FINAL
SITE INSPECTION REPORT
FORT BLISS, TEXAS

MILITARY MUNITIONS RESPONSE PROGRAM
SITE INSPECTION
MUNITIONS RESPONSE SITES

Submitted To:

US ARMY CORPS OF ENGINEERS
OMAHA DISTRICT
CENWO-PM-HC
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JANUARY 2007
(APRIL 2007 revised)

SIGNATURE PAGE

engineering-environmental Management, Inc.

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EXECUTIVE SUMMARY

Under contract with the United States Army Corps of Engineers (USACE), Omaha District; engineering-environmental Management, Inc. (e²M) has prepared the following Site Inspection (SI) Report for the other than operational ranges and other sites with known or suspected munitions and explosives of concern (MEC), munitions debris, or munitions constituents (MC) at Fort Bliss, located in Dona Ana and Otero counties in New Mexico, and El Paso County in Texas. These Munitions Response Sites (MRSs) are being addressed under the United States (US) Army Military Munitions Response Program (MMRP). The work performed for this SI was completed in accordance with the *Scope of Work Closed, Transferring, and Transferred (CTT) Ranges/Sites, Site Inspection, Multiple Installations, Air Combat Command (ACC) Contract Number DACA-63-03-D0009, Task Order DK02*; dated June 2005.

This SI Report includes the findings of the Historical Records Review (HRR); the results of discussions which took place during the Technical Project Planning Meeting Number 2 (TPP 2) in May 2006, a conference call in June 2006, and the TPP 3 meeting in December 2006; responses to comments on the Draft HRR and the Draft SI; and the proposed recommendations for one MMRP eligible site identified at Fort Bliss.

As presented in the Draft HRR, two independent US Army CTT Range/Site Inventories identified six potential MMRP eligible sites at Fort Bliss. The first Army CTT Range/Site Inventory, completed in November 2002 by TechLaw, Inc., identified Dona Ana Range Camp (Army Environmental Database Restoration [AEDB-R] identification number FTBL-005-R-01) as a potential MRS. The second Army CTT Range/Site Inventory, completed in January 2003 by e²M, identified five potential MMRP eligible sites: Castner Range (FTBL-004-R-01), Castner Range-XD (Defense Environmental Restoration Tracking System [DSERTS] number FTBL-078) (Note: this DSERTS number was later found to be in error), Dona Ana Range-McNew Surplus (FTBL-001-R-01), Maneuver Areas No. 1 and 2 (FTBL-002-R-01), and Winfree's Nose (FTBL-003-R-01). Upon further evaluation of eligibility the Castner Range-XD, Dona Ana Range-McNew Surplus, Maneuver Areas No. 1 and 2, and Winfree's Nose were determined to be Formerly Used Defense Sites (FUDS) eligible, and are not addressed as part of this MMRP SI effort. Further, in January 2006, evaluation of the Dona Ana Range Camp MMRP eligible site by the Operational Range Inventory Team and verified by the Operational Range Inventory Sustainment (ORIS), determined that this site was part of an operational range and therefore, was ineligible for the MMRP. Consequently, the Dona Ana Range Camp site will not be addressed in this MMRP SI effort. Therefore, based upon further evaluation of eligibility, only Castner Range (FTBL-004-R-01) was identified as being MMRP eligible.

Because data obtained through previous investigations at Castner Range were considered adequate for the purposes of this SI, further characterization during the SI/Resource Conservation and Recovery Act (RCRA) Facility Assessment (RFA) phase was not conducted at the Castner Range MRS.

Historical data have verified the presence of MEC and elevated concentrations of MC at the Castner Range MRS. Due to the presence of MEC and past incidents (injuries and deaths) at the Castner Range MRS, it is recommended that an immediate response (fencing and signage) be taken to discourage trespassers from entering the site. In addition, further characterization of the site through a Remedial Investigation/Feasibility Study (RI/FS) is recommended.

A summary of the findings and recommendations for each MRS is presented in the following table:

MRS	Recommendation	Basis for Recommendation	
		MEC	MC
Castner Range (FTBL-004-R-01)[1] (7,007.34 acres)	Immediate Response Required and Further Characterization. Installation of fencing and signage to limit access to trespassers is recommended as an immediate response. Further characterization is recommended to be performed during the next phase of work in an MRS specific RI/FS.	MEC was identified during previous investigations.	Soil samples collected during previous investigations indicate the presence of explosives and elevated concentrations of metals.
Castner Range-XD (AEDB-R number not assigned) (1,338.9 acres)	Determined ineligible for MMRP because site qualifies under the FUDS MMRP.	N/A	N/A
Dona Ana Range- McNew Surplus (FTBL-001-R-01) (52,410.7 acres)	Determined ineligible for MMRP because site qualifies under the FUDS MMRP.	N/A	N/A
Maneuver Areas No. 1 and 2 (FTBL-002-R-01) (73,528.6 acres)	Determined ineligible for MMRP because site qualifies under the FUDS MMRP.	N/A	N/A
Winfree's Nose (FTBL-003-R-01) (1,898.4 acres)	Determined ineligible for MMRP because site qualifies under the FUDS MMRP.	N/A	N/A
Dona Ana Range Camp (FTBL-005-R-01) (17 acres)	Determined to be Operational Range.	N/A	N/A

[1] Army Environmental Database-Restoration Number
N/A – Not Applicable

Abbreviations and Acronyms

Acronym	Definition
AAA	Anti-Aircraft Artillery
ACC	Air Combat Command
AEDB-R	Army Environmental Database-Restoration
AAF	Army Air Field
Afy	Acre feet per year
A/I	Active/Inactive
AP	Armor Piercing
ARID	Army Range Inventory Database
ARS	Advanced Range Survey
ASR	Archive Search Report
ATV	All Terrain Vehicle
Bgs	Below ground surface
BLM	Bureau of Land Management
CA	Corrective Action
Cal	Caliber
CENWO-PM	USACE, Omaha District Project Manager
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CMS	CMS Environmental, Inc.
CS	Confirmatory Sampling
CSM	Conceptual Site Model
CTC	Cost to Complete
CTT	Closed, Transferring, and Transferred
DERP	Defense Environmental Restoration Program
DMM	Discarded Military Munitions
DoD	Department of Defense
DOE	Fort Bliss Directorate of Environment
DSERTS	Defense Environmental Restoration Tracking System
e^2M	engineering-environmental Management
EHSI	Environmental Hazards Specialists International, Inc.
EOD	Explosive Ordnance Disposal
EPA	Environmental Protection Agency
EPCWID	El Paso County Water Improvement District
EPISD	El Paso Integrated School District
ERIS	Environmental Restoration Information System
°F	Degrees Fahrenheit
ft	Feet
ft^2	Square feet

Abbreviations and Acronyms

Acronym	Definition
FORSCOM	US Army Forces Command
FS	Feasibility Study
FUDS	Formerly Used Defense Site
FY	Fiscal Year
GIS	Geographic Information Systems
HE	High explosive
HMX	High Melting Point Explosive; octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine
HRR	Historical Records Review
INS	Immigration Naturalization Service
IRP	Installation Restoration Program
Lb	Pound
MACOM	US Army Major Command
MC	Munitions Constituents
MEC	Munitions and Explosives of Concern
mg/kg	Milligram per kilogram
Mm	Millimeter
MMRP	Military Munitions Response Program
Mph	Mile per Hour
MR	Munitions Response
MRA	Munitions Response Area
MRS	Munitions Response Site
MRS-PP	Munitions Response Site Prioritization Protocol
MSCs	Medium Specific Concentrations
MSL	Mean Sea Level
MYBP	Million Years Before Present
NARA	National Archives and Records Administration
NCP	National Contingency Plan
NDAA	National Defense Authorization Act
NFA	No Further Action
NOI	Notices of Intent
NRHP	National Register of Historic Places
OB/OD	Open Burn/Open Detonation
OE	Ordnance and Explosives
OEW	Ordnance and Explosive Waste
ORIS	Operational Range Inventory Sustainment
OSD	Office of Secretary of Defense
PA	Preliminary Assessment
PCLs	Protective Concentration Levels

Abbreviations and Acronyms

Acronym	Definition
RCRA	Resource Conservation and Recovery Act
RI	Remedial Investigation
RDX	Royal or Research Department Explosive; hexahydro-1,3,5-trinitro-1,3,5-triazine; cyclonite
RFA	RCRA Facility Assessment
RFI	RCRA Facility Investigation
RI/FS	Remedial Investigation/Feasibility Study
ROI	Region of Influence
RRS2	Risk Reduction Standard 2
SARA	Superfund Amendments and Reauthorization Act
SI	Site Inspection
TCEQ	Texas Commission on Environmental Quality
TCPs	Traditional Cultural Properties
TDS	Total Dissolved Solids
TNT	2,4,6-trinitrotoluene
TNRCC	Texas Natural Resource Conservation Commission
TPP	Technical Project Planning
TRADOC	Training and Doctrine Command
TxDOT	Texas Department of Transportation
US	United States
USA	USA Environmental, Inc.
USAADACENFB	US Army's Air Defense and Artillery Center and Fort Bliss
USACE	United States Army Corps of Engineers
USAEC	United States Army Environmental Command
USBR	US Bureau of Reclamation
USFWS	United States Fish and Wildlife Service
U.S.C.	United States Code
USDA	United States Department of Agriculture
USEPA	United States Environmental Protection Agency
UTEP	University of Texas, El Paso
UXB	UXB International, Inc.
UXO	Unexploded Ordnance
WBAMC	William Beaumont Army Medical Center
WWI	World War I
WWII	World War II

GLOSSARY OF TERMS

Closed Range – A military range that has been taken out of service as a range and that either has been put to new uses that are incompatible with range activities or is not considered by the military to be a potential range area. A closed range is still under the control of a Department of Defense (DoD) component.

Defense Site – Locations that are or were owned by, leased to, or otherwise possessed or used by the Department of Defense. The term does not include any operational range, operating, storage or manufacturing facility, or facility that is used for or was permitted for the treatment or disposal of military munitions. (10 USC 2710(e)(1))

Discarded Military Munitions (DMM) – Military munitions that have been abandoned without proper disposal or removed from storage in a military magazine or other storage area for the purpose of disposal. The term does not include unexploded ordnance, military munitions that are being held for future use or planned disposal, or military munitions that have been properly disposed of consistent with applicable environmental laws and regulations. (10 USC 2710(e)(2))

Explosive Ordnance Disposal (EOD) – The detection, identification, on-site evaluation, rendering safe, recovery, and final disposal of unexploded explosive ordnance and of other munitions that have become an imposing danger, for example, by damage or deterioration.

Explosives Safety – A condition where operational capability and readiness, personnel, property, and the environment are protected from the unacceptable effects or risks of potential mishaps involving military munitions.

Formerly Used Defense Site (FUDS) – A DoD program that focuses on compliance and cleanup efforts at sites that were formerly used by the DoD. A FUDS property is eligible for the Military Munitions Response Program (MMRP) if the release occurred prior to October 17, 1986; the property was transferred from DoD control prior to October 17, 1986; and the property or project meets other FUDS eligibility criteria.

Glossary of Terms (continued)

Military Munitions – All ammunition products and components produced for or used by the armed forces for national defense and security, including ammunition products or components under the control of the Department of Defense, the Coast Guard, the Department of Energy, and the National Guard. The term includes confined gaseous, liquid, and solid propellants; explosives, pyrotechnics, chemical and riot control agents, smokes, and incendiaries, including bulk explosives and chemical warfare agents; chemical munitions, rockets, guided and ballistic missiles, bombs, warheads, mortar rounds, artillery ammunition, small arms ammunition, grenades, mines, torpedoes, depth charges, cluster munitions and dispensers, demolition charges; and devices and components thereof.

The term does not include wholly inert items; improvised explosive devices; and nuclear weapons, nuclear devices, and nuclear components, other than non-nuclear components of nuclear devices that are managed under the nuclear weapons program of the Department of Energy after all required sanitization operations under the Atomic Energy Act of 1954 (42 USC 2011 et seq.) have been completed. (10 USC 101(e)(4))

Munitions Constituents (MC) – Any materials originating from unexploded ordnance (UXO), discarded military munitions (DMM), or other military munitions, including explosive and non-explosive materials, and emission, degradation, or breakdown elements of such ordnance or munitions. (10 USC 2710(e)(4))

Munitions and Explosives of Concern (MEC) – This term, which distinguishes specific categories of military munitions that may pose unique explosives safety risks, means: Unexploded Ordnance (UXO), as defined in 10 USC 2710(e)(9); Discarded military munitions (DMM), as defined in 10 USC 2710 (e)(2); or Munitions Constituents (MC) (e.g. TNT, RDX), as defined in 10 USC 2710 (e)(3), present in high enough concentrations to pose an explosive hazard.

Munitions Debris – Remnants of munitions (e.g. fragments, penetrators, projectiles, shell casings, links, fins) remaining after munitions use, demilitarization, or disposal.

Glossary of Terms (continued)

Munitions Response (MR) – Response actions, including investigation, removal and remedial actions to address the explosives safety, human health, or environmental risks presented by unexploded ordnance (UXO), discarded military munitions (DMM), or munitions constituents (MC), or to support a determination that no removal or remedial action is required.

Munitions Response Area (MRA) – Any area on a defense site that is known or suspected to contain UXO, DMM, or MC. Examples include former ranges and munitions burial areas. A munitions response area is comprised of one or more munitions response sites.

Munitions Response Site (MRS) – A discrete location within a MRA that is known to require a munitions response.

Operational Range – A range that is under the jurisdiction, custody, or control of the Secretary of Defense and that is used for range activities; or although not currently being used for range activities, that is still considered by the Secretary to be a range and has not been put to a new use that is incompatible with range activities (10 USC 101 (e)(3)). Also includes "military range", "active range", and "inactive range" as those terms are defined in 40 Code of Federal Regulations (CFR) 266.201.

Range – The term 'range,' when used in a geographic sense, means a designated land or water area that is set aside, managed, and used for range activities of the Department of Defense. The term includes firing lines and positions, maneuver areas, firing lanes, test pads, detonation pads, impact areas, electronic scoring sites, buffer zones with restricted access, and exclusionary areas. The term also includes airspace areas designated for military use in accordance with regulations and procedures prescribed by the Administrator of the Federal Aviation Administration. (10 USC 101 (e)(1))

Transferred Range – A range that is no longer under military control and had been leased by the DoD, transferred, or returned from the DoD to another entity, including federal entities. This includes a military range that is no longer under military control, but that was used under the terms of an executive order, special-use permit or authorization, right-of-way, public land order, or other instrument issued by the federal land manager. Additionally, property that was previously used by the military as a range, but did not have a formal use agreement, also qualifies as a transferred range.

Glossary of Terms (continued)

Transferring Range – A range that is proposed to be leased, transferred, or returned from the DoD to another entity, including federal entities. This includes a military range that was used under the terms of a withdrawal, executive order, special-use permit or authorization, right-of-way, public land order, or other instrument issued by the federal land manager or property owner. An operational range will not be considered a transferring range until the transfer is imminent (generally defined as the transfer date is within 12 months and a receiving entity has been notified).

Unexploded Ordnance (UXO) – Military munitions that: have been primed, fuzed, armed, or otherwise prepared for action; have been fired, dropped, launched, projected, or placed in such a manner as to constitute a hazard to operations, installations, personnel, or material; and remain unexploded whether by malfunction, design, or any other cause. (10 USC 101 (e)(5))

Table of Contents

EXECUTIVE SUMMARY i

Abbreviations and Acronyms iii

GLOSSARY OF TERMS vi

1.0 INTRODUCTION 1-1
- 1.1 Regulatory Framework 1-3
- 1.2 Project Objectives 1-4

2.0 PROJECT TEAM 2-1

3.0 BACKGROUND 3-1
- 3.1 Installation Description and History 3-1
- 3.2 TPP 2 Meeting Conclusions and Recommendations 3-3

4.0 HISTORICAL AND SITE LAYOUT SUMMARIES 4-1
- 4.1 Castner Range MRS (FTBL-004-R-01) 4-3
- 4.2 Castner Range-XD (AEDB-R Number Not Assigned) 4-3
- 4.3 Dona Ana Range-McNew Surplus (FTBL-001-R-01) 4-4
- 4.4 Maneuver Areas No. 1 and 2 (FTBL-002-R-01) 4-4
- 4.5 Winfree's Nose (FTBL-003-R-01) 4-5
- 4.6 Dona Ana Range Camp (FTBL-005-R-01) 4-5
- 4.7 Updated MRS Status 4-5

5.0 DATA COLLECTION AND DOCUMENT REVIEW PROCESS 5-1
- 5.1 Data Collection Methods 5-1
  - 5.1.1 Fort Bliss Site Visit and Interviews with Installation Personnel 5-1
  - 5.1.2 National Archives 5-1
  - 5.1.3 Internet Searches 5-2
- 5.2 Archival/Historical and Other Records Collected 5-3

6.0 SUMMARY OF FINDINGS 6-1
- 6.1 Castner Range (FTBL-004-R-01) 6-1
  - 6.1.1 Historical Use 6-1
  - 6.1.2 Previous Investigations 6-12
  - 6.1.3 MEC/MC Summary 6-39
- 6.2 MRS-PP Summary 6-39

7.0 CONCEPTUAL SITE MODEL 7-41
- 7.1 Introduction 7-41
- 7.2 Installation Setting 7-41
  - 7.2.1 Physical Setting 7-41
  - 7.2.2 Ecological Setting 7-47
  - 7.2.3 Cultural Setting 7-50
- 7.3 Castner Range MRS 7-52
  - 7.3.1 MRS Profile 7-52
  - 7.3.2 Physical Profile 7-53

Table of Contents (continued)

7.3.3 Land Use and Exposure Profile 7-53
7.3.4 Ecological Profile 7-55
7.3.5 Munitions/Release Profile 7-55
7.3.6 Pathway Analysis 7-57
7.3.7 MRS Data Gaps 7-58

8.0 CONCLUSIONS 8-1
8.1 Castner Range MRS (FTBL-004-R-01) 8-1
8.1.1 MEC 8-1
8.1.2 MC 8-1
8.1.3 CSM Summary 8-1

9.0 RECOMMENDATIONS 9-1

List of Appendices

Appendix A Archive Documents
Appendix B Interviews and Other Pertinent Correspondence
Appendix C TPP Meeting Minutes and Responses to Comments
Appendix D Munitions Response Site Prioritization Protocols
Appendix E Munitions Technical Data Sheets

List of Photographs

Photograph 1: Current Site Conditions on Castner Range MRS 2001 6-1
Photograph 2: Fence Along North and Portion of West Perimeter of Castner Range MRS 1999 6-8
Photograph 3: Large Warning Sign Posted at Castner Range MRS 1999 6-9
Photograph 4: Small Warning Sign at Castner Range MRS 6-9
Photograph 5: Live 105mm Projectile, M314 Series with Fuze Found During USA's Investigation January 2004 6-39
Photograph 6: Live 2.36-Inch Rocket, M6 HEAT Found During USA's Investigation February 2004 6-39
Photograph 7: Live 37mm Projectile, MK1 Found During USA's Investigation December 2003 6-39
Photograph 8: Live Grenade, Smoke, M22 Found During USA's Investigation October 2003 6-39

EXECUTIVE SUMMARY i

Abbreviations and Acronyms iii

GLOSSARY OF TERMS vi

1.0 INTRODUCTION 1-1
1.1 Regulatory Framework 1-3
1.2 Project Objectives 1-4

2.0 PROJECT TEAM 2-1

3.0 BACKGROUND 3-1
3.1 Installation Description and History 3-1
3.2 TPP 2 Meeting Conclusions and Recommendations 3-3

4.0 HISTORICAL AND SITE LAYOUT SUMMARIES 4-1
4.1 Castner Range MRS (FTBL-004-R-01) 4-3
4.2 Castner Range-XD (AEDB-R Number Not Assigned) 4-3
4.3 Dona Ana Range-McNew Surplus (FTBL-001-R-01) 4-4
4.4 Maneuver Areas No. 1 and 2 (FTBL-002-R-01) 4-4
4.5 Winfree's Nose (FTBL-003-R-01) 4-5
4.6 Dona Ana Range Camp (FTBL-005-R-01) 4-5
4.7 Updated MRS Status 4-5

5.0 DATA COLLECTION AND DOCUMENT REVIEW PROCESS 5-1
5.1 Data Collection Methods 5-1
5.1.1 Fort Bliss Site Visit and Interviews with Installation Personnel 5-1
5.1.2 National Archives 5-1
5.1.3 Internet Searches 5-2
5.2 Archival/Historical and Other Records Collected 5-3

6.0 SUMMARY OF FINDINGS 6-1
6.1 Castner Range (FTBL-004-R-01) 6-1
6.1.1 Historical Use 6-1
6.1.2 Previous Investigations 6-12
6.1.3 MEC/MC Summary 6-39
6.2 MRS-PP Summary 6-39

7.0 CONCEPTUAL SITE MODEL 7-41
7.1 Introduction 7-41
7.2 Installation Setting 7-41
7.2.1 Physical Setting 7-41
7.2.2 Ecological Setting 7-47
7.2.3 Cultural Setting 7-50
7.3 Castner Range MRS 7-52
7.3.1 MRS Profile 7-52
7.3.2 Physical Profile 7-53
7.3.3 Land Use and Exposure Profile 7-53

7.3.4 Ecological Profile 7-55
7.3.5 Munitions/Release Profile 7-55
7.3.6 Pathway Analysis 7-57
7.3.7 MRS Data Gaps 7-58

8.0 CONCLUSIONS 8-1
8.1 Castner Range MRS (FTBL-004-R-01) 8-1
8.1.1 MEC 8-1
8.1.2 MC 8-1
8.1.3 CSM Summary 8-1

9.0 RECOMMENDATIONS 9-1

List of Figures

Figure 3-1: Installation Location 3-2
Figure 4-1: Locations of MRSs Identified in the US Army CTT Range/Site Inventories 4-2
Figure 4-2: MRS Location 4-7
Figure 6-1: Historical Range Locations and Areas of Concern on Castner Range MRS 6-2
Figure 6-2: Current Structures on Castner Range MRS 6-6
Figure 6-3: UXO Cleared Areas on Castner Range MRS 6-11
Figure 6-4: Location of Historic Investigations on Castner Range MRS 6-13
Figure 6-5: 1975 Engineer Studies Group Study Areas on Castner Range MRS 6-14
Figure 6-6: EHSI 1994 Investigation Areas on Castner Range MRS 6-17
Figure 6-7: UXB 1997 Surface Removal Action Areas on Castner Range MRS 6-22
Figure 6-8: CMS 1998 Zones and Investigation Areas on Castner Range MRS 6-25
Figure 6-9: UXB 1998 Investigation Areas on Castner Range MRS 6-28
Figure 6-10: USACE 1996 and 1999 Surface Soil Sampling at OB/OD Pit B-1 on Castner Range MRS 6-32
Figure 6-11: Summary of UXO Removed from Castner Range MRS 1995-2004 6-36
Figure 6-12: 2004 OB/OD Area A-1 Test Bore Location 6-38
Figure 7-1: Castner Range - MEC Exposure Pathway Analysis 7-59
Figure 7-2: Castner Range - MC Exposure Pathway Analysis 7-60

List of Tables

Table 1-1: MMRP Eligible Sites Identified During US Army CTT Range/Site Inventories 1-2
Table 1-2: Comparison of the CERCLA and RCRA Processes 1-2
Table 4-1: MRS Summary 4-6
Table 5-1: Summary of Documents and Relevant Information 5-3
Table 6-1: Timeline of Range Use 6-5
Table 6-2: UXO Removed During December 1979 Surface Sweep 6-15

Table 6-3: Items Located During the 1994 EHSI Investigation 6-18
Table 6-4: UXO Removed During the UXB 1995 Surface Ordnance Removal Action 6-23
Table 6-5: UXO Removed During 1998 CMS Investigation 6-24
Table 6-6: Items Detonated During UXB 1998 Removal Action 6-26
Table 6-7: UXO Removed During 2004 USA Removal Action 6-37
Table 6-8: Castner Range MRS-PP Priority Rating 6-40
Table 7-1: Common Wildlife Species Occurring at Fort Bliss 7-48
Table 7-2: Summary of MEC and Potential MC Present at Castner Range 7-55
Table 7-3: Maximum Penetration Depths for MEC Present at Castner Range 7-56
Table 9-1: MRS Recommendations 9-1

1.0 INTRODUCTION

Under contract with the United States Army Corps of Engineers (USACE), Omaha District; engineering-environmental Management, Inc. (e^2M) has prepared the following Site Inspection (SI) Report for the other than operational ranges and sites with known or suspected munitions and explosives of concern (MEC), munitions debris, or munitions constituents (MC) at Fort Bliss, Texas. These Munitions Response Sites (MRSs) are being addressed under the United States (US) Army Military Munitions Response Program (MMRP). The work performed for this SI was completed in accordance with the Statement of Work, Military Munitions Response Program, Site Inspection, Fort Bliss, Texas, Fort Sam Houston, Texas, Contract Number DACA63-03-D-0009, dated September 2005.

Two independent US Army Closed, Transferred, and Transferring (CTT) Range/Site Inventories identified six potential MMRP eligible sites at Fort Bliss. The first US Army CTT Range/Site Inventory, completed in November 2002 by TechLaw, Inc., identified Dona Ana Range Camp (Army Environmental Database Restoration [AEDB-R] identification number FTBL-005-R-01) as a potential MRS. The second US Army CTT Range/Site Inventory, completed in January 2003 by e^2M, identified five potential MMRP eligible sites; Castner Range (FTBL-004-R-01), Castner Range-XD (Defense Environmental Restoration Tracking System [DSERTS] number FTBL-078) (Note: this DSERTS number was later found to be in error), Dona Ana Range-McNew Surplus (FTBL-001-R-01), Maneuver Areas No. 1 and 2 (FTBL-002-R-01), and Winfree's Nose (FTBL-003-R-01). Upon further evaluation of eligibility the Castner Range-XD, Dona Ana Range-McNew Surplus, Maneuver Areas No. 1 and 2, and Winfree's Nose were determined to be Formerly Used Defense Sites (FUDS) eligible, and are not addressed as part of this MMRP SI effort. In addition, in January 2006, evaluation of the Dona Ana Range Camp MMRP eligible site by the Operational Range Inventory Team and verified by the Operational Range Inventory Sustainment (ORIS), determined that this site was part of an operational range and therefore, was ineligible for the MMRP. Consequently, the Dona Ana Range Camp site will not be addressed in this MMRP SI effort either. Therefore, based upon further evaluation of eligibility, only Castner Range (FTBL-004-R-01) was identified as being MMRP eligible because releases occurred prior to September 2002, munitions (e.g., projectiles, grenades, mortars, small arms and rockets) were used during past range activities, live-fire operations were conducted from 1926 to 1966, and demolition and/or disposal of MEC and/or MC was performed at the site. **Table 1-1** below lists the MMRP Sites identified during the US Army CTT Range/Site inventories:

Table 1-1: MMRP Eligible Sites Identified During US Army CTT Range/Site Inventories

Site Name	AEDB-R number	CTT Acreage	MRS Eligibility	Reason for Ineligibility
Castner Range	FTBL-004-R-01	7,084	Yes	Not Applicable
Castner Range-XD	FTBL-078[1]	1,338.9	No	Qualifies for FUDS MMRP
Dona Ana Range - McNew Surplus	FTBL-001-R-01	52,410.7	No	Qualifies for FUDS MMRP
Maneuver Areas No. 1 and 2	FTBL-002-R-01	73,528.6	No	Qualifies for FUDS MMRP
Winfree's Nose	FTBL-003-R-01	1,898.4	No	Qualifies for FUDS MMRP
Dona Ana Range Camp	FTBL-005-R-01	17	No	Determined to be Operational

AEDB-R Site ID = Army Environmental Database-Restoration Site Identification Number
[1] DSERTs number later determined to be incorrect

While it is the goal of the Department of Defense (DoD) to address MMRP sites under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and the US Environmental Protection Agency's (EPA) National Oil and Hazardous Substances Contingency Plan (NCP) Remedial Site Evaluation process as stated in Code of Federal Regulations (CFR) Title 40, Part 300.420, the US Army recognizes some installations (including Fort Bliss) may need to address these sites under the Resource Conservation and Recovery Act (RCRA) Corrective Action (CA) program.

The two separate Final Phase 3 CTT Range/Site Inventory Reports (CTT Range Inventory) for Fort Bliss dated November 2002 and January 2003; respectively, marked the completion of the Preliminary Assessment (PA) phase of work under CERCLA, and a portion of the RCRA Facility Assessment (RFA) phase of work under the RCRA CA program. The next step in the process is the SI (CERCLA terminology), which also corresponds with the RFA Phase under RCRA. The work at Fort Bliss will be implemented under the MMRP SI program, which utilizes CERCLA terminology for programmatic documents. It is understood that the following RCRA CA program terminology, shown in **Table 1-2** below, is implied:

Table 1-2: Comparison of the CERCLA and RCRA Processes

CERCLA	RCRA
Preliminary Assessment (PA)	RCRA Facility Assessment (RFA)
Site Inspection (SI)	RFA
Remedial Investigation (RI)	RCRA Facility Investigation (RFI)

Because data obtained through previous investigations at Castner Range were considered adequate for the purposes of this SI, further characterization during the SI (RFA) phase was not conducted at the Castner Range MRS.

This SI Report includes the findings of the Historical Records Review (HRR); the results of discussions which took place during the Technical Project Planning Meeting Number 2 in May 2006 (TPP 2), a conference call in June 2006, and the TPP 3 meeting in December 2006; responses to comments on the Draft HRR and the Draft SI; and the proposed recommendations for the one MMRP eligible site identified at Fort Bliss (Castner Range).

This SI Report includes the following specific information:

- Introduction, Regulatory Framework and Project Objectives,
- Project Team,
- Site Background,
- MRS Historical and Site Layout Summaries,
- Data Collection and Document Review Process,
- Summary of Findings,
- Conceptual Site Model (CSM),
- Conclusions, and
- Recommendations.

The following appendices are attached to and considered part of this SI report: Archive Documents (**Appendix A**); Interviews and Other Pertinent Correspondence (**Appendix B**); TPP Meeting Minutes and Response to Comments (**Appendix C**); Munitions Response Site Prioritization Protocols (MRS-PPs) (**Appendix D**); and Munitions Technical Data Sheets (**Appendix E**).

1.1 Regulatory Framework

The regulatory structure for managing MRSs at Fort Bliss is guided by a mixture of federal, state, and local laws, as well as DoD and US Army regulations and guidance. Key legislative and administrative precedents to date will likely influence the final regulatory framework for the MMRP. The key legislative and administrative precedents include the following:

- The Office of the Secretary of Defense (OSD), Defense Environmental Restoration Program (DERP) Guidance (September 2001) established an MMRP element for defense sites with known or potential unexploded ordnance (UXO) or discarded military munitions (DMM). The history

of DERP dates back to the Superfund Amendments and Reauthorization Act of 1986 (SARA) and is defined in 10 United States Code (USC) §2701(b), which states the goals of the program shall include the following:

- The identification, investigation, research and development, and cleanup of contamination from hazardous substances, and pollutants and contaminants; and
- Correction of other environmental damage (such as detection and disposal of UXO) which creates an imminent and substantial endangerment to the public health or welfare, or to the environment.

- Sections 311-312 of the National Defense Authorization Act (NDAA) of Fiscal Year (FY) 02 reinforced the Office of the Secretary of Defense (OSD) 2001 DERP Guidance by tasking the DoD to develop and maintain an inventory of defense sites that are known or suspected to contain UXO, DMM, or MC. Together, UXO and DMM are categorized as munitions and explosives of concern (MEC); when MC is present at concentration greater than 10 percent in a medium, that medium is also categorized as MEC.
  - Section 311 requires the DoD to develop a protocol for prioritizing defense sites for response activities in consultation with state regulators and Tribal members.
  - Section 312 requires the DoD to create a separate program element to ensure the DoD can identify and track MMRP funding.

The OSD 2001 DERP Guidance and the NDAA FY 2002, described above, established the MMRP. The DERP and the MMRP provide guidance and methods for conducting a baseline inventory of defense sites known or suspected to contain UXO, DMM, or MC.

1.2 Project Objectives

The primary objective of the SI is to collect reliable information necessary to make one of the following recommendations in accordance with the MMRP:

- Whether an MRS qualifies for No Further Action (NFA).
- Whether an immediate response is needed.
- Whether further characterization is warranted.

The secondary objective of the SI is to collect information to refine the MMRP Cost to Complete (CTC) estimates, in part by providing analytical data to enter into the Environmental Restoration Information System (ERIS) and to populate a portion of the MRS-PP for each of the MMRP eligible sites.

2.0 PROJECT TEAM

The role of the Project Team is to execute this MMRP SI in accordance with Federal, State, and local regulatory requirements. The Project Team consists of the following:

- Regulatory Agency – Texas Commission on Environmental Quality (TCEQ);
- Program Manager – United States Army Environmental Command (USAEC);
- Executing Agency – USACE, Omaha District;
- Installation Personnel – Fort Bliss Directorate of Environment;
- SI Consultant – e^2M; and
- Other TPP 2 Attendees – USACE, Tulsa District and USACE, Huntsville District.

3.0 BACKGROUND

3.1 Installation Description and History

Fort Bliss (Federal Facility Identification number: TX213720101) is located in west Texas and southern New Mexico on approximately 1.1 million acres of land. Fort Bliss encompasses portions of two states and three counties (Dona Ana and Otero counties in New Mexico, and El Paso County in Texas). The main cantonment area is situated adjacent to the City of El Paso, Texas and just north of the City of Ciudad Juarez which is located across the border in Mexico (FTBL-2.A.1). An Installation location map is provided in **Figure 3-1**.

The Installation's mission is to be prepared for combat operations with trained and ready soldiers and units, which can be deployed rapidly to areas of crises. This includes not only all active forces assigned to Fort Bliss, but also reserve component forces, which will activate and mobilize during an emergency (FTBL-2.A.1).

During the war with Mexico in 1846, Colonel Alexander W. Doniphan and the 1st Missouri Mounted Volunteers became the first US Army troops to enter the El Paso area. The War Department directed the establishment of a post in El Paso on November 7, 1848. "The initial mission of the military post was to protect railways, stage routes, and settlers." The Post was renamed "Fort Bliss" in honor of Lieutenant Colonel William Wallace Smith Bliss on March 8, 1854. In March 1890, the citizens of El Paso raised money to purchase a permanent site for the post. Troops began to occupy the current site in 1893 (FTBL-2.A.1).

Following the turn of the century, Fort Bliss entered its greatest growth period when the Army responded to a raid across the border by Pancho Villa. Border patrol and defense became a major concern. William Beaumont Army Medical Center (WBAMC) and Biggs Army Air Field (AAF) were added after World War II (WWII) (FTBL-2.A.1).

Until WWII, the cavalry ruled the post. The Army's new anti-aircraft artillery (AAA) arrived in 1940 and re-established the mission of Fort Bliss as the largest overland air defense missile range and training center throughout the free world. The US Air Force closed Biggs Air Force Base in 1966 and turned the base over to Fort Bliss (FTBL-2.A.1).

INSTALLATION LOCATION
Fort Bliss, Texas

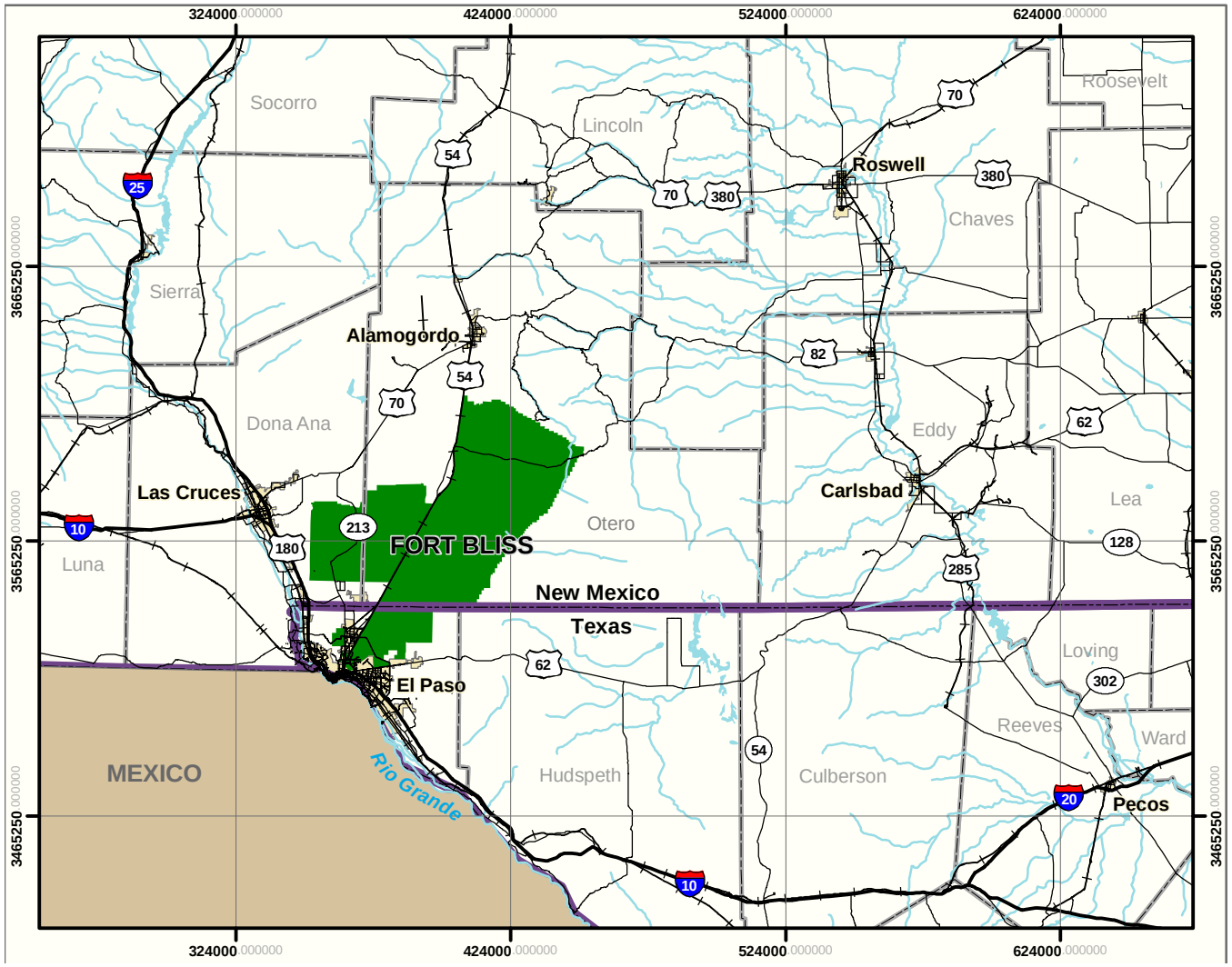

Figure 3-1

N
W E
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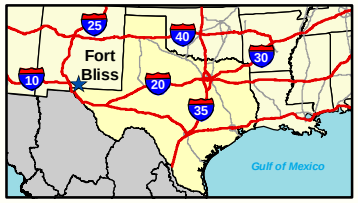
- State Border
- County Boundary
- Mexico
- Urban Area
- Installation, Fort Bliss
- Railroad
- Interstate Highway
- Major Road
- Stream
- Water

Projection:	**UTM Zone 13**
Datum :	**WGS 84**
Units:	**Meters**
Grid:	**100,000 Meter**

1:2,500,000

0 10 20 30 40 50 Miles
0 20 40 60 80 Kilometers

Installation Location
Texas



SITE INSPECTION REPORT
FORT BLISS, TEXAS

Source: Produced for the U.S. Army Corps of Engineers by engineering-environmental Management, Inc. (e²M)

Date: January 2007
Edition: Final

Today, Fort Bliss is the second largest Army post, second only to White Sands Missile Range, which is adjacent to Fort Bliss. The US Army's Air Defense and Artillery Center and Fort Bliss (USAADACENFB) is a US Army Training and Doctrine Command (TRADOC) installation. Fort Bliss is the largest of the 16 TRADOC facilities and is the only troop training installation in the continental US capable of supporting long-range missile firings (FTBL-1.A.1, FTBL-2.A.1). USAADACENFB supports joint US and Allied training, and major US Army Forces Command (FORSCOM) units. The US Army Sergeants Major Academy, WBAMC, the German Air Force Training Command and Air Defense School, and several DoD liaison officers are also located at Fort Bliss. Under the recent reorganization of the US Army, Fort Bliss now reports to the Installation Management Agency, Southwest Regional Office located at Fort Sam Houston, Texas (FTBL-2.A.1).

3.2 TPP 2 Meeting Conclusions and Recommendations

The TPP 2 Meeting took place at Fort Bliss on 2 May 2006 and was followed up with a telephone conference call on 6 June 2006. The findings from the records review, which were summarized in the HRR and CSM, were presented at the meeting by e²M. Representatives from TCEQ, EPA Region 6, USAEC, USACE Omaha, Tulsa, and Huntsville Districts, Fort Bliss Directorate of Environment, and e²M discussed the findings, and made recommendations for the SI at the Installation.

During the 2 May 2006 and 6 June 2006 meetings, two key items of discussion included whether Castner Range was the only MMRP eligible MRS out of the six sites originally identified in the HRR and whether additional sampling was needed during the SI process at Castner Range MRS. The stakeholders agreed that Castner Range was the only MMRP eligible MRS and that sufficient soil sampling had been conducted during previous investigations at Castner Range and there was enough evidence of MEC presence to eliminate the need for additional field work during the SI. It was also agreed that the Castner Range MRS be recommended for both an "Immediate Response" in the form of fencing and signage and "Further Characterization" in the form of a Remedial Investigation/Feasibility Study (RI/FS). The meeting minutes are provided in **Appendix C**.

4.0 HISTORICAL AND SITE LAYOUT SUMMARIES

Six potential MMRP eligible sites were identified during two independent US Army CTT Range/Site Inventories: the first completed in November 2002 by TechLaw, Inc. which identified Dona Ana Range Camp (FTBL-005-R-01); and the second completed in January 2003 by e²M which identified Castner Range (FTBL-004-R-01), Castner Range-XD (FTBL-078), Dona Ana Range-McNew Surplus (FTBL-001-R-01), Maneuver Areas No. 1 and 2 (FTBL-002-R-01), and Winfree's Nose (FTBL-003-R-01). Upon further evaluation of eligibility the DSERTS identification number FTBL-078 for Castner Range-XD was found to be in error. Due to historical site activities and the potential for MC and MEC to be present, the sites qualified for the MMRP.

The sites identified during the two independent US Army CTT Range/Site Inventories at Fort Bliss are shown on **Figure 4-1** and include the following:

- Castner Range (FTBL-004-R-01),
- Castner Range-XD (AEDB-R Number not assigned),
- Dona Ana Range-McNew Surplus (FTBL-001-R-01),
- Maneuver Areas No. 1 and 2 (FTBL-002-R-01),
- Winfree's Nose (FTBL-003-R-01), and
- Dona Ana Range Camp (FTBL-005-R-01).

Descriptions of these MRSs as derived from the US Army CTT Range/Site Inventories completed in November 2002 by TechLaw, Inc., and in January 2003 by e²M, are presented in **Sections 4.1** through **4.6**.

LOCATIONS of MRSs IDENTIFIED in the US ARMY CTT RANGE/SITE INVENTORIES Fort Bliss, Texas

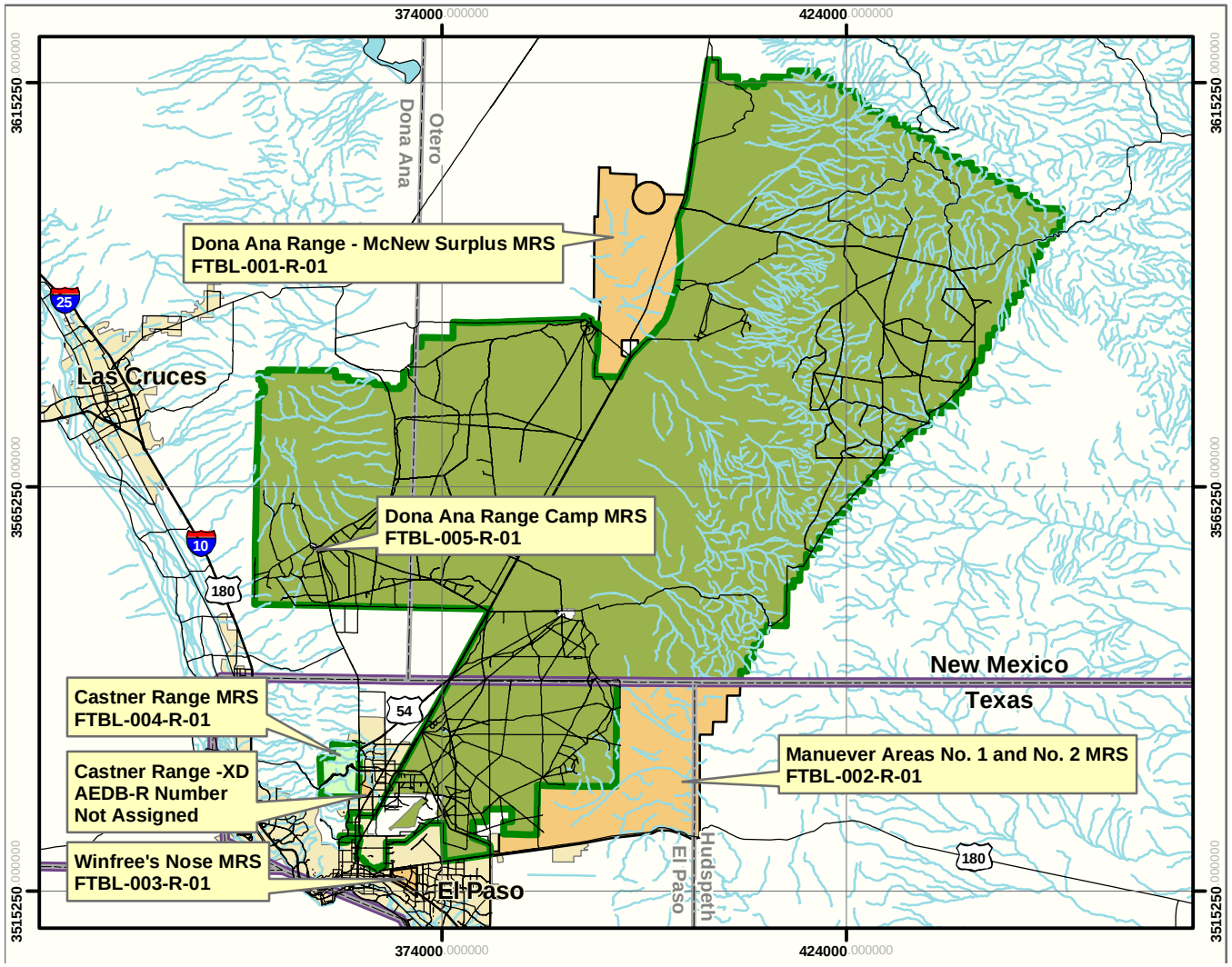


Figure 4-1

N
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- State Border
- County Boundary
- Urban Area
- Installation Boundary
- Road
- Stream
- Water

Area Status

- Operational Range
- MRS, Closed
- MRS, Transfered

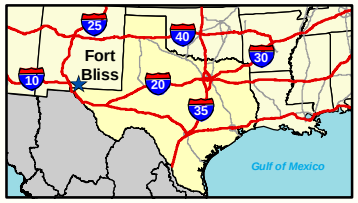
Projection:	**UTM Zone 13**
Datum :	**WGS 84**
Units:	**Meters**
Grid:	**50,000 Meter**

1:850,000

0 5 10 15 20 Miles

0 10 20 30 Kilometers

Installation Location
Texas



SITE INSPECTION REPORT
FORT BLISS, TEXAS

Source: Produced for the U.S. Army Corps of Engineers by engineering-environmental Management, Inc. (e²M)

Date: April 2007
Edition: Final (Revised)

4.1 Castner Range MRS (FTBL-004-R-01)

The Castner Range MRS (FTBL-004-R-01) is located within the City limits of El Paso, Texas between US Highway 54 and the Franklin Mountains State Park, approximately 15 miles south of the New Mexico border. Acquisition of Castner Range began in 1926 and initially it was approximately 3,500 acres in size. By 1939, additional land was acquired bringing the range to a total of 8,328 acres in size. Castner Range was heavily used for small arms firing courses and artillery firing and impact areas from 1926 through 1966, at which time all ordnance use at Castner Range was discontinued. In 1972, the Department of the Army declared Castner Range surplus to its needs. Since then several parcels of land have been transferred to non-DoD entities. Many isolated clearance operations have been conducted on Castner Range over the years and approximately 1,230 acres that have been transferred have been thoroughly cleared of UXO. These transferred acres are designated as the Castner Range-XD MRS (see **Section 4.2** below). However, the remaining 7,084 acres are still unsuitable for transfer. This site contains large caliber high explosives, mortars, pyrotechnics, illumination flares, grenades, and small arms. Additionally, a large area was used for open burning (OB)/open detonation (OD) and has been found to contain High Melting Point Explosive/octahydro-1,3,5,7-tetranitro-1,3,5,7 tetrazocine (HMX), Royal or Research Department Explosive/hexahydro-1,3,5-trinitro-1,3,5-triazine, cyclonite (RDX), and RCRA metals (FTBL-1.A.2).

4.2 Castner Range-XD (AEDB-R Number Not Assigned)

Castner Range-XD (AEDB-R number not assigned) consists of several parcels of land totaling 1,338.9 acres which was transferred to non-DoD entities, including the State of Texas, private developers, and the City of El Paso. (Note to Reader: there is a discrepancy in acreages noted in the CTT Inventories and other documentation for the Castner Range-XD [1,230, 1,244, 1,247, and 1,338.9]). Castner Range was used for small arms and artillery firing, and impact areas from 1926 through 1966, at which time all ordnance use at Castner Range was discontinued. Ordnance types found in the transferred portions of Castner Range include large and medium caliber high explosives, mortars, and pyrotechnics (FTBL-1.A.2). In 1964, the State of Texas acquired 216 acres of Castner Range to construct Trans Mountain Road. Throughout construction several truckloads of UXO and shrapnel were removed from the developed highway easement. In 1974, approximately 1,230 acres were surface cleared of UXO by the 41st Ordnance Detachment and the 3rd Army Cavalry Regiment, to make the land suitable for transfer. The surface clearance was performed by placing 100 individuals 10 feet apart and sweeps were made in 1000 foot widths. These transferred acres currently have multiple uses. Part of the land was sold and is now a residential area known as Castner Heights. Another 580 acres were donated as follows: 227 acres is park land operated by the City of El Paso; 144 acres were used to develop the El Paso

Community College for their TransMountain Campus; 112 acres were transferred to the El Paso Integrated School District (EPISD) for schools; 39 acres were transferred to the Education Service Center for El Paso and Hudspeth Counties; and 58 acres were transferred to the University of Texas, El Paso (UTEP). In addition, Fort Bliss developed a recreational area for soldiers and their families on 58 acres that are no longer used (FTBL-1.A.2).

4.3 Dona Ana Range-McNew Surplus (FTBL-001-R-01)

In December 1911, Fort Bliss acquired for military purposes approximately 40,250 acres in Dona Ana County, New Mexico, along US Highway 54, the main route between El Paso, Texas and Alamogordo, New Mexico. Several additional land acquisitions over the next 10 years brought the total acreage of land owned by Fort Bliss in New Mexico up to 46,010 acres. In 1921, this land was established as the Fort Bliss Target Range or the Dona Ana Range, originally to be used for small arms and artillery firing ranges. In 1940, an adjacent tract of nearly 422,000 acres was leased. This newly leased land along with the Dona Ana Range was named the Fort Bliss AAA Range (FTBL-1.A.2).

The Fort Bliss AAA Range continued to change shape and purpose for several years. In November 1945, 19,122.67 acres were declared surplus. This parcel eventually increased to approximately 52,410.7 acres and was referred to as the McNew Surplus Area. A 90millimeter (mm) gun position and two impact areas were located within the surplus property (FTBL-1.A.2).

4.4 Maneuver Areas No. 1 and 2 (FTBL-002-R-01)

Maneuver Areas No. 1 and No. 2 is a transferred range that occupies approximately 73,528.6 acres in the southeastern portion of the Fort Bliss range area, adjacent to the City of El Paso, Texas. In 1939, 54,953 acres, known as the Expansion of Facilities Area, was acquired for field exercises. In 1942, Fort Bliss leased an 118,667-acre plot adjacent to the Expansion of Facilities Area for tactical training known as the Maneuver Area. Troops from Fort Bliss and Biggs Field utilized this Maneuver Area during WWII. Between 1946 and 1947, the entire Maneuver Area was declared surplus, only to be re-acquired and expanded a few years later (FTBL-1.A.2).

In 1949, the 54,953-acre Expansion of Facilities Area was renamed as Maneuver Area No. 1, and the newly leased 125,151-acre parcel was named Maneuver Area No. 2. During the 1970s, the municipal airport and expansions to Biggs Field reduced Maneuver Area No. 1 by roughly 10,000 acres. At about the same time, 65,920 acres of Maneuver Area No. 2 were purchased outright and the last lease along Carlsbad Highway was not renewed (FTBL-1.A.2).

Portions of this transferred range are currently used as commercial property, and as part of the airport for the City of El Paso (FTBL-1.A.2).

4.5 Winfree's Nose (FTBL-003-R-01)

Winfree's Nose is a small parcel approximately 1,898.4 acres in size located south of Biggs Field at the southern end of Fort Bliss. This portion of land was declared surplus in January 1947. It is assumed that this range was used as a training and maneuver area between 1921 and 1947. Much of the supporting documentation addresses Maneuver Areas No. 1 and No. 2 together with Winfree's Nose; therefore, the history of this range is expected to have been similar until this land was declared surplus in 1947. Commercial property and residential areas are currently present on Winfree's Nose (FTBL-1.A.2).

4.6 Dona Ana Range Camp (FTBL-005-R-01)

Dona Ana Range Camp is a closed range, still owned by the US Army, comprising 17 acres in the western portion of the Installation property, and is part of an area that is currently used for vehicle and equipment maintenance. This area was part of a much larger area used by Fort Bliss, Texas, for training and testing at various times throughout the 20th century. From 1911-1940, it was part of the Fort Bliss "Dona Ana Target Range" where small arms and artillery were fired. From 1964 to 1975, it was again used as part of ranges where small arms and rockets were used in training (FTBL-3.A.1).

4.7 Updated MRS Status

Upon further evaluation of eligibility, the Dona Ana Range-McNew Surplus, Maneuver Areas No. 1 and 2, Winfree's Nose, and Castner Range Range-XD MMRP potentially eligible sites identified during the January 2003 US Army CTT Range/Site Inventory were determined to be FUDS eligible and will not be addressed as part of this MMRP SI effort. The Dona Ana Range-McNew Surplus and Maneuver Areas No. 1 and 2 were identified as FUDS eligible in the "Transmittal of Active Military Munitions Response Program (MMRP) Sites to the Formerly Used Defense Site (FUDS) Program" memorandum dated 1 July 2005. Winfree's Nose was identified as FUDS eligible in the "Findings and Determination of Eligibility Project Determination of Eligibility Project Determination of Property as a Formerly Used Defense Site Winfree's Nose Range, Fort Bliss, Texas; FUDS Project No. K06TX112800" memorandum dated July 2004. The excessed portion of Castner Range (Castner Range XD) was identified as FUDS eligible in a 16 January 1997 memorandum for the Omaha USACE, "Transmittal of Amended Inventory Project Report (INPR) No. K06TX005402 for Castner Range, Fort Bliss, El Paso, TX".

The Dona Ana Range Camp site was identified during the November 2002 US Army CTT Range/Site Inventory. This site was then evaluated in January 2006 by the Operational Range Inventory Team and

verified by the ORIS, and the determination was made that this site was part of an operational range and therefore ineligible for the MMRP. Consequently, the Dona Ana Range Camp site will not be addressed in this MMRP SI effort.

Therefore, these MRSs will not require any further investigation under the MMRP. The remaining MRS, Castner Range, qualifies for the MMRP because of the following:

1) releases occurred prior to September 2002;
2) live munitions were used at the range from 1926 to 1966 and included projectiles, grenades, mortars, small arms and rockets; and
3) demolition and/or disposal of MEC and/or MC occurred on the range.

Figure 4-2 shows the remaining MRS, Castner Range (FTBL-004-R-01), at Fort Bliss.

Based on data available at the time of the CTT Range/Site Inventories, the Castner Range acreage was cited as 7,084 acres; however, current Operational Range Inventory Sustainment (ORIS) data show the acreage as 7,007.34.

In addition, it should be reiterated **Sections 4.1** through **4.6** above summarize information directly from the CTT Range/Site Inventories. It should be noted several discrepancies regarding acreages of the Castner Range and the Castner Range-XD were observed in the CTT data. **Table 4-1** summarizes changes in the MRS eligibility and acreages between the CTT Range/Site Inventories and this SI report:

Table 4-1: MRS Summary

Site Name	AEDB-R Number	CTT Acreage	HRR/SI Acreage	Reason for Change
Castner Range	FTBL-004-R-01	7,084	7,007.34	Based on current ORIS data.
Castner Range-XD	FTBL-078[1]	1,338.9	0	Site determined to be eligible under the FUDS MMRP
Dona Ana Range - McNew Surplus	FTBL-001-R-01	52,410.7	0	Site determined to be eligible under the FUDS MMRP
Maneuver Areas No. 1 and 2	FTBL-002-R-01	73,528.6	0	Site determined to be eligible under the FUDS MMRP
Winfree's Nose	FTBL-003-R-01	1,898.4	0	Site determined to be eligible under the FUDS MMRP
Dona Ana Range Camp	FTBL-005-R-01	17	0	Determined to be Operational and not eligible for the MMRP

AEDB-R Site ID = Army Environmental Database-Restoration Site Identification Number
[1] DSERTs number later determined to be incorrect. AEDB-R # will not be assigned

MRS LOCATION
Fort Bliss, Texas

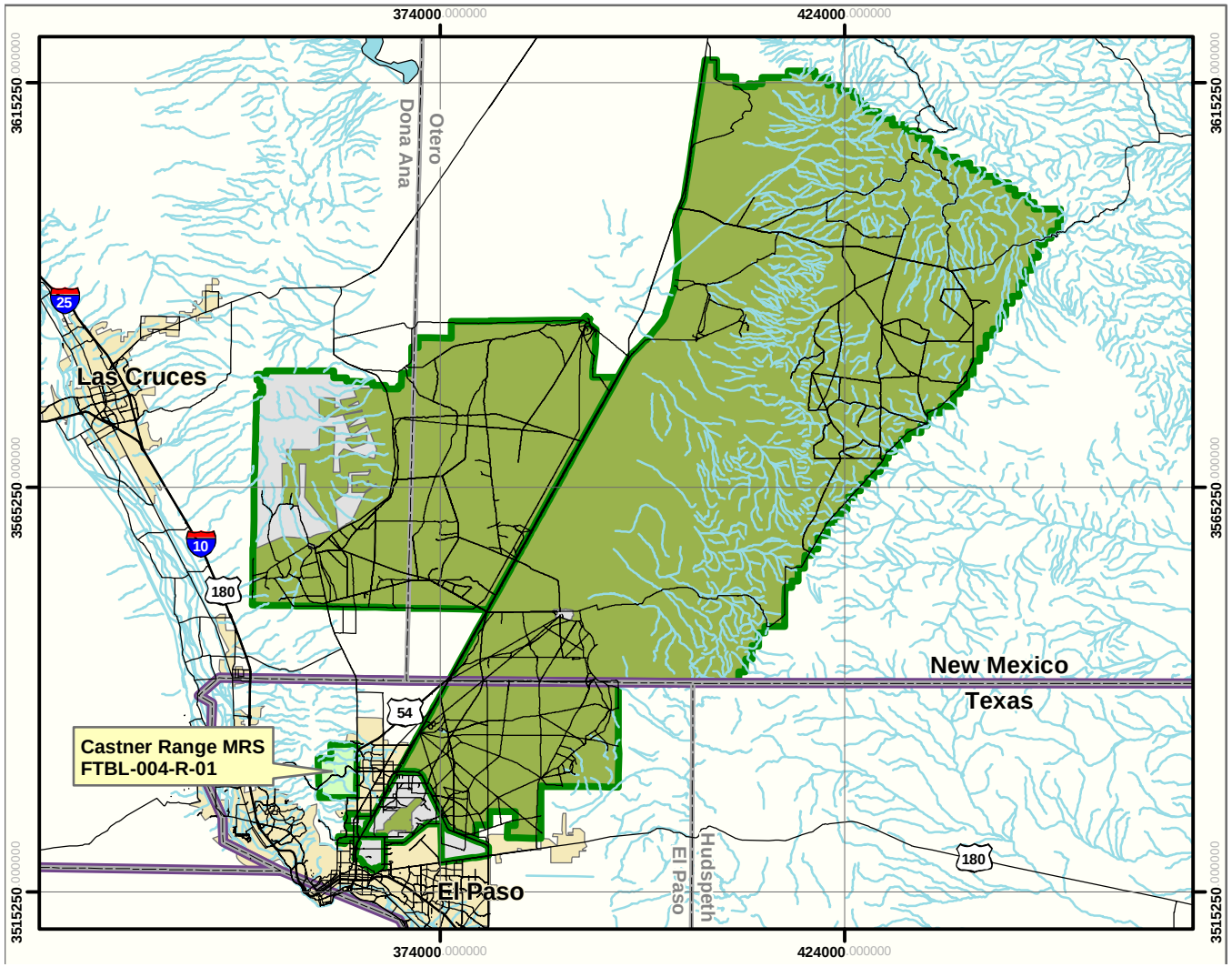


Figure 4-2

N
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S

State Border
County Boundary
Urban Area
Installation Boundary
Road
Stream
Water

Area Status

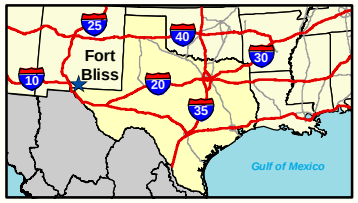
Operational Range
Other than Operational Range
MRS, Closed

Projection:	**UTM Zone 13**
Datum :	**WGS 84**
Units:	**Meters**
Grid:	**50,000 Meter**

1:850,000

0 5 10 15 20 Miles
0 10 20 30 Kilometers

Installation Location
Texas



SITE INSPECTION REPORT
FORT BLISS, TEXAS

Source: Produced for the U.S. Army Corps of Engineers by engineering-environmental Management, Inc. (e^2M)

Date: April 2007
Edition: Final (Revised)

5.0 DATA COLLECTION AND DOCUMENT REVIEW PROCESS

5.1 Data Collection Methods

5.1.1 Fort Bliss Site Visit and Interviews with Installation Personnel

e²M performed a records review site visit at Fort Bliss, Texas from 9-13 January 2006. The intent of the site visit was to gather on-site records pertaining to the Castner Range and Dona Ana Range Camp MRSs which were both determined MMRP eligible at the time of the SI records review. Also, the goal was to interview on-site contractors and on-site personnel from the Environmental Office.

e²M reviewed environmental documents and performed interviews of site personnel to determine the environmental status and risk associated with specific portions of Fort Bliss.

Four primary sources of information were researched as part of the data collection effort for the HRR. Please refer to **Appendix A** for archive documents referenced in this report. The types of data included:

- Installation site visit and interviews;
- Review of existing Fort Bliss Directorate of Environment (DOE) document Files;
- Review of historical documents from the National Archives; and
- Review of the US Army CTT Range/Site Inventory Reports and back up data.

A windshield tour of the MRSs was conducted with Ron Baca of the Fort Bliss DOE, and an interview was conducted with David Dodge of Weston Solutions (formerly of the Fort Bliss DOE) to collect information for the HRR. Please refer to **Appendix B** for the interview record.

5.1.2 National Archives

Relevant archival record repositories and Record Groups were selected based on guidance set forth in the "Technical/Regulatory Guideline for Munitions Response Historical Records Review", prepared by the Interstate Technology & Regulatory Council Unexploded Ordnance Team, and based on the process developed by the United States Army Corps of Engineers (USACE) for performing Archive Search Reports (ASRs) (guidance provided at http://www.mvs.usace.army.mil/engr/ed-p/asr.htm). Only the record repositories that have historically proven to be most useful were searched. The archival repositories and Record Groups that were searched for the HRR include the following:

- National Archives, National Archives & Records Administration (NARA), College Park, Maryland
    - Textual Records
        1. Army Air Forces
        2. Bureau of Budget
        3. Chief of Engineers
        4. Quartermaster General
        5. Farm Credit Administration
        6. Public Buildings Service
        7. Chief of Ordnance
        8. Office Of Inspector General
        9. Army Services Forces
        10. War Department General and Special Staffs
        11. Chemical Warfare Service
        12. Chief of Arms
        13. General Services Administration
        14. Federal Property Resources Service
        15. Interservice Agencies, Armed Forces Explosives Board
        16. Headquarters Army Ground Forces
        17. Record of Headquarters US Air Force
        18. Provost Marshal General
        19. Records of United States Army Continental Commands, 1920-1942
        20. Adjutant General
        21. Records of Federal Property Council
        22. Army Materiel Command
    - Cartographic Division
        1. Bureau of Public Roads
        2. USGS
        3. Chief of Engineers
        4. Quartermaster General
        5. Surgeon General
        6. Federal Property Resources Management
        7. US Army Continental Commands, 1821-1920
        8. US Army Continental Commands, 1920-1941
    - Aerials
    - Still Photos

5.1.3 Internet Searches

Research was conducted on the internet to supplement the archival data and information received from the Installation and the National Archives. Web sites searched for information on Fort Bliss included the following:

- US Census: http://quickfacts.census.gov/qfd/states/48/4824000.html
- UXO INFO: http://www.uxoinfo.com/uxoinfo/ordfillers.cfm
- USACE ASR Process: http://www.mvs.usace.army.mil/engr/ed-p/asr.htm
- ORDATA online: http://maic.jmu.edu/ordata/search.asp

5.2 Archival/Historical and Other Records Collected

The following table (**Table 5-1**) presents the relevant data collected from the various sources outlined above for the development of the Fort Bliss HRR and CSM.

Table 5-1: Summary of Documents and Relevant Information

Document Title	MEC	MC	Environmental
CMS. Final Survey Report – Castner Range, Ft. Bliss, TX, 25 February 1998	X		X
Environmental Hazards Specialists International, Inc. After Action Report Letter, Unexploded Ordnance Site Characterization, Ft. Bliss, TX. 10 August 1994	X		X
Fort Bliss. FY2006 Fort Bliss, Texas Installation Action Plan. March 2005.			X
Fort Bliss. FY2005 Fort Bliss, Texas Installation Action Plan. April 2004.			X
Fort Bliss DOE et. al. Integrated Natural Resource Management Plan. November 2001.			X
IT Corporation. Final Work Plan Soil Investigation Proposed INS Site, Castner Range, El Paso, Texas. February 2003.		X	X
IT/OHM. Final Interim Control Measures Work Plan Trans Mountain Buried Drum Site (FTBL-070), Castner Range, Fort Bliss, Texas. January 2001.			X
IT/OHM. Final Response Action Completion Report Trans Mountain Buried Drum Site (FTBL-070) Castner Range. November 2002.		X	X
IT/OHM. Addendum #1 Remedial Action Plan OB/OD Pit B-1 Site (FTBL-072) Castner Range, Fort Bliss, Texas to the Final Remedial Action Plan Trans Mountain Buried Drum Site (FTBL-070) Castner Range, Fort Bliss, Texas. May 2001.		X	X
J.K. Wagner & Company, Inc. The North Castner Range Fort Bliss, Texas Archival Research. September 1999.			X
Malcolm Pirnie, Inc. Draft Report Site Investigation Work Plan OB/OD Pit B-1 (FTBL-042) Castner Range Fort Bliss, Texas. December 1998.			X
Parsons Engineering Science Inc. OE Characterization and Cost Analysis Report for Fort Bliss: Castner Range. May 1998.	X	X	X
Report of Sampling Activities for Ft. Bliss Relative Risk Site Evaluation.			X
Shaw Environmental, Inc. Final Summary of Test Boring Activities, Open Burn/Open Detonation (OB/OD) Area A-1, FTBL-073, Castner Range, Fort Bliss, Texas. May 2004.			X
USA Environmental Inc. Draft Final Removal Report Ordnance and Explosives (OE) Removal Action at Castner Range, Fort Bliss, Texas. 16 April 2004.	X		X

Table 5-1: Summary of Documents and Relevant Information (continued)

Document Title	MEC	MC	Environmental
USACE, Huntsville. Penetration of Projectiles into Earth, An Analysis of UXO Clearance Depths at Ft. Ord. 29 July 1997.			X
USACE, St. Louis District. Archives Search Report Fort Bliss, Castner Range, El Paso, Texas. August 1994.	X		X
UXB International, Inc. Final Removal Report Ordnance and Explosive Removal Action Castner Range, Fort Bliss, El Paso, Texas. 30 October 1998	X		X
UXB International, Inc. Final Report for Castner Range Fort Bliss, Texas, Unexploded Ordnance (UXO) Removal Action. April 1997.	X		X
Carlson, Kurt R. 41st Ordnance Detachment Explosive Ordnance Disposal FORSCOM Field Operating Activity, Fort Bliss, Texas. Letter to Mr. Bywater Albuquerque District, Corps of Engineers. Subject: Northgate Dam Site, Castner Range, Ft. Bliss, TX, Range Clearance. 8 January 1986.	X		X
Perez, Daniel. El Paso Times. New threat menaces Castner – roving cattle. 25 February 1999.			
Perez, Daniel. El Paso Times. Officials devise new ways to keep out trespassers. 24 May 1999.			
Pino-Marina, Christina. El Paso Times. Stranded hiker, 19, rescued. 20 March 2000.			
Ramirez, Christina and Christina Pino-Marina. El Paso Times. Students, teachers mourn lost hiker. 23 February 2000.			
Ramirez, Christina. El Paso Times. Military training device causes bomb scare. 27 June 1999.	X		
Fort Bliss RAB. Castner Range Fence: New Fence on the North and West Boundary of Castner Range. 11 January 2000.			
Fort Bliss RAB. Castner Range Sign Briefing. 5 April 2000.			
Fort Bliss RAB. Effectiveness of Land Use Controls at Castner. 14 November 2001.			

6.0 SUMMARY OF FINDINGS

6.1 Castner Range (FTBL-004-R-01)

6.1.1 Historical Use

Castner Range is a 7,007.34-acre closed firing range located in northwest El Paso on the foothills of the Franklin Mountains. The range was used for live-fire operations from 1926 to 1966 (FTBL-2.A.2). Castner Range was originally established in 1926 for small arms firing courses and artillery firing and impact areas. Munitions from small arms to 120mm projectiles have been fired on Castner Range. The firing of 8-inch artillery rounds has been cited in several general histories but no records were found to confirm this. The range was also used for firing demonstrations. These operations involved extensive firing of conventional weapons in addition to white phosphorus and smoke munitions (FTBL-4.A.3). **Photograph 1** shows current site conditions on Castner Range (FTBL-6.A.1).

6.1.1.1 Pre-World War II Activities

Four rifle ranges were constructed in the south central area of the range. Additional land was purchased in 1939 and more ranges were added (FTBL-4.A.2). The boundary of the pre-WWII range is shown on **Figure 6-1** (the individual boundaries of the four rifle ranges were not depicted in the reference).

Photograph 1: Current Site Conditions on Castner Range MRS 2001

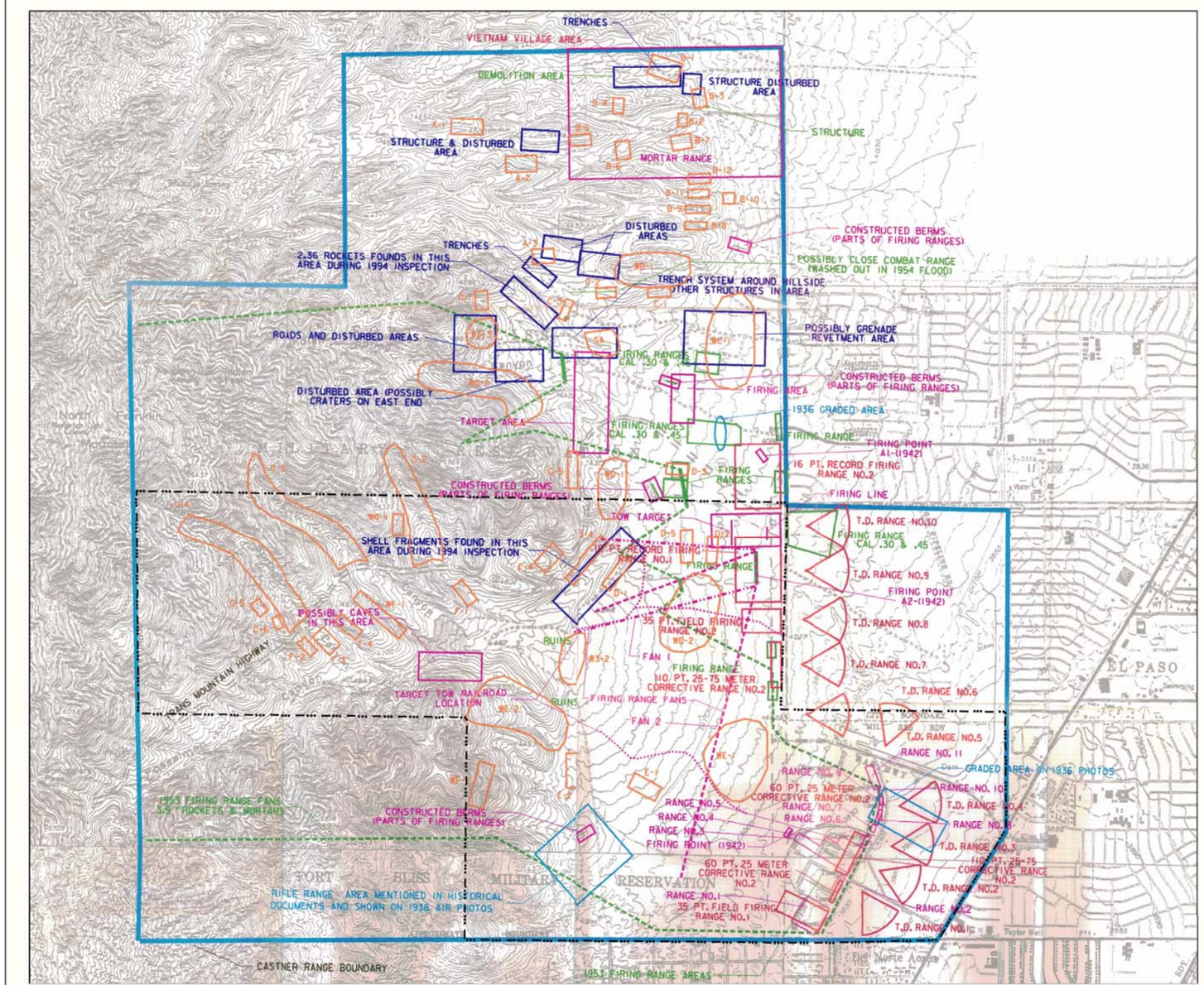
The range area was probably also used for firepower demonstrations during this time (FTBL-4.A.2). The range may also have been used for artillery firing as the 82nd Field Artillery Unit was stationed at Fort Bliss (FTBL-4.A.3).

6.1.1.2 WWII Era Ranges

Range maps from 1943 identify 17 ranges (see **Figure 6-1**). Most ranges were small arms ranges with the exception of a 37mm sub-caliber range, a mortar range, and moving target and field firing courses.

HISTORICAL RANGE LOCATIONS and AREAS of CONCERN on CASTNER RANGE MRS
Fort Bliss, Texas

Figure 6-1



World War II Ranges

Range 1	Rifle
Range 2	.30 Caliber Machine Gun
Range 3	Rifle
Range 4	Rifle
Range 5	Rifle
Range 6	.30 and .50 Caliber Machine Gun
Range 7	Pistol
Range 8	.30 Caliber Machine Gun
Range 9	37mm Sub-caliber
Range 10	.22 Caliber Landscape
Range 11	Rifle - .30 Caliber
Range 12	Gravity Course Moving Target
Range 13	Field Firing Course
Range 14	Submachine Gun / Shotgun
Range 15	Mortar
Range 28	.22 Caliber Aerial Target
Range 29	Tow Target Course

Three artillery firing points, two located in Range 12 and one in Range 13
One possible additional firing point in Range 14

1950's Ranges

Range 1	Known Distance (KD) 100 and 200 Yard
Range 2	KD 100, 200, and 300 Yard
Ranges 3 & 4	Transition Table VII
Range 5	KD 100, 200, and 300 Yard
Range 6	KD 100, 200, and 300 Yard (unsatisfactory condition)
Range 7	KD 100, 200, and 300 Yard
Range 8	1000-inch and Landscape (unsatisfactory condition)
Range 9	Pistol 15, 25, and 50 Yard
Ranges 10 & 11	1000-inch and Landscape
Range 12	Infiltration
Range 13	Individual Day Training (barbwire entanglements)
Ranges 14A & 14B	500-inch Machine Gun
Range 14C	Attack Course
Range 15	1000-inch and Landscape (unsatisfactory condition)
Range 16	3.5 Rocket Launcher
Range 17	Transition Table VII (225 yards instead of 500 yards)
Range 17A	Transition Table VIII
Range 18	Hand Grenade - Dummy Practice
Range 19	Hand Grenade - Practice
Range 20	Hand Grenade - Live
Ranges 23-25	Close Combat (unsatisfactory, washed out in 1954 flood)
Range 26	Demolition (Consisted of a number of demolition pits)

A subsequent undated document which rescinded the 17 March 1955 range training memorandum list the same ranges but with different numbers. Significant additional information is shown below.

Range 14	3.5-inch Practice Rocket Only Course (target is stationary tank)
Range 18	Dummy and Live Rifle Grenade Course (20 firing points, impact area)
Range 19	Live Grenade Course (10 throwing revetments)

NOTE: The exact locations of the 1950's ranges listed above were not shown in any of the archive documents. Consistency with the range numbering system for the 1940's and 1960's would locate Range 1 in the southeast area of the property with numbers increasing in a northward direction.

- 1930's Features
- 1940's Features
- 1950's Features
- 1960's Features
- Areas of Concern Identified and Referenced in EHSI SI Report, 10 August 1994 (Appendix C-3)
- Castner Range Boundary Prior to 1971 transfer of southeast portion to the city of El Paso
- pre WWII Range Boundary Added to primary map (Plate 5 cited below) based on other historical information (Plate 1 cited below)

Data Source:
USACE-St. Louis District, Defense Environmental Restoration Program Ordnance and Explosive Waste Archives Search Report, Fort Bliss, Castner Range, El Paso, Texas, El Paso County, August 1994, Archives Search Report Composite Map, Plate 5

USACE Archives Search Report, August 1994, Plate 1

Approximate Scale:
0 1,000 2,000 3,000 4,000 Feet
0 400 800 1,200 Meters

Installation Location
Texas

SITE INSPECTION REPORT
FORT BLISS, TEXAS

Source: Produced for the U.S. Army Corps of Engineers by engineering-environmental Management, Inc. (e²M)

Date: January 2007
Edition: Final

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Three field artillery firing points were identified in addition to the ranges. These firing points were located in the eastern portion of the range, and firing was to the west or southwest. A report from the Commander of Fort Bliss, dated 11 May 1971, states the western mountainous portions of the range had been used for large artillery impact areas during the 1930's and 1940's (FTBL-4.A.2).

6.1.1.3 Post WWII Ranges

Army Military Service maps from the 1950's show a firing range and a demolition area in the northeast portion in addition to the firing ranges located in the southeast area. Range firing fans from 1953 show firing points located along the eastern edge of the range using the Franklin Mountains as a backstop. By 1955, 27 ranges existed on Castner Range. The ranges were mostly small arms ranges with the exception of a 3.5-inch rocket range, a live hand grenade range, and a demolition range (FTBL-4.A.2) (see **Figure 6-1**). The exact location of the grenade range was not identified but the course contained 10 throwing revetments. The demolition range consisted of pits for blowing demolitions (FTBL-4.A.3). The entire Castner Range area west of US Highway 54 was a potential impact area for 3.5-inch rockets and grenades (FTBL-4.A.4).

Documents from 1961 indicate a complex of firing ranges identified as Trainfire I was located along the eastern edge of the Castner Range. It included 8 live firing courses and 10 target detection courses. The only operations specified for these ranges were rifle and other small arms firing. Target detection courses do not involve live munitions firing. The Vietnam Village was constructed for close combat training in the same area as the demolition range in the northern portion of Castner Range (FTBL-4.A.2) (see **Figure 6-1**). The Vietnam Village occupied 20 acres and probably involved operations for live hand grenades, bulk explosives, and explosive booby-traps (FTBL-4.A.3).

6.1.1.4 Other Activities

Fort Bliss was originally a combat garrison and became the Air Defense School. The Installation was heavily involved in training personnel in the use of various air defense weapons. Any type of field artillery in use prior to the start of WWII and any type of air defense artillery may have been used, demonstrated, or disposed of on Castner Range. Firing demonstrations were reported to have been conducted on Castner Range. Selected weapons were mass fired on a location to demonstrate to an audience the destructive fire power of the weapons being used. White phosphorus and smoke munitions were probably used in addition to live ammunition of various calibers (FTBL-4.A.2).

Historical documents indicate special explosive operations were carried out on Castner Range in 1958 and 1976. In 1958, an operation involving blasting and quarrying along rock faces of the Franklin Mountains was conducted in the Castner Range. Small diameter holes were drilled into the rock and filled with explosives to split the rock formation. The operations were carried out as part of explosives training for the 273rd Engineer Detachment. In June 1976, a cratering exercise involved placing shaped charges in holes advanced into the soil and then detonated to create excavations. M2A3 (15-pound) and M3A4 (40-pound) shaped charges were exploded. Charges were detonated near the highway and museum and in the demolition area (FTBL-4.A.2).

During 1966, all organized weapons firing was discontinued on the Castner Range and range operations were transferred to the Meyer Range complex (FTBL-4.A.2). A chronological list of range use is depicted below in **Table 6-1**.

Table 6-1: Timeline of Range Use

Time Period	Range Use
Pre-WWII	• Rifle Ranges • Fire power demonstrations • Artillery firing
WWII	• Small arms ranges • Mortar range • 37mm sub-caliber range • Moving target courses • Field firing courses • Artillery firing
Post WWII	• Demolition area • Small arms ranges • 3.5 inch rocket range • Live hand grenade range • Trainfire I – live firing and target detection courses (small arms) • Vietnam Village – live hand grenades, bulk explosives, booby-traps

Source: FTBL-4.A.2

6.1.1.5 OB/OD Areas

OB/OD Pit B-1 (FTBL-072) is a former OB/OD pit located near the northernmost boundary of Castner Range. The site sits on the side of an arroyo that runs east of the Franklin Mountains. The site location is shown on **Figure 6-2**. The exact usage dates are unknown but would match the usage dates of Castner Range, 1926 to 1966. This pit was used as a "Burn Kettle" or "Burn Pit" exclusively for the destruction of small arms ammunition. The center of the site was a small concrete pit, 5 x 10 feet with

CURRENT STRUCTURES on CASTNER RANGE MRS
Fort Bliss, Texas

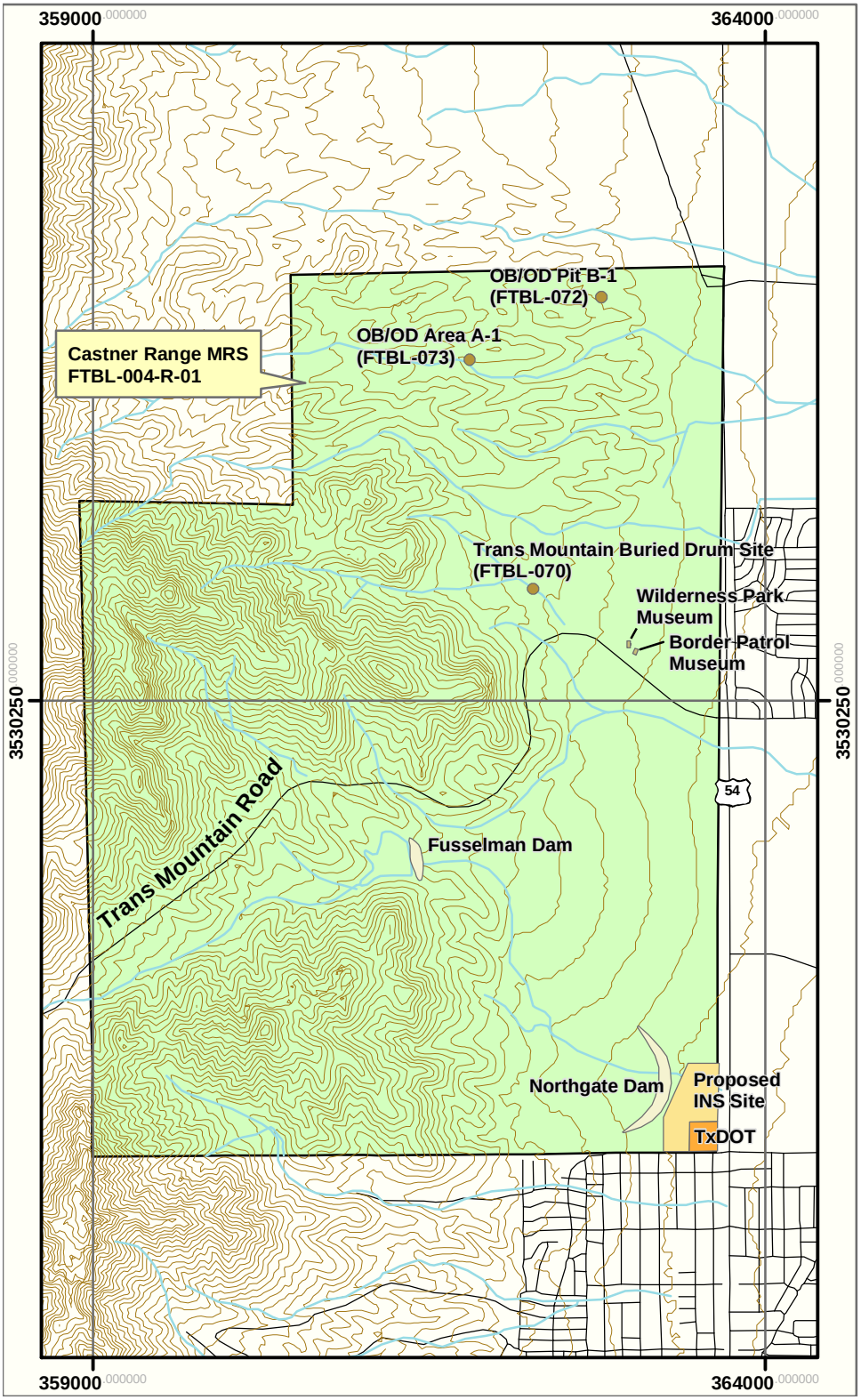


Figure 6-2

N
W E
S

- Elevation Contour
- Road
- Stream
- Immigration and Naturalization Service (INS)
- TxDOT Facility
- Dam
- Museum
- IRP Site

Area Status

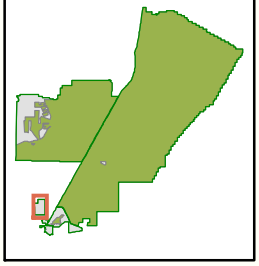
- Castner Range MRS

Data Source:
IT Corporation, Remedial Action Plan, OB/OD Pit B-1, May 2001, Figure 3-3, Access Path and Stockpile Layout
IT Corporation, Response Action Completion Report, Trans Mountain Buried Drum Site, October 2001, Figure 1-1, Site Location Map

Projection:	UTM Zone 13
Datum :	WGS 84
Units:	Meters
Grid:	5,000 Meter

1:50,000
0 0.1 0.2 0.3 0.4 0.5 Miles
0 0.25 0.5 0.75 1 Kilometers

Installation Location
Texas



SITE INSPECTION REPORT
FORT BLISS, TEXAS

Source: Produced for the U.S. Army Corps of Engineers by engineering-environmental Management, Inc. (e^2M)

Date: April 2007
Edition: Final (Revised)

2 foot high walls and open on one side. Fort Bliss completed a removal action at this site in 2001 (FTBL-2.B.1).

OB/OD Area A-1 (FTBL-073) is a second OB/OD area located near the northwest corner of Castner Range. The general location of the area is in a small valley with a dry streambed running through the bottom. The site location is shown on **Figure 6-2**. The exact usage dates are unknown but would probably coincide with the use of Castner Range, 1926 to 1966. The site contains several earthen depressions, a bulldozed cut, and fragmentary surface debris. The material from past range activities is spread over an approximately 4-acre area along the valley floor. Site Investigation field work was completed to delineate the nature and extent of the contamination in Area A-1 in the fall of 2002.

Additional site investigative work has been ongoing and recent testing has identified pesticide contamination requiring remediation. Soil remediation activities to address the pesticide contamination were initiated in March 2006 and additional remedial work was planned for the site in October 2006. During the remedial activities, no munitions related issues were identified.

6.1.1.6 Trans Mountain Buried Drum Site

The Trans Mountain Buried Drum Site (FTBL-070) covers approximately 6 acres of Castner Range and is situated on an alluvial fan adjacent to the east side of the Franklin Mountains. It is located approximately 2,000 feet north of Trans Mountain Road and approximately 3,000 feet from the Wilderness Park Museum and Border Patrol Museum (FTBL-7.A.1). The site location is shown on **Figure 6-2**. In 1994, an ordnance removal contractor discovered 55-gallon drums and a large surface flow of tar material on the site (FTBL-7.B.2). The Texas Natural Resource Conservation Commission (TNRCC) issued a Notice of Violation on 30 June 1995 for the release of tar-like material from drums (FTBL-2.B.1). The history of the site is not well known, although historical information indicates that the US Army may have operated a bituminous concrete patching operation at the site (FTBL-7.B.1). The site contained concrete slabs, asphalt pavement, piles of concrete and metal debris, piles of asphalt pavement material, drums containing tar-like material, and buried 55-gallon drums (FTBL-7.A.1). The central feature of the site was a pit approximately 230 x 10 x 12 feet wide at the top that contained asphaltic tar material. Originating from the pit was a surface flow of asphalt. Fort Bliss completed a removal action at the site in June and July of 2001. The concrete slabs erected by the USACE were left as historical evidence of the site usage (FTBL-2.B.1).

6.1.1.7 Range Incidents

Explosive items picked up by civilians at Castner Range have resulted in several fatalities off the base. In 1955, a 75mm projectile detonated and killed three children and injured ten others. In 1962, a 2.36-inch rocket detonated and killed one child, and four others lost one or both legs. In 1967, during the construction of the Trans Mountain Road, numerous high explosive (HE) duds were found. In 1988, a 3.5-inch rocket was recovered from a local El Paso resident by the Explosive Ordnance Disposal (EOD) unit from Fort Bliss (FTBL-4.A.2).

An off-duty police officer on a bike ride discovered a practice bazooka round containing no explosives in June 1999 near US Highway 54. It was believed the device washed down from the mountain during recent rains. The bazooka round was intact but had noticeable rust damage. The Fort Bliss EOD unit was called and identified the round (FTBL-8.A.1).

The El Paso Times reported in 1999 that cattle from Bowen Ranch were entering Castner Range through downed fences (FTBL-9.A.1). The newspaper also reported in 1999 that "people continue to use the former military bombing range to jog, hike, and enjoy nature despite the danger of unexploded ordnance" (FTBL-9.B.1). In February 2000, a 16-year old was killed while hiking in the Franklin Mountains on the Castner Range (FTBL-10.A.1). In March 2000, a 19-year-old was hiking in the Castner Range and had to be rescued from a mountain face (FTBL-11.A.1).

6.1.1.8 MRS Profile

Castner Range is bordered by Franklin Mountains State Park to the northwest, west and southwest; by US Highway 54 to the east; by a residential and business district to the southeast; and by undeveloped area to the northeast (FTBL-5.A.1). There is a short section of fence along the north side and limited portion of the west side of the property. **Photograph 2** shows a portion of the fence (FTBL-12.A.1).

There are no fences along the rest of the perimeter of Castner Range.

Photograph 2: Fence Along North and Portion of West Perimeter of Castner Range MRS 1999

Fort Bliss has erected 67 large bilingual (English and Spanish) warning signs in addition to 102 smaller signs with a large visual display to alert the public against trespassing. **Photographs 3** and **4** show warning signs posted at Castner Range (FTBL-28.A.1, FTBL 29.A.1).

Photograph 3: Large Warning Sign Posted at Castner Range MRS 1999

Photograph 4: Small Warning Sign at Castner Range MRS

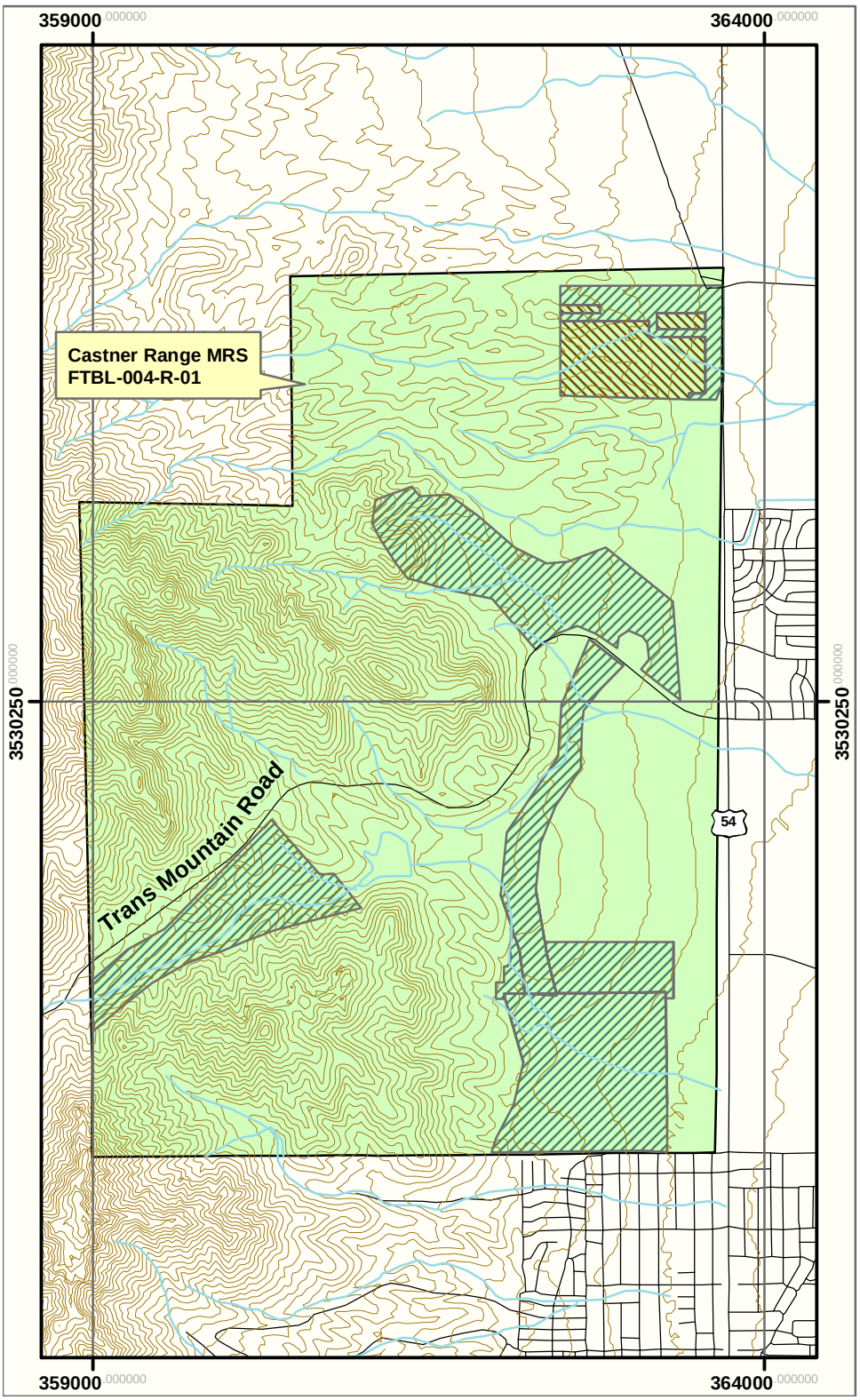
To block the entrances to old roads into the range, 110 large boulders have been emplaced. Castner Range is also patrolled by the Range Riders and Military Police for trespassers since it is a popular hiking area with the public (FTBL-2.A.2). Both the Range Riders and Military Police are stationed at McGregor Range Camp and are responsible for monitoring all of the 845,000 acres of training and impact areas of Fort Bliss (FTBL-12.B.1).

Trans Mountain Road, an important route for traffic flowing between east and west El Paso, bisects Castner Range (FTBL-2.A.2). In 1976, the City of El Paso constructed the Wilderness Park Museum within Castner Range. Adjacent to the Wilderness Park Museum is a museum dedicated to the history of the US Border Patrol (FTBL-5.A.2). An 11.5-acre site in the southeast corner of Castner Range has been cleared of UXO and granted as an easement to the Texas Department of Transportation (TxDOT). The Immigration Naturalization Service (INS) Border Patrol Sector Headquarters is making an application for an easement of 45 acres adjacent to the TxDOT site. The flood control structure known as the Northgate Dam is located near the INS Headquarters in the southeast corner of Castner Range (FTBL-13.A.1). The Fusselman Dam is located in the middle of the range, south of Trans Mountain Road (FTBL-16.B.1). The locations of current structures at the site are shown on **Figure 6-2**.

Many organized ordnance investigations have been conducted at Castner Range from 1971 to 2004. Investigations have included surface and subsurface clearance of UXO (see **Figure 6-3**). UXO has been found in the majority of the investigations. Limited soil sampling investigations have been conducted. Contamination at Castner Range includes UXO, white phosphorus, MC, and possibly smoke rounds (FTBL-2.A.2).

UXO CLEARED AREAS on CASTNER RANGE MRS
Fort Bliss, Texas

Figure 6-3



N
W E
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Elevation Contour
Road
Stream

UXO Cleared Area
Surface
Subsurface (0-3 feet)

Area Status
Castner Range MRS

Data Source:
Directorate of Environment-Conservation, Garrison Command, Fort Bliss, Texas

Projection: UTM Zone 13
Datum : WGS 84
Units: Meters
Grid: 5,000 Meter

1:50,000
0 0.1 0.2 0.3 0.4 0.5 Miles
0 0.25 0.5 0.75 1 Kilometers

Installation Location
Texas

SITE INSPECTION REPORT
FORT BLISS, TEXAS

Source: Produced for the U.S. Army Corps of Engineers by engineering-environmental Management, Inc. (e^2M)

Date: April 2007
Edition: Final (Revised)

6.1.2 Previous Investigations

6.1.2.1 Archives Search Report Fort Bliss Castner Range, USACE St. Louis, August 1994

In September 1971, Fort Bliss personnel completed a surface investigation of 200 acres of land on Castner Range. Area A on **Figure 6-4** shows these areas. Forty Ordnance and Explosive Waste (OEW) items were found during the surface sweep, 30 of these items were considered lethal or hazardous (FTBL-4.A.3). Items included 75mm shrapnel rounds, a 40mm HE round, 37mm HE rounds, 37mm Armor Piercing (AP) projectiles, and other various round components. All OEW items were removed from the area and destroyed (FTBL-4.A.2).

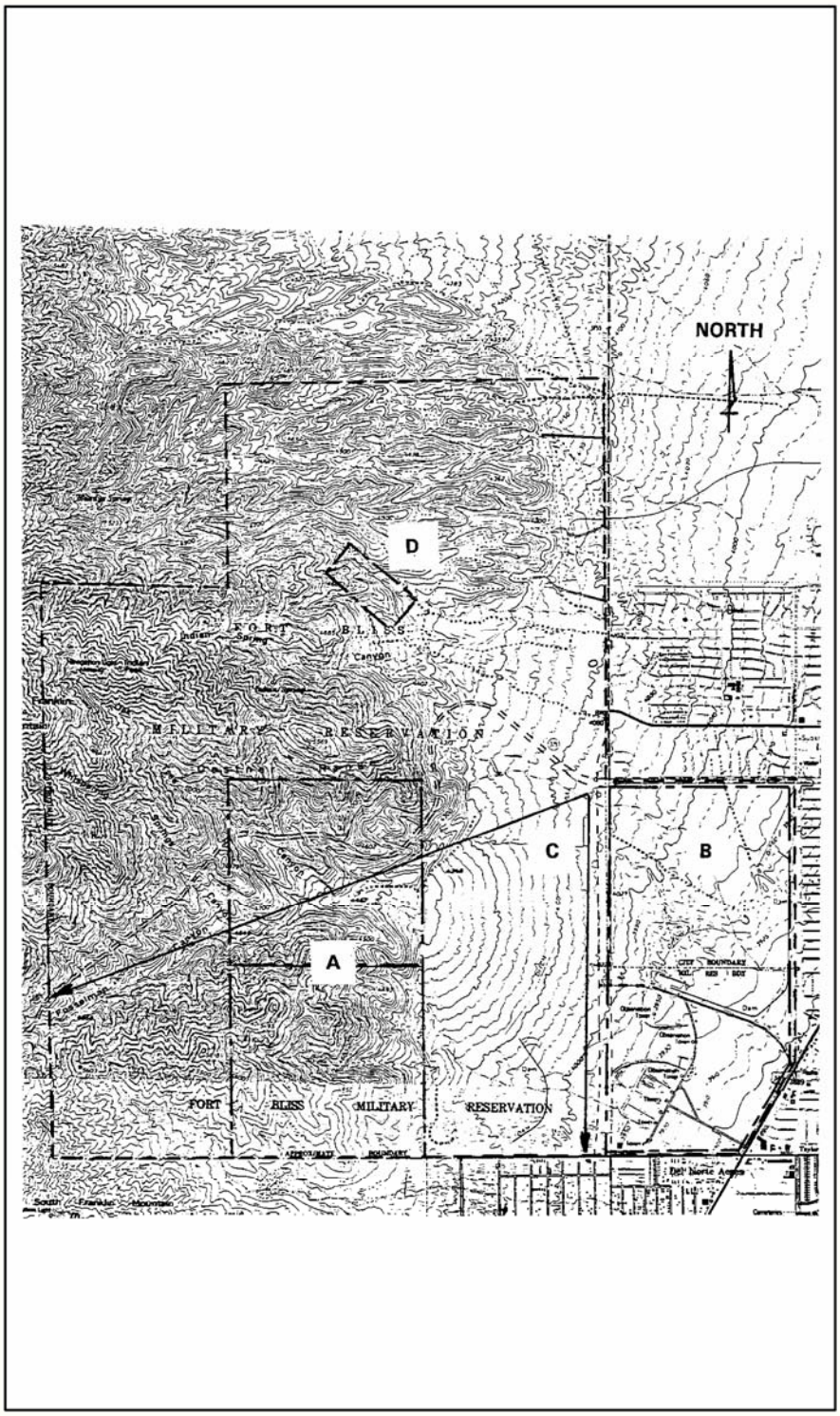
A Memorandum for Record from 1976 reported miscellaneous munitions found on the Castner Range. No specific locations were noted with each finding. Between 8 April and 7 May 1974, a 4.2-inch mortar round and four 40mm rounds were found. On 9 June 1975, a .50 caliber round was found. On 28 May 1976, a 3.5-inch rocket was found (FTBL-4.A.2).

In January 1975, the Engineer Studies Group of the Department of the Army, Chief of Engineers Office prepared a report concerning the OEW contamination on Castner Range. Castner Range was divided into six areas (A-F) based on previous use and potential for contamination (see **Figure 6-5**). Areas A and B are the transferred portion of Castner Range. The remaining four areas (C-F) were thought to be heavily to very heavily contaminated with ordnance items. Area C was located in front of the primary firing line in the southeast area of the range. Area D was located in the northeast section and was used as an impact area for heavy artillery in the 1930s and 1940s. Area E located in the southwest portion of the range was the impact area for most of the large caliber ordnance. Area F located in the northwest was the impact area for large caliber ordnance. The Study Group concluded the whole range must be considered contaminated (FTBL-4.A.2).

During December 1979, an ordnance surface sweep was conducted by the Army 200 meters on either side of the Trans Mountain Road and along a two-mile portion of the US Highway 54 right-of-way on the Castner Range (FTBL-4.A.2) (see **Figure 6-4**). **Table 6-2** lists items removed during the surface sweep.

LOCATION of HISTORIC INVESTIGATIONS on CASTNER RANGE MRS Fort Bliss, Texas

Figure 6-4



Area A -1971 Search Area

Area B -1974 Search Area
(1,247 Acres Excessed)

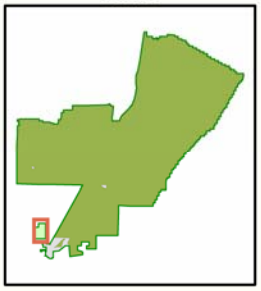
Area C -1979 Search Area
(Roadway Right-of-Way)

Area D -1994 Site Visit
(OEW Found)

Data Source:
USACE-St. Louis District, Defense Environmental Restoration Program Ordnance and Explosive Waste Archives Search Report, Fort Bliss, Castner Range, El Paso, Texas, El Paso County, August 1994, Figure 7-1

Scale Unknown

Installation Location
Texas



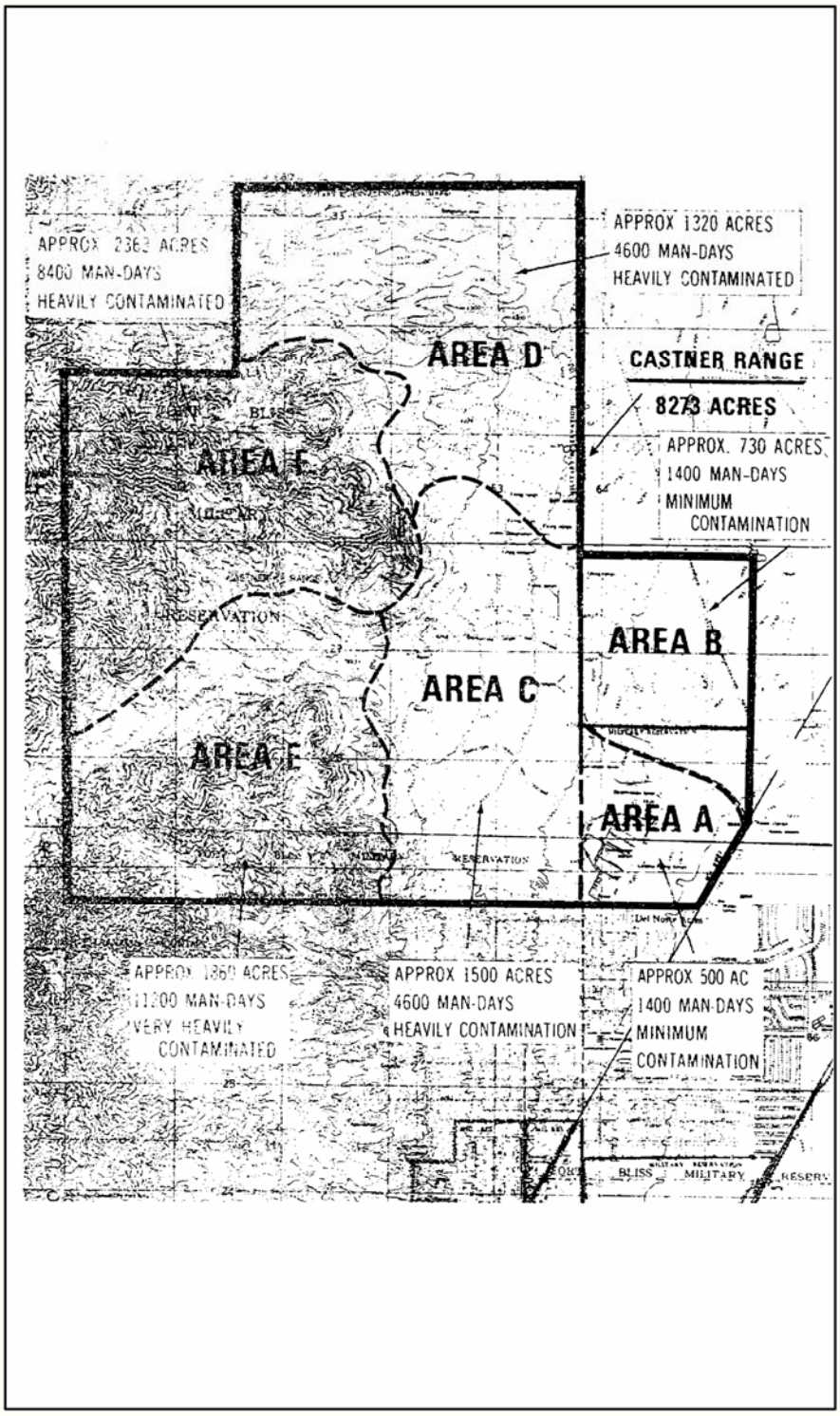
SITE INSPECTION REPORT
FORT BLISS, TEXAS

Source: Produced for the U.S. Army Corps of Engineers by engineering-environmental Management, Inc. (e^{2}M)

Date: January 2007
Edition: Final

1975 ENGINEER STUDIES GROUP STUDY AREAS on CASTNER RANGE MRS Fort Bliss, Texas

Figure 6-5

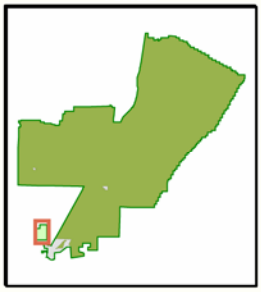


N
W E
S

Data Source:
USACE, St. Louis District, Archives Search Report, Fort Bliss, Castner Range, August 1994, Engineer Studies Group of the Department of the Army, Chief of Engineers Office Study, Figure B-2-3, Estimated Degree of Contamination

Scale Unknown

Installation Location
Texas



SITE INSPECTION REPORT
FORT BLISS, TEXAS

Source: Produced for the U.S. Army Corps of Engineers by engineering-environmental Management, Inc. (e²M)

Date: January 2007
Edition: Final

Table 6-2: UXO Removed During December 1979 Surface Sweep

UXO	Quantity
M52 series fuzes	6 each
Pop flares	1 each
37mm shot rounds	14 each
75mm illumination rounds (nose ejection)	12 each
75mm HE rounds	5 each
7.62mm blank	3 each
7.62mm ball	2 each
57mm HE	1 each
40mm "Duster"	1 each
Powder train time fuzes	3 each
Stokes mortar (filler unknown)	1 each

Source: FTBL-4.A.2

In 1981, the Army conducted an ordnance surface sweep along a 30-foot wide power line easement running perpendicular from US Highway 54 to the Wilderness Museum on Trans Mountain Road. A few rounds of small arms ammunition were found. It is unknown if the ammunition was removed. The EOD supervisor recommended the area be restricted to surface use only (FTBL-4.A.2).

In June 1994, personnel from Fort Bliss and the USACE, Huntsville and St. Louis Districts completed a site visit to Castner Range. During the site visit, a complete 2.36-inch rocket, the head of a 2.36-inch rocket, smoke or white phosphorus grenade canisters, and fragments from 105mm rounds were found (FTBL-4.A.3); however, the items were not removed. See **Figure 6-4**.

6.1.2.2 Fort Bliss Letter, 8 January 1986

A letter dated 8 January 1986 from the 41st Ordnance Detachment at Fort Bliss, stated a surface sweep was conducted on 7.459 acres at the Northgate Dam Site on Castner Range on 7 January 1986; however, the exact location of the sweep is unknown. Various metal fragments from 90mm and 37mm HE rounds and 10 each of 7.62mm ball rounds were found. This area of land was given a Statement of Clearance by the Commander of the 41st Ordnance Detachment which states "….have been given a careful surface search and have been cleared of all dangerous and/or explosive materials reasonably possible to detect." (FTBL-14.A.1).

6.1.2.3 Environmental Hazards Specialists International, Inc. (EHSI) After Action Report Letter, UXO Site Characterization, 10 August 1994

Between 11 July and 22 July 1994, EHSI completed a UXO Site Investigation on Castner Range. "The primary objective of the task was to assess and document the extent and location of UXO contamination and prioritize their associated hazards based on accessibility by the local populace" (FTBL-15.A.1). Approximately 6,700 acres were investigated. Approximately 720 of those acres were covered using either standard EOD Surface Search Procedures including grids and search lanes, or were traversed on foot and visually swept. The remaining acreage was randomly covered on foot or on All Terrain Vehicles (ATVs) (FTBL-15.A.1). A few items were removed or detonated; however, most items were left on site. **Figure 6-6** depicts the investigated areas. **Table 6-3** lists items found during the investigation.

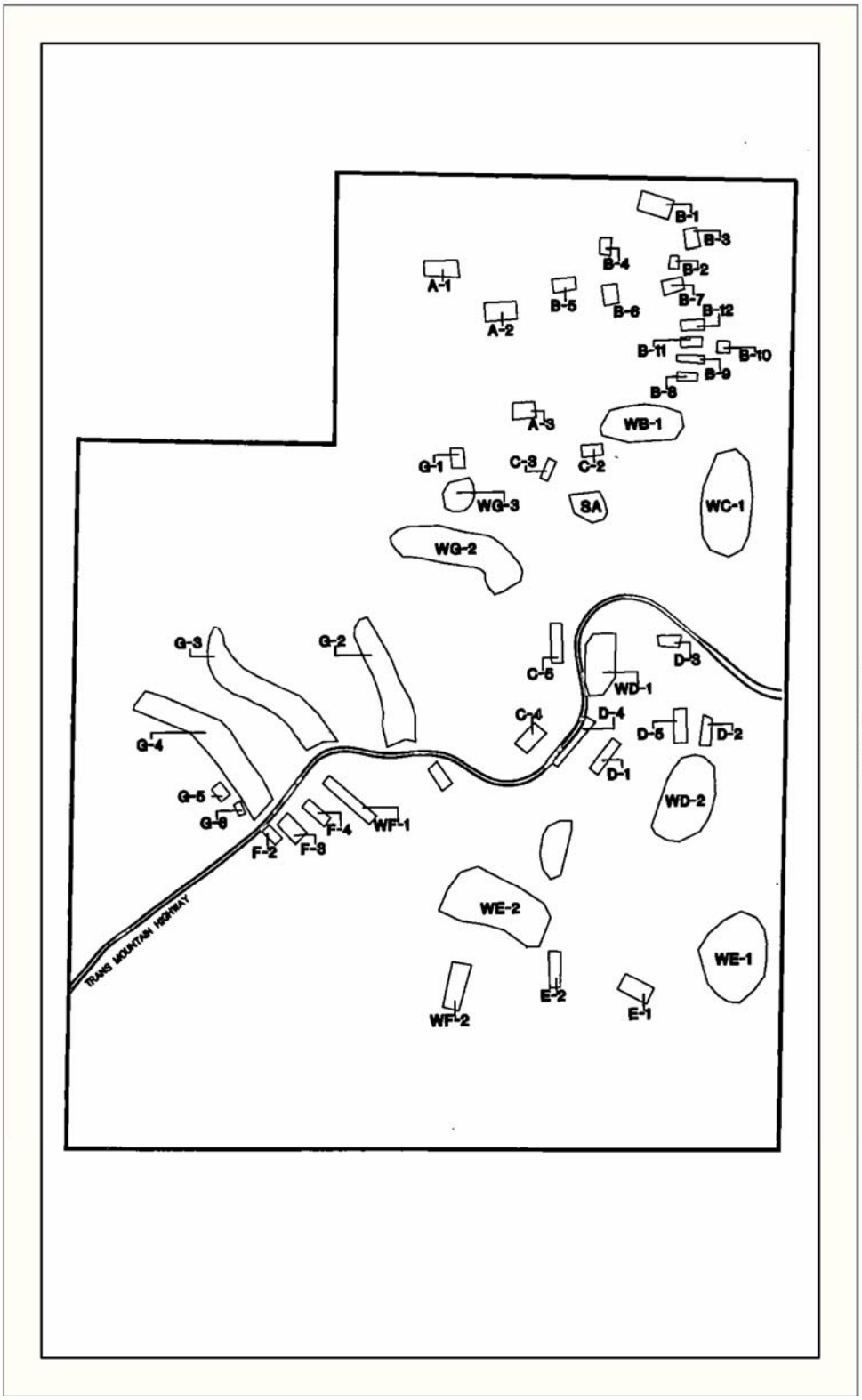
Site A-1 and B-1 were both described as demolition areas for disposal of munitions (FTBL-15.A.2). Site A-1 corresponds with OB/OD Area A-1, and Site B-1 corresponds with OB/OD Pit B-1, sites further investigated as part of the Installation Restoration Program (IRP) in 2003 (see **Figure 6-2**). Site SA, as seen on **Figure 6-6**, corresponds to the Trans Mountain Buried Drum Site which was discovered during EHSI's investigation.

EHSI recommended that two levels of clearance activities be completed at Castner Range based on the results of the 1994 investigation. Light cased ordnance (2.36-inch rocket, 3.5-inch bazooka, small arms) impact areas require only a surface clearance and subsurface clearance to a depth of six inches. Heavier cased artillery round impact areas requires surface and subsurface clearance to a depth of three feet. It was noted that due to the weather conditions and elevations there is a possibility that the heaving effect of freezing weather could force previously un-detected items to the surface (FTBL-15.A.1).

It should be noted there is no documentation that specific removal actions were taken based on the EHSI recommendations. However, subsequent studies and removal actions most likely used prior information for planning purposes.

EHSI 1994 INVESTIGATION AREAS on CASTNER RANGE MRS Fort Bliss, Texas

Figure 6-6



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Data Source:
Parsons Engineering Sciences Inc., OE Characterization and Cost Analysis Report for Fort Bliss: Castner Range, May 1998 Figure 2.2-1, Approximate Location of the EHSI Study Areas

Scale Unknown

Installation Location
Texas

SITE INSPECTION REPORT
FORT BLISS, TEXAS

Source: Produced for the U.S. Army Corps of Engineers by engineering-environmental Management, Inc. (e^{2}M)

Date: January 2007
Edition: Final

Table 6-3: Items Located During the 1994 EHSI Investigation

Area	Size (Acres)	UXO Located	OEW Located
Site A-1	6.8	(1) 40mm Artillery Projectile	Fragments from 4.2-inch mortars, 40mm and 37mm projectiles Heavy wall/thin wall frag (unidentified) Aluminum Fragments Expended fuze lighters, explosive containers Small arms casings
Site A-2	6.8	None	(1) Heavy case munitions fragment
Site A-3	NA	None	None
Site B-1	8.5	(1) 40mm projectile	(5) .37mm AP projectiles (4) .90mm projectiles, inert (7) Rifle grenades tail sections (1) 3.5-inch rocket motor, empty (4) 3.5-inch rocket nose cap, empty (3) Mechanical time fuzes, expended (3) Base fuzes, expended (57) .30 cal casings, empty (83) .50 cal casings, empty (2) Hand grenade spoons (200+) .30/.50 cal bullets (1) Pressure release booby trap device, expended (100+) large projectiles frags (100+) small cal projectiles frags
Site B-2	6.8	None	small arms casings, empty
Site B-3	5.7	None	(1) 60mm mortar tail fin assembly (1) Point detonating fuze, expended Heavy case fragments
Site B-4	5.7	None	(3) 60mm tail fin assemblies 5.56mm, .30 caliber and 7.62mm casings Heavy case fragments
Site B-5	6.8	None	(1) Hand grenade fuze, fired (1) Hand grenade spoon Assorted small arms casings (5) heavy frag pieces
Site B-6	6.8	None	Assorted small arms casings
Site B-7	6.8	None	Assorted small arms casings
Site B-8, B-9	6.8	None	None
Site B-10	6.8	None	Unidentified Fragments
Site B-11, B-12	6.8	None	None
Site WB-1	26.2	None	Small arms casings
Site C-1	6.8	None	(83) .30 cal casings (6) .50 cal bullets

Table 6-3: Items Located During the 1994 EHSI Investigation (continued)

Area	Size (Acres)	UXO Located	OEW Located
Site C-2	6.8	(2) 2.36-inch bazooka rounds	(5) 2.36-inch bazooka training rounds (470) .30 cal casings (89) .50 cal casings Numerous grenade pins and spoons
Site C-3	6.8	(2) 2.36-inch bazooka rounds	(10) 2.36-inch rifle grenade training rounds (18) Rifle grenade tail sections (1) Rifle grenade flare, empty (2) Flare fins (8) Hand grenade fuzes, expended (1) WP grenade frag
Site C-4	6.8	(2) 57mm HE projectile (1) 75mm HE projectile	(8) 37mm AP projectiles (1) 4.2-inch mortar, expended (18) Nose fuzes, expended (86) .30 cal bullets (61) .50 cal bullets Heavy and thin walled frags
Site C-5	6.8	None	None
Site WC-1	63.1	None	Small arms casings
Site D-1	6.8	None	(95) PD fuzes, expended (20) 37mm AP projectiles (15) 40mm AP projectiles (50) 3.5-inch rocket nose cones (30) Hand grenade fuzes, fired (4) Parachute flare hand launchers, empty (500+) Assorted small arms casing (200+) Heavy walled fragments (200+) Thin walled Fragments
Site D-2	6.8	None	(75) .50 cal bullets (6) .30 cal bullets (1) Grenade fuze, fired (14) .30 cal belt links Thin walled projectile frags
Site D-3	6.8	None	Small arms casings
Site D-4	10.3	None	(2) 37mm AP projectiles Light cased frags
Site D-5	6.8		Small arms casings / Light cased frags
Site WD-1	27.6	None	None
Site WD-2	55	None	Small arms casings
Site E-1	6.8	None	(16) 7.62mm blank casings, fired (23) .50 cal bullets (106) .30 cal bullets (12) Small frag pieces

Table 6-3: Items Located During the 1994 EHSI Investigation (continued)

Area	Size (Acres)	UXO Located	OEW Located
Site E-2	6.8	None	(2) 37mm training projectiles, inert (8) .50 cal bullets (12) .30 cal bullets Light and heavy cased frags
Site E-3	6.8	None	(9) .50 cal bullets (13) .30 cal bullets Light and heavy cased frags
Site WE-1, WE-2	121.9	None	Small amount of unspecified OEW
Site WE-3	18.4	None	(2) 75mm projectiles, empty 37mm and 40mm projectiles frags
Site F-1, F-2, F-3, F-4, and WF-1	26.8	None	Unspecified frags
Site WF-2	10.1	None	None
Site G-1	6.8	None	(4) 37mm AP projectiles (46) .30 cal bullets (21) .50 cal bullets (1) Rifle grenade fin Light and heavy cased frags, grenade spoons
Site G-2	14	None	(1) 37mm AP projectile Unspecified frags
Sites G-3, G-4, G-5, and WG-1	72.5	None	Small amounts of unspecified frags
Site G-6	11.7	None	(5) 37mm projectiles, empty
Site WG-2	42.6	(1) 40mm HE projectile (1) 57mm HE projectile	(3) 37mm AP projectiles (6) 60mm mortar tail fin assembly (13) 2.36-inch bazooka motors/fin assembly, fired (4) 3.5-inch rocket motors/fin assembly, fired Large amounts .30 and .50 cal casings Light and heavy cased frags

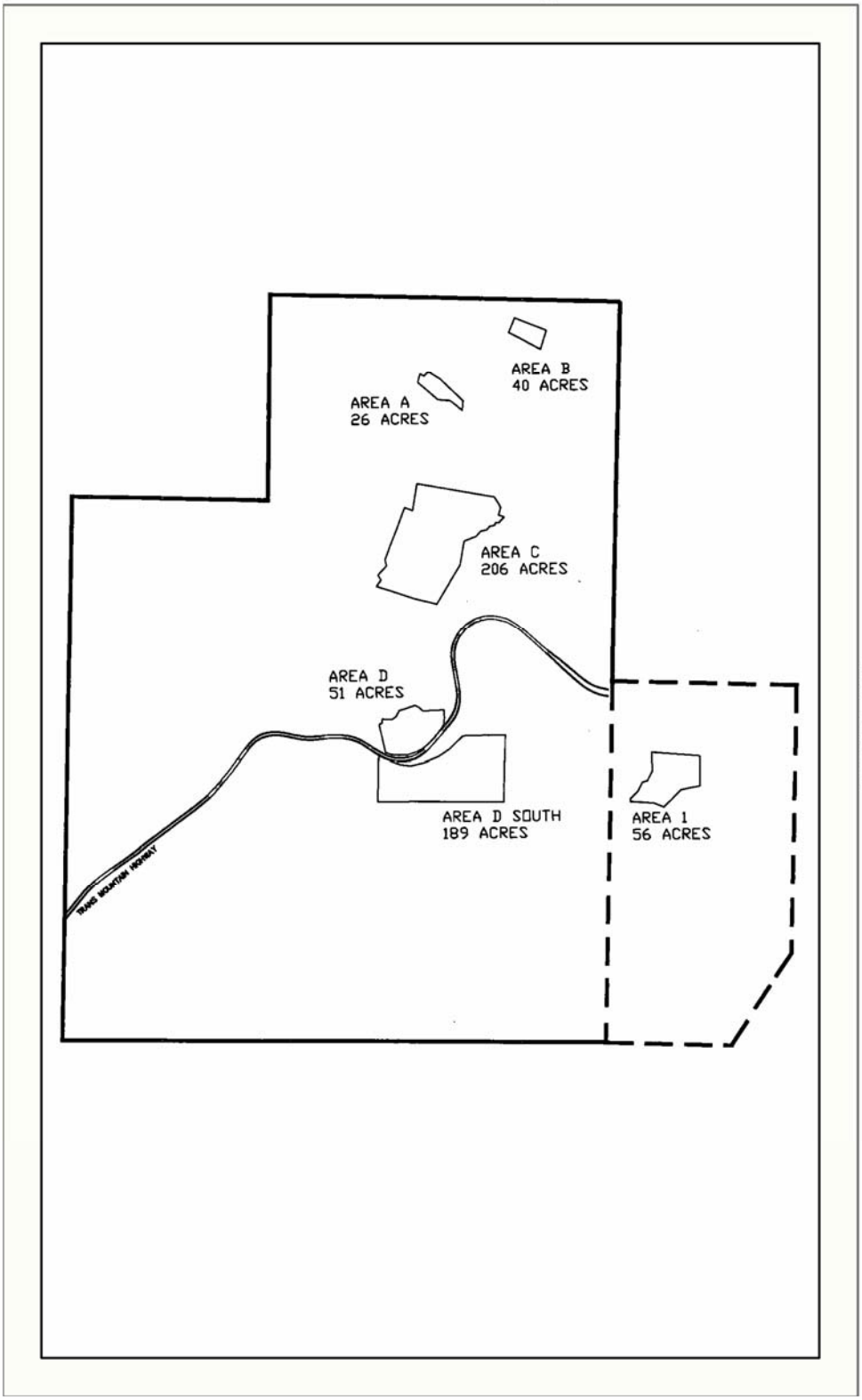
Source: FTBL-15.A.2

6.1.2.4 UXB, Final Report for Castner Range, Fort Bliss Texas, April 1997

UXB International, Inc. (UXB) performed a surface removal action on areas that were determined to pose an immediate risk to the public from May through October 1995 where the potential for encountering OEW was suspected at Castner Range. Area 1 is located in the transferred portion of Castner Range; a 100 percent surface clearance action was performed at this site along with 10 percent subsurface selective sampling to a depth of one foot. Area A, Area B, Area C, Area D, and Area D South are all described as former OB/OD areas and a 100 percent surface clearance action was performed at these sites (FTBL-16.A.1) (see **Figure 6-7**). Area A contained 26.25 acres, and UXO contamination included 20mm to 75mm projectiles, a rifle grenade and a mine fuze. This area contained four large craters which were former demolition sites. This area corresponds with OB/OD Area A-1. Area B contained 40 acres, and UXO contamination included 20mm to 40mm projectiles, blasting caps, small arms, and grenade and projectile fuzes. This area corresponds with OB/OD Pit B-1. Area C contained 206.25 acres, and UXO contamination included 2.36-inch rockets, a 60mm mortar, blasting caps, pyrotechnic star clusters, grenades, and fuzes. Area D contained 51 acres and was referred to as the Bowl. UXO contamination included 37mm to 105mm projectiles, 3-inch Stokes Mortars, and projectile fuzes. Area D South contained 189.94 acres, and UXO contamination included 20mm to 75mm projectiles, 3-inch Stokes Mortars, small arms, and fuzes (FTBL-16.A.1). **Table 6-4** lists UXO removed during the investigation. **Figure 6-7** shows UXO locations.

UXB 1997 SURFACE REMOVAL ACTION AREAS on CASTNER RANGE MRS Fort Bliss, Texas

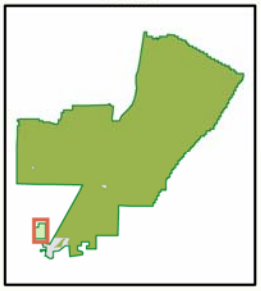
Figure 6-7



Data Source:
Parsons Engineering Sciences Inc., OE Characterization and Cost Analysis Report for Fort Bliss: Castner Range, May 1998 Figure 2.2-2, Approximate Location of the UXB Study Areas

Scale Unknown

Installation Location
Texas



SITE INSPECTION REPORT
FORT BLISS, TEXAS

Source: Produced for the U.S. Army Corps of Engineers by engineering-environmental Management, Inc. (e²M)

Date: January 2007
Edition: Final

Table 6-4: UXO Removed During the UXB 1995 Surface Ordnance Removal Action

UXO	Quantity
30 Caliber Ball Ammo (in M1 Mag)	18
30 Caliber Mags (live primers)	2
50 Caliber Ball Ammo	2
20mm projectile, HE	19
20mm projectile, HE (w/o fuze)	2
30mm projectile, HE	10
37mm projectile, HE	10
37mm projectile, HE (base fuze)	4
37mm projectile, HE (dummy fuze)	2
37mm projectile, HE (w/o fuze residue)	1
37mm projectile, HE (w/o fuze)	1
37 mm projectile, AP HE	2
37mm projectile, practice (Demil)	2
40mm projectile, HE	17
40mm projectile, HE (w/o fuze)	2
40mm fuze	1
57mm projectile, HE	8
57mm projectile, HE (w/o fuze)	1
75mm projectile, HE	20
75mm projectile, HE (w/o fuze)	4
75mm projectile, HE (partial-w/o fuze)	1
75mm projectile shrapnel (w/o fuze)	2
75mm projectile shot (w/o fuze)	1
105mm projectile, HE (w/o fuze)	1
60mm mortar HE	1
3-inch Stokes mortar HE	13
3-inch Stokes mortar HE (w/o fuze)	3

UXO	Quantity
3-inch Stokes mortar HE (w/nose plug)	13
2.36-inch rocket	25
2.36-inch rocket warhead (only)	1
Grenade, WP (cocked striker)	1
Grenade, rifle	1
Grenade, rifle M9A1	1
Grenade, rifle fuze	1
Grenade, rifle det	1
Grenade fuzes	30
Grenade fuze (primer only)	1
Grenade fuze practice (demil)	1
Grenade fuze MKII	1
Grenade simulator	1
Grenade, smoke M18 (green)	1
Star cluster	2
Parachute flare	1
M48 PD fuzes	4
PD fuze	1
Base fuzes	14
Fuzes	5
M51-AF fuze	2
Mech time fuze, M502	2
Mech time fuze	1
VT fuze	1
Mine fuze	1
Booster HE	1
Blasting cap (w/adaptor)	1
Electric blasting caps	21

Source: FTBL-16.B.1

6.1.2.5 CMS Environmental, Inc., Final Survey Report-Castner Range, Fort Bliss, Texas, 25 February 1998

CMS Environmental, Inc. (CMS) performed surface sampling operations on Castner Range from 5 November 1996 to 26 March 1997. Subsurface sampling operations (to 2 feet bgs) were performed from 31 March 1997 to 21 May 1997 (FTBL-17.A.1). "The work…was executed to determine the extent of Ordnance and Explosives (OE) contamination that constitutes an imminent and substantial endangerment to the local populace and site personnel" (FTBL-17.A.1). Castner Range was divided into 11 zones based on accessibility by the public, terrain, vegetation, soil type, and historical use while active (see **Figure 6-8**). Ten percent of the range was selected for surface sampling resulting in 2,035 100 x 100 feet grids. After surface sampling, 172 of the 2,035 grids were selected for subsurface sampling. OE items were found and either detonated on site or removed in nine of the eleven zones (see **Figure 6-8**) (FTBL-17.A.2). The report concluded that a sufficient number of grids were sampled such that each zone can be expected to have a density of subsurface UXO that is consistent with the sample findings. The potential for any significant density of subsurface UXO remaining is very small (FTBL-17.A.2). **Table 6-5** lists surface OE items found and either detonated on site or removed. During the subsurface sampling only one item, a 3.5-inch rocket, motor only, was found (FTBL-17.A.1). **Figure 6-8** shows the locations of the items found and removed.

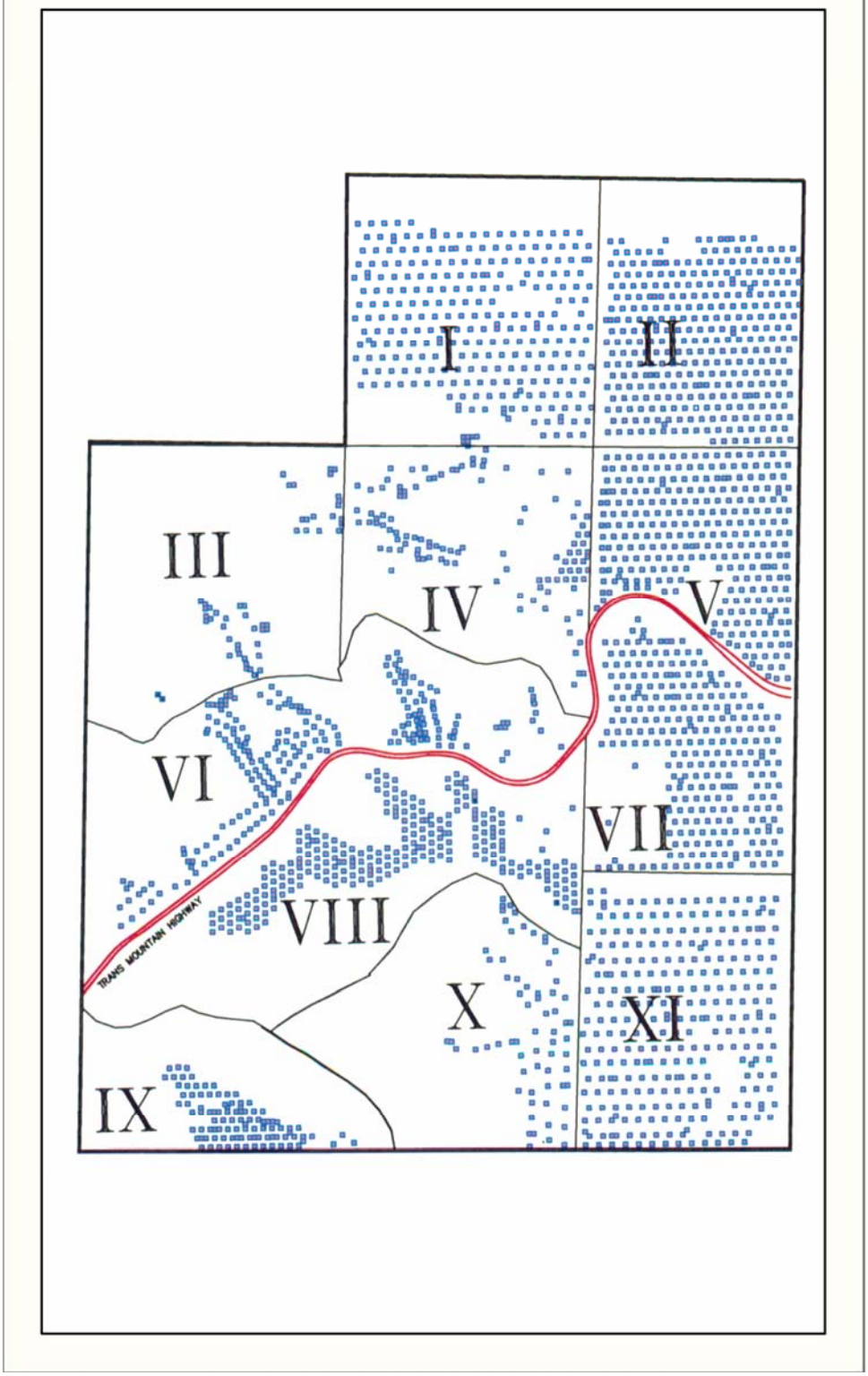
Table 6-5: UXO Removed During 1998 CMS Investigation

Zone	Surface OE Items found
1	(2) 40mm projectile, cartridge w/ primer only (2) 40mm projectile, HE, MK II (1) 81mm mortar, tail boom w/primer only (1) M52 fuze
2	(2) Trip flare (2) Grenade fuze (1) Ground signal, hand launched (slap flare) (1) Grenade, MK II training (1) Firing device, M1 pressure release, w/ base coupling
4	(1) 60mm mortar, HE
5	(2) Grenade fuze
6	(1) 40mm projectile, HE, MK II (1) 75mm projectile, HE, MK I
7	(1) 37mm projectile, HE, MK II (1) 40mm projectile, HE, MK II (1) 105mm projectile, HE (1) Electric blasting cap
8	(5) 37mm projectile, HE, M54 (1) 57mm projectile, recoilless rifle, HE (1) 75mm projectile, HE (2) 75mm projectile, shrapnel, MK II
10	(2) 37mm projectile, HE, M63 (1) 75mm projectile, HE (1) 75mm projectile, HE, MK I (1) 75mm projectile, HE, MM I (1) 105mm projectile, HE
11	(1) 37mm projectile, HE, M54 (4) 37mm projectile, HE, M63 (1) 105mm projectile, HE, w/M48A2 fuze (1) 4.2-inch mortar, WP, burster tube only

Source: FTBL-17.A.1

CMS 1998 ZONES and INVESTIGATION AREAS on CASTNER RANGE MRS Fort Bliss, Texas

Figure 6-8



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100' X 100' Study Area

Data Source:
Parsons Engineering Science Inc., OE Characterization and Cost Analysis Report for Fort Bliss: Castner Range, May 1998
Figure 2.2-3, Location of the CMS Study Areas

Scale Unknown

Installation Location
Texas

SITE INSPECTION REPORT
FORT BLISS, TEXAS

Source: Produced for the U.S. Army Corps of Engineers by engineering-environmental Management, Inc. (e^{2}M)

Date: January 2007
Edition: Final

6.1.2.6 UXB International, Inc., Final Removal Report OE Removal Action Castner Range, October 1998

UXB completed an OE removal action at the following readily accessible areas: White Sands Bus Parking Lot, a former Hand Grenade Range, and the canyon mouth area below Fusselman Dam from 15 June 1998 to 21 August 1998 (see **Figure 6-9**). The White Sands Bus Parking Lot (approximately 7 acres) is located on the transferred portion of Castner Range. The former Hand Grenade Range is located in the vicinity of the Wilderness Museum along the Trans Mountain Road and consists of approximately 5 acres. This site was cleared to a depth of one foot (FTBL-16.B.1). Six live UXO or explosives were encountered and a total of 278 pounds of OE scrap was collected at the former Hand Grenade Range (FTBL-16.B.2). The Fusselman Canyon area is located in the vicinity of the Fusselman Dam and consists of approximately 110 acres. This site was surface cleared only (FTBL-16.B.1). Nine live UXO or explosives were encountered and a total of 1,273 pounds of OE scrap was collected at the Fusselman Canyon site (FTBL-16.B.2). All UXO was detonated on site, and all OE scrap was inspected, certified, and given to the Border Trading Company. **Table 6-6** lists items found and detonated on site during the removal action.

Table 6-6: Items Detonated During UXB 1998 Removal Action

Location	UXO	Quantity
Hand Grenade Range	Grenade w/o fuze	1
	Grenade fuze	5
Fusselman Canyon	37mm projectile w/fuze	6
	75mm projectile, HE	3

Source: FTBL-16.B.3

UXB concluded the existence of OE/UXO at depths greater than what was searched is unknown. It is possible for OE/UXO material to gradually work its way through to the surface via frost heave. If any future soil disruption is anticipated it is recommended to continue the removal action or conduct another UXO investigation (FTBL-16.B.2).

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UXB 1998 INVESTIGATION AREAS on CASTNER RANGE MRS
Fort Bliss, Texas

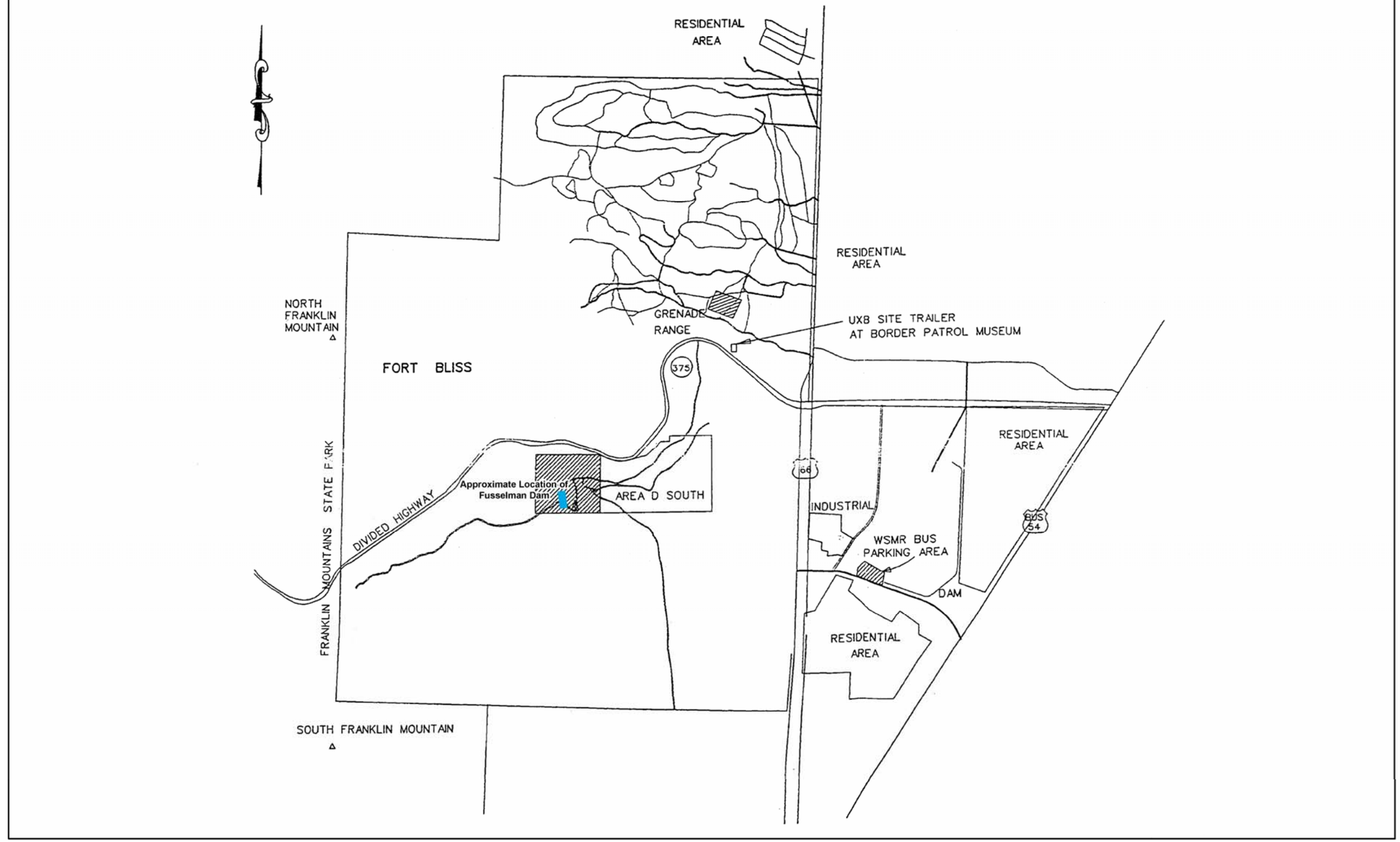

Figure 6-9

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Data Source:
UXB International, Inc., Final Removal Report, Ordnance and Explosive Removal Action, Castner Range, Fort Bliss, El Paso, Texas, October 30, 1998, Castner Range Site Map, Figure B-1b

Note:
US 54 is incorrectly labeled as US 66

Scale Unknown

Installation Location
Texas

SITE INSPECTION REPORT
FORT BLISS, TEXAS
Source: Produced for the U.S. Army Corps of Engineers by engineering-environmental Management, Inc. (e²M)
Date: January 2007
Edition: Final

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6.1.2.7 IT/OHM, Addendum #1 Remedial Action Plan OB/OD Pit B-1 Site (FTBL-072) Castner Range, May 2001

In December 1996, surface soil sampling was conducted at the OB/OD Pit B-1 Site by the USACE, Fort Worth District to collect chemical data for a DoD Relative Risk Site Evaluation. Four surface soil samples were taken from outside of the pit (see **Figure 6-10**). The TNRCC Risk Reduction Rules were used as the regulatory framework and the site was evaluated under Risk Reduction Standard 2 (RRS2). Lead was detected at concentrations up to 17,426 milligrams per kilogram (mg/kg) which exceeds the medium specific concentrations (MSCs) for groundwater protection, inhalation and ingestion. Barium, cadmium, and chromium were detected above Fort Bliss background levels and RRS2 MSCs. The explosives 2,4-dinitrotoluene and 2,6-dinitrotoluene were detected above Tier 1 soil and groundwater protective concentration levels (PCLs) (FTBL-7.C.1).

In November 1999, Malcolm Pirnie, Inc. completed sampling at the OB/OD Pit B-1 Site (see **Figure 6-10**). Metals and explosives were detected above RRS2 MSCs. Lead was detected in samples at concentrations up to 12,100 mg/kg, and explosives (2,4-dinitrotoluene) were detected in samples at concentrations up to 15.1 mg/Kg (FTBL-7.C.1).

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USACE 1996 and 1999 SURFACE SOIL SAMPLING at OB/OD PIT B-1 on CASTNER RANGE MRS
Fort Bliss, Texas

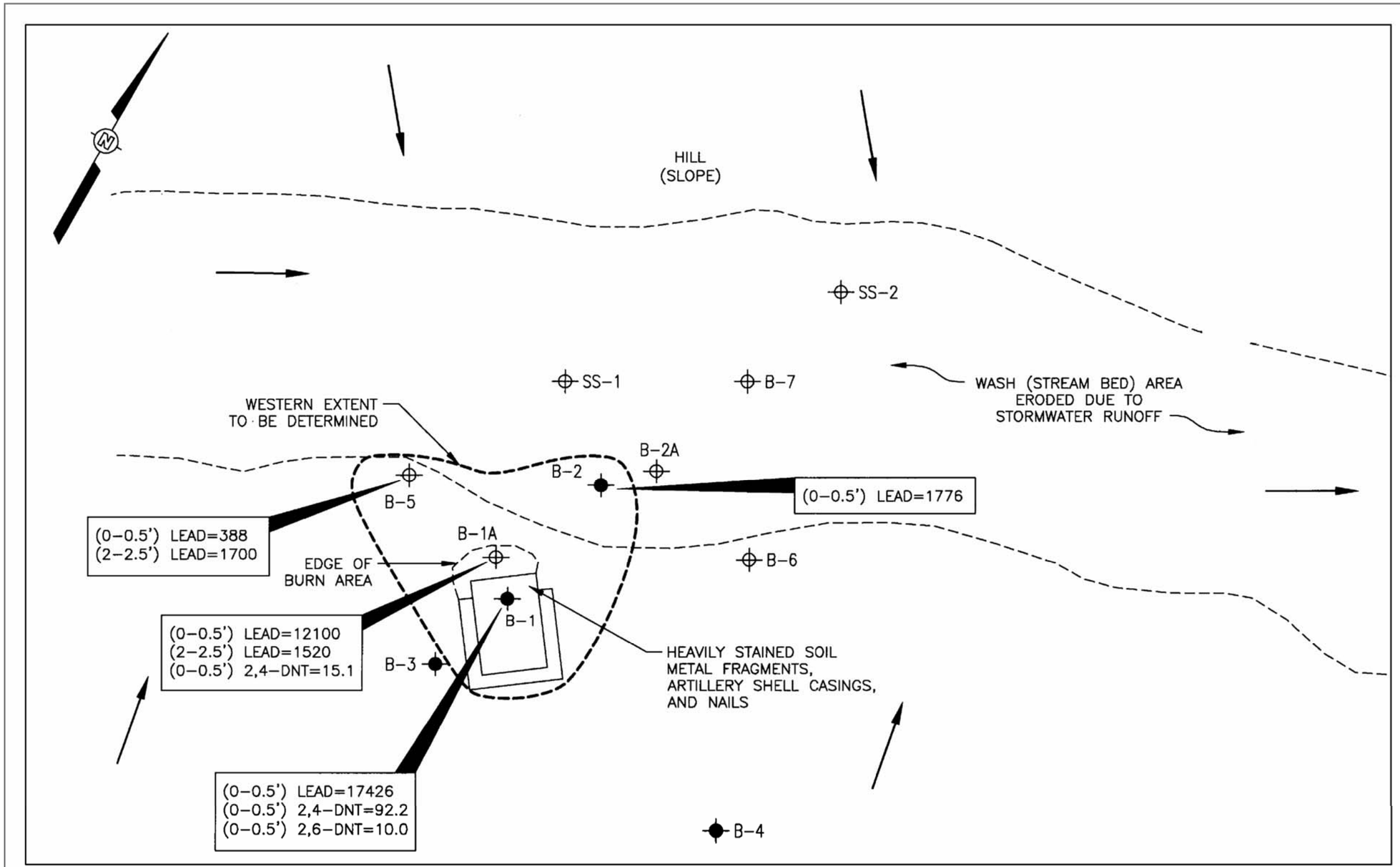

Figure 6-10

- Topographical Downgradient
- Proposed Excavation Protection Concentration Exceedance Zone
- Toe of Slope
- Sampling Location, 1996 (concentrations in mg/Kg)
- Sampling Location, 1999 (concentrations in mg/Kg)

DNT Dinitrotoluene

Data Source:
IT Corporation, Final Addendum #1, Remedial Action Plan, OB/OD Pit B-1 Site, May 2001
Figure 2-1, Constituents of Concern Concentration Map

Approximate Scale (Feet):

0 8 16

Installation Location
Texas

SITE INSPECTION REPORT
FORT BLISS, TEXAS
Source: Produced for the U.S. Army Corps of Engineers by engineering-environmental Management, Inc. (eM)
Date: January 2007
Edition: Final

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6.1.2.8 IT/OHM, Final Response Action Completion Report Trans Mountain Buried Drum Site, November 2002

From November 1997 to February 1998, a site investigation was conducted to evaluate if surface or subsurface contamination was associated with the tar flow and drums found on the Trans Mountain Buried Drum Site. **Figure 6-2** shows the site location. A geophysical survey and backhoe trenching found several surface anomalies containing tar and metal debris. Surface and subsurface soil samples were collected from trenches and soil borings. Arsenic, chromium and lead were the only metals detected in the report, which concluded no immediate or high degree of risk to human health and the environment appeared to be present (FTBL-7.B.2).

In 1999, samples of the tar material and asphalt construction debris at the Trans Mountain Buried Drum Site were collected for waste disposal characterization. Analytical results indicated the materials were non-hazardous (FTBL-7.B.2).

The Trans Mountain Buried Drum Site was surface swept and cleared in January and June/July 2001 prior to removal of the tar, asphalt and metal debris. One 105mm projectile and two 2.36-inch rocket motors were found during the sweep (FTBL-7.B.2). Tar/asphalt materials, metal drums, and buried piping were excavated, and surface asphalt construction debris was removed from the site (FTBL-7.B.3). Soil samples were collected from the bottom of the excavations. The analytical results determined the remedial action fulfilled clean closure requirements (FTBL-7.B.4).

In June 2001, the OB/OD Pit B-1 was cleared to a depth of one-foot. The access road between the OB/OD pit and the staging area located 250 feet east of the pit was cleared to a depth of approximately 2 feet. No ordnance was encountered during the clearance (FTBL-7.B.2). **Figures 6-2** and **6-10** show the OB/OD Pit B-1 site location.

6.1.2.9 8 November 2002 Memorandum for Record, Subject: Closure Decision for FTBL-073

A Memorandum for Record states that a third RI/FS investigation was conducted in the spring of 2002 at OB/OD Area A-1 (FTBL-20.A.1). Because no reports identified as RI/FS documents could be located for OB/OD Area A-1, it appears that the use of the term "RI/FS" in the memorandum is a misnomer and that activities conducted at the site are likely to have been part of several site investigations rather than an RI/FS. The Memorandum lists the following references, presumably the first two "RI/FS's," in its "Documentation of Investigation" section:

- Report of Sampling Activities for Fort Bliss Relative Risk Site Evaluation, US Army Corps of Engineers, USACOE-Ft Worth, April 1997; and

- Final Report, Environmental Site Assessment OB/OD Pit A-1, Malcolm Pirnie, Inc, USACOE-Ft Worth, October 2000.

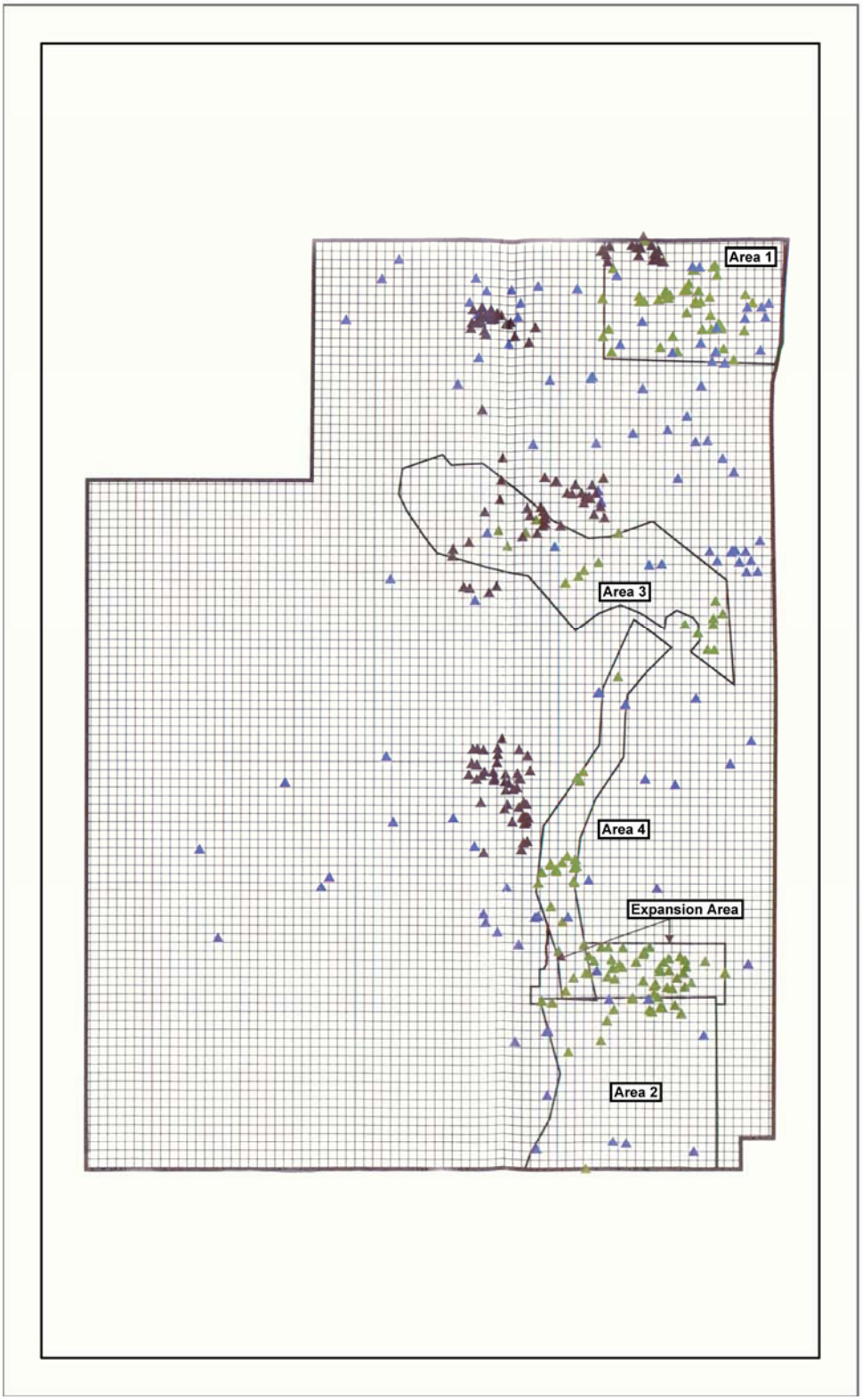
During the third investigation in 2002, extensive soil samples were collected to complement and complete the scope of the two limited previous investigations listed above. Suspected contaminants included HMX, RDX, RCRA metals, and UXO. Test results determined there was no release of regulated materials above Environmental Protection Agency (EPA) Region VI screening levels on the site (FTBL-20.A.1). These investigations were conducted as part of IRP activities, as verified by Mr. Ron Baca at Fort Bliss.

6.1.2.10 USA Environmental, Inc. (USA) Draft Final Removal Report OE Removal Action, April 2004

USA performed an OE removal on Castner Range from 1 July 2003 to 11 March 2004. During the removal action, USA subsurface cleared 167 acres to depth (up to 3 ft bgs), excavating approximately 41,000 subsurface anomalies, and surface cleared 975 acres for a total of 1,142 acres cleared (FTBL-18.A.1). USA located, identified and disposed of 128 UXO items, 52 OE items, and 241 assorted small arms ammunition (FTBL-18.A.2). See **Figure 6-11**. **Table 6-7** lists UXO removed during the removal action.

SUMMARY of UXO REMOVED from CASTNER RANGE MRS 1995-2004 Fort Bliss, Texas

Figure 6-11



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- UXO found by UXB June-Aug 1998
- UXO found by CMS Nov 1996 to May 1997
- UXO found by USA July 2003 to March 2004
- Master Grid System
- Areas Searched by USA
- Castner Range Boundary

Data Source:
USA Environmental Inc., Draft Final Removal Report, Ordnance and Explosives (OE) Removal Action at Castner Range, Fort Bliss, Texas, April 16, 2004, Figure D-4

Approximate Scale:
650 325 0 650
Meters

Installation Location
Texas

SITE INSPECTION REPORT FORT BLISS, TEXAS

Source: Produced for the U.S. Army Corps of Engineers by engineering-environmental Management, Inc. (e²M)

Date: January 2007
Edition: Final

Table 6-7: UXO Removed During 2004 USA Removal Action

UXO	Quantity
2.36-inch Rocket	3
20mm projectiles	2
37mm projectiles	44
40mm projectiles	11
57mm projectiles	2
75mm projectiles	4
76mm projectile	1
105mm projectiles	8
120mm projectile	1
Artillery simulators	8
Cartridge, 75mm, w/primer	1
Demolition block, 2,4,6-trinitrotoluene (TNT), ½ lb.	1
Flare, trip, M48	1
Grenade fuzes	33
Grenade, hand, MKII	1
Grenade, smoke, M22	1
Projectiles fuzes	3
Rifle grenades	3

Source: FTBL-18.A.2

In September 2003, USA tested surface soils in the former OB/OD site (OB/OD Pit B-1) near Area 1. All tests were negative for explosives and propellants (FTBL-18.A.3).

6.1.2.11 Shaw Environmental, Final Summary of Test Boring Activities OB/OD Area A-1, FTBL-073, May 2004
A test boring (SBT-1) was drilled on 28 January 2004 in OB/OD Area A-1 to determine if groundwater is present beneath the site. The boring was drilled into bedrock to a depth of 48.5 ft below ground service (bgs). It was concluded groundwater was not present beneath the site, and it is therefore not a potential exposure pathway (FTBL-19.A.1) (see **Figure 6-12**).

2004 OB/OD AREA A-1 TEST BORE LOCATION
Fort Bliss, Texas

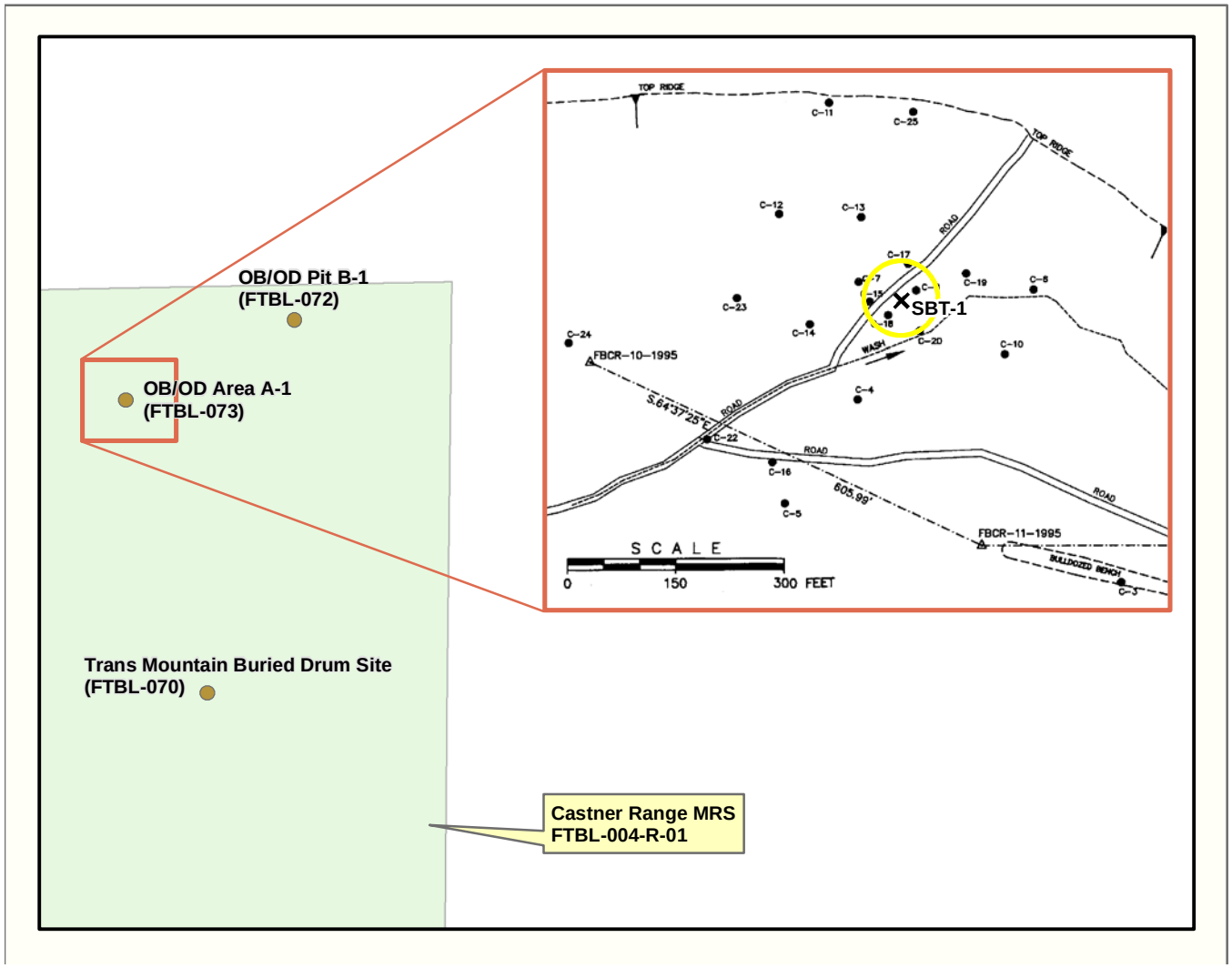


Figure 6-12

N
W E
S

- Soil Sample Location
- Test Boring Location
- IRP Site
- MRS, Closed

Data Source: Shaw, Test Boring OB/OD Area A-1, Castner Range, Fort Bliss, Texas, January 2004, Figure 1.

Projection:	**UTM Zone 13**
Datum :	**WGS 84**
Units:	**Meters**
Grid:	**50,000 Meter**

1:40,000

0 0.25 0.5 0.75 1 Miles

0 0.5 1 1.5 Kilometers

Installation Location
Texas

SITE INSPECTION REPORT
FORT BLISS, TEXAS

Source: Produced for the U.S. Army Corps of Engineers by engineering-environmental Management, Inc. (e^2M)

Date: April 2007
Edition: Final (Revised)

6.1.3 MEC/MC Summary

MEC (e.g., 37mm projectiles, 105mm projectiles, 2.36-inch rockets, and grenades) have been identified at the Castner Range MRS from numerous surface and subsurface UXO investigations. Evidence of this is shown in **Photographs 5, 6, 7 and 8** (FTBL-18.A.4).

Photograph 5: Live 105mm Projectile, M314 Series with Fuze Found During USA's Investigation January 2004

Photograph 6: Live 2.36-Inch Rocket, M6 HEAT Found During USA's Investigation February 2004

Photograph 7: Live 37mm Projectile, MK1 Found During USA's Investigation December 2003

Photograph 8: Live Grenade, Smoke, M22 Found During USA's Investigation October 2003

Further, during various remedial actions at the Castner Range, MC (explosives and metals) were detected in soil samples taken from these locations (e.g. (OB/OD Pit B-1) indicating that the presence of MC in the soils is very likely. As such, the Castner Range MRS is considered to contain MEC and MC.

6.2 MRS-PP Summary

The MRS-PP evaluates the following potential explosive safety and environmental hazards:

- Explosive hazards posed by UXO and DMM.
- Hazards associated with the effects of chemical warfare materiel (CWM), and

- The chronic health and environmental hazards posed by MC or other chemical constituents.

DoD recognizes the different hazards inherent to each class of materials. To address these differences, the Protocol has three hazard evaluation modules, each of which is specific to one type of hazard, specifically:

- Explosive hazards are evaluated using the Explosives Hazard Evaluation (EHE) module,
- CWM-related hazards are evaluated using the Chemical Warfare Materiel Hazard Evaluation (CHE) module, and
- Health and environmental hazards posed by MC are evaluated using the Health Hazard Evaluation (HHE) module.

Each hazard evaluation model is assigned a module rating consisting of a priority number. A "1" priority would represent the highest priority rating, and a "8" priority would represent the lowest priority. The CHE module is given more weight than the other two modules. An overall rating is then assessed consisting of the highest priority rating of the three modules. A conservative approach is applied when completing the modules.

The module ratings and final MRS priority rating for the Castner Range MRS are summarized in **Table 6-8** below**.** The complete MRS-PP for Castner Range MRS is included in **Appendix D**.

Table 6-8: Castner Range MRS-PP Priority Rating

MRS-PP Module	MRS-PP Rating
Explosive Hazard Evaluation (EHE)	3
Chemical Warfare Materiel Hazard Evaluation (CHE)	No Known Hazard or Suspected CWM Hazard
Health Hazard Evaluation (HHE)	3
Final MRS Priority	**3**

7.0 CONCEPTUAL SITE MODEL

7.1 Introduction

The primary purpose of the CSM is to identify current or reasonably anticipated human and environmental exposure to MEC and MC by identifying potential human and ecological receptors and pathways. As such, this document provides a conceptualization of the following site conditions:

- Actual or reasonably anticipated presence of MEC and MC;
- Actual or reasonably anticipated points of exposure and exposure pathways; and
- Actual or reasonably anticipated future human and ecological receptors.

The evaluation of these site-specific conditions will assist in determining effective and achievable future actions that are protective of human health and the environment.

This section begins with a general description of the Fort Bliss Installation (**Section 7.2**) and continues with a site-specific discussion of the Castner Range MRS (**Section 7.3)**.

7.2 Installation Setting

7.2.1 Physical Setting

Fort Bliss is located in the Sacramento section of the Basin and Range province and is characterized by cuesta-form and plateau like topography. Faulting is prevalent in this section. Several prominent bolsons exist in the Sacramento section. The prominent basin known as Salt Basin exists between the Delaware Mountains in Texas and the Guadalupe Mountains in New Mexico. The north-south trending mountain ranges of the region run east of the site. The mountains consist of bold scarps on the west and gentle slopes on the east sides. The Guadalupe and Delaware Mountains initially formed a great tectonic arch with the steepest dip on the west side. This structure was broken by numerous faults on the west. Along the Border fault zone, strata have been dropped down 2,000 to 4,000 feet into the Salt Basin (FTBL-4.A.6).

7.2.1.1 Climate

The climate across Fort Bliss can be characterized as having low relative humidity, hot summers, and moderate winters. Some higher elevation areas of the Installation have semi- and sub-humid climatic zones due to higher precipitation. Springtime is normally moderate in temperature with high winds and blowing dust (FTBL-22.A.1).

Temperatures at Fort Bliss are highly variable, ranging from -8 degrees Fahrenheit (°F) to 114°F with a daily average of 64°F. The maximum and minimum daily averages are 76°F and 51°F, respectively. The first killing frost of the year occurs around November 15 and the last killing frost is expected about March 20, which allows approximately 235 frost-free days per year. Temperatures drop below freezing an average of 34 days per year and rise above 90°F an average of 87 days per year. Average relative humidity ranges from 51 percent at 6 A.M. to 26 percent at 6 P.M. mountain time. Evaporation rates are very high, averaging a 97-inch precipitation deficit each year (FTBL-22.A.1).

Annual precipitation at Fort Bliss averages from 8 inches in the valley to 20 inches in the mountains. Thunderstorms usually follow an inflow of warm, moist air from the Gulf of Mexico, and less frequently from the Pacific Ocean. Snow typically falls each winter with accumulations averaging 4.6 inches annually and seldom lasts for more than one day. The majority of rainfall occurs from July to September resulting from intense thunderstorm activity, with a dry season occurring from winter to early summer (FTBL-22.A.1).

Wind speeds at Fort Bliss average 9 to 12 miles per hour (mph) with gusts over 60 mph in March and April. Dust and sandstorms occur in March and April due to these stronger winds and lack of precipitation. Spring winds are typically from the west while summer and winter usually bring a more southerly and northerly flow, respectively (FTBL-22.A.1).

7.2.1.2 Geology

Fort Bliss and the surrounding area were essentially a stable, relatively shallow marine shelf from late Cambrian (500 to 600 million years before present [MYBP]) through early Pennsylvanian (280 to 310 MYBP) time. The oldest sedimentary deposits in this area are approximately 400 million years old, and they consist chiefly of dolomite beds that range in age from late Cambrian to late Ordovician (425 to 500 MYBP). Deposition during Devonian (325 to 405 MYBP) time consisted mainly of marine shales and shaly limestones. A relatively thin sequence of upper Mississippian age limestone and shale overlies the Devonian rocks. Unconformably overlying the Mississippian deposits are approximately 3,000 feet of Pennsylvanian age sediments. These strata consist of limestone, sandstone, dolomite, and shale, which were deposited in a shallow marine environment. Tectonic disturbances in Virgilian time (late Pennsylvanian) altered the sedimentation origin from marine to terrestrial. The tectonic movement resulted in the subject area becoming a large depression with landmasses developed to the east, west, and southwest. In later Pennsylvanian and early Permian time, the Tularosa Basin received a thick sequence of land-derived sediments. Most sedimentary rocks in the area consist of limestone strata of

the San Andres formation. These sediments mark the return of marine shelf deposition in the area (FTBL-22.A.1).

Broad regional uplift that occurred between 80 to 40 MYBP (Cenozoic Era) and differential drift within the North American Plate, which occurred 30 MYBP (Miocene), created fault patterns in the region. The result was a physiographic province characterized by down-dropped basins (grabens) bounded by tilted faultblock mountains (FTBL-23.A.1). These grabens have been filled with heterogeneous, unconsolidated to poorly consolidated sediments, which cover underlying sediments. By middle Cenozoic time (present to 65 MYBP), the Hueco and the Mesilla bolsons, respectively on the east and west of the Franklin Mountains, were the prominent basins of deposition (FTBL-22.A.1).

There is evidence that the Tularosa Basin has had a history of continuous, closed basin deposition, with Kansas playa complexes possibly united with Lake Cabeza de Vaca and/or Lake Lucero to the north (FTBL-23.A.2). Eroded petrocalcic horizons, braided stream deposits alternating with poorly sorted mudflows, relic and Paleozoic horizons, topographic expressions of old sediment surfaces and terrace-strand lines, and multiple superimposed petrocalcic (caliche) horizons demonstrate several periods of alternatively wetter and drier climatic trends during and since the Pleistocene (0.01 to 2 MYBP). The southern portion of the Tularosa Basin contains more than 6,000 feet of valley fill, stream sand, and gravel; rock slides; alluvial fans from mountains on either side; and lake deposits rich in salt and gypsum derived from sedimentary rocks of the adjacent ranges. Any rainfall or melted snowfall that occurs in the valley either seeps into the porous valley deposits or evaporates from small pools leaving behind deposits of gypsum, salt, or other minerals. Fault lines along the edge of the Tularosa Basin may still be active, although no movement has been recorded in recent time (FTBL-23.A.2). The mountain ranges adjacent to Fort Bliss developed during separate geologic time periods and comprise a variety of minerals and soils. These geologically different mountain ranges generally contain site-specific substrates, creating areas of unique communities (FTBL-22.A.1).

The Fort Bliss region lies in an area considered to be of moderate seismic activity. The Franklin Mountain block has been rising and the Hueco Bolson block has been sinking for tens of millions of years (FTBL-23.A.2). Earthquake data estimate that the strongest earthquake in the area in a 100-year period lies between a magnitude of 4.8 and 6.0 on the Richter Scale (FTBL-22.A.1).

7.2.1.3 Topography

Topographic relief on Fort Bliss is substantial. Elevations range from about 3,900 feet above mean sea level (MSL) in the cantonment area to approximately 8,825 feet above MSL in the Organ Mountains. Otero Mesa located on the east side of Fort Bliss, features broad, gently rolling grasslands. The Sacramento Mountains, bordering Fort Bliss to the northeast, are composed of steep terrain ascending from the lower slopes to an altitude of more than 7,600 feet above MSL within the Fort Bliss boundary. The Organ Mountains are also composed of steep terrain and reach the highest altitudes within the Fort Bliss boundary. The northernmost reaches of the Franklin Mountains that extend into Fort Bliss are composed mostly of lower slopes and alluvial fans, which range from 4,265 to slightly over 5,000 feet above MSL. Portions of the Hueco Mountains included within Fort Bliss range from 4,500 to approximately 6,000 feet above MSL. The lower slopes of the mountains containing the transition zone between the higher elevations and the Tularosa Basin feature steep slopes that eventually flatten out into alluvial fans and outwashes. Similarly, the escarpment for Otero Mesa consists of steep slopes that grade into alluvial fans. Castner Range is located in nearly level to gently sloping areas of Fort Bliss (FTBL-22.A.1).

7.2.1.4 Soils

There are four soil associations and one rock type associated with the Castner Range. The four soil associations are the Agustin, Delnorte, Pintura, and the Wink. The Agustin is characterized by deep, pale-brown gravelly soils at the base of limestone and igneous mountains and on alluvial fans, generally near gravelly arroyos. The Delnorte association is characterized by Shallow to very shallow hard caliche. Very gravelly soils formed over outwash material of sand and gravel. They occur on foot slopes and outwash plains of igneous and limestone mountains. The Pintura association is characterized by deep, somewhat excessively drained soils formed in coarse textured eolian material. They are on coppice dunes on uplands with 0-5 percent slopes. The dunes have slopes of 20 to more than 80 percent. The Wink association is characterized by deep well drained soils formed in calcareous eolin sediment. They are on upland pediments. The igneous rock is characterized by exposed, stratified igneous rocks, mostly granite, andesite, synite, and rhyolite. Slopes range from 30 percent to almost vertical escarpments several hundred feet thick (FTBL-22.A.1).

7.2.1.5 Hydrogeology

Groundwater is obtained from both fluvial and lacustrine deposits, although fluvial aquifers are the primary source for the area. Groundwater at Fort Bliss comes from two major basins, the Hueco Bolson and the Mesilla Bolson, which are separated by the Franklin Mountains. Thirty-nine deep wells

from the Hueco Bolson aquifer provide most of the water used at Fort Bliss. The Hueco Bolson is located in the southern half of the Tularosa Basin paralleling the eastern base of the Franklin Mountains. It contains fill material consisting primarily of fluvial and lacustrine deposits with a maximum thickness of 9,000 feet (FTBL-22.A.2).

Groundwater recharge is provided by the runoff of precipitation percolating through alluvial deposits at nearby mountain bases. The fresh water aquifers in the Hueco Bolson are of very high quality and require only chlorination. Chemical analyses showed that the Total Dissolved Solids (TDS), chloride, sulfate, and nitrate concentrations do not meet state and federal standards. The Mesilla Bolson lies on the west side of the Franklin Mountains, extending along the Rio Grande Valley through New Mexico and Mexico. The geology in the Mesilla Bolson is similar to that of the Hueco Bolson, with basin fills that are contemporaneous formations of Recent and Sante Fe geologic periods. Fort Bliss uses only limited water resources from Mesilla Bolson (FTBL-22.A.2).

Because of limited supplies of groundwater, Fort Bliss and the City of El Paso have entered into a partnership to construct and operate the largest inland desalinization plant in the US. The limited water supply is caused by population growth and the cut-off of recharge from the Rio Grande River. The Rio Grande River channel was lined with concrete to stop it from meandering. The meandering was a problem because the river is considered the border between the US and Mexico. Once the channel was lined the river could no longer recharge the Hueco Bolson aquifer. The groundwater levels drop an average of 2.5 feet per year due to withdrawal exceeding recharge (FTBL-22.A.2).

7.2.1.6 Hydrology

The only significant surface water body near Fort Bliss is the Rio Grande River. The Rio Grande is used by local municipalities and industries to partially fulfill their water needs. Water from the Rio Grande is part of a US Bureau of Reclamation (USBR) irrigation project that regulates and administers the flow of the Rio Grande below Elephant Butte Reservoir in New Mexico. The reservoir stores and releases water for power generation. Caballo Reservoir, downstream of Elephant Butte Reservoir, regulates releases to meet downstream demands through the January to October irrigation season. Five diversion dams on the river divert flows to the Elephant Butte Irrigation District, New Mexico; the El Paso County Water Improvement District #1 (EPCWID), Texas; and to Mexico. The Rio Grande Compact Commission apportions water from the river to Colorado, New Mexico, and Texas by interstate agreement. The compact provides for normal releases of 790,000 acre feet per year (afy) to the irrigation districts, including 60,000 afy to Mexico (FTBL-22.A.2).

7.2.1.7 Vegetation

The major plant community types in the relatively lowland areas of Fort Bliss are desert grasslands, Chihuahuan Desert scrub, and plains mesa sandscrub. Plant communities that occur in the mountains include juniper savanna, conifer and mixed woodlands, and montane conifer forests (FTBL-22.A.2).

Within the Tularosa Basin, alluvial fans and piedmonts support desert shrub on the basin floor, and desert grassland plant communities dominate the Otera Mesa. The upper Sacramento Mountains foothills generally support a wooded plant community dominated by open and closed stands of pinyon pine (*Pinus edulis*), oneseed juniper (*Juniperus monosperma*) and checker-bark (alligator) juniper (*Juniperus deppeana*). This woodland type also occurs in the Organ Mountains, along with oak woodlands and Rocky Mountain montane conifer forest (FTBL-22.A.2).

Grassland plant communities cover about 342,576 acres, which accounts for over 30 percent of the land on Fort Bliss. Within Fort Bliss, Otero Mesa covers about 152,706 acres and most of this area is dominated by blue grama (*Bouteloua gracilis*), black grama (*Bouteloua eriopoda*), soap tree yucca (*Yucca elata*) and banana yucca (*Yucca baccata*). The remainder of the grassland plant communities occurs in the Tularosa Basin and the foothills of the Organ Mountains. The Tularosa Basin is dominated by tobosa grass (*Hilaria mutica*) and alkali sacaton (*Sporobolus airoides*), whereas the foothills of the Organ Mountains are dominated by black grama and Torrey's jointfir (*Ephedra torreyana*) (FTBL-22.A.2).

Woodland plant communities cover about 10,184 acres or about one percent of Fort Bliss. These plant community types are in the Organ Mountains and the foothills of the Sacramento Mountains. Pinyon pine-juniper woodlands occur in both mountain ranges. The montane riparian and montane conifer forests occur only in the Organ Mountains. In addition, montane shrublands dominated by mountain mahogany (*Cercocarpus montanus*) occur in both mountain ranges, while montane shrublands dominated by Gambel oak (*Quercus gambelii*) occur in the Organ Mountains only (FTBL-22.A.2).

Castner Range has three primary plant communities which are Agave-Lechuguilla, alluvial fan-creosote bush and draw yucca grassland (FTBL-5.A.3).

The mountainous areas of the Castner Range are characterized by the Agave-Lechuguilla community. Lechuguilla (*Agave lechuguilla*) forms dense clonal clumps on colluvial slopes, rides, and benches of hills and mountains. This community also extends down slope onto erosional piedmont surfaces, dropping out at the juncture where deposition prevails over erosion on the lower toeslopes of alluvial plains. The

predominant species occurring in the Agave-Lechuguilla community are viscid acacia (*Acacia neovernicosa*), lechuguilla, common sotol (*Dasylirion wheeleri*), ocotillo (*Foquieria splendens*), and catclaw mimosa (FTBL-5.A.3).

The alluvial fan-creosote bush community occurs on the alluvial fans of the Franklin Mountains. The vegetation is characterized by the presence of creosote bush, whitethorn (*Acacia constricta*), American tarbush (*Flourensia cernua*), Spanish dagger (*Yucca torreyi*), broom snakeweed (*Gutierrezia sarothrae*), and lechuguilla. Grasses are absent to rare, and if present, basal coverage is quite low (less than 0.5 percent). Arroyos and drainage areas are moister than other areas and support different vegetation types including desert willow (*Chilopsis linearis*), Apache plume (*Fallugia paradoxa*), and little leaf sumac (*Rhus microphylla*) (FTBL-5.A.3).

The draw yucca grassland has diversity in grass and shrub species. Grama grasses are the dominant species which includes side-oats grama and black grama, with purple three-awn (*Aristida purpurea*) and sand dropseed (*Sporobolus cryptandrus*) being common as well. Soaptree yucca, all-thorn (*Koeberlinia spinosa*), tree chollo (*Opuntia imbricata*), long-leaf Mormon tea (*Ephedra trifurca*), and Apache plume are common shrubs of the draw yucca grassland (FTBL-5.A.3).

7.2.2 Ecological Setting

7.2.2.1 Habitat type

Fort Bliss exhibits a high degree of plant biodiversity because of its large size and varied topography. The vegetation ranges from Chihuahuan Desert scrub to Rocky Mountain conifer forests. The major plant community types in Fort Bliss are desert grasslands, Chihuahuan Desert scrub, and plains mesa sandscrub. A total of 1,113,403 acres were mapped using satellite imagery. Of this total, six percent (67,000 acres) consists of rock, barren soil, military cantonment, military facilities and roads. The various types of shrubland totaled 63.6 percent (708,375 acres), the grasslands were 29.4 percent (327,391 acres) and the woodlands totaled one percent (10,205 acres) (FTBL-22.A.2). See **Section 7.2.1** for more detail.

7.2.2.2 Degree of Disturbance

The current degree of disturbance is low at the Castner Range. Castner Range has been closed since 1966 and future development is under consideration. Future construction at Castner Range may result in disturbance of flora and fauna located around this area. Erosion is also possible in association with any construction activities (based on soil types of the area), which may also disturb the natural vegetation and subsurface fauna.

7.2.2.3 Ecological Receptors

Wildlife is abundant at Fort Bliss. There are 58 mammalian species, 39 reptilian species, eight amphibian species, and 335 species of birds which are either resident or transient at Fort Bliss. **Table 7-1** is a list of a few common wildlife species that occur at Fort Bliss.

Table 7-1: Common Wildlife Species Occurring at Fort Bliss

Common Name	Scientific Name
Mammals	
Badger	*Taxidea taxus*
Banner-tailed kangaroo rat	*Dipodomys spectabilis*
Black-tailed jackrabbit	*Lepus californicus*
Bobcat	*Lynx rufus*
Collared peccary	*Pecari tajacu*
Coyote	*Canis latrans*
Desert cottontail	*Sylvilagus audubonii*
Kit fox	*Vulpes macrotis*
Mountain lion	*Puma concolor*
Merriam's kangaroo rat	*Dipodomys merriami*
Mexican free-tailed bat	*Tadarida brasiliensis*
Mule deer	*Odocoileus hemionus*
Oryx	*Oryx gazelle*
Pallid bat	*Antrozous pallidus*
Plains pocket mouse	*Perognathus flavescens*
Pronghorn	*Antilocapra Americana*
Silly pocket mouse	*Perognathus flavus*
Western pipistrelle	*Pipistrellus Hesperus*
Reptiles	
Chihuahuan spotted whiptail	*Cnemidophorus exsanguis*
Checkered whiptail	*Cnemidophorus tesselatus*
Coachwhip	*Masticophis flagellum*
Crevice spiny lizard	*Sceloporus poinsettia*
Desert box turtle	*Terrapene ornata luteola*
Great Plains skink	*Eumeces obsoletus*
Longnose leopard lizard	*Gambelia wislizenii wislizenii*
Mojave rattlesnake	*Crotalus scutulatus*
Mountain patchnose snake	*Salvadora grahamiae*
Ornate box turtle	*Terrapene ornate*
Rock rattlesnake	*Crotalus Lepidus*
Roundtail horned lizard	*Phrynosoma modestum*

Table 7-1: Common Wildlife Species Occurring at Fort Bliss, continued

Common Name	Scientific Name
Southern prairie lizard	*Sceloporus undulatus consobrinus*
Western diamondback rattlesnake	*Crotalus atrox*
Western hognose snake	*Heterodon nasicus*
Amphibians	
Couch's spadefoot	*Scaphiopus couchii*
Great plains toad	*Bufo cognatus*
Green toad	*Bufo debilis*
New Mexico spadefoot	*Spea (Scaphiopus) muliplicata*
Red-spotted toad	*Bufo punctatus*
Birds	
American kestrel	*Falco sparverius*
Bewick's wren	*Thryomanes bewickii*
Black-throated sparrow	*Amphispiza bilineata*
Cactus wren	*Campylorhynchus brunneicapillus*
Canyon wren	*Catherpes mexicanus*
Cooper's hawk	*Accipiter cooperii*
Gambel's quail	*Callipepla gambelii*
Golden eagle	*Aquila chrysaetos*
Great horned owl	*Bubo virginianus*
Ladder-backed woodpecker	*Picoides scalaris*
Mountain bluebird	*Sialia currucoides*
Mourning dove	*Zenaida macroura*
Northern mockingbird	*Mimus polyglottos*
Red-tailed hawk	*Buteo jamaicensis*
Red-breasted nuthatch	*Sitta Canadensis*
Rock wren	*Salpinctes obsoletus*
Savannah Sparrow	*Passerculus sandwichensis*
Scaled quail	*Callipepla squamata*
Sharp-shinned hawk	*Accipiter striatus*
Spotted towhee	*Pipilo maculates*
Swainson's hawk	*Buteo swainsoni*
Turkey vulture	*Cathartes aura*
Western bluebird	*Sialia Mexicana*
White-winged dove	*Zenaida asiatica*

Source: FTBL-22.A.3

There are a number of threatened and endangered species that occur or have the potential to occur on Fort Bliss. Six species are listed as threatened or endangered by the United States Fish and Wildlife Service (USFWS) and the states of New Mexico and Texas. Of the six species listed, only one species, the Sneed pincushion cactus (*Escobaria* [*Coryphantha*] *sneedii*), is both federally and state endangered and is found on Fort Bliss year around. One federally and state threatened species is the bald eagle (*Haliaeetus leucocephalus*), which is a seasonal resident. The northern aplomado falcon (*Falco femoralis septentrionalis*) which is both federally and state endangered has been sighted at Fort Bliss. Habitat for the remaining three listed species, the federally and state endangered interior least tern (*Sterna antillarum*), the southwest willow flycatcher (*Empidonax traillii extimus*), and the federally threatened Mexican spotted owl (*Strix occidentalis lucida*) species do not exist or are of an insufficient amount to maintain a population. These species have passed, or may pass, through portions of Fort Bliss (FTBL-22.A.3).

7.2.3 Cultural Setting

7.2.3.1 Beneficial Resources

Five shallow petroleum exploration tests, two that reported multiple oil and gas shows, were drilled on McGregor Range prior to military occupation. At least 4,800 and 6,400 feet of potential oil-bearing rocks remain untested in the Tularosa Basin and Otero Mesa areas, respectively (FTBL-22.A.1).

The Bureau of Land Management (BLM) has the responsibility for permitting, inspecting, and enforcing Notices of Intent (NOI) to conduct oil and gas exploration; surface management responsibilities associated with Applications for Permit to Drill; and monitoring all "down hole" work such as ensuring aquifer protection, blowout prevention, and approved well completions, recompletions, and abandonments (FTBL-22.A.1).

Many gypsum beds of commercial quality are located on the gentle slopes of the small cuestas (ridges or plateaus cut away by erosion from the mesa escarpment) below and west of Otero Mesa. They also occur on the steep slopes of the Otero Mesa escarpment in a varied pure form. In addition, the Hueco Mountains contain a 25- to 75-foot thick gypsum deposit that is of commercial value (FTBL-22.A.1).

High-purity dolomite deposits outcrop near the base of the Sacramento escarpment. These strata contain more than 20 percent magnesium. Sand and gravel deposits, valued for use in construction, are present throughout the range, including deposits near the base of the Sacramento-Otero escarpments and in the arroyos in the northern part of Otero Mesa. Limestone and sandstone strata, suitable for

crushed stone for concrete aggregate, base course material, and building stone, are present near the surface over a large part of Fort Bliss (FTBL-22.A.1).

As of November 24, 1997, the Fort Bliss cultural resource database contained information on over 15,405 cultural resource sites on Fort Bliss. The number and management status of cultural resources in the different portions of the Region of Influence (ROI) are summarized in the database (FTBL-22.A.4).

Castner Range contains numerous prehistoric and historic resources ranging from pueblos to ranching-related sites, a Spanish Salt Trail, and military training locations including a theodolite station from the 1800s and Vietnam War-era simulated village sites. No architectural resources or traditional cultural properties (TCPs) have been identified within Castner Range, but both could potentially occur (FTBL-22.A.4).

The results of the various survey projects completed on the Installation indicate that the area was occupied in varying degrees of intensity from the earliest recognized prehistoric period to recent times. Fort Bliss currently has approximately 16,000 archaeological sites entered in its databases. Approximately 15,600 are prehistoric while 400 are historic. Sites currently considered eligible for inclusion in the National Register of Historic Places (NRHP) number about 600. These numbers will continue to change as more areas are surveyed and evaluated for inclusion in the NRHP (FTBL-22.A.4).

7.2.3.2 Demographics

According to the US Census Bureau (2000 statistics), El Paso had a population of 563,662 within the city and a population of 679,622 within the county during the 2000 census period. The population density was 2,263 persons per square mile for the city and 670.8 persons per square mile for the county. In the City of El Paso, 31.0 percent of the population was under 18 years of age, and 10.7 percent was over 65 years of age. The City of El Paso encompasses 249 square miles of land, while the county sustains 1,013 square miles of land (FTBL-25.A.1).

7.2.3.3 Land Use/Activities

Most of the land area within Fort Bliss is defined as training areas, maneuver areas, impact areas, or safety zones. Castner Range is no longer used for training activities. Much of this range contains ordnance and explosive hazards and is being restored as funding becomes available. Other land uses on Fort Bliss, including maintenance, industrial, supply/storage, troop housing, and administrative facilities, are located within the cantonment area, or to a smaller scale at range camps on Dona Ana Range-North

Training Areas and McGregor Range. Family housing (e.g., Logan Heights), community facilities, Biggs AAF, and WBAMC are located within the cantonment area (FTBL-22.A.5).

A numbering system used at Fort Bliss divides the major land management units (Dona Ana Range-North Training Areas, McGregor Range, South Training Areas, Cantonment Area, and Castner Range) into smaller, more manageable training areas. Division of these large land management units allows for greater access control, improves management of land uses, and helps ensure safety. Safety requirements and precautions are paramount for the firing of guided missiles, automatic weapons, tank weapons, conventional artillery, aerial gunnery, and small arms; launch and control of aerial targets; and explosive ordnance activities at the McGregor, Meyer, and Dona Ana Range complexes (FTBL-22.A.5).

The Fort Bliss Training Area Complex is used for a variety of overlapping military and nonmilitary uses including ground maneuvers, safety zones, recreation and hunting, grazing, and natural resource field surveys. The public has limited access to some areas for recreation, hunting, and cattle grazing, to the extent that it does not conflict with military uses (FTBL-22.A.5).

Castner Range is an inactive range. An 11.5- acre parcel was cleared of UXO and granted as an easement to TxDOT. Another 45 acres was cleared of UXO for development by INS for a new Border Patrol Headquarters (FTBL-13.A.1). In addition, a total of 1,338.9 acres, identified as Castner Range-XD (FTBL-078), were transferred to non-DoD entities, including the State of Texas, private developers, and the City of El Paso. There are two museums located on Castner Range. The remaining acres are currently undeveloped. Signs have been placed around the range warning of the potential for UXO hazards (FTBL-2.A.2).

7.3 Castner Range MRS

7.3.1 MRS Profile

7.3.1.1 Areas and Layout

The Castner Range MRS (FTBL-004-R-01) is located within the City limits of El Paso, Texas between US Highway 54 to the east and the Franklin Mountains State Park to the west, approximately 15 miles south of the New Mexico border. The area of Castner Range has varied throughout its operational history and was 8,328 acres in 1939. Areas of the MRS have been transferred, and the current size of the site is 7,007.34 acres.

7.3.1.2 Boundaries

Castner Range is bordered by Franklin Mountains State Park to the northwest, west and southwest; by US Highway 54 to the east; by a residential and business district to the southeast; and by undeveloped area to the northeast (FTBL-5.A.1).

7.3.1.3 Structures

The Wilderness Park and Border Patrol Museums are located in the east-central portion of Castner Range. Fusselman Dam is located in the mid-southern-central portion of the MRS and Northgate Dam is located in the southeastern corner of the MRS. The TxDOT and INS Border Patrol Headquarters are also located in the southeastern corner of the MRS.

7.3.1.4 Utilities

Utilities located within Castner Range include electricity, telephone, and water.

7.3.1.5 Security

Castner Range contains a short section of fence along the northern side and a limited portion of the western side of the property. Fort Bliss has erected 67 large bilingual (English and Spanish) warning signs in addition to 102 smaller signs with a large visual display to alert the public against trespassing.

7.3.2 Physical Profile

The general physical profile (i.e., climate, geology, topography, soil, hydrogeology, hydrology, and vegetation) at Castner Range is analogous to the conditions described for the Installation. Descriptions of each profile were described previously in **Sections 7.2.1.1** through **7.2.1.7**.

7.3.3 Land Use and Exposure Profile

7.3.3.1 Current Land Use

Castner Range has been declared excess and is currently undeveloped. It consists of rugged mountains and canyons to the west and rounded foothills and gently sloping desert floor to the east. It is heavily vegetated and the vast majority of the land remains untouched since most range activity was confined to firing points and roads (FTBL-2.A.2). Current site activities include traffic on Trans Mountain Road and activities at the Border Patrol Museum, Wilderness Park Museum, TxDOT, and INS Border Patrol Headquarters. Illegal hiking and biking also occurs on Castner Range.

7.3.3.2 Current Human Receptors

Current human receptors include: workers and guests to the Border Patrol Museum, Wilderness Park Museum, TxDOT, and INS Border Patrol Headquarters; illegal hikers and bikers trespassing on the site; Range Riders and Military Police conducting security patrols; and contract workers.

7.3.3.3 Potential Future Land Use

Future land use is undetermined at this time. This would be dependent upon future remedial or corrective action alternatives selected for Castner Range. Two future land use scenarios being considered are: deeding the entire site to the State of Texas as an annex to the Franklin Mountains State Park; or retaining the eastern flat area of Castner Range by Fort Bliss for commercial/residential development and deeding the western mountainous areas to the State of Texas for an annex to the Franklin Mountains State Park (FTBL-5.A.4).

7.3.3.4 Potential Future Human Receptors

Potential future human receptors would include current human receptors with the exception of the Range Riders and Military Police who would no longer need to patrol the area. New potential future human receptors would depend on the future use of the land and could include employees of businesses, residents, or park guests.

7.3.3.5 Zoning/Land Use Restrictions

The MRS has a "restricted access" use designation due to concerns over the presence of MEC. Within the majority of Castner Range there are no zoning or land-use restrictions (FTBL-5.A.5).

7.3.3.6 Site Specific Beneficial Resources

Castner Range contains numerous prehistoric and historic resources ranging from pueblos to ranching-related sites, a Spanish Salt Trail, and military training locations including a theodolite station from the 1800s and Vietnam War-era simulated village sites (FTBL-22.A.4). Specific details of the beneficial resources located at the Installation are provided in **Section 7.2.3.1**.

7.3.3.7 Demographics/Zoning

Fort Bliss is located in west Texas and southern New Mexico on approximately 1.1 million acres of land. The Installation encompasses portions of three counties including El Paso County in Texas and Dona Ana and Otero counties in New Mexico. The main cantonment area of Fort Bliss is located adjacent to the City of El Paso, Texas. Ciudad Juarez, Mexico is located south of the Installation.

7.3.4 Ecological Profile

The general ecological profile (habitat, degree of disturbance, and ecological receptors) at Castner Range is analogous to the conditions throughout Fort Bliss. Specific details of the ecological setting at Fort Bliss are provided in **Sections 7.2.2.1** through **7.2.2.3**.

7.3.5 Munitions/Release Profile

7.3.5.1 Types of Munitions and Release Mechanisms

Castner Range was used for live-fire operations from 1926 to 1966. MEC (e.g., projectiles, grenades, mortars, and rockets) have been identified on site. As such, Castner Range MRS is considered to contain MEC and associated MC.

The release mechanisms for MEC and MC are the intentional firing of munitions and related items for training or demonstrations. **Table 7-2** provides a summary of the types of munitions observed at the MRS, MC potentially present, and the release mechanisms.

Table 7-2: Summary of MEC and Potential MC Present at Castner Range

MEC	Potential MC	Primary Release Mechanisms
Flares, Signals, Simulators, Obscurant Smoke	Smokeless powder (nitrocellulose, nitroglycerin)	Intentional for training
Grenades (hand, rifle, smoke)	Smoke, white phosphorus, HE, riot-control agent, illumination	Intentional for training
Large Caliber Projectiles (37mm or greater)	Smoke, white phosphorus, incendiary, HE, practice.	Intentional for training or demonstration
Medium Caliber Projectiles (20mm, 25mm, 30mm)	HE, inert.	Intentional for training or demonstration
Mortars	Smoke, white phosphorus, incendiary, illumination, HE, inert.	Intentional for training
Rockets	Propellant, HE, white phosphorus, submunitions, riot-control agent, illumination flares, toxic chemicals	Intentional for training or demonstration

Source: FTBL-26.A.1

7.3.5.2 Maximum Probable Penetration Depth

Munitions were fired at many locations across the range. MEC would be expected to be in the surface and subsurface soil based on documentation of past remedial activities. The penetration of MEC items has been shown to be variable (FTBL-7.C.1).

Table 7-3 provides a summary of the types of munitions observed at the MRS and the maximum penetration depths for the worst case scenario soil type on the Installation (sand). The majority of the range consists of gravel and cobbles; however, sand is present in the arroyos.

Table 7-3: Maximum Penetration Depths for MEC Present at Castner Range

Ordnance Type	Maximum UXO Penetration in Sand*
105mm projectile	5.5 feet
90mm projectile	7.0 feet
75mm projectile	4.5 feet
40mm projectile	2.5 feet
37mm projectile	2.5 feet
3.5 inch rocket	5.5 feet
3 inch mortar	6.0 feet
4.2 inch mortar	4.0 feet
81mm mortar	3.0 feet
8-inch shell	12.0 feet

Source: FTBL-4.A.5
*Worst Case scenario soil type

7.3.5.3 MEC Density

Exact locations of impact areas have been identified in some locations at the Castner Range. However, it is likely that the entire range was an impact area for large caliber munitions. Therefore, the entire MRS has the potential to contain MEC.

7.3.5.4 Munitions Debris

Numerous munitions rounds have been identified at the MRS. Evidence of recent discoveries (i.e., last 10 years) of munitions debris was identified during this records search (see **Section 6.1.2**). Additionally, there is photographic documentation (see **Section 6.1.3**) of large and small caliber munitions.

7.3.5.5 Associated Munitions Constituents (MC)

Previous investigations have documented the presence of explosives and metals at Castner Range MRS.

7.3.5.6 Transport Mechanisms/Migration Routes

The primary transport mechanisms evaluated for the MRS include the following:

Surface Soil

- handling/re-distribution by human or ecological elements
- surface water run-on and/or run-off

Subsurface Soil

- soil disturbance via excavation or intrusive soil sampling
- ecological elements (e.g., nesting/burrowing animals)

Migration routes would include the following:

Surface Soil

- surface soil to subsurface soil
- surface soil to surface water and/or sediment
- surface soil to groundwater

Subsurface Soil

- subsurface soil to surface soil (via ecological element)
- subsurface soil to groundwater

Surface Water

- surface water/sediment to subsurface soil and groundwater

Groundwater

- groundwater discharge to surface water

7.3.6 Pathway Analysis

7.3.6.1 MEC

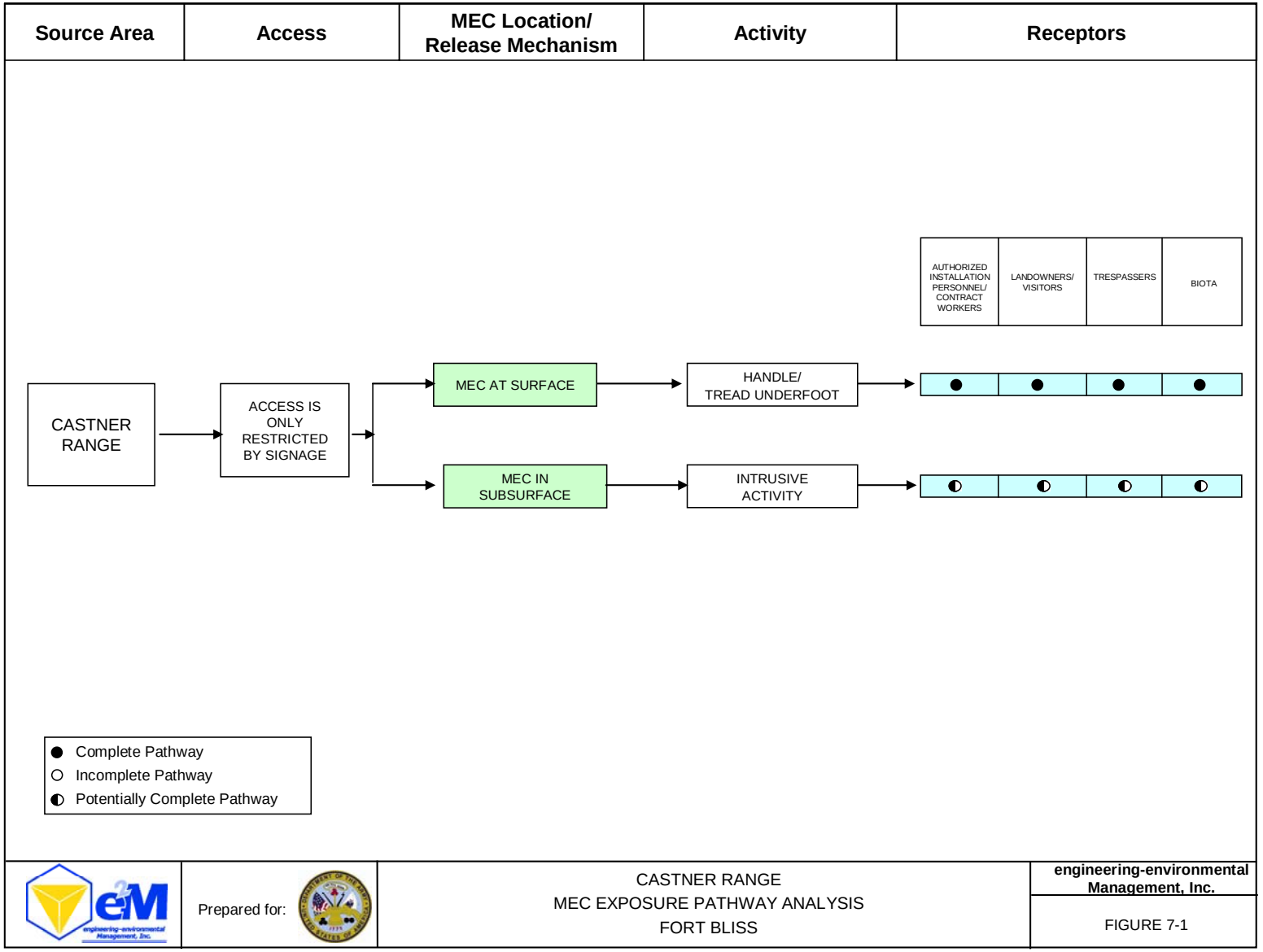
After cessation of range activities in 1966, the MRS has not been used for training, demonstrations or demolition with the exception of the cratering exercise in 1976; and the majority of the land remains untouched (FTBL-4.A.2). Due to current site activities at the museums, TxDOT, and INS Border Patrol Headquarters, along with illegal hiking and biking, surface contact is anticipated, thus the primary exposure pathway for human and ecological receptors would be through the surface soil. Subsurface exposure would be likely during excavation or other intrusive activities. Since potential MEC is likely to be on the surface and in the subsurface, transport and migration is likely. **Figure 7-1** provides the pathways evaluated and the findings of the assessment.

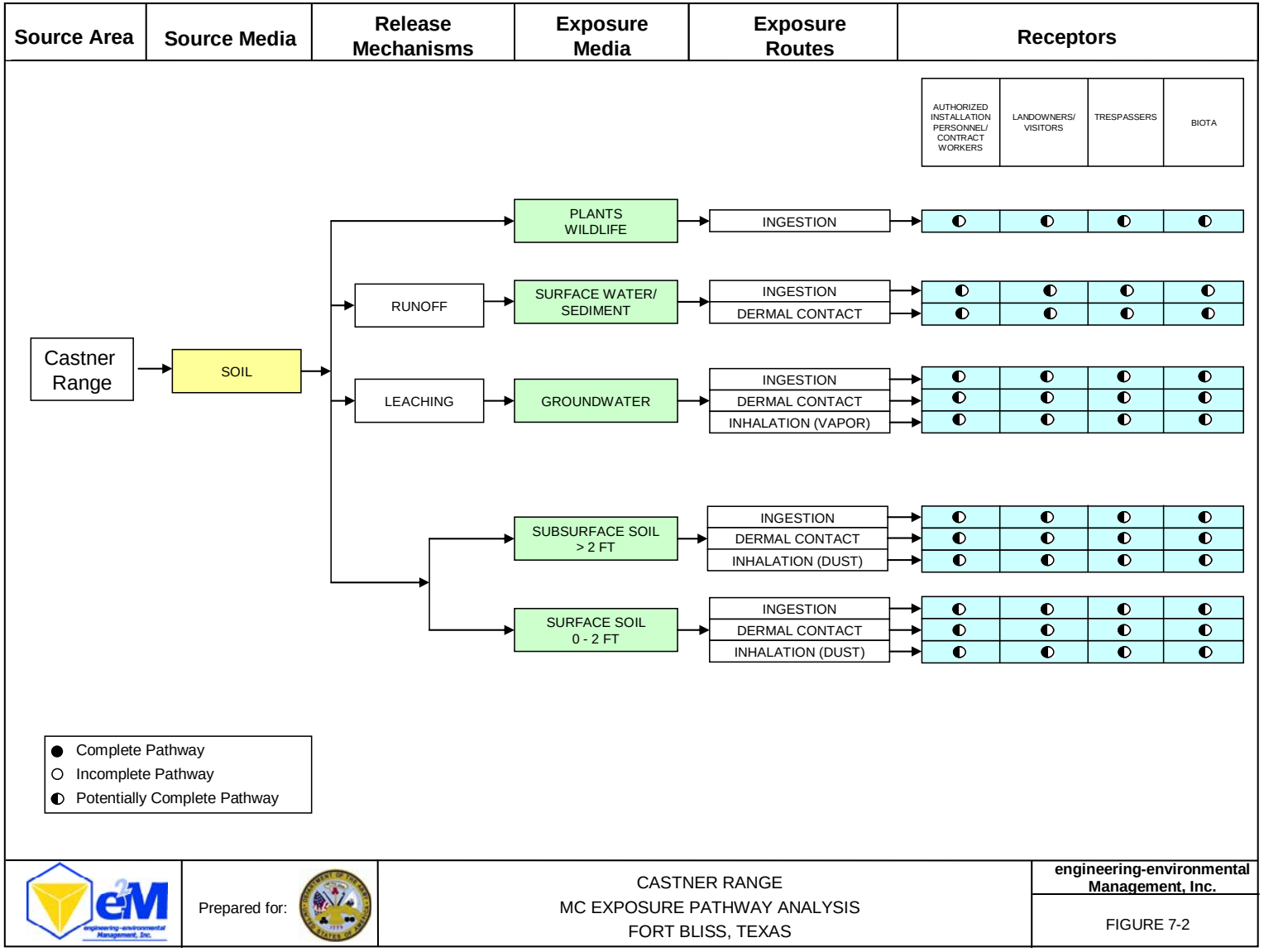
7.3.6.2 MC

The presence of explosives and metals in the surface soil has been established by investigations conducted at the OB/OD Pit B-1. There is potential of transport of MC via surface soil, subsurface soil, groundwater, surface water and sediments. **Figure 7-2** provides the pathways evaluated and the findings of the assessment.

7.3.7 MRS Data Gaps

Numerous investigations and several remedial actions have taken place at the Castner Range MRS. During these activities, extensive documentation has been generated documenting the presence of MEC and to a lesser extent MC. Existing data gaps include the surface and subsurface distribution of MEC and MC.


Source Area
Access
MEC Location/ Release Mechanism
Activity
Receptors
AUTHORIZED INSTALLATION PERSONNEL/ CONTRACT WORKERS
LANDOWNERS/ VISITORS
TRESPASSERS
BIOTA
CASTNER RANGE
ACCESS IS ONLY RESTRICTED BY SIGNAGE
MEC AT SURFACE
MEC IN SUBSURFACE
HANDLE/ TREAD UNDERFOOT
INTRUSIVE ACTIVITY
Complete Pathway
Incomplete Pathway
Potentially Complete Pathway
Prepared for:
CASTNER RANGE
MEC EXPOSURE PATHWAY ANALYSIS
FORT BLISS
engineering-environmental Management, Inc.
FIGURE 7-1


Source Area
Source Media
Release Mechanisms
Exposure Media
Exposure Routes
Receptors
AUTHORIZED INSTALLATION PERSONNEL/ CONTRACT WORKERS
LANDOWNERS/ VISITORS
TRESPASSERS
BIOTA
Castner Range
SOIL
RUNOFF
LEACHING
PLANTS WILDLIFE
SURFACE WATER/ SEDIMENT
GROUNDWATER
SUBSURFACE SOIL > 2 FT
SURFACE SOIL 0 - 2 FT
INGESTION
DERMAL CONTACT
INHALATION (VAPOR)
INHALATION (DUST)
Complete Pathway
Incomplete Pathway
Potentially Complete Pathway
Prepared for:
CASTNER RANGE
MC EXPOSURE PATHWAY ANALYSIS
FORT BLISS, TEXAS
engineering-environmental Management, Inc.
FIGURE 7-2

8.0 CONCLUSIONS

Six MMRP potentially eligible sites were identified during the two independent US Army CTT Range/Site Inventories. The Castner Range-XD, Dona Ana-McNew Surplus, Winfree's Nose, and Maneuver Areas 1 and 2 have been found eligible for the FUDS MMRP. The Operational Range Inventory Team confirmed the Dona Ana Range Camp is currently designated as operational. This operational range status was also verified by the ORIS. Therefore, these sites have been determined to be ineligible for the MMRP SI and have been removed from consideration under this program.

The remaining MRS, Castner Range, qualifies for the MMRP based on the documented range activities that were conducted on the site, and remedial activities which resulted in the discovery of MEC and/or MC which was determined to be present prior to September 2002.

8.1 Castner Range MRS (FTBL-004-R-01)

The Castner Range MRS is a 7,007.34-acre closed firing range located in northwest El Paso, Texas in the foothills of the Franklin Mountains. The range was used for live-fire operations from 1926 to 1966 (FTBL-2.A.2). Munitions ranging from small arms to 120mm (and possibly up to 8-inch) projectiles have been fired on Castner Range (FTBL-4.A.3).

8.1.1 MEC

MEC has been documented during numerous surface and subsurface investigations at the Castner Range MRS. Although several areas of the range have been cleared of UXO (See **Figure 6-3**), MEC remains a concern at the site. Surface and subsurface soil contact are anticipated as the primary exposure pathways for human and ecological receptors. Adequate historical data determining the presence of MEC exists for this MRS; therefore, further characterization during the SI (RFA) phase is not required.

8.1.2 MC

Adequate historical data determining the presence of elevated levels of MC exists for the Castner Range MRS; therefore, further characterization during the SI (RFA) phase is not required. MC is a concern at the site and surface and subsurface soil contact are anticipated as the primary exposure pathways for human and ecological receptors at the site.

8.1.3 CSM Summary

Based on the findings, complete exposure pathways for MEC exist and potentially complete pathways for MC exist at the Castner Range MRS.

9.0 RECOMMENDATIONS

Recommendations for the Castner Range MRS (FTBL-004-R-01) at Fort Bliss are based upon the results of historical investigations at the site and stakeholder discussions during the TPP 2 meeting in May 2006, a conference call in June 2006, and the TPP 3 meeting in December 2006. **Appendix C** provides the TPP meeting minutes and Responses to Comments. The Castner Range MRS contains MEC, munitions debris, and elevated levels of MC in numerous locations as determined during previous investigations at the site. The MRS-PP priority ranking is a "3" (see **Appendix D**). Therefore, the Castner Range MRS is recommended for both an immediate response, and further characterization. It was also agreed to by the Stakeholders that concerns identified in the Responses to Comments (**Appendix C**) must be addressed during the planning and implementation of future remedial characterization phases.

It is recommended that an immediate response at Castner Range MRS include the installation of fencing and warning signs at access points known to be used by trespassers along the northern and southern perimeters of the MRS where private development exists.

Further characterization of the MRS is recommended to be conducted through an RI/FS (RFI) process. Although several areas within the Castner Range MRS have been cleared of MEC, further characterization of the entire site would be necessary to support future remedial alternatives.

Table 9-1 below summarizes the recommendations and basis of the recommendations for the MRSs.

Table 9-1: MRS Recommendations

MRS	Recommendation	Basis for Recommendation	
		MEC	MC
Castner Range (FTBL-004-R-01)[1] (7,007.34 acres)	Immediate Response Required and Further Characterization. Installation of fencing and signage to limit access to trespassers is recommended as an immediate response. Further characterization is recommended to be performed during the next phase of work in an MRS specific RI/FS.	MEC was identified during previous investigations.	Soil samples collected during previous investigations indicate the presence of explosives and elevated concentrations of metals.

Table 9-1: MRS Recommendations (continued)

MRS	Recommendation	Basis for Recommendation	
		MEC	MC
Castner Range-XD (AEDB-R number not assigned) (1,338.9 acres)	Determined ineligible for MMRP because site qualifies under the FUDS MMRP.	N/A	N/A
Dona Ana Range-McNew Surplus (FTBL-001-R-01) (52,410.7 acres)	Determined ineligible for MMRP because site qualifies under the FUDS MMRP.	N/A	N/A
Maneuver Areas No. 1 and 2 (FTBL-002-R-01) (73,528.6 acres)	Determined ineligible for MMRP because site qualifies under the FUDS MMRP.	N/A	N/A
Winfree's Nose (FTBL-003-R-01) (1,898.4 acres)	Determined ineligible for MMRP because site qualifies under the FUDS MMRP.	N/A	N/A
Dona Ana Range Camp (FTBL-005-R-01) (17 acres)	Determined to be Operational Range.	N/A	N/A

[1] Army Environmental Database-Restoration Number

TBD – To Be Determined

N/A – Not Applicable