civilian employees, students, and temporary duty personnel.

SF = Square foot; km² = square kilometers

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

6

Table 3.9-2. Summary Comparison of the Environmental Consequences of the Alternatives

<i>Resource</i>	<i>No Action</i>	<i>Alternative 1</i>	<i>Alternative 2</i>	<i>Alternative 3</i>	<i>Alternative 4 - Proposed Action</i>
Land Use	<p>No change in land use designations on Fort Bliss or in non-military use of training areas.</p> <p>Off-post areas adjacent to North and South Training Areas could be exposed to increased noise and dust.</p> <p>Development for one Heavy BCT will make Biggs AAF appear more urbanized.</p>	<p>Main Cantonment Area land use changed to mixed use designation. Major new development on about 4,000 acres of the Main Cantonment Area.</p> <p>Change in land use designation of south Tularosa Basin portion of McGregor Range and more visible development of ranges. Non-military uses not expected to be greatly affected.</p> <p>Additional personnel and related population increase would increase development in the City of El Paso. Open space would be converted to more urban use. Rural communities in El Paso and Doña Ana Counties likely to become more developed.</p>	<p>Main Cantonment Area effects similar to Alternative 1.</p> <p>Development for a second CAB consistent with existing land use and visual character of Biggs AAF.</p> <p>Off-road vehicle maneuvers on McGregor Range north of Highway 506 would affect visual character of landscape and, depending on level of use, may eventually affect productivity of the land to support grazing.</p>	<p>Main Cantonment Area effects same as Alternatives 1 and 2.</p> <p>Off-road vehicle maneuvers in southeast training areas of McGregor Range would affect visual character of landscape.</p>	<p>Same as Alternatives 1, 2, and 3 combined. In addition, Main Cantonment Area could become more developed, and population growth associated with the potential stationing of two additional BCTs could further increase development and urbanization of surrounding off-post communities.</p>
Main Cantonment Area Infrastructure	<p>Increased traffic in vicinity of Main Cantonment Area not expected to significantly affect level of service on roadways.</p> <p>Utilities and energy demand well within the capacity of service providers.</p>	<p>Increased traffic in vicinity of Main Cantonment Area would reduce level of service on some roadways, but only one segment of U.S. Highway (US) 54 would degrade to unacceptable level by 2021.</p> <p>Population increase would represent 20 percent of EPWU's demand for potable water. Additional wastewater generation by increased population in combination with baseline population growth in El Paso estimated to exceed existing treatment capacity by approximately 7 percent. If new on-post landfill is constructed, solid waste generation</p>	<p>Same as Alternative 1 with marginal increase in traffic and utilities and energy demand associated with second CAB. Roadway level of service would decline to unacceptable level on two additional roadway segments by 2021.</p> <p>Population increase would represent 22 percent of EPWU's demand for potable water. Increased wastewater generation</p>	<p>Same as Alternative 2.</p>	<p>Same as Alternatives 1, 2, and 3. Level of service on another segment of US 54 would decline to unacceptable level. Population increase would represent 28 percent of EPWU's demand for potable water. Increased wastewater generation in El Paso estimated to exceed existing capacity by approximately 13 percent. Additional</p>

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

<i>Resource</i>	<i>No Action</i>	<i>Alternative 1</i>	<i>Alternative 2</i>	<i>Alternative 3</i>	<i>Alternative 4 - Proposed Action</i>
		from new family housing and increased off-post population is estimated to shorten life of Clint Landfill by about 1.4 years. If new on-post landfill is not constructed, increase in solid waste is estimated to shorten life of Clint Landfill by about 1.7 years.	in El Paso estimated to exceed existing treatment capacity by approximately 8 percent. Increased solid waste generation estimated to shorten life of Clint Landfill by about 1.6 years if new on-post landfill is constructed and 1.9 years if new on-post landfill is not constructed. Increased capacity needed in natural gas feeders to Main Cantonment Area.		population increase estimated to reduce the life of the Clint Landfill by about 2.2 years if new on-post landfill is constructed and 2.6 years if new on-post landfill is not constructed.
Training Area Infrastructure	Wastewater treatment facilities at Doña Ana and McGregor Range Camps require expansion and upgrading, including lining, to increase capacity. Size of four culverts at Orogrande Range Camp needs to be increased.	Same improvements needed as No Action Alternative. Military convoys to Doña Ana Range-North Training Areas would reduce level of service on Martin Luther King, Jr. Boulevard/New Mexico Highway 213. Military convoy traffic on US 54 not expected to affect level of service. More frequent solid waste collection and delivery of liquefied petroleum gas needed due to increased use of range camps.	Same as Alternative 1. Highway 506 would be occasionally and temporarily closed for military vehicle crossings; delays expected to last 15 minutes or less. Orogrande pipeline in north McGregor Range would need to be protected from damage by heavy tracked vehicles.	Same as Alternative 1.	Same as Alternative 2.

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

<i>Resource</i>	<i>No Action</i>	<i>Alternative 1</i>	<i>Alternative 2</i>	<i>Alternative 3</i>	<i>Alternative 4 - Proposed Action</i>
Airspace Use and Management	No impact.	Increase in helicopter and unmanned aerial vehicle operations not expected to affect airspace use or management.	Same as Alternative 1. Additional helicopter operations not expected to affect airspace use or management.	Same as Alternative 2.	Same as Alternative 2.
Earth Resource	Minor, temporary increase in soil erosion potential from construction in Main Cantonment Area. Off-road vehicle maneuvers not expected to change soil conditions significantly in North and South Training Areas and TA 8.	Temporary increase in soil erosion from construction in Main Cantonment Area. Significant increase in wind erosion potential in south Tularosa Basin portion of McGregor Range from range construction and off-road vehicle maneuvers. Heavily used areas would be vulnerable to down-wind soil transport. Down-wind vegetation could become covered, leading to further desertification. Vegetation cover in less heavily used areas likely to become patchy.	Same as Alternative 1, with extension of off-road vehicle maneuvers, and resulting increase in soil erosion, into training areas north of Highway 506.	Same as Alternative 1, with extension of off-road vehicle maneuvers, and resulting increase in soil erosion, into TAs 24, 26, and 27 on McGregor Range, which are also susceptible to moderate to severe water erosion.	Same as Alternatives 1, 2, and 3 combined.
Air Quality	Emissions from construction, vehicle combustion, and training not expected to significantly affect air quality.	Higher emissions from construction, vehicle combustion, and training operations than No Action Alternative; resulting air pollutant concentrations not expected to exceed National Ambient Air Quality Standards. Increase in off-road vehicle maneuvers would result in increased fugitive dust generation. Particulate levels at installation boundary would be well below air quality standards.	Similar to Alternative 1 with slight increase in emissions.	Similar to Alternative 2.	Similar to Alternative 1, 2, and 3 with increased emissions and fugitive dust associated with additional BCTs and associated off-road vehicle maneuver training.

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

<i>Resource</i>	<i>No Action</i>	<i>Alternative 1</i>	<i>Alternative 2</i>	<i>Alternative 3</i>	<i>Alternative 4 - Proposed Action</i>
Water Resources	Additional water demand within existing planned capacity of water purveyors.	Increase in demand for potable water in combination with baseline population growth in El Paso area estimated to consume 97 percent of EPWU's available resources by 2015. Potential short-term increase in pumpage of groundwater from the Hueco Bolson to meet need while EPWU plans for alternative sources are put in place. Tularosa Basin not expected to be adversely affected.	Increase in demand for potable water in combination with baseline population growth in El Paso area estimated to consume 99 percent of EPWU's available resources by 2015.	Same as Alternative 2.	Increase in demand for potable water in combination with baseline population growth in El Paso area estimated to exceed EPWU's available resources by 3 percent, requiring acceleration of EPWU plans to obtain additional supplies.
Biological Resources	No significant impacts expected. Some loss of breeding bird habitat in Main Cantonment Area.	Construction in Main Cantonment Area would reduce breeding bird habitat and likely to affect nests and displace birds. Off-road vehicle maneuvers in south Tularosa Basin portion of McGregor Range would have moderate impact on vegetation and wildlife. Areas affected are dominated by mesquite coppice dunes and other shrubland vegetation communities, which are common on Fort Bliss. Vegetation cover likely to become more patchy with herbaceous species, which could lead to less wildlife density. A small portion of the affected area susceptible to additional coppice dune formation. Impacts on sensitive species not anticipated to jeopardize regional populations.	Similar to Alternative 1 with impacts extended to eastern portion of Main Cantonment Area and areas north of Highway 506.	Same as Alternative 1 for Main Cantonment Area, North and South Training Areas, and south Tularosa Basin portion of McGregor Range. Habitat in southeast training areas of McGregor Range (TAs 24, 26, and 27) dominated by grasslands with higher species richness. Intensive off-road vehicle maneuver training could ultimately change vegetative cover and ecological state of those TAs. Sensitive species not expected to be significantly affected.	Same as Alternatives 1, 2, and 3 combined.

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

<i>Resource</i>	<i>No Action</i>	<i>Alternative 1</i>	<i>Alternative 2</i>	<i>Alternative 3</i>	<i>Alternative 4 - Proposed Action</i>
Cultural Resources	Significant impacts reduced or mitigated in accordance with Programmatic Agreement and ICRMP.	Significant impacts reduced or mitigated in accordance with Programmatic Agreement and ICRMP. Some loss of archaeological resources in training areas likely but would be managed as provided for in the Programmatic Agreement. Increased risk of uncovering previously unknown cultural resources during construction.	Same as Alternative 1 with potential for loss of archaeological resources in the north Tularosa Basin portion of McGregor Range.	Same as Alternative 1 with potential for loss of archaeological resources in southeast training areas of McGregor Range.	Same as Alternatives 1, 2 and 3 combined.
Noise	Increase in noise from large caliber weapons firing at Doña Ana Range and southern end of McGregor Range.	Expansion of noise contours associated with large caliber weapons firing at Doña Ana Range and McGregor Range, including new Orogrande Range Complex. No significant impact from increased helicopter operations at Biggs AAF. Additional noise from helicopters crossing US 54 from Orogrande Range Camp to McGregor Range. Off-road vehicle maneuvers would generate elevated noise levels near maneuver areas during use. Elevated noise from military vehicle convoys could extend out approximately 2,000 feet from roadways.	Same as Alternative 1.	Same as Alternative 1.	Further expansion of noise contours associated with large caliber weapons firing at Doña Ana and McGregor Ranges.

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

<i>Resource</i>	<i>No Action</i>	<i>Alternative 1</i>	<i>Alternative 2</i>	<i>Alternative 3</i>	<i>Alternative 4 - Proposed Action</i>
Safety	Negligible increase in chance of Class A mishap.	Minor increase in chance of Class A mishap. Slight potential increased risk of wildfires not significant due to low fuel load in the Tularosa Basin and prevention, detection, and response procedures in Range SOP.	Same as Alternative 1 with slight increased risk of Class A mishaps with second CAB.	Same as Alternatives 1 and 2. Higher risk of wildfires in grasslands of the southeast training areas.	Same as Alternatives 1, 2, and 3. Additional increase in chance of Class A mishap but probability still low. Risk of wildfires highest in southeast training areas.
Hazardous Materials and Items of Special Interest	Minor increase in hazardous waste generation and risk of release of hazardous materials or waste.	Additional increase of hazardous waste generation and risk of release of hazardous materials or waste manageable through existing procedures.	Same as Alternative 1 with slightly higher generation of hazardous waste with second CAB.	Same as Alternative 2.	Same as Alternative 1 with somewhat higher generation of hazardous waste with second CAB and two additional BCTs.
Socioeconomics	Minor increase in population, economic activity, and demand for housing and community services.	Significant increase in population growth in El Paso County. Annual population growth rate estimated to increase from less than 3 percent to more than 4 percent over next five years. Significant beneficial impact on economic activity and tax revenues in the City of El Paso and El Paso County. Short-term significant increase in military construction may create a risk of “boom-bust” effects. Demand for additional housing may out pace ability of local market to respond, resulting in increased housing prices. El Paso school districts, law enforcement and fire protection, and medical services would require	Same as Alternative 1 with potential for additional socioeconomic effects from construction and population increase with second CAB. Additional population could further stress housing market and community services.	Same as Alternative 2.	In addition to impacts described for Alternative 2, potential for extended socioeconomic effects from construction and population increase with two additional BCTs. Additional military construction could reduce or defer risk of “bust” effect. Additional population growth could further stress housing market and community services.

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

<i>Resource</i>	<i>No Action</i>	<i>Alternative 1</i>	<i>Alternative 2</i>	<i>Alternative 3</i>	<i>Alternative 4 - Proposed Action</i>
		substantial personnel increases and new facilities in some cases. Medical service impacts especially significant due to already existing shortfalls in the community. Quality of life in El Paso would be affected by increased urbanization and probable cost of living increases.			
Environmental Justice	No disproportionately high and adverse impacts on minority or low-income populations expected.	Noise from large caliber weapons firing at Doña Ana Range would affect the community of Chaparral, which has a higher percent of low-income population than the average for the region of influence.	Same as Alternative 1	Same as Alternative 1.	Additional areas in Doña Ana, El Paso, and Otero Counties with higher than average low-income population would be affected by large caliber weapons firing at Doña Ana and McGregor Ranges.

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4.0 AFFECTED ENVIRONMENT

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This chapter describes the existing environment of Fort Bliss and the surrounding area in the region of influence (ROI) to form a baseline for analysis of the environmental effects from the alternatives described in Chapter 3. The information is provided in 14 sections addressing the following resources: Land Use, Main Cantonment Area Infrastructure, Training Area Infrastructure, Airspace Use and Management, Earth Resources, Air Quality, Water Resources, Biological Resources, Cultural Resources, Noise, Safety, Hazardous Materials and Items of Special Concern, Socioeconomics, and Environmental Justice.

The ROI varies among resources and defines the geographic extent of potential impacts from the alternatives on the important elements of that resource. Each section in this chapter delineates its ROI and identifies the topics and resources addressed by that section. Relevant information in the Mission and Master Plan PEIS is incorporated by reference and not repeated. In this SEIS, each section focuses on information that is pertinent to the proposed land use changes and on updating conditions that have changed since the Mission and Master Plan PEIS was prepared. In general, the updates provide data from the 2004/2005 timeframe or represent the most recent data available. Recent activities that have been reviewed through the NEPA process, such as relocation of the 4th BCT, 1st CAV to Fort Bliss, are included in the No Action Alternative as part of the baseline for comparison with the action alternatives in Chapter 5. For areas that have not changed since the PEIS, such as geographic setting and climate, the descriptions in the PEIS remain current and are not repeated.

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4.1 LAND USE

This section summarizes the existing land use on Fort Bliss and areas surrounding the installation. It also summarizes the compatibility between Fort Bliss and neighboring areas. The Mission and Master Plan PEIS and TADC (Ref# 3, 174) describe the size, location, and use of the Fort Bliss Main Cantonment Area, ranges, and training areas during the period between 1990 and 1996. These are valid for historic perspective for the installation. The adoption of the RPMP and TADC laid the framework for land use and activities since 2000. The nature of land use on Fort Bliss has not changed substantially since that time. This section focuses on differences in current land use and trends that may be important considerations in the future.

The ROI for land use includes the installation and areas adjacent to Fort Bliss boundaries in El Paso County, Texas, and Doña Ana and Otero Counties, New Mexico. The basic real estate components of Fort Bliss remain the same as described in the Mission and Master Plan PEIS. The Main Cantonment Area, with the heaviest concentration of facilities and mission support activities, is located in El Paso County. Training areas and ranges are located to the north and east of the Main Cantonment Area, extending into Doña Ana and Otero Counties, New Mexico.

The principal segments of the Fort Bliss Training Complex include the South Training Areas in El Paso County, Texas, immediately adjacent to the Main Cantonment Area, and the Doña Ana Range–North Training Areas and McGregor Range, located in south-central New Mexico. Castner Range, a previously used training and weapons firing area, also in El Paso County, is no longer in use. Acreages for these different geographic components are provided in **Table 4.1-1**. Some of these vary slightly from the 2000 PEIS and the BLM’s recent Resource Management Plan Amendment for McGregor Range due to minor administrative boundary changes and updated GIS mapping data.

Table 4.1-1. Fort Bliss Installation Components

<i>Component</i>	<i>Acres</i>
Main Cantonment Area (including Biggs AAF)	15,194
Doña Ana Range–North Training Areas	297,006
McGregor Range	697,472
South Training Areas	99,813
Castner Range	7,040
Castner Recreation Area	14
<i>Total</i>	1,116,539

Source: Ref# 3

The following subsections describe installation land use in the Main Cantonment Area and Fort Bliss Training Complex, land use in surrounding areas of Texas and New Mexico that may be affected by the Proposed Action and other alternatives, and the visual characteristics of the installation.

4.1.1 Fort Bliss Existing Land Use

4.1.1.1 Main Cantonment Area

The current Long Range Component of the RPMP describes the layout of land uses in the Main Cantonment Area using the Army’s standard land use categories (see Figure 3.3-1). These include: airfield, maintenance, service/industrial, supply/storage, administration, training/ranges, troop housing, family housing, community facilities, medical, outdoor recreation, and open space.

Overall land use on the Main Cantonment Area has remained fairly consistent over the last decade. Construction and demolition has resulted in replacement and improvement in facilities. These have provided greater efficiency, comfort, safety, and security for mission and support operations. One of the primary areas of redevelopment has been military family housing. Many substandard units have been

37 demolished to provide sites for new housing. Some of those sites are still vacant and available for
38 redevelopment under the ongoing Residential Community Initiative.

39 **Main Post.** Many large warehouse buildings on the Main Post have been renovated in order to meet
40 mission functions. The Main Post is currently adding new housing along Jeb Stuart Road in previously
41 open space.

42 **Biggs Army Airfield.** A new rail terminal facility has been constructed to the northwest of the runway
43 area. Aero Vista housing has been demolished and is being replaced and expanded.

44 **Logan Heights.** Logan Heights, separated from the Main Post by US 54 and the Southern Pacific
45 railroad, is primarily used for family housing and community facilities and recreation. Most of the troop
46 housing on the west side of Dyer Street has been demolished. The north end of this area has new family
47 housing. The eastern portion of Logan Heights has two golf courses and family housing. Many of the
48 housing units are being renovated or replaced to meet Army standards.

49 **William Beaumont Army Medical Center.** WBAMC provides a full-range of medical services to
50 military personnel, retirees, and dependents. The easternmost parcel has been developed with family
51 housing. About 92 acres is being planned for Enhanced Use Leasing, to include some demolition,
52 preservation of some historic buildings, and development of housing and commercial uses.

53 **Castner Range.** This 7,040-acre parcel continues to be largely unused. A new Border Patrol facility is
54 being constructed and is functioning on a small parcel located off Hondo Pass Drive. Previous use for
55 extensive military training resulted in accumulation of unexploded ordnance (UXO) throughout most of
56 the range. Currently, the Army has no plans for future use or disposition of this parcel.

57 **4.1.1.2 Fort Bliss Training Complex**

58 The Fort Bliss Training Complex supports a variety of activities, some requiring a large land and airspace
59 arena such as missile and rocket firing, aircraft operations, and aerial gunnery training. Other activities
60 take place at smaller sites and ranges that are equipped or set aside for specific activities such as training
61 in use of weapons and firearms, mortar and artillery, demolition, and urban tactics. Activities performed
62 in the training areas include soldiers on foot (dismounted training), vehicles traveling on roads, and
63 vehicles maneuvering off road.

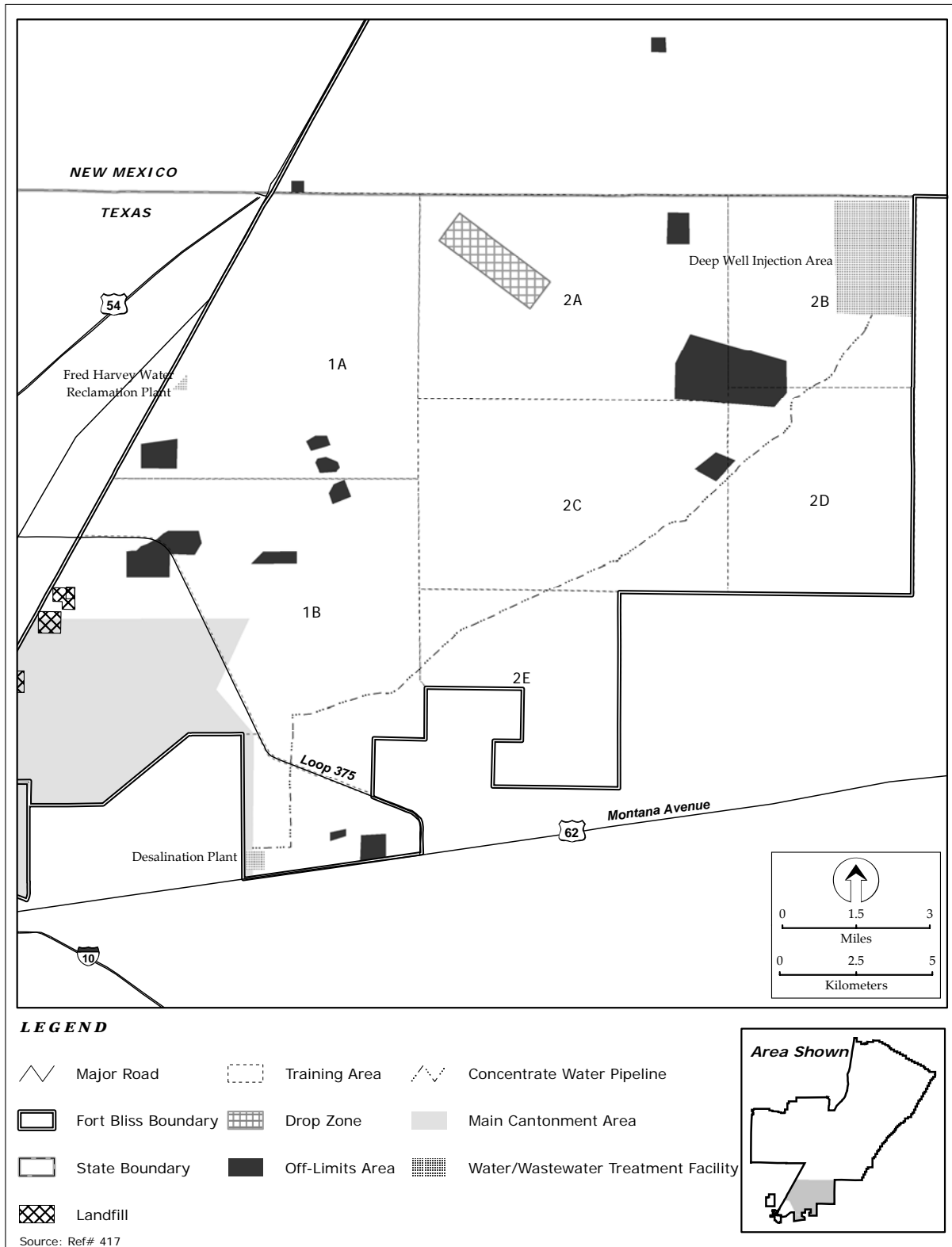
64 Military and non-military facilities and areas within each segment of the Fort Bliss Training Complex are
65 described in the following sections and shown on **Figures 4.1-1, 4.1-2, and 4.1-3**. Current military land
66 use is discussed in more detail in Section 3.1 and shown on Figure 3.1-2.

67 Non-military land uses of the Fort Bliss Training Complex include public recreation and hunting in some
68 areas, grazing on some portions of McGregor Range, and infrastructure development on easements and
69 rights-of way (ROW). **Figure 4.1-4** shows areas on the installation that are open to public access and for
70 hunting.

71 **South Training Areas**

72 **Military Land Use.** The South Training Areas continue to be used primarily for tracked vehicle
73 maneuvers. Being adjacent to the Main Cantonment Area, this part of the Fort Bliss Training Complex is
74 easily accessible and convenient for training units. The South Training Areas support weapons firing in
75 TA 2D and a drop zone in TA 2A.

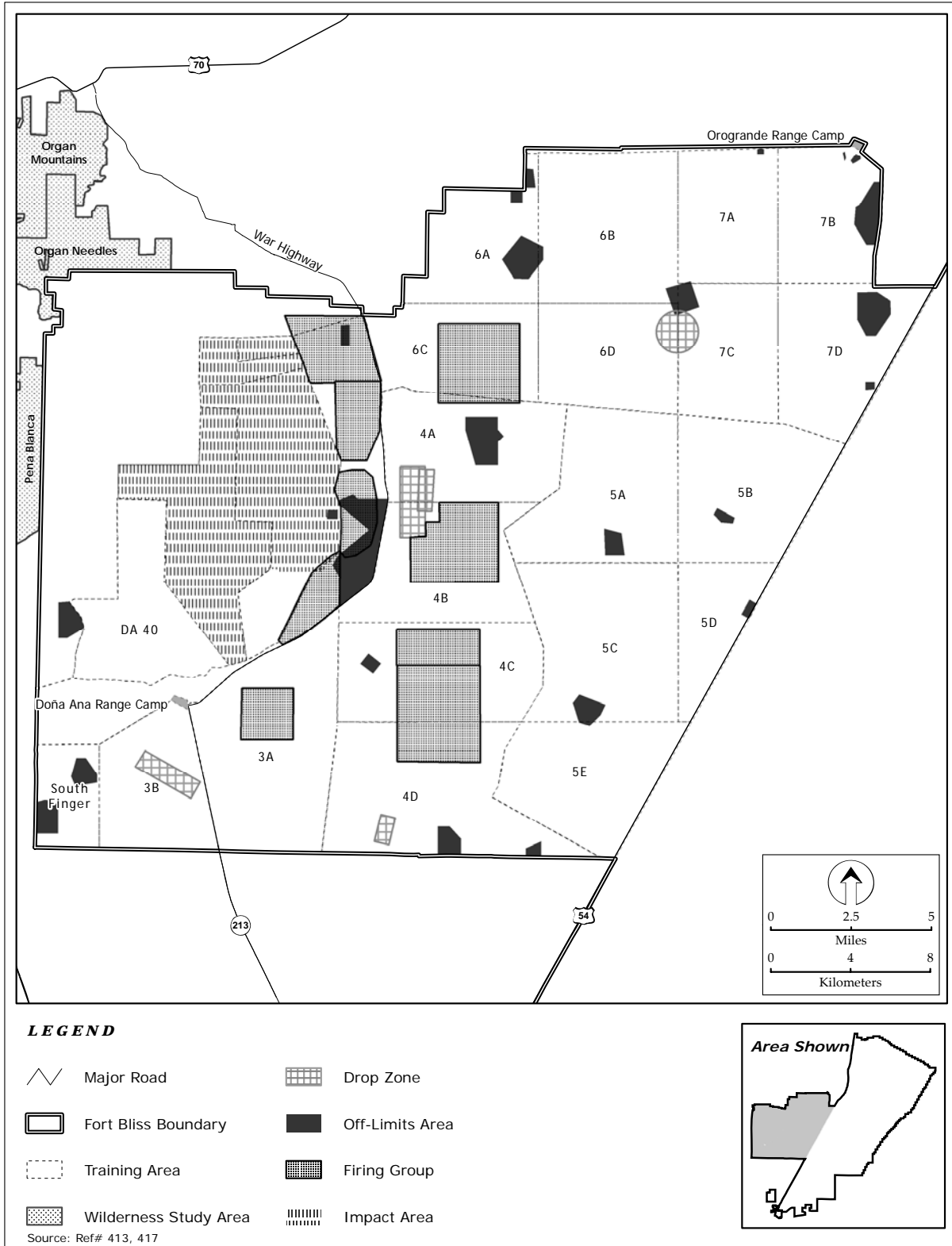
**Fort Bliss Mission and Master Plan Supplemental Programmatic Environmental Impact Statement
Final SEIS**



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Figure 4.1-1. Land Use and Mission Facilities in the South Training Areas

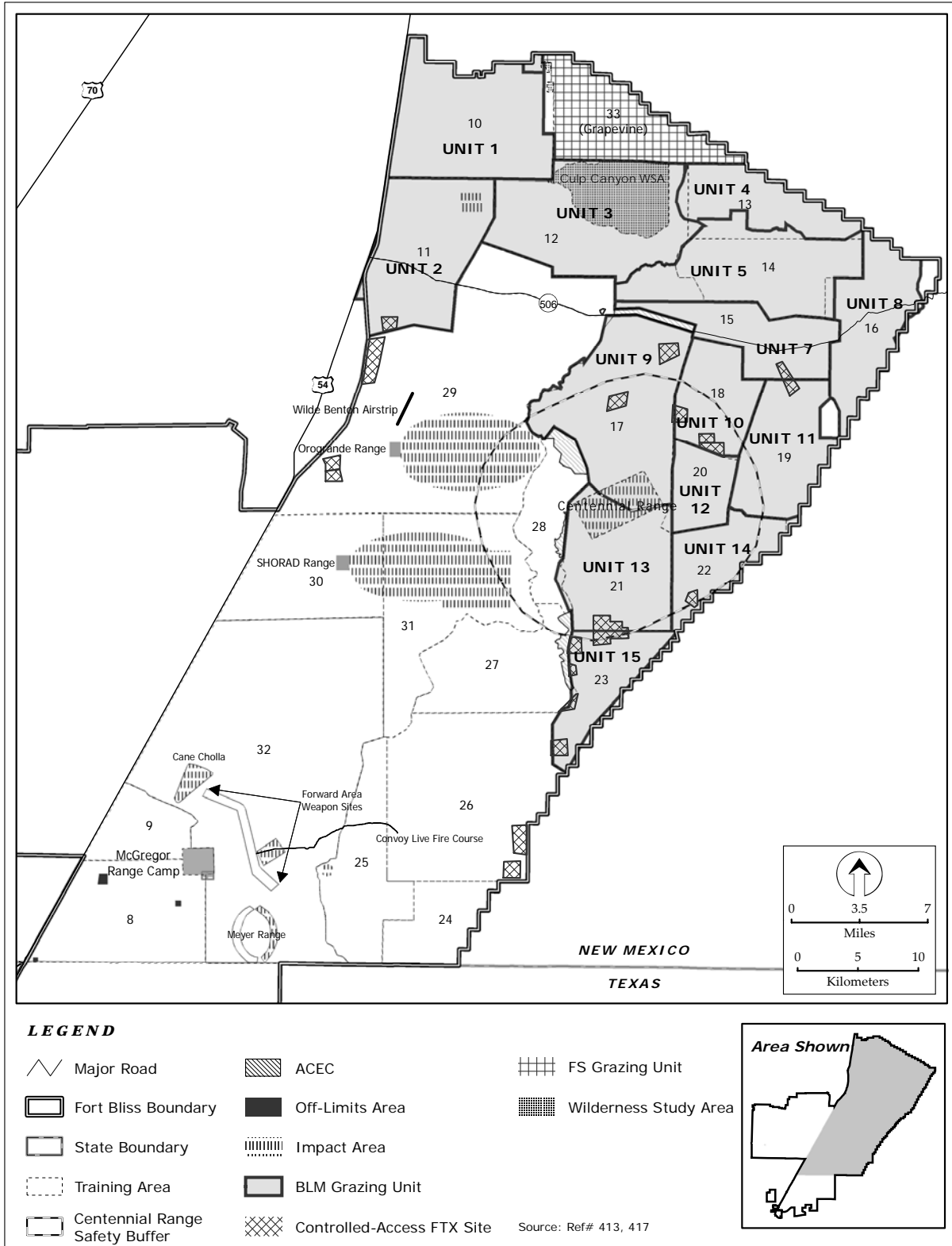
**Fort Bliss Mission and Master Plan Supplemental Programmatic Environmental Impact Statement
Final SEIS**



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Figure 4.1-2. Land Use and Mission Facilities on Doña Ana Range-North Training Areas

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



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Figure 4.1-3. Land Use and Mission Facilities on McGregor Range

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

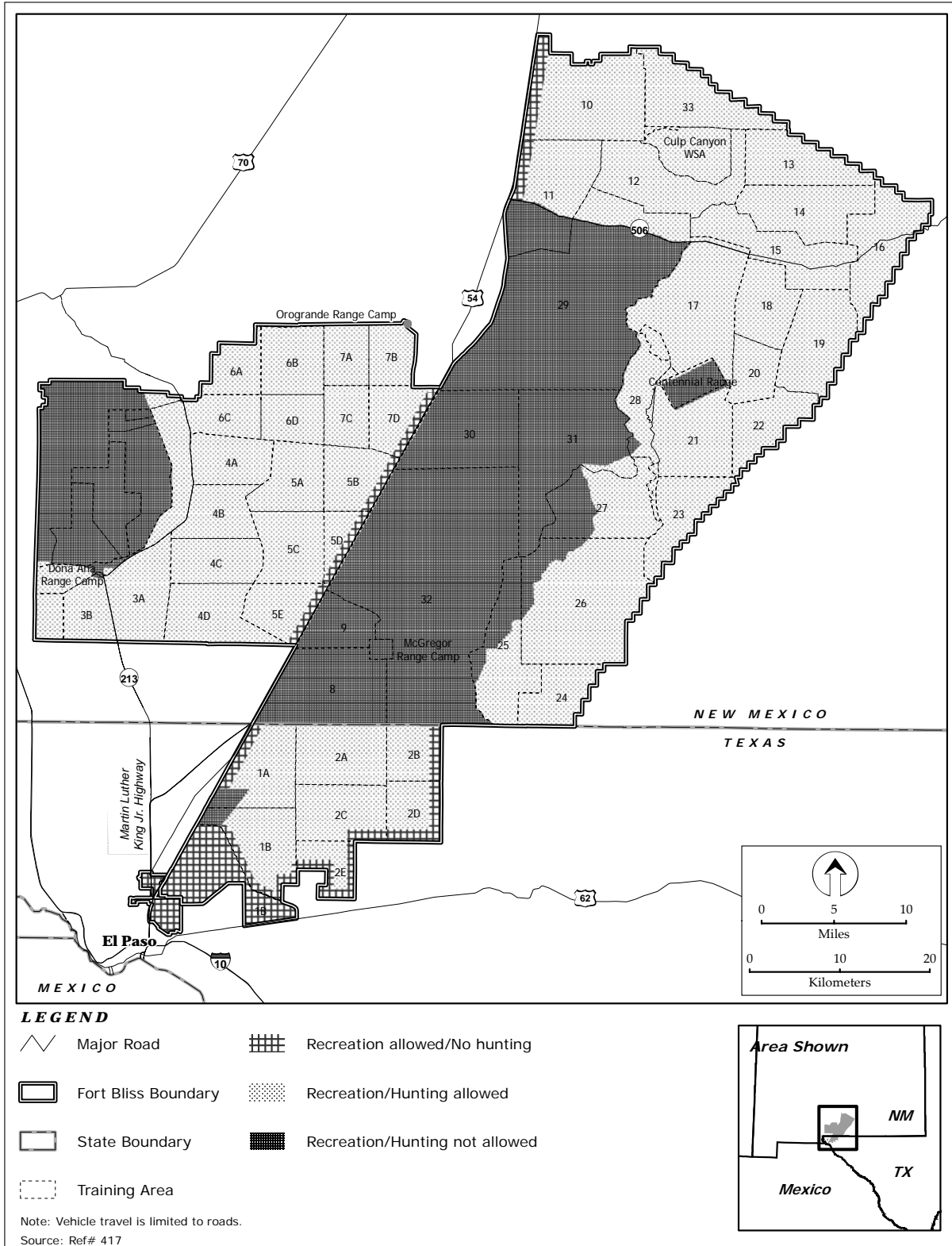


Figure 4.1-4. Public Access Areas on Fort Bliss

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84 **Non-Military Land Use.** The primary non-military land use in the South Training Areas is a new
85 brackish-water desalination plant and water wells being constructed and operated by the El Paso Water
86 Utilities in TA 1B, associated deep-well injection area in the far northeast corner of TA 2B, and
87 connecting pipeline across TAs 2C, 2D, and 2E (Ref# 222). Some public recreational use occurs in the
88 South Training Areas due to the proximity and accessibility to residential areas of El Paso. Three gas
89 pipelines traverse the South Training Areas.

90 **Doña Ana Range-North Training Areas**

91 **Military Land Use.** Figure 4.1-2 shows the military uses of the Doña Ana Range-North Training Areas.
92 War Highway divides the Doña Ana Range from the North Training Areas. A series of weapons firing
93 ranges are located on the west side of War Highway. There have been upgrades to existing live fire
94 ranges on Doña Ana Range, providing expanded capability for soldier training. The impact area is
95 located in the foothills of the Organ Mountains. DA 40 supports aerial operations and weapons firing.
96 Helicopter operations tend to concentrate in the southwest part of the range, around DA 40, the Stewart
97 drop zone, and Doña Ana Range Camp. The North Training Areas, on the east side of War Highway,
98 continue to be used primarily for tracked vehicle maneuvering. Drop zones and firing areas are located in
99 the western part of the North Training Areas.

100 **Non-Military Land Use.** Seven utility easements cross portions of the Doña Ana Range-North
101 Training Areas, including six above-ground electric lines and two underground gas pipelines. War
102 Highway (NM 213) is a public access road that serves as the primary link between El Paso and White
103 Sands Missile Range. Limited recreation occurs in the North Training Areas, primarily for bird hunting.
104 Level of use by the public is low and only permitted when the training areas are not being used for
105 military activities.

106 Adjacent to Doña Ana Range, on BLM land in the Organ Mountains, are three Wilderness Study Areas:
107 Peña Blanco to the west and Organ Mountains and Organ Needles to the northwest.

108 **McGregor Range**

109 **Military Land Use.** McGregor Range continues to be comanaged by the Army and BLM. Figure 4.1-3
110 shows military facilities and uses on McGregor Range. It is used for a variety of missile testing and
111 training programs and large-scale field training exercises. TA 32 has a series of missile firing sites, a
112 helicopter gunnery range at Cane Cholla, a series of small arms ranges at Meyer Range, missile firing
113 areas at Forward Area Weapon sites, and Convoy Live Fire Courses at FAW 10 and 20. TAs 29, 30, and
114 31 contain the Orogrande and SHORAD ranges and impact areas and Wilde Benton, a 2-mile long dirt
115 airstrip. Only TA 8 in the southwest of McGregor Range is currently used for off-road vehicle
116 maneuvers. Several smaller controlled-access FTX sites have been designated adjacent to existing
117 roadways where vehicles and equipment can set up and personnel can bivouac.

118 The primary change in military use on McGregor Range over the last five years has been the construction
119 and use of the Centennial Range on Otero Mesa. This U.S. Air Force facility occupies about 5,200 acres
120 and is used for air-to-ground target training.

121 **Non-Military Land Use.** Non-military uses have been allowed on McGregor Range to the extent they
122 do not conflict with military uses or pose safety risks to the public. The primary non-military land uses
123 on McGregor Range are grazing and recreation, including hunting.

124 BLM has recently completed an updated RMPA and EIS for McGregor Range. The following paragraphs
125 provide an updated status of non-military uses presented in the plan (Ref# 21):

- 126 • BLM continues to manage public road access and ROWs. Highway 506 provides access to the
127 southeastern portion of Otero County and to Dell City, Texas, as well as to a few communities in
128 the south part of the Sacramento Mountains. It functions as an emergency egress for residents in

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

129 the area (see Section 4.3.3.1). Smaller range roads provide the only ingress to some grazing
 130 allotments in the north part of McGregor on U.S. Forest Service land and in the Culp Canyon
 131 WSA. The amended plan includes two ROW corridors, one along the western boundary of
 132 McGregor Range parallel to US 54, and one following the existing power transmission ROW.
 133 These corridors would be used to consolidate future utility and ROW requirements.

- 134 • The RMPA redefines areas where watershed management and habitat management plans will be
 135 prepared.
- 136 • Grazing continues in up to 14 active grazing units (see Figure 4.1-3). The number of units
 137 available for grazing, season of use, and livestock use on each grazing unit varies each year
 138 depending on ecological conditions. Reduced grazing levels in some allotments on McGregor
 139 Range in recent years, as shown in **Table 4.1-2**, reflect drought conditions and low flows from
 140 the Sacramento Mountains and Carrizo Springs. In the early 1990s, about 12 units were grazed,
 141 and only six were grazed in 2001. Drought further reduced gazing levels in 2002. There has
 142 been a 22 percent reduction in the number of animal unit months contracted each year.

Table 4.1-2. Animal Unit Months (AUMs) for Grazing Units on McGregor Range

<i>Grazing Unit</i>	<i>Animal Unit Months Contracted</i>						
	<i>1996</i>	<i>1997</i>	<i>1998</i>	<i>1999</i>	<i>2000</i>	<i>2001</i>	<i>2002</i>
1	1,802	1,802	2,252	1,782	1,808	0	1,126
2	1,351	1,802	0	1,336	1,356	0	0
3	0	0	1,802	0	1,821	0	0
4	2,240	3,000	3,000	1,801	1,801	0	0
5	3,000	3,000	3,000	1,801	1,801	0	0
7	2,624	2,999	2,999	2,962	2,962	2,962	0
8	1,798	1,798	2,252	2,252	2,281	2,281	0
9	2,702	2,702	2,702	2,702	1,622	1,622	0
10	2,252	2,252	1,801	1,801	2,030	2,031	1,126
11	1,801	1,801	1,801	1,801	1,801	0	0
12	721	901	720	722	722	722	0
13	1,790	1,790	2,252	2,702	2,781	0	1,295
14	1,351	1,351	1,351	1,351,	1,582	1,582	0
15	901	901	901	901	901	0	0

Source: Ref# 3, 239

- 144 • Since its construction, the new Centennial Range reduced the available grazing land by 5,200
 145 acres (in units 13 and 9). The associated surface danger zone generally excludes public access to
 146 areas within the SDZ south of Highway 506 on weekdays. BLM’s range manager and crew
 147 coordinate with McGregor Range Control to maintain adequate access opportunities to perform
 148 their grazing management tasks. Although there has been a reduction in permitted AUMs in
 149 grazing units 13 and 9, given the variation in levels since 2000, it is difficult to determine whether
 150 this reflects changes due to Centennial Range. Records indicate an increase in the bid value for
 151 grazing in the units on Otero Mesa.
- 152 • BLM continues to be responsible for livestock infrastructure, including fences, corrals, and water
 153 improvements.
- 154 • The RMPA does not alter conditions for energy and mineral production. In general, commercial
 155 production is not allowed, but salable minerals may be used by the Army, the state, or the county
 156 for local projects on Fort Bliss or roadways. There is no oil and gas development on McGregor
 157 Range. BLM will not permit any commercial-scale solar or wind projects on McGregor Range
 158 due to the potential to conflict with military use.

159 There has been no change in recreational use on the range. Public access is allowed in the joint-use areas
160 (see Figure 4.1-4) when not scheduled for conflicting military uses. In general, Otero Mesa is accessible
161 on weekends. Members of the public must acquire a recreational access permit from the Army or BLM
162 on an annual basis. The New Mexico Department of Game and Fish (NMDGF) manages antelope and
163 deer hunts on McGregor Range in the joint-use areas. The number and type of hunts are dependent on
164 game populations. In recent years (2001-2003), deer hunts have been cancelled (Ref# 273). Camping is
165 permitted year-round when there is no conflict with the military mission. Off-highway vehicle use by the
166 public is limited to existing roads and trails on McGregor Range. Fort Bliss is working with NMDGF to
167 schedule deer hunts for the 2007-2008 license year.

168 The RMPA identifies the need to develop a joint transportation and access plan with the Army to manage
169 road construction and management. Also, the need was identified for a Public Recreation map that shows
170 roads, trails, features of interest, and off-limits or hazardous areas such as impact areas and areas with
171 UXO contamination.

172 **4.1.2 Land Use in Surrounding Areas**

173 The Mission and Master Plan PEIS provides an overview of areas surrounding Fort Bliss. This section
174 focuses on major changes in land use in the ROI since the PEIS and/or areas of ongoing concern or that
175 were raised in scoping for the SEIS.

176 The region surrounding Fort Bliss includes federal lands managed by various agencies, state land, and
177 private land (**Figure 4.1-5**). Most of the surrounding region in Texas is private land, with some state-
178 owned land in Franklin Mountains State Park. DoD land includes WSMR north of the Doña Ana Range–
179 North Training Areas. McGregor Range is largely surrounded by public lands administered by the BLM,
180 U.S. Forest Service (USFS), National Park Service (NPS), U.S. Fish and Wildlife Service (USFWS), and
181 State of New Mexico. Figure 4.1-5 shows special status areas in the region, including White Sands
182 National Monument and San Andres National Wildlife Refuge.

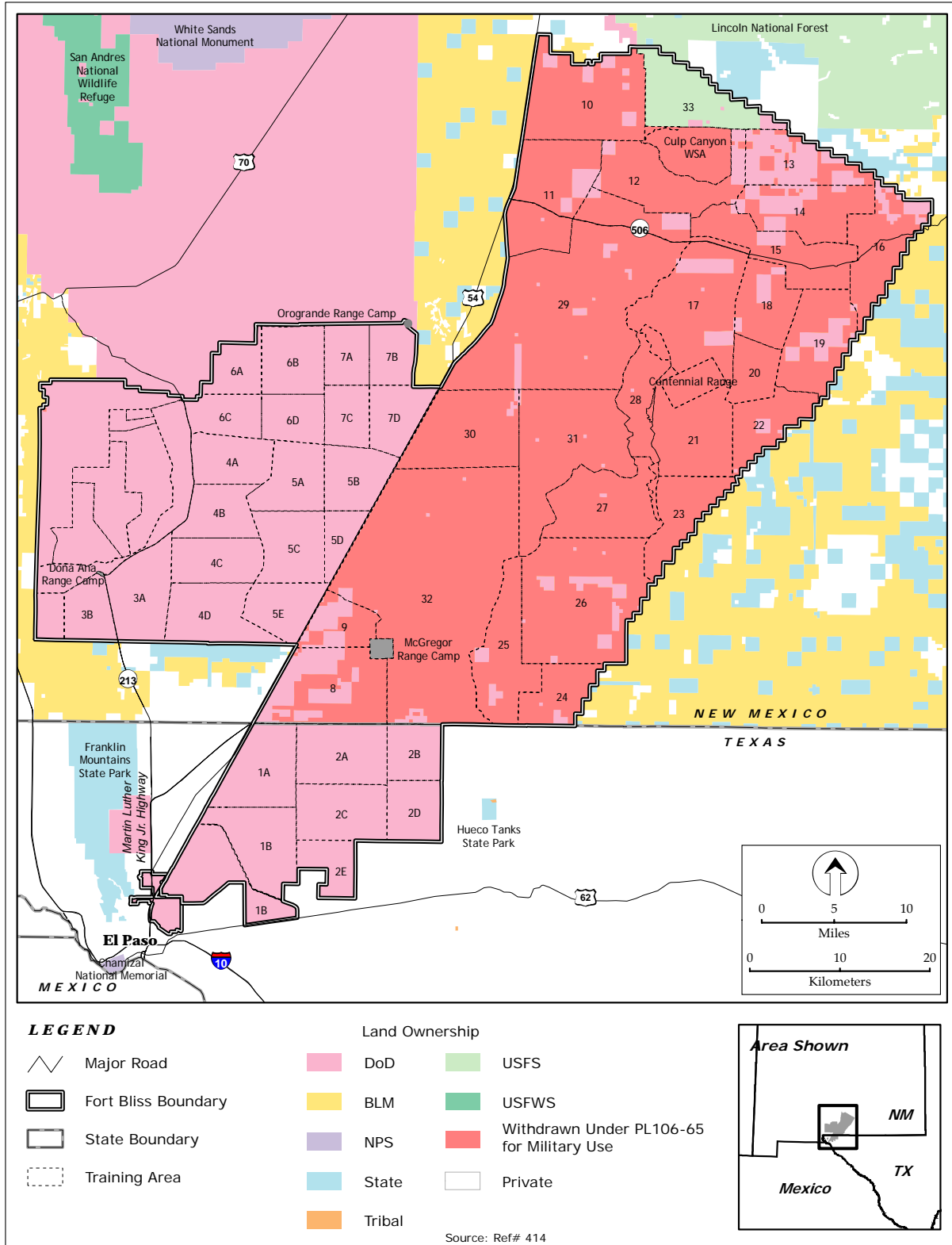
183 **4.1.2.1 Texas**

184 The population in the City and County of El Paso has grown steadily but not dramatically over the last ten
185 to 15 years. The Plan for El Paso Year 2025 guides long-range land use and infrastructure planning. For
186 planning purposes, the City is subdivided into five planning areas (**Figure 4.1-6**): the northwest,
187 northeast, central, east, and lower valley. The central and lower valley areas declined in population
188 between 1990 and 2000, while population in the northwest increased by 28 percent, in the northeast by 7
189 percent, and in the east by 39 percent. It is expected that population growth in the northwest will slow
190 down when development fills up to the New Mexico border. The east and northeast areas are still
191 considered prime areas for new development into the future. Particularly, the northeast area of El Paso,
192 located between Fort Bliss and the Franklin Mountains, has some residential and commercial use, but it is
193 largely undeveloped at this time.

194 Two major initiatives are underway that could set the stage for rapid planned development in the
195 northeast area: the master planning for 16,000 acres of public service board property and the development
196 of the Northeast Parkway. The master planned community includes residential areas for up to 62,000 new
197 dwelling units (ranging from low to high density); commercial and industrial corridors and nodes; mixed
198 use with retail, community facilities (including schools), and parks; and natural buffer zone along the
199 mountain edges (Ref# 114).

200 The Northeast Parkway will link Loop 375 to I-10 around the north end of the Franklin Mountains to
201 Anthony, New Mexico. The plan proposes to extend this route farther west to an outer belt (High Mesa
202 Road) that will connect into Mexico, around the perimeter of the Ciudad de Juárez (Ref# 77, 114).

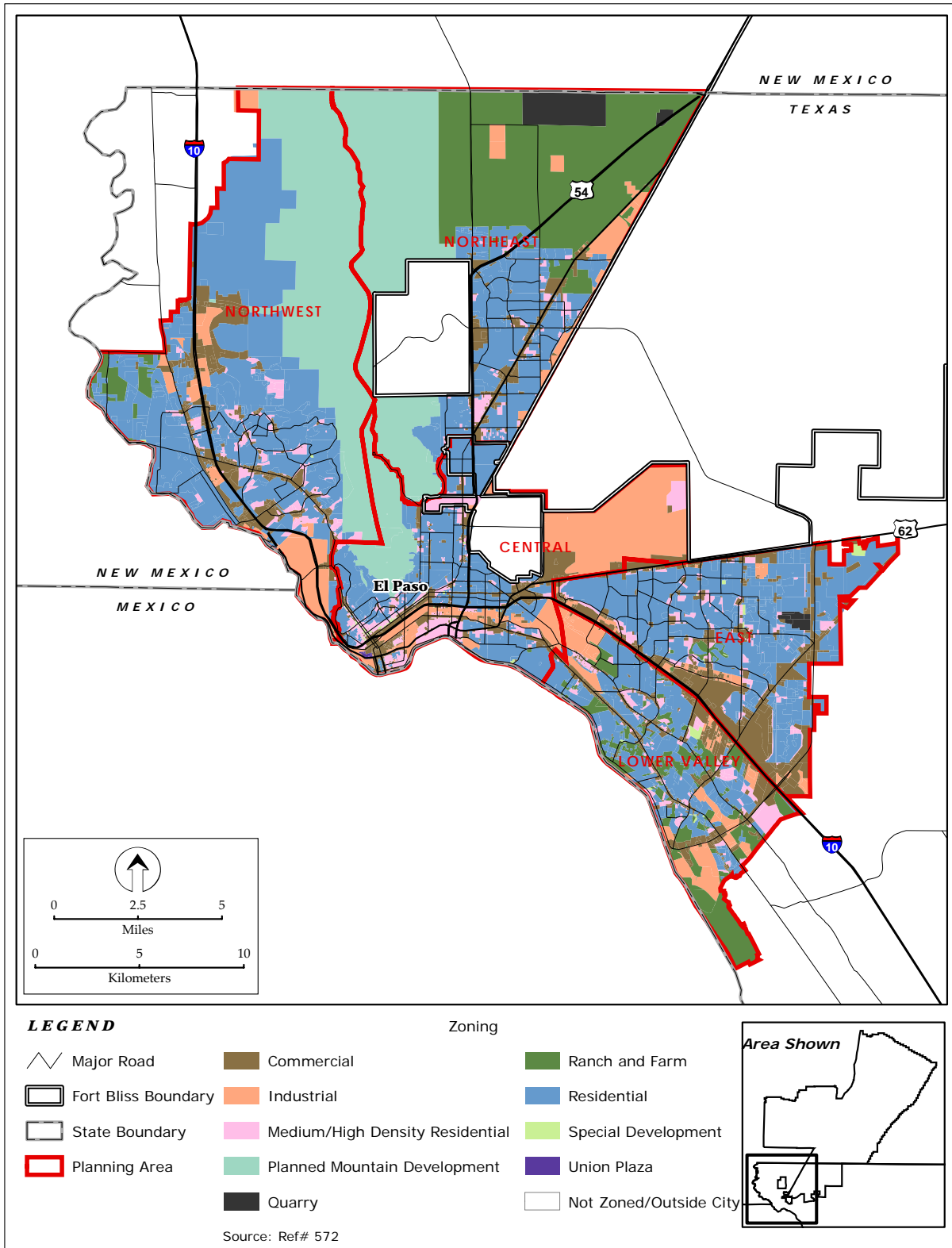
**Fort Bliss Mission and Master Plan Supplemental Programmatic Environmental Impact Statement
Final SEIS**



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Figure 4.1-5. Land Ownership in the ROI

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



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Figure 4.1-6. Zoning in the City of El Paso

207 Land use immediately surrounding the boundaries of the Main Cantonment Area has not changed
208 significantly over the last decade. Within the City of El Paso, these areas have been developed for a long
209 time and offer little space for new development. One of two areas where there has been some change
210 includes the strip of land along the west side of the South Training Areas, currently zoned for ranches and
211 agriculture. There has been some residential infill and some industrial-type development along the
212 railroad and US 54 corridor. The other area that has changed is to the east where new residential
213 development has grown with a resulting increase in the number of people commuting from this side of the
214 city (Ref# 299). Residential development is extending into unincorporated areas, including areas with
215 limited infrastructure.

216 **4.1.2.2 New Mexico**

217 **Doña Ana County**

218 Doña Ana County has been experiencing rapid growth, particularly around Las Cruces, Sunland Park,
219 Anthony, and Santa Teresa. This growth is largely influenced by economic and commercial activity
220 related to El Paso and border economics, the presence of New Mexico State University, and agriculture
221 (Ref# 425).

222 Doña Ana County prepared an Extraterritorial Zone (ETZ) Comprehensive Plan 2000-2020 to provide a
223 land use framework for almost 343 square miles. Most of this land (65 percent) is owned by the State of
224 New Mexico and BLM. Private land in the valley is predominantly agricultural with urban/developed
225 land located around the City of Las Cruces, the Town of Mesilla, and the Village of Doña Ana.

226 The community of Chaparral, located in the panhandle area between the Doña Ana Range and the El Paso
227 County border, is mostly within New Mexico, although some development is spilling over into El Paso
228 County and most residents work in El Paso. The community (a census-defined place) includes about 39
229 square miles with about 2,150 homes. About half of the community lies within Doña Ana County and
230 half within Otero County. Its population was 6,117 in 2000. Residents voted down incorporation in
231 January 2006. Some residential properties are immediately adjacent to the southern boundary of the Doña
232 Ana Range and North Training Areas. A similar situation exists on the southwest edge of the Doña Ana
233 Range where private development is occurring close to the boundary.

234 To the west of the Doña Ana Range, the western slopes of the Organ Mountains are popular for recreation
235 and serve as a buffer for residential development on the outskirts of Las Cruces, the largest city in Doña
236 Ana County.

237 **Otero County**

238 Overall, land use in Otero County has not changed over the last decade. The City of Alamogordo and
239 other communities have experienced some growth and new development, and highway projects,
240 specifically the widening of US 54 between El Paso and Alamogordo, have improved the connection
241 between the urban areas. The Otero County Comprehensive Plan was drafted in 1998. It is primarily a
242 statement of goals reflecting desired outcomes for the future. Military activities at Holloman Air Force
243 Base, WSMR, and Fort Bliss provide a long-standing presence in the county. Grazing and ranching are a
244 predominant use of private, state, and federal land holdings in the county.

245 Over the past six years, on average, 132,816 AUMs have been permitted annually in the county and the
246 average number billed (i.e., used) has been 87,314 AUMs (Ref# 554). Key concerns of residents in rural
247 areas surrounding McGregor Range include continued use and access of public lands for grazing and
248 recreation. Access to remote communities (such as Timberon and Piñon) is also a primary concern.
249 During scoping for this SEIS, residents expressed concern that adequate emergency service and fire
250 protection be maintained. Currently, these services use alternative routes coming from Alamogordo
251 through Cloudcroft along US 82, State Route 24, and county and forest roads.

252 Otero County anticipates growth in the Chaparral area, half of which is in Otero County and half in Doña
253 Ana County, and has initiated a process to develop a Community Economic Action Plan to address the
254 community's infrastructure needs. Because of overlapping jurisdiction with Doña Ana County, meeting
255 the community's future needs will be managed and coordinated to provide maximum return on county
256 investments. The growth is viewed as having a positive impact on Otero County, which has been
257 historically dominated by and reliant on the economy of Alamogordo (Ref# 405).

258 **4.1.3 Visual Resources**

259 Visual resources include the natural and man-made physical features that give a particular landscape its
260 character and value. Features that contribute to the overall impression a viewer receives of an area
261 include landform, vegetation, water, color, adjacent scenery, scarcity, and man-made (cultural)
262 modifications (Ref# 422, 423, 424).

263 Fort Bliss is located in arid plains of western Texas and southern New Mexico. The installation presents
264 two major settings. The first is the Main Cantonment Area within urban/suburban areas of the City of El
265 Paso and adjacent communities. The second is comprised of the extensive open training areas. These
266 areas are visible when traveling along roadways within Fort Bliss and surrounding areas and from
267 overlooks at higher elevations. The Fort Bliss Training Complex is surrounded mostly by undeveloped
268 areas. The following sections describe the visual environment for these two components of the
269 installation, including overall appearance and visual elements, management goals and guidelines, and
270 visual resource value.

271 **4.1.3.1 Main Cantonment Area and Surroundings**

272 As described in the Mission and Master Plan PEIS, Fort Bliss has developed over time in response to
273 mission and on-post population demands. As a result, it is a composite of open areas that are used for
274 troop training and staging and developed areas with differing visual characteristics and qualities. Fort
275 Bliss continues to use the Installation Design Guide (IDG) in the master planning process (AR 210-20) to
276 guide physical development in the Main Cantonment Area to help maintain consistent style and materials
277 to reflect functions, and to address site planning issues such as access, parking, landscaping, signage, and
278 the visual elements that create a cohesive context.

279 The IDG for Fort Bliss has developed visual images for different parts of the post reflecting the themes of
280 mission, history, and regional context and based on functional use. The Main Post has a combination of
281 large open training areas surfaced with gravel and rock, with peripheral clusters of functional one- and
282 two-story buildings, and more built-up areas. The built-up areas have a variety of uses, reflected in a
283 range of visual character. Some of the most visually interesting areas are found in the older, historic parts
284 of the post such as the Parade Ground and historic homes on either side of Sheridan and Pershing Roads;
285 old classrooms, barracks, and stables (now used mostly for administrative functions), the red brick
286 housing in the 1400 Area, industrial facilities along the railroad (1300 Area), and the old Warehouses
287 (700 and 800 Areas).

288 The Main Cantonment Area is evolving mostly with replacement and infill projects, such as new family
289 housing areas on Main Post, renovations to warehouses, and demolition of deteriorated and outdated
290 facilities. Individually, these projects are noticeable, but they fit into the surrounding context using forms
291 and materials that are replicated in buildings with similar functions. Over time, infill is creating an
292 increasingly dense visual context with less open area between pockets of facilities.

293 The WBAMC area also has a core of historic structures that provide a unique visual quality and scale
294 from the street pattern and well-established landscape of former administrative and housing areas.
295 Juxtaposed to this area are the modern, large-scale WBAMC buildings sited prominently on the slopes of
296 the Franklin Mountains. New housing and mixed commercial development is underway in this area.

297 At Biggs AAF, the flightline area has not changed substantially in recent years. A new rail depot has
298 been constructed on the north side of the airfield. To the south of the flightline, portions of the family
299 housing area have been demolished. However, the land surrounding the airfield on the east, northeast,
300 and north remains largely open and undeveloped out to Loop 375. The area is essentially flat and has low
301 grassy and scrub vegetation. For travelers on the Loop 375, the view onto the installation presents an
302 open airfield with isolated pockets of industrial-type facilities.

303 The western half of Logan Heights is being developed for military family housing, following demolition
304 of old barracks and administration buildings, that will maintain most of this area's residential appearance
305 and scale, in context with surrounding neighborhoods. The new Chapin High School is highly visible
306 from US 54.

307 Along Montana Avenue in the western edge of the South Training Areas, the new desalination plant to be
308 operated by EPWU is under construction. This facility fits into the commercial and industrial context of
309 the development along this arterial.

310 Urban areas surrounding the Main Cantonment Area are a mixture of residential, commercial, and
311 industrial uses. The area has been developed for several decades, with only minor changes occurring to
312 the visual environment due to new construction. The northeast, east, and lower valley areas of El Paso
313 are undergoing transformation. In these peripheral areas, the dominant pattern is residential tract
314 development with commercial complexes at major roadway intersections.

315 In this context of transformation, a new concern for city planners is preservation of open space. The City
316 of El Paso is confined by the Rio Grande, Mexican border, New Mexico border, steep slopes and arroyos
317 in the Franklin Mountains, and Fort Bliss. The least constrained boundary is to the east. The city is
318 studying the attributes of its existing open space to plan for adequate open space for water recharge,
319 recreation, and ecological sustainment using "Green Infrastructure" concepts (Ref# 426).

320 **4.1.3.2 Fort Bliss Training Complex and Surrounding Areas**

321 The natural context of the Fort Bliss Training Complex and surrounding areas is semi-arid to arid
322 Chihuahuan Desert, characterized by vistas framed by distant mountain ranges or escarpments, dominated
323 by the overlying blue sky. There has been very little perceptible change in the overall landscape character
324 over the past five years. Isolated manmade features are absorbed within the largeness of the viewshed.

325 Variations in elevation and precipitation result in a range of vegetative regimes with indistinct boundaries.
326 These create a patchwork of varying textures and patterns in the middle and distant landscape. Broad
327 valley floors and alluvial slopes are bisected by steep-sided but relatively shallow intermittent streams
328 that are noticeable only up close. The mixed hues of reddish brown and gray-colored soils, rocks, and
329 woody vegetation provide the dominant colors of the ground plane.

330 The cultural landscape is defined by both the natural setting and human modifications. Throughout the
331 area, human-made features are evidence of current and past uses and events. These include roadways
332 (both paved and unpaved), fences, wooden corrals, isolated homesteads, powerlines, watering tanks,
333 windmills, pipelines, antennae, and satellite dishes. Most of these features are noticeable in the
334 foreground, but are either not perceptible or only defined by subtle lines or forms in the middle and
335 distant landscape.

336 The South Training Areas in El Paso County are comprised primarily of mesquite coppice dunes.
337 Portions of the South Training Areas have bare patches that are highly noticeable in the foreground but do
338 not alter the overall middle and distant visual character. Northeast of the South Training Areas, foothills
339 of the Hueco Mountains rise from the desert floor providing moderate visual interest in the distance.
340 Vegetation on the lower slopes is sparse. The Loop 375 highway corridor to the southwest is defined by
341 chain link fences. In general, when viewed from locations beyond the installation boundary, isolated

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

342 facilities and equipment in the middle and far distances within the training areas are visually subordinate
343 to the natural landscape.

344 Visual conditions in the Doña Ana Range–North Training Areas have not change noticeably over the last
345 five years. The Organ Mountains have outstanding scenic quality due to dramatic forms of precipitous
346 mountains. Some of the weapons ranges on the west side of War Highway have visible features from the
347 road, but most are hidden by intervening terrain. The remaining areas on the Doña Ana Range–North
348 Training Areas are mostly comprised of mesquite coppice dunes that form a homogenous pattern of dark
349 shrubs against a sandy ground plane. The height of the dunes obstructs a viewer’s visual field when
350 moving through them. Some patches are bare and sandy. These areas are visible in the foreground but do
351 not alter the overall middle and distant vistas. Doña Ana Range Camp is visible when traveling along
352 some roadways, but specific qualities of its built environment are not discernible, and it also tends to be
353 unobtrusive in the overall landscape. Other constructed or mobile military structures and equipment are
354 smaller in scale and therefore less visible from roadways. Human-made modifications tend to be most
355 visible to persons on foot or horseback due to closer viewing distances.



356
357
358

Doña Ana Range-North Training Areas



359
360
361

Doña Ana Range-North Training Areas mesquite coppice dunes and dirt roadway



362
363

Doña Ana Range, Range 40 arroyo-riparian area and Organ Mountains

364 McGregor Range is located partly in the Tularosa Basin, which is visually typical of the Chihuahuan
365 Desert landscape described above; partly on Otero Mesa, which is predominantly grassland; and partly in
366 the foothills of the Sacramento Mountains. The Otero Mesa grasslands provide a distinctive and
367 appealing expanse of vegetation. In the southeast part of McGregor is an area of transition between the
368 basin and the mesa escarpment that has more varied terrain and vegetation, with a mixture of grasses,
369 shrubs, and cacti, and is broken up by small drainages along the escarpment edge. Visible human-made

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

370 features throughout McGregor Range include military and livestock infrastructure. These features are
371 noticeable from the foreground but are generally subordinate in distant views.

372 Since the Mission and Master Plan PEIS was completed, Centennial Range has been constructed on Otero
373 Mesa. The 5,200-acre range is fenced. Within the fenced area, the vegetation is natural, although it is
374 clear of large shrubs in the center. From the fenceline, several targets are clearly visible. However, the
375 natural surroundings have not been altered.

376 Areas of higher elevation in the Sacramento Mountains and its foothills have distant views onto
377 McGregor Range, including expansive vistas of grasslands on Otero Mesa that appear relatively
378 uninterrupted by human-made structures, except for a few roadways, stock corrals, and water
379 improvements.



380
381

McGregor Range, escarpment transition zone

382 McGregor Range is comanaged by BLM through the RMPA. BLM classifies lands according to
383 objectives for retaining their visual character. The classifications are based on a scenic analysis,
384 perceived value, and numbers of viewers. The withdrawn land on McGregor Range has been categorized
385 under the BLM's Visual Resource Management (VRM) classification system. The purpose of this system
386 is to provide an inventory of visual resources and to provide management objectives according to the
387 visual quality and sensitivity of an area. BLM lands are classified as VRM Classes I, II, III, IV, and
388 unclassified (from the most valued and sensitive to alteration, to the least). Areas along U.S. Highway 54
389 and New Mexico Highway 506 are Class III, where changes in the basic elements of the landscape may
390 be evident but should remain subordinate. Culp Canyon WSA is rated as Class II to preserve the
391 character of the natural landscape. The remainder of McGregor Range is rated as Class IV where the
392 level of change to characteristic landscape can be high. This classification reflects lower visual sensitivity
393 because viewer numbers are relatively low away from major public roadways.

394 BLM has completed preliminary work on evaluating Otero Mesa as part of a rural historic landscape
395 potentially eligible for listing on the National Register of Historic Places. Other historic landscapes that
396 may also be present on Fort Bliss are described in Section 4.9.

397 BLM land adjacent to the Fort Bliss Training Complex has also been classified according to its visual
398 quality and sensitivity. A portion of the Organ Mountains west of Doña Ana Range is designated as a
399 scenic ACEC (see Figure 4.1-2) and is managed as a VRM Class I area (where management actions

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

400 should not alter the natural landscape). Views from most locations in the ACEC onto Fort Bliss are
401 obstructed by the intervening terrain of the Organ Peaks. The Sacramento Escarpment ACEC, located
402 north of McGregor Range, is also managed as VRM Class I. Distant views of the northwest corner of
403 McGregor Range may be visible from some viewing locations in this ACEC. Most of the mountainous
404 areas carry a VRM Class II rating, including the WSAs, the Organ and Franklin Mountains, and most
405 mountain ranges and hills throughout the region.



406
407 McGregor Range Chihuahuan Desert vegetation, south of Wilde Benton



409
410 McGregor Range, Centennial Range on Otero Mesa

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

411 The USFS uses a similar VRM rating system to manage visual resources. Areas are classified as
412 Preservation, Retention, Partial Retention, Modification, and Maximum Modification, each class denoting
413 diminishing visual value and sensitivity to visible alterations. Land in Lincoln National Forest,
414 Sacramento District, adjacent to McGregor Range is primarily classified as a Modification area due to
415 alterations (such as roads, signage, and evidence of productive uses) and relatively low visual quality.
416 There are some areas classified as Retention, mostly in mountainous terrain, where changes within the
417 natural landscape should not be evident.

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1 **4.2 MAIN CANTONMENT AREA INFRASTRUCTURE**

2 Infrastructure within the Main Cantonment Area is composed of the following systems: ground
3 transportation, utilities, energy, and communications. The ROI for the ground transportation systems is
4 El Paso County, TX. The ROI for assessing utility, energy, and communication systems is made up of
5 the service areas of each service purveyor serving the facilities operated by Fort Bliss in the Main
6 Cantonment Area and the surrounding area. It includes El Paso County in Texas, and Doña Ana and
7 Otero Counties in New Mexico; the City of El Paso; and the service areas of El Paso Electric Company
8 (EPEC), El Paso Gas Company (EPGC), and other utility service purveyors.

9 **4.2.1 Ground Transportation**

10 This section describes the existing highway system, roads, and railways in the ROI.

11 **4.2.1.1 Roadways**

12 The evaluation of roadway conditions is based on capacity estimates (Ref# 352). The capacity of a
13 roadway depends on the number of lanes, lateral obstructions, percentage of trucks in the traffic stream,
14 intersection control, and other physical factors depending on the type of roadway. Traffic volume is
15 typically reported as Annual Average Daily Traffic (AADT), which is the total number of vehicles for an
16 entire year divided by the number of days in the year. The AADT may be measured directly with
17 continuous count equipment, but locations with such equipment are limited. The AADT may also be
18 estimated by taking short traffic counts called Average Daily Traffic (ADT) with portable equipment
19 (usually for two consecutive days) and adjusting the counts with factors derived from the AADTs to
20 account for daily and seasonal variations.

21 The AADT factors for estimating the percent of daily traffic that occurs during the peak hour are called
22 K-factors. Capacity analysis for highways with four or more lanes is conducted for direction during the
23 peak hour. Therefore, continuous count locations are used to estimate peak hour directional distributions
24 factors, called D-factors. Applying K- and D-factors to AADT estimates the peak hour volume (phv) that
25 is used in determining the capacity of a particular roadway.

26 A comparison of a roadway's AADT to its capacity is expressed in terms of level of service (LOS). The
27 LOS scale ranges from A to F, where A is the best (free-flow conditions) and F is the worst (stop-and-go
28 conditions). LOS A, B, and C are considered good operating conditions while LOS D is considered
29 below average, and LOS E and F are considered unacceptable. Volume (in AADT)-to-capacity ratios as
30 they relate to LOS values are shown in **Table 4.2-1**.

31 **Regional Roadway Systems**

32 Several highways provide regional access to El Paso and Fort Bliss. The major east-west access is
33 provided by I-10 (see Figure 1-1), which runs through downtown El Paso and passes just south of the
34 Main Cantonment Area. I-10 is the most heavily traveled roadway in El Paso and connects the region to
35 western and central Texas to the east and southern New Mexico and Arizona to the west. I-25 provides
36 the major northern access to the El Paso region and intersects I-10 approximately 44 miles northwest of
37 El Paso at Las Cruces, NM. U.S. Highway 54 (Patriot Freeway), a major non-Interstate freeway, also
38 provides northern access to Alamogordo, NM.

39 Another key inter-regional roadway is Montana Avenue (US 62/180), which is located immediately south
40 of Fort Bliss and provides access to locations east of El Paso (**Figure 4.2-1**). Loop 375, which connects
41 the northeast and eastern portions of the city and helps to reduce traffic congestion along the US 54
42 corridor, crosses the Fort Bliss installation between Montana Avenue and US 54. Overpasses have been
43 constructed to allow military vehicles and equipment to pass under the loop. Loop 375 becomes
44 Woodrow Bean Transmountain Drive west of US 54, connects to I-10 northwest of El Paso, and has the
45 advantage of few cross streets.

46

Table 4.2-1. Roadway Levels of Service

<i>LOS</i>	<i>Description</i>	<i>Criteria (Volume/Capacity)</i>		
		<i>Freeways</i>	<i>Signalized Intersections</i>	<i>Two-lane Highways</i>
A	Free flow with users unaffected by presence of other users of roadway	0.32	0.50	0.15
B	Stable flow, but presence of the users in traffic stream becomes noticeable	0.50	0.65	0.27
C	Stable flow, but operation of single users becomes affected by interactions with others in traffic stream	0.75	0.85	0.43
D	High density, but stable flow; speed and freedom of movement are severely restricted; poor level of comfort and convenience	0.90	0.95	0.64
E	Unstable flow; operating conditions at capacity with reduced speeds, maneuvering difficulty, and extremely poor levels of comfort and convenience	1.00	1.00	1.00
F	Forced breakdown flow with traffic demand exceeding capacity; unstable stop-and-go traffic	>1.00	>1.00	>1.00

Source: Ref# 352

47 **Main Cantonment Area Roadways**

48 The Main Cantonment Area of Fort Bliss is surrounded by major arterial city streets (**Figure 4.2-2**). It is
 49 generally bounded by Loop 375 to the northeast, Railroad Drive to the northwest, and various roads on
 50 the south and west. Key arterials include Fred Wilson Road and Airport Road, which separate the Main
 51 Post and Biggs AAF.

52 The road network on the Fort Bliss Main Post consists of two- and four-lane asphaltic concrete paved
 53 surfaces, mostly with curb and gutter. The primary roadways provide motor access to all areas of the
 54 installation and are capable of handling all types of highway vehicles. Minor delays and congestion occur
 55 during the morning and afternoon peak travel periods. The primary roads include Jeb Stuart, Ricker, and
 56 Forrest Roads and portions of Marshall, Sheridan, Haan, and Robert E. Lee Roads.

57 Currently, vehicles exiting the Main Post for the training areas must either cross Fred Wilson Road at
 58 Chaffee or Airport Road at Haan Road. Access to training ranges for the majority of tracked vehicles and
 59 truck convoys is provided by the Chaffee/Fred Wilson crossing. Vehicle access to Biggs AAF is
 60 provided along Sergeant Major Boulevard east of Airport Road.

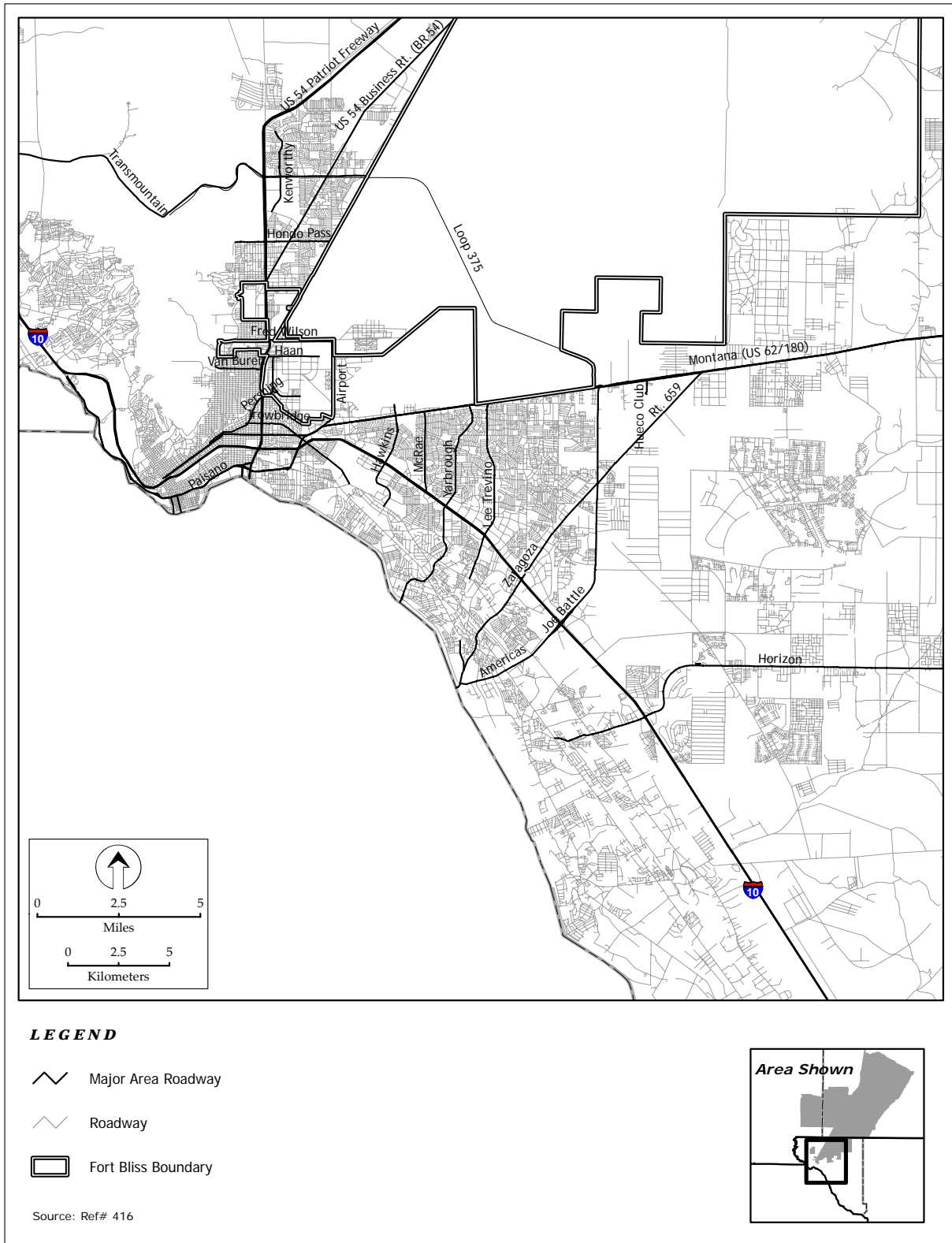
61 **Table 4.2-2** presents the results of capacity analyses on selected roadway segments in the ROI around
 62 Fort Bliss. The traffic numbers represent the AADTs from which the peak vehicles per hour (vph) levels
 63 were derived.

64 The capacity levels were derived by using the following assumptions:

- 65 • 2,300 passenger cars per hour per lane (pcphpl) for freeways and interstates; and
- 66 • 900 pcphpl for signalized arterials, with the exception of Montana Avenue, which assumed 1,100
 67 pcphpl.

68 Following standard capacity analysis procedures, passenger car capacity flow rates were reduced by 10
 69 percent to account for trucks in the traffic stream and other physical factors affecting capacity. The vph
 70 compared to the capacity results in the volume-to-capacity ratio (V/C) used to determine LOS based on
 71 the criteria in Table 4.2-1.

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



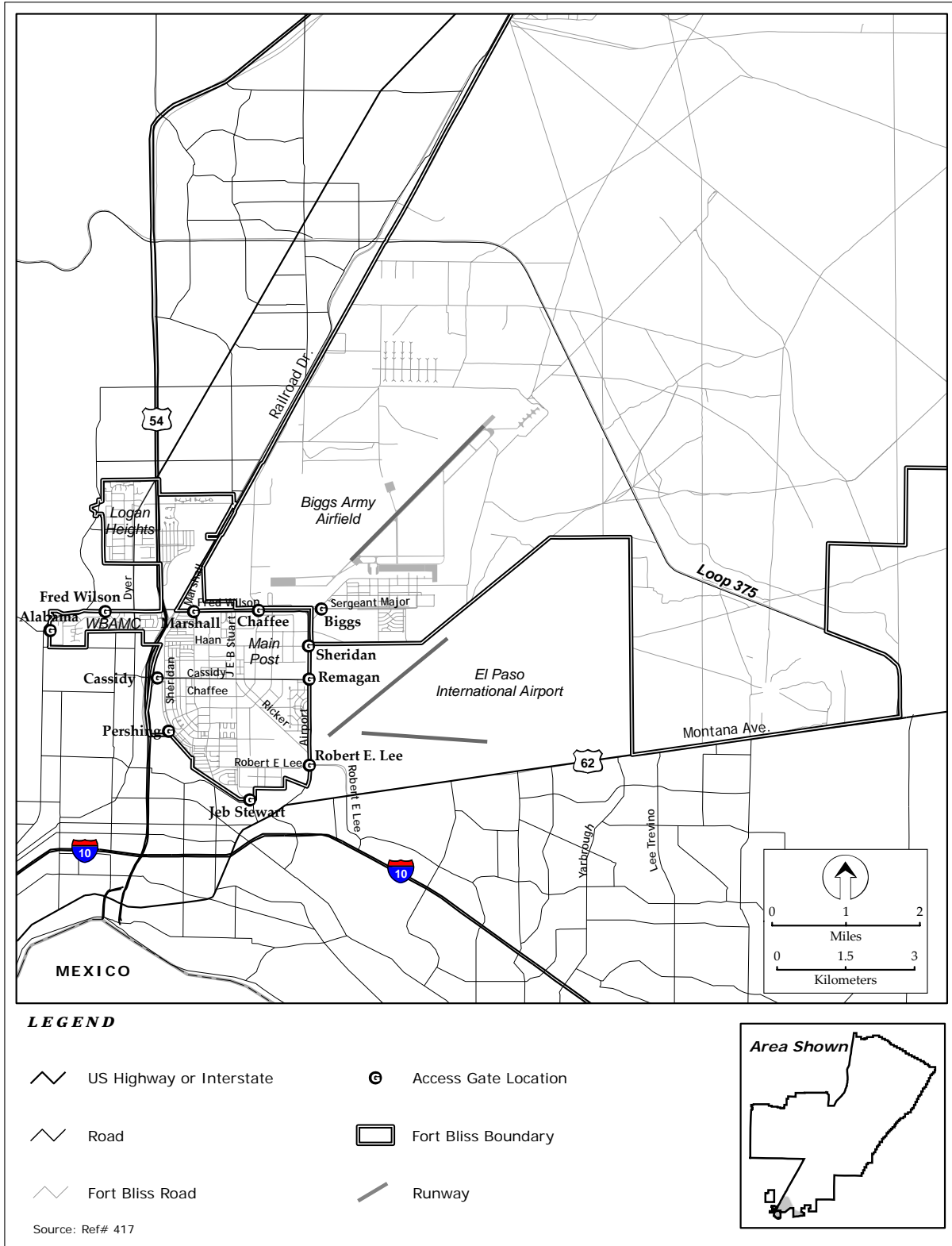
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Figure 4.2-1. Major Roadways Around the Main Cantonment Area of Fort Bliss

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



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Figure 4.2-2. Transportation Network in the Fort Bliss Main Cantonment Area

Table 4.2-2. Capacity Analysis of Area Roadways, 2006

<i>Route</i>	<i>Segment</i>	<i>Traffic</i>	<i>vph</i>	<i>Capacity</i>	<i>V/C</i>	<i>LOS</i>
I-10	US 54 (Patriot Fwy) to Paisano Dr (US 62)	87,680	8,446	8,280	1.02	F
I-10	Paisano Dr (US 62) to McRae Blvd	189,520	8,528	8,280	1.03	F
I-10	McRae Blvd to Yarbrough Dr	140,760	6,334	6,210	1.02	F
I-10	Yarbrough Dr to Lee Trevino Dr	139,380	6,272	6,210	1.01	F
I-10	Lee Trevino Dr to Zaragoza Rd	104,880	4,720	6,210	0.76	D
I-10	Zaragoza Rd to Loop 375 (Americas Ave)	74,520	3,353	4,140	0.81	D
I-10	Loop 375 (Americas Ave) to Horizon Blvd	65,320	2,939	4,140	0.71	C
Montana Ave	US 54 (Patriot Fwy) to Paisano Dr (US 62/180)	26,280	1,445	1,980	0.73	C
Montana Ave	Paisano Dr (US 62/180) to Hawkins Blvd	43,200	2,376	2,970	0.80	C
Montana Ave	Hawkins Blvd to McRae Blvd	59,400	3,267	2,970	1.10	F
Montana Ave	McRae Blvd to Yarbrough Dr	44,280	2,435	2,970	0.82	C
Montana Ave	Yarbrough Dr to Lee Trevino Dr	38,880	2,138	1,980	1.08	F
Montana Ave	Lee Trevino Dr to Loop 375 (Joe Battle Blvd)	31,680	1,742	1,980	0.88	D
Montana Ave	Loop 375 (Joe Battle Blvd) to Hueco Club Rd	41,040	2,257	1,980	1.14	F
US 54	I-10 to Trowbridge Ave	85,811	4,720	12,420	0.38	B
US 54	Trowbridge Ave to Pershing Dr	83,553	4,595	12,420	0.37	B
US 54	Pershing Dr to Van Buren Ave	75,085	4,130	7,245	0.57	B
US 54	Van Buren Ave to Fred Wilson Ave	56,455	3,105	4,140	0.75	C
US 54	Fred Wilson Ave to Hondo Pass	42,905	2,360	4,140	0.57	B
US 54	Hondo Pass to Loop 375 (Transmountain Dr) to Kenworth St	32,367	1,780	4,140	0.43	A
Loop 375	Route 659 to Montana Avenue	16,100	1,449	4,140	0.35	A
Loop 375	Montana Avenue to BR 54	13,800	1,242	4,140	0.30	A
Loop 375	BR 54 to US 54	20,700	1,863	4,140	0.45	A
Fred Wilson Blvd	US 54 to Airport Drive	30,000	1,980	2,430	0.81	C
Airport Rd	Fred Wilson to Haan Rd	34,609	2,284	2,430	0.94	D

Source: Ref# 412

79 As shown in Table 4.2-2, portions of I-10 and Montana Avenue currently experience unacceptable level
 80 of service during peak periods due to limited capacity and high hourly traffic volumes. Long-range plans
 81 call for widening I-10 along these affected segments as well as upgrading Montana Avenue to expressway
 82 standards.

83 **Local Roads and Access Points**

84 Access to the Main Cantonment Area is provided by eleven Access Control Points (shown on Figure 4.2-
 85 2). Eight of the gates provide access to the Main Post: Cassidy Gate, Chaffee Gate, Jeb Stuart Gate,
 86 Marshall Gate, Pershing Gate, Remagen Gate, Robert E. Lee Gate, and Sheridan Gate. There is one gate
 87 on Biggs AAF (Biggs Gate) and two gates on WBAMC (Fred Wilson Gate and Alabama Gate). All
 88 vehicles that enter Fort Bliss are required to display either a decal or vehicle pass. For those persons
 89 without decals, vehicle passes are issued at the Cassidy Gate, Robert E. Lee Gate, Chaffee Gate, Biggs
 90 Gate, and Fred Wilson Gate.

91 **Table 4.2-3** summarizes the average weekday traffic entering at the installation gates. The highest
 92 volumes are observed at the Cassidy, Sheridan, Biggs, and Robert E. Lee Gates. The highest volume of
 93 traffic entering the installation occurs during the morning rush hour between 0700 and 0900 hours (7:00 –
 94 9:00 a.m.). Most of the gates have two entering lanes, and there is generally little or no delay or
 95 congestion at entry points.

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

96

Table 4.2-3. Average Weekday Entering Traffic at Installation Gates

<i>Hour</i>	<i>Gate</i>									
	<i>Cassidy</i>	<i>Sheridan</i>	<i>Biggs</i>	<i>Lee</i>	<i>Wilson</i>	<i>Remagen</i>	<i>Pershing</i>	<i>Alabama</i>	<i>Jeb Stuart</i>	<i>Chaffee</i>
0001-0100	68	0	30	46	13	N/A	N/A	N/A	N/A	N/A
0101-0200	36	0	18	33	6	N/A	N/A	N/A	N/A	N/A
0201-0300	39	0	19	40	6	N/A	N/A	N/A	N/A	N/A
0301-0400	74	0	12	70	6	N/A	N/A	N/A	N/A	N/A
0401-0500	168	0	58	105	20	N/A	N/A	N/A	N/A	N/A
0501-0600	485	327	611	354	210	401	189	30	110	95
0601-0700	400	317	596	321	384	331	179	152	139	85
0701-0800	637	547	550	386	740	308	367	434	193	137
0801-0900	617	595	722	386	461	418	261	299	165	119
0901-1000	353	507	251	247	338	268	134	256	69	78
1001-1100	365	430	170	245	282	208	83	215	80	65
1101-1200	432	507	244	281	274	227	100	159	109	77
1201-1300	489	562	460	387	317	317	173	206	235	71
1301-1400	475	460	237	356	247	268	106	197	122	88
1401-1500	390	424	198	272	285	179	73	151	83	63
1501-1600	429	422	194	262	228	178	73	99	79	68
1601-1700	381	396	154	220	157	165	68	53	72	50
1701-1800	351	373	168	252	107	157	66	32	61	37
1801-1900	263	211	172	161	105	106	38	22	41	26
1901-2000	192	122	98	157	62	71	29	9	32	14
2001-2100	162	82	69	129	53	36	23	6	23	6
2101-2200	155	0	60	161	41	0	0	0	0	0
2201-2300	112	0	44	98	59	0	0	0	0	0
2301-2400	87	0	47	65	35	0	0	0	0	0
Total	7,161	6,282	5,184	5,035	4,437	3,639	1,962	2,321	1,612	1,080

Note: Excludes Marshall Gate, which is outbound only
N/A = not applicable – gate is closed during those hours
Source: Ref# 471

97 Planned Roadway Improvements

98 Two improvement projects planned for the region could affect Fort Bliss and traffic patterns in the
99 surrounding area:

100 The Inner Loop is a proposed 9.54-mile route that will begin at the junction of US 54 at Fred Wilson and
101 extend Fred Wilson Avenue east to terminate at Loop 375. This route will traverse between Biggs AAF
102 and EPIA. One of the purposes of the Inner Loop is to provide a direct route for trucks in the area to US
103 54 and Loop 375, thus relieving traffic congestion on Airport Road, Airway Boulevard, US 62/180, and
104 Paisano Drive. The route will also provide additional access to Fort Bliss, EPIA, and Butterfield Trail
105 Industrial Park. It will improve key intersections along Fred Wilson Road, including the interchange with
106 US 54, Airport Road/Sergeant Major Boulevard, and the Loop 375 interchange.

107 The Northeast Parkway is being planned to provide a limited access roadway for trucks and other traffic
108 to bypass I-10 through El Paso and also to provide a more efficient and direct access to regional industrial
109 parks. This 20-mile long, limited-access, four-lane freeway would include a corridor between Anthony,
110 NM at the I-10/NM 404 Interchange and Loop 375 near the Railroad Drive overpass in northeast El Paso.

111 **4.2.2 Utilities**

112 This section describes the facilities and utilities used for potable water pumping, treatment, storage, and
113 distribution; wastewater collection and treatment; and solid waste collection, recycling, and disposal.

114 **4.2.2.1 Water Supply**

115 Potable water is currently provided to the Main Cantonment Area from on-post wells and
116 interconnections with the City of El Paso (Ref# 2).

117 On-post wells occur in two well fields: the Tobin Well Field (seven wells) is located approximately three
118 miles northeast of the Main Post. The Pike Well Field (four wells) is on the Main Post. Water from each
119 of the well fields is pumped to separate buildings, where it is chlorinated and delivered to the Main
120 Cantonment Area grid. The well fields can produce a combined flow of 15.8 million gallons per day
121 (MGD), and the City of El Paso currently can provide up to 4.24 MGD, for a total capacity of
122 approximately 20 MGD (Ref# 2).

123 Biggs AAF has two wells, each capable of providing 1.44 MGD to the airfield and Aero Vista Housing.
124 The Main Post and the City of El Paso can also supply Biggs AAF, but the connections are normally
125 closed because Biggs AAF produces its own water. The Tobin and Pike Well Fields plus the two wells
126 on Biggs AAF have a combined capacity of approximately 22.9 MGD (Ref# 2).

127 The great majority of water used on Fort Bliss is obtained from the on-post well fields; consumption of
128 water from the City of El Paso is generally low. The water produced by the well fields averaged
129 approximately 4.6 MGD in 2004, approximately 20 percent of the capacity of the on-post wells (Ref# 2).
130 Assuming an on-post resident population of approximately 15,800 (including permanently assigned
131 military personnel, dependents, and students) and a daily (non-resident) population of approximately
132 16,400 (including civilian personnel and military personnel not resident on the post, who are assumed to
133 consume water at the rate of 24 gallons/capita/day), per capita water consumption for 2004 averaged 266
134 gallons/day. This on-post consumption rate is approximately 83 percent higher than the 145
135 gallons/capita/day calculated based on data from EPWU on average water consumed per customer in
136 2004 (average daily water demand of 179,000 gallons per year, or approximately 95.0 MGD divided by
137 the population of the estimated EPWU service area [Ref# 215, 317]).

138 An estimated 26,300 military and civilian dependents and 16,400 military and civilian employees reside
139 in the City of El Paso. At the average rate of 145 gallons/capita/day for the dependents and 121
140 gallons/capita/day for the employees, consumption from the El Paso water system would be
141 approximately 6.1 MGD. This value represents approximately 5.8 percent of the EPWU 2004 average
142 daily demand of 95.0 MGD (Ref# 215) or 1.9 percent of existing EPWU treatment capacity of 305 MGD
143 (Ref# 318).

144 **4.2.2.2 Wastewater Treatment**

145 Wastewater generated at Fort Bliss flows through five connections to the City of El Paso's sewer system.
146 This water is treated at the Haskell Street Wastewater Treatment Plant, about 3 miles away. The plant has
147 a current treatment capacity of 27.7 MGD (Ref# 214). In 2004, approximately 2.9 MGD of sewage was
148 generated on post. Assuming a sewage generation rate of 24 gallons/person/day for daily staff, per capita
149 sewage generation is estimated at approximately 158 gallons/person/day. The post typically uses
150 approximately 10.5 percent of the plant's treatment capacity.

151 The City of El Paso currently has a total treatment capacity of 94.2 MGD at four facilities, including the
152 Haskell Street plant (Ref# 322). Military and civilian employees and dependents living off post use
153 approximately 3.7 MGD (3.9 percent) of the City of El Paso's treatment capacity. Combined with the
154 sewage generation on post, Fort Bliss employees and their dependents use approximately 7.0 percent of
155 El Paso's treatment capacity. The four treatment plants operated by EPWU have a combined excess
156 capacity of 44.7 MGD.

157 **4.2.2.3 Storm Water**

158 Most of the storm water runoff from the Main Cantonment Area flows through a series of storm drainage
159 channels, pipes, and storm water pump stations to various storm water retention ponds. Water collected
160 in these ponds is lost through evaporation and infiltration; none is discharged to surface waters (Ref# 3).
161 There are several small connections with the City of El Paso's storm water collection system at the post
162 boundary, mainly along access roads to the post. These discharges are currently covered by the City of El
163 Paso's municipal separate storm sewer system permit, but are anticipated to be covered in the near future
164 by a new permit issued to Fort Bliss.

165 Much of the storm water collected from the Main Cantonment Area flows into the main storm water
166 retention pond located north of Fred Wilson Road and east of the Union Pacific/Southern Pacific rail
167 lines. It has a capacity of 2,230 acre feet (af) (Ref# 3) and could store the runoff generated by a 100-year
168 storm at that time. This area is a CWA Section 404 jurisdictional wetland.

169 Storm water collected from Landfill Road, housing on Sheridan Road, and off-post areas is collected in a
170 retention basin northwest of Pershing Street Gate, west of the Officers' Club. Should this retention basin
171 be overtopped, storm water would flow in a drainageway south to the Rio Grande (Ref# 3). This
172 discharge is covered by a National Pollutant Discharge Elimination System (NPDES) General Storm
173 Water Permit. This permit will be replaced by the new permit covering all storm water discharges from
174 the post.

175 Storm water collected from Biggs AAF is discharged to two retention basins northwest of the airfield.
176 There is also a series of dry wells near the southwest end of the primary runway (Ref# 3).

177 **4.2.2.4 Solid Waste Disposal**

178 Domestic solid waste is collected and disposed of by private contractor at a government-owned, 102-acre
179 landfill (MSW ID No. 1422) located 3 miles north of the intersection of Fred Wilson and Chaffee Roads.
180 Landfill cells handle Type I waste (refuse) and Type IV waste (construction and demolition wastes).

181 Fort Bliss has an aggressive waste recycling program, and all paper, plastic, and aluminum containers and
182 metal scrap (from artillery use) are recycled. This has substantially reduced the post's reliance on the
183 onsite landfill. In FY 2005, the post generated approximately 105 tons of solid waste per day, but
184 beginning July 1, residential waste (approximately 8.8 tons per day) was disposed of in the Clint Landfill.
185 Prior to July 1, approximately 47 tons of refuse and 44 tons of construction and demolition waste were
186 disposed of in the on-post landfill per day. At current disposal rates, the Type I cell can accept waste until
187 2008, and the Type IV cell for approximately 10 more years.

188 Based on these figures, and assuming a continuation of the waste recycling program, the following per
189 employee daily generation rates were calculated: approximately 2.6 pounds of refuse are disposed of in
190 the post's landfill, and 0.3 pounds of material per day are recycled.

191 The City of El Paso owns and operates a Type I Landfill (Clint Landfill—MSW ID No. 2284) that
192 receives wastes from residents and businesses in the city. It is designed with a 30-year life expectancy at
193 the current daily solid waste accumulation rate of 800 tons per day (tpd) (Ref# 202). Since the landfill
194 was constructed in 1983, this implies closure around 2013. Several actions may be taken that could
195 increase the life of the landfill, but it is not currently known how long they would extend operations. The
196 landfill is governed under TCEQ and USEPA rules and regulations. The per capita generation rate for the
197 City of El Paso is about 3 pounds per day.

198 **4.2.3 Energy**

199 **4.2.3.1 Electricity**

200 Electrical power is supplied to Fort Bliss by the EPEC through a 115 kilovolt (KV) transmission line that
201 serves Fort Bliss, the City of El Paso, and military reservations to the north. The line is part of a loop that

202 can supply Fort Bliss from two directions. The line has a loading capacity of about 150 megavolt
203 amperes (MVA) (Ref# 2). The EPEC substation on Fort Bliss consists of two 15/20/25 MVA power
204 transformers operated in parallel for a total capacity of 50 MVA.

205 The Main Cantonment Area has a peak demand of 30 MVA, or about 1 volt ampere per person on post.
206 Average power consumption for the area, based on standard rates in Army Technical Manual TM-5-811,
207 is on the order of 0.3 kilowatts/person, or 10 megawatts (MW) (Ref# 2).

208 EPEC has a total generating capacity of 840 MW and can purchase an additional 110 MW from the Four
209 Corners Plant. Current peak electricity usage within the EPEC service area is estimated to be
210 approximately 75 percent of available power (Ref# 2). The Main Cantonment Area thus consumes
211 approximately 1 percent of power available from EPEC (1.4 percent of peak electricity use). Off-site
212 military dependents consume considerably less than this amount.

213 **4.2.3.2 Natural Gas**

214 Natural gas, the primary heating fuel in the Main Cantonment Area, is supplied by the El Paso Natural
215 Gas Company through lines owned and maintained by Texas Gas Services. A number of distribution
216 points, with an estimated total capacity of 2.5 million cubic feet per hour (CFH), are dispersed on a
217 looped network throughout the post.

218 Design per capita gas consumption on the post is estimated at 28.2 CFH (Ref# 2), a level that would only
219 be used on the coldest days. With a population on post of approximately 30,000, this translates to a
220 consumption rate on the coldest days of 0.85 million CFH. Assuming an energy requirement of 80
221 British thermal units (btu) per square foot of floor space per hour, approximately 11 million SF of floor
222 space, and 1,000 btu per cubic foot of natural gas, the post would require approximately 0.88 million CFH
223 on the coldest days. The annual consumption of natural gas in the Main Cantonment Areas is not known.

224 The Texas Gas Company provides 25.9 billion cubic feet of natural gas per year to 28 cities in Texas,
225 including El Paso, with an annual average consumption of 47 thousand cubic feet per customer (Ref#
226 280).

227 **4.2.4 Communications**

228 Communication systems on Fort Bliss include telephone, optical cable, automated digital network
229 (AUTODIN), microwave, and television systems. Part of the telephones on post are commercial sets
230 linked to the commercial telephone network (more than 350 lines), the Integrated Switch Digital Network
231 (ISDN) (78 lines), and the Defense Switched Network (DSN) (96 lines). These telephones are
232 complemented by commercially provided cell phones operating through a tower in the Franklin
233 Mountains. Fort Bliss also has 12 secure phone systems (Ref# 2).

234 The AUTODIN is supported by a Worldwide Area Network. Diskettes containing organizational
235 messages are hand carried to the network center for transmittal to virtually any place on earth (Ref# 2).

236 The microwave system allows communication within the entire installation. Radio systems comprise
237 amplitude modulation (AM), very high frequency (VHF), and trunking radios. They are used for
238 communications among military units, between aircraft and controllers, and with the Military Police and
239 fire department. Use of radio frequencies is managed by two frequency managers assigned to the post.
240 The use of radio frequencies has the potential to interfere with radio astronomy telescopes that operate in
241 Socorro, New Mexico and part of the transcontinental very long baseline array that has nearby stations in
242 Fort Davis, Texas, and Pie Town and Los Alamos, New Mexico (Ref# 2).

243 There are four television networks on post. Two are closed circuit systems used for training, one is a
244 cable network provided to housing units, and the WBAMC has its own television network (Ref# 2).

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1 **4.3 TRAINING AREA INFRASTRUCTURE**

2 Infrastructure within the Fort Bliss Training Complex is composed of ground transportation, utilities,
3 energy, and communication systems. The ROI for these systems consists of the South Training Areas,
4 Doña Ana Range–North Training Areas, and McGregor Range.

5 **4.3.1 South Training Areas**

6 **4.3.1.1 Ground Transportation**

7 The South Training Areas are northeast of Fort Bliss’s Main Cantonment Area and are bordered on the
8 north by the New Mexico state line. TAs 1A and 1B are adjacent to the Main Cantonment Area and
9 EPIA. U.S. Highway 54 runs along the northwest boundary, and the southernmost boundary is U.S.
10 Highway 62/180 (Montana Avenue) (see Figure 4.2-1). Loop 375 divides TA 1B. None of the other
11 training areas are near any major roadways.

12 **4.3.1.2 Utilities**

13 **Water Supply**

14 There is a small complex of Site Monitor buildings 10 miles east of the Main Cantonment Area. These
15 buildings obtain water from an on-site well. The water is chlorinated and stored in a 30,000-gallon tank
16 (Ref# 3).

17 **Wastewater Treatment**

18 Wastewater generated at the Site Monitor buildings is collected in septic tanks that flow to drain fields or
19 dry wells. Wastewater flow is estimated to be approximately 1,200 gallons per day.

20 **Storm Water**

21 Storm water generated by the Site Monitor location is passed by sheet flow to outlets cut in the perimeter
22 fence. The outlets pass to a dune area, where water is lost through infiltration and evaporation (Ref# 3).

23 **Solid Waste**

24 Solid waste generated at the Site Monitor location is placed in dumpsters, which are periodically trucked
25 to the on-site landfill (Ref# 3).

26 **4.3.1.3 Energy**

27 Electricity to meet the peak demand of the Site Monitor location, 268 kW, is supplied by EPEC. No
28 natural gas is provided to the South Training Areas. Liquefied Petroleum Gas (LPG) at the Site Monitor
29 location is stored in four 1,000-gallon tanks, one 800-gallon tank, and one 500-gallon tank (Ref# 3).

30 **4.3.2 Doña Ana Range-North Training Areas**

31 **4.3.2.1 Ground Transportation**

32 The Doña Ana Range-North Training Areas are bounded by U.S. Highway 54 on the east. Doña Ana
33 Range Camp is located west of U.S. Highway 54 and is provided access by War Highway, which runs
34 along the Organ Mountains. While operations take place on the range, War Highway is required to be
35 closed occasionally for safety reasons. Orogrande Range Camp is accessed off US 54. Average Annual
36 Daily Traffic on U.S. 54 is approximately 5,400 in Otero County. AADT on Martin Luther King, Jr.
37 Boulevard is estimated to be between 10,000 and 12,000. Martin Luther King, Jr. Boulevard becomes
38 New Mexico Highway 213 in New Mexico; AADT on NM 213 is approximately 5,100.

39 **4.3.2.2 Utilities**

40 **Water Supply**

41 Doña Ana Range Camp is provided with water from two wells into the Hueco Bolson, one with a capacity
42 of 500 gallons per minute (gpm) (0.72 MGD) and the second with a capacity of 200 gpm (0.29 MGD).
43 The water is disinfected at each well and pumped to the distribution system or to a 150,000 gallon
44 elevated tank. Water is chlorinated and stored in two 250,000-gallon tanks (Ref# 2).

45 The Orogrande Range Camp water system receives potable water from WSMR. WSMR makes the
46 production from one well, nominally 1,000 GPM, available for Fort Bliss use. Currently, two 4-inch lines
47 with pumps rated at approximately 500 GPM each provide water to Orogrande Range Camp. This water
48 is stored on site (200,000 gallon capacity) or trucked to the SHORAD and Red Eye Sites on McGregor
49 Range (Ref# 2).

50 The water that supplies WSMR is pumped from the Soledad Recharge Area, and WSMR has agreed not
51 to extract more water than the natural recharge rate, estimated at 750 acre feet per year (afy). WSMR
52 uses an average of approximately 520 afy. This leaves up to approximately 230 afy (average of 0.21
53 MGD) available for Fort Bliss use (Ref# 479).

54 In addition, the Hueco Camp wells, located in TA 4D, support 250 gpm (0.36 MGD). Water from the
55 wells is disinfected and stored in a 20,000-gallon elevated tank (Ref# 2).

56 **Wastewater Treatment**

57 Wastewater is collected from Doña Ana Range Camp in a small network and treated in a two-cell, 3.75-
58 acre lagoon about 0.5 miles to the south. The lagoon has a design biological oxygen demand loading of
59 40 lbs/day/acre (Ref# 2). Wastewater is collected from Orogrande Range Camp in a small network and is
60 treated in a one-cell, 4.74-acre lagoon about 0.25 miles to the northeast (Ref# 2).

61 **Storm Water**

62 Doña Ana Range Camp is located in a gently sloping area at the southeast foothills of the Organ
63 Mountains. Storm water consists of sheet flow, most of which is channelized into a graded ditch that runs
64 along the south loop of the access road. Drainage from the ditch flows south of the access road and to the
65 southeast towards a dry lake. Ten- and 25-year storm water events were evaluated and the facilities at the
66 range camp were determined to be adequate (Ref# 3).

67 Orogrande Range Camp is located in a relatively flat area with a gentle slope to the northwest. An
68 analysis of the storm water drainage system in 1983 indicated that arroyos and graded ditches had
69 adequate capacity to carry 10-year storm flows; however, four culverts within the camp were
70 insufficiently sized for 10-year storms (Ref# 3).

71 **Solid Waste**

72 Solid waste generated at the range camps is placed in dumpsters and picked up by the private contractor
73 that services the Main Cantonment Area. Solid waste is then disposed of at the Fort Bliss Type I landfill
74 (Ref# 3).

75 **4.3.2.3 Energy**

76 Electricity is supplied to Doña Ana Range Camp from an EPEC substation with a total capacity of 5,500
77 KV amperes (KVA) located to the southwest. Electricity is supplied to Orogrande Range Camp from a
78 substation on WSMR to a 10 MVA substation on site. The WSMR substation, with power supplied by
79 the EPEC, can meet an average power consumption of 3,034 KW (Ref# 2).

80 No natural gas is supplied to the Doña Ana Range-North Training Areas (Ref# 2). Doña Ana Range
81 Camp has four 5,000-gallon LPG storage tanks serving most of the area, one 5,000-gallon tank serving

82 eight buildings, and one 1,000-gallon storage tank serving a single building. Consumption of LPG is
83 estimated to be 7 gallons per person per month, and a 30-day supply must be maintained (Ref# 2).

84 **4.3.3 McGregor Range**

85 **4.3.3.1 Ground Transportation**

86 U.S. Highway 54 connects El Paso, Texas with Alamogordo, New Mexico and is on the western border of
87 McGregor Range. New Mexico Highway 506 is an east-west roadway that crosses the northern part of
88 the range. This road provides access on to McGregor Range on the west at U.S. Highway 54 and exits the
89 range at TA 16. Highway 506 is a gravel road maintained by Otero County and is a primary access route
90 that connects several communities, including Timberon, Piñon, and Crow Flats, with the Otero County
91 seat in Alamogordo. The AADT volume on Highway 506 in 1995 was less than 30 vehicles per day.
92 There are numerous other roads in the McGregor Range road network that total over 1,000 miles of
93 roadway. The Army maintains the road network on McGregor Range, which primarily consists of dirt
94 roads that provide access to different parts of the range. The only ingress to grazing units in the
95 Sacramento Mountains, including the Grapevine area, is via county and Forest Service roads originating
96 at US 54 and traversing the north end of McGregor Range (Ref# 405).

97 **4.3.3.2 Utilities**

98 **Water Supply**

99 McGregor Range Camp receives water from the City of El Paso through a line with a capacity of 2.88
100 MGD. Water is chlorinated and is stored in two 250,000-gallon tanks. The Meyer Range Complex
101 receives water by pipeline from McGregor Range Camp. Water is stored in a 25,000-gallon tank (Ref#
102 2).

103 **Wastewater Treatment**

104 Wastewater from McGregor Range Camp is treated in a 10.23-acre, single-celled lagoon. As of June
105 2006, a second 5-acre lined pond has been constructed and collects overflow wastewater from the
106 adjacent McGregor pond. Wastewater from the Meyer Range Complex is treated in a 3.36-acre, two-cell
107 lagoon located one-half mile to the west (Ref# 2).

108 **Storm Water**

109 Storm water from McGregor Range Camp and the Meyer Range Complex drains to the south and west,
110 either to small playa lakes within the basin or to larger playa lakes east of Newman, Texas. Storm water
111 drainage within McGregor Range Camp consists of sheet flow to the west and southwest, eventually
112 flowing into an ephemeral lake 1 mile southwest of the camp. Analysis of the storm drainage system
113 indicates that the large ephemeral lake has adequate volume to contain a 10-year discharge. There may be
114 a small amount of nuisance ponding within the range camp and at Meyer Range. Twenty-five-year storm
115 water events were evaluated and the facilities at the Range Camp and Meyer Range were determined to
116 be adequate (Ref# 3).

117 **Solid Waste**

118 Solid waste generated at McGregor Range Camp is placed in dumpsters and picked up by the private
119 contractor that services the Main Cantonment Area and taken to the Fort Bliss landfill (Ref# 3).

120 **4.3.3.3 Energy**

121 Electricity is supplied to McGregor Range Camp and Meyer Range Complex from an EPEC 7,500 KVA
122 substation to the southwest, although a higher demand (15,000 KVA) can be provided for without
123 jeopardizing projected service requirements for the adjoining communities. McGregor Range Camp
124 receives natural gas from the Texas Gas Services-owned and operated distribution system. The two-inch,
125 high-pressure line and high-pressure meters on site limit the capacity of the system. Meyer Range

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

126 Complex has an LPG system. LPG is stored in two 2,000-gallon tanks in the bivouac area and a 500-
127 gallon tank on the range. Consumption of LPG is estimated to be 7 gallons per person per month, and a
128 30-day supply must be maintained (Ref# 2).

4.4 AIRSPACE USE AND MANAGEMENT

Airspace management includes air traffic control and is defined as the direction, control, and handling of flight operations in the “navigable airspace” that overlies the geopolitical borders of the United States and its territories. Navigable airspace is airspace above the minimum altitudes of flight prescribed by regulations under United States Code Title 49, Subtitle VII, Part A, and includes airspace needed to ensure safety in the takeoff and landing of aircraft, as defined in Federal Aviation Administration (FAA) Order 7400.2E (49 USC). This navigable airspace is a limited natural resource that Congress has charged the FAA to administer in the public interest as necessary to ensure the safety of aircraft and its efficient use (Ref# 324). Management of this resource considers how airspace is designated, used, and administered to best accommodate the individual and common needs of military, commercial, and general aviation. The FAA considers multiple and sometimes competing demands for aviation airspace in relation to airport operations, Federal Airways, Jet Routes, military flight training activities, and other special needs to determine how the National Airspace System (NAS) can best be structured to address all user requirements.

The FAA has designated four types of airspace within the U.S:

Controlled airspace is airspace of defined dimensions within which air traffic control service is provided to Instrument Flight Rule (IFR) flights and to Visual Flight Rule (VFR) flights in accordance with the airspace classification (Ref# 258). Controlled airspace is categorized into five separate classes, Classes A through E. These classes identify airspace that is controlled, airspace supporting airport operations, and designated airways providing en route transit from place to place. The classes also dictate pilot qualification requirements, rules of flight that must be followed, and the type of equipment necessary to operate within that airspace.

Special Use Airspace (SUA) is designated airspace within which flight activities are conducted that require confinement of participating aircraft or place operating limitations on non-participating aircraft. Restricted Areas and Military Operations Areas (MOAs) are examples of SUA.

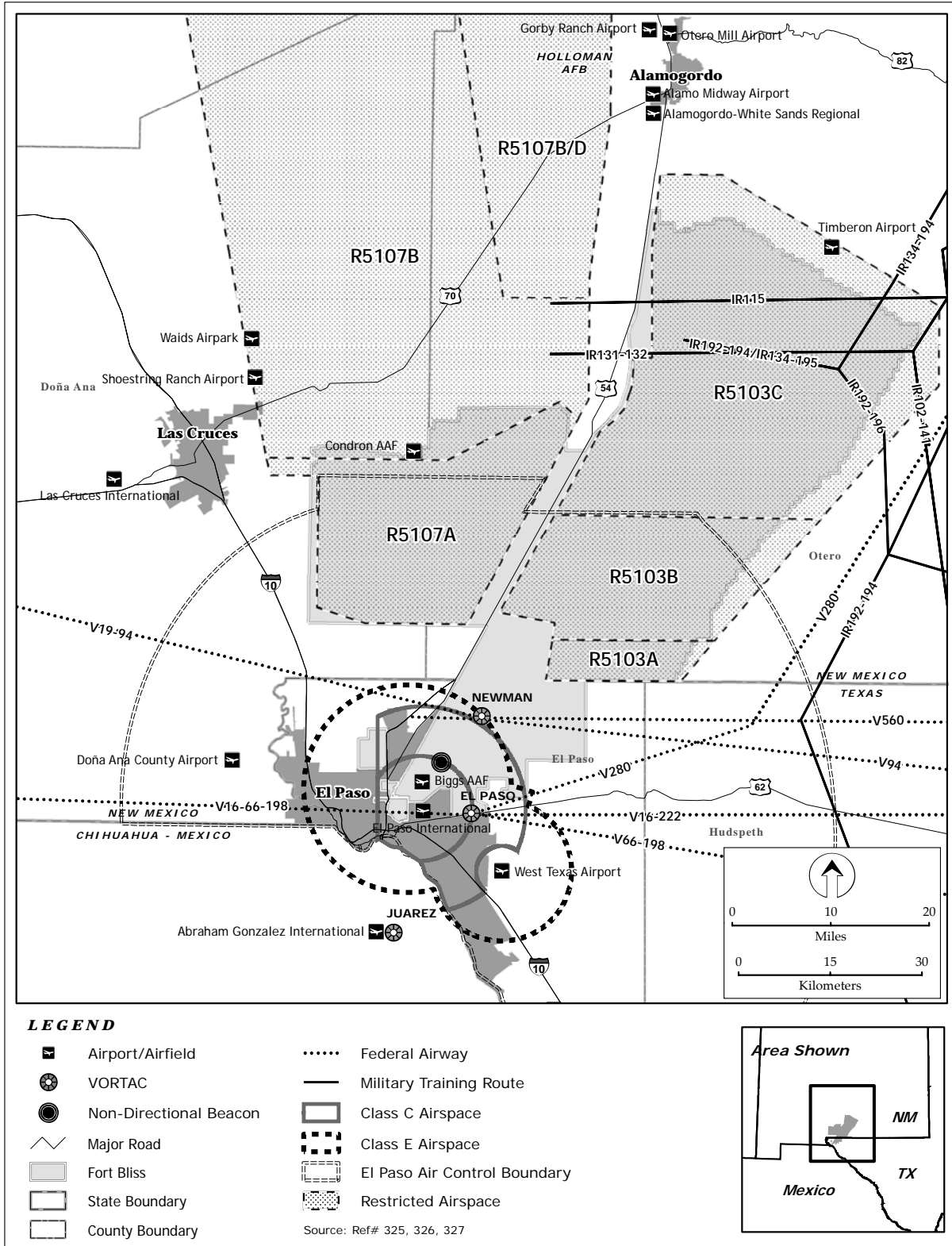
Other airspace consists of advisory areas, areas that have specific flight limitations or designated prohibitions, areas designated for parachute jump operations, Military Training Routes (MTRs), and Aerial Refueling Tracks (ARs). This category also includes Air Traffic Control Assigned Airspace (ATCAA). When not required for other needs, ATCAA is airspace authorized for military use by the managing Air Route Traffic Control Center (ARTCC), usually to extend the vertical boundary of SUA.

Uncontrolled airspace is designated Class G airspace and has no specific prohibitions associated with its use.

The U.S military manages airspace in accordance with processes and procedures detailed in DoD Directive 5030.19, DoD Responsibilities on Federal Aviation and National Airspace System Matters. The U.S. Army implements these requirements through AR 95-2, Air Traffic Control, Airspace, Airfields, Flight Activities, and Navigational Aids.

The ROI for this SEIS is the airspace that is affected by aviation activities at Biggs AAF and the military training activities on McGregor Range and Doña Ana Range–North Training Areas (**Figure 4.4-1**).

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



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Figure 4.4-1. Airspace in the Region of Influence

41 **4.4.1 Terminal Airspace**

42 Biggs AAF mission activities occur within the airspace terminal area under the control of the FAA-
43 operated El Paso Approach Control facility at EPIA. The Approach Control Area contains elements of
44 controlled airspace, uncontrolled airspace, SUA (Restricted Areas), and MTRs.

45 There are several public use and private airports in the ROI. The public-use airports within the El Paso
46 Approach Control Area include EPIA; West Texas Airport near Horizon City, Texas; and Doña Ana
47 County Airport near Santa Teresa, New Mexico. El Paso Approach Control provides terminal area Air
48 Traffic Control (ATC) radar services to Biggs AAF, EPIA, and West Texas Airport. The Doña Ana
49 County Airport is VFR-only with no ATC services. The private Timberon, New Mexico airport lies
50 within the boundaries of Restricted Area R-5103C.

51 Although Biggs AAF and EPIA are contiguous, each has distinct airspace and ATC operating parameters
52 and procedures. Simultaneous operations typically occur at both airports. However, their proximity to
53 one another and the relationship of their runway configurations can require air traffic considerations,
54 particularly during peak traffic periods or instrument weather conditions in which landings and takeoffs at
55 both facilities may be coordinated and controlled as a single airport. The Biggs AAF ATC tower is open
56 from 7:00 a.m. to 10:00 p.m. Monday through Thursday, from 7:00 a.m. to 5:00 p.m. on Friday, and is
57 closed on Saturdays, Sundays, and holidays except when extended hours are requested. When the Biggs
58 AAF ATC tower is closed, aircraft arriving to or departing from Biggs AAF receive air traffic advisories
59 and departure clearances from El Paso Approach Control.

60 The controlled airspace structure within the ROI consists of Class C airspace established around Biggs
61 AAF and EPIA in conjunction with approach control and ATC tower services for IFR operations; Class D
62 airspace around Biggs AAF and EPIA in conjunction with ATC tower services for landings, takeoffs, and
63 instrument procedures at each respective airport; and Class E airspace around Biggs AAF and EPIA for
64 aircraft transitioning between the airports and the enroute airspace environment. Because ATC tower
65 services are not available at the West Texas Airport, Class E airspace has been established to
66 accommodate instrument operations at the airport and aircraft transitioning between the airport and the
67 enroute airspace system.

68 Aviation operations at Biggs AAF have remained relatively constant, with 39,850 in 2002, 38,903 in
69 2003, 39,715 in 2004, and 39,556 in 2005 (Ref# 316). In calendar year (CY) 2004, EPIA supported
70 116,351 aviation operations (Ref# 278).

71 The El Paso Approach Control Area also contains segments of seven low-altitude airways, which are
72 designated as Class E airspace.

73 **4.4.2 Training Airspace**

74 The ROI contains Restricted Area SUA and MTRs that are used for military training operations by the
75 Army and other DoD services.

76 Restricted Areas are airspace that support ground or flight activities that could be hazardous to non-
77 participating aircraft. A Restricted Area is airspace designated under 14 CFR Part 73, within which the
78 flight of aircraft, while not wholly prohibited, is subject to restriction. Most Restricted Areas are
79 designated "joint-use" and IFR/VFR operations in the area may be authorized by the controlling ATC
80 facility when it is not being utilized by the using agency (Ref# 258).

81 MTRs are flight corridors developed and used by the DoD to practice high-speed, low-altitude flight,
82 generally below 10,000 feet above mean sea level (MSL). Specifically, MTRs are airspace of defined
83 vertical and lateral dimensions established for the conduct of military flight training at airspeeds in excess
84 of 250 knots indicated airspeed (Ref# 258). MTRs are identified as Visual Routes (VR) or Instrument
85 Routes (IR).

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

86 The Doña Ana Range–North Training Areas are located in Restricted Area R-5107A, approximately 5
87 nautical miles (nm) north of the New Mexico-Texas border and west of US 54. The lateral boundaries of
88 this Restricted Area extend approximately 13 nm to the north and south. The east/west boundaries are
89 approximately 13.5 nm wide at the southern boundary and 23 nm wide at the northern boundary.
90 Altitudes in R-5107A extend from the surface to unlimited, but there is a 2,000-foot above ground level
91 (AGL) restriction over the part of the Organ Mountains that contains potential raptor nesting habitat. This
92 Restricted Area is active 24 hours a day, 7 days per week (Ref# 326).

93 McGregor Range is located under Restricted Areas R-5103A, B, and C. The lateral boundaries of these
94 Restricted Areas extend northward approximately 45 nm from the New Mexico-Texas border to
95 approximately 8 nm south of Alamogordo, New Mexico, and eastward within a radius of 25 nm of US 54.
96 The altitudes for R-5103A extend from the surface to, but not including, 18,000 feet MSL; for R-5103B
97 from the surface to unlimited; and for R-5103C from surface to unlimited. The published hours of
98 operation for R-5103A/B/C are from 7:00 a.m. to 8:00 p.m. local time Monday through Friday. Changes
99 to these hours of operation are disseminated through the nationwide Notice to Airmen (NOTAM) system
100 that pilots are expected to review prior to flight in the vicinity of Restricted Areas or other defense-related
101 airspace.

102 Segments of eight MTRs transit through the McGregor Range Restricted Area (**Table 4.4-1**).

103

Table 4.4-1. Military Training Routes in the ROI

<i>MTR</i>	<i>Altitude Range</i>	<i>Route Width Range</i>	<i>Operating Hours</i>
IR-102	500' AGL–10,000' MSL	7–10 nm	Daylight hours by NOTAM
IR-115	500' AGL –12,000' MSL	10 nm	Daylight hours by NOTAM
IR-116	500' AGL –12,000' MSL	10 nm	Daylight hours by NOTAM
IR-131	500' AGL –12,000' MSL	10 nm	Daylight hours by NOTAM
IR-132	500' AGL –12 000' MSL	10 nm	Daylight hours by NOTAM
IR-134	100' AGL –12,500' MSL	Varied as defined by geographical coordinates	Sunrise–11:00 p.m.
IR-192	100' AGL –12,500' MSL	10–20 nm	Sunrise–11:00 p.m.
IR-194	100' AGL –12,500' MSL	7–24 nm	Sunrise–11:00 p.m.
IR-195	100' AGL –12,500' MSL	Varied as defined by geographical coordinates	Sunrise–11:00 p.m.

AGL = above ground level; IR = Instrument Route; MSL = mean sea level; nm=nautical mile; NOTAM = Notice to Airmen

1 **4.5 EARTH RESOURCES**

2 The Earth Resources section in the Mission and Master Plan PEIS included six topics: physiography,
3 stratigraphy, structure, seismicity, mineral and energy resources, and soils. There have not been any
4 substantive changes in the condition of the first five topics, and they are not expected to be affected by the
5 actions considered in the SEIS. Therefore, the information in the PEIS is incorporated by reference and
6 not repeated in this document. However, new data have been generated regarding soils in the vicinity and
7 soils are the one earth resource that has the potential to be affected by the proposed land use changes.
8 Therefore, the primary earth resource to be addressed in this SEIS is soils in the Main Cantonment Area
9 and Fort Bliss Training Complex, with specific emphasis on factors that would affect and be affected by
10 construction and ground-disturbing training activities, especially off-road vehicle maneuvers.

11 Since the PEIS, a new soil survey was completed for all of Fort Bliss except approximately 19,160 acres
12 within Lincoln National Forest. The Fort Bliss Soil Survey database (Ref# 191) provides updated soils
13 information in a single data source, including physical, chemical, and engineering properties, as well as
14 limitations for military uses and ecological site descriptions and classifications. The new soil survey data
15 characterize current conditions of soils, vegetation, and overall ecology, which provide a baseline for
16 comparison of the effects of planned future construction and training activities.

17 The ROI for soils is the area that may be affected by proposed changes from facility construction and
18 changes in training or intensity. It includes all Fort Bliss land other than the area within Lincoln National
19 Forest and Castner Range.

20 **4.5.1 General Setting**

21 Major land resource areas (MLRA) are geographically associated land resource units identified by the
22 U.S. Department of Agriculture (Ref# 190) to facilitate regional and national planning. The dominant
23 physical characteristics of the MLRAs describe relevant land use, elevation and topography, climate,
24 water, soils, and potential natural vegetation. Fort Bliss falls within three MLRAs that are briefly
25 described in **Table 4.5-1** to broadly characterize the region. The majority (82 percent) of Fort Bliss falls
26 within MLRA 42: Southern Desertic Basins, Plains, and Mountains. **Figure 4.5-1** displays the MLRAs
27 on Fort Bliss.

28 **4.5.2 Soils on Fort Bliss**

29 In general, soils on Fort Bliss are well drained to excessively drained with depth to bedrock ranging from
30 shallow to very deep. The Soil Survey document (Ref# 282) provides descriptions of general soil map
31 units, grouped by landscape position, that are suitable for characterizing soils over a large area. The eight
32 general soil map units are displayed in **Figure 4.5-2**. Basic characteristics of each of these general soil
33 map units are shown in **Table 4.5-2**.

34 Soil characteristics such as susceptibility to erosion and the suitability for roads, building construction,
35 and use by military vehicles are a function of many physical and chemical properties of each soil, in
36 combination with the climate, topography, and vegetation. Most soils on the North and South Training
37 Areas are highly susceptible to wind erosion, while McGregor Range contains soils that are highly
38 susceptible to both water and wind erosion (Ref# 191).

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

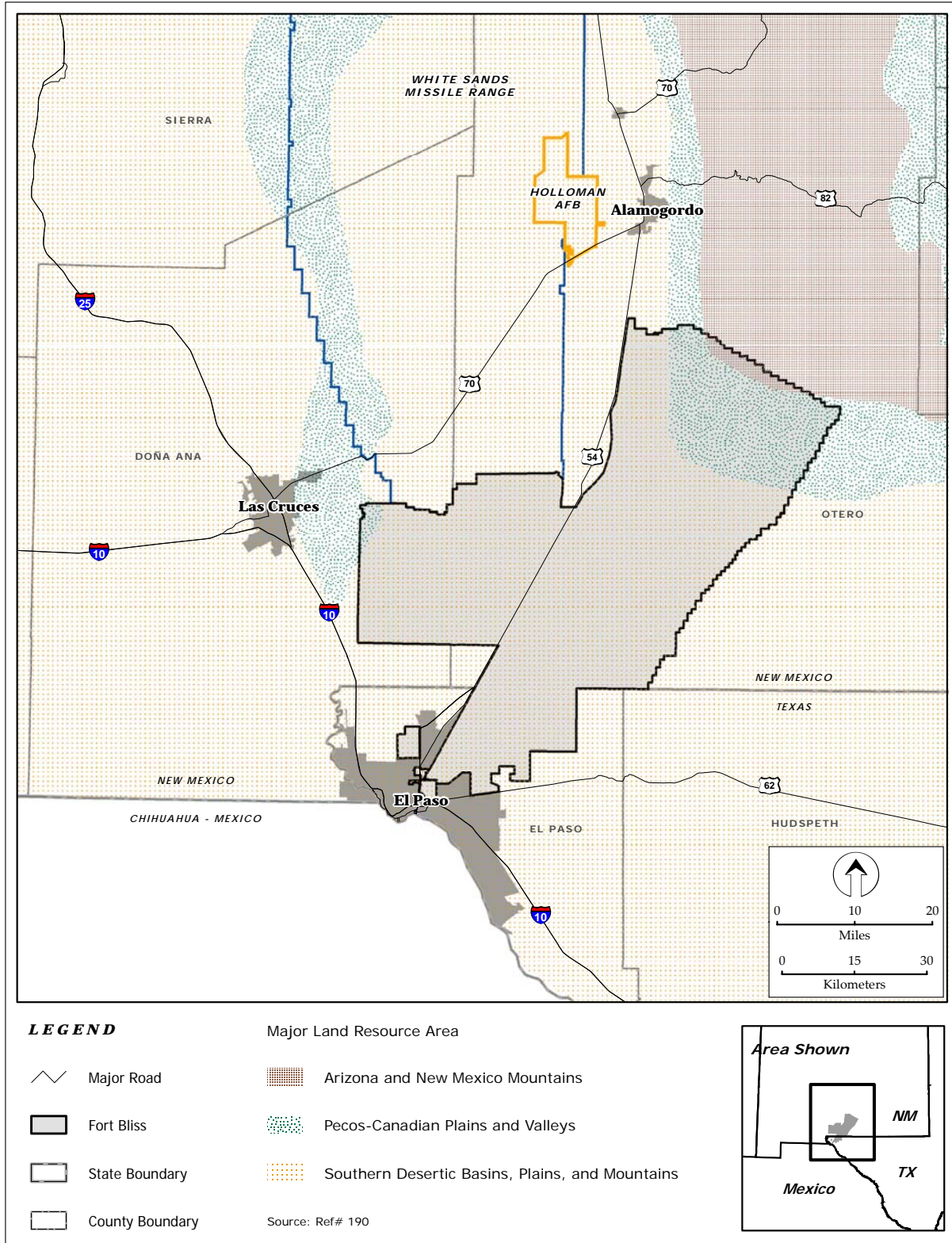
40

Table 4.5-1. Summary of Major Land Resource Areas on Fort Bliss

<i>Major Land Resource Area</i>	<i>Percent of Total Fort Bliss Land</i>	<i>Brief Description of Characteristics</i>
42: Southern Desertic Basins, Plains, and Mountains	82%	<p>About 1/3 federally owned (mainly in New Mexico), with most of the rangeland at low carrying capacity. Mean sea level elevations range from 2,625 feet (800 meters) to 8,530 feet (2,600 meters) in the mountains. Broad desert basins and valleys are bordered by gently sloping to strongly sloping fans and terraces. Average annual precipitation ranges from approximately 8 inches (200 millimeters) to 13 inches (325 millimeters), most occurring from mid-spring to mid-autumn.</p> <p>With scarce surface water and low precipitation, the Rio Grande, Pecos River, and a few larger tributaries are the only perennial streams. Groundwater in deep valley fill provides most water for domestic, municipal, and livestock use.</p> <p>Most soils are well drained and medium textured, formed mainly in locally transported sediments on the smoothly sloping sites. Shallow soils occur on steep and broken hill slopes. This area supports desert grass-shrub vegetation with variations of plant communities, depending on landscape position, soils, and topography.</p>
70: Pecos-Canadian Plains and Valleys	17%	<p>Located in Colorado and New Mexico, mostly in farms, ranches, or other private holdings. Some of the northern and eastern slopes of the high mesas in the north are covered by forest vegetation, but the total forested area is small. Elevation ranges from 3,940 feet (1,200 meters) to almost 7,900 feet (2,400 meters), increasing gradually from southeast to northwest. Most of these dissected high plains are gently sloping to rolling, but bands of steep slopes and rough broken land border the stream valleys. Average annual precipitation ranges from approximately 12 inches (300 millimeters) to 16 inches (400 millimeters), fluctuating widely from year to year.</p> <p>Water is scarce throughout the area because of low and erratic precipitation and few perennial streams. Groundwater in deep sand and gravel in the north and from limestone in the south provides water for domestic and agricultural purposes, but is scarce in areas where shale and sandstone are near the surface.</p> <p>Most soils are well drained and moderately fine to moderately coarse textured with mixed mineralogy. Vegetation is predominantly short and mid-height grasses, dominated by blue grama, western wheatgrass, and lesser amounts of black grama, galleta, New Mexico feathergrass, and a variety of shrubs, half shrubs, and forbs in the southern part. Scattered juniper and piñon with an understory of sideoats grama, bottlebrush squirreltail, and western wheatgrass grow on shallow soils and in escarpments.</p>
39: Arizona and New Mexico Mountains	1%	<p>Located in parts of Arizona, Colorado, New Mexico, and Utah. Mostly covered with timber and woodlands. Most of this area is very hilly and mountainous, with an upland plateau dissected by deep canyons.</p> <p>Average annual precipitation is higher than MLRA 42, increasing with elevation, with more larger streams and tributaries maintaining perennial flow. Groundwater is limited and usually occurs at great depth.</p> <p>At lower elevations, soils overlie mostly sedimentary rocks and old alluvium. Vegetation at lower elevations grade to chaparral and grassland.</p>

Source: Ref# 190

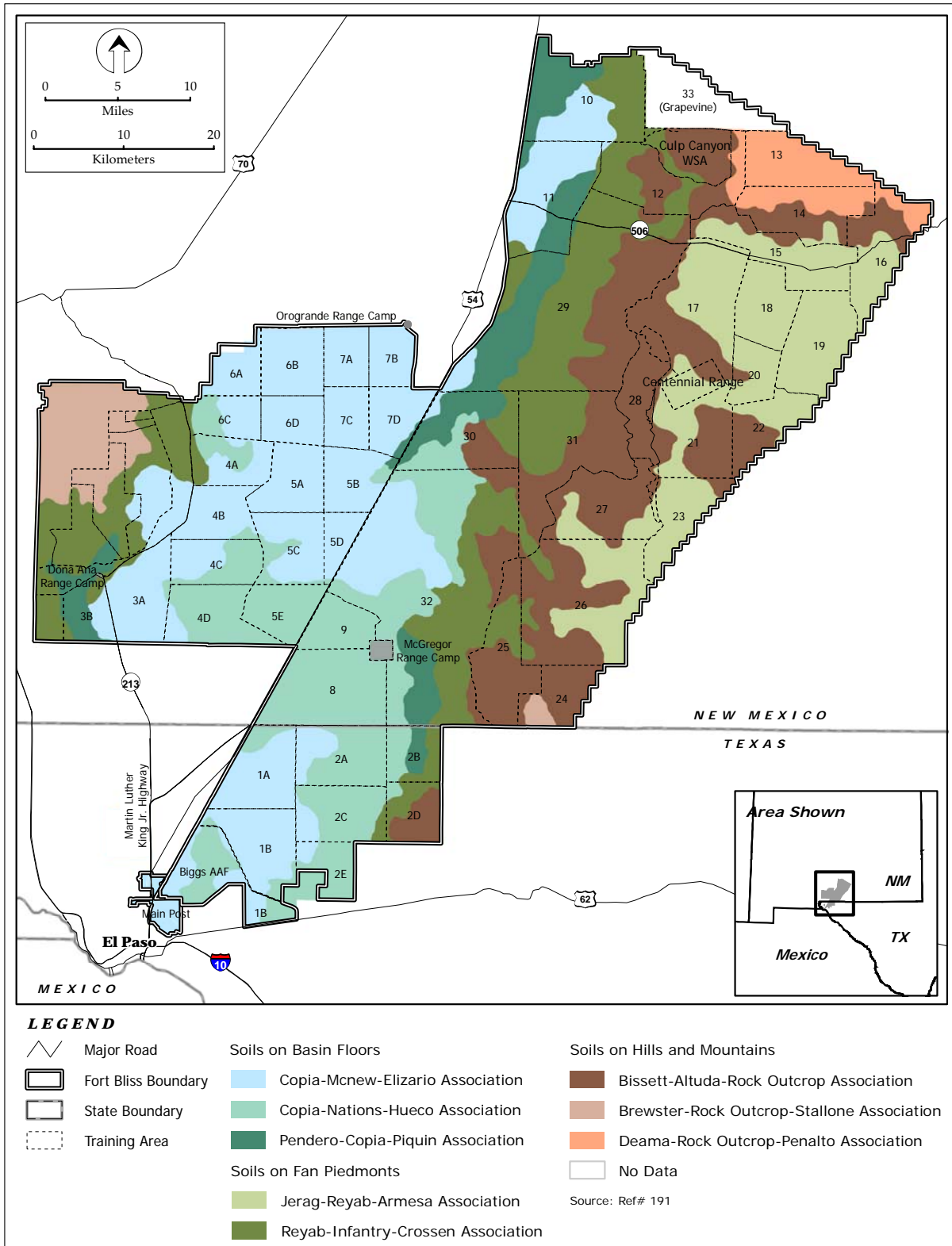
**Fort Bliss Mission and Master Plan Supplemental Programmatic Environmental Impact Statement
Final SEIS**



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Figure 4.5-1. Major Land Resource Areas on Fort Bliss

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



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Figure 4.5-2. General Soil Map Units on Fort Bliss

Table 4.5-2. Characteristics of General Soil Map Units

<i>Landscape Position</i>	<i>Map Unit Name</i>	<i>Percent of Fort Bliss¹</i>	<i>Physical Properties</i>
Basin Floors	Copia-Mcnew-Elizario Association	22%	2–5% slopes, very deep, well drained to excessively drained, high proportion of sand on surface
	Pendero-Copia-Piquin Association	6%	2–15% slopes, very deep, excessively drained, loamy fine sand to very gravelly sandy loam surface texture
	Copia-Nations-Hueco Association	15%	0–5% slopes, very deep to moderately deep, loamy fine sand surface texture
Subtotal	Basin Floors	43%	
Fan Piedmonts	Reyab-Infantry-Crossen Association	20%	0-10% slopes, well drained, very deep to very shallow, surface texture mixed (silt loam, very gravelly loam, gravelly fine sandy loam)
	Jerag-Reyab-Armesa Association	14%	0–5% slopes, well drained, very deep to shallow, very fine sandy loam and silt loam surface texture
Subtotal	Fan Piedmonts	34%	
Hills and Mountains	Deama-Rock Outcrop-Penalto Association	3%	5–65% slopes, well drained, shallow and very shallow, very cobbly or gravelly loam surface texture
	Brewster-Rock Outcrop-Stallone Association	4%	5–90% slopes, well drained, very deep to very shallow, very gravelly loam to extremely bouldery sandy loam surface texture and rock outcrop
	Bissett-Altuda-Rock Outcrop Association	16%	5–65% slopes, well drained, shallow and very shallow, very gravelly or very cobbly loam surface texture
Subtotal	Hills and Mountains	23%	

1. Excluding Castner Range and TA 33 (Grapevine)
Source: Ref# 282

46 Soil loss tolerance is the maximum rate of soil loss that can occur while sustaining productivity. When
47 soil loss is greater than the tolerance threshold, erosion is considered excessive. This generally results
48 from human activities that remove the ground cover and loosen the soil, exposing soil to wind and water,
49 accelerating the erosion process. Many of the soils on Fort Bliss are deep, with a relatively high (5 tons
50 per acre per year) soil loss tolerance. However, with vegetation damaged or removed, annual erosion
51 frequently exceeds 5 tons per acre, resulting in sand dunes, rills, gullies, and soil pedestals evident in
52 many places (Ref# 191).

53 The Soil Survey (Ref# 191, 282) provides interpretations for specific land uses. These include suitability
54 ratings for construction and maintenance of buildings and roads, erosion hazards, and soil trafficability
55 using a range of vehicles under wet and dry conditions. **Table 4.5-3** summarizes areas on Fort Bliss
56 associated with selected soil ratings, hazards, and limitations that are relevant to the proposed mission
57 changes.

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

58

Table 4.5-3. Soil Limitations for Use on Fort Bliss

<i>Land or Training Use¹</i>	<i>Percent of Soils with Designated Rating, Hazard, or Limitation</i>				
	<i>Excellent/ Slight Limitations</i>	<i>Good²</i>	<i>Fair/ Moderate Limitations</i>	<i>Poor/ Severe Limitations</i>	<i>Not Rated³</i>
Main Post and Biggs AAF					
Natural Surface Road Construction	96%	N/A	0%	2%	2%
Small Commercial Buildings	71%	N/A	27%	0%	2%
Wind Erosion	0%	N/A	0%	100%	0%
Water Erosion	100%	N/A	0%	0%	0%
Trafficability, Vehicle Type 2	51% (wet) 98% (dry)	47% (wet) 0% (dry)	0% (wet) 0% (dry)	0% (wet) 0% (dry)	2% (wet) 2% (dry)
Trafficability, Vehicle Type 3	51% (wet) 98% (dry)	47% (wet) 0% (dry)	0% (wet) 0% (dry)	0% (wet) 0% (dry)	2% (wet) 2% (dry)
Trafficability, Vehicle Type 4	51% (wet) 98% (dry)	47% (wet) 0% (dry)	0% (wet) 0% (dry)	0% (wet) 0% (dry)	2% (wet) 2% (dry)
South Training Areas (TAs 1A, 1B, 2A-E)					
Natural Surface Road Construction	88%	N/A	4%	5%	3%
Small Commercial Buildings	65%	N/A	27%	5%	3%
Wind Erosion	0%	N/A	0%	100%	0%
Water Erosion	95%	N/A	2%	3%	0%
Trafficability, Vehicle Type 2	61% (wet) 95% (dry)	34% (wet) 0% (dry)	0% (wet) 1% (dry)	2% (wet) 2% (dry)	3% (wet) 2% (dry)
Trafficability, Vehicle Type 3	61% (wet) 95% (dry)	33% (wet) 0% (dry)	1% (wet) 1% (dry)	2% (wet) 2% (dry)	3% (wet) 2% (dry)
Trafficability, Vehicle Type 4	61% (wet) 95% (dry)	33% (wet) 0% (dry)	1% (wet) 1% (dry)	2% (wet) 2% (dry)	2% (wet) 2% (dry)
North Training Areas (TAs 3A & B, 4 A-D, 5 A-E, 6 A-D, 7 A-D, AA)					
Natural Surface Road Construction	96%	N/A	4%	0%	0%
Small Commercial Buildings	55%	N/A	43%	2%	0%
Wind Erosion	0%	N/A	0%	100%	0%
Water Erosion	100%	N/A	0%	0%	0%
Trafficability, Vehicle Type 2	49% (wet) 100% (dry)	51% (wet) 0% (dry)	0% (wet) 0% (dry)	0% (wet) 0% (dry)	0% (wet) 0% (dry)
Trafficability, Vehicle Type 3	49% (wet) 100% (dry)	51% (wet) 0% (dry)	0% (wet) 0% (dry)	0% (wet) 0% (dry)	0% (wet) 0% (dry)
Trafficability, Vehicle Type 4	49% (wet) 100% (dry)	51% (wet) 0% (dry)	0% (wet) 0% (dry)	0% (wet) 0% (dry)	0% (wet) 0% (dry)
Doña Ana Range					
Natural Surface Road Construction	24%	N/A	44%	25%	7%
Small Commercial Buildings	21%	N/A	46%	25%	8%
Wind Erosion	14%	N/A	0%	86%	0%
Water Erosion	58%	N/A	32%	10%	0%
Trafficability,	12% (wet)	62% (wet)	0% (wet)	18% (wet)	8% (wet)

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

<i>Land or Training Use¹</i>	<i>Percent of Soils with Designated Rating, Hazard, or Limitation</i>				
	<i>Excellent/ Slight Limitations</i>	<i>Good²</i>	<i>Fair/ Moderate Limitations</i>	<i>Poor/ Severe Limitations</i>	<i>Not Rated³</i>
Vehicle Type 2	73% (dry)	0% (dry)	1% (dry)	18% (dry)	8% (dry)
Trafficability, Vehicle Type 3	12% (wet) 73% (dry)	61% (wet) 0% (dry)	1% (wet) 1% (dry)	18% (wet) 18% (dry)	8% (wet) 8% (dry)
Trafficability, Vehicle Type 4	12% (wet) 73% (dry)	61% (wet) 0% (dry)	1% (wet) 1% (dry)	18% (wet) 18% (dry)	8% (wet) 8% (dry)
McGregor Range, North Tularosa Basin (TAs 10, 11, & 29 north of Highway 506, west half of 12)					
Natural Surface Road Construction	46%	N/A	42%	8%	4%
Small Commercial Buildings	43%	N/A	18%	35%	4%
Wind Erosion	2%	N/A	0%	98%	0%
Water Erosion	93%	N/A	5%	2%	0%
Trafficability, Vehicle Type 2	24% (wet) 91% (dry)	71% (wet) 0% (dry)	0% (wet) 4% (dry)	1% (wet) 1% (dry)	4% (wet) 4% (dry)
Trafficability, Vehicle Type 3	24% (wet) 91% (dry)	59% (wet) 0% (dry)	12% (wet) 4% (dry)	1% (wet) 1% (dry)	4% (wet) 4% (dry)
Trafficability, Vehicle Type 4	24% (wet) 91% (dry)	59% (wet) 0% (dry)	12% (wet) 4% (dry)	1% (wet) 1% (dry)	4% (wet) 5% (dry)
McGregor Range, South Tularosa Basin (TAs 8, 9, 25, 30, 31, 32, 11 and 29 south of Highway 506)					
Natural Surface Road Construction	46%	N/A	27%	17%	10%
Small Commercial Buildings	44%	N/A	18%	35%	4%
Wind Erosion	2%	N/A	0%	98%	0%
Water Erosion	81%	N/A	14%	5%	0%
Trafficability, Vehicle Type 2	34% (wet) 81% (dry)	52% (wet) 0% (dry)	0% (wet) 5% (dry)	4% (wet) 3% (dry)	10% (wet) 11% (dry)
Trafficability, Vehicle Type 3	34% (wet) 81% (dry)	44% (wet) 0% (dry)	8% (wet) 5% (dry)	4% (wet) 3% (dry)	10% (wet) 11% (dry)
Trafficability, Vehicle Type 4	34% (wet) 81% (dry)	43% (wet) 0% (dry)	9% (wet) 5% (dry)	3% (wet) 3% (dry)	11% (wet) 11% (dry)
McGregor Range, Southeast Training Areas (TAs 24, 26, 27)					
Natural Surface Road Construction	17%	N/A	19%	42%	22%
Small Commercial Buildings	2%	N/A	21%	49%	28%
Wind Erosion	6%	N/A	0%	94%	0%
Water Erosion	50%	N/A	32%	18%	0%
Trafficability, Vehicle Type 2	0% (wet) 47% (dry)	60% (wet) 13% (dry)	0% (wet) 0% (dry)	12% (wet) 12% (dry)	28% (wet) 28% (dry)
Trafficability, Vehicle Type 3	0% (wet) 47% (dry)	47% (wet) 0% (dry)	13% (wet) 13% (dry)	12% (wet) 12% (dry)	28% (wet) 28% (dry)
Trafficability, Vehicle Type 4	0% (wet) 47% (dry)	47% (wet) 13% (dry)	13% (wet) 0% (dry)	12% (wet) 12% (dry)	28% (wet) 28% (dry)
Remainder of McGregor Range (TAs 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 28, 33, east half of 12)					
Natural Surface Road Construction	26%	N/A	21%	35%	18%
Small Commercial Buildings	0%	N/A	36%	42%	22%

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

<i>Land or Training Use¹</i>	<i>Percent of Soils with Designated Rating, Hazard, or Limitation</i>				
	<i>Excellent/ Slight Limitations</i>	<i>Good²</i>	<i>Fair/ Moderate Limitations</i>	<i>Poor/ Severe Limitations</i>	<i>Not Rated³</i>
Wind Erosion	1%	N/A	0%	99%	0%
Water Erosion	61%	N/A	22%	17%	0%
Trafficability, Vehicle Type 2	0% (wet) 58% (dry)	65% (wet) 0% (dry)	0% (wet) 9% (dry)	11% (wet) 11% (dry)	24% (wet) 22% (dry)
Trafficability, Vehicle Type 3	0% (wet) 57% (dry)	57% (wet) 0% (dry)	9% (wet) 9% (dry)	11% (wet) 11% (dry)	23% (wet) 23% (dry)
Trafficability, Vehicle Type 4	0% (wet) 47% (dry)	47% (wet) 0% (dry)	13% (wet) 13% (dry)	12% (wet) 12% (dry)	28% (wet) 28% (dry)

1. Vehicle Type 2 includes high-speed tracked vehicles like M2A1, M2A2, and trucks like HMMWV. Vehicle Type 3 includes tracked vehicles like 155-mm, Howitzer, and M1A1 tanks. Vehicle Type 4 includes most medium tanks like M1A2.
 2. Applies only to vehicle trafficability ratings.
 3. Includes miscellaneous map units such as rock outcrops, pits, and dumps.
- AA = Assembly Area
Source: Ref# 191

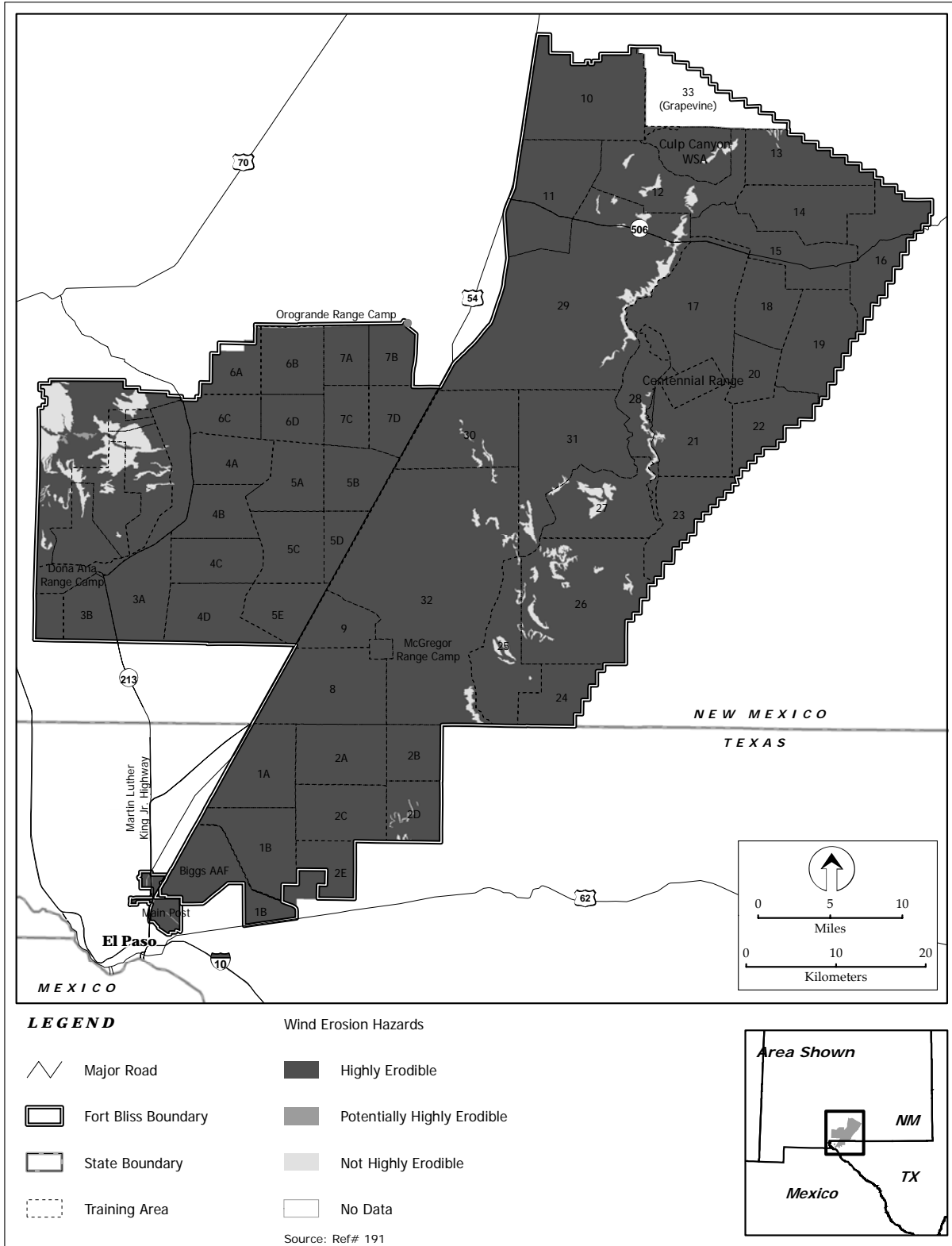
59 Limitations for Natural Surface Road Construction are developed by considering soil properties such as
60 slope, rock fragments, ponding, and soil slippage that could cause problems for roads of minimal design
61 and construction. This category is used to alert managers to areas where roads should be rerouted or
62 where mitigation measures would be needed to minimize maintenance needs (Ref# 191).

63 Soil properties influence the construction of Small Commercial Buildings, including the selection of the
64 site, the design of the structure, construction, performance after construction, and maintenance. Small
65 Commercial Buildings are structures less than three stories high without basements. Rating terms
66 indicate the extent to which the soil features affect building site development. A slight rating indicates
67 that the soil is favorable for building construction and low maintenance can be expected. Moderate
68 limitations can be overcome or minimized by special planning, design, or installation. Severe limitations
69 indicate that the soils are unfavorable and generally cannot be overcome without major soil reclamation,
70 special design, or expensive installation procedures (Ref# 282).

71 Based on the Soil Survey database (Ref# 191), the slight, moderate, and severe limitations for erosion
72 shown in Table 4.5-3 correlate to the Not Highly Erodible, Potentially Highly Erodible, and Highly
73 Erodible areas shown in **Figures 4.5-3** and **4.5-4**. The correlations were computed by comparing the
74 Highly Erodible ratings for each soil map unit to the Kw factor (for water erosion) or Wind Erosion Index
75 for dominant soil components.

76 Erosion Hazard ratings indicate the susceptibility of soils to accelerated wind or water erosion (shown in
77 Figures 4.5-3 and 4.5-4 for the Fort Bliss Training Complex). A rating of slight (Not Highly Erodible)
78 indicates that erosion is unlikely under ordinary climatic conditions with natural vegetation and ground
79 cover intact; moderate (Potentially Highly Erodible) indicates that some erosion is likely and erosion
80 control measures may be needed; severe (Highly Erodible) indicates that erosion is very likely and
81 erosion control measures are advised. If soils with severe erosion hazards are left untreated, significant
82 erosion is expected, resulting in loss of soil productivity and off-site damage. There is a close correlation
83 between soil blowing and the size and durability of surface crust, rock fragments, and organic matter.
84 This rating considers the natural vulnerability of the soils, with erosion most likely to occur if vegetation
85 or other ground cover is reduced or removed. For example, if repeated maneuvers cause damage to
86 vegetation or removal of ground cover like leaves, biological crusts, or other litter, the training areas with
87 the highest percentage of soils with severe erosion hazards would be the most likely to erode, causing
88 onsite and offsite damage and possibly resulting in unstable conditions for future training (Ref# 282).

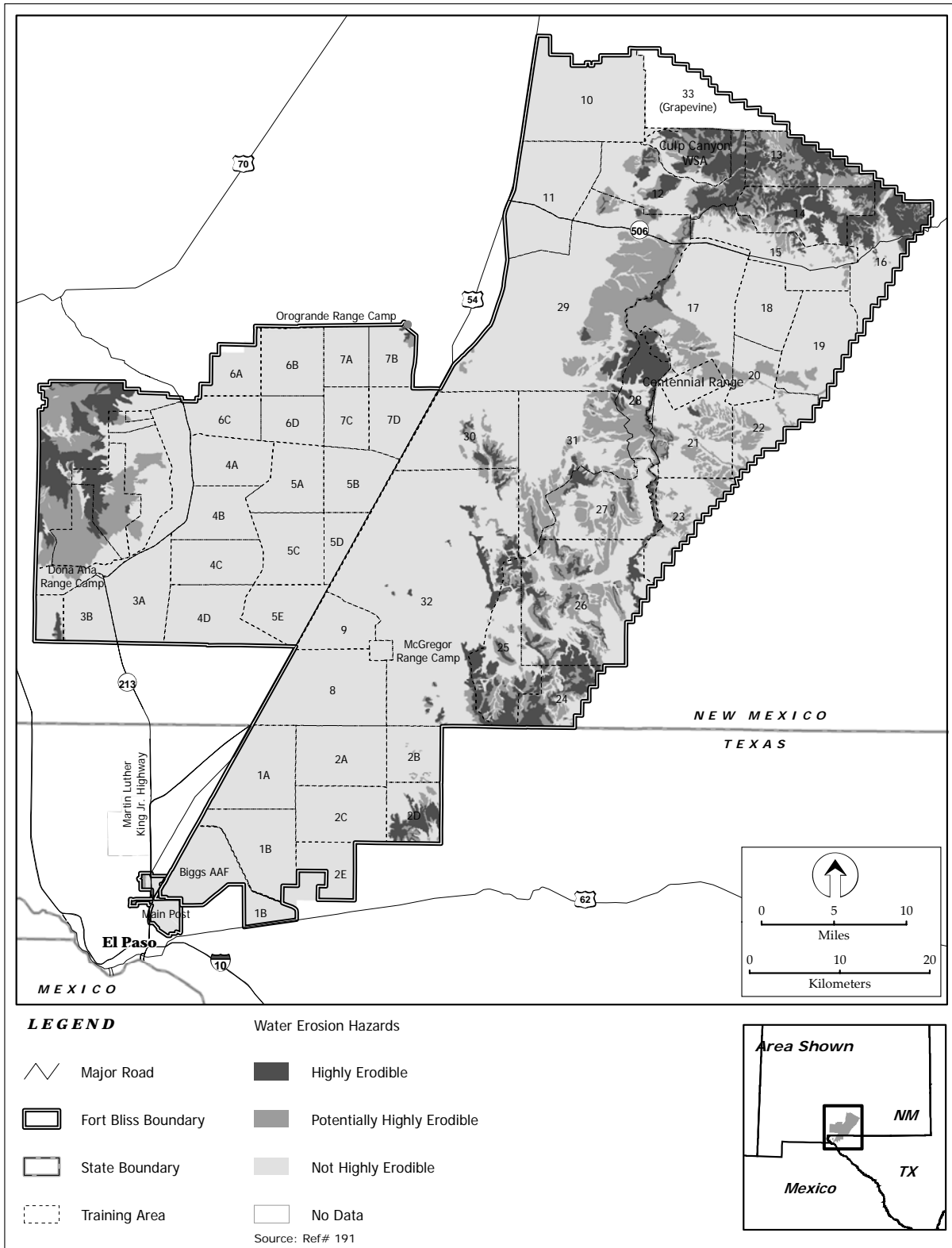
**Fort Bliss Mission and Master Plan Supplemental Programmatic Environmental Impact Statement
Final SEIS**



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Figure 4.5-3. Soils on Fort Bliss Susceptible to Wind Erosion

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



91
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Figure 4.5-4. Soils on Fort Bliss Susceptible to Water Erosion

93 Trafficability is the capacity of soils to support military vehicles. Trafficability is affected by soil
94 strength, slope, stickiness, slipperiness, vegetation, and natural obstacles. It is subdivided by vehicle type,
95 depending on the contact pressure of tires or tracks and vehicle weight, and considers the effect on the
96 surface soil layer under wet or dry conditions. The Soil Survey provides Trafficability ratings under wet
97 conditions (high soil moisture) for one pass and 50 passes during a wet season. The ratings listed in
98 Table 4.5-3 are for 50 passes. An excellent rating means that soil features are very favorable for the
99 vehicle to pass; good indicates moderately favorable soil conditions; fair indicates some significant soil
100 limitations that are likely to require adjustments to the vehicle spacings or route; poor indicates soil
101 features that cannot be overcome. Areas with fair to poor trafficability may require greater vehicle
102 maintenance (Ref# 282).

103 **4.5.3 Ecological Conditions**

104 The new Fort Bliss Soil Survey (Ref# 191, 282) describes ecological sites and applies the principles of
105 the transition state concept to characterize changes in the ecosystem structure and function. The state and
106 transitional model provides a framework for understanding vegetation dynamics that incorporates current
107 ecological knowledge from many different sources. State and transition models in the ecological site
108 (also called ecosite) description characterize ecological states (vegetative and ecological conditions) and
109 transitions (ecological dynamics) that lead to changes in vegetative and ecologic conditions. An
110 ecological site is defined as “a kind of land with specific physical characteristics, which differs from other
111 kinds of land in its ability to produce distinctive kinds and amounts of vegetation and in its response to
112 management” that is correlated with soil map units (Ref# 194). This concept was developed by a task
113 force for the Society of Range Management to provide improved methods of tracking and monitoring
114 rangeland health while providing some sensitive and useful tools to manage for sustainability. Since
115 1997, agency leaders for the three agencies with primary responsibility for assessing rangeland health
116 (BLM, U.S. Forest Service, and Natural Resources Conservation Service) participated in a committee to
117 promote the use of the ecological site concept and to develop indicators and protocols for assessment
118 (Ref# 194).

119 Each ecological site describes a desired plant community and uses a threshold concept to characterize
120 changes in the system. There are 17 standard indicators that are used to evaluate soil and site stability,
121 hydrologic function, and biotic integrity and their degree of departure from the potential plant community
122 and optimum ecological condition. These indicators primarily include measures of erosion by water and
123 wind, plant community composition and production, and earth cover (Ref# 41).

124 The various plant community types possible on an ecological site correspond to the states of the
125 vegetation and soil and help determine the management actions that may cause a transition from one plant
126 community to another. Each ecosite description that follows the new format adopted by the lead federal
127 agencies includes a description of the historic climax plant community species composition, ground
128 cover, and production in its optimum state. It also describes other transition states that result due to
129 degradation of the optimum system. On the Fort Bliss Training Complex, the departure from the historic
130 plant community typically involves a reduction in grasses, increasing shrub components and bare ground,
131 and accelerated soil erosion. This condition also exists in other areas of the Chihuahuan Desert that have
132 been disturbed. In general, transitions to shrub-invaded and shrub-dominated ecosites are considered very
133 difficult to convert back to higher level states dominated by grasses, even with active management (Ref#
134 29).

135 The ecosite description attempts to attribute possible causes for transitions within each ecosite, such as
136 overgrazing, drought, or surface-disturbing activities, but it does not identify specific causes and effects.
137 However, considering the transition states of the ecosites that dominate each of the major segments of the
138 Fort Bliss Training Complex provides a way to characterize current conditions and evaluate the likelihood
139 of change as more of the training areas are affected by off-road vehicle maneuvers. The occurrence of

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

140 coppice dunes is one indicator of a lower transition state, especially on Sandy and Deep Sand ecosites.
141 Coppice dunes existed on Fort Bliss prior to military use.

142 The dominant ecological sites are summarized in **Table 4.5-4**, grouped by segment. Only those ecosites
143 comprising 5 percent or more of each segment are listed, so the total is less than 100 percent. Only those
144 with an ecosite identification (ID) ending in NM are currently described using the new ecological site
145 description content and format containing the transition state model. Where ecosites have the same name
146 but different ID numbers (Loamy, for example), the primary difference is related to precipitation, which
147 causes other differences in vegetative cover and soils.

Table 4.5-4. Dominant Ecological Sites in the Fort Bliss Training Complex

<i>Training Range Segment</i>	<i>Ecological Site Name</i>	<i>Ecosite ID</i>	<i>Percent of Segment</i>
South Training Areas (TAs 1A & B, 2 A-E)	Deep Sand 8 to 10.5 inches	R042XB011NM	74%
	Gravelly	R042XB014NM	7%
	Loamy 8 to 10.5 inches	R042XC001NM	6%
	Sandy 8 to 10.5 inches	R042XB012NM	6%
	Limestone Hill & Mountain (Desert Grassland)	R042XY249TX	5%
North Training Areas (TAs 3A & B, 4 A-D, 5 A-E, 6 A-D, 7 A-D, AA)	Deep Sand 8 to 10.5 inches	R042XB011NM	83%
	Sandy 8 to 10.5 inches	R042XB012NM	5%
Doña Ana Range	Gravelly	R042XC001NM	28%
	Igneous Hills	R042XE002NM	16%
	Igneous Mountains	R042XF001NM	11%
	Foothill Slope (Mixed Prairie)	R042XY274TX	11%
	Gravelly Sand 8 to 10.5 inches	R042XB024NM	7%
	Igneous Hill & Mountain (Desert Grassland)	R042XY247TX	6%
	Limestone Hill & Mountain (Desert Grassland)	R042XY249TX	5%
McGregor Range, North Tularosa Basin (TAs 10, 11 & 29 north of Highway 506, west half of 12)	Deep Sand 8 to 10.5 inches	R042XB011NM	37%
	Loamy 8 to 10.5 inches	R042XC007NM	30%
	Gravelly	R042XC001NM	16%
	Sandy 8 to 10.5 inches	R042XB012NM	6%
	Limestone Hill & Mountain (Desert Grassland)	R042XY249TX	5%
McGregor Range, South Tularosa Basin (TAs 9, 25, 30, 31, 32, 11 & 29 south of Highway 506)	Deep Sand 8 to 10.5 inches	R042XB011NM	31%
	Gravelly	R042XC001NM	21%
	Loamy 8 to 10.5 inches	R042XC007NM	15%
	Limestone Hill & Mountain (Desert Grassland)	R042XY249TX	15%
	Sandy 8 to 10.5 inches	R042XB012NM	12%
McGregor Range, Southeast Training Areas (TAs 24, 26, 27)	Limestone Hills	R042XE001NM R070XD151NM R042XE001NM	35%
	Limestone Hill & Mountain (Desert Grassland)	R042XY249TX	16%
	Shallow Sandy 12 to 14 inches	R042XD006NM	13%
	Loamy 12 to 14 inches	R042XD001NM	8%
	Gravelly	R042XC001NM	7%
	Limy 12 to 14 inches	R042XD004NM	6%
	Loamy 8 to 10.5 inches	R042XC007NM	6%
	Draw 12 to 14 inches	R042XD003NM	6%

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

<i>Training Range Segment</i>	<i>Ecological Site Name</i>	<i>Ecosite ID</i>	<i>Percent of Segment</i>
Otero Mesa (TAs 15, 17, 18, 19, 20, 21, 22, 23, 28, ACEC, Centennial Range)	Limy 12 to 14 Inches	R042XD004NM	24%
	Limestone Hills	R042XE001NM	19%
		R070XD151NM	
		R042XC020NM	
	Loamy 12 to 14 inches	R042XD001NM	18%
	Shallow Sandy 12 To 14 inches	R042XD006NM	18%
Gravelly 12 to 14 inches	R042XD007NM	7%	
	Limestone Hill & Mountain (Desert Grassland)	R042XY249TX	6%
Sacramento Foothills (TAs 12, 13, 14, 16, 33 Grapevine, Culp Canyon WSA)	Limestone Hills	R042XE001NM	56%
		R070XD151NM	
		R042XC020NM	
	Limestone Hill & Mountain (Desert Grassland)	R042XY249TX	16%
	Gravelly	R042XC001NM	8%
Draw 12 to 14 inches	R042XD003NM	7%	
Loamy 12 to 14 inches	R042XD001NM	5%	
All of Fort Bliss with Ecological Sites Mapped (1,103,595 acres)	Deep Sand 8 to 10.5 inches	R042XB011NM	34%
	Gravelly	R042XC001NM	11%
	Limestone Hills	R042XE001NM	10%
	Limestone Hill & Mountain (Desert Grassland)	R042XY249TX	8%
	Loamy 8 To 10.5 inches	R042XC007NM	8%
	Sandy 8 to 10.5 inches	R042XB012NM	5%

Source: Ref# 191

149 The dominant ecosites, totaling at least 10,000 acres within the Fort Bliss Training Complex, are listed in
 150 **Table 4.5-5**, in descending order of total acreage. The ecosite ID numbers provide information on the
 151 dominant land type (R for rangeland), MLRA (for example, 042X), a letter reflecting the Land Resource
 152 Unit (the basic unit from which MLRAs are determined), a three-digit site number assigned by the state,
 153 and the postal code for the state responsible for the ecosite description (NM or TX). A brief description
 154 of the ecosites and the most common transition state are also included in the table. The most common
 155 transition states are based on vegetation mapping of Fort Bliss (see Section 4.8).

156 **Table 4.5-5. Dominant Ecosites and Brief Descriptions, in Order of Occurrence**

<i>Ecosite Name (% of Fort Bliss)</i>	<i>Ecosite ID</i>	<i>Current Estimated Primary Transition State¹</i>	<i>Brief Description</i>
Deep Sand (34%)	R042XB011NM	Mesquite Dune State	This ecosite often intergrades with either the Sandy or Gravelly Sand ecosites. The historic plant community of this ecosite is dominated by dropseeds and a significant cover of black grama and bush muhly. Coppice dunes are similar to the mesquite-dominated state in the Sandy ecosite. This site is often associated with dunes in the soil survey data, primarily on either Copia or Nations soil map unit components. Causes of the transition from the historic plant community are unknown, but may relate to destruction of plants by trampling or vehicles with consequent erosion.

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

<i>Ecosite Name (% of Fort Bliss)</i>	<i>Ecosite ID</i>	<i>Current Estimated Primary Transition State¹</i>	<i>Brief Description</i>
Gravelly (11%)	R042XC001NM	Shrubland	This ecosite is associated with Limestone Hills, Draw, Loamy, and Sandy sites. The historic plant community is dominated by grasses, with shrubs scattered and evenly distributed. Black grama is the dominant grass species; winterfat, fourwing saltbush, and creosotebush are common shrubs. Overgrazing, other damage to vegetation, or extended drought can reduce grass cover, effect a change in grass species dominance, and may result in a shrub-dominated state.
Limestone Hills (10%)	R042XC020NM R042XE001NM R070XD151NM	Grass-Succulent Mix	This ecosite is associated with both Draw and Gravelly ecosites, but in a higher topographic position. The historic plant community is a grass/succulent mix, with grasses dominant, followed by succulents and shrubs. Forbs are the minor component. Transitions from Grass-Succulent mix to a Succulent-Dominated state may occur as a result of surface disturbance.
Limestone Hill & Mountain (Desert Grassland) (8%)	R042XY249TX	Grass-Succulent Mix	The historic plant community includes mid- and short-grasses with an abundance of perennial forbs and woody shrubs. Transitions from Grass-Succulent mix to a Succulent-dominated state may occur as a result of surface disturbance.
Loamy 8 to 10.5 inches (8%)	R042XC007NM	Shrub-Dominated	This ecosite is associated with the Gyp Upland, Gravelly, and Shallow ecosites. The historic plant community is dominated by grasses with shrubs sparse and evenly distributed. Continuous damage to grass cover reduces surface water infiltration and may eventually effect a change to bare or shrub-dominated states from which it is extremely difficult to recover. Survey data and vegetation mapping indicate relatively low perennial grass cover, high percentages of bare ground, and the beginning of mesquite invasion.
Sandy 8 to 10.5 inches (5%)	R042XB012NM	Mesquite Shrubland	This ecosite is often associated with the Shallow Sandy ecosite depending on the depth of caliche and intergrades with Deep Sand and Gravelly Sand. The historic plant community is dominated by black grama and other grasses, especially dropseeds. Shrub invasion is very common, and mesquite invasion is documented by the average mesquite canopy cover on 27 plots. The causes for transition to coppice dunes is attributed to drought and surface disturbance, including grazing.
Limy 12 to 14 inches (4%)	R042XD004NM	Shrub-Invaded Grasslands	This ecosite is associated with the Gyp Upland ecosite with an increase in alkali sacaton along this interface. The historic plant community is dominated by grasses with shrubs and half-shrubs sparse and evenly distributed. Tobosa, black grama, and blue grama are the dominant species. Retrogression within this state is characterized by a decrease in black and blue grama and an increase in burrograss, initiated by a transition to a Burrograss-Grassland state. Continued reduction in grass

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

<i>Ecosite Name (% of Fort Bliss)</i>	<i>Ecosite ID</i>	<i>Current Estimated Primary Transition State¹</i>	<i>Brief Description</i>
			cover and resulting infiltration problems may eventually effect a change to a Bare State, with very little or no remaining grass cover. Alternatively, creosotebush, tarbush, or mesquite may expand or invade. Transitions back to a Grassland State from a Bare or Shrub-Dominated state may not be economically feasible.
Shallow Sandy 12 to 14 inches (4%)	R042XD006NM	Grass-Succulent Mix	This ecosite occurs adjacent to or as a component associated with both the Gravelly and Limy ecosites. The historic community is open grassland sparsely dotted with shrubs with black grama and blue grama as the dominant species. Forb production and composition fluctuates both seasonally and from year to year. This site is subject to invasion by creosotebush.
Loamy 12 to 14 inches (3%)	R042XD001NM	Shrub-Invaded Grasslands	This ecosite typically receives surface water flows from adjacent Gravelly and Shallow Sandy ecosites. The historic plant community is open prairie grassland with short grasses (blue grama and tobosa) dominant. Occasional forbs and woody shrubs occur in association with the grasses. The transition to a shrub-invaded state is facilitated by loss of grass cover due to drought or surface disturbance. Continued reduction in grass cover and increased erosion may eventually lead to a shrub-dominated state subject to erosion and unlikely to recover.
Gravelly 12 to 14 inches (1%)	R042XD007NM	Grassland	This ecosite is associated with the topographically higher Limestone Hills from which it can receive surface water flows. It is also associated with the Shallow Sandy ecosite, where they occur together as a complex on fan piedmonts and adjacent to the Limy and Loamy ecosites. The Gravelly ecosite occupies a convex landscape position. The soils contain a shallow petrocalcic horizon, which is very slowly permeable, keeping soil water perched and available to plants. Black grama is the dominant grass species. Forb production is variable and an important component. Shrubs are a noticeable component of this site and include yucca, prickly pear, creosotebush, tarbush, winterfat, and others. Retrogression within this state is characterized by a decrease in black grama, blue grama, and sideoats and an increase in dropseeds, sand muhly, and creosotebush, influenced by drought or overgrazing. The relative density of shrubs for this ecosite may have been kept in check by fire, so fire suppression may facilitate shrub expansion and the transition to a shrub-dominated state. Drought and overgrazing may assist in shrub establishment and expansion. As grass cover is reduced, the amount of bare ground increases, increasing susceptibility to physical crusting, reduced infiltration, litter movement and redistribution, and erosion.

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

<i>Ecosite Name (% of Fort Bliss)</i>	<i>Ecosite ID</i>	<i>Current Estimated Primary Transition State¹</i>	<i>Brief Description</i>
Loamy 8 to 10.5 inches (1%)	R042XB014NM	Shrub-Dominated	This ecosite intergrades with Sandy, Clayey, and Gravelly or Gravelly Loam ecosites, without sharp boundaries. The presumed historic plant community is dominated by black grama and tobosa with some alkali sacaton. Survey data and vegetation mapping indicate relatively low perennial grass cover, high percentages of bare ground, and the beginning of mesquite invasion with some coppice dune formation.
Igneous Hills (1%)	R042XE002N	Grassland-Succulent Mix	The historic plant community type is dominated by black grama, bush muhly, and sideoats grama. Tobosa may be abundant where soil moisture is higher. Shrubs and succulents are common, especially on south-facing slopes where there is low grass cover. Where there is increased bare ground, there is evidence of sheet flow by surface water. The presence of creosotebush may increase with surface disturbance.
Draw 12 to 14 inches (1%)	R042XD003NM	Grass-Shrub Mix	This ecosite is associated with Limestone Hills, Igneous Hills, and Gravelly sites from which it receives and transports runoff water. It consists of two separate elements, the arroyo channel and its associated floodplain, with an ephemeral stream floodplain and gently sloping surface. Along the channel it has the appearance of an elongated sinuous savannah with shrubs and trees dominant, and high production from grasses and an abundant variety of forbs in the understory. Vegetation is variable and is dependent on flood events, distance from the channel, parent material, and amount of gravel and cobble in the soil profile. Sideoats grama is the dominant grass in the historic plant community, in addition to cane bluestem, bush muhly, blue grama, and plains bristlegrass. Desert willow, Apache plume, brickellbush, littleleaf sumac, mariola, and mesquite are common woody species. Retrogression is characterized by a decrease in the dominant grasses. Transition to the creosotebush-dominated state may occur as a result of continued loss of grass cover and increased erosion.

1. Applies to those sites with Ecological Site Descriptions that have information associated with Fort Bliss GIS vegetation data.

Source: Ref# 29, 30

4.6 AIR QUALITY

This section describes the current air quality conditions in the area around Fort Bliss, Texas and New Mexico, and compares it to the relevant federal and state air quality standards. In addition, a 2004 baseline air emissions inventory is presented to represent current air emissions from Fort Bliss operations.

Air quality in a given location can be described by the concentration of individual pollutants in the atmosphere and is generally expressed in units of parts per million (ppm) or micrograms per cubic meter ($\mu\text{g}/\text{m}^3$). Air quality is determined by the type and amount of pollutants emitted into the atmosphere, the size and topography of the air basin, and the prevailing meteorological conditions. Meteorological conditions have a significant impact on the pollutant concentrations because they control the dispersion or mixing of pollutants in the atmosphere through the influences of wind speed, wind direction, atmospheric stability, and other meteorological variables. In some cases, natural conditions can increase pollution levels. For example, summer thunderstorms can produce dust storms that carry large quantities of particulate matter high into the atmosphere.

The main pollutants of concern considered in this air quality analysis include volatile organic compounds (VOCs), ozone (O_3), carbon monoxide (CO), nitrogen oxides (NO_x), sulfur dioxide (SO_2), particulate matter less than 10 microns in diameter (PM_{10}), and particulate matter less than 2.5 microns in diameter ($\text{PM}_{2.5}$). Although VOCs or NO_x have no established ambient standards, they are important precursors to O_3 formation, and their emissions are often regulated.

Identifying the ROI for air quality requires knowledge of the types of pollutants being emitted, the emission rates and release parameters of the pollutant source, the source proximity to other pollutant sources, and local and regional meteorological conditions. The ROI for inert pollutants (all pollutants other than ozone and its precursors) is generally limited to a few miles downwind from a source. Thus, for PM_{10} emissions from construction and operational activities at Fort Bliss, the ROI is limited to the immediate surrounding area. However, for large sources of ozone precursors, the ROI for ozone can extend much farther downwind than for inert pollutants. In the presence of solar radiation, the maximum effect of VOCs and NO_x emissions on ozone levels usually occurs several hours after they are emitted and many miles downwind from the source. Therefore, the ROI for air quality includes Doña Ana and Otero Counties, New Mexico, and El Paso County, Texas.

4.6.1 Applicable Regulations and Standards

Comparing the concentration of a pollutant in the atmosphere to relevant federal and state ambient air quality standards determines the significance of that pollutant in a region or geographical area. Federal, Texas, and New Mexico regulations and standards affect the Main Cantonment Area within Texas and the Fort Bliss Training Complex within Texas and New Mexico.

4.6.1.1 Federal Air Quality Standards

Under the authority of the Clean Air Act (CAA), the USEPA has established nationwide air quality standards to protect public health and welfare, with an adequate margin of safety. These federal standards, known as the National Ambient Air Quality Standards (NAAQS), were developed for six “criteria” pollutants: O_3 , nitrogen dioxide (NO_2), CO, PM_{10} , SO_2 , and lead (Pb). The standards are defined in terms of concentration (e.g., ppm) determined over various periods of time (averaging periods). Short-term standards (1-hour, 8-hour, or 24-hour periods) were established for pollutants with acute health effects, while long-term standards (annual periods) were established for pollutants with chronic health effects.

In 1997, the USEPA promulgated two new standards: a new 8-hour O_3 standard (which has replaced the 1-hour O_3 standard revoked in 2005) and a new standard for particulate matter less than or equal to 2.5 μm in diameter ($\text{PM}_{2.5}$), which are fine particulates that had not been previously regulated. In addition, the USEPA revised the existing PM_{10} standard. Attainment designations for the 8-hour O_3 standard were

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

47 promulgated on April 15, 2004 and were effective as of June 15, 2004. Attainment designations for the
48 PM_{2.5} standard were promulgated on December 17, 2004, based on 2001-2003 monitoring data, and were
49 effective as of April 5, 2005. The NAAQS are presented in **Table 4.6-1**.

50 **Table 4.6-1. National and State Ambient Air Quality Standards**

<i>Air Pollutant</i>	<i>Averaging Time</i>	<i>Federal NAAQS</i>		<i>New Mexico AAQS</i>		<i>Texas AAQS</i>	
		<i>Primary</i>	<i>Secondary</i>	<i>Primary</i>	<i>Secondary</i>	<i>Primary</i>	<i>Secondary</i>
Carbon Monoxide (CO)	8-hour	9 ppm	---	8.7 ppm	---	9 ppm	---
	1-hour	35 ppm	---	13.1 ppm	---	35 ppm	---
Nitrogen Dioxide (NO ₂)	AAM	0.053 ppm	0.053 ppm	0.05 ppm	0.053 ppm	0.053 ppm	0.053 ppm
	24-hour	---	---	0.10 ppm	---	---	---
Sulfur Dioxide (SO ₂)	AAM	0.03 ppm	---	0.02 ppm	---	0.03 ppm	---
	24-hour	0.14 ppm	---	0.10 ppm	---	0.14 ppm	---
	3-hour	---	0.5 ppm	---	0.5 ppm	---	0.5 ppm
Particulate Matter (PM ₁₀)	AAM	50 µg/m ³	50 µg/m ³	---	50 µg/m ³	50 µg/m ³	50 µg/m ³
	24-hour	150 µg/m ³	150 µg/m ³	---	150 µg/m ³	150 µg/m ³	150 µg/m ³
Particulate Matter (PM _{2.5})	AAM	15 µg/m ³	15 µg/m ³	---	---	15 µg/m ³	15 µg/m ³
	24-hour	65 µg/m ³	65 µg/m ³	---	---	65 µg/m ³	65 µg/m ³
Total Suspended Particulates (TSP)	AGM	---	---	60 µg/m ³	---	---	---
	30-day	---	---	90 µg/m ³	---	---	---
	7-day	---	---	110 µg/m ³	---	---	---
	24-hour	---	---	150 µg/m ³	---	---	---
Ozone (O ₃)	8-hour	0.08 ppm	---	---	---	0.08 ppm	0.08 ppm
Lead (Pb) and Lead Compounds	Calendar Quarter	1.5 µg/m ³	1.5 µg/m ³	1.5 µg/m ³	1.5 µg/m ³	1.5 µg/m ³	1.5 µg/m ³

NAAQS = National Ambient Air Quality Standards; AAQS = Ambient Air Quality Standards; AAM = Annual Arithmetic Mean; AGM = Annual Geometric Mean; ppm = parts per million; µg/m³ = micrograms per cubic meter
Source: Ref# 209, 210

51 USEPA has classified all areas of the United States as meeting the NAAQS (in attainment) or not meeting
52 the NAAQS (in nonattainment) for each individual criteria pollutant. The CAA Amendments (CAAA) of
53 1990 established a framework to achieve attainment and maintenance of the health-protective NAAQS.
54 Title I sets provisions for the attainment and maintenance of the NAAQS.

55 **4.6.1.2 State Air Quality Standards**

56 Under the CAA, state and local agencies may establish air quality standards and regulations of their own,
57 provided these are at least as stringent as the federal requirements. Activities on the Fort Bliss Military
58 Reservation are measured against air quality standards in New Mexico and Texas. The New Mexico
59 Environment Department's Air Quality Bureau revised its ambient air quality standards (AAQS) in
60 November 1995. According to the preamble of the new regulation, the New Mexico AAQS are not
61 intended to provide a sharp dividing line between air of satisfactory quality and air of unsatisfactory
62 quality. They are, however, numbers that represent objectives that will preserve the state's air resources.
63 The Texas Commission on Environmental Quality has adopted the NAAQS as their state standards.
64 Table 4.6-1 shows the national and state ambient air quality standards that apply to Fort Bliss.

65 **4.6.1.3 State Implementation Plans**

66 Individual states are required to establish a State Implementation Plan (SIP), which is approved by
67 USEPA. A SIP is a document designed to provide a plan for maintaining existing air quality in
68 attainment areas and programmatically eliminating or reducing the severity and number of NAAQS
69 violations in nonattainment areas, with an underlying goal to bring state air quality conditions into (and
70 maintain) compliance with the NAAQS.

71 The principal method of maintaining or improving ambient air quality is by controlling emissions from
72 sources. The SIP establishes regulations to control stationary emission sources, and the USEPA
73 establishes regulations to control mobile sources, which are installed by vehicle manufacturers. In
74 attainment areas, Prevention of Significant Deterioration (PSD) regulations apply; in nonattainment areas,
75 New Source Review regulations apply.

76 Several control regulations can apply to large stationary emission sources, including Best Available
77 Control Technology (BACT), New Source Performance Standards (NSPS), National Emission Standards
78 for Hazardous Air Pollutants (NESHAPs), and Maximum Achievable Control Technology (MACT).
79 Based on the type of source, the emission levels of criteria pollutants, and the location, one or more of
80 these control requirements may be applicable.

81 The PSD regulations provide special protection from air quality impacts for certain areas, primarily
82 National Parks and Wilderness Areas, which have been designated as "Class I" areas. Mandatory PSD
83 Class I areas established under the CAAA of 1977 for the States of New Mexico and Texas are listed
84 under 40 CFR 81.421 and 81.429, respectively. These are areas where air quality related values
85 (especially visibility and acid deposition) have been determined to be important issues. The nearest PSD
86 Class I area to Fort Bliss is Guadalupe Mountains National Park, which is 45 miles to the southeast.
87 Other PSD Class I areas in the region include Big Bend National Park, Carlsbad Caverns National Park,
88 the White Mountain Wilderness Area, and the Bosque del Apache Wilderness Area. However, because of
89 their distance from Fort Bliss, these PSD Class I areas are not expected to be impacted by the proposed
90 activities.

91 **4.6.1.4 Conformity Rule**

92 Under the General Conformity Rule of the CAA, Section 176(c), federal activities must not: cause or
93 contribute to any new violation, increase the frequency or severity of any existing violation, or delay
94 timely attainment of any standard, interim emission reductions, or milestones in conformity to a SIP's
95 purpose of eliminating or reducing the severity and number of NAAQS violations or achieving attainment
96 of the NAAQS.

97 In 1996, Fort Bliss entered into an Agreed Final Judgment with the State of Texas as a result of an air
98 quality enforcement action involving asbestos management, dust control, gasoline truck inspections, and
99 oxygenated fuels. Since 24 December 2003, the Agreed Final Judgment has been terminated with the
100 State of Texas, as Fort Bliss has demonstrated compliance with the requirements of the order. Fort Bliss
101 continues with demonstrated compliance and operates in the spirit of the Judgment parameters.

102 **4.6.2 Regional Climate**

103 Fort Bliss is located in the northern Chihuahua Desert and has a semi-arid to arid, subtropical desert
104 climate characterized by low rainfall, relatively low humidity, hot summers, moderate winters, wide
105 temperature variations, and an abundance of sunshine throughout the year. Records of the weather in the
106 area that have been kept since 1904 indicate that the area has an average annual precipitation of 8.8
107 inches, (Ref# 3) with extremes of 2.22 inches and 18.29 inches. More than half of the total average
108 annual precipitation occurs during the months of July, August, and September. During these months,
109 brief but heavy rainstorms frequently cause localized flooding. A small percentage of annual
110 precipitation falls in the form of snow. Periods of extreme dryness lasting up to several months are not
111 unusual.

112 Fort Bliss has a frost-free season that averages 248 days a year. Temperatures are generally warm,
113 ranging from highs in the mid-50 degrees Fahrenheit (°F) during the winter months to highs well above
114 90°F during the summer. The annual average temperature is 63.3°F, with a record low of -8°F and a
115 record high of 114°F. Daytime humidity is generally low, ranging from 10 to 14 percent. Because of the
116 mountainous terrain and the Rio Grande Valley, there are significant diurnal and regional fluctuations in
117 humidity. Typical of desert climates, rapid cooling from nighttime re-radiation causes increases in

118 relative humidity. Average daily relative humidity increases to about 40 percent at midnight and to 51
119 percent by 6:00 a.m.

120 Wind speeds in the El Paso area are moderate, with an annual average of 9.0 miles per hour (mph). From
121 October through February, average wind speeds range from 8.2 to 9.0 mph and are predominantly from
122 the north. The highest average wind speeds (11.3 mph) occur during the months of March and April,
123 decreasing slightly in May to an average of 10.5 mph. The combination of relatively strong sustained
124 winds and the low precipitation in the spring contribute considerably to the occurrence of dust and sand
125 storms in the area, particularly at that time of year. During the summer months, average wind speeds
126 drop to their lowest levels of the year (less than 8.0 mph). The predominant wind direction during the
127 summer months is from the south-southwest.

128 A combination of abundant sunshine, high temperatures, low relative humidity, and continuous winds
129 results in an evaporative rate that is more than 10 times the amount of annual precipitation. The annual
130 evaporation rate for shallow water bodies in the area (known as “pans”) is about 105 inches, and the
131 average annual evaporation rate from small lakes in the region ranges from 72 to 80 inches.

132 **4.6.3 Regional Air Quality**

133 **4.6.3.1 Texas**

134 El Paso County, Texas, is classified as being in attainment for all criteria pollutants, with the exception of
135 the City of El Paso, which is designated as moderate nonattainment for CO and PM₁₀. El Paso County,
136 including Fort Bliss, was designated as being in attainment of the PM_{2.5} standard and the 8-hour ozone
137 standard. The El Paso City-County Health and Environment District (EPCCHED), in cooperation with
138 TCEQ and USEPA, has been monitoring PM_{2.5} since 1998 in the El Paso County area. PM_{2.5} data do not
139 exist for the areas in the Fort Bliss Training Complex. The source of fine particles (measured as PM_{2.5}) is
140 generally combustion processes (e.g., boilers, internal combustion engines), while coarse particles
141 (measured by PM₁₀) result from windblown dust on deserts and fields or road dust kicked up from motor
142 vehicles. Based on the information collected in the 2005 Baseline Air Emission Inventory (Ref# 206), it
143 is not expected that emissions from boilers, furnaces, and internal combustion engines will contribute
144 significantly to an exceedance of the PM_{2.5} standard.

145 The TCEQ Air Monitoring Division and EPCCHED maintain several air quality monitoring sites in El
146 Paso County, the majority of which are located within or near the El Paso city limits. EPCCHED has a
147 monitoring station on Fort Bliss west of the Air Defense School. The data from the city monitoring sites
148 are not representative of the air quality over Fort Bliss because the city monitoring sites have additional
149 emissions related to heavily populated areas that would not occur on the more remote sites of Fort Bliss,
150 and therefore they have not been considered for this evaluation. On the eastern side of the City of El Paso
151 near Fort Bliss, monitoring stations located south and east of the installation provide representative air
152 quality data for the area. Monitoring data for 2002 through 2004 from these stations are presented in
153 **Table 4.6-2** and indicate generally good air quality. According to the Natural Events Action Plan, the
154 majority of exceedances of the 24-hour PM₁₀ standard in the City of El Paso during these years were due
155 to high winds lifting dust into the air from areas of exposed soil (i.e., dust storms). These days of
156 exceedance were not included in the calculation of the attainment status for the area. USEPA has
157 accepted the plan and its assumptions.

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

158

Table 4.6-2. Air Quality Monitoring Data for El Paso, Texas

<i>Pollutant/Monitoring Station</i>	<i>Averaging Time/ Measurement</i>	<i>Maximum Concentration</i>		
		<i>2002</i>	<i>2003</i>	<i>2004</i>
CO (ppm)				
Ivanhoe C414	8-hour	2.8	2.8	2.0
Chamizal C41		6.7	6.6	5.3
Ascarate Park SE C37		5.3	5.7	4.0
Skyline Park C72		2.2	2.2	2.1
Ivanhoe C414	1-hour	4.6	4.87	3.5
Chamizal C41		12.3	9.2	7.8
Ascarate Park SE C37		12.0	13.3	7.6
Skyline Park C72		3.9	3.6	2.5
O ₃ (ppm)				
Ivanhoe C414	8-hour	0.088	0.078	0.077
Chamizal C41		0.105	0.080	0.078
Ascarate Park SE C37		0.097	0.086	0.081
Skyline Park C72		0.092	0.076	0.084
NO ₂ (ppm)				
Ascarate Park SE C37	AAM	0.017	0.016	0.018
Chamizal C41		0.021	0.020	0.014
Skyline Park C72		0.011	0.011	0.009
PM ₁₀ (µg/m ³) ¹				
Ivanhoe C414	AAM	33	37	24
Ascarate Park SE C37		49	61	45
Ivanhoe C414	24-hour	226	187	167
Ascarate Park SE C37		421	802	397
PM _{2.5} (µg/m ³)				
Chamizal C41	AAM	10.6	9.7	---
Skyline Park C72		7.5	5.9	---
Chamizal C41	24-hour	49	27	---
Skyline Park C72		19	24	---
SO ₂ (ppm)				
Skyline Park C72	AAM	0.001	0.001	0.001
	24-hour	0.004	0.008	0.002
	3-hour	0.021	0.031	0.007
Pb (µg/m ³)				
Skyline Park C72	QAM	0.04	0.04	---

1. The high PM₁₀ values recorded at the El Paso monitoring stations were due to unusual events (dust storms). These days of exceedance were not included in the calculation of the attainment status for the area

ppm = part per million by volume; µg/m³ = micrograms per cubic meter; AAM = Annual Arithmetic Mean.; QAM = Quarterly Arithmetic Mean

Source: Ref# 208

159

4.6.3.2 New Mexico

160

Otero and Doña Ana Counties are designated as being in attainment for all criteria pollutants. However, the western portion of Doña Ana County has experienced violations of the PM₁₀ standard. USEPA has a Natural Events Policy that is meant to address violations of the PM₁₀ standard that are caused by natural events such as high winds in areas that have exposed, dry soil. Doña Ana County has a Natural Events

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

164 Action Plan (NEAP) in place, which exempts PM₁₀ exceedances during wind storms or other naturally
 165 occurring events (Ref# 212). Fort Bliss is a party to the NEAP, although because of the prevailing
 166 westerly winds and geography, it tends to be a receptor, rather than a generator, of blowing dust entrained
 167 within the western portion of the county (Ref# 211).

168 The New Mexico Air Quality Bureau does not monitor ambient air pollutant concentrations on Fort Bliss.
 169 Routine air quality monitoring occurs at several stations in Doña Ana County, west and north of the
 170 military reservation. **Table 4.6-3** presents a summary of air quality monitoring data for 2002 through
 171 2004. The federal 24-hour PM₁₀ standard was exceeded in 2002 and 2003, mainly during extremely high
 172 wind conditions.

173 **Table 4.6-3. Air Quality Monitoring Data for South-Central New Mexico**

<i>Pollutant/Monitoring Station</i>	<i>Averaging Time/ Measurement</i>	<i>Maximum Concentration</i>		
		<i>2002</i>	<i>2003</i>	<i>2004</i>
CO (ppm)				
Las Cruces Holiday Inn	8-hour	3.2	2.8	2.5
Las Cruces Holiday Inn	1-hour	5.2	3.8	4.2
O ₃ (ppm)				
Chaparral	8-hour	0.080	0.071	0.080
La Union		0.080	0.090	0.075
Las Cruces Holiday Inn		0.068	0.067	0.063
Desert View Elementary School		0.085	0.082	0.076
Sunland Park City Yard		0.087	0.080	0.073
Santa Teresa Int. Blvd.		0.090	0.079	0.081
PM ₁₀ (µg/m ³) ¹				
Las Cruces	AAM	23	24	---
Anthony		33	34	26
Sunland Park City Yard		40	53	36
Las Cruces	24-hour	100	70	---
Anthony		95	113	111
Sunland Park City Yard		152	147	120
PM _{2.5} (µg/m ³)				
Las Cruces	AAM	6.6	6.9	6.1
Sunland Park City Yard		12.2	11.2	10.2
Las Cruces	24-hour	26	17	23
Sunland Park City Yard		56	51	39
NO ₂ (ppm)				
Desert View Elementary School	AAM	0.010	0.011	0.011
Santa Teresa Int. Blvd.		0.006	0.005	0.005
Desert View Elementary School	24-hour	—	0.030	0.036
Santa Teresa Int. Blvd.		—	0.024	0.026

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

<i>Pollutant/Monitoring Station</i>	<i>Averaging Time/ Measurement</i>	<i>Maximum Concentration</i>		
		<i>2002</i>	<i>2003</i>	<i>2004</i>
SO ₂ (ppm)				
La Union	AAM	0.001	0.001	---
Sunland Park City Yard		0.001	0.001	0.001
La Union	24-hour	0.003	0.003	---
Sunland Park City Yard		0.003	0.004	0.005
La Union	3-hour	0.006	0.009	---
Sunland Park City Yard		0.008	0.009	0.009

1. The exceedance of the federal 24-hr PM₁₀ standard in 2002 and 2003 is primarily due to extremely high wind conditions

ppm = part per million by volume; µg/m³ = micrograms per cubic meter; AAM = Annual Arithmetic Mean

Source: Ref# 208

174 **4.6.4 Current Air Emissions at Fort Bliss**

175 Separate air emissions inventories for Fort Bliss have been generated for Texas and New Mexico. This is
176 a logical division, although the two parts of Fort Bliss are adjoining, because Texas and New Mexico
177 have different attainment status for some of the criteria pollutants, and there are differences in their air
178 quality regulations.

179 **4.6.4.1 Texas**

180 The emissions inventory for CY 2004 for the portions of Fort Bliss in Texas, including the Main
181 Cantonment Area, is summarized in **Table 4.6-4** (Ref# 206).

182 **Table 4.6-4. Baseline Air Emission Inventory for Portions of Fort Bliss in Texas**
183 **(CY 2004)**

<i>Emission Sources</i>	<i>Actual Emissions (Tons/Year)</i>					
	<i>NO_x</i>	<i>SO₂</i>	<i>CO</i>	<i>PM</i>	<i>VOC</i>	<i>HAPs</i>
External Combustion Sources	31.59	0.22	26.39	2.40	1.73	0.69
Internal Combustion Sources (including Emergency and Portable Generators)	64.50	1.51	7.90	2.19	4.79	0.18
Solvent Use Sources	0.00	0.00	0.00	0.02	8.85	0.61
Storage Tanks and Fueling Operations	0.00	0.00	0.00	0.00	5.13	1.33
Miscellaneous Operations	0.17	0.00	0.05	1.92	1.90	0.42
Abrasive Blasting Operations	0.00	0.00	0.00	0.08	0.00	0.00
Surface Coating Operations	0.00	0.00	0.00	0.75	14.09	2.92
Fugitive Dust Sources	0.00	0.00	0.00	18.30	0.00	0.00
Total Emissions	96.3	1.7	34.3	7.4	36.5	6.2

HAPs = hazardous air pollutants

Source: Ref# 206

184 These sources can be divided into several groups:

- 185 • Combustion sources. Portable gasoline/diesel/JP-8-fired generators, diesel emergency generators,
186 electric peak shaving plant generators, natural gas-fired boilers, and an incinerator.
- 187 • Solvent use sources. Degreasers used for maintenance and repair in motor pools and other facilities.
- 188 • Storage tanks and fueling operations. Fuel storage tanks, aviation fuel farm, and fuel dispensing
189 facilities.

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

- 190 • Miscellaneous operations. Fire fighting training, welding operations, soil vapor extraction by
191 systems, woodworking, and landfill operations.
- 192 • Abrasive blasting operations. Abrasive blasting room and portable blasting units.
- 193 • Surface coating. Surface coating operations occur in several painting booths. Emissions have been
194 reduced by the use of low VOC paints.
- 195 • Fugitive dust. These result from Landfill Road and unpaved range roads. Emissions from Landfill
196 Road are kept to a minimum by a strictly enforced 10 mph speed limit.

197 **4.6.4.2 New Mexico**

198 Fort Bliss is not considered to be a major source of air emissions by the Air Quality Bureau of the State of
199 New Mexico, because it is primarily comprised of multiple minor individual emission sources that are
200 included on the Air Quality Bureau's List of Insignificant Activities. A Baseline Air Emission Inventory
201 for CY 2004 in the New Mexico portion of the installation was recently developed (Ref# 472) to
202 determine the status of Fort Bliss with regard to air emission sources in the State of New Mexico and to
203 address the dynamic activities in the training ranges. A summary of the air emission inventory is
204 presented in **Table 4.6-5**.

205 **Table 4.6-5. Baseline Air Emission Inventory for Portions of Fort Bliss in New Mexico**
206 **(CY 2004)**

<i>Emission Sources</i>	<i>Actual Emissions (Tons/Year)</i>					
	<i>NO_x</i>	<i>SO₂</i>	<i>CO</i>	<i>PM</i>	<i>VOC</i>	<i>HAPs</i>
External Combustion Sources	3.81	0.48	1.95	0.47	0.16	0.04
Internal Combustion Sources (including Emergency and Portable Generators)	25.53	0.48	3.08	1.08	1.27	0.06
Solvent Use Sources	0.00	0.00	0.00	0.00	0.42	0.00
Storage Tanks and Fueling Operations	0.00	0.00	0.00	0.00	1.54	0.12
Miscellaneous Operations	0.00	0.00	0.00	0.36	0.00	0.40
Surface Coating Operations	0.00	0.00	0.00	0.01	0.05	0.01
Total Emissions	29.35	0.95	5.03	1.91	3.44	0.63

Source: Ref# 472

207 **4.6.5 Current Status of Air Quality Permits for Fort Bliss**

208 Fort Bliss, Texas, has been able to retire its existing air quality permits with the TCEQ and register the
209 sources with either historic standard exemptions or permit-by-rule regulations and proactive management.
210 Fort Bliss has an application for a Federal Operating Permit (Title V permit) based on the updated
211 Emission Inventory for 2004. The application is currently under review by TCEQ. NO_x is the key
212 pollutant triggering major source for Title V. Fort Bliss has consolidated all historical standard
213 exemptions and permit by rule (PBR) for surface coating, miscellaneous spray paints, and solvent
214 degreasers under one state flexible permit. Old source evaluations and PBRs will be voided once the
215 flexible permit is issued. The Air Quality Bureau of New Mexico considers Fort Bliss, New Mexico, a
216 minor source of emissions. Consequently, Fort Bliss is not currently required to have any air quality
217 permits for operations in New Mexico.

1 **4.7 WATER RESOURCES**

2 This section addresses surface and groundwater resources. The ROI for water resources includes the
3 surface water and groundwater sources that supply Fort Bliss, the City of El Paso, and other communities
4 whose water supply may be affected by activities at Fort Bliss. The ROI is comprised of portions of the
5 Tularosa–Hueco Basin (including the Lower Tularosa Basin and the Upper Hueco Bolson), the Mesilla
6 Basin, and the Salt Basin (**Figure 4.7-1**). The general hydrologic environment in the ROI was described
7 in the 2000 Mission and Master Plan PEIS, which is incorporated by reference and not repeated.

8 Existing water resources information in this section is summarized from the EIS for *Proposed Leasing of*
9 *Lands at Fort Bliss, Texas for the Proposed Siting, Construction, and Operation by the City of El Paso of*
10 *a Brackish Water Desalination Plant and Support Facilities* (Ref# 222), which is incorporated by
11 reference.

12 **4.7.1 Surface Water**

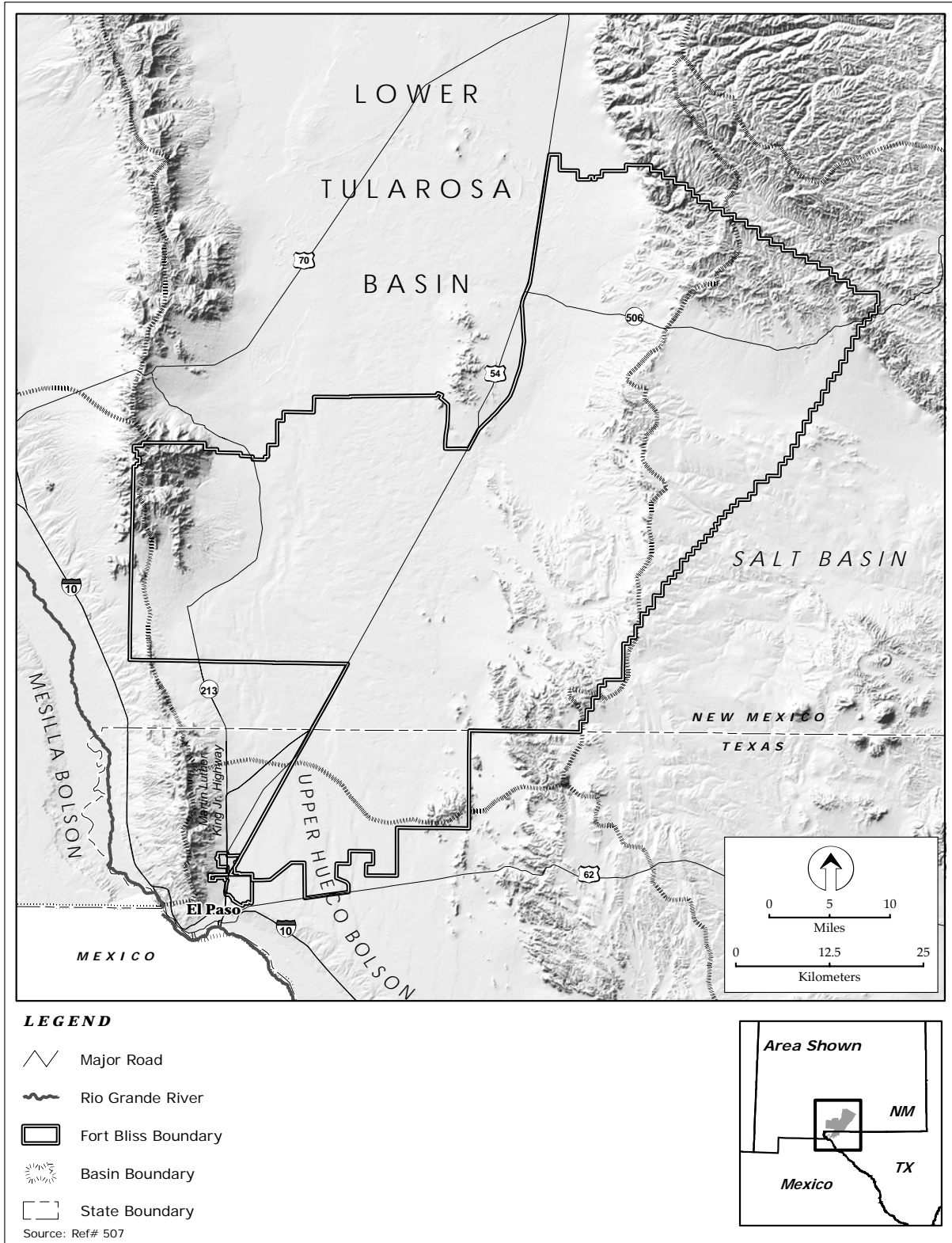
13 The Rio Grande is the only sizable usable source of surface water in the ROI. The El Paso region
14 obtained an average of 24 percent of its water supply from the Rio Grande between 1967 and 2002 and
15 the remaining 76 percent of its water supply from intermontane-basin aquifers in the Hueco and Mesilla
16 Bolsons. The maximum annual surface water production of 58,743 af occurred in 2002 and comprised
17 approximately 49 percent of the total water production for that year.

18 Reuse of river water for irrigation between the headwaters of the Rio Grande and El Paso degrades the
19 quality of the water by increasing its dissolved solids content. During periods of high reservoir releases,
20 the water quality meets drinking water standards, and El Paso can use the water after conventional
21 treatment. However, during periods of low discharge, including the nonirrigation season (October-
22 March), and during droughts, the salinity increases to the point that the water is no longer usable for
23 domestic purposes without additional treatment.

24 The Doña Ana Range-North Training Areas and McGregor Range are located in two basins, the Tularosa
25 Basin and the Salt Basin. The Salt Basin includes the western part of Otero Mesa and the southern slopes
26 of the Sacramento Mountains foothills. The Tularosa Basin and the Salt Basin are characterized by small
27 ephemeral streams that discharge toward the central areas of the basin. Under natural conditions, small
28 playas develop in low-lying areas during periods of high runoff. Some streams that originate in the
29 mountains are perennial in their upper reaches. The Sacramento River, prior to the installation of
30 upstream diversions, probably was perennial for at least part of its course through McGregor Range.
31 **Figure 4.7-2** shows surface water drainages in the Fort Bliss Training Complex.

32 Three diversions capture water for use on the McGregor Range and the adjoining community of
33 Orogrande. The diverted water is transported via three pipelines; one crosses the northwest quarter of
34 McGregor Range to Orogrande, and the other two supply water to numerous storage tanks and water
35 troughs across Otero Mesa. Otero Mesa earthen dams capture most of the available water for livestock.
36 **Figure 4.7-3** shows the water pipelines, storage tanks, and earthen impoundments on McGregor Range.
37 The Army holds water right number 01657 for the diversions used on McGregor Range. A change in the
38 beneficial use from “livestock and domestic purposes” to “the preservation of fish and wildlife” was
39 granted in 1963 by the New Mexico State Engineers Office. The right entitles the Army to divert 60,000
40 gallons per day (gpd) of surface water flow from the Sacramento River and 50,000 gpd from Carrisa
41 Springs (Ref# 434).

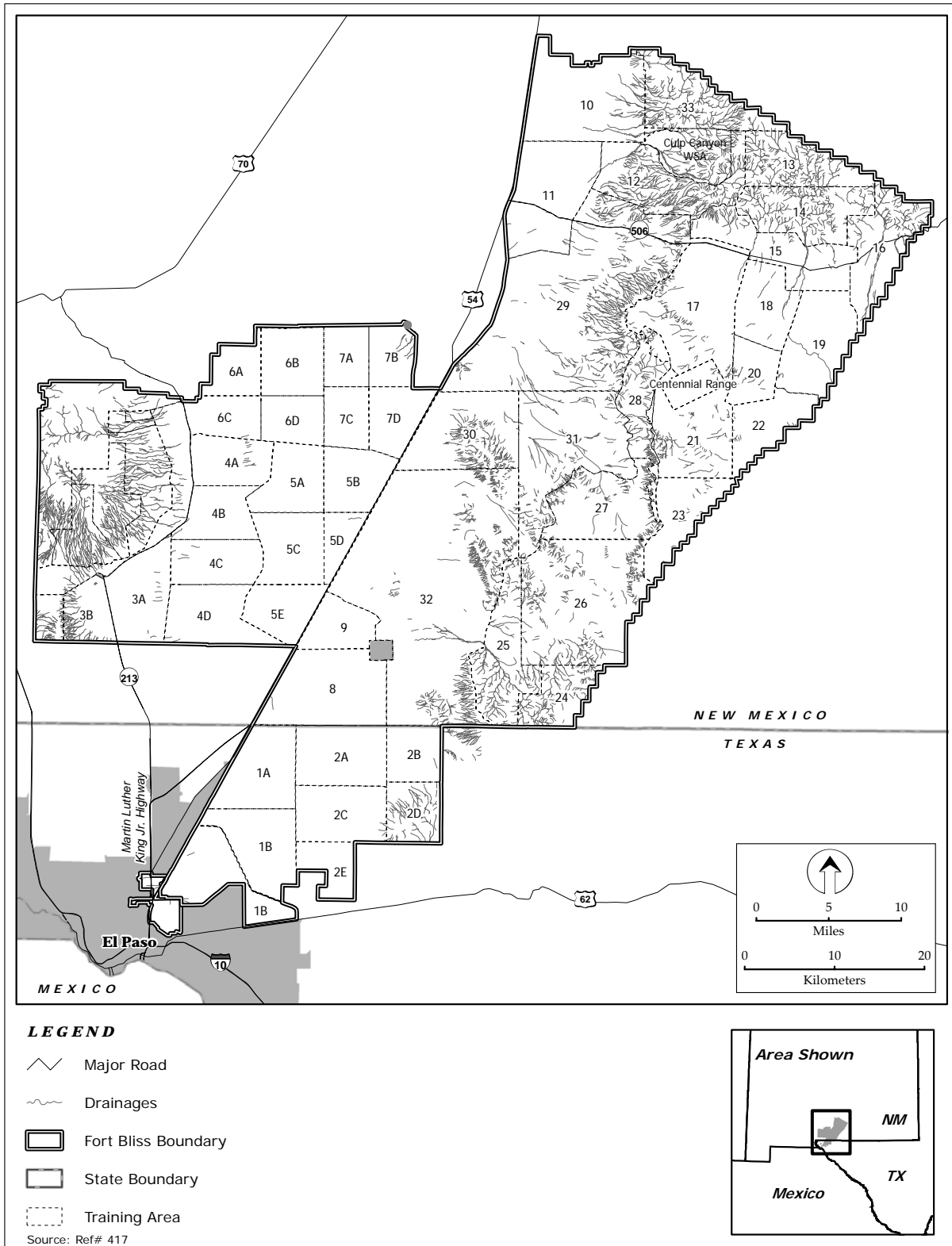
42 The McGregor pipeline system (exclusive of the Orogrande system) is a large gravity-fed water network
43 that is operated and maintained by BLM for wildlife and livestock. The three intakes (sources) for the
44 system are in the Sacramento Mountains, north of McGregor Range. A smaller system, the El Paso line,



45
46

Figure 4.7-1. Basins in the Region of Influence

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

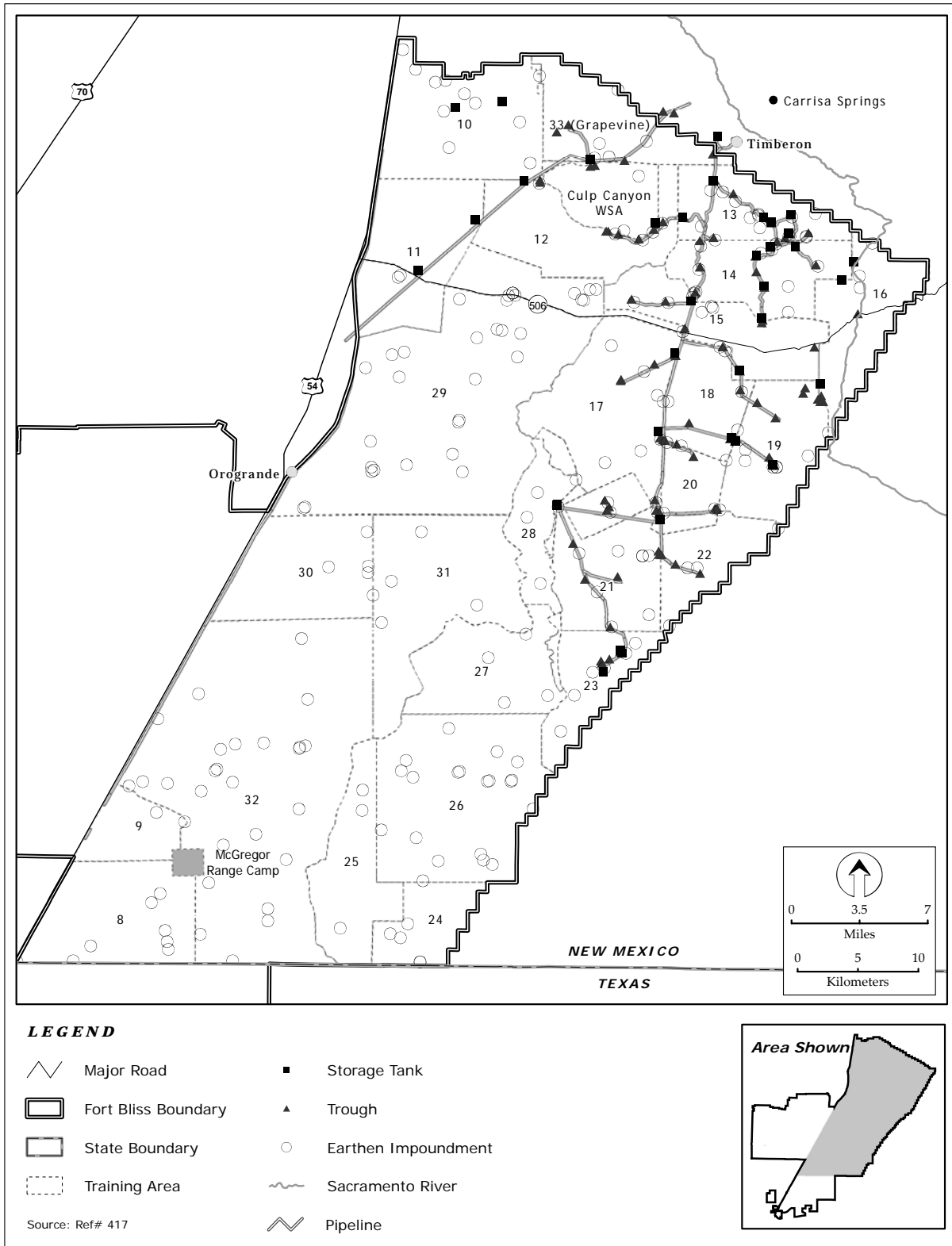


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Figure 4.7-2. Surface Water Drainages in the Fort Bliss Training Complex

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



49
50

Figure 4.7-3. Water Pipelines and Storage Areas on McGregor Range

51 runs through El Paso Canyon to the east boundary of McGregor Range in the north part of Otero Mesa.
52 The total flow of both lines is about 76 gpm (about 110 afy) (Ref# 3).

53 **4.7.2 Groundwater**

54 Fort Bliss is located primarily in the Tularosa-Hueco Basin of the Basin and Range Physiographic
55 Province with small portions in the Mesilla Basin and the Salt Basin (see Figure 4.7-1). The principal
56 aquifers in the Tularosa-Hueco Basin are the Hueco Bolson, which provides groundwater to the City of El
57 Paso, the Fort Bliss Main Cantonment Area, and Ciudad Juárez, and the Tularosa Basin, which underlies
58 parts of Doña Ana, Otero, Lincoln, and Sierra Counties and portions of the Doña Ana Range–North
59 Training Areas and McGregor Range.

60 **4.7.2.1 Hueco Bolson**

61 The Hueco Bolson is an intermontane basin incised by the Rio Grande Valley. The part of the basin north
62 of the Rio Grande is referred to as the Upper Hueco Bolson. The principal area of recharge to the bolson
63 is along the eastern edge of the Franklin and Organ Mountains, where runoff from the mountains
64 infiltrates into the coarse gravel of alluvial fans. U.S. Geological Survey (USGS) modeling efforts in the
65 area indicate natural recharge from infiltration of 5,600 afy. Most of the Rio Grande channel through the
66 El Paso metropolitan area has been lined since 1968, virtually eliminating infiltration to the aquifer from
67 the river in that area. Since 1985, the Fred Herve water reclamation plant has recharged the basin
68 artificially through injection of tertiary treated effluent into the aquifer at a rate estimated to be less than
69 2,000 afy (half of the plant's current average daily wastewater treatment).

70 The majority of the fresh water (chloride less than 250 milligram per liter [mg/L]) in the Hueco Bolson
71 aquifer lies along the eastern front of the Franklin Mountains. The thickest part of the aquifer underlies
72 Fort Bliss, northeastern El Paso, and northern Mexico. The freshwater portion of the aquifer is more than
73 1,000 feet deep in this area. The freshwater zone is widest at or near the water table and narrows with
74 depth.

75 Small areas of fresh water in the eastern portion of the Hueco Bolson aquifer are surrounded by slightly to
76 moderately saline water. The area of fresh water thins toward the east until only brackish water is
77 present. Small pockets of fresh water occur along the base of the Hueco Mountains and serve as a water
78 supply for commercial and residential users. In addition to fresh groundwater in storage, large volumes of
79 brackish water are stored within deeper bolson sediments.

80 Domestic water supplies for the Fort Bliss Main Cantonment Area and the City of El Paso are furnished
81 by on-post wells and EPWU. EPWU obtains groundwater primarily from the Hueco Bolson, while some
82 additional groundwater is obtained from the Mesilla Bolson.

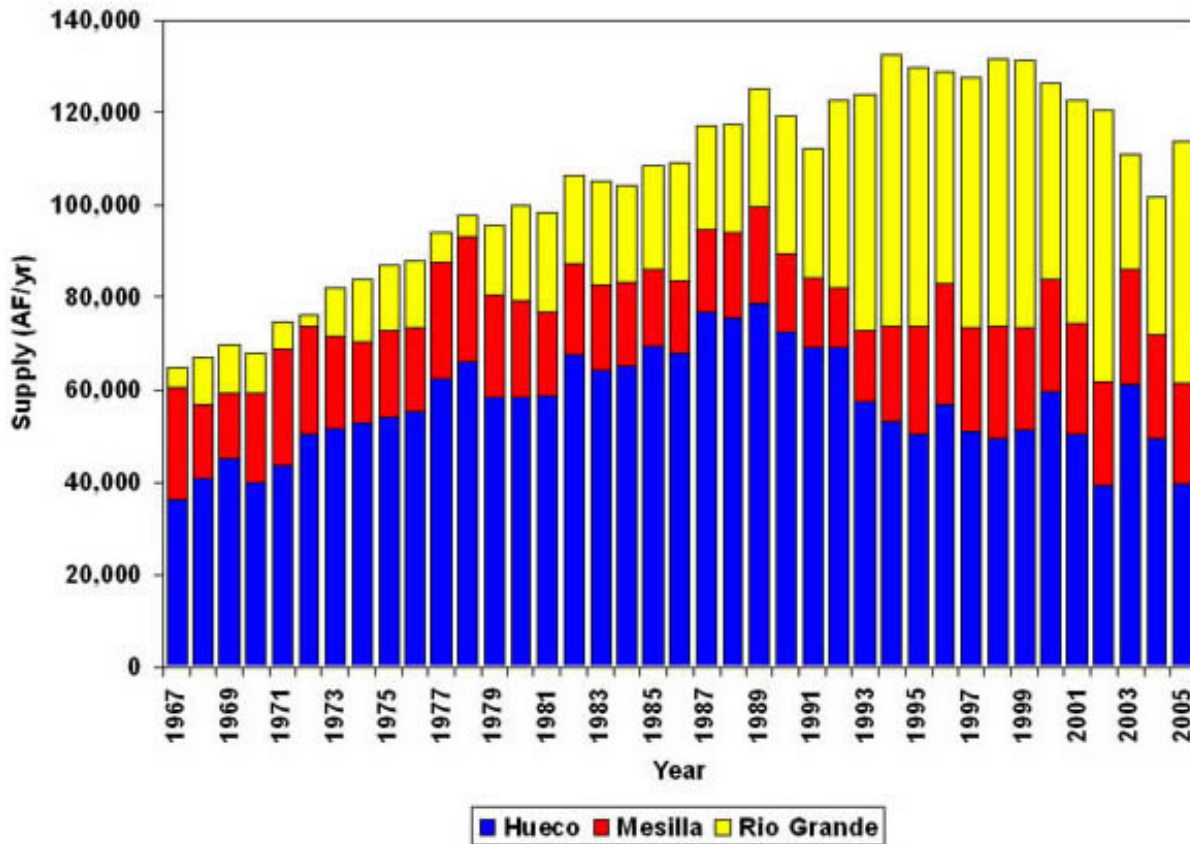
83 Estimates of groundwater availability representing the amount of usable water in the Hueco Bolson
84 aquifer in Texas are varied and range from 3 million af to 10.6 million af. Estimates of the availability of
85 saline groundwater between 1,000 and 3,000 mg/L total dissolved solids are more uncertain, ranging from
86 2.5 to 20 million af. EPWU estimates fresh (less than 250 mg/L chloride) groundwater storage in the
87 Hueco Bolson is approximately 9.4 million af and saline (greater than 250 mg/L chloride up to 1,000
88 mg/L chloride) storage is approximately 26.3 million af.

89 In 2002, EPWU operated 84 wells in the Hueco Bolson aquifer, producing 131,000 af (equivalent to an
90 average of 117 MGD). The rate of groundwater pumping from the aquifer currently exceeds the recharge
91 rate, creating water level declines, the largest of which have occurred adjacent to the municipal well
92 fields. Rates of water level decline in the metropolitan El Paso area range from less than 0.5 feet per year
93 in the east to more than 5 feet per year near pumping centers. Historically, from 1903 through 1989,
94 declines of as much as 150 feet have occurred in the downtown areas of El Paso and Ciudad Juárez.
95 Declines of more than 50 feet occurred in the same general area during the 10-year period between 1979

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

96 and 1989. The decline of water levels in the bolson deposits has allowed infiltration of salt water into the
97 freshwater zones.

98 Over the past decade, combined water use by the City of El Paso and Fort Bliss averaged approximately
99 133,000 afy (117.8 MGD). On average, approximately 60 percent of the total annual water used by Fort
100 Bliss and the City of El Paso combined was drawn from freshwater supplies in the Hueco Bolson and
101 Mesilla Bolson aquifers. The amount of groundwater withdrawal has declined since 2000 (**Figure 4.7-4**)
102 due to EPWU’s increased use of the Rio Grande as a source of drinking water, aggressive water
103 conservation, emphasis on reclaimed water, and effluent exchange agreements.



104
105 Source: Ref# 428

106 **Figure 4.7-4. Sources of Water Supplied by EPWU Since 1967**

107 In spite of a steadily increasing population, water use in the El Paso area has remained relatively constant
108 or declined since about 1994 through water conservation programs. The goal of the city’s water
109 conservation efforts is to maintain per capita water consumption at or below 140 gallons per day (Ref#
110 321).

111 As indicated in Figure 4.7-4, during the past decade, most of the groundwater used by EPWU and Fort
112 Bliss has been drawn from fresh water stored in the Hueco Bolson. The bolson provided approximately
113 72 percent of the total groundwater and 46 percent of the total combined water used by the installation
114 and the city since 1993. Fort Bliss withdrawals of fresh water from the bolson have averaged
115 approximately 5,000 afy (4.5 MGD) and remained relatively constant.

116 Groundwater withdrawals from the Hueco Bolson by Ciudad Juárez, Mexico, were about 15,000 afy (13.4
117 MGD) in the late 1950s and throughout the 1960s, but in the early 1970s water use began to increase
118 sharply to the extent that withdrawals in 1984 amounted to 66,000 afy (58.9 MGD). In the past five

119 years, pumping has declined from over 126,000 af (112 MGD) in 2000 to under 120,000 af (107 MGD) in
120 2004 (Ref# 317).

121 A desalination plant to be operated by EPWU is being built within the boundaries of Fort Bliss. The plant
122 will draw approximately 34,000 afy (30.5 MGD) of brackish water from the Hueco Bolson and produce a
123 projected output of 31,000 afy (27.5 MGD) of potable water. The impact of the desalination plant
124 operation on groundwater movement and water quality in the El Paso area was evaluated by EPWU (Ref#
125 222). This evaluation was based on projected population growth within the EPWU service area.
126 Modeling predicted the effect of 50 years of pumping from the feed and blend wells that would be used as
127 source water for the desalination plant. The model results show that the resulting drawdown would alter
128 groundwater flow direction and hydraulic gradients.

129 After 50 years, there would be southerly-directed groundwater movement west of the desalination plant
130 and the development of a localized groundwater trough (deeper area of drawdown) around the feed and
131 blend wells. Because EPWU currently plans to pump the same total quantity of water from the Hueco
132 Bolson with or without the proposed desalination project, the increased pumping from the feed and blend
133 wells is expected to be offset by decreased pumping from other EPWU wells in the city. This would
134 reduce the groundwater drawdown in the vicinity of those wells and have the beneficial effect of
135 intercepting the flow of brackish groundwater from the northeast, maximizing the availability of fresh
136 water to wells west of the desalination plant. By reducing the pumpage of fresh water, the project would
137 slow down the intrusion of saline water in the area of Fort Bliss' existing water wells. While the
138 modeling considered the effects on drawdown in general and the Fort Bliss wells in particular, it did not
139 provide estimates of drawdown on wells neighboring the blend wells or estimate changes in water quality
140 that would result from pumping the blend wells (Ref# 473).

141 **4.7.2.2 Tularosa Basin**

142 The southern (lower) portion of the Tularosa Basin is contiguous with and geologically similar to the
143 Upper Hueco Bolson. Large quantities of saline water occur within most of the basin sediments. Water
144 enters the groundwater system principally as mountain-front recharge from storm runoff in alluvial fan
145 areas adjacent to the Organ and Sacramento Mountains.

146 Well fields in the Tularosa Basin supply water for Doña Ana Range Camp, the Main Post at WSMR, and
147 the City of Alamogordo. Groundwater development in the Tularosa Basin area of McGregor Range,
148 except for a few livestock wells, has not been extensive because of the salinity of the water (Ref# 3).

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1 **4.8 BIOLOGICAL RESOURCES**

2 Biological resources consist of native or naturalized plants and animals and their habitats. This section
3 focuses on plant and animal species and vegetation types that typify or are important to the function of the
4 ecosystem, are of special societal importance, or are protected under federal or state law or statute. For
5 purposes of this evaluation, sensitive biological resources are defined as those plants and animal species
6 listed by the USFWS, under different levels of concern by the states of Texas and New Mexico, or
7 considered sensitive by Fort Bliss.

8 The ROI for biological resources encompasses Fort Bliss and the surrounding areas that may be affected
9 by activities on Fort Bliss, including a portion of the Tularosa Basin. The Organ Mountains, Sacramento
10 Mountains, Hueco Mountains, and Otero Mesa are not discussed in detail here because land use in those
11 areas will not change under any of the alternatives being considered in this SEIS. Detailed descriptions of
12 these areas are provided in the 2000 Mission and Master Plan PEIS (Ref# 3) and INRMP (Ref# 23),
13 which are incorporated by reference. Substantive changes and/or specifically relevant information from
14 the PEIS are included in this section.

15 **4.8.1 Vegetation**

16 Fort Bliss exhibits a high degree of biodiversity due to its varied topography and large size
17 (approximately 1.1 million acres). Plant communities on the installation range from the Chihuahuan
18 Desert plant communities in the Tularosa Basin to Rocky Mountain conifer forests in the Organ
19 Mountains (Ref# 3). Of the approximately 4,000 plant species found in New Mexico, an estimated 300
20 nonvascular (lichen, mosses, liverworts) and 1,200 vascular (ferns, fern allies, ephedras, conifers,
21 flowering plants) species occur on Fort Bliss, with over 800 taxa in the Organ Mountains alone (Ref# 23).

22 Fort Bliss is generally characterized floristically as a shrub-grassland vegetation community. Over 98
23 percent of Fort Bliss is classified by these two general vegetation types. The remaining area is generally
24 classified as woodland or disturbed. The vegetation data were recently updated and the new
25 characterization and mapping (Ref# 417) is included in this section. Each general vegetation category is
26 composed of a diverse subset of flora ranging from Chihuahuan Desert scrub in the Tularosa Basin to
27 Rocky Mountain conifer forests in the Organ Mountains. Within the basin, alluvial fan, piedmont, desert
28 shrub, and grassland plant communities dominate. Isolated islands of deep sand dominated by shinnery
29 oak (*Quercus havardii*) occur on McGregor Range. These areas are approximately 1 square mile in size
30 and are unique. Similar shinnery oak dominated dunes occur at the entrance to Culp Canyon and
31 Grapevine Canyon. Additional wooded communities are generally found at higher elevations in the upper
32 Sacramento Mountains foothills and in the Organ Mountains.

33 The ecological site units on the Main Cantonment Area and the Fort Bliss Training Complex were
34 mapped using GIS, resulting in 16 land cover mapping units and 14 vegetation types for Fort Bliss,
35 totaling approximately 1,071,616 acres. The land cover (vegetation) types are listed in **Table 4.8-1**, and
36 shown in **Figures 4.8-1, 4.8-2, and 4.8-3**. **Table 4.8-2** summarizes the vegetation types within the
37 groupings of training areas. The various types of shrubland total 67 percent, while there are 31 percent
38 grasslands, 0.9 percent woodlands, and 0.3 percent of facilities.

39 The desert shrublands on Fort Bliss are mostly in the Tularosa Basin. About 31 percent of Fort Bliss is
40 covered with mesquite-dominated plant communities, most of which are coppice dunes. Creosote-
41 dominated plant communities cover over 15.5 percent of the total land. Shrub-dominated plant
42 communities have replaced grassland plant communities (including black grama [*Bouteloua eriopoda*]
43 grasslands) over large areas in southern New Mexico in the last century (Ref# 10, 328, 350).

44

Table 4.8-1. General Land Cover Types on Fort Bliss

<i>General Land Cover Type</i>	<i>Mapping Units</i>		<i>Percentage of Fort Bliss</i>
	<i>New</i>	<i>Old*</i>	
Mesquite Coppice Dunes	1	1	30.91%
Sandscrub	2	2,3	8.11%
Basin Shrublands	3	4,5	4.49%
Creosote Piedmont Shrublands	4	6,7,8	15.48%
Foothill Desert Shrublands	5	9,10,11,12	6.39%
Sandy Plains Desert Grasslands	6	13,34	0.96%
Basin Lowland Desert Grasslands	7	14,15	4.03%
Piedmont Grasslands	8	16,17	3.70%
Mesa Grasslands	9	19,20,21,22	11.16%
Foothill Desert Grasslands	10	18,23,24,31	11.34%
Montane Riparian	11	25	0.04%
Montane Shrublands	12	26,27	2.18%
Montane Coniferous Woodland	13	28,29	0.87%
Montane Forest	14	30	0.03%
Facilities	15	32,33,35	0.32%
No Data	0	0	0.53%

*Mapping units do not directly correlate to the Mission and Master Plan PEIS due to updates.

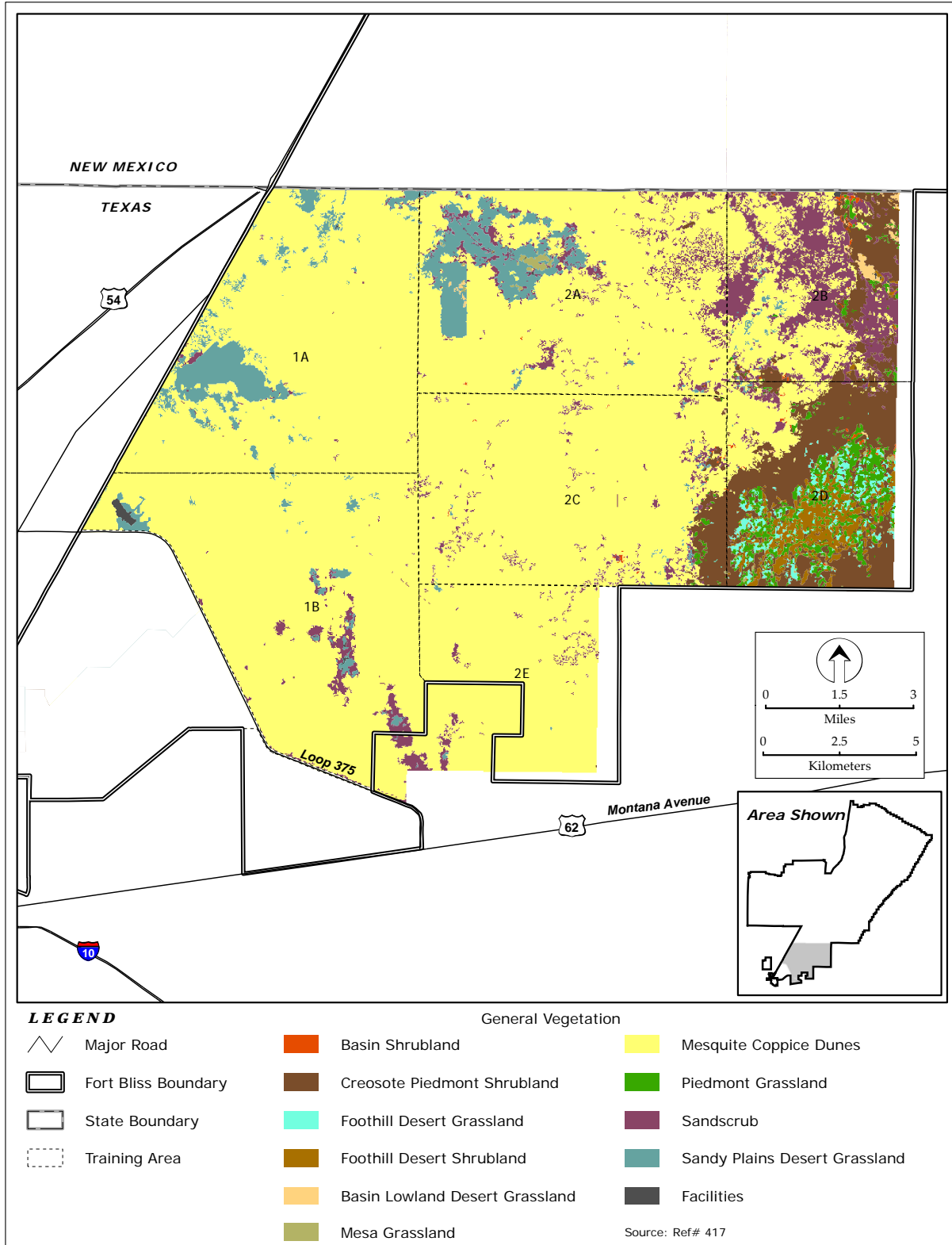
Source: Ref# 3, 526

45 Historic land use in southern New Mexico has contributed to the current landscape conditions. Large
 46 grazing operations transformed grassland communities to shrub-dominated landscapes. Some areas have
 47 been transformed further to mesquite coppice dune communities with little chance of reverting back to the
 48 historic grassland conditions that once dominated (Ref# 331).

49 The vegetation and soils of Fort Bliss appear to have changed greatly in the last 150 years. A very early
 50 survey reported the range as rolling or gently rolling hills, and coppice dunes were reported for only one
 51 small area. An 1858 survey reports the area as a prairie, grass, or grass and prairie, but mesquite
 52 underbrush was becoming established. Even as late as 1884, surveys still reported large areas of
 53 grassland. Sand hills and dunes became more frequently mentioned between 1910 and 1940. As a further
 54 example, the McGregor Ranch was reported to be a grassland in 1884, but grass dominated areas had
 55 disappeared by the survey of 1937 (Ref# 509).

56 Currently, the maneuver areas are dominated by mesquite coppice dunes and grasslands. According to a
 57 survey done by Satterwhite and Ehlen in 1982, the major vegetation in these areas is mesquite-
 58 snakeweed-saltbush-dropseed grass (*Prosopis glandulosa*, *Gutierrezia sarothrae*, *Atriplex canescens*, and
 59 *Sporobolus cryptandrus*) and dropseed grass-sand sagebrush (*Sporobolus flexuosus*, *Sporobolus*
 60 *cryptandrus*, and *Artemisia filifolia*). Wind erosion, which occurs mostly between January and June, is a
 61 major problem in the region (Ref# 460). It is associated with both degrading grasslands and shrub-
 62 dominated areas, particularly on sandy soils (Ref# 82).

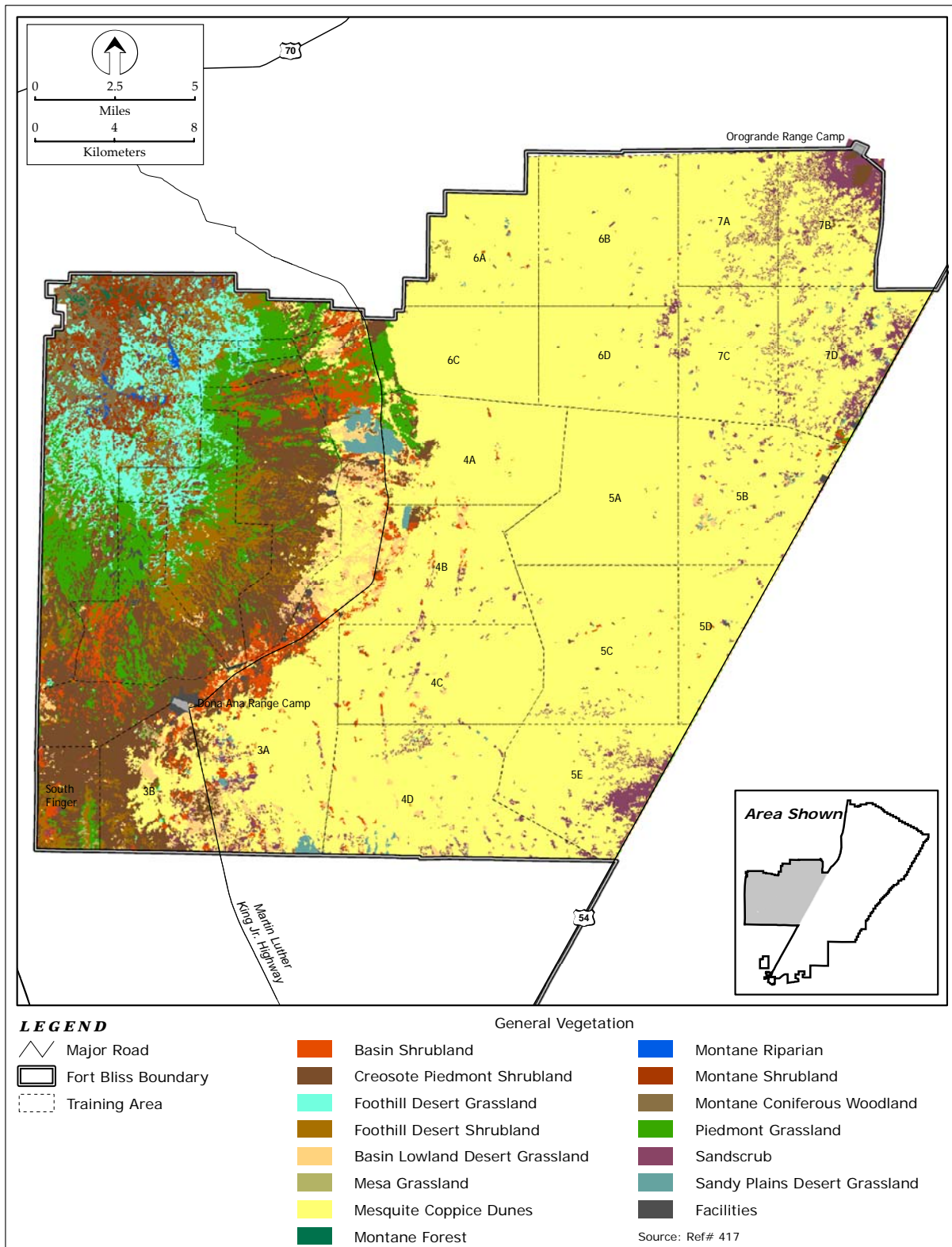
63 The conversion from grassland to shrublands is considered a step in the desertification process (Ref# 3,
 64 329, 330, 331). Long-term studies carried out at the Jornada Experimental Range have shown that the
 65 conversion to shrublands has resulted in a reduction in plant species diversity (Ref# 3, 331, 332).
 66 Grassland communities had 2.5 times more plant species than the mesquite community and 1.7 times
 67 more plant species than the creosote community. Net primary productivity did not differ substantially
 68 between the grassland and shrubland types (Ref# 332, 333). Once established, coppice dunes persist with
 69 little conversion back to less desertified communities. The return to grasslands, even in areas where
 70 livestock and other perturbations have been excluded for many years, is highly unlikely (Ref# 334, 350,
 71 351).



72
73

Figure 4.8-1. South Training Areas Vegetation

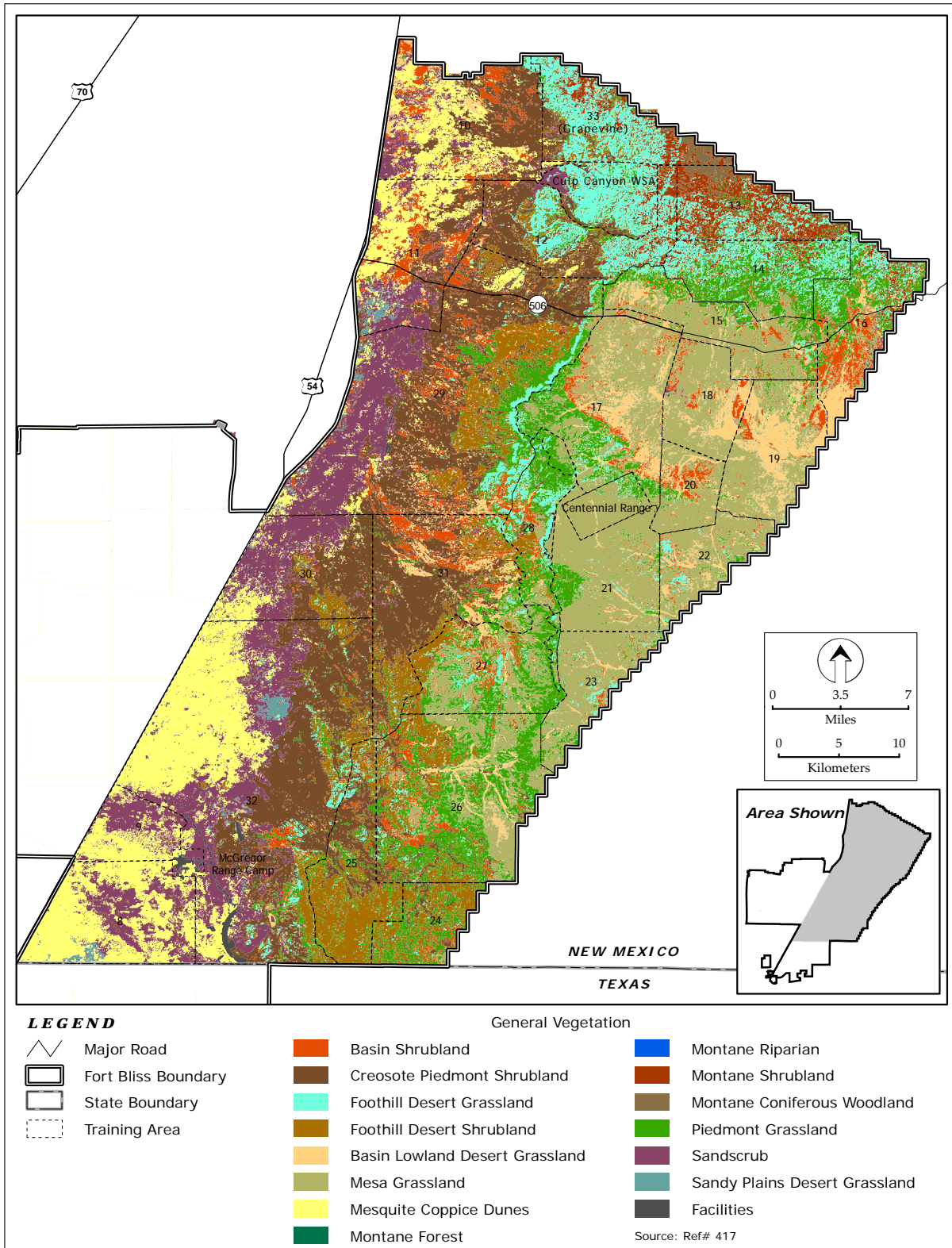
**Fort Bliss Mission and Master Plan Supplemental Programmatic Environmental Impact Statement
Final SEIS**



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Figure 4.8-2. Doña Ana Range-North Training Areas Vegetation



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Figure 4.8-3. McGregor Range Vegetation

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

78

Table 4.8-2. General Land Cover Type Distribution Across Areas of Fort Bliss

<i>General Land Cover Type</i>	<i>Percent of Fort Bliss in land cover type (%)</i>	<i>McGregor Range North Tularosa Basin (%)</i>	<i>McGregor Range South Tularosa Basin (%)</i>	<i>McGregor Range Southeast TAs (%)</i>	<i>North Training Areas (%)</i>	<i>Organ Mountains (Doña Ana Range) (%)</i>	<i>Otero Mesa (%)</i>	<i>Sacramento Foothills (%)</i>	<i>South Training Areas(%)</i>
Mesquite Coppice Dunes	31	27	20	0	82	2	0	<1	76
Sandscrub	8	11	21	0	4	<1	<1	2	7
Basin Shrublands	4	14	5	5	2	3	7	4	<1
Creosote Piedmont Shrublands	15	38	31	8	6	25	<1	7	7
Foothill Desert Shrublands	6	4	11	20	<1	15	1	5	1
Sandy Plains Desert Grasslands	<1	<1	1	0	<1	0	0	0	5
Basin Lowland Desert Grasslands	4	3	2	5	3	2	14	3	<1
Piedmont Grasslands	4	<1	3	15	1	15	1	<1	1
Mesa Grasslands	11	<1	<1	24	<1	<1	61	4	<1
Foothill Desert Grasslands	11	3	4	23	<1	22	16	50	1
Montane Riparian	<1	0	0	0	0	<1	0	0	0
Montane Shrublands	2	<1	0	0	0	7	<1	19	0
Montane Coniferous Woodland	<1	0	0	0	0	7	0	5	0
Montane Forest	<1	0	0	0	0	<1	0	0	0
Facilities	<1	0	<1	0	<1	<1	0	0	<1
No Data	<1	<1	<1	<1	<1	<1	<1	<1	<1

Source: 526

79 Grassland plant communities account for over 31 percent of the land on Fort Bliss. Of this 31 percent,
80 approximately 5 percent is sandy plains and basin lowland desert grasslands, 15 percent is mesa and
81 piedmont grasslands, and 11 percent is foothill grasslands. This distinction is important as certain
82 grassland species, such as the northern aplomado falcon, may find much of the grasslands present
83 unsuitable (e.g., foothill grasslands that tend to have steep slopes and poor ground cover, or grasslands
84 with shrub encroachment) (Ref# 361). Sandy plains desert grasslands, basin lowland desert grasslands in
85 the Tularosa Basin, and piedmont grasslands are less suitable for northern aplomado falcon, while mesa
86 grasslands and some basin lowland desert grasslands (e.g., on Otero Mesa) currently provide the best
87 potential habitat for this species on the installation.

88 Woodland plant communities cover approximately 0.9 percent of Fort Bliss. These plant community
89 types are in the higher elevations (such as the Organ Mountains and Sacramento Mountains foothills).
90 Piñon-juniper woodlands and montane shrublands dominated by mountain mahogany occur in both
91 mountain ranges. However, montane riparian, montane coniferous forests, and montane shrublands
92 dominated by Gambel's oak occur only in the Organ Mountains and Sacramento Mountains foothills on
93 Fort Bliss (Ref# 3).

94 Exotic plant species have become established on some areas on Fort Bliss. African rue and Russian
95 thistle become established on disturbed ground and compete with other vegetation. Salt cedar (*Tamarix*
96 *ramosissima*), which is a highly invasive species, has become established at some stock tanks and at other
97 widely scattered locations with more mesic characteristics on Fort Bliss. Another potential problem plant
98 is Malta thistle (*Centaurea melitensis*), which is currently known to grow along U.S. Highway 54 and
99 other roadways on Fort Bliss. An additional exotic species of concern is Johnson grass (*Sorghum*
100 *halepense*), which occurs in some drainages on Fort Bliss. Fort Bliss completes annual monitoring of
101 distribution and abundance of exotic plant species and does targeted mitigation (Ref# 23). This
102 information has been incorporated into the Fort Bliss INRMP (2000) providing necessary
103 recommendations to preserve biological diversity on post.

104 **4.8.2 Wetlands and Arroyo-Riparian Drainages**

105 Wetlands provide a variety of functions, including groundwater recharge and discharge, flood attenuation,
106 sediment stabilization, sediment and toxicant retention, nutrient removal and transformation, aquatic and
107 terrestrial diversity and abundance, and aesthetic values. Three criteria are necessary to define
108 jurisdictional wetlands: vegetation (hydrophytes), soils (hydric), and hydrology (frequency of flooding or
109 soil saturation). Jurisdictional wetlands are wetlands subject to regulatory authority under Section 404 of
110 the Clean Water Act (CWA) and EO 11990, Protection of Wetlands.

111 A U.S. Army Corps of Engineers study identified 2,410 miles of drainages on Fort Bliss (Ref# 3).
112 Subsequent study by the U.S. Geologic Survey in 1997 (Ref# 507) refined that number to 1,722 miles
113 (see Figure 4.7-2). The majority of these drainages are found in the northeast, central, and southeast
114 portions of McGregor Range. The vast majority of arroyo-riparian drainages on Fort Bliss do not qualify
115 as jurisdictional wetlands as defined by the U.S. Army Corps of Engineers. The only known Waters of
116 the U.S. are on the west side of the Organ Mountains, which is part of the Rio Grande drainage, and some
117 arroyos on McGregor Range that cross the state line into Texas. In addition, a storm water retention pond
118 in the Main Cantonment Area has been identified as a jurisdictional wetland by USACE.

119 Perennial riparian corridors and some ephemeral corridors of the western U.S. have been shown to
120 support high densities and diversity of fauna. In areas of the southwest, 90 percent of the avian diversity is
121 found within riparian corridors (Ref# 335). Based on studies of the ephemeral drainages on McGregor
122 Range and the Doña Ana Range–North Training Areas, the ephemeral drainages have been determined to
123 have: 1) shrub, tree, and forb cover that is more dense along the drainage channels than the surrounding
124 area; 2) greater species richness (for shrubs, trees, grasses, and forbs) than the perennial channel; 3)
125 heights of shrubs along the drainage channels that are nearly twice the height of shrubs in the uplands; 4)
126 riparian species such as desert willow that tended to be taller than nondrainage species; and 5) species

127 normally found in drainages at lower elevations that may be found outside drainages at higher elevations
128 (Ref# 3).

129 **4.8.3 Wildlife**

130 This section summarizes amphibians and reptiles, avifauna, and mammals that occur in the ROI.
131 Additional detail in the 2000 Mission and Master Plan PEIS (Ref# 3) and Fort Bliss INRMP (Ref# 23) is
132 incorporated by reference and not repeated. Additional descriptions of wildlife on McGregor Range can
133 be found in the Resource Management Plan Amendment prepared by BLM (Ref# 21).

134 Fort Bliss supports a relatively high faunal diversity. The State of Texas has the highest biodiversity of
135 herpetofauna in the U.S. with 219 native and exotic species of amphibians and reptiles. New Mexico
136 ranks third, supporting 123 species of amphibians and reptiles. Fort Bliss has documented 54 species and,
137 although they have not been observed, 12 additional species have the potential to occur on Fort Bliss
138 (Ref# 24). Texas has more bird species than any other state in the United States. There are
139 approximately 620 identified species and subspecies of birds that regularly breed, migrate, winter, or nest
140 in Texas (Ref# 336). There are an estimated 509 species of birds recorded in New Mexico and 334
141 species (54 and 68 percent for Texas and New Mexico, respectively) have been recorded on Fort Bliss
142 (Ref# 338, 339). Studies on Fort Bliss have demonstrated that arroyo-riparian drainage areas are used
143 more extensively by wildlife than adjacent upland areas (Ref# 337, 340). Over 1,700 miles of these
144 arroyos have been mapped on Fort Bliss (Ref# 507) and many of these arroyos offer suitable habitat for
145 wildlife, particularly avian species (Ref# 337).

146 **4.8.3.1 Amphibians and Reptiles**

147 Surveys for amphibians and reptiles were conducted on Otero Mesa and in the Tularosa Basin on
148 McGregor Range in 1996 and 1997. In 2003, 2004, and 2005, the Hueco Mountains, dunes of west Culp
149 Tank and Toy Tank areas, mixed dunes, mesquite dunes, and shinnery oak dunes were surveyed (Ref#
150 24). Based on these surveys and other information, 8 species of amphibians and 47 species of reptiles
151 have been observed on Fort Bliss; an additional 11 species of amphibians and reptiles have the potential
152 to occur (Ref# 24). The largest number of species occurs in the Hueco Mountains, which are
153 characterized by fractured limestone outcrops (32 species), followed by grasslands (27 species), dune
154 habitat (25 species), and desert shrublands (19 species) (Ref# 13, 24), Sacramento Mountains foothills (10
155 species), and Organ Mountains (6 species) (Ref# 3, 23).

156 During the surveys, it was determined that the box turtle (*Terrapene ornata*) is the only species of turtle
157 observed on Fort Bliss and is most common in the grassland plant communities on Otero Mesa, although
158 it has been regularly observed in the desert shrubland communities in the Tularosa Basin (Ref# 3, 23).
159 The most diverse group of reptiles is the lizards; 24 species have been recorded from Fort Bliss including
160 6 species of whiptails (Ref# 3, 24). The striped whiptail (*Aspidoscelis moinata*) was commonly found
161 during the 2003-2005 herpetofauna surveys (Ref# 24). Twenty-two species of snakes are known to occur
162 on Fort Bliss. Species such as the western diamondback rattlesnake (*Crotalus atrox*) and bull snake
163 (*Pituophis catenifersayi*) are common and widespread throughout Fort Bliss. During the 2003-2005
164 surveys, four previously unrecorded snake species were observed: the Western thread-snake, western
165 patchnose snake, black-necked garter snake, and western hognose snake (Ref# 24).

166 **4.8.3.2 Avifauna**

167 A total of 334 species of birds have been recorded on Fort Bliss. Most of these species are listed and
168 protected under the Migratory Bird Treaty Act (1918). Fort Bliss falls within the Chihuahuan desert and
169 Mesa and Plain Physiographic Partners in Flight Region. Grassland and desert shrubland priority species
170 within this region are primarily addressed in the sensitive species discussion (Section 4.8.4) due to
171 parallel protection. Eighty species occur throughout the year, 129 species are seen only temporally during
172 migration, 42 species are spring and summer residents, and the remaining species occur principally during
173 the winter (Ref# 3, 23). Thirty-two species are common, 89 fairly common, 72 uncommon, and 141 rare

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

174 to very rare (Ref# 3, 23). Bird life in the Main Cantonment Area is typical of a more urbanized area.
175 Species such as the house sparrow (*Passer domesticus*), great-tailed grackle (*Quiscalus mexicanus*), house
176 finch (*Carpodacus mexicanus*), and Rock Dove (*Columba livia*) are common. Many of the 101 species of
177 diving birds, wading birds, waterfowl, shorebirds, gulls, and terns observed on Fort Bliss have been
178 observed at the EPWU Oxidation Ponds near the Main Cantonment Area. These bird species also have
179 been observed on playa lakes and stock tanks in the South Training Areas, Doña Ana Range–North
180 Training Areas, and McGregor Range.

181 EO 13186, Responsibilities of Federal Agencies to Protect Migratory Birds (2001), recognizes the
182 ecological and economic importance of migratory birds to this and other countries. It requires federal
183 agencies to evaluate the effects of their actions and plans on migratory birds (with an emphasis on species
184 of concern) in their NEPA documents. Species of concern are those identified in 1) the report “Migratory
185 Nongame Birds of Management Concern in the United States” (Ref# 489), 2) priority species identified
186 by established plans such as those prepared by Partners in Flight, or 3) listed species in 50 CFR 17.11
187 Endangered and Threatened Wildlife.

188 In the West, over 60 percent of the neotropical migrants use riparian areas for stop-over habitat during
189 migration or for breeding (Ref# 342, 343, 344). The arroyo-riparian drainages on Fort Bliss have a
190 similar attraction to neotropical migrants (Ref# 3, 23, 337, 346). Recent studies of nesting and migratory
191 birds at Fort Bliss and the surrounding area demonstrate that arroyo-riparian drainages are used more
192 frequently and intensely than adjacent upland sites. Fort Bliss has an extensive network of arroyos with
193 well-developed channels that occur throughout the training areas. Much of the focus on arroyo-riparian
194 drainage research has occurred in the foothill desert shrublands vegetation communities, especially within
195 the Tularosa Basin and southeast training areas of McGregor Range.

196 Raptor surveys revealed that the Swainson’s hawk (*Buteo swainsonii*) and turkey vulture (*Cathartes aura*)
197 were the most common raptors observed (Ref# 3, 23). Winter surveys showed that the golden eagle and
198 red-tailed hawk were the most common wintering species (Ref# 3, 23).

199 **4.8.3.3 Mammals**

200 A total of 58 species of mammals have been documented and an additional 20 species have the potential
201 to occur on Fort Bliss (this does not include domesticated species such as dogs, cats, cattle, or horses).

202 Rodent surveys in 1997 and 1998 revealed that the largest numbers of species were in the sandy arroyo
203 scrub (14 species) and *Chilopsis* arroyo (14 species) and the smallest number (7 species) was in the
204 mesquite dunes. Studies of rodents in arroyos and associated adjacent upland habitats found the relative
205 abundance was greater in the arroyos than the adjacent uplands. In the 1997 surveys, the most abundant
206 species were the silky pocket mouse (*Perognathus flavus*) and Merriam’s kangaroo rat (*Dipodomys*
207 *merriami*). Other common species were the deer mouse (*Peromyscus maniculatus*), hispid cotton rat
208 (*Sigmodon hispidus*), white-footed mouse (*Peromyscus leucopus*), cactus mouse (*Peromyscus eremicus*),
209 western harvest mouse (*Reithrodontomys megalotis*), and Ord’s kangaroo rat (*Dipodomys ordii*). The
210 deer and cactus mice were most common in the acacia scrub habitat while the white-footed mouse, hispid
211 cotton rat, and western harvest mouse were most common in swales. Other rodents observed were the
212 Texas antelope squirrel (*Ammospermophilus interpres*), rock squirrel (*Spermophilus variegatus*), Botta’s
213 pocket gopher (*Thomomys bottae*), and yellow-faced pocket gopher (*Cratogeomys castanops*). In
214 addition, the porcupine (*Erethizon dorsatum*), coyote (*Canis latrans*), badger (*Taxidea taxus*), and bobcat
215 (*Lynx rufus*) were observed (Ref# 3, 23).

216 The desert cottontail (*Sylvilagus audubonii*) and black-tailed jackrabbit (*Lepus californicus*) are common
217 on post and most commonly found in the desert shrubland habitat. The coyote, kit fox (*Vulpes macrotis*),
218 badger, and bobcat are predators in the desert shrubland and grassland habitats. The cougar (*Felis*
219 *concolor*) occurs in a variety of habitats on Fort Bliss as well. The mule deer (*Odocoileus hemionus*)
220 occurs throughout Fort Bliss and is most common in the mountainous portions including the foothills of

221 the Sacramento and Organ Mountains. The pronghorn antelope (*Antilocapra americana*) occurs mostly
222 in the grassland communities of Otero Mesa and adjoining grasslands adjacent to the mesa, with
223 occasional use of the desert shrubland habitat in the Tularosa Basin. The oryx (*Oryx gazella*) occurs
224 throughout the Fort Bliss Training Complex, is common in the desert shrubland communities, has been
225 observed in the area of Mack Tanks in the Tularosa Basin, and evidence of them was common at New
226 Tank in the Hueco Mountains. Javelina (*Dicotyles tajacu*) is widely dispersed but uncommon in the
227 Tularosa Basin and on Fort Bliss and have been observed infrequently in many locations (Ref# 3, 23).

228 **4.8.4 Sensitive Species**

229 Three categories of protection status are included in this section:

230 **Federally Listed Threatened and Endangered Species.** The Endangered Species Act of 1973 provides
231 protection to species federally listed as endangered or threatened. Endangered species are those species
232 that are at risk of extinction in all or a significant portion of their range. Threatened species are those that
233 could be listed as endangered in the near future.

234 **State Listed Threatened and Endangered Species.** The states of New Mexico and Texas maintain their
235 own lists of state endangered and threatened plant and animal species.

236 **Other Sensitive Species.** These include federally and state-listed candidates, proposed endangered,
237 proposed threatened, and species of concern. Candidate species are those for which the USFWS has
238 sufficient information on biological vulnerability and threats to support proposals to list them as
239 endangered or threatened, but issuance of proposed rules for these species is precluded by higher priority
240 listing actions. Proposed endangered and threatened species are those proposed for listing as endangered
241 and threatened, respectively, and for which formal ruling is in progress. Species of concern are those
242 identified to receive attention for planning purposes. At present, none of those species receive legal
243 protection under the ESA.

244 **Table 4.8-3** includes 61 sensitive species of flora and fauna known to occur, or having the potential to
245 occur, on Fort Bliss. The list addresses species protection status and provides brief comments on their
246 location within the installation. The diverse habitats on Fort Bliss have the potential to support species
247 that have not been confirmed as occurring on post. Continued monitoring and improved documentation
248 of Fort Bliss' natural environment ensures that sensitive species receive adequate protection in the event a
249 new population is discovered.

250 Of the 61 sensitive species, 45 are federally listed. However, only nine species are federally listed as
251 threatened, endangered, or candidate status. Of these nine species, only two regularly occur on Fort Bliss:
252 the Sneed pincushion cactus (*Coryphantha sneedii* var. *sneedii*) populations exist on specific limestone
253 habitats, and bald eagles (*Haliaeetus leucocephalus*) roost on winter slopes in Lincoln National Forest
254 and forage on the Sacramento Mountains foothills part of McGregor Range. The northern aplomado
255 falcon (*Falco femoralis septentrionalis*) has been observed on Fort Bliss, but only occasionally as
256 transients. There have been no documented nesting attempts since the early 1900s, despite many surveys.
257 The remaining six species (Kuenzler's hedgehog cactus [*Echinocereus fendleri* var. *kuenzleri*], interior
258 least tern [*Sterna antillarum athalassos*], yellow-billed cuckoo [*Coccyzus americanus*], southwest willow
259 flycatcher [*Empidonax trailii extimus*], piping plover [*Charadrius melodus*], and Mexican spotted owl
260 [*Strix occidentalis lucida*]) are not known to occur; have no suitable habitat or insufficient habitat to
261 maintain a population; or exist as rare, transitory, or seasonal migrants, but breeding is not known to
262 occur on Fort Bliss.

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

263

Table 4.8-3. Sensitive Species Known or Having the Potential to Occur on Fort Bliss

<i>Species</i>	<i>Status</i>			<i>Location on Fort Bliss</i>
	<i>Federal</i>	<i>New Mexico</i>	<i>Texas</i>	
Plants				
Sneed pincushion cactus (<i>Coryphantha sneedii</i> var. <i>sneedii</i>)	E	E	E	Limestone Hills, Doña Ana Range–North Training Areas
Kuenzler’s hedgehog cactus (<i>Echinocereus fendleri</i> var. <i>kuenzleri</i>)	E	E	—	Not known to occur on Fort Bliss. Potential habitat on extreme northern McGregor Range in the Sacramento Mountains
Alamo beardtongue (<i>Penstemon alamosensis</i>)	SC	SC		Hueco Mountains, South Training Areas
Organ Mountains evening primrose (<i>Oenothera organensis</i>)	SC	SC	—	Organ Mountains, Doña Ana Range–North Training Areas
Organ Mountains figwort (<i>Scrophularia laevis</i>)	SC	SC	—	Organ Mountains, Doña Ana Range–North Training Areas
Standley whitlowgrass (<i>Draba standleyi</i>)	SC	SC	—	Organ Mountains, Doña Ana Range–North Training Areas
Desert night blooming cereus (<i>Peniocereus greggii</i> var. <i>greggii</i>)	SC	E	—	Desert shrublands, Doña Ana Range–North Training Areas
Hueco Mountains rock daisy (<i>Perityle huecoensis</i>)	SC	—	—	Hueco Mountains, South Training Areas
Nodding cliff daisy (<i>Perityle cernua</i>)	SC	SC	—	Organ Mountains, Doña Ana Range–North Training Areas
Sand prickly pear (<i>Opuntia arenaria</i>)	SC	E	—	Low Potential to occur on Fort Bliss
Organ Mountains pincushion cactus (<i>Escobaria organensis</i>)	—	E	—	Organ Mountains, Doña Ana Range–North Training Areas
Crested coral-root (<i>Hexalectris spicata</i>)	—	SC	—	Organ Mountains, Doña Ana Range–North Training Areas
Sandhill goosefoot (<i>Chenopodium cycloides</i>)	—	SC	—	Occasional in sandy, disturbed places, Doña Ana Range–North Training Areas
Invertebrates				
Franklin Mountain talussnail (<i>Sonorella metcalfi</i>)	SC	—	—	Rock talus slopes in the Franklin Mountains and possible in the Organ Mountains
Anthony blister beetle (<i>Lytta mirifica</i>)	SC	—	—	Not known to occur on Fort Bliss, but habitat occurs in sand dunes
Los Olmos tiger beetle (<i>Cicindela nevadica</i>)	SC	—	—	Not known to occur on Fort Bliss, could occur in areas of limestone soil
Boulder woodlandsnail (<i>Ashmunella auriculata</i>)	FB	—	—	Organ Mountains, Doña Ana Range–North Training Areas
Maple Canyon woodlandsnail (<i>Ashmunella todseni</i>)	FB	—	—	Organ Mountains, Doña Ana Range–North Training Areas
Organ Mountains woodlandsnail (<i>Ashmunella organensis</i>)	FB	—	—	Organ Mountains, Doña Ana Range–North Training Areas
Beasley’s woodlandsnail (<i>Ashmunella beasleyi</i>)	FB	—	—	Organ Mountains, Doña Ana Range–North Training Areas
Reptiles				
Texas horned lizard (<i>Phrynosoma cornutum</i>)	SC	—	T	Widespread throughout post
Mountain short-horned lizard (<i>Phrynosoma douglasii hernandezii</i>)	—	—	T	Species occurs on McGregor Range; subspecies not recorded on post

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

<i>Species</i>	<i>Status</i>			<i>Location on Fort Bliss</i>
	<i>Federal</i>	<i>New Mexico</i>	<i>Texas</i>	
Gray-banded kingsnake (<i>Lampropeltis alterna</i>)		E		Known from Hueco Tanks State Park. Possible in Hueco Mountains of South Training Areas and on McGregor Range.
Mottled rock rattlesnake (<i>Crotalus lepidus lepidus</i>)	—	T	—	Species documented from the Organ Mountains; subspecies not recorded on post
Texas lyre snake (<i>Trimorphodon biscutatus vilkinsoni</i>)	—	—	T	Castner Range in Texas
Birds				
Interior least tern (<i>Sterna antillarum athalassos</i>)	E	E	E	Not known to occur on Fort Bliss; could occur as very rare migrant at sewage lagoon on Fort Bliss
Northern aplomado falcon (<i>Falco femoralis septentrionalis</i>)	E*	E	E	Several sightings of transient birds on or very close to Otero Mesa, McGregor Range
Southwestern willow flycatcher (<i>Empidonax trailii extimus</i>)	E	E	—	Occasional migrant on McGregor Range
Bald eagle (<i>Haliaeetus leucocephalus</i>)	T	T	T	Forages in Sacramento Mountains, McGregor Range; roosts on Lincoln National Forest
Piping plover (<i>Charadrius melodus</i>)	T	E	—	Rare migrant on McGregor Range; observed once in 1987 at sewage lagoon on Fort Bliss
Mexican spotted owl (<i>Strix occidentalis lucida</i>)	T	—	T	Very rare on Fort Bliss; not known to breed on site; best potential habitat in Organ mountains, Doña Ana Range–North Training Areas
Yellow-billed cuckoo (<i>Coccyzus americanus</i>)	C	C	—	Uncommon migrant on Fort Bliss; lack of riparian habitat
Peregrine falcon (<i>Falco peregrinus anatum</i>)	SC	SC	E	Migrant and occasionally nesting in some mountains of Fort Bliss
Mountain plover (<i>Charadrius montanus</i>)	SC	SC	—	Several sightings on Otero Mesa, McGregor Range
Black tern (<i>Chlidonias niger</i>)	SC	—	—	Regular migrant throughout Fort Bliss at available water sources
White-faced ibis (<i>Plegadis chihi</i>)	SC	—	T	Regular migrant at sewage lagoons on McGregor Range and playas or earthen tanks
Northern goshawk (<i>Accipiter gentilis</i>)	SC	—	T	Uncommon migrant on Fort Bliss
Zone-tailed hawk (<i>Buteo albonotatus</i>)	—	—	T	Uncommon migrant on Fort Bliss
Ferruginous hawk (<i>Buteo regalis</i>)	SC	—	—	Wintering and migrant species; mostly on Otero Mesa, McGregor Range
Western burrowing owl (<i>Athene cunicularia</i>)	SC	—	—	Occurs throughout Fort Bliss except the mountain areas; occurs in all desert shrubland and grassland vegetative communities on Fort Bliss
Costa's hummingbird (<i>Calypte costae</i>)	—	T	—	Uncommon migrant in arroyo-riparian habitat on Fort Bliss

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

<i>Species</i>	<i>Status</i>			<i>Location on Fort Bliss</i>
	<i>Federal</i>	<i>New Mexico</i>	<i>Texas</i>	
Loggerhead shrike (<i>Lanius ludovicianus</i>)	SC	—	—	Winter and breeding bird from Otero Mesa and Tularosa Basin
Baird's sparrow (<i>Ammodramus bairdii</i>)	SC	T	—	Migrates through and winters in dense grasslands primarily on Otero Mesa
Varied bunting (<i>Passerina versicolor</i>)	—	T	—	Very rare on Fort Bliss
Bell's vireo (<i>Vireo bellii</i>)	—	T	—	Occasional on Fort Bliss in heavy mesquite thickets in arroyo-riparian drainage habitats
Gray vireo (<i>Vireo vicinior</i>)	—	T	—	Nests in the Organ Mountains, Doña Ana Range–North Training Areas
Mammals				
Small-footed myotis (<i>Myotis ciliolabrum</i>)	SC	—	—	Distribution unknown
Occult little brown bat (<i>Myotis occultus</i>)	SC	—	—	Distribution unknown
Fringed myotis (<i>Myotis thysanodes</i>)	SC	—	—	Reported from the Sacramento Mountains foothills, McGregor Range
Cave myotis (<i>Myotis velifera</i>)	SC	—	—	Distribution unknown
Long-legged myotis (<i>Myotis volans</i>)	SC	—	—	Distribution unknown
Yuma myotis (<i>Myotis yumanensis</i>)	SC	—	—	Distribution unknown
Townsend's pale big-eared bat (<i>Corynorhinus townsendii pallescens</i>)	SC	—	—	Distribution unknown
Big free-tailed bat (<i>Nyctinomops macrotis</i>)	SC	—	—	Distribution unknown
Spotted bat (<i>Euderma maculatum</i>)	SC	T	T	Distribution unknown
Townsend's pale big-eared bat (<i>Corynorhinus townsendii pallescens</i>)	SC	—	—	Distribution unknown
Big free-tailed bat (<i>Nyctinomops macrotis</i>)	SC	—	—	Distribution unknown
Gray-footed chipmunk (<i>Neotamias canipes</i>)	SC	T	—	Occurs in woodland and forest habitats in the Sacramento Mountains foothills on McGregor Range
Organ Mountain Colorado chipmunk (<i>Neotamias quadrivittatus australis</i>)	SC	T	—	Occurs in Organ Mountains, Doña Ana Range–North Training Areas
Arizona black-tailed prairie dog (<i>Cynomys ludovicianus arizonensis</i>)	SC	—	—	Occurs on Otero Mesa , McGregor Range
Desert bighorn sheep (<i>Ovis canadensis mexicana</i>)	—	E	—	Does not occur on Fort Bliss; previously existed in Organ Mountains on Doña Ana Range–North Training Areas

*This species has been designated as a Nonessential Experimental Population within the states of NM and AZ, thus carrying 10(j) status under ESA. Thus, the species is designated as threatened within these designated geographic confines and is separated from other populations' federal listing status.

SC = federal or state species of concern; E = endangered species; T = threatened species; C = candidate; FB = Fort Bliss sensitive species; — = without status.

Source: Ref# 3, 495, 497, 498

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

264 Of these species, the northern aplomado falcon has received substantial local interest. This is a grassland
 265 species of southern Texas, New Mexico, and Arizona. Historic records show that it was common
 266 throughout its range until about 1940 (Ref# 3). Loss of quality habitat is believed to be one of the leading
 267 causes of the falcon's decline. The northern aplomado falcon was listed as endangered under ESA in
 268 1986. From 1952 until the present, only one documented successful nesting and several unsuccessful
 269 attempts have occurred in New Mexico (Ref# 494). It has been designated as a Nonessential
 270 Experimental Population within the states of New Mexico and Arizona, thus carrying 10(j) status under
 271 ESA. This designated the species as threatened within these geographic confines, separated from other
 272 populations' federal listing status (Ref# 494).

273 Potential aplomado falcon habitat on Fort Bliss, based on GIS analysis of several sources, is depicted on
 274 **Figures 4.8-4** and **4.8-5**. The aplomado falcon is known as a transient species on Fort Bliss; no nesting or
 275 residential populations are known on the installation. **Table 4.8.4** summarizes observations and survey
 276 efforts on Fort Bliss.

277 **Table 4.8-4. Northern Aplomado Falcon Sightings and Survey Summary on Fort Bliss**

<i>Date</i>	<i>Action</i>	<i>Comments</i>
June 1917	Female northern aplomado falcon shot at nest 45 miles south of Alamogordo.	Nest apparently on Otero Mesa portion of McGregor Range because elevation listed as 5,500 feet.
23 May 1997	Northern aplomado falcon sighting as part of Air Force study on Fort Bliss.	Follow-up survey failed to observe bird again.
11 & 18 September 1999	Northern aplomado falcon observed on Otero Mesa portion of McGregor Range. Bird was a juvenile, banded before fledging earlier in the year.	Bird hatched in Mexico and moved 186 miles north as part of post-hatch wandering. Follow-up surveys failed to observe bird again.
1994-2005	Surveys completed on Fort Bliss in 1994, 1996, 1997, 1998, 1999, 2000, 2001, 2002, 2003, 2004, 2005.	One bird was observed in 2005, (mentioned below), one in 1999 (mentioned above), one in 1997 (mentioned above).
3 October 2005	Northern aplomado falcon observed on Fort Bliss.	Area was checked twice prior to observation and five times post sighting with no additional observations.
Early 1990s-present	Hundreds of miles of annual survey routes within potential northern aplomado falcon habitat on Fort Bliss.	Minimal transient northern aplomado falcon observations, no documented nesting.

Source: Ref# 3, 23, 494, 496

278 Figure 4.8-4 illustrates current grassland conditions with habitat potential for northern aplomado falcon
 279 based on the 2002 updated vegetation map for Fort Bliss and a fall 2004 LANDSAT Thematic Mapper
 280 (TM) satellite image. Grasslands greater than 240 hectares in size and on areas with slopes less than 7
 281 degrees are included on the map. The percent bare ground is estimated from TM imagery. Sandy plains
 282 grasslands in deserts are seldom as dense as other grassland types on Fort Bliss and do not usually fit
 283 habitat conditions reported for grasslands inhabited by aplomado falcons (Ref# 3, 511). Figure 4.8-5,
 284 map A, illustrates habitat potential for the species by mapping ecosites with grasslands potentially
 285 suitable for aplomado falcons. This map was modified from the map published by the BLM (Ref# 21) to
 286 exclude slopes greater than 7 degrees, and it includes ecosites across all of Fort Bliss in addition to
 287 McGregor Range. Ecosites included are all of the Loamy, Limy, Limestone Hills, Limestone Hill and
 288 Mountain (Desert Grassland), Gravelly 12-14 inches, Loamy Bottom 12-14 inches, Loamy Sand 10-12
 289 inches, and Shallow Sandy 12-14 inches ecosites. Figure 4.8-5, map B shows the results of a habitat
 290 evaluation conducted by Taffanelli and Montoya (Ref# 525) as part of surveys for northern aplomado
 291 falcons on Fort Bliss. Their evaluation was based on a visual examination and comparison to occupied

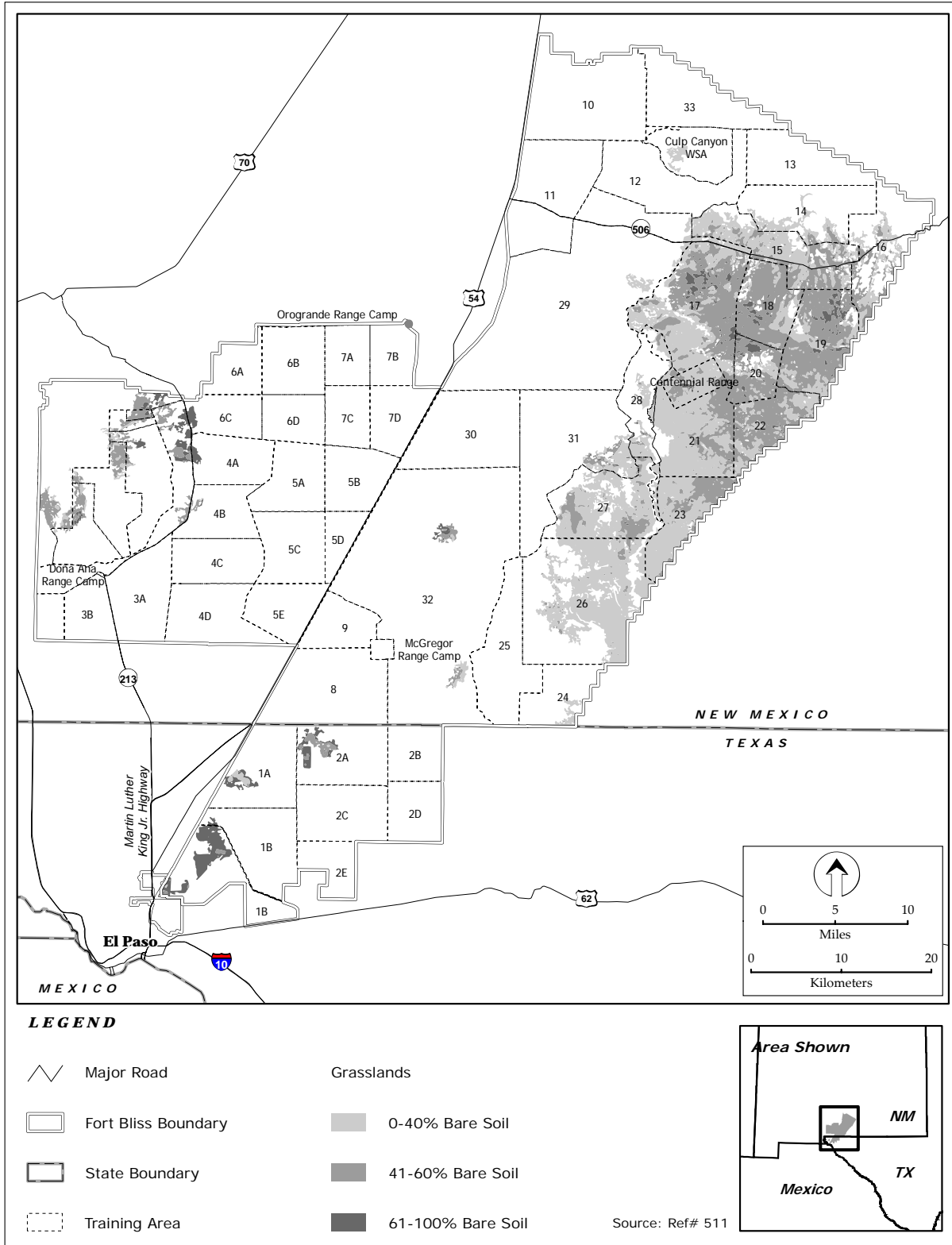
**Fort Bliss Mission and Master Plan Supplemental Programmatic Environmental Impact Statement
Final SEIS**

292 grasslands in the Mexican state of Chihuahua. Both Figures 4.8-4 and 4.8-5 show that the vast majority
293 of habitat is on Otero Mesa and portions of the southeast TAs on McGregor Range. Figure 4.8-5, map C,
294 shows potential habitat based on unsupervised classification of a 1999 TM imagery (Ref# 361). A logistic
295 regression was created to describe habitat in Chihuahua and applied to TM imagery of New Mexico and
296 west Texas.

297 Direct measures of vegetation conditions in occupied habitat in desert grassland in Chihuahua, Mexico
298 show a high percent of grass basal cover (average of 40 percent or greater) (Ref# 3, 511). Occupied
299 grasslands are usually dominated by tobosa or blue grama. Coincident with the grassland condition is a
300 relatively low bare ground percentage and lower shrub densities (Ref# 3, 511). Occupied areas are often
301 in topographically flat or even slightly concave areas in large basins or draws (Ref# 511, 516). The 240
302 hectare minimum polygon size used in habitat mapping schemes is based on Montoya's thesis finding that
303 minimum male home range during the nesting season was 240 hectares (Ref# 3). Montoya also reported
304 a minimum home range area for pairs at about 1,600 hectares based on no observed overlap in use of
305 space. Montoya estimated a density in his study area of about one pair per 4,300 hectares. During the
306 nesting season, the birds may stay in relatively small areas, but they apparently require substantial areas
307 for year-round habitation. In addition to these requirements, suitable nesting substrate for raptors must
308 exist, and abundant avian prey must be available (Ref# 3, 511). Comparisons of prey availability between
309 Otero Mesa and Chihuahuan grasslands showed a difference in average biomass of birds between the two
310 locations, with a higher average biomass of birds in Chihuahua grasslands (Ref# 3).

311 These studies point out there are many aspects to habitat characteristic of northern aplomado falcons, and
312 all are needed to create suitable habitat. Many areas on Fort Bliss have one or more of these
313 characteristics; however, few areas have all characteristics present in an area large enough for nesting
314 territory. The most favorable areas on Fort Bliss are draws on Otero Mesa. Southeast McGregor Range
315 has limited favorable habitat for aplomado falcon because of slope limitations, shrub encroachment, and
316 terrain. Habitat evaluations are currently being conducted on McGregor Range to determine habitat
317 suitability. Monitoring of birds released as an experimental population may help in the understanding of
318 habitat requirements and relative condition of desert grasslands in southern New Mexico.

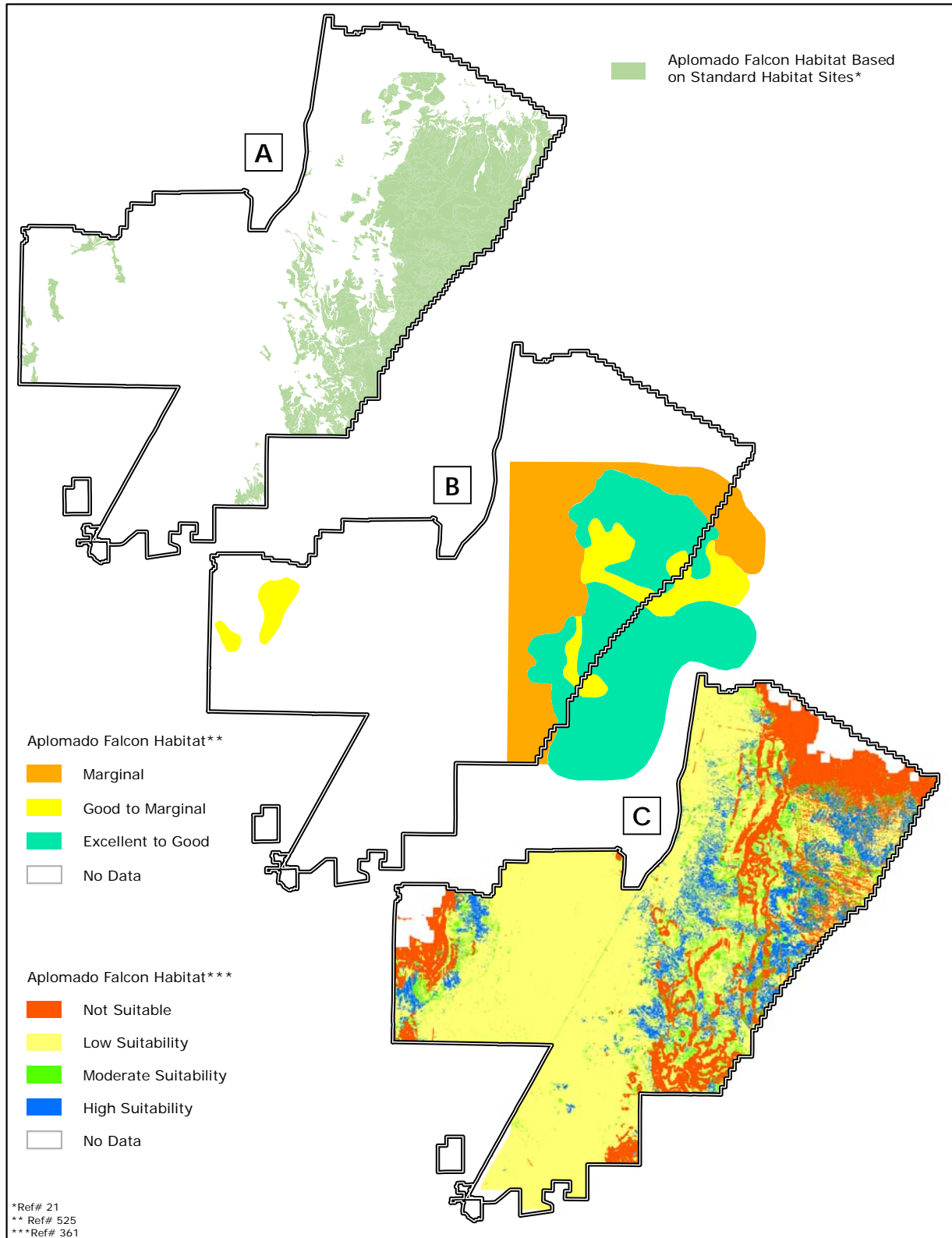
**Fort Bliss Mission and Master Plan Supplemental Programmatic Environmental Impact Statement
Final SEIS**



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Figure 4.8-4. Current Grassland Conditions with Habitat Potential for Aplomado Falcons



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Figure 4.8-5. Potential Habitat for Northern Aplomado Falcon on Fort Bliss Identified by Various Screening Models

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4.9 CULTURAL RESOURCES

The ROI for cultural resources consists of all areas within the boundaries of Fort Bliss including the Main Cantonment Area, South Training Areas, Doña Ana Range–North Training Areas, and McGregor Range. The Mission and Master Plan PEIS (Ref# 3) describes in detail the cultural history of Native Americans and post-contact inhabitants in the ROI and is incorporated by reference. This baseline information has not changed since 2000 and is not repeated here.

Cultural resources on Fort Bliss are composed of Native American or Euroamerican districts, landscapes, sites, buildings, structures, artifacts, and other evidence of human use. These resources can be grouped into four major categories.

- Archaeological resources — locations where human activity measurably altered the earth or left deposits of physical remains (e.g., stone tools, projectile points, bottles). In this discussion, Native American archaeological resources pre-date the beginning of written records and consist of the remains of Native American activities. In the El Paso area, they range from isolated stone tools to pueblo sites to more recent occupations by the Manso, Suma, Jocomo, and early Apache. Euroamerican resources are defined as those formed after the beginning of written records. Euroamerican archaeological resources on Fort Bliss include campsites, roads, fences, trails, dumps, and a variety of other features.
- Architectural resources — standing buildings, dams, canals, bridges, and other structures of historic, aesthetic, or scientific significance. The structures are generally 50 years of age or older, although military buildings and structures from the Cold War era (1946 to 1991), for example, can be considered significant historic properties if they were of exceptional importance to the nation’s military history. At Fort Bliss, historic properties can date to the late 19th century and also include World War I, World War II, and Cold War-era military facilities, buildings, and structures.
- Cultural landscape — a geographic area that includes related cultural and natural resource features and the spatial relationships among those features. Historic cultural landscapes are generally 50 years old or older and can include military installations with associated operations areas, ranching landscapes, farming landscapes, industrial landscapes, and traditional landscapes. Historic vernacular landscapes are those modified by human activity to reflect certain traditions, customs, or values in the everyday lives of people. Ethnographic or traditional landscapes contain a variety of natural and cultural resources that an associated people define as heritage resources (e.g., contemporary settlements, religious sites, or geological structures).
- Properties of traditional cultural and religious importance — cultural resources associated with cultural practices and beliefs of a Tribal community, which are rooted in its history and are important in maintaining the continuing cultural identity of the Tribe. These can only be identified by Native American groups. Native American properties of traditional cultural and religious importance may include archaeological sites, locations of significant events, sacred areas, sources of raw materials, and traditional hunting or gathering areas. Native Americans may consider these properties essential for the preservation of their culture.

Two federally recognized Native American Tribes who live near Fort Bliss today have been identified as having traditional lands within the ROI: the Mescalero Apache Tribe and the Ysleta del Sur Pueblo (Tigua). Two additional federally recognized Native American Tribes have expressed an interest in lands managed by Fort Bliss: the Comanche Tribe and The Navajo Nation. The Army has initiated consultation with these four Tribes. One purpose of this consultation is to identify properties of traditional cultural and religious importance on Fort Bliss facilities. A project to survey sacred sites is included in the

46 ICRMP (Ref# 242). Two other modern tribes, the Fort Sill Apache and Kiowa, may have traditional
47 interests in lands managed by Fort Bliss but have not requested consultation.

48 **4.9.1 Applicable Regulations and Standards**

49 **4.9.1.1 National Register of Historic Places**

50 Federal agencies must take into account the effect that their undertakings may have on historic properties.
51 Historic properties are resources that are eligible for inclusion in the NRHP under the established criteria
52 in 36 CFR 60.4 (*Parks, Forests, and Public Property—National Register of Historic Places Criteria For*
53 *Evaluation*). A historic property must usually be more than 50 years old, although exceptions can occur.
54 For example, more recent historic resources on a military base may be considered significant if they are of
55 exceptional importance in understanding the Cold War.

56 To be considered eligible for inclusion in the NRHP, Native American and Euroamerican archaeological
57 resources, architectural resources, landscapes, and properties of traditional cultural and religious
58 importance must be determined to be significant by meeting one or more of the criteria outlined in 36
59 CFR 60.4. Properties identified by Tribes as properties of traditional cultural and religious importance
60 need not qualify for inclusion in the NRHP to be managed as significant resources. A property of
61 traditional cultural and religious importance that is eligible for the NRHP (i.e., a historic property) may be
62 called a Traditional Cultural Property (TCP). Significant resources are those that:

- 63 a. are associated with events that have made a significant contribution to the broad patterns of our
64 history;
- 65 b. are associated with lives of persons significant in our past;
- 66 c. embody the distinctive characteristics of a type, period, or method of construction, or that
67 represent the work of a master, or that possess high artistic values, or that represent a significant
68 and distinguishable entity whose components may lack individual distinction; or
- 69 d. have yielded, or may be likely to yield, information important in prehistory or history.

70 To be listed in or determined eligible for listing in the NRHP, a historic resource must meet at least one of
71 the above criteria and must also possess integrity. Integrity is defined as the authenticity of a resource's
72 historic identity as evidenced by the survival of physical characteristics that existed during the resource's
73 historic or prehistoric occupation or use. The NRHP recognizes seven aspects or qualities that define
74 integrity: location, design, setting, materials, workmanship, feeling, and association.

75 **4.9.1.2 Fort Bliss Significance Standards**

76 As part of its continuing cultural resource management efforts, Fort Bliss is revising its previously issued
77 *Significance Standards for Prehistoric Archaeological Sites at Fort Bliss* (Ref# 474). These standards
78 continue to provide guidance for determining a site's NRHP eligibility. They base eligibility on a
79 resource's ability to address research questions. This method of determining NRHP eligibility provides a
80 more consistent evaluation since it is based on explicit local research domains and data needs.

81 Standards for maintaining architectural resources have been established in a number of Design Guides,
82 Specifications, and other documentation prepared by and for the Fort Bliss Directorate of Environment
83 (Ref# 242). As inventory and NRHP eligibility evaluation is completed on buildings and structures, their
84 status as historical resources determines whether or not they are subject to these standards.

85 **4.9.1.3 Traditional Cultural Properties, Properties of Traditional Cultural and 86 Religious Importance, and Native American Consultation**

87 Traditional Cultural Properties are resources that are associated with cultural practices and beliefs rooted
88 in the history of a community, and that are important to maintaining the continuity of that community's
89 traditional beliefs and practices (Ref# 243, 250). Properties of traditional cultural and religious

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

90 importance are similar to TCPs except that they specifically apply to those sites identified by Native
91 American Tribes as important to their cultural identity and need not be eligible for inclusion in the NHRP
92 for management purposes. Legislatively, properties of traditional cultural and religious importance were
93 recognized in the 1992 amendments to the NHPA. These amendments themselves grew out of passage of
94 AIRFA and NAGPRA.

95 Evaluation of the significance of a TCP uses the standard NRHP evaluation criteria, with several key
96 conditions. These are that the property: (1) must have been important to maintaining traditions for at least
97 50 years; (2) must be described and its significance documented; and (3) must have a boundary (Ref#
98 243, 250). It is important to note that properties of traditional cultural and religious importance may not
99 fulfill the criteria for significance under 36 CFR 60.4 but may still be of significance to Native American
100 groups. Although these resources may not be protected by NHPA, they may still fall under the purview
101 of NAGPRA, AIRFA, or other legislation and are also managed as significant resources.

102 Consultation with interested Tribal groups is required as part of any action that might affect properties of
103 traditional cultural and religious importance. The April 29, 1994, *Memorandum on Government-to-*
104 *Government Relations with Native American Tribal Governments* issued by the President requires the
105 development of effective day-to-day working relationships with sovereign Tribal governments.

106 Several laws and regulations address the requirement of federal agencies to notify or consult with Native
107 American groups or otherwise consider their interests when planning and implementing federal
108 undertakings. Legal mandates requiring consideration of Native American interests include NHPA,
109 AIRFA, Archaeological Resources Preservation Act (ARPA), NAGPRA, and EO 13007, Indian Sacred
110 Sites. NAGPRA specifically addresses the disposition of human remains, funerary objects, sacred
111 objects, and objects of cultural patrimony. The chance of investigations on the Fort Bliss complex
112 encountering artifacts or human remains subject to NAGPRA remains a possibility. Consultations
113 between Fort Bliss and interested Native American Tribes are ongoing.

114 Consultations with Tribes expressing interest in lands managed by Fort Bliss identify properties important
115 to their culture. If properties of traditional cultural and religious importance are identified by a federally
116 recognized Tribe, they are managed, in consultation with that Tribe, as though eligible for the NRHP.

117 **4.9.1.4 Historic Landscapes**

118 Like other historic resources, historic landscapes are evaluated for significance as historic properties using
119 NRHP criteria. Historic landscapes have not been addressed on Fort Bliss; however, the Programmatic
120 Agreement provides management guidance once studies are conducted.

121 A rural historic landscape is defined as a geographical area that historically has been used by people or
122 shaped or modified by human activity, occupancy, or intervention and that possesses a significant
123 concentration, linkage, or continuity of areas of land use, vegetation, building and structures, roads and
124 waterways, and natural features (Ref# 249). The integrity of rural landscapes can be affected by the
125 introduction of new vegetation, such as could occur if there were a shift in land use from cattle grazing to
126 extensive irrigation and planting of fruit trees. Other changes that may reduce the integrity of a landscape
127 include widening and resurfacing roads; changes in land use and management; introduction of nonhistoric
128 land uses like recreational areas, landfills, or utilities; deterioration and abandonment of historic
129 buildings; replacement or alteration of bridges and barns; and the loss of fences and other boundary
130 markers. Military training can alter a rural landscape; for example, training activities can increase erosion
131 or cause re-deposition of sediments, may require the addition of features that alter the viewshed, or may
132 result in increased use of existing roads and facilities.

133 A historic military landscape reflects the cultural traditions and history of military activity in an area as it:
134 (1) is expressed in the relationships among the buildings, structures, and grounds of an installation; (2) is
135 significantly associated with historically important persons or events; (3) is an important indicator of the
136 broad patterns of history; or (4) represents a significant example of design or construction. To be eligible

137 for listing in the National Register, it must have sufficient integrity to convey its significance (Ref# 251).
138 Land use history and setting are used to evaluate the integrity of a military landscape. Integrity can be
139 negatively affected by the relocation of buildings or roads; changes in landscape design; and the loss of
140 important topographic features, vegetation, spatial relationships, original materials, or workmanship.

141 The Army plans to evaluate and focus preservation efforts on historic landscapes that could be affected by
142 uses of the Fort Bliss Training Complex. The revised ICRMP will include plans to complete studies of
143 viewsheds and historic vistas as part of historic landscapes.

144 **4.9.2 Existing Management Plans, Agreements, and Procedures**

145 In 1982, Fort Bliss became the first DoD installation to develop an installation-specific Historic
146 Preservation Plan (HPP) (Ref# 242). An ICRMP replaced the HPP in 1998. In 2005, Fort Bliss entered
147 into consultation with the ACHP and Texas and New Mexico SHPOs in preparation of a Programmatic
148 Agreement addressing Sections 106 and 110 of NHPA historic properties management requirements.
149 This consultation culminated in a signed PA in 2006 (see Appendix B). The ICRMP will be revised to
150 reflect historic property management under the Programmatic Agreement as well as addressing
151 management under laws and regulations governing historic preservation other than NHPA.

152 The 2006 Programmatic Agreement includes 15 SOPs that provide for consistent, day-to-day
153 management of the various undertakings that may affect historic resources on the installation, without
154 project-by-project review by the SHPO and ACHP. Section 2.1.3 summarizes the SOPs. The complete
155 Programmatic Agreement is provided in Appendix B.

156 Fort Bliss maintains a Curatorial Facility that meets all standards as outlined in 36 CFR 79 Curation of
157 Federally-Owned and Administered Archaeological Collections. The facility contains a fully functional
158 artifact processing laboratory; a cold collection room that contains project and site information, maps,
159 photographs, and building plans; and a main collection room that houses artifacts, botanical samples, and
160 NAGPRA-regulated objects and remains. The facility also has provisions for accepting materials through
161 Deeds of Gift and through short-term loan agreements as required by 36 CFR 79.

162 Fort Bliss shares use of portions of McGregor Range with USFS Lincoln National Forest and BLM. The
163 co-use lands shared with USFS are in the Sacramento Mountains foothills on the northern part of
164 McGregor Range. A 1971 Memorandum of Understanding (MOU) between Fort Bliss and USFS
165 specifies that the USFS is responsible for administering all archaeological and paleontological activities on the
166 co-use lands.

167 A 1990 MOU with BLM regarding the McGregor Range withdrawal specifies that the proponent of an
168 undertaking, whether the BLM or Fort Bliss, is responsible for permitting and oversight of historic
169 resource investigations performed as part of compliance with Section 106 of the NHPA. The MOU
170 further stipulates that both the BLM and Fort Bliss will consult on undertakings involving historic
171 resources on McGregor Range, share information on completed projects, and coordinate future projects
172 annually. This MOU is under revision. The revised agreement will address the agencies' responsibilities
173 under ARPA and NAGPRA, in addition to the current MOU's treatment of NHPA.

174 As part of early efforts to manage cultural resources on Fort Bliss, restricted and limited-use areas were
175 defined by Fort Bliss archaeologists. These are internal management units established under the
176 installation's 1982 HPP. All military activity is prohibited in restricted areas; limited military activity is
177 allowed in limited-use areas. Both the restricted and limited-use areas are relatively small parcels
178 surrounded by unrestricted areas. Restricted areas tend to contain larger sites with buried materials and
179 dense concentrations of surface artifacts. They also contain representative samples of the type of sites
180 present on Fort Bliss. Limited-use areas contain numerous archaeological sites, but these sites are
181 generally smaller and more scattered than those found in restricted areas. Currently, the South Training
182 Areas contain 29 restricted areas totaling approximately 8,512 acres and 30 limited-use areas totaling
183 14,016 acres. Doña Ana Range–North Training Areas contain five restricted areas totaling 3,136 acres.

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

184 Fort Bliss is in the process of redefining restricted and limited-use areas throughout the Fort Bliss
185 installation, including on McGregor Range, based on resurveys and NRHP eligibility evaluations (Ref#
186 248).

187 **4.9.3 Historic Resource Inventories**

188 Since the 1920s, there have been hundreds of historic resource studies conducted on Fort Bliss and in the
189 El Paso area. To date, approximately 75 percent of the Fort Bliss installation has been surveyed for
190 historic resources. Investigators have identified over 17,000 historic resource sites on the installation, the
191 vast majority being Native American archaeological sites. Since the 2000 Mission and Master Plan PEIS,
192 NRHP eligibility has been determined for thousands of sites. Almost 88 percent of the sites have been
193 evaluated; although the majority of the sites are not eligible, almost 3,000 sites have been determined to
194 be eligible for the NRHP. **Table 4.9-1** summarizes a 2005 review of the historic resources database of
195 archaeological sites on Fort Bliss. Close to 3,000 historic buildings, structures, archaeological sites, and
196 historic landscapes have also been determined to be NRHP-eligible. Although only eight are listed in the
197 NRHP, all eligible properties are managed to the same standards.

198 **Table 4.9-1. Fort Bliss Historic Properties Database Summary – Archaeological Sites**

<i>Location</i>	<i>Listed in NRHP</i>	<i>Eligible</i>	<i>Not Eligible</i>	<i>Undetermined</i>	<i>Fort Bliss Subtotals</i>
Main Post/Biggs AAF					
Prehistoric	0	3	37	10	50
Historic	1*	6**	11	4	22
South Training Areas (TAs 1-2)					
Prehistoric	6	996	3,128	1,175	5,305
Historic	0	8	43	49	100
North Training Ranges (TAs 3-7)					
Prehistoric	0	1,065	3,856	488	5,409
Historic	0	11	40	15	66
Doña Ana Range					
Prehistoric	0	127	472	49	648
Historic	0	7	10	34	51
Organ Mountains					
Prehistoric	0	5	12	40	57
Historic	0	11	11	14	36
Doña Ana Range Camp					
Prehistoric	0	0	0	0	0
Historic	0	0	0	1	1
Orogrande Range Camp					
Prehistoric	0	0	0	0	0
Historic	0	0	0	0	0
McGregor Range (TAs 8-12 and 24-32)					
Prehistoric	0	454	963	1,362	2,779
Historic	0	48	138	61	247
TA 33-Grapevine					
Prehistoric	0	12	73	8	93
Historic	0	4	3	3	10
Otero Mesa (TAs 13-23)					
Prehistoric	0	85	182	362	629
Historic	0	15	52	21	88

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

<i>Location</i>	<i>Listed in NRHP</i>	<i>Eligible</i>	<i>Not Eligible</i>	<i>Undetermined</i>	<i>Fort Bliss Subtotals</i>
McGregor Range Camp					
Prehistoric	0	21	22	1	44
Historic	0	0	2	0	2
Culp Canyon WSA					
Prehistoric	0	5	44	5	54
Historic	0	0	3	0	3
Castner Range					
Prehistoric	1	3	3	11	18
Historic	0	1	3	11	15
Total	8	2,887	9,108	3,724	15,727

* Historic District comprised of 346 buildings.

** Includes Historic District comprised of 70 buildings.

Source: Ref# 246

199 The majority of the recent historic resource surveys at Fort Bliss were undertaken either to provide
200 baseline management information (under Section 110 of the NHPA, PL 89-665) or to assess the effects of
201 specific undertakings on historic properties (under Section 106 of the NHPA).

202 **4.9.3.1 Archaeological Inventories**

203 Archaeological investigations in the El Paso area began in the 1920s. During this period, several
204 museum-sponsored projects were undertaken at the pueblos and caves of the region. Shortly after World
205 War II, the La Cueva rockshelter, a pueblo, and a pithouse village site were excavated. In the 1940s,
206 Lehmer's "Jornada Branch of the Mogollon" was based on sites in the Fort Bliss area and is the most
207 significant work in the area for that period. The type site for El Paso phase occupations, the Bradfield
208 Pueblo, was likely located on Fort Bliss land. No major archaeological work was undertaken in the
209 1950s, although local amateur archaeologists continued exploring the area.

210 During the 1960s and 1970s a substantial amount of archaeological work was undertaken by the El Paso
211 Archaeological Society (EPAS). This work consisted of excavations and surveys within the South
212 Training Areas, Doña Ana Range-North Training Areas, and McGregor Range. EPAS excavated
213 portions of a number of pueblo sites, including the Sergeant Doyle and McGregor sites and the Escondido
214 and Hot Well Pueblo. Much of the work before 1980 is not thoroughly documented by today's standards
215 and provides less information than is usually required for NRHP evaluations.

216 Later work by professional archaeologists provided a foundation for understanding historic resources on
217 Fort Bliss. Much of this work was centered in the South Training Areas and Doña Ana Range-North
218 Training Areas. McGregor Range received less focus. These surveys resulted in relatively reliable
219 estimates of the density of historic resources in different portions of Fort Bliss, which are summarized in
220 **Table 4.9-2.**

221 **Table 4.9-2. Summary of Archaeological Resource Density at Fort Bliss**

<i>Portion of Fort Bliss</i>	<i>Archaeological Site Density (sites per acre)</i>
Main Cantonment Area	.04
South Training Areas	.01-.12
Doña Ana Range-North Training Areas	<.01-.02
McGregor Range	<.01-.08

Source: Ref# 3.

222 Native American or prehistoric archaeological resources are uncommon within the Main Cantonment
223 Area. However, undiscovered buried materials are likely to remain in some parts of the Main
224 Cantonment Area (Ref# 3). Likewise, Euroamerican archaeological resources relating to early military
225 use of the Main Cantonment Area are known and have been unearthed during construction activities. The
226 installation maintains a map dividing the Main Cantonment Area into archaeological sensitivity zones
227 ranging from low to high. The high-sensitivity zones are those that are likely, based on archival research,
228 to contain subsurface archaeological materials. Before ground disturbance can occur within the Main
229 Cantonment Area, project maps are reviewed by the Fort Bliss Historic Preservation Officer to determine
230 the sensitivity of the project location.

231 **4.9.3.2 Historic Inventories**

232 Fort Bliss has inventoried and evaluated all historic resources that are 50 years of age or older (Ref# 3,
233 242). The evaluations identified 405 buildings, 12 landscapes, and 5 structures as eligible for inclusion in
234 the NRHP either individually or as part of two NRHP-eligible historic districts. One of these districts,
235 Fort Bliss Main Post Historic District, includes buildings, sites, and structures that contribute to its
236 significance. This district has been listed in the NRHP and is managed according to the following eight
237 thematic groups:

- 238 • Initial Construction Period Group, 1891 to 1899;
- 239 • Interim Period Group, 1900 to 1912;
- 240 • First Expansion Period Group, 1913 to 1917;
- 241 • 7th Cavalry Construction Period Group, 1919 to 1921;
- 242 • Second Expansion Period Group, 1919 to 1926;
- 243 • Depression Era Group, 1927 to 1939;
- 244 • World War II Build-up Period Group, 1940 to 1945; and
- 245 • Post-World War II Period Group, 1946 to 1950.

246 In all, these groups encompass 346 buildings, sites, and structures and landscapes that contribute to the
247 district. A number of historic resources from the 1950s and early 1960s have been included within this
248 NRHP-listed historic district. Seventy-two additional properties are inside the boundary of the historic
249 district but do not contribute to its significance.

250 Historic properties in the William Beaumont General Hospital Historic District area were evaluated
251 separately (Ref# 242). This hospital was constructed in 1920 and included a number of support buildings
252 in addition to the 400-bed main hospital. Seventy historic properties were identified as contributing to the
253 significance of the William Beaumont General Hospital Historic District, which is eligible for inclusion in
254 the NRHP (Ref# 242).

255 A Nationwide Programmatic Memorandum of Agreement (PMOA) between the Department of Defense,
256 the ACHP, and the National Conference of SHPOs allows the demolition of World War II-era temporary
257 buildings. Because of this PMOA, this building type is not subject to management under the Fort Bliss
258 Programmatic Agreement. If the Army requests additional programmatic comments from ACHP, then
259 additional property types could be subject to specific management actions or exemptions.

260 Inventory of Cold War resources is currently underway, with some areas completely evaluated. For
261 example, mission critical facilities at the Main Post have been evaluated. Approximately 3,000 buildings
262 date to this period (1946-1991). Additional buildings built prior to 1946 that may have played a role in
263 the Cold War and that have been evaluated for significance under other contexts have not been evaluated
264 for Cold War significance. Of the 3,000 Cold War era buildings, approximately 1,660 are Capehart-
265 Wherry housing that are covered by the U.S. Army Program Comment (Ref# 245).

266 Another 335 Cold War era buildings have been evaluated for NRHP eligibility, and 65 have been
267 determined eligible under this context. When another 315 buildings have been evaluated during 2006, all
268 buildings built between 1946 and 1963 will have been evaluated for NRHP eligibility under the Cold War
269 context. Most buildings constructed during or after 1964 have not yet been evaluated, including late 20th
270 century base operations facilities. Some Cold War facilities of exceptional importance, associated with
271 the Air Defense Artillery weapons systems and early missiles, have been identified. Future plans are to
272 complete these inventories, including those at Biggs AAF (Ref# 242). Biggs AAF was evaluated under a
273 U.S. Air Force Strategic Air Command historic context covering the years 1948-1966 when it was a
274 Strategic Air Command base. Only Building 1108 (SAC Hangar) was found eligible for inclusion in the
275 NRHP and concurred in by the Texas SHPO.

276 The following Program Comments remove a number of Cold War Era buildings on Fort Bliss from
277 management as historic properties:

- 278 • Program Comment regarding Capehart-Wherry housing provides for the ongoing operations;
279 maintenance; repair; rehabilitation; renovation; mothballing; cessation of maintenance; new
280 construction; demolition; deconstruction and salvage; remediation activities; and transfer, sale,
281 lease, and closure of Cold War Era (1946-1962) family housing without further Section 106
282 consideration.
- 283 • Program Comment regarding Cold War Era Unaccompanied Personnel Housing provides for
284 ongoing operations; maintenance; repair; rehabilitation; renovation; mothballing; cessation of
285 maintenance; new construction; demolition; deconstruction and salvage; remediation activities;
286 and transfer, sale, lease, and closure of Cold War Era (1946-1974) barracks without further
287 Section 106 consideration.
- 288 • Program Comment regarding Cold War Era Ammunition Storage Facilities provides for ongoing
289 operations; maintenance; repair; rehabilitation; renovation; mothballing; cessation of
290 maintenance; new construction; demolition; deconstruction and salvage; remediation activities;
291 and transfer, sale, lease, and closure of Cold War Era (1939-1974) ammunition storage facilities
292 without further Section 106 consideration.

293 **4.9.3.3 Inventories of Properties of Traditional Cultural and Religious** 294 **Importance**

295 Detailed information on traditional beliefs, values, customs, sacred sites, and use areas is often not
296 available, as Native Americans are reluctant to share such information with outsiders. However, the
297 NHPA and EO 13007 require consideration of Native American concerns in the management of historic
298 resources. Fort Bliss has therefore consulted with, and will continue to consult with, Native American
299 groups with traditional ties to the area.

300 Fort Bliss has contacted the Ysleta del Sur Pueblo (Tigua) regarding their concerns about properties of
301 traditional cultural and religious importance that may be present on the Fort Bliss installation. Although
302 the Ysleta del Sur Pueblo (Tigua) have not yet specifically told Fort Bliss the location of sacred or
303 important areas, consultation will continue. Fort Bliss has initiated consultation with the Mescalero
304 Apache, the Comanche Tribe, and The Navajo Nation to identify sites that may be properties of
305 traditional cultural and religious importance to them.

306 The entire area surrounding Fort Bliss also falls within the traditional territory of the Mescalero Apache.
307 Generally, several types of topographic features have spiritual significance, including caves, springs, and
308 certain mountain peaks (Ref# 252). To a lesser extent, resource areas containing specific botanical and
309 geological materials used in ceremonies are also considered important by the Mescalero Apache.
310 Consultation efforts related to other undertakings in the region have indicated that the Mescalero Apache
311 have concerns of a general nature about resources on Fort Bliss (Ref# 3).

312 As part of its responsibilities under NAGPRA, Fort Bliss has completed an initial inventory of all cultural
313 remains previously found on Fort Bliss lands that contain human remains or artifacts associated with
314 these remains. A search of the site record at Fort Bliss and records of the cultural materials collections
315 housed at Fort Bliss and other facilities indicated that 16 recorded sites on Fort Bliss have or had either
316 human remains or suspected human remains. In some cases, the human remains had been removed. As
317 required by NAGPRA, Tribal groups with historic ties to the area (Mescalero Apache and Ysleta del Sur
318 Pueblo [Tigua]) were notified by letter of the materials and asked for their comments (Ref# 3). Fort Bliss
319 has initiated consultation the Comanche Tribe, and The Navajo Nation and reinitiated consultation with
320 the Ysleta del Sur Pueblo (Tigua) and with the Mescalero Apache.

321 **4.9.4 Summary of Cultural Resources on Fort Bliss**

322 As of November 2005, the Fort Bliss cultural resource database contained information on over 17,000
323 historic resources. The number and management status of historic resources in the different portions of
324 the ROI are summarized in the database.

325 **4.9.4.1 NRHP Listed and Eligible Properties**

326 Information provided by Fort Bliss and supplemented with a search of the NPS listing of NRHP
327 properties for El Paso County, Texas, identified eight properties listed in the NRHP. These are:

- 328 • Pershing House. Building 228 is individually listed in the NRHP.
- 329 • Fort Bliss Main Post Historic District. This district includes buildings, monuments, and
330 landscapes constructed between 1893 and 1948.
- 331 • Sergeant Doyle Site. This site is a multi-room pueblo dating to the El Paso phase of the
332 Formative period.
- 333 • Hot Well Site. This archaeological site is a late Formative period multi-room pueblo.
- 334 • Fusselman Canyon Rock Art District. This district includes Formative period rock art.
- 335 • Escondido Pueblo Ruin. This is an early Formative pueblo.
- 336 • Two archaeological sites in the South Training Areas
- 337 • Castner Range Archaeological District. This district consists of 53 sites and 100 archaeological
338 isolates dating from the Formative period through the Historic period.

339 The Fort Bliss cultural resource database (as of November 2005) also lists 2,691 Native American sites
340 that have been determined eligible for listing on the NRHP. These include, among others, Pendejo,
341 Ceremonial, Sandal, and Bishop's Cap caves; Pintada Rockshelter; and McGregor Pueblo. Another 97
342 historic sites have been determined to be eligible for the NRHP (Ref# 246). Approximately 600 historic
343 buildings and structures dating from the period of the William Beaumont General Hospital Historic
344 District and the Cold War are NRHP-eligible.

345 **4.9.4.2 Main Cantonment Area**

346 The Main Cantonment Area contains a number of historic structures and both Native American and
347 Euroamerican archaeological resources. The earliest of the historic structures date to 1893 and include
348 Victorian buildings originally used for medical purposes, barracks, mess halls, recreational activities,
349 officer's residences, stables, warehouses, and magazines. Many of these buildings are still used today,
350 but for other purposes. A total of 346 buildings, sites, and structures contribute to the NRHP-listed Fort
351 Bliss Main Post Historic District (Ref# 242).

352 Native American archaeological resources are uncommon within the Main Cantonment Area because of
353 the extensive construction, and none are known on the Main Post, Logan Heights, or William Beaumont
354 General Hospital Historic District. However, 50 sites have been located within Biggs AAF. Three of
355 these are considered NRHP eligible, 37 are not eligible, and 10 remain to be evaluated. Twenty-two

356 Euroamerican archaeological sites have been identified in the Main Cantonment Area. Most of these
357 Euroamerican archaeological sites are related to occupation of the site by Fort Bliss (Ref# 242). No
358 properties of traditional cultural and religious importance have been identified to date in the Main
359 Cantonment Area.

360 **4.9.4.3 South Training Areas**

361 The South Training Areas contain portions of the Hueco Mountains. These limestone deposits are
362 conducive to the formation of caves and rockshelters, many of which were used by prehistoric people.
363 More than 5,300 prehistoric archaeological sites have been recorded from this area, including six that are
364 listed on the NRHP. The South Training Areas were also used historically. Inventories of historic
365 archaeological sites in the South Training Areas have recorded 125 sites, including a portion of the
366 Butterfield Overland mail route (Ref# 3). No architectural resources or properties of traditional cultural
367 and religious importance have been identified within the South Training Areas, but both could potentially
368 occur.

369 **4.9.4.4 Doña Ana Range–North Training Areas**

370 Complete survey of the Doña Ana Range–North Training Areas has resulted in the identification of over
371 6,110 prehistoric sites, including Paleoindian (including a possible Clovis site), Archaic, and Formative
372 period sites. Historic resources totaling 154 sites include ranching, Civilian Conservation Corps, and
373 military sites; a portion of the Spanish Salt Trail; historic mines; and the 1920s campsite of early
374 paleontologists. Camp Hueco once contained World War II and Cold War architecture, but only a well
375 house remains (Ref# 3). No properties of traditional cultural and religious importance have been
376 identified within the Doña Ana Range–North Training Areas, although they could potentially occur.

377 **4.9.4.5 McGregor Range**

378 McGregor Range contains a variety of environmental zones and landforms. Its historic resources are
379 diverse and include scatters of Paleoindian, Archaic, and Formative materials, rockshelters, rock art sites,
380 historic ranching sites, the townsite of Turquoise, several of Oliver Lee’s pipelines, two reservoirs, a
381 number of railroad-related sites, and military sites, including Cold War-era Nike test sites (Ref# 3). Five
382 pueblos have been identified on McGregor Range. The approximately 200,000 acres inventoried for
383 historic resources to date contain over 4,000 historic and prehistoric sites. Approximately 780 of these
384 are located on Otero Mesa (Ref# 246). No properties of traditional cultural and religious importance have
385 been identified within the range, but they could potentially occur.

4.10 NOISE

This section describes the existing noise environment associated with activities conducted on Fort Bliss, Biggs AAF, and the Fort Bliss Training Complex.

Noise is defined as unwanted sound that interferes with normal activities or otherwise diminishes the quality of the environment. It may be intermittent or continuous, steady or impulsive, stationary or transient. Stationary sources are normally related to specific land uses (e.g., industrial facilities, firing ranges). Transient sources move through the environment, either along relatively established routes (e.g., highways, aircraft departure and arrival routes), or randomly (e.g., off-road vehicle maneuver area). There is wide diversity in responses to sound that not only vary according to the type of noise and the characteristics of the sound source, but also according to the sensitivity and expectations of the receptor, the time of day, and the distance between the sound source (e.g., an explosion or heavy vehicle) and the receptor (e.g., a person or animal).

The physical characteristics of sound include its intensity, frequency, and duration. Sound is created by acoustic energy, which produces minute pressure waves that travel through a medium, like air, and are sensed by the eardrum. This may be likened to the ripples in water that are produced when a stone is dropped into it. As the acoustic energy increases, the intensity or amplitude of the pressure waves increase, and the ear senses louder noise. Sound intensity varies widely (from a soft whisper to a jet engine) and is measured on a logarithmic scale to accommodate this wide range. The logarithm is a mathematical tool that simplifies dealing with very large and very small numbers.

The frequency of sound is measured in cycles per second, or hertz (Hz). This measurement reflects the number of times per second the air vibrates from the acoustic energy. Low frequency sounds are heard as rumbles or roars, and high frequency sounds are heard as screeches.

Sound measurement is further refined through the use of "weighting." The normal human ear can detect sounds that range in frequency from about 20 Hz to 15,000 Hz. However, not all sounds in this range are heard equally well. Therefore, some sound meters are calibrated to emphasize frequencies in the 1,000 to 4,000 Hz range because the human ear is most sensitive to frequencies in this range. Sounds measured with these instruments are termed "A-weighted" and are shown in terms of A-weighted decibels (dBA).

In contrast, when describing large amplitude impulsive sounds such as a clap of thunder, a gunshot, or an explosion, the actual total amount of acoustic energy created by the event is an important consideration. Sounds of this nature are normally measured on the "C-weighted" scale, which gives nearly equal emphasis to all frequencies but suppresses the very low and very high bands. Values of C-weighted sound are shown in terms of C-weighted decibels (dBC).

Since A-weighted and C-weighted sounds are measured on different scales, it is not appropriate to add them together. Therefore, they are documented separately in this SEIS. The durations of sound events and the number of times they occur are also considerations in assessing noise impacts.

4.10.1 Noise Metrics

A number of different metrics have been developed to represent the effects of environmental noise. The metrics used to assess noise impacts from activities on Fort Bliss include the Sound Pressure Level (SPL), the maximum sound level (L_{max}), the Sound Exposure Level (SEL), and Day-Night Average Sound Levels.

4.10.1.1 Sound Pressure Level

The SPL metric is used to assess noise impacts resulting from impulsive noise, such as explosions and artillery. This is the actual sound level, in decibels, and is identified as dBP. This metric reflects the actual sound pressure associated with the event. The dBP thresholds, associated overpressure in pounds

45 per square inch (psi), and effects as presented in **Table 4.10-1** serve as guidelines for evaluating the
46 potential impact of impulsive noise.

47 **Table 4.10-1. Acoustic Thresholds for Impulsive Noise Events**

<i>Sound Pressure Level (dBP)</i>	<i>Overpressure (psi)</i>	<i>Effect</i>
115 - 130	0.002 – 0.009	Low to moderate annoyance in 15% of exposed populations.
130 - 140	0.009 - 0.03	Maximum exposure without hearing protection. High risk of noise complaints.
151	0.10	Increased risk of hearing impairment.
185	5.00	Eardrum rupture.
194	15.00	Lung hemorrhage.
201	35.00	Death.

Source: Ref# 67, 517

48 Meteorological conditions also influence noise propagation, especially impulsive noise. Variations such
49 as changes in wind speed and temperature inversions have a distinct influence on the behavior of sound as
50 it moves through the atmosphere. These climatic variables may concentrate or focus sound waves in a
51 particular direction or reflect or refract sound energy. In general, influences of variable weather
52 conditions at Fort Bliss may be described as favorable or unfavorable as defined below:

- 53 • Favorable — no temperature inversions with altitude and light, uniform, east/northeast surface
54 winds with a moderate wind speed gradient aloft.
- 55 • Unfavorable — cool season day; low-altitude, layered, or multiple temperature inversions; and
56 strong north/northwest winds.

57 **4.10.1.2 Maximum Sound Level**

58 The L_{max} metric is used to define peak noise levels. L_{max} is the highest sound level measured during a
59 single noise event. For an observer, the noise level starts at the ambient noise level, rises up to the
60 maximum level as the noise source passes closest to the observer, and then returns to the ambient level as
61 the noise source recedes into the distance. Maximum sound level is important in judging interference
62 with conversation, sleep, or other common activities.

63 **4.10.1.3 Sound Exposure Level**

64 L_{max} alone may not represent how intrusive a noise event is because it does not consider the length of time
65 that the noise persists. The SEL metric combines both the intensity and the duration of a noise event in a
66 single measure. It is important to note, however, that SEL does not directly represent the sound level
67 heard at any given time, but rather provides a measure of the total exposure of the entire noise event. Its
68 value represents all of the acoustic energy associated with the event, as though it was present for one
69 second. Therefore, for sound events that last longer than one second, the SEL will be higher than the
70 L_{max} . Conversely, for instantaneous noise events that last less than one second, the SEL will be lower
71 than the L_{max} .

72 **4.10.1.4 Day-Night Average Sound Level**

73 The number of times noise events occur during given periods is also an important consideration in
74 assessing noise impacts. Two cumulative noise metrics support the analysis of multiple time-varying
75 noise events, the Day-Night Average Sound Level for A-weighted noise (ADNL) and the Day-Night
76 Average Sound Level for C-weighted noise (CDNL).

77 Both metrics sum all individual noise events that occur in a 24-hour period and average the resulting level
78 over that period. Each is a composite metric representing the maximum noise levels, the duration of the
79 events, the number of events, and the time of day during which they occur. These metrics add 10 dB to

80 those events that occur between 10:00 p.m. and 7:00 a.m. to account for the increased intrusiveness of
81 noise events that occur at night when ambient noise levels are normally lower than during the day time.
82 These cumulative metrics do not represent the variations in the sound level heard, but they do provide a
83 means of comparing environmental noise exposures when there are multiple noise events to be
84 considered.

85 Day-Night Average Sound Level can be thought of as the continuous or cumulative A- or C-weighted
86 sound level present if all of the variations in sound levels occurring over a 24-hour period were smoothed
87 out so as to contain the same total sound energy. While it provides a single measure of overall noise
88 impact, it does not provide specific information on the number of noise events or the specific individual
89 sound levels experienced. For example, a Day-Night Average Sound Level of 65 dB could result from a
90 very few noisy events, or a large number of quieter events. Although it does not represent the sound level
91 heard at any one particular time, it does represent the total sound exposure in 24 hours. Scientific studies
92 and social surveys have found the Day-Night Average Sound Level to be the best measure to assess levels
93 of community annoyance associated with all types of environmental noise. Therefore, its use is endorsed
94 by the scientific community and governmental agencies (Ref# 254, 307, 311).

95 Ambient background noise is not considered in environmental noise calculations. There are two reasons
96 for this. First, ambient background noise, even in wilderness areas, varies widely depending on location
97 and other conditions. For example, while ambient noise is usually considered to average approximately
98 40 dBA, studies conducted in an open pine forest in the Sierra National Forest in California have
99 measured up to a 10 dBA variance in sound levels simply due to an increase in wind velocity (Ref# 357).
100 It is reasonable to assume that ambient background noise would have little or no effect on the calculated
101 Day-Night Average Sound Levels. In calculating noise levels, louder sounds dominate the calculations.

102 **4.10.1.5 Peak Noise Level**

103 A concern often voiced by the public is that people do not hear Day-Night Average Sound Levels; they
104 hear specific events. The DNL metric (both A- and C-weighted) is the primary descriptor for noise
105 exposure. However, since this is a time-averaged metric, it may not always account for human reaction to
106 possibly sporadic and infrequent blast noise events or weapons firing. To account for statistical variation
107 in received noise levels that could be experienced in varying meteorological conditions, the U.S. Army
108 has developed computer models that consider peak noise levels (i.e., the noise actually heard when a
109 weapon is fired). These models calculate a range of peak noise levels expected to be actually experienced
110 at specific points, based on varying weather conditions that favor or hinder sound propagation. The
111 outputs are noise contours that describe the peak noise level expected to be heard. The normal contour
112 plotted is the PK 15(met), which describes the peak noise level expected to be experienced 85 percent of
113 the time. **Table 4.10-2** summarizes the expected risk of public complaint based on the extent and level of
114 the PK 15(met) contour.

115 **Table 4.10-2. Assessment of Risk of Public Complaints**

<i>Risk of Complaints</i>	<i>PK 15(met) Noise Contour</i>	
	<i>Small Arms (50 caliber and below)</i>	<i>Large Caliber Weapons (20 mm and greater)</i>
Low	<87 dB	<115 dB
Moderate	87 – 104 dB	115 – 130 dB
High	>104 dB	>130 dB

Source: Ref# 67

116 **4.10.1.6 Land Use Planning Guidelines**

117 The U.S. Army Center for Health Promotion and Preventive Medicine (CHPPM) has defined three noise
118 zones to be considered in land use planning (**Table 4.10-3**). These zones are described by the noise levels
119 to which they are exposed and recommendations for compatible land uses (**Table 4.10-4**). In general,

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

120 within Zone I, where very few people will be bothered by noise levels, land use is unrestricted. In Zone
121 II, as outdoor noise levels increase and more people become annoyed by the noise, restrictions or
122 qualifications are placed on certain land uses, specifically residential development. In Zone III, as noise
123 levels escalate, fewer and fewer compatible land uses are indicated.

124 **Table 4.10-3. DNL-Based Noise Zones**

<i>Noise Zone</i>	<i>Population Highly Annoyed</i>	<i>Transportation (ADNL)</i>	<i>Impulsive (CDNL)</i>	<i>Small Arms (dBP)</i>
I	< 15 %	< 65 dBA	< 62 dBC	< 87 dBP
II	15 % - 39 %	65 – 75 dBA	62 – 70 dBC	87 - 104 dBP
III	> 39 %	> 75 dBA	> 70 dBC	> 104 dBP

Source: Ref# 67

125 As an added consideration, the Federal Interagency Committee on Urban Noise (FICUN) report (Ref#
126 311) states "Localities, when evaluating the application of these guidelines to specific situations, may
127 have different concerns or goals to consider." For residential land uses, depending on attitudes and other
128 factors, an ADNL of 60 dB or CDNL of 57dB (5 dBA lower than the outer boundary of the normally
129 incompatible [Zone II] noise zone) may be considered an adverse aspect of the community environment
130 and up to 9 percent of the residents may be highly annoyed. In order to provide a planning tool that can
131 be used to account for days of higher than average training and possible adverse reactions, the Land Use
132 Planning Zone (LUPZ) was developed. It encompasses noise levels between 60 and 65 dB ADNL and
133 57–62 CDNL and was established as a planning tool for working with communities to prevent
134 encroachment.

135 **Table 4.10-4. Land Use Recommendations in Noise Zones**

<i>Land Use</i>	<i>Noise Zones</i>		
	<i>Zone I</i>	<i>Zone II</i>	<i>Zone III</i>
Residential	Acceptable	Generally unacceptable ¹	Unacceptable
Manufacturing	Acceptable	Acceptable	Acceptable ²
Transportation, communication, and utilities	Acceptable	Acceptable	Acceptable
Trade	Acceptable	Acceptable	Acceptable ²
Public services	Acceptable	Generally unacceptable ¹	Unacceptable
Cultural, recreational, and entertainment	Acceptable	Generally unacceptable ¹	Unacceptable
Agricultural	Acceptable	Acceptable	Acceptable
Livestock farming and animal breeding	Acceptable	Acceptable	Unacceptable

1. Use is generally discouraged; however, if allowed, sound attenuation techniques should be used.

2. Sound attenuation techniques should be used.

Source: Ref# 307

136 **4.10.2 Noise Levels at Fort Bliss**

137 In January 2005, the Environmental Noise Program Directorate of Environmental Health Engineering at
138 CHPPM and the Directorate of Environment at Fort Bliss prepared an *Installation Environmental Noise*
139 *Management Plan* (Ref# 67). Data below summarize the results from that document. The plan considers
140 environmental noise resulting from aircraft operations at Biggs AAF and from small arms ranges and
141 large caliber weapons on Doña Ana and McGregor Ranges.

142 **4.10.2.1 Biggs AAF Aircraft Operations**

143 The Army, the Army National Guard, and the Air National Guard use the Biggs AAF for training. The
144 airfield supports a mix of fixed-wing and rotary-wing operations during day and night hours.

145 **Figure 4.10-1** illustrates the noise contours for current operations at Biggs AAF. The data used to
146 generate these contours was provided by the Airfield Tower and represents a maximum
147 (mobilization/deployment period) or reasonable worst case scenario for the airfield. The percentage of
148 operations (departures and arrivals) diverted due to possible unsafe winds could not be obtained from the
149 Airfield Office for this analysis; therefore, the contours represent an equal number of events or operations
150 at both ends of the main runway.

151 Zones II and III do not extend beyond the installation boundary, thus no off-post land uses are affected by
152 incompatible noise levels from the airfield. The LUPZ extends south of the installation boundary into
153 residential areas of El Paso. The LUPZ also covers a portion of the Main Post, including troop and family
154 housing areas that may be adversely impacted by the noise. However, on a day-to-day basis the activity
155 on Biggs AAF would be significantly lower than is reflected in the contours.

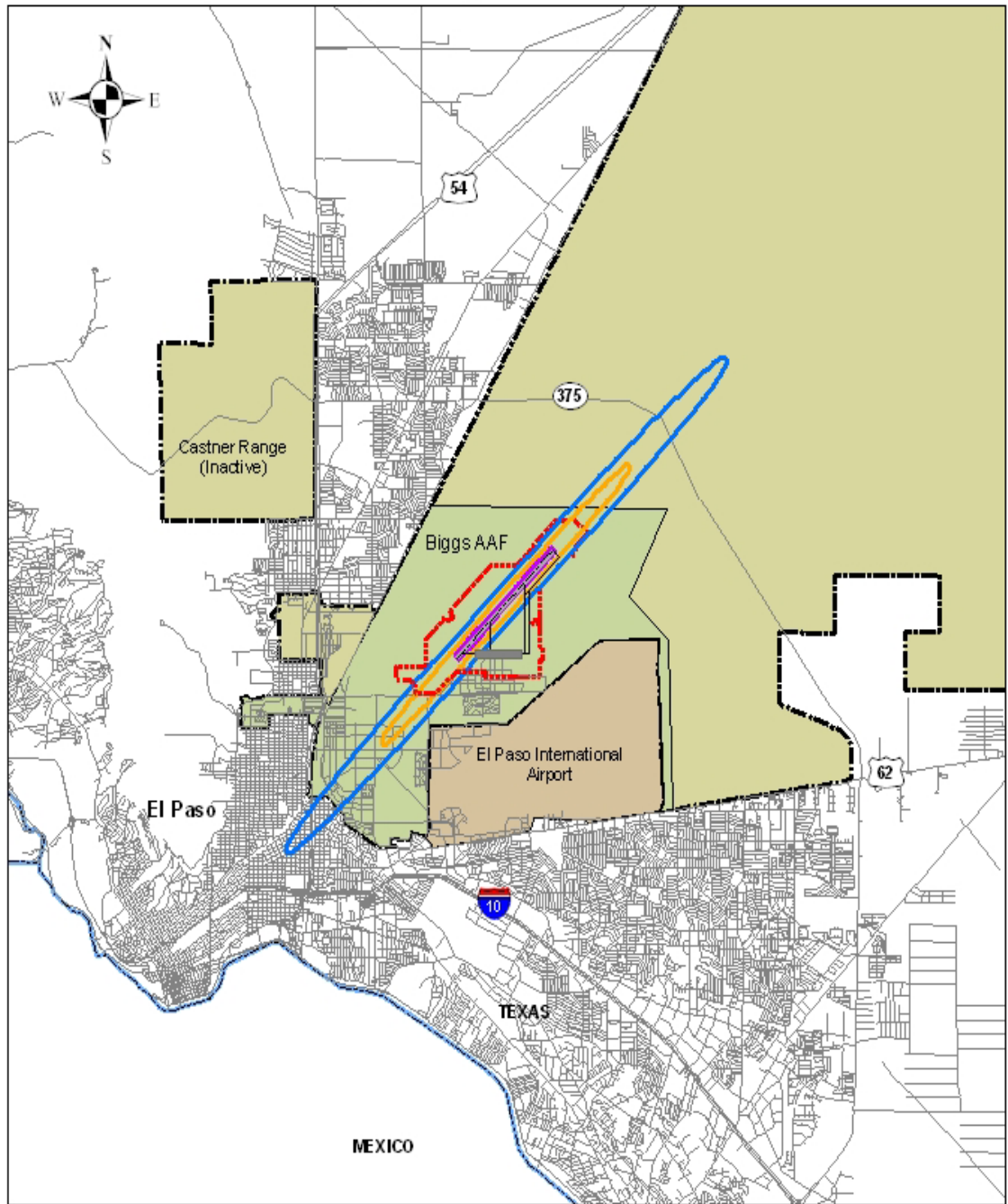
156 When compared to neighboring EPIA, the operations at Biggs AAF represent a small portion of the
157 overall aircraft noise exposure in El Paso. The 2004 noise exposure map for EPIA is provided in **Figure**
158 **4.10-2**. Noise Zones II and III envelop a large area of residential land use within the City of El Paso, as
159 well as extending onto Fort Bliss. The noise from EPIA is not compatible with residential use and does
160 not meet the federal guidelines for noise compatibility. EPIA officials are in the process of preparing a
161 new noise study. All new residential construction on Fort Bliss includes mitigation measures for noise
162 exposure (e.g., increased wall thickness and insulation values, upgraded doors and windows, and seals on
163 all openings and penetrations in the structure).

164 **4.10.2.2 Small Arms Ranges**

165 The small arms weapons firing on Fort Bliss takes place in several locations across the installation
166 including Meyer Range, Doña Ana Range, SHORAD Range, and McGregor Range. Activities at the
167 SHORAD and McGregor Ranges were not large enough to generate noise contours. The noise contours
168 associated with activities at Meyer and Doña Ana Ranges are shown in **Figure 4.10-3**. All noise zones
169 are within the installation boundary, and the land use of areas affected is compatible with federal
170 guidelines.

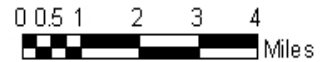
171 **4.10.2.3 Large Caliber Weapons**

172 The large caliber weapons training on Fort Bliss involves of a variety of weapons systems from grenade,
173 mortars, artillery (105, 155 Howitzer), and M1 Tank fire to anti-tank rockets, guided missiles, and ADA
174 training. All large caliber weapons training takes place at either the Doña Ana Range Complex or
175 McGregor Range, with the exception of demolitions that take place on Meyer Range. Rather than present
176 each range separately, combined noise contours were generated to offer a more accurate assessment of the
177 total noise picture based on annual operations. The activity data used to generate the contours represent
178 the maximum number of operations and the reasonable worst-case scenario as far as noise is concerned.
179 **Figure 4.10-4** shows CDNL contours for existing large caliber weapons use at Fort Bliss. **Figure 4.10-5**
180 shows peak level contours.



LEGEND

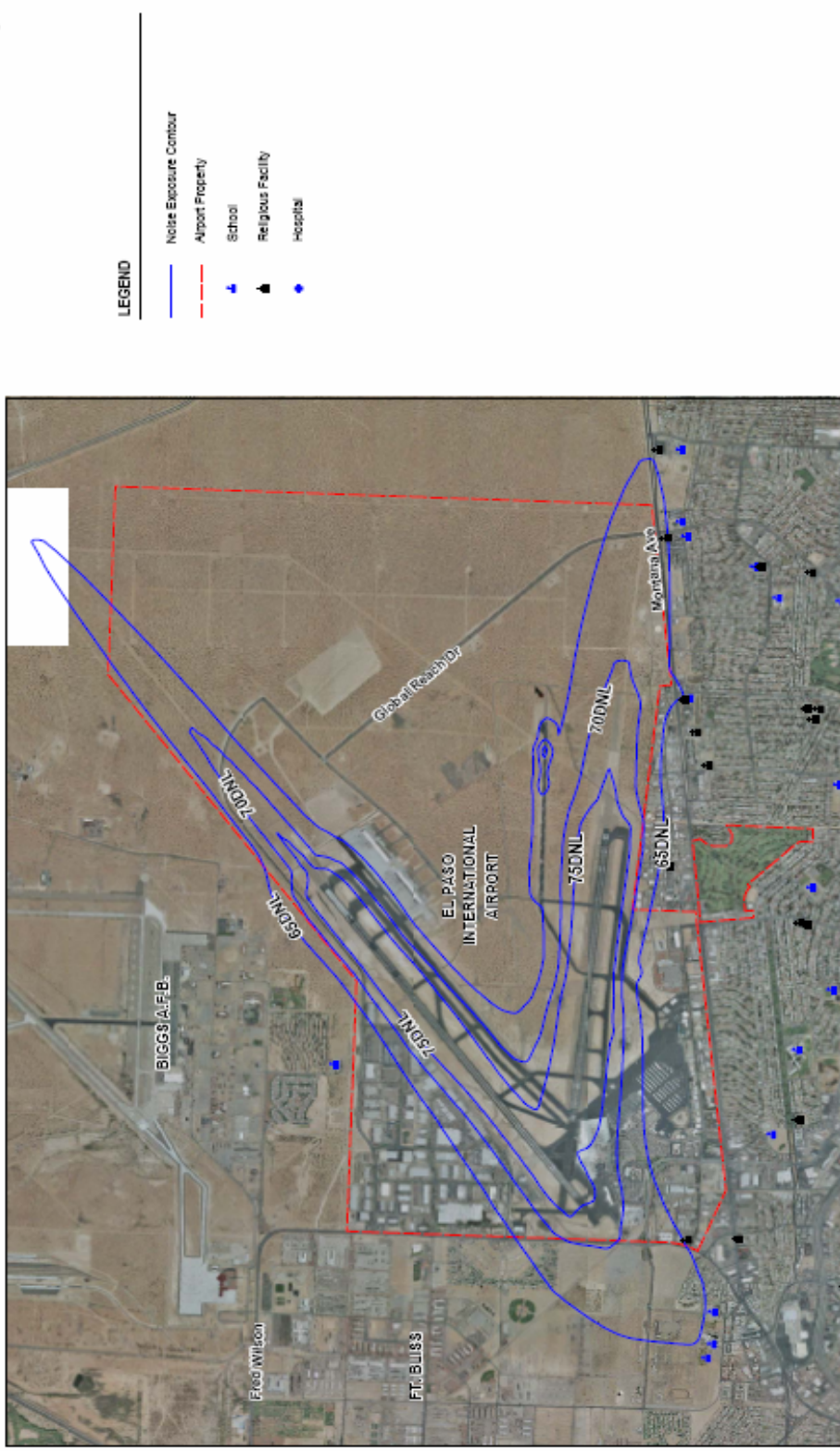
- | | |
|--------------------|-------------------------------|
| 60 ADNL- LUPZ | Cantonment Area |
| 65 ADNL - Zone II | Fort Bliss |
| 75 ADNL - Zone III | El Paso International Airport |
| State Boundary | Biggs AAF |



Source: Ref# 200

Figure 4.10-1. Existing Biggs Army Airfield Noise Contours

El Paso International Airport



Source: Aerial background - Moreno Calderas, Inc.; Integrated Noise Model Version 6.1
 Prepared by: Piccolo & Associates, Inc.

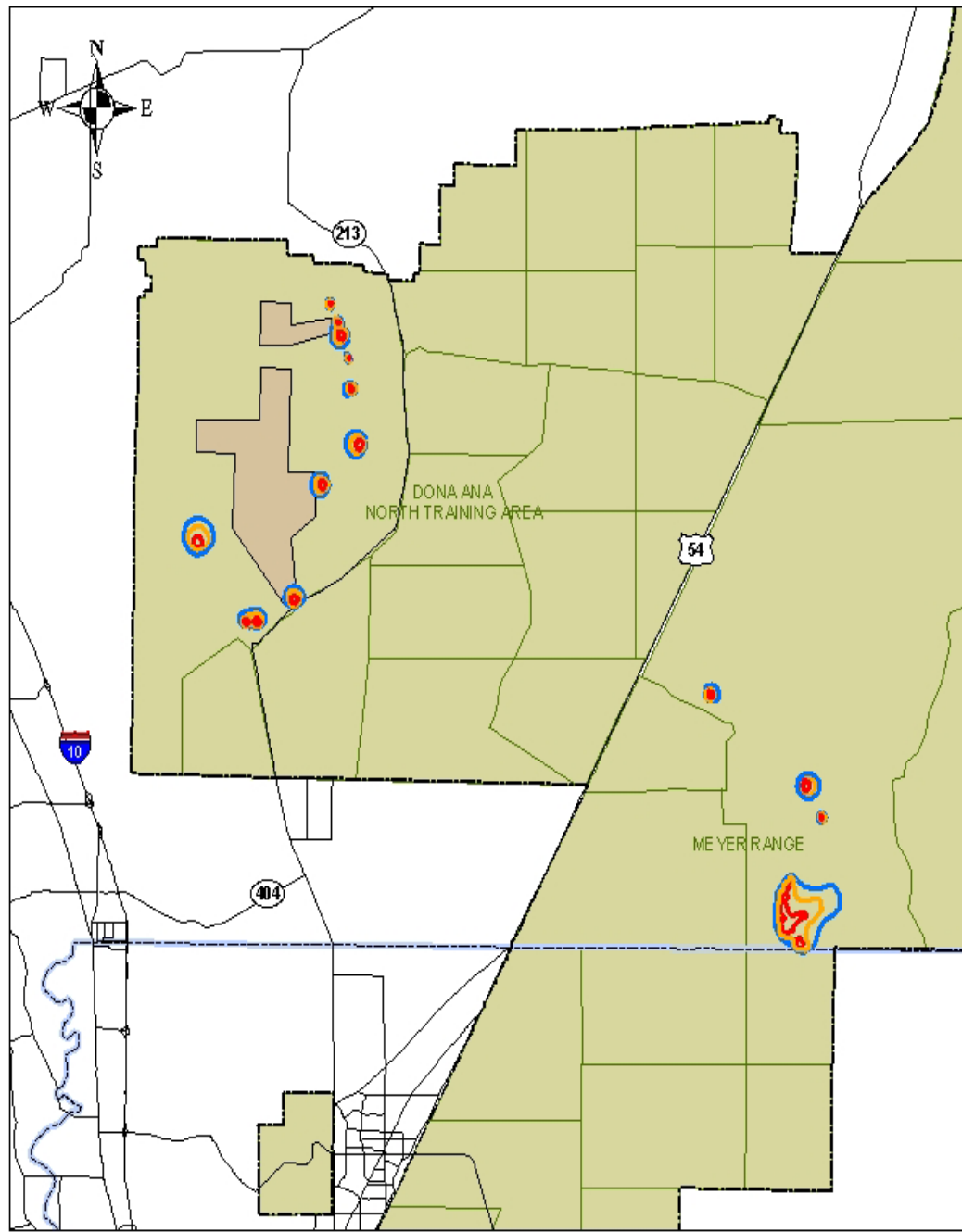
0 100ft 3,000 Feet
 N
 THE UNIVERSITY OF TEXAS AT EL PASO
 El Paso International Airport
 Master Plan Update
 Environmental Overview

Exhibit 8-3

2004 Noise Exposure Contours
 El Paso International Airport

August 2005
 CRHPT

Figure 4.10-2. 2004 EPIA Noise Contours



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- 60 ADNL - LUPZ □ State Boundaries
- 65 ADNL - Zone II ■ Impact Areas
- 75 ADNL - Zone III ■ Training Areas
- Fort Bliss



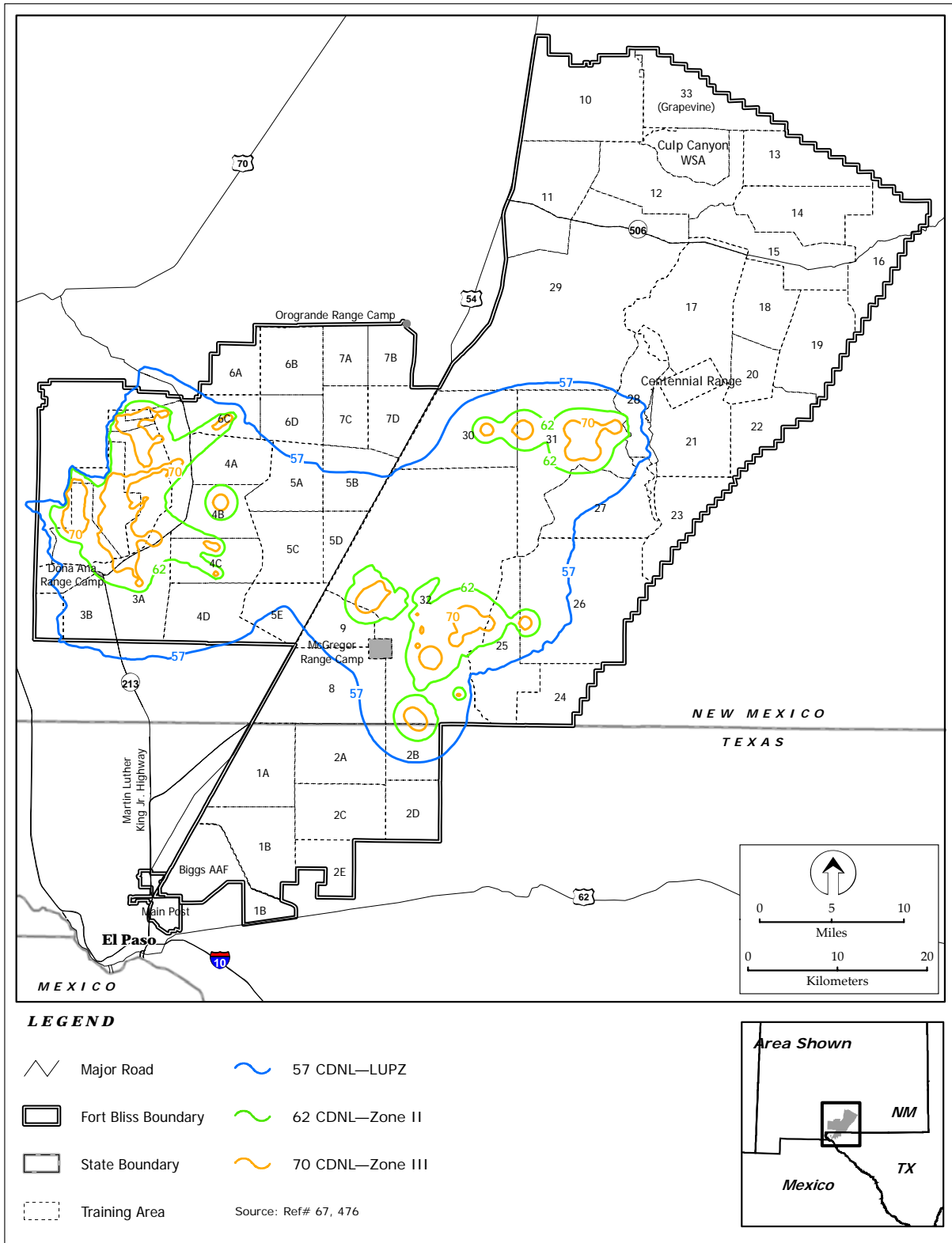
Source: Ref# 200

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Figure 4.10-3. Existing Small Arms Noise Contours at Fort Bliss

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

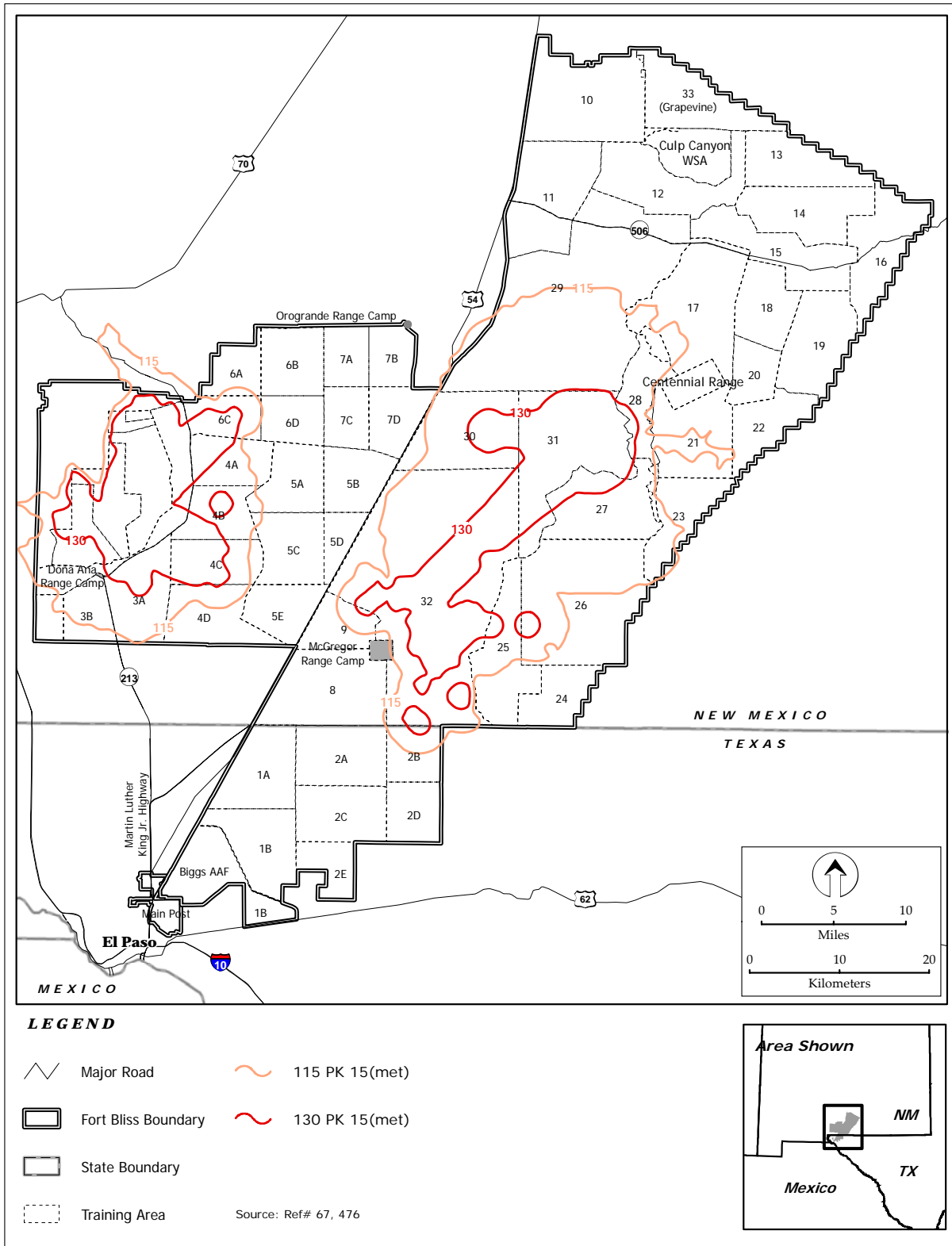


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Figure 4.10-4. Existing Large Caliber Weapons Noise Contours at Fort Bliss

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



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Figure 4.10-5. Existing Large Caliber Weapons Peak Noise Contours at Fort Bliss

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

189 The contours in Figure 4.10-4 reflect the barrier effect of the Organ Mountains operations on the west
190 side of Doña Ana Range. Noise Zones II and III are completely contained within the installation
191 boundary, while the LUPZ extends beyond the boundary in four areas. Fort Bliss has a distinct advantage
192 in that the terrain (i.e., mountain ranges) on the installation serves as a natural barrier to low-frequency
193 sound waves emitting from noise generating activities. This is apparent when looking at activity at the
194 Doña Ana Range complex. The Organ Mountains adjacent to the impact area serve as one of those
195 barriers.

196 Although the LUPZ from large caliber weapons operations extends beyond the boundary in four places,
197 Fort Bliss receives few noise complaints. Between 2000 and 2004, Fort Bliss received one to three noise
198 complaints per year. The majority of land uses contained within the LUPZ consist of grasslands, shrub
199 lands, and barren land with little residential use. The area north of Doña Ana Range extends into WSMR
200 where there are no concerns about incompatibility. The area south of Doña Ana Range stretches to the
201 northern edge of the town of Chaparral, which may be exposed to elevated noise levels during heavy
202 training periods.

1 **4.11 SAFETY**

2 The topics addressed in this section include ground safety, flight safety, explosive safety, and installation
3 compatible use. The ROI for the safety analysis includes the Main Cantonment Area and Fort Bliss
4 Training Complex. Ground safety includes activities associated with ongoing operations and
5 maintenance, fire safety, and demolition and construction. Aircraft flight safety addresses the risk of
6 aircraft mishaps from both rotary- and fixed-wing aircraft activities. Explosive safety considerations
7 involve storage, processing, handling, and use of ordnance. Installation compatible use addresses
8 potential hazards associated with airfield operations and delivery of ordnance on weapons ranges.

9 The U.S Army classifies accidents, incidents, and injuries in one of six classes based on the severity and
10 type of the event. A Class A accident is one in which the total cost of property damage is \$1,000,000 or
11 more; an Army aircraft or missile is destroyed, missing, or abandoned; or an injury and/or occupational
12 illness results in a fatality or permanent total disability. A Class B accident is one in which total cost of
13 property damage is \$200,000 or more, but less than \$1,000,000; an injury and/or occupational illness
14 results in permanent partial disability; or when five or more personnel are hospitalized as inpatients as the
15 result of a single occurrence. A Class C accident is one in which the total cost of property damage is
16 \$10,000 or more, but less than \$200,000; a nonfatal injury that causes any loss of time from work beyond
17 the day or shift on which it occurred; or a nonfatal occupational illness that causes loss of time from work.
18 A Class D accident is one in which the total cost of property damage is \$2,000 or more, but less than
19 \$10,000. A Class E Aviation Incident is one in which the resulting damage cost and injury severity do
20 not meet the criteria for a Class A-D accident. A Foreign Object Damage (FOD) Aviation Incident (Class
21 F incident) is one where damage is confined to the aircraft turbine engine (Ref# 257). This SEIS focuses
22 on Class A accidents due to their severity and high cost.

23 **4.11.1 Ground Safety**

24 All day-to-day operations and maintenance activities on Fort Bliss are performed by trained, qualified
25 personnel in accordance with applicable equipment technical directives, approved occupational safety and
26 health standards, and sound maintenance practices. The handling, processing, storage, and disposal of
27 hazardous by-products resulting from demolition, construction, operations, or maintenance are
28 accomplished in accordance with all federal and state requirements applicable to each substance.

29 Fire suppression on Fort Bliss is the responsibility of the Fort Bliss Fire Department. It is staffed by
30 trained firefighters and is capable of responding to fires that may occur within the Main Cantonment
31 Area. The Fort Bliss Fire Department is party to a Mutual Support Agreement (MSA) with the City of El
32 Paso. If required, augmented support for fire suppression would be available from the city. The Fort
33 Bliss Fire Department also has a Mutual Aid Agreement with BLM for responding to fires on both
34 withdrawn land and Army fee-owned land in the Fort Bliss Training Complex.

35 From 1993 through 2002, a total of 205 fires were recorded on the Fort Bliss Training Complex, burning
36 a total of 94,627 acres (Ref# 557). The most number of fires occurred in 2001 (56) and burned a total of
37 23,221 acres. The smallest number of fires was recorded in 1998 (3). The largest acreage burned was in
38 1993 (33,949), which had only 12 fires but included the single largest fire recorded during the period
39 (20,314 acres) (Ref# 557).

40 The largest number of fires (110) were in the south Tularosa Basin portion of McGregor Range. Most
41 (101) stayed within the Tularosa Basin; five also extended into the southeast training areas and four up to
42 Otero Mesa. Sixty-two, including the four mentioned above, were on Otero Mesa, including 10 of the 14
43 largest fires, as well as the single largest fire. Twenty-two of the fires burned in the southeast training
44 areas. The North and South Training Areas combined only account for seven of the fires. It is likely that
45 the cause of these fires is predominantly due to missile firings (Ref# 557).

46 In the McGregor RMPA, BLM has identified two areas that present potential fire safety hazards: (1) the
47 impact areas below Otero Mesa and on Centennial Range and (2) the urban interface area between the
48 northern part of the range and private lands and communities such as Timberon (Ref# 21). Neither
49 Centennial Range nor the urban interface is proposed for off-road vehicle maneuvers or other land use
50 changes. All fires in the grazing units on McGregor Range are suppressed (Ref# 21). Fort Bliss is
51 participating with BLM in implementing a fire reduction program in the urban interface around
52 Timberon. The Army has invested nearly \$118,000 in thinning and controlled burning of 1,220 acres to
53 reduce fuel loading and create a fire break between McGregor Range and Timberon.

54 Day-to-day operations and maintenance activities performed at Biggs AAF include limited aircraft
55 maintenance. Detailed safety processes and procedures for ramp access, aircraft movement, and fueling
56 and defueling are in place. Two parking areas are designated for loading and unloading of hazardous
57 cargo, which includes munitions.

58 Overall, throughout the U.S. Army over the last 10 years, on-duty personnel have been involved in an
59 average of 64 Class A accidents per year. Based on personnel strengths over that same 10-year period,
60 this represents an average of 0.098 Class A accidents per 1,000 soldiers, or one event for every 10,200
61 soldiers (Ref# 303).

62 **4.11.2 Flight Safety**

63 While it is impossible to predict the precise location of an aircraft accident, in considering potential
64 impact to persons and private property, several factors are relevant: the ROI and immediate surrounding
65 areas have relatively low population densities; pilots of aircraft are instructed to avoid direct overflight of
66 population centers at very low altitudes; and the limited amount of time the aircraft is over any specific
67 geographic area limits the probability of impact from a disabled aircraft in a populated area.

68 Possible effects of an aircraft crash include the potential for injury, property damage, fire, and
69 environmental contamination. Weather and surface conditions (topography, vegetation, etc.) will
70 determine the extent of fire hazard. When an aircraft crashes, it may release hydrocarbons. Those
71 petroleum, oils, and lubricants not consumed in a fire could contaminate soil and water, depending on the
72 physical characteristics of the area where the crash occurred.

73 Based on historical data of mishaps at all U.S. military installations worldwide, and under all conditions
74 of flight, the military services calculate Class A mishap rates per 100,000 flying hours. Combat losses
75 due to enemy action are excluded from these statistics. These data are only statistically indicative. Class
76 A mishaps result from many factors, not simply the amount of flying time of the aircraft.

77 Recent operations at Biggs AAF have been approximately 43 percent Army rotary-wing aircraft and 57
78 percent Army, Air Force, and Civil fixed-wing aircraft. Overall, during the last ten years, Army aviation
79 activities have experienced an average of 17.4 Class A mishaps per year. This equates to an average
80 Class A mishap rate of 1.71 per 100,000 flying hours (Ref# 303).

81 **4.11.3 Explosive Safety**

82 All explosives stored on Fort Bliss are stored in fully licensed and approved storage areas and facilities.
83 All quantity-distance criteria are satisfied except one rail load facility operating on a waiver. Biggs AAF
84 has two approved "Hot Pads" that support trans-shipment of hazardous cargo. These locations satisfy all
85 requirements for temporary processing of explosive material.

86 The South Training Areas contain no explosive storage facilities. This area has been widely used for off-
87 road vehicle training, and while no archive search report has been done for these areas, the training
88 experience makes the probability of explosive ordnance hazards low.

89 There are several areas on the Doña Ana Range complex that have high potential for ordnance or
90 explosive debris contamination. Historical documentation indicates that almost the entire complex has

91 been used for ordnance-related activities. Many areas, especially the ranges west of War Highway, have
92 been repeatedly used with various weapons systems. In addition, the entire complex has been subjected
93 to possible contamination from artillery activities.

94 Ordnance and explosives are stored on McGregor Range in approved and licensed storage facilities.
95 Areas on McGregor Range with the highest potential for ordnance or explosive debris are anti-aircraft
96 artillery ranges, missile and rocket firing areas, Cane Cholla, SHORAD Range, MLRS areas, and Meyer
97 Range Complex. Besides the historical use of specific locations, the overall range has been subjected to
98 possible ordnance and explosive hazards from high- and medium-altitude missiles (Ref# 3).

99 During use of the ranges, temporary storage for ordnance is available at the range camps. The unit using
100 the range is responsible for ordnance safety and security during transport, storage, and use. During
101 training, use of ordnance on the range is guided by SOPs that provide detailed direction on the handling
102 of explosives and explosive safety (Ref# 165). When feasible, after an exercise, the area used is groomed
103 to ensure proper disposal and disposition of ordnance that is considered a hazard. The impact areas are
104 not sanitized on a regular basis. Therefore, ordnance or explosive hazards may exist in those areas.
105 Detailed instructions in SOPs provide for designating and marking ordnance or explosive hazards if
106 encountered. When necessary, explosives ordnance disposal (EOD) specialists are available to render the
107 ordnance safe. It is either destroyed in-place, or removed for demolition on an EOD range.

108 **4.11.4 Installation Compatible Use**

109 **4.11.4.1 Biggs AAF**

110 The Army has an Installation Compatible Use Zone (ICUZ) program to recommend land use
111 compatibility guidelines for areas exposed to increased safety risk and noise in the vicinity of airfields.
112 Three zones are delineated at both ends of the runway: Clear Zones (CZs), Accident Potential Zone
113 (APZ) I and APZ II. In addition, safety zones have been established around the airfield. Within clear and
114 safety zones, construction is either prohibited or limited in terms of placement and height (safety zones).
115 Areas around the airfield where experience has shown most aircraft accidents occur are designated as
116 APZs. In developing these zones, Biggs AAF is considered to have a Class B runway. These zones are
117 shown in **Figure 4.11-1**.

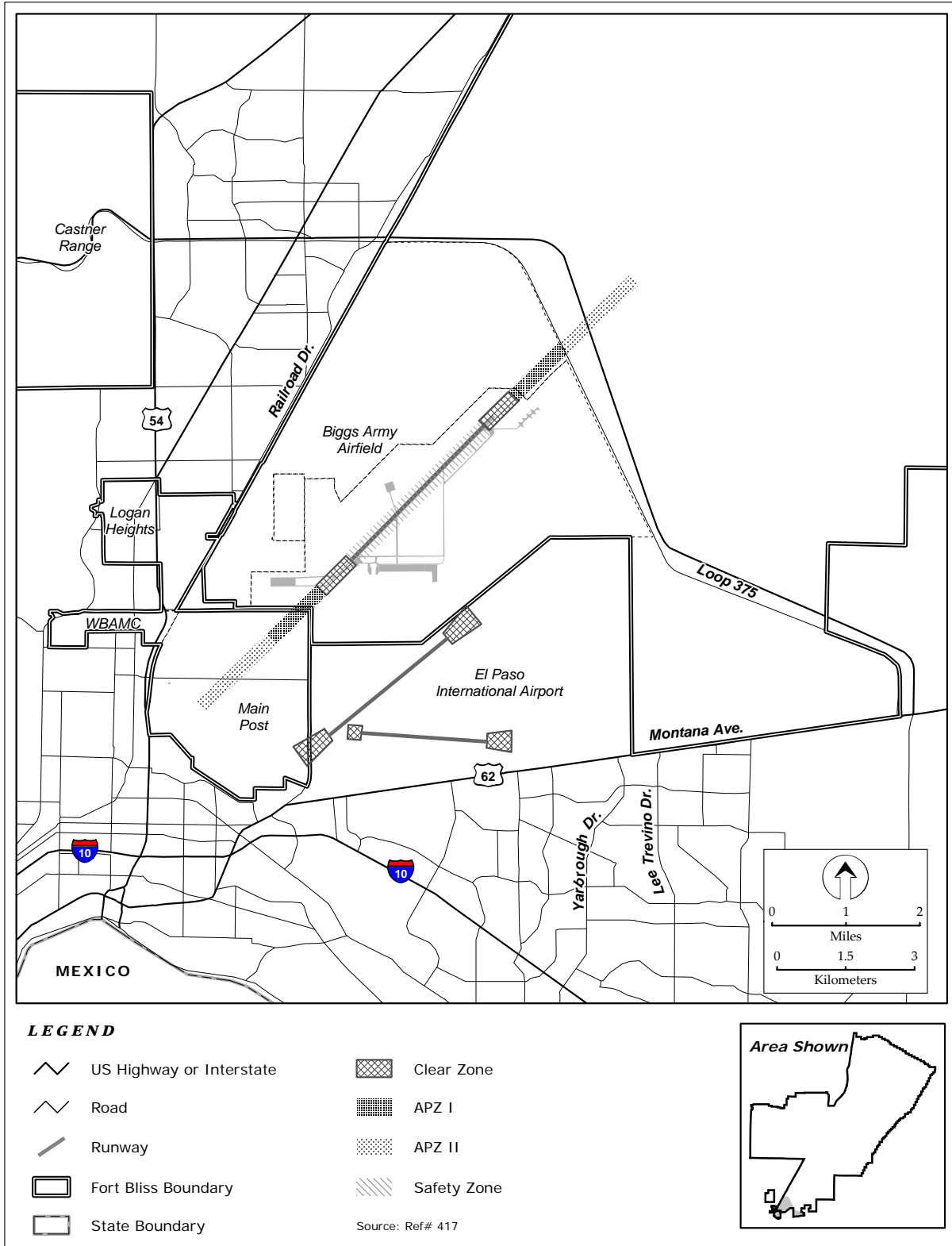
118 The CZ for Class B runways is an area 1,000 feet wide by 3,000 feet long located at the immediate ends
119 of the runway. The accident potential in this area is so high that no building is allowed. For safety
120 reasons, the Army is authorized to purchase the land for these areas if not already part of the installation
121 (Ref# 305).

122 APZ I for Class B runways is 1,000 feet wide by 5,000 feet long and located just beyond the CZ. Land
123 use compatibility guidelines for this zone allow a variety of industrial, manufacturing, transportation,
124 communication, utilities, wholesale trade, open space, and agricultural uses. However, uses that
125 concentrate people in small areas are not acceptable (Ref# 305).

126 APZ II for Class B runways is 1,000 feet wide and extends 7,000 feet beyond APZ I. Compatible land
127 uses include those for APZ I, as well as low density single family residential and personal and business
128 services and commercial retail trade uses with low intensity or scale of operation. High density functions
129 such as multi-story buildings, places of assembly (e.g., theaters, schools, churches, and restaurants), and
130 high density offices uses are not considered compatible (Ref# 305).

131 Military heliports are similar to military airfields in that both have runways for takeoff and landing of
132 aircraft. As a general rule, however, the length of the runway at a heliport is much shorter than an airfield
133 runway since helicopters, characteristically, need less distance to take off or land. The Takeoff Safety
134 Zone at a heliport corresponds to the Clear Zone at an airfield for land use planning purposes. Similarly,
135 for land use planning, the Approach-Departure Zone for heliports corresponds to APZ I at military
136 airfields. Heliports do not have an equivalent to APZ II.

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



137
138

Figure 4.11-1. Airfield Safety Zones at Biggs AAF and EPIA

139 **4.11.4.2 *Live Fire Ranges in the Fort Bliss Training Complex***

140 U.S Army firing ranges are managed in accordance with processes and procedures required by AR 385-
141 63, Range Safety. Specific details are contained in Department of the Army Pamphlet 385-63. Fort Bliss
142 has published detailed SOPs addressing all aspects of range use. The focus of range management is on
143 ensuring the safe, effective, and efficient operation of all ranges.

144 A good deal of the Fort Bliss Training Complex provides safety buffers for the expenditure of ordnance.
145 These safety zones include areas where ordnance or fragments of ordnance are expected to impact. As a
146 result of years of use, Fort Bliss impact areas have been categorized for management purposes as either
147 permanent or temporary.

148 Doña Ana Range–North Training Areas are used for small arms, heavy and light automatic weapons,
149 mortars, artillery, rockets, armor, mechanized infantry, and aerial gunnery. Impact areas are in the Organ
150 Mountains and the TAs.

151 McGregor Range supports delivery of a wide variety of ground-to-ground, ground-to-air, and air-to-
152 ground ordnance. The Orogrande Range is used primarily by TEXCOM’s ADA Test Directorate for
153 weapons system testing. The range can support use of missiles, 81 mm mortars (illumination only), and
154 laser operations. Weapons supported by the SHORAD Range include missiles and 25 mm, 7.62 mm, and
155 .50 caliber ammunition.

156 The Meyer Range complex on McGregor Range supports small arms; hand grenades; M-60 machine
157 guns; Claymore mines; and M249, M203, AT-4, and M79 grenade launchers.

158 **4.11.4.3 *Centennial Range***

159 Centennial Range is a U.S. Air Force operated air-to-ground range located on Otero Mesa at McGregor
160 Range. Safety processes and procedures for Air Force air-to-ground ranges are defined in Air Force
161 Instruction (AFI) 13-212. These requirements ensure that Air Force ranges are planned, operated, and
162 managed in a safe manner; all required equipment and facilities are available to support range use; and
163 proper security for range assets is present. Specific direction on different range activities is contained in
164 AFI 13-212, Volume 1 Range Planning and Operations, Volume 2 Range Construction and Maintenance,
165 and Volume 3 SAFE-RANGE Program Methodology (Ref# 420).

1 **4.12 HAZARDOUS MATERIALS AND ITEMS OF SPECIAL**
2 **CONCERN**

3 This section provides a description of the hazardous materials, items of special concern, and related
4 management programs at Fort Bliss. The ROI for hazardous materials and environmental media
5 management programs includes the Main Cantonment Area, including Biggs AAF, and the Fort Bliss
6 Training Complex.

7 The 2000 Mission and Master Plan PEIS (Ref# 3) documents impacts associated with hazardous materials
8 and items of special concern. This SEIS focuses on changes that have occurred since completion of that
9 document.

10 **4.12.1 Hazardous Materials**

11 This section discusses hazardous chemicals, hazardous waste, and ordnance and explosives used, stored,
12 and managed at Fort Bliss.

13 **4.12.1.1 Hazardous Chemicals**

14 Training activities and installation maintenance require the use of many types of hazardous chemicals.
15 Fort Bliss stores and uses hazardous chemicals, including a variety of flammable and combustible liquids.
16 Types of hazardous chemicals used by the installation include acids, corrosives, caustics, glycols,
17 compressed gases, aerosols, batteries, hydraulic fluids, solvents, paints, cleaning agents, pesticides,
18 herbicides, lubricants, fire retardants, photographic chemicals, alcohols, insecticides, sealants, and
19 ordnance.

20 In accordance with the Pollution Prevention Act (PPA) and Emergency Planning and Community Right-
21 to-Know Act (EPCRA), source reduction, recycling, and treatment activities involving EPCRA Section
22 313 chemicals must be reported on Toxic Release Inventory (TRI) Form R. EPCRA Section 311 requires
23 that facilities with chemicals stored above certain quantities must submit either copies of their MSDSs or
24 a list of MSDS chemicals, and Section 312 requires submission of an annual inventory report (Tier II
25 report) for the same chemicals to the State Emergency Response Commission, Local Emergency Planning
26 Committee, and local fire department (Ref# 287).

27 Fort Bliss prepares a yearly chemical storage report in accordance with EPCRA Section 312. The report
28 identifies the hazardous chemicals stored on Fort Bliss in excess of 10,000 pounds and generally includes
29 the chemical name, physical state of the chemical, associated hazards, type of storage container, amount
30 stored, and storage locations. The chemicals on Fort Bliss are categorized as EPCRA Section 313, and
31 the reporting threshold varies by TRI chemical (for example, lead reporting threshold is 100 pounds and
32 diisocyanates is 10 pounds) (see Appendix C). In January 2005, a survey of hazardous materials storage
33 data at Fort Bliss identified the following as hazardous materials with potential to be reported in 2004 for
34 Tier II: gasoline, JP-8, antifreeze, ordnance and munitions, breakthrough solvent, chlorine, and chemical
35 agent resistant coating (CARC) paint. Calculations were performed on the total amounts of hazardous
36 chemicals not exempt from EPCRA for determining whether a Tier II report was necessary. Based on the
37 information gathered for 2004, gasoline and JP-8 exceeded reporting levels (Ref# 289).

38 **4.12.1.2 Hazardous Waste**

39 The Fort Bliss hazardous waste management program includes an Installation Hazardous Waste
40 Management Plan and SOP for the handling and storage of hazardous waste. These documents provide
41 detailed information on training; hazardous waste management roles and responsibilities; and hazardous
42 waste identification, storage, transportation, and spill control, consistent with federal and state
43 regulations. Fort Bliss is categorized as a Large Quantity generator of hazardous waste as defined by 40
44 CFR Parts 262 and 264 and is permitted by TCEQ to operate as a HWSF (permit #50296). The operating

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

45 permit was renewed on March 11, 2002 and is valid for 10 years. The permit allows Fort Bliss to store
46 hazardous waste at the HWSF for up to one year.

47 The Fort Bliss HWSF is located in the Building 11614 area at Biggs AAF and is currently managed by
48 the Directorate of Environment and the DRMO. Wastes generated throughout Fort Bliss, including the
49 McGregor, Doña Ana, and Orogrande Range Camps, are brought to the Building 11614 area for
50 classification, labeling, and storage. Waste processing at the facility is continual, resulting in a
51 turnaround time of approximately 90 days and ensuring that storage capacity is available for wastes
52 generated during training exercises or spills. Several times a month, or more often if necessary, wastes
53 are transported to an off-site Treatment, Storage, Disposal Facility (Ref#177).

54 The HWSF consists of a fenced area approximately 280 feet by 480 feet (approximately 3 acres) with the
55 following facilities (Ref# 177):

- 56 • Unit 1, a permitted container storage area for storing containers of free liquids. Ignitable and
57 corrosive wastes are only stored in this building if TCEQ permit requirements are satisfied.
58 Wastes that may not be stored in Unit 1 include lithium batteries, nickel-cadmium batteries,
59 oxalic acid powder, and paint filters. The permitted storage capacity for this building is 8,600
60 gallons.
- 61 • Unit 2, a permitted container storage area for storing containers that do not contain free liquids.
62 The permitted storage capacity for Unit 2 is 31,900 gallons.
- 63 • Unit 4, a permitted container storage area for wastes with no free liquids. It has a capacity of
64 13,440 gallons.
- 65 • Units 5, 6, and 7, 500 SF modular buildings permitted for storage of hazardous liquid wastes.
66 The units are fully enclosed to prevent rainwater from impacting containment capacity. Ignitable
67 wastes are stored in Units 5 and 6; corrosive wastes in Unit 7. Permitted storage capacity is 6,600
68 gallons for each unit.
- 69 • Unit 8, a permitted area for storing containers with no free liquids. It has a permitted storage
70 capacity of 47,520 gallons.

71 The paved area between the modular buildings and Unit 8 serves as a staging area for loading and
72 unloading waste containers. Absorbent materials are available for immediate spill response during
73 loading/unloading to prevent a spill or other release from impacting the surrounding soil.

74 In addition to these hazardous waste storage units, two modular buildings for polychlorinated biphenyl
75 equipment storage are located in the southeast corner of the facility (Ref# 177).

76 Hazardous wastes are generated by various military and civilian entities at Fort Bliss. Before wastes are
77 transferred to the permitted storage facility, they are accumulated in the following permit-exempt,
78 temporary storage areas:

- 79 • Hazardous Waste Accumulation Points – wastes generated at vehicle-maintenance facilities, paint
80 shops, etc., are accumulated at or near the point of generation. Waste generators are limited to
81 accumulating no more than 55 gallons per waste stream. Once the 55-gallon threshold is reached,
82 the wastes are transferred to the HWSF within 72 hours. These accumulation sites at Fort Bliss
83 are called Waste Accumulation Points (WAPs) and are under control of the operator of the
84 process generating the waste.
- 85 • 90-Day Storage Areas – 90-day storage sites are located in the Main Cantonment Area and at
86 McGregor, Doña Ana, and Orogrande Range Camps. The 90-day sites are fenced, and each is
87 equipped with two climate-controlled modular buildings designed for hazmat storage. The 90-
88 day storage sites are used only during field training exercises. Wastes are transferred to the
89 HWSF within 90 days.

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

90 All waste streams are recertified when waste-generating processes change. Waste stream composition
91 can be altered by operational changes and changes in material suppliers; such changes are identified
92 during compliance inspections at generator facilities. If available, process knowledge will be the primary
93 method for confirming waste stream classification, but recertification may also be based on MSDSs
94 and/or sampling data. Waste streams are validated, as required through laboratory sampling and analysis.
95 Waste streams that require initial analysis or re-analysis include newly generated waste streams and waste
96 streams resulting from process changes. **Table 4.12-1** lists waste streams considered for annual re-
97 analysis.

98 **Table 4.12-1. Waste Streams Considered for Annual Re-Analysis**

<i>Waste Stream</i>	<i>Analytical Parameter</i>
Antifreeze	VOCs RCRA metals
Adhesives	Flash point, VOCs
Waste oil	VOCs, flash point, TOX, RCRA metals
Waste paint	VOCs, RCRA metals
Contaminated fuel	flash point, VOC
Rags	VOCs
Soil contaminated with POL	Total petroleum hydrocarbons, pH, BTEX
Photographic fixer, developer	pH, total metals (Silver)
Spent battery electrolyte, potassium hydroxide from nickel-cadmium batteries	pH, total metals (Cadmium)
Sludge from oil-water separators	VOCs, flash point, TOX, RCRA metals
Oil in abandoned containers	VOCs, flash point, TOX, RCRA metals

BTEX = benzene, toluene, ethyl benzene, and xylenes; POL = petroleum, oil, and lubricants; TOX = total organic halogens; VOC = volatile organic compounds

Source: Ref# 177

99 Fort Bliss submits an Annual Waste Summary to TCEQ detailing the management of each hazardous
100 waste generated on site during the previous calendar year. A waste minimization report is also submitted
101 to TCEQ in accordance with the installation's hazardous waste permit. In addition, a Biennial Report is
102 submitted to TCEQ in every even-numbered year and covers the activities for the previous odd-numbered
103 years, per 40 CFR 262.41. These reports detail information on the hazardous wastes generated, including
104 the DOT hazard class, USEPA hazardous waste identification number, quantity of waste, the USEPA
105 Identification (ID) Number of each TSDF the waste was sent to, and a description of the Fort Bliss waste
106 minimization program. A summary of amounts of hazardous and universal waste generated by Fort Bliss
107 operations during the period 1997-2004 is provided in Appendix C.

108 **4.12.1.3 Ordnance and Explosives**

109 At Fort Bliss, ordnance is expended in a variety of grenades, mortars, howitzers, artillery, rockets, and
110 missiles during training exercises and testing activities. Currently, the Fort Bliss EOD unit eliminates
111 explosives hazards on Fort Bliss ranges by detonation in place or, if safe to do so, by removing the hazard
112 to the EOD range and detonating there. If an emergency permit is required (for example, to destroy a
113 batch of unused but deteriorated munitions), it is obtained from New Mexico Environment Department
114 (Ref# 284).

115 Fort Bliss did not renew the permit for the Open Detonation Treatment Unit when the permit expired July
116 2005 and ceased operations. In December 2006, the New Mexico Environment Department issued a
117 Notice of Approval for clean closure of the unit. A Corrective Actions Only Permit will be issued with
118 the remaining Solid Waste Management Units attached.

119 **4.12.2 Items of Special Concern**

120 Items of special concern include medical and biohazardous waste, radioactive waste, asbestos, lead-based
121 paint, pesticides, PCBs, and petroleum storage tanks.

122 **4.12.2.1 Medical and Biohazardous Waste**

123 Medical wastes include wastes generated by hospitals, clinics, physicians' offices, dental offices,
124 veterinary facilities, and other medical laboratories and research facilities. Biohazardous waste can
125 typically include human blood and blood products, cultures and stocks of infectious agents and associated
126 biologicals, isolation wastes, contaminated and unused sharps, animal carcasses, contaminated bedding
127 material, and pathological wastes. Radioisotopes used for medical purposes are discussed in Section
128 4.12.2.

129 Fort Bliss generates approximately 13,000 pounds of medical and biohazardous waste per month at the
130 Dental Clinic, two Blood Banks, the Veterinary Clinic, the Troop Clinic, and WBAMC. Large-scale
131 training exercises, such as Roving Sands, may add several thousand pounds of waste per month during
132 the exercise. Waste is collected and stored at the generating locations. These wastes are picked up by a
133 licensed medical waste contractor about every other day and removed from the post (Ref# 3).

134 **4.12.2.2 Low-Level Radioactive Waste**

135 Various Fort Bliss organizations and WBAMC generate small amounts of low-level radioactive waste.
136 The use of radioisotopes for medical purposes generates short-lived (half life less than 90 days), low-level
137 waste. Other Fort Bliss organizations also generate low-level radioactive waste from commodity items
138 such as unusable compasses, dials, targeting devices, gauges, rocket sights, and chemical weapons
139 detection equipment. These wastes include the radioactive isotopes tritium (H3), thorium 232, radium
140 226, americium 241, nickel 63, promethium 141, cesium 137, cobalt 60 and strontium 90. All waste
141 items are consolidated, inventoried, the radioactive material removed if possible, and temporarily stored
142 in waste containers in Building T2550 on Fort Bliss. The consolidated waste is collected for subsequent
143 disposal at an authorized disposal site.

144 Short-lived radiological waste generated by WBAMC is managed by the hospital Radiation Safety
145 Officer. All other low-level waste is managed by the Installation Radiation Protection Officer. Low-level
146 waste is segregated at a turn-in point and is stored within a double-fenced, locked area on the Main
147 Cantonment Area. Over recent years, Fort Bliss has drastically reduced the amount of low-level
148 radioactive waste generated. During the period from 2003 to the present, one 55-gallon drum has been
149 used and is still in use.

150 The Installation Radiation Protection Officer coordinates all radiological waste shipments with Army
151 Material Command. Currently, the Army is coordinating with waste deposit sites in Nevada to dispose of
152 low-level radioactive wastes from Fort Bliss. Once a waste repository site is designated, a disposal
153 contractor will transport the waste from Fort Bliss to the assigned waste deposit site (Ref# 241).

154 **4.12.2.3 Asbestos**

155 Fort Bliss has a Draft Asbestos Management Plan for the identification and removal of friable asbestos.
156 The plan is in draft form but conformance with it is ongoing (Ref# 197).

157 Approximately 80 percent of all buildings on Fort Bliss contain some form of asbestos. Many of the
158 buildings at Fort Bliss were built or renovated between 1940 and 1975, when the use of asbestos was
159 common. The majority of the asbestos was in the form of pipe insulation, most of which has been
160 removed and replaced with nonhazardous material. Several other types of ACM, such as floor tiles,
161 cement siding, and wall/ceiling coverings remain in place throughout Fort Bliss facilities. As long as this
162 ACM remains nonfriable, it is not considered a health risk (Ref# 176).

163 It is Fort Bliss policy to presume all buildings built before 1980 contain asbestos. Limited surveys are
164 presently being conducted in buildings that have been identified for renovation. Surveys are limited to
165 the area of renovation to comply with the NESHAP asbestos requirements. Complete building surveys
166 are conducted for those buildings identified for demolition (Ref# 295).

167 As of July 2005, all housing at Fort Bliss was turned over to a private contractor, which is responsible for
168 identifying all areas of ACM within its area of responsibility. The contractor is responsible for
169 conducting asbestos surveys as necessary; providing the results to the Army; and maintaining a database
170 containing the list of homes that have been tested for asbestos, the test results, any action taken to abate
171 potential hazardous areas, and housing units/buildings demolished to make way for new housing.

172 Regulated ACM resulting from renovation and demolition projects is disposed of in the Fort Bliss
173 Municipal Solid Waste Landfill. The landfill permit from TCEQ allows disposal of regulated and non-
174 regulated ACM in the landfill. The material is disposed of at the bottom of the working cell and is
175 covered by three feet of solid waste. Fort Bliss has an Asbestos Program Manager (APM) who is the
176 primary contact for all asbestos-related projects at Fort Bliss (Ref# 176).

177 **4.12.2.4 *Lead-Based Paint***

178 Potential sources of lead in the environment include lead-based paint, lead in water, and lead-
179 contaminated soil. Flaking and peeling paint is an exposure concern in homes, day care centers, schools,
180 and playgrounds. Toddlers and young children may chew on painted surfaces such as window sills while
181 teething. Other hazards include lead-containing dust generated during renovation, demolition, sanding,
182 and stripping of painted surfaces. Lead-containing dust can also be generated when surface abrasion
183 occurs during routine activities such as opening and shutting doors and windows (Ref# 179).

184 Soil can represent a potential lead exposure concern in urban areas where past auto and industrial
185 emissions have left lead residues. Lead-tainted soil is found near homes where deteriorated exterior paint
186 has leached into the soil from rain. At Fort Bliss, very high levels of lead in soil have been found around
187 steel structures such as bridges, water towers, and shooting ranges (Ref# 179).

188 Many of the houses and facilities at Fort Bliss were constructed before 1978 and are likely to contain
189 lead-based paint. A risk-based assessment has been completed on all family housing, and a project for
190 encapsulating or abatement of lead-contaminated surfaces on the exterior porches of family housing units
191 was implemented. To date, all lead wastes have been determined to be nonhazardous and were disposed
192 of in the Fort Bliss landfill (Ref# 295).

193 As of July 2005, all housing at Fort Bliss was turned over to a private contractor, which is responsible for
194 identifying areas of deteriorated paint and dust accumulation and providing recommendations to the
195 Family Child Care Office for either in-place management measures or lead-based paint abatement. The
196 contractor is responsible for conducting lead inspections and risk assessments if necessary, providing the
197 results to the Army, and maintaining a database containing the list of homes that have been tested for
198 lead, results of the tests, and any action taken to abate potential hazard areas (Ref# 295).

199 **4.12.2.5 *Pesticides***

200 The Pest Management Plan for Fort Bliss describes the installation's pest management requirements,
201 outlines the resources necessary for surveillance and control, and describes the administrative, safety, and
202 environmental requirements of the program. Adequate records of all pest management operations
203 performed by Fort Bliss personnel are maintained by the Installation Pest Management Coordinator (Ref#
204 286).

205 Fort Bliss utilizes Integrated Pest Management (IPM), a sustainable approach that incorporates the use of
206 multiple techniques to prevent or suppress pests in a given situation. Although IPM emphasizes the use
207 of nonchemical strategies, chemical control may be an option used in conjunction with other methods.

208 IPM strategies depend on surveillance to establish the need for control and to monitor the effectiveness of
209 management efforts (Ref# 286).

210 Pesticides are stored and mixed at two facilities on the Main Post, Buildings 2509 and 3008. Material
211 Safety Data Sheets for the pesticides are kept at each of those buildings. The pesticides and equipment
212 inventories at each of the storage facilities are updated every year, and an Annual Pesticide Use Report
213 (pesticide use measured in pounds of active ingredients) is generated. Copies of these inventories are
214 provided to the Fort Bliss Fire Department and the Safety Officer.

215 Precautions are taken during pesticide application to protect personnel. Pesticides are not applied
216 outdoors when the wind speed exceeds five miles per hour. Whenever pesticides are applied outdoors,
217 care is taken to make sure that any spray drift is kept away from individuals, including the applicator, and
218 other non-target sites. Pesticide application indoors is accomplished by individuals wearing the proper
219 personal protective clothing and equipment. At no time are other personnel permitted in a treatment area
220 during pesticide application.

221 Sensitive areas listed on pesticide labels are considered before pest control operations are conducted. No
222 pesticides are applied directly to wetlands or areas subject to flooding unless use in such sites is
223 specifically approved on the label and the proposed application is approved by the Directorate of
224 Environment. No pest management operations will be conducted that are likely to have a negative impact
225 on endangered or other species of special concern or their habitats without prior review and approval.

226 Pesticide use on Fort Bliss was 884 pounds of active ingredients in FY 2000, 809 pounds in FY 2001, 788
227 pounds in FY 2002, 1,174 pounds in FY 2003, 2,618 pounds in FY 2004, and 1,768 pounds in FY 2005.

228 **4.12.2.6 Polychlorinated Biphenyls**

229 The Fort Bliss PCB management program is comprised of a PCB Management Plan, updated SOPs, and a
230 new PCB Compliance Tracking System database which includes an inventory of all tested electrical and
231 hydraulic equipment with data plate information; an updated inventory of new electrical equipment; and
232 tracking of “out of service” electrical equipment from “cradle-to-grave.”

233 Fort Bliss has completed three PCB survey, testing, and labeling projects since 1990. The identified PCB
234 transformers, capacitors, and other PCB items have been removed from service and disposed of properly
235 through DRMO. There are approximately 300 PCB-contaminated transformers (equal to or greater than
236 50 ppm and less than 500 ppm of PCBs) in service (Ref# 293). There are no regulatory requirements to
237 replace those transformers.

238 Waste PCBs and PCB items are managed through DRMO and sent to a designated off-site facility for
239 disposal in accordance with Toxic Substance Control Act (TSCA) regulations. PCB wastes are stored at a
240 TSCA facility, separate from the RCRA Part B facility, before disposal

241 **4.12.2.7 Petroleum Storage Tanks**

242 Fort Bliss has completed a four-phase project to upgrade existing underground storage tanks (USTs) to
243 meet federal and state requirements and reduce total number of USTs on the installation to 110. By 1996,
244 Fort Bliss had identified 366 petroleum storage tanks. Records indicate that 110 USTs and 132 above
245 ground storage tanks (ASTs) are currently in use for storing diesel fuel, unleaded gasoline, used oil,
246 antifreeze, JP-8 jet fuel, and heating oil. These tanks range in size from 55 to 250,000 gallons. One UST
247 and three ASTs are located at the Doña Ana Range–North Training Areas; three USTs and one AST are
248 located at Orogrande Range; and six USTs and 18 ASTs are located on McGregor Range (Ref# 296).

249 Fort Bliss has identified 34 sites that formerly had leaking petroleum storage tanks, of which four were
250 ASTs. All but one have been remediated and closed and two new tank sites have been added to the list,
251 leaving three open and under remediation. The sites were reported to TCEQ and NMED, as required, and
252 remedial actions were performed in consultation with the respective agency (Ref# 296).

253 **4.12.3 Related Management Programs**

254 **4.12.3.1 Installation Restoration Program**

255 The Installation Restoration Program (IRP) is the DoD program designed to identify, characterize, and
256 remediate the environmental contamination on military installations. The program was implemented in
257 response to the Comprehensive, Environmental Response, Compensation and Liability Act (CERCLA)
258 requirements to remediate sites that posed a health threat. Section 211 of the Superfund Amendments
259 Reauthorization Act (SARA) amended CERCLA and established the Defense Environmental Restoration
260 Program (DERP) through which DoD funds and conducts its environmental restoration programs.

261 All Fort Bliss IRP high-risk sites in Texas have been closed. Sites in New Mexico include the McGregor,
262 Doña Ana, and Meyer Oxidation Ponds, which have been moved into the Compliance-Related Cleanup
263 (CC) program for groundwater monitoring. All medium- and low-risk IRP sites in Texas and New
264 Mexico have been remediated and closed with the exception of Area A-1, where soil is being sampled for
265 pesticides. Soils with slightly elevated analysis are removed and properly disposed of; however, further
266 delineation of the sites that have slightly elevated chemicals of concern is required by TCEQ.

267 Fort Bliss may be required to maintain a Corrective-Actions Only Permit because there are several Solid
268 Waste Management Units in New Mexico that have not yet been granted No Further Action status (Ref#
269 284).

270 **4.12.3.2 Military Munitions Response Program (MMRP)**

271 Fort Bliss has five MMRP sites which are described below.

272 FTBLS-005-R-01, the New Mexico National Guard Impact Area on Doña Ana Range, has not been
273 physically investigated (only historical record search) but is probably fairly contaminated with UXO. The
274 location of this site must first be verified. The site coordinates place it on top of the existing Doña Ana
275 Range Camp, which has been in its present location since the 1930s without recorded UXO discovery or
276 evidence of live firing fragmentation.

277 FTBLS-003-R-01 has the least chance of having UXO as it is the present site of the Chevron Oil Refinery
278 in the City of El Paso. The ground surface in this area has been heavily reworked and is not near its
279 original grade.

280 FTBLS-001-R-01, McNew Surplus, and FTBLS-002-R-01, Maneuver Areas 1 & 2, are fairly remote and
281 have minor human activity. These sites could contain some light UXO contamination.

282 The fifth site is Castner Range, which is not proposed for any further military use.

283 Fort Bliss plans to complete all site investigations by 2008 and execute follow-on phases/actions as
284 required by the individual site cleanup strategies.

285 **4.12.3.3 Compliance-Related Cleanup (CC)**

286 Petroleum products are contaminants of concern at two of the five open CC sites. Because the drinking
287 water aquifer for the City of El Paso, Texas; Juárez, Mexico; and Fort Bliss is a minimum of 385 feet
288 below the ground surface and the draw depth of all water wells is over 650 feet from the surface, surface
289 and near surface (+/- 65 feet below the ground surface) areas of trapped free petroleum product have little
290 chance of reaching the drinking water supply. The sediments that underlie Fort Bliss contain numerous
291 horizontal aquitards of fat clay, which act as barriers to the vertical migration of any substance. The
292 vadose zone is dry, due to the small amounts of rainfall in the region (average 9 inches per year) and the
293 high evaporation rate of 105 inches per year.

294 The landfill at the Orogrande Range Camp is known to be a small municipal landfill receiving household
295 trash and garbage from the range camp. For years, the practice was to burn the landfill contents, greatly

296 reducing the chance of liquid waste. The depth to the regional aquifer, intervening clay aquitards, and
297 sparse rainfall also protect it from a chance of environmental release.

298 The Open Detonation Unit and the Engineer Demolition Range at Doña Ana Range have had soil tests
299 taken and all results are at least below USEPA industrial soil screening levels (SSL) and most likely also
300 below New Mexico residential SSLs. However, most Fort Bliss sites will show elevated arsenic levels in
301 the soil, when compared to New Mexico residential SSL. This is a known characteristic of the native
302 soils in this region, and NMED requires Fort Bliss to conduct a widespread testing program producing a
303 robust group of statistically valid soil samples to document the background level of arsenic in the military
304 property at each site, unless the sites are within ½ mile of each other.

305 **4.12.3.4 *Pollution Prevention***

306 The PPA established pollution prevention as the nation's preferred approach to environmental protection
307 and waste management. Other EOs, Army regulations, and state environmental laws have been enacted
308 to supplement the PPA by providing the method and means by which federal facilities will prevent
309 pollution and reduce wastes. A basic requirement of these regulations is the creation of a P2 plan (Ref#
310 287). As part of the Fort Bliss P2 Program, PPOAs are periodically conducted on various processes
311 across the installation.

312 The Fort Bliss P2 Plan complies with current Army regulations and TCEQ requirements. The success of
313 Fort Bliss' P2 Program is measured against the Army's P2 Program reduction goals. In accordance with
314 the Texas Waste Reduction Policy Act (WRPA) and Army Pamphlet 200-1, the P2 Plan is revised either
315 every five years or upon any occurrence of change to a function or process at Fort Bliss (Ref# 296).

316 The objective of Fort Bliss P2 Program is to reduce or eliminate use of hazardous materials, generation of
317 wastes, and emissions of pollutants to the environment, and to conserve resources. To meet this
318 objective, Fort Bliss has established the goals listed in **Table 4.12-2**. Various factors were considered in
319 developing the P2 goals including the federal, state, DoD, and Army regulatory requirements, the volume
320 and relative hazards of materials used and wastes generated on post, and procurement and waste disposal
321 costs.

322 In response to the amount of waste produced on the installation and an increased awareness of the
323 environmental impact of this waste and its liabilities, Fort Bliss developed a Hazardous Waste "Curbside"
324 Service. This service seeks to address the particular challenges facing waste management at Fort Bliss, a
325 large installation with numerous waste generation points and high personnel turnover. The "Curbside"
326 service applies professional resources at the front end of the waste management process, proactively
327 collecting waste rather than relying upon voluntary drop-off and infrequent inspections for compliance.
328 This is accomplished by:

- 329 • Providing monitoring, on-the-spot corrections, and guidance related to waste handling;
- 330 • Preparing waste for collection, transportation, storage, and disposal;
- 331 • Recycling waste and reissuing recovered product; and
- 332 • Providing spill protection equipment and response care.

333 In addition, both new and existing P2 initiatives have been centralized into a single Sustainability Center,
334 which has resulted in significant reduction of waste disposal and increased cost savings.

335 Fort Bliss has a central recycling center and one drop-off point that has containers for cardboard, papers,
336 magazines, newspapers, toner cartridges, cell phones, and plastics. Mandatory workplace recycling was
337 implemented in November 1996 and a Fort Bliss Recycling Policy, U.S. Army Garrison Regulation 200-
338 2, was signed on 8 March 2005 making recycling mandatory. The recycling center currently recycles
339 about 163 tons of material a month. Fort Bliss also has recycling programs for used antifreeze, wet lead
340 acid batteries, used tires, used oil, scrap metal, aluminum cans, and solvents. A fluorescent tube-crushing

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

341 operation is also in place to save space at the landfill and to control the disposal of mercuric compounds
342 contained in the tubes (Ref# 296).

343 **Table 4.12-2. P-2 Program Goals**

<i>Goal</i>	<i>Source of Goal</i>	<i>Baseline Year</i>	<i>Target Year</i>
Reduce Toxic Release Inventory releases 10% annually or 40% by 2006.	EO 13148	2001	31 Dec 2006
Reduce use of USEPA priority chemicals (cadmium, lead, PCBs, mercury, and naphthalene) by 50%.	EO 13148	2004	31 Dec 2006
Continually reduce the quantity on non-hazardous solid waste generated (excluding construction and demolition debris), increase percentage of non-hazardous solid waste diverted from disposal facilities, and increase economic benefit of solid waste diversion.	DOD MOM	N/A	December 2005
Reduce greenhouse gas emissions from facility energy use 30%.	EO 13123	1990	2010
Continuous annual reductions in air emissions.	DOD MOM	On-going	On-going
Continuous annual reductions in hazardous waste disposal.	DOD MOM	On-going	On-going
Reduce facility energy consumption 30% per square foot by 2005 and 35% by 2010.	EO 13123	1985	2005/2010
Phase out Class I Ozone Depleting Chemicals (ODC).	EO 13148	N/A	31 Dec 2010
Reduce water consumption and related energy use in facilities.	EO 13123	On-going	On-going
Reduce vehicle petroleum consumption 20%.	EO 13149	1999	2005
Increase USEPA fuel economy of cars and light trucks by at least 1 mile per gallon by 2002 and 3 miles per gallon by 2005.	EO 13149	1999	2002/ 2005
Use at least 50% alternative fuels in alternative/dual-fuel vehicles.	EO 13149	N/A	2005
Ensure at least 75% of all cars and light trucks procured after the target year are alternatively fueled vehicles.	EO 13149	N/A	2005
Train procurement officers and implement affirmative procurement into developing plans, work statements and specifications.	EO 13148	On-going	On-going
Implement acquisition programs aimed at procuring products that are environmentally preferable, energy efficient or contain post-consumer recovered materials.	EO 13101	On-going	On-going

EO = Executive Order; DODMOM = Department of Defense Measures of Merit; N/A = not applicable
Source Ref# 287

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1 **4.13 SOCIOECONOMICS**

2 Socioeconomic resources addressed in this document include population, economic development
3 (employment and earnings), housing, education (public schools), law enforcement, fire protection, public
4 finance, governmental structure, medical facilities, and quality of life. The ROI is defined as the
5 geographical area within which the principal direct and indirect socioeconomic effects of actions at Fort
6 Bliss are likely to occur and where most consequences for local jurisdictions are expected. The ROI is
7 resource-specific (employment, law enforcement, housing, etc.) and the geographic extent varies from
8 one socioeconomic resource to another.

9 The 2000 Mission and Master Plan PEIS reported that about 96 percent of civilians who work at Fort
10 Bliss live in El Paso County, about 3 percent live in Doña Ana County, New Mexico, and less than one
11 percent live in Otero County, New Mexico and other areas of Texas. Interviews with personnel at Fort
12 Bliss and the City of El Paso indicate a trend in new development to the east of Fort Bliss in the Clint
13 school district. Growth is also occurring to the west in the Anthony and Canutillo districts and is planned
14 in the area directly north of Castner Range. All these locations are within El Paso County. Active-duty
15 military personnel living off-post are encouraged to live within reasonable distance of the installation in
16 order to respond to emergency events or other calls to action. It is therefore likely that El Paso County
17 will remain the primary place of residence for Fort Bliss personnel, even as the City of El Paso and
18 suburbs expand and commuting distances increase, and the great majority of socioeconomic effects from
19 Fort Bliss mission changes are expected to be concentrated in these jurisdictions.

20 Consequently, the ROI for each of the resource areas addressed in this section is defined as follows:

- 21 • The three-county region comprised of El Paso County, Texas, and Doña Ana and Otero Counties
22 in New Mexico for population, economic development, and housing.
- 23 • El Paso Independent School District (ISD) and Ysleta ISD (both in El Paso County) for education
24 (public schools) with consideration of Anthony, Canutillo, Socorro, and Clint ISDs in El Paso
25 County, Las Cruces and Gadsden ISD in Doña Ana County, and Alamogordo ISD in Otero
26 County.
- 27 • City of El Paso Police Department and El Paso County Sheriff's Department for law
28 enforcement.
- 29 • City of El Paso Fire Department for fire protection.
- 30 • City of El Paso and County of El Paso for public finance and government structure.
- 31 • El Paso County for medical facilities.
- 32 • El Paso, Doña Ana, and Otero Counties for quality of life.

33 **4.13.1 Population**

34 **4.13.1.1 Fort Bliss Related Population**

35 The population associated with Fort Bliss remained relatively stable between 1996 and 2001, although the
36 number of retirees increased substantially. Since then, employment on post has increased steadily, and
37 active duty military personnel grew by over 80 percent between 2001 and 2005 (**Table 4.13-1**). As of the
38 third quarter of FY 2005, actual active duty personnel numbered 21,712. This represented an increase
39 over FY 2004 of about 23 percent, the largest single-year increase over the past six years. Growth in
40 military assignments has outpaced that of civilian jobs, and the ratio of civilian to military personnel
41 decreased from 0.56 in FY 2000 to approximately 0.34 in FY 2005. The ratio of military dependents to
42 active duty military personnel has also decreased over the past five years, likely reflecting the increase in
43 Fort Bliss' mobilization mission.

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

44

Table 4.13-1. Fort Bliss Personnel and Dependents, Fiscal Years 1996 and 2000-2005

<i>FY</i>	<i>Employees</i>			<i>Dependents</i>				<i>Retirees</i>			<i>Grand Total</i>
	<i>Active Duty Military⁸</i>	<i>Civilian</i>	<i>Subtotal</i>	<i>Military On/Post</i>	<i>Military Off/Post</i>	<i>Civilian⁹</i>	<i>Subtotal</i>	<i>Retirees/annuitants</i>	<i>Retiree dependants</i>	<i>Subtotal</i>	
1996 ¹	11,530	7,140	18,670	8,069	8,371	16,065	32,505	14,299	21,900	36,199	87,374
2000 ²	11,594	6,507	18,101	7,577	7,328	14,641	29,546	32,447	47,787	80,234	127,881
2001 ³	11,992	6,513	18,505	7,675	9,434	14,654	31,763	33,484	49,565	83,049	133,317
2002 ⁴	12,739	6,714	19,453	7,489	11,316	15,107	33,912	33,484	47,207	80,691	134,056
2003 ⁵	15,055	7,102	22,157	7,254	9,677	15,980	32,911	33,484	47,207	80,691	135,759
2004 ⁶	17,605	7,362	24,967	7,219	9,779	16,565	33,563	33,464	47,207	80,671	139,201
2005 ⁷	21,712	7,383	29,095	8,216	5,720	16,612	30,548	33,726	49,296	83,022	142,665

1. From Mission and Master Plan PEIS

2. Fourth Quarter FY 2000

3. Fourth Quarter FY 2001

4. Fourth Quarter FY 2002

5. Second Quarter FY 2003

6. First Quarter FY 2004

7. Second Quarter FY 2005

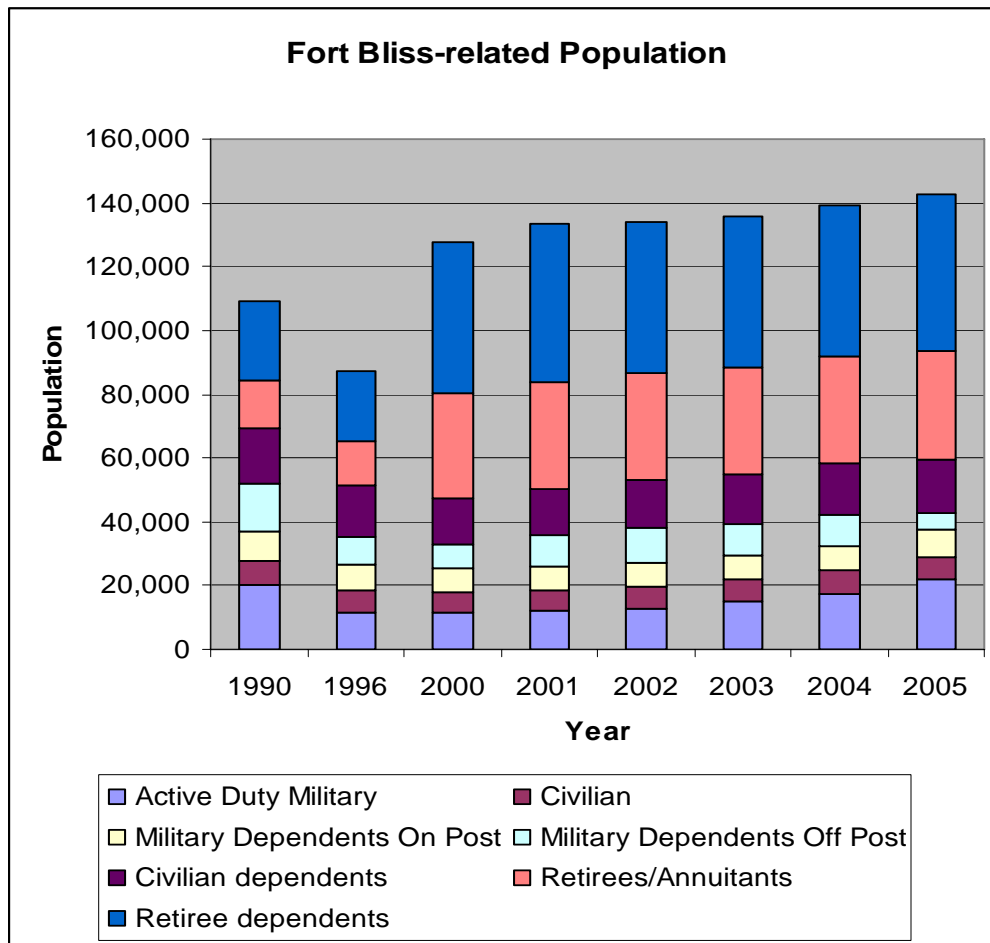
8. Includes permanently party, student, and TDY personnel

9. Based on multiplier of 2.5 per employee

Source: Ref# 3, 227

45 The estimated total population supported by Fort Bliss (defined as the number of active duty military
46 personnel and civilian employees and their respective dependents) has ranged from a high of 59,643
47 persons in FY 2005 to a low of 47,647 in FY 2000, an increase of 25 percent, with an average of 2,000
48 additional people per year. In contrast, the current population supported by Fort Bliss is 16 percent lower
49 than in FY 1991, when it was at its highest level in the last 15 years (Ref# 3). In FY 1991, the Fort Bliss
50 population, estimated at 71,399, represented approximately 9 percent of the total population contained in
51 the three-county ROI and 12 percent of the El Paso County population. By FY 2005, Fort Bliss
52 population comprised about 6 percent and 8 percent, respectively, of the population of the ROI and El
53 Paso County.

54 The overall Fort Bliss-related population, including retirees, annuitants, and their dependents in the area,
55 has grown from 127,811 in FY 2000 to 142,665 in FY 2005, an increase of almost 12 percent. In 2004,
56 the Fort Bliss-related population represented about 15 percent of the population in the three-county ROI,
57 compared to 14 percent in 1990 and 10 percent in 1996. **Figure 4.13-1** illustrates the fluctuation in Fort
58 Bliss-related population between 1990 and 2005.



Source: Ref# 227

Figure 4.13-1. Fort Bliss Population Changes from 1990 to 2005

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60

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62 **4.13.1.2 Population in the Region of Influence**

63 **Current Population**

64 The population in the three-county ROI increased over the period 1980-2004 from 620,904 persons to
65 962,503 persons, at an average annual rate of 1.84 percent. The highest growth rate occurred in the 1980s
66 (at an average annual rate of 2.29 percent), followed by the 1990s (at an average rate of 1.64 percent), and
67 the 2000s (at an average rate of 1.23 percent), as shown in **Table 4.13-2**. With the exception of the
68 1990s, these growth rates exceeded that of both Texas and New Mexico, as well as the nation.

69 Of the three counties in the ROI, the most rapid growth was experienced in Doña Ana County, New
70 Mexico, where the average annual rate of change was 2.78 percent over the period 1980-2004. The
71 population nearly doubled from 96,340 in 1980 to 186,095 in 2004. The population of El Paso County,
72 Texas, grew at an average annual rate of 1.66 percent over the 24-year period, increasing from 479,899 in
73 1980 to 713,126 in 2004. The least rapid growth occurred in Otero County, New Mexico, where the
74 number of residents increased from 44,665 in 1980 to 63,282 in 2004, at an average annual rate of 1.46
75 percent.

76 In 2000, nearly 83 percent of the population in El Paso County lived in the City of El Paso. Other urban
77 areas contained an additional 14 percent of the total county population, and 3 percent resided in rural
78 areas. In Doña Ana County, over 20 percent of the total county population resides in rural areas. The
79 largest incorporated community (the City of Las Cruces) contained almost 43 percent of the county
80 population, with other urban areas containing 37 percent. Chaparral is an unincorporated community of
81 about 6,100 persons in Doña Ana and Otero Counties just north of the El Paso County border. Most of
82 the residents work in El Paso. In Otero County, over half (57 percent) of the county population resides in
83 the City of Alamogordo. An additional 14 percent resides in other smaller urban areas, with the
84 remaining 29 percent of the population residing in rural areas of the county.

85 **Population Projections**

86 Population projections for the years 2010, 2015, 2020, 2025, 2030, 2035, and 2040 are presented in **Table**
87 **4.13-3** for the states of New Mexico and Texas; each of the three counties in the ROI; and the cities of
88 Alamogordo, El Paso, and Las Cruces. The annual population growth in the three-county ROI is
89 projected to average 1.30 percent over the period 2010- 2040, compared to 2.31 percent for Texas and
90 1.05 percent for New Mexico. These projections do not include upcoming changes at Fort Bliss.

91 These projections indicate the population of El Paso County was anticipated to increase at a rate
92 considerably less than projected for the State of Texas. The average annual growth rate was projected to
93 decline from 1.75 percent during the period 2010-2020, to 1.32 percent over the period 2020-2030, and to
94 1.01 percent over the period 2030-2040. Population growth in Doña Ana County is expected to exceed
95 the anticipate growth rate for the State of New Mexico, while projected growth in Otero County is
96 expected to be less. The forecasts project average annual growth over the 30-year period from 2010 to
97 2040 to be 1.30 percent in Doña Ana County and 0.45 percent in Otero County, compared to 1.05 percent
98 in New Mexico overall.

99

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

100 **Table 4.13-2. Population of Region of Influence, Counties, States, and Nation (1980 to 2004)**

<i>Geographical Area</i>	<i>Population</i>				<i>Average Annual Percentage Growth Rate</i>			
	<i>1980</i>	<i>1990</i>	<i>2000</i>	<i>2004</i>	<i>1980-1990</i>	<i>1990-2000</i>	<i>2000-2004</i>	<i>1980-2004</i>
United States	226,542,204	248,718,291	281,421,906	293,655,404	0.94%	1.24%	1.07%	1.09%
State of New Mexico	1,303,302	1,515,069	1,819,046	1,903,289	1.52%	1.85%	1.14%	1.59%
Doña Ana County	96,340	135,510	174,682	186,095	3.47%	2.57%	1.59%	2.78%
Otero County	44,665	51,928	62,298	63,282	1.52%	1.84%	0.39%	1.46%
State of Texas	14,225,513	16,986,335	20,851,820	22,490,022	1.79%	2.07%	1.91%	1.93%
El Paso County	479,899	591,610	679,622	713,126	2.11%	1.40%	1.21%	1.66%
Three-County ROI	620,904	779,048	916,602	962,503	2.29%	1.64%	1.23%	1.84%

Source: Ref# 238.

101 **Table 4.13-3. Population Projections, 2000 to 2030**

<i>Geographic Area</i>	<i>Year</i>							<i>Annual Rate of Change</i>		
	<i>2010</i>	<i>2015</i>	<i>2020</i>	<i>2025</i>	<i>2030</i>	<i>2035</i>	<i>2040</i>	<i>2010-2020</i>	<i>2020-2030</i>	<i>2030-2040</i>
Texas ¹	26,058,593	29,213,821	32,736,685	36,682,181	41,117,590	46,105,944	51,707,489	2.31%	2.31%	2.32%
El Paso County ¹	824,786	904,596	981,274	1,051,853	1,118,871	1,181,836	1,237,030	1.75%	1.32%	1.01%
City of El Paso ⁴	684,058	750,250	813,845	872,381	927,964	980,186	1,025,963	1.75%	1.32%	1.01%
New Mexico ^{2,3}	2,112,986	2,251,319	2,383,116	2,507,548	2,626,553	2,761,313	2,889,650	1.21%	0.98%	0.96%
Doña Ana County ^{2,3}	218,523	238,044	255,057	270,761	286,741	304,571	321,486	1.56%	1.18%	1.15%
City of Las Cruces ⁴	92,906	101,206	108,439	115,116	121,909	129,490	136,682	1.56%	1.18%	1.15%
Otero County ^{2,3}	67,018	68,896	70,508	71,981	73,348	75,074	76,648	0.51%	0.40%	0.44%
City of Alamogordo ⁴	38,278	39,351	40,271	41,113	41,893	42,879	43,778	0.51%	0.40%	0.44%
Three-County ROI	1,110,327	1,211,536	1,306,839	1,394,595	1,478,960	1,561,481	1,635,165	1.64%	1.24%	1.01%

1. Source: Ref# 235, 236.

2. Source: Ref# 235.

3. Projections past 2030 assume continuation of 2010-2030 growth rate.

4. Assumes community continues to represent same share of county population as in 2000.

102 The El Paso Metropolitan Planning Organization (MPO) develops population projections and their spatial
 103 distribution in order to anticipate future regional transportation needs. The MPO has revised its
 104 projections to include an estimate of personnel increases at Fort Bliss. These overall population
 105 projections are broken down by planning areas. **Table 4.13-4** provides the most recent MPO projections.
 106 **Table 4.13-5** shows the share of projected population that is expected to reside within six MPO planning
 107 areas shown in Figure 4.1-6. This information reveals that growth is expected to occur primarily in east,
 108 west, and northeast El Paso and in the New Mexico portion of the planning region (Ref# 412). A
 109 reduction in population share in the central El Paso and lower valley areas reflects static conditions, as
 110 these areas are mostly fully developed. (The region encompassed in the MPO planning does not coincide
 111 directly with the three-county ROI).

Table 4.13-4. El Paso MPO Demographic Projections

<i>Demographic Category</i>	<i>2000</i>	<i>2005</i>	<i>2015</i>	<i>2025</i>	<i>2030</i>	<i>Change 2000-2030</i>
Population	698,283	768,420	945,186	1,145,148	1,266,028	81%
Households	215,257	240,561	302,189	371,860	414,541	93%
Household size	3.24	3.19	3.13	3.08	3.05	-6%
Employment	330,235	346,674	435,761	528,065	579,816	76%

Source: Ref# 412

Table 4.13-5. El Paso MPO Projected Planning Area Population Share

<i>Planning Area</i>	<i>Percent of Population in Region</i>					
	<i>1990</i>	<i>2000</i>	<i>2005</i>	<i>2015</i>	<i>2025</i>	<i>2030</i>
Central	25.8	19.3	15.8	13.4	10.6	9.7
East	20.0	26.9	30.6	31.4	28.5	27.5
Lower Valley	24.5	22.7	22.0	20.4	20.0	19.6
Northeast	14.2	13.1	12.8	13.2	16.6	18.3
Westside	13.5	15.3	15.7	17.9	19.7	20.4
New Mexico	2.0	2.7	3.0	3.7	4.6	4.6

Source: Ref# 412

4.13.2 Economic Development

4.13.2.1 Economic Setting

116 The economy of the three-county ROI is dominated by the City of El Paso. The economy of El Paso, as
 117 well as the ROI, is heavily influenced by government employment and expenditures and the city's
 118 location along the United States-Mexico border across the Rio Grande from Ciudad Juárez, Chihuahua,
 119 Mexico.

120 From 1990 through about 1994, El Paso experienced relatively strong growth in terms of both birth rate
 121 and in-migration. After 1994, El Paso had a negative in-migration rate. This trend toward out-migration
 122 is probably attributable to the attraction of higher salaries in other metropolitan areas and El Paso's
 123 relatively high unemployment rate, typically 2-3 percentage points above the national and state rates. As
 124 of December 2002, El Paso's unemployment rate was 9.1 percent (seasonally adjusted), well above the
 125 6.5 percent for the State of Texas.

126 For close to two decades (1970s and 1980s), the community tied its economic future to the low-wage
 127 garment industry, which eventually left the area in search of even lower wages, and few El Paso
 128 businesses were prepared to develop a new economic base. Recovery is slow, and unskilled or
 129 mismatched skill sets in the workforce remain an impediment.

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

130 Ciudad Juárez and the State of Chihuahua are major economic contributors to the broader (international)
131 economic region (Ref# 146). Maquiladora manufacturing in Juárez principally supports automotive parts
132 and higher-end electronic components and their integration with the U.S. auto industry. El Paso
133 businesses and residents take advantage of the convenient access to Mexico, with frequent imports and
134 exports through the Port of El Paso (Ref# 256).

135 **4.13.2.2 Employment and Income**

136 **Table 4.13.6** exhibits aggregate trends for the three-county ROI from 1969 through 2003 for employment
137 and income, extracted from the Economic Impact Forecast System (EIFS) (Ref# 178, 354). The yearly
138 change is shown, and the income values are adjusted to constant 2005 dollars using the Consumer Price
139 Index (CPI).

140 Overall, the ROI has exhibited growth in employment and income. The negative yearly changes
141 indicated in the Bureau of Economic Analysis (BEA) data are isolated and generally last for only one
142 year, indicating no periods of sustained decline in the local economy.

143 This section reports projections for the economic region taken from research performed at the University
144 of Texas at El Paso (UTEP) Institute for Policy and Economic Development (IPED) (Ref# 164). These
145 projections are derived through the use of the Border Model, a tailored Regional Economic Models, Inc
146 (REMI) model designed specifically for the U.S./Mexico border region.

147 The general trends in the three-county ROI tend to indicate a close correlation between population and
148 employment, as well as a gradual increase in income (per capita and per employee) in the region.
149 Declines in employment at Fort Bliss between 1996 and 2005 were generally not reflected in similar
150 declines in the regional economic indicators, indicating that the three-county ROI is supported by a
151 broader economic base, beyond Fort Bliss, that also stimulates economic growth. Over this same time
152 period, El Paso County and the three-county ROI have experienced substantially higher unemployment
153 rates than the state of Texas and the United States.

154 **Table 4.13-6. Employment and Income in the Three-County ROI**

<i>Year</i>	<i>Employment</i>		<i>Income</i>		
	<i>No.</i>	<i>Change</i>	<i>Value (\$)</i>	<i>Adjusted Value (\$)¹</i>	<i>Change (\$)</i>
1969	200,881	NA	1,339,691	7,046,775	NA
1970	195,525	-5,356	1,418,354	7,063,403	16,628
1971	201,228	5,703	1,558,400	7,433,568	370,165
1972	206,123	4,895	1,696,395	7,837,345	403,777
1973	221,933	15,810	1,926,011	8,378,148	540,803
1974	228,575	6,642	2,184,783	8,542,502	164,354
1975	233,935	5,360	2,336,704	8,388,767	-153,735
1976	242,588	8,653	2,628,796	8,937,907	549,139
1977	250,860	8,272	2,912,376	9,290,480	352,573
1978	260,276	9,416	3,271,696	9,684,220	393,741
1979	270,114	9,838	3,720,264	9,895,903	211,682
1980	276,776	6,662	4,170,980	9,760,093	-135,810
1981	286,190	9,414	5,01,5864	10,683,791	923,698
1982	288,627	2,437	5,463,861	10,927,722	243,931
1983	288,815	188	5,943,154	11,529,719	601,997
1984	300,363	11,548	6,541,883	12,167,902	638,183
1985	307,548	7,185	7,089,555	12,761,199	593,296
1986	311,968	4,420	7,426,183	13,070,082	308,883

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

<i>Year</i>	<i>Employment</i>		<i>Income</i>		
	<i>No.</i>	<i>Change</i>	<i>Value (\$)</i>	<i>Adjusted Value (\$)¹</i>	<i>Change (\$)</i>
1987	325,384	13,416	7,776,094	13,219,360	149,278
1988	337,801	12,417	8,271,561	13,482,644	263,284
1989	348,202	10,401	9,013,767	14,061,476	578,832
1990	353,222	5,020	9,736,106	14,506,798	445,322
1991	357,542	4,320	10,126,018	14,378,945	-127,853
1992	369,184	11,642	11,126,373	15,354,395	975,450
1993	377,786	8,602	11,674,835	15,644,279	289,885
1994	385,646	7,860	12,294,496	15,982,844	338,565
1995	39,3964	8,318	13,007,501	16,519,526	536,682
1996	394,384	420	13,508,523	16,615,484	95,958
1997	403,771	9,387	14,418,275	17,301,931	686,447
1998	412,172	8,401	15,285,783	18,190,083	888,152
1999	420,341	8,169	15,752,526	18,272,930	82,847
2000	429,107	8,766	16,823,640	18,842,477	569,547
2001	428,794	-313	18,093,019	19,721,391	878,914
2002	437,027	8,233	18,818,797	20,136,114	414,722
2003	443,083	6,056	19,686,846	20,671,187	535,074

1. Adjusted to 2005 dollars
 NA = Not Applicable
 Source: Ref# 382

155 A large portion of employment in the three-county ROI (29.5 percent) is associated with government and
 156 government-related organizations, including federal civilian, military, and state and local organizations.
 157 In the non-governmental employment sectors, shown in **Table 4.13-7**, the largest employers are health
 158 care and social assistance with 11.2 percent, retail trade with 10.3 percent, manufacturing with 8.6
 159 percent, and accommodation and food services with 7.9 percent of jobs. Due to Fort Bliss, Holloman
 160 AFB, and state and local government, the share of government jobs is substantially greater in the ROI
 161 than in Texas (14.6 percent) and the U.S. overall (14.0 percent) (Ref# 3). In this data, the difference in
 162 percentages between El Paso County and the three-county ROI is due to different sectoral composition in
 163 Doña Ana and Otero Counties, such as the contribution of an active construction sector in Doña Ana
 164 County and active military sector in Otero County (i.e., Holloman AFB).

Table 4.13-7. Regional Non-Government Employment by Sector in 2004

<i>Sector</i>	<i>El Paso County</i>	<i>ROI</i>	<i>Texas</i>	<i>U.S.</i>
Retail Trade	12.4%	10.3%	11.0%	11.0%
Health care and social assistance	9.3%	11.2%	8.9%	9.7%
Manufacturing	8.5%	8.6%	7.7%	9.5%
Accommodation and food services	7.0%	7.9%	6.7%	6.5%
Administrative and waste services	6.7%	7.3%	6.0%	5.7%
Other services	6.1%	3.6%	6.0%	5.5%
Construction	5.4%	3.7%	6.6%	5.9%
Transportation and warehousing	4.5%	2.8%	3.6%	3.2%
Finance and insurance	3.4%	2.8%	4.9%	4.7%
Wholesale trade	3.4%	3.1%	4.0%	3.7%

Source: Ref# 178, 382.

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

166 The changing dependence of the regional economy on military activities is shown by the changing
167 military share of total employment, which declined from 14.1 percent in 1970 to 10.4 percent by 1980,
168 6.8 percent by 1990, and 5.0 percent by 1995, comprised primarily of military staff at Fort Bliss and
169 Holloman AFB. In 2002, military employment was approximately 7.2 percent of the region (Ref# 58).
170 The decline in the military employment share is attributable to down-sizing of the military and increasing
171 economic diversification in the ROI as other industry sectors are established or grow (Ref# 3). However,
172 Fort Bliss remains the single largest employer in the ROI, exerting substantial direct influence on the
173 local economy.

174 Baseline employment, excluding the announced changes at Fort Bliss, is projected to increase to 564,410
175 jobs in 2015 at an average annual increase of approximately 1.3 percent, slightly more than the
176 anticipated growth rate for the State of Texas (Ref# 3). This growth will occur more in Doña Ana County
177 (1.6 percent per year) and less in Otero County (0.9 percent per year), compared to an average projected
178 rate of 1.4 percent for the State of New Mexico. A more recent study using the Border Model (Ref# 164)
179 estimates annual compound rate of growth (ACRG) in employment of 0.95 percent. This compares to a
180 much larger estimated employment ACRG of 2.39 percent for Texas and 0.90 percent for the U.S.,
181 projecting a total 6.9 percent increase in employment (23,000 jobs) between 2003 and 2010. This
182 projection is primarily (85 percent) attributable to private sector growth and includes moderate increases
183 in employment at Fort Bliss.

184 Both state and local employment are expected to remain relatively flat between 2003 and 2010. A slight
185 increase of over 200 new jobs may be attributed to the public education sector, due to population
186 increases in the school system. Federal military growth reflects troop increases at Fort Bliss associated
187 with the wars in Afghanistan and Iraq.

188 The Border Model (Ref# 164) estimates an ACRG in population of 0.34 percent, compared to a much
189 larger estimated population ACRG of 1.84 percent for Texas and 0.90 percent for the U.S. According to
190 the output of the Border Model, El Paso's population is expected to grow at approximately the same rate
191 as historical trends between 2003 and 2010, resulting in an increase of approximately 17,000 persons by
192 2010.

193 **4.13.2.3 Earnings and Expenditures**

194 Fort Bliss continues to contribute significantly to the local economy both directly and indirectly through
195 payrolls and local purchases. These contributions produce a “multiplier effect” as goods and services are
196 purchased and continue to circulate in the ROI until they are locally unavailable and must be purchased
197 outside the ROI.

198 The regional economy is based primarily on manufacturing, retail trade, transportation and warehousing,
199 administrative support, health care and social assistance, and accommodation and food services, in
200 addition to federal, state, and local government activities. Major private sector employers in the El Paso
201 area include WalMart, Sierra Providence Health Network, Las Palmas Del Sol Regional Healthcare
202 System, and Echostar Satellite Corporation (Ref# 429).

203 As of 2000, 65.8 percent of El Paso residents had high school degrees, compared to 75.7 percent for the
204 state and 80.4 percent nationally. Only 16.6 percent of residents had four-year college degrees, compared
205 to 23.2 percent for the state and 24.4 percent national average. These statistics are accompanied by lower
206 overall incomes and higher poverty rates in El Paso. El Paso's median household income is 75 percent of
207 state and national levels, and the per capita income level is 62 percent of the national level. In the 2000
208 Census, 23.8 percent of El Paso residents fell below the federal poverty limit, compared to 15.4 percent
209 for the state and 12.4 percent for the U.S.

210 The Border Model (Ref# 164) estimates an ACRG of 2.84 percent for personal income and 2.47 percent
211 for disposable income, compared to an ACRG of 4.64 percent for personal and 2.95 percent for
212 disposable income for Texas, and 2.58 percent for personal and 2.12 percent for disposable income for the

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

213 U.S. Total personal and disposable income will likely grow 36.6 and 36.4 percent, respectively, between
214 2003 and 2010.

215 Fort Bliss affects earnings in the ROI through salaries (both civilian and military) and local procurements
216 (contracts, supplies, construction, etc.). **Table 4.13-8** shows the breakout of Fort Bliss expenditures (in
217 millions of dollars) for military pay, civilian pay, local purchases, non-local purchases, utilities, military
218 construction, foreign purchases, and student impact aid. Fort Bliss also distributes payments to military
219 retirees and annuitants, but these are independent of the level of activity on the installation and are not
220 included in the table.

221 **Table 4.13-8. Fort Bliss Expenditures (\$million)**

	<i>Military Pay</i>	<i>Civilian Pay</i>	<i>Local Purchases</i>	<i>Non-Local Purchases</i>	<i>Utilities</i>	<i>Military Construction</i>	<i>Foreign Purchases</i>	<i>Student Impact Aid</i>	<i>Total</i>
1990	337.38	149.66	82.37	126.35	13.31	17.71	21.34	2.33	750.46
	45.0%	20.0%	11.0%	16.8%	1.8%	2.4%	2.8%	0.3%	100.0%
1996	350.04	168.42	128.46	105.52	12.72	72.30	32.07	2.46	872.02
	40.2%	19.3%	14.8%	12.1%	1.5%	8.3%	3.6%	0.3%	100.0%

Source: Ref# 3

222 **Table 4.13-9** shows growth in earnings over the period from 1990 to 2003 (both per job and per capita) in
223 the region (Ref# 256). Numbers are adjusted to reflect constant 2005 dollars:

224 **Table 4.13-9. Earnings in El Paso County**

	<i>1990</i>	<i>1995</i>	<i>2000</i>	<i>2003</i>
El Paso County				
Earnings per Job	\$29,305	\$30,919	\$33,610	\$36,783
Per Capita Income	\$16,750	\$17,731	\$20,375	\$21,718
Texas				
Earnings per Job	\$34,570	\$36,233	\$43,891	\$44,618
Per Capita Income	\$23,756	\$25,175	\$31,079	\$30,247
United States				
Earnings per Job	\$36,220	\$37,512	\$42,817	\$44,270
Per Capita Income	\$26,560	\$27,661	\$32,760	\$32,742

Source: Ref# 256

225 As shown in the table, the rate of earnings growth in both Texas and the U.S. declined (leveled off) in the
226 2000-2003 timeframe. By comparison, the rate of growth in El Paso County has continued to rise,
227 although earnings remain much lower than comparable state and national figures.

228 **4.13.2.4 Impacts of Fort Bliss on the Region**

229 In 1989 and 2002, Fort Bliss commissioned studies to evaluate the effects of Fort Bliss on the local
230 economy (Ref# 101, 272). These analyses were completed using a modified and calibrated REMI model
231 (Ref# 164), a leading and widely-accepted economic impact and forecasting model. The model has been
232 adapted and tailored to the El Paso region by UTEP.

233 The 2002 study compared the estimates of impacts in 2002 with those in 1989. **Table 4.13-10** provides a
234 summary of results for key economic statistics. It also shows the adjusted change when accounting for
235 effects of inflation (using CPIs) and average yearly adjusted change.

236 Table 4.13-10 indicates that Fort Bliss fits into a regional economy that has continued to exhibit
237 consistent and moderate growth, in spite of the Fort Bliss personnel reductions over the 1989-2002 time
238 period. While there was a 38 percent drop in the number of active duty military personnel, Fort Bliss

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

239 remained the region's principal employer in 2002, including over 6,600 civilian employees, a decline of
240 23 percent since the 1989 study. In addition to employment, Fort Bliss supported a retirement community
241 of more than 10,000 former military, a source of further economic activity for the broader economic
242 region, and more than 49,000 family members. Fort Bliss troops, civilian employees, and their families
243 added more than 78,000 individuals to the 2002 El Paso population and more than 17,500 students to El
244 Paso area schools. While the population and school enrollments associated with Fort Bliss declined over
245 the subject time period, they remained a substantial economic influence.

246 **Table 4.13-10. Comparison of Fort Bliss Economic Impact Indicators for 1989 and 2002**

	<i>1989</i>	<i>2002</i>	<i>Change</i>	<i>Adjusted¹</i>	<i>Yearly</i>
Fort Bliss Key Statistics					
Active Duty Military	19,234	12,021	-38%		
Civilian Employment	8,616	6,620	-23%		
Retired Military	14,614	10,398	-29%		
Fort Bliss Community Population	90,582	78,196	-14%		
Students in El Paso Schools	22,166	17,570	-21%		
El Paso Key Statistics					
Gross Income	\$7.8 billion	\$15.6 billion	+100%	+68%	+5.6%
Retail & Wholesale Sales	\$5.4 billion	\$10.1 billion	+87%	+60%	+5.0%
Employed Civilian Labor Force	216,200	284,800	+32%	+22%	+1.8%
Business Effects					
Increased Sales Volume	\$822.8 mil	\$1,698.9 mil	+106%	+73%	+6.0%
Expanded Credit Base	\$676.8 mil	\$659.6 mil	-3%	-2%	-0.2%
Increase Sales/El Paso Sales	15.2%	16.8%			
Individual Effects					
Increased Personal Income	\$1,462.9 mil	\$1,715.8	+17%	+12%	+1.0%
Employment	29,242	16,156	-45%		-3.8%
Increased Income/ EP Gross Income	18.7%	11.0%			
Impact on Unemployment Rate	+4.6% points	+1.5% points			
Governmental Effects					
Net Govt. Outlays to Provide	\$55.1 mil	\$112.5 mil	+104%	+72%	+6.0%
Municipal Services					
Supporting Base					
Operations					
Capital Required by Local Govt. to Provide Public Goods and Services	\$300.6 mil	\$175.3 mil	-42%	-29%	-2.4%
Increased Sales/Net Local Govt. Outlays	15 to 1	15 to 1			
Increased Income/Net Local Govt. Outlays	27 to 1	15 to 1			

1. Adjusted by CPI

Source: Ref# 501

247 The REMI model addressed aggregate effects on three components of the local economy, as described
248 below.

249 **Businesses.** The impact on the local business sector was estimated to be an increase in business sales
250 volume of \$1,699 million, which would not occur without Fort Bliss. Between 1989 and 2002, these
251 effects increased 106 percent (73 percent when adjusted for inflation and at a yearly adjusted rate of 6
252 percent). The local economy also benefited from the addition of \$659.6 million to the credit base of local
253 depository institutions in 2002, a source of loanable funds that would be unavailable without the presence
254 of Fort Bliss. Overall, Fort Bliss accounted for 16.8 percent of total retail and wholesale sales in El Paso,
255 representing an increase from 1989 and confirming the importance of the military to the regional
256 economy. In addition, the use of business property has grown by approximately 36 percent (25 percent

257 when adjusted for inflation and at a yearly adjusted rate of 2 percent) since 1989. More than \$824.1
258 million worth of business property was added to the regional inventory in 2002, resulting in significant
259 increases in tax revenues from property and added sales.

260 **Individuals.** In spite of an overall decrease in personnel at Fort Bliss, personal income increased 17
261 percent (12 percent when adjusted for inflation and at a yearly adjusted rate of 1 percent) from 1989,
262 resulting in a \$1,716 million flow into the regional economy in 2002. While the regional workforce
263 related to Fort Bliss declined approximately 45 percent (or 3.8 percent per year) from 1989 to 2002, the
264 2002 workforce (16,156 jobs) was still substantial. Approximately 11 percent (or \$1 of every \$9) in
265 regional personal income in 2002 was linked to Fort Bliss. Fort Bliss employment opportunities reduced
266 the effective unemployment level by approximately 1.5 percent in 2002. While the effect of Fort Bliss
267 jobs on unemployment in 2002 was less than in 1989, when more jobs were associated with the
268 installation, they are still important to the stability of the labor market.

269 **Governments.** While the local government in El Paso receives revenues from the economic effects of
270 Fort Bliss operations, it must provide public schools and other municipal services and, over the long term,
271 must allocate capital and other property to support these needs. Between 1989 and 2002, government
272 outlays for municipal services increased 104 percent (72 percent when adjusted for inflation and a yearly
273 adjusted rate of 6 percent) to \$112.5 million, a cost that must be offset through taxes from regional
274 residents, including Fort Bliss employees and soldiers living off-post. These services required more than
275 \$175 million of government capital outlays in 2002, a decline of 42 percent (a 29 percent decrease when
276 adjusted for inflation and at a yearly adjusted reduction of 2.4 percent) since 1989.

277 The comparisons between the 1989 and 2002 analyses, in spite of Fort Bliss downsizing over the time
278 period, show the significant economic impact of the installation, indicating that Fort Bliss accounts for
279 approximately 16.8 percent of regional retail and wholesale trade.

280 **4.13.3 Housing**

281 This section addresses both military and civilian housing resources in the ROI. For military housing, the
282 description distinguishes between on- and off-post housing units and, for the on-post housing, between
283 family and unaccompanied housing (barracks).

284 **4.13.3.1 Fort Bliss**

285 Fort Bliss provides housing for active duty personnel permanently assigned to the installation (both with
286 and without dependents) and personnel on temporary duty assignment at the installation.

287 **Military Family Housing**

288 As of October 2004 there are a total of 2,752 military family housing units under the control of Fort Bliss
289 (Ref# 223). The main housing areas include Logan Heights, George Moore Park, Lindquist Heights,
290 Upper and Lower Beaumont, Hayes, Aero Vista, Corregidor, Leyte, Pershing Heights, and Van Horne
291 Park. A new area of housing called Paso De Norte Heights is being built at Logan Heights. Military
292 family housing on Fort Bliss has been privatized under the Residential Communities Initiative.

293 **Unaccompanied Housing**

294 Unaccompanied housing is located primarily on the Main Post (4,748 units) with some (2,320 units) at
295 Doña Ana, McGregor, and Orogrande Range Camps for use during training operations. Since October
296 2004, 70 unaccompanied housing units on the Main Post have been deactivated and are slated to be
297 demolished, and approximately another 30 units are undergoing renovations (Ref# 223).

298 **Transient Housing Facilities**

299 Fort Bliss maintains 1,124 units for TDY personnel, including the 156-unit Fort Bliss Inn. Most of these
300 facilities are located on the Main Post, with at least 16 units located at McGregor Range and Doña Ana

301 Range Camps. The Fort Bliss Inn is primarily for families undergoing a permanent change of station and
302 is located on the Main Post (Ref# 271). An additional 52 rooms for military families are available at the
303 Armed Forces Young Men’s Christian Association (YMCA).

304 **4.13.3.2 Housing in the ROI**

305 **Current Housing Stock**

306 The number of housing units in the three-county ROI increased from 259,798 in 1990 to 318,929 in 2000
307 at an average annual growth rate of 2.1 percent (Ref# 259, 260). The largest growth occurred in Doña
308 Ana County where the number of housing units grew 2.9 percent per year between 1990 and 2000.
309 Housing units in Otero County increased 2.4 percent annually, and El Paso County experienced the
310 smallest growth with an average annual increase in housing units of 1.8 percent from 1990 to 2000
311 (Table 4.13-11).

312 **Table 4.13-11. Housing Units by County and Region of Influence, 1990 and 2000**

	<i>Total Housing Units</i>		<i>Change (percent per year)</i>	<i>Percent Owner Occupied</i>	
	<i>1990</i>	<i>2000</i>		<i>1990-2000</i>	<i>1990</i>
Doña Ana County	49,148	65,210	2.9	59	62
Otero County	23,177	29,272	2.4	49	53
El Paso County	187,473	224,447	1.8	56	60
Total Three-County ROI	259,798	318,929	2.1	N/A	N/A

N/A = Not Applicable.
Source: Ref# 204, 260

313 **Table 4.13-12** provides housing characteristics for the counties and communities in the ROI. At the time
314 of the 2000 Census, the large proportion (65 percent) of the housing supply in the ROI was comprised of
315 single family units. Multifamily units represented 21 percent of the total number of housing units, and
316 mobile homes represented 13 percent. Renter-occupied units represented 35 percent of the total occupied
317 units (Ref# 204). The vacancy rate of units for sale has hovered around 1.5 to 1.6 percent since 1990.
318 The vacancy rate of rentals has fluctuated from 5.3 percent in 1990 to 7.9 percent in 2000 and about 6.0
319 percent in 2005 (Ref# 256).

320 The median value for occupied units was highest in Doña Ana County (\$90,900) compared to Otero
321 County (\$78,800) and El Paso County (\$69,600) (Ref# 260). The median gross monthly rent, which
322 includes an average monthly cost for utilities, was highest in El Paso County (\$468) and lower in Doña
323 Ana County (\$445) and Otero County (\$441) (Ref# 204).

324 More recent data from El Paso County (**Table 4.13-13**) shows the total number of housing units increased
325 from 224,447 in 2000 to 240,600 in 2004, an increase of 1.8 percent (Ref# 261). The proportion of single
326 family housing units declined slightly from 68 to 65 percent. In 2004, 39 percent was occupied by
327 renters, compared to 36 percent in 2000. The median value of occupied housing in 2004 was \$73,647,
328 representing an increase of 1.4 percent per year between 2000 and 2004. Median gross monthly rent,
329 which includes the average monthly cost of utilities, increased from \$468 in 2000 to \$493 in 2004,
330 representing an increase of 1.3 percent per year (Ref# 261). More recent data were not available for Doña
331 Ana County or Otero County.

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

332

Table 4.13-12. Housing Characteristics of Communities in the Region of Influence, 2000

Community	Total Housing Units	Occupied Housing Units	Owner-occupied Housing Units	Percent Owner-occupied Units	Renter-occupied Housing Units	Percent Renter-occupied Units	Housing Units in Structure				Mobile & Trailer	Median Home Value	Median Gross Rent
							1	2-4	5-9	10 +			
Doña Ana County, New Mexico													
Anthony CDP	2,191	2,050	1,390	68%	660	32%	1,221	211	22	51	666	\$54,900	\$350
Chaparral CDP	2,134	1,837	1,498	82%	339	18%	721	0	0	0	1,382	\$73,300	\$407
Doña Ana CDP	506	501	350	70%	151	30%	205	7	0	0	294	\$68,800	\$375
Hatch Village	636	535	322	60%	213	40%	346	34	94	10	159	\$59,700	\$265
Las Cruces City	31,652	29,137	17,047	59%	12,090	41%	18,770	3,615	1,143	4,076	3,930	\$91,200	\$470
Mesilla Town	1,031	933	645	70%	288	30%	910	40	21	4	19	\$132,800	\$502
Sunland Park	3,579	3,335	2,314	69%	1,021	31%	1,866	289	39	145	1,240	\$58,700	\$334
University Park CDP	622	0	0	NA	421	NA	373	106	13	122	8	\$0	\$426
White Sands CDP	668	454	5	1%	449	99%	634	24	0	0	10	\$0	\$610
Total County	65,210	59,515	40,201	68%	19,355	32%	36,616	4,732	1,409	4,484	17,584	\$90,900	\$445
Otero County, New Mexico													
Alamogordo City	15,818	13,626	8,250	61%	5,376	39%	10,118	938	365	685	3,560	\$75,400	\$456
Boles Acres CDP	603	535	462	86%	73	14%	338	0	0	0	265	\$161,400	\$403
Cloudcroft Village	922	318	237	75%	81	25%	839	22	0	22	36	\$119,300	\$508
HAFB CDP	438	403	19	5%	384	95%	381	18	0	0	31	\$0	\$514
La Luz CDP	736	655	522	80%	133	20%	447	0	0	0	289	\$92,000	\$380
Mescalero CDP	389	347	201	58%	146	42%	311	11	0	0	67	\$50,600	\$195
Tularosa Village	1,311	1,139	844	74%	295	26%	869	27	26	43	335	\$64,200	\$349
Total County	29,272	22,984	15,377	67%	7,607	33%	18,275	1,054	441	764	8,487	\$78,800	\$441
El Paso County, Texas													
Anthony Town	722	684	516	75%	168	25%	561	4	4	26	127	\$57,900	\$308
Canutillo CDP	1,592	1,427	1,104	77%	323	23%	801	51	42	0	698	\$47,100	\$373
Clint Town	337	309	246	80%	63	20%	293	19	0	0	25	\$68,300	\$337
El Paso City	193,780	182,177	111,808	61%	70,369	39%	134,710	12,862	10,939	28,622	6,426	\$71,300	\$474
Fabens CDP	2,252	2,088	1,473	71%	615	29%	1,310	208	11	186	537	\$43,600	\$236
Fort Bliss CDP	2,310	1,527	25	2%	1,502	98%	1,523	72	0	715	0	\$61,700	\$815

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

<i>Community</i>	<i>Total Housing Units</i>	<i>Occupied Housing Units</i>	<i>Owner-occupied Housing Units</i>	<i>Percent Owner-occupied Units</i>	<i>Renter-occupied Housing Units</i>	<i>Percent Renter-occupied Units</i>	<i>Housing Units in Structure</i>				<i>Mobile & Trailer</i>	<i>Median Home Value</i>	<i>Median Gross Rent</i>
							<i>1</i>	<i>2-4</i>	<i>5-9</i>	<i>10 +</i>			
Homestead Meadows North CDP	1,308	1,154	993	86%	161	14%	635	10	0	10	653	\$63,000	\$442
Homestead Meadows South CDP	1,590	1,498	1,328	89%	170	11%	1,043	42	0	0	505	\$46,500	\$399
Horizon City	1,780	1,680	1,514	90%	166	10%	1,597	0	6	42	135	\$83,800	\$709
San Elizario CDP	2,780	2,579	2,173	84%	406	16%	1,715	29	9	0	1,020	\$46,600	\$371
Total County	224,447	210,222	133,596	64%	76,426	36%	153,241	13,659	11,083	29,705	16,479	\$69,600	\$468
Three-County ROI	318,929	292,562	189,174	65%	103,388	35%	208,132	19,445	12,903	34,953	42,550	N/A	N/A

CDP = Census Designated Place, an unincorporated community; N/A = not applicable.

Source: Ref# 204

333

Table 4.13-13. Housing Units by Type, El Paso County, 2000-2004

<i>Housing Characteristics</i>	<i>El Paso County 2000</i>	<i>El Paso County 2004</i>	<i>Annual Change 2000-2004</i>
Total Units	224,447	240,600	1.8%
Single Family Units	153,241	157,432	0.7%
Detached	141,646	149,462	1.4%
Attached	11,595	7,970	-8.9%
Percent	68.3%	65.4%	-1.1%
Multiple Family Units	54,447	63,506	3.9%
2 Units	5,388	2,353	-18.7%
3 or 4 Units	8,271	10,312	5.7%
5-9 Units	11,083	17,679	12.4%
10 or more Units	29,705	33,162	2.8%
Percent	24.3%	26.4%	2.1%
Mobile Home or Trailer	16,479	19,662	4.5%
Percent	7.3%	8.2%	2.7%
Occupied Housing Units	210,022	226,172	1.9%
Owner-occupied	133,596	138,490	0.9%
Renter-occupied	76,426	87,682	3.5%
Percent	36.4%	38.8%	1.6%
Median Value	\$69,600	\$73,647	1.4%
Median Gross Rent	\$468	\$493	1.3%

Source: Ref# 261

334 **Housing Projections**

335 As an indication of the level of housing construction activity, building permits issued in the three-county
 336 ROI between 1990 and 2004 averaged 4,432 permits per year (**Table 4.13-14**). The number ranged from
 337 a high of 7,206 permits issued in 2003 to a low of 2,651 permits issued in 1991. The majority of these
 338 permits were for single family housing units, comprising on average 83.7 percent of the total number of
 339 building permits issued. Multi-family housing units comprised on average 16.3 percent. The most
 340 construction activity occurred in El Paso County with 3,266 average annual building permits compared to
 341 1,020 average annual permits in Doña Ana County and 146 average annual building permits for Otero
 342 County (Ref# 268).

343 Assuming the ratio between number of residents and number of housing units in 2000 remains constant,
 344 the number of housing units in the three-county ROI is estimated to grow to approximately 425,300 by
 345 2005; 567,100 by 2010; 756,200 by 2020; and 1,793,100 by 2030.

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

346

Table 4.13-14. New Private Housing Units in the ROI Authorized by Building Permit, 1990 to 2004

<i>Year</i>	<i>Doña Ana County, NM</i>			<i>Otero County, NM</i>			<i>El Paso County, TX</i>			<i>Three-County ROI</i>		
	<i>Total</i>	<i>Single Family Units</i>	<i>Percent Single Family Units</i>	<i>Total</i>	<i>Single Family Units</i>	<i>Percent Single Family Units</i>	<i>Total</i>	<i>Single Family Units</i>	<i>Percent Single Family Units</i>	<i>Total</i>	<i>Single Family Units</i>	<i>Percent Single Family Units</i>
1990	553	433	78.3	52	52	100.0	2,111	1,851	87.7	2,716	2,336	86.0%
1991	685	484	70.7	57	57	100.0	1,909	1,631	85.4	2,651	2,172	81.9%
1992	875	710	81.1	113	113	100.0	2,761	2,270	82.2	3,749	3,093	82.5%
1993	1,008	905	89.8	132	132	100.0	2,681	2,296	85.6	3,821	3,333	87.2%
1994	1,105	936	84.7	138	138	100.0	3,797	2,323	61.2	5,040	3,397	67.4%
1995	983	812	82.6	154	152	99.0	2,629	2,259	85.9	3,766	3,223	85.6%
1996	890	765	86.0	205	99	48.3	3,333	2,347	70.4	4,428	3,211	72.5%
1997	740	673	91.0	173	103	59.5	2,713	2,316	85.4	3,626	3,092	85.3%
1998	913	796	87.2	345	61	17.7	3,290	3,039	92.4	4,548	3,896	85.7%
1999	920	756	82.2	100	98	98.0	4,196	3,472	82.7	5,216	4,326	82.9%
2000	982	754	77.0	144	96	66.7	3,203	2,879	89.9	4,329	3,729	86.1%
2001	994	744	75.0	79	79	100.0	3,438	3,317	96.5	4,511	4,140	91.8%
2002	1,213	906	75.0	104	104	100.0	3,710	3,459	93.2	5,027	4,469	88.9%
2003	1,767	1,231	70.0	168	168	100.0	5,271	4,829	91.6	7,206	6,228	86.4%
2004	1,675	1,355	81.0	223	209	93.7	3,942	3,407	86.4	5,840	4,971	85.1%
Annual Average	1,020	817	80.7	146	111	85.5	3,266	2,780	85.1	4,432	3,708	83.7

Source: Ref# 268

347

348 **4.13.4 Public Schools**

349 The majority of Fort Bliss military personnel reside within three independent school districts in El Paso
350 County. In the 2004/2005 school year, there were approximately 6,000 military dependent school-aged
351 children, about 70 percent of which attended schools in the El Paso ISD, 15 percent in the Socorro ISD,
352 and 12 percent in the Ysleta ISD. A small number of military dependents attended schools in the
353 Canutillo and Clint ISDs. Attendance in other districts in El Paso County was negligible (Ref# 75).
354 School districts in New Mexico serving Fort Bliss employees (primarily civilians) include the Las Cruces
355 and Gadsden school districts in Doña Ana County and the Alamogordo school district in Otero County.
356 Each district is described below.

357 **El Paso ISD.** The El Paso ISD serves students residing in the City of El Paso, including school-age
358 dependents of military personnel residing on post. The district has about 90 campuses, including 13 high
359 schools, 14 middle schools, 56 elementary schools, and 6 auxiliary facilities. **Table 4.13-15** shows that
360 enrollments grew about 1 percent between school year 1999/00 and 2003/04. Looking back to the 1990s,
361 enrollments were at about 64,700. This reflects the relatively stable population in this part of El Paso
362 where most residential neighborhoods are older with little new residential development. This trend is
363 expected to continue.

364 Three elementary schools in the El Paso ISD are located on Fort Bliss: Bliss (on the Main Post), Milam
365 (on Biggs AAF), and Logan (in Logan Heights). The catchment areas for these schools extend off the
366 post and include civilian residences. The proportion of students from military families in those three
367 schools in the 2004/2005 school year was 66, 91, and 71 percent, respectively. Since 2000, El Paso ISD
368 has gained one new high school, Chapin High School, located on a leased parcel in the Logan Heights
369 area of Fort Bliss. It serves about 1,700 students, of which 17 percent are from military households.

370 **Table 4.13-15. School District Enrollment and Staffing, 1999/00 to 2004/05 School Years**

School Year	El Paso ISD			Ysleta ISD			State of Texas		
	Enrolled	Certified Teachers	Student-Teacher Ratio	Enrolled	Certified Teachers	Student-Teacher Ratio	Enrolled	Certified Teachers	Student-Teacher Ratio
1999/00	62,306	3785	16.5	46,950	3,043	15.4	3,991,783	267,922	14.9
2000/01	62,325	4,078	15.3	46,394	2,979	15.6	4,059,619	274,817	14.8
2001/02	62,739	4,163	15.1	46,742	2,986	15.7	4,146,653	282,583	14.7
2002/03	62,048	4,434	14.2	46,668	2,939	15.9	4,239,911	288,386	14.7
2004/05	63,216	4,417	14.3	46,394	3,075	15.1	4,505,572	302,148	14.9

Source: Ref# 558, 559, 560, 561

371 Overall, 7 percent of the students in the El Paso ISD were from military households in the 2004/05 school
372 year. In the same year, El Paso ISD received about \$3 million in impact aid for federally connected
373 students. Off-post schools that had 20 percent or more of enrolled students with one or more active duty
374 military parents included Austin and Andress High Schools; Basset Charles, Richardson, and Ross
375 Middle Schools; and Burnet, Hughey, Nixon, and Travis Elementary Schools.

376 **Ysleta ISD.** The Ysleta ISD serves students residing in the City of El Paso, including school-age
377 dependents of military personnel residing off post. The district has 7 conventional high schools, 5 special
378 campuses, 11 middle schools, and 36 elementary schools (Ref# 430). Like El Paso ISD, the Ysleta ISD
379 enrollments have been relatively stable since 2000, declining by less than 1 percent. The Ysleta ISD
380 accommodates a moderate number of school-age dependents of military personnel assigned to Fort Bliss,
381 all of whom reside off post. As of school year 2004/05, the school district received about \$200,000 in
382 federal impact aid (Ref# 320). The schools with the largest concentrations of military-connected students

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

383 are Parkland and Eastwood High Schools; Parkland and Eastwood Middle Schools; and Desertaire,
384 Edgemere, Tierra Del Sol, Pebble Hills, and Dolphin Terrace Elementary Schools.

385 **Socorro ISD.** The Socorro ISD is located in the eastern and southeastern portion of El Paso County.
386 The school district had 29,919 students in the 2002/03 school year, an increase of 41 percent from
387 1996/97 levels. The number of schools has also increased. The district has 21 elementary schools, 7
388 middle schools, 4 high schools, and one alternate school. Fort Bliss-related students attend both El
389 Dorado and Americas High Schools.

390 **Clint ISD.** The Clint ISD consists of 11 schools serving almost 8,600 students. Like Socorro ISD, this
391 district is experiencing rapid expansion in enrollment, reflecting development of new suburbs to the east
392 of El Paso.

393 **Canutillo ISD.** The Canutillo ISD consists of six schools (four elementary, one middle, and one high
394 school) serving almost 4,900 students (Ref# 431). Higher-than-average growth is expected to continue in
395 this district.

396 **Anthony ISD.** The Anthony school district has three schools, one each for elementary, middle, and high
397 school level. The district had 777 students in the 2002/2003 school year.

398 **Gadsden ISD.** The Gadsden ISD has 20 campuses, including 2 high schools, 3 middle schools, 12
399 elementary schools, and 3 alternative schools. According to the 2004-2005 district report card, the current
400 student enrollment is about 13,800 (Ref# 106). The students are overwhelmingly Hispanic (95 percent).
401 The individual schools that could be affected by actions at Fort Bliss include Anthony Elementary
402 School, La Union Elementary School, Chaparral Elementary School, Gadsden Middle School, Chaparral
403 Middle School, Anthony Texas Junior/Senior High School, and Gadsden High School.

404 **Las Cruces.** The Las Cruces School District is the second largest school district (after Albuquerque) in
405 the State of New Mexico. It has 30 campuses with over 23,100 students in the 2004/05 school year
406 (Ref#110).

407 **Alamogordo.** The Alamogordo Public School District has 16 campuses, including 2 high schools, 4
408 middle (or intermediate) schools, and 10 elementary schools. Total enrollment in the 2004/05 school year
409 was about 6,800. Three of the schools are located on Holloman Air Force Base and primarily serve
410 military-related children.

411 **4.13.5 Law Enforcement**

412 There are two types of law enforcement jurisdiction on Fort Bliss: areas of exclusive or concurrent federal
413 jurisdiction to enforce civilian law, and areas of proprietary jurisdiction. Proprietary jurisdiction refers to
414 use of the land and differs from exclusive or concurrent federal jurisdiction, which deals with law
415 enforcement authority on the land.

416 Fort Bliss has exclusive federal jurisdiction within the Main Cantonment Area, the South Training Areas
417 (except for TA 2), and throughout the Doña Ana Range–North Training Areas. In these areas, the
418 Military Police of the Provost Marshal’s Office have complete police powers, including apprehension and
419 detention. The Military Police do not, however, have the authority to incarcerate civilians apprehended in
420 these areas. For situations warranting immediate incarceration, appropriate civilian law enforcement
421 agencies are contacted and the case is transferred to them for further processing.

422 Areas on Fort Bliss under proprietary jurisdiction include a portion of Logan Heights, which is
423 government-owned, but within which the El Paso Police Department retains normal police jurisdiction;
424 TA 2, which is government-owned (and previously leased from the State of Texas); and McGregor
425 Range, which is government-owned, but within which New Mexico State Police and New Mexico county
426 authorities retain normal police jurisdiction. In these areas, civilian law enforcement agencies retain
427 primary jurisdiction to apprehend, cite, investigate, and prosecute violations of civilian law. However,

428 Military Police may patrol these areas, assess a situation, and hand it over to the appropriate civilian
429 agents.

430 **4.13.5.1 Fort Bliss Law Enforcement**

431 The Fort Bliss Law Enforcement Battalion is responsible for the entire extent of the federal installation
432 encompassing 1.12 million acres. Operations are housed at a facility located on the Main Post. The
433 number of personnel totaled 533 in FY 2005 (Ref# 198). The battalion is currently equipped with 43
434 marked patrol cars, 3 unmarked cars, and 5 vans. Currently, there is one law enforcement officer for every
435 100 persons on post (including dependents), compared to one for every 76 persons in 1996. All military
436 housing areas and WBAMC are patrolled by Military Police. Leased military family housing areas
437 located off the Main Cantonment Area are under the jurisdiction of the City of El Paso Police Department
438 but are patrolled by both military and city police.

439 BLM enforces federal laws that pertain to the use, management, and development of withdrawn public
440 land on McGregor Range. BLM exercises enforcement authority over military personnel on the range in
441 coordination with the Fort Bliss Provost Marshal's Office. Similarly, Fort Bliss notifies BLM if persons
442 not conducting military purposes are found causing resource damage.

443 The U.S. Border Patrol maintains a station in Alamogordo and a checkpoint on U.S. Highway 54 between
444 New Mexico Highway 506 and Orogrande. The Fort Bliss Law Enforcement Battalion calls Border
445 Patrol when illegal immigrants are apprehended on the installation.

446 **4.13.5.2 County Sheriffs' Departments**

447 The El Paso County Sheriff's Department has jurisdiction within the limits of El Paso County and covers
448 an area of 1,150 square miles. The department operates out of four facilities and has a full-time staff (as
449 of 2005) of 1,021. The staff has grown from 659 personnel in 1995. The department is equipped with 72
450 marked cars, 62 unmarked cars, 8 vans, and 11 motorcycles. The Sheriff's Department operates the El
451 Paso County Detention Facility (with a capacity for 1,024 inmates) and the County Juvenile Detention
452 Center (with a capacity for 64 juveniles). An Annex to the County Detention Facility was completed in
453 September 1997 with a capacity for 879 inmates.

454 In New Mexico, the Doña Ana County Sheriff's Department includes approximately 100 officers and a
455 number of sheriff reservists. Law enforcement personnel operating in Otero County include 23 personnel
456 from the Sheriff's Department and 13 state police.

457 **4.13.5.3 City Police Departments**

458 The City of El Paso Police Department has jurisdiction within the limits of the City of El Paso and covers
459 an area of 248 square miles. The department operates out of six facilities and has over 1,100
460 commissioned officers and about 300 civilian support personnel. The city is a national leader in adopting
461 Community Based Policing practices to prevent crime and create a safer environment (Ref# 186). The
462 department uses the El Paso County Jail, operated by the Sheriff's Office, and the County Juvenile
463 Detention Center for detention.

464 The City of Las Cruces Police Department has 144 uniformed officers and 7 volunteers. The Alamogordo
465 community is served by a Department of Public Safety, which incorporates fire protection, law
466 enforcement, and emergency medical services into one function. The City of Alamogordo currently has a
467 staff of 105 persons who are cross-trained to handle both police and firefighting duties (Ref# 184).

468 **4.13.6 Fire Protection**

469 **4.13.6.1 Fort Bliss Fire Department**

470 The Fort Bliss Fire Department is responsible for the Main Cantonment Area and training areas within 5
471 miles of the Main Post. USACAS is responsible for fires caused by military operations on the remainder

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

472 of Fort Bliss. Operations are housed in four facilities on the Main Post, McGregor Range Camp, and
473 Biggs AAF. The department had 71 personnel in 1996, a hazardous materials response team, and the
474 following machinery: four active and one reserve engine, one supply tanker, three command vehicles, five
475 small pumper vehicles, one aerial ladder truck, two P-19 crash vehicles, one light rescue truck, one air
476 support vehicle, two support vehicles, one brush-fire truck, and one hazardous materials response vehicle.
477 The Fort Bliss Fire Department has a formal mutual aid agreement with the City of El Paso Fire
478 Department; use of the agreement is rare.

479 **4.13.6.2 City of El Paso Fire Department**

480 The City of El Paso fire department provides fire protection services to an area coincident with the city
481 limits (248 square miles) and operates out of 31 neighborhood fire stations (with one more under
482 construction), a 24-hour station at EPIA, and six support facilities. In 2000, the city's Emergency
483 Medical Services and Fire Department merged to provide better response. In 2003, the department had
484 858 personnel. The department possesses a wide range of equipment, including 31 pumpers, 7 ladder
485 trucks, 6 rescue trucks, 6 quints (pumper/ladder trucks), 19 ambulances, 4 aircraft firefighting vehicles,
486 and a 24-hour hazardous materials unit (Ref# 185). The department maintains formal mutual aid
487 agreements with Fort Bliss and El Paso County.

488 **4.13.7 Public Finance**

489 **4.13.7.1 El Paso County, Texas**

490 Services provided by El Paso County are funded principally through the general fund, with additional
491 support from special revenue funds. The most important special revenue funds are grants (mainly
492 intergovernmental transfer), road and bridge, and tourist and convention-related funds. In FY 2005,
493 revenues from all government fund types were projected at \$216 million, compared to \$105 million in FY
494 1996, an increase of 49 percent over the nine-year period after adjusting for inflation. Principal revenue
495 sources were taxes (55.4 percent of total revenues) and charges for services (20.5 percent), as shown in
496 **Table 4.13-16** (Ref# 553).

497 **Table 4.13-16. El Paso County, Texas Budgeted Revenues and Expenditures, Fiscal Year 2005**

<i>Revenue Source</i>	<i>Amount</i>	<i>Percent of Total Revenue</i>	<i>Expenditure Category</i>	<i>Amount</i>	<i>Percent of Total Expenditures</i>
Taxes	\$119,871,396	55.4%	General Government	\$33,275,851	14.2%
Licenses and Permits	\$177,500	0.1%	Administration of Justice	\$39,391,656	16.8%
Intergovernmental Revenue	\$21,717,608	10.0%	Public Safety	\$90,852,448	38.8%
Service Revenues	\$44,339,469	20.5%	Health and Welfare	\$10,773,608	4.6%
Fines and Forfeitures	\$6,110,041	2.8%	Community Services	\$1,327,805	0.6%
Interest	\$1,333,151	0.6%	Resource Development	\$815,782	0.3%
Miscellaneous Revenues	\$5,367,277	2.5%	Culture and Recreation	\$6,053,297	2.6%
Other Financing Sources	\$17,539,056	8.1%	Public Works	\$5,323,686	2.3%
			Capital Outlays	\$12,567,552	5.4%
			Debt Service	\$16,319,551	7.0%
			Other Financing Uses	\$17,656,904	7.5%
Total Revenues	\$216,455,498	100.0%	Total Expenditures	\$234,358,140	100.0%

Source: Ref# 553

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

498 Expenditures in FY 2005 were projected at \$234 million, compared to \$110 million in FY 1996, an
499 increase of 49 percent over the nine-year period after adjusting for inflation. Major expenditure
500 categories were public safety (38.8 percent of total annual expenditures), administration of justice (16.8
501 percent), and general government (14.2 percent) (Ref# 553).

502 **4.13.7.2 City of El Paso**

503 Services provided by the City of El Paso are funded principally through the general fund, which was the
504 source of 49 percent of all revenues in FY 2005 compared to 76 percent of all revenues in FY 1996.
505 Additional support is generated from special revenue funds, the most important of which are enterprise
506 funds (airport and mass transit). In FY 2005, revenues from all government fund types totaled \$526
507 million, compared to \$271 million in FY 1996, an increase of 33 percent over the nine-year period after
508 adjusting for inflation. Principal revenue sources were taxes (44 percent of total revenues) and service
509 revenues (16 percent), as shown in Table 4.13-17 (Ref# 552).

510 Expenditures in FY 2005 totaled \$534 million, compared to \$289 million in FY 1996, an increase of 35
511 percent over the nine-year period after adjusting for inflation. Major expenditure categories were public
512 safety (30.7 percent of total annual expenditures), non-departmental (17.2 percent), and transportation
513 (17.0 percent). The combined fund balance stood at \$66,369,604 as of September 1, 2005, or 12 percent
514 of total expenditures, representing a substantial drop from the relative fund balance of 48 percent in
515 August 1996 (Ref# 552).

516 **Table 4.13-17. City of El Paso, Texas Revenues and Expenditures, Fiscal Year 2005**

<i>Revenue Source</i>	<i>Amount</i>	<i>Percent of Total Revenue</i>	<i>Expenditure Category</i>	<i>Amount</i>	<i>Percent of Total Expenditures</i>
Taxes	\$233,717,327	44.4%	General Government	\$35,740,352	6.7%
Franchise Fees	\$45,880,134	8.7%	Public Safety	\$163,932,299	30.7%
Service Revenues	\$78,811,272	15.0%	Quality of Life Services	\$43,437,924	8.1%
Operating Revenues	\$85,501,010	16.3%	General Services	\$24,083,863	4.5%
Non-Operating Revenues	\$21,267,061	4.0%	Development & Infrastructure	\$66,764,366	12.5%
Intergovernmental Revenue	\$21,491,381	4.1%	Public Health & Welfare	\$17,462,328	3.3%
Transfers In	\$39,246,832	7.5%	Non-Departmental	\$91,936,771	17.2%
			Transportation	\$90,520,832	17.0%
Total Revenues	\$525,915,017	100.0%	Total Expenditures	\$533,878,735	100.0%

Source: Ref# 552

517 **4.13.8 Government Structure**

518 **4.13.8.1 El Paso County**

519 The El Paso County governmental system is the same as described in the 2000 PEIS. Like all counties in
520 Texas, it has a Commissioners' Court composed of four County Commissioners and a single County
521 Judge, all publicly elected. The County Judge is elected at large and serves a 4-year term, while County
522 Commissioners are elected from each of four precincts and serve a 2-year term. Elections are staggered,
523 with three positions available at one election and two positions at the following election.

524 The county had 2,765 employees in 2003, increased from 1,912 in 2000. It was ranked as the eighth
525 largest government sector employer in El Paso County, following the El Paso ISD, Ysleta ISD, and Fort
526 Bliss as the top three employers of county residents. The large majority of the county's staff assists in the
527 court system administered by the county (Ref# 232).

528 **4.13.8.2 City of El Paso**

529 The City of El Paso recently adopted the Council–Manager form of government through a City Charter
530 approved on February 7, 2004. The voters continue to elect a Mayor and City Councilors who hold 4-
531 year terms and retain political leadership. The Mayor and City Council appoint a City Manager who has
532 a managerial role. The City Manager and three deputies carry out Council directives and oversee delivery
533 of public services (Ref# 432).

534 The city had a total of 6,280 employees in 2005. Of the various departments of city government, the
535 following employ the largest number of personnel: police (1,440 persons), fire (890 persons), water
536 utilities (671 persons), mass transit (580 persons), and parks and recreation (547 persons). Since 1996,
537 increases in employment occurred in the fire department, parks and recreation department, and police
538 department (Ref# 353).

539 **4.13.9 Medical Services**

540 **4.13.9.1 Fort Bliss Medical Services**

541 Located just west of the Main Post, WBAMC is one of 38 U.S. Army Medical Centers. The facility
542 serves an estimated 85-90 percent of the local eligible population, comprised mainly of active duty
543 military and their dependents, retired military and their dependents, and some federal employees with
544 occupational injuries or illness. It also serves as one of two trauma centers for El Paso County. WBAMC
545 serves the health care needs of more than 400,000 beneficiaries in the southwest region.

546 Fort Bliss also provides healthcare at a consolidated Troop Medical Center on the Main Post and at
547 several small facilities located with individual units. A small medical clinic also serves troops and family
548 members associated with the Sergeants Major Academy on Biggs AAF. There is a dental clinic on the
549 Main Post and a veterinary clinic.

550 **4.13.9.2 El Paso County Medical Services**

551 El Paso County has six general hospital medical facilities. In addition, there are five specialty medical
552 facilities, excluding WBAMC. **Table 4.13-18** shows selected statistics for the general and specialty
553 facilities. In comparison to 1995, the number of staffed beds for inpatient care at the six general hospitals
554 in 2004 has declined by 4 percent, from 1,627 to 1,564, even though the population of El Paso County has
555 increased by 7 percent. The number of annual outpatient visits has increased by 59 percent, from 656,861
556 to 1,046,344. The annual inpatient numbers have increased by 24 percent from 60,651 to 74,947, while
557 the average number of daily patients has increased only slightly by 3 percent.

558 Considering the decline in beds, this information indicates that the average inpatient stay has declined in
559 length. These data partially reflect trends to administer health care primarily through outpatient, day, and
560 specialty facilities.

561 The number of employees at the general hospital facilities has increased by 9 percent since 1995, fairly
562 consistent with the population growth for the time period. Payrolls and expenses have increased by 57
563 and 72 percent, respectively, over nine years.

564 The specialty facilities tend to have fewer beds but high occupancy rates for inpatients. Rio Vista Physical
565 Rehabilitation Hospital serves 5 percent of outpatient visits for El Paso County.

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

566

Table 4.13-18. Medical Facilities in El Paso County 2004

<i>Facility</i>	<i>Beds¹</i>	<i>Admissions (Inpatients)</i>	<i>Average Bed Occupancy Rate</i>	<i>Outpatient Visits</i>	<i>Employees</i>	<i>Payroll (\$000)</i>	<i>Expenditures (\$000)</i>
General Hospitals							
Sierra Medical Center	334	13,213	54%	109,258	1108	52.9	163.6
Providence Memorial Hospital	389	20,105	70%	205,535	1,741	80.8	194.0
Del Sol MC-East	293	15,224	76%	144,166	1,125	50.5	125.4
Las Palmas-West	221	9,528	56%	74,269	789	31.1	94.8
Southwestern General	53	1,863	40%	21,754	203	6.4	133.8
RE Thomason General	274	15,014	64%	491,362	1,869	69.3	220.0
Subtotal	1,564	74,947	64%	1,046,344	6,835	291	932
Specialty Medical Facilities							
Rio Vista Rehab	45	1,576	100%	57,946	239	11.7	251.1
EP Psychiatric	52	ND	ND	ND	ND	ND	ND
EP Specialty Hosp	31	843	23%	8,586	117	4.3	16.8
NCED Mental Health center	49	526	16%	3,235	56	1.8	3.7
Mesa Hills Specialty Hospital	32	431	91%	0	80	2.7	6.4
Del Sol Rehab	40	ND	ND	ND	ND	ND	ND
Total for El Paso County ²	1,813	78,323	60%	1,116,111	7,327	312	1,210
WBAMC	209	ND	ND	ND	ND	ND	ND
Total with WBAMC	2,022						

1. Staffed beds.

2. Totals do not include categories with no reported data.

ND = no data

Source: Ref# 228

567

568 Currently, El Paso County and border counties have relatively low numbers of health care providers,
569 including primary care physicians, specialists, registered nurses, and dentists, according to a report
570 prepared by the Institute for Policy and Economic Development in 2002. The ratio of healthcare
571 providers to population is much lower in El Paso and other border counties than in selected urban
572 counties in Texas. Overall, in 2001, El Paso County had 759 direct patient care physicians and 308
573 primary care physicians. In 2000, the county had 31 physician assistants, 3,387 registered nurses, and
574 119 dentists (Ref# 255, 272). These professionals served a general population of about 680,000.

575 **4.13.10 Quality of Life**

576 Quality of life is subjective. The analysis of quality of life, therefore, focuses on what is important and
577 valued by the affected community. This section summarizes quality of life issues identified in scoping
578 and data collection to the extent that they can be related to projected changes at Fort Bliss. The following
579 description also cross-references other sections of the SEIS that describe current issues or trends in the
580 region relevant to quality of life. Relevant findings from a quality of life study conducted by the UTEP
581 are also cited.

582 For analysis purposes, quality of life issues have been divided into three broad categories: cost of living,
583 convenience/access, and physical environment.

584 Topics of concern related to cost of living include:

- 585 • Water rates — impact of higher water rates on existing residents, especially given recent
586 experience with drought contingency planning/implementation and conservation (water supply
587 and demand are addressed in Section 4.7).
- 588 • Housing costs — increases in housing costs as a result of project-related growth and new
589 development (housing is addressed in Section 4.13.3).

590 Topics of concern related to convenience and access include:

- 591 • Traffic/commuting — increases in congestion, commuting times, and heavy truck traffic in
592 neighborhoods (traffic and level of service on roadways in the vicinity of the Main Cantonment
593 Area are discussed in Section 4.2.1).
- 594 • Access to services — school overcrowding (public schools are discussed in Section 4.13.4.)
- 595 • Recreation — reduction in recreation access to the Fort Bliss Training Complex and indirect
596 effects on recreation access from growth in demand and new development (recreation is
597 discussed in Section 4.1).

598 Topics of concern related to the physical environment include:

- 599 • Open space — likely reductions in open space due to population growth and development (open
600 space is discussed in section 4.1).
- 601 • Landscape — changes in urban and rural landscapes due to development and urbanization
602 (availability of land to accommodate growth and development is discussed in Section 4.1; Section
603 4.1.3 discusses the appearance of the landscape).
- 604 • Dust — increased dust from construction, off-road vehicle training activities, and other sources
605 (Section 4.6 discusses air quality).

606 In 2002, The Institute for Policy and Economic Development at UTEP published a report titled *Quality of*
607 *Life in El Paso: Citizen's Perceptions – 2002* (Ref# 118). The study was based on 514 valid surveys
608 obtained and weighted by ZIP code. The survey was undertaken to define what the citizens of El Paso
609 like and dislike about El Paso life. The 2002 survey replicated a previous study done in 1999.

610 The study addressed ten topic areas affecting quality of life. Each of the ten areas was surveyed through a
611 set of questions, individually reported, and then placed into an index providing an overall, composite
612 measure. All questions relating to quality of life were rated on a five-point scale ranging from 1
613 (Completely Satisfied) to 5 (Completely Dissatisfied), with a Neutral mid-point of 3. These ten areas and
614 their scores in the 2002 study are shown in **Table 5.13-19**.

615 **Table 4.13-19. Quality of Life Survey Results**

<i>Topic</i>	<i>Score</i>
Environment	2.97
Transportation	3.13
Public Safety	2.90
Education	2.7
Entertainment/Services	3.06
Business/Industry	3.37
Cost of Living	3.37
Community Relations	2.83
Health Care	3.26
City Planning	3.32

Source: Ref# 118

616 In general, the results indicated that overall satisfaction with El Paso quality of life had declined in almost
617 all areas between 1999 and 2002. However, considering the smaller 2002 sample size and a confidence
618 level of 5 percent (plus or minus), the findings are relatively consistent between the two studies.

619 Study findings relevant to topics addressed in the SEIS are summarized below.

- 620 • Cost of living. Overall perceptions indicate that the cost of living in 2002 was in the
621 unsatisfactory range but had improved slightly since 1999. Cost of housing was perceived as
622 reasonable, reflecting El Paso's housing market relative to other communities. Cost of utilities
623 fell in the unsatisfactory range.
- 624 • Convenience/access. Commute times were viewed positively. There was satisfaction with the
625 quality of public schools. Perceptions of the number of public parks and their quality were in the
626 neutral range.
- 627 • Physical environment. Overall lack of satisfaction about city planning prevailed among survey
628 participants and increased between 1999 and 2002. Growth management, downtown planning,
629 and suburban planning each rated in the unsatisfactory range. Overall, respondents perceived a
630 slight decrease in the quality of the environment between 1999 and 2002; however, the 2002
631 rating was in the neutral range. Air quality was perceived as generally unsatisfactory to the
632 survey participants.

633

4.14 ENVIRONMENTAL JUSTICE

EO 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, requires that the Army 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. For this SEIS, census data were used to estimate the number of persons in minority populations and low-income populations living in areas that could potentially be affected by the Proposed Action and other alternatives.

EO 13045, Protection of Children From Environmental Health Risks and Safety Risks, requires that federal agencies identify and assess environmental health risks and safety risks that may disproportionately affect children and address such risks in their policies, programs, activities, and standards.

The ROI for environmental justice considerations in this SEIS consists of El Paso County, Texas and Doña Ana and Otero Counties, New Mexico. For purposes of this analysis, minority populations and low-income populations are defined as follows:

- Minority populations — persons of Hispanic origin of any race plus Blacks; American Indians, Eskimos, and Aleuts; and Asian or Pacific Islanders (without double-counting persons of Hispanic origin who are also contained in the latter groups).
- Low-income populations — as reported in the 2000 Census, persons living below the poverty level, which is \$18,104 for a family of four in 1999 and varies depending on family size.

An environmental justice outreach program was conducted as part of the SEIS process. The purpose of this program is to expand participation of potentially affected populations in the process and to identify public concerns.

Estimates of minority and low-income populations were developed using data from the 2000 Census of population and housing, which estimates each of the separate categories contained in these definitions. Minority populations were estimated using Census data that report Hispanic or Latino populations, by race and separately, and populations not Hispanic or Latino by race (Ref# 203). Low-income populations were estimated using Census data that report poverty status in 1999 by age (Ref# 205). Data on the percent of population of Hispanic or Latino origin and the percent of population by race for El Paso, Doña Ana, and Otero Counties were obtained from Census profiles of general demographic characteristics (Ref# 204).

There are 171 census tracts in the three-county ROI, including 126 in El Paso County, 32 in Doña Ana County, and 13 in Otero County. **Table 4.14-1** presents data on minority populations and low-income populations in the ROI for each census tract. In 2000, the ROI contained 916,602 persons, of whom 709,651 persons (77.4 percent) were minorities and 213,513 persons (23.8 percent) were living below the poverty level.

El Paso County contained 679,622 persons, of whom 564,087 persons (83.0 percent) were minorities and 158,722 (23.8 percent) were living below the poverty level. Persons of Hispanic or Latino origin comprised 531,654 persons (78.2 percent of the total population). A total of 20,809 persons (3.1 percent) were Black or African American; 5,559 persons (0.8 percent) American Indian and Alaskan Native; 6,633 persons (1.0 percent) Asian; 669 persons (0.1 percent) Native Hawaiian and Other Pacific Islander; 121,721 persons (17.9 percent) some other race; and 21,652 persons (3.2 percent) two or more races. For each county, some persons in the latter categories are also included in the subtotal for persons of Hispanic or Latino origin. To avoid double-counting these persons, they are added in only once when the minority population total is calculated.

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

46 Doña Ana County contained 174,682 persons, of which 117,994 (67.5 percent) were minorities and
 47 43,054 (25.4 percent) were living below the poverty level. Persons of Hispanic or Latino origin
 48 comprised 110,665 persons (63.4 percent of the total population). A total of 2,723 persons (1.6 percent)
 49 were Black or African American; 2,580 persons (1.5 percent) American Indian and Alaskan Native; 1,330
 50 persons (0.8 percent) Asian; 117 persons (0.1 percent) Native Hawaiian and Other Pacific Islander;
 51 43,209 persons (24.7 percent) some other race; and 6,245 persons (3.6 percent) two or more races.

52 Otero County contained 62,298 persons, of which 34,728 (44.3 percent) were minorities and 11,737 (19.3
 53 percent) were living below the poverty level. Persons of Hispanic or Latino origin comprised 20,033
 54 persons (32.2 percent of the total population). A total of 2,440 persons (3.9 percent) were Black or
 55 African American; 3,614 persons (5.8 percent) American Indian and Alaskan Native; 728 persons (1.2
 56 percent) Asian; 82 persons (0.1 percent) Native Hawaiian and Other Pacific Islander; 7,273 persons (11.7
 57 percent) some other race; and 2,242 persons (3.6 percent) two or more races. The Mescalero Apache
 58 Reservation is located in northeastern Otero County, with small, unpopulated portions also located in
 59 Lincoln County, New Mexico. Approximately 3,156 persons lived on the reservation in 2000, of which
 60 96.7 percent were minority and 35.7 percent were living below the poverty level.

61 **Figure 4.14-1** shows the counties and census tracts in the ROI, and **Figure 4.14-2** provides detailed data
 62 for El Paso, Alamogordo, and Las Cruces. Individual census tracts are highlighted if either of two criteria
 63 are met for minority populations: if the percentage of persons in minority population exceeds 50.0
 64 percent, indicating that in the census tract, minorities constitute a majority of the persons who could
 65 potentially be affected by the project, and if the minority population exceeds 77.4 percent, which is the
 66 ROI average. Individual census tracts are also highlighted if the percentage of persons living below the
 67 poverty level in the census tract exceeds 23.8 percent, the ROI average.

68 Minorities comprise more than 50 percent of the total population in 152 census tracts in the ROI, or 88.9
 69 percent of all census tracts. The minority population percentage exceeds the ROI average in 97 (56.7
 70 percent) of the census tracts. The percentage of the population living below the poverty level exceeds the
 71 ROI average in 81 (47.4 percent) of the census tracts.

Table 4.14-1. Minority and Low-Income Populations by Census Tract

<i>Geographic Area / Census Tract</i>	<i>Percent Minority</i>	<i>Census Tract Exceeds 50 Percent Minority</i>	<i>Census Tract Exceeds ROI Percent Minority</i>	<i>Percent Low Income</i>	<i>Census Tract Exceeds ROI Percent Low Income</i>
ROI	77.4	N/A	NA	23.8	N/A
El Paso County	83.0	N/A	NA	23.8	N/A
Doña Ana County	67.5	N/A	NA	25.4	N/A
Otero County	44.3	N/A	NA	19.3	N/A
El Paso County, Texas					
1.01	64.3	Y		11.8	
1.06	59.6	Y		11.4	
1.07	77.7	Y	Y	19.3	
1.08	70.3	Y		21.4	
1.09	80.9	Y	Y	23.0	
1.10	70.0	Y		27.3	Y
1.11	55.6	Y		6.8	
1.12	73.1	Y		15.0	
2.03	78.2	Y	Y	21.0	
2.04	70.9	Y		22.9	
2.05	78.4	Y	Y	40.4	Y

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

<i>Geographic Area / Census Tract</i>	<i>Percent Minority</i>	<i>Census Tract Exceeds 50 Percent Minority</i>	<i>Census Tract Exceeds ROI Percent Minority</i>	<i>Percent Low Income</i>	<i>Census Tract Exceeds ROI Percent Low Income</i>
2.06	75.2	Y		20.5	
3.01	87.6	Y	Y	39.4	Y
3.02	88.5	Y	Y	31.8	Y
4.01	49.7			4.9	
4.03	77.9	Y	Y	16.7	
4.04	92.9	Y	Y	64.6	Y
6.00	89.8	Y	Y	34.2	Y
8.00	92.0	Y	Y	32.5	Y
9.00	90.0	Y	Y	30.5	Y
10.01	91.8	Y	Y	24.8	Y
10.02	93.7	Y	Y	31.0	Y
11.04	66.9	Y		14.4	
11.05	76.3	Y		29.2	Y
11.07	53.8	Y		9.8	
11.09	39.4			3.2	
11.10	52.5	Y		13.0	
11.11	66.9	Y		17.5	
11.12	56.3	Y		12.8	
11.13	62.5	Y		9.4	
12.01	89.4	Y	Y	37.0	Y
12.02	72.8	Y		11.2	
12.03	95.6	Y	Y	48.8	Y
13.01	45.4			5.4	
13.02	47.2			6.7	
14.00	85.9	Y	Y	35.3	Y
15.01	60.2	Y		14.2	
15.02	60.3	Y		20.3	
16.00	87.8	Y	Y	38.9	Y
17.00	91.3	Y	Y	53.4	Y
18.00	97.2	Y	Y	53.5	Y
19.00	97.7	Y	Y	72.3	Y
20.00	98.2	Y	Y	55.3	Y
21.00	97.0	Y	Y	70.0	Y
22.01	85.1	Y	Y	41.7	Y
22.02	93.8	Y	Y	51.1	Y
23.00	92.6	Y	Y	28.9	Y
24.00	90.7	Y	Y	33.7	Y
25.00	88.3	Y	Y	23.8	
26.00	96.5	Y	Y	32.7	Y
28.00	98.2	Y	Y	53.1	Y
29.00	99.0	Y	Y	57.9	Y
30.00	97.2	Y	Y	48.4	Y
31.00	97.2	Y	Y	31.2	Y
32.00	98.2	Y	Y	37.9	Y

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

<i>Geographic Area / Census Tract</i>	<i>Percent Minority</i>	<i>Census Tract Exceeds 50 Percent Minority</i>	<i>Census Tract Exceeds ROI Percent Minority</i>	<i>Percent Low Income</i>	<i>Census Tract Exceeds ROI Percent Low Income</i>
33.00	90.8	Y	Y	20.6	
34.01	90.2	Y	Y	23.4	
34.03	78.5	Y	Y	16.7	
34.04	64.3	Y		6.9	
35.01	93.5	Y	Y	28.9	Y
35.02	94.8	Y	Y	33.8	Y
36.01	96.7	Y	Y	29.0	Y
36.02	94.9	Y	Y	40.1	Y
37.01	95.6	Y	Y	27.8	Y
37.02	96.4	Y	Y	34.3	Y
38.01	97.1	Y	Y	24.2	Y
38.03	94.3	Y	Y	26.3	Y
38.04	95.1	Y	Y	26.7	Y
39.01	94.5	Y	Y	32.7	Y
39.02	96.9	Y	Y	28.4	Y
39.03	97.9	Y	Y	37.4	Y
40.02	97.0	Y	Y	31.7	Y
40.03	98.1	Y	Y	30.4	Y
40.04	97.7	Y	Y	19.2	
41.03	94.0	Y	Y	36.1	Y
41.04	94.8	Y	Y	13.1	
41.05	96.9	Y	Y	29.4	Y
41.06	96.5	Y	Y	24.0	Y
41.07	89.2	Y	Y	12.6	
42.01	96.9	Y	Y	32.2	Y
42.02	95.3	Y	Y	22.3	
43.03	72.9	Y		12.4	
43.05	70.8	Y		9.1	
43.07	70.6	Y		6.6	
43.09	80.2	Y	Y	10.2	
43.10	80.5	Y	Y	22.2	
43.11	71.5	Y		7.3	
43.12	73.5	Y		13.9	
43.13	73.8	Y		17.9	
43.14	86.4	Y	Y	14.7	
43.15	88.8	Y	Y	13.3	
43.16	91.4	Y	Y	16.4	
102.03	87.5	Y	Y	25.9	Y
102.04	57.8	Y		11.2	
102.06	67.7	Y		7.9	
102.07	66.1	Y		15.9	
102.08	92.4	Y	Y	32.8	Y
102.09	65.6	Y		10.4	
103.03	75.8	Y		13.0	

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

<i>Geographic Area / Census Tract</i>	<i>Percent Minority</i>	<i>Census Tract Exceeds 50 Percent Minority</i>	<i>Census Tract Exceeds ROI Percent Minority</i>	<i>Percent Low Income</i>	<i>Census Tract Exceeds ROI Percent Low Income</i>
103.07	85.2	Y	Y	22.3	
103.09	93.0	Y	Y	36.2	Y
103.10	94.1	Y	Y	31.5	Y
103.11	81.9	Y	Y	20.2	
103.12	77.3	Y		6.8	
103.13	92.2	Y	Y	12.6	
103.14	82.6	Y	Y	11.2	
103.15	85.9	Y	Y	4.0	
103.16	82.0	Y	Y	16.0	
103.17	84.3	Y	Y	18.5	
103.18	82.1	Y	Y	23.1	
103.19	80.4	Y	Y	29.1	Y
103.20	88.0	Y	Y	23.1	
103.21	91.0	Y	Y	7.5	
104.01	98.8	Y	Y	31.2	Y
104.02	97.1	Y	Y	24.9	Y
104.03	98.6	Y	Y	40.1	Y
104.04	94.8	Y	Y	34.8	Y
105.01	94.6	Y	Y	46.9	Y
105.02	91.5	Y	Y	35.4	Y
105.03	95.9	Y	Y	39.3	Y
105.04	95.9	Y	Y	35.2	Y
Doña Ana County, New Mexico					
1.01	56.1	Y		18.1	
1.02	55.6	Y		17.2	
2.00	63.4	Y		20.4	
3.00	50.1	Y		15.5	
4.01	91.0	Y	Y	36.6	Y
4.02	71.0	Y		20.7	
5.00	69.7	Y		34.4	Y
6.00	80.7	Y	Y	27.3	Y
7.00	69.4	Y		30.9	Y
8.00	52.2	Y		32.1	Y
9.00	65.2	Y		48.2	Y
10.00	56.1	Y		53.1	Y
11.01	63.5	Y		20.0	
11.02	56.4	Y		10.9	
12.01	46.2			10.7	
12.02	35.6			16.0	
13.01	56.5	Y		16.1	
13.02	72.0	Y		28.7	Y
13.03	54.9	Y		10.3	
14.00	82.0	Y	Y	37.3	Y
15.00	45.2			12.2	

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

<i>Geographic Area / Census Tract</i>	<i>Percent Minority</i>	<i>Census Tract Exceeds 50 Percent Minority</i>	<i>Census Tract Exceeds ROI Percent Minority</i>	<i>Percent Low Income</i>	<i>Census Tract Exceeds ROI Percent Low Income</i>
16.00	85.9	Y	Y	31.1	Y
17.01	60.9	Y		6.9	
17.02	82.4	Y	Y	34.9	Y
17.03	73.2	Y		20.6	
17.04	98.4	Y	Y	41.9	Y
17.05	97.3	Y	Y	32.0	Y
18.01	88.8	Y	Y	32.1	Y
18.02	92.4	Y	Y	35.9	Y
18.03	96.9	Y	Y	38.4	Y
18.04	68.1	Y		31.3	Y
19.00	37.3			2.6	
Otero County, New Mexico					
1.00	60.5	Y		27.1	Y
2.00	42.3			19.8	
3.01	32.0			12.9	
3.02	32.0			10.1	
4.01	35.4			9.8	
4.02	50.9	Y		20.8	
5.00	48.8			21.5	
6.01	30.6			11.0	
6.02	20.8			21.7	
6.03	30.2			10.6	
7.00	46.4			20.0	
8.00	96.7	Y	Y	35.7	Y
9.00	46.9			30.0	Y

Notes: Low income is measured by identifying the number of persons below poverty level (\$18,104 for a family of four in 1999, as report in the 2000 Census of Population and Housing).

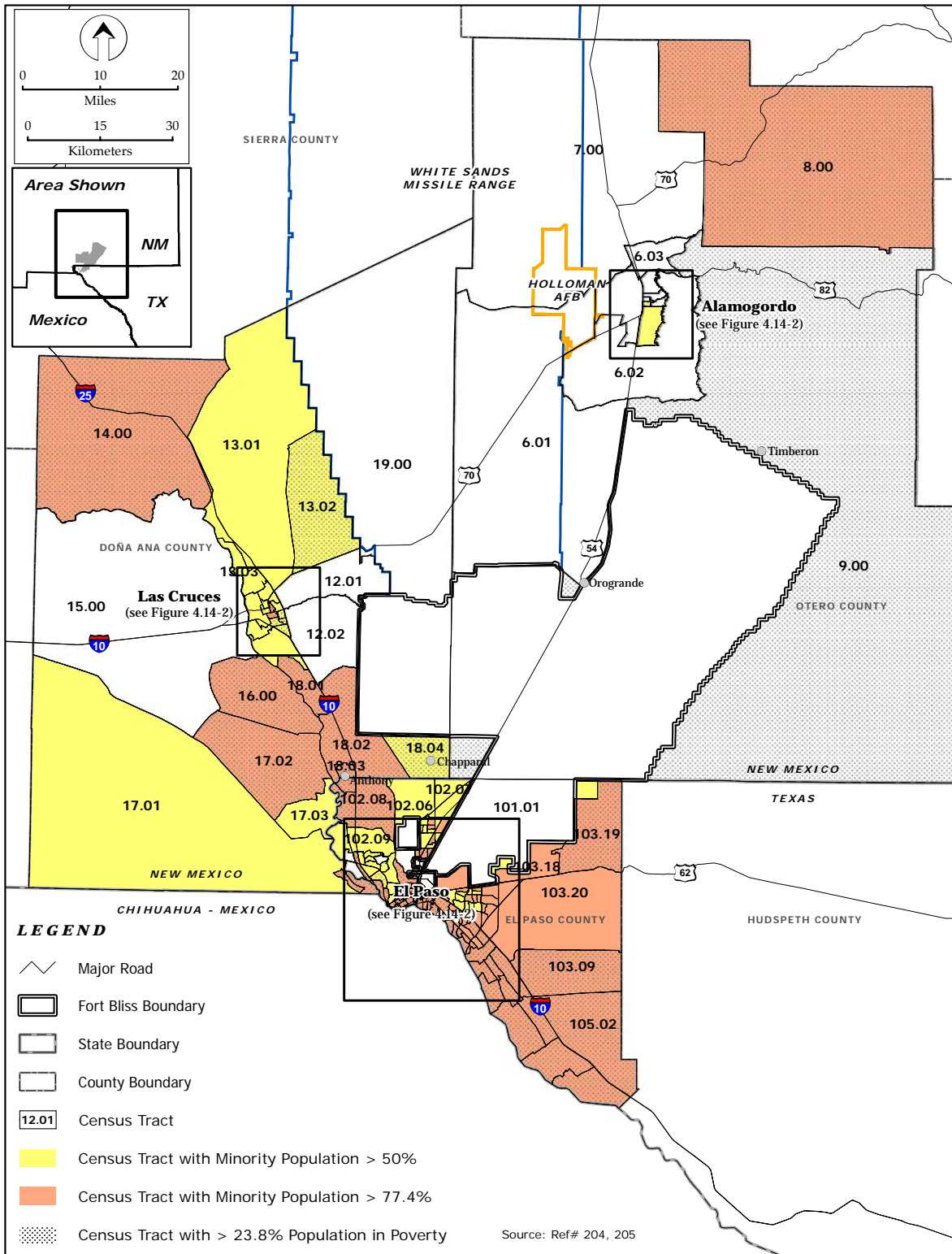
The ROI is comprised of 171 census tracts.

The table represents data for 167 individual census tracts. Four census tracts in El Paso County that comprise the Main Post are excluded from the list because the environmental justice analysis does not evaluate effects on populations living on military installations. Data presented at the top of the table for the three-county ROI and for El Paso County as a whole, represent totals including the four census tracts.

N/A=Not applicable.

Source: Ref# 203, 205

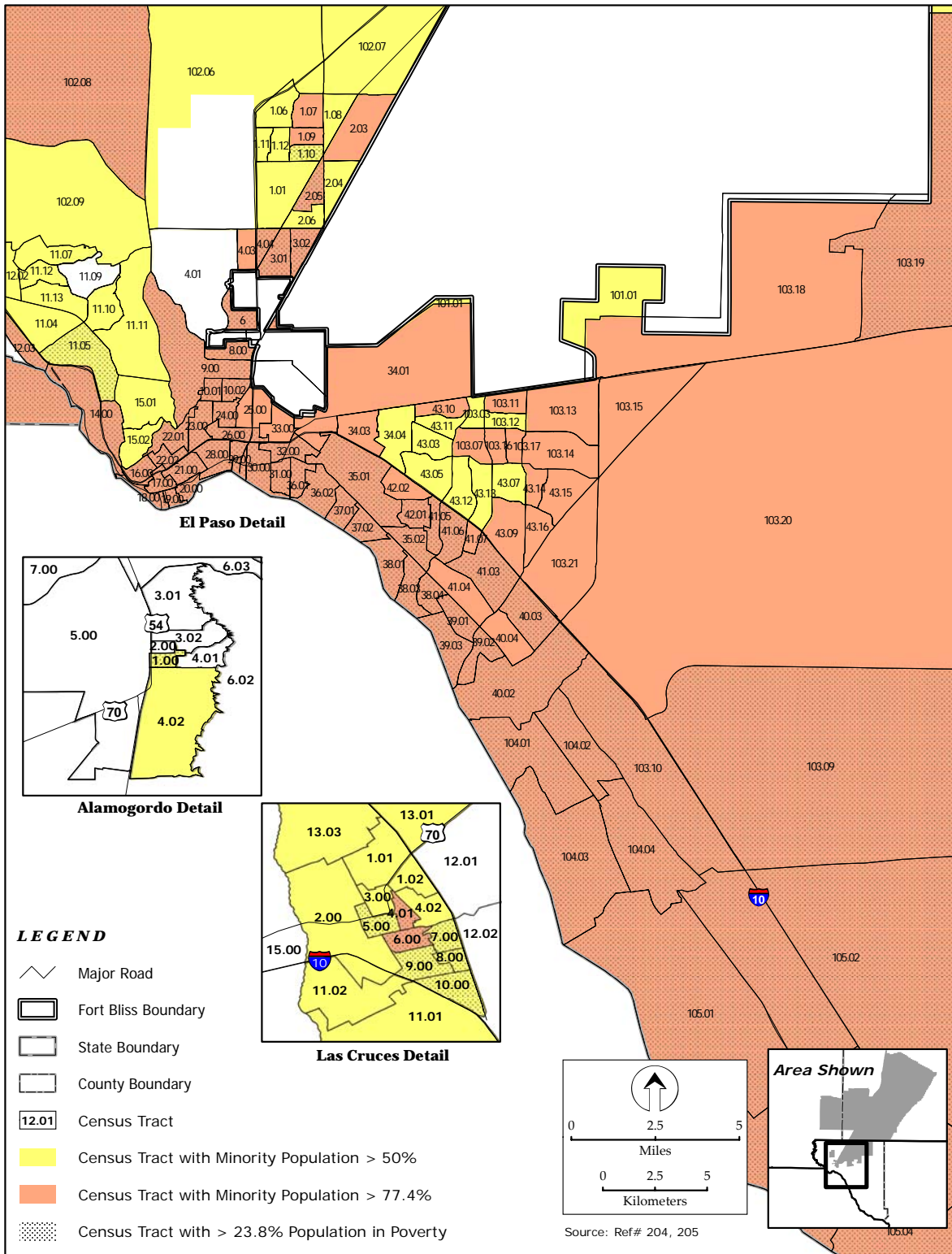
**Fort Bliss Mission and Master Plan Supplemental Programmatic Environmental Impact Statement
Final SEIS**



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Figure 4.14-1. Census Tracts with Minority and Low-Income Population Percentages Exceeding the ROI Average

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



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Figure 4.14-2. Detail of Census Tracts in El Paso, Alamogordo, and Las Cruces

5.0 ENVIRONMENTAL CONSEQUENCES

This chapter presents the direct and indirect effects of implementing each of the five alternatives described in Chapter 3: the No Action Alternative, Alternative 1, Alternative 2, Alternative 3, and Alternative 4–Proposed Action. The findings are organized by the same 14 resource topics presented in Chapter 4. Direct effects are impacts directly related to and caused by the proposed activities that occur in the same time and place. Indirect effects are impacts that are related to the proposed activities but occur later in time or farther removed in distance. For example, impacts from construction of facilities at Fort Bliss would be a direct effect associated with the alternatives, while an increase in local spending by construction workers would be an indirect effect. In addition, this chapter describes potential cumulative impacts of implementing the proposed land use changes in combination with other past, present, and reasonably foreseeable future actions in the region of influence and summarizes irreversible and irretrievable commitments of resources, the relationship between short-term use of the environment and long-term productivity; and probable adverse impacts that cannot be avoided if the proposed land use changes are implemented.

Each section of this chapter addresses impacts from proposed actions in the Main Cantonment Area and in the Fort Bliss Training Complex. In general, effects in the Fort Bliss Training Complex are presented for the following geographic areas (see Figure 1-2):

- South Training Areas – TAs 1A, 1B, 2A, 2B, 2C, 2D, and 2E
- Doña Ana Range
- North Training Areas – TAs 3A, 3B, 4A, 4B, 4C, 4D, 5A, 5B, 5C, 5D, 5E, 6A, 6B, 6C, 6D, 7A, 7B, 7C, 7D, and Assembly Area
- McGregor Range
 - South Tularosa Basin portion – TAs 8, 9, 25, 30, 31, 32, and portions of TAs 11 and 29 south of Highway 506
 - North Tularosa Basin portion – TA 10, western half of TA 12, and portions of TAs 11 and 29 north of Highway 506
 - Southeast Training Areas – TAs 24, 26, and 27
 - Remainder of McGregor Range – TAs 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 28, 33, and the eastern half of TA 12
- Range Camps – Doña Ana, Orogrande, and McGregor.

Ongoing effects of Fort Bliss’ mission described in the 2000 PEIS that are still applicable are incorporated by reference and not repeated. The impacts of each alternative are presented relative to existing conditions described in Chapter 4; however, projects and actions included in the No Action Alternative have previously been evaluated to comply with NEPA, in accordance with the procedures described in the PEIS.

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1 **5.1 LAND USE**

2 **5.1.1 Introduction**

3 Potential land use issues related to the Proposed Action and other alternatives include the following:

- 4 • Compatibility of proposed changes in land use designation with existing and projected on-post
5 land uses.
- 6 • Potential for proposed training activities to displace or curtail non-military uses, activities, and
7 infrastructure (such as grazing operations, recreation, and utility rights-of-way) on Fort Bliss
8 land.
- 9 • Compatibility of on-post land uses with adjacent off-post land use.
- 10 • Potential for development resulting from increase in Fort Bliss personnel and induced population
11 growth in the region to negatively affect land uses in the region or to conflict with municipal and
12 county planning goals and objectives.
- 13 • Potential for land use changes on McGregor Range to conflict with BLM plans for the range.
- 14 • Potential for proposed development and training activities to alter the landscape and adversely
15 affect sensitive visual resources.
- 16 • Potential for on-post development and training activities to indirectly impact off-post lands by
17 affecting ground transportation and access, through generation of dust and noise, or by increasing
18 safety risks that may reduce the suitability of those lands for their current or planned uses.

19 This section addresses direct and indirect impacts on the Main Cantonment Area and surrounding areas
20 and the Fort Bliss Training Complex and surrounding areas for each of the alternatives. Direct effects on
21 land use include changes in land use designations and in military and non-military uses of Fort Bliss land.
22 Indirect effects include impacts on land use surrounding Fort Bliss due to population changes associated
23 with mission and unit changes at the installation, and off-post effects of on-post activities that may result
24 in land use incompatibilities. This section focuses on direct land use effects, the compatibility of on-post
25 land use designations with adjacent off-post areas, impacts on visual resources, and indirect effects
26 associated with Fort Bliss-related population changes. Other off-post impacts that can indirectly affect
27 land use are addressed in subsequent sections of this SEIS, including:

- 28 • Transportation impacts are addressed in Sections 5.2 and 5.3.
- 29 • Impacts on utility lines and rights-of-way in the Fort Bliss Training Complex are addressed in
30 Section 5.3.
- 31 • Impacts from dust emissions are addressed in Section 5.6.
- 32 • Off-post impacts of elevated noise levels are addressed in Section 5.10.
- 33 • Safety impacts are addressed in Section 5.11.

34 **5.1.2 No Action Alternative**

35 **5.1.2.1 Main Cantonment Area**

36 **On-Post Land Use**

37 Under the No Action Alternative, land use in the Main Cantonment Area would remain as designated in
38 the RPMP adopted pursuant to the ROD for the Mission and Master Plan PEIS. Since the ROD,
39 construction and demolition projects have been implemented in accordance with the procedures described
40 in the PEIS, including development for one BCT on open land on the east side of Biggs AAF. Projects
41 listed for the No Action Alternative primarily address known deficiencies, replacement of substandard
42 facilities, and expansion to meet mission and welfare needs of the additional military personnel. The No

43 Action Alternative responds to the overall Master Planning goals and objectives, and specific issues such
44 as access, traffic, and efficiency will continue to be addressed in site planning for each project.

45 **Land Use in Surrounding Areas**

46 The effects of Fort Bliss development and mission activities on surrounding land uses under the No
47 Action Alternative will remain essentially the same as under the current conditions. Development for one
48 BCT is compatible with adjacent uses of EPIA. The increase in personnel does not significantly affect
49 land use in the ROI.

50 **5.1.2.2 Fort Bliss Training Complex**

51 **Military Land Use**

52 The No Action Alternative will not change the land use designations in the Fort Bliss Training Complex
53 from those established through the TADC pursuant to the ROD for the Mission and Master Plan PEIS.
54 Training units will use the South Training Areas, North Training Areas, and TA 8 on McGregor Range
55 for off-road vehicle maneuver training by a Heavy BCT and other users. The remainder of McGregor
56 Range will continue to be used for On-Road Vehicle Maneuver, Weapons Firing/Safety Danger Zone,
57 Dismounted Training, Aircraft Operations, and Mission Support Facility as designated in the TADC.

58 **Non-Military Land Use**

59 The No Action Alternative will not alter existing public access to and use of the training areas currently
60 open to public access by permit, including the joint-use areas of McGregor Range. An increase in
61 mobilization training in recent years has resulted in a decrease in the time available for public access for
62 recreation in the South and North Training Areas. Public access for recreation is low in number and
63 managed through a permitting system requiring approval for each entry onto the range. Public access will
64 still be available most weekends.

65 **Land Use in Surrounding Areas**

66 Areas adjacent to the Fort Bliss Training Complex will be exposed to increased dust and noise associated
67 with training by one Heavy BCT (see Sections 5.6 and 5.10).

68 **5.1.2.3 Visual Resources**

69 Under the No Action Alternative, the visual character of the Main Cantonment Area will be maintained in
70 accordance with the RPMP and Mission and Master Plan PEIS. Fort Bliss will continue to use the
71 Installation Design Guidelines to achieve an integrated appearance for the installation, in response to
72 varying functional needs. Consideration of visual changes from demolition and new construction on
73 historic districts and facilities will also follow requirements of the National Historic Preservation Act.
74 EUL development in the WBAMC area will include restoration and reuse of historic facilities and
75 landscape features to mitigate the loss of some historic structures. This will provide a strong visual image
76 for the redeveloped area that is respectful of the surrounding neighborhood context. Several projects will
77 upgrade and modernize existing facilities, providing the positive benefit of well-maintained surroundings.

78 New development on the east side of Biggs AAF changes open land into urbanized forms. Some of this
79 will be visible from Loop 375 and the expanded Sergeants Major Boulevard. The development for a new
80 BCT is consistent with the existing surrounding context of Biggs AAF, EPIA, and long-established areas
81 of El Paso.

82 New live-fire ranges being constructed in the training areas involve clearing and leveling to provide sites
83 for structures, stands, roads, and targets. Some new sites may be visible from adjacent roadways at
84 locations that are slightly higher in elevation or where there are no intervening terrain features. These
85 areas will be similar to other existing sites on the Fort Bliss Training Complex. The projects on

86 McGregor Range will be located in VRM Class IV areas, which are least sensitive to visual change due to
87 lack of visual resource value.

88 **5.1.3 Alternative 1**

89 **5.1.3.1 Main Cantonment Area**

90 **On-Post Land Use**

91 Under Alternative 1, land use designations in the Main Post and Biggs AAF portions of the Main
92 Cantonment Area would be changed to a single mixed-use designation, and the Main Cantonment Area
93 would be expanded to include all of the installation south and west of Loop 375, as well as a small portion
94 of TA 1B east of Loop 375. This would enhance the capability and flexibility of the Main Cantonment
95 Area to accommodate mission requirements in a manner that maximizes functional adjacencies. By
96 increasing the efficiency of facility and infrastructure siting, including locating unaccompanied personal
97 quarters near work locations, this approach to land use planning has the potential to decrease traffic and
98 congestion within the Main Cantonment Area and reduce consumption of fuel and other resources. It
99 would also improve the responsiveness of the installation infrastructure to evolving mission requirements
100 and increase training efficiency by locating functions such as vehicle fueling and maintenance closer to
101 training areas. Land use compatibility on post would be maintained by using Army compatibility criteria
102 in siting new facilities and other development. Major development and redevelopment would occur on
103 about 4,000 acres within the Main Cantonment Area to provide needed mission and support facilities for
104 new troops, their dependents, and additional civilian personnel.

105 In addition to the projects being implemented under the No Action Alternative, about 1,500 acres on the
106 east side of Biggs AAF and along the existing ramp areas would be developed for a new CAB and three
107 additional BCTs. This location is favorable from a land use perspective because it can be connected to
108 the existing infrastructure through extensions of utility distribution lines, and it is adjacent to the South
109 Training Areas. Convenient access to training areas would reduce the time and cost of operations and
110 maximize time for training. Troops would have access to the existing services on the Main Post as well
111 as new support facilities built near the main BCT complex (e.g., fitness facilities, chapel, medical clinics,
112 shopping centers, and service centers). Existing explosive storage areas on Biggs AAF would be
113 relocated as needed to remove the land use constraints imposed by quantity-distance safety zones. New
114 locations for those facilities would be selected that are less suited to development but still convenient to
115 mission functions. On the Main Post, new construction and facility upgrades would result in changes
116 from the current land use.

117 The RCI is planning to develop an additional 1,730 homes for military families in the area between EPIA
118 and Loop 375. This area is outside the 65 DNL noise contour for EPIA (see Figure 4.10-2).

119 **Land Use in Surrounding Areas**

120 The additional units identified for stationing on Fort Bliss are projected to increase population in the ROI
121 by about 120,000 people over the next five years, above baseline growth level (see Section 5.13). This
122 includes new military and civilian personnel, their dependents, and other incoming population caused by
123 increased economic activity. The population influx would generate a demand for more than 36,000
124 homes in the region above that projected under the No Action Alternative (see Section 5.13). The
125 increased growth would affect local land use plans and infrastructure development, especially in El Paso
126 County. Most of the growth in the county in recent years has occurred in east El Paso, and this trend is
127 expected to continue. The City of El Paso recently changed its Master Plan to proceed with zoning an
128 18,000-acre area in Northeast El Paso. The conceptual planned development for this area includes about
129 62,000 homes, commercial and industrial areas, community facilities, parks, and schools. This large-
130 scale initiative would meet future housing needs, but in the interim, new housing supplies may not be able
131 to keep up with demand and there may be interim shortfalls in residential capacity in the city. Residents

132 may seek areas that are already established, accessible, or less expensive such as Chaparral and Anthony,
133 New Mexico. The planned Northeast Loop highway project could also influence the location of new
134 growth in the region into Northeast El Paso and the Chaparral and Anthony areas of Doña Ana County.
135 Open space areas would be converted to residential and other development.

136 Municipal and county planning and land use controls are the primary mechanisms for managing
137 sustainable growth. There is currently no community-level plan for development in the Chaparral area.
138 Issues of public financing and housing demands are addressed in more detail in Section 5.13.

139 **5.1.3.2 Fort Bliss Training Complex**

140 **Military Land Use**

141 Land use in the South Training Areas would not change under Alternative 1, although the boundary of
142 TA1B would be modified to reflect the expansion of the Main Cantonment Area. Additional mission
143 support facilities would be developed on TA1B, which would be compatible with the designated use of
144 this training area. Land use in the Doña Ana Range-North Training Areas would only change in the
145 Assembly Area between War Highway and Doña Ana Range, which would be opened to Off-Road
146 Vehicle Maneuver. Development of new live-fire ranges in the Doña Ana Range complex would be
147 compatible with the designated land use of this area.

148 Land use in the south Tularosa Basin portion of McGregor Range would be changed under this alternative
149 to permit Off-Road Vehicle Maneuver and to develop the Orogrande Range Complex. This would
150 increase the training demand in the affected training areas and require efficient scheduling of test and
151 training activities. In particular, missile firings on McGregor Range, which historically have scheduled
152 the range for up to two days per event, would need to schedule shorter windows and possibly incorporate
153 real-time adjustments to allow more co-use for military training consistent with safety restrictions.

154 Increasing the amount of training land available for Off-Road Vehicle Maneuver would enhance the
155 overall capability of the Fort Bliss Training Complex to support Army mission requirements. The ability
156 to train to full doctrinal standards would improve the overall quality of training provided to troops
157 potentially deploying to areas of conflict and, by providing more realistic training, reduce the risks they
158 face in combat.

159 **Non-Military Land Use**

160 Additional use of the North and South Training Areas for Off-Road Vehicle Maneuver would limit the
161 time when non-military users could get access for recreation. Since there is very little public recreational
162 use (documented by the number of annual permits issued) other than on weekends and during designated
163 hunts, and demand has not been increasing, the impact would be minor. On McGregor Range, there may
164 be a slight increase in military use in areas where public access is permitted. Conversely, the duration of
165 closures of TAs on Otero Mesa and in the Sacramento Mountains for missile firings would likely
166 decrease. Therefore, little impact is projected on public activities on McGregor Range. Increased
167 training on McGregor Range may result in more use of Highway 506, but this would not cause road
168 closures or preclude access to communities on the east side of the range. The proposed changes in
169 military use of McGregor Range would not preclude non-military use of the land. The McGregor RMPA
170 does not permit non-military off-road vehicle use on the range.

171 **Land Use in Surrounding Areas**

172 Increased dust and noise may reduce the desirability of some areas adjacent to the Fort Bliss Training
173 Complex for residential use and for recreation, particularly on the south and east sides of the South
174 Training Areas and south and west sides of Doña Ana Range (see Sections 5.6 and 5.10). It is unlikely
175 that land uses would change dramatically, but unfavorable conditions may influence where people choose
176 to live, affecting regional growth patterns over time.

177 **5.1.3.3 Visual Resources**

178 Under Alternative 1, the Main Post, Logan Heights, and WBAMC would continue to be redeveloped and
179 have some infill projects that would not be visually different from the past or current visual context. In
180 general, those projects would keep up the image of well-maintained facilities and improve the appearance
181 of the installation.

182 Development east of Biggs AAF would increase under this alternative, resulting in about 1,500 acres of
183 new urbanized landscape. This visual change would be evident to travelers along major roadways such as
184 Loop 375 and Sergeants Major Boulevard. It would be similar to the industrial and commercial
185 development occurring on adjacent airport property. The new development on Biggs AAF would not be
186 near existing residential areas that might be sensitive to the visual effects of large-scale industrial
187 development. Dust during construction may be a temporary direct impact on visibility and cause
188 annoyance to El Paso residents driving and living in proximity to Fort Bliss, but this would be a
189 temporary impact and would not alter the visual environment.

190 The North and South Training Areas would have increased off-road vehicle activity, but the landscape has
191 already undergone change from reduced vegetation and soil disturbance. Most of this land has evolved
192 into a hummocky dune landscape. Further changes in this relatively stable degraded landscape would be
193 slow, and therefore no impact on visual resources is expected from training in those areas.

194 Additional new ranges would be developed on the Fort Bliss Training Complex. Development of the
195 DAGIR and CACTF on the McGregor Range would involve large areas, but the features would be
196 relatively dispersed given the size of the range. Within the areas classified by BLM as VRM IV, the
197 visual changes would not be inconsistent with management objectives. For the most part, the new
198 features would not be visible off the installation, except from higher viewing locations along the
199 roadways.

200 Off-road vehicle maneuvers in the south Tularosa Basin portion of McGregor Range may change the
201 vegetative cover over time, and areas close to key facilities such as the Orogrande Range Complex and
202 McGregor Range Camp would become more bare. Such changes to the landscape could occur slowly,
203 and viewers may adapt to the altering visual context. This incremental nature of the change over time
204 could lessen the impact of the visual changes, even when they are substantial. The changes may be
205 visible from observation points along the rim of Otero Mesa overlooking the Tularosa Basin. The
206 reduced vegetation, greater visibility of the soil, and increased dust in the air could result in a less
207 desirable visual character. The major new facilities at the Orogrande Range Complex would be visible as
208 distant features but not incongruous with a landscape that has existing dispersed human-made elements.

209 Night training would occur on the Fort Bliss Training Complex and would include use of illumination
210 flares, especially at the DAGIR. These would be temporary light sources that might be visible off-post,
211 but because of distance, would be small, temporary, and unobtrusive.

212 **5.1.4 Alternative 2**

213 **5.1.4.1 Main Cantonment Area**

214 Land use impacts in the Main Cantonment Area and surrounding areas under Alternative 2 would be
215 similar to Alternative 1. This alternative also includes the construction of facilities and operations
216 associated with a second CAB along the Biggs AAF flightline. This may require relocating the existing
217 hot cargo pad on the north side of the airfield, depending on the site selected.

218 **5.1.4.2 Fort Bliss Training Complex**

219 **Military Land Use**

220 The effects of Alternative 2 on military land use in the Fort Bliss Training Complex would be essentially
221 that same as described for Alternative 1. This alternative provides the additional benefit of enabling
222 movement-to-contact maneuver exercises at the BCT level.

223 **Non-Military Land Use**

224 In addition to the non-military land use impacts described for Alternative 1, this alternative would expand
225 off-road vehicle maneuvers into TAs 10, 11, and 12 north of Highway 506. These are currently joint-use
226 areas and support grazing (Grazing Units 1 and 2) and other public uses. These training areas are
227 relatively far from the Main Cantonment Area and the range camps and are likely to receive less use than
228 other parts of the Fort Bliss Training Complex, at least in the near term. As training use increases,
229 changes in vegetation and forage condition caused by tracked vehicles could limit the productivity of the
230 area for grazing. It would become more difficult to maintain the integrity of the fences that separate
231 pastures, and cattle would likely avoid the area during maneuvers. Based on current and historic grazing
232 levels from 1993 through 2002 for these two grazing units, if all grazing in this area were eliminated, it
233 could eventually result in a reduction of about 3,660 AUMs per year on McGregor Range. This
234 represents a reduction of about 17 percent for McGregor Range and about 2 percent county wide. The
235 McGregor RMPA would need to be modified if BLM were to take these units out of grazing.

236 Road access along Highway 506 and on the road through Grazing Unit 1 to grazing units on Forest
237 Service land may be interrupted occasionally by military activity under Alternative 2 (see Section 5.3.4).
238 Access to the grazing units would generally be available on weekends. Access at other times could be
239 scheduled to avoid hours when tracked vehicles are maneuvering in these areas. While this may be less
240 convenient for a few operators, it would not significantly affect operations on Forest Service pastures.

241 TAs 10, 11, and 12 also offer opportunities for bird hunting and other recreation. Public access is
242 expected to continue to be available most weekends. Recreation activities would be permitted to the
243 extent they do not interfere with military activities.

244 **Land Use in Surrounding Areas**

245 Impacts from Alternative 2 on land use in areas surrounding the Fort Bliss Training Complex would
246 generally be the same as described for Alternative 1. The addition of a second CAB would increase
247 helicopter operations on Doña Ana Range and the DAGIR. This might generate increased aircraft noise
248 in the community of Orogrande.

249 **5.1.4.3 Visual Resources**

250 The effects of Alternative 2 on visual resources would be similar to Alternative 1, with the addition of
251 more development along the flightline of Biggs AAF for a second CAB. This development would be
252 visible but similar in building type, scale, and function to other structures around the airfield. It would
253 not change the visual quality or character of the airfield, nor affect the surrounding areas.

254 Alternative 2 would expand the area used for Off-Road Vehicle Maneuver into the north Tularosa Basin
255 portion of McGregor Range where there is currently public access and some recreational use. Areas of
256 concentrated use, such as crossings over Highway 506, could experience reduced vegetation. Public
257 access may continue to be available in the training areas north of Highway 506 (although it may be
258 reduced), and viewers may be able to see more close-up effects of the landscape changes from that
259 roadway. The color and texture of the landscape could change over time and be perceived as a loss of
260 productivity and sustainability of the land. The affected areas in TAs 10 and 11 are classified by BLM as
261 VRM III and IV, depending on distance from roadways.

262 **5.1.5 Alternative 3**

263 **5.1.5.1 Main Cantonment Area**

264 Land use impacts of Alternative 3 in the Main Cantonment Area and surrounding areas would be the
265 same as described for Alternatives 1 and 2.

266 **5.1.5.2 Fort Bliss Training Complex**

267 The impacts from Alternative 3 on the Fort Bliss Training Complex would be similar to Alternative 1. In
268 addition, opening TAs 24, 26, and 27 to Off-Road Vehicle Maneuver would offer a more diverse military
269 training environment.

270 The use of TAs 24, 26, and 27 for Off-Road Vehicle Maneuver would not affect non-military land use on
271 McGregor Range. These areas are open for public use, but there is little road access.

272 **5.1.5.3 Visual Resources**

273 The impacts from Alternative 3 on visual resources in the Main Cantonment Area, North and South
274 Training Areas, south Tularosa Basin portion of McGregor Range, and surrounding areas would be the
275 same as described for Alternatives 1 and 2. Under Alternative 3, Off-Road Vehicle Maneuver would also
276 be extended to the more varied terrain in the southeastern training areas of McGregor Range. These areas
277 have somewhat more interesting landscape features in the near and middle ground, more varied terrain,
278 and more vegetative cover than other parts of the range. Tracked vehicle operations could alter the
279 vegetation and disrupt some of the natural drainages. Over time, as training levels increase, this land
280 could undergo major changes in the landscape, with more gullies, less vegetation, and loss of soil due to
281 erosion. This change in character could be perceived as a reduction in the visual quality of the landscape.

282 **5.1.6 Alternative 4 – Proposed Action**

283 Alternative 4 would increase the capability of Fort Bliss to support a wide range of future test and training
284 needs. In order to understand fully the reasonably foreseeable consequences of providing the additional
285 capability, this SEIS analyzes the effects of stationing one or two (with one deployed) additional BCTs at
286 Fort Bliss, although there are no current plans to do so.

287 **5.1.6.1 Main Cantonment Area**

288 The impacts of Alternative 4 on land use in the Main Cantonment Area and in the surrounding area would
289 include the effects described for Alternatives 1 and 2.

290 The analysis of land use impacts in the Main Cantonment Area considers adding capacity for up to two
291 additional BCTs at Fort Bliss. This could involve developing two additional 300-acre areas in the Main
292 Cantonment Area or in adjacent TA 1B to accommodate the troops and mission requirements. The siting
293 of this development would need to respond to the surrounding context to ensure compatibility with
294 adjacent land uses. For example, the future location of additional military family housing is not yet
295 known and may not be compatible adjacent to BCT mission activities. It is unlikely that additional BCT
296 areas would be sited close to off-post residential areas without a barrier, such as a major roadway,
297 separating them from other land uses.

298 **5.1.6.2 Fort Bliss Training Complex**

299 Alternative 4 would include adding the Off-Road Vehicle Maneuver training category to the south
300 Tularosa Basin, north Tularosa Basin, and southeast TAs on McGregor Range. The impacts on land use
301 would be the same as described for Alternatives 1, 2, and 3.

302 This alternative would substantially increase the training capability of the Fort Bliss Training Complex,
303 including doubling the amount of area available for Off-Road Vehicle Maneuver, provide a greater
304 variety of terrain conditions and more options for realistic training, and provide the ability to conduct

305 movement-to-contact maneuver exercises at the BCT level. With a larger area available for Off-Road
306 Vehicle Maneuver, Fort Bliss would have the capability to simultaneously train up to six Heavy BCTs or
307 the equivalent amount of training by other units.

308 Alternative 4 would result in similar impacts on non-military use as described for Alternatives 1, 2 and 3,
309 including impacts to grazing on McGregor Range described for Alternative 2. This alternative would not
310 change military use on Otero Mesa, although some activities (e.g., Dismounted Training) may increase.
311 Public use on Otero Mesa would still be possible, but time availability could be reduced depending on
312 future military requirements.

313 **5.1.6.3 Visual Resources**

314 The impacts of the Alternative 4 on visual resources in the Main Cantonment Area would be the same as
315 described for Alternatives 1, 2, and 3. The addition of facilities for up to two additional BCTs would not
316 cause a visual impact. The degree of urbanization, both on post and off post, by 2010 or beyond would
317 encompass any further development.

318 The impacts of the Proposed Action on visual resources in the Fort Bliss Training Complex would also be
319 the same as described for Alternatives 1, 2, and 3. The overall landscape changes in the Tularosa Basin
320 would likely remain similar to its current condition, although there would be an increase in bare ground
321 and weedy vegetation in areas of concentrated use. This area is not classified as a distinctive and valued
322 resource. The more valued grassland areas on Otero Mesa, especially in the ACEC, would not be directly
323 affected by training and are expected to retain their visual quality.

1 **5.2 MAIN CANTONMENT AREA INFRASTRUCTURE**

2 **5.2.1 Introduction**

3 **5.2.1.1 Ground Transportation**

4 The effects of each alternative on roadway traffic were assessed by estimating the number of trips
5 generated by each land use, considering the expected number of employees, visitors, residents, and
6 service vehicles associated with construction and other on-site activities. The trip generation was
7 determined by estimating the number of vehicle trips in the peak hour and distributing the trips on the
8 regional and local road network. The principal trip-generating land uses include a mixture of housing,
9 administrative space, and light industrial type areas. Trip generation was based on applying the trip rates
10 from the Institute of Transportation Engineers *Trip Generation Manual, 5th Edition* (Ref# 410) to the
11 proposed land uses to forecast peak-hour trips. The ITE manual does not have specific trip generation
12 rates for military land uses, therefore the closest ITE land uses were used. **Table 5.2-1** outlines the
13 comparison of military land uses to ITE land uses (Ref# 411). Using these ITE land uses, trips were
14 estimated for each of the alternatives in the years 2016 and 2021.

15 **Table 5.2-1. Comparison of Military and ITE Land Uses**

<i>Military Use</i>	<i>ITE Land Use</i>	<i>ITE Land Use Code</i>
Headquarters Buildings, CAB Complex, Sustainment Bde Complex, Battle Command Training Center, Heavy BCT Complex ¹	Single Tenant Office Building	715
Criminal Investigation Division Command, Fire Station/MP	Government Office Building	730
Youth Center, Community Activities Center, Physical Fitness, Community Services Center, Junior Enlisted Club, EOD Facility, Soldier Service Center	Recreational Community Center	495
Chapel Complex, Chapel Family Life Center	Church	560
Mini-Mall, Shopping Center	Shopping Center	820
RCI Development	Single-Family Detached Housing	210
Barracks	Low-Rise Apartments	221
Ammunition Storage Facility	Warehousing	150
Bulk Fuel Facility, Motor Pool	Service Station	844
Medical/Dental Clinic, Hospital, Consolidated Family Care/Troop Medical	Medical-Dental Office Building	720
Child Development Center, School Aged Services Center	Daycare Center	565
Softball Complex	City Park	411
Library	Library	590
Maintenance, Central Issue Facility, Deploy Storage Facility, TAC Equip Shop, DOIM Facility, Pallet Processing Facility	General Light Industrial	110
Aviation Facilities	General Aviation Support	22
Dual Food Facility	High-Turnover (Sit-Down) Restaurant	832
Bio/Safety Lab	Research and Development Center	760
Enhanced Use Leasing	Retail-General Merchandise	810

1. BCT complexes include a mix of uses, including office, industrial, and barracks.

16 A determination was made on how to distribute these trips on the roadway network, based on where the
17 trips are generated and attracted. A 30 percent capture rate was used for trips generated in the Main

18 Cantonment Area (Ref# 411). This means 30 percent of the trips generated in the Main Cantonment Area
19 are estimated to stay inside the Main Cantonment Area and not enter the regional roadway network
20 system. The trip distribution combined with normal baseline growth rates on the roadway network
21 provide an overall amount of traffic on each roadway.

22 For this analysis, the baseline growth rates on the roadway network correspond to the population forecasts
23 provided in the 2030 Metropolitan Transportation Plan, in which 1.7 percent growth rate per year was
24 used (Ref# 412). The 2030 Metropolitan Transportation Plan also includes future transportation projects
25 and their effects on the roadway system. In addition to the Inner Loop and Northeast Parkway described
26 in Section 4.2.1, they include adding additional lanes to I-10, Montana Avenue, and US 54. The
27 additional roadway capacity resulting from the planned and programmed projects was taken into account
28 in calculating the LOS in the years 2016 and 2021. The trips generated under each alternative were
29 distributed onto the roadway network and compared to the future capacity of the roadways and volume-
30 to-capacity ratios to determine LOS for each roadway segment.

31 **5.2.1.2 Utilities, Energy, and Communications**

32 The impacts of the Proposed Action and other alternatives on utilities, energy, and communications are
33 primarily related to projected increases in population on and off post. These were analyzed by estimating
34 per unit consumption on generation rates using the most recently available data, and then estimating how
35 total consumption or generation rates would change with the changed population. The increased
36 consumption and generation were then compared with the ability of existing infrastructure to handle those
37 changes. The method of estimating unit consumption and generation rates is described in Section 4.2.
38 Impacts on potable water supply are based on water consumption rates described in Section 4.7.
39 Additional storm water runoff was calculated based on average annual rainfall and the projected increase
40 in impervious surface in the Main Cantonment Area, including Biggs AAF.

41 The effects of increased population on water resources are discussed in Section 5.7. This section deals
42 only with the infrastructure component of water supply.

43 **5.2.2 No Action Alternative**

44 **5.2.2.1 Ground Transportation**

45 **Table 5.2-2** summarizes the total estimated trips associated with each geographic segment of the Main
46 Cantonment Area for the No Action Alternative and other alternatives.

47 **Table 5.2-2. Estimated Main Cantonment Area Trip Generation**

<i>Alternative</i>	<i>Main Post and Biggs AAF (a.m.)</i>	<i>Main Post and Biggs AAF (p.m.)</i>	<i>Logan Heights (a.m.)</i>	<i>Logan Heights (p.m.)</i>	<i>WBAMC (a.m.)</i>	<i>WBAMC (p.m.)</i>	<i>Total Trips (a.m.)</i>	<i>Total Trips (p.m.)</i>
No Action	4,600	5,700	400	500	7,500	7,600	12,500	13,800
Alternative 1	19,300	22,600	1,100	1,500	8,200	8,600	28,600	32,700
Alternative 2	21,800	25,800	1,100	1,500	8,200	8,600	31,100	35,900
Alternative 3	21,800	25,800	1,100	1,500	8,200	9,600	31,100	35,900
Alternative 4	24,000	28,000	1,500	1,500	8,200	8,600	33,300	38,100

48 Based on the trip distribution method described in Section 5-2.1.1, **Table 5.2-3** (for 2016) and **Table 5.2-**
49 **4** (for 2021) indicate the resulting LOS for each road segment analyzed under each alternative.
50 Improvements in LOS on some segments compared to current conditions described in Section 4.2.1
51 reflect planned roadway improvements.

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

52

Table 5.2-3. Level of Service for Area Roadways in 2016

<i>Route</i>	<i>Segment</i>	<i>No Action</i>	<i>Alternative 1</i>	<i>Alternative 2</i>	<i>Alternative 3</i>	<i>Alternative 4</i>
I-10	US 54 to Paisano Dr	E	F	F	F	F
I-10	Paisano Dr to McRae Blvd	F	F	F	F	F
I-10	McRae Blvd to Yarborough Dr	D	D	D	D	D
I-10	Yarborough Dr to Lee Trevino Dr	D	D	D	D	D
I-10	Lee Trevino Dr to Zaragoza Rd	C	C	C	C	C
I-10	Zaragoza Rd to Loop 375	C	C	C	C	C
I-10	Loop 375 to Horizon Blvd	C	C	C	C	C
Montana Ave	US 54 to Paisano Dr	B	B	B	B	C
Montana Ave	Paisano Dr to Hawkins Blvd	C	C	C	C	C
Montana Ave	Hawkins Blvd to McRae Blvd	C	D	D	D	D
Montana Ave	McRae Blvd to Yarborough Dr	C	C	C	C	C
Montana Ave	Yarborough Dr to Lee Trevino Dr	B	C	C	C	C
Montana Ave	Lee Trevino Dr to Loop 375	B	C	C	C	C
Montana Ave	Loop 375 to Hueco Club Rd	B	C	C	C	C
US 54	I-10 to Trowbridge Ave	B	B	C	C	C
US 54	Trowbridge Ave to Pershing Dr	B	C	C	C	C
US 54	Pershing Dr to Van Buren Ave	D	D	D	D	D
US 54	Van Buren Ave to Fred Wilson Ave	C	D	D	D	D
US 54	Fred Wilson Ave to Hondo Pass	C	C	C	C	C
US 54	Hondo Pass to Loop 375 (Transmountain) to Kenworth St.	C	D	D	D	D
Loop 375	Route 659 to Montana Ave	C	D	D	D	D
Loop 375	Montana Ave to BR 54	C	C	D	D	D
Loop 375	BR 54 to US 54	C	D	D	D	D
Fred Wilson	US 54 to Airport Rd	C	D	D	D	E
Airport Rd	Fred Wilson Ave to Haan Rd	F	F	F	F	F

Note: Definitions for LOS are provided in Section 4.2.1

53 Under the No Action Alternative, three segments are operating at LOS E or F, which are unacceptable
 54 levels. Several other segments are experiencing a decline in LOS from current conditions, but still
 55 operate at acceptable levels. Three segments operate at LOS D. By 2021, the same three segments of I-
 56 10 and Airport Road will still be the only roads projected to have unacceptable LOS, and I-10 between
 57 US 54 and Paisano Drive will degrade further to LOS F.

58

Table 5.2-4. Level of Service for Area Roadways in 2021

<i>Route</i>	<i>Segment</i>	<i>No Action</i>	<i>Alternative 1</i>	<i>Alternative 2</i>	<i>Alternative 3</i>	<i>Alternative 4</i>
I-10	US 54 to Paisano Dr	F	F	F	F	F
I-10	Paisano Dr to McRae Blvd	F	F	F	F	F
I-10	McRae Blvd to Yarborough Dr	D	D	D	D	D
I-10	Yarborough Dr to Lee Trevino Dr	D	D	D	D	D
I-10	Lee Trevino Dr to Zaragoza Rd	D	D	D	D	D
I-10	Zaragoza Rd to Loop 375	C	C	C	C	C
I-10	Loop 375 to Horizon Blvd	C	C	C	C	C
Montana Ave	US 54 to Paisano Dr	B	B	C	C	C
Montana Ave	Paisano Dr to Hawkins Blvd	C	C	C	C	C
Montana Ave	Hawkins Blvd to McRae Blvd	C	D	D	D	D

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

<i>Route</i>	<i>Segment</i>	<i>No Action</i>	<i>Alternative 1</i>	<i>Alternative 2</i>	<i>Alternative 3</i>	<i>Alternative 4</i>
Montana Ave	McRae Blvd to Yarborough Dr	C	C	C	C	C
Montana Ave	Yarborough Dr to Lee Trevino Dr	B	C	C	C	C
Montana Ave	Lee Trevino Dr to Loop 375	B	C	C	C	C
Montana Ave	Loop 375 to Hueco Club Rd	C	C	C	C	C
US 54	I-10 to Trowbridge Ave	C	C	C	C	C
US 54	Trowbridge Ave to Pershing Dr	C	C	C	C	C
US 54	Pershing Dr to Van Buren Ave	D	E	E	E	E
US 54	Van Buren Ave to Fred Wilson Ave	D	D	D	D	E
US 54	Fred Wilson Ave to Hondo Pass	C	C	C	C	C
US 54	Hondo Pass to Loop 375 (Transmountain) to Kenworth St.	C	D	D	D	D
Loop 375	Route 659 to Montana Ave	C	D	D	D	D
Loop 375	Montana Ave to BR 54	C	D	D	D	D
Loop 375	BR 54 to US 54	C	D	E	E	E
Fred Wilson	US 54 to Airport Dr	C	D	E	E	E
Airport Rd	Fred Wilson Ave to Haan Rd	F	F	F	F	F

Note: Definitions for LOS are provided in Section 4.2.1

59 **5.2.2.2 Utilities**

60 **Water Supply**

61 The No Action Alternative involves a total increase in on-post population of approximately 7,311
62 persons, resulting in an increase of approximately 0.8 MGD (912 afy) in consumption of potable water,
63 which would be provided by EPWU. This estimate assumes the current per capita consumption rate (203
64 gallons/person/day), which is an overestimation because Fort Bliss is redeveloping existing housing and
65 is building additional housing that will use water-conserving plumbing and xeriscaping. This is expected
66 to reduce water consumption by approximately 81,000 gallons per household per year, or approximately
67 84 gallons per person per day. Water connections will need to be added to new construction, but existing
68 capacities of the pipelines from EPWU connections are adequate to meet increased flows.

69 Off-post population is estimated to increase by approximately 19,680 persons, requiring an additional 2.8
70 MGD (3,095 afy) from EPWU's water distribution system. The combined requirement of both on-post
71 and off-post population increase represents approximately 4 percent of EPWU's existing demand and
72 slightly over 1 percent of EPWU's treatment capacity.

73 **Wastewater Treatment**

74 New facilities constructed under the No Action Alternative will have sewer lines laid and connected to the
75 existing sewer connections with EPWU's sewer system. No other upgrades to the on-post sewer system
76 will be required. The available capacity of EPWU's treatment system is adequate to handle the additional
77 on-post load, estimated at 0.7 MGD. This load represents approximately 5 percent of the Haskell Street
78 plant's existing excess capacity. Off post, the increase in population associated with the No Action
79 Alternative will generate approximately 2.1 MGD of additional wastewater. The combined additional
80 flow represents about 6 percent of EPWU's excess treatment capacity. Combined with estimated
81 population growth in the El Paso area, wastewater treatment would require approximately 94 percent of
82 EPWU's existing capacity in 2010.

83 **Storm Water**

84 Storm water conveyances will be constructed in the area between EPIA and Biggs AAF to handle the
85 runoff from the estimated 330 acres of new impervious surface created by the No Action Alternative.

86 Additional storm water management facilities will be built to minimize the discharge of storm water from
87 the Main Cantonment Area during high-intensity rainfall.

88 **Solid Waste Disposal**

89 The construction at Fort Bliss under the No Action Alternative will generate an estimated 6.6 tons of
90 additional construction waste per day that will be disposed of in the Fort Bliss landfill, and 0.8 tons of
91 recyclable material. Refuse from the post disposed of in the Fort Bliss landfill will increase by
92 approximately 6.0 tons per day (16 percent increase). Refuse from on-post residential areas and off-post
93 residents will increase the disposal rate of solid waste to the Clint Landfill by approximately 31.4 tons per
94 day (4 percent increase), shortening its life by less than a year.

95 **5.2.2.3 Energy**

96 **Electricity**

97 With the increase in personnel on Fort Bliss under the No Action Alternative, peak electrical demand will
98 increase by approximately 9.1 MVA, and consumption will increase by approximately 2.7 MW. The
99 increase in consumption represents 3.8 percent of the current excess power available from EPEC. Power
100 will be routed to areas of new construction on post and will require the addition of a substation. The
101 increase in off-post population will increase peak electrical demand by approximately 10.8 MVA, which
102 is 4.5 percent of the current excess power available from EPEC.

103 **Natural Gas**

104 The square footage of buildings on Fort Bliss will increase by 60 percent under the No Action Alternative
105 to a total of approximately 18 million square feet. At the current rate of hourly gas consumption per
106 square foot (0.08 CFH), total gas consumption during the coldest days will be on the order of 1.4 million
107 CFH. This consumption is well within the current capacity of the existing infrastructure.

108 **5.2.2.4 Communications**

109 Under the No Action Alternative, except for routing of telephone lines and other communications lines to
110 new facilities, no major changes in communications systems are anticipated.

111 **5.2.3 Alternative 1**

112 **5.2.3.1 Ground Transportation**

113 For the analysis of Alternative 1 the large influx of vehicles was distributed around the Fort Bliss Main
114 Cantonment Area on US 54, Airport Road, and Fred Wilson Avenue. LOS on 11 roadway segments
115 would be lower than under the No Action Alternative in 2016 (see Table 5.2-3). Six would decline to
116 LOS D and I-10 between US 54 and Paisano Drive would further degrade to LOS F. By 2021, another
117 segment of I-10 would be at LOS D, and US 54 between Pershing Drive and Van Buren Avenue would
118 operate at LOS E (see Table 5.2-4). Four of the roadway segments would operate at LOS E or F.

119 The decline to unacceptable LOS on I-10 and US 54 could be mitigated by widening those roadway
120 segments. I-10 is already projected to be at LOS F between Paisano Drive and McRae boulevard by 2016
121 and between Paisano Drive and US 54 by 2021 under the No Action Alternative. It is estimated that
122 widening the 5-mile segment between US 54 and McRae Boulevard to 12 lanes would cost approximately
123 \$75 million. Widening US 54 to 8 lanes between Pershing Drive and Van Buren Avenue is estimated to
124 cost approximately \$10 million. Airport Road between Fred Wilson Avenue and Haan Road is projected
125 to operate at LOS F under all alternatives. Widening that roadway segment to 8 lanes is estimated to cost
126 \$14 million (Ref# 568, 569, 570).

127 **5.2.3.2 Utilities**

128 **Water Supply**

129 Alternative 1 involves an increase in the on-post population of approximately 18,768 persons and a daily
130 population of approximately 11,491, requiring an additional 4.1 MGD (4,570 afy) of potable water. As
131 noted for the No Action Alternative, this is based on a per capita consumption rate of 203 gallons/day and
132 likely an overestimation because of water conservation measures being incorporated in military family
133 housing. The additional water required would be supplied by EPWU. Water connections would need to
134 be added to new buildings, and existing capacities of the pipelines from EPWU connections may need to
135 be upgraded to meet increased flows.

136 Off post, the projected population increase of approximately 101,328 persons would require an additional
137 14.4 MGD (16,140 afy) from EPWU's water distribution system. The combined requirements from both
138 on-post and off-post population increases would represent almost 20 percent of EPWU's existing demand
139 for water and 6 percent of EPWU's current treatment capacity.

140 **Wastewater Treatment**

141 Alternative 1 would require sewer lines and extensions between new facilities and the existing sewer
142 connections with EPWU's sewer system. Sewer lines on post would need to be increased in size to
143 handle the additional loads. The wastewater load from the post would nearly double (increase by 3.2
144 MGD), which would be about 24 percent of the existing excess capacity of the Haskell Street plant. The
145 increase in off-post population would generate another 11.1 MGD of wastewater. The combined
146 additional flow represents about 32 percent of EPWU's excess treatment capacity. Combined with
147 baseline population growth, total wastewater treatment demand is projected to exceed EPWU's existing
148 treatment capacity by about 7 percent by 2015.

149 **Storm Water**

150 Under Alternative 1, storm water conveyances would need to be constructed in the area between EPIA
151 and Biggs AAF to handle the runoff from the estimated 1,300 acres of new impervious surface in the area.
152 Additional storm water management facilities may need to be built to minimize the discharge of storm
153 water from Fort Bliss during moderate to high-intensity rainfall.

154 **Solid Waste Disposal**

155 The construction at Fort Bliss under Alternative 1 would generate an estimated additional 34.2 tons per
156 day of construction waste that would be disposed of in the Fort Bliss landfill, and 4.1 tons of recyclable
157 material per day. If a new landfill is constructed on Fort Bliss, refuse that would be disposed of in on-
158 post landfills would increase by approximately 31.4 tons per day (82 percent increase). Refuse from on-
159 post residential areas and the increased off-post population would increase the disposal rate of solid waste
160 to the Clint Landfill by approximately 162.0 tons per day (20 percent increase), shortening the remaining
161 life by about 1.4 years. If a new on-post landfill is not constructed, all refuse from Fort Bliss would have
162 to be disposed of off post, increasing the disposal rate to the Clint Landfill by approximately 193.4 tons
163 per day and shortening its remaining life by about 1.7 years (less than 6 percent).

164 **5.2.3.3 Energy**

165 **Electricity**

166 With the increase in personnel on post under Alternative 1, peak demand would increase by
167 approximately 36.3 MVA, and consumption would increase by approximately 10.9 MW. The increase in
168 peak demand would represent 15.3 percent of the current excess power available from EPEC. Power
169 would need to be routed to areas of new construction on post and may require the addition of a substation.
170 The increase in off-post population would increase peak electrical demand by approximately 79.4 MVA,
171 which is 33.4 percent of EPEC's current excess power available.

172 **Natural Gas**

173 The square footage of buildings on Fort Bliss is anticipated to more than double under Alternative 1, to a
174 total of approximately 33 million square feet. At the current rate of hourly gas consumption per square
175 foot (0.08 CFH), total gas consumption during the coldest days would be on the order of 2.6 million CFH.
176 The existing capacity of the gas supply system to the post is 2.5 million CFH, so additional connections
177 or increased feeder line sizes would be needed to meet demands under this alternative. In addition, total
178 annual gas consumption would increase by a factor of three.

179 **5.2.3.4 Communications**

180 Except for routing of telephone lines and other communications lines to new facilities, no major changes
181 in communications systems are anticipated under Alternative 1.

182 **5.2.4 Alternative 2**

183 The impacts of Alternative 2 on Main Cantonment Area infrastructure would be similar as described for
184 Alternative 1. Traffic and utilities and energy demand would be slightly higher with the addition of a
185 second CAB.

186 **5.2.4.1 Ground Transportation**

187 Under Alternative 2, one additional roadway segment, Loop 375 from Montana Avenue to BR 54, would
188 decline to LOS D (see Table 5.2.3). No additional roadway segments would decline to unacceptable
189 levels of service. By 2021, Loop 375 between BR 54 and US 54 and Fred Wilson Avenue between US
190 54 and Airport Drive would be at LOS E, slightly more degraded than under Alternative 1 (see Table 5.2-
191 4).

192 The decline of LOS on Loop 375 and Fred Wilson Avenue to unacceptable levels could be mitigated by
193 widening those roadway segments. It is estimated the cost of widening Loop 375 to 6 lanes would cost
194 approximately \$9 million. The cost of widening Fred Wilson Avenue to 8 lanes is estimated to be
195 approximately \$10 million (Ref# 568, 569, 570).

196 **5.2.4.2 Utilities**

197 **Water Supply**

198 Alternative 2 would involve an increase in the on-post residential population of approximately 18,768 and
199 a daily population of approximately 14,191. On-post demand for potable water would increase by
200 approximately 4.2 (4,650 afy) MGD above current levels. As noted for the No Action Alternative, this
201 assumes a per capita consumption rate of 203 gallons/day and is likely an overestimation because of water
202 conservation measures being incorporated in military family housing. The additional water required
203 would be supplied by EPWU. The capacity of the pipelines from the EPWU connections may need to be
204 upgraded to meet increased flows.

205 The increase in off-post population would require an additional 16.6 MGD (18,540 afy) from EPWU's
206 water distribution system. The combined requirement both on-post and off-post population increase
207 would represent approximately 22 percent of EPWU's existing demand for water and 7 percent of
208 EPWU's current treatment capacity.

209 **Wastewater Treatment**

210 Alternative 2 would require sewer lines and extensions between new facilities and the existing sewer
211 connections with EPWU's sewer system. Sewer lines on post would need to be increased in size to
212 handle the additional loads. The wastewater load from the post would increase by 3.3 MGD above
213 current levels, which would represent approximately 24 percent of the existing excess capacity of the
214 Haskell Street plant. The additional off-post population would generate approximately 12.7 MGD of

215 wastewater. This load would represent approximately 36 percent of EPWU's excess treatment capacity.
216 Combined with baseline population growth, total wastewater treatment demand would exceed EPWU's
217 existing treatment capacity by over 8 percent by 2015.

218 **Storm Water**

219 Under Alternative 2, storm water conveyances would need to be constructed in the area between EPIA
220 and Biggs AAF to handle the runoff from the estimated 1,450 acres of new impervious surface in the area.
221 Additional storm water management facilities may need to be built to minimize the discharge of storm
222 water from Fort Bliss during moderate to high-intensity rainfall.

223 **Solid Waste Disposal**

224 The construction of Fort Bliss under Alternative 2 would generate an estimated 35.6.1 tons per day of
225 additional construction waste that would be disposed of in the Fort Bliss landfill, and 4.2 tons of
226 additional recyclable materials per day. If a new landfill is constructed on post, refuse from the post
227 disposed of in Fort Bliss landfills would increase by approximately 32.6 tons per day (85 percent
228 increase). Refuse from on-post residential areas and the increased off-post population associated with this
229 alternative would increase the disposal rate of solid waste to the Clint Landfill by approximately 184.8
230 tons per day (23 percent increase over the current disposal rate), shortening its remaining life by
231 approximately 1.6 years. If a new on-post landfill is not constructed, the disposal rate of solid waste to
232 the Clint Landfill would increase by approximately 217.4 tons per day, shortening its remaining life by
233 about 1.9 years (6 percent).

234 **5.2.4.3 Energy**

235 **Electricity**

236 Under Alternative 2, peak electrical demand would increase by approximately 40.7 MVA above current
237 levels, and consumption would increase by approximately 12.2 MW. The increase in peak demand
238 represents 17.1 percent of the current excess power available from EPEC. Power would need to be routed
239 to the areas of new construction on post and may require the addition of a substation. The increase in off-
240 post population associated with this alternative would increase peak electrical demand by approximately
241 83.4 MVA, which is 35.1 percent of the current excess power available from EPEC.

242 **Natural Gas**

243 The square footage of buildings on Fort Bliss is anticipated to more than triple under Alternative 2, to a
244 total of approximately 34 million square feet. At the current rate of hourly gas consumption per square
245 foot (0.08 CFH), total gas consumption during the coldest days would be on the order of 2.7 million CFH.
246 The existing capacity of the gas supply system to the post is 2.5 million CFH, so additional connections
247 or increased feeder line sizes would be needed to meet demands under this alternative. In addition, total
248 annual gas consumption would increase by slightly more than a factor of three above current levels.

249 **5.2.4.4 Communications**

250 Except for routing of telephone lines and other communications lines to new facilities, no major changes
251 in communications systems are anticipated under Alternative 2.

252 **5.2.5 Alternative 3**

253 The impacts of Alternative 3 on Main Cantonment Area infrastructure would be the same as described for
254 Alternative 2.

255 **5.2.6 Alternative 4 – Proposed Action**

256 **5.2.6.1 Ground Transportation**

257 Alternative 4 would include the potential for adding up to two more BCTs at Fort Bliss. The
258 development for those units east of Biggs AAF would add another source of traffic to the local roads and
259 highway network (Loop 375 and Sergeants Major Boulevard). To minimize congestion and queuing at
260 access gates to Fort Bliss, site development would need to address the interface of the additional BCT
261 areas with infrastructure and roadway networks.

262 Projected LOS under this alternative would not be substantially different from Alternatives 2 and 3. One
263 more segment, US 54 between Van Buren and Fred Wilson Avenues, would decline to LOS E by 2021
264 (see Table 5.2-4). A total of seven segments would operate at LOS D and another seven at LOS E or F,
265 including two segments each of I-10 and US 54 and one segment each of Loop 375, Fred Wilson Avenue,
266 and Airport Road. Future transportation planning would need to consider the concentrated development
267 in the Main Cantonment Area. Projects identified to date would not provide enough capacity to handle
268 the additional traffic.

269 The additional decline of LOS on US 54 could be mitigated by widening that roadway segment to 8 lanes.
270 The estimated cost would be approximately \$10 million (Ref# 568, 569, 570).

271 **5.2.6.2 Utilities**

272 **Water Supply**

273 Alternative 4 could involve an increase in the on-post population of approximately 18,768 and a daily
274 population of approximately 21,791. The total demand for potable water in the Main Cantonment Area
275 could increase by an estimated 4.3 MGD (4,850 afy) above current levels. As noted for the No Action
276 Alternative, this is likely an overestimation because of water conservation measures being incorporated in
277 military family housing. The additional water required would be supplied by EPWU. The capacity of the
278 pipelines from EPWU connections may need to be upgraded to meet increased flows.

279 Off-post population increases could increase demand by approximately 22.6 MGD (25,280 afy) above
280 current levels. The combined requirement from both on-post and off-post population increases would be
281 approximately 28 percent of EPWU's existing demand for water and 9 percent of EPWU's current
282 treatment capacity.

283 **Wastewater Treatment**

284 Alternative 4 would increase the wastewater load from the post by 3.4 MGD above current levels,
285 representing 25 percent of existing excess capacity of the Haskell Street plant. The increase in off-post
286 population would generate approximately 17.2 MGD of wastewater above current levels. The combined
287 additional flow represents approximately 46 percent of EPWU's excess treatment capacity. Combined
288 with baseline population growth, total wastewater treatment demand could exceed EPWU's existing
289 treatment capacity by approximately 13 percent by 2015.

290 **Storm Water**

291 Under Alternative 4, storm water conveyances would need to be constructed in the area between EPIA
292 and Biggs AAF to handle the runoff from the estimated 1,600 acres of new impervious area. Additional
293 storm water management facilities would likely need to be built to minimize the discharge of storm water
294 from Fort Bliss during moderate to high-intensity rainfall.

295 **Solid Waste Disposal**

296 The potential additional construction at Fort Bliss under Alternative 4 could generate an estimated 44 tons
297 per day of additional construction waste that would be disposed of at the Fort Bliss landfill, and 5.2 tons
298 of recyclable material per day. If a new landfill is constructed on post, refuse from the post disposed of in

299 the Fort Bliss landfills could increase by 40.3 tons per day (105 percent increase). Refuse from on-post
300 residential areas and the increased off-post population associated with this alternative could increase the
301 disposal rate of solid waste to the Clint Landfill by approximately 236.3 tons per day (almost 30 percent
302 increase) over current levels, shortening its remaining life by approximately 2.2 years. If a new on-post
303 landfill is not constructed, the disposal rate of solid waste to the Clint Landfill would increase by
304 approximately 276.6 tons per day, shortening its remaining life be about 2.6 years (9 percent).

305 **5.2.6.3 Energy**

306 **Electricity**

307 Under Alternative 4, peak electrical demand could increase by as much as 52.3 MVA and consumption
308 could increase by as much as 15.7 MW. The increase in peak demand would represent 22 percent of the
309 current excess power available from EPEC. Power would need to be routed to areas of new construction
310 on post and may require the addition of a substation. The potential increase in off-post population
311 associated with this alternative would increase peak electrical demand by approximately 108.6 MVA,
312 which is 45.7 percent of the current excess power available from EPEC.

313 **Natural Gas**

314 The square footage of buildings on Fort Bliss could more than triple under Alternative 4 to a total of
315 approximately 37 million square feet. At the current rate of hourly gas consumption per square foot (0.08
316 CFH), total gas consumption during the coldest days would be on the order of 2.9 million CFH. The
317 existing capacity of the gas supply system to the post is 2.5 million CFH, so additional connections or
318 increased feeder line sizes would be needed to meet demands under this alternative. In addition, total
319 annual gas consumption could increase by a factor of about 3.4.

320 **5.2.6.4 Communications**

321 Except for routing of telephone lines and other communications lines to new facilities, no major changes
322 in communications systems are anticipated under the Proposed Action.

1 **5.3 TRAINING AREA INFRASTRUCTURE**

2 **5.3.1 Introduction**

3 Impacts on training area infrastructure are primarily related to changes in the use of range camps, the
4 most developed areas in the Fort Bliss Training Complex. While some new range facilities would be
5 constructed, the effect of their operation on infrastructure would be relatively minor.

6 The analysis of impacts on ground transportation considers the effects of military convoys traveling from
7 the Main Cantonment Area to the training areas on public roadways and the potential for off-road vehicle
8 maneuvers on McGregor Range to affect traffic on Highway 506 and access roads through McGregor
9 Range to Forest Service land in the Sacramento Mountains.

10 The analysis of impacts on range camp utilities is based primarily on a report addressing the adequacy of
11 their wastewater treatment systems (Ref# 302). That document presents anticipated person-weeks at each
12 range camp, which is assumed to be the level of utilization that would occur under Alternative 1, updated
13 to incorporate more recent planning. The change in utilization was estimated by comparing the projected
14 utilization in 2011 with the “base case” utilization from that report. Estimated increases for the other
15 action alternatives were scaled from the Alternative 1 level based on their relative increases in military
16 population. Each utility was then evaluated for adequacy to support the projected increase in use.

17 **5.3.2 No Action Alternative**

18 **5.3.2.1 *South Training Areas***

19 No changes are anticipated in ground transportation, utilities, energy, or communications at the South
20 Training Areas under the No Action Alternative.

21 **5.3.2.2 *Doña Ana Range-North Training Areas***

22 Under the No Action Alternative, use of the Doña Ana Range-North Training Areas will increase but the
23 roadway, utilities, energy, and communications capabilities are generally adequate to accommodate the
24 additional demand. The waste treatment facility at the Doña Ana Range Camp is already over capacity
25 and will need to be substantially upgraded to meet the existing demands (Ref# 302). Orogrande Range
26 Camp has four undersized culverts that will need to be increased in size. With the increase in training,
27 refuse may need to be picked up more frequently, and liquefied petroleum gas may need to be replenished
28 more frequently.

29 **5.3.2.3 *McGregor Range***

30 Ground transportation, utilities, energy, and communications at McGregor Range are generally adequate
31 to accommodate the demands of the No Action Alternative, including the potential for 2,000 additional
32 soldiers in temporary troop quarters at McGregor Range Camp during exercises. The wastewater
33 treatment system at McGregor Range Camp was recently expanded. It may be desirable to improve
34 drainage around the range camp to eliminate occasional ponding.

35 **5.3.3 Alternative 1**

36 **5.3.3.1 *South Training Areas***

37 No changes are anticipated in ground transportation, utilities, energy, or communications at the South
38 Training Areas under Alternative 1.

39 **5.3.3.2 Doña Ana Range-North Training Areas**

40 **Ground Transportation**

41 The increase in off-road maneuver training at the Doña Ana Range-North Training Areas with four Heavy
42 BCTs would increase military vehicle and heavy equipment traffic between the Main Cantonment Area
43 and Doña Ana Range Camp. Military traffic would range from relatively small platoons to large numbers
44 of vehicles participating in major battalion and BCT-level exercises. A battalion-level exercise can
45 involve several hundred vehicles and take 2-3 days to transit to the range camp and another 2-3 days to
46 transit back to the Main Cantonment Area after the exercise. A BCT-level exercise can involve over
47 1,000 vehicles and take 4-5 days each way to transit to and from the range camp. Under Alternative 1, an
48 estimated ten 14-day battalion-level exercises and two 14-day BCT-level exercises would be conducted
49 annually in the North Training Areas.

50 Tracked vehicles would be transported to the range and training areas by heavy equipment transporters
51 (HETs) traveling north on Martin Luther King, Jr. Boulevard. This highway is a four-lane arterial up to
52 just south of the New Mexico state line, with an estimated capacity of about 1,000 vehicles per hour per
53 lane. Existing traffic on the roadway is estimated at approximately 10-12,000 average daily trips, with 15
54 percent of the trips (1,500-1,800) assumed to occur during the peak hour period, resulting an LOS of A.
55 Typically, military traffic convoying to the training areas would be traveling in the opposite direct of peak
56 civilian traffic.

57 During planning for movement of equipment to the North Training Areas for an exercise, unit
58 commanders would conduct a risk assessment to determine a safe travel speed for the convoy, typically
59 50-55 miles per hour. Convoys would travel at the lower of the posted speed limit or the safe speed
60 determined by the risk assessment. A military convoy with HETs, which generally travel at slower
61 speeds than civilian traffic, would essentially turn the highway into a single-lane roadway for the non-
62 military traffic. This could reduce LOS on the roadway to level B.

63 Martin Luther King, Jr. Highway turns into Highway 213 going into New Mexico and becomes a two-
64 lane roadway. Average daily traffic on Highway 213 is estimated to be approximately 5,000 vehicles
65 (Ref# 519), with a peak hour volume of 450 vehicles and a peak-hour LOS of D. Assuming vehicles are
66 not able to pass the military convoy along segments where the roadway is two lanes and would be limited
67 to the speed of the convoy, the LOS on this highway would decline to level E when convoys are traveling
68 to and from the North Training Areas.

69 **Water Supply**

70 Under Alternative 1, Doña Ana Range Camp would be occupied by approximately 208,000 person weeks
71 annually (about 4,000 people per day), an increase of approximately 375 percent (Ref# 302). Current
72 piping infrastructure is adequate to provide the water needed for the range camp, although an almost four-
73 fold increase in total annual water consumption is anticipated. With this level of occupancy, additional
74 water storage at the site would be advantageous.

75 Historically, Orogrande Range Camp has supported more than 1,100 personnel during training operations
76 (Ref# 302). Temporary troop quarters at Orogrande Range Camp would increase from 350 to
77 approximately 1,700 beds. Conservatively, the maximum water use at the range camp could include
78 1,700 temporary residents and up to an additional 3,800 daytime soldiers, resulting in a demand for
79 approximately 200,000 gallons of water per peak use day. Even if that peak demand level were sustained
80 on a continuous basis, it would not exceed the capacity of the WSMR well supplying Orogrande Range
81 Camp (approximately 267,000 gallons per day, assuming 242 training days per year). The capacity of the
82 water system that delivers water to the range camp is about 600 gpm, which is more than four times the
83 estimated peak demand.

84 **Wastewater Treatment**

85 The waste treatment facility at Doña Ana Range Camp is already over capacity and would need to be
86 substantially upgraded to meet projected demands under this alternative (Ref# 302).

87 The waste treatment facility at Orogrande Range Camp is more than adequate to meet current and
88 projected loads under this alternative (Ref# 302).

89 **Storm Water**

90 No changes in storm water infrastructure are necessary at Doña Ana Range Camp, but Orogrande Range
91 Camp has four undersized culverts that would need to be increased in size.

92 **Solid Waste**

93 With a large increase in utilization of facilities in the Doña Ana Range–North Training Areas, additional
94 on-site refuse storage and more frequent refuse pickup would be required.

95 **Energy**

96 The existing infrastructure would be adequate to meet electrical demands under this alternative. There
97 would be an approximate four-fold increase in annual electricity consumption.

98 Existing distribution infrastructure for liquefied petroleum gas at Doña Ana Range Camp would be
99 adequate, but storage capacity would be undersized to meet the approximate four-fold increase in use of
100 this range camp. Additional storage and more frequent replenishment would be required.

101 **5.3.3.3 McGregor Range**

102 **Ground Transportation**

103 Military vehicles traveling to McGregor Range would either use military supply routes internal to Fort
104 Bliss when convoying to McGregor Range Camp or US 54. The latter is more likely to be used by
105 vehicles traveling to the Orogrande Range Complex and more northern TAs of McGregor Range.
106 Tracked vehicles can travel on unpaved tank trails that run along the west edge of McGregor Range, but
107 for longer distances are more likely to be transported by HETs. HETs traveling on US 54 would require a
108 permit.

109 Average daily traffic on US 54 is approximately 8,000 vehicles (Ref# 520), and peak hour traffic is
110 estimated at 720 vehicles. Military convoys would typically be traveling in the opposite direction of
111 peak-hour civilian traffic. US 54 is four lanes the full length of the Fort Bliss boundary. Assuming
112 average non-peak hour traffic is 720 vehicles, with an LOS of A, and the volume of military traffic would
113 average 150 vehicles per hour, LOS along US 54 would not be affected.

114 **Water Supply**

115 The water distribution infrastructure at McGregor Range Camp and Meyer Range Complex would be
116 adequate to meet current and projected future water demand. The increase in use would more than double
117 annual water consumption (2.5 times at McGregor Range Camp and 1.8 times at Meyer Range).
118 Additional water storage at this level of utilization would be beneficial.

119 Potable water for the Orogrande Range Complex would be trucked to the complex from Orogrande Range
120 Camp (see Section 5.3.3.2) and stored in water buffalos.

121 **Wastewater Treatment**

122 The wastewater treatment system at McGregor Range Camp is currently inadequate to meet existing use
123 of the facility and will need to be upgraded to meet existing and future wastewater loads, especially with
124 the increased utilization of the range camp (Ref# 302). The wastewater treatment system at Meyer Range
125 is adequate to meet existing and projected future wastewater loads under this alternative (Ref# 302).

126 Domestic wastewater at the Orogrande Range Complex would be collected in portable toilets and hauled
127 off site for disposal.

128 **Storm Water**

129 No changes in storm water infrastructure requirements are anticipated at McGregor Range Camp,
130 although it may be desirable to improve drainage to eliminate occasional ponding.

131 **Solid Waste**

132 With a large increase in utilization of facilities on McGregor Range under Alternative 1, additional
133 storage for refuse and more frequent refuse pickup would be necessary.

134 **Energy**

135 There would be no change in peak occupancy of McGregor Range Camp, so the existing electrical
136 infrastructure would be adequate to meet demands under Alternative 1. Total consumption of electricity
137 is expected to more than double with increased use of the Range Camp.

138 The existing natural gas infrastructure at McGregor Range Camp would be adequate to meet the demands
139 of Alternative 1. Total gas consumption is expected to increase by a factor of approximately 2.5.

140 Existing liquefied petroleum gas distribution infrastructure at Meyer Range is adequate to meet the
141 projected utilization under Alternative 1. With utilization increasing by a factor of 1.8, additional storage
142 capacity and more frequent replenishment would be required.

143 **5.3.4 Alternative 2**

144 The impacts from Alternative 2 on training area infrastructure would include those described for
145 Alternative 1. More military convoy traffic with HETs would travel on US 54 to reach the north Tularosa
146 Basin portion of McGregor Range. An estimated ten 14-day battalion-level exercises would be conducted
147 annually on that portion of the range. LOS on US 54 is not expected to be affected.

148 Off-road vehicle maneuvers in the north Tularosa Basin portion of McGregor Range would occasionally
149 cross Highway 506 resulting in temporary delays, but significant road closures are not expected to occur.
150 Convoys that include tracked vehicles would cross the highway at hardened crossing points. Typically,
151 they would cross in company-size “march units,” taking 15 minutes or less to cross, between which any
152 travelers on Highway 506 would be permitted to pass. A similar situation would exist for the county and
153 Forest Service roads that traverse the northern McGregor TAs to the Sacramento Mountains and
154 Grapevine area. Fort Bliss would notify the Otero County Administrator and BLM of any road closings
155 on Highway 506.

156 Utilities and energy consumption and waste generation at the range camps would be expected to increase
157 about 10 percent over Alternative 1 with the addition of a second CAB. The underground Orogrande
158 water distribution pipeline traverses TA 11 and a corner of TA 10 on McGregor Range north of Highway
159 506. The pipeline has provided water to the community of Orogrande since the early 20th Century.
160 Unless protected, it is probable that tracked vehicles would damage the pipeline. To avoid damage, either
161 tank crossings would need to be constructed over the pipeline, or it would need to be identified as an off-
162 limits area as long as the pipeline is in use.

163 The existing electrical transmission line on McGregor Range is not expected to be affected by off-road
164 vehicle maneuvers. BLM plans to use the transmission corridor as a preferred utility easement under its
165 revised plan. This would be possible, but any underground lines may require special installation (for
166 example, deeper trenches or tank crossings).

167 **5.3.5 Alternative 3**

168 The impacts from Alternative 3 on training area infrastructure would be the same as described for
169 Alternative 1, with approximately 10 percent increase in utilities and energy use with the addition of a
170 second CAB.

171 **5.3.6 Alternative 4 – Proposed Action**

172 The impacts from Alternative 4 on training area infrastructure would include those described for
173 Alternatives 1 and 2. Military traffic on US 54 would increase under Alternative 4 as vehicles convoyed
174 to training locations in the north Tularosa Basin portion of McGregor Range. This could include an
175 estimated ten 14-day battalion-level exercises and one 14-day BCT-level exercise annually. HET travel
176 on US 54 would require a permit. LOS on US 54 is not expected to be affected.

177 As described for Alternative 2, some exercises would involve tracked vehicles crossing Highway 506,
178 potentially resulting in delays for civilian travelers on that road. Road closures are expected to be
179 infrequent, and vehicles on the highway would typically be delayed for 15 minutes or less. A similar
180 situation would exist for access roads through McGregor Range to the Sacramento Mountains and
181 Grapevine. Fort Bliss would notify the Otero County Administrator and BLM of any road closings on
182 Highway 506.

183 The impacts of Alternative 4 on utilities and energy on the Fort Bliss Training Complex would be as
184 described for Alternative 1, with the potential for approximately 20 percent higher demand.

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5.4 AIRSPACE USE AND MANAGEMENT

5.4.1 Introduction

The potential effects of the alternatives on the existing airspace environment were assessed by considering the changes in airspace utilization that could result from increased aviation operations at Biggs AAF. The assessment considered compliance with DoD Directive 5030.19, DoD Responsibilities on Federal Aviation and National Airspace System Matters, and AR 95-2, Air Traffic Control, Airspace, Airfields, Flight Activities, and Navigational Aids. The assessment also considered measures that could minimize potential impacts on other regional air traffic and the Air Traffic Control system.

The type, size, shape, and configuration of individual airspace elements in a region are based upon, and are intended to satisfy, competing aviation requirements. Potential impacts could occur if air traffic in the region and/or the ATC systems were encumbered by changed flight activities associated with the Proposed Action or another alternative. When any significant change is planned, such as new or revised defense-related activities within an airspace area or a change in the complexity or density of aircraft movements, the Federal Aviation Administration reassesses the airspace configuration. The FAA seeks to determine if such changes could adversely affect (1) ATC systems and/or facilities; (2) movement of other air traffic in the area; or (3) airspace already designated and used for other purposes supporting military, commercial, or general aviation.

5.4.2 No Action Alternative

Aviation operations from Biggs AAF would not change from current conditions under the No Action Alternative. Thus, this alternative will not involve any change in management of the airspace supporting Army aviation activity either at the airfield or in the military training airspace.

5.4.3 Alternative 1

Under Alternative 1, one CAB would be assigned to Biggs AAF. Currently, Biggs AAF supports approximately 40,000 aviation operations annually. The assignment of the CAB would result in an additional 53,250 aviation operations, raising the total to approximately 93,000 annual operations.

As described in Section 4.4, detailed ATC processes and procedures have been coordinated between Biggs AAF and El Paso International Airport to manage the flow of military, commercial, and other civil air traffic into and out of the two airfields. Discussions between the U.S. Army and EPIA have indicated that airport officials do not believe the increase in operations at Biggs AAF would have an adverse effect on EPIA (Ref# 518).

Alternative 1 would increase operations by helicopters and unmanned aerial vehicles in the Restricted Areas overlying the Fort Bliss Training Complex. Use of this airspace would continue to be managed through scheduling, balancing training requirements with airspace availability. The hours of operation in R-5103 may need to be expanded to accommodate night operations. Although some scheduling issues may arise due to the increased demand, use of the airspace in itself would not create any airspace management issues.

5.4.4 Alternative 2

Alternative 2 includes the potential for two CABs located at Biggs AAF. Currently, Biggs AAF supports approximately 40,000 aviation operations annually. The addition of two CABs would result in an additional 104,500 aviation operations, raising the total to approximately 144,500 annual operations. Based on preliminary assessments by EPIA (Ref# 518), the increase in operations at Biggs AAF is not anticipated to adversely affect EPIA.

43 Use of other military training airspace in the region would continue to be managed through scheduling,
44 balancing training requirements with airspace availability. Scheduling issues may increase, but use of the
45 airspace would not in itself create any airspace management issues.

46 **5.4.5 Alternative 3**

47 The effects of Alternative 3 on local airspace management and use would be the same as described for
48 Alternative 2.

49 **5.4.6 Alternative 4 – Proposed Action**

50 The effects of Alternative 4 on local airspace management and use would be the same as described for
51 Alternative 2.

52

1 **5.5 EARTH RESOURCES**

2 **5.5.1 Introduction**

3 This section presents the environmental consequences of the alternatives on soils. None of the
4 alternatives is expected to affect other earth resources.

5 Direct effects on soils are primarily due to the physical disturbance of the upper soil layers and the
6 disruption of soil biological processes caused by activities that alter the natural soil layers or result in
7 accelerated erosion, increased soil compaction, loss of protective vegetation, and loss of soil productivity.
8 Indirect effects on soils include reduced surface water infiltration, an associated increase in surface water
9 runoff, and poor plant growth or seed germination. Both direct and indirect effects on soils can be
10 expected as a result of surface-disturbing activities like off-road vehicle maneuvers at the Fort Bliss
11 Training Complex, as well as from construction of buildings, roads, firing ranges, and other facilities.
12 The significance of the effects on soils is related to the areal extent of the impacts and the length of time
13 necessary for the soils to recover following surface disturbance.

14 There are different definitions of “recovery” from disturbance in the literature. Full recovery from
15 surface disturbance that damages the ecological processes in soils involves the reestablishment of soil
16 stability, hydrologic function, and protective covers such as vegetation and biological crust. The status of
17 these indicators is used to measure the health of the land. A full recovery reestablishes the ecological
18 processes in soils so that they (Ref# 41):

- 19 • Support the normal range of plant communities for site conditions and soil type;
- 20 • Capture, store, and safely release surface water;
- 21 • Are stable, resisting accelerated erosion;
- 22 • Have reestablished damaged biological crust cover and species or support the integrity of the
23 natural soil biotic community.

24 The length of time for full recovery varies depending on the soil type, climatic conditions, size of the area
25 disturbed, and land use during recovery. For the purposes of this effects analysis, full recovery of the
26 ecological processes of the soil is considered unlikely, due to the projected use of the Fort Bliss Training
27 Complex for off-road vehicle maneuvers as well as livestock grazing and public access for recreation in
28 some areas, especially if combined with drought conditions. This analysis therefore focuses on limited
29 recovery, defined to mean that the site is stable and resistant to accelerated erosion from wind or water
30 following surface disturbance, but from a practical standpoint may not reach full recovery due to the
31 lengthy periods required in this desert climate.

32 Earthmoving for construction of new facilities would excavate soils, temporarily removing vegetation and
33 exposing them to wind and water erosion. In general, impacts can be minimized for planned facility
34 construction by siting and designing facilities to take into account soil limitations, employing construction
35 techniques appropriate for the soils and climate, and implementing temporary and permanent erosion
36 control measures. While soils would be changed by construction activities, the effects would be localized
37 and would not result in significant indirect impacts on air or water resources because best management
38 practices, erosion and sediment controls, and storm water management measures would be implemented.

39 Hot deserts with summer rainfall, like the Chihuahuan Desert that encompasses Fort Bliss, are dominated
40 by biological crusts at or near the soil surface. Soils with healthy biological crusts provide conditions
41 favorable to plant growth because they provide high amounts of nutrients (especially nitrogen) and plant-
42 available water, both of which are limiting factors for plant growth and productive soils in desert
43 conditions (Ref# 89). Soils with well-established and undisturbed biological crusts have from 2 to 130
44 times greater resistance to soil erosion than less well-developed crusts or bare soil. Biological crusts on

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

45 finer soils (dominated by clay or silt) recover more quickly from disturbance and are more resistant to
46 wind erosion than on sandy soils. Recovery of soil biological crusts is related to the frequency and
47 intensity of surface disturbance — the more frequent and intense the disturbance, the longer time the
48 crusts take to recover. Sandy soils in areas of low precipitation have the longest recovery time (Ref# 83).

49 Disturbance of biological crusts by vehicles and foot traffic (human and livestock) has been demonstrated
50 to reduce nitrogen input from crusts on all soils immediately by 25 to 40 percent on silty soils and from
51 76 to 89 percent on sandy soils, with a decrease of 80 to 100 percent over time. A primary reason for this
52 is that the compression caused by traffic damages the ability of the organisms within the top few inches of
53 soil to perform photosynthesis and nitrogen fixation (Ref# 83). Soils with high gypsum content are more
54 resistant to disruption of biological crusts by vehicle traffic; one soil map unit with high gypsum content,
55 Malargo Silt Loam, is found on McGregor Range (Ref# 181).

56 Burial of biological crusts through deposition resulting from wind or water erosion kills the organisms in
57 the crust, eliminating the crust's function in soil stabilization and nutrient contribution that is needed for
58 soil productivity. Vegetative cover may also be damaged by wind and water erosion through abrasion,
59 burial, or deposition of dust on plants, which reduces their ability for photosynthesis, minimizes
60 evapotranspiration, and causes increased soil surface temperatures (Ref# 34). Activities on or upwind
61 from Sandy ecosites with tobosa grass prevalent would be especially susceptible to damage from wind
62 erosion because the deposition would bury and eventually kill the grass, exposing more areas to wind and
63 water erosion as vegetative cover decreases (Ref# 240). A study performed at the Jornada Experimental
64 Range (Ref# 34, 82) in the Chihuahuan Desert near Fort Bliss documented that soils 200 meters (656
65 feet) or more downwind from areas of bare soils were affected by surface burial or abrasion that caused
66 decreased vegetative cover and dune formation.

67 Cross-country travel by vehicles has been shown to compact soils, crush vegetation and crusts, and
68 accelerate soil erosion (Ref# 89). The effects of vehicle track disturbance (whether wheeled or tracked
69 vehicles are used) may be severe. When crusts are completely removed or are damaged over large or
70 continuous areas (as in vehicle tracks), the recovery of biological crusts is generally slow, especially in
71 areas with low precipitation and sandy soils. Recolonization of the organisms that form biological crusts
72 in disturbed areas occurs mostly from adjacent areas, so the size and shape of disturbance affects recovery
73 rates. Under good conditions, damaged biological crusts take at least 10 years without disturbance to
74 recover (Ref# 83).

75 Physical soil crusts are also present on Fort Bliss. These physical crusts are caused by compaction and
76 the impact of raindrop splash on bare soil. When undisturbed, physical crusts may protect soils from
77 wind and water erosion by forming a resistant surface, but they also reduce surface water infiltration and
78 seedling emergence, contributing factors that limit plant growth and continue bare soil conditions.
79 Grasses and biological crusts break up physical soil crusts, improving surface water infiltration and
80 increasing nutrients needed for plant growth (Ref# 83).

81 Simulated tracking studies were conducted in various ecosystems on McGregor Range in the 1980s and
82 1990s. An article analyzing erosion data at one site in 1996-1996 (Ref# 125) documented that five passes
83 (although the article mistakenly says three) with an M1A1 tank in dry conditions produced the most water
84 erosion on the site during periods of intense rainfall and the highest dry season total sediment loss
85 compared to a single pass and control sites. Five passes with the tank under dry conditions created the
86 highest amount of bare ground, resulting in more runoff, less water infiltration, and more physical soil
87 crusting than the same type of tank use under wet conditions. The article noted that "the most substantial
88 dry season treatments' total cumulative sediment losses at the end of the sampling period were associated
89 with triple [sic] pass tank treatments. Control and single pass treatment total cumulative losses were
90 essentially identical and statistically similar." (Ref# 125) The article reported that tracked vehicles are
91 especially destructive when they turn because this action crushes and uproots vegetation and compacts
92 soil.

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

93 The article documented that climatic conditions, specifically drought and the timing and intensity of
94 storms, have a major impact on rates of water erosion. The article concludes that vehicle maneuvers
95 should be scheduled “with regard to landscape suitability” and “capacity to sustain disturbance,” and
96 “should reflect necessary recovery periods ... and be monitored for progress” (Ref# 125).

97 The simulated tracking studies conducted on McGregor Range involved a low number of passes over a
98 short period of time. Consequently, they have limited applicability to the Proposed Action and other
99 alternatives, which involve repeated use for an indefinite period at an average rate of one pass every two
100 years. The only study locations used for off-road vehicle maneuvers over multiple years show that
101 mesquite coppice dunes and dropseed grasslands persist. Sufficient funding has not been available to
102 complete the analysis of recovery at the study sites over time, and the limited scope of the studies brings
103 into question the relevance of that analysis to the Proposed Action. The above-mentioned article (Ref#
104 125) recommended repetitious tracked vehicle studies to assess vegetation recovery and proactive
105 adaptive management in military maneuver areas.

106 A study designed to evaluate the effects of military training using M1A2 tanks on vegetation structure and
107 wind erosion was conducted at the Idaho Army National Guard Orchard Training Area (Ref# 130). Three
108 previously undisturbed blocks with similar soils and vegetation were treated by simulating straight (no
109 turning) travel of one, two, four, and eight consecutive passes at approximately 30 miles per hour. These
110 passes occurred one after another in a line, with each vehicle following the one in front. Vegetative cover
111 was measured before and after the vehicle passes, as was wind speed and soil loss due to wind erosion.
112 This study concluded that the untracked sites were stable even at the highest wind speeds, and that even
113 one pass was sufficient to make soil surface conditions “significantly less stable” than the undisturbed
114 areas but without a significant decrease in the vertical vegetation structure that minimize wind erosion.
115 The critical threshold for M1A2 tracking on this area dominated by grasses and forbs was concluded to be
116 four consecutive passes because significant damage to the vegetative canopy and accelerated soil erosion
117 resulted.

118 Surface disturbance has different impacts under wet and dry conditions but can adversely affect soils in
119 both. Because the organisms in biological crusts are brittle when dry, disturbance in dry conditions is
120 more destructive and the crusts take longer to recover (Ref# 83). However, soil compaction from vehicle
121 traffic is more likely to occur in wet conditions on soils with finer textures (high proportions of clay or
122 silt), resulting in reduced water infiltration, increased runoff, and less suitable conditions for plant growth.

123 On Fort Bliss, wind erosion is more prevalent than water erosion. Wind and its transport of soil particles
124 are influenced by vegetation and terrain at different scales. Soil roughness and vegetative cover affect the
125 local transport and deposition of soil particles by sheltering the soil from the force of the wind, slowing
126 down wind speeds, and trapping soil particles that move to the bare areas between plants. Damage to
127 vegetation and crusts expose bare soil to wind, which picks up and transports soil particles until
128 structures, tall vegetation, hills, mountains, or mesas reduce wind speeds to the point where the particles
129 are deposited. If vegetation and soil crusts are damaged or destroyed by surface disturbance, without
130 adequate recovery periods, wind erosion will cause the bare ground to expand downwind until slowed by
131 terrain (Ref# 82).

132 Due to the importance of maintaining soil biological crusts, vegetative cover, and soil productivity in
133 order to sustain soil stability and a healthy ecosystem, activities that disrupt or destroy these resources
134 would cause adverse impacts to soils. If biological crusts, vegetative cover, and soil productivity were
135 damaged to the point that their recovery would be lengthy or infeasible, these adverse impacts would be
136 considered significant.

137 Most mesquite coppice dunes presently exist on Deep Sand or Sandy ecosites in the Fort Bliss Training
138 Complex, predominantly in the North and South Training Areas. In general, the Sandy and Deep Sand
139 ecosites of the North and South Training Areas and McGregor Range that are not currently coppice dunes
140 would be the most susceptible to wind erosion if disturbed and would require longer recovery times. If

141 vegetation were not allowed to recover on the Deep Sand and Sandy ecosites that are not already in
 142 coppice dunes, accelerated wind erosion would occur and one of the following conditions would likely
 143 result:

- 144 • Coppice dunes would form in areas where mesquite is present nearby to seed the area.
- 145 • In areas where little mesquite exists, the extent of bare ground would likely spread downwind
 146 until wind speeds were slowed by terrain or tall vegetation. This situation is projected to occur on
 147 two different soil map units on McGregor Range: Pendero fine sand, 2 to 5 percent slopes (Map
 148 Unit 6), and Copia loamy fine sand, 5 to 15 percent slopes (Map Unit 7) (Ref# #190).

149 **Table 5.5-1** provides a summary of the amount of each grouping of TAs in the Fort Bliss Training
 150 Complex that is susceptible to becoming either coppice dunes or bare ground resulting in accelerated
 151 wind erosion due to surface disturbance, without time for recovery. The areas not in coppice dunes are
 152 most likely to experience changes in transition states as a result of off-road vehicle maneuvers. There are
 153 no coppice dunes in the southeast training areas of McGregor Range.

**Table 5.5-1. Segments in the Fort Bliss Training Complex with Sandy Soils Susceptible to
Change from Off-Road Vehicle Maneuver**

<i>Grouping</i>	<i>Percent of Grouping</i>			
	<i>Coppice Dunes</i>	<i>Sandy or Deep Sand Ecosites</i>	<i>Sandy or Deep Sand Ecosites Not Currently in Coppice Dunes</i>	<i>Areas of Map Unit 6 or 7 Likely to Become Bare</i>
North Training Areas	82%	89%	9%	0%
South Training Areas	74%	80%	10%	0%
McGregor Range, North Tularosa Basin	27%	43%	22%	17%
McGregor Range, South Tularosa Basin	20%	43%	24%	11%
McGregor Range, Southeast Training Areas	0%	0%	0%	0%

156 The soils on McGregor Range are the most susceptible to water erosion of all segments of the Fort Bliss
 157 Training Complex, especially if vegetation and biological crusts are damaged. Accelerated erosion caused
 158 by rainfall and runoff on soils with little or no cover is most likely to occur in the southeast training areas
 159 (50 percent of grouping), the south Tularosa Basin portion of McGregor Range (19 percent of grouping),
 160 and the north Tularosa Basin portion of McGregor Range (7 percent of grouping).

161 In summary, direct adverse impacts on soils at the Fort Bliss Training Complex can be expected from
 162 surface disturbance due to vehicle and foot traffic under wet and dry conditions. The extent and
 163 significance of the impacts would be determined by the frequency and total area of disturbance, and
 164 ultimately on the amount of bare ground created. Because vehicle traffic is more disruptive to soils and
 165 vegetation than foot traffic, the extent and frequency of off-road vehicle maneuvers is used as the primary
 166 indicator of impacts on soils within the training areas.

167 **5.5.2 No Action Alternative**

168 **5.5.2.1 Construction**

169 Most of the soils within the Main Cantonment Area, where the majority of the facilities are planned, are
 170 suitable for construction of roads and buildings. Surface disturbance of 1,000 acres projected under the
 171 No Action Alternative would be phased over approximately five years, so no large areas would be
 172 exposed to wind or water erosion at one time. Temporary erosion controls and permanent landscaping or
 173 other earth cover (pavement, buildings, gravel) would minimize indirect and offsite impacts from surface

174 disturbance. While excavated soils would be altered, the impacts from construction would not be
175 significant.

176 **5.5.2.2 Training Activities**

177 Under the No Action Alternative, the training areas currently used for off-road vehicle maneuvers would
178 continue with a similar level of frequency and intensity as in the past. Most of the North and South
179 Training Areas and TA 8 on McGregor Range are currently in use for off-road vehicle maneuvers and
180 consist of Deep Sand or Sandy ecosites characterized by mesquite coppice dunes or other shrub invasion
181 vegetation communities. The shrubs and coppice dunes slow down the local wind speeds so wind erosion
182 abrades the bare soil in between plants, but the coarser soil particles loosened by maneuvers that are
183 transported in the wind get trapped before traveling long distances. Assuming the shrubs and dunes act as
184 obstacles to vehicle travel, making it likely that tracked and wheeled vehicles would drive around and not
185 over them, it is anticipated that the amount and size of the areas of bare ground would remain similar to
186 current conditions.

187 A majority of the soils within the TAs currently approved for off-road vehicle maneuvers have Excellent
188 or Good trafficability ratings, indicating that the soils have the capacity to support maneuvers under both
189 wet and dry conditions.

190 The No Action Alternative would not change soils at the Fort Bliss Training Complex from current
191 conditions.

192 **5.5.3 Alternative 1**

193 **5.5.3.1 Construction**

194 Most of the soils within the Main Cantonment Area are suitable for construction of roads and buildings.
195 All of the expansion area between EPIA and Loop 375, where most of the new construction would be
196 located, has severe wind erosion hazards. Surface disturbance of the estimated 3,400 acres under
197 Alternative 1 would be phased over approximately five years, so no large areas would be exposed to wind
198 or water erosion at one time. Temporary erosion controls and permanent landscaping or other earth cover
199 (pavement, buildings, gravel) would minimize indirect and offsite impacts from surface disturbance.

200 Most of the soils within the South Training Areas have few limitations for road and building construction,
201 so few adverse impacts would be expected as a result of new construction. The soils in the North
202 Training Areas, Doña Ana Range, and the south Tularosa Basin portion of McGregor Range have more
203 moderate to severe limitations for building construction than in the South Training Areas, requiring
204 aggressive sediment and erosion controls to minimize offsite impacts. The south Tularosa Basin portion
205 of McGregor Range has the highest percentage of severe limitations for road construction under
206 Alternative 1 and would require the most maintenance for roads. The soils at McGregor Range Camp
207 have slight limitations for building construction.

208 While excavated soils would be altered, the impacts from construction would not be significant because
209 best management practices, erosion and sediment control, and storm water management measures would
210 be implemented.

211 **5.5.3.2 Training Activities**

212 Under Alternative 1, more training areas would be used for off-road vehicle maneuvers and the frequency
213 and intensity of use would increase. As much as 55 percent of the total area available for off-road vehicle
214 maneuver could be driven on annually, assuming every vehicle involved in training exercises drove over a
215 different track. In reality, some vehicles would drive over the same track as previous vehicles, and some
216 areas would be left undisturbed.

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

217 Most of the North and South Training Areas used for off-road vehicle maneuvers consist of Deep Sand or
218 Sandy ecosites characterized by coppice dunes or other shrub-invaded vegetation communities, which
219 would remain in their current condition. The areas not already in coppice dunes and that are characterized
220 by Deep Sand or Sandy ecosites would be the most likely to sustain damage to vegetation and biological
221 crusts from off-road vehicle maneuvers. The areas most likely to be adversely affected include an
222 estimated 24 percent of the south Tularosa Basin of McGregor Range, 9 percent of the North Training
223 Areas, and 10 percent of the South Training Areas. In the south Tularosa Basin portion of McGregor
224 Range, 11 percent of the area would likely become more bare with repeated tracking and 13 percent might
225 convert to mesquite coppice dunes if the vegetation is not allowed to recover. Without adequate periods
226 of rest to allow for recovery of soil cover, off-road vehicle maneuvers in these portions of the Fort Bliss
227 Training Complex are likely to cause a change in vegetation and accelerated erosion.

228 The shrubs and coppice dunes provide surface roughness that slows down the local wind speeds so wind
229 erosion abrades the bare soil in between plants, but the coarser soil particles loosened by maneuvers get
230 trapped before traveling long distances. If the shrubs and dunes act as obstacles to vehicle travel so that
231 vehicles would drive around and not over them, then it is anticipated that the areas currently in mesquite
232 coppice dunes would remain similar to their current conditions. However, areas of concentrated use in
233 the vicinity of the range camps and CACTF are more likely to become barren, accelerating damage to
234 soils by wind and water erosion and expanding adverse offsite impacts by blowing dust and burial of
235 vegetation and biological crusts downwind from the bare areas.

236 Of all the training areas proposed for off-road vehicle maneuvers under Alternative 1, the south Tularosa
237 Basin portion of McGregor Range has the most acreage of Sandy or Deep Sand ecosites with grass cover,
238 which have been identified as especially sensitive to accelerated wind erosion and deposition, but this
239 amounts to only about 1 percent of that area. Training Areas 8, 11, 29, 31, and 32 contain some high
240 gypsum soils that would be resistant to disruption by vehicle traffic.

241 Soils within the south Tularosa Basin portion of McGregor Range have the highest percentage of
242 moderate to severe limitations for road and building construction and for water erosion hazards of any of
243 the areas proposed for off-road vehicle maneuvers under Alternative 1. It is anticipated that maintenance
244 to keep water erosion to a minimum and roads accessible would be the most frequent in this area under
245 this alternative.

246 A majority of the soils within the proposed off-road vehicle maneuver areas have excellent or good
247 trafficability ratings, indicating that the soils have the capacity to support maneuvers under both wet and
248 dry conditions.

249 Accelerated wind erosion resulting from increased areas of bare ground due to damaged vegetation and
250 biological crusts would be a significant adverse impact under Alternative 1. The high frequency and
251 density of projected maneuvers by wheeled and tracked vehicles, as well as the concentrations of troops
252 on foot, would be likely to lead to increasing areas of bare ground or mesquite coppice dunes in areas
253 where they do not currently exist on the Sandy and Deep Sand ecosites. This would result in locally
254 adverse impacts that would spread downwind over time.

255 Management goals listed in the INRMP (Ref# 23) include monitoring of earth resources and preventing
256 accelerated erosion. An improved understanding of the local effects of increased off-road vehicle
257 maneuvers would aid in planning to meet the goals of the INRMP and help identify mitigation measures
258 that meet site-specific conditions on the Fort Bliss Training Complex. Regular and repeated monitoring
259 of selected locations in the training areas before and after maneuvers would provide needed data useful to
260 help identify areas that require mitigation measures for minimizing erosion and to determine trends in
261 ecosite transition states. Fort Bliss has instituted on-going monitoring efforts using remote sensing and
262 vegetation plots.

263 In some cases, mitigation may include avoiding intensive vehicle maneuvers on areas with high or
264 moderate erosion hazards to maintain ground cover. Construction of roads and buildings in areas that
265 have fewer hazards or limitations and mitigation by design would minimize the need for after-
266 construction rehabilitation and maintenance. The capacity of vegetation and soils to recover from
267 disturbance should be considered when scheduling training activities (Ref# 125).

268 Soil erosion controls that may be implemented to reduce soil movement by air and water may include
269 typical measures as (Ref# 133):

- 270 • Establishment of earth cover such as vegetation or aggregate
- 271 • Installation of artificial or vegetative windbreaks
- 272 • Adding soil binding materials to the ground surface

273 Other mitigation measures may be identified as a result of monitoring, such as avoiding areas where
274 vegetation and biological crusts have been damaged by multiple vehicle passes in order to allow recovery
275 to occur.

276 **5.5.4 Alternative 2**

277 **5.5.4.1 Construction**

278 The impacts of proposed construction in the Main Cantonment Area would be the same for Alternative 2
279 as discussed under Alternative 1. The potential for additional construction at Orogrande Range Camp to
280 support training in the northern portions of McGregor Range would be in an area where limitations for
281 building construction are slight. While excavated soils would be altered, the impacts from construction
282 would not be significant because best management practices, erosion and sediment control, and storm
283 water management measures would be implemented.

284 Soils within the north Tularosa Basin portion of McGregor Range have the highest percentage of
285 moderate to severe limitations for road and building construction and for water erosion hazards of all the
286 areas proposed for off-road vehicle maneuvers under this alternative. For this reason, it is anticipated that
287 road maintenance would be the most frequent in this area, primarily due to water erosion (gullies crossing
288 or forming in wheel tracks along natural surface roads), with maintenance requirements next highest in
289 the south Tularosa Basin portion of McGregor Range.

290 **5.5.4.2 Training Activities**

291 Under Alternative 2, more training areas would be used for off-road vehicle maneuvers and the frequency
292 and intensity of use would be greater than the No Action Alternative and but slightly less than Alternative
293 1. The highest level of off-road vehicle maneuver would occur on the North and South Training Areas
294 and the south Tularosa Basin portion of McGregor Range. Off-road vehicle maneuvers would be
295 extended into the north Tularosa Basin of McGregor Range at a somewhat lower intensity of use because
296 the training would be distributed over a larger area.

297 As much as 50 percent of the total area available for off-road vehicle maneuver could be driven on
298 annually, using the assumptions noted for Alternative 1. The impacts in the North and South Training
299 Areas and the south Tularosa Basin portion of McGregor Range would be the same as described for
300 Alternative 1. Approximately 27 percent of the north Tularosa Basin portion of McGregor Range
301 contains existing mesquite coppice dunes. The areas not already in coppice dunes that are characterized
302 by Deep Sand or Sandy ecosites would be the most likely to sustain damage to vegetation and biological
303 crusts from off-road vehicle maneuvers, an estimated 22 percent of the north Tularosa Basin portion of
304 McGregor Range. Without adequate periods of rest to allow for recovery of soil cover, off-road vehicle
305 maneuvers are likely to cause a change in vegetation and accelerated erosion. Eventual coppice dune
306 formation may occur on the Deep Sand or Sandy ecosites where they do not already exist on

307 approximately 5 percent of the north Tularosa Basin portion of McGregor Range, and 17 percent may
308 become bare ground susceptible to accelerated wind erosion if not able to recover.

309 Soils in all training areas proposed for off-road vehicle maneuvers would be suitable for vehicle
310 maneuvers, with a majority having excellent or good trafficability ratings.

311 Mitigation measures described for Alternative 1 would also apply to Alternative 2.

312 **5.5.5 Alternative 3**

313 **5.5.5.1 Construction**

314 The impacts of proposed construction in the Main Cantonment Area would be the same for Alternative 3
315 as discussed under Alternative 1.

316 The soils within the southeast TAs of McGregor Range have the highest percentage of moderate to severe
317 limitations for construction of new roads and buildings of the areas proposed for off-road vehicle
318 maneuver training under this alternative. Aggressive sediment and erosion controls and a high level of
319 road maintenance would be anticipated in this area.

320 **5.5.5.2 Training Activities**

321 Under Alternative 3, more training areas would be used for off-road maneuvers and the frequency and
322 intensity of use would be higher than the No Action Alternative, but slightly lower than Alternative 1.
323 High levels of off-road vehicle maneuver would occur in the North and South Training Areas and the
324 south Tularosa Basin portion of McGregor Range. Off-road vehicle maneuver training would also be
325 extended into the southeast TAs of McGregor Range at a somewhat lower level of use.

326 As much as 50 percent of the total area available for off-road vehicle maneuver would be driven on
327 annually, using the assumptions noted for Alternative 1. The impacts in the North and South Training
328 Areas and the south Tularosa Basin portion of McGregor Range would be the same as described for
329 Alternative 1. The southeast TAs on McGregor Range do not contain mesquite coppice dunes or Deep
330 Sand or Sandy ecosites. Most of the soils in the southeast TAs are less susceptible to wind erosion than
331 most of the other areas proposed for off-road vehicle maneuvers.

332 Half of the southeast TAs of McGregor Range would be susceptible to moderate to severe water erosion
333 and up to 25 percent is rated moderate to poor for trafficability under wet conditions. These TAs would
334 require the highest level of maintenance to sustain their usefulness for training. Without adequate periods
335 of rest to allow for recovery of soil cover, off-road vehicle maneuver training in the southeast TAs is
336 likely to cause a change in vegetation and accelerated erosion compared to current conditions.

337 Mitigation measures described for Alternative 1 would also apply to Alternative 3. In addition, limiting
338 off-road vehicle maneuvers on loamy soils in the vicinity of Hackberry Tank would reduce erosion in that
339 area.

340 **5.5.6 Alternative 4 – Proposed Action**

341 **5.5.6.1 Construction**

342 The impacts of the additional potential construction in the Main Cantonment Area would be similar for
343 Alternative 4 to those discussed under Alternative 1. Additional construction of facilities could occur, but
344 it is expected to be after the currently projected construction has been completed.

345 Most of the soils within the South Training Areas have few limitations for road and building construction,
346 so few adverse impacts would be expected as a result of new construction. The soils in Doña Ana Range
347 and McGregor Range have more moderate to severe limitations for building and road construction and
348 maintenance than in the South Training Areas, requiring more aggressive sediment and erosion controls

349 to minimize offsite impacts. The soils within the southeast TAs of McGregor Range have the highest
350 percentage of moderate to severe limitations for construction of new roads and buildings. Aggressive
351 sediment and erosion controls and a high level of road maintenance would be anticipated in this area.

352 **5.5.6.2 Training Activities**

353 Under Alternative 4, more training areas would be used for off-road vehicle maneuvers and the frequency
354 of use and intensity would be higher than the other alternatives. Like the other alternatives, the highest
355 level of off-road vehicle maneuver would occur in the North and South Training Areas and the south
356 Tularosa Basin portion of McGregor Range. Alternative 4 would also extend off-road vehicle maneuver
357 training into both the north Tularosa Basin portion of McGregor Range and the southeast TAs at
358 somewhat lower levels of use.

359 As much as 55 percent of the total area available for off-road vehicle maneuver could be driven on
360 annually under Alternative 4. The impacts would be the same as described for Alternatives 1, 2, and 3.
361 The areas not already in coppice dunes that are characterized by Deep Sand or Sandy ecosites would be
362 likely to sustain damage to vegetation and biological crusts from off-road vehicle maneuvers. The areas
363 most likely to be adversely affected include an estimated 9 percent of the North Training Areas, 10
364 percent of the South Training Areas, 24 percent of the south Tularosa Basin portion of McGregor Range,
365 and 22 percent of the north Tularosa Basin portion of McGregor Range. In the south Tularosa Basin
366 portion of McGregor Range, an estimated 11 percent is likely to become more bare ground susceptible to
367 accelerated wind erosion and 13 percent may become mesquite coppice dunes. In the north Tularosa
368 Basin portion of McGregor Range, an estimated 17 percent may become more bare ground and 5 percent
369 mesquite coppice dunes. The soils in the southeast TAs of McGregor Range are likely to be more
370 resistant to adverse impacts from off-road vehicle maneuvers due to the grass cover and lack of Sandy or
371 Deep Sand ecosites. Without adequate periods of rest to allow for recovery of soil cover, eventual
372 coppice dune formation may occur on the Deep Sand or Sandy ecosites where they do not already exist.

373 Half of the southeast TAs of McGregor Range would be susceptible to moderate to severe water erosion,
374 and up to 25 percent is rated moderate to poor for trafficability under wet conditions. This area would
375 require the highest maintenance to sustain its usefulness for training.

376 Mitigation measures described for Alternative 1 would also apply to this alternative.

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1 **5.6 AIR QUALITY**

2 **5.6.1 Introduction**

3 The air quality analysis in this section is based on estimated increases in emission levels due to
4 construction, operations, and training activities associated with each of the alternatives. The resulting air
5 emissions were evaluated in accordance with federal, state, and local air pollution standards and
6 regulations. The air quality impacts from a proposed activity or action are considered significant if they:

- 7 Increase ambient air pollution concentrations above any NAAQS;
- 8 Contribute to an existing violation of any NAAQS;
- 9 Interfere with or delay timely attainment of NAAQS; or
- 10 Impair visibility within any federally mandated PSD Class I area.

11 Calculations of VOCs, NO_x, CO and PM₁₀ emissions from construction activities were performed using
12 emission factors compiled in the *CEQA Air Quality Handbook* (Ref# 475). Emission factors for SO₂ and
13 PM_{2.5} are not yet available. These are screening level general emission factors for general building,
14 residential, pavement, and building demolition, including contributions from engine exhaust emissions
15 (i.e., construction equipment, material handling, and workers' commuting) and fugitive dust emissions
16 (e.g., from grading activities). The emission factors are based on projected increases in building surface
17 area, paved surface area, and building demolition area proposed under each alternative.

18 Emissions from facility operations were calculated for each alternative by multiplying the baseline
19 emissions inventory for Fort Bliss in Texas and New Mexico by the fractional increase in assigned
20 personnel at Fort Bliss. Emissions estimates were developed for VOC, NO_x, CO, SO₂, Total Suspended
21 Particulates (TSP), lead (Pb), and HAPs. This approach makes the assumption that the increase in
22 emissions from routine facility operations will be directly proportional to the increase in the Fort Bliss
23 population for each alternative. That is, the increase in assigned personnel will result in proportional
24 increases in combustion sources such as hot water boilers and generators.

25 The emissions inventory for training activities includes the following components:

- 26 Combustion emissions from military vehicles used in training events.
- 27 Combustion emissions from generators used in training events.
- 28 Combustion emissions from helicopters in the Combat Aviation Brigade.
- 29 Fugitive dust emissions from vehicles traveling on unpaved roads or off road.

30 A small quantity of emissions is generated by ordnance detonation and firing points, but the impacts of
31 these sources is minimal and they are not addressed further.

32 Emission factors for vehicles and generators were taken from a USEPA document (Ref# 492), and
33 emission factors for helicopters were taken from a U.S. Air Force document (Ref# 491). Estimated
34 activity levels for each military vehicle, generator, and helicopter were projected using TC 25-1 and other
35 Army documents (Ref# 380). These sources identified approximately 1,700 vehicles included in a typical
36 Heavy BCT.

37 Recent field tests conducted at Fort Bliss to estimate the emissions of heavy wheeled military vehicles
38 traveling on unpaved roads (Ref# 418, 419) showed that the two primary factors affecting fugitive dust
39 emissions (calculated as emissions of PM₁₀ in these reports and distinguished from particulate emissions
40 from engines) from an individual vehicle are the vehicle's weight and speed. The regression equation
41 developed through these studies was used to calculate training-related fugitive dust emissions, based on
42 the estimated weight and speed of each participating vehicle. The studies characterized fugitive dust

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

43 emissions from unpaved roads. Fugitive dust emissions from off-road activities could be higher or lower,
44 depending on the composition of the soil, extent of native vegetation, previous vehicular traffic over the
45 same area, and other factors. The emission factors developed for unpaved roads are used to provide a best
46 estimate of fugitive dust emissions during off-road vehicle maneuver training.

47 The studies calculated emissions from light and heavy wheeled vehicles but not from tracked vehicles,
48 which are a significant component of the Heavy BCT vehicle inventory. However, the physical processes
49 that produce fugitive dust are the same for vehicles with wheels and tracks. Therefore, the studies'
50 authors concluded that the emission factors for wheeled vehicles could be used as an approximation of
51 fugitive dust emissions from tracked vehicles.

52 Fugitive dust emissions for Heavy BCT training exercises were calculated using the regression equations
53 produced by these studies, published data on the weight of military vehicles, and activity levels and
54 vehicle speeds derived from TC 25-1 and other sources (Ref# 380). The calculated emissions were then
55 increased to account for off-road vehicle maneuvering by other units.

56 To determine the impacts of these fugitive dust emissions on surrounding areas, a dust plume modeling
57 analysis was conducted by Pacific Northwest National Laboratory (PNNL) for selected training exercises
58 (Ref# 500). To conduct the modeling, PNNL used the DUSTRAN system, which was developed under
59 the U.S. Department of Defense's Strategic Environmental Research and Development Program.
60 DUSTRAN consists of a meteorological model (CALMET), an emissions model, and a dispersion model.
61 The model incorporates a deposition algorithm which accounts for fallout of particles from the dust
62 plume. This model produces the best-available estimate of impacts from fugitive dust emissions resulting
63 from off-road vehicle training activities at Fort Bliss.

64 PNNL modeled fugitive dust emissions for a Heavy BCT-level exercise in the North Training Areas
65 (referred to as "Doña Ana Training Area" in the PNNL report), a Heavy BCT-level exercise on McGregor
66 Range, and a battalion-level exercise in the South Training Areas. The DUSTRAN modeling results
67 showed that the maximum impacts occurred in the North Training Areas.

68 PNNL used an early estimate of the number of vehicles that would be involved in a BCT-level exercise,
69 based on a Prevention of Significant Deterioration analysis conducted in December 2005 (Ref# 571).
70 Updated estimates of vehicle activity associated with a BCT exercise are at least 50 percent larger than
71 the earlier estimate. Therefore, the results of the PNNL modeling were scaled upwards for this SEIS to
72 account for the larger number of vehicles.

73 In addition to direct emissions increases associated with construction and training activities, vehicle
74 emissions were estimated for privately owned vehicles operated by increased personnel at Fort Bliss and
75 the induced population increase. The increase in direct privately owned vehicle emissions was calculated
76 based on the assumption that personnel living on post and their spouses (for accompanied personnel)
77 would drive an average of 10 miles per day each. Personnel living off post and their spouses were
78 assumed to drive an average of 20 miles per day. A multiplier of 0.7 was applied to personnel living off
79 post to account for dependents that drive, and they were also assumed to travel an average of 20 miles per
80 day. Daily mileage for the induced population was calculated based on Texas Department of
81 Transportation average total daily vehicle miles traveled in El Paso, divided by the population of the
82 district, which resulted in 16.5 miles per person per day (Ref# 493). The vehicles were assumed to be the
83 default mix of vehicle types provided in USEPA's most recent version of the MOBILE6 emissions
84 model.

85 According to USEPA's General Conformity Rule, any proposed federal action that has the potential to
86 impact air quality in a nonattainment or maintenance area must undergo a conformity analysis. Fort Bliss
87 is located in attainment areas, both in Texas and New Mexico, so a conformity analysis is not required.
88 However, part of Fort Bliss in Texas is located adjacent to the city of El Paso, which is classified as in
89 moderate nonattainment for CO and PM₁₀. Motor vehicle emissions within El Paso are anticipated to

90 increase due to the proposed action and alternatives (e.g., commuting between El Paso and Fort Bliss).
 91 Therefore, transportation conformity must be considered, and Fort Bliss transportation projects must be
 92 included in transportation plans developed by the El Paso Metropolitan Planning Organization. The El
 93 Paso MPO has included the anticipated growth of Fort Bliss in its current travel demand modeling; Fort
 94 Bliss will continue working with the MPO to ensure that growth and development on the installation are
 95 captured in the region's transportation plans.

96 Section 169A of the CAA established a program to prevent, and remedy existing, impairment of visibility
 97 in mandatory federal Class I areas. Certain national parks, monuments, and wilderness areas have been
 98 designated as PSD Class I areas. The nearest PSD Class I area to Fort Bliss is Guadalupe Mountains
 99 National Park, which is located 45 miles to the southeast. Other PSD Class I areas located at greater
 100 distances include Big Bend National Park, Carlsbad Caverns National Park, White Mountains Wilderness
 101 Area, and Bosque del Apache Wilderness Area. Because of their distance from Fort Bliss, these Class I
 102 areas are not expected to be impacted by the proposed action or alternatives.

103 **5.6.2 No Action Alternative**

104 **5.6.2.1 Construction**

105 Construction in the No Action Alternative, which will occur primarily in the Main Cantonment Area, is
 106 scheduled to take place over a five-year period. Emissions will be produced by the construction of single
 107 family housing, general building construction (including industrial and administrative buildings), paving
 108 of additional areas, and demolition of existing buildings. Emissions (in tons per year) were calculated by
 109 assuming a uniform distribution of construction activities over the five-year period. **Table 5.6-1** presents
 110 estimated annual construction emissions over the construction period.

111 **Table 5.6-1. Construction Emissions – No Action Alternative**

<i>Facility Construction Type</i>	<i>Construction / Demolition (SF)¹</i>	<i>Construction Emissions (tons/year)</i>			
		<i>VOC</i>	<i>NO_x</i>	<i>CO</i>	<i>PM₁₀</i>
Single Family Housing	4,148,000	9.8	144.2	31.4	10.2
General Building Construction	2,368,745	13.1	193.0	42.0	13.7
Paved Area	7,811,000	1.3	18.8	6.7	1.1
Building Demolition	3,074,000	2.2	10.9	11.3	4.2
Total Construction Emissions		26.4	366.9	91.4	29.2

1. Assumed to be built over a 5-year period.

112 Emissions generated by construction projects are temporary in nature and will end when construction is
 113 complete. They are primarily from mobile emission sources and material handling operations, and are
 114 also distributed over time and space, so that impacts are not likely to be as concentrated as from a single
 115 point source, for example. These are screening level emission estimates that are calculated by assuming
 116 activities typical for construction of various facilities types. In general, combustive and fugitive dust
 117 emissions will produce localized, short-term elevated air pollutant concentrations that do not result in any
 118 long-term impacts on the regional air quality.

119 **5.6.2.2 Facility Operations**

120 Fort Bliss has developed a comprehensive 2004 baseline emissions inventory for Texas and New Mexico
 121 operations. These emission sources include external combustion sources (hot water boilers and heaters),
 122 internal combustion sources (generators and other engines), solvent use, storage tanks and fueling
 123 operations, miscellaneous operations (including welding, landfill operations, woodworking, and firing
 124 range training), abrasive blasting operations, surface coating operations, and fugitive dust sources.

125 **Table 5.6-2** presents the estimated increased annual emissions from facility operations for the No Action
 126 Alternative, based on the projected increase in personnel at full implementation of this alternative. With

127 the addition of one Heavy BCT under this alternative, the number of personnel at Fort Bliss is projected
128 to increase by approximately 45 percent.

129 **Table 5.6-2. Increase in Facility Operational Emissions - No Action Alternative**

<i>Portion of Fort Bliss</i>	<i>Annual Emissions (tons/year)</i>						
	<i>VOC</i>	<i>NO_x</i>	<i>CO</i>	<i>TSP</i>	<i>SO₂</i>	<i>Pb</i>	<i>HAPs</i>
Texas	52.9	139.6	49.7	10.7	2.5	0.0	9.0
New Mexico	5.0	42.6	7.3	2.8	1.4	0.06	0.91

130 **5.6.2.3 Training Activities**

131 Increased air pollutant emissions from training activities include combustion emissions from vehicles and
132 equipment and fugitive dust from off-road vehicle maneuvers. These emissions are primarily from
133 mobile sources. **Table 5.6-3** includes estimated combustion emissions from training activities for the No
134 Action Alternative.

135 **Table 5.6-3. Increase in Combustion Emissions – No Action Alternative**

<i>Emission Source</i>	<i>Annual Combustion Emissions (tons/year)</i>				
	<i>VOC</i>	<i>NO_x</i>	<i>CO</i>	<i>PM₁₀</i>	<i>SO₂</i>
Military Vehicles	21.0	400.0	12.0	86.0	2.0
Generators	1.0	14.0	2.0	1.0	1.0
<i>Subtotal Military Equipment</i>	<i>22.0</i>	<i>414.0</i>	<i>14.0</i>	<i>87.0</i>	<i>3.0</i>
Privately Owned Vehicles ¹	34.4	48.7	394.4	1.5	0.4
Total Combustion Emissions	56.4	462.7	408.4	88.5	3.4

1. Direct personnel and their dependents.

136 The annual combustion emissions from military equipment presented in Table 5.6-3 were distributed as
137 follows: 89 percent of the activity in the North Training Areas and 11 percent in the South Training
138 Areas. **Table 5.6-4** presents the resulting distribution of emissions in each segment.

139 **Table 5.6-4. Geographical Distribution of Emissions from Training Activities - No Action**
140 **Alternative**

<i>Emission Distribution</i>	<i>Annual Combustion Emissions (tons/year)</i>				
	<i>VOC</i>	<i>NO_x</i>	<i>CO</i>	<i>PM₁₀</i>	<i>SO₂</i>
North Training Areas	19.6	368.0	12.5	77.4	2.7
South Training Areas	2.4	46.0	1.5	9.6	0.3

141 These emissions would be widely distributed throughout the year over approximately 1,356 km². Given
142 the wide distribution of the emissions, air quality in the region would not be significantly affected.

143 PM₁₀ emissions from fugitive dust were calculated as described in Section 5.6.1. **Table 5.6-5** provides
144 the distribution of those PM₁₀ emissions over the Fort Bliss training areas for all alternatives.

145 To estimate PM₁₀ emissions from fugitive dust, the results of modeling performed by PNNL for the North
146 and South Training Areas were adjusted to incorporate the updated vehicle inventory for a Heavy BCT
147 and account for off-road vehicle maneuver training by other units. These adjustments indicate that PM₁₀
148 emissions in the North Training Areas are expected to be approximately twice the emissions calculated in
149 the PNNL analysis.

150 The PNNL impact analyses at the boundaries of the North Training Areas had a maximum 24-hour
151 average PM₁₀ concentration of 10 µg/m³, which was doubled to 20 µg/m³ to account for the updated
152 vehicle inventory. This was then combined with an assumed PM₁₀ background level of 35 µg/m³ for
153 Doña Ana County, as recommended in a document produced by the New Mexico Environment
154 Department, Air Quality Bureau (Ref# 499), and compared with the 24-hour National Ambient Air
155 Quality Standard for PM₁₀. The maximum impact at the boundary of the North Training Area would
156 therefore be 55 µg/m³, which is well below the 24-hour PM₁₀ NAAQS of 150 µg/m³. The NAAQS is

157 designed to protect public health and welfare and provide an adequate margin of safety. Therefore, this
158 analysis shows that there will be no significant adverse impacts from fugitive dust emissions under the No
159 Action Alternative.

160 **Table 5.6-5. Distribution of PM₁₀ Emissions From Fugitive Dust**
161 **Due to Off-Road Vehicle Maneuver Training**

<i>Alternative</i>	<i>PM₁₀ Emissions (tons/year)</i>		
	<i>North Training Areas</i>	<i>South Training Areas</i>	<i>McGregor Range</i>
No Action Alternative	6,561	811	0
Alternative 1	13,385	1,654	7,077
Alternative 2	12,204	1,508	8,404
Alternative 3	12,597	1,557	7,967
Alternative 4 – Proposed Action	15,222	1,881	12,385

162 **5.6.2.4 Population-Related Emissions**

163 The No Action Alternative will result in an increase of 4,500 personnel at Fort Bliss. Table 5.6-3
164 includes the estimated increase in annual privately owned vehicle emissions associated with those
165 personnel and their dependents. This level of change in emissions will not result in significant long-term
166 impacts on the local air quality.

167 **Table 5.6-6** presents estimated emissions from privately owned vehicles that would be operated by the
168 induced population (population not directly associated with Fort Bliss but attracted to the region by the
169 increased economic opportunities stimulated by the growth at Fort Bliss).

170 **Table 5.6-6. Estimated Induced Population Vehicle Emissions**

<i>Alternative</i>	<i>Estimated Daily Vehicle Miles Traveled</i>	<i>Estimated Annual Vehicle Miles Traveled</i>	<i>Emissions (tons/year)</i>			
			<i>VOC</i>	<i>NO_x</i>	<i>CO</i>	<i>PM₁₀</i>
No Action Alternative	188,113	47,028,250	51.7	73.4	594.0	2.3
Alternative 1	984,622	246,155,540	270.8	384.2	3,109.2	12.1
Alternatives 2 and 3	1,117,375	279,343,770	307.3	436.0	3,528.3	13.7
Alternative 4	1,491,153	372,788,130	410.1	581.9	4,709.0	18.2

171 **5.6.3 Alternative 1**

172 **5.6.3.1 Construction**

173 **Table 5.6-7** presents estimated annual emissions from construction in the Main Cantonment Area for
174 Alternative 1.

175 **Table 5.6-7. Construction Emissions – Alternative 1**

<i>Facility Construction Type</i>	<i>Construction / Demolition (SF)¹</i>	<i>Construction Emissions (tons/year)</i>			
		<i>VOC</i>	<i>NO_x</i>	<i>CO</i>	<i>PM₁₀</i>
Single Family Housing	10,148,000	24.0	352.9	76.7	25.1
General Building Construction	11,731,000	65.0	955.8	207.9	67.9
Paved Area	34,055,560	6.7	87.4	34.8	5.8
Building Demolition	3,474,000	2.5	12.3	12.7	4.8
Total Construction Emissions		98.2	1,408.0	332.1	103.6

1. Assumed to be built over a 5-year period.

176 As noted for the No Action Alternative, emissions generated by construction projects are temporary in
177 nature and end when construction is complete. Several methods are available for reducing construction
178 emissions, including using efficient construction practices, avoiding long periods where construction

179 equipment engines are running at idle, carpooling of construction workers, and by requiring post-
180 combustion control equipment on heavy duty diesel engines. The PM₁₀ emissions from construction-
181 related fugitive dust could be reduced significantly by frequent spraying of water on exposed soil during
182 construction and proper soil stockpiling methods.

183 In general, construction-related combustive and fugitive dust emissions may have the potential to produce
184 localized, short-term elevated air pollutant concentrations that would not result in any long-term impacts
185 on the regional air quality.

186 **5.6.3.2 Facility Operations**

187 Facility-related operational emissions were estimated for Alternative 1 as described in Section 5.6.1 and
188 include operational activities at Fort Bliss in both Texas and New Mexico. **Table 5.6-8** presents
189 estimated increased annual emissions associated with operations in Alternative 1, based on a projected
190 200 percent increase in personnel by 2011.

191 **Table 5.6-8. Increase in Facility Operational Emissions – Alternative 1**

<i>Portion of Fort Bliss</i>	<i>Annual Emissions (tons/year)</i>						
	<i>VOC</i>	<i>NO_x</i>	<i>CO</i>	<i>TSP</i>	<i>SO₂</i>	<i>Pb</i>	<i>HAPs</i>
Texas	109.5	288.9	102.9	22.2	5.1	0.0	18.6
New Mexico	10.3	88.1	15.1	5.7	2.9	0.12	1.9

192 **5.6.3.3 Training Activities**

193 Training-related emissions were estimated for Alternative 1 as described in Section 5.6.1 and include the
194 training activities associated with four Heavy BCTs, a CAB, and other units and users of the Fort Bliss
195 Training Complex. These emissions would be primarily from mobile sources. **Table 5.6-9** includes
196 estimated combustion emissions associated with training activities in Alternative 1.

197 **Table 5.6-9. Increase in Combustion Emissions – Alternative 1**

<i>Emission Source</i>	<i>Annual Combustion Emissions (tons/year)</i>				
	<i>VOC</i>	<i>NO_x</i>	<i>CO</i>	<i>PM₁₀</i>	<i>SO₂</i>
Military Vehicles	71.0	1,338.0	39.0	290.0	6.0
Generators	4.0	43.0	9.0	3.0	3.0
Combat Aviation Brigade	1.0	25.0	8.0	3.0	2.0
<i>Subtotal Military Equipment</i>	<i>76.0</i>	<i>1,406.0</i>	<i>56.0</i>	<i>296.0</i>	<i>11.0</i>
Privately Owned Vehicles ¹	158.1	224.4	1,815.8	7.0	1.4
Total Combustion Emissions	234.1	1,630.4	1,871.8	303.0	12.4

1. Direct personnel and their dependents

198 The annual combustion emissions from military equipment presented in Table 5.6-9 were distributed as
199 follows: 60.5 percent of the activity in the North Training Areas, 7.5 percent in the South Training Areas,
200 and 32.0 percent in the south Tularosa Basin portion of McGregor Range. **Table 5.6-10** presents the
201 resulting emissions in each area.

202 **Table 5.6-10. Geographical Distribution of Emissions from Training Activities – Alternative 1**

<i>Emission Distribution</i>	<i>Annual Combustion Emissions (tons/year)</i>				
	<i>VOC</i>	<i>NO_x</i>	<i>CO</i>	<i>PM₁₀</i>	<i>SO₂</i>
North Training Areas	46.0	851.0	33.9	179.0	6.7
South Training Areas	5.7	105.0	4.2	22.0	0.8
McGregor Range	24.3	450.0	17.9	95.0	3.5

203 These combustions emissions would be widely distributed throughout the year over an area of
204 approximately 2,230 km². The emissions in the North Training Areas would be distributed over
205 approximately 874 km², emissions in the South Training Areas over approximately 378 km², and

emissions in McGregor Range over approximately 978 km². Given the wide distribution of these emissions, no significant impacts to the air quality in the region are anticipated from vehicle combustion.

Estimated PM₁₀ emissions from fugitive dust generated by off-road vehicle maneuvers under Alternative 1 are presented in Table 5.6-5. Greater utilization of the training areas for off-road vehicle maneuvers would increase the annual PM₁₀ emissions in Alternative 1 compared to the No Action Alternative. The maximum 24-hour emissions at the North Training Areas would be the same because these are based on the maximum capacity of that segment of the Fort Bliss Training Complex at any given time. The worst-case 24-hr PM₁₀ levels calculated in the PNNL modeling were multiplied by a factor of 2 for both the North Training Areas and McGregor Range to account for the updated vehicle inventory. The PNNL modeling showed a maximum 24-hour average PM₁₀ concentration of 10 µg/m³ at the installation boundary. Multiplying this estimate by a factor of 2 produces maximum impact of 20 µg/m³ at the installation boundary. When added to the background PM₁₀ concentration of 35 µg/m³ for Doña Ana County recommended by the New Mexico Environment Department, this results in an estimated maximum ambient PM₁₀ concentration of 55 µg/m³ at the boundary of the North Training Areas. The recommended background concentration for Otero County is 20 µg/m³, resulting in a maximum concentration of 40 µg/m³ at the installation boundary. These levels are well below the NAAQS for PM₁₀ of 150 µg/m³. Therefore, this analysis shows that the impacts of PM₁₀ emissions from off-road vehicle maneuvers under Alternative 1 would not be significant.

Dust suppressants or gravel can be used to mitigate fugitive dust emissions on heavily traveled unpaved roads and tank trails. These mitigation efforts would not be practical for off-road maneuver areas because of the extensive geographic size of those areas. Fugitive dust from military vehicle convoys could be reduced by regulating convoy routes, spacing and speed. Using internal roadways removed from installation boundaries would reduce off-post impacts from fugitive dust. Off-road vehicle maneuvers could be reduced during periods of high wind that might transport particulates greater distances.

5.6.3.4 Population-Related Emissions

Alternative 1 would result in a net increase of 22,100 personnel at Fort Bliss. Table 5.6-9 includes the estimated direct increase in annual privately owned vehicle emissions associated with those personnel. These changes in emissions are not expected to result in significant long-term impacts on air quality. Estimated annual emissions from privately owned vehicles of the induced population under Alternative 1 are presented in Table 5.6-6. Increased use of car pooling could reduce emissions from privately owned vehicles.

5.6.4 Alternative 2

5.6.4.1 Construction

Table 5.6-11 presents estimated annual emissions from construction in the Main Cantonment Area for Alternative 2, including facilities and infrastructure for a second CAB.

Table 5.6-11. Construction Emissions – Alternative 2

Facility Construction Type	Construction / Demolition (SF) ¹	Construction Emissions (tons/year)			
		VOC	NO _x	CO	PM ₁₀
Single Family Housing	10,148,000	24.0	352.9	76.7	25.1
General Building Construction	13,041,885	72.3	1,062.5	231.1	75.4
Paved Area	39,155,560	7.8	101.3	40.8	6.8
Building Demolition	3,474,000	2.5	12.3	12.7	4.8
Total Construction Emissions		106.6	1,529.0	361.3	112.1

1. Assumed to be built over a 5-year period.

242 Emissions generated by construction projects are temporary in nature and end when construction is
243 complete. Methods for reducing construction emissions would be the same as described for Alternative 1.

244 In general, construction-related combustive and fugitive dust emissions may have the potential to produce
245 localized, short-term elevated air pollutant concentrations that would not result in any long-term impacts
246 on the regional air quality.

247 **5.6.4.2 Facility Operations**

248 Facility-related operational emissions were estimated for Alternative 2 as described in Section 5.6.1 and
249 include operational activities at Fort Bliss in both Texas and New Mexico. **Table 5.6-12** presents
250 estimated increased annual emissions associated with operations in Alternative 2, based on a projected
251 227 percent increase in personnel at full implementation of this alternative.

252 **Table 5.6-12. Increase in Facility Operational Emissions – Alternative 2**

<i>Portion of Fort Bliss</i>	<i>Annual Emissions (tons/year)</i>						
	<i>VOC</i>	<i>NO_x</i>	<i>CO</i>	<i>TSP</i>	<i>SO₂</i>	<i>Pb</i>	<i>HAPs</i>
Texas	119.4	314.9	112.2	24.2	5.6	0.0	20.3
New Mexico	11.2	100.0	16.4	6.2	3.1	0.13	2.1

253 **5.6.4.3 Training Activities**

254 Training-related emissions were estimated for Alternative 2 as described in Section 5.6.1 and include the
255 training requirements of a second CAB in addition to the requirements identified for Alternative 1. These
256 emissions would be primarily from mobile sources. **Table 5.6-13** includes estimated combustion
257 emissions associated with training activities in Alternative 2.

258 **Table 5.6-13. Increase in Combustion Emissions – Alternative 2**

<i>Emission Source</i>	<i>Annual Combustion Emissions (tons/year)</i>				
	<i>VOC</i>	<i>NO_x</i>	<i>CO</i>	<i>PM₁₀</i>	<i>SO₂</i>
Military Vehicles	77.0	1,460.0	43.0	316.0	7.0
Generators	4.0	43.0	9.0	3.0	3.0
Combat Aviation Brigades	1.0	47.0	15.0	3.0	6.0
<i>Subtotal Military Equipment</i>	<i>82.0</i>	<i>1,550.0</i>	<i>67.0</i>	<i>322.0</i>	<i>16.0</i>
Privately Owned Vehicles ¹	180.9	256.6	2,076.7	8.0	1.6
Total Combustion Emissions	262.9	1,806.6	2,143.7	330.0	17.6

1. Direct personnel and their dependents.

259 The annual combustion emissions from military equipment presented in Table 5.6-13 were distributed as
260 follows: 55.2 percent of the activity in the North Training Areas, 6.8 percent in the South Training Areas,
261 and 38.0 percent in the Tularosa Basin portion of McGregor Range. **Table 5.6-14** presents the resulting
262 emissions in each area.

263 **Table 5.6-14. Geographical Distribution of Emissions from Training Activities –**
264 **Alternative 2**

<i>Emission Distribution</i>	<i>Annual Combustion Emissions (tons/year)</i>				
	<i>VOC</i>	<i>NO_x</i>	<i>CO</i>	<i>PM₁₀</i>	<i>SO₂</i>
North Training Areas	45.3	856.0	37.0	178.0	8.8
South Training Areas	5.6	105.0	4.6	22.0	1.1
McGregor Range	31.1	589.0	25.4	122.0	6.1

265 These combustion emissions would be widely distributed throughout the year over an area of
266 approximately 2,491 km². The emissions in the North Training Areas would be distributed over
267 approximately 874 km², emissions in the South Training Areas over approximately 378 km², and

268 emissions in McGregor Range over approximately 1,129 km². Given the wide distribution of these
269 emissions, no significant impacts to the air quality in the region are anticipated from vehicle combustion.

270 Estimated PM₁₀ emissions from fugitive dust generated by off-road vehicle maneuvers under Alternative
271 2 are presented in Table 5.6-5. Greater utilization of the training areas would increase the annual PM₁₀
272 emissions in Alternative 2, but the maximum 24-hour emissions would be the same as under Alternative 1
273 because the analysis for Alternative 1 is based on the maximum use of the training areas at any one time.
274 The 24-hour PM₁₀ levels at the installation boundary would be well below the NAAQS of 150 µg/m³.
275 Therefore, this analysis shows that the impacts of PM₁₀ emissions from off-road vehicle maneuvers under
276 Alternative 2 would not be significant. The potential for mitigating impacts of fugitive dust would be the
277 same as described for Alternative 1.

278 **5.6.4.4 Population-Related Emissions**

279 Alternative 2 would result in a net increase of 24,800 personnel at Fort Bliss. Table 5.6-13 includes the
280 estimated direct increase in annual privately owned vehicle emissions associated with those personnel.
281 These changes in emissions are not expected to result in significant long-term impacts on air quality.
282 Estimated annual emissions from privately owned vehicles of the induced population under Alternative 2
283 are presented in Table 5.6-6. Increased use of car pooling could reduce emissions from privately owned
284 vehicles.

285 **5.6.5 Alternative 3**

286 **5.6.5.1 Construction**

287 Emissions from construction in the Main Cantonment Area under Alternative 3 would be the same as
288 described for Alternative 2.

289 **5.6.5.2 Facility Operations**

290 Facility-related operational emissions under Alternative 3 would be the same as described for Alternative
291 2.

292 **5.6.5.3 Training Activities**

293 Training-related emissions were estimated for Alternative 3 as described in Section 5.6.1 and include the
294 training requirements of a second CAB in addition to the requirements identified for Alternative 2. These
295 emissions would be primarily from mobile sources. **Table 5.6-15** includes estimated combustion
296 emissions associated with training activities in Alternative 3.

297 **Table 5.6-15. Increase in Combustion Emissions – Alternative 3**

<i>Emission Source</i>	<i>Annual Combustion Emissions (tons/year)</i>				
	<i>VOC</i>	<i>NO_x</i>	<i>CO</i>	<i>PM₁₀</i>	<i>SO₂</i>
Military Vehicles	79.0	1,487.0	44.0	322.0	7.0
Generators	4.0	43.0	9.0	3.0	3.0
Combat Aviation Brigades	1.0	47.0	15.0	3.0	6.0
<i>Subtotal Military Equipment</i>	<i>84.0</i>	<i>1,577.0</i>	<i>68.0</i>	<i>328.0</i>	<i>16.0</i>
Privately Owned Vehicles ¹	180.9	256.6	2,076.7	8.0	1.6
Total Combustion Emissions	264.9	1,833.6	2,144.7	336.0	17.6

1. Direct personnel and their dependents.

298 The annual combustion emissions from military equipment presented in Table 5.6-15 were distributed as
299 follows: 57.0 percent of the activity in the North Training Areas, 7.0 percent in the South Training Areas,
300 and 36.0 percent in the Tularosa Basin portion of McGregor Range. **Table 5.6-16** presents the resulting
301 emissions in each area.

302
303

**Table 5.6-16. Geographical Distribution of Emissions from Training Activities –
Alternative 3**

<i>Emission Distribution</i>	<i>Annual Combustion Emissions (tons/year)</i>				
	<i>VOC</i>	<i>NO_x</i>	<i>CO</i>	<i>PM₁₀</i>	<i>SO₂</i>
North Training Areas	47.9	899.0	38.7	187.0	9.1
South Training Areas	5.9	110.0	4.8	23.0	1.1
McGregor Range	30.2	568.0	24.5	118.0	5.8

304 These combustion emissions would be widely distributed throughout the year over an area of
305 approximately 2,519 km². The emissions in the North Training Areas would be distributed over
306 approximately 874 km², emissions in the South Training Areas over approximately 378 km², and
307 emissions in McGregor Range over approximately 1,267 km². Given the wide distribution of these
308 emissions, no significant impacts to the air quality in the region are anticipated from vehicle combustion.

309 Estimated PM₁₀ emissions from fugitive dust generated by off-road vehicle maneuvers under Alternative
310 3 are presented in Table 5.6-5. The maximum 24-hour emissions would be the same as described for
311 Alternative 1 because the analysis for that alternative is based on the maximum concurrent use of the
312 training areas. The 24-hour levels at the installation boundary would be well below the NAAQS of 150
313 µg/m³. Therefore, this analysis shows that the impacts of PM₁₀ emissions from off-road vehicle
314 maneuvers under Alternative 3 would not be significant. The potential for mitigating impacts of fugitive
315 dust would be the same as described for Alternative 1.

316 **5.6.5.4 Population-Related Emissions**

317 The estimated direct increase in annual privately owned vehicle emissions associated with increased
318 personnel at Fort Bliss under Alternative 3 would be the same as under Alternative 2 and are included in
319 Table 5.6-15. These changes in emissions are not expected to result in significant long-term impacts on
320 air quality. Estimated privately owned vehicle emissions from the induced population are presented in
321 Table 5.6-6. Increased use of car pooling could reduce emissions from privately owned vehicles.

322 **5.6.6 Alternative 4 – Proposed Action**

323 **5.6.6.1 Construction**

324 **Table 5.6-17** presents estimated annual emissions from construction in the Main Cantonment Area for
325 Alternative 4, including facilities and infrastructure for two additional BCTs, in addition to the
326 construction described for Alternatives 2 and 3.

327

Table 5.6-17. Construction Emissions – Alternative 4

<i>Facility Construction Type</i>	<i>Construction / Demolition (SF)¹</i>	<i>Construction Emissions (tons/year)</i>			
		<i>VOC</i>	<i>NO_x</i>	<i>CO</i>	<i>PM₁₀</i>
Single Family Housing	10,148,000	24.0	352.9	76.7	25.1
General Building Construction	15,681,885	86.9	1,277.6	277.8	90.7
Paved Area	43,233,560	8.6	111.6	44.8	7.4
Building Demolition	3,474,000	2.5	12.3	12.7	4.8
Total Construction Emissions		122.0	1,754.0	412.0	128.0

1. Assumed to be built over a 5-year period.

328 Emissions generated by construction projects are temporary in nature and end when construction is
329 complete. Methods for reducing construction emissions would be the same as described for Alternative 1.

330 In general, construction-related combustive and fugitive dust emissions may have the potential to produce
331 localized, short-term elevated air pollutant concentrations that would not result in any long-term impacts
332 on the regional air quality.

333 **5.6.6.2 Facility Operations**

334 Facility-related operational emissions were estimated for Alternative 4 as described in Section 5.6.1 and
 335 include operational activities at Fort Bliss in both Texas and New Mexico. **Table 5.6-18** presents
 336 estimated increased annual emissions associated with operations in Alternative 4, based on a projected
 337 264 percent increase in personnel at full implementation of this alternative.

338 **Table 5.6-18. Increase in Facility Operational Emissions – Alternative 4**

<i>Portion of Fort Bliss</i>	<i>Annual Emissions (tons/year)</i>						
	<i>VOC</i>	<i>NO_x</i>	<i>CO</i>	<i>TSP</i>	<i>SO₂</i>	<i>Pb</i>	<i>HAPs</i>
Texas	132.9	350.5	124.9	26.9	6.2	0.0	22.6
New Mexico	12.5	106.8	18.3	7.0	3.5	0.15	2.3

339 **5.6.6.3 Training Activities**

340 Training-related emissions were estimated for Alternative 4 as described in Section 5.6.1 and include the
 341 training requirements of two additional BCTs in addition to the requirements identified for Alternatives 1,
 342 2, and 3. These emissions would be primarily from mobile sources. **Table 5.6-19** includes estimated
 343 combustion emissions associated with training activities in Alternative 4.

344 **Table 5.6-19. Increase in Combustion Emissions – Alternative 4**

<i>Emission Source</i>	<i>Annual Combustion Emissions (tons/year)</i>				
	<i>VOC</i>	<i>NO_x</i>	<i>CO</i>	<i>PM₁₀</i>	<i>SO₂</i>
Military Vehicles	87.0	1,647.0	48.0	356.0	8.0
Generators	5.0	56.0	13.0	4.0	4.0
Combat Aviation Brigades	1.0	47.0	15.0	3.0	6.0
<i>Subtotal Military Equipment</i>	<i>93.0</i>	<i>1,750.0</i>	<i>76.0</i>	<i>363.0</i>	<i>18.0</i>
Privately Owned Vehicles ¹	244.8	347.3	2,811.0	10.9	2.2
Total Combustion Emissions	337.8	2,097.3	2,887.0	373.9	20.2

1. Direct personnel and their dependents.

345 The annual combustions emissions from military equipment presented in Table 5.6-19 were distributed as
 346 follows: 51.6 percent of the activity in the North Training Areas, 6.4 percent in the South Training Areas,
 347 and 42.0 percent in the Tularosa Basin portion of McGregor Range. **Table 5.6-20** presents the resulting
 348 emissions in each area.

349 **Table 5.6-20. Geographical Distribution of Emissions from Training Activities – Alternative 4**

<i>Emission Distribution</i>	<i>Annual Combustion Emissions (tons/yr)</i>				
	<i>VOC</i>	<i>NO_x</i>	<i>CO</i>	<i>PM₁₀</i>	<i>SO₂</i>
North Training Areas	48.0	903.0	39.2	187.0	9.3
South Training Areas	6.0	112.0	4.9	23.0	1.2
McGregor Range	39.0	735.0	31.9	153.0	7.5

350 These combustions emissions would be widely distributed throughout the year over an area of
 351 approximately 2,780 km². The emissions in the North Training Areas would be distributed over
 352 approximately 874 km², emissions in the South Training Areas over approximately 378 km², and
 353 emissions in McGregor Range over approximately 1,528 km². Given the wide distribution of these
 354 emissions, no significant impacts to the air quality in the region are anticipated from vehicle combustion.

355 Estimated PM₁₀ emissions from fugitive dust generated by off-road vehicle maneuvers under Alternative
 356 4 are presented in Table 5.6-5. Greater utilization of the training areas would increase the annual
 357 emissions in Alternative 4 compared to the other alternatives. The maximum 24-hour emissions at the
 358 North Training Areas would be the same as described for Alternative 1 because that analysis is based on
 359 the maximum concurrent use of those training areas. The maximum impact of 20 µg/m³ at the installation
 360 boundary, when added to the background PM₁₀ concentration in Doña Ana County of 35 µg/m³

361 recommended by the New Mexico Environment Department, results in an estimated maximum ambient
362 PM₁₀ concentration of 55 µg/m³. At McGregor Range, the PNNL level of 10 µg/m³ was multiplied by a
363 factor of 3 to account for potential concurrent training by one Heavy BCT and one battalion. Added to
364 the recommended background PM₁₀ concentration of 20 µg/m³ for Otero County results in a maximum
365 concentration of 50 µg/m³. These levels are well below the NAAQS of 150 µg/m³. Therefore, this
366 analysis shows that the impacts of fugitive dust from off-road vehicle maneuvers under Alternative 4
367 would not be significant. The potential for mitigating impacts of fugitive dust would be the same as
368 described for Alternative 1.

369 **5.6.6.4 *Population-Related Emissions***

370 Alternative 4 could result in a net increase of as many as 32,400 personnel at Fort Bliss. Table 5.6-19
371 includes the estimated direct increase in annual privately owned vehicles emissions associated with those
372 personnel. These changes in emissions are not expected to result in significant long-term impacts on air
373 quality. Estimated annual emissions from privately owned vehicles of the induced population under
374 Alternative 4 are presented in Table 5.6-6. Increased use of car pooling could reduce emissions from
375 privately owned vehicles.

5.7 WATER RESOURCES

5.7.1 Introduction

The water resources analysis addresses surface water and groundwater supplies and storm water quality.

The availability of water in far west Texas, southeastern New Mexico, and north-central Mexico was identified as a scoping issue for this SEIS. Fresh water that can be easily treated to potable standards is in short supply, and the quality of historically used aquifers is declining. The pressure to find suitable drinking water supplies is increasing as El Paso and Ciudad Juárez are both growing rapidly.

The only surface water available for potable water supply in the El Paso region is the Rio Grande. El Paso Water Utilities is using Rio Grande water to the extent allowed by existing water quality and available water rights. EPWU is purchasing additional agricultural water rights to increase its use of Rio Grande water, but during drought years, the quality of that water is not adequate for treatment to potable water standards. Groundwater currently remains the only source of additional water for the region in drought years.

The primary groundwater source in the ROI is the Hueco Bolson, which supplies the Fort Bliss Main Cantonment Area, El Paso, and Ciudad Juárez. The adequacy of this source to meet future demand depends on population growth and water management activities on both sides of the U.S.-Mexico border.

Potable water to support Fort Bliss personnel and dependents comes from two primary sources: on-post wells, which currently provide the great majority of the water used in the Main Cantonment Area (Ref# 2), and EPWU. In 2004, Fort Bliss pumped approximately 5,200 acre feet (4.6 MGD) from the Main Post wells and 572 af (0.5 MGD) from Biggs AAF wells. The Main Post wells have the capacity of pumping approximately 17,800 afy, and the Biggs AAF wells have a capacity of pumping approximately 880 afy. EPWU can supply approximately 4,800 afy to the Main Cantonment Area (Ref# 2).

EPWU is planning for future population growth in the area and has developed projects for obtaining and distributing water to approximately 640,000 people by 2010. EPWU projections, not including the increased number of personnel and dependents and induced growth associated with Fort Bliss, indicate a population increase from 566,858 in 2000 to 637,481 in 2010.

Table 5.7-1 presents the Far West Texas Water Plan estimated water demand in El Paso County. Projects to meet the estimated increase in demand include the construction of the desalination plant on Fort Bliss land to ameliorate the withdrawal of fresh groundwater from the Hueco Bolson, increased use of Rio Grande water, and purchase of agricultural water rights. Complementing these efforts is an aggressive water conservation program intended to limit per capita consumption at 140 gal/day and a water reuse (“purple pipe”) program for irrigation. According to the Far West Texas Water Plan, EPWU has established plans that it believes, based on its population projections, will provide “nearly sustainable” water for the next 100 years.

Table 5.7-1. Estimated Municipal Water Demand for El Paso County

	<i>2000</i>	<i>2010</i>	<i>2020</i>	<i>2030</i>	<i>2040</i>	<i>2050</i>	<i>2060</i>
Acre feet/year	134,065	155,795	176,736	194,882	209,460	226,764	244,450

Note: These demands represent the demand for all of El Paso County, which includes more than the service area of EPWU but does not include Fort Bliss.

Source: Ref# 317

EPWU plans to meet the water demand in 2010 from existing supplies (estimated at approximately 150,000 afy) by increasing the amount of reclaimed water and water conservation efforts. By 2020, however, an additional 10,000 afy will be required to meet projected baseline growth not including increases projected for Fort Bliss. A combination of Rio Grande water and Hueco and Mesilla Bolson

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

40 water will be used to meet this demand. By 2030, an additional 15,000 afy is planned to be obtained from
41 the Dell City Area Aquifer. These increases result from projected demands of 168,264 afy by 2010,
42 193,820 afy by 2020, and 213,836 afy by 2030 (Ref# 321)

43 Simulations of future management alternatives for the Texas portion of the Hueco Bolson aquifer showed
44 that EPWU pumping of 40,000 afy in years with full allocation of Rio Grande water and 75,000 afy in
45 drought years would result in minor storage declines that would not impact existing infrastructure for at
46 least 100 years (Ref# 317).

47 The unincorporated village of Chaparral, which lies just over the Texas-New Mexico border north of El
48 Paso, has recently developed a draft plan to ensure adequate water supplies to meet further growth (Ref#
49 319). In analyzing alternative sources, including increased pumpage from the Hueco Bolson or the
50 Tularosa Basin, the study concluded that desalination of readily available saline water was the best
51 option. Should this plan be implemented, there would be essentially no impact of increased demand from
52 this source on the aquifer.

53 Ciudad Juárez, located across the Rio Grande from El Paso, currently depends on the Hueco Bolson
54 aquifer for its municipal and industrial water demands. Current planning calls for limiting Ciudad
55 Juárez's pumping from the Hueco Bolson aquifer at about 122,000 afy and supplying increased demands
56 through 2020 from the following groundwater sources (Ref# 317):

- 57 • Conejos Medanos (38,000 afy)
- 58 • Bismark Mine (26,000 afy)
- 59 • Mesilla (26,000 afy)
- 60 • Somero (28,000 afy)
- 61 • Profundo (31,000 afy)

62 Of these projects, the first phase of the Conejos Medanos was expected to be operational in 2006 (Ref#
63 317). In addition, plans are also being developed to convert 38,000 afy of surface water from the Rio
64 Grande for municipal use. Mexico's current allocation from the Rio Grande Project of 60,000 afy is used
65 for irrigated agriculture. The conversion would involve supplying wastewater effluent to farmers in
66 exchange for surface water.

67 According to the Far West Texas Water Plan (Ref# 317), projected flows of Hueco Bolson groundwater
68 to Juárez would be about the same as occurs now, in spite of EPWU and Fort Bliss pumpage from the
69 aquifer. In the future, however, Ciudad Juárez may also need to develop desalination capability to
70 guarantee supply.

71 The impacts of the alternatives on water resources were analyzed based on projected population increases
72 associated with the units to be stationed at Fort Bliss over the next five years. The projection of water
73 demand by employees who do not reside on post was estimated at 24 gallons per person per day.
74 Estimated water consumption for the on-post population is based on 2004 water consumption in the Main
75 Cantonment Area (203 gallons per person per day). The off-post population includes the dependents of
76 military and civilian employees that live off post, the induced population, and the off-post water
77 consumption of military and civilian employees that do not reside on post. Estimated water consumption
78 for the equivalent off-post population is based on EPWU 2004 average consumption per customer (Ref#
79 215), assuming an average customer (household) size of 3.07 persons (Ref# 213). Total water
80 consumption was then calculated for the on-post and off-post population. In addition, the analysis of the
81 Proposed Action considers possible additional personnel increases at Fort Bliss, which are not currently
82 planned, in order to estimate the reasonably foreseeable consequences of increasing training capability
83 and use of the Fort Bliss Training Complex.

84 Impacts on storm water quality are based on proposed construction and increased impervious surface due
85 to development of facilities and infrastructure, primarily in the Main Cantonment Area.

86 **5.7.2 No Action Alternative**

87 The No Action Alternative will result in an increase in on-post consumption of approximately 912 afy
88 (0.8 MGD) and increased off-post water consumption of approximately 3,095 afy (2.8 MGD).

89 **5.7.2.1 Surface Water**

90 Under the No Action Alternative, the additional water needs can be met from the existing sources.
91 Surface water resources will not be affected.

92 **5.7.2.2 Groundwater**

93 The increased demand for potable water on and off post under the No Action Alternative represents
94 approximately 19 percent of EPWU's projected excess resource availability in 2010.

95 **5.7.2.3 Storm Water**

96 Under the No Action Alternative, the impervious surface in the Main Cantonment Area will expand by
97 approximately 330 acres, generating increased surface water runoff of approximately 250 afy. This
98 amount will likely be contained in existing storm water management ponds, but could result in discharge
99 to the Rio Grande through existing conveyances during moderate to severe rainfall intensities. This
100 discharge would be in compliance with Fort Bliss' anticipated municipal separate storm sewer system
101 permit.

102 **5.7.3 Alternative 1**

103 Alternative 1 is projected to result in an increase in on-post water consumption of approximately 4,570
104 afy (4.1 MGD) and an increase in off-post water consumption of approximately 16,140 afy (14.4 MGD).
105 The majority of this increase would be met through additional supplies from EPWU.

106 **5.7.3.1 Surface Water**

107 The impact of Alternative 1 on the use of Rio Grande water by the City of El Paso and others would be
108 indirectly affected by increased water demand associated with Fort Bliss. EPWU might need to purchase
109 additional Rio Grande water rights more rapidly than currently anticipated in order to increase available
110 potable water between 2010 and 2020. Current plans do not anticipate a need for additional Rio Grande
111 water until 2020 (Ref# 317).

112 **5.7.3.2 Groundwater**

113 **Hueco Bolson**

114 Under Alternative 1, the increase in on-post and off-post water consumption, combined with projected
115 baseline population growth, would require approximately 97 percent of EPWU's available resources by
116 2015. Although the increased demand associated with this alternative could be met from existing sources,
117 EPWU may need to develop additional water sources by 2010 that are currently not anticipated to be
118 needed until 2020 (Ref# 317). One water source that EPWU anticipates using to meet demand is the
119 purchase of additional Rio Grande water rights, which would not change the total human use of Rio
120 Grande water but would change the use from irrigation to municipal water. In addition to increased
121 utilization of surface water, additional use of the Hueco and Mesilla Bolsons might also occur.

122 Increased pumpage from the Hueco Bolson could result in further drawdown of the aquifer. However,
123 EPWU expects that its plans to obtain water from other sources can be accelerated to meet the increased
124 demand, and if a temporary increase in pumpage from the Hueco Bolson is needed while new projects
125 come online, it would be limited to 1,000-7,000 afy for a period of three years. A temporary increase in
126 pumping of this magnitude would have no significant impact on Hueco Bolson (Ref# 551).If the
127 increased demand requires EPWU, as it monitors increases in water consumption, to develop projects

128 more rapidly than currently anticipated to meet those demands, there may be an impact on water rates,
129 although EPWU anticipates rate increases of 5 percent per year or less for the next 20 years (Ref# 318).

130 Fort Bliss is working with EPWU to investigate the possibility of using more reclaimed water for on-post
131 landscaping to reduce the consumption of fresh water.

132 Construction and operations activities on post could result in fuel spills and release of hazardous liquids
133 with the potential to affect subsurface water resources. The depth to fresh groundwater is approximately
134 200 feet below the surface, however, and it is unlikely that any spill would reach freshwater or deeper
135 brackish water resources used for potable water supplies. Any release of oil or hazardous substance will
136 be responded to and cleaned up in accordance with the Fort Bliss Installation Spill Contingency Plan.

137 **Tularosa Basin**

138 Communities in New Mexico farther removed from the Fort Bliss/El Paso area are unlikely to experience
139 any changes in the availability of fresh groundwater for the foreseeable future (i.e., for more than 50
140 years). Those changes that do occur after this time frame are not likely to be large.

141 Spills from military vehicles operating in the Fort Bliss Training Complex are unlikely to affect
142 groundwater in the Tularosa Basin. Fuel bladders used in the training areas would be lined and bermed.
143 Any release of oil or hazardous substance will be responded to in accordance with the ISCP, and
144 applicable notification requirements will be followed in the event of a spill.

145 **5.7.3.3 Storm Water**

146 Under Alternative 1, the impervious area in the Main Cantonment Area would expand by approximately
147 1,300 acres, 970 acres more than the No Action Alternative. Assuming the developed Main Cantonment
148 Area is approximately 6,100 acres and has 40 percent impervious surface, there are currently about 2,500
149 acres of impervious surface in the Main Cantonment Area. The increase in impervious area under the
150 action alternatives thus represents a 52.6 percent increase over the 2005 Main Cantonment Area
151 impervious area, and a 39 percent increase over the No Action impervious area. This would result in
152 approximately 1,000 afy additional surface water runoff above 2005 levels and about 740 afy additional
153 surface runoff above the No Action Alternative. While some of this additional runoff would be contained
154 by existing retention ponds on the post, during moderate to high-intensity storms, it is likely that storm
155 water would need to be discharged through existing conveyances to avoid flooding conditions unless
156 additional storm water basins are constructed on post.

157 The quality of the storm water is not expected to change. Storm water discharges would need to comply
158 with Fort Bliss' MS4 permit. Appropriate best management practices would be required in areas where
159 water quality could be adversely affected.

160 **5.7.4 Alternative 2**

161 Alternative 2 would result in an increase in on-post water consumption of approximately 4,650 afy (4.2
162 MGD) and an increase in off-post water consumption of approximately 18,540 afy (16.6 MGD).

163 The increased consumption, combined with baseline population growth, would require approximately 99
164 percent of EPWU's available resources by 2015. Impacts on the Hueco Bolson and Tularosa Basin would
165 be the same as those described for Alternative 1. Measures for reducing groundwater withdrawals and
166 on-post consumption of fresh water would be the same as described for Alternative 1.

167 Alternative 2 would increase the impervious area in the Main Cantonment Area slightly more than
168 Alternative 1. Increased storm water discharges would be required to comply with Fort Bliss' MS4
169 permit.

170 Impacts from and responses to potential spills of fuels and hazardous substances would be as described
171 for Alternative 1.

172 **5.7.5 Alternative 3**

173 The impacts of Alternative 3 on water resources and associated mitigation measures would be the same as
174 described for Alternatives 1 and 2.

175 **5.7.6 Alternative 4 – Proposed Action**

176 With the potential addition of two more Heavy BCTs at Fort Bliss, Alternative 4 could result in an
177 increase in on-post water consumption of approximately 4,850 afy (4.3 MGD) and an increase in off-post
178 water consumption of approximately 25,280 afy (22.6 MGD).

179 The increased consumption, combined with baseline population growth, could exceed EPWU's available
180 resources by 3 percent. Depending on when the additional population influx occurred, EPWU would
181 need to develop additional sources of potable water, currently not anticipated to be needed until 2020
182 (Ref# 317). Possible sources include purchase of additional Rio Grande water rights, increased
183 withdrawals from the Hueco and Mesilla Bolsons, and development of the Dell City Area Aquifer. The
184 impacts would be similar to Alternatives 1, 2, and 3 but marginally higher. Using more reclaimed water
185 for on-post landscaping would reduce the consumption of fresh water

186 The impacts of Alternative 4 on the Tularosa Basin and associated mitigation measures would be the
187 same as those described for Alternative 1

188 Under Alternative 4, the impervious area in the Main Cantonment Area could expand by a total of 1,600
189 acres. This would represent an 88 percent increase in impervious area above the 2005 Main Cantonment
190 Area impervious area and could result in approximately 1,700 afy additional surface water runoff over
191 2005 conditions. While some of this additional runoff will be contained by existing retention ponds on
192 the post, during storms, it is likely that storm water would need to be discharged through existing
193 conveyances to the Rio Grande to avoid flooding conditions. Storm water discharges would be required
194 to comply with Fort Bliss' MS4 permit and incorporate appropriate best management practices.

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1 **5.8 BIOLOGICAL RESOURCES**

2 **5.8.1 Introduction**

3 Proposed facilities development and training activities have the potential to affect biological resources in
4 the Main Cantonment Area and the Fort Bliss Training Complex. Facility construction and demolition
5 would take place in the Main Cantonment Area and other built-up areas such as the range camps and live-
6 fire ranges.

7 The majority of biological resources on Fort Bliss are found within the Training Complex. Training can
8 result in damage to biological resources primarily from vehicle maneuvers. Vegetation can be crushed
9 or uprooted and soils can be mixed, compacted, and/or unstabilized. The magnitude of these disturbances
10 increases at concentrations of activities such as command centers, staging areas, and bivouac sites. The
11 degree of disturbance is affected by vegetation, slope, soils, and wet or dry conditions.

12 Wildfires can be started from ground vehicles during maneuver training and are also a potential
13 disturbance of flora and fauna. Fires on Fort Bliss are primarily started naturally by lightning strikes or
14 caused by ordnance use. Fires have occurred on Otero Mesa and in the Organ Mountains and less
15 frequently elsewhere because of low fuel loads. Section 5.11 discusses fire risks associated with the
16 Proposed Action and other alternatives. The potential impacts of wildfire on biological resources are
17 described in the Mission and Master Plan PEIS (Ref# 3).

18 The analysis of impacts on biological resources from proposed increased and expanded off-road vehicle
19 maneuvers considered the existing most common ecological site transition state (see Section 4.5) of each
20 segment of the Fort Bliss Training Complex, coupled with soil type and existing vegetation community,
21 to project what changes are likely to occur with increased off-road vehicle maneuver training. Most of
22 the areas under consideration for off-road vehicle maneuvers are mesquite coppice dunes, sandscrub, and
23 creosote piedmont or foothills shrubland. The southeast TAs of McGregor Range are dominated by mesa
24 and piedmont grasslands (see Table 4.8-1). Soils are primarily sandy, gravelly, or loamy.

25 Mesquite coppice dune communities are already in an altered ecological state and are unlikely to change
26 substantially. Conversely grasslands are the potential vegetation for many ecosites and vulnerable to
27 shrub invasion and other transitions if disturbed. Areas in Deep Sand and Sandy ecosites that are not
28 presently mesquite coppice dune dominated are susceptible to dune formation (see Section 5.5). As the
29 vegetation changed, it would support different species, and wildlife in these areas could be displaced to
30 other areas with suitable habitat and be replaced by species common to the area's new transition state.

31 Of the 62 sensitive species listed in Table 4.8-3, only ten are known or likely to occur in areas affected by
32 the Proposed Action and other alternatives: desert night blooming cereus, sandhill goosefoot, Texas
33 horned lizard, gray-banded kingsnake, Ferruginous hawk, northern aplomado falcon, western burrowing
34 owl, Baird's sparrow, loggerhead shrike, and Bell's vireo. The other 52 species do not occur in habitats
35 that would be affected by off-road vehicle maneuvers

36 **Desert Night Blooming Cereus**

37 This species is federally a species of concern and a State of New Mexico sensitive species. There have
38 been over 80 individuals documented within shrubland communities on Fort Bliss (Ref# 202). It
39 generally occurs in Chihuahuan Desert shrublands communities. Populations on Fort Bliss are
40 documented on Doña Ana Range but are not documented in the North Training Areas. Known
41 populations are restricted from maneuver activities. Additional populations may occur outside of firing
42 ranges and buffers but that is unlikely due to lack of suitable habitat. Impact may occur from weapons
43 firing, but this has not been observed from the monitoring program, and fire is unlikely to be the cause of
44 mortality because fuel loads are low in desert night blooming cereus habitat.

45 **Sandhill Goosefoot**

46 This species is a State of New Mexico species of concern. It generally occurs in Chihuahuan Desert
47 shrubland communities on sandy disturbed ground. Its occurrence is not currently known in the areas
48 used or proposed for off-road vehicle maneuvers (Ref# 202). Undocumented populations could be
49 affected, but it is unlikely.

50 **Texas Horned Lizard**

51 This species is a federal species of concern and a State of Texas threatened species. Texas horned lizards
52 are widespread across Fort Bliss in grassland and shrubland communities (Ref# 3). Construction and
53 increased off-road vehicle maneuver training may impact and/or reduce local populations of Texas horned
54 lizard.

55 **Gray-Banded Kingsnake**

56 This species is a State of New Mexico endangered species. It inhabits limestone rock crevices. It has not
57 been documented on Fort Bliss, but it is known from nearby Hueco Tanks State Park and may occur in
58 the Hueco Mountains portions of the South Training Areas and southeast McGregor Range and on the
59 Otero Mesa escarpment (Ref# 574).

60 **Ferruginous Hawk**

61 This species is a federal species of concern. Ferruginous hawks are grassland species and can be found as
62 wintering residents on Otero Mesa in close association with black-tailed prairie dog colonies. They are
63 also observed during migration, but breeding does not occur on Fort Bliss. Otero Mesa is the only
64 common location for observation of this species during winter months and during migration.

65 **Northern Aplomado Falcon**

66 This species is a federally endangered species. Within the state of New Mexico, recent (May 2006) 10(j)
67 status (experimental) under the Endangered Species Act was awarded to this species, which carries
68 threatened status as a nonessential experimental population. Aplomado falcon breeds and forages in
69 desert grasslands dominated by tobosa and grama grasses with high basal grass cover and relatively little
70 bare ground cover compared to shrub-invaded and shrub-dominated vegetation communities. The species
71 has had sporadic documentation on or near Otero Mesa over the last decade. The most likely occurrence
72 of potential suitable habitat for this species is in mesa grassland and basin lowland desert grassland
73 vegetation types; these two vegetation communities account for approximately 15 percent of Fort Bliss,
74 primarily on Otero Mesa. Potential habitat may exist on Doña Ana Range and the adjacent Assembly
75 Area, but it is small and fragmented and there is no documented occurrence of aplomado falcons in this
76 area.

77 **Western Burrowing Owl**

78 This species is a federal species of concern. Burrowing owls occur throughout Fort Bliss, with
79 concentrations in desert grassland and shrubland habitat, as well as mesquite coppice dune/sand scrub
80 habitat. Surveys in the late 1990s documented over 40 breeding pairs on a small portion of Fort Bliss.
81 The extent to which burrowing owls use mesquite coppice dune/sand scrub habitat is unknown, but they
82 have been observed utilizing rodent burrows in the side of coppice dunes. Areas between coppice dunes
83 are hard and almost no burrows exist. There are few burrows in the sandy plains grasslands. The most
84 concentrated areas of burrows and burrowing owls are in the prairie dog colonies of the Otero Mesa
85 grasslands.

86 **Baird's Sparrow**

87 This species is a federal species of concern. Baird's sparrow is found in grassland habitat with low shrub
88 density and along swales. The species is known as a winter resident as well as a migrant primarily on the
89 Otero Mesa grasslands of Fort Bliss (Ref# 3).

90 **Loggerhead Shrike**

91 This species is a federal species of concern. Loggerhead shrikes are grassland and shrubland species.
92 They are observed during migration, and breeding occurs on Otero Mesa and within the Tularosa Basin.

93 **Bell's Vireo**

94 This species is a State of New Mexico threatened species. Bell's vireo is found in shrubland
95 communities, generally in arroyo-riparian habitat. The species is known occasionally on Fort Bliss (Ref#
96 3), but no nesting activity has been detected.

97 Management of natural resources on Fort Bliss is governed through the INRMP (Ref# 23). Activities
98 planned in the current INRMP are described in Section 2.1.4.

99 **5.8.2 No Action Alternative**

100 Under the No Action Alternative, the amount of off-road vehicle maneuvers will increase to
101 accommodate the training needs of one Heavy BCT but will be limited to training in the South Training
102 Areas, North Training Areas, and TA 8 on McGregor Range, areas already analyzed in the PEIS and
103 approved for this use.

104 Construction of facilities in the Main Cantonment Area for one Heavy BCT will affect approximately
105 1,000 acres of vegetation, most of which is already disturbed and provides limited habitat value. This will
106 result in mortality of some small animals and some loss of nests and mortality of young birds. Some
107 adult birds and fledged young will likely be displaced. The largest amount of disturbance will occur in
108 mesquite-dune habitat. Species utilizing this habitat will be displaced, but population changes are
109 unlikely due to the amount of this habitat present on adjacent lands.

110 **5.8.2.1 Vegetation**

111 Under the No Action Alternative, off-road vehicle maneuvers will be restricted to training areas already
112 approved for those purposes. Vegetation disturbance will be heavily concentrated in shrubland
113 communities; specifically, mesquite coppice dune communities. Impacts will be as analyzed in the
114 Mission and Master Plan PEIS. Impacts from other ongoing testing and training activities are also as
115 described in the PEIS. Off-road vehicle maneuvers are not expected to significantly alter existing
116 mesquite coppice dune communities, which comprise 79 percent of the area available for off-road vehicle
117 maneuver.

118 **5.8.2.2 Wetland and Arroyo-Riparian Drainages**

119 Wetlands occur in the North Training Areas near land used for off-road vehicle maneuvers. Although
120 wetlands are not off-limits for vehicle crossings, historically, impacts have been minimal due to the
121 selection of a limited number of crossing points.

122 The majority of the arroyo-riparian drainages within the North and South Training Areas are in the Organ
123 and Hueco Mountains, respectively. The Organ Mountains are off limits to off-road vehicle maneuver.
124 Approximately 74 miles of arroyos are located in the areas approved for off-road vehicle maneuvers,
125 which is 4 percent of the arroyos on Fort Bliss. The magnitude of impact to arroyo vegetation from off-
126 road vehicle maneuvers under the No Action Alternative is very low.

127 **5.8.2.3 Wildlife**

128 Off-road vehicle maneuvers under the No Action Alternative will be concentrated within mesquite
129 coppice dune vegetation communities. Direct wildlife mortality is generally expected to be negligible
130 because wildlife populations have been exposed to military training activities for decades, and population
131 levels likely reflect a level of habituation to those activities. Increased off-road vehicle maneuvers may
132 result in localized displacement of less disturbance-tolerant species and some direct mortality to fossorial
133 species is unavoidable. Migratory birds may be impacted because training will unavoidably occur during
134 the breeding season of many avian species. However, the majority of fossorial animals and nesting birds
135 in coppice dune habitat utilize the dunes or the vegetation on the dunes, which are generally avoided
136 during vehicle maneuvers for tactical reasons. High-priority Partners In Flight species occupying
137 shrubland communities on Fort Bliss including scaled quail, crissal thrasher, black-tailed gnatcatcher, and
138 Scott's oriole, may be impacted by off-road maneuvers. Overall, impacts may increase due to increased
139 training, but not significantly under this alternative.

140 The literature concerning noise impacts generally suggests that impacts to wildlife populations similar to
141 those found on Fort Bliss appear to be short term and affect individuals, but do not translate to long-term
142 or population-level impacts (Ref# 3).

143 **5.8.2.4 Sensitive Species**

144 Sensitive species affected or with the potential to be affected under the No Action Alternative include
145 desert night blooming cereus, sandhill goosefoot, Texas horned lizard, gray-banded kingsnake, western
146 burrowing owl, loggerhead shrike, and Bell's vireo. Desert night blooming cereus populations have been
147 documented on Doña Ana Range but not in off-road vehicle maneuver areas. Because known populations
148 are restricted from maneuver activities, off-road vehicle maneuvers under the No Action Alternative will
149 not likely affect this species. No populations of sandhill goosefoot have been documented on Fort Bliss,
150 but it has the potential to occur. Increased off-road vehicle maneuver activity under the No Action
151 Alternative will not likely affect populations of sandhill goosefoot. Texas horned lizard and western
152 burrowing owl are known in areas currently used for off-road vehicle maneuver. Local populations of
153 Texas horned lizard may be reduced, but regional populations (county or state level) will not be
154 jeopardized. Off-road vehicle maneuvers will have minimal impact on western burrowing owls because
155 the burrows typically occur in sand dunes, which are rarely driven over. Gray-banded kingsnakes are not
156 likely to be affected because they only occur in areas that are too steep or rugged for off-road vehicle
157 maneuvers (Ref# 574). Bell's vireo is generally found in arroyo-riparian habitat. No nesting activity has
158 been detected on Fort Bliss, so off-road vehicle maneuvers have little chance of affecting this species.

159 **5.8.3 Alternative 1**

160 The following activities associated with Alternative 1 are the primary sources of potential impacts to
161 biological resources:

- 162 • Construction of three additional BCT complexes in the Main Cantonment Area.
- 163 • Expansion of Off-Road Vehicle Maneuver, Mission Support Facility, Weapons Firing, and
164 SDZ/Safety Footprint training categories in TAs 9, 11, 25, 29, 30, 31, and 32 in the Tularosa
165 Basin portion of McGregor Range south of Highway 506.
- 166 • Establishment of the Orogrande Range Complex in TA 29 near the Wilde Benton airstrip, thus
167 concentrating training and impacts around those facilities.
- 168 • Construction of live-fire and qualification ranges on Doña Ana and McGregor Ranges.

169 Ground disturbance from facility construction and demolition in the Main Cantonment Area and other
170 built-up areas would result in loss of vegetation and habitat, mortality of fossorial species individuals, and
171 reduction on breeding and foraging areas for birds, including several species listed under the Migratory

172 Bird Treaty Act. The overall impact on biological resources would be minimal due to the existing
173 urbanized/developed setting. The increase in disturbed ground in the Main Cantonment Area would be
174 mitigated with ornamental landscaping, so bare ground from the development would be minimized.
175 Vegetation in the Main Post is already ornamental in nature and has been heavily disturbed for decades,
176 and therefore supports minimal wildlife habitat.

177 Construction activities on Biggs AAF would result in loss of some shrubland habitat, including habitat
178 used by avian species for nesting and foraging. Impacts to migratory birds would be similar in nature but
179 greater in magnitude to those described under the No Action Alternative. Surface disturbance of
180 approximately 3,400 acres under Alternative 1 would be phased over five years. The displacement of
181 migratory bird species would be spread out over this time period and thus reduce impacts to nesting
182 species. The largest amount of disturbance from construction in the Main Cantonment Area would occur
183 in mesquite-dune habitat. Species utilizing the habitat would be displaced but population changes are
184 unlikely due to the amount of the habitat present on adjacent lands and the likelihood that this habitat will
185 not experience an overall net decrease on Fort Bliss (see Section 5.8.3.1). The impact of construction in
186 the Main Cantonment Area and at the range camps would have negligible impacts to wetlands and arroyo-
187 riparian drainages and sensitive species because of the already highly disturbed condition of those areas.

188 **5.8.3.1 Vegetation**

189 Most of the South Training Areas, North Training Areas, Doña Ana Range, and the south Tularosa Basin
190 portion of McGregor Range is dominated by shrub communities. Construction of new ranges in these
191 areas is not expected to have adverse impacts to vegetation and wildlife populations. The south Tularosa
192 Basin portion of McGregor Range would require more aggressive sediment and erosion controls because
193 Deep Sand soils are present which are less stable (see Section 5.5). While excavated soils would alter
194 habitat, the impacts to vegetation and wildlife populations from range construction would not be
195 significant.

196 Under Alternative 1, training areas in the south Tularosa basin portion of McGregor Range would be used
197 for off-road vehicle maneuvers, in addition to the area already approved for this use. Based on the
198 projected level of use, if every vehicle traveled on a different path, as much as 55 percent of the area
199 could be driven on annually. This means that the entire proposed area could be impacted from off-road
200 vehicle maneuvers every two years. In reality, not every vehicle is likely to travel a unique route, so the
201 actual areal impact would be somewhat less. Nevertheless, at this temporal scale, recovery from
202 disturbance would be low.

203 Impacts to vegetation under Alternative 1 would occur primarily as a result of mission activities and
204 include destruction and change in the composition of vegetation, wildfires, and reduced/lost vegetation
205 productivity due to soil erosion (see Section 5.5 for discussion of soil erosion and Section 5.11 for
206 discussion of wildfires). Off-road vehicle maneuvers can significantly alter landscape and vegetation
207 communities (Ref# 3, 23, 348, 349). Several studies in desert communities and pertaining specifically to
208 Fort Bliss have been conducted (Ref# 3, 23). Concluding results of these studies suggest that heavy
209 vehicle (both tracked and wheeled) use results in vegetation disturbance, including direct loss of
210 individuals. However, incremental recovery of vegetation does occur, with results beginning the first
211 year. Climate is an import factor in the recovery process, as well as utilization. During drought
212 conditions and successive annual utilization, recovery is reduced or hindered (Ref# 125)

213 Vegetation disturbance from off-road vehicle maneuvers in the North and South Training Areas and south
214 Tularosa Basin portion of McGregor Range would be heavily concentrated in shrubland communities
215 under Alternative 1 (**Table 5.8-1**); specifically, mesquite coppice dunes, creosote piedmont shrublands,
216 and sandscrub. Impacts to vegetation communities would be low in the dominant mesquite coppice dune
217 communities (approximately 20 percent of the south Tularosa Basin portion of McGregor Range). The
218 Natural Resource Conservation Service ecological site description for the Sandy ecosite indicates that it is

219 possible that changes in climate over the last several hundred years have created a transition throughout
 220 the Southern Desertic Basins from the presumed historic plant community type. These communities have
 221 stabilized in an altered ecological state, and further change is unlikely. Reversing the transition has
 222 proven unsuccessful (Ref# 331).

223 Communities of sandscrub in Deep Sand that are subjected to extensive disturbance, such as at the
 224 Orogrande Range Complex, would likely become more patchy with bare ground. Opportunistic
 225 herbaceous vegetation would likely colonize those patches. This accounts for approximately 11 percent
 226 of the south Tularosa Basin portion of McGregor Range. A small percentage may transition to mesquite
 227 coppice dunes. Disturbance of creosote piedmont shrublands on gravelly and loamy soils would be likely
 228 to reduce shrub cover. This accounts for approximately 23 percent of the south Tularosa Basin portion of
 229 McGregor Range.

230 **Table 5.8-1. Dominant Vegetation in Areas Proposed for Off-Road Vehicle Maneuvers**

<i>Segment</i>	<i>Training Areas</i>	<i>Dominant Vegetation</i>		
		<i>1st</i>	<i>2nd</i>	<i>3rd</i>
South Training Areas	1A, 1B, 2A, 2B, 2C, 2D, 2E	Mesquite Coppice Dunes (76%)	Creosote Piedmont Shrublands (7%)	Sandscrub (7%)
North Training Areas	3A, 3B, 4A, 4B, 4C, 4D, 5A, 5B, 5C, 5D, 5E, 6A, 6B, 6C, 6D, 7A, 7B, 7C, 7D, AA	Mesquite Coppice Dunes (82%)	Creosote Piedmont Shrublands (6%)	Sandscrub (4%)
McGregor Range, South Tularosa Basin	8, 9, 25, 30, 31, 32, portions of 11 and 29 south of Highway 506	Creosote Piedmont Shrublands (31%)	Sandscrub (21%)	Mesquite Coppice Dunes (20%)
McGregor Range, North Tularosa Basin	10, western half of 12, portions of 11 and 29 north of Highway 506	Creosote Piedmont Shrublands (38%)	Mesquite Coppice Dunes (27%)	Sandscrub (14%)
McGregor Range, Southeast TAs	24, 26, 27	Mesa Grasslands (24%)	Foothill Desert Grasslands (23%)	Foothill Desert Shrublands (20%)

AA =Assembly Area

231 **5.8.3.2 Wetland and Arroyo-Riparian Drainages**

232 Overall impacts to wetlands under Alternative 1 would be minor, due to restrictions in certain areas
 233 (Organ Mountains) and the location of these communities (a majority of the areas where those
 234 communities occur are excluded from off-road vehicle maneuvers, see Figure 4.7-2). Approximately 468
 235 miles, (27 percent) of the arroyos on Fort Bliss are contained in the area that would be available for off-
 236 road vehicle maneuver under Alternative 1. Some arroyos would be modified to allow safe off-road
 237 vehicle maneuver by reshaping and stabilizing the banks of the drainage. These modifications would be
 238 limited to portions of arroyos that do not support riparian vegetation; therefore, arroyo-riparian habitat
 239 would not be affected by this activity. Off-road vehicle maneuvers would occur in and near arroyo-
 240 riparian drainages on a limited-use basis. No bivouacs or concentrations of personnel or vehicles would
 241 be permitted in or within 50 meters of riparian vegetation. The magnitude of impact to arroyo-riparian
 242 vegetation under Alternative 1 would be low except at arroyo crossing points that receive higher levels of
 243 vehicle traffic.

244 **5.8.3.3 Wildlife**

245 Impacts to wildlife would potentially result from off-road vehicle maneuvers that cause habitat
246 degradation and destruction, noise impacts, fire, species displacement, and direct mortality. Off-road
247 vehicle maneuvers under Alternative 1 would be concentrated within mesquite coppice dune, creosote
248 piedmont shrublands, and sandscrub vegetation communities (see Table 5.8-1) and impacts would be
249 similar to those describe for the No Action Alternative. The primary difference in the North and South
250 Training Areas would be an increase in the amount of off-road vehicle maneuver use proposed under
251 Alternative 1. With an increase in the number of BCTs, as much as 55 percent of the available training
252 area could be driven over annually, compared to 45 percent under the No Action Alternative. More
253 shrubland communities would be impacted due to more frequent usage and less recovery time under
254 Alternative 1. In addition, the TAs in the south Tularosa Basin portion of McGregor Range would be
255 newly exposed to off-road vehicle maneuvers.

256 Direct mortality of fossorial species that use shrubland communities would be likely. The probability of
257 mortalities would be highest in areas of concentrated use including the vicinity of the range camps and the
258 range complexes, such as the Orogrande Range Complex. Mortalities from off-road vehicle maneuvers
259 would be relatively low in mesquite coppice dunes because vehicles generally avoid crossing the dunes.

260 Among avian species, breeding birds utilizing shrubland communities for nesting and foraging would be
261 impacted the greatest. This includes several species listed under the Migratory bird Treaty Act such as
262 the black-throated sparrow (*Amphispiza bilineata*), blue grosbeak (*Guiraca caerulea*), house finch
263 (*Carpodacus mexicanus*), verdin (*Auriparus flaviceps*), and loggerhead shrike (*Lanius ludovicianus*).
264 Habitat destruction would reduce nesting substrate and possible prey. Individuals would likely move to
265 adjacent locations. Birds that nest in mesquite coppice dunes such as the western kingbird (*Tyrannus*
266 *verticalis*), crissal thrasher (*Toxostoma crissale*), Scott's oriole (*Icterus parisorum*), mourning dove
267 (*Zenaida macroura*), and northern mockingbird (*Mimus polyglottus*) would be less affected.

268 While existing nests could be lost due to habitat destruction and nesting substrate would be reduced in
269 some areas, nesting substrate could increase in other areas where disturbance from off-road vehicle
270 maneuvers leads to increased shrub invasion and density and additional coppice dune formation.

271 Wildlife species richness within mesquite coppice dune communities is low (compared to other
272 vegetation communities described in Section 4.8) for birds, mammals, and reptiles (Ref# 21). Within the
273 mesquite coppice dune community, most of the wildlife is located in the dunes, which would generally be
274 driven around rather than over. Many wildlife species are habituated to military training activities and
275 thus would experience minimal impacts. Slow-moving species (e.g., some lizard species and turtles) are
276 more likely to be affected than fast-moving species (e.g., coyote). Increased off-road vehicle training
277 may result in greater localized displacement of less disturbance-tolerant species. Increased habitat
278 disturbance may also result in changes in species distribution.

279 Communities of mesquite coppice dunes have stabilized in an altered ecological state and thus would
280 likely continue to support existing levels of wildlife. Communities of sandscrub in Deep Sand would
281 become more patchy with bare ground. Species richness would likely decrease in those areas. Shrub
282 cover in heavily used communities of creosote piedmont shrublands on gravely and loamy soils would
283 decrease. Loss of shrub cover would reduce potential nesting substrate for some species, and bare ground
284 generally supports lower densities of wildlife.

285 In summary, wildlife species density in the south Tularosa Basin portion of McGregor Range is likely to
286 decrease, due to up to 11 percent of the area becoming more patchy in sandscrub communities, coupled
287 with reduced shrub cover and increased bare ground within creosote piedmont communities. Wildlife
288 populations would likely utilize adjacent lands; thus, overall regional changes (at the county or state level)
289 in non-status wildlife populations are not expected under Alternative 1.

290 Impacts from noise would be similar to those described for the No Action Alternative but higher because
291 of increased noise levels at live-fire ranges. Most studies evaluating noise impacts from military activities
292 are associated with aircraft. Avian studies report slight behavior responses, but reproductive responses
293 have not been documented (Ref# 481, 487, 488). Wild ungulates appear to vary in sensitivity to aircraft
294 noise. Responses reported in the literature varied from no effect and habituation to panic reactions
295 followed by stampeding (Ref# 483, 484). Novel or new noises tend to result in a response from an
296 animal, as opposed to regular, predictable noises. Similarly, loud and close aircraft typically evoke a
297 more severe response (Ref# 485, 486). Nevertheless, noise impacts to wildlife species carry a low
298 likelihood of population-level impacts. Although noise associated with the live-fire ranges on Doña Ana
299 and McGregor Ranges and helicopter training in the Restricted airspace would increase under Alternative
300 1, these uses would not be a new source of noise.

301 **5.8.3.4 Sensitive Species**

302 The types of potential impacts to sensitive species under Alternative 1 are similar to those described for
303 vegetation and wildlife species. Off-road vehicle maneuvers and training would be the primary source of
304 impacts. Construction activities in the Main Cantonment Area would have little impact on sensitive
305 species due to the lack of preferred habitat in this area. Off-road vehicle maneuvers would be
306 concentrated within shrubland habitat types, and sensitive species occupying these types of habitat would
307 likely be impacted the greatest. The TAs proposed for off-road vehicle usage under this alternative are
308 not specific habitat for sensitive species.

309 Alternative 1 could affect the same seven sensitive species as the No Action Alternative. Impacts to
310 affected species on the North and South Training Areas would be similar to those described for the No
311 Action Alternative. More individuals would be impacted, but regional populations are not likely to be
312 jeopardized. The south Tularosa Basin portion of McGregor Range is known to contain or has the
313 potential to be occupied by loggerhead shrikes, Texas horned lizards, and western burrowing owls. As
314 noted for the No Action Alternative, loggerhead shrikes and western burrowing owls occupying
315 shrublands primarily occur in mesquite coppice dunes, which would generally be driven around, not over,
316 by maneuvering vehicles. Texas horned lizards would be affected, but regional populations are not
317 expected to be impacted.

318 **5.8.4 Alternative 2**

319 Impacts to biological resources under Alternative 2 would be similar to those described for Alternative 1,
320 with the addition of off-road vehicle maneuvers in the north Tularosa Basin portion of McGregor Range.
321 As shown in Table 5.8-1, the vegetation in this portion of McGregor Range is dominated by the same
322 three vegetation communities as the North and South Training Areas and the south Tularosa Basin portion
323 of McGregor Range – mesquite coppice dunes, creosote piedmont shrublands, and sandscrub – but in
324 different proportions. Like the south Tularosa Basin TAs, the north Tularosa Basin TAs are more
325 predominantly creosote piedmont shrublands (38 percent). The second most common community is
326 mesquite coppice dunes (27 percent), followed by sandscrub (14 percent). In total, as much as 50 percent
327 of the training areas available for off-road vehicle maneuver could be driven over annually under
328 Alternative 2. However, the north Tularosa Basin TAs on McGregor Range are expected to be used
329 somewhat less than the other off-road vehicle maneuver areas, so the level of tracking there would likely
330 be closer to 20-30 percent annually at the low end of estimated use (see Table 3.5-1) and increase as
331 utilization increases.

332 **5.8.4.1 Vegetation**

333 The impacts to vegetation communities from off-road vehicle maneuvers would be similar in nature to
334 those described for Alternative 1. However, they would be more wide spread due to expansion of vehicle
335 maneuvers into the north Tularosa Basin portion of McGregor Range. The western half of the north
336 Tularosa Basin portion of McGregor Range is predominantly mesquite coppice dune communities. This

337 could increase by approximately 2 percent as some interspersed sandscrub communities transition to
338 mesquite coppice dune communities. Approximately 5 percent of the area in sandscrub communities
339 would experience more bare ground in areas of repeated disturbance. In the east half of this area, shrub
340 cover in creosote piedmont shrublands on gravely and loamy soils could be reduced, depending on the
341 level of use and disturbance from off-road vehicle maneuvers. This community accounts for
342 approximately 33 percent of the north Tularosa Basin portion of McGregor Range. The impact to these
343 shrub communities would result in less shrub cover and more herbaceous vegetation.

344 **5.8.4.2 Wetland and Arroyo-Riparian Drainages**

345 Impacts to arroyo-riparian communities from Alternative 2 would be similar in nature to those described
346 for the No Action Alternative and Alternative 1. Approximately 574 miles (33 percent) of arroyos on
347 Fort Bliss are contained in the areas proposed for off-road vehicle maneuvers under this alternative.

348 **5.8.4.3 Wildlife**

349 The potential for direct wildlife mortality under Alternative 2 would be similar to that described for
350 Alternative 1. Most species would avoid training activities; however, fossorial species and some avian
351 species would be impacted. Increased training may result in greater localized displacement of less
352 disturbance-tolerant species. Increased habitat disturbance may also result in changes in species
353 distribution. Overall regional changes (at the county or state level) in non-status wildlife populations are
354 not expected. Wildlife in the north Tularosa Basin portion of McGregor Range would likely become less
355 dense, due to a reduction in vegetation cover, transition from sandscrub to mesquite coppice dune
356 communities, and potential reduction in shrub cover in creosote piedmont communities. Wildlife
357 populations would likely utilize adjacent lands; thus, overall regional changes (at the county or state level)
358 in non-status wildlife populations are not expected under Alternative 2.

359 **5.8.4.4 Sensitive Species**

360 The types of potential impacts to sensitive species would be similar to Alternative 1. The species
361 potentially occurring in the north Tularosa Basin portion of McGregor Range include loggerhead shrike,
362 Texas horned lizard, western burrowing owl, and sandhill goosefoot. These species are known to occur,
363 or potential habitat exists, in training areas dominated by shrubland communities. Because, with the
364 addition of the north Tularosa Basin TAs, more shrubland communities would be used for off-road
365 vehicle maneuvers under Alternative 2, the number of individuals potentially affected would be larger
366 than under Alternative 1 and the No Action Alternative. The Texas horned lizard would likely utilize
367 adjacent habitat, and therefore species populations would not be greatly impacted under Alternative 2.
368 Impacts to the other species would be similar to Alternative 1, but higher, because more nesting habitat
369 would be disturbed. Although local populations may be affected, regional populations are not likely to be
370 jeopardized.

371 **5.8.5 Alternative 3**

372 Impacts to biological resources in the North and South Training Areas and the south Tularosa Basin
373 portion of McGregor Range would be the same under Alternative 3 as described for Alternative 1. The
374 addition of the Mission Support Facility training category to TAs 5A, 5B, 5C, 5D, 5E, 6A, 6B, 7A, and
375 7D could result in increased development in those areas.

376 Alternative 3 would not include off-road vehicle maneuvers in the north Tularosa Basin of McGregor
377 Range. Instead, the southeast Training Areas of McGregor Range (TAs 24, 26, and 27) would be opened
378 for off-road vehicle maneuvers. In total, as much as 50 percent of the training areas available for off-road
379 vehicle maneuver could be driven over annually under this alternative. However, the southeast TAs on
380 McGregor Range are expected to be used somewhat less than the other off-road vehicle maneuver areas,
381 so the level of tracking there would be closer to 15-25 percent annually.

382 **5.8.5.1 *Vegetation***

383 The habitat within the southeast TAs of McGregor Range is dominated by grasslands. Construction and
384 maintenance of roads would potentially remove some grassland habitat, permanently eliminating a small
385 portion of this habitat. Vegetation and wildlife populations may suffer localized impacts but regional
386 impacts to populations are not likely from construction. Aggressive sediment and erosion controls would
387 aid in the reduction of impacts from disturbance associated with construction.

388 The southeast TAs on McGregor Range are more susceptible to water erosion (see Section 5.5). Once
389 substantial vegetation cover is lost, there is an increased likelihood of bare ground longevity. Mesa,
390 foothill desert, and piedmont grassland communities dominate the southeast TAs. Foothill desert
391 shrubland communities are also common in these TAs. With repeated disturbance, mesa and piedmont
392 grasslands may transition to a shrub-succulent dominant state. Foothill grasslands would likely maintain
393 their current transition state. Mesa and piedmont grasslands could be decreased by as much as 18 percent,
394 depending on the level and extent of disturbance, while foothill grasslands would likely remain at
395 approximately 26 percent of the southeast TAs (Ref# 29). Grasslands would be designated as limited-use
396 areas where no bivouacs or concentration of personnel or vehicles would be permitted, which would
397 reduce the impact of off-road vehicle maneuvers. Alternative 3 is expected to have moderate impacts to
398 vegetation communities.

399 **5.8.5.2 *Wetland and Arroyo-Riparian Drainages***

400 Impacts to arroyo-riparian communities from Alternative 3 would be similar in nature to those described
401 for the No Action Alternative and Alternative 1. The areas proposed for off-road vehicle maneuvers
402 under this alternative contain approximately 775 miles (45 percent) of the arroyos on Fort Bliss.

403 **5.8.5.3 *Wildlife***

404 Impacts to wildlife from Alternative 3 would be similar to those described for Alternative 1. The primary
405 difference would be increased use of grassland communities for off-road vehicle maneuvers.
406 Approximately two-thirds of the southeast TAs on McGregor Range is comprised of grassland
407 communities, specifically mesa and foothill desert grassland communities. Grassland community species
408 may be impacted. Grassland communities generally support higher diversity of birds, mammals, and
409 reptiles (Ref# 21). Existing wildlife richness within mesa, piedmont, and foothill grasslands is high in
410 comparison to adjacent lands. With off-road vehicle maneuver training, species richness would likely
411 decrease in the mesa and piedmont grasslands as they transition to more succulent dominated
412 communities. Loss of grass cover would potentially result in reduced prey species and increased bare
413 ground, which supports lower diversity of wildlife. Reduction of grass species can also result in an
414 increase in shrublands. Therefore an increase in species associated with shrublands is possible. Wildlife
415 species diversity within foothill grasslands would likely remain unchanged. Increased training may result
416 in greater localized displacement of less disturbance-tolerant species, and increased habitat disturbance
417 may also result in changes in the distribution of species. Overall regional changes (at the county or state
418 level) in non-status wildlife populations are not expected.

419 **5.8.5.4 *Sensitive Species***

420 The types of potential impacts to sensitive species under Alternative 3 would be similar to those described
421 under the No Action Alternative and Alternative 1. Sensitive species found or with potential to occur in
422 grassland communities in the southeast TAs include loggerhead shrike, Texas horned lizard, western
423 burrowing owl, ferruginous hawk, northern aplomado falcon, and Baird's sparrow. Impacts to loggerhead
424 shrikes, Texas horned lizards, and western burrowing owls would be the same as described for
425 Alternative 1. Gray-banded kingsnakes in the Hueco Mountains are not likely to be affected because they
426 only occur in areas that are too steep or rugged for off-road vehicle maneuvers (Ref# 574).

427 Otero Mesa is the only common location for observation of ferruginous hawks during winter months and
428 during migration. Alternative 3 would not involve off-road vehicle maneuvers on Otero Mesa; therefore,
429 this species is not expected to be affected. The most likely occurrence of potential suitable habitat for
430 northern aplomado falcon is in mesa grassland and basin lowland desert grassland vegetation types; these
431 two vegetation communities account for approximately 5 percent of the area that could be affected by off-
432 road vehicle maneuver under this alternative. Training activities under Alternative 3 are not expected to
433 affect northern aplomado falcon. Baird's sparrow is also primarily found in grasslands on Otero Mesa.
434 Off-road vehicle maneuvers in the grasslands of the southeast TAs could affect Baird's sparrow but are
435 not likely to significantly impact this species.

436 In summary, impacts to sensitive species populations are not likely because their occurrence on areas of
437 Fort Bliss proposed for off-road vehicle maneuver is transitory or non-breeding, or they are not present at
438 all.

439 **5.8.6 Alternative 4 – Proposed Action**

440 The impacts to biological resources from Alternative 4 would be similar to those described for
441 Alternatives 1, 2, and 3. The area open for off-road vehicle maneuvers would be more extensive. In total,
442 as much as 55 percent of the training areas available for off-road vehicle maneuvers could be driven over
443 annually. However, the north Tularosa Basin and the southeast TAs on McGregor Range are expected to
444 be used somewhat less than the other off-road vehicle maneuver areas, so the level of tracking there
445 would more likely range from 20 to 50 percent annually.

446 **5.8.6.1 Vegetation**

447 The impacts of off-road vehicle maneuvers on the vegetation in various segments of the Fort Bliss
448 Training Complex would be as described for the other alternatives. Due to increased off-road vehicle
449 training within shrubland and grassland communities, the use of areas susceptible to erosion, and minimal
450 recovery periods, Alternative 4 would have moderate impacts on vegetation communities.

451 **5.8.6.2 Wetland and Arroyo-Riparian Drainages**

452 Impacts to arroyo-riparian communities from Alternative 4 would be similar to those described for the
453 other alternatives. The areas proposed for off-road vehicle maneuvers under this alternative contain
454 approximately 882 miles (51 percent) of the arroyos on Fort Bliss. Impacts to arroyo-riparian vegetation
455 would be limited due to the use limitations described under Alternative 1.

456 **5.8.6.3 Wildlife**

457 Wildlife in various segments of the Fort Bliss Training Complex would be as described for the other
458 alternatives. The impacts would be more extensive, but overall regional changes (at the county or state
459 level) in non-status wildlife populations are not expected.

460 **5.8.6.4 Sensitive Species**

461 The types of potential impacts to sensitive species would be the same as those described for the other
462 alternatives. Local populations of sensitive species that occupy shrubland and grassland communities
463 would be affected, but regional populations are not likely to be jeopardized. Potential habitat for desert
464 night blooming cereus, loggerhead shrike, Texas horned lizard, western burrowing owl, sandhill
465 goosefoot, ferruginous hawk, northern aplomado falcon, Baird's sparrow, and Bell's vireo may be
466 affected, but populations are not likely to be significantly impacted. The gray-banded kingsnake is
467 unlikely to be affected because its habitat is too steep and rugged for off-road vehicle maneuvers (Ref#
468 574).

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5.9 CULTURAL RESOURCES

5.9.1 Introduction

Fort Bliss has executed a Programmatic Agreement that provides the process for how historic properties on the installation will be managed as provided for by NHPA Section 106 and 36 CFR Part 800. The analysis in this section complies with this requirement and with AR 200-4, which encompasses compliance with NEPA, NHPA, and associated federal regulations (36 CFR 60.4, 36 CFR 800) that require federal agencies to consider what effects their undertakings may have on historic properties as part of the decision-making process. In addition, U.S. Army Pamphlet 200-4 provides guidance for implementation of Army policy regarding compliance with all laws and regulations associated with historic properties management. The Fort Bliss HPO will continue to coordinate with the Texas and New Mexico SHPOs regarding NRHP eligibility on previously unevaluated sites, public awareness, and impact mitigation strategies in accordance with the PA stipulations (see Appendix B).

Fort Bliss currently provides for survey of 30 percent of the unsurveyed land on McGregor Range that would be open to off-road vehicle maneuvers. The additional survey will emphasize areas of development and concentrated use and unsurveyed areas identified through predictive modeling as most likely to have archaeological sites. Areas of future facility development will be surveyed prior to construction.

For this SEIS, impact analysis for historic properties has employed guidelines and standards set forth in NHPA Section 106's implementing regulations (36 CFR 800) and historic property management procedures at Fort Bliss outlined in the Standard Operating Procedures stipulated in the PA. In accordance with Section 106, once an action is determined to be an undertaking, impacts to historic properties are assessed by: (1) identifying the nature and location of all elements of the proposed action and alternatives; (2) comparing those locations with identified historic properties, sensitive areas, and surveyed locations; (3) determining the known or potential significance of historic properties that could be affected; and (4) assessing the extent and intensity of the effects. The impact assessment process for historic properties centers on the concept of significance. Federal laws and regulations require federal agencies to manage historic properties (i.e., resources that are eligible for inclusion in or are listed in the NRHP). A summary of NRHP eligibility criteria for historic properties in the areas affected by the Proposed Action and other alternatives is presented in Section 4.9.

An action results in an adverse effect to a historic property when it alters qualities of the resource, including relevant features of its environment or use, that make it eligible for inclusion in the NRHP (36 CFR 800.9[b]). Potential adverse effects could include the following:

- Physical destruction, damage, or alteration of all or part of the property;
- Isolation of the property from, or alteration of the character of, the property's setting, when that character contributes to the property's qualification for the NRHP;
- Introduction of visual, audible, or atmospheric elements that are out of character with the property or alter its setting if setting, is integral to the property's significance;
- Neglect of a property resulting in its deterioration or destruction;
- Transfer, lease, or sale of the property if the sale removes the property from federal protection.

Although Section 106 requires federal agencies to consider all findings of effect whether beneficial or not, only adverse effects require mitigation.

Potential sources of impacts that were considered for this SEIS include:

- Ground disturbance, including erosion, resulting from actions such as construction, demolition, operation, and maintenance of facilities; training activities; and operation, management, and maintenance of training areas.

46 • Vibration, noise, and visual impacts resulting from construction, training, operations, or
47 maintenance.

48 • Access-related impacts resulting in increased vandalism due to improved access.

49 Historic properties on Fort Bliss will be affected by facility construction and demolition, training
50 activities, and maintenance. Transfer, lease, or sale of the property out of federal ownership or
51 management is defined as an adverse effect by 36 CFR Part 800

52 **5.9.1.1 Facility Construction and Demolition**

53 Facility and infrastructure construction and demolition activities that could potentially impact historic
54 properties include foundation or trench excavation, grading or filling, asphalt removal, heavy machinery
55 movement, soil compaction, and renovation or demolition of historic buildings or facilities. New
56 structures or additions to structures with designs that are not compatible with existing historic properties
57 could also be considered adverse effects, particularly within the boundaries or viewshed of one of the two
58 historic districts in the Main Cantonment Area. These activities could adversely affect existing historic
59 properties in areas that have not been previously cleared for renovation or construction by the Fort Bliss HPO.

60 Specific historic resources at Fort Bliss are managed through four agreements that operate outside the
61 Fort Bliss PA for the management of historic properties. These agreements address project effects and
62 appropriate impact mitigations. The agreements include mitigation of effects from all actions up to and
63 including renovation, repair, and demolition of the buildings and associated landscapes.

64 • World War II Temporary Buildings (Programmatic Agreement among DoD, ACHP and
65 NCSHPO Regarding the Demolition of World War II Temporary Buildings, effective June 7,
66 1986) are not subject to Section 106 unless an undertaking will affect another building not
67 covered by the PA.

68 • Capehart and Wherry Era Army Family Housing is covered by a Program Comment (approved
69 March 31, 2002 by the ACHP, effective June 7, 2002) that addresses all undertakings affecting
70 these buildings.

71 • Family housing units and associated undertakings are to be managed according to the Residential
72 Communities Initiative (Programmatic Agreement between the U.S. Army Air Defense Artillery
73 Center and Fort Bliss and the Texas SHPO for the Privatization of Family Housing at Fort Bliss,
74 Texas).

75 • Expanded Use Leasing at the WBGHHD, in the WBAMC will be managed through a
76 Programmatic Agreement between the U.S. Army Air Defense Artillery Center Fort Bliss and the
77 Texas SHPO.

78 • Cold War Unaccompanied Housing is covered by a Program Comment (approved August 19,
79 2006 by the ACHP) that addresses all undertakings affecting those buildings.

80 • World War II and Cold War Era Ammunition Storage Facilities are covered by a Program
81 Comment (approved August 19, 2006 by the ACHP) that addresses all undertakings affecting
82 those buildings.

83 **5.9.1.2 Training Operations and Maintenance of Training Areas**

84 Ground-disturbing activities that occur on Fort Bliss can potentially impact historic properties either
85 through destruction of the resource or through damaging the resource's integrity, a key criterion for
86 determining a historic resource's eligibility for nomination to the NRHP. These activities could include
87 maintenance and operation of training facilities; vehicle maneuvers and associated activities; small arms,
88 gunnery, and artillery activities; ordnance delivery; firefighting; human trampling; non-military actions
89 such as grazing and recreation; and indirect results of ground disturbance such as increased erosion.

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

90 Blowing sediment from ground disturbing activities can affect historic properties. Wind-aided erosion
91 can expose archaeological deposits, affecting context and revealing artifacts. Conversely, blowing
92 sediments can bury or obscure archaeological sites, in some cases providing a beneficial effect as the site
93 becomes protected from inadvertent damage and casual collecting.

94 Vibration effects to historic properties can originate from a variety of sources, including ground sources
95 such as construction and blasting, vehicle traffic, and aircraft overflights. Historic properties have been
96 shown to be susceptible to impacts from vibrations, depending on a number of factors such as decibel
97 level, proximity, and overpressure (Ref# 253, 309, 310). However, studies have established that subsonic
98 noise-related vibration damage to structures, even historic buildings, requires high decibel levels
99 generated at close proximity to the structure and in a low frequency range (Ref# 134, 137, 138, 144).
100 Aircraft must generate at least 120 dB at a distance of no more than 150 feet to potentially result in
101 structural damage (Ref# 138), and even at 130 dB, structural damage is unlikely.

102 There is evidence on both sides of the issue as to the effects of helicopter overflight on architectural
103 resources. Although noise and vibration levels from helicopters are less than those produced by low-
104 flying jet aircraft (Ref# 306), the duration of noise and vibration is considerably longer from helicopter
105 overflight. Extremely close and low overflights (50 feet) by heavy (more than 20,000 pounds) helicopters
106 have a high probability of damaging architectural resources (Ref# 144). However, helicopter flights that
107 approach within 300 feet have not been demonstrated to damage historic properties (Ref# 138).
108 Archaeological resources are unlikely to experience adverse effects from aircraft overflight. No data exist
109 that would indicate that surface artifact scatters and subsurface archaeological deposits are affected by
110 vibrations resulting from subsonic aircraft overflight.

111 Actions that could potentially impact a resource's setting include the addition of new roads, buildings, or
112 features; removal of fences and other features; changes in vegetation; or changes in land use out of
113 character with traditional uses (e.g., recreation). The effects of noise and visual intrusions on historic
114 properties may be related to setting, if the setting of a historic property comprises an integral part of the
115 characteristics that make that resource eligible for listing in the NRHP. Because of modern development,
116 this is often not the case for historic properties. Even in rural areas, noise intrusions from vehicles and
117 machinery may create a noise environment inconsistent with the historic setting of the properties. Noise
118 and visual impacts may be of less importance to historic properties whose NRHP eligibility rests
119 primarily on their scientific importance, such as archaeological sites. There are no architectural or
120 archaeological historic properties identified on Fort Bliss for which setting has been defined as a
121 characteristic essential to the resource's NRHP eligibility.

122 Audible intrusions could also have potentially adverse impacts to the setting of certain properties of
123 traditional cultural and religious importance. For example, traditional ceremonies and rituals by Native
124 Americans may depend in part on isolation, solitude, or silence. An aircraft flying overhead, even at high
125 altitudes, could be deemed an auditory or visual intrusion if it occurs during a ceremony or at another
126 inappropriate time. Native American groups that have expressed interest in lands managed by Fort Bliss,
127 the Mescalero Apache, the Ysleta del Sur Pueblo (Tigua), the Comanche Tribe and The Navajo Nation,
128 have not identified specific properties of traditional cultural and religious importance on the installation.

129 Access or improved access to an area can result in impacts to historic properties. Historic properties such
130 as buildings, large pueblos, rockshelters, or rock art are likely targets for vandalism because these are
131 typically the most visible resources. When these historic properties are located near roads, they become
132 more vulnerable.

133 Fire can cause major damage to various types of historic properties, and activities that significantly
134 increase fire risk may have an adverse effect on those resources. Range fires on Fort Bliss can result from
135 weapons firing in the impact areas and surface danger zones and from various activities within the
136 training areas. The necessary and unavoidable fire suppression efforts, including road and fire-break
137 construction, vehicle and foot traffic, and trenching, can be nearly as destructive as the range fires

138 themselves. Fire management practices that involve ground disturbance or use of fire retardants delivered
139 by aircraft have the potential to damage rock art sites and archaeological sites. Fires can also result from
140 maintenance and repair of buildings. Vandalism can also increase fire risk.

141 Other sources of impacts include recreation and grazing where these activities are permitted within the
142 Fort Bliss Training Complex.

143 Some areas, including Otero Mesa and the Sacramento Mountains foothills, will not experience any
144 change in land use under any of the alternatives being considered. The types of impacts that historic
145 properties in those areas will be subject to would therefore not change.

146 **5.9.2 No Action Alternative**

147 The No Action Alternative consists of the continuation of the activities, programs, and management
148 practices established by the 2001 ROD for the Mission and Master Plan PEIS. Effects to historic
149 properties will be managed under the PA for management of historic properties on Fort Bliss or in the
150 separate agreements described in Section 5.9.1.1. The effects of development projects encompassed in
151 the No Action Alternative have been considered in previous NEPA documents.

152 **5.9.2.1 Main Cantonment Area**

153 An architectural inventory of existing buildings has identified those that are of concern, and ongoing
154 consultation and documentation will result in proper documentation and mitigation if required. For all
155 areas, if ground disturbance reveals previously unknown archaeological resources, the installation HPO
156 will be notified and SOPs in the PA will be followed.

157 Archaeological inventory is complete for the Main Post, and architectural inventory has been completed
158 for buildings with construction dates up to 1963. In accordance with the PA, renovation and additions to
159 existing historic buildings have been or will be coordinated and cleared with the HPO. Impacts from
160 future activities to NRHP-eligible or listed historic properties, including the Main Post Historic District,
161 not covered by other agreements are the subject of ongoing consultation and mitigation as specified in the
162 PA. Development in WBGHHD under EUL is managed through a separate programmatic agreement.
163 Construction of new military housing and changes to existing housing will be coordinated under the
164 existing RCI programmatic agreement.

165 Biggs AAF has been surveyed for archaeological resources (Ref# 242). Construction of temporary
166 facilities on 300 acres of previously disturbed land and permanent facilities on an additional 200 acres
167 will occur in disturbed areas and have a low potential to encounter previously unrecorded archaeological
168 resources. If unrecorded archaeological resources are encountered, consultation with the Fort Bliss HPO
169 and adherence to SOPs in the PA will ensure mitigation of any adverse effect to NRHP-eligible historic
170 properties.

171 **5.9.2.2 Fort Bliss Training Complex**

172 The No Action Alternative includes construction of mission support facilities, upgrades to existing
173 ranges, development of firing ranges and training facilities, and increases in the amount of off-road
174 vehicle maneuvers in TAs already approved for that use. Upgrades and expansions of live-fire and
175 qualification ranges on Doña Ana and McGregor Ranges will occur in areas approved for those uses.
176 Implementation of the PA with its associated SOPs will mitigate any impacts to archaeological resources
177 from ground disturbance. In the event of unanticipated discovery of historic properties in the course of
178 construction, SOPs specified in the PA will be followed to determine the proper course of action.

179 Portions of training areas that include Otero Mesa, which is highly sensitive for the presence of historic
180 properties, will not undergo any land use modifications under the No Action Alternative. Continued
181 avoidance of restricted areas and appropriate use of limited-use areas will allow resources in those areas
182 be managed in accordance with the PA.

183 **5.9.3 Alternative 1**

184 Alternative 1 includes stationing of four Heavy BCTs and other units at Fort Bliss and development and
185 use of facilities throughout the Main Cantonment Area and Fort Bliss Training Complex.

186 **5.9.3.1 Main Cantonment Area**

187 Construction, renovation, and demolition of facilities on the Main Post under Alternative 1 could affect
188 historic resources located there. However, compliance with the guidelines set out in the PA would
189 mitigate adverse effects from these projects. This would require appropriate rehabilitation of buildings in
190 the Main Post Historic District and compatibility with the Historic District's viewshed. Consultation with
191 the HPO would ensure compliance with the PA for previously identified archaeological sites and
192 evaluation for NRHP eligibility of any previously unknown resources that may be found during
193 construction.

194 To accommodate the additional Heavy BCTs, the Main Cantonment Area would expand to the south and
195 east into portions of what is now TA 1B. All of Biggs AAF has been surveyed for historic properties; the
196 area formerly part of TA 1B south of Loop 375 would need to be surveyed for historic properties, which,
197 if found, would be managed according to the PA.

198 The additional traffic and personnel associated with the Heavy BCTs could have an adverse effect on
199 historic properties. Archaeological sites could be more subject to casual looting and impacts from
200 increased use, and the setting of historic properties could change.

201 **5.9.3.2 Fort Bliss Training Complex**

202 Alternative 1 includes development in four main training activity centers, addition of Off-road Vehicle
203 Maneuver training category to training areas in the south Tularosa Basin portion of McGregor Range, and
204 development of new tactical and firing ranges. Increased use of training areas would require coordination
205 with the Fort Bliss HPO to complete inventory in areas not surveyed and monitor adherence to Restricted
206 and Limited-Use areas and impacts to sites. This would be accomplished in accordance with the
207 requirements and SOPs in the PA. In all cases, discovery of previously unrecorded archaeological sites
208 would be coordinated with the HPO to evaluate the resource for NRHP eligibility and develop appropriate
209 treatments.

210 Although the Doña Ana Range-North Training Areas have been surveyed for archaeological historic
211 properties, ground disturbing activities associated with the new live-fire and qualification ranges proposed
212 at Doña Ana Range and opening the Assembly Area along the east edge of the Organ Mountains to off-
213 road vehicle maneuver training have the potential to adversely affect historic properties, particularly
214 archaeological sites. Adherence to the SOPs in the PA would address any impacts. Increased personnel
215 at the range camps could also affect archaeological sites through casual looting and inadvertent impacts
216 through increased traffic.

217 Opening approximately 216,000 acres in the south Tularosa Basin portion of McGregor Range to Off-
218 Road Vehicle Maneuver and Mission Support Facility training categories would have the effect of
219 increasing ground disturbance throughout much of the Tularosa Basin training areas. While this has the
220 possibility of adversely affecting archaeological sites, management according to the PA would include
221 defining Restricted and Limited-Use areas within these training areas. The concentration of activity and
222 the intensive use of the training areas would make timely inventory and monitoring more critical. In
223 particular, intensive use around live-fire ranges and training facilities in the southern portion of TA 32
224 and around the Orogrande Range Complex would require close coordination with the HPO and
225 management according to the PA for completing surveys, monitoring, and impact mitigation at affected
226 historic properties.

227 **5.9.4 Alternative 2**

228 **5.9.4.1 Main Cantonment Area**

229 Impacts from Alternative 2 in the Main Cantonment Area would be the same as described for Alternative
230 1. Potential additional development of facilities and infrastructure would be managed according to the
231 applicable programmatic agreements. Any adverse effects to historic properties would be mitigated
232 through adherence to the SOPs in the Fort Bliss PA.

233 **5.9.4.2 Fort Bliss Training Complex**

234 Alternative 2 would include the land use changes and construction and training activities in Alternative 1.
235 In addition, it would add the Off-Road Vehicle Maneuver training category in the north Tularosa Basin
236 portion of McGregor Range.

237 Land use and effects to historic properties in the South Training Areas and Doña Ana Range-North
238 Training Areas would be the same as described under Alternative 1. These areas have been completely
239 surveyed for historic properties, and management according to the PA would anticipate and mitigate
240 adverse effects, particularly to archaeological sites.

241 Land use and potential effects to historic properties on McGregor Range would be the same as described
242 for Alternative 1 south of Highway 506. North of the highway, the Off-Road Vehicle Maneuver training
243 category would be added to TA 10, TAs 11 and 29 north of Highway 506, and the western part of TA 12.
244 Use of individual training areas is expected to be less intensive in those TAs than in the TAs south of
245 Highway 506. Coordination with the HPO and adherence to the programs outlined in the PA and its
246 SOPs would provide for scheduling of monitoring and inventory programs to identify historic properties
247 in previously unsurveyed areas. Historic property inventory would cover possible construction of mission
248 support facilities in the TAs north of 506 and possible identification of new restricted and/or limited-use
249 areas. Escondido Pueblo will likely become a restricted area.

250 **5.9.5 Alternative 3**

251 **5.9.5.1 Main Cantonment Area**

252 Impacts from Alternative 3 in the Main Cantonment Area would be the same as described for Alternative
253 2.

254 **5.9.5.2 Fort Bliss Training Complex**

255 Alternative 3 would include the land use changes and construction and training activities in Alternative 1.
256 In addition, it would extend the Off-Road Vehicle Maneuver training category into the southeast training
257 areas of McGregor Range and expand Mission Support Facility, Weapons Firing, and SDZ/Safety
258 Footprint capabilities in a large part of the Fort Bliss Training Complex.

259 Under Alternative 3, the South Training Areas would become land use category A with Mission
260 Facilities, adding Mission Support Facility, Weapons Firing, and SDZ/Safety Footprint training
261 categories to those areas. All numbered North Training Areas and the Assembly Area would also become
262 land use category A with Mission Facilities. Land use in Doña Ana Range would be the same as under
263 Alternative 1. In all cases, continued use of the project planning tools described in the PA and adherence
264 to its SOPs would address any adverse effects to historic properties.

265 On McGregor Range, all training areas west of Otero Mesa and south of Highway 506 would be land use
266 category A with Mission Facilities. This would add the Off-Road Vehicle Maneuver training category to
267 TAs 9, 11 and 29 south of Highway 506, 24, 25, 26, 27, 30, 31, and 32. Use of TAs 24, 26, and 27 could
268 entail additional construction at McGregor Range Camp. Training activities in TAs 24, 26, and 27 are
269 expected to be less than in the south Tularosa Basin portion of McGregor Range, allowing more time for

270 historic property management activities. Adherence to the SOPs in the Fort Bliss PA would mitigate
271 potential adverse effects to historic properties.

272 **5.9.6 Alternative 4 – Proposed Action**

273 Alternative 4 would include all the land-use changes discussed for Alternatives 1, 2 and 3, which would
274 more than double the amount of land designated for Off-Road Vehicle Maneuver compared to the No
275 Action Alternative. All areas designated for Off-Road Vehicle Maneuver would also include Mission
276 Support Facility, Weapons Firing, and SDZ/Safety Footprint training categories.

277 **5.9.6.1 Main Cantonment Area**

278 Impacts from Alternative 4 in the Main Cantonment Area would be similar to those described for
279 Alternative 1. Potential additional facility and infrastructure development would be managed according
280 to the Fort Bliss PA and the various other programmatic agreements. Adverse effects to historic
281 properties would be mitigated through adherence to the SOPs in the Fort Bliss PA.

282 **5.9.6.2 Fort Bliss Training Complex**

283 Alternative 4 combines all the changes to training area use discussed for Alternatives 1, 2, and 3. This
284 would add the training category of Off-Road Vehicle Maneuver to approximately 352,000 acres of
285 McGregor Range and add Mission Support Facility, Weapons Firing, and SDZ/Safety Footprint training
286 categories to all TAs that include Off-Road Vehicle Maneuver.

287 The South Training Areas would become land use category A with Mission Facility, adding Weapons
288 Firing and SDZ/Safety Footprint training categories to those areas. All numbered North Training Areas
289 and the Assembly Area would also be land use category A with Mission Support Facility. Land use in the
290 Doña Ana Range would be the same as described for Alternative 1. Adherence to the SOPs in the Fort
291 Bliss PA would mitigate adverse effects to historic properties from training activities.

292 On McGregor Range, Alternative 4 would change the land use category of TAs 9, 10, 11, the western half
293 of 12, 24, 25, 26, 27, 29, 30, 31, and 32 to include Off-Road Vehicle Maneuver. Depending on the
294 intensity of training use, historic properties management activities could be restricted in some areas. In
295 general, it is expected that the North and South Training Areas and the areas near McGregor Range Camp
296 and the Orogrande Range Complex on McGregor Range would experience the highest concentration of
297 use, while training areas north of Highway 506 and in the southeast portion of McGregor Range would
298 likely be used less intensively for off-road vehicle maneuver training. In all areas, adherence to the PA
299 would mitigate adverse effects to historic properties.

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1 **5.10 NOISE**

2 **5.10.1 Introduction**

3 The analysis of noise impacts from the alternatives is based primarily on the potential for human
4 annoyance and on land use compatibility. None of the projected noise levels associated with proposed
5 activities at Fort Bliss are high enough to raise concerns about impacts on hearing or structural damage.
6 The U.S. Army has developed land use planning guidelines to support noise assessments related to human
7 annoyance. The Land Use Planning Zone portion of Noise Zone I and Noise Zones II and III are
8 presented in Section 4.10, and Table 4.10-3 identifies the noise level thresholds associated with each. The
9 LUPZ is that portion of Noise Zone I with Day-Night Average Sound Levels between 65 and 70 dB (for
10 A-weighted sounds) and 57-62 dB (for C-weighted sounds).

11 The analysis of noise effects in this section considers ADNL for aircraft and vehicle noise and CDNL and
12 peak noise level (PK15 [met]) for impulsive noise (see Table 4.10-2). The following sections present the
13 results of the analysis of noise from large caliber weapons, aircraft operations, and off-road vehicle
14 maneuvers.

15 In October 2005, the U.S. Army Center for Health Promotion and Preventive Medicine conducted an
16 *Operational Noise Consultation for 52-ON-046R-06 Aircraft and Large Caliber Weapon's Noise for Fort*
17 *Bliss, TX* (Ref# 200). The purpose of the consultation was to provide noise data in support of Fort Bliss'
18 BRAC actions. CHPPM modeled DNL contours for projected activities at Biggs AAF and both DNL and
19 PK 15(met) contours for large caliber weapons on the Fort Bliss Training Complex for each alternative
20 analyzed in this SEIS. The result of the small arms range modeling (see Figure 4.10-3) revealed that none
21 of the contours would extend outside the installation boundary, so this noise source is not discussed
22 further.

23 In July 2006, CHPPM updated its results to reflect some adjustments in the location of proposed large
24 caliber weapons ranges and add an analysis of helicopter operations at Orogrande Range Camp and
25 entering McGregor Range (Ref# 476).

26 Maximum noise levels from increased off-road vehicles maneuvers were estimated for this SEIS by
27 evaluating a BCT-level exercise involving nearly 300,000 vehicle miles within a 16-by-31 km maneuver
28 box over a 14-day period. The vehicles were distributed along the perimeter of the maneuver box to
29 provide a conservative measure of noise exposure. Representative noise levels were estimated for an
30 average 24-hour period and a peak 1-hour period at various distances from the perimeter of the box.

31 The noise emission levels for off-road vehicle maneuvers were based on available measurements of a
32 variety of tracked and wheeled vehicles that are the same as or acoustically similar to vehicles in a Heavy
33 BCT. Noise levels for tracked vehicles were based on measurements of comparable Army vehicles
34 performed at Fort Indiantown Gap, Pennsylvania, presented in **Table 5.10-1**. Wheeled vehicles were
35 assigned an average noise level of 75 dBA at 100 feet, based on the Department of Transportation's
36 Transportation Noise Model, Version 2.1, which predicts 65.2, 71.7, and 75.8 dBA at 100 feet for
37 automobiles, light-duty trucks, and heavy-duty trucks, respectively, at 60 miles per hour. Resulting noise
38 propagation estimates also took into consideration average vehicle speed (assumed to be 20 km/hour),
39 average kilometers per day traveled, and the attenuation of noise over flat, sandy terrain. These noise data
40 were then used to estimate the equivalent sound levels over a 24-hour period (Leq₂₄) and during a peak 1-
41 hour period (Leq_(h)), and to calculate the distance from the perimeter of the maneuver box to Leq₂₄ and
42 Leq_(h) levels of 65 and 75 dBA.

43

Table 5.10-1. Sound Levels of Selected Army Tracked Vehicles

<i>Equipment</i>	<i>Distance</i>		
	<i>50 feet</i>		<i>100 feet</i>
	<i>Moving Max</i>	<i>Idle Max</i>	<i>Moving Max</i>
M1A1 Tank	89.4 dBA	75.1 dBA	84.9 dBA
Howitzer M109	95.6 dBA	76.1 dBA	91.6 dBA
M113 Personnel Carrier	86.8 dBA	76.0 dBA	81.9 dBA
M548 Ammunition Carrier	85.0 dBA	70.0 dBA	79.0 dBA
M88 Recovery Vehicle	96.8 dBA	70.0 dBA	91.5 dBA
ABLV Bridge Launcher	95.9 dBA	70.0 dBA	90.5 dBA
D-8K Bulldozer	92.2 dBA	73.3 dBA	86.5 dBA

Note: Maximum sound measured with meter set on “slow response.”

Source: Ref# 480

44 **5.10.2 No Action Alternative**

45 The No Action Alternative includes stationing of one Heavy BCT at Fort Bliss, in addition to the existing
46 units located at and testing and training on the installation. There will be no change in aircraft activities at
47 Biggs AAF from current conditions.

48 **5.10.2.1 Aircraft Noise**

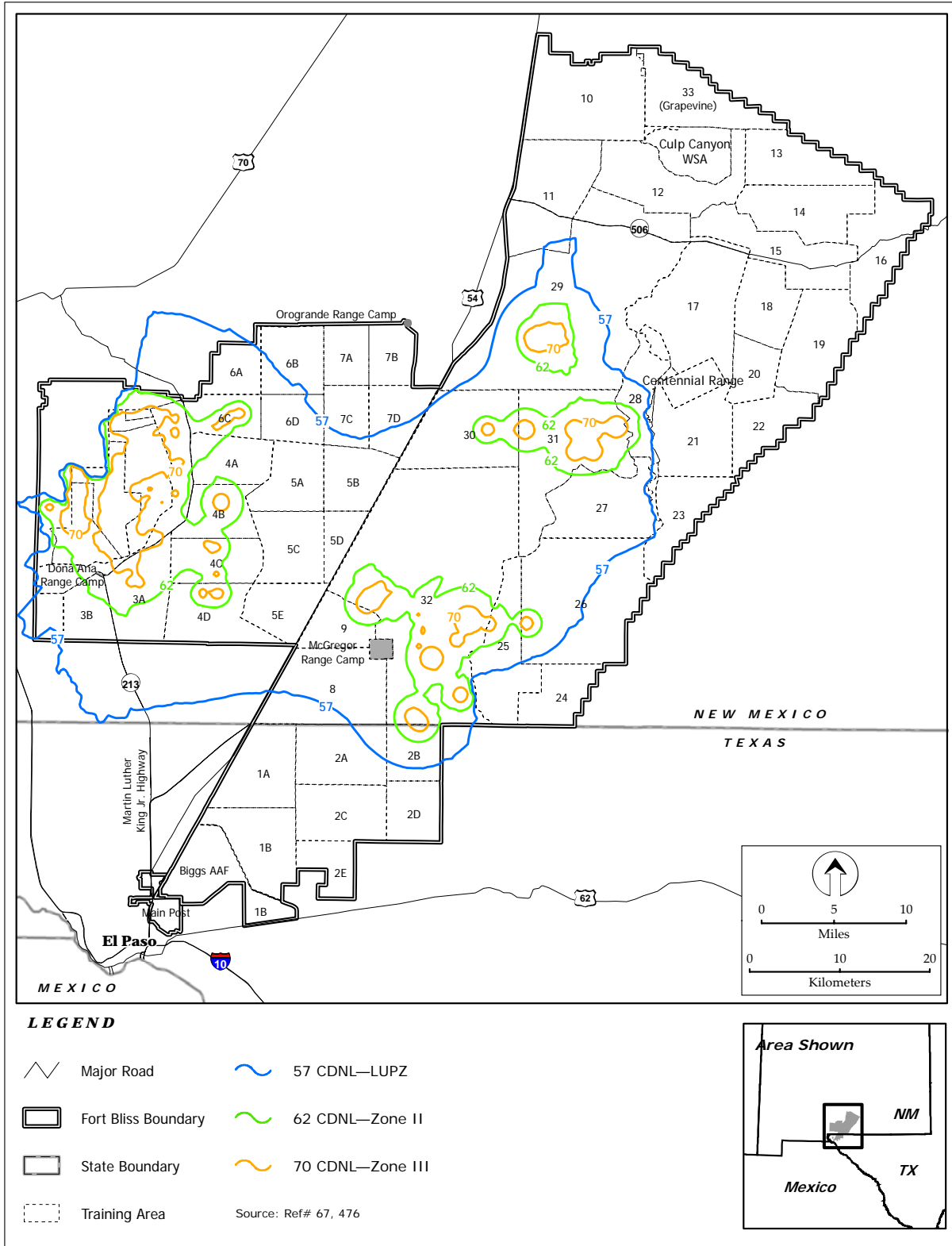
49 Aviation noise contours associated with aircraft operations at Biggs AAF under the No Action Alternative
50 will remain as described in Section 4.10 and illustrated in Figure 4.10-1.

51 **5.10.2.2 Large Caliber Weapons Noise**

52 The CDNL noise contours associated with large caliber weapons training by one Heavy BCT, in
53 combination with existing users, are shown in **Figure 5.10-1** (Ref# 200). The LUPZ 57 CDNL contour
54 extends off the installation at the northern, southern, and western boundaries of the Doña Ana Range
55 complex and in a small area east of the South Training Areas and south of McGregor Range. The Noise
56 Zone II 62 CDNL contour extends up to the northern boundary of Doña Ana Range and the eastern corner
57 where the South Training Areas and McGregor Range meet but does not extend outside the installation.
58 The Noise Zone III 70 CDNL contours are well within the installation boundary. Approximately 53,000
59 acres outside of Fort Bliss would be newly affected by noise levels between 57 and 62 CDNL.

60 **Table 5.10-2** identifies total acres by type of land ownership within each of the noise zones. The BLM
61 and state-owned lands to the south of Doña Ana Range are mostly used for grazing. The BLM land west
62 of Doña Ana Range includes the Organ Mountains Recreation Area, which has a variety of scenic,
63 cultural, and other special resources. Private lands in the LUPZ south of Doña Ana Range are developing
64 with low-density residential land use in the community of Chaparral. Under this alternative, no areas
65 outside of Fort Bliss will be affected by levels of CDNL 62 dB or greater. Noise levels below CDNL 62
66 dB are generally compatible with all land uses.

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



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**Figure 5.10-1. Day-Night Average Sound Levels for Large Caliber Weapons –
No Action Alternative**

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71

**Table 5.10-2. Acres Affected by Noise from Large Caliber Weapons –
No Action Alternative**

<i>Land Owner</i>	<i>Noise Zone (acres)</i>		
	<i>LUPZ</i>	<i>Zone II</i>	<i>Zone III</i>
Fort Bliss ¹	374,503	112,486	47,833
WSMR	18,372	0	0
BLM	21,011	0	0
State (NM)	9,153	0	0
Private	15,325	0	0
Total	438,366 ²	112,486	47,833

1. Includes withdrawn land on McGregor Range
2. Includes approximately 1 acre of Texas state-owned land

72 The PK 15(met) noise contours are shown in **Figure 5.10-2** (Ref# 476). The 115 dB contour extends past
73 the northern and western boundary of Doña Ana Range, the eastern boundary of the South Training
74 Areas, and a small area east of TA 23 on McGregor Range. The 130 dB contour only extends past the
75 southern boundary of McGregor Range.

76 **Table 5.10-3** shows the total area, by type of land ownership, affected by PK 15 (met) levels above 115
77 and 130 dB. The new demolition range being constructed in the south part of TA 32 will cause peak
78 noise levels to extend off the installation south of McGregor Range. Approximately 24,609 acres of land
79 outside Fort Bliss is affected by PK 15(met) levels of between 115 and 130 dB, an increase of 11,973
80 acres over current conditions. This noise level generally carries a moderate risk of complaints. The
81 affected area does not have a road network or utilities, so new development is not likely in the near term;
82 however, there are no land use controls to preclude development in the future. The area affected includes
83 Hueco Tanks State Park, and visitors may be annoyed by increased noise levels during detonations at the
84 demolition range.

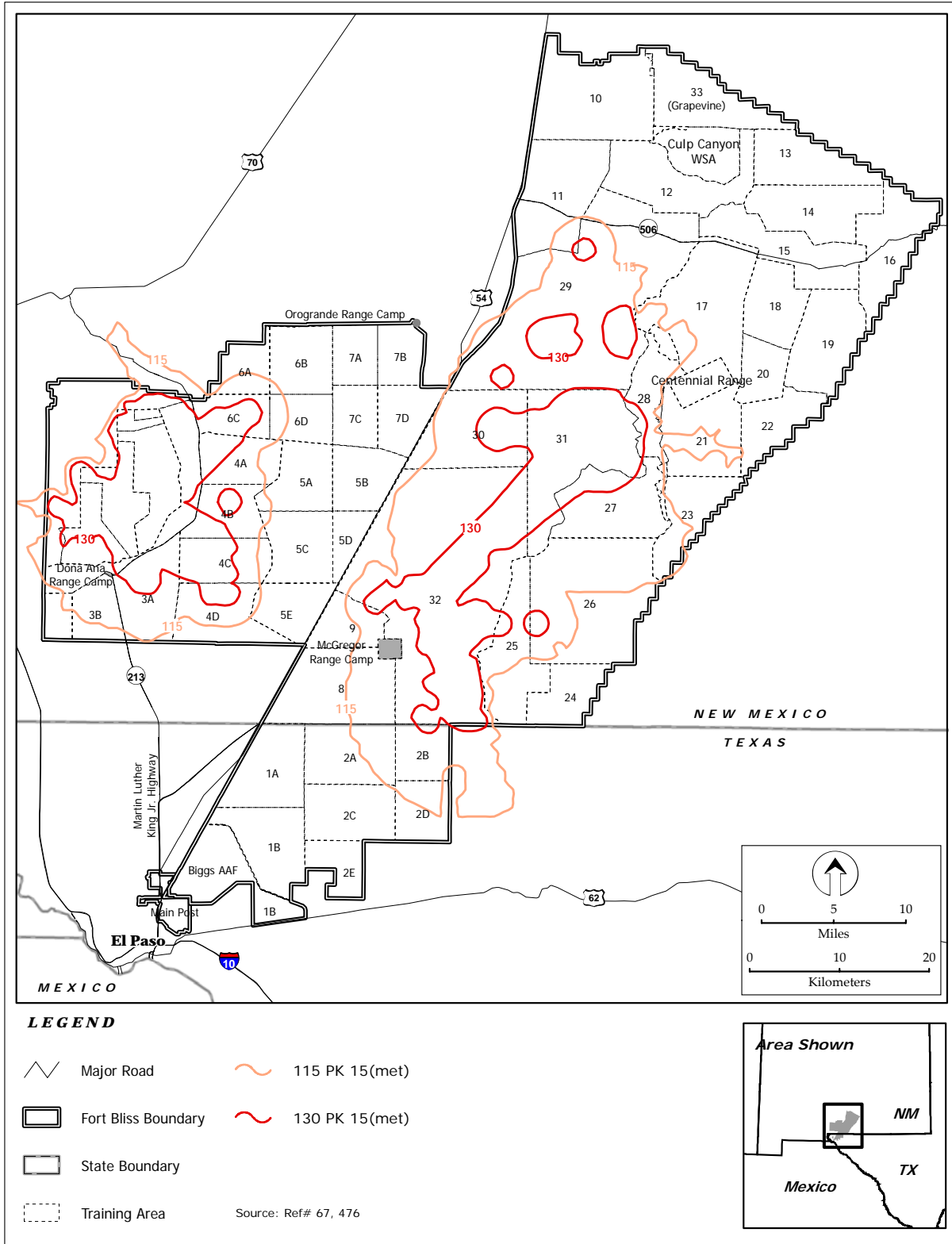
85 A total of 533 acres of private land will be newly exposed to PK 15(met) levels exceeding 130 dB. This
86 noise level carries a high risk of complaints.

87 **Table 5.10-3. Area Affected by Peak Noise Levels from Large Caliber Firing–**
88 **No Action Alternative**

<i>Land Owner</i>	<i>Acres Within PK 15(met) Contours</i>	
	<i>115-130dB</i>	<i>>130dB</i>
Fort Bliss ¹	295,326	178,701
WSMR	7,735	17
BLM	3,544	0
Tribal	46	0
State	677	0
Private	12,607	533
Total	319,934	179,234

1. Includes withdrawn land on McGregor Range

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



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Figure 5.10-2. Projected Peak Level Noise Contours for Large Caliber Weapons

91 **5.10.2.3 Off-Road Vehicle Maneuvers**

92 Under the No Action Alternative, noise generated by off-road vehicles maneuvers will be confined to
93 areas where such maneuvers are currently conducted and have been conducted in the past.

94 **5.10.3 Alternative 1**

95 Under Alternative 1, four Heavy BCTs and one Combat Aviation Brigade would be stationed at Fort
96 Bliss. The noise analysis considers the impacts of training by these and other units that use the Fort Bliss
97 Training Complex.

98 **5.10.3.1 Aircraft Noise**

99 Helicopter operations conducted by the CAB would generate additional noise at Biggs AAF and enroute
100 to the Restricted Airspace. The helicopters would use a path heading north from the airfield and
101 following Railroad Drive/US 54.

102 The noise contours created by the operations of one CAB are shown in **Figure 5.10-3** (Ref# 200). The
103 LUPZ 60 ADNL contour extends off the northern and southwestern boundaries of Fort Bliss into El Paso.
104 The Noise Zone II 65 ADNL contour extends off the northern boundary of Fort Bliss into El Paso. A
105 total of 821 acres of off-post land would be exposed to noise levels between 60 and 65 ADNL, and 633
106 acres would be exposed to noise levels between 65 and 70 ADNL.

107 Noise levels above 65 ADNL are generally not compatible with residential use. There are also
108 commercial and industrial parcels in the affected area, which would be generally compatible with the
109 projected noise levels.

110 The CAB would use the airstrip at Orogrande Range Camp as a staging area and Forward Area Refuel
111 Point for training operations at the Digital Air Ground Integration Range. Helicopters would take off and
112 land at Orogrande Range Camp, crossing over US 54 at altitudes ranging from 250 to 2,000 feet AGL to
113 reach the DAGIR on McGregor Range. **Table 5.10-4** shows the maximum sound level of different
114 helicopters at various altitudes. **Figure 5.10-4** shows the proposed flight track for these cross-overs and
115 an annoyance buffer where noise levels are estimated to be 70 dBA or higher (Ref# 476).

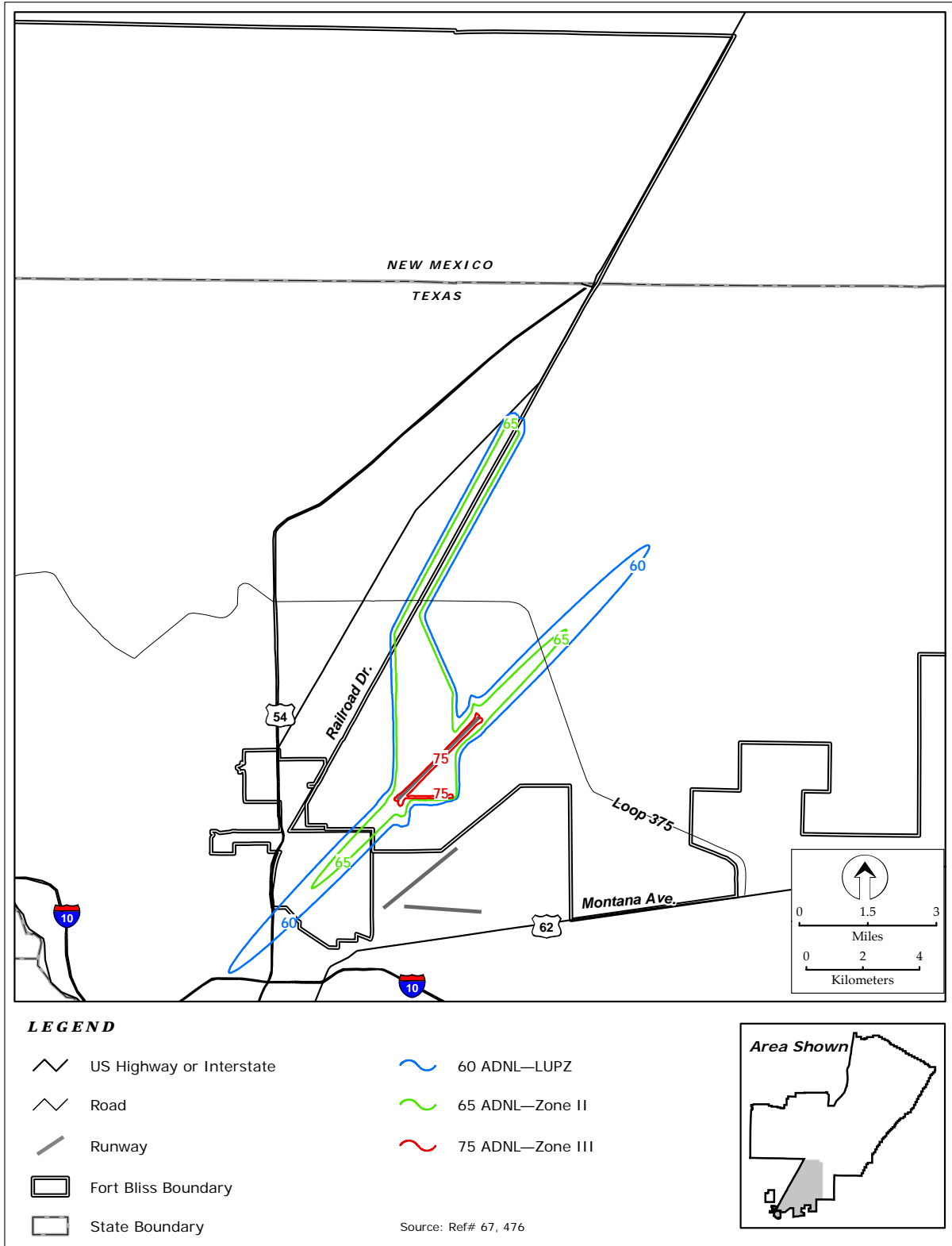
116 **Table 5.10-4. Maximum Noise Levels of Helicopters at Various Altitudes**

<i>Altitude (feet AGL)</i>	<i>Maximum dBA</i>		
	<i>AH-64</i>	<i>CH-47</i>	<i>UH-60</i>
250	90	90	86
500	83	84	80
1,000	77	75	73
2,000	70	71	66

Source: Ref# 476

117 The CAB's AH-64 helicopters would also perform low-altitude "Nap-of the Earth" (NOE) training at
118 altitudes between 50 and 200 feet AGL in the Restricted Area airspace overlying McGregor Range.
119 **Figure 5.10-5** shows the expected flight track for these operations and a nominal buffer (not accounting
120 for any terrain features) where noise levels are estimated to be 70 dBA or higher for helicopters traveling
121 at 50 feet AGL (Ref# 200).

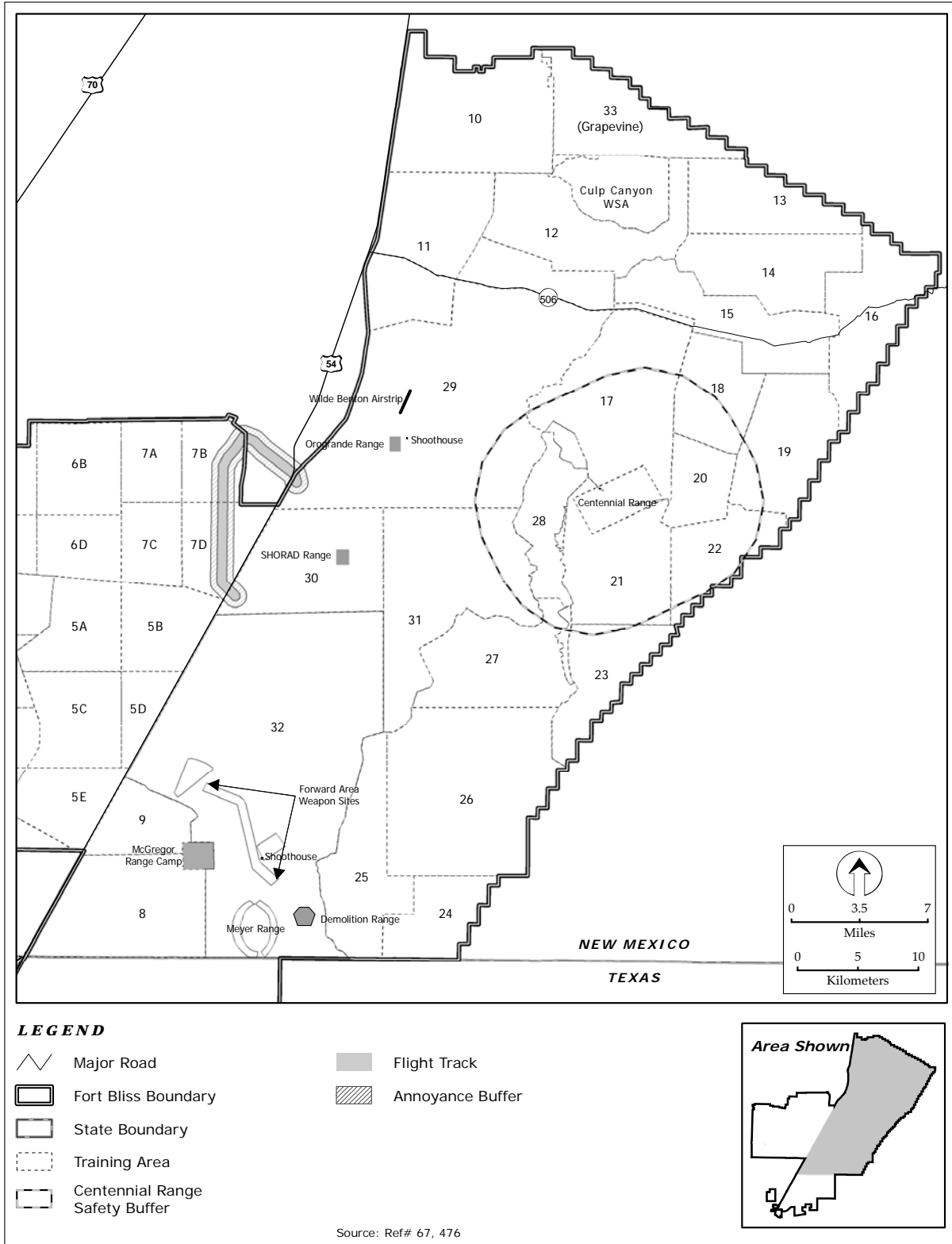
**Fort Bliss Mission and Master Plan Supplemental Programmatic Environmental Impact Statement
Final SEIS**



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Figure 5.10-3. Day-Night Average Sound Levels at Biggs AAF With One CAB

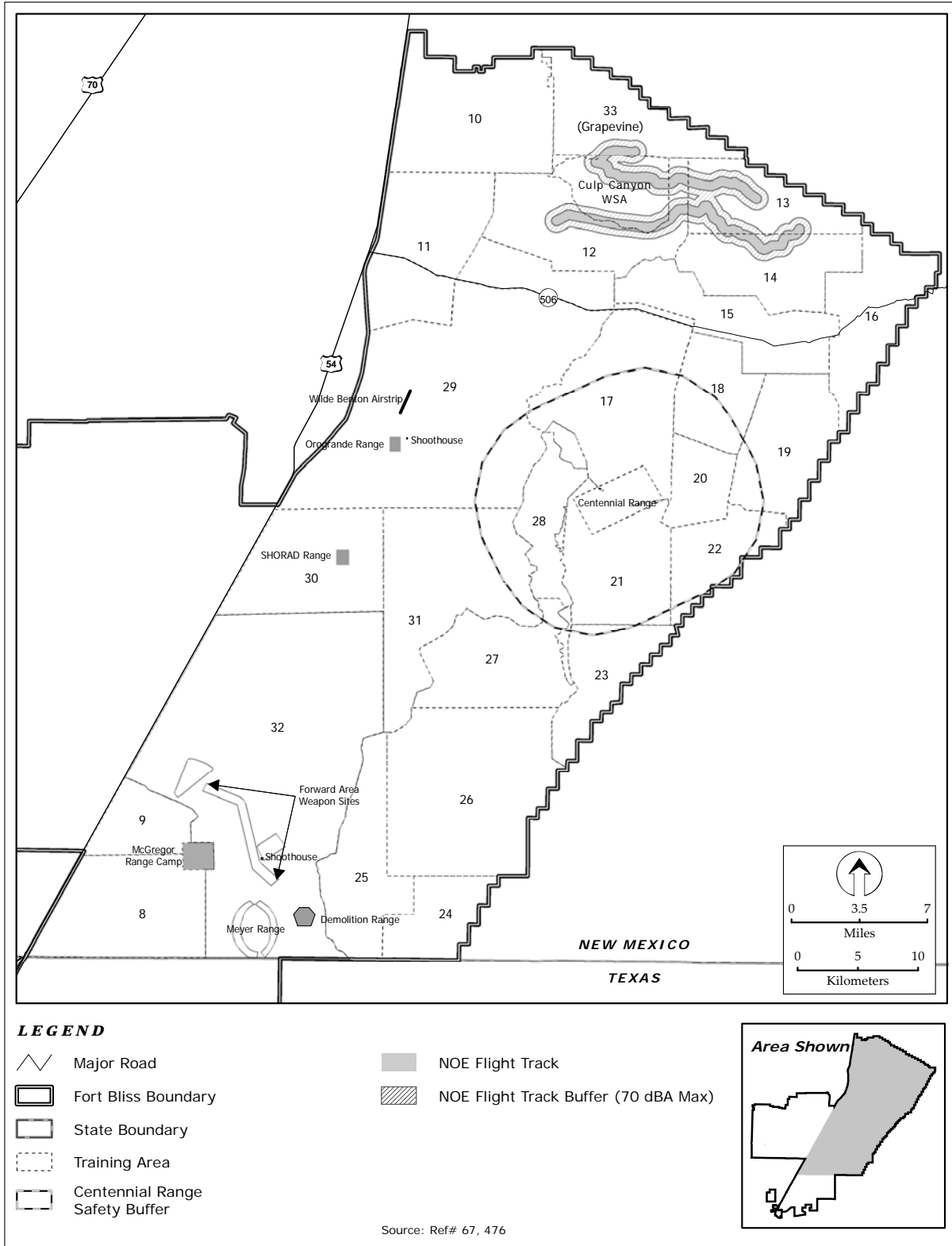
**Fort Bliss Mission and Master Plan Supplemental Programmatic Environmental Impact Statement
Final SEIS**



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Figure 5.10-4. Helicopter Flight Track and Noise Buffer From Orogrande Range Camp

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



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Figure 5.10-5. Nap-of-the Earth Flight Track and Noise Buffer

128 **5.10.3.2 Large Caliber Weapons Noise**

129 The CDNL noise contours associated with large caliber weapons training by four Heavy BCTs are shown
 130 in **Figure 5.10-6**. The LUPZ 57 CDNL contour extends off the installation at the northern, southern, and
 131 western boundary of the Doña Ana Range complex, the southeastern corner where the South Training
 132 Areas and McGregor Range meet, and the eastern boundary of TA 23 on McGregor Range. The Noise
 133 Zone II 62 CDNL contour extends off the northern, southern, and western boundary of Doña Ana Range.
 134 A total of 167,702 acres outside Fort Bliss would be newly exposed to noise levels between 57 and 62
 135 CDNL and 27,955 acres to noise levels above 62 CDNL, compared to existing conditions.

136 **Table 5.10-5** identifies total acres by type of land ownership within each of the noise zones under
 137 Alternative 1. Approximately 2,973 acres of private land would be in Noise Zone II. The Noise Zone II
 138 contour for Doña Ana Range would extend south of TAs 3A and 3B to the community of Chaparral.
 139 Some households in this area would be affected by noise levels that are generally not compatible with
 140 residential use. The community is not incorporated (and has recently voted to remain unincorporated) and
 141 has no land use controls. With increasing growth, it is possible for additional homes to be built in
 142 incompatible areas near the installation boundary. Grazing is the primary use on affected state and BLM
 143 lands. No land outside of Fort Bliss would be in Noise Zone III.

144 An estimated 57,297 acres of private land would be in the LUPZ. Noise levels in this zone are
 145 compatible with most land uses. Communities such as Berino and the outskirts of Anthony, New Mexico,
 146 as well as the northeast suburbs of El Paso, would experience an increase in noise exposure. The southern
 147 part of the Organ Mountains Recreation Area would also be exposed to noise levels between 57 to 62
 148 CDNL as far north as Pyramid Peak and Pena Blanca.

149 Weapons firing at the new CACTF and DAGIR would expand the 57 CDNL off the installation along US
 150 54 in Otero County, mostly affecting public lands but also the community of Orogrande. South of TA 32,
 151 the LUPZ contour would expand south toward the Hueco Tanks, where the noise would likely be audible
 152 to park visitors.

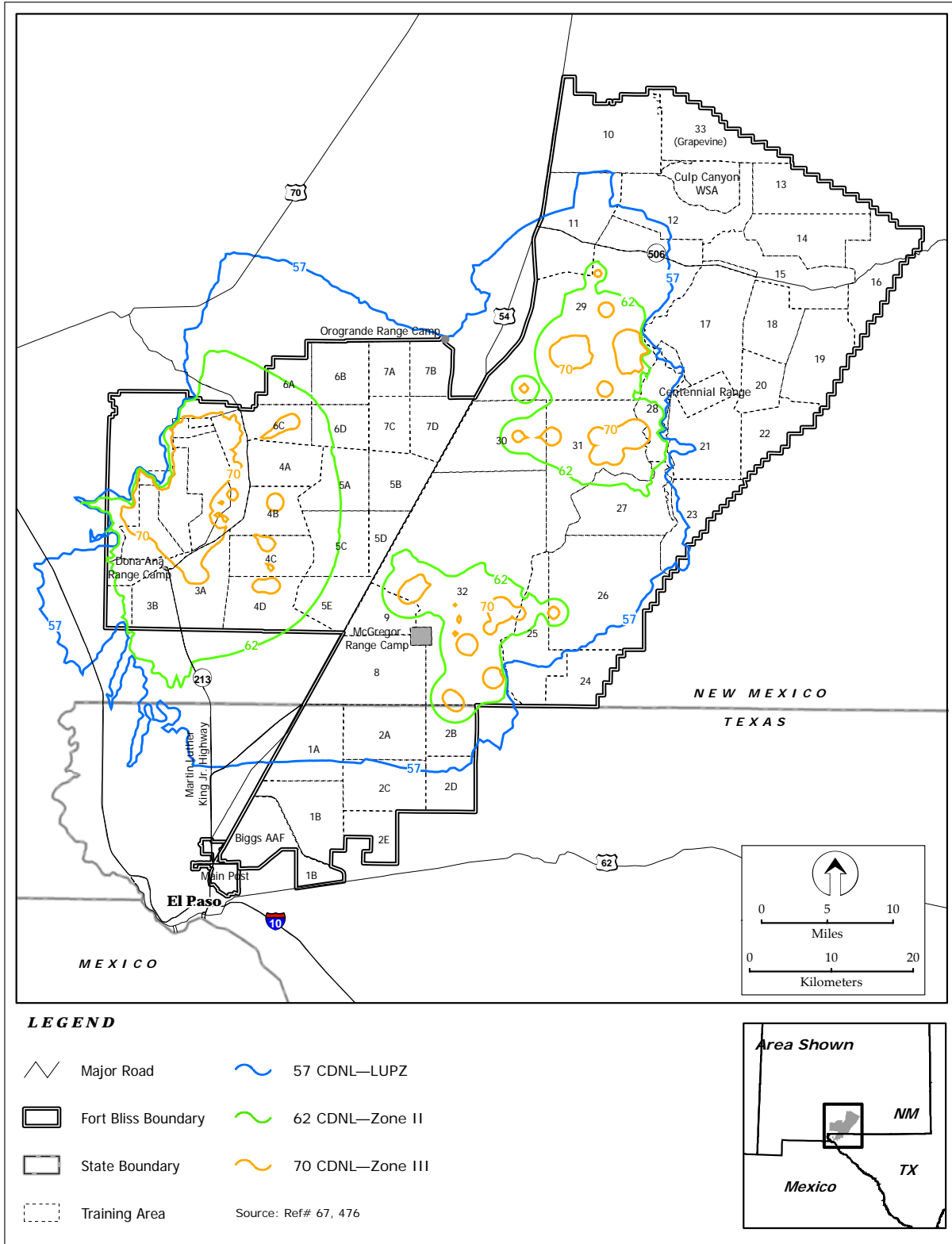
153 **Table 5.10-5. Acres Affected by Noise From Large Caliber Weapons–**
 154 **Alternative 1**

<i>Land Owner</i>	<i>Noise Zone (acres)</i>		
	<i>LUPZ</i>	<i>Zone II</i>	<i>Zone III</i>
Fort Bliss ¹	400,119	227,932	71,648
WSMR	56,988	11,096	0
BLM	50,924	9,399	0
State (NM)	7,922	4,487	0
State (TX)	5,488	0	0
Private	57,297	2,973	0
Total	578,738	255,887	71,648

1. Includes withdrawn land on McGregor Range

155 The PK 15(met) noise contours would be as shown in Figure 5.10-2 for the No Action Alternative.

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



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**Figure 5.10-6. Day-Night Average Sound Levels for Large Caliber Weapons –
Alternative 1**

159 **5.10.3.3 Off-Road Vehicle Maneuvers**

160 An analysis of a BCT-level off-road vehicle maneuver exercise using the assumptions described in
161 Section 5.10.1 calculated the distances from the perimeter of the maneuver box to an Leq_{24} noise level of
162 75 dBA to be 55 feet and to 65 dBA to be 286 feet. The distances for the $Leq_{(h)}$ are 122 feet to 75 dBA
163 and 630 feet to 65 dBA. These are very conservative estimates because they assume all vehicles would
164 be traveling along the perimeter of the maneuver box, when in fact they would be distributed through the
165 area. As an indication of human perception of loudness while a vehicle is driving by, **Table 5.10-6**
166 presents the maximum sound level for a “representative” vehicle at various distances from the perimeter
167 of the maneuver box. This depicts the sound levels that would be heard by an individual standing at the
168 indicated distances as a representative vehicle passed the point on the perimeter of the maneuver area
169 closest to the individual. The noise level of the representative vehicle was derived by averaging the noise
170 levels for the entire fleet engaged in the exercise.

171 **Table 5.10-6. Maximum Sound Level of a Representative Vehicle**
172 **at Various Distances From the Perimeter of a Maneuver Box**

<i>Distance (feet)</i>	<i>Max dBA</i>
100	83
200	77
400	71
800	65
1,600	59

173 An estimate was also made of the noise from a convoy of tracked Army vehicles traveling to a maneuver
174 area along a tank trail. Assuming an average speed of 30 km/hour, the volume of traffic was estimated to
175 be approximately 300 vehicles per hour. This results in an $Leq_{(h)}$ of 65 dBA at a distance of
176 approximately 2,000 feet from the convoy.

177 **5.10.4 Alternative 2**

178 Alternative 2 considers the noise impacts associated with training by four Heavy BCTs, two CABs, and
179 other units that use the Fort Bliss Training Complex.

180 **5.10.4.1 Aircraft Noise**

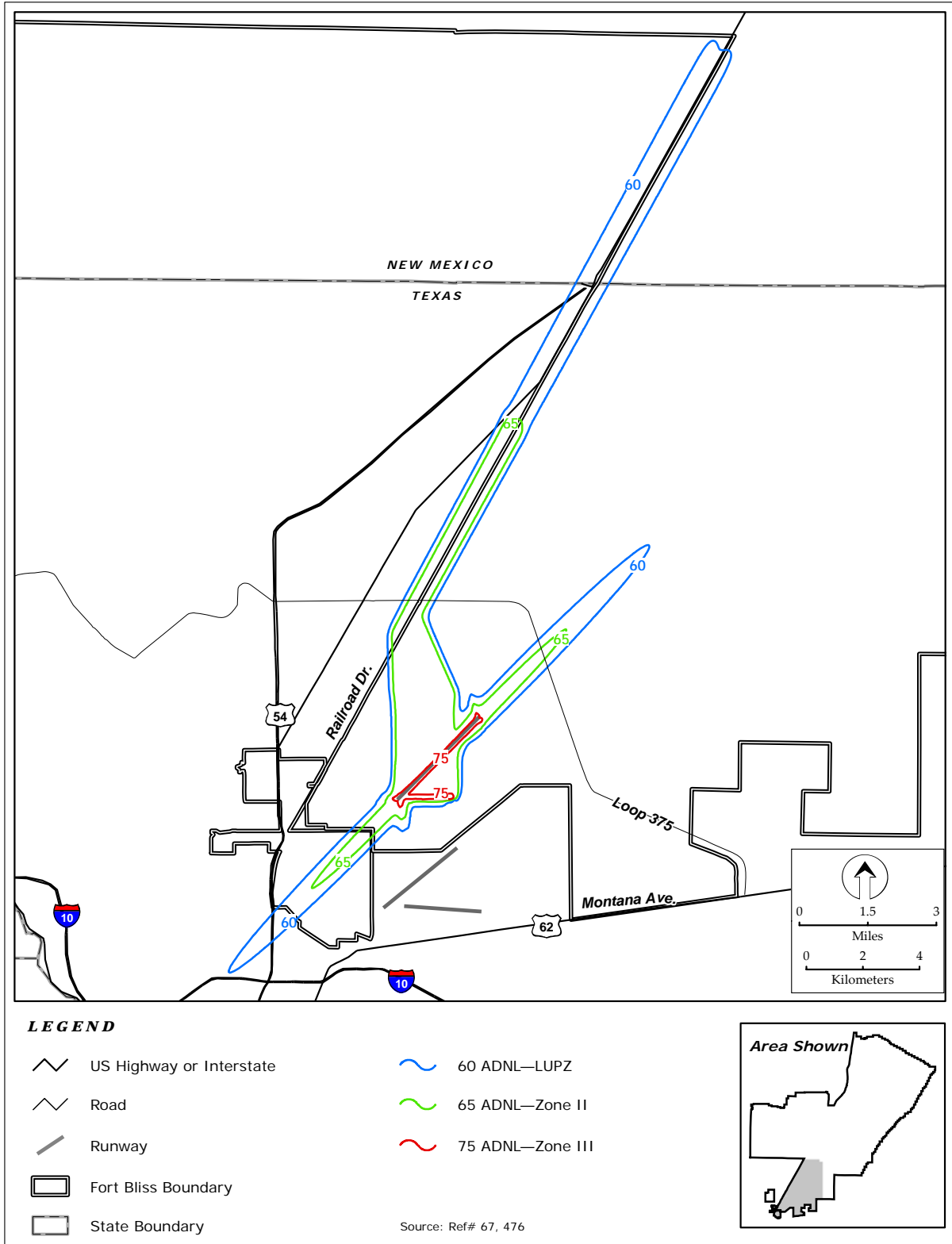
181 The noise contours created by two CABs operating at Biggs AAF are shown in **Figure 5.10-7** (Ref# 200).
182 The LUPZ 60 ADNL contour extends off the northern and southwestern boundaries of Fort Bliss into El
183 Paso. The Noise Zone II 65 ADNL contour extends off the northern boundary of Fort Bliss into El Paso.
184 Approximately 3,300 acres of off-post land would be exposed to noise levels between 60 and 65 ADNL,
185 and 882 acres would be exposed to noise levels between 65 and 70 ADNL. The LUPZ would include
186 land that is planned for low-density residential in the newly approved City of El Paso Northeast Area
187 Master Plan. The area in Noise Zone II would include some residents, although most housing is to the
188 west of the corridor that would be used by helicopters transiting to the Restricted airspace.

189 Noise from helicopter operations at Orogrande Range Camp and NOE training would be as described for
190 Alternative 1, but more frequent with two CABs.

191 **5.10.4.2 Large Caliber Weapons Noise**

192 The CDNL noise contours associated with large caliber weapons training under Alternative 2 would be
193 the same as shown in Figure 5.10-6 for Alternative 1. The PK15 (met) noise contours would be the same
194 as shown in Figure 5.10-2.

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



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Figure 5.10-7. Day-Night Average Sound Levels for Two CABs at Biggs AAF

197 **5.10.4.3 Off-Road Vehicle Maneuvers**

198 Off-road vehicle maneuver noise under Alternative 2 would be as described for Alternative 1.

199 **5.10.5 Alternative 3**

200 Alternative 3 considers the noise impacts associated with training by four Heavy BCTs, two CABs, and
201 other units that use the Fort Bliss Training Complex.

202 **5.10.5.1 Aircraft Noise**

203 Aircraft noise from CAB operations at Biggs AAF would be as described for Alternative 2 and shown on
204 Figure 5.10-7. Noise from helicopter operations at Orogrande Range Camp (Figure 5.10-4) and NOE
205 training (Figure 5.10-5) would be as described for Alternative 1, but more frequent with two CABs.

206 **5.10.5.2 Large Caliber Weapons Noise**

207 The CDNL contours associated with large caliber weapons training under Alternative 3 would be the
208 same as shown on Figure 5.10-6 for Alternative 1. Peak level noise would be as shown on Figure 5.10-2.

209 **5.10.5.3 Off-Road Vehicle Maneuvers**

210 Off-road vehicle maneuver noise under Alternative 3 would be as described for Alternative 1.

211 **5.10.6 Alternative 4 – Proposed Action**

212 The analysis of the Proposed Action considers the potential impacts associated with training by the
213 equivalent of six Heavy BCTs (with deployments, assuming up to five are training) and two CABs.

214 **5.10.6.1 Aircraft Noise**

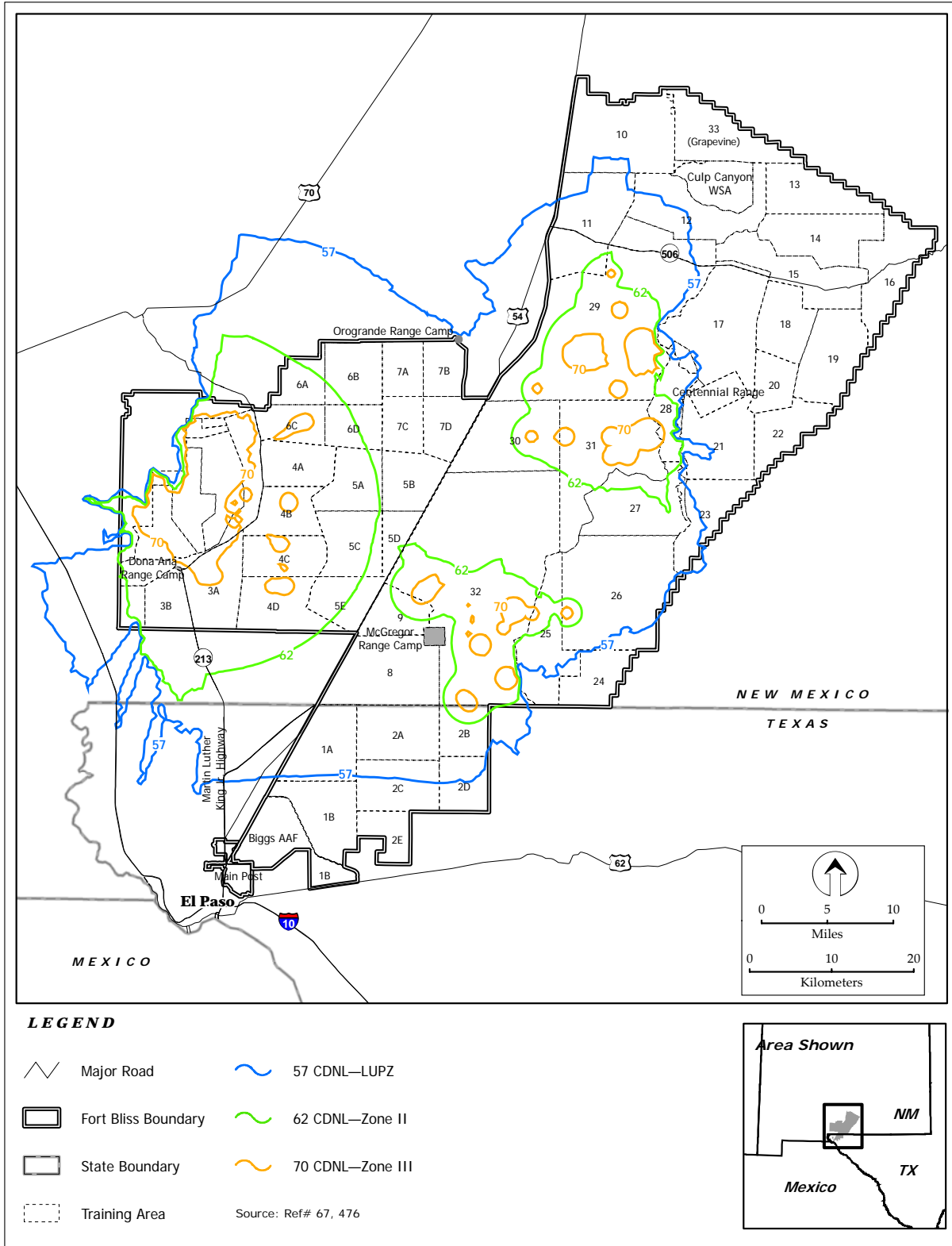
215 The noise contours created by two CABs at Biggs AAF are shown in Figure 5.10-7. The impacts would
216 be as described for Alternative 2. Noise from helicopter operations at Orogrande Range Camp (Figure
217 5.10-4) and NOE training (Figure 5.10-5) would be as described for Alternative 1, but more frequent with
218 two CABs.

219 **5.10.6.2 Large Caliber Weapons Noise**

220 The CDNL noise contours associated with large caliber weapons training by five BCTs are shown in
221 **Figure 5.10-8**. The LUPZ 57 CDNL contour extends off the installation at the northern, southern, and
222 western boundaries of Doña Ana Range, southeast of the boundary where the South Training Areas and
223 McGregor Range meet, and east of TA 23. The Noise Zone II 62 CDNL contour extends off the northern,
224 southern, and western boundaries of Doña Ana Range and south of McGregor Range. Approximately
225 193,170 acres outside of Fort Bliss would be newly exposed to noise levels between 57 and 62 CDNL and
226 40,264 acres to noise levels above 62 CDNL.

227 **Table 5.10-7** identifies the total acres by type of land ownership within each of the noise zones under
228 Alternative 4. The Fort Bliss land within the LUPZ includes 1,314 acres of Castner Range. The increase
229 in activity at the firing ranges would further increase noise exposure in areas around the installation.
230 Private land extending as far south as Transmountain Highway in northeast El Paso would be in the
231 LUPZ. Almost 4,400 acres of private land, primarily in the Chaparral area, would be in Noise Zone II,
232 which is generally incompatible with residential use. Based on current density in the areas affected, the
233 potential number of homes affected is small.

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



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Figure 5.10-8. Day-Night Average Sound Levels for Large Caliber Weapons – Alternative 4

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**Table 5.10-7. Acres Affected by Noise from Large Caliber Weapons –
Alternative 4**

<i>Land Owner</i>	<i>Noise Zone (acres)</i>		
	<i>LUPZ</i>	<i>Zone II</i>	<i>Zone III</i>
Fort Bliss ¹	386,046	264,061	76,413
WSMR	71,942	15,357	0
BLM	51,838	14,560	0
State (NM)	7,044	5,985	0
State (TX)	7,551	0	0
Private	65,713	4,363	0
Total	590,134	304,325	76,413

1. Includes land on Castner Range and withdrawn land on McGregor Range

239 The PK 15(met) noise contours would be as shown in Figure 5.10-2.

240 **5.10.6.3 Off-Road Vehicle Maneuvers**

241 Off-road vehicle maneuver noise under Alternative 4 would be as described for Alternative 1.

1 **5.11 SAFETY**

2 **5.11.1 Introduction**

3 Numerous federal, civil, and military laws and regulations govern operations on Fort Bliss. Individually
4 and collectively they prescribe measures, processes, and procedures required to ensure safe operations
5 and to protect the public, military, and property.

6 For each alternative, the elements of the proposal that have a potential to affect safety were evaluated
7 relative to the degree to which the action would increase or decrease safety risks to military personnel, the
8 public, and property. Ground, fire, and crash safety were assessed for the potential to increase risk and
9 the installation's capability to manage that risk by responding to emergencies and suppressing fire.
10 Ground safety considerations also include risk-exposure to personnel and ordnance use on firing and
11 gunnery ranges. Analysis of flight risks correlates current risk-exposure with projected airspace
12 utilization associated with the alternatives. In considering explosive safety, projected changed uses and
13 handling requirements were compared to current uses and practices.

14 **5.11.2 No Action Alternative**

15 ***5.11.2.1 Ground Safety***

16 Under the No Action Alternative, operations on Fort Bliss, its associated ranges, and Biggs AAF will
17 continue to be conducted in accordance with applicable laws and regulations. Fire suppression and crash
18 response capabilities are in place. All operations conducted on firing ranges will continue to be
19 conducted in accordance with Army regulations and Fort Bliss Standard Operating Procedures. These
20 processes and procedures will continue to minimize safety risks.

21 The addition of a Heavy BCT at Fort Bliss and associated personnel will not affect ground safety risks for
22 the U.S. Army overall, but it is reasonable to assume that, statistically, the probability of a Class A
23 mishap occurring on Fort Bliss could increase slightly. Also, ground safety risks will be somewhat
24 increased during the time when off-post personnel are present on Fort Bliss conducting off-road vehicle
25 training.

26 ***5.11.2.2 Flight Safety***

27 There are no changes to aviation operations associated with the No Action Alternative. Flight safety
28 assessments remain as discussed in Section 4.11.

29 ***5.11.2.3 Explosive Safety***

30 The addition of a Heavy BCT to Fort Bliss will result in some increased expenditure of ordnance.
31 Adequate facilities and infrastructure exist to ensure the safe handling, transportation, and storage of those
32 explosives. While some additional ordnance may be present on the installation as compared to current
33 conditions, the real increase will be in through-put of these items. All explosive safety processes and
34 procedures currently in effect will continue, and the increased risk would be minimal.

35 ***5.11.2.4 Installation Compatible Use***

36 The Clear Zones and Accident Potential Zones at Biggs AAF will continue to be in effect and will not
37 change. Safety danger zones will be expanded and modified as needed at the new and upgraded live-fire
38 ranges on the Fort Bliss Training Complex. All surface danger zones will be contained within installation
39 boundaries. No land use compatibility concerns are associated with the No Action Alternative.

40 **5.11.3 Alternative 1**

41 ***5.11.3.1 Ground Safety***

42 Under Alternative 1, operations on Fort Bliss, its associated ranges, and Biggs AAF would continue to be
43 conducted in accordance with applicable laws and regulations. Fire suppression and crash response
44 capability would be adequate to respond to mission changes. All operations conducted on the firing
45 ranges would continue to be conducted in accordance with Army regulations and Fort Bliss SOPs.
46 Although this alternative would result in an overall increased utilization of the ranges, each specific
47 activity is a discreet event and would be scheduled and managed in accordance with published directives.
48 These processes and procedures would continue to minimize safety risks.

49 Alternative 1 would increase the number of military personnel assigned to Fort Bliss by approximately
50 20,000. Based on the Class A Mishap rate for soldiers on duty over the last ten years (0.098 per 1,000
51 soldiers), statistically, the increased exposure would result in a slight (approximately 2 percent) increase
52 in risk of mishap in the ROI. Ground safety risks would also increase as a result of more off-road vehicle
53 maneuver training.

54 Based on fire history at Fort Bliss, the primary risk of wildfires is associated with weapons firing and
55 ordnance use. The majority of fires have been in the SDZ for missile firings on McGregor Range. Fires
56 in the Organ Mountains have been infrequent and small because fuels are discontinuous, fuel loading is
57 low, and crown fires are limited to isolated locations. This area has been used for live-fire ranges for
58 many years, and although use of Doña Ana Range is projected to increase, fire hazard is not anticipated to
59 change significantly.

60 The risk of wildfires from live-fire ranges in the south Tularosa Basin portion of McGregor Range is not
61 expected to be significant due to relatively low fuel loading and fire detection and suppression
62 capabilities. Live-fire ranges are concentrated in discrete areas that are continuously manned and have
63 the infrastructure and fire suppression capability to respond rapidly to any fire outbreak, including Meyer
64 Range, the FAW area, and the Orogrande Range Complex.

65 Very little data exist on the risk of wildfire from military off-road vehicle training. Factors that contribute
66 to fire danger include fuel load (type, quantity, and moisture content of vegetation), climate, terrain,
67 length of time before a fire is reported, and response capability. The lack of fine fuels in the Tularosa
68 Basin portion of the Fort Bliss Training Complex indicates relatively low risk of fire. Nevertheless, the
69 increased presence of personnel and vehicles in maneuver areas can be expected to lead to higher fire risk.
70 Most fires would be small as has historically been the case in these areas of the installation.

71 The Fort Bliss Range SOP specifies the following procedures for fire prevention and response:

- 72 • All training units are required to furnish a firefighting team while on the Fort Bliss Training
73 Complex.
- 74 • All fires must be reported to Range Control immediately on detection. Range Control will
75 immediately place a hold on live fire and dispatch a fire fighting team with suppression
76 equipment.
- 77 • Unit commanders are required to ensure that smoke grenades, trip flares, and other fire-causing
78 devices are not used in an area that could cause a range or brush fire. Live or spent devices will
79 not be abandoned or discarded anywhere on the Fort Bliss Training Complex.
- 80 • Sufficient unit personnel and firefighting equipment are required to be present at artillery and
81 mortar powder burning areas during use, including at least 10 gallons of water.
- 82 • Range Control restricts burning of excess powder bags during extremely dry and windy periods
83 (wind exceeding 12 knots). Unused powder increments that cannot be burned due to weather
84 conditions will be packed in metal containers and returned to the ammunition supply point.

85 Tracers, pyrotechnics, and illumination projectiles are subject to restriction/suspension during dry
86 periods.

- 87 • Fires are not fought in impact areas.

88 **5.11.3.2 Flight Safety**

89 With the assignment of a CAB to Fort Bliss under Alternative 1, aviation operations at Biggs AAF would
90 increase. Currently, the airfield supports approximately 40,000 operations per year. The CAB is
91 expected to conduct approximately 53,250 annual operations, increasing overall operations to
92 approximately 93,000 annually.

93 Over the last ten years, the Army Aviation Class A Mishap rate averaged 1.71 Class A Mishaps per
94 100,000 flying hours. Based on these statistics, the operations conducted by the CAB would increase the
95 risk of an aviation Class A mishap on Fort Bliss by a factor of approximately 2.3. However, the risk
96 would still be low.

97 **5.11.3.3 Explosive Safety**

98 The assignment of four BCTs and other units at Fort Bliss would result in an increased expenditure of
99 ordnance. Facilities and infrastructure would be provided to ensure the safe handling, transportation, and
100 storage of explosives. While some additional ordnance would be present on the installation as compared
101 to current conditions, the main increase would be in through-put of these items. All explosive safety
102 processes and procedures currently in effect would continue, and the increased risk would be minimal.

103 **5.11.3.4 Installation Compatible Use**

104 The addition of CAB operations at Biggs AAF would not change the CZs, APZs, or safety zones at the
105 airfield. The development of new live-fire ranges on Doña Ana and McGregor Ranges would involve
106 new and expanded safety danger zones, but none of them would extend off the installation or result in
107 incompatible land uses.

108 **5.11.4 Alternative 2**

109 **5.11.4.1 Ground Safety**

110 The ground safety effects of Alternative 2 would be the same as described for Alternative 1. The addition
111 of a second CAB would incrementally increase the risk of a Class A Mishap on Fort Bliss by a small
112 amount compared to Alternative 1.

113 The TAs in the north Tularosa Basin portion of McGregor Range include Grazing Units 1 and 2 and a
114 part of Grazing Unit 3. The Army is responsible for suppressing and monitoring fires caused by military
115 activities on the range, but BLM responds to and takes the lead in suppressing fires in the grazing units
116 (Ref# 21). The Range SOP described in Section 5.11.3.1 would also apply to Alternative 2. It requires
117 all units to furnish a firefighting team while on the Fort Bliss Training Complex. It also specifies
118 restrictions on use of fire-causing devices during extremely dry and windy conditions. These measures
119 would reduce fire hazard by ensuring timely detection and response in the event of a fire. The TAs north
120 of Highway 506 are not proposed for live-fire use.

121 **5.11.4.2 Flight Safety**

122 With two CABs assigned to Fort Bliss, aviation operations from Biggs AAF under Alternative 2 would
123 increase annual operations by approximately 104,500 to approximately 144,000. This would increase the
124 risk of an aviation Class A mishap on Fort Bliss by a factor of 3.7, but it would still remain low.

125 **5.11.4.3 Explosive Safety**

126 The explosive safety effects of Alternative 2 would be the same as described for Alternative 1, with a
127 slight increase in ordnance use by the second CAB.

128 **5.11.4.4 Installation Compatible Use**

129 Installation compatible use effects from Alternative 2 would be the same as described for Alternative 1.

130 **5.11.5 Alternative 3**

131 The ground, flight, and explosive safety impacts and installation compatible use under Alternative 3
132 would be the same as described for Alternatives 1 and 2.

133 The southeast TAs of McGregor Range contain more grasslands than other areas proposed for off-road
134 vehicle maneuver. Grasslands tend to produce fast-moving, low-intensity fires and therefore present
135 higher potential fire hazard due to increased fuel load and the relatively remote locations of the southeast
136 TAs. The increased presence of personnel and vehicles in these TAs would increase the risk of wildfires,
137 however, except during periods of higher than normal rainfall, the height of the grass is generally too low
138 to be ignited by passing vehicles. These training areas are not proposed for live-fire use.

139 Adherence to the Range SOP procedures described in Section 5.11.3.1 would reduce the risk of fire starts,
140 increase the timeliness of detection, and provide for response in the event of a fire, thereby decreasing the
141 probability of fire spreading over a large area and to Otero Mesa. Grasslands are designated as limited-
142 use areas where bivouacs and concentrations of personnel and vehicles are prohibited except in specified
143 locations, further reducing the risk of ignition. However, this portion of the Fort Bliss Training Complex
144 presents the highest fire hazard of areas proposed for off-road vehicle maneuver.

145 **5.11.6 Alternative 4 – Proposed Action**

146 The impacts from Alternative 4 on ground, flight, and explosive safety and installation compatible use
147 would be similar to those described for Alternatives 1 and 2. The incremental increase in personnel at
148 Fort Bliss and in off-road vehicle maneuvers in the training areas would marginally increase the statistical
149 risk of a Class A mishap.

150 Fire hazards under Alternative 4 would be as described for Alternatives 1, 2, and 3. The procedures in the
151 Range SOP described in Section 5.11.3.1 would also apply to this alternative.

1 **5.12 HAZARDOUS MATERIALS AND ITEMS OF SPECIAL**
2 **CONCERN**

3 **5.12.1 Introduction**

4 To assess potential impacts from an increase in hazardous materials use and hazardous waste generation,
5 Fort Bliss' most current environmental compliance management plans were reviewed, interviews were
6 conducted with Fort Bliss DOE and WBAMC personnel, and federal and state laws and regulations were
7 reviewed. In reviewing the types of hazardous materials used and hazardous waste generation reports
8 from the 4th BCT, 1st CAV, it was estimated that Heavy BCTs will generate approximately the same
9 waste types and volumes as the 31st ADA. Hazardous waste generated by the 4th BCT, 1st CAV was then
10 used to determine a percentage increase for each additional BCT.

11 **5.12.2 No Action Alternative**

12 **5.12.2.1 Hazardous Materials**

13 Under the No Action Alternative, Fort Bliss will continue to store and use hazardous chemicals during
14 training exercises and installation maintenance. There will be an increase in the types and quantities of
15 hazardous materials due to increases in equipment and maintenance facilities associated with one Heavy
16 BCT. This will marginally increase the risk of releases of fuels, oils, and hydraulic fluids during the
17 servicing and operation of military equipment. Construction equipment for demolition, renovation, and
18 development of additional facilities will have negligible impact on the use of hazardous chemicals.
19 Existing programs for the management of hazardous materials and wastes will continue. The slight
20 increased use of hazardous chemicals will have no adverse environmental impacts.

21 Some M1 tanks include armor that contains encased depleted uranium in the turret. DU is the very dense
22 metal by-product of the uranium enrichment process used to make nuclear materials. That enrichment
23 process removes most of the U234 and U235 isotopes, leaving mostly U238. DU is 40 percent less
24 radioactive than naturally occurring uranium. DU emits alpha, beta, and gamma radiation as it decays.
25 Alpha particles, the primary type produced by DU, are blocked by the skin and pose no hazard. Beta
26 particles are blocked by clothing. Studies of exposure to gamma radiation from DU in tanks were well
27 below the occupational limit (Ref# 543, 544).

28 The risk of exposure to radiation from the DU in the M1 tank armor is extremely low because the DU is
29 encased (i.e., not exposed to the environment). Further, no maintenance or repair activities performed at
30 Fort bliss would expose DU. In the remote possibility of exposure due to fire or impact, DU can form
31 mixtures of both soluble and insoluble oxide aerosols. Exposure assessments and medical monitoring
32 conducted to date indicate no health hazard from inhaled DU aerosols (Ref# 543).

33 DU contamination greater than 50 parts per million is believed to be harmful to plants, and wildlife can be
34 affected by high levels of DU in the soil (Ref# 544). However, the potential for exposure of any DU from
35 the armor of M1 tanks at Fort Bliss is remote, and the resulting concentration of DU from a release would
36 be far below levels that could pose a risk to the environment. Therefore, the M1 tanks at Fort Bliss that
37 may contain DU in their armor would not have a significant environmental or health impact.

38 Fort Bliss will continue to generate hazardous wastes under this alternative. During FY 2005, the 31st
39 ADA generated hazardous waste totaling 1,481 lbs., universal waste volumes totaling 2,399 lbs., and
40 Texas Class waste totaling 68,421 lbs. (Universal waste includes batteries, pesticides, thermostats with
41 mercury, and fluorescent lamp bulbs. Texas Class Waste is hazardous waste that has to be reported to
42 TCEQ.) Based on these volumes, a Heavy BCT can be expected to increase hazardous waste generation
43 at Fort Bliss by approximately 1,500 lbs. per year. In addition, there could be a slight increase in
44 hazardous waste generation due to hazardous chemicals use in the new facilities and during demolition

45 and renovation of existing facilities. Current hazardous waste disposal processes will continue. The
46 minimal increased generation of hazardous wastes will have no adverse environmental impacts.

47 Increased use of live-fire ranges will involve more ordnance and explosives at the ranges and in impact
48 areas. This is not expected to measurably increase hazards associated with unexploded ordnance.

49 AR 385-63, paragraph 2-5A (3) prohibits the firing of DU ammunition from tanks or A-10 aircraft in the
50 continental U.S. unless approved by the Chief of Staff of the Army or the Commandant of the Marine
51 Corps. No exception has been provided for Fort Bliss, nor is one anticipated. Furthermore, live
52 ammunition (rounds that explode) of any sort will not likely be fired by M1 tanks on the live-fire and
53 qualification ranges or anywhere on Fort Bliss. When using the ranges to qualify and train crews, tanks
54 fire a 120 millimeter training round that consists of an inert steel dart. Targets are typically composed of
55 wood, cardboard, or other synthetic materials. "Hits" are registered and scored electronically.

56 **5.12.2.2 *Items of Special Concern***

57 Medical and biohazardous wastes will continue to be generated under The No Action Alternative at
58 approximately the same rate as in the past. There will be a slight increase with the addition of new
59 personnel. Waste collection, storage, and disposal processes will remain the same. The generation of
60 medical and biohazardous wastes will not cause adverse impacts.

61 WBAMC and various Fort Bliss commands will continue to generate small amounts of low-level
62 radioactive wastes. The types and amounts of these wastes will be about the same as described in Section
63 4.12.2. Management process for the radioactive wastes will remain unchanged. The generation of low-
64 level radioactive waste will not result in adverse impacts.

65 Asbestos abatement performed prior to facility demolition could generate asbestos waste. Abatement
66 actions to deal with threats arising from past hazardous waste practices will continue. The generation of
67 asbestos material waste will not cause adverse impacts.

68 The RCI contractor is responsible for conducting lead-safe work practices when it renovates housing.
69 Where necessary, lead-based paint abatement will be conducted, which may include encapsulation as an
70 option. Lead waste generated from demolition of buildings will continue to be characterized to determine
71 if it is a hazardous waste. The generation of lead waste will not result in adverse impacts.

72 The current storage and use of pesticides and associated certification and management plans will
73 continue. The use of hazardous pesticides will not result in adverse impacts.

74 The PCB management plan will continue to provide guidance for PCB identification, sampling, removal,
75 disposal, and record keeping. The handling of PCB-contaminated equipment and soils will not result in
76 adverse impact.

77 Fort Bliss will continue to use both USTs and ASTs for petroleum products, but any new tanks will most
78 likely be ASTs. All USTs were upgraded to meet federal and state environmental requirements by the
79 1998 deadline. Fort Bliss maintains compliance through an aggressive inspection and maintenance
80 program to avoid releases and minimize environmental impacts.

81 **5.12.2.3 *Related Management Programs***

82 Current Installation Restoration Program activities and public interactions will continue. Restoration of
83 currently identified sites will continue and any new sites that are identified will be added to the program.
84 The contaminated wastes that are removed from IRP sites will be managed in accordance with approved
85 practices and procedures; therefore, they will not result in adverse impacts. The overall impact of the IPR
86 program will be beneficial, since contaminated sites will be restored.

87 Fort Bliss will continue to identify and implement pollution prevention initiatives to reduce the amount
88 and types of hazardous materials used and the amount and type of hazardous waste that are generated

89 from the use of those materials. The Hazardous Waste Management Plan and the Pollution Prevention
90 Plan will address pollution prevention and waste minimization issues and provide an automated tracking
91 system for hazardous materials and chemicals. Improvements under this program will result in beneficial
92 impacts.

93 **5.12.3 Alternative 1**

94 **5.12.3.1 Hazardous Materials**

95 Under Alternative 1, there would be an increase in the use of hazardous chemicals due to the addition of
96 new facilities such as fuel storage/fueling facilities, tactical equipment shops, and motor pools in the Main
97 Cantonment Area and at the range camps. This would increase the potential for releases of fuels, oils, and
98 hydraulic fluids during servicing and operation of additional military vehicles, helicopters, and the
99 operations associated with the new units stationed at Fort Bliss within the Main Cantonment Area and
100 range camps, as well as in the training areas where vehicles and equipment would stage and operate.
101 Increased use of fuel bladders during field training would pose an additional risk of release and resulting
102 contamination. Construction equipment used in demolition, renovation, and development of additional
103 facilities would have a negligible impact on the use of hazardous chemicals. Existing programs for the
104 management of hazardous materials and wastes would continue and would be adequate to manage
105 additional hazardous chemicals. The installation SPCC Plan would need to be amended. With
106 management practices to prevent and respond to accidental releases, the increased use of hazardous
107 chemicals would have no adverse environmental impacts.

108 As noted for the No Action Alternative, DU in M1 tank armor will pose no significant environmental or
109 health risk.

110 The types and quantities of hazardous waste generated would also increase with use of increased amounts
111 of hazardous chemicals. Based on hazardous waste generation by the 31st ADA, the volume of hazardous
112 waste generated by Fort Bliss is expected to increase by approximately 6,000 lbs. per year. Hazardous
113 waste disposal processes would be the same as described for the No Action Alternative, and the
114 hazardous waste disposal facilities would be adequate to manage the increase in hazardous waste. The
115 increased generation of hazardous waste would have no adverse environmental impacts.

116 There would be an increase in ordnance and explosives used by the additional troops and in the additional
117 live-fire ranges at Doña Ana and McGregor Ranges. An additional ordnance disposal facility is planned.
118 The existing ordnance management procedures would be updated as needed. No ammunition containing
119 DU will be used on Fort Bliss.

120 The new live-fire ranges to be developed in the Fort Bliss Training Complex would be located at or
121 adjacent to existing live-fire ranges and within existing impact areas and would therefore not create new
122 areas of unexploded ordnance contamination. Lead ammunition used on small arms ranges would be
123 captured in berms, and munitions fired from vehicles such as tanks would be contained within defined
124 SDZs. Any ordnance that impacts off post would be subject to the Military Munitions Rule. However,
125 SDZs are designed to ensure that all ordnance used in training impacts within the installation boundary.
126 No live fire would occur in the open maneuver areas outside the ranges (i.e., Doña Ana Range, Meyer
127 Range Complex, FAW area, and Orogrande Range Complex).

128 **5.12.3.2 Items of Special Concern**

129 There would be an increase in medical and biohazardous waste generated under Alternative 1 due to the
130 increased military population and the construction of a new dental clinic. Waste collection, storage, and
131 disposal processes would remain the same. The generation of medical and biohazardous wastes would
132 not cause adverse impacts.

133 There would be an increase in the generation of asbestos containing material during renovation and
134 demolition of family housing and other facilities. Asbestos abatement procedures would continue, and
135 regulated ACM would be disposed of in an approved off-post asbestos disposal facility. Non-pulverized
136 material containing asbestos would be disposed of in the on-post construction waste cell.

137 Under this alternative, there would be an increase in the generation of lead-contaminated wastes from the
138 renovation and demolition of housing facilities. Waste disposal processes would be the same as described
139 for the No Action Alternative. The increase in the generation of lead wastes would result in no adverse
140 impacts because the wastes would be managed in accordance with applicable standards and regulations.

141 There would be a slight increase in the use of pesticides and herbicides due to the addition of family
142 housing and other facilities. However, since the majority of pesticides and herbicides occur on the golf
143 course, the increase would be insignificant. Existing programs for the management of pesticides and
144 herbicides would continue, and the management plan would be continually updated as needed. The
145 minimal increase in generation of pesticides and herbicides would result in no adverse impacts.

146 Under Alternative 1, low-level radioactive waste, PCBs, and petroleum storage tanks would be managed
147 as described under the No Action Alternative.

148 **5.12.3.3 Related Management Programs**

149 The IRP and Pollution Prevention Program at Fort Bliss would continue under Alternative 1 as described
150 under the No Action Alternative. The Hazardous Waste Management Plan and Pollution Prevention Plan
151 would be updated as needed to incorporate mission activities associated with the new units stationed at
152 Fort Bliss and expanded training activities on the Fort Bliss Training Complex.

153 **5.12.4 Alternative 2**

154 **5.12.4.1 Hazardous Materials**

155 Generation and management of hazardous materials, hazardous waste, and ordnance and explosives under
156 Alternative 2 would be as described for Alternative 1. The volume of hazardous waste generated would
157 be slightly higher than under Alternative 1 due to the addition of a second CAB. There would be a slight
158 increase in the area potentially exposed to release of fuels and affected by ordnance and explosives due to
159 the extension of off-road vehicle maneuver training in the north Tularosa Basin portion of McGregor
160 Range. The environmental impacts under this alternative would be the same as described for Alternative
161 1.

162 **5.12.4.2 Items of Special Concern**

163 Generation and management of medical, biohazardous, low-level radioactive, asbestos, and lead wastes;
164 pesticides; PCBs; and petroleum storage tanks would be the same under Alternative 2 as described under
165 the No Action Alternative and Alternative 1. The increased population of Fort Bliss would increase
166 generation of medical and biohazardous wastes and pesticide use. The volume of petroleum storage
167 would increase with a second CAB. Existing procedures would be adequate to ensure that the increases
168 do not adversely affect the environment.

169 **5.12.4.3 Related Management Programs**

170 The IRP and Pollution Prevention Program at Fort Bliss would continue under Alternative 2 as described
171 under the No Action Alternative. The Hazardous Waste Management Plan and Pollution Prevention Plan
172 would be updated as needed to incorporate mission activities associated with the new units stationed at
173 Fort Bliss and expanded training activities on the Fort Bliss Training Complex.

174 **5.12.5 Alternative 3**

175 **5.12.5.1 Hazardous Materials**

176 Generation and management of hazardous materials, hazardous waste, and ordnance and explosives under
177 Alternative 3 would be as described for Alternative 1. There would be a slight increase in the area
178 potentially exposed to release of fuels and affected by ordnance and explosives under this alternative due
179 to the extension of off-road vehicle maneuver in the southeast training areas of McGregor Range. The
180 environmental impacts under this alternative would be the same as described for Alternative 2.

181 **5.12.5.2 Items of Special Concern**

182 Generation and management of medical, biohazardous, low-level radioactive, asbestos, and lead wastes;
183 pesticides; PCBs; and petroleum storage tanks would be the same under Alternative 3 as described for the
184 No Action Alternative and Alternatives 1 and 2.

185 **5.12.5.3 Related Management Programs**

186 The IRP and Pollution Prevention Program at Fort Bliss under Alternative 3 would continue as described
187 under the No Action Alternative. The Hazardous Waste Management Plan and Pollution Prevention Plan
188 would be updated as needed to incorporate mission activities associated with the new units stationed at
189 Fort Bliss and expanded training activities on the Fort Bliss Training Complex.

190 **5.12.6 Alternative 4 – Proposed Action**

191 **5.12.6.1 Hazardous Materials**

192 Generation and management of hazardous materials, hazardous waste, and ordnance and explosives under
193 Alternative 4 would be as described for Alternatives 1, 2, and 3. The volume of hazardous materials and
194 ordnance used and hazardous and explosive wastes generated would be about 50 percent higher than that
195 used or generated under the other alternatives, but this would be managed in accordance with established
196 procedures and regulations.

197 **5.12.6.2 Items of Special Concern**

198 Generation and management of medical, biohazardous, low-level radioactive, asbestos, and lead wastes;
199 pesticides; PCBs; and petroleum storage tanks would be the same under Alternative 4 as described for the
200 No Action Alternative and Alternatives 1, 2, and 3. If there were additional increases in the population of
201 Fort Bliss, the generation of medical and biohazardous wastes would also increase, as could the use of
202 pesticides and the volume of petroleum storage. Existing procedures would be adequate to ensure that the
203 increases do not adversely affect the environment.

204 **5.12.6.3 Related Management Programs**

205 The IRP and Pollution Prevention Program at Fort Bliss would continue under Alternative 4 as described
206 under the No Action Alternative. The Hazardous Waste Management Plan and Pollution Prevention Plan
207 would be updated as needed to incorporate mission activities associated with the new units stationed at
208 Fort Bliss and expanded training activities on the Fort Bliss Training Complex.

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5.13 SOCIOECONOMICS

5.13.1 Introduction

The socioeconomics analysis addresses five main topic areas: population, economic activity, housing, public services, and quality of life. Indirect population and direct and indirect economic effects were estimated using the U.S. Army’s Economic Impact Forecast System (Ref# 178). This model integrates data elements from agencies (BEA and Census) in the U.S. Department of Commerce, as well as supporting data from other government agencies. EIFS projections use an export-base multiplier, calculated through the use of detailed BEA data for each ROI. The multiplier is used to distinguish direct and indirect effects and represent the characteristics of the affected community. In addition, EIFS provides a uniform methodology to determine the significance of projected impacts based on business volume, income, employment, and population.

The criteria for determining the significance of these impacts reflect the local historical year-to-year fluctuations through the use of a Rational Threshold Value (RTV). This technique (Ref# 356) is independent of the estimates or the model used to produce them, and was developed in response to voiced community concerns over arbitrary DoD significance criteria that failed to account for each ROI’s peculiar or specific characteristics. It relies on yearly BEA time series data on employment, income, and population to evaluate historical trends within a subject community (region) and uses those trends to measure the “resilience” of the local community to change or its ability to accommodate such change. A positive and negative RTV is derived from these data, based on past inherent fluctuations in the ROI, as well as some weightings (for negative effects) to ensure sound determinations. Only the positive RTVs (for increased activities) are used in this SEIS.

A study conducted in 2002 by UTEP (Ref# 101) examined a “status quo” alternative projecting results to 2020 and included some potential expansion scenarios for Fort Bliss using the UTEP IPED Regional Impact Forecast Model. The following data were provided by Fort Bliss for the model, representing the 2002 time period:

- Number of active duty personnel – 12,021
- Average military wage – \$49,904.21
- Number of federal civilian personnel – 6,620
- Average civilian wage – \$53,615.22
- Total Fort Bliss expenditures – \$421,929,339
- Cost of new barracks each housing 480 – \$28,000,000

The “standard regional control” (status quo) covered the period of 2000 to 2020. With no changes in Fort Bliss operations:

- Regional employment is expected to increase by 71,549, or 15.70 percent;
- Population is expected to grow 16.05 percent;
- Gross regional product is expected to grow 64.24 percent;
- Construction increases are expected to be 12.83 percent; and
- Income is expected to grow 55.35 percent.

The majority of these effects will be felt in El Paso County, but surrounding counties may increasingly share in the regional growth.

The UTEP analysis then examined potential increases in Fort Bliss force structure of 1,000, 2,500, 3,500, and 5,000 personnel, along with associated costs and requirements (e.g., barracks, buildings, etc.). Forecasts were made across 10 economic factors and compared to a control forecast. UTEP also

44 performed some preliminary analyses on an increase of 20,000 new military personnel (Ref# 300), but
45 these were less exhaustive and extensive in terms of data inputs; relied on IMPLAN (as opposed to the
46 UTEP modified REMI model) for a quick, preliminary analysis; and did not specifically address the issue
47 of population increases. Verbal communications (Ref# 501) indicate that a final REMI analysis will be
48 performed in the near future, when input data are fully developed and have stabilized.

49 For this SEIS, the initial UTEP analysis (Ref# 101) provided useful data for assessing overall impacts on
50 population. The scenario reflecting a 5,000 troop increase indicates a total population change of 14,911
51 over a four year period, including estimates for indirect support of these military changes (in terms of
52 both civilian employees and military construction). This represents an induced (indirect) population
53 change of 2.98 for each additional military person, or approximately 0.75 per year spread over a 4-year
54 period.

55 The quantitative analysis presented in this section is based on the best information available on the
56 magnitude and timing of changes in personnel assignments at Fort Bliss. The results are provided for
57 general planning and analysis purposes only and are subject to change as plans continue to evolve.

58 **5.13.1.1 Population**

59 The analysis of population effects from the alternatives considers both direct population changes,
60 including military and government civilian personnel and their dependents, and indirect effects, defined
61 as the population growth from in-migration induced by the economic activity associated with the
62 personnel and other expenditures at Fort Bliss. Induced population projections were derived using EIFS
63 (Ref# 170), based partly on studies performed by UTEP (Ref # 101).

64 **5.13.1.2 Economic Activity**

65 The analysis of economic activity evaluates the effects of military salaries, civilian salaries, and purchases
66 and expenditures on business volume, local employment, and income using the EIFS model (Ref# 170).
67 Yearly changes in EIFS were estimated using the projected yearly direct changes in military and civilian
68 personnel under each alternative and applying their average annual salaries to ascertain the direct
69 economic effects. An average military salary of \$43,500 was derived from sample military grade
70 distributions and salaries, including off-post housing allowances and other adjustments. In addition, the
71 percent of military personnel housed on post was estimated. A survey conducted by UTEP (Ref# 308)
72 indicates that 67.5 percent of current military employees reside off post. Other estimates were derived
73 from the most recent Housing Market Analysis for Fort Bliss.

74 Purchases and expenditures are comprised of local expenditures for goods and services. These include
75 direct purchases of materials and supplies as well as contracts and purchase orders. The salaries of
76 contract employees are also commonly included in the reports of contracts and purchase orders in the
77 local region. Military construction and renovation projects are the major and predominant component of
78 local purchases and expenditures. These construction projects involve large dollar amounts and span
79 multiple years and are the predominant inputs for this analysis. The estimated construction expenditures
80 for individual projects were spread over multiple years, reflecting the required execution time for major
81 projects.

82 The EIFS model results for changes in total business volume, income, and employment are presented both
83 quantitatively and as percentages of the activity in the total ROI, which are compared to the following
84 RTVs for the three-county ROI:

- 85 • Total business volume – 4.74 percent
- 86 • Income – 5.00 percent
- 87 • Employment – 4.01 percent

88 **5.13.1.3 Housing**

89 The housing demands associated with each alternative comprise the number of incoming military
90 personnel to Fort Bliss, the number of additional direct civilian employees, and the increase in population
91 induced by the actions at Fort Bliss. The number of military households that seek private sector housing
92 is determined by U.S. Army policies. For this analysis, the on-post housing is assumed to be fully
93 occupied, and the households not provided housing on post will seek private sector housing.

94 **5.13.1.4 Public Services**

95 The analysis of public service impacts considers public finance, schools, law enforcement, fire protection,
96 and medical services.

97 **Public Finance**

98 The fiscal impact of the increase in military personnel at Fort Bliss is estimated in terms of increased
99 property taxes and sales taxes for the City of El Paso and El Paso County. This analysis is based on fiscal
100 year 2005 base data. Property tax estimates are based on total per-household property taxes in fiscal year
101 2005. In the City of El Paso, the number of households was estimated by assuming an average household
102 size of 2.4, for a total of 251,732 households. This results in a slight underestimation of per-household
103 property tax because there were fewer dwellings in the City El Paso, but it provides a consistent basis of
104 estimating the effects of the changes associated with each alternative. The baseline 2005 property taxes
105 for El Paso County reflect a total of 240,600 households in 2004. This number was used to calculate the
106 per household property tax rate for the county. The City of El Paso collected \$137,711,242 in property
107 taxes in fiscal year 2005. El Paso County collected an estimated \$97,514,414 in property taxes in fiscal
108 year 2005 (Ref# 552, 553).

109 Sales tax revenues were calculated based on the per capita sales tax. The City of El Paso had an
110 estimated population of 604,156 in fiscal year 2005 and collected \$80,236,149 in sales taxes. El Paso
111 County had an estimated population of 713,126 and collected an estimated \$22,356,982 in sales taxes
112 (Ref# 552, 553). Additional sales taxes under each alternative were calculated assuming local
113 expenditures of military personnel living on post is approximately 32.5 percent, and of military personnel
114 living off post is approximately 57.5 percent, of civilians (Ref# 513, 514).

115 In addition to sales and property taxes, the city and county receive revenues from fees, fines, licenses, and
116 permits, grants, bond proceeds, and fund transfers. Property and sales taxes comprised approximately 41
117 percent of the City of El Paso's total revenues, and all taxes (predominantly property and sales)
118 comprised approximately 55 percent of the County of El Paso's revenues in FY 2005 (Ref# 552, 553).

119 Estimating the net increase in cost associated with project-related increases in population is difficult, they
120 are not necessarily linear. In the absence of a detailed assessment, however, the analysis in this SEIS
121 assumes a directly proportional increase in costs based on per capita appropriations by the two
122 jurisdictions in fiscal year 2005 (Ref# 552, 553). For purposes of analysis, costs associated with the
123 projected population increases were calculated for persons living off post. It was assumed that 100
124 percent of the population impact would be felt in the County of El Paso and 85 percent in the City of El
125 Paso, conservative assumptions since some percentage of the population would live in other jurisdictions.

126 In this section, the estimates of increased public service costs and tax revenues are presented in 2005
127 dollars.

128 **Schools**

129 Two school districts, El Paso ISD and Ysleta ISD, educate approximately 82 percent of Fort Bliss
130 military dependents. Their combined student enrollment in 2004/2005 was 109,610 and the combined
131 number of teachers was 7,492 for a combined student/teacher ratio of 14.6. The SEIS analysis considers

132 the total Fort-Bliss impact on student population for each alternative and estimates the number of teachers
133 needed for the new enrollment levels, based on the existing student/teacher ratio.

134 Additional revenues for El Paso and Ysleta ISDs were estimated by applying the per-student impact aid
135 paid for military students in the 2004/2005 school year to the projected increases in military students and
136 the per-student tax revenue for the same year to the projected increases in civilian students. Additional
137 costs were estimated by applying the average per-student operating expenditures that were funded by
138 taxes in school year 2004/2005 to the total increase in students for each alternative. The increase in
139 revenues and expenditures for military students was distributed as 89 percent to El Paso ISD and 11
140 percent to Ysleta ISD. The increase in revenues and costs for civilian students was distributed as 58
141 percent to El Paso ISD and 42 percent to Ysleta ISD, reflecting the relative ratio of all students in those
142 districts (Ref# 558, 559)

143 **Law Enforcement and Fire Protection**

144 Anticipated increases in personnel assigned to Fort Bliss, in conjunction with induced population
145 increases, will generate added demand for community services, including law enforcement and fire
146 protection. Existing personnel numbers for law enforcement in and around Fort Bliss, including the Fort
147 Bliss Law Enforcement Battalion, El Paso County Sheriff's Department, and City of El Paso Police
148 Department, reflect a service level ratio of 4.3 law enforcement personnel for every 1,000 persons.
149 Existing personnel numbers for fire protection in and around Fort Bliss, including Fort Bliss Fire
150 Department and City of El Paso Fire Department, reflect a service level ratio of 1.3 fire protection
151 personnel for every 1,000 persons. By comparison, proxy service demand factors developed in Rau and
152 Wooten's "Environmental Impact Analysis Handbook" indicates a law enforcement service level ratio of
153 1.7:1000 and a fire protection ration of 1.43:1000 (Ref# 355).

154 The considerable difference in the two ratios probably reflects regional variation in service levels due to
155 local conditions. Both ratios are applied in this analysis to produce a range of initial estimates and
156 provide a basis for community planning and preparation.

157 **Medical Services**

158 Existing numbers for physicians and medical facilities in and around Fort Bliss reflect service level ratios
159 of 1.57 physicians for every 1,000 persons and 2.85 hospital beds per 1,000 persons. By comparison,
160 generalized service demand factors developed in Rau and Wooten indicate a hospital bed per resident
161 ratio of 4.5:1000 (Ref# 355). Both ratios are applied in this analysis to produce a range of initial
162 estimates of increased demand for medical services. It is assumed that WBAMC would continue to
163 service 85-90 percent of the eligible (military and military dependent) population associated with Fort
164 Bliss.

165 **Government Structure**

166 No change in government structure is anticipated in response to the actions at Fort Bliss; however, several
167 departments may increase staffing to meet new demands.

168 **5.13.1.5 Quality of Life**

169 The quality of life analysis in this SEIS addresses three broad categories: cost of living,
170 convenience/access, and physical environment. Specific topics of concern evaluated for each of the three
171 categories are:

- 172 • Cost of living considers increases in water purchase rates and housing costs.
- 173 • Convenience/access considers increases in traffic congestion and commuting times, overcrowding
174 of schools, and reduction in access to recreation resources.
- 175 • Physical environment considers changes in urban and rural landscapes, potential reduction in
176 open space, and increased dust.

177 Analysis results from other relevant sections of the SEIS are used to address each of these factors.

178 **5.13.2 No Action Alternative**

179 **5.13.2.1 Population**

180 Under the No Action Alternative, the stationing of one Heavy BCT at Fort Bliss is estimated to increase
 181 the total regional population by 23,250 persons (**Table 5.13-1**). This represents a 20 percent increase in
 182 the number of Fort-Bliss related persons residing in the region by the end of 2006, compared to 2005.
 183 Total population includes the direct new personnel (both military and civilians), their families, and new
 184 population that may in-migrate as a result of the stronger economy and spending that the region would
 185 experience (induced). Of this total, 19,680 are projected to live off post, including all civilians and the
 186 induced population, as well as some military personnel.

187 The estimated 2005 population in the three-county ROI of 968,700 is projected to increase to about
 188 1,110,327 by 2010, with an average annual growth rate of 2.9 percent. With the addition of the Heavy
 189 BCT, the average annual regional growth rate is expected to increase to 3.4 percent.

Table 5.13-1. Population Impacts – No Action Alternative

	<i>2005 Baseline</i>	<i>Additional Population</i>	<i>Total</i>
Military ¹	10,200	3,800	14,000
Military Dependents ²	16,500	6,270	22,770
Civilians	7,500	700	8,200
Civilian Dependents ³	10,500	980	11,480
Students and TDY Personnel	7,700	100	7,800
<i>Subtotal Direct Population</i>	<i>52,400</i>	<i>11,850</i>	<i>64,250</i>
Induced Population	30,396	11,400	41,796
Total	82,796	23,250	106,046
Off Post Residents	65,641	19,680	85,321

1. Including U.S. and non-U.S military personnel.
2. Assuming a ratio of 1.65 dependents for every military person.
3. Assuming a ratio of 1.40 dependents for every civilian employee.

191 **5.13.2.2 Economic Activity**

192 The variables input into EIFS to calculate the economic effects of the No Action Alternative include the
 193 following:

- 194 • An increase of 3,800 military personnel over 2005 numbers,
- 195 • An increase of 700 civilians, and
- 196 • \$682.4 million in local expenditures between 2006 and 2010.

197 **Table 5.13-2** summarizes the resultant EIFS projections (model runs) by year for business volume,
 198 income, and employment in estimated numbers and in terms of the percent change (impacts) in the region
 199 compared to the RTVs for the Fort Bliss economic region.

200 As indicated by these figures, the No Action Alternation will produce only minimal effects on the ROI, as
 201 the changes fall well within the respective RTVs.

202

Table 5.13-2. Projected Changes in Economic Activity – No Action Alternative

<i>Year</i>	<i>Total Business Volume</i>		<i>Income</i>		<i>Employment</i>	
	<i>\$M</i>	<i>% Change</i>	<i>\$M</i>	<i>% Change</i>	<i>No.</i>	<i>% Change</i>
2006	339.1	1.40	249.2	1.73	6,849	1.70
2007	313.6	1.29	57.1	0.40	2,080	0.52
2008	237.8	0.99	43.3	0.30	1,578	0.39
2009	71.5	0.30	12.0	0.09	474	0.12
2010	8.2	0.03	1.5	0.01	55	0.01
RTV		4.74		5.00		4.01

203 **5.13.2.3 Housing**

204 The No Action Alternative increases the personnel stationed at Fort Bliss by approximately 3,800
 205 military, 700 civilians, and 100 TDY personnel, bringing the total personnel to about 30,000 including
 206 permanent party, temporary duty, civilian government employees, and contractor personnel. Some active
 207 duty military personnel will be provided with on-post housing while others will find housing in the
 208 private sector. Fort Bliss is currently implementing a Residential Communities Initiative that includes
 209 demolition, renovation, and new construction of military family housing. The on-going RCI project is
 210 scheduled to be completed in 2009 and result in 859 additional military family housing units on Fort
 211 Bliss, bringing the total inventory of military family housing to 3,611 housing units. While the number of
 212 military households provided housing on post is dictated by U.S. Army policies, it is assumed that on-post
 213 family housing and visitors' quarters will be fully occupied. Any military households not housed on post
 214 compete with civilians for the available housing. **Table 5.13-3** projects on- and off-post housing
 215 demands for the No Action Alternative and the other alternatives.

216

Table 5.13-3. Increases in On- and Off-Post Housing Demands by Alternative

	<i>No Action Alternative</i>	<i>Alternative 1</i>	<i>Alternatives 2 and 3</i>	<i>Alternative 4</i>
Increase in Personnel ¹	4,600	22,100	24,900	32,500
Personnel Housed On Post ²	859	10,609	10,609	10,609
Personnel Housed Off Post	3,741	11,491	14,291	21,891
Induced Personnel Households	4,750	24,865	28,217	37,653
Total Off-Post Households	8,491	36,356	42,508	59,544

1. Total personnel include permanent party military personnel, personnel on temporary duty, civilian government employees, and civilian contractors.
2. Personnel housed on post assuming on-post housing is fully occupied by military personnel.

217 While the increased demand could contribute to a tightening of the housing market, decreasing the
 218 number of vacant housing units in the market, the number of vacant units in El Paso County numbered
 219 over 14,000 in 2004. The induced population, estimated at 11,400 additional persons, will also enter the
 220 housing market. Based on an average household size of 2.4, this represents about 4,750 additional
 221 households, for a total increase of approximately 8,491 households including direct and induced
 222 populations seeking housing off post. The number of vacant housing units is able to accommodate the
 223 additional demand.

224 A possible development of approximately 1,000 housing units over the next two years is planned in the
 225 northeast portion of the City of El Paso (Ref# 385). Land is available for the expansion of housing;
 226 however, homebuilders are concerned with a possible labor shortage in the area (Ref# 386).

227 **5.13.2.4 Public Services**

228 **Public Finance**

229 The No Action Alternative involves a direct increase of approximately 3,800 military personnel, 700
 230 civilian personnel, and a total of 7,250 dependents, bringing the Fort Bliss related population to 30,000 by
 231 FY 2011. The majority of these personnel will likely reside in El Paso County and the City of El Paso.
 232 The estimated increases in sales and property taxes are presented in **Table 5.13-4**. The impact is the
 233 largest in the City of El Paso due to a higher rate of sales tax. The increase in the collected tax revenues
 234 from the direct population increases could be more than \$2.4 million for the City of El Paso. The
 235 increased revenue for El Paso County could be over \$1.7 million in additional sales and property tax
 236 revenues from the direct population increases at Fort Bliss.

237 The No Action Alternative is estimated to generate an induced population of approximately 11,400
 238 persons. The increased property and sales tax revenues for the City of El Paso from the induced
 239 population could be nearly \$3.5 million, and for El Paso County the additional tax revenues could be
 240 nearly \$2.3 million.

241 The total impact on property and sales tax revenues for the City of El Paso including both direct and
 242 induced population effects could be an additional \$5.9 million in tax revenues. For El Paso County, the
 243 additional tax revenues collected could be \$3.9 million. The total tax revenues represent an increase of
 244 approximately 3 percent for each jurisdiction.

245 **Table 5.13-4. Estimated Increase in Tax Revenues of El Paso County and City of El Paso –**
 246 **No Action Alternative**

<i>Tax Revenue</i>	<i>El Paso County</i>		<i>City of El Paso</i>	
	<i>\$M</i>	<i>%</i>	<i>\$M</i>	<i>%</i>
Direct Population Effects				
Property Tax	1.456	1.5	1.671	1.2
Sales Tax	0.208	0.9	0.749	0.9
Subtotal Direct Population	1.664	1.4	2.420	1.1
Induced Population Effects				
Property Tax	1.925	2.0	2.201	1.6
Sales Tax	0.357	1.6	1.283	1.6
Subtotal Induced Population	2.283	1.9	3.484	1.6
Total				
Property Tax	3.381	3.5	3.872	2.8
Sales Tax	0.565	2.5	2.032	2.5
Total Increase	3.947	3.3	5.904	2.7

Source: Ref# 552, 553

247 Based on FY 2005 revenues and appropriations, total per capita revenues in El Paso County were
 248 approximately \$304 and per capita appropriations were approximately \$329 (Ref# 553). Property and
 249 sales taxes represent approximately 55 percent of the total revenues; based on this ratio, the total revenue
 250 to the county associated with the population increases is estimated to be approximately \$6.6 million.
 251 Total costs to the county of providing services to the increased off-post population, based on the FY 2005
 252 per capita average appropriations, are estimated at approximately \$6.5 million.

253 Based on FY 2005 revenues and appropriations, per capita revenues in the City of El Paso were
 254 approximately \$870 and per capita appropriations were approximately \$884 (Ref# 552). Property and
 255 sales taxes represent approximately 41 percent of total revenues; based on this ratio, total revenue to the
 256 city associated with the population increase is estimated to be approximately \$15.0 million. Total costs to
 257 the city of providing services to the increased off-post population are estimated at \$14.8 million.

258 **Schools**

259 Under the No Action Alternative, the Fort Bliss-related student population is estimated to increase by
 260 approximately 5,056 (**Table 5.13-5**), requiring approximately 346 additional teachers. Assuming that 80
 261 percent will attend school in the El Paso and Ysleta districts, this represents an increase of less than 4
 262 percent over 2004/2005 school year levels for these districts. This is a minor impact on the public school
 263 system.

264 **Table 5.13-5. Fort Bliss-Related Student Population—No Action Alternative**

	<i>2004/2005 Baseline</i>	<i>No Action Alternative Addition</i>	<i>Total</i>
Military Elementary School	2,663	992	3,656
Military High School	2,272	846	3,118
Civilian Elementary School	8,131	2,197	10,328
Civilian High School	3,775	1,020	4,795
Total	16,841	5,056	21,897

265 In the 2004/2005 school year, the El Paso ISD received \$849/military student and the Ysleta ISD received
 266 \$465/military student in impact aid payments. Total General Fund revenues in the 2004/2005 school year
 267 were \$6,172/student in the El Paso ISD and \$6,076/student in the Ysleta ISD. Total General Fund
 268 expenditures were \$6,157/student in the El Paso ISD and \$6,243/student in the Ysleta ISD (Ref# 558,
 269 559). Taxes account for 38 percent of El Paso ISD revenues and 23 percent of Ysleta ISD revenues. The
 270 increase in students under the No Action Alternative is estimated to generate approximately \$5.7 million
 271 in additional impact aid and tax revenues and \$8.1 million in additional tax-funded costs to the El Paso
 272 ISD. The Ysleta ISD is estimated to receive \$2.0 million in additional impact aid and tax revenues and
 273 incur \$2.2 million in additional tax-funded costs.

274 **Law Enforcement**

275 **Table 5.13-6** presents the estimated increased need for off-post law enforcement personnel associated
 276 with the No Action Alternative and other alternatives. Based on the current local law enforcement service
 277 level ratio of 4.3:1000, the off-post population increase under the No Action Alternative generates a need
 278 for 85 additional law enforcement personnel, representing a 3 percent increase above current levels. By
 279 comparison, applying the Rau and Wooten demand factor of 1.7:1000 for law enforcement personnel
 280 results in an estimated need for 33 additional personnel, a 1 percent increase. In either case, an increase
 281 of this magnitude will not have a significant impact on law enforcement services in the region.

282 **Table 5.13-6. Law Enforcement Effects by Alternative**

	<i>No Action Alternative</i>	<i>Alternative 1</i>	<i>Alternatives 2 and 3</i>	<i>Alternative 4</i>
Total Population Change	23,250	202,892	218,091	260,879
Off-Post Population Change	19,680	101,328	116,527	159,315
Law Enforcement Demand				
Local Service Ratio ¹	85	436	502	685
Rau and Wooten Ratio ²	33	172	198	271

1. Estimated increase in demand for law enforcement personnel based on current service levels.
2. Estimated increase in demand for law enforcement personnel based on demand factors provided in Rau and Wooten, 1980.

283 **Fire Protection**

284 **Table 5.13-7** presents the estimated increased need for off-post fire protection personnel associated with
 285 the No Action Alternative and other alternatives. Based on the current local fire protection service level
 286 ratio of 1.3:1000, the off-post population increase under the No Action Alternative generates a need for

287 26 additional fire protection personnel, a 3 percent increase above current levels. Applying the Rau and
 288 Wooten demand factor of 1.43:1000 for fire protection personnel results in an estimated need for 28
 289 additional personnel. In either case, an increase of this magnitude will not have a significant impact on
 290 fire protection services in the region.

291

Table 5.13-7. Fire Protection Effects by Alternative

	<i>No Action Alternative</i>	<i>Alternative 1</i>	<i>Alternatives 2 and 3</i>	<i>Alternative 4</i>
Total Population Change	23,250	202,892	218,091	260,879
Off-Post Population Change	19,680	101,328	116,527	159,315
Fire Protection Demand				
Local Service Ratio ¹	26	132	152	207
Rau and Wooten Ratio ²	28	145	167	228

1. Estimated increase in demand for fire protection personnel based on current service levels.
2. Estimated increase in demand for fire protection personnel based on demand factors provided in Rau and Wooten, 1980.

292 **Medical Services**

293 **Table 5.13-8** presents the estimated increased need for off-post medical personnel and hospital beds
 294 associated with the No Action Alternative and other alternatives. Based on current local medical service
 295 ratios for physicians and hospital beds, the additional population using off-post medical services under the
 296 No Action Alternative generates a demand for 23 additional physicians and 41 additional hospital beds, a
 297 2 percent increase above current levels. By comparison, applying the Rau and Wooten demand factor
 298 results in an estimated demand for 65 additional hospital beds, a 3 percent increase. In either case, an
 299 increase of this magnitude, while not significant, could exacerbate the existing shortage of medical
 300 services available in the region.

301

Table 5.13-8. Medical Services Effects by Alternative

	<i>No Action Alternative</i>	<i>Alternative 1</i>	<i>Alternatives 2 and 3</i>	<i>Alternative 4</i>
Total Population Change	23,250	202,892	218,091	260,879
Change in Off-Post Demand ¹	14,351	74,464	84,147	109,312
Physician Demand				
Local Service Ratio ²	23	117	132	172
Rau and Wooten Ratio	NA	NA	NA	NA
Hospital Bed Demand				
Local Service Ratio ²	41	212	240	312
Rau and Wooten Ratio ³	65	335	379	492

1. Assuming 12.5% of military and their dependents and 100% of civilians.
 2. Estimated increase in demand for physicians and hospital beds based on current service levels.
 3. Estimated increase in demand for hospital beds based on demand factors provided in Rau and Wooten, 1980.
- NA = not available

302 The considerable difference between the local and Rau and Wooten hospital bed ratios reflects regional
 303 variation in service levels and supports the conclusion that the El Paso region already lacks adequate
 304 numbers of health care practitioners and facilities to serve the medical needs of the existing population.
 305 El Paso has a disproportionately low number of medical practitioners compared to other urban counties in
 306 Texas (Ref# 255). In general, the relative number of physicians in El Paso is about 40 to 50 percent of
 307 the number in other major urban areas in the state.

308 The Team El Paso Healthcare Council, in collaboration with the Greater El Paso Chamber of Commerce
 309 and the Institute for Policy and Economic Development at UTEP, examined health care access issues in
 310 El Paso and developed measures needed to attract and retain primary care and specialist physicians. The

311 need for such measures, including state establishment of a medical school at Texas Tech University
312 Health Sciences Center at El Paso, creation of a state healthcare infrastructure fund, and financial
313 incentives for physicians in underserved areas, would be intensified by the actions occurring at Fort Bliss.

314 **5.13.2.5 Quality of Life**

315 **Cost of Living**

316 The population increase associated with the No Action Alternative increases the demand for potable water
317 by approximately 3,100 acre feet per year, an amount that is not likely to have appreciable impacts on
318 water supply. EPWU has plans in place for projects that would support projected baseline growth
319 through 2010. Stationing of one Heavy BCT at Fort Bliss will increase the demand for potable water in
320 the Fort Bliss-EPWU service area by approximately 2 percent. EPWU's water rates are already
321 increasing because of the projects planned in the near future.

322 The No Action Alternative will not significantly impact the housing market. The increased demand could
323 contribute to a tightening of the market, decreasing the number of vacant housing units. Rental prices and
324 sales prices could increase to compensate for the increased demand.

325 **Convenience/Access**

326 The No Action Alternative adds about 26,300 trips in the vicinity of the Main Cantonment Area. This
327 will further aggravate roadways that are already congested and contribute marginally to traffic delays,
328 especially along segments of I-10 between the intersections with US 54 and McRae Blvd. Fred Wilson
329 and Airport Road, which provide access to installation gates, are also congested during peak hours.

330 The No Action Alternative will not alter existing public access to and use of the training areas currently
331 open to public access by permit, including the joint-use areas of McGregor Range. The increase in off-
332 road vehicle maneuvers may decrease the time available for public access for recreation in the South and
333 North Training Areas. Public use of these areas is low in number and managed through a permitting
334 system requiring approval for each entry onto the range. Public access will still be available for specific
335 hunting events and game bird hunting on weekends.

336 Projected increases in baseline population in the ROI through 2010, not including growth at Fort Bliss,
337 will result in increased recreation demand and potential need for additional facilities such as
338 neighborhood parks and sports fields as new development occurs. The No Action Alternative will
339 contribute marginally to that increased demand.

340 **Physical Environment**

341 Projected development in the El Paso area will result in a reduction in the amount of open space as land is
342 converted to developed uses. Population growth also increases the demand for access to open space,
343 estimated at 7-25 acres per 1,000 persons.

344 Under the No Action Alternative, development for one Heavy BCT on the east side of Biggs AAF is
345 converting open land to developed areas. Some of this is visible from Loop 375 and the expanded
346 Sergeants Major Boulevard. This development is consistent with the existing surrounding context of
347 Biggs AAF, EPIA, and urbanized areas of El Paso. Live-fire ranges being constructed under the No
348 Action Alternative are in areas already developed for this use.

349 Most of the growth in the county in recent years has occurred in east El Paso, and this trend is expected to
350 continue. The City of El Paso recently changed its Master Plan to proceed with zoning an 18,000-acre
351 area in northeast El Paso. The conceptual planned development for this area includes about 62,000
352 homes, commercial and industrial areas, community facilities, parks, and schools.

353 In summary, the physical environment of the El Paso region is changing due to baseline population
354 growth. The No Action Alternative will contribute minimally to this change.

355 **5.13.3 Alternative 1**

356 **5.13.3.1 Population**

357 **Table 5.13-9** presents the estimated direct and indirect (induced growth) population change for
358 Alternative 1 between 2006 and 2014 using the implied relationships from the REMI model (Ref# 101).

359 **Table 5.13-9. Population Increases by Year -- Alternative 1**

<i>Year</i>	<i>Military¹</i>	<i>Military Dependents</i>	<i>Civilian</i>	<i>Civilian Dependents</i>	<i>Students and TDY</i>	<i>Induced Population</i>	<i>Total</i>	<i>Percent Change</i>
2006	3,800	6,270	700	980	100	2,850	14,700	1.0
2007	200	330	1,000	1,400	0	2,999	5,929	0.6
2008	2,400	3,960	200	280	0	4,787	11,627	0.9
2009	8,600	14,190	1,200	1,680	-1,800	11,194	35,064	2.7
2010	4,000	6,600	600	840	0	11,324	23,364	1.9
2011	1,000	1,650	100	140	0	11,920	14,810	1.4
2012	0	0	0	0	0	10,132	10,132	1.0
2013	0	0	0	0	0	3,725	3,725	0.3
2014	0	0	0	0	0	745	745	<0.1
Total	20,000	33,000	3,800	5,320	-1,700	59,676	120,096	
RTV								1.29

<0.1 = less than 0.1 percent

360 Civilian dependents were estimated using a ratio of 1.4 dependents per civilian employee. The projected
361 off-post population change includes all civilians and approximately 52 percent of the military personnel
362 and their dependents. Based on the initial analysis of Fort Bliss impacts conducted by UTEP (Ref# 101),
363 an induced (indirect) population change of 2.98 can be expected for each additional military person
364 assigned to Fort Bliss. This induced population influx is estimated to occur over a 4-year period, which
365 accounts for the induced population increases extending past the direct population increases.

366 The major potential population impacts are projected to occur in 2009 and 2010, driven by the arrival of
367 8,600 military in 2009 (offset by the departure of 1,800 ADA students) and 4,000 in 2010. The RTV for
368 population. 1.29, would be exceeded in 2009 through 2011. The RTV reflects a fairly consistent (and
369 constant) population growth pattern in the ROI and relatively little historical fluctuation. Therefore,
370 Alternative 1 would create a major change in the region. The projected population growth would require
371 considerable expansion of supporting infrastructure and services. While the economic expansion (in
372 terms of business volume or sales, income, and employment, discussed in the next subsection) can likely
373 be assimilated and would improve the overall economic health of the El Paso region, the associated
374 demand on community infrastructure and services due to the projected population growth is
375 unprecedented.

376 **Table 5.13-10** indicates that the overall increase in population, estimated at over 120,000 for this
377 alternative, is 145 percent over the baseline population impact of Fort Bliss. Under baseline conditions in
378 2005, Fort Bliss-related population comprised about 8 percent of the ROI population. The projected
379 baseline ROI population for 2010 is 1,110,327, compared to 1,201,011 under Alternative 1, resulting in
380 Fort Bliss-related population comprising 17 percent of the ROI population.

381 The baseline population in the three-county ROI is projected to increase at an average annual growth rate
382 of 2.9 percent. Under Alternative 1, the average annual regional growth rate between 2006 and 2014
383 would increase to 4.1 percent.

384

Table 5.13-10. Fort Bliss-Related Population Impacts - Alternative 1

	<i>2005 Baseline</i>	<i>Alternative 1 Increase</i>	<i>Total</i>
Military ¹	10,200	20,000	30,200
Military Dependents ²	16,500	33,000	49,500
Civilians	7,500	3,800	11,300
Civilian Dependents ³	10,500	5,320	15,820
Students and TDY Personnel	7,700	(1,700)	6,000
<i>Subtotal Direct Population</i>	<i>52,400</i>	<i>60,420</i>	<i>112,820</i>
Induced Population	30,396	59,676	90,072
Total	82,796	120,096	202,892
Off Post Residents	65,641	101,328	167,125

1. Including U.S. and non-U.S. military personnel.
2. Assuming a ration of 1.65 dependents for every military person.
3. Assuming a ration of 1.4 dependents for every civilian employee.

385 **5.13.3.2 Economic Activity**

386 Alternative 1 would have an impact on local economic activity through personnel salaries, direct
387 purchases, and construction projects. The inputs to the EIFS model, which include both the No Action
388 Alternative and Alternative 1 increases, are as follows:

- 389 • A total increase of 20,000 military personnel between 2006 and 2011,
- 390 • A total increase of 3,800 civilian personnel between 2006 and 2011,
- 391 • \$3.041 billion in local expenditures between 2006 and 2011.

392 Using the EIFS model, percent change by year in business volume, income, and employment was
393 estimated for Alternative 1 (**Table 5.13-11**). The percentage changes are compared to the relevant RTVs
394 for the Fort Bliss economic region.

395 Alternative 1 would produce unprecedented effects in business volume (local sales) in 2008. This
396 primarily results from the large construction expenditures planned in that year. While these relative
397 impacts only exceed the RTV for business volume in 2008 and employment in 2009, the continuous
398 indicated impacts over multiple years would be substantial and could be exacerbated by other actions in
399 the region that may occur during the same timeframe. Cumulatively, these projects may compete for the
400 economic resources of the community, straining the labor base and other components of the local
401 economy.

402 **Table 5.13-11. Projected Changes in Economic Activity – Alternative 1**

<i>Year</i>	<i>Total Business Volume</i>		<i>Income</i>		<i>Employment</i>	
	<i>\$M</i>	<i>% Change</i>	<i>\$M</i>	<i>% Change</i>	<i>No.</i>	<i>% Change</i>
2006	339.1	1.40	249.2	1.73	6,849	1.70
2007	1,103.3	4.55	248.5	1.72	8,519	2.11
2008	1,414.4	5.84	363.3	2.52	11,983	2.97
2009	1,061.3	4.38	592.9	4.11	16,840	4.17
2010	307.4	1.27	243.5	1.69	6,639	1.20
2011	138.8	0.57	70.2	0.49	2,021	0.50
RTV		4.74		5.00		4.01

403 Overall, these economic consequences would be generally positive in the ROI, accelerating economic
404 growth in a local economy that has been sluggish at best (Ref# 146). The historical unemployment rate
405 has been high relative to the state and the nation. The increased demands for construction and other

406 services would have a major initial impact, stimulating considerable growth over several years and
407 offsetting the decline of historical manufacturing in the ROI. Although the long-term demand for
408 construction and other services would materialize as the increased mission is assimilated, there is a risk of
409 a “boom-bust” phenomenon occurring.

410 Under Alternative 1, as the demand for construction and services rises in the ROI, considerable labor
411 (particularly in the construction trades) would likely be supplied by trans-border employees, as
412 immigrants or day-to-day (though repeat) labor. This would likely be a major component of the labor
413 market that is available to respond to the Fort Bliss mission expansion. Its utilization would provide the
414 needed short-term labor during the “boom” period without the accompanying infrastructure and other
415 facilities that can create problems after economic expansions end and a “bust” occurs.

416 **5.13.3.3 Housing**

417 The increase in housing demand under Alternative 1 is shown in Table 5.13-3. This alternative includes
418 construction/renovation of approximately 8,000 barracks and RCI construction of approximately 1,750
419 military family housing units on post, in addition to the RCI construction occurring under the No Action
420 Alternative. The number of units to be constructed under the RCI program is based on a market analysis
421 of housing available off post to meet the military demand. If this analysis finds that fewer units are
422 available off post than anticipated, RCI plans may change.

423 An estimated 7,691 additional military personnel would be housed off post. An additional 3,800 direct
424 and 24,865 induced civilian households would also compete for off-post housing for a total demand of
425 approximately 36,356 units. This is more than 2.6 times the estimated number of vacant housing units in
426 the area and would cause a tightening of the housing market, stimulating housing construction. The
427 decreased number of available housing units would likely lead to an increase in housing prices. A report
428 by the National City Corp and Global Insight named the City of El Paso as the second-most undervalued
429 market out of nearly 300 of the biggest cities in the U.S. (Ref# 387). The affordability of the current
430 housing market in addition to an increase in demand could stimulate more investment in rental housing.

431 Over time, investors would likely enter the market, providing more housing units to satisfy the increased
432 demand. The severity of the impact from the increased housing demand would depend on the timing of
433 new housing starts relative to the influx of new personnel and population increases. This timing, as well
434 as resulting housing costs, would be affected by the competition for construction labor presented by the
435 on-post construction projects.

436 **5.13.3.4 Public Services**

437 Alternative 1 would result in substantial increases in tax revenue to the City of El Paso and El Paso
438 County. The City of El Paso would receive an estimated increase in tax revenues from direct population
439 changes at Fort Bliss of over \$9.9 million including sales tax and property tax. In El Paso County, the
440 additional tax revenue from the direct personnel increases at Fort Bliss could be almost \$6.4 million
441 (Table 5.13-12). The induced population could result in additional tax revenues for the City of El Paso of
442 over \$18.2 million and for El Paso County of over \$11.9 million.

443 With over 120,000 people entering the El Paso area, the total impact on tax revenues could be over \$28
444 million in additional tax revenue for the City of El Paso and over \$18 million for El Paso County. This
445 represents an increase of over 15 percent for the city, and almost 13 percent for the county.

446 Based on the assumptions described in Section 5.13.2.4, total additional annual revenues could be \$32.1
447 million to El Paso County and \$75.2 million to the City of El Paso. Additional annual costs associated
448 with the increase in off-post population are estimated to be approximately \$33.3 million for the county
449 and \$76.0 million for the city.

450 **Table 5.13-12. Estimated Increase in Tax Revenues of El Paso County and City of El Paso –**
451 **Alternative 1**

<i>Tax Revenue</i>	<i>El Paso County</i>		<i>City of El Paso</i>	
	<i>\$M</i>	<i>%</i>	<i>\$M</i>	<i>%</i>
Direct Population Effects				
Property Tax	5.327	5.5	6.111	4.4
Sales Tax	1.064	4.8	3.830	4.8
Subtotal Direct Population	6.391	5.3	9.941	4.6
Induced Population Effects				
Property Tax	10.078	10.3	11.524	8.4
Sales Tax	1.871	8.4	6.714	8.4
Subtotal Induced Population	11.949	10.0	18.238	8.4
Total				
Property Tax	15.405	15.8	17.635	12.8
Sales Tax	2.935	13.1	10.544	13.1
Total Increase	18.340	15.3	28.179	12.9

Source: Ref# 552, 553.

452 **Schools**

453 Under Alternative 1 the Fort Bliss-related student population is estimated to increase by 26,649 (**Table**
454 **5.13-13**), requiring about 1,825 additional teachers. Assuming that 80 percent would attend school in the
455 El Paso and Ysleta ISDs, this represents an increase of 19 percent over 2004/2005 levels for these
456 districts. It would be a significant increase in the student population with associated costs to the affected
457 school districts, likely requiring capital investment in new facilities and school sites, as well as additional
458 personnel. The increased costs would be mitigated by military impact aid and an increase in revenues.

459 Based on the assumptions described in Section 5.13.2.4, the increase in students are estimated to generate
460 an additional \$30.0 million in annual military aid and tax revenues and \$42.6 million in annual tax-funded
461 costs to the El Paso ISD. Annual military aid and tax revenues to the Ysleta ISD are estimated to increase
462 by \$10.4 million and annual tax-funded costs by \$11.8 million. The DoD Office of Economic
463 Adjustment is consulting to the school districts to assist in acquiring grants and funds to offset the
464 increased costs.

465 **Table 5.13-13. Fort Bliss-Related Student Population—Alternative 1**

	<i>2004/2005 Baseline</i>	<i>Alternative 1 Increase</i>	<i>Total</i>
Military Elementary School	2,663	5,249	7,912
Military High School	2,272	4,477	6,748
Civilian Elementary School	8,131	11,558	19,688
Civilian High School	3,775	5,366	9,141
Total	16,841	26,649	43,490

466 **Law Enforcement**

467 Alternative 1 would increase regional off-post population by an estimated 101,328 persons. Based on the
468 current local law enforcement service level ratio of 4.3:1000, Alternative 1 would generate a need for 436
469 additional law enforcement personnel, a 15 percent increase above current levels (see Table 5.13-6). By
470 comparison, applying the Rau and Wooten demand factor of 1.7:1000 for law enforcement results in an
471 estimated need for 172 additional personnel, a 6 percent increase. In either case, an increase of this
472 magnitude would affect law enforcement services in the region. The El Paso County Sheriff and City of
473 El Paso Police could be expected to increase their recruitment and training efforts in anticipation of the
474 expected population influx. Given the relatively high service level ratios existing in the region, however

475 (4.3 law enforcement personnel per 1,000 versus the more typical 1.7 per 1,000 of the Rau and Wooten
476 factor), the existing staffing should be able to accommodate a temporary lag in increased staffing levels.

477 **Fire Protection**

478 Based on the current local fire protection service level ratio of 1.3:1000, the anticipated off-post
479 population increase under Alternative 1 would generate a need for 132 fire protection personnel, a 14
480 percent increase above current levels (see Table 5.13-7). By comparison, applying the Rau and Wooten
481 demand factor of 1.43:1000 for fire protection results in an estimated need for 145 additional personnel, a
482 16 percent increase. In either case, an increase of this magnitude would affect services in the region. The
483 City of El Paso Fire Department could be expected to increase their recruitment and training efforts in
484 anticipation of the expected population influx.

485 **Medical Services**

486 WBAMC is expected to continue serving 85-90 percent of the military and military dependent population
487 associated with Fort Bliss. Based on the current local medical service level ratios, the anticipated increase
488 in non-military population, combined with 10-15 percent of the military population increase under
489 Alternative 1, would generate a need for 117 additional physicians and 212 additional hospital beds, a 11
490 percent increase above current levels (see Table 5.13-8). By comparison, applying the Rau and Wooten
491 demand factor results in an estimated need for 335 additional hospital beds, a 17 percent increase. In
492 either case, an increase in demand of this magnitude would significantly affect medical services in the
493 region, especially given the existing shortfall.

494 **5.13.3.5 Quality of Life**

495 **Cost of Living**

496 The population growth created by the activities at Fort Bliss under Alternative 1 would increase water
497 demand by an estimated 20,710 acre feet per year, an increase of approximately 15 percent. It is likely
498 EPWU would need to develop projects more rapidly than currently anticipated to meet the increased
499 demands for potable water (see Section 5.7). This may impact water rates as capital is needed to finance
500 the new projects; however, EPWU does not expect rates to increase by more than 5 percent (Ref# 510).

501 Increased demand on the housing market due to incoming personnel relocating to Fort Bliss between
502 2006 and 2011 could have a significant impact on the housing market in El Paso County. The
503 affordability of the current housing market, in addition to an increase in demand, could stimulate
504 investment in additional housing. Overall, the decreased number of housing units available could cause
505 housing prices to increase at a more rapid pace (see Section 5.13.3.3).

506 **Access/Convenience**

507 By 2016, LOS on some roadways would decline under Alternative 1, but most roadways would still
508 operate at acceptable levels. LOS along on portions of I-10 would still be at unacceptable levels despite
509 planned improvements (see Section 5.2). In 2021, LOS on several roadways would decline further, but
510 only one segment of US 54 (Pershing Drive to Van Buren Ave) would change to an unacceptable level.

511 The increase in Fort Bliss military personnel and dependents living off post, civilian staff and their
512 dependents, and induced population growth would substantially increase demands on the affected El Paso
513 school districts over the next decade. This is likely to require the districts to develop projects more
514 rapidly than currently anticipated to meet those demands (see Section 5.13.3.4). If facility expansion lags
515 behind the population growth, school overcrowding could occur. Should future demand indicate that
516 earlier development of facility projects is necessary, there may be an impact on school financing which
517 could, in turn, affect local tax rates. Increased service costs would be mitigated by increased tax
518 revenues, and the DoD is consulting to the local school districts to assist in finding additional revenues to
519 offset the additional costs associated with BRAC changes.

520 The projected population increase would increase the demand for recreation. Using Rau and Wooten
521 multipliers for calculating the demand for various size parks (Ref# 501), an estimated additional 3,040
522 acres of parks, including neighborhood parks, district parks, large parks, and regional parks, would be
523 needed under Alternative 1. This assumes 2.5 acres of neighborhood parks, 2.5 acres of district parks, 5
524 acres of large parks, and 20 acres of regional parks per 1,000 persons.

525 Under Alternative 1, additional use of the North and South Training Areas for off-road vehicle maneuvers
526 could limit the time available for non-military access for recreation. Since there is very little public
527 recreational use (documented by the number of annual permits issued) and demand has not been
528 increasing, the impact is expected to be minor (see Section 5.1). On McGregor Range, military use may
529 increase slightly in areas where public access and joint use are permitted. Conversely, the duration of
530 closures for missile firings would likely decrease. Therefore, no impact is projected on public activities in
531 the Otero Mesa and Sacramento Mountains foothills portions of McGregor Range.

532 **Physical/Environment**

533 The increased population growth projected under Alternative 1 and resulting development would affect
534 local land use plans and infrastructure development, especially in El Paso County. A large-scale initiative
535 planned for northeast El Paso, involving 62,000 homes and other development, could meet future housing
536 needs, but in the interim, new housing supplies may not be able to keep up with demand, creating interim
537 shortfalls in residential capacity in the city. Residents may seek areas that are already established,
538 accessible, or less expensive such as Chaparral and Anthony, New Mexico. The planned Northeast Loop
539 highway project could also influence the location of new growth in the region into northeast El Paso.
540 Open space areas would be converted to residential and other development.

541 The increased demand for housing in El Paso from in-migrating households in rural communities such as
542 Chaparral and Anthony could stimulate greater development and urbanization of those communities,
543 affecting the rural landscape and small-town character of those areas.

544 Alternative 1 would increase development east of Biggs AAF, resulting in about 1,500 acres of new
545 urbanized landscape. This visual change would be evident to travelers along major roadways such as
546 Loop 375 and Sergeants Major Boulevard. Off-road vehicle maneuvers in the south Tularosa Basin
547 portion of McGregor Range would change the vegetative cover over time, and areas close to key facilities
548 such as the Orogrande Range Complex and McGregor Range Camp would become more bare. The
549 changes may be visible from observation points along the rim of Otero Mesa overlooking the Tularosa
550 Basin (see Section 5.1).

551 Increased dust and noise may reduce the desirability of some areas adjacent to the Fort Bliss Training
552 Complex for residential and recreation use, particularly on the south, east, and west side of Doña Ana
553 Range and east of TA 2B (see Sections 5.6 and 5.10).

554 **5.13.4 Alternative 2**

555 **5.13.4.1 Population**

556 Under Alternative 2, with the addition of a second CAB to the changes described for Alternative 1,
557 population in the three-county ROI is projected to increase by approximately 135,295 persons (**Table**
558 **5.13-14**). The population increase is anticipated to be the same as Alternative 1 through 2011, with the
559 additional increase occurring after 2011.

560

Table 5.13-14. Fort Bliss-Related Population Impacts for Alternative 2

	<i>2005 Baseline</i>	<i>Alternative 2 Increase</i>	<i>Total</i>
Military ¹	10,200	22,700	32,900
Military Dependents ²	16,500	37,455	53,955
Civilians	7,500	3,800	17,500
Civilian Dependents ³	10,780	5,320	13,720
Students and TDY Personnel	7,700	(1,700)	6,000
<i>Subtotal Direct Population</i>	<i>52,400</i>	<i>67,575</i>	<i>119,975</i>
Induced Population	30,396	67,720	98,116
Total	82,796	135,295	218,091
Off Post Residents	65,641	116,527	182,168

1. Including U.S. and non-U.S military personnel.
2. Assuming a ratio of 1.65 dependents for every military person.
3. Assuming a ratio of 1.40 dependents for every civilian employee.

561 **5.13.4.2 Economic Activity**

562 Additional personnel and spending under this alternative would slightly increase regional growth in
563 business volume, income, and employment over Alternative 1 (see Table 5.13-11), extending the growth
564 period beyond the 2010 timeframe. This would provide added benefits for the regional economy;
565 however, expansion of community services would be a challenge for community planners.

566 Following are inputs into the EIFS model for Alternative 2:

- 567 • A total increase of 22,700 military personnel,
- 568 • A total increase of 3,800 civilian personnel,
- 569 • \$3.298 billion in local expenditures.

570 The impact of Alternative 2 on total business volume, income, and employment would be the same as
571 reported for Alternative 1 through 2010. If additional construction for a second CAB started as soon as
572 2011, the increase in total business volume could be \$270.9 million in 2011, \$221.5 million in 2012, and
573 \$132.1 million in 2013. These increases would range from 1.12 percent in 2011 to 0.55 percent in 2013,
574 well within the RTV of 4.74 percent. The increase in total income could be \$94.2 million in 2011, \$150.9
575 million in 2012, and \$24.0 million in 2013. These increases would range from 0.65 percent in 2011 to
576 1.05 percent in 2012 and 0.17 percent in 2013, all well within the RTV of 5.00 percent. Employment
577 could increase by 2,897 (0.72 percent) in 2011, 4,170 (1.03 percent) in 2012, and 876 (0.22 percent) in
578 2013, compared to the 4.01 percent RTV. Thus, the addition of a second CAB at Fort Bliss would extend
579 the growth period, but not at the high levels experienced in the 2008-2009 timeframe.

580 **5.13.4.3 Housing**

581 Population growth and associated housing demand under Alternative 2 would be marginally higher than
582 under Alternative 1 (see Table 5.13-3). As the military households and incoming civilians compete for
583 housing, fewer housing units would be available, contributing to a tighter housing market. As fewer
584 housing units became available, prices would likely increase in response to the increased demand. Over
585 time, new housing units would be constructed; investors could add housing units to the overall supply in
586 response to the increased demand.

587 **5.13.4.4 Public Services**

588 Alternative 2 would result in substantial increases in tax revenues to El Paso County and the City of El
589 Paso. The increase in tax revenues from the projected direct personnel increases could exceed \$11.6
590 million for the City of El Paso and \$7.6 million for El Paso County (**Table 5.13-15**).

591 **Table 5.13-15. Estimated Increase in Tax Revenues of El Paso County and City of El Paso –**
592 **Alternative 2**

<i>Tax Revenue</i>	<i>El Paso County</i>		<i>City of El Paso</i>	
	<i>\$M</i>	<i>%</i>	<i>\$M</i>	<i>%</i>
Direct Population Effects				
Property Tax	6.421	6.6	7.367	5.4
Sales Tax	1.193	5.3	4.294	5.4
Subtotal Direct Population	7.614	6.4	11.661	5.4
Induced Population Effects				
Property Tax	11.436	11.7	13.077	9.5
Sales Tax	2.123	9.5	7.619	9.5
Subtotal Induced Population	13.559	11.3	20.696	9.5
Total				
Property Tax	17.857	18.3	20.444	14.9
Sales Tax	3.316	14.8	11.913	14.9
Total Increase	21.173	17.7	32.357	14.9

Source: Ref# 552, 553

593 In addition, the impact on tax revenues of the induced population increase could be almost \$20.7 million
594 in additional tax revenue for the City of El Paso and \$13.6 million in additional tax revenue for El Paso
595 County. With a total population increase of over 135,000 people into the El Paso area, the total impact
596 could be over 32 million in tax revenues for the City of El Paso and \$21 million for El Paso County. The
597 additional revenues represent an increase of almost 15 percent for the city and 18 percent for the county.

598 Based on the assumptions described in Section 5.13.2.4, total additional annual revenues could be \$37.0
599 million to El Paso County and \$86.5 million to the City of El Paso. Additional annual costs associated
600 with the increase in off-post population are estimated to be approximately \$38.3 million for the county
601 and \$87.4 million for the city.

602 **Schools**

603 Under Alternative 2, the Fort Bliss-related student population would increase by an estimated 29,886
604 (Table 5.13-16), requiring about 2,047 additional teachers. Assuming that 80 percent attend school in the
605 El Paso and Ysleta districts, this represents an increase of 22 percent over 2004/2005 levels for these
606 districts. The impacts would be similar to Alternative 1. Costs and revenues to the affected school
607 districts would be approximately 12 percent higher than estimated for Alternative 1.

608 **Table 5.13-16. Fort Bliss-Related Student Population—Alternative 2**

	<i>2004/2005 Baseline</i>	<i>Alternative 2 Increase</i>	<i>Total</i>
Military Elementary School	2,663	5,927	8,591
Military High School	2,272	5,056	7,327
Civilian Elementary School	8,131	12,909	21,040
Civilian High School	3,775	5,994	9,768
Total	16,841	29,886	46,726

609 **Law Enforcement**

610 Based on the current local law enforcement service level ratio of 4.3:1000, the anticipated off-post
611 population increase under Alternative 2 would generate a need for 502 law enforcement personnel, a 17
612 percent increase above current levels (see Table 5.13-6). By comparison, applying the Rau and Wooten
613 demand factor of 1.7:1000 for law enforcement results in an estimated need for of 198 additional
614 personnel. In either case, an increase of this magnitude would affect law enforcement services in the
615 region. The El Paso County Sheriff and City of El Paso Police could be expected to increase their

616 recruitment and training efforts in anticipation of the projected population influx. Given the relatively
617 high local service level ratios compared to the national average, however, the existing staffing should be
618 able to accommodate a temporary lag in increased staffing.

619 **Fire Protection**

620 Based on the current local fire protection service level ratio of 1.3:1000, the anticipated off-post
621 population increase under Alternative 2 would generate a need for 152 additional fire protection
622 personnel, a 16 percent increase above current levels (see Table 5.13-7). By comparison, applying the
623 Rau and Wooten demand factor of 1.43:1000 for fire protection results in an estimated need for 167
624 additional personnel, a 18 percent increase. In either case, an increase of this magnitude would affect fire
625 protection services in the region. The City of El Paso Fire Department would be expected to increase
626 their recruitment and training efforts in anticipation of the projected population influx.

627 **Medical Services**

628 Based on the current medical service level ratios, the anticipated additional population needing off-post
629 medical services under Alternative 2 would generate a demand for 132 additional physicians and
630 additional 240 hospital beds, a 12 percent increase above current levels (see Table 5.13-8). By
631 comparison, applying the Rau and Wooten demand factor results in an estimated demand for 379
632 additional hospital beds, a 19 percent increase. In either case, an increase in demand of this magnitude
633 would significantly affect medical services in the region that are already short of standard levels.

634 **5.13.4.5 Quality of Life**

635 The quality of life effects of Alternative 2 would be similar to those described for Alternative 1, with an
636 additional increase in water and housing demand. An estimated additional 3,500 acres of parks would be
637 needed. In addition, off-road vehicle maneuvers would be expanded into TAs 10, 11, and 12 north of
638 Highway 506. TAs 10, 11, and 12 offer opportunities for bird hunting and other recreation. Public access
639 is expected to continue to be available on weekends. Recreation activities would be permitted on a non-
640 interference basis with military activities.

641 Under Alternative 2, areas of bare soil and reduced vegetation could develop in the north Tularosa Basin
642 portion of McGregor Range over time, converting the physical and visual character of this area. Viewers
643 on Highway 506 and US 54 would be able to see near-field changes in the landscape (see Section 5.1).

644 **5.13.5 Alternative 3**

645 Population, economic activity, housing, and community service impacts under Alternative 3 would be the
646 same as described for Alternative 2. In general, quality of life effects would also be similar, except off-
647 road vehicle maneuvers would not occur on the north Tularosa Basin portion of McGregor Range.
648 Instead, under this alternative, off-road vehicle maneuvers would be extended to the southeast training
649 areas of McGregor Range. These areas have somewhat more interesting landscape features in the near
650 and middle ground, more varied terrain, and more vegetative cover than other parts of the range. Off-road
651 vehicle operations could alter the vegetation and disrupt some of the natural drainages. Over time, as
652 training levels increase, this land could undergo major changes in the landscape, with more gullies, less
653 vegetation, and loss of soil due to erosion. This change in character could be perceived as a reduction in
654 the visual quality of the landscape (see Section 5.1).

655 **5.13.6 Alternative 4 – Proposed Action**

656 **5.13.6.1 Population**

657 Under Alternative 4, with the potential addition of two BCTs on top of the units included in Alternatives
658 1, 2, and 3, the estimated population in the three-county ROI could increase by another 42,788 direct and
659 induced people after 2010 (**Table 5.13-17**).

660

Table 5.13-17. Fort Bliss-Related Population Impacts for Alternative 4

	<i>2005 Baseline</i>	<i>Alternative 4 Increase</i>	<i>Total</i>
Military	10,200	30,300	40,500
Military Dependents	16,500	49,995	66,495
Civilians	7,500	3,800	11,300
Civilian Dependents	10,500	5,320	15,820
Students and TDY Personnel	7,700	(1,700)	6,000
<i>Subtotal Direct Population</i>	<i>52,400</i>	<i>87,715</i>	<i>140,115</i>
Induced Population	30,396	90,368	120,764
Total	82,796	178,083	260,879
Off Post Residents	65,641	159,315	224,956

1. Including U.S. and non-U.S military personnel.
2. Assuming a ratio of 1.65 dependents for every military person.
3. Assuming a ratio of 1.40 dependents for every civilian employee.

661 **5.13.6.2 Economic Activity**

662 The potential additional personnel and spending under Alternative 4 would moderately increase regional
663 growth in business volume, income, and employment over Alternatives 1, 2, and 3 and extend the growth
664 period beyond the 2010 timeframe. While this would provide added benefits for the regional economy,
665 expansion of community services would be a challenge for community planners. Because the additional
666 BCTs are unlikely to arrive before 2010, the increase in demand for community services would be phased
667 over time, smoothing out the impact of any downturn and mitigating the risk of a “boom-bust” growth
668 pattern.

669 Inputs into the EIFS model for Alternative 4 are as follows:

- 670 • Total increase of 30,300 military personnel,
- 671 • Total increase of 3,800 civilian personnel, and
- 672 • \$3.895 billion in local expenditures.

673 The impact of Alternative 4 on total business volume, income, and employment would be the same as
674 reported for Alternative 1 through 2010. If additional construction for a second CAB and two additional
675 BCTs started as soon as 2011, total increase in business volume could be \$567.4 million in 2011, \$518.1
676 million in 2012, and \$383.9 million in 2013. These increases of 2.34 percent in 2011, 2.14 percent in
677 2012, and 1.58 percent in 2013 would all be well within the RTV of 4.74 percent. Total increase in
678 income could be \$148.2 million in 2011, \$204.9 million in 2012, and \$381.3 million in 2013. These
679 increases would range from 1.03 percent in 2011 to 2.64 percent in 2013, all well within the RTV of 5.00
680 percent. Employment could increase by 4,864 (1.2 percent) in 2011, 6,137 (1.52 percent) in 2012, and
681 10,147 (2.51 percent) in 2013, compared to the 4.01 percent RTV. Thus, the addition of a second CAB
682 and two more BCTs at Fort Bliss would provide higher extended growth than Alternatives 2 and 3, but
683 still not at the high levels experienced in the 2008-2009 timeframe.

684 **5.13.6.3 Housing**

685 Alternative 4 would extend the increase in demand for housing further into the future, potentially creating
686 a sustained market for new housing starts beyond the 2010-11 timeframe (see Table 5.13-3). Some
687 additional on-post housing might be developed. Depending on how well housing development kept up
688 with the continuing increase in demand, tightening of the housing market could become more serious and
689 prolonged. Housing prices could increase in response to the reduced number of available units.

690 **5.13.6.4 Public Services**

691 Alternative 4 could result in substantial additional increases in tax revenues to the City of El Paso and El
692 Paso County. The additional direct population associated with the growth on Fort Bliss could add nearly
693 \$17 million to the City of El Paso and over \$11 million in El Paso County (**Table 5.13-18**).

694 **Table 5.13-18. Estimated Increase in Tax Revenues of El Paso County and City of El Paso –**
695 **Alternative 4**

<i>Tax Revenue</i>	<i>El Paso County</i>		<i>City of El Paso</i>	
	<i>\$M</i>	<i>%</i>	<i>\$M</i>	<i>%</i>
Direct Population Effects				
Property Tax	9.501	9.7	10.901	7.9
Sales Tax	1.556	7.0	5.601	7.0
Subtotal Direct Population	11.057	9.2	16.502	7.6
Induced Population Effects				
Property Tax	15.261	15.7	17.451	12.7
Sales Tax	2.833	12.7	10.168	12.7
Subtotal Induced Population	18.094	15.1	27.619	12.7
Total				
Property Tax	24.762	25.4	28.352	20.1
Sales Tax	4.389	19.6	15.769	19.7
Total Increase	29.151	24.3	44.121	20.2

Source: Ref# 552, 553

696 In addition, the induced population increase could add nearly \$28 million to the tax revenues collected by
697 the City of El Paso and over \$18 million to the tax revenues collected by El Paso County. The total
698 increase in tax revenues could be an additional \$44 million for the City of El Paso and \$29 million for El
699 Paso County. The total increase in revenues would represent an increase of over 20 percent for the city
700 and 24 percent for the county.

701 Based on the assumptions described in Section 5.13.2.4, total additional annual revenues could reach
702 \$50.7 million to El Paso County and \$118.3 million to the City of El Paso. Additional annual costs
703 associated with the off-post population increase could reach \$52.4 million in the county and \$119.4
704 million in the city.

705 **Schools**

706 Under Alternative 4, the Fort Bliss-related student population would increase by more than 39,000 (**Table**
707 **5.13-19**), requiring about 2,680 additional teachers. Assuming that 80 percent attend school in the El
708 Paso and Ysleta districts, this represents an increase of 28 percent over 2004/2005 levels for these
709 districts. The increased costs would be mitigated by additional military impact payments and increases in
710 revenues. The increases in costs and revenues would be approximately 46-47 percent higher than the
711 estimates for Alternative 1, with an estimated increase in impact aid and taxes of approximately \$59
712 million and an estimated \$80 million in increased tax-funded costs.

713 **Table 5.13-19. Fort Bliss-Related Student Population — Alternative 4**

	<i>2004/2005 Baseline</i>	<i>Alternative 4 Increase</i>	<i>Total</i>
Military Elementary School	2,663	7,912	10,575
Military High School	2,272	6,748	9,020
Civilian Elementary School	8,131	16,714	24,845
Civilian High School	3,775	7,760	11,535
Total	16,841	39,134	55,975

714 **Law Enforcement**

715 Based on the current local law enforcement service level ratio of 4.3:1000, the potential off-post
716 population increase under Alternative 4 could generate a need for 685 additional law enforcement
717 personnel, representing a 23 percent increase above current levels (see Table 5.13-6). By comparison,
718 applying the Rau and Wooten demand factor of 1.7:1000 for law enforcement results in an estimated
719 increased need for 271 additional personnel, a 9 percent increase. In either case, an increase of this
720 magnitude would affect law enforcement services in the region. The El Paso County Sheriff and City of
721 El Paso Police would be expected to increase their recruitment and training efforts in anticipation of the
722 potential population influx.

723 **Fire Protections**

724 Based on the current local fire protection service level ratio of 1.3:1000, the potential off-post population
725 increase under Alternative 4 could generate a need for 207 fire protection personnel, a 22 percent increase
726 above current levels (see Table 5.13-7). By comparison, applying the Rau and Wooten demand factor of
727 1.43:1000 for fire protection results in an estimated need for 228 additional personnel, a 25 percent
728 increase. In either case, an increase in demand of this magnitude would significantly affect fire protection
729 services in the region. The City of El Paso Fire Department would be expected to increase their
730 recruitment and training efforts in anticipation of the potential population influx.

731 **Medical Services**

732 Based on the current local medical service level ratios, the potential additional population needing off-
733 post medical services under Alternative 4 could generate a demand for 172 additional physicians and 312
734 hospital beds, a 16 percent increase above current levels (see Table 5.13-8). By comparison, applying the
735 Rau and Wooten demand factor results in an estimated demand for 492 additional hospital beds, a 25
736 percent increase. In either case, an increase in demand of this magnitude would significantly affect
737 medical services in the region.

738 **5.13.6.5 Quality of Life**

739 The effects of Alternative 4 on quality of life would be similar to those described for Alternatives 1, 2,
740 and 3. In general, the El Paso area can be expected to become substantially more urbanized, with
741 development extending farther north and east. This would result in longer commute times, increased
742 congestion, and increased competition for housing and community services. Cost of living would likely
743 increase, at least in the short term. An estimated additional 4,700 acres of parks would be needed. Open
744 space would become more rare.

745 The increase in off-road vehicle maneuver training would also affect the landscape of the Fort Bliss
746 Training Complex. Overall, the landscape changes in the Tularosa Basin would be substantial, but this
747 area is not classified as a distinctive and valued resource. The more valued grassland areas on Otero
748 Mesa, especially in the ACEC, would not be directly affected by training and are expected to retain their
749 visual quality.

5.14 ENVIRONMENTAL JUSTICE

5.14.1 Introduction

The Environmental Justice analysis considers whether the alternatives would have disproportionately high and adverse human health or environmental impacts on minority and/or low-income populations. The analysis was performed by reviewing the environmental consequences in each of the other resource areas (Sections 5.1-5.13), identifying any significant adverse impacts reported in those sections, and determining whether those impacts would affect areas with minority and/or low-income populations above the ROI average to a greater degree than the population in general.

Based on that review, the impacts from the following resources are not expected to result in disproportionately high and adverse human health or environmental effects on minority or low-income populations and therefore are not evaluated further in this section: Land Use, Main Cantonment Area Infrastructure, Training Area Infrastructure, Airspace Use and Management, Earth Resources, Air Quality, Water Resources, Biological Resources, Cultural Resources, Safety, Hazardous Materials and Items Of Special Concern, and Socioeconomics. Impacts from these resources would typically fall into one or more of the following categories, and thus would not create the potential for disproportionately high and adverse health or environmental effects on minority and/or low-income populations:

- The impact would be adverse but less than significant;
- The impact would primarily affect natural or physical resources as opposed to the public and/or residential populations; or
- The impact would affect the population more generally, as opposed to affecting a particular population group in a delineated location within the study ROI. Minority and/or low-income populations may be affected, but either the impact is not specifically concentrated in those populations, or the specific location of the impact is not known and it cannot be determined whether the effect on minority and/or low-income populations would be disproportionately high and adverse.

Only the Noise analysis was found to present the potential for higher adverse impacts in locations where the minority and/or low-income population is higher than the ROI average.

Section 5.10 discusses noise impacts from two types of sources: large caliber weapons (CDNL and peak noise) and aviation (helicopter) noise (ADNL). For the Environmental Justice analysis, areas exposed to the following noise levels were evaluated further:

- Large caliber weapons noise – Day-Night Average Sound Levels of 62 CDNL or greater. In areas exposed to noise level over 62 CDNL, restrictions or qualifications are placed on certain land uses, specifically residential development.
- Peak noise level from large caliber weapons – Studies have shown a greater percentage of people are highly annoyed at peak noise levels of 115 dB or greater.
- Aviation noise – Day-Night Average Sound Levels of ADNL 65 or greater.

For areas within the above noise contours, population densities were estimated for geographic census units containing private lands. Only areas with private land were considered because residential land use is generally limited to private land. This was done by allocating population based on the percent of land contained within the noise contour compared to the total land area of the geographic census unit. Depending upon the size of the area affected, the analysis was performed at the census tracts or the census block group level. The percent minority and percent low-income populations within the noise contours were estimated for each noise source and each alternative, where there were differences. If the percent minority or percent low income is measurably greater than the percent in the three-county ROI, (i.e.,

45 greater than 77 percent minority and greater than 24 percent low income), these populations are
46 considered to be disproportionately impacted.

47 **5.14.2 No Action Alternative**

48 Under the No Action Alternative, neither aviation noise nor average noise levels from large caliber
49 weapons will be significant. Peak noise levels from large caliber weapons will be 115 dB or greater in
50 census tracts 12.02 and 18.02 in Doña Ana County, census tract 103.19 in El Paso County, and block
51 group 1 in census tract 6.01 and block group 9 in census tract 9 in Otero County. The population in the
52 affected area is approximately 77 percent minority and 42 percent low income. The percent minority
53 population in the area of elevated peak noise is similar to the percent minority in the three-county ROI.
54 The population in the affected area is 42 percent low income, compared to the three-county ROI average
55 of 24 percent. However, the peak noise threshold for 115 dB is only associated with increased potential
56 for noise complaints. There are no land use or health criteria indicative of a significant adverse impact
57 from this noise exposure. As described in Section 4.10, sound pressure levels exceeding 130 dB would
58 be considered high and adverse. No off-post areas would be exposed to PK (met) levels exceeding 130
59 dB. Therefore, the No Action Alternative will not have any disproportionately high and adverse impacts
60 on minority or low-income populations.

61 **5.14.3 Alternative 1**

62 Under Alternative 1, noise from large caliber weapons would be 62 CDNL or greater in census tract 18.04
63 in Doña Ana County in the vicinity of the community of Chaparral. The population in the affected area is
64 approximately 68 percent minority and 31 percent low income. Because 68 percent is less than the 77
65 percent minority average for the three-county ROI, even though it is greater than 50 percent, the impact
66 on minority populations is not considered disproportionately high and adverse. However, because 31
67 percent low income in the area affected by elevated noise levels is appreciably greater than the 24 percent
68 average for the three-county ROI, the impact on low-income populations can be considered
69 disproportionately high.

70 Aviation noise levels under Alternative 1 would be 65 ADNL or higher in census tracts 2.03, 2.04,
71 101.02, and 102.07 in El Paso County. The population of the affected area is approximately 70 percent
72 minority and 21 percent low-income, both of which are less than the average for the three-county ROI.
73 Therefore, aviation noise would not result in disproportionately high and adverse impacts on minority or
74 low-income populations.

75 **5.14.4 Alternative 2**

76 The impacts of noise from large caliber weapons would be the same for Alternative 2 as Alternative 1.
77 With the addition of two CABs under Alternative 2, noise levels would be 65 ADNL or higher in census
78 tracts 2.03, 2.04, 101.02, and 102.07 in El Paso County. The population of the affected area is
79 approximately 71 percent minority and 21 percent low income, both of which are less than the averages
80 for the three-county ROI. Therefore, aviation noise would not result in disproportionately high and
81 adverse impacts on minority or low-income populations.

82 **5.14.5 Alternative 3**

83 The impacts of noise under Alternative 3 would be the same as reported for Alternative 1.

84 **5.14.6 Alternative 4 – Proposed Action**

85 Under Alternative 4, with training by five Heavy BCTs, noise levels from large caliber weapons would
86 exceed 62 CDNL in census tracts 12.02, 18.02, and 18.04 in Doña Ana County, census tract 102.06 in El
87 Paso County, and block group 9 within census tract 9 in Otero County. The population of the affected
88 area is approximately 73 percent minority and 34 percent low income. The minority population is not

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

89 greater than the average for the ROI, but the low-income population is. Therefore, large caliber weapons
90 noise impacts would result in disproportionately high and adverse effects on low-income populations.

91 Impacts from aviation noise would be the same under Alternative 4 as reported for Alternative 2. Neither
92 minority nor low-income populations would be affected by disproportionately high and adverse aviation
93 noise.

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1 **5.15 CUMULATIVE IMPACTS**

2 In addition to identifying the direct and indirect environmental impacts of their actions, the Council on
3 Environmental Quality’s NEPA Regulations require federal agencies to address cumulative impacts
4 related to their proposals. A cumulative impact is defined in the CEQ Regulations as “the impact on the
5 environment which results from the incremental impact of the action **when added to** other past, present,
6 and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person
7 undertakes such other actions. Cumulative impacts can result from individually minor but collectively
8 significant actions taking place over a period of time [emphasis added].” (40 CFR 1508.7) This section
9 describes the process used to identify potential cumulative impacts related to the proposed actions at Fort
10 Bliss (Section 5.15.1) and discusses those impacts for each of the resources addressed in Chapter 4 and
11 the first 14 sections of Chapter 5 (Section 5.15.2).

12 **5.15.1 Process for Identification of Cumulative Impacts**

13 CEQ has published guidance for assessing cumulative impacts in *Considering Cumulative Effects under*
14 *the National Environmental Policy Act* (January 1997). In summary, the process outlined by CEQ
15 includes identifying significant cumulative effects issues, establishing the relevant geographic and
16 temporal (time frame) extent of the cumulative effects analysis, identifying other actions affecting the
17 resources of concern, establishing the cause and effect relationship between the proposed actions and the
18 cumulative impacts, determining the magnitude and significance of the cumulative effects, and
19 identifying ways in which the agency’s proposal might be modified to avoid, minimize, or mitigate
20 significant cumulative impacts. Each of these is addressed below.

21 **5.15.1.1 Identification of Significant Issues**

22 Issues to be addressed in this cumulative impacts analysis were identified based on (1) concerns
23 expressed by the affected public during scoping and (2) issues identified through the analysis of direct and
24 indirect effects that have the potential to combine with other past, present, or reasonably foreseeable
25 future actions to produce a larger impact. Comments received during scoping for this SEIS are
26 summarized in Table 2-4 and include:

- 27 • Impacts of dust on local and regional air quality.
- 28 • Damage to soils, vegetation, habitat, and wildlife.
- 29 • Transportation and access.
- 30 • Impacts on cultural resources.
- 31 • Impacts on other uses of McGregor Range, including grazing, recreation, special land
32 designations such as Culp Canyon Wilderness Study Area, and Bureau of Land Management
33 plans and management activities.
- 34 • Impacts of increased population on water supply, public services, education, utility costs, and
35 quality of life.
- 36 • Cumulative impacts of military training in combination with the effects of drought.
- 37 • Cumulative impacts of Army actions in combination with other plans, uses, and development.

38 The scoping issues also frame the analysis of direct and indirect impacts, presented in the preceding 14
39 sections of this chapter, which identified effects that may have more than discrete, localized consequences
40 and therefore have the potential to combine with the effects of other actions to produce a larger
41 cumulative impact. These include:

- 42 • Effects of increased development on and off post on land use in the region.
- 43 • Changes in the visual character of the landscape.
- 44 • Impacts of increased traffic on local and regional roadways.
- 45 • Increased demand for utilities (water, wastewater treatment, solid waste disposal) and energy
- 46 consumption.
- 47 • Increased military use of the regional airspace.
- 48 • Changes in physical and natural resources including soils, vegetation, wildlife, and protected
- 49 species.
- 50 • Effects of increased air pollutant emissions and fugitive dust on regional air quality.
- 51 • Depletion of surface and groundwater resources due to increased demand for potable water.
- 52 • Loss of historic properties that could be eligible for listing in the National Register of Historic
- 53 Places.
- 54 • Increased pressure on socioeconomic resources, including housing, schools, law enforcement and
- 55 fire protection, and medical services.

56 **National and International Concerns**

57 The proposed actions will have impacts that may contribute to issues of national or international scope,
58 such as depletion of non-renewable fossil fuel resources, energy shortages and increasing costs, and
59 global warming due to increased emissions of greenhouse gasses. These issues are not discussed further
60 because of the very broad nature and variability of both the contributing actions and the resulting impacts.
61 Although it is acknowledged that activities at Fort Bliss will add, however marginally, to cumulative
62 impacts related to these issues, they are outside the scope of this SEIS. It is neither feasible nor practical
63 for the Army to address these larger national or global impacts in the context of the actions proposed at
64 Fort Bliss, other than through conservation measures aimed at mitigating the direct and indirect effects of
65 those actions.

66 Other national and international issues that could affect resources also affected by the proposed actions at
67 Fort Bliss are outside the scope of this analysis because (1) the actions at Fort Bliss would not change the
68 significance of the cumulative impacts, (2) there is no clear cause and effect relationship between the
69 actions proposed at Fort Bliss and the impacts of those other actions, or (3) the cumulative effects are too
70 speculative to allow for meaningful analysis. These issues include the following:

- 71 • Cumulative impacts of the 2005 BRAC decisions.
- 72 • Cumulative impacts from all Army Transformation and IGPBS activities.
- 73 • Impacts of the Global War on Terrorism, military actions in Iraq and Afghanistan, or potential
- 74 future military deployments and engagements.
- 75 • Immigration policies and border programs that may affect El Paso and/or Ciudad Juárez.
- 76 • Growth, development, and economic activity in Mexico.

77 **5.15.1.2 Geographic and Temporal Extent of Analysis**

78 A region of influence was defined for each of the 14 resources in Chapter 4. These ROIs represent the
79 geographic areas within which all notable impacts from the proposed actions and alternatives are expected
80 to occur. Impacts from the proposed actions that might extend beyond the defined ROI are expected to be
81 negligible and do not have the potential to contribute measurably to cumulative impacts. Therefore, the
82 geographic extent of the cumulative impacts analysis generally coincides with the ROI of each resource;

83 in most instances the three-county region encompassing El Paso County, Texas and Doña Ana and Otero
84 Counties in New Mexico. A few exceptions are warranted by the nature of the affected resource. As
85 noted in Section 5.7, the El Paso area obtains the majority of its potable water supply from the same
86 aquifer, the Hueco Bolson, as Ciudad Juárez, Mexico. Therefore, consideration of cumulative impacts on
87 water resources includes trans-border influences on that source. Similarly, as discussed in Section 5.13,
88 the economies of El Paso and Juárez are intertwined, and the consideration of cumulative socioeconomic
89 impacts addresses that interrelationship. Although most impacts on natural resources are local or regional
90 in nature, effects to species that are listed under the Endangered Species Act are by definition of national
91 concern, and cumulative impacts on those species must be considered irrespective of geographic location.

92 CEQ Regulations specify that cumulative impacts analyses encompass past, present, and reasonably
93 foreseeable future actions. As a practical matter, the impacts of past actions are already reflected in the
94 conditions that currently exist, as described in the affected environment in Chapter 4. Where appropriate
95 and feasible, those sections note past activities that may have cumulatively contributed to the current
96 condition of the environment. For example, the Earth Resources and Biological Resources sections
97 indicate that the present ecological transition states of the Fort Bliss Training Complex are believed to be
98 the result of cumulative stresses from past grazing, ground disturbance, and drought conditions. As
99 another example, the Water Resources section describes the effect of past withdrawals on the Hueco
100 Bolson.

101 Other present and reasonably foreseeable future actions considered in the analysis are identified in
102 Section 5.15.1.3 below. In general, this SEIS assumes a 20-year horizon for estimating future impacts;
103 actions beyond that timeframe become increasingly speculative and difficult to assess

104 **5.15.1.3 Identification of Other Actions**

105 The direct and indirect effects of the proposed actions at Fort Bliss described in preceding sections of this
106 SEIS generally address the impacts of adding Fort Bliss-related population influx to the existing
107 population of the ROI. However, the population of the ROI is projected to grow, albeit to a lesser extent,
108 independent of the changes projected for Fort Bliss. This “baseline” population growth would be additive
109 to the growth induced by Fort Bliss and thus has the potential to further exacerbate the impacts from the
110 Army’s activities.

111 The ROI has been historically affected by military activity at Fort Bliss, White Sands Missile Range, and
112 Holloman Air Force Base, as well as other government and non-government industrial, business, and
113 institutional activities. The latter influences have included foundries, diverse manufacturing, mixed
114 agriculture, mining, government, financial institutions, educational institutions, health services, and other,
115 smaller entrepreneurial sources of growth. Many of these activities have been shaped by the geographic
116 position of El Paso as an international border crossing and “sister city” of Ciudad Juárez and as a
117 historical transportation hub. Future impacts will mostly occur through the continued growth of these
118 diverse components of the El Paso community, exacerbated and accelerated by the continued growth and
119 expanded influence of much larger Ciudad Juárez.

120 Castner Range, an approximately 7,000-acre closed range on Fort Bliss, has been a subject of substantial
121 interest in El Paso. The Army currently has no plans for its future use or disposal. A small parcel on the
122 range was recently transferred to the Department of Homeland Security for construction of a Border
123 Patrol facility. Other proposals promoted by organizations such as the Franklin Mountains Wilderness
124 Coalition, El Paso Regional Economic Development Corporation, and others vary from making the range
125 part of Franklin Mountains State Park and preserving it as open space, to developing the property as a
126 joint-use light-industrial-commercial-residential-recreation area.

127 Military plans in the ROI outside of Fort Bliss include expansion of Defense Threat Reduction Agency
128 activities (Ref# 522) and Future Combat Systems test program (Ref# 521) at WSMR and Transformation
129 of the 49th Fighter Wing at Holloman AFB (Ref# 524). FCS testing also involves use of Fort Bliss

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

130 training areas and Orogrande Range Camp and would be performed by the Army Evaluation Force
131 stationed at Fort Bliss. The transformation of the 49th Fighter Wing would bring in F/A-22 aircraft to
132 Holloman AFB to backfill for the F-117 aircraft that are being retired. The retirement of the F-117s
133 would reduce Holloman AFB use of Centennial Range on Fort Bliss; conversely, beddown of the F/A-22
134 would involve use of Restricted Area airspace overlying the Doña Ana Range-North Training Areas and
135 McGregor Range.

136 Non-military land management activities of other federal agencies in the ROI (e.g., Bureau of Land
137 Management and U.S. Forest Service) focus on land management and multiple use (Ref# 21), including
138 development and/or expansion of transportation infrastructure, pipelines, and energy transmission lines.
139 BLM is currently reviewing plans to expand oil and gas exploration and extraction on Otero Mesa east of
140 McGregor Range outside the Fort Bliss boundary (Ref# 512).

141 Economic expansion in the region will likely include activities by the 70 Fortune 500 companies
142 represented in El Paso, including vacuum cleaner manufacturers, defense contractors, and automobile
143 component manufacturers, as well as current manufacturing activities such as food products, clothing,
144 construction materials, electrical and medical equipment, plastics, and agricultural activities (cotton, fruits
145 and vegetables, livestock, pecans). Recent trends have seen expansion of call center operations (14
146 centers and over 10,000 employees, currently representing seven of the top ten business employers),
147 health care, business/trade services, international trade, and telecommunications.

148 Many ongoing initiatives are related to management of water resources in the region. The U.S. Army
149 Corps of Engineers, Bureau of Reclamation, and New Mexico Interstate Stream Commission are engaged
150 in joint planning of infrastructure and management policies for the Rio Grande (Ref# 523). The United
151 States Section of the International Boundary and Water Commission, in cooperation with the Bureau of
152 Reclamation, has developed long-term plans for management of the Rio Grande Canalization Project
153 along a 105-mile river corridor extending from Percha Dam in Sierra County, New Mexico to American
154 Dam in El Paso, Texas. The Far West Texas Water Plan addresses long-term projects to provide a
155 sustainable water supply to the El Paso region (Ref# 317). El Paso Water Utilities, a principal participant
156 in this plan, has worked with Fort Bliss to construct and operate a brackish water desalination plant on
157 Fort Bliss land aimed at reducing freshwater withdrawals from the Hueco Bolson (Ref# 222). The El
158 Paso-Las Cruces Regional Sustainable Water Project is designed to provide year-round water from the
159 Rio Grande to the cities of El Paso and Las Cruces. Other water-related initiatives have included reuse of
160 treated wastewater, aquifer recharge, and aggressive water conservation measures, including limitations
161 on water use for landscaping.

162 Recent State of New Mexico plans include development of a civilian regional spaceport near Upham,
163 New Mexico supported by the New Mexico Economic Development Department. Although WSMR is a
164 cooperating agency on that initiative, it is not expected to affect resources potentially impacted by Fort
165 Bliss activities and is therefore outside the region of influence of this analysis.

166 **5.15.1.4 *Establishment of Cause and Effect Relationship***

167 The objective of this cumulative impact analysis is to aid in the understanding of the full extent of the
168 environmental consequences of making the decisions ensuing from the SEIS. To accomplish this, the
169 impacts addressed in this section must be related to those decisions in a material way. At a broad level,
170 all actions can be considered as cumulatively contributing to the degradation of the environment if they
171 use natural resources or produce waste. However, taking a global view of cumulative effects in that
172 manner does not assist in meaningfully understanding the implications of the proposals contemplated in
173 this document and making an informed decision, in accordance with the following purpose stated in the
174 CEQ Regulations: “NEPA’s purpose is not to generate paperwork – even excellent paperwork – but to
175 foster excellent action. The NEPA process is intended to help public officials make decisions that are
176 based on understanding of environmental consequences, and take actions that protect, restore, and
177 enhance the environment.” (40 CFR 1500.1) Accordingly, the cumulative impacts discussed in this

178 section focus on issues with an identifiable cause and effect relationship to the Proposed Actions and
179 other alternatives and the potential for leading to better decisions and actions on the part of both the Army
180 and the communities that would be affected by the Army's actions.

181 **5.15.1.5 *Determination of the Magnitude and Significance of Cumulative***
182 ***Impacts***

183 The nature, magnitude, and significance of potential cumulative impacts from the proposed actions and
184 the alternatives added to the actions identified in Section 5.15.1.3 are described by resource in Section
185 5.15.2.

186 **5.15.1.6 *Possible Modifications to the Proposed Action to Avoid, Minimize, or***
187 ***Mitigate Significant Cumulative Impacts***

188 In general, opportunities for avoiding, minimizing, or mitigating cumulative impacts related to the
189 Proposed Actions and other alternatives have been incorporated by design or through the management
190 processes described in Chapter 2 to address the direct and indirect impacts identified in this SEIS. They
191 include such measures as siting and consolidating facilities and live-fire ranges to reduce the area
192 affected; ensuring land use compatibility in the Real Property Master Plan; energy-efficient facility
193 design; executing a Programmatic Agreement for historic properties; implementing projects in the
194 Integrated Natural Resources Management Plan; promoting a sustainable range and training base through
195 the Integrated Training Area Management program; and maintaining Solid Waste Management (including
196 an aggressive recycling program), Storm Water Management, Spill Prevention, Control, and
197 Countermeasures, Asbestos Management, Lead Hazard Management, and Pollution Prevention Plans.
198 Fort Bliss is implementing an Environmental Management System that will monitor environmental
199 compliance and waste reduction metrics and provide data for adaptive management programs in the
200 future. In addition, the procedures described in Appendix A provide a process for determining the
201 appropriate level of environmental impact analysis under NEPA based on potential environmental effects
202 of future development and operations at the installation.

203 The Army has established multiple programs to reduce the accumulated effects of its actions nationwide
204 and worldwide, which are already incorporated as applicable in the actions contemplated in this SEIS.
205 They include the Installation Sustainability Program and The Army Sustainable Range Program, as
206 outlined in Army Regulation 350-19.

207 In addition, Fort Bliss is actively involved in joint planning initiatives with the Metropolitan Planning
208 Organization to address transportation needs of the installation and community; El Paso Water Utilities to
209 address water and wastewater treatment needs; and other city services (e.g., school districts) in connection
210 with the mission changes occurring at the installation.

211 **5.15.2 *Cumulative Impacts by Resource***

212 This section describes potential cumulative impacts related to the actions occurring and proposed at Fort
213 Bliss by resource. For each resource, the following subsections first list the significant cumulative impact
214 issues related to that resource, then identify other actions that could combine with the proposed actions at
215 Fort Bliss to produce larger cumulative impacts, and finally describe the nature and magnitude of the
216 cumulative impact, to the extent feasible considering uncertainties inherent in this kind of analysis.

217 **5.15.2.1 *Land Use***

218 The important land use cumulative impact issues considered in this analysis are:

- 219 • The cumulative effects of development associated with baseline population growth in the El Paso
220 region, unrelated to Fort Bliss, in addition to the growth stimulated by the mission changes at Fort
221 Bliss.

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

222 • Increased urbanization of developing areas on the fringes of El Paso and in surrounding rural
223 areas.

224 • Changes in the visual landscape, including increased urbanization and decreased open space.

225 Other activities that could combine with actions at Fort Bliss to produce cumulative land use impacts
226 include any future plans for Castner Range (although the Army has no such plans), development plans for
227 the City of El Paso, and Otero and Doña Ana County plans to jointly address the infrastructure needs of
228 the Chaparral area (see Section 4.1.2.2). Two major projects that will affect land use in the ROI include
229 (1) a plan to develop mixed commercial-industrial-residential uses, incorporating community and
230 recreation facilities, on 16,000 acres in northeast El Paso and (2) the Northeast Parkway around the north
231 end of the Franklin Mountains to Anthony, New Mexico, and connecting to Mexico around the perimeter
232 of Ciudad Juárez.

233 The City of El Paso has grown and developed as an urban hub as a result of historic manufacturing and
234 more recent border economic initiatives such as the North American Free Trade Act and the
235 establishment of trans-border maquiladora industries. Although the recent economic downturn has
236 slowed population growth in the city, it is anticipated to continue growing at an average rate of
237 approximately 2.9 percent per year, independent of Fort Bliss expansion, reaching 750,250 by 2015. This
238 baseline growth necessarily means further expansion and urbanization on the outskirts of the city and
239 across the state boundary into southern New Mexico communities such as Anthony, Sunland Park, and
240 Chaparral. The Metropolitan Planning Organization forecasts future city growth will be concentrated to
241 the northeast and east. The population expansion will lead to demand for more commercial facilities and
242 services in areas that are now largely rural or residential.

243 The actions at Fort Bliss are expected to accelerate the rate of population growth in the region. This
244 would likely stimulate more rapid development of the northeastern and eastern sections of El Paso, as
245 well as towns in southern New Mexico, as investors and developers respond to the impending influx of
246 people. The pressures of development would make it more difficult to maintain open space, at the same
247 time that population growth would increase the demand for more open space for recreation and quality of
248 life. Castner Range could ultimately be a factor in those competing interests, depending on its future land
249 use, by either providing an open respite in an increasingly urban environment or supporting facilities and
250 services to meet increased development demands.

251 Rural communities like Chaparral could be susceptible to increased density and urbanization, and the
252 overall open visual quality of the landscape, especially in southern New Mexico, can be expected to be
253 changed by the combination of development in the Main Cantonment Area of Fort Bliss, increased
254 urbanization in surrounding communities, and more intense training use of the Fort Bliss Training
255 Complex. The increase in off-road vehicle maneuvers at Fort Bliss, combined with increased supersonic
256 aircraft operations from Holloman AFB, could cumulatively decrease solitude and the attractiveness of
257 outdoor recreation resources in the region. Although the landscape of Fort Bliss would be affected by
258 increased military training, the amount of additional facilities development in the training areas would be
259 modest, and the vast expanses of land will remain in a relatively open, natural visual state.

260 **5.15.2.2 Main Cantonment Area Infrastructure**

261 The important Main Cantonment Area infrastructure cumulative impact issues considered in this analysis
262 are:

263 • Impacts of population growth in the El Paso region on the regional transportation network.

264 • Impacts of baseline population growth in the El Paso region, in combination with the population
265 growth generated by the mission changes at Fort Bliss, on the infrastructure of utilities (potable
266 water, wastewater, and solid waste) and energy (electricity and natural gas) suppliers.

267 Other actions that could combine with actions at Fort Bliss to produce cumulative impacts include
268 increased development in northeastern and eastern El Paso that would use Martin Luther King, Jr.
269 Boulevard, US 54, and Montana Avenue as major arterials. Increased trans-border traffic could also
270 contribute to further traffic pressures on US 54 as well as I-10.

271 Plans to extend EPWU water supply and wastewater treatment capabilities to currently unserved areas,
272 including Colonias east and south of the City of El Paso, have the potential to contribute to cumulative
273 infrastructure effects. EPWU currently has infrastructure in place to treat and deliver over 305 million
274 gallons per day of potable water to its service area (Ref# 510). With an existing demand of 162 MGD,
275 this is adequate to meet the projected demands of both the Fort Bliss expansion and the baseline
276 population growth. The ability of the utility to supply water to the community is limited more by
277 available resources than by adequate infrastructure (see Section 5.15.2.7).

278 EPWU's wastewater treatment capacity is more limited. While substantial unused capacity still exists at
279 the Haskell Street and Northwest Wastewater Treatment Plants, the two plants that service the fastest
280 growing areas of El Paso could be strained by accelerated development. The Fred Hervey plant, which
281 services northeast El Paso, has the smallest capacity of all EPWU plants and an excess capacity of only
282 approximately 3.5 MGD. The current excess capacity of the Roberto Bustamante plant is approximately
283 14 MGD, but it services the east, southeast, and Lower Valley areas of El Paso. In addition to being an
284 area of highest future growth, this service area encompasses 1,730 new military family housing units
285 planned for construction under the Fort Bliss Residential Communities Initiative.

286 Cumulative growth and development in the ROI would also increase demands on El Paso Electric
287 Company and El Paso Gas Company. Although those companies' access to their respective resources is
288 not a constraint, the additional demand would likely require some infrastructure expansion, including
289 substations, transmission lines, gas pipelines, etc. The proposed development at Fort Bliss and related
290 population growth would consume between 33 and 46 percent of EPEC's excess power supply. EPEC
291 would eventually need to expand its capacity to respond to continued population growth. The impact of
292 increases in energy demand associated with new facilities at Fort Bliss would be mitigated by the use of
293 more energy-efficient construction methods that will reduce the overall per-square-foot gas consumption
294 for heating.

295 Communities in southern New Mexico such as Anthony, Sunland Park, and Chaparral could also require
296 infrastructure improvements as a result of baseline population growth in combination with the growth
297 generated by the actions at Fort Bliss.

298 **5.15.2.3 Training Area Infrastructure**

299 The important training area infrastructure cumulative impact issues considered in this analysis are:

- 300 • Impacts from military convoys traveling from the Main Cantonment Area to the Fort Bliss
301 Training Complex on roadways passing through and serving growing and developing areas of the
302 community.
- 303 • Cumulative impacts of increased demand at Orogrande Range Camp for potable water from
304 WSMR supplies.

305 Other actions in the ROI that could combine with proposed actions at Fort Bliss to produce cumulative
306 infrastructure impacts include planned development in northeast El Paso and activities at WSMR.

307 Fort Bliss units propose to transport military vehicles and equipment via public roads from the Main
308 Cantonment Area to Doña Ana Range Camp and the North Training Areas, as well as northern portions of
309 McGregor Range, to conduct training exercises. Main arterials expected to be used include Martin Luther
310 King, Jr. Boulevard (Highway 213 in New Mexico) and US 54. Military convoys (some of which could
311 be long and require several days to transport equipment to and from the training areas) include heavy
312 equipment transporters that tend to slow overall traffic speed. These convoys could substantially reduce

313 level of service, especially on two-lane roads with little or no opportunities for passing. Roads that may
314 currently be underutilized and experiencing unrestricted flows could become more congested as general
315 population growth and development increased in this area of El Paso, as well as in communities served by
316 Highway 213 and US 54 in New Mexico. The cumulative impacts could be further exacerbated by
317 increased trans-border traffic on US 54. Potential adverse effects of military convoys in more developed
318 areas near the Main Cantonment Area would be mitigated by Texas Department of Transportation
319 projects to build overpasses over US 54 to separate military and civilian traffic.

320 Expansion of the range camps and range complexes on Fort Bliss is not expected to combine with other
321 actions to produce larger cumulative impacts. Orogrande Range Camp receives potable water from
322 WSMR. However, WSMR currently has no plans for major expansions that would significantly increase
323 its water demand.

324 **5.15.2.4 *Airspace Use and Management***

325 The important cumulative impact issues concerning airspace use and management considered in this
326 analysis are:

- 327 • Cumulative impacts from increased aircraft operations at Biggs AAF in combination with
328 increased airline traffic at El Paso International Airport resulting from population growth in the El
329 Paso region.
- 330 • Increased military operations in Special Use Airspace in the region.

331 Other actions in the ROI that have the potential to combine with proposed actions at Fort Bliss to produce
332 cumulative airspace impacts include the Phase One FCS test program at WSMR and the transformation of
333 the 49th Fighter Wing at Holloman AFB. Airspace use in connection with Phase One FCS testing would
334 be minor and not affect airspace use in any measurably way. The transformation of the 49th Fighter Wing
335 would involve bedding down F/A-22 aircraft at the base and using Special Use Airspace in the region,
336 including Restricted Areas overlying Fort Bliss, to conduct training, including supersonic flight
337 operations and use of self-protection chaff and flares.

338 Both current and projected aircraft operations at Biggs AAF are negligible in comparison to operations at
339 El Paso International Airport and too few to significantly affect airspace use or management. As the El
340 Paso region continues to grow, airline traffic at EPIA can be expected to increase. However, the
341 cumulative impact with increased operations at Biggs AAF is not expected to be significant.

342 With the stationing of at least one and potentially two CABs at Fort Bliss, helicopter flights to and within
343 Restricted Area airspace overlying the Fort Bliss Training Complex would increase. Unmanned aerial
344 vehicles would also operate in Restricted Areas and could be extended to other classes of airspace in the
345 future. Restricted Area airspace overlying McGregor Range is also used for air-to-ground training
346 operations on Centennial Range. In addition, the proposed F/A-22 aircraft beddown at Holloman AFB
347 would increase subsonic and supersonic training in Fort Bliss airspace, primarily at high altitude. The
348 cumulative use of this Special Use Airspace is not anticipated to adversely affect either military training
349 or civil airspace use, and any potential conflict would be managed through routine scheduling procedures.

350 **5.15.2.5 *Earth Resources***

351 The important earth resources cumulative impact issues considered in this analysis are:

- 352 • Cumulative changes in the transition states of ecological sites in the region due to increased
353 development, oil and gas production, and other military and non-military uses.
- 354 • Potential for wind erosion caused by off-road vehicle maneuvers to generate increased fugitive
355 dust.

- 356 • Potential for cumulative increases in sedimentation from increased water erosion on Fort Bliss
357 land in combination with other sources of sedimentation in down-stream surface waters.

358 Other projects in the ROI that could combine with proposed actions at Fort Bliss to produce cumulative
359 impacts on earth resources include off-road vehicle maneuvers planned in connection with Phase One
360 FCS tests at WSMR, expansion of oil and gas development on Otero Mesa outside of Fort Bliss, and
361 general construction and development in the ROI. Other influences that contribute to ground disturbance
362 and reduction in vegetation or surface crusts include ongoing recreational off-road vehicle use, livestock
363 grazing, and drought.

364 Much of the undeveloped land in the ROI, including Fort Bliss, is already partially degraded as a result of
365 past and current uses and weather conditions. Off-road recreational vehicles also disturb vegetation and
366 soil crusts. Much of the land is characterized by degraded shrub communities, mesquite coppice dunes,
367 and bare soils. The cumulative impacts of multiple disruptions over time have been significant as each
368 subsequent disruption has prevented recovery to a pre-disturbance state.

369 Continued disturbance can be expected to increase the amount of bare ground, and uncovered soils are
370 more susceptible to wind and water erosion. The proposed increase in off-road vehicle maneuvers at Fort
371 Bliss would result in increases in fugitive dust. Although the direct impact on regional air quality is not
372 expected to be significant outside the installation boundaries (see Section 5.6), visibility could be reduced
373 in nearby areas, especially during periods of high winds. Other ground-disturbing activities such as
374 grazing, agriculture, and construction would contribute to these effects, which are also exacerbated by
375 natural events such as sandstorms.

376 The drainages on the Fort Bliss Training Complex are in a closed basin, therefore increased water erosion
377 is not anticipated to contribute to cumulative sedimentation of surface waters.

378 **5.15.2.6 Air Quality**

379 The important air quality cumulative impact issues considered in this analysis are:

- 380 • Potential for increased emissions of criteria pollutants by Fort Bliss activities, in combination
381 with increased emissions due to population growth, to result in non-attainment of National
382 Ambient Air Quality Standards.
- 383 • Impact of increase in ground disturbance and exposure due to construction, off-road vehicle
384 traffic, grazing, and other activities that affect vegetative cover and soils on fugitive dust
385 generation and particulate matter emissions.
- 386 • Cumulative effects of increased human-caused dust generation in combination with natural wind-
387 blown dust events on ambient air quality in El Paso and Doña Ana Counties.

388 Other actions in the ROI that could combine with proposed actions at Fort Bliss to produce cumulative air
389 quality impacts primarily include construction of commercial, industrial, and residential facilities and
390 infrastructure to support the growing population in the ROI, along with associated stationary and mobile
391 sources of air pollutant emissions.

392 Section 5.6 presents projected construction emissions for facilities and infrastructure on Fort Bliss,
393 operational emissions on Fort Bliss, combustion emissions from military and private vehicles, and
394 fugitive dust from off-road vehicle maneuvers. While these emission sources are analyzed separately, air
395 quality in the ROI would be affected by the cumulative total of these sources, in addition to other off-post
396 sources. The forecast baseline population growth, in combination with Fort Bliss-induced population
397 changes, is projected to result in a 44-52 percent increase in the population of El Paso County between
398 2004 and 2015. This could ultimately result in exceedances of the NAAQS, especially of carbon
399 monoxide and particulate matter (PM₁₀) (for which the City of El Paso is in moderate non-attainment) and
400 of nitrogen oxides. PM₁₀ levels in El Paso and Doña Ana Counties are further aggravated by windblown

401 dust, especially during dust storms. Additional ground disturbance due to construction both on and off
402 post, in combination with agricultural uses and off-road vehicle use (both military and civilian), would all
403 contribute to potentially significant cumulative increases in PM₁₀ emissions in the ROI.

404 While air pollutant emissions from proposed activities at Fort Bliss are not expected to significantly affect
405 visibility in Class I areas such as Guadalupe National Park, cumulatively, increased emissions in the ROI
406 can be expected to contribute to increasing haze in those areas.

407 **5.15.2.7 Water Resources**

408 The important water resources cumulative impact issues considered in this analysis are:

- 409 • Cumulative impacts of increased demand for potable water due to actions at Fort Bliss, in
410 combination with increased population growth in both El Paso and Ciudad Juárez, on regional
411 water sources, including groundwater in the Hueco Bolson and surface water in the Rio Grande.
- 412 • Effect of drought and other climatic variations on water production to meet increased demand.

413 The principal other actions that could combine with proposed actions at Fort Bliss to affect water
414 resources are water management initiatives, including the Far West Texas Water Plan, plans by the
415 Bureau of Reclamation and International Boundary and Water Commission concerning management of
416 the Rio Grande, the desalination plant on Fort Bliss to be operated by EPWU, and EPWU plans to
417 provide potable water to Colonias not currently in their service areas.

418 Regional surface and groundwater resources have been dramatically affected by past management and
419 use. The Rio Grande has numerous dams, channels, and other improvements designed for flood control
420 or water storage. Agriculture has been a major historic user of Rio Grande water. The primary source of
421 potable water for El Paso and Fort Bliss has been groundwater from the Hueco Bolson. Historically,
422 groundwater withdrawals have exceeded the aquifer's ability to recharge and resulted in aquifer
423 drawdown, subsidence, and salt-water intrusion into the bolson. Ciudad Juárez also depends on the
424 Hueco Bolson for its potable water supply. Withdrawals from the Hueco Bolson by Ciudad Juárez grew
425 from approximately 15,000 acre feet per year in the 1960s to 66,000 acre feet per year by 1984, reflecting
426 the city's growth during that period. From 1903 through 1989, water levels in the bolson declined 150
427 feet in downtown El Paso and Ciudad Juárez.

428 The regional water management initiatives are aimed at slowing, stopping, or reversing the historic trends
429 and providing a sustainable water supply for the region. The desalination plant on Fort Bliss, for
430 example, is designed to use brackish water supplies in the Hueco Bolson, thereby preserving freshwater
431 supplies and reducing salt-water intrusions. Other projects, such as reinjection of treated wastewater, are
432 designed to increase aquifer recharge.

433 The principal recharge areas for the Hueco Bolson are in the Franklin and Organ Mountains, where runoff
434 infiltrates the coarse alluvial gravel fans. If all, or at least the critical alluvial fans, of Castner Range are
435 preserved, the Franklin Mountains' recharge capability will not be significantly affected. Future
436 development of recharge areas could affect the Hueco Bolson.

437 Both EPWU and Ciudad Juárez have plans to increase use of Rio Grande water to meet the demands of
438 population growth. EPWU has plans to use agricultural water rights and import water from other basins
439 to increase domestic water supply. The quality of Rio Grande water has declined over time due to
440 agricultural uses and increased salinity. In drought years when less surface water is available,
441 groundwater withdrawals are increased. This in turn results in increased potential for salt-water intrusion.

442 The impact of the increased demand for potable water generated by a growing population will be offset to
443 some degree by water conservation measures that have been successful in reducing per capita water
444 consumption in El Paso from 201 gallons per day in 1989 to 159 GPD in 2000 and 145 GPD in 2005.

445 Comments submitted on the Draft SEIS raised questions about the potential for global warming to result
446 in reduced water supply in the ROI at the same time that population growth is increasing the demand for
447 potable water. These comments referred to a report produced in July 2006 by the New Mexico Office of
448 the State Engineer/Interstate Stream Commission, “The Impact of Climate Change on New Mexico’s
449 Water Supply and Ability to Manage Water Resources” (Ref# 533). The report noted that Global Climate
450 Models contain a large degree of uncertainty and involve a wide array of assumptions, which affects their
451 precision and can lead to widely varying results. The study conducted by the state used an Accelerated
452 Climate Prediction Initiative model to develop a broad estimate of potential future changes in temperature
453 and precipitation. The report indicated that “by the end of this century, the American Southwest, and
454 more specifically New Mexico, can expect a significant increase in temperature, resulting in a decrease in
455 snowpack.” It further notes that “even moderate increases in precipitation would not offset the negative
456 impacts to the water supply caused by increases in temperature.” The report does not provide precise
457 predictions that can be used to assess cumulative impacts on water supply in the 20-year planning horizon
458 considered in this SEIS. It acknowledges that other existing climatic variations, such as drought cycles,
459 can lead to greater year-to-year and near-term fluctuations in water availability. As part of the nature of
460 the climate in the ROI, drought cycles are already incorporated in the planning conducted by water
461 resource agencies such as EPWU.

462 Valdosta State University conducted a study of archaeological tree-ring samples from southern New
463 Mexico to reconstruct precipitation over a 1,373-year period from 622 through 1994. The resulting
464 report, *A 1,373 Year Reconstruction of Annual Precipitation for the Southern Rio Grande Basin* (Ref #
465 550), shows a wide variability in precipitation levels, ranging from a low of less than 4 inches in the year
466 1407 to a high of over 15 inches in 1815, with an average of 9 inches. The report reflects a pattern of dry
467 and wet periods throughout the study period that has not changed markedly. The most severe long-term
468 drought is thought to have occurred between the years 940 and 1040, with other prolonged periods of low
469 precipitation occurring in 1270-1295, 1560-1600, and 1946-1965 periods. The wettest long-term period
470 is thought to have been between 1040 and 1210, with above average rainfall in the 14th and 17th Centuries.
471 The Valdosta study was an attempt to shed light on past environmental and cultural changes and is not
472 applicable to predicting future changes in precipitation or their effects.

473 **5.15.2.8 Biological Resources**

474 The important biological resources cumulative impact issues considered in this analysis are:

- 475 • Cumulative changes in ecological conditions in the region and increased desertification due to
476 development, grazing, and other ground-disturbing activities in combination with drought
477 conditions.
- 478 • Reduction and alteration of habitat, leading to reduced diversity of wildlife species.
- 479 • Increased pressures from urbanization, habitat loss or alteration, and human activity on species
480 listed as threatened or endangered under the Endangered Species Act.

481 Other actions in the ROI that could combine with proposed actions at Fort Bliss to produce cumulative
482 impacts on biological resources include increased development in rural areas and activities at WSMR.

483 Natural resources in the ROI have been in a state of transition since the beginning of livestock grazing in
484 the region. Developed areas like the City of El Paso and other communities have undergone the most
485 change, with complete alteration of ecological conditions and habitat and concomitant loss of indigenous
486 vegetation and wildlife. Undeveloped areas of Fort Bliss, as well as WSMR and adjacent public lands,
487 have been altered by past and present uses. Land in the Fort Bliss Training Complex supported livestock
488 grazing prior to military use, and much of the transition from historic grasslands to shrublands and
489 mesquite coppice dunes predates military presence. Drought conditions have also contributed to
490 increased desertification of the land in the region.

491 Ground disturbing activities such as off-road vehicle maneuvers in areas that have not transitioned to a
492 different ecological condition (as have areas already in coppice dunes) contribute to the desertification
493 process. A reduction in vegetation and cover typically leads to decreased wildlife richness and/or density.
494 Because land use on military installations is substantially less intensive than urban development or
495 agriculture, Fort Bliss has been able to maintain relatively high species richness, compared to other parts
496 of the region.

497 Plans to conduct limited off-road maneuvers at WSMR and expansion of oil and gas development on
498 Otero Mesa outside of Fort Bliss would include ground disturbing activities that can alter vegetation and
499 habitat conditions, but the footprint of disturbance associated with those proposals is relatively small
500 compared to proposed actions at Fort Bliss, and they are not expected to contribute measurably to the
501 transition of the regional ecology.

502 Overall cumulative ecosystem impacts will be determined by the effects that occur over the broader
503 landscape/ecosystem. While many wildlife species are tolerant of and adaptive to change, moving
504 beyond habitats that are stressed into more desirable habitats, large-scale ecological transitions will
505 incrementally decrease options for relocation and may reduce or eventually eliminate species from their
506 natural or current range, which may result in regional population impacts over the long term. This change
507 will result from both human activities and weather conditions (such as droughts) and be affected by
508 development trends that alter water consumption (from irrigation to municipal use) and the long-term
509 economic viability of some current land uses (e.g., livestock operations in the face of drought and
510 diminishing grasslands). Given the international expanse of the Chihuahuan desert ecosystem
511 (encompassing more than 200,000 square miles in the U.S. and Mexico), viable “cells” of sensitive
512 habitats (and their species) will likely survive, but they may be limited to discrete geographic areas
513 specifically identified for preservation.

514 Regionally, cumulative impacts on biological resources are likely to continue incrementally, decreasing
515 available grassland habitat, transitioning ecological states, and increasing desertification, as a result of
516 inevitable urban growth, development, military ground operations, and other smaller actions such as
517 increased oil and gas extraction. The areas proposed for off-road vehicle maneuvers on Fort Bliss
518 comprise 0.3 percent of the Chihuahuan Desert.

519 The Section 7 consultation process of the Endangered Species Act is designed to consider the individual
520 and cumulative impacts of actions on the viability of federally listed threatened and endangered species.
521 However, cumulative reductions in habitat will inevitably increase the chances of regional population
522 effects. Section 7 consultation by the Army, in combination with the Fort Bliss INRMP, will minimize
523 the installation’s contribution to impacts on species protected under the Endangered Species Act.

524 **5.15.2.9 Cultural Resources**

525 The primary cultural resources cumulative impact issue is the potential loss of historic properties and the
526 scientific information they may offer due to increased ground disturbance and increased exposure to
527 vandalism with the population growth. WSMR is also proposing limited off-road vehicle maneuvers in
528 connection with Phase One FCS testing. Off-road vehicle maneuvers at both Fort Bliss and WSMR have
529 the potential to damage archaeological resources. Archaeological resources have also been lost over time
530 due to increased development. In addition, construction at Fort Bliss also has the potential to affect
531 historic buildings. Both Fort Bliss and WSMR are executing Programmatic Agreements with the
532 Advisory Council on Historic Preservation and the cognizant State Historic Preservation Officers, which
533 will ensure that historic properties are managed to avoid, reduce, or mitigate adverse effects.
534 Development on private property, where cultural resources are not protected by federal law, has a higher
535 potential for adversely affecting resources that may have important cultural, scientific, or religious value.

536 **5.15.2.10 Noise**

537 Direct noise increases from training activities on the Fort Bliss Training Complex are not expected to
538 combine with other noise sources to produce cumulative impacts. Construction activities, increased
539 vehicle traffic, and general urbanization associated with population growth and development will cause
540 overall ambient noise levels to increase.

541 Aircraft noise from increased operations at Biggs AAF would result in increased exposure to elevated
542 noise levels in some areas of El Paso. EPIA also generates aircraft noise levels that are generally
543 incompatible with residential land use in residential areas to the south and southwest. Accelerated
544 population growth in the El Paso region could increase airline traffic at EPIA and resulting noise levels in
545 adjacent areas. However, this could be offset by increasingly quieter aircraft. Noise contours at EPIA in
546 2005 were substantially lower than they were in 1996.

547 **5.15.2.11 Safety**

548 The primary safety issue that could raise cumulative impact concerns is the potential for wildfires caused
549 by military operations in the Fort Bliss Training Complex. Wildfires can spread rapidly and damage
550 extensive areas, especially in grasslands and during windy and dry conditions. The fire hazard associated
551 with proposed increases in live-fire training and off-road vehicle maneuvers on Fort Bliss are generally
552 expected to be contained within discrete areas and not affect Otero Mesa, the area most susceptible to
553 cumulative impacts from wildfires. Most of the historic wildfires that have affected the Otero Mesa
554 portion of McGregor Range were caused by missile firings or lightning. Natural causes like lightning will
555 continue to combine with human-caused wildfires to generate cumulative impacts.

556 **5.15.2.12 Hazardous Materials and Items of Special Concern**

557 No important cumulative impact issues related to the proposed actions at Fort Bliss were identified for
558 hazardous materials and items of special concern. Increased industrial development and overall
559 population growth would result in increased hazardous waste generation, but no significant adverse
560 impacts have been identified as a result.

561 **5.15.2.13 Socioeconomics**

562 The principal cumulative socioeconomic impact issue considered in this analysis is the potential for
563 baseline population growth, independent of Fort Bliss-related increases, to further aggravate the effects of
564 the population growth induced by the mission changes at Fort Bliss on housing and community services,
565 as well as quality of life. Direct and indirect population effects from the actions at Fort Bliss will stress
566 the community's ability to meet the rapidly increasing housing demand. Baseline population growth
567 would further aggravate the impact. In addition to the staffing and facility increases required in law
568 enforcement and fire protection described in Section 5.13, baseline population growth would add further
569 to those needs. Medical services, which are already unable to meet the needs of the existing population,
570 would become especially stressed with the combination of baseline growth and Fort Bliss-induced
571 population increases.

572 The cumulative effect of multiple construction projects in the region to meet both military needs and
573 facilities and infrastructure needs associated with the increased population can be expected to put a strain
574 on the available labor pool, attracting temporary workers from out of the area to take advantage of the job
575 opportunities. This could, in turn, exceed the area's capacity to accommodate the temporary influx of
576 personnel, saturating the commercial lodging market over the next 5-7 years, on top of the more
577 permanent population in-migration.

578 Quality of life is subjective. In some respects, the economic activity stimulated by the changes at Fort
579 Bliss would have beneficial effects that could improve quality of life by increasing job opportunities and
580 income. As competition for housing, utilities, and services increases due to population growth, costs can

581 also be expected to increase. In addition, increased development and urbanization of the El Paso region
582 in general due to changes at Fort Bliss in combination with other activities will affect living conditions in
583 a variety of ways, ranging from physical changes in the environment to longer commuting times.

584 ***5.15.2.14 Environmental Justice***

585 No additional cumulative environmental justice issues have been identified other than those described in
586 Section 5.14. Cost of living increases, including higher housing costs, water rates, and energy costs, have
587 an overall greater impact on low-income populations than on the population in general, but the increases
588 themselves would be the same across the affected population and not disproportionately high and adverse
589 for minority or low-income populations.

1 **5.16 SUMMARY OF IRREVERSIBLE AND IRRETRIEVABLE**
2 **COMMITMENTS OF RESOURCES**

3 All alternatives considered in detail in this SEIS include construction of facilities, ranges, and other
4 infrastructure that involve commitment of construction materials and use of irretrievable petroleum
5 products in the form of fuel and chemicals. Training activities involving ground vehicles and aircraft
6 would also irretrievably commit non-renewable fossil fuel resources.

7 The potential for further drawdown of the Hueco Bolson due to increased withdrawals above the aquifer's
8 recharge rate could result in subsidence and irretrievably alter the aquifer's structure. This impact can be
9 avoided, however, by meeting more of the additional demand through other water sources or by
10 increasing reinjection of surface water or treated wastewater into the bolson.

11 While damage to land in the Tularosa Basin portion of McGregor Range from off-road vehicle maneuvers
12 may not be completely irreversible, the time required to recover from significant damage to the biological
13 crust and to vegetation and soil could be sufficiently long to render the impact nearly irreversible. This
14 would especially be the case if long-term use of the land for off-road vehicle maneuver resulted in a
15 change in landform due to erosion and/or change in the vegetative community and habitat.

16 It would be considered an irretrievable commitment if historic properties that may be eligible for listing in
17 the National Register of Historic Places were inadvertently lost or damaged during ground disturbing
18 activities or training, or due to vandalism.

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1 **5.17 SUMMARY OF RELATIONSHIP BETWEEN SHORT-TERM**
2 **USE OF THE ENVIRONMENT AND LONG-TERM**
3 **PRODUCTIVITY**

4 The use of land on Fort Bliss for military training including off-road vehicle maneuvers could result in a
5 long-term reduction in the productivity of that land for others uses. McGregor Range is public land
6 withdrawn for military use. The current and proposed military use of that land will have a long-term
7 effect that could impact its productivity for other uses if the land is returned to the public domain in the
8 future. Similarly, development in the Fort Bliss Main Cantonment Area and in the ROI to accommodate
9 population growth would commit land, especially in the El Paso area, to short-term urban land use and
10 affect long-term options for its use. Rural areas in the vicinity of Fort Bliss, especially in southern Doña
11 Ana County, would likely become more developed as a result of the Fort Bliss-induced influx of
12 population. However, increased growth and development are also expected to occur whether or not the
13 proposed actions are implemented on Fort Bliss. The expansion of the Fort Bliss mission is expected to
14 accelerate local growth, development, and urbanization.

15 El Paso and Fort Bliss currently withdraw water from the Hueco Bolson in quantities that exceed the
16 aquifer's ability to recharge. This drawdown is expected to continue independent of the actions proposed
17 at Fort Bliss. The increased water demand associated with the increase in personnel at Fort Bliss, coupled
18 with associated direct and indirect population growth, may result in increases in withdrawals from the
19 bolson and accelerate the resulting drawdown in the aquifer's water table, reducing its long-term
20 productivity. However, El Paso Water Utilities does not expect any increase in withdrawals from the
21 Hueco Bolson to last for more than three years, which would not significantly change the rate of
22 drawdown. The impact of increased water demand would be offset to some degree by the desalination
23 plant on Fort Bliss that will be operated by EPWU, which is expected to extend the useful life of the
24 aquifer's freshwater resource. Implementation of projects to acquire water from other sources, including
25 projects to inject water to recharge the Hueco Bolson, would also mitigate the impact.

1 **5.18 SUMMARY OF PROBABLE ADVERSE IMPACTS THAT**
2 **CANNOT BE AVOIDED**

3 This section summarizes adverse impacts identified in Chapter 5 for which mitigation is either infeasible
4 or impractical and that are therefore unavoidable. Probable unavoidable impacts from the alternatives
5 include the following:

- 6 • Ground disturbance during construction and off-road vehicle maneuvers.
- 7 • Wind erosion of areas exposed by off-road vehicle maneuvers and resulting temporary
8 degradation in air quality due to dust generation. Although erosion control measures are
9 available, it is not feasible to implement these measures on the scale needed to prevent erosion
10 and fugitive dust generation in the training areas used for off-road vehicle maneuvers.
- 11 • Changes in vegetation type and cover and in habitat type and quality in areas that are heavily used
12 for off-road vehicle maneuver training. Although most areas identified for off-road vehicle
13 maneuvers under any of the alternatives already provide limited habitat for wildlife, some loss of
14 habitat value and mortality of individual animals is unavoidable.
- 15 • Impacts to individual plants and animals, including sensitive species, in numbers not expected to
16 significantly affect populations.
- 17 • Loss of some archaeological resources in the training areas
- 18 • Increase in noise exposure in areas adjacent to the live-fire ranges used for large caliber weapons
19 training.
- 20 • Increased development of the El Paso area to accommodate the increase in population, both direct
21 and induced by the economic activity associated with the actions at Fort Bliss. Increased
22 urbanization, reduction in open space, and change in visual character are likely unavoidable
23 consequences of this development.
- 24 • Increase in utilities use, including potable water consumption, wastewater treatment, solid waste
25 disposal, and energy, in many cases leading to the need for additional infrastructure and/or
26 resources sooner than previously planned by the various service providers.

6.0 MITIGATION AND MONITORING

This chapter presents a summary of mitigation measures that have the potential to reduce adverse environmental impacts from the Proposed Action and other alternatives analyzed in this SEIS. Section 6.1 summarizes mitigation measures that have already been incorporated in the alternatives, as described in Chapters 2 and 3. Section 6.2 presents a broad range of possible additional mitigation measures to be considered by the Army and other entities, consolidated from the sections in Chapter 5, and incorporating other measures identified in the public review of the Draft SEIS. The Record of Decision for this SEIS will identify those mitigation measures that the Army will implement. Section 6.3 summarizes monitoring activities that will be employed by the Army at Fort Bliss to track environmental changes, support development of adaptive management strategies, and assess the effectiveness of mitigation measures.

Council on Environmental Quality Regulations for Implementing the Procedural Provisions of NEPA require environmental impact statements to identify measures to mitigate adverse environmental impacts (40 CFR 1502.14(f) and 1502.16(h)), including measures that are outside the lead agency's jurisdiction. Paragraph 1508.20 of the regulations defines mitigation as including the following:

- Avoiding impacts by not taking certain actions;
- Minimizing impacts by limiting the implementation of the action;
- Repairing, rehabilitating, or restoring the affected environment following actions taken;
- Reducing or eliminating the impacts over time by preservation and maintenance operations;
- Compensating for the impact by replacing or providing substitute resources or environments.

The existing land use planning and management framework at Fort Bliss supports an active environmental management program to ensure that operations, physical development, and training activities are performed in compliance with all applicable laws and regulations. The Fort Bliss Directorate of Environment implements natural and cultural resource conservation and environmental quality programs to provide the optimum environment for supporting the military mission and to maintain, protect, and improve environmental quality and preserve ecological conditions. The Fort Bliss ITAM program is responsible for maintaining and rehabilitating training lands to enhance and sustain their capability.

6.1 MITIGATION MEASURES INCORPORATED IN THE ALTERNATIVES

A number of mitigation measures have been incorporated in the alternatives through site selection, design, and management procedures. They include four primary avenues for avoiding or reducing adverse environmental impacts: (1) siting, design, and construction of facilities and training infrastructure, (2) the Real Property Master Plan and other master planning processes, (3) the installation environmental compliance program and associated plans and procedures, and (4) the environmental impact analysis process.

6.1.1 Siting, Design, and Construction Mitigations

Section 3.2 discusses the procedures used to identify proposed locations for facilities in the Main Cantonment Area and Fort Bliss Training Complex required to support Army Transformation and Base Realignment and Closure. It also describes the process and criteria used to identify the land use alternatives considered in the SEIS. This process minimized potential environmental impacts by:

- Maximizing use of existing facilities through renovation and reuse of buildings on the Main Post that will be vacated by Air Defense Artillery units leaving Fort Bliss.

- 44 • Locating new BCT facilities in enclaves or “campuses” that encompass unaccompanied barracks;
45 administrative, maintenance, training, and other mission facilities; and community services, in
46 order to maximize functional adjacencies and reduce commuting and transportation requirements.
47 In addition, the BCT campuses would be located on the east side of the Main Cantonment Area,
48 nearest to the South Training Areas, in order to minimize tank and heavy equipment travel
49 through the Main Cantonment Area.
- 50 • Siting new live-fire ranges within existing and proposed range complexes to consolidate heavy
51 activity and minimize conversion of training land. Criteria used in siting the additional live-fire
52 ranges included maximizing the efficiency of range use, overlaying on existing ranges and impact
53 areas when possible, clustering small arms and individual qualification ranges around range
54 camps, and grouping the ranges in complexes. The majority of live-fire ranges are located in
55 areas already containing similar facilities, including Doña Ana Range, Meyer Range, McGregor
56 Range Camp, and the Forward Area Weapons sites. New live-fire ranges that do not fit within
57 those areas are proposed to be consolidated in the new Orogrande Range Complex, which is sited
58 in the location of the existing Orogrande and SHORAD ranges.
- 59 • Avoiding the most environmentally sensitive areas of the Fort Bliss Training Complex in the
60 formulation of four land use alternatives for meeting off-road vehicle maneuver requirements.
61 All four land use alternatives would concentrate off-road vehicle activity in the Tularosa Basin
62 portion of Fort Bliss, primarily in ecosites that have already degraded from their historic peak
63 potential. No land use changes are proposed for the Otero Mesa grasslands and the Sacramento
64 Mountains foothills that contain the highest species diversity.

65 In addition, various conservation measures are being incorporated in facilities designs. For example, new
66 military family housing under the Residential Communities Initiative incorporates water conservation
67 measures such as xeriscaping.

68 **6.1.2 Real Property Master Plan and Other Plans**

69 The RPMP, Training Development Concept/Range Complex Master Plan, Integrated Cultural Resources
70 Management Plan, Integrated Natural Resources Management Plan, and Integrated Training Area
71 Management program described in Section 2.1 provide processes for sustaining environmental
72 stewardship in future use and development of Fort Bliss lands. All of these plans will be updated as
73 appropriate to reflect the alternative selected pursuant to this SEIS.

74 These plans are designed to achieve, among other things, the following goals (see Section 2.1 for
75 complete listing):

- 76 • Improvement of functional efficiency by locating interrelated activities in proximity to one
77 another.
- 78 • Development and operation of the installation in harmony with the surrounding community.
- 79 • Coordination of on-post natural and cultural environment in a manner consistent with effective
80 military training and adherence to environmental guidance and laws.
- 81 • Improvement of traffic circulation and functional effectiveness to reduce intra-cantonment travel
82 and encourage pedestrian circulation.
- 83 • Regional cooperation on infrastructure systems.
- 84 • Reduction of long-term energy and operations and maintenance inefficiencies.
- 85 • Integration of important environmental needs into all planning and construction projects.

86 • Protection and management of the installation’s cultural resources in compliance with applicable
87 laws and regulations and in support of the overall mission. Fort Bliss has executed a
88 Programmatic Agreement with the Texas and New Mexico State Historic Preservation Officers,
89 the Advisory Council on Historic Preservation, and interested Tribes for management of historic
90 properties on the installations.

91 • Conservation of Fort Bliss natural resources and compliance with related laws and regulations
92 while maintaining quality training lands.

93 • Optimum, sustainable use of training lands.

94 Section 2.1 also identifies specific activities to be accomplished through the PA/ICRMP, INRMP, and
95 ITAM program. Many of these activities involve surveying and monitoring installation lands and natural
96 and cultural resources and documenting their conditions for use in developing adaptive management
97 processes. These activities will continue to be utilized on a regular basis to provide feedback on the need
98 for mitigation measures and the success of their implementation (see Section 6.3).

99 **6.1.3 Environmental Compliance Program**

100 The Fort Bliss Directorate of Environment is responsible for achieving and maintaining compliance with
101 all applicable laws and regulations governing air and water quality, waste management, and pollution
102 prevention. Section 2.1.6 describes various compliance plans and Standard Operating Procedures, which
103 contain specific activities and requirements for ensuring compliance. They include the following:

104 • Solid Waste Management Plan, which includes an active recycling program.

105 • Storm Water Management Plan, which specifies Best Management Practices for minimizing
106 storm water pollutants.

107 • Waste Analysis Plan, which documents procedures for classifying wastes to ensure compliant
108 management of all waste streams generated at Fort Bliss.

109 • Spill Prevention, Control, and Countermeasures Plan, which establishes responsibilities, duties,
110 procedures, and resources for containing, mitigating, and cleaning up oil and hazardous substance
111 spills.

112 • Asbestos Management Plan, which defines procedures for minimizing releases of and exposure to
113 asbestos fibers.

114 • Lead Hazard Management Plan, which specifies procedures for identifying lead-based paint,
115 reviewing any activity that might disturb lead-based paint, and protecting housing occupants and
116 workers from exposure to sources of lead poisoning.

117 • Pollution Prevention Plan, which identifies specific targets for reducing or eliminating use of
118 hazardous and ozone depleting chemicals; water consumption and energy use; and generation of
119 air pollutants, non-hazardous solid waste, and toxic and hazardous waste (see Section 4.12.3.4).

120 **6.1.4 Range Management**

121 The Fort Bliss Range SOP contains specific requirements and restrictions for all users of the Fort Bliss
122 Training Complex, including measures for prevention of and response to environmental damage. Chapter
123 14 of the Range SOP addresses Environmental Stewardship and Protection, and Chapter 15 addresses
124 Hazardous Material and Hazardous Waste Management. Included are checklists to be used in the field
125 for items such as fuel bladder sites and inspection of waste accumulation points. The Range SOP will be
126 updated as needed to incorporate the selected alternative and adopted mitigation measures in the ROD for
127 this SEIS.

128 All requests for use of the Fort Bliss Training Complex are scheduled through the Range Facility
 129 Management Support System and are reviewed for compliance with the Range SOP, safety procedures,
 130 and environmental requirements and restrictions, including observation of restricted areas and limited-use
 131 areas. Restricted areas are clearly marked on all range maps as “restricted areas” and are uploaded into
 132 the GIS section of RFMSS for use by training planners, so they can be considered when RFMSS and
 133 Form 88 requests are submitted. The requester provides grid coordinates for any fixed sites, bivouac
 134 areas, and troop/vehicle concentrations. All requests for off-road maneuver and field training exercises
 135 are sent to DOE for approval prior to scheduling. DOE checks to see if any protected biological resources
 136 or historic properties are present at the requested locations. If they are, the unit is provided alternative
 137 near-by locations that avoid protected resources/sites. This procedure is briefed to all incoming units, the
 138 Commanders Training Course, and the Environmental Compliance Officers course.

139 In the field, restricted areas are marked around the perimeter with siber stakes (t-post with reflector tubes)
 140 and “Off Limits” signs. Periodic inspections of units in the field are conducted by Range Liaison
 141 personnel to monitor for compliance with site restrictions and other environmental requirements and to
 142 identify any adverse effects from training.

143 **6.1.5 Environmental Impact Analysis Process**

144 Section 2.2 describes Fort Bliss’ process for reviewing future installation projects and activities in
 145 compliance with NEPA. Appendix A details the methodology and criteria that will be used to evaluate
 146 mission activities, projects, and environmental management actions to assess their potential for generating
 147 significant environmental impacts, as well as determine the level of NEPA analysis and documentation
 148 needed. It includes procedures for environmental review of unit requests for use of ranges and training
 149 lands through RFMSS.

150 **6.2 OTHER POSSIBLE MITIGATION MEASURES**

151 **Table 6-1** presents a summary of potential mitigations that have been identified through the SEIS process
 152 and that are under consideration by the Army in its decision-making. It also identifies possible
 153 mitigations that could be adopted by other entities to reduce impacts from the Proposed Action and other
 154 alternatives. The table identifies the impact that each mitigation addresses, mechanisms for implementing
 155 the mitigation, and alternatives to which the mitigation applies. The measures listed in the table address
 156 various types and levels of impacts or potential impacts, not just significant adverse impacts. The Army
 157 will identify which mitigation measures it will implement in the Record of Decision.

158 **Table 6-1. Summary of Possible Mitigation Measures**

<i>Impact</i>	<i>Mitigation Measure</i>	<i>Implementation Mechanisms</i>	<i>Alternative</i>
Land Use			
Public access affected by additional use of training ranges	Develop joint transportation and access plan with BLM to manage public access and identify off-limits or hazardous areas.	BLM RMPA; range permit process	1, 2, 3, 4
Impacts from off-road vehicle maneuvers in Grazing Units 1, 2, and 3	Work with BLM and leaseholders to identify issues and determine future grazing in affected training areas.	BLM RMPA	2, 4
Damage to fences and other range improvements in grazing areas from off-road vehicle maneuvers	Identify fences and other range improvements as off-limits.	Range SOP; RFMSS	2, 4
Main Cantonment Area Infrastructure			
Additional traffic and delays due to development and associated personnel and population increases	Transportation planning; roadway widening projects.	El Paso Metropolitan Planning Organization	1, 2, 3, 4

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

<i>Impact</i>	<i>Mitigation Measure</i>	<i>Implementation Mechanisms</i>	<i>Alternative</i>
Increased wastewater treatment demand exceeding available capacity	Reroute wastewater to plants with additional capacity; develop additional capacity.	El Paso Water Utilities	1, 2, 3, 4
Increased storm water runoff from new impervious areas	Construct additional storm water management facilities.	Military construction program	No Action, 1, 2, 3, 4
Increased solid waste generation on post	Develop new on-post landfill. Transport refuse to off-post landfills.	Military construction program; installation operations and maintenance	No Action, 1, 2, 3, 4
Increased peak electrical and natural gas demands	Add new substations and gas lines; energy-efficient facility design.	El Paso Electric Company; El Paso Gas Company; military construction program; RCI	1, 2, 3, 4
Training Area Infrastructure			
Delay of civilian traffic on routes between Main Cantonment Area and Fort Bliss Training Complex	Regulate size, spacing, and speed of military vehicle convoys on Martin Luther King, Jr. Blvd./NM Highway 213. Use internal installation routes when practicable.	Range SOP	No Action, 1, 2, 3, 4
Delay of civilian traffic on NM Highway 506	Provide traffic control during unit crossings of NM Highway 506; limit typical civilian traffic delays to 15 minutes or less; notify Otero County Administrator and BLM of Highway 506 closures.	Range SOP	2, 4
Increased demand for utilities and energy	Upgrade wastewater treatment facilities, drainage/storm water facilities, and solid waste and liquefied petroleum gas storage capacity, as needed, at range camps.	Military construction program; range improvements	No Action, 1, 2, 3, 4
Damage to water pipelines from off-road vehicle maneuver	Increase depth of or develop hardened crossings over water pipelines on McGregor Range in areas open to off-road vehicle maneuver. Place water pipelines off limits.	Military construction program; Range SOP	1, 2, 3, 4
Airspace Use and Management			
Increased operations in the Restricted Areas overlying the Fort Bliss Training Complex	Manage through scheduling, balancing training requirements with airspace availability.	Range scheduling; RFMSS	1, 2, 3, 4
Earth Resources			
Accelerated soil erosion during facility construction	Install and maintain Best Management Practices, erosion and sediment controls, and storm water management measures during construction.	U.S. Army Corps of Engineers construction contract terms and conditions	No Action, 1, 2, 3, 4
Accelerated soil erosion in training areas	Establish earth cover; add soil binding materials to the ground surface in areas of concentrated development and use. Install artificial or vegetative windbreaks in highly erosive areas. Perform	Range construction contract terms and conditions; range maintenance; ITAM	1, 2, 3, 4

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

<i>Impact</i>	<i>Mitigation Measure</i>	<i>Implementation Mechanisms</i>	<i>Alternative</i>
	soil erosion impact surveys and implement Land Rehabilitation and Maintenance to repair damage caused by maneuver training.		
Accelerated soil erosion in loamy soils in the vicinity of Hackberry Tank	Limit maneuver activities in this area; restrict concentrations of vehicles and personnel in this area.	Range SOP; RFMSS	3, 4
Erosion of range access roads	Maintain range roads and tank trails to minimize erosion.	Directorate of Public Works; ITAM; USACAS	1, 2, 3, 4
Air Quality			
Temporarily increased emissions from construction equipment	Use efficient construction practices; avoid long periods with equipment engines idling; carpooling of construction workers; use post-combustion control equipment on heavy duty diesel engines.	U.S. Army Corps of Engineers construction contract terms and conditions	No Action, 1, 2, 3, 4
Temporarily increased fugitive dust during construction activities	Frequent spraying of water on exposed soil during construction and proper soil stockpiling methods; minimize size of exposed areas.	U.S. Army Corps of Engineers construction contract terms and conditions	No Action, 1, 2, 3, 4
Increased emissions from privately owned vehicles	Encourage car pooling.	Fort Bliss policy; El Paso Metropolitan Planning Organization	No Action, 1, 2, 3, 4
Increased fugitive dust from military vehicle convoys	Regulate convoy routes, spacing, and speed. Apply surface treatments (e.g., dust suppressants, gravel) on heavily traveled segments of unpaved range roads and tank trails. Construct or upgrade internal range roadways that lead to training areas away from installation boundaries.	Range SOP; DPW; ITAM; USACAS	No Action, 1, 2, 3, 4
Increased fugitive dust from off-road vehicle maneuver	Reduce training during periods of high wind.	Range SOP	No Action, 1, 2, 3, 4
Water Resources			
Increased demand for potable water leading to increase in withdrawal of fresh water from Hueco Bolson and potential aquifer drawdown	Accelerate implementation of projects for alternative water sources; increase desalination capability.	El Paso Water Utilities	1, 2, 3, 4
Increased demand for potable water taxing fresh water resources	Use more reclaimed water for landscaping on post.	Fort Bliss and EPWU	1, 2, 3, 4
Potential for storm water contamination from hazardous material spills	Construct containment systems such as bermed areas for fuel bladders in Forward Area Refueling Points and other hazardous materials handling areas.	Range improvements	1, 2, 3, 4
Biological Resources			
Loss of habitat due to construction	Minimize size of construction zone; revegetate bare ground after construction.	U.S. Army Corps of Engineers and range construction contracts terms and conditions	No Action, 1, 2, 3, 4

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

<i>Impact</i>	<i>Mitigation Measure</i>	<i>Implementation Mechanisms</i>	<i>Alternative</i>
Damage to vegetation and loss of habitat from off-road vehicle maneuver	Where practicable and appropriate, rotate off-road vehicle training among training areas to provide for recovery or restoration of vegetation; invasive weed monitoring and control.	INRMP; ITAM program; Range SOP; pest management program	1, 2, 3, 4
Damage to grasslands from off-road vehicle maneuver	Limit maneuver activities in grasslands; restrict concentrations of personnel and vehicles in grasslands.	Range SOP; RFMSS	1, 2, 3, 4
Damage to wetlands and arroyo-riparian areas	Establish limited-use area buffer of 50 meters around arroyo-riparian habitat; limit crossing in these habitats to a small number of defined points; perform selected habitat improvements; invasive weed monitoring and control.	Range SOP; INRMP; RFMSS	No Action, 1, 2, 3, 4
Damage to grasslands and arroyos in southeast training areas of McGregor Range	Restrict concentrations of personnel and vehicles in grasslands.	Range SOP; RFMSS	3, 4
Impacts on sensitive species from construction, maintenance, and training activities	Identify Restricted areas and Limited-use areas in sensitive species habitat.	INRMP; Range SOP; RFMSS	No Action, 1, 2, 3, 4
Cultural Resources			
Adverse impact from renovation or new construction to properties in the Main Cantonment Area that are on or eligible for listing on the National Register of Historic Places	Adhere to SOPs in the Programmatic Agreement; consult with Fort Bliss HPO during facility design; follow Secretary of the Interior Standards for the Rehabilitation of Historic Buildings.	PA/ICRMP; installation Architectural Design Guide; facility design specifications	No Action, 1, 2, 3, 4
Adverse effects to historic properties from training activities	Establish Restricted areas as appropriate; mitigate potential adverse effects in accordance with procedures in PA.	PA; Range SOP; RFMSS	No Action, 1, 2, 3, 4
Loss of unrecorded archaeological resources during construction	Survey facility sites prior to construction; stop construction activities if unknown archaeological deposits uncovered; consult with Fort Bliss HPO and adhere to SOPs in the PA to mitigate potential adverse effects to NRHP-eligible historic properties.	PA; U.S. Army Corps of Engineers construction contract terms and conditions	1, 2, 3, 4
Loss of archaeological sites due to off-road vehicle maneuver	Survey 30 percent of unsurveyed maneuver lands; implement continuing survey program (target of 10,000 acres/year) in unsurveyed areas, focusing on areas that receive greater military use; establish Restricted areas and Limited-use areas as appropriate; mitigate potential adverse effects to historic properties in accordance with procedures in the PA.	PA/ICRMP; Range SOP; RFMSS	1, 2, 3, 4

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

<i>Impact</i>	<i>Mitigation Measure</i>	<i>Implementation Mechanisms</i>	<i>Alternative</i>
Noise			
Elevated helicopter noise in residential areas, especially during night operations	Route helicopter traffic between Biggs AAF and the Fort Bliss Training Complex over Fort Bliss land.	Combat Aviation Brigade SOP	1, 2, 3, 4
Elevated helicopter noise at the town of Orogrande	Route helicopter traffic between Orogrande Range Camp and the DAGIR at sufficient distance from Orogrande to keep Day-Night Average Sound Levels at residences in the town below 65 ADNL.	Combat Aviation Brigade SOP	1, 2, 3, 4
Incompatible noise from large-caliber weapons firing	Restrict new residential development in areas with Day-Night Average Sound Levels above 62 CDNL.	City of El Paso, El Paso County, Doña Ana County, Otero County plans and zoning ordinances	No Action, 1, 2, 3, 4
Incompatible noise levels in off-post residential areas due to military activities	Provide sound attenuation of existing residences exposed to Day Night Average Sound Levels above 62 CDNL and 65 ADNL.	Army encroachment prevention programs	No Action, 1, 2, 3, 4
Safety			
Risk of wildfires in Fort Bliss Training Complex	Units furnish on-site fire-response personnel and equipment for all training exercises and report all fires immediately to Range Control.	Range SOP	No Action, 1, 2, 3, 4
Risk of wildfires in Fort Bliss Training Complex	Avoid use of fire-producing ammunition and flares in high-risk areas such as grasslands during extremely dry and windy conditions.	Range SOP	No Action, 1, 2, 3, 4
Risk of wildfires in Fort Bliss Training Complex	Establish schedule to monitor and maintain strategic fire breaks.	DPW	No Action, 1, 2, 3, 4
Preclude off-post explosive safety impacts	Site all live-fire ranges in accordance with safety criteria to ensure all Surface Danger Zones remain within installation boundaries.	Range Complex Master Plan; Future Range Mission Analysis Planning	No Action, 1, 2, 3, 4
Hazardous Materials and Items of Special Concern			
Increase in generation of hazardous waste and items of special concern	Ensure proper storage and disposal of hazardous waste and items of special concern (e.g., asbestos) and compliance with regulatory requirements; reduce use of hazardous materials.	U.S. Army Corps of Engineers, RCI, and range construction contracts terms and conditions; Range SOP	No Action, 1, 2, 3, 4
Risk of release of hazardous materials and petroleum products	Continue aggressive inspection and maintenance program to avoid releases and minimize environmental impacts; comply with USEPA and applicable state notification requirements.	Waste Analysis Plan; SPCC Plan; Range SOP; Range Liaisons	No Action, 1, 2, 3, 4

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

<i>Impact</i>	<i>Mitigation Measure</i>	<i>Implementation Mechanisms</i>	<i>Alternative</i>
Socioeconomics			
Increased housing demand from Fort Bliss military personnel	Construct additional on-post housing.	Housing Requirements and Market Analysis; RCI	1, 2, 3, 4
Impact of increase in student population on area schools	Military student impact aid; additional grants and funding for school improvements	DoD Office of Economic Adjustment consultation and assistance; El Paso and Ysleta ISD plans and programs	1, 2, 3, 4
Impact of increased demand for medical services on top of existing shortfalls	Establish medical school in El Paso; create state healthcare infrastructure fund; provide financial incentives for physicians and healthcare professionals.	Team El Paso Healthcare Council, Texas Tech University, University of Texas at El Paso plans and programs	1, 2, 3, 4

159 6.3 MONITORING

160 Monitoring will be conducted at Fort Bliss for two main purposes: (1) support adaptive management of
 161 training lands and (2) evaluate the effectiveness of mitigation measures. Future monitoring activities at
 162 Fort Bliss will depend on the availability of funding. Planned monitoring activities are listed in Tables 2-
 163 1, 2-2, and 2-3 and include remote sensing analysis confirmed through field surveys of soils erosion,
 164 vegetation, wildlife populations, and cultural resources.

165 As part of adaptive management, monitoring will assist in determining what mitigation measures are
 166 needed and where they need to be implemented. It is important to recognize that monitoring and
 167 implementation of mitigation measures are an iterative and ongoing process that must regularly be
 168 adapted for site-specific conditions. Under adaptive management, proposed mitigations are implemented,
 169 a period of monitoring and research occurs, and activities are modified based on an analysis of the data
 170 collected, with cycles of further measurement and adjustment to reach and sustain management
 171 objectives.

172 Fort Bliss already employs adaptive management as an effective approach to reducing adverse effects of
 173 training. After surveying and monitoring FTX sites on Otero Mesa, Fort Bliss adjusted the rotation
 174 schedule to reflect different levels of recovery among the sites, resting less resilient sites for longer
 175 periods between use. Restricted and limited-use areas are monitored for compliance with use restrictions,
 176 and when violations are identified, an investigation is conducted and the cause is rectified. Lessons
 177 learned from these investigations have resulted in modifications in the way units are informed about use
 178 restrictions and educated in environmental awareness. Changes have included new signs and markers to
 179 help soldiers comply with the restrictions. Fort Bliss is implementing an Environmental Management
 180 System that will monitor environmental compliance and waste reduction metrics and support adaptive
 181 management programs in the future. The EMS includes “root cause analysis” as part of the process
 182 designed to document and correct problems.

183 The Fort Bliss ITAM office is preparing a Range and Training Land Assessment protocol to identify
 184 Land Rehabilitation and Maintenance needs and establish management objectives and projects to respond
 185 to those needs. The overall goals of the RTLA program are to assess the impacts of live training and
 186 testing activities, recommend options for sustained use, and prioritize and assess land management

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

187 activities in order to maximize the capability and accessibility of the lands to meet the training mission.
188 The RTLA will support LRAM by organizing and prioritizing projects so that available funding is
189 concentrated on the highest priority needs.

190 The near-term focus of the Fort Bliss RTLA includes the following activities:

- 191 • Work with Fort Bliss DOE to establish benchmarks for measuring the impact of new missions
192 and training activities. DOE has used remote sensing to classify ecosite types and is ground
193 truthing these classifications with field plots. These plots will be adapted and expanded through
194 the RTLA program.
- 195 • Identify areas susceptible to water erosion that may create a safety hazard, reduce accessibility to
196 training lands, or impede maneuver. Many of the water erosion problems that occur on Fort Bliss
197 are created by tank trails and unpaved range roads channeling storm-water runoff. The general
198 management objective for unpaved roads in the Fort Bliss Training Complex is to minimize
199 transport of sediment and concentrated runoff from roadways to drainages and to provide safe
200 driving conditions for vehicles. Arroyos generally contain vegetation that stabilize the soil, while
201 tank trails and range roads are devoid of this protection and can rapidly deteriorate during storm
202 events. RTLA plans to ground truth all erosion points along range roads, tank trails, and Forward
203 Area Weapon sites to detect erosion problems that may slow down or stop training. This analysis
204 will then be used to identify future LRAM projects. The objective of this effort is to prioritize
205 rehabilitation projects to protect the training mission.
- 206 • Map and monitor areas of off-road vehicle maneuver to evaluate changes in vegetative cover.
207 This will be accomplished through analysis of remote sensing combined with field survey to
208 identify changes in vegetation and cover. The objective of this effort is to determine thresholds in
209 the extent of bare ground that lead to ecosite transition and identify the most viable rehabilitation
210 strategy to inhibit ecosite decline.
- 211 • Maintain grasslands and shrub invaded grasslands. Grasslands will be monitored by establishing
212 additional vegetation plots and through remote sensing analysis. The objective of this effort is to
213 identify where measures to sustain the diversity of ecological conditions in the Fort Bliss Training
214 Complex should be applied.
- 215 • Map and monitor concentrated use areas (e.g., bivouac and assembly areas). The objective of this
216 effort is to develop recommendations for dispersing and reducing the intensity of disturbance
217 from those uses. This information will also be used to determine the best rehabilitation strategy
218 for disturbed areas.

219 RTLA will support LRAM by monitoring past, current, and future rehabilitation and maintenance projects
220 to assess project success, determine the durability of mitigations, and analyze the effect on surrounding
221 areas. The analysis of monitoring results will be used for iterative improvements to mitigation measures.

222 Fort Bliss DOE also conducts monitoring in support of natural and cultural resources management. DOE
223 collects and analyzes remote sensing data to identify changes in vegetation conditions. DOE biologists
224 continue to monitor species lists and conduct planning level surveys of suitable habitat for the presence of
225 sensitive species. Professional archaeologists at Fort Bliss perform periodic checks of restricted areas and
226 properties eligible for listing on the NRHP near grid locations that have been requested for training use
227 through RFMSS. Adverse effects to historic properties from training will be documented in a Record of
228 Historic Property Consideration for consultation with the SHPO, ACHP, and Tribes that are parties to the
229 PA. Appropriate mitigation will be developed in consultation with the parties to the PA, which could
230 include controlling access to the site, data recovery, or other measures.

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8.0 GLOSSARY

Acre-foot (af)	The volume of water that covers 1 acre to a depth of 1 foot; approximately 326,000 gallons.
Active Component	The part of the U.S. Army comprised of full-time, active duty military personnel.
Adverse Effect	A term used to characterize the impact of an action on a historic property (property listed in or eligible for listing in the National Register of Historic Places). An adverse effect is one that destroys, damages, or alters the qualities of a historic property, including relevant features of its environment or use that contribute to its eligibility for listing.
Airspace management	The coordination, integration, and regulation of the use of airspace of defined dimensions.
Ambient Air Quality Standards (AAQS)	Standards established on a state or federal level that define the limits for airborne concentrations of designated criteria pollutants (NO ₂ , SO ₂ , CO, PM ₁₀ , O ₃ , and Pb) to protect public health with an adequate margin of safety (primary standards) and to protect public welfare, including plant and animal life, visibility, and materials (secondary standards).
Aquifer	A body of rock that contains enough saturated permeable material to transmit groundwater and to yield significant quantities of groundwater to wells and springs.
Archaeological Resource Protection Act	Law that strengthens preservation and protection laws through civil and criminal felony-level penalties for the destruction of resources and sites (enacted 1979).
Army Campaign Plan (ACP)	The detailed plan for implementing Army Transformation.
Army Transformation	A 30-year, phased program to change U.S. Army doctrine, training, organization, installations, materiel, and personnel to be able to respond more rapidly to different types of operations requiring military action. The transformation is intended to fulfill the Army vision for a force that is more responsive, deployable, agile, versatile, lethal, survivable, and sustainable.
Asbestos	Any of several minerals (e.g., chrysotile) that readily separate into long flexible fibers suitable for use as a noncombustible, nonconducting, or chemically-resistant material. Asbestos has been used in the construction of floor tile, wall panels, brake pads in vehicles, ceiling tile, pipe material, and as insulating material around pipes and buildings. Inhalation of asbestos fibers can cause lung cancer.
Attainment area	A region that meets the National Ambient Air Quality Standards for a criteria pollutant under the Clean Air Act.

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

Attenuation of sound	The diminishing of any noise level with distance from the source in a mathematically predictable manner. Under normal conditions, distance alone reduces the noise level by 6 decibels for each doubling of the distance from the source. For example, a noise source that produces an 80 dB noise level at a distance of 50 meters would produce 74 dB at 100 meters. Absorption of sound energy by the atmosphere reduces noise levels even further.
Average annual daily traffic (AADT)	For a 1-year period, the total volume passing a point or segment of a highway facility in both directions divided by the number of days in the year.
A-weighted decibels	Sound measurement scale that emphasizes frequencies in the 1,000 to 4,000 hertz range that are most sensitive to human hearing.
Base Realignment and Closure (BRAC)	The commonly used acronym for the Defense Base Closure and Realignment Commission. The BRAC Commission was created to provide a thorough, objective, accurate, and non-partisan review and analysis, through a process determined by law, of the list of bases and military installations which the Department of Defense has recommended be closed and/or realigned.
Baseline	The initial environmental conditions against which the environmental consequences of various alternatives are evaluated.
Basin	A drainage or catchment area of a stream or lake.
Battalion	An Army unit composed of a headquarters and two or more batteries, companies, or troops.
Battalion Task Force	A force generally organized by combining tank and mechanized infantry elements under a single battalion commander to conduct specific operations. A Battalion Task Force may be tank-heavy, mechanized infantry-heavy, or balanced, depending on the concept and plan of operation.
Battery	An artillery unit of equivalent size to a company.
Biodiversity	Different life forms or species within a defined area.
Bolson	An intermontane basin extending from the divide of one block-faulted mountain to the divide of the adjacent mountain, generally with no external drainage, but that may be transected by regional streams.
Brigade Combat Team (BCT)	The basic deployable unit of maneuver in the U.S. Army. A Heavy BCT consists of two Combined Arms Battalions, a Reconnaissance Battalion, and attached support and fires units. A BCT carries with it support units necessary to sustain its operations separate from its parent division.

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

Brigade	Organizational element commanding the tactical operation of two to five combat battalions. Brigades are employed on independent or semi-independent operations.
Candidate species	Species for which the U.S. Fish and Wildlife Service has on file sufficient information on biological vulnerability and threat(s) to support the issuance of a proposed rule to list as a threatened or endangered species, but issuance of the proposed rule is precluded.
Capacity (traffic)	The maximum rate of flow at which vehicles can be reasonably expected to traverse a point or uniform segment of a lane or roadway during a specified time period under prevailing roadway, traffic, and control conditions.
Carbon monoxide (CO)	A colorless, odorless, poisonous gas formed by incomplete combustion of carbon or a carbonaceous material, including gasoline and other petroleum fuels.
Census block	Cluster of blocks within the same census tract. Census blocks do not cross county or census tract boundaries and generally contain between 250 and 550 housing units.
Company	Organizational element capable of performing a function on its own, consisting of three to five platoons.
Component Plans	Those documents that, when taken together, comprise the Real Property Master Plan of a military installation. This series of documents consists of the Long Range Component, Short Range Component, and Capital Improvement Strategy.
Controlled-access field training exercise (FTX) sites	FTX sites where military access is subject to higher control and restricted to activities with limited ground-disturbing effects. Examples include training involving off-road wheeled vehicle movement limited to entering and exiting the site, no site improvements, no clearing of vegetation on the site, and no digging on the site.
Coppice dunes	Sand dunes characterized by a thicket of woody vegetation.
Corps	Organizational element consisting of two to five divisions. The Corps provides the framework for multi-national operations.
Criteria pollutants	The Clean Air Act required the USEPA to set air quality standards for common and widespread pollutants after preparing criteria documents summarizing scientific knowledge on their health effects. There currently are standards for six criteria pollutants: NO ₂ , SO ₂ , CO, PM, O ₃ , and Pb.
Culture	The system of behavior, beliefs, institutions, and objects that human beings use to relate to each other and to the environment.

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

Cultural resource	Cultural resources include historic properties as defined by the National Historic Preservation Act and 36 CFR 800, properties of traditional religious and cultural importance, Native American human remains, sacred objects, and objects of cultural patrimony, as defined in the Native American Graves Protection and Repatriation Act and 43 CFR 10.
Cumulative impact	The environmental impact resulting from the incremental impact of a particular activity when added to other past, present, or reasonably foreseeable future activities. Cumulative impacts may be individually insignificant but collectively become significant.
C-weighted decibels	Sound measurement scale that gives equal emphasis to all frequencies but suppresses very low and very high bands. Used to measure impulsive sounds such as explosions.
Day-Night Average Sound Level (DNL)	Sound-pressure levels averaged over a 24-hour period with 10 decibels added for events occurring between 10 p.m. and 7 a.m. ADNL is for A-weighted sounds and CDNL is for C-weighted sounds.
Decibel (dB)	A standard unit of measuring sound-pressure levels based on a reference sound pressure of 0.0002 dynes per square centimeter. This is the smallest sound a human can hear.
Depleted uranium (DU)	Very dense metal by-product of the uranium enrichment process with most of the higher radioactive isotopes removed. DU is approximately 40 percent less radioactive than natural uranium.
Direct effect/impact	Beneficial or detrimental impact that is caused by an action and occurs at the same time and place.
Division	Organizational element usually consisting of three to six brigade-size elements. Divisions are numbered and assigned missions based on their structures. The Division performs major tactical operations for the Corps and can conduct sustained battles and engagements.
Endangered species	A plant or animal species that is threatened with extinction or serious depletion in its range and is formally listed as such by the USFWS.
Endangered Species Act	An act of the U.S. Congress of 1972; 16 USC 1531-1544 that requires federal agencies to ensure that their actions do not jeopardize the existence of endangered or threatened species.
Environmental impact statement	A detailed written statement that helps public officials make decisions that are based on understanding of environmental consequences and to take actions that protect, restore, and enhance the environment.

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

Ephemeral stream	A stream or reach of a channel that flows only in direct response to precipitation in the immediate locality, whose channel is at all times above the zone of saturation.
Equivalent sound level (L_{eq})	A single number representing the fluctuating sound level in decibels over a specified period of time; the average of a fluctuating level of sound energy.
Erosion	The set of all processes by which soil and rock are loosened and moved downhill or downwind.
Escarpment	A long, usually continuous cliff or steep slope facing in one general direction, separating two level or gently sloping surfaces, and produced by erosion or faulting.
Explosive ordnance	All munitions containing explosives, nuclear fission or fusion materials, biological, or chemical agents. This includes bombs and warheads; guided and ballistic missiles; artillery, mortar, rocket, and small arms ammunition; mines, torpedoes, and depth charges; pyrotechnics; clusters and dispensers; cartridge- and propellant-actuated devices; electro-explosive devices; clandestine and improvised explosive devices; and similar or related items or components explosive in nature.
Field artillery	Equipment, supplies, ammunition, and personnel involved in the use of cannon, rocket, or surface-to-surface missile launchers. Field artillery cannons are classified according to caliber as: light—(120 mm and less); medium—(121 mm to 160 mm); heavy—(161 mm to 210 mm); and very heavy—(greater than 210 mm).
Field training exercise (FTX)	An exercise conducted in field training areas under simulated war conditions in which troops and armament of one side are actually present, while those of the other side may be imaginary or in outline.
Firing fan	The fan-shaped area encompassing all firing scenario directions and their associated surface danger zones.
Force packaging	The process of grouping units and equipment to accomplish a specific mission or achieve a desired capability. A force package is a predefined standardized grouping of manpower and/or equipment to provide a specific wartime capability.
Force Projection Platform	An installation having the mission and providing the infrastructure needed to move military forces from the continental U.S. or another area in response to war or other requirements. Force projection operations include mobilization and deployment, redeployment, and demobilization.

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

Fugitive dust	Particulate matter composed of soil. Fugitive dust may include emissions from haul roads, wind erosion of exposed soil surfaces, and other activities in which soil is either removed or redistributed.
Geologic	Any natural process acting as a dynamic physical force on the earth, including faulting, erosion, and mountain-building resulting in rock formations.
Groundwater	Subsurface water within the zone of saturation.
Groundwater recharge	Water that infiltrates the land surface and is not lost to evaporation or consumed by plants, which percolates downward and replenish the groundwater aquifers. This deep percolation is called recharge.
Guided missile	An unmanned vehicle moving above the surface of the earth whose trajectory or flight is capable of being altered by an external or internal mechanism.
Habitat type	A land area capable of supporting a given plant association at climax. It represents a mature vegetation association and is usually characterized by two indicator species.
Hazardous air pollutants (HAPs)	Also known as air toxics, air pollutants known or suspected to cause cancer or other serious health effects. USEPA has identified and established national emission standards for 188 HAPs.
Hazardous material	Any substance or material in a quantity or form that may be harmful to humans, animals, crops, water systems, or other elements of the environment if accidentally released. Hazardous materials include explosives, gases (compressed, liquefied, or dissolved), flammable and combustible liquids, flammable solids or substances, oxidizing substances, poisonous and infectious substances, radioactive materials, and corrosives.
Hazardous waste	Wastes that are designated as hazardous by the USEPA or state regulations. Hazardous waste, defined under the Resource Conservation and Recovery Act, is waste from production or operation activities that poses a potential hazard to human health or the environment when improperly treated, stored, or disposed; hazardous wastes that appear on special USEPA lists or possess at least one of the four following characteristics: ignitability, corrosivity, reactivity, and toxicity.
Herbicide	A chemical used to kill or inhibit the growth of plants.
Historic property	Property included in or eligible for inclusion in the National Register of Historic Places.

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

Hydric soils	Soils that are saturated to the surface sometime during the growing season.
Impact	Effect of an action. The terms “impacts” and “effects” are synonymous as used in NEPA. Impacts may be beneficial or adverse and may apply to natural, aesthetic, historic, cultural, and socioeconomic resources. Where applicable, impacts may be classified as direct or indirect.
Indirect effect/impact	Effect/impact caused by an action that occurs later in time or farther removed in distance but is still reasonably foreseeable. Indirect impacts may include growth-inducing effects and other effects related to induced changes in the pattern of land use, population density or growth rate, and related effects on air, water, and other natural systems, including ecosystems.
Infiltration	Water that falls on the land surface that does not run off but percolates into the ground. Some of this water evaporates, some is used by plants, and some percolates downward to the groundwater.
Infrastructure	Utilities and other physical support systems, including electric distribution systems, water supply systems, sewage disposal systems, roads, and others.
Integrated Global Presence Basing Strategy (IGPBS)	A Department of Defense initiative to reduce U.S. overseas forces over a 6-8 year period from the numbers and locations of overseas bases left over from the Cold War to new locations optimized to support current allies and to confront new threats.
Intermittent stream	An intermittent stream is a stream or reach of a channel that flows only during certain times of the year (e.g., when it receives water from springs or seeps).
Level of service (traffic)	A qualitative measure describing operational conditions within a traffic stream and how they are perceived by motorists and/or passengers.
Limited-use area	An area with a dense concentration of archaeological sites or sensitive biological resources where only vehicle travel is allowed and no digging, bivouac sites, or concentrations of personnel or vehicles are allowed.
Long-term impacts	Impacts that persist beyond the initial activity that produces them.
Low-altitude flight	Flight that is less than 300 feet above the ground.
Main Cantonment Area	Part of a military installation where the majority of administrative, industrial, housing, and community support facilities are located.

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

Military Training Route (MTR)	A route developed for the high-speed (greater than 250 knots) low-altitude training of tactical aircrews. Instrument flight rules MTRs are mutually developed by the Federal Aviation Administration and the DoD. Visual flight rules MTRs are developed by the DoD. MTRs are published on aeronautical charts. Each MTR has its own unique number consisting of either three or four digits. Three digits indicate that at least one segment of the route is 1,500 feet above ground level, and four digits indicate that the entire route is at or below 1,500 feet AGL. The number is preceded by either instrument flight rules (IR) or visual flight rules (VR) designator respectively. Since routes are one way, the same route flown the opposite direction will have a separate, distinct number.
Mission	The primary purpose and function of an organization.
Mitigation	Measure to reduce or eliminate an impact. Mitigations generally include avoiding the impact altogether by stopping or modifying a 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; or compensating for the impact by replacing or providing substitute resources or environments.
Mobilization mission	Mobilization is the process of assembling and organizing resources to support Army objectives in time of war or other emergencies. It involves the deployment of active duty, Reserve, and National Guard units and individuals. Fort Bliss' mobilization mission is to provide facilities, infrastructure, and training to military personnel and units in order to prepare them for deployment or areas of engagement.
Modular force	A military structure comprised of standardized, independent components that include all support elements needed to deploy and operate as self-contained units.
Mounted maneuver	A military activity undertaken within or on a ground vehicle or platform (i.e., not on foot).
National Ambient Air Quality Standards (NAAQS)	Section 109 of the Clean Air Act requires the USEPA to set nationwide standards for widespread air pollutants. Currently, six pollutants are regulated: NO ₂ , SO ₂ , CO, PM, O ₃ , and Pb.

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

National Historic Preservation Act (NHPA)	Law that states that the federal government will cooperate with other governments (including state and local), Native American Tribes, and private organizations and individuals to ensure that prehistoric and historic resources are properly preserved for present and future generations (enacted 1966).
National Register of Historic Places (NRHP)	Document containing those resources deemed to be important in American history, architecture, anthropology, engineering, or culture and associated with significant past events or persons and/or representing distinctive construction or high artistic value.
Native American	A generalized term referring collectively to individuals, Tribes, bands, or organizations that trace their ancestry to indigenous populations of North America.
Native American Graves Protection and Repatriation Act (NAGPRA)	Law that states that any remains of Native Americans (and associated objects) must be professionally curated and made available to any descendants for a traditional tribal burial (enacted 1990).
Neotropical migrants	Birds that breed in the temperate zone and then migrate in winter to tropical zones.
Nitrogen dioxide (NO₂)	Gas formed primarily from atmospheric nitrogen and oxygen when combustion takes place at high temperature. Nitrogen dioxide emissions contribute to acid deposition and formation of atmospheric ozone.
Nitrogen oxide (NO_x)	Gases formed primarily by fuel combustion, which contribute to the formation of acid rain. Hydrocarbons and nitrogen oxides combine in the presence of sunlight to form ozone, a major constituent of smog.
Noise	Any sound that is undesirable because it interferes with speech and hearing or is intense enough to damage hearing.
Nonattainment area	An area that has been designated by the USEPA or the appropriate state air quality agency as exceeding one or more national or state AAQS.
Nonpotable	Water that is unsafe or unpalatable to drink because it contains pollutants, contaminants, minerals, or infective agents.
Obscurant	A substance used to simulate extreme weather conditions or battlefield settings such as explosive-generated smoke and dust.
Off-road vehicle	Any motorized vehicle designated for cross-country travel over any type of natural terrain.
Ordnance	Explosives, chemicals, pyrotechnic and similar stores; for example, bombs, guns, ammunition, flares, and smoke.

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

Ozone (O₃)	A major ingredient in smog. O ₃ is produced from reactions of hydrocarbons and nitrogen oxides in the presence of sunlight and heat.
Particulate	Fine liquid or solid particles such as dust, smoke, mist, fumes, or smog, found in air or emissions. PM ₁₀ are particulates that are 10 microns or less in diameter, and PM _{2.5} are particulates 2.5 microns or less in diameter.
Peak hour (traffic)	The hour of highest traffic volume on a given section of roadway.
Pesticide	Chemical used to kill or inhibit growth of undesirable species.
Platoon	Organizational element consisting of two to four squads or sections.
Polychlorinated biphenyls (PCB)	A class of toxic, nonflammable, nonvolatile chlorinated oils used in transformers, capacitors, and fluorescent ballasts. PCBs are potential carcinogens and are regulated under the Toxic Substances Control Act.
Property of traditional cultural and religious importance	Cultural resource associated with cultural practices and beliefs of a Tribal community, which is rooted in its history and is important in maintaining the continuing cultural identity of the Tribe.
Range complex	Firing ranges and weapons training facilities designated for firing ammunition and explosives, heavy rockets, and guided missiles for training and target practice.
Real estate outgrant	Lease, license, easement, permit, use agreement, or other arrangement that changes government control of real property by conferring property rights to another governmental agency or private party.
Recharge	Percolation of rainwater and snowmelt through the unsaturated soil zone to the groundwater table.
Reconnaissance	A mission undertaken to obtain, by visual observation or other detection methods, information about the activities and resources of an enemy or potential enemy or to secure data concerning the meteorological, hydrographic, or geographic characteristics of a particular area.
Record of Decision (ROD)	A public document that explains which of the alternatives evaluated in an environmental impact statement has been selected.
Regiment	Armored cavalry, ranger, and special forces units of comparable size to a brigade.
Reserve Component	The part of the U.S. Army comprised of part-time, active duty military personnel, including the Army National Guard of the United States and the Army Reserve.

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

Restricted area	An area defined based on the density and significance of historic properties and that is off limits to all military and public entry and travel, except through-traffic on existing roads.
Riparian	Of or pertaining to the banks of a body of water.
Scoping	Process in the beginning stages of an EIS during which the public and federal and state agencies may voice concerns they wish the study to address.
Seismicity	The worldwide or local distribution of earthquakes in space and time; a general term for the number of earthquakes in a unit time.
Short-term impacts	Temporary direct or indirect impacts usually occurring during the construction phase of an activity.
Significance	A measure of the degree of impact of an action. Significance requires consideration of the context and intensity of the impact or effect. Context 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.
Sound	A physical disturbance in a medium (e.g., air) that is capable of being detected by the human ear.
Squad	The smallest element in the Army structure; its size is dependent on its function.
Square kilometer days (km²d)	Measure combining geographic area in square kilometers and time in days to calculate how much of the available training area is used in an individual exercise or cumulatively over the course of a year.
Sulfur dioxide (SO₂)	Gas formed from the combustion of sulfur compounds, including coal and petroleum. Sulfur dioxide emissions can be catalyzed by nitrogen dioxide to form acid rain.
Surface danger zone (SDZ)	That area which is endangered by projectiles, fragments, or explosions and the associated peripheral safety areas.
Tactical maneuver	Positioning and moving soldiers and equipment to counter and destroy enemy forces on the battlefield.
Threatened species	A species that is likely to become endangered within the foreseeable future throughout all or a significant portion of its range.
Tiering	Process of covering general materials in a broad NEPA document, with further documents to cover subsets of the broader program or to provide more precise information and analysis.

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

Traditional Cultural Properties (TCP)	A legal term referring to properties of traditional cultural and religious importance that are eligible for listing in the National Register of Historic Places.
Trafficability	Capacity of soil to support vehicles driving on it.
Trip generation	A determination of the quantity of trip ends associated with a parcel of land.
Troop	An armored or air cavalry unit of comparable size to a company.
Unconfined aquifer	An aquifer in which the water table defines the upper limit of the aquifer; also known as a water-table aquifer.
Underground storage tank (UST)	Typically used to contain gasoline or other petroleum fuels; buried beneath the ground surface.
Unemployment rate	The number of civilians, as a percentage of the total civilian labor force, without jobs but actively seeking employment.
Unexploded ordnance	Explosive ordnance that has been primed, fused, armed, or otherwise prepared for action, and which has been fired, dropped, launched, projected, or placed in such a manner as to constitute a hazard to operations, installations, personnel, or material and remains unexploded due to malfunction, design, or any other cause.
Water table	The depth or level below which the ground is saturated with water.
Waters of the U.S.	A legal term referring to interstate lakes, rivers, streams, (including intermittent streams), mud flats, sand flats, wetlands, playa lakes, and tributaries to such features.
Well yield	The sustainable volume of water discharged from a well per unit of time, often expressed in gallons per minute.
Wetland	An area that is regularly saturated by surface water or groundwater and subsequently supports vegetation that is adopted for life in saturated soil conditions.
Woodland	Plant community characterized by a generally open growth of small trees.

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Final SEIS**

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

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

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

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Final SEIS**

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Final SEIS**

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11.0 INDEX

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- Air Defense Artillery/ADA, S-3, S-9, 1-1, 1-4, 1-5, 1-6, 1-7, 1-8, 1-10, 3.1-1, 3.1-3, 3.2-4, 3.4-1, 4.9-8, 4.10-5, 4.11-5, 5.9-2, 5.12-1, 5.12-3, 5.13-11, 6-1
- Air Quality, 2-23, 3.9-4, 4.0-1, 4.6-1, 4.6-2, 4.6-3, 4.6-4, 4.6-5, 4.6-6, 4.6-7, 4.6-8, 4.13-25, 4.13-26, 5.6-1, 5.6-2, 5.6-3, 5.6-4, 5.6-5, 5.6-6, 5.6-7, 5.6-8, 5.6-9, 5.6-10, 5.6-11, 5.6-12, 5.14-1, 5.15-1, 5.15-2, 5.15-9, 5.18-1, 6-6
- Airspace, S-13, 1-1, 1-4, 1-5, 2-3, 2-22, 3.1-3, 3.1-6, 3.9-4, 4.0-1, 4.1-2, 4.4-1, 4.4-2, 4.4-3, 4.4-4, 5.4-1, 5.4-2, 5.8-8, 5.10-6, 5.10-12, 5.11-1, 5.14-1, 5.15-2, 5.15-4, 5.15-8, 6-5
- Ambient Air Quality Standard, S-13, 3.9-4, 4.6-1, 4.6-2, 5.6-4, 5.15-9
- Animal Unit Month/AUM(s), 4.1-8, 4.1-12, 5.1-6
- Applomado Falcon, 2-10, 4.8-7, 4.8-10, 4.8-12, 4.8-14, 4.8-15, 4.8-16, 4.8-17, 5.8-1, 5.8-2, 5.8-10, 5.8-11
- Archaeological resources, S-15, 3.9-6, 4.9-2, 4.9-3, 4.9-7, 4.9-9, 5.9-3, 5.9-4, 5.15-2, 5.18-1, 6-7
- Area of Critical Environmental Concern/ACEC(s), S-9, 3.1-3, 3.4-11, 4.1-17, 4.1-18, 4.5-13, 5.1-8, 5.13-22
- Armor Division, S-2, S-3, S-6, 1-4, 1-6, 1-7, 1-8, 1-10, 1-12, 3.2-2, 3.4-1, 3.4-3
- Asbestos, 2-18, 4.6-3, 4.12-4, 4.12-5, 5.12-2, 5.12-4, 5.12-5, 5.15-5, 6-3
- Base Realignment and Closure/BRAC, S-1, S-2, S-3, S-4, S-5, S-6, S-8, 1-4, 1-5, 1-6, 1-8, 1-11, 1-12, 2-2, 2-20, 3.0-1, 3.2-1, 3.2-2, 3.3-1, 3.3-5, 3.4-1, 3.4-7, 3.5-3, 3.6-3, 3.7-3, 3.8-1, 5.10-1, 5.13-15, 5.15-2, 6-1
- Biggs Army Airfield/AAF, S-11, S-15, 1-1, 1-5, 1-6, 1-9, 2-8, 2-17, 3.1-1, 3.3-1, 3.3-3, 3.3-4, 3.4-1, 3.4-3, 3.4-4, 3.4-5, 3.5-1, 3.6-1, 3.9-2, 3.9-6, 4.1-1, 4.1-2, 4.1-14, 4.2-2, 4.2-5, 4.2-6, 4.2-7, 4.2-8, 4.4-1, 4.4-3, 4.5-6, 4.9-5, 4.9-8, 4.9-9, 4.10-1, 4.10-4, 4.10-5, 4.10-6, 4.11-2, 4.11-3, 4.11-4, 4.12-1, 4.12-2, 4.13-18, 4.13-21, 4.13-23, 5.1-1, 5.1-2, 5.1-3, 5.1-5, 5.1-6, 5.2-2, 5.2-4, 5.2-6, 5.2-8, 5.2-9, 5.4-1, 5.7-1, 5.8-5, 5.9-4, 5.9-5, 5.10-1, 5.10-2, 5.10-6, 5.10-7, 5.10-12, 5.10-13, 5.10-14, 5.11-1, 5.11-2, 5.11-3, 5.13-10, 5.13-16, 5.15-8, 5.15-13, 6-8
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**Fort Bliss Mission and Master Plan Supplemental Programmatic Environmental Impact Statement
Final SEIS**

Ciudad Juárez, S-10, 4.7-5, 4.7-6, 4.13-6, 4.13-7, 5.7-1, 5.7-2, 5.15-2, 5.15-3, 5.15-6, 5.15-10

Combat Aviation Brigade/CAB, S-2, S-3, S-6, S-7, S-11, S-16, 1-4, 1-6, 1-8, 1-11, 3.4-1, 3.4-4, 3.4-5, 3.4-8, 3.5-1, 3.6-1, 3.9-2, 3.9-7, 5.1-3, 5.1-5, 5.1-6, 5.2-1, 5.2-7, 5.3-4, 5.3-5, 5.4-1, 5.6-1, 5.6-6, 5.6-7, 5.6-8, 5.6-9, 5.6-11, 5.10-6, 5.10-7, 5.10-12, 5.10-13, 5.10-14, 5.11-3, 5.11-4, 5.12-4, 5.13-16, 5.13-17, 5.13-20, 5.14-2, 5.15-8, 6-8

Communications, 3.4-4, 4.2-9, 5.2-2, 5.2-5, 5.2-7, 5.2-8, 5.2-10

Construction, S-4, S-4, S-4, S-9, S-12, S-13, S-15, S-16, 1-5, 1-13, 2-19, 2-22, 3.3-1, 3.3-3, 3.3-6, 3.4-1, 3.4-8, 3.4-11, 3.4-12, 3.9-5, 4.1-1, 4.5-6, 4.5-7, 4.5-8, 4.7-1, 4.9-7, 4.11-5, 4.13-8, 4.13-10, 5.5-4, 5.5-5, 5.5-7, 5.5-8, 5.6-3, 5.6-5, 5.6-7, 5.6-9, 5.6-10, 5.7-4, 5.8-2, 5.8-3, 5.8-4, 5.8-5, 5.8-8, 5.8-10, 5.9-2, 5.9-4, 5.9-5, 5.12-1, 5.12-3, 5.13-1, 5.15-13, 6-1

Culp Canyon, S-9, 2-24, 3.1-3, 4.1-8, 4.1-17, 4.5-13, 4.8-1, 4.9-6, 5.15-1

Day-Night Average Sound Level/DNL, 4.10-1, 4.10-2, 4.10-3, 4.10-4, 5.1-3, 5.10-1, 5.10-3, 5.10-7, 5.10-11, 5.10-13, 5.10-15, 5.14-1, 6-8

Demolition, S-9, 3.3-3, 3.3-6, 3.4-4, 4.12-8, 5.6-3, 5.6-5, 5.6-7, 5.6-10, 5.9-2

Dependents, 1-9, 4.13-2, 5.13-5, 5.13-11, 5.13-12, 5.13-17, 5.13-20

Depleted uranium/DU, 1-10, 5.6-2, 5.12-1, 5.12-2, 5.12-3

Doña Ana County, S-10, 4.1-12, 4.1-13, 4.4-3, 4.6-5, 4.6-6, 4.13-1, 4.13-4, 4.13-5, 4.13-8, 4.13-9, 4.13-13, 4.13-14, 4.13-16, 4.13-17, 4.13-18, 4.13-20, 4.14-1, 4.14-2, 4.14-5, 5.1-4, 5.6-4, 5.6-7, 5.6-11, 5.14-2, 5.15-6, 5.17-1, 6-8

Doña Ana Range Camp, 3.1-3, 3.3-3, 3.4-7, 4.1-7, 4.1-15, 4.3-1, 4.3-2, 4.7-7, 4.9-5, 4.12-7, 4.13-13, 5.3-1, 5.3-2, 5.3-3, 5.15-7

Doña Ana Range, S-1, S-10, S-12, S-15, S-17, 1-1, 2-5, 2-6, 3.1-1, 3.1-3, 3.3-1, 3.3-4, 3.3-6, 3.4-5, 3.4-7, 3.4-8, 3.4-10, 3.4-11, 3.5-1, 3.9-3, 3.9-6, 3.9-8, 4.1-1, 4.1-4, 4.1-7, 4.1-12, 4.1-15, 4.1-16, 4.1-17, 4.3-1, 4.3-2, 4.4-1, 4.4-4, 4.5-6, 4.5-12, 4.7-1, 4.7-5, 4.7-7, 4.8-4, 4.8-6, 4.8-7, 4.8-9, 4.8-11, 4.8-13, 4.9-1, 4.9-4, 4.9-5, 4.9-6, 4.9-10, 4.10-5, 4.10-11, 4.11-2, 4.11-5, 4.12-6, 4.12-8, 4.13-13, 4.13-19, 5.0-1, 5.1-4, 5.1-6, 5.3-1, 5.3-2, 5.3-3, 5.5-8, 5.8-1, 5.8-2, 5.8-4, 5.8-5, 5.9-5, 5.9-6, 5.9-7, 5.10-2, 5.10-4, 5.10-10, 5.10-14, 5.11-2, 5.12-3, 5.13-16, 5.15-4, 5.15-7, 6-2

Doña Ana Range-North Training Areas, S-1, S-12, 1-1, 3.1-3, 3.1-7, 3.2-4, 3.2-6, 3.2-7, 3.3-5, 3.4-7, 3.4-8, 3.4-10, 3.5-3, 3.6-1, 3.6-3, 3.7-3, 3.8-1, 4.1-1, 4.1-7, 4.1-9, 4.1-12, 4.1-15, 4.3-2, 4.5-6, 4.5-12, 4.7-1, 4.8-6, 4.8-7, 4.8-9, 4.8-11, 4.8-12, 4.8-13, 4.9-6, 4.9-10, 5.3-1, 5.3-2, 5.3-3, 5.8-1, 5.8-3, 5.8-5, 5.9-5, 5.9-6, 5.9-7, 5.13-16, 5.15-7

Drought, 4.1-8, 4.5-15, 5.15-11

Dust, S-11, S-13, 2-11, 2-14, 2-15, 2-16, 2-17, 2-19, 2-23, 3.9-4, 4.6-1, 4.6-3, 4.6-4, 4.6-5, 4.6-6, 4.6-7, 4.12-5, 4.13-25, 5.1-1, 5.1-2, 5.1-4, 5.1-5, 5.5-2, 5.5-6, 5.6-1, 5.6-2, 5.6-3, 5.6-4, 5.6-5, 5.6-6, 5.6-7, 5.6-8, 5.6-9, 5.6-10, 5.6-11, 5.6-12, 5.13-16, 5.15-1, 5.15-2, 5.15-9, 5.15-10, 5.18-1, 6-6

Ecology/Ecological/Ecosite, S-9, S-14, 2-10, 2-11, 2-12, 3.9-5, 4.1-8, 4.1-14, 4.5-1, 4.5-11, 4.5-12, 4.5-13, 4.5-14, 4.5-15, 4.5-16, 4.8-1, 4.8-9, 4.8-14, 5.5-1, 5.5-2, 5.5-3, 5.5-4, 5.5-5, 5.5-6, 5.5-7, 5.5-8, 5.5-9, 5.8-1, 5.8-5, 5.8-6, 5.8-7, 5.15-3, 5.15-8, 5.15-11, 5.15-12, 6-1, 6-10

El Paso County, S-9, S-11, S-16, 3.1-1, 3.9-7, 4.1-1, 4.1-12, 4.1-14, 4.2-1, 4.6-1, 4.6-4, 4.9-9, 4.13-1, 4.13-3, 4.13-4, 4.13-5, 4.13-7, 4.13-8, 4.13-10, 4.13-13, 4.13-14, 4.13-16, 4.13-17, 4.13-18, 4.13-19, 4.13-20, 4.13-21, 4.13-22, 4.13-23, 4.13-24, 4.13-25, 4.14-1, 4.14-2, 4.14-6, 5.1-3, 5.7-1, 5.13-1, 5.13-3, 5.13-4, 5.13-6, 5.13-7, 5.13-13, 5.13-14, 5.13-15, 5.13-16, 5.13-17, 5.13-18, 5.13-21, 5.13-22, 5.14-2, 5.15-2, 5.15-9, 6-8

El Paso International Airport/EPIA, 2-22, 3.3-1, 3.3-4, 3.3-6, 3.4-3, 3.4-5, 4.2-6, 4.3-1, 4.4-3, 4.10-5, 4.11-4, 4.13-21, 5.1-2, 5.1-3, 5.2-4,

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

5.2-6, 5.2-8, 5.2-9, 5.4-1, 5.5-5, 5.13-10, 5.15-8, 5.15-13	5.12-4, 5.12-5, 5.14-1, 5.15-13, 6-3, 6-6, 6-8, 8-6
Employment, 1-6, 3.4-13, 4.13-1, 4.13-6, 4.13-7, 4.13-8, 4.13-9, 4.13-11, 4.13-12, 4.13-23, 5.13-1, 5.13-2, 5.13-5, 5.13-6, 5.13-11, 5.13-12, 5.13-17, 5.13-20	Helicopter(s), S-2, S-3, S-8, S-13, S-15, 1-7, 1-9, 3.4-1, 3.4-8, 3.4-12, 3.9-1, 3.9-4, 3.9-6, 4.1-7, 5.1-6, 5.4-1, 5.6-1, 5.8-8, 5.9-3, 5.10-1, 5.10-6, 5.10-8, 5.10-12, 5.10-4, 5.12-3, 5.14-1, 5.15-8, 6-8
Energy, S-11, 2-2, 3.9-2, 4.1-8, 4.2-1, 4.2-8, 4.2-9, 4.3-1, 4.3-2, 4.3-3, 4.5-1, 4.10-1, 4.10-2, 4.10-3, 4.12-9, 5.2-2, 5.2-5, 5.2-6, 5.2-7, 5.2-8, 5.2-10, 5.3-1, 5.3-3, 5.3-4, 5.3-5, 5.15-2, 5.15-4, 5.15-5, 5.15-6, 5.15-7, 5.15-14, 5.18-1, 6-2, 6-3, 6-5	Historic Property/Properties, 2-1, 2-3, 2-4, 2-5, 4.9-1, 5.15-2, 5.15-5, 5.15-12, 5.16-1, 6-3, 6-4, 6-7, 6-10, 8-6
Environmental Justice, S-9, S-17, 4.0-1, 4.14-1, 4.14-6, 5.14-1, 5.15-14	Housing, S-10, S-12, S-16, 2-2, 2-19, 3.1-1, 3.3-1, 3.3-3, 3.3-4, 3.4-3, 3.4-4, 3.4-5, 3.4-8, 3.5-1, 3.5-4, 3.6-1, 3.7-1, 3.9-3, 3.9-7, 4.2-7, 4.9-8, 4.13-12, 4.13-13, 4.13-14, 4.13-16, 4.13-17, 4.13-25, 4.14-6, 5.1-3, 5.1-4, 5.1-7, 5.2-1, 5.2-4, 5.2-7, 5.2-9, 5.6-3, 5.6-5, 5.6-7, 5.6-10, 5.9-2, 5.9-4, 5.10-12, 5.12-2, 5.12-4, 5.13-2, 5.13-1, 5.13-2, 5.13-3, 5.13-4, 5.13-6, 5.13-10, 5.13-13, 5.13-15, 5.13-16, 5.13-17, 5.13-19, 5.13-20, 5.13-22, 5.15-13, 5.15-2, 5.15-7, 5.15-14, 6-2, 6-3, 6-9
Erosion, 2-13, 2-14, 2-15, 2-24, 3.9-4, 4.5-1, 4.5-5, 4.5-6, 4.5-7, 4.5-8, 4.5-9, 4.5-10, 4.5-11, 4.5-13, 4.5-15, 4.5-16, 4.8-2, 4.9-3, 5.1-7, 5.5-1, 5.5-2, 5.5-3, 5.5-4, 5.5-5, 5.5-6, 5.5-7, 5.5-8, 5.5-9, 5.8-5, 5.8-10, 5.8-11, 5.9-1, 5.9-2, 5.9-3, 5.13-19, 5.15-8, 5.15-9, 5.16-1, 5.18-1, 6-5, 6-6, 6-9, 6-10	Hueco Bolson, S-10, S-14, 3.9-5, 4.3-2, 4.7-1, 4.7-5, 4.7-6, 4.7-7, 5.7-1, 5.7-2, 5.7-3, 5.7-4, 5.7-5, 5.15-3, 5.15-4, 5.15-10, 5.16-1, 5.17-1, 6-6
Explosive(s), 3.4-1, 3.4-4, 3.4-11, 3.4-12, 4.11-1, 4.11-2, 4.11-3, 4.12-1, 4.12-3, 5.1-3, 5.11-1, 5.11-4, 5.12-2, 5.12-3, 5.12-4, 5.12-5, 6-8	Hueco Mountains, 4.1-14, 4.7-5, 4.8-1, 4.8-8, 4.8-10, 4.8-11, 4.8-12, 4.9-10, 5.8-2, 5.8-3, 5.8-10
Field Training Exercise(s)/FTX, 3.1-3, 3.1-4, 3.1-8, 3.3-5, 3.4-7, 3.4-12, 3.5-3, 3.6-3, 3.7-3, 4.1-7, 4.12-2, 6-4, 6-9	Income, S-17, 3.9-8, 4.13-7, 4.13-10, 4.13-11, 4.14-2, 5.13-1, 5.13-2, 5.13-5, 5.13-6, 5.13-11, 5.13-12, 5.13-17, 5.13-20, 5.15-13
Flight Safety, 4.11-1, 4.11-2, 5.11-1, 5.11-3	Infrastructure, S-1, S-2, S-4, S-5, S-9, S-10, S-11, S-12, 1-1, 1-4, 1-5, 1-12, 2-2, 2-6, 2-23, 2-24, 3.0-1, 3.2-1, 3.2-6, 3.3-1, 3.3-3, 3.3-4, 3.4-1, 3.4-3, 3.4-4, 3.4-5, 3.4-8, 3.5-1, 3.7-1, 3.8-1, 3.9-2, 3.9-3, 4.0-1, 4.1-14, 4.2-1, 4.3-1, 4.13-22, 5.1-1, 5.1-3, 5.2-1, 5.3-1, 5.14-1, 5.15-6, 5.15-7, 5.16-1, 5.18-1, 6-1, 6-2, 6-4, 6-5, 6-9, 8-7
Geology/Geological, 4.7-5, 4.7-7, 4.9-1, 4.9-8	Installation Restoration Program/IRP, 4.12-7, 5.12-2, 5.12-4, 5.12-5
Grapevine, 2-23, 2-24, 3.1-8, 4.3-3, 4.5-5, 4.5-13, 4.8-1, 4.9-5, 5.3-4, 5.3-5	Integrated Cultural Resources Management Plan/ICRMP, S-1, S-15, 1-1, 1-4, 2-1, 2-3, 2-6, 2-7, 2-8, 2-13, 2-20, 3.1-3, 3.9-6, 4.9-2, 4.9-4, 6-2, 6-3, 6-7
Grazing, S-9, S-11, 2-23, 3.1-3, 3.8-1, 3.9-2, 4.1-2, 4.1-7, 4.1-8, 4.1-12, 4.3-3, 4.5-11, 4.5-14, 4.5-15, 4.8-2, 4.9-3, 4.11-2, 5.1-1, 5.1-6, 5.1-8, 5.5-1, 5.9-2, 5.9-4, 5.10-2, 5.10-10, 5.11-3, 5.15-1, 5.15-3, 5.15-9, 5.15-11, 6-4	
Groundwater, S-14, 3.9-5, 4.5-2, 4.7-1, 4.7-5, 4.7-6, 4.7-7, 4.8-7, 4.12-7, 5.7-1, 5.7-2, 5.7-3, 5.7-4, 5.15-2, 5.15-10	
Habitat(s), S-14, 2-9, 2-10, 2-11, 2-23, 3.9-5, 4.8-15, 4.8-16, 4.8-17, 5.8-1, 5.8-7, 6-6, 6-7, 6-10, 8-6	
Hazardous Material(s), S-9, S-10, S-16, 1.13, 2-18, 2-19, 3.9-7, 4.0-1, 4.12-1, 5.12-1, 5.12-3,	

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

Integrated Global Presence Basing Strategy/IGPBS, S-1, S-2, S-8, 1-4, 1-5, 1-6, 1-8, 2-20, 3.0-1, 3.8-1, 5.15-2, 8-7	Medical Services, S-10, S-17, 3.9-7, 3.9-8, 4.1- 2, 4.13-20, 4.13-21, 4.13-23, 5.13-3, 5.13-4, 5.13-9, 5.13-10, 5.13-15, 5.13-19, 5.13-22, 5.15-2, 5.15-13, 6-9
Integrated Training Area Management/ITAM, 1- 1, 2-1, 2-11, 2-12, 2-13, 2-14, 3.1-3, 5.15-5, 6-1, 6-2, 6-3, 6-5, 6-6, 6-7, 6-9	Meyer Range, 3.2-6, 3.3-6, 3.4-5, 3.4-7, 3.4-11, 3.4-13, 4.1-7, 4.3-3, 4.10-5, 4.11-3, 4.11-5, 5.3-3, 5.3-4, 5.11-2, 5.12-3, 6-2
Large Caliber Weapons, S-15, S-17, 3.9-6, 3.9- 8, 4.10-3, 4.10-4, 4.10-5, 4.10-9, 4.10-10, 4.10-11, 5.10-1, 5.10-2, 5.10-3, 5.10-4, 5.10- 5, 5.10-10, 5.10-11, 5.10-12, 5.10-14, 5.10- 15, 5.10-16, 5.14-1, 5.14-2, 5.14-3, 5.18-1	Minority Population(s), S-17, 3.9-8, 4.14-1, 4.14-2, 4.14-7, 5.14-1, 5.14-2, 5.14-3, 5.15- 14
Lead-Based Paint, 2-19, 4.12-4, 4.12-5, 5.12-2, 6-3	Mitigation(s), S-10, 1-13, 2-4, 2-5, 2-7, 2-9, 2- 15, 2-16, 5.5-6, 5.5-7, 5.5-8, 5.5-9, 5.6-7, 5.7-5, 5.9-1, 5.9-2, 5.9-4, 5.9-5, 5.18-1, 6-1, 8-8
Level of Service/LOS, S-11, S-12, 3.9-2, 3.9-3, 4.2-1, 4.2-2, 4.2-5, 5.2-2, 5.2-3, 5.2-4, 5.2-5, 5.2-7, 5.2-9, 5.3-2, 5.3-3, 5.3-4, 5.3-5, 5.13- 15, 5.15-8, 8-7	Mobilization, 1-4, 1-9, 1-11, 2-2, 2-5, 2-13, 3.1- 1, 3.2-2, 3.2-4, 3.3-1, 3.3-5, 3.4-7, 3.5-3, 3.6-3, 3.7-1, 3.7-3, 4.10-5, 4.13-1, 5.1-2, 8- 8
Lincoln National Forest, 4.1-19, 4.5-1, 4.8-10, 4.8-12, 4.9-4	National Register of Historic Places/NRHP, 2-4, 2-5, 2-6, 2-8, 4.1-17, 4.9-2, 4.9-3, 4.9-4, 4.9- 5, 4.9-6, 4.9-7, 4.9-8, 4.9-9, 4.9-10, 5.9-1, 5.9-2, 5.9-3, 5.9-4, 5.9-5, 5.15-2, 5.16-1, 6- 7, 6-10, 8-1, 8-6, 8-9, 8-12
Live-Fire Range, S-2, S-5, S-10, 1-5, 1-10, 1-12, 2-1, 2-3, 3.2-1, 3.3-6, 3.4-8, 3.5-3, 5.1-2, 5.1-4, 5.8-1, 5.8-8, 5.9-5, 5.11-1, 5.11-2, 5.11-3, 5.12-2, 5.12-3, 5.13-10, 5.15-5, 5.18- 1, 6-2, 6-8	Native American, 4.9-1, 4.9-2, 4.9-3, 4.9-5, 4.9- 7, 4.9-8, 4.9-9, 5.9-3, 8-4, 8-9
Logan Heights, 1-1, 3.1-1, 3.3-3, 3.4-4, 4.1-2, 4.1-14, 4.9-9, 4.13-12, 4.13-18, 4.13-19, 5.1- 5, 5.2-2	North Training Areas, S-1, S-6, S-12, 1-1, 2-5, 2-6, 3.1-1, 3.1-3, 3.1-7, 3.2-4, 3.2-6, 3.2-7, 3.3-4, 3.3-5, 3.3-6, 3.4-7, 3.4-8, 3.4-10, 3.5- 1, 3.5-3, 3.6-1, 3.6-3, 3.7-3, 3.8.1, 3.9-3, 4.1- 1, 4.1-4, 4.1-7, 4.1-9, 4.1-12, 4.1-15, 4.1-16, 4.3-1, 4.3-2, 4.4-1, 4.4-4, 4.5-6, 4.5-12, 4.7- 1, 4.7-5, 4.8-4, 4.8-6, 4.8-7, 4.8-9, 4.8-11, 4.8-12, 4.8-13, 4.9-1, 4.9-4, 4.9-6, 4.9-10, 4.11-5, 4.12-6, 4.13-19, 5.0-1, 5.1-2, 5.1-4, 5.3-1, 5.3-2, 5.3-3, 5.5-4, 5.5-5, 5.5-6, 5.5-9, 5.6-2, 5.6-4, 5.6-5, 5.6-6, 5.6-7, 5.6-8, 5.6-9, 5.6-10, 5.6-11, 5.8-1, 5.8-3, 5.8-5, 5.8-6, 5.9-5, 5.9-6, 5.9-7, 5.13-10, 5.15-4, 5.15-7
Low-Income Populations, S-17, 3.9-8, 4.14-1, 4.14-2, 4.14-7, 5.14-1, 5.14-2, 5.14-3,	Ordnance, 3.3-4, 3.4-4, 3.4-11, 4.11-1, 4.11-2, 4.11-3, 4.11-4, 4.11-5, 4.12-1, 4.12-3, 5.6-1, 5.8-1, 5.9-2, 5.11-1, 5.11-2, 5.11-3, 5.11-4, 5.12-2, 5.12-3, 5.12-4, 5.12-5, 8-5, 8-9, 8-12
Low-Level Radioactive Waste(s), 4.12-4, 5.12- 2, 5.12-4, 5.12-5	Organ Mountains, 4.1-7, 4.1-12, 4.1-15, 4.1-16, 4.1-17, 4.3-1, 4.3-2, 4.4-4, 4.7-5, 4.8-1, 4.8- 6, 4.8-7, 4.8-8, 4.8-10, 4.8-11, 4.8-12, 4.8-
Main Post, 1-1, 2-5, 2-6, 2-8, 3.1-1, 3.3-3, 3.3-4, 3.4-1, 3.4-3, 3.4-4, 3.4-5, 4.1-2, 4.1-13, 4.2- 2, 4.2-5, 4.2-7, 4.5-6, 4.7-7, 4.9-5, 4.9-7, 4.9-9, 4.10-5, 4.12-6, 4.13-12, 4.13-13, 4.13- 18, 4.13-20, 4.13-21, 4.13-23, 4.14-6, 5.1-3, 5.1-5, 5.2-2, 5.7-1, 5.8-5, 5.9-4, 5.9-5, 6-1	
McGregor Range Camp, S-12, 2-17, 3.1-3, 3.2- 6, 3.3-1, 3.3-4, 3.3-6, 3.4-5, 3.4-7, 3.4-12, 3.5-3, 3.6-1, 3.6-3, 3.7-1, 3.9-3, 4.1-2, 4.3-3, 4.7-7, 4.9-6, 4.12-2, 4.13-12, 4.13-21, 5.0-1, 5.1-5, 5.3-1, 5.3-3, 5.3-4, 5.5-5, 5.9-6, 5.9-7, 5.13-16, 6-2	
Medical and Biohazardous Waste, 4.12-4, 5.12- 2, 5.12-3, 5.12-4, 5.12-5	

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

13, 4.9-5, 4.10-11, 4.11-5, 5.8-1, 5.8-3, 5.8-6, 5.9-5, 5.10-2, 5.10-10, 5.11-2, 5.15-10	5.13-10, 5.13-15, 5.13-19, 5.13-22, 5.15-1, 5.15-6, 5.15-13
Otero County, S-10, 2-23, 3.1-1, 3.5-4, 4.1-7, 4.1-12, 4.1-13, 4.3-1, 4.3-3, 4.13-1, 4.13-4, 4.13-5, 4.13-8, 4.13-9, 4.13-13, 4.13-14, 4.13-16, 4.13-17, 4.13-18, 4.13-20, 4.14-1, 4.14-2, 4.14-6, 5.3-4, 5.3-5, 5.6-7, 5.6-12, 5.10-10, 5.14-2, 6-5, 6-8	Range Complex, S-15, 1-1, 1-10, 2-3, 3.2-6, 3.3-6, 3.4-1, 3.4-5, 3.4-7, 3.4-11, 3.4-12, 3.4-13, 3.5-3, 3.5-4, 3.6-1, 3.7-1, 3.9-6, 4.3-3, 4.3-4, 4.10-5, 4.10-11, 4.11-2, 4.11-3, 4.11-5, 5.1-4, 5.1-5, 5.3-3, 5.3-4, 5.8-4, 5.8-6, 5.8-7, 5.9-5, 5.9-7, 5.10-2, 5.10-10, 5.11-2, 5.12-3, 5.13-16, 5.15-8, 6-2, 6-8, 8-10
Otero Mesa, S-7, S-8, S-9, 2-24, 3.2-2, 3.2-4, 3.8-1, 4.1-7, 4.1-8, 4.1-9, 4.1-16, 4.1-17, 4.1-18, 4.5-13, 4.7-1, 4.7-5, 4.8-1, 4.8-6, 4.8-7, 4.8-8, 4.8-10, 4.8-12, 4.8-13, 4.8-14, 4.8-15, 4.9-5, 4.9-10, 4.11-1, 4.11-2, 4.11-5, 5.1-4, 5.1-5, 5.1-8, 5.8-1, 5.8-2, 5.8-3, 5.8-11, 5.9-4, 5.9-6, 5.11-4, 5.13-16, 5.13-22, 5.15-4, 5.15-9, 5.15-12, 5.15-13, 6-2, 6-9	Real Property Master Plan/RPMP, S-1, S-5, S-9, 1-1, 1-4, 1-11, 2-1, 2-2, 2-13, 2-20, 3.1-1, 3.3-1, 3.3-3, 4.1-1, 5.1-1, 5.1-2, 5.15-5, 6-1, 6-2, 8-3
Personnel, S-2, S-3, S-4, S-6, S-8, S-9, S-11, S-17, 1-1, 1-5, 1-6, 1-7, 1-8, 1-9, 1-10, 1-12, 1-13, 2-18, 3.2-7, 3.3-1, 3.4-1, 3.4-5, 3.4-8, 3.7-1, 3.9-1, 3.9-2, 3.9-8, 4.2-7, 4.9-8, 4.11-1, 4.11-2, 4.12-5, 4.12-6, 4.12-8, 4.13-1, 4.13-2, 4.13-3, 4.13-6, 4.13-10, 4.13-12, 4.13-18, 4.13-20, 4.13-21, 4.13-23, 5.1-1, 5.1-2, 5.1-3, 5.2-5, 5.2-6, 5.3-2, 5.6-1, 5.6-2, 5.6-3, 5.6-4, 5.6-5, 5.6-6, 5.6-7, 5.6-8, 5.6-9, 5.6-10, 5.6-11, 5.6-12, 5.7-1, 5.8-6, 5.8-10, 5.9-5, 5.10-2, 5.11-1, 5.11-2, 5.11-4, 5.12-2, 5.13-1, 5.13-2, 5.13-3, 5.13-4, 5.13-5, 5.13-6, 5.13-7, 5.13-8, 5.13-9, 5.13-11, 5.13-12, 5.13-13, 5.13-14, 5.13-15, 5.13-17, 5.13-18, 5.13-19, 5.13-20, 5.13-22, 5.15-13, 5.17-1	Record of Decision/ROD, S-1, S-5, S-9, 1-1, 1-11, 2-1, 2-3, 2-6, 2-20, 2-22, 3.1-1, 3.3-1, 3.3-6, 5.1-1, 5.1-2, 5.9-4, 6-1, 6-3, 6-4, 8-10
Pesticide(s), 4.12-1, 4.12-5, 4.12-6, 5.12-1, 5.12-2, 5.12-4, 5.12-5, 8-10	Recreation/Recreational, 2-2, 2-24, 3.1-1, 3.3-3, 3.4-5, 3.8-1, 4.1-1, 4.1-7, 4.1-9, 4.1-12, 4.1-14, 4.9-3, 4.9-9, 4.10-4, 4.13-21, 4.13-23, 4.13-25, 5.1-1, 5.1-2, 5.1-4, 5.1-6, 5.2-1, 5.10-2, 5.10-10, 5.13-4, 5.13-16, 5.13-19, 5.15-1, 5.15-3, 5.15-6, 5.15-9,
Pollution Prevention, 2-19, 2-20, 4.12-1, 4.12-8, 5.12-2, 5.12-3, 5.12-4, 5.12-5, 5.15-5, 6-3	Region of Influence/ROI, S-9, S-10, S-17, 3.9-8, 4.0-1, 4.1-1, 4.1-9, 4.1-10, 4.2-1, 4.2-2, 4.3-1, 4.4-1, 4.4-2, 4.4-3, 4.4-4, 4.5-1, 4.6-1, 4.7-1, 4.7-2, 4.8-1, 4.8-8, 4.9-1, 4.9-9, 4.11-1, 4.11-2, 4.12-1, 4.13-1, 4.13-3, 4.13-4, 4.13-5, 4.13-6, 4.13-7, 4.13-8, 4.13-9, 4.13-10, 4.13-12, 4.13-13, 4.13-14, 4.13-15, 4.13-16, 4.13-17, 4.14-1, 4.14-2, 4.14-6, 4.14-7, 5.1-2, 5.1-3, 5.7-1, 5.11-2, 5.13-1, 5.13-2, 5.13-5, 5.13-10, 5.13-11, 5.13-12, 5.13-13, 5.13-16, 5.13-19, 5.14-1, 5.14-2, 5.14-3, 5.15-2, 5.15-3, 5.15-4, 5.15-6, 5.15-7, 5.15-8, 5.15-9, 5.15-10, 5.15-11, 5.17-1
Polychlorinated Biphenyls/PCB(s), 4.12-4, 4.12-6, 4.12-9, 5.12-2, 5.12-4, 5.12-5, 8-10	Right(s)-of-Way/ROW(s), 4.1-2, 4.1-7, 4.1-8
Properties of Traditional Cultural and Religious Importance, 4.9-1, 4.9-2, 4.9-3, 4.9-8, 4.9-10, 5.9-3, 8-12	Road(s), S-9, S-10, S-11, S-15, 2-2, 2-5, 2-13, 2-19, 3.1-3, 3.1-4, 3.1-7, 3.1-8, 3.2-1, 3.2-2, 3.2-4, 3.2-6, 3.2-7, 3.3-1, 3.3-3, 3.3-4, 3.3-5, 3.3-6, 3.4-1, 3.4-3, 3.4-4, 3.4-5, 3.4-7, 3.4-8, 3.4-11, 3.4-12, 3.5-1, 3.5-3, 3.5-4, 3.6-1, 3.6-3, 3.7-1, 3.7-3, 3.8-1, 3.8-2, 3.9-1, 3.9-2, 3.9-4, 3.9-5, 4.1-2, 4.1-7, 4.1-8, 4.1-9, 4.1-12, 4.1-13, 4.1-14, 4.1-15, 4.1-16, 4.2-1, 4.2-2, 4.2-5, 4.2-6, 4.2-8, 4.5-6, 4.5-7, 4.5-8, 4.6-8, 4.8-7, 4.9-1, 4.9-3, 4.9-4, 4.9-10, 4.10-1, 4.11-2, 4.13-25, 5.1-2, 5.1-6, 5.1-8,
Public Access, 2-1, 3.1-3, 3.1-4, 4.1-2, 4.1-6, 4.1-7, 4.1-8, 4.1-9, 5.1-4, 5.1-6, 5.5-1, 5.13-10, 5.13-16, 5.13-19, 6-4	
Quality of Life, S-17, 2-2, 2-24, 3.9-8, 4.13-1, 4.13-22, 4.13-25, 4.13-26, 5.13-1, 5.13-4,	

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

- 5.2-3, 5.2-5, 5.2-9, 5.3-5, 5.8-3, 5.8-4, 5.8-5, 5.8-6, 5.8-7, 5.8-8, 5.8-9, 5.8-10, 5.8-11, 5.9-1, 5.9-2, 5.9-3, 5.9-7, 5.10-1, 5.10-4, 5.10-6, 5.10-12, 5.10-14, 5.10-16, 5.11-1, 5.11-2, 5.11-4, 5.12-4, 5.12-5, 5.13-10, 5.13-15, 5.13-16, 5.13-19, 5.13-22, 5.15.2, 5.15-6, 5.15-8, 6-2, 6-4, 6-5, 6-7, 6-10, 8-3, 8-6, 8-7, 8-9, 8-10, 8-11
- Roadway(s), S-10 S-11, S-15, 2-2, 3.3-4, 3.4-3, 3.9-2, 3.9-6, 4.1-7, 4.1-8, 4.1-13, 4.1-14, 4.1-15, 4.1-16, 4.1-17, 4.2-1, 4.2-2, 4.2-3, 4.2-5, 4.2-6, 4.3-1, 4.3-3, 4.8-7, 4.13-25, 5.1-2, 5.1-5, 5.1-6, 5.1-7, 5.2-1, 5.2-2, 5.2-3, 5.5-5, 5.2-7, 5.2-9, 5.3-1, 5.3-2, 5.6-7, 5.13-10, 5.13-15, 5.13-16, 5.15-2, 5.15-7, 8-3, 8-10
- Safety, S-9, S-10, S-16, 2-17, 2-18, 2-19, 3.1-3, 3.1-4, 3.1-8, 3.3-3, 3.3-5, 3.4-1, 3.4-3, 3.4-7, 3.5-3, 3.5-4, 3.6-1, 3.6-3, 3.7-1, 3.7-3, 3.9-7, 4.0-1, 4.1-1, 4.1-7, 4.3-1, 4.4-1, 4.6-1, 4.11-1, 4.11-2, 4.11-3, 4.11-4, 4.11-5, 4.12-4, 4.12-5, 4.12-6, 4.13-20, 4.13-21, 4.13-22, 4.13-26, 4.14-1, 5.1-1, 5.1-2, 5.1-3, 5.1-4, 5.2-1, 5.6-5, 5.8-4, 5.9-6, 5.9-7, 5.11-1, 5.11-2, 5.11-3, 5.11-4, 5.14-1, 5.15-13, 6-4, 6-8, 6-10, 8-1, 8-11
- Schools, S-3, S-16, 1-4, 1-5, 1-6, 1-7, 1-8, 3.1-1, 3.4-1, 3.4-4, 3.9-7, 4.1-9, 4.1-14, 4.6-4, 4.6-6, 4.11-3, 4.12-5, 4.13-1, 4.13-9, 4.13-11, 4.13-12, 4.13-18, 4.13-19, 4.13-25, 4.13-26, 5.1-3, 5.2-1, 5.13-3, 5.13-4, 5.13-8, 5.13-10, 5.13-14, 5.13-15, 5.13-18, 5.13-21, 5.15-2, 5.15-5
- Sensitive Species, S-14, 2-10, 2-23, 3.9-5, 4.8-8, 4.8-10, 4.8-11, 4.8-13, 5.8-1, 5.8-4, 5.8-5, 5.8-8, 5.8-9, 5.8-10, 5.8-11, 5.18-1, 6-7, 6-10
- Small Arms, 1-10, 3.1-1, 3.1-3, 3.2-1, 3.3-6, 4.1-7, 4.10-3, 4.10-4, 4.10-5, 4.10-8, 4.11-5, 5.9-2, 5.10-1, 5.12-3, 6-2, 8-5
- Soil(s), S-13, 2-13, 2-14, 2-23, 3.9-4, 4.1-14, 4.5-1, 4.5-2, 4.5-4, 4.5-5, 4.5-6, 4.5-8, 4.5-9, 4.5-10, 4.5-11, 4.5-12, 4.5-13, 4.5-15, 4.5-16, 4.6-4, 4.6-5, 4.6-8, 4.8-7, 4.8-11, 4.11-2, 4.12-2, 4.12-3, 4.12-5, 4.12-7, 4.12-8, 5.1-5, 5.1-7, 5.5-1, 5.5-2, 5.5-3, 5.5-4, 5.5-5, 5.5-6, 5.5-7, 5.5-8, 5.5-9, 5.6-2, 5.6-6, 5.8-1, 5.13-19, 5.15-1, 5.15-2, 5.15-9, 5.16-1, 6-5, 6-6, 6-9, 6-10, 8-6, 8-7, 8-10, 8-12
- South Training Areas, S-1, S-4, S-6, S-10, S-11, S-13, S-14, 1-1, 2-5, 2-6, 2-22, 3.1-1, 3.1-3, 3.1-7, 3.2-2, 3.2-4, 3.2-6, 3.2-7, 3.3-5, 3.3-6, 3.4-1, 3.4-3, 3.4-5, 3.4-7, 3.4-8, 3.4-9, 3.5-1, 3.5-3, 3.6-1, 3.6-3, 3.7-1, 3.7-3, 3.8-1, 3.9-2, 3.9-4, 3.9-5, 4.1-1, 4.1-2, 4.1-3, 4.1-7, 4.1-12, 4.1-14, 4.3-1, 4.5-1, 4.5-6, 4.5-12, 4.8-3, 4.8-6, 4.8-9, 4.8-11, 4.8-12, 4.9-1, 4.9-4, 4.9-5, 4.9-6, 4.9-9, 4.9-10, 4.11-1, 4.11-2, 4.13-19, 5.0-1, 5.1-2, 5.1-3, 5.1-4, 5.1-5, 5.1-7, 5.3-1, 5.5-3, 5.5-4, 5.5-5, 5.5-6, 5.5-7, 5.5-8, 5.5-9, 5.6-2, 5.6-4, 5.6-5, 5.6-6, 5.6-8, 5.6-9, 5.6-10, 5.6-11, 5.8-2, 5.8-3, 5.8-5, 5.8-6, 5.8-7, 5.8-8, 5.8-9, 5.9-6, 5.9-7, 5.10-2, 5.10-4, 5.10-10, 5.10-14, 5.13-16, 6-2
- Storm Water, 2-17, 4.2-8, 4.3-1, 4.3-2, 4.3-3, 4.8-7, 5.2-2, 5.2-4, 5.2-5, 5.2-6, 5.2-8, 5.2-9, 5.3-3, 5.3-4, 5.5-1, 5.5-5, 5.5-7, 5.7-1, 5.7-2, 5.7-3, 5.7-4, 5.7-5, 5.15-5, 6-3, 6-5, 6-6
- Surface Danger Zone(s)/SDZ(s), 3.1-3, 3.1-4, 3.1-8, 3.2-4, 3.3-5, 3.4-1, 3.4-7, 3.4-8, 3.5-3, 3.5-4, 3.6-1, 3.6-3, 3.7-1, 3.7-3, 4.1-8, 5.8-4, 5.9-3, 5.9-6, 5.9-7, 5.11-1, 5.11-2, 5.12-3, 6-8, 8-5, 8-11
- Surface Impact, 3.1-3, 3.1-4, 3.1-8, 3.3-5, 3.4-7, 3.5-3, 3.6-3, 3.7-3
- Threatened and Endangered Species, 4.8-10, 5.15-12
- Tracked Vehicle(s), S-2, S-3, S-8, S-12, 1-6, 1-8, 1-9, 1-10, 3.1-1, 3.1-3, 3.4-1, 3.5-3, 3.8-1, 3.9-1, 3.9-3, 4.1-2, 4.1-7, 4.2-2, 4.5-8, 5.1-6, 5.1-7, 5.3-2, 5.3-3, 5.3-4, 5.3-5, 5.5-2, 5.6-2, 5.5-3, 5.5-6, 5.10-1, 5.10-2
- Traditional Cultural Property(ies)/TCP(s), 4.9-2, 4.9-3, 8-12
- Traffic, S-10, S-11, S-12, 2-2, 2-5, 3.3-4, 3.4-1, 3.4-5, 3.5-3, 3.5-4, 3.9-2, 3.9-3, 4.2-1, 4.2-2, 4.2-5, 4.2-6, 4.3-1, 4.4-1, 4.4-3, 4.13-25, 5.2-1, 5.2-2, 5.2-7, 5.2-9, 5.3-1, 5.3-2, 5.3-3, 5.3-4, 5.3-5, 5.4-1, 5.5-2, 5.5-3, 5.5-4, 5.5-6, 5.6-2, 5.8-6, 5.9-3, 5.9-5, 5.10-12, 5.13-4, 5.13-10, 5.15-2, 5.15-7, 5.15-8, 5.15-9, 5.15-13, 6-2, 6-4, 6-5, 6-8, 8-2, 8-3, 8-7, 8-10, 8-11

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

Training Area Development Concept/TADC, S-1, S-5, S-6, S-9, 1-1, 1-4, 1-11, 1-12, 2-1, 2-3, 2-20, 3.1-1, 3.3-4, 3.3-5, 3.3-6, 4.1-1, 5.1-2

Training Category(ies), 2-3, 3.1-3, 3.1-4, 3.1-7, 3.2-6, 3.2-7, 3.3-4, 3.3-5, 3.3-6, 3.4-1, 3.4-5, 3.4-11, 3.5-1, 3.6-1, 3.7-1, 5.1-7, 5.8-4, 5.8-9, 5.9-5, 5.9-6, 5.9-7

Transportation, S-2, S-10, 1-6, 1-7, 1-8, 1-13, 2-2, 2-24, 3.3-4, 4.1-9, 4.2-1, 4.2-4, 4.3-1, 4.3-3, 4.10-4, 4.11-3, 4.12-1, 4.12-8, 4.13-6, 4.13-8, 4.13-9, 4.13-22, 4.13-26, 5.1-1, 5.2-1, 5.2-2, 5.2-5, 5.2-7, 5.2-9, 5.3-1, 5.3-2, 5.3-3, 5.6-2, 5.6-3, 5.10-1, 5.11-1, 5.11-3, 5.15-1, 5.15-3, 5.15-4, 5.15-5, 5.15-6, 5.15-8, 6-2, 6-4

Utilities, S-10, S-11, 3.3-6, 3.4-12, 3.9-2, 4.1-7, 4.2-1, 4.2-7, 4.3-1, 4.3-2, 4.3-3, 4.9-3, 4.10-4, 4.11-3, 4.13-10, 4.13-13, 4.13-23, 4.13-26, 5.2-2, 5.2-4, 5.2-6, 5.2-7, 5.2-9, 5.3-1, 5.3-4, 5.3-5, 5.7-1, 5.10-4, 5.15-2, 5.15-4, 5.15-5, 5.15-6, 5.15-13, 5.17-1, 5.18-1, 6-5, 6-6, 8-7

Vegetation, S-10, S-13, S-14, 2-9, 2-10, 2-11, 2-12, 2-13, 2-14, 2-23, 3.9-4, 3.9-5, 4.1-13, 4.1-14, 4.1-16, 4.1-17, 4.1-18, 4.5-1, 4.5-2, 4.5-5, 4.5-8, 4.5-11, 4.5-13, 4.5-14, 4.5-16, 4.8-1, 4.8-2, 4.8-3, 4.8-4, 4.8-5, 4.8-7, 4.8-9, 4.8-14, 4.8-15, 4.9-3, 4.9-4, 4.11-2, 5.1-5, 5.1-6, 5.1-7, 5.1-8, 5.5-1, 5.5-2, 5.5-3, 5.5-4, 5.5-5, 5.5-6, 5.5-7, 5.5-8, 5.5-9, 5.6-2, 5.8-1, 5.8-3, 5.5-4, 5.8-5, 5.8-6, 5.8-7, 5.8-8, 5.8-9, 5.8-10, 5.8-11, 5.9-3, 5.11-2, 5.13-19, 5.15-1, 5.15-2, 5.15-9, 5.15-11, 5.15-12, 5.16-1, 5.18-1, 6-7, 6-9, 6-10, 8-3, 8-6, 8-12

Visual Resources, 4.1-13, 4.1-17, 4.1-19, 5.1-1, 5.1-2, 5.1-5, 5.1-6, 5.1-7, 5.1-8

War Highway, 3.1-8, 3.4-8, 4.1-7, 4.1-15, 4.3-1, 4.11-3, 5.1-4

Wastewater, S-11, S-12, 3.9-2, 3.9-3, 4.2-7, 4.3-1, 4.3-2, 4.3-3, 4.7-5, 5.2-4, 5.2-6, 5.2-7, 5.2-8, 5.2-9, 5.3-1, 5.3-3, 5.3-4, 5.7-2, 5.15-2, 5.15-4, 5.15-5, 5.15-6, 5.15-7, 5.15-10, 5.16-1, 5.18-1, 6-5

Water Demand, S-14, 3.9-5, 4.2-7, 5.3-3, 5.7-1, 5.7-2, 5.17-1

Water Resources, S-9, S-10, S-14, 1-13, 2-22, 2-23, 2-24, 3.9-5, 4.0-1, 4.7-1, 5.2-2, 5.5-1, 5.7-1, 5.7-2, 5.7-3, 5.7-4, 5.7-5, 5.14-1, 5.15-2, 5.15-3, 5.15-4, 5.15-10, 5.15-11, 6-6

Water Supply, 2-24, 4.2-7, 4.3-1, 4.3-2, 4.3-3, 4.7-1, 4.7-5, 4.12-7, 4.13-25, 5.2-2, 5.2-4, 5.2-6, 5.2-7, 5.2-9, 5.3-2, 5.3-3, 5.7-1, 5.13-10, 5.15-1, 5.15-3, 5.15-4, 5.15-7, 5.15-10, 5.15-11

Wetland(s), 2-9, 2-11, 4.2-8, 4.8-7, 4.12-6, 5.8-3, 5.8-5, 5.8-6, 5.8-9, 5.8-10, 5.8-11, 6-7, 8-12

Wheeled Vehicle(s), S-2, S-3, 1-6, 1-7, 1-8, 1-9, 3.1-3, 3.3-1, 3.4-1, 5.5-5, 5.6-2, 5.10-1, 8-3

White Sands Missile Range/WSMR, S-8, 2-22, 3.8-2, 4.1-7, 4.1-9, 4.1-12, 4.3-2, 4.7-7, 4.10-11, 5.3-2, 5.10-4, 5.10-10, 5.10-16, 5.15-3, 5.15-4, 5.15-7, 5.15-8, 5.15-9, 5.15-11, 5.15-12

Wilderness Study Area/WASA, S-9, 2-24, 3.1-3, 4.1-7, 4.1-8, 4.1-17, 4.5-13, 4.9-6, 5.15-1

Wildlife, S-14, 2-9, 2-11, 2-23, 3.9-5, 4.1-9, 4.7-1, 4.8-8, 4.8-9, 5.8-1, 5.8-4, 5.8-5, 5.8-7, 5.8-8, 5.8-9, 5.8-10, 5.8-11, 5.12-1, 5.15-1, 5.15-2, 5.15-11, 5.15-12, 5.18-1, 6-9, 8-3

William Beaumont Army Medical Center/WBAMC, 1-1, 1-6, 1-8, 2-18, 3.1-1, 3.3-3, 3.3-4, 3.4-3, 4.1-2, 4.1-13, 4.2-5, 4.2-9, 4.12-4, 4.13-20, 4.13-23, 4.13-24, 5.1-2, 5.1-5, 5.2-2, 5.9-2, 5.12-1, 5.12-2, 5.13-4, 5.13-15

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Fort Bliss Training Area Land Use Categories

Training Area Land Use Category	Fort Bliss Training Categories											
	1	2	3	4	5	6	7	8	9	10	ENV	PA
	Mission Support Facility	Weapons Firing	Surface Impact	SDZ/Safety Footprint	Off-Road Vehicle Maneuver	On-Road Vehicle Maneuver	Controlled Access FTX	Dismounted Training	Aircraft Operations	Built-Up Areas	Environmental Management	Public Access
A		●		●	●	●		●	●		●	○
A with Mission Facilities	●	●		●	●	●		●	●		●	○
B					●	●		●	●		●	○
B with Mission Facilities	●				●	●		●	●		●	○
C		●		●		●	●	●	●		●	○
C with Mission Facilities	●	●		●		●	●	●	●		●	○
D		●		●		●		●	●		●	○
D with Mission Facilities	●	●		●		●		●	●		●	○
E				●		●	●	●	●		●	○
F				●		●		●	●		●	○
G				●				●	●		●	●
H			●						●			
I	●			●		●			●	●	●	○

● Training Category occurs in Land Use Category – uses may be concurrent.
○ Public access in some areas. Fort Bliss Training Complex permit required.
ENV = Environmental Management; PA = Public Access; SDZ = Surface Danger Zone; FTX = Field Training Exercise

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Acronym List

°F	Fahrenheit
µg/m ³	micrograms per cubic meter
AADT	Annual Average Daily Traffic
AAF	Army Air Field
AAM	Annual Arithmetic Mean
AAQS	ambient air quality standards
ACEC	Area of Critical Environmental Concern
ACHP	Advisory Council on Historic Preservation
ACM	asbestos containing material
ACP	Army Campaign Plan
ACR	Armored Cavalry Regiment
ACRG	annual compound rate of growth
ADA	Air Defense Artillery
ADNL	Day-Night Average Sound Level for A-weighted noise
ADT	Average Daily Traffic
AEF	Army Evaluation Force
af	acre feet
AFI	Air Force Instruction
afy	acre feet per year
AGL	above ground level
AGM	Annual Geometric Mean
AH	Attack Helicopter
AIRFA	American Indian Religious Freedom Act
AM	amplitude modulation
AMP	Asbestos Management Plan
AMT	Asbestos Management Team
APE	Area of Potential Effect
APM	Asbestos Program Manager
APZ	Accident Potential Zone
AR	Army Regulation
ARPA	Archaeological Resources Preservation Act
ARTCC	Air Route Traffic Control Center
AST	above ground storage tank
ATACMS	Army Tactical Missile System
ATC	Air Traffic Control
ATCAA	Air Traffic Control Assigned Airspace
ATSC	Army Transformation Support Center
AUM	Animal Unit Month

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

AUTODIN	Automated Digital Network
BACT	Best Available Control Technology
BCT	Brigade Combat Team
BEA	Bureau of Economic Analysis
BLM	Bureau of Land Management
BRAC	Base Realignment and Closure
BTEX	benzene, toluene, ethyl benzene, and xylene
btu	British thermal unit
CA	Commercial Activities
CAA	Clean Air Act
CAAA	CAA Amendments
CAB	Combat Aviation Brigade
CACTF	Combined Arms Collective Training Facility
CARC	chemical agent resistant coating
CAV	Cavalry Division
CDNL	Day-Night Average Sound Level for C-weighted noise
CDP	Census Designated Place
CEQ	Council on Environmental Quality
CERCLA	Comprehensive, Environmental Response, Compensation and Liability Act
CFH	cubic feet per hour
CFR	Code of Federal Regulations
CH	Cargo Helicopter
CHPPM	U.S. Army Center for Health Promotion and Preventive Medicine
CIS	Capital Investment Strategy
CO	carbon monoxide
CPI	Consumer Price Index
CPQC	Combat Pistol Qualification Course
CWA	Clean Water Act
CX	Categorical Exclusion
CY	calendar year
CZ	Clear Zone
DA	Doña Ana Firing Range
DAGIR	Digital Air Ground Integration Range
dB	decibel
dBA	A-weighted decibel
dBC	C-weighted decibel
dBp	peak sound pressure level
DCA	Directorate of Community Activities
DEIS	Draft Environmental Impact Statement

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

DERP	Defense Environmental Restoration Program
DINAH	Desktop Interface Network to the AUTODIN Host
DMPTR	Digital Multi-Purpose Training Range
DNL	Day-Night Average Sound Level
DOC	Directorate of Contracting
DoD	Department of Defense
DODMOM	Department of Defense Measures of Merit
DOE	Directorate of Environment
DOI	Department of the Interior
DOPAA	Description of Proposed Action and Alternatives
DOT	Department of Transportation
DPTMS	Director of Plans, Training, Mobilization, and Security
DPW	Directorate of Public Works
DRM	Directorate of Resource Management
DRMO	Defense Reutilization and Marketing Office
DSN	Defense Switched Network
DU	depleted uranium
EA	Environmental Assessment
EAB	Echelons Above Brigade
EBCT	Evaluation Brigade Combat Team
EBS	Environmental Baseline Survey
EIFS	Economic Impact Forecast System
EIS	Environmental Impact Statement
EM	electromagnetic
EO	Executive Order
EOD	explosives ordnance disposal
EMPAC	Engineer Multi-Purpose Assault Course
EPA	Environmental Protection Agency
EPAS	El Paso Archaeological Society
EPCCHED	El Paso City-County Health and Environment District
EPCRA	Emergency Planning and Community Right-to-Know Act
EPEC	El Paso Electric Company
EPGC	El Paso Gas Company
EPIA	El Paso International Airport
EPWU	El Paso Water Utilities
ETZ	Extraterritorial Zone
EUL	Enhanced Use Leasing
FAA	Federal Aviation Administration
FARP	Forward Area Refuel Point

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

FAW	Forward Area Weapons
FCS	Future Combat Systems
FEIS	Final Environmental Impact Statement
FICUN	Federal Interagency Committee on Urban Noise
FIFRA	Federal Insecticide, Fungicide, and Rodenticide Act
FIREX	Fire Exercise
FM	frequency modulation
FOD	Foreign Object Damage
FONSI	Finding of No Significant Impact
FORSCOM	Forces Command
FRMAP	Future Range Mission Analysis Planning
FTX	field training exercise
FY	fiscal year
GIS	Geographic Information System
gpd	gallons per day
gpm	gallons per minute
GSA	General Services Administration
GWOT	Global War on Terrorism
H ₃	tritium
HAP	hazardous air pollutant
HH	Heavy Helicopter
HIMAD	High-to-Medium Altitude Air Defense
HMMWV	High Mobility Multipurpose Wheeled Vehicle
HPO	Historic Preservation Officer
HPP	Historic Preservation Plan
HQ	Headquarters
HWSF	Hazardous Waste Storage Facility
ICRMP	Integrated Cultural Resources Management Plan
ICUZ	Installation Compatible Use Zone
ID	Identification
IDG	Installation Design Guide
IFR	Instrument Flight Rules
IGPBS	Integrated Global Presence Basing Strategy
INRMP	Integrated Natural Resources Management Plan
IPBC	Infantry Platoon Battle Course
IPED	Institute for Policy and Economic Development
IPM	Integrated Pest Management
IR	Instrument Route
IRP	Installation Restoration Program

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

ISBC	Infantry Squad Battle Course
ISCP	Installation Spill Contingency Plan
ISD	Independent School District
ISDN	Integrated Switch Digital Network
ISO	International Organization for Standardization
ISWM	Integrated Solid Waste Management
ITAM	Integrated Training Area Management
ITU	International Telecommunications Union
JIM	Joint Interagency, Intergovernmental, and Multinational
JTF	Joint Task Force
km	kilometer
km ²	square kilometer
km ² d	square kilometer days
KV	kilovolt
KVA	kilovolt ampere
kWh	kilowatt-hours
LCTA	Land Condition Trend Analysis
LOS	level of service
LPG	Liquefied Petroleum Gas
LRAM	Land Rehabilitation and Maintenance
LRC	Long Range Component
LUPZ	Land Use Planning Zone
MACT	Maximum Achievable Control Technology
MC	Mobilization Component
MCA	Main Cantonment Area
MCL	maximum contaminant level
mg	milligram
mg/L	milligrams per liter
MGD	million gallons per day
MHz	megahertz
MLRA	Major Land Resource Area
MLRS	Multiple Launch Rocket System
mm	millimeter
MMP	Mission and Master Plan
MOA	Military Operations Area
MOU	Memorandum of Understanding
MOUT	Military Operations Urbanized Terrain
mph	miles per hour
MPMG	Multi-Purpose Machine Gun

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

MPO	Metropolitan Planning Organization
MRF	Modified Record Fire
MS4	municipal separate storm sewer system
MSA	Mutual Support Agreement
MSDS	Material Safety Data Sheet
MSGP	Multi-Sector General Permit
MSL	mean sea level
MSWLF	Municipal Solid Waste Landfill
MTR	Military Training Route
MVA	megavolt ampere
MW	megawatt
NAAQS	National Ambient Air Quality Standards
NAGPRA	Native American Graves Protection and Repatriation Act
NAS	National Airspace System
NCO	Noncommissioned Officer
NEAP	Natural Events Action Plan
NEPA	National Environmental Policy Act
NESHAP	National Emission Standards for Hazardous Air Pollutants
NHPA	National Historic Preservation Act
nm	nautical mile
NMDGF	New Mexico Department of Game and Fish
NMED	New Mexico Environment Department
NMSU	New Mexico State University
NO ₂	nitrogen dioxide
NOI	Notice of Intent
NOTAM	Notice to Airmen
NO _x	nitrogen oxide
NPDES	National Pollutant Discharge Elimination System
NPS	National Park Service
NRAO	National Radio Astronomy Observatory
NRHP	National Register of Historic Places
NSPS	New Source Performance Standards
O ₃	ozone
ODC	Ozone Depleting Chemicals
OSHA	Occupational Health and Safety Administration or Act
P2	pollution prevention
P3	Power Projection Platform
PA	Programmatic Agreement
Pb	lead

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

PBR	permit by rule
PCB	polychlorinated biphenyls
pcphpl	passenger cars per hour per lane
PEIS	Programmatic Environmental Impact Statement
phv	peak hour volume
PK	peak noise level
PL	Public Law
PM ₁₀	particulate matter less than 10 microns in diameter
PM _{2.5}	particulate matter less than 2.5 microns in diameter
POL	petroleum, oil, and lubricants
PPA	Pollution Prevention Act
ppm	parts per million
PPOA	pollution prevention opportunity assessment
PSD	Prevention of Significant Deterioration
psi	pounds per square inch
PX	Post Exchange
QAM	Quarterly Arithmetic Mean
R&D	Research and Development
RCI	Residential Communities Initiative
RCMP	Range Complex Master Plan
RCRA	Resource Conservation and Recovery Act
REC	Record of Environmental Consideration
REMI	Regional Economic Models, Inc
RFMSS	Range Facility Management Support System
RMP	Resource Management Plan
RMPA	Resource Management Plan Amendment
ROD	Record of Decision
ROI	Region of Influence
ROW	right of way
RPMP	Real Property Master Plan
RTLA	Range and Training Land Assessment
RTV	Rational Threshold Value
SARA	Superfund Amendments Reauthorization Act
SDSFIE	Spatial Data Standards for Facilities, Infrastructure, and Environment
SDZ	Surface Danger Zone
SEIS	Supplemental Environmental Impact Statement
SEL	Sound Exposure Level
SF	square foot/feet
SHORAD	Short Range Air Defense System

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

SHPO	State Historic Preservation Officer
SIP	State Implementation Plan
SO ₂	sulfur dioxide
SOP	standard operating procedure
SO _x	sulfur oxide
SPCCP	Spill Prevention, Control, and Countermeasures Plan
SPL	Sound Pressure Level
SRC	Short-Range Component
SUA	Special Use Airspace
SWMP	Storm Water Management Plan
SWMU	solid waste management unit
TA	Training Area
TAC	Texas Administrative Code
TADC	Training Area Development Concept
TC	Training Circular
TCC	Telecommunications Center
TCEQ	Texas Commission on Environmental Quality
TCP	Traditional Cultural Property
TDY	temporary duty
TEXCOM	Test and Experimentation Command
THAAD	Terminal High-Altitude Area Air Defense
TNRCC	Texas Natural Resource Conservation Commission
TOX	total organic halogen
tpd	tons per day
TRADOC	Training and Doctrine Command
TRI	Toxic Release Inventory
TSCA	Toxic Substance Control Act
TSDF	Treatment, Storage, Disposal Facility
TXDOT	Texas Department of Transportation
U.S.	United States
UAC	Urban Assault Course
UH	Utility Helicopter
USAADACENFB	U.S. Army Air Defense Artillery Center and Fort Bliss
USACAS	U.S. Army Combined Arms Support Battalion
USACE	U.S. Army Corps of Engineers
USAG	U.S. Army Garrison
USASMA	U.S. Army Sergeants Major Academy
U.S.C.	United States Code
USEPA	U.S. Environmental Protection Agency

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

USFS	U.S. Forest Service
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
UST	underground storage tank
UTEP	University of Texas at El Paso
UXO	unexploded ordnance
V/C	volume-to-capacity ratio
VFR	Visual Flight Rules
VHF	very high frequency
VLA	very large array
VLBA	very long baseline array
vmt	vehicle miles traveled
VOC	volatile organic compound
vph	vehicles per hour
VR	Visual Route
VRM	Visual Resource Management
WAN	Worldwide Area Network
WAP	Waste Accumulation Point
WBAMC	William Beaumont Army Medical Center
WBGHHD	William Beaumont General Hospital Historic District
WQS	Water Quality Standard
WRPA	Waste Reduction Policy Act
WSA	Wilderness Study Area
WSMR	White Sands Missile Range

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