Draft

ENVIRONMENTAL ASSESSMENT

FOR THE PROPOSED CONSTRUCTION, OPERATION, AND MAINTENANCE OF TACTICAL INFRASTRUCTURE

U.S. Border Patrol Del Rio Sector, Texas

U.S. Department of Homeland Security
U.S. Customs and Border Protection
U.S. Border Patrol

January 2008

ABBREVIATIONS AND ACRONYMS

°F	Degrees Fahrenheit
ACHP	Advisory Council on Historic Preservation
APE	Area of Potential Effect
AQCR	air quality control region
BA	Biological Assessment
BLM	Bureau of Land Management
BMP	Best Management Practice
BO	Biological Opinion
CAA	Clean Air Act
CBP	U.S. Customs and Border Protection
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CO	carbon monoxide
CO_2	carbon dioxide
CM&R	Construction Mitigation and Restoration
CRS	Congressional Research Service
CWA	Clean Water Act
CY	calendar year
dB	decibels
dBA	A-weighted decibels
DHS	U.S. Department of Homeland Security
EA	Environmental Assessment
ECSO	Engineering and Construction Support Office
EIS	Environmental Impact Statement
EO	Executive Order
ESA	Endangered Species Act
FEMA	Federal Emergency Management Agency
FHWA	Federal Highway Administration
FIRM	Flood Insurance Rate Map
FONSI	Finding of No Significant Impact
FPPA	Farmland Protection Policy Act
FY	fiscal year
GLO	General Land Office
GSA	General Services Administration
HABS	Historic American Building Survey
HAER	Historic American Engineering Record
hp	horsepower
IBWC	International Boundary and Water Commission
MBTA	Migratory Bird Treaty Act
MD	Management Directive
MMTCE	million metric tons of carbon equivalent
MSAI AQCR	Metropolitan San Antonio Intrastate Air Quality Control Region
NAAQS	National Ambient Air Quality Standards
NADB	North American Development Bank
NAGPRA	Native American Graves Protection and Repatriation Act
NEPA	National Environmental Policy Act
NHL	National Historic Landmark

continued on back cover →

COVER SHEET

DRAFT ENVIRONMENTAL ASSESSMENT
FOR THE PROPOSED CONSTRUCTION, OPERATION, AND MAINTENANCE
OF TACTICAL INFRASTRUCTURE
U.S. BORDER PATROL DEL RIO SECTOR, TEXAS

Responsible Agencies: U.S. Department of Homeland Security (DHS), U.S. Customs and Border Protection (CBP), U.S. Border Patrol (USBP).

Cooperating Agencies: U.S. Army Corps of Engineers (USACE) Fort Worth District and the United States Section, International Boundary and Water Commission (USIBWC).

Affected Location: U.S./Mexico international border in Val Verde and Maverick counties, Texas.

Proposed Action: The Proposed Action includes the construction, operation, and maintenance of tactical infrastructure, to include pedestrian fencing, concrete retaining wall, access and patrol roads, and lights along approximately 4 miles of the U.S./Mexico international border within USBP Del Rio Sector, Texas. The Proposed Action would be implemented in two discrete sections, approximately 3 miles and 1 mile in length, respectively. The section in Maverick County would connect to a previously evaluated and approved primary pedestrian fence section which is addressed in separate existing National Environmental Policy Act (NEPA) document.

Report Designation: Draft Environmental Assessment (EA).

Abstract: CBP proposes to construct, operate, and maintain approximately 4 miles of tactical infrastructure, including two discrete sections of primary pedestrian fence, concrete retaining wall, lights, and access and patrol roads, along the U.S./Mexico international border in Val Verde and Maverick counties, Texas. Individual sections would be approximately 3 miles and 1 mile in length. The proposed tactical infrastructure would encroach on parcels of privately and publicly owned land.

The EA analyzes and documents potential environmental consequences associated with the Proposed Action. If the analyses presented in the EA indicate that implementation of the Proposed Action would not result in significant environmental or socioeconomic impacts, a Finding of No Significant Impact (FONSI) will be prepared. If potential environmental concerns arise that cannot be mitigated to insignificance, a Notice of Intent to prepare an Environmental Impact Statement (EIS) would be required.

Throughout the NEPA process, the public may obtain information concerning the status and progress of the Proposed Action and the EA via the project Web site at *www.BorderFenceNEPA.com*; by emailing *information@BorderFenceNEPA.com*;

or by written request to Mr. Charles McGregor, Environmental Manager, U.S. Army Corps of Engineers (USACE), Fort Worth District, Engineering and Construction Support Office, 814 Taylor Street, Room 3B10, Fort Worth, TX 76102, and fax: 757-299-4101.

You may submit comments on this Draft EA to CBP. To avoid duplication, please use only one of the following methods:

(a) Electronically through the Web site at: *www.BorderFenceNEPA.com*

(b) By email to: *DRcomments@BorderFenceNEPA.com*

(c) By mail to: Del Rio Sector Tactical Infrastructure EA, c/o e²M, 2751 Prosperity Avenue, Suite 200, Fairfax, Virginia 22031

(d) By fax to: 757-299-4101.

Privacy Notice

Your comments on this document are due by February 5, 2008. Comments will be addressed in the EA and made available to the public. Any personal information included in comments will therefore be publicly available.

DRAFT

ENVIRONMENTAL ASSESSMENT
FOR THE PROPOSED CONSTRUCTION, OPERATION, AND MAINTENANCE OF TACTICAL INFRASTRUCTURE U.S. BORDER PATROL DEL RIO SECTOR, TEXAS

U.S. Department of Homeland Security
U.S. Customs and Border Protection
U.S. Border Patrol

JANUARY 2008

This document printed on paper that contains at least 30 percent postconsumer fiber.

EXECUTIVE SUMMARY

EXECUTIVE SUMMARY

INTRODUCTION

The U.S. Department of Homeland Security (DHS), U.S. Customs and Border Protection (CBP), U.S. Border Patrol (USBP) proposes to construct, operate, and maintain approximately 4 miles of tactical infrastructure along the U.S./Mexico international border in Val Verde and Maverick counties, Texas. The section in Maverick County would connect to a previously evaluated and approved primary pedestrian fence section that is addressed in a separate existing National Environmental Policy Act (NEPA) document (CBP 2007).

The mission of CBP is to prevent terrorists and terrorist weapons from entering the United States, while also facilitating the flow of legitimate trade and travel. In supporting CBP's mission, USBP is charged with establishing and maintaining effective control of the border of the United States. USBP's mission strategy consists of five main objectives:

- Establish substantial probability of apprehending terrorists and their weapons as they attempt to enter illegally between the Ports of Entry (POEs)
- Deter illegal entries through improved enforcement
- Detect, apprehend, and deter smugglers of humans, drugs, and other contraband
- Leverage "smart border" technology to multiply the effect of enforcement personnel
- Reduce crime in border communities and consequently improve quality of life and economic vitality of targeted areas.

This Environmental Assessment (EA) has been prepared through coordination with Federal and state agencies to identify and assess the potential impacts associated with the proposed construction, operation, and maintenance of tactical infrastructure. This Draft EA is also being prepared to fulfill the requirements of NEPA.

PURPOSE AND NEED

The purpose of the Proposed Action is to increase border security within the USBP Del Rio Sector through the construction, operation, and maintenance of tactical infrastructure in the form of primary pedestrian fences, roads, lights, and supporting technological and tactical assets. The USBP Del Rio Sector has identified two discrete areas along the U.S./Mexico international border that experience high levels of illegal cross-border activity. This activity occurs in areas that are remote and not easily accessed by USBP agents, near POEs where concentrated populations might live on either side of the border, contain thick vegetation that can provide concealment, or have quick access to U.S. transportation routes.

The Proposed Action is needed because of high levels of illegal cross-border activity in these two sections of the USBP Del Rio Sector. The Proposed Action would provide USBP agents with the tools necessary to strengthen their control of the U.S. border between POEs in the USBP Del Rio Sector. The Proposed Action would help to deter illegal cross-border activities within the USBP Del Rio Sector by improving enforcement, preventing terrorists and terrorist weapons from entering the United States, reducing the flow of illegal drugs and other contraband, and enhancing response time, while providing a safer work environment for USBP agents.

PUBLIC INVOLVEMENT

CBP notified relevant Federal, state, and local agencies of the Proposed Action and requested input on environmental concerns they might have regarding the Proposed Action. CBP has coordinated with the U.S. Environmental Protection Agency (USEPA); U.S. Fish and Wildlife Service (USFWS); State Historic Preservation Office (SHPO); and other Federal, state, and local agencies. Agency responses have been incorporated into the analysis of potential environmental impacts.

A Notice of Availability (NOA) for this EA and proposed FONSI will be published in the *Del Rio News–Herald* (in both English and Spanish), *Eagle Pass News Guide* (in English), and the Eagle Pass *News Gram* (in English and Spanish). This has been done to solicit comments on the Proposed Action and involves the local community in the decisionmaking process. Comments from the public and other Federal, state, and local agencies will be incorporated into the Final EA**.**

DESCRIPTION OF THE PROPOSED ACTION

CBP proposes to construct, operate, and maintain tactical infrastructure consisting of two discrete sections of primary pedestrian fence, concrete retaining wall, patrol and access roads, and lights along the U.S./Mexico international border in the Del Rio Sector, Texas. The Proposed Action also includes the removal and management of the invasive species giant reed (*Arundo donax*) to improve line of sight for USBP agents. The proposed section in Maverick County would connect to a previously evaluated and approved primary pedestrian fence section that is addressed in a separate existing NEPA document (CBP 2007). The proposed locations of tactical infrastructure are based on a USBP Del Rio Sector assessment of local operational requirements where such infrastructure would assist USBP agents in reducing illegal cross-border activities. The Fiscal Year (FY) 2007 DHS Appropriations Act (Public Law [P.L.] 109-295) provided $1,187,565,000 under the Border Security Fencing, Infrastructure, and Technology appropriation for the installation of fencing, infrastructure, and technology along the U.S./Mexico border. CBP has identified

Alternative 2, Route B as its Preferred Alternative. Implementation of Alternative 2, Route B would meet USBP's purpose and need.

ALTERNATIVES ANALYSIS

Alternative 1: No Action Alternative

Under the No Action Alternative, proposed tactical infrastructure would not be built and there would be no change in fencing, roads, or other facilities along the U.S./Mexico international border in the proposed project locations within USBP Del Rio Sector. The USBP Del Rio Sector would continue to use agents and technology to identify illegal cross-border activity, and deploy agents to make apprehensions. Although USBP agents would continue to patrol the U.S./Mexico international border within the USBP Del Rio Sector and make apprehensions, their response time and success rate in apprehensions would continue to be impeded. The No Action Alternative is no longer an efficient use of USBP resources and would not meet future USBP mission or operational needs. However, inclusion of the No Action Alternative is prescribed by the Council on Environmental Quality (CEQ) regulations and will be carried forward for analysis in the EA. The No Action Alternative also serves as a baseline against which to evaluate the impacts of the Proposed Action.

Alternative 2: Proposed Action

Under this alternative, two discrete sections of primary pedestrian fence, 0.5 miles of concrete retaining wall, patrol and access roads, and lights would be constructed along the U.S./Mexico international border in the Del Rio Sector, Texas. Individual sections would be approximately 3 miles and 1 mile in length, respectively. The proposed section in Maverick County would connect to a previously evaluated and approved primary pedestrian fence section which is addressed in a separate existing NEPA document.

Two alternatives for the alignment of the tactical infrastructure (Route Alternatives) are being considered under the Proposed Action: Route A and Route B. Route A is the route initially identified by USBP Del Rio Sector as meeting its operational requirements. Route B was developed through coordination with Federal and state agencies to identify an alignment for the infrastructure that continues to meet current operational requirements with fewer environmental effects. Route B meets current operational requirements with fewer environmental impacts, and is CBP's preferred alternative.

Alternative 3: Secure Fence Act Alignment Alternative

Under this alternative, two layers of fence, known as primary and secondary pedestrian fence, would be constructed approximately 130 feet apart along the same alignment as Alternative 2, Route B. This alternative would be most closely aligned with fence described in the Secure Fence Act of 2006, P.L. 109-367, 120 Stat. 2638, codified at 8 United States Code (U.S.C.) 1701.

This alternative would also include 0.5 miles of concrete retaining wall, and construction, operation, and maintenance of access and patrol roads. The patrol roads would be constructed between the primary and secondary pedestrian fences. The design of the tactical infrastructure for this alternative would be similar to that of Alternative 2, Route B.

SUMMARY OF ENVIRONMENTAL IMPACTS

Table ES-1 provides an overview of potential impacts anticipated under each alternative considered, broken down by resource area. **Section 3** of this EA addresses these impacts in more detail.

CBP followed design criteria to reduce adverse environmental impacts and would implement mitigation measures to further reduce or offset adverse environmental impacts. Design criteria to reduce adverse environmental impacts include selecting a route that would minimize impacts, consulting with Federal and state agencies and other stakeholders to avoid or minimize adverse environmental impacts, and developing appropriate Best Management Practices (BMPs) to protect natural and cultural resources. Effects, including physical disturbance and construction of solid barriers, on wetlands, riparian areas, streambeds, and floodplains would be avoided or mitigated. BMPs would include implementation of a Storm Water Pollution Prevention Plan (SWPPP), Construction Mitigation and Restoration (CM&R) Plan, Spill Prevention Control and Countermeasures (SPCC) Plan, Dust Control Plan, Fire Prevention and Suppression Plan, and Unanticipated Discovery Plan to protect natural and cultural resources.

Table ES-1. Summary of Anticipated Environmental Impacts by Alternative

Resource Area	Alternative 1: No Action Alternative	Alternative 2: Proposed Action (Route A)	Alternative 2: Proposed Action (Route B)	Alternative 3: Secure Fence Act Alignment Alternative
Air Quality	No new effects would be expected.	Short-term minor adverse effects would be expected.	Short-term minor adverse effects would be expected.	Short-term minor adverse effects would be expected.
Noise	No new effects would be expected.	Short-term moderate and long-term negligible adverse effects would be expected.	Short-term moderate and long-term negligible adverse effects would be expected.	Effects would be similar to, but slightly greater than, the effects described under Alternative 2, Route B.

Resource Area	Alternative 1: No Action Alternative	Alternative 2: Proposed Action (Route A)	Alternative 2: Proposed Action (Route B)	Alternative 3: Secure Fence Act Alignment Alternative
Land Use	No new effects would be expected.	Short- and long-term minor to major adverse effects would be expected. Private residences and structures would be south of the proposed tactical infrastructure.	Short- and long-term minor adverse effects would be expected. Private residences and structures that are south of the proposed tactical infrastructure under Route A would be north of the proposed tactical infrastructure.	Effects would be similar to, but slightly greater than, the effects described under Alternative 2, Route B.
Geology and Soils	Long-term minor adverse effects would be expected.	Short- and long-term negligible to minor adverse effects would be expected.	Short- and long-term negligible to minor adverse effects would be expected.	Effects would be similar to, but slightly greater than, the effects described under Alternative 2, Route B.
Hydrology and Groundwater	Long-term minor adverse effects would be expected.	Short-term minor adverse effects would be expected.	Short-term minor adverse effects would be expected.	Effects would be similar to, but slightly greater than, the effects described under Alternative 2, Route B.
Surface Waters and Waters of the United States	Long-term minor adverse effects would be expected.	Short- and long-term minor adverse effects would be expected.	Short- and long-term minor adverse effects would be expected.	Effects would be similar to, but slightly greater than, the effects described under Alternative 2, Route B.

Resource Area	Alternative 1: No Action Alternative	Alternative 2: Proposed Action (Route A)	Alternative 2: Proposed Action (Route B)	Alternative 3: Secure Fence Act Alignment Alternative
Floodplains	Long-term minor adverse effects would be expected.	Short and long-term minor adverse effects would be expected. Section M-2A would be in the floodplain.	Short- and long-term minor adverse effects would be expected. Sections M-1 and M-2A would be in the floodplain.	Effects would be similar to, but slightly greater than, the effects described under Alternative 2, Route B.
Vegetation	Short- and long-term negligible to minor adverse effects would be expected.	Short- and long-term negligible to moderate adverse effects would be expected.	Short- and long-term minor to moderate adverse effects would be expected.	Effects would be similar to, but slightly greater than, the effects described under Alternative 2, Route B.
Wildlife and Aquatic Resources	Long-term minor adverse effects would be expected.	Short- and long-term minor and short-term moderate adverse effects, and long-term minor beneficial effects would be expected.	Short- and long-term minor and short-term moderate adverse effects, and long-term minor beneficial effects would be expected.	Effects would be similar to, but slightly greater than, the effects described under Alternative 2, Route B.
Threatened and Endangered Species	Long-term minor adverse effects would be expected.	Short- and long-term negligible to minor adverse and long-term minor beneficial effects would be expected.	Short- and long-term negligible to minor for ocelot and jaguarundi and minor to moderate adverse effects on indigo snake would be expected.	Effects would be similar to, but slightly greater than, the effects described under Alternative 2, Route B.
Cultural, Historical, and Archaeological Resources	No new effects would be expected.	Long-term major adverse effects would be expected.	Long-term minor to major adverse effects would be expected.	Effects would be similar to the effects described under Alternative 2, Route B.

Resource Area	Alternative 1: No Action Alternative	Alternative 2: Proposed Action (Route A)	Alternative 2: Proposed Action (Route B)	Alternative 3: Secure Fence Act Alignment Alternative
Aesthetics and Visual Resources	No new effects would be expected.	Short- and long-term minor to major adverse effects, and potential long-term beneficial effects would be expected.	Short- and long-term minor to major adverse effects, and potential long-term beneficial effects would be expected.	Effects would be similar to, but greater than, the effects described under Alternative 2, Route B.
Socioeconomic Resources, Environmental Justice, and Safety	Long-term minor to major adverse effects would be expected.	Short- and long-term minor beneficial effects on the local economy and safety, respectively, would be expected, and potential minor adverse effects on low-income or minority populations would be expected. Major adverse effects on displaced property owners would be mitigated through fair market compensation and relocation assistance.	Short- and long-term minor beneficial effects on the local economy and safety, respectively, would be expected, and potential minor adverse effects on low-income or minority populations would be expected. Major adverse effects on displaced property owners would be mitigated through fair market compensation and relocation assistance. Private structures would be noth of the proposed tactical infrastructure.	Effects on the local economy would be similar to, but greater than, the effects described under Alternative 2, Route B. All other effects would be similar to Route B.

Resource Area	Alternative 1: No Action Alternative	Alternative 2: Proposed Action (Route A)	Alternative 2: Proposed Action (Route B)	Alternative 3: Secure Fence Act Alignment Alternative
Utilities and Infrastructure	No new effects would be expected.	No new effects on storm water, or electrical or natural gas systems. Short-term minor adverse effects on municipal water, sanitary sewer systems, and solid waste management.	No new effects on storm water, or electrical or natural gas systems. Short-term minor adverse effects on municipal water, sanitary sewer systems, and solid waste management.	Effects would be similar to the effects described under Alternative 2, Route B.

TABLE OF CONTENTS

DRAFT ENVIRONMENTAL ASSESSMENT FOR THE PROPOSED CONSTRUCTION, OPERATION, AND MAINTENANCE OF TACTICAL INFRASTRUCTURE U.S. BORDER PATROL DEL RIO SECTOR, TEXAS

TABLE OF CONTENTS

APPENDICES

FIGURES

TABLES

THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 1

Introduction

1. INTRODUCTION

The U.S. Department of Homeland Security (DHS), U.S. Customs and Border Protection (CBP), U.S. Border Patrol (USBP) proposes to construct, operate, and maintain approximately 4 miles of tactical infrastructure along the U.S./Mexico international border in Val Verde and Maverick counties, Texas. The proposed tactical infrastructure would consist of primary pedestrian fence, concrete retaining wall, patrol and access roads, and lights in two discrete sections along the U.S./Mexico international border in the vicinity of Del Rio and Eagle Pass, Texas (see **Figures 1-1** and **1-2**). The Proposed Action also includes the removal and management of the invasive species giant reed (*Arundo donax*) to improve line of sight for USBP agents. The locations of the individual tactical infrastructure sections were proposed based on the situational and operational requirements of USBP Del Rio Sector. Each tactical infrastructure section represents an individual project and could proceed independent of the other section. The two individual sections would be approximately 3 miles and 1 mile in length. Detailed descriptions of the sections are presented in **Section 2.2.2**. Some portions of the tactical infrastructure sections would encroach on parcels of privately and publicly owned land. A detailed description of the alternatives considered is presented in **Section 2**.

This Draft Environmental Assessment (EA) is divided into seven sections plus appendices. **Section 1** provides background information on USBP missions, identifies the purpose of and need for the Proposed Action, describes the area in which the Proposed Action would occur, and explains the public involvement process. **Section 2** provides the screening criteria for the alternatives; a detailed description of the Proposed Action, alternatives considered, and the No Action Alternative; and identification of the least-damaging practicable alternative. **Section 3** describes, in detail, existing environmental conditions and potential environmental effects from each alternative. **Section 4** discusses potential cumulative and other impacts that might result from implementation of the Proposed Action, combined with foreseeable future actions. **Section 5** provides a summary of necessary mitigation measures and best management practices (BMPs). **Sections 6** and **7** provide a list of references and preparers of the EA, respectively.

Appendix A provides potential primary pedestrian fence designs and a description of the proposed tactical infrastructure. **Appendix B** contains a listing of those laws, regulations, and executive orders (EOs) potentially applicable to the Proposed Action. **Appendix C** presents the letters associated with coordinating and cooperating agencies and interested party letters. **Appendix D** contains detailed maps of the two proposed tactical infrastructure sections. **Appendix E** presents air quality information. **Appendix F** contains detailed soil maps of the two proposed tactical infrastructure sections. **Appendix G** contains the draft Biological Resources Survey Report. **Appendix H** contains the Preliminary Cultural Resources Findings.

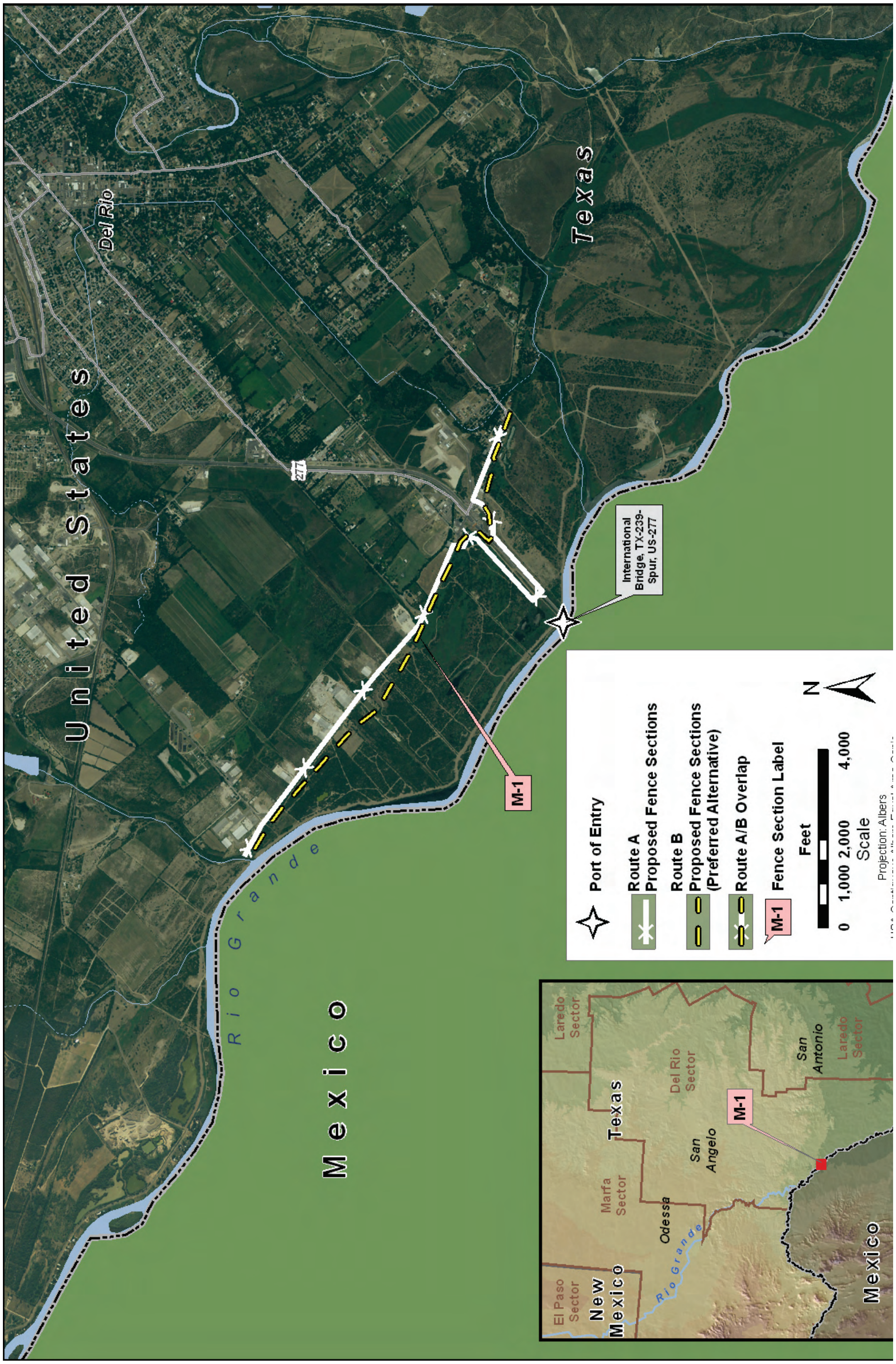


Figure 1-1. Location of the Proposed Section M-1, Del Rio, Texas

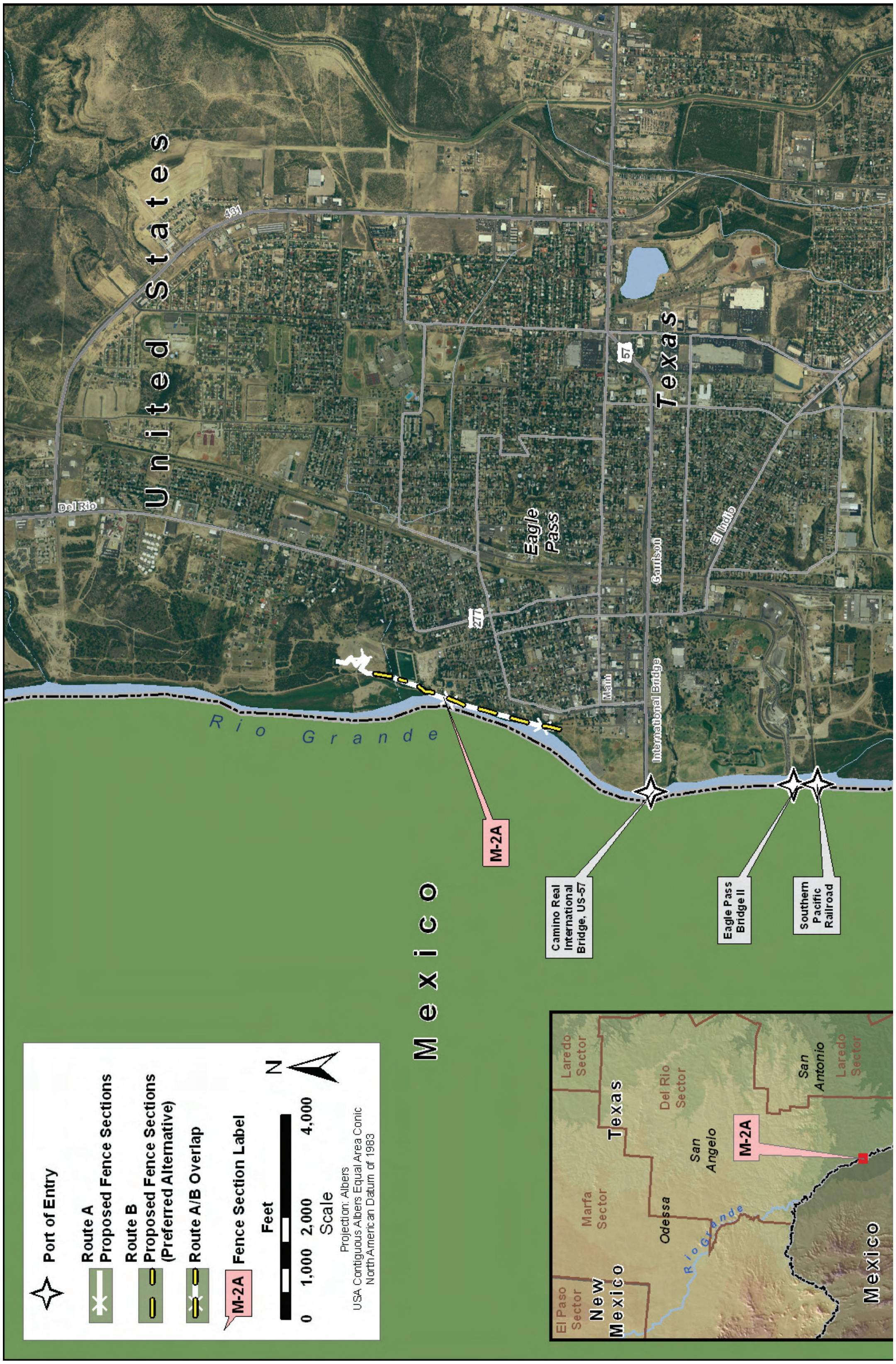


Figure 1-2. Location of the Proposed Section M-2A, Eagle Pass, Texas

1.1 USBP BACKGROUND

The mission of CBP is to prevent terrorists and terrorist weapons from entering the United States, while also facilitating the flow of legitimate trade and travel. In supporting CBP's mission, USBP is charged with establishing and maintaining effective control of the border of the United States. USBP's mission strategy consists of the following five main objectives:

- Establish substantial probability of apprehending terrorists and their weapons as they attempt to enter illegally between the Ports of Entry (POEs)
- Deter illegal entries through improved enforcement
- Detect, apprehend, and deter smugglers of humans, drugs, and other contraband
- Leverage "smart border" technology to multiply the effect of enforcement personnel
- Reduce crime in border communities and consequently improve quality of life and economic vitality of targeted areas.

USBP has nine administrative sectors along the U.S./Mexico international border. Each sector is responsible for implementing an optimal combination of personnel, technology, and infrastructure appropriate to its operational requirements. USBP Del Rio Sector is responsible for 59,541 square miles of Texas and 210 miles of the U.S./Mexico international border. Del Rio Sector stations are located in Abilene, Brackettville, Carrizo Springs, Comstock, Del Rio, Eagle Pass, Llano, Rocksprings, San Angelo, and Uvalde, Texas (CBP undated). Within the USBP Del Rio Sector, areas for tactical infrastructure improvements have been identified that would help the Sector gain more effective control of the border and significantly contribute to USBP's priority mission of homeland security.

1.2 PURPOSE AND NEED

The purpose of the Proposed Action is to increase border security within the USBP Del Rio Sector through the construction, operation, and maintenance of tactical infrastructure in the form of primary pedestrian fences, roads, lights, and supporting technological and tactical assets. The USBP Del Rio Sector has identified two discrete areas along the border that experience high levels of illegal cross-border activity. This activity occurs in areas that are remote and not easily accessed by USBP agents; and near POEs where concentrated populations might live on either side of the border, contain thick vegetation that can provide concealment, or have quick access to U.S. transportation routes.

The Proposed Action is needed because of high levels of illegal cross-border activity in the USBP Del Rio Sector. The Proposed Action would provide USBP agents with the tools necessary to strengthen their control of the U.S. borders between POEs in the USBP Del Rio Sector. The Proposed Action would help to deter illegal cross-border activities within the USBP Del Rio Sector by improving enforcement, preventing terrorists and terrorist weapons from entering the United States, reducing the flow of illegal drugs and other contraband, and enhancing response time, while providing a safer work environment for USBP agents.

1.3 PROPOSED ACTION

CBP proposes to construct, operate, and maintain tactical infrastructure consisting of primary pedestrian fence; concrete retaining wall; and associated patrol and access roads, and lights along two discrete areas of the U.S./Mexico international border in the USBP Del Rio Sector, Texas (examples of primary pedestrian fence and lights are included in **Appendix A**). Proposed tactical infrastructure includes installation of primary pedestrian fence sections in areas of the border that are not currently fenced. The proposed locations of tactical infrastructure are based on a USBP Del Rio Sector assessment of local operational requirements where such infrastructure would assist USBP agents in reducing illegal cross-border activities. The Fiscal Year (FY) 2007 DHS Appropriations Act (Public Law [P.L.] 109-295) provided $1,187,565,000 under the Border Security Fencing, Infrastructure, and Technology appropriation for the installation of fencing, infrastructure, and technology along the border (CRS 2006). **Figures 1-1** and **1-2** illustrate the location of the proposed tactical infrastructure within the Del Rio Sector. Details of the Proposed Action are included in **Section 2.2.2**. CBP has identified Alternative 2, Route B as its Preferred Alternative.

1.4 FRAMEWORK FOR ANALYSIS

The process for implementing the National Environmental Policy Act (NEPA) is codified in Code of Federal Regulations 40 (CFR) 1500–1508, *Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act*, and DHS's related Management Directive (MD) 5100.1, *Environmental Planning Program*. The Council on Environmental Quality (CEQ) was established under NEPA to implement and oversee Federal policy in this process. CEQ regulations specify that the following must be accomplished when preparing an EA:

- Briefly provide evidence and analysis for determining whether to prepare an Environmental Impact Statement (EIS) or a Finding of No Significant Impact (FONSI)
- Aid in an agency's compliance with NEPA when an EIS is unnecessary
- Facilitate preparation of an EIS when one is necessary.

To comply with NEPA, the planning and decisionmaking process for actions proposed by Federal agencies involves a study of other relevant environmental statutes and regulations. The NEPA process, however, does not replace procedural or substantive requirements of other environmental statutes and regulations. It addresses them collectively in the form of an EA or EIS, which enables the decisionmaker to have a comprehensive view of major environmental issues and requirements associated with the Proposed Action. According to CEQ regulations, the requirements of NEPA must be integrated "with other planning and environmental review procedures required by law or by agency so that all such procedures run concurrently rather than consecutively."

Within the framework of environmental impact analysis under NEPA, additional authorities that might be applicable include the Clean Air Act (CAA), Clean Water Act (CWA) (including a National Pollutant Discharge Elimination System [NPDES] storm water discharge permit and Section 404 permit), Rivers and Harbors Act of 1899 (Section 10), Noise Control Act, Endangered Species Act (ESA), Migratory Bird Treaty Act (MBTA), National Historic Preservation Act (NHPA), Archaeological Resources Protection Act, Resource Conservation and Recovery Act, Toxic Substances Control Act, and various EOs. A summary of additional laws, regulations, and EOs that might be applicable to the Proposed Action are shown in **Appendix B**. **Table 1-1** lists major Federal and state permits, approvals, and interagency coordination required to construct, operate, and maintain the proposed tactical infrastructure.

1.5 PUBLIC INVOLVEMENT

Agency and public involvement in the NEPA process promotes open communication between the public and the government and enhances the decisionmaking process. All persons or organizations having a potential interest in the Proposed Action are encouraged to participate in the decisionmaking process.

Implementing regulations under NEPA from the CEQ and DHS direct agencies to make their EAs available to the public during the decisionmaking process and prior to actions being taken. The premise of NEPA is that the quality of Federal decisions will be enhanced if proponents provide information to the public and involve the public in the planning process.

Through the public involvement process, CBP notified relevant Federal, state, and local agencies of the Proposed Action and requested input regarding environmental concerns they might have regarding the Proposed Action. The public involvement process provides CBP the opportunity to cooperate with and consider state and local views in implementing this Federal proposal. As part of the EA, CBP has coordinated with the U.S. Environmental Protection Agency (USEPA); U.S. Fish and Wildlife Service (USFWS); Texas Historical Commission (THC); and other Federal, state, and local agencies (see **Appendix C**). Agency

Table 1-1. Major Permits, Approvals, and Interagency Coordination

Agency	Permit/Approval/Coordination
U.S. Department of the Interior, U.S. Fish and Wildlife Service (USFWS)	- Section 7 (ESA) consultation - MBTA coordination - Special Use Permits for access to National Wildlife Refuge areas
U.S. Environmental Protection Agency (USEPA)	- CWA Sections 402 and 404
U.S. Army Corps of Engineers (USACE)	- CWA Section 404 permit - Rivers and Harbors Act of 1899, Section 10
Texas Commission on Environmental Quality (TCEQ)	- CWA Section 401 State Water Quality Certification - CAA permit consultation - Construction Storm water Permit (Construction General Permit, TXR150000)
Texas Parks and Wildlife Department (TPWD)	- Texas Endangered Species Act coordination
Texas Historical Commission	- NHPA Section 106 consultation
Federally recognized American Indian Tribes	- Consultation regarding potential effects on cultural resources
Advisory Council on Historic Preservation (ACHP)	- NHPA Section 106 consultation

responses have been incorporated into the analysis of potential environmental impacts.

A Notice of Availability (NOA) for this EA and proposed FONSI will be published in the *Del Rio News–Herald* (in English and Spanish), *Eagle Pass News Guide* (in English), and the Eagle Pass *News Gram* (in English and Spanish). This is done to solicit comments on the Proposed Action and involve the local community in the decisionmaking process. Comments from the public and other Federal, state, and local agencies will be incorporated into the Final EA and included in **Appendix C.**

This Draft EA also serves as a public notice regarding impacts on floodplains. EO 11988 directs Federal agencies to avoid floodplains unless the agency determines that there is no practicable alternative. Where the only practicable alternative is to site in a floodplain, a specific process must be followed to comply with EO 11988. This eight-step process is detailed in the Federal Emergency Management Agency (FEMA) (FEMA 1983) document "Further Advice on EO 11988 Floodplain Management." The eight steps are as follows:

1. Determine whether the action will occur in, or stimulate development in, a floodplain.
2. Receive public review/input of the Proposed Action.
3. Identify and evaluate practicable alternatives to locating in the floodplain.
4. Identify the impacts of the Proposed Action (when it occurs in a floodplain).
5. Minimize threats to life, property, and natural and beneficial floodplain values, and restore and preserve natural and beneficial floodplain values.
6. Reevaluate alternatives in light of any new information that might have become available.
7. Issue findings and a public explanation.
8. Implement the action.

Steps 1, 3, and 4 have been undertaken as part of this Draft EA and are discussed in **Section 3**. Steps 2 and 6 through 8 are being conducted simultaneously with the EA development process, including public review of the Draft EA. Step 5 relates to mitigation and is currently undergoing development.

Anyone wishing to provide written comments, suggestions, or relevant information regarding the Proposed Action may do so by submitting comments to CBP. To avoid duplication, please use only <u>one</u> of the following methods:

(a) Electronically through the Web site at: *www.BorderFenceNEPA.com*

(b) By email to: *DRcomments@BorderFenceNEPA.com*

(c) By mail to: Del Rio Sector Tactical Infrastructure EA, c/o e²M, 2751 Prosperity Avenue, Suite 200, Fairfax, Virginia 22031

(d) By fax to: 757-299-4101.

Throughout the NEPA process, the public may obtain information concerning the status and progress of the EA via the project Web site at *www.BorderFenceNEPA.com*; by emailing *information@BorderFenceNEPA.com*; or by written request to Mr. Charles McGregor, Environmental Manager, U.S. Army Corps of Engineers (USACE), Fort Worth District, Engineering and Construction Support Office, 814 Taylor Street, Room 3B10, Fort Worth, TX 76102, fax: 757-299-4101.

1.6 COOPERATING AND COORDINATING AGENCIES

The USACE-Fort Worth District and the United States Section, International Boundary and Water Commission (USIBWC), as cooperating agencies, also have decisionmaking authority for components of the Proposed Action and intend for this EA to fulfill their requirements for compliance with NEPA. The CEQ regulations implementing NEPA instruct agencies to combine environmental documents to reduce duplication and paperwork (40 CFR 1506.4).

The USACE-Fort Worth District Engineer has the authority to authorize actions under Section 404 of the CWA and Section 10 of the Rivers and Harbors Act of 1899 (33 United States Code [U.S.C.] 403). Applications for work involving the discharge of fill material into waters of the United States and work in, or affecting, a navigable water of the United States will be submitted to the USACE-Fort Worth District Regulatory Program Branch for review and for a decision on issuance of a permit, where required.

The International Boundary and Water Commission (IBWC) is an international body composed of a U.S. Section and a Mexican Section, each headed by an Engineer-Commissioner appointed by their respective president. Each Section is administered independently of the other. USIBWC is a Federal government agency headquartered in El Paso, Texas, and operates under the foreign policy guidance of the Department of State (USIBWC 2007a). As a cooperating agency, USIBWC would ensure that design and placement of the proposed tactical infrastructure does not impact the flood control process and does not violate treaty obligations between the United States and Mexico. For purposes of the analysis in this EA, the phrase "north of the proposed project corridor" refers to the area on the U.S. side of the proposed tactical infrastructure.

USFWS is a coordinating agency. Section 7 of the ESA requires Federal agencies to consult with the USFWS when actions might affect federally listed species or designated critical habitat. Pre-consultation coordination with the USFWS is underway and the USFWS has provided critical feedback on the location and design of primary pedestrian fence sections to avoid, minimize, or mitigate potential effects on listed species or designated critical habitat. CBP is developing the Biological Assessment (BA) in coordination with the USFWS. Potential effects of construction, operation, and maintenance of the proposed tactical infrastructure will be analyzed in both the BA and the USFWS's decision document (Biological Opinion [BO] or Letter of Concurrence/Nonconcurrence, as appropriate) to accompany the Final EA.

THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 2

Proposed Action and Alternatives

2. PROPOSED ACTION AND ALTERNATIVES

This section provides detailed information on CBP's proposal to construct, operate, and maintain tactical infrastructure along the U.S./Mexico international border in the Del Rio Sector, Texas. The range of reasonable alternatives considered in this EA is constrained to those that would meet the purpose and need described in **Section 1** to provide USBP agents with the tools necessary to achieve effective control of the border in the Del Rio Sector. Such alternatives must also meet essential technical, engineering, and economic threshold requirements to ensure that each is environmentally sound, economically viable, and complies with governing standards and regulations.

2.1 SCREENING CRITERIA FOR ALTERNATIVES

The following screening criteria were used to develop the Proposed Action and evaluate potential alternatives. The USBP Del Rio Sector is working to develop an appropriate combination of personnel, technology, and infrastructure to meet its objective to gain effective control of the border in the USBP Del Rio Sector.

- *USBP Operational Requirements*. The alternative must support USBP mission needs to hinder or delay individuals crossing the border illegally. Once individuals have entered an urban area or suburban neighborhood, it is much more difficult for USBP agents to identify and apprehend suspects engaged in unlawful border entry. In addition, around populated areas it is relatively easy for cross-border violators to find transportation into the interior of the United States.
- *Threatened or Endangered Species and Critical Habitat*. The alternative would be designed to minimize adverse effects on threatened or endangered species and their critical habitat to the maximum extent practicable. CBP is working with the USFWS to identify potential conservation and mitigation measures.
- *Floodplains and Waters of the United States*. The alternative would be designed to avoid and minimize effects on waters of the United States, including wetlands, surface waters, and floodplain resources to the maximum extent practicable. CBP is working with the USACE-Fort Worth District and USIBWC to avoid, minimize, and mitigate potential effects on waters of the United States, including wetlands, and floodplains.
- *Cultural and Historic Resources.* The alternative would be designed to minimize effects on cultural and historic resources to the maximum extent practical. CBP is working with the THC to identify potential conservation and mitigation measures.
- *Suitable Landscape*. Some areas of the border have steep topography, highly erodible soils, are in a floodway, or have other characteristics that could compromise the integrity of fence or other tactical infrastructure. For

example, in areas susceptible to flash flooding, fence and other tactical infrastructure might be prone to erosion that could undermine the fence's integrity. Areas with suitable landscape conditions would be prioritized.

2.2 ALTERNATIVES ANALYSIS

CBP evaluated a range of possible alternatives to be considered for the Proposed Action, including Route Alternatives and alternative fence designs. The following sections describe the alternative analysis for this Proposed Action. **Section 2.2.1** presents the No Action Alternative, **Section 2.2.2** provides specific details of the Proposed Action, and **Section 2.2.3** discusses the Secure Fence Act Alternative. **Section 2.3** discusses alternatives considered but not analyzed in detail, **Section 2.4** is a summary of the alternatives analysis, and **Section 2.5** identifies the preferred alternative.

2.2.1 Alternative 1: No Action Alternative

Under the No Action Alternative, proposed tactical infrastructure would not be built and there would be no change in fencing, roads, or other facilities along the U.S./Mexico international border in the proposed project locations within the Del Rio Sector. The USBP Del Rio Sector would continue to use agents and technology to identify illegal cross-border activity, and deploy agents to make apprehensions. Although USBP agents would continue to patrol the U.S./Mexico international border within the USBP Del Rio Sector and make apprehensions, their response time and success rate in apprehensions would continue to be impeded. The No Action Alternative is no longer an efficient use of USBP resources and would not meet future USBP mission or operational needs. However, inclusion of the No Action Alternative is prescribed by the CEQ regulations implementing NEPA and will be carried forward for analysis in the EA. The No Action Alternative also serves as a baseline against which to evaluate the effects of the Proposed Action.

2.2.2 Alternative 2: Proposed Action

CBP proposes to construct, operate, and maintain tactical infrastructure consisting of two discrete sections of primary pedestrian fence, 0.5 miles of concrete retaining wall, patrol and access roads, and lights along the U.S./Mexico international border in the Del Rio Sector, Texas. Congress has appropriated funds for the construction of the proposed tactical infrastructure. Construction of additional tactical infrastructure might be required in the future as mission and operational requirements are continually reassessed.

The proposed tactical infrastructure would be constructed in two discrete sections within the Del Rio Sector in Del Rio in Val Verde County and in Eagle Pass in Maverick County. The individual sections would be approximately 3 miles and 1 mile in length, respectively. Each proposed tactical infrastructure section would be an individual project that could proceed independent of the other section. The two sections of tactical infrastructure are designated as Sections M-1 and M-2A in **Figures 1-1** and **1-2**. **Table 2-1** provides a general description of the two proposed tactical infrastructure sections.

Table 2-1. Proposed Tactical Infrastructure Sections for USBP Del Rio Sector

Section Number	Border Patrol Station	General Location	Length of Section (miles)	
			Route A	Route B
M-1	Del Rio	Del Rio, Texas	3.0	2.4
M-2A	Eagle Pass	Eagle Pass, Texas	0.9	0.8
		Total	**3.9**	**3.2**

Design criteria that have been established based on USBP operational needs specify that, at a minimum, any fencing must meet the following requirements:

- Built 15 to 18 feet high and extend below ground
- Capable of withstanding a crash of a 10,000-pound (gross weight) vehicle traveling at 40 miles per hour
- Capable of withstanding vandalism, cutting, or various types of penetration
- Semi-transparent, as dictated by operational needs
- Designed to survive extreme climate changes
- Designed to reduce or minimize effects on small animal movements
- Engineered to not impede the natural flow of surface water
- Aesthetically pleasing to the extent possible.

In addition, the USIBWC has design criteria for tactical infrastructure to avoid adverse impacts on the floodplain, levees, and flood control operations (USIBWC 2007b). Typical primary pedestrian fence designs that could be used are included in **Appendix D**. The design that meets the Del Rio Sector's operational needs is aesthetic fencing (Section M-1 and M-2A) and a concrete retaining wall (Section M-2A only). The preliminary cost estimate to construct the proposed Del Rio Sector tactical infrastructure sections is approximately $12 million. Additionally, USBP is proposing to construct, operate, and maintain permanent lighting along Sections M-1 and M-2A. Each light pole would be placed approximately 100 yards apart. Standard design for permanent lights is also discussed in **Appendix A**.

Two alternatives for the alignment of the tactical infrastructure (Route Alternatives) are being considered under the Proposed Action: Route A and Route B. Route A is the route initially identified by USBP Del Rio Sector as meeting its operational requirements. Route B was developed through coordination with Federal and state agencies to identify an alignment for the infrastructure that would continue to meet current operational requirements but with fewer environmental effects. Differences between Routes A and B are shown in **Figures 1-1** and **1-2**, outlined in **Table 2-1**, and shown on detailed maps in **Appendix D**.

Under both Routes A and B, the tactical infrastructure would also encroach on multiple privately and publicly owned land parcels.

In Del Rio, Section M-1, Route A would follow Garza Lane and Rio Grande Road and Route B would parallel the USIBWC floodplain. Section M-1, Route A is outside both the USIBWC floodplain and the FEMA 100-year floodplain. Section M-1, Route B would be outside of the USIBWC floodplain and inside of the FEMA 100-year floodplain. Giant reed (an invasive species) and other brush would also be removed as part of the Proposed Action to improve line of sight for border patrol agents. The corridor would be revegetated as appropriate to maintain an open space for patrol purposes.

The proposed tactical infrastructure would affect approximately a 150-foot-wide corridor along Section M-1. This corridor would include a primary pedestrian fence, a patrol and access road, and lights. In Section M-1, a new road would be needed for construction access and patrols along the proposed project corridor. **Figure 2-1** shows a schematic of a typical proposed project corridor for tactical infrastructure in Section M-1. A 150-foot corridor would be maintained free of giant reed and other brush (to the extent practical) along Section M-1. This corridor would include giant reed and brush removal from an area 100 feet south and 50 feet north of the primary pedestrian fence. The area affected by the maintenance of this corridor would be approximately 55 acres for Route A and approximately 43 acres for Route B. Operation and maintenance of this section would include keeping the primary pedestrian fence free of debris (e.g., trash and leaf litter), keeping the corridor free of giant reed and other brush, painting the fence, and maintaining lights. Effects on jurisdictional waters of the United States, including wetlands, would be mitigated.

In Eagle Pass, Section M-2A, Routes A and B would generally follow the bank of the Rio Grande. Section M-2A Routes A and B are both inside of the FEMA 100-year floodplain. Section M-2A would connect to a previously evaluated and approved primary pedestrian fence section (Section M-2B) which is addressed in a separate existing NEPA document (see **Appendix D**) (CBP 2007). Approximately 0.5 miles of Section M-2A, would be a 15- to 18-foot-high concrete retaining wall and the remaining would be aesthetic fencing (see **Appendix D**). A cross section of the proposed concrete retaining wall is presented in **Figure 2-2**. In Section M-2A, existing roads would be used for construction access and patrol roads. Improvement of existing patrol roads along the entire length of the primary pedestrian fence section and the management of giant reed is also included in the Proposed Action for Section M-2A. The corridor would be revegetated as appropriate to maintain an open space for patrol purposes.

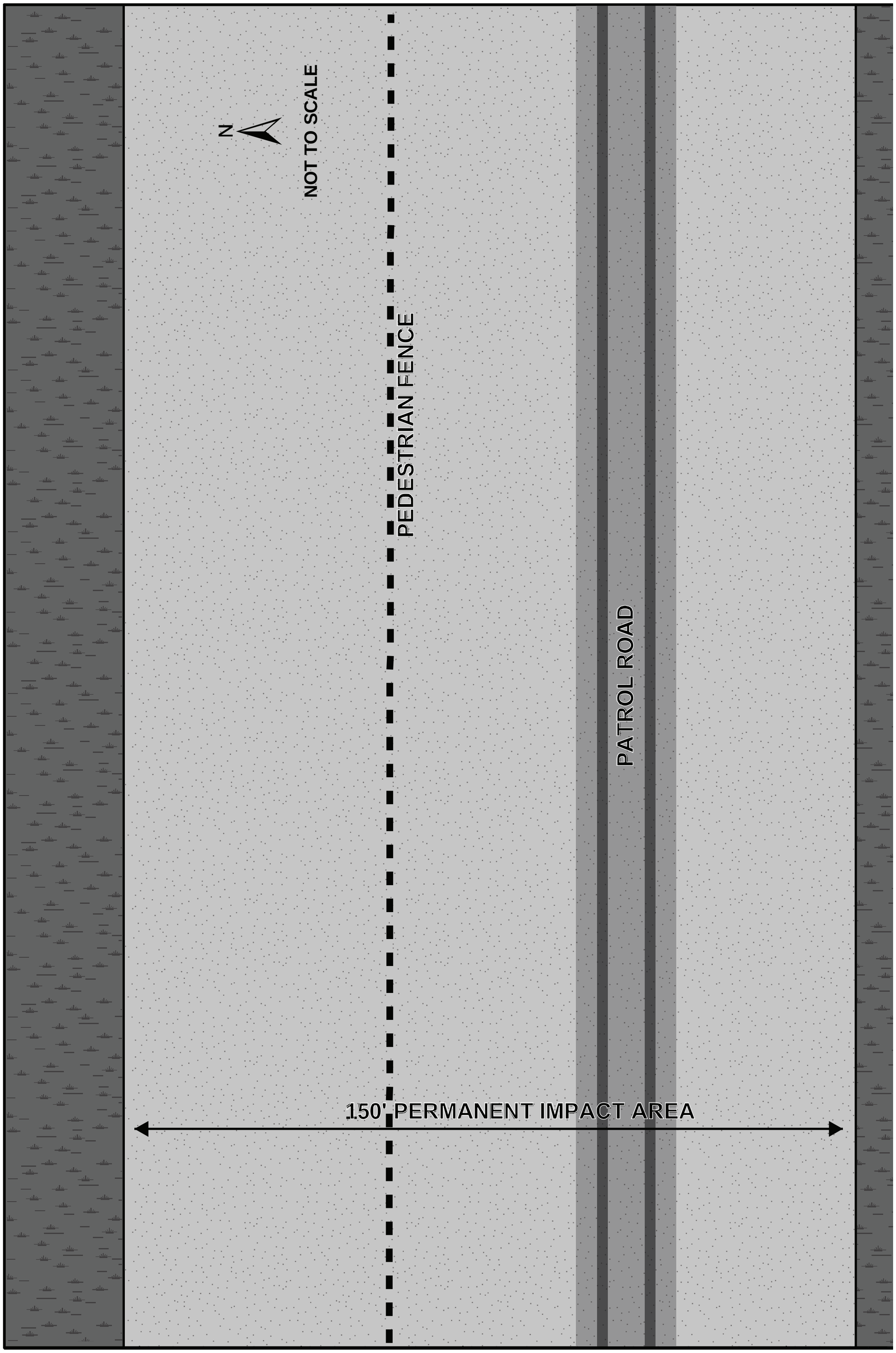


Figure 2-1. Schematic of Typical Proposed Project Corridor – Alternative 2, Section M-1

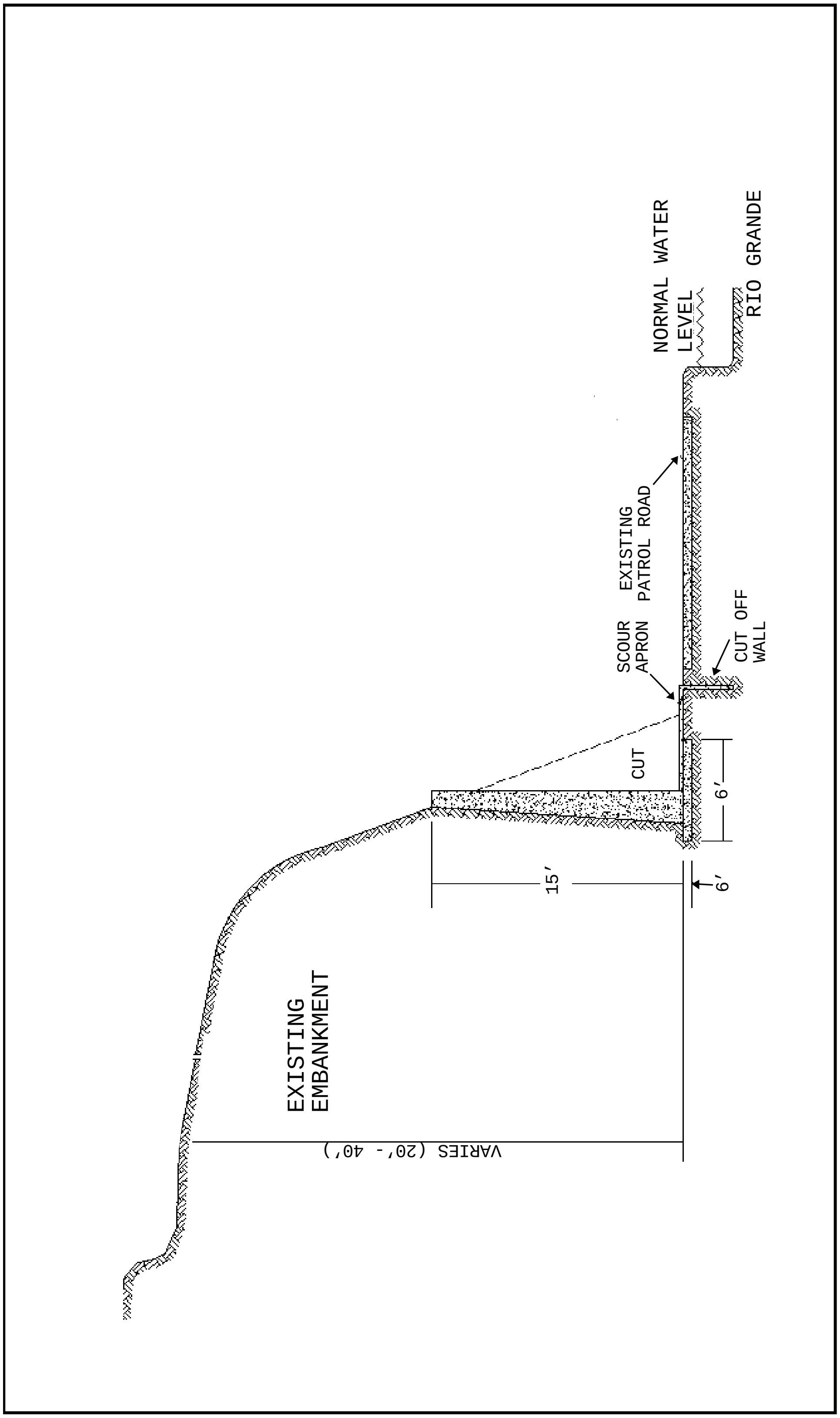


Figure 2-2. Schematic of Concrete Retaining Wall – Alternative 2, Section M-2A

The proposed tactical infrastructure would affect approximately a 60-foot-wide corridor along Section M-2A. This corridor would include a primary pedestrian fence, concrete retaining wall, improvement of the existing access and patrol road, and lights. Figure 2-3 shows a schematic of a typical proposed project corridor for tactical infrastructure in Section M-2A. Vegetation would be cleared and grading would occur where needed. In Section M-2A, the area affected by the construction of tactical infrastructure would total approximately 6 acres for Route A and approximately 5 acres for Route B. Operation and maintenance of this section would include keeping the primary pedestrian fence free of debris, maintaining the structural integrity of the concrete retaining wall, keeping the corridor free of giant reed, painting the fence, and maintaining lights. Effects in this section on jurisdictional waters of the United States, including wetlands, would be mitigated.

There would be no overall change in Del Rio Sector operations. The USBP Del Rio Sector activities routinely adapt to operational requirements, and would continue to do so under this alternative. The Del Rio Sector operations would retain the same flexibility to most effectively provide a law enforcement resolution to illegal cross-border activity. Fence maintenance would initially be performed by USBP Sector personnel, but would eventually become a contractor-performed activity.

USBP is working closely with local landowners and municipalities potentially affected by the proposed tactical infrastructure. For both Route Alternatives, gates would be constructed to allow USBP personnel, landowners, and others access to land, the Rio Grande, and other water resources and infrastructure. Gates would be situated to provide access to existing recreational amenities; water resources, and other areas. On a case-by-case basis, USACE might purchase the land between the proposed tactical infrastructure and the Rio Grande on behalf of USBP, if operationally necessary.

If approved, construction of the proposed tactical infrastructure would begin in Spring 2008 and continue through December 2008. Construction access roads would be 30 to 60 feet wide. Wherever possible, existing roads and previously disturbed areas would be used for construction access and staging areas. If fill material is needed, the construction contractor would use clean material from commercially available sources that do not pose an adverse effect on biological or cultural resources.

To the extent that additional actions in the study area are known, they are discussed in **Section 4** of this EA under Cumulative and Other Impacts. Both Routes A and B under Alternative 2 are viable and are carried forward for detailed analysis in this EA.

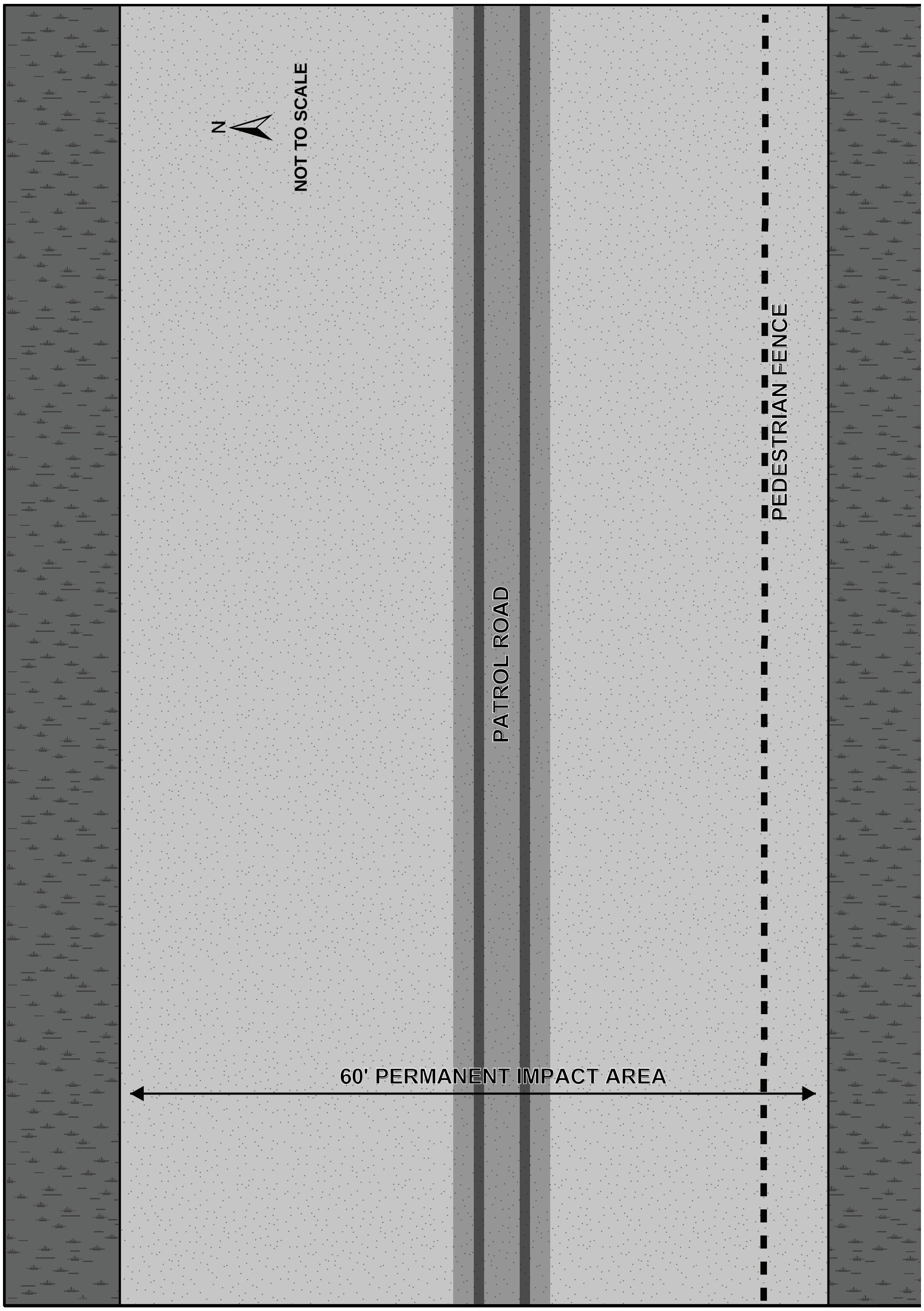


Figure 2-3. Schematic of Typical Proposed Project Corridor – Alternative 2, Section M-2A

2.2.3 Alternative 3: Secure Fence Act Alignment Alternative

In addition to Route Alternatives A and B, an alternative of two layers of fence, known as primary and secondary pedestrian fence, is analyzed in this EA. Under this alternative, the two layers of fence would be constructed approximately 130 feet apart along the same alignment as Route B and would be most closely aligned with the fence description in the Secure Fence Act of 2006, P.L. 109-367, 120 Stat. 2638, codified at 8 U.S.C. 1701. This alternative would also include construction of 0.5 miles concrete retaining wall, and construction and maintenance of access and patrol roads. Proposed lighting would be as described in **Section 2.2.2**. The patrol road would be between the primary and secondary pedestrian fences.

Figure 2-4 shows a schematic of typical proposed project corridor for this alternative. The design of the tactical infrastructure for this alternative would be similar to that of Alternative 2.

Construction of the proposed tactical infrastructure would affect an approximate 150-foot-wide corridor for approximately 4 miles along the two fence sections. This construction corridor would accommodate access roads and construction staging areas. Vegetation would be cleared and grading would occur where needed. Unavoidable effects on jurisdictional waters of the United States, including wetlands, would be mitigated. Wherever possible, existing roads would be used for construction access. This is a viable alternative and is carried forward for detailed analysis in this EA.

2.3 ALTERNATIVES CONSIDERED BUT ELIMINATED FROM FURTHER DETAILED ANALYSIS

CBP evaluated possible alternatives to be considered for the Proposed Action, including multiple Route Alternatives. This section addresses options that were reviewed but not carried forward for detailed analysis.

2.3.1 Additional USBP Agents in Lieu of Tactical Infrastructure

CBP considered the alternative of increasing the number of USBP agents assigned to the U. S./Mexico international border as a means of gaining effective control of the U.S./Mexico international border. Under this alternative, USBP would hire and deploy a significantly larger number of agents than are currently deployed along the U.S./Mexico international border and increase patrols to apprehend cross-border violators. USBP would deploy additional agents as determined by operational needs, but patrols might include 4-wheel drive vehicles, all-terrain vehicles, helicopters, or fixed-wing aircraft. Currently, USBP maintains an aggressive hiring program and a cadre of well-trained disciplined agents.

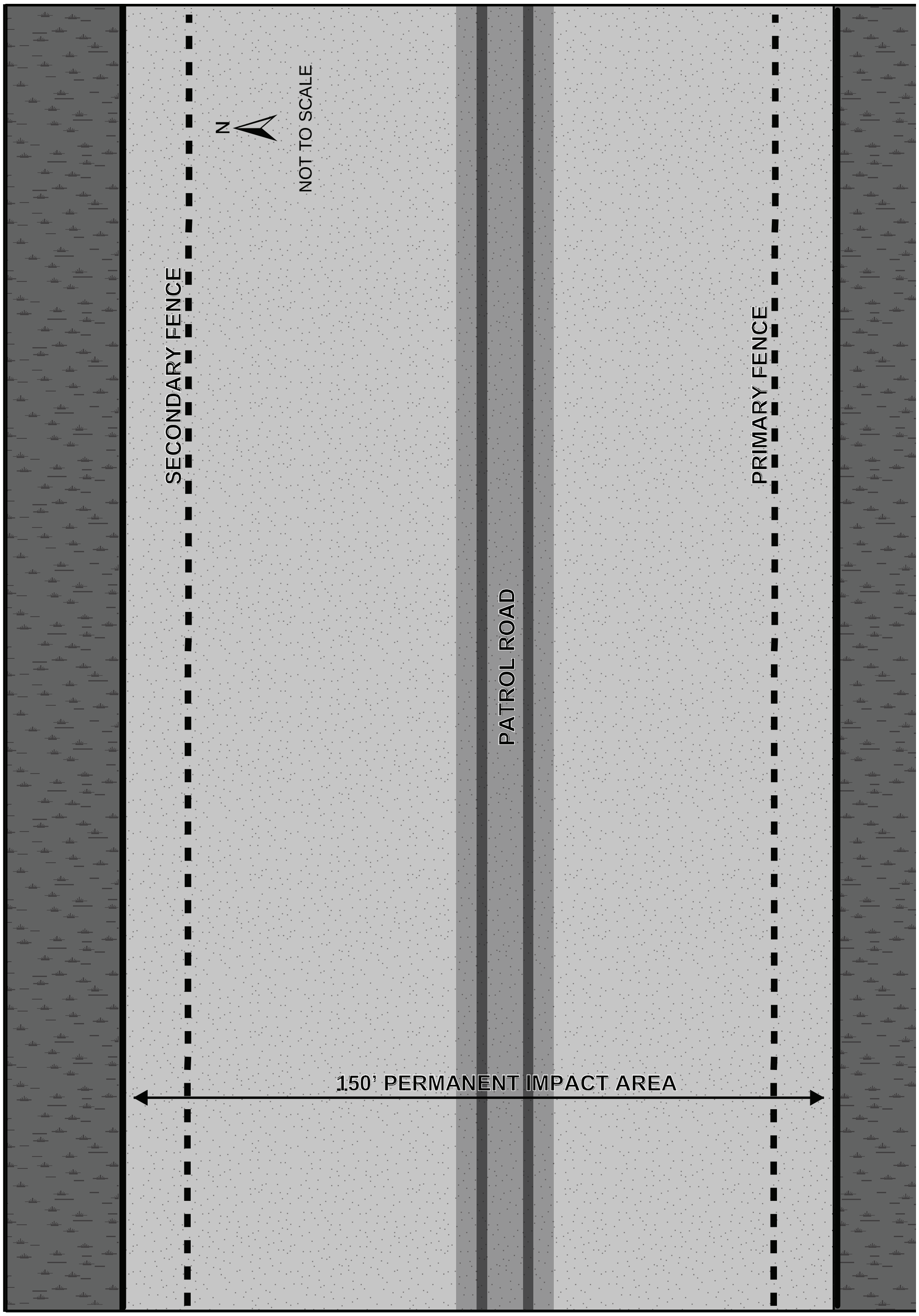


Figure 2-4. Schematic of Typical Proposed Effect Area – Alternative 3

This alternative was determined not to meet the screening criteria of USBP operational requirements. The physical presence of an increased number of agents could provide an enhanced level of deterrence against illegal entry into the United States, but the use of additional agents alone, in lieu of the proposed tactical infrastructure, would not provide a practical solution to achieving effective control of the border in the Del Rio Sector. The use of physical barriers has been demonstrated to slow cross-border violators and provide USBP agents with additional time to make apprehensions (USACE 2000). Additionally, as tactical infrastructure is built, agents could be more effectively redeployed to secure other areas.

A Congressional Research Service (CRS) report (CRS 2006) concluded that USBP border security initiatives within the USBP San Diego Sector such as the 1994 "Operation Gatekeeper" required a 150 percent increase in USBP manpower, lighting, and other equipment. The report states that "It soon became apparent to immigration officials and lawmakers that the USBP needed, among other things, a 'rigid' enforcement system that could integrate infrastructure (i.e., multi-tiered fence and roads), manpower, and new technologies to further control the border region" (CRS 2006).

Increased patrol agents would aid in interdiction activities, but not to the extent anticipated by the construction of primary pedestrian fence and other tactical infrastructure along Sections M-1 and M-2A. As such, this alternative is not practical in the USBP Del Rio Sector and will not be carried forward for further detailed analysis.

2.3.2 Technology in Lieu of Tactical Infrastructure

CBP does and would continue to use various forms of technology to identify cross-border violators. The use of technology in certain sparsely populated areas is a critical component of the Secure Border Initiative (SBI) and an effective force multiplier that allows USBP to monitor large areas and deploy agents to where they would be most effective. However, the apprehension of cross-border violators is still performed by USBP agents and other law enforcement agents. In the more densely populated areas within the Del Rio Sector, physical barriers represent the most effective means to control illegal entry into the United States, as noted above. The use of technology alone would not provide a practical solution to achieving effective control of the border in the Del Rio Sector. Therefore, this alternative would not meet the purpose and need as described in **Section 1.2** and will not be carried forward for further detailed analysis.

2.3.3 Native Thorny Scrub Hedge in Lieu of Tactical Infrastructure

An alternative considered was to maintain a 200- to 300-yard-wide mowed area outside the Rio Grande floodplain and plant a 100-yard-wide hedge of dense, short native thorny scrub brush (a hedge row) within the mowed area. This alternative would also incorporate technology such as sensors, cameras, and lights pointed towards the Rio Grande from the cleared area. The primary benefit associated with this alternative would be its ability to provide suitable habitat for the endangered ocelot (*Leopardus [=Felis] pardalis*) and jaguarundi (*Herpailurus [=Felis] yaguarondi*), which would find suitable habitat along the riverbank travel corridor and within the hedge.

The primary deficiency with this alternative is that a hedge would not be as durable as a fence (pathways could be cut or burned through or under the hedge), it would be relatively slow to grow, and it might require more maintenance than a fence. USBP experience indicates that cross-border violators are willing to traverse dangerous terrain to avoid being caught. A 100-yard-wide hedge could become a haven where they could hide. If a cross-border violator was to become injured and trapped in the hedge, USBP agents would likely have to cut through the hedge to rescue the person, damaging or destroying the hedge in the process. For these reasons, this alternative was determined not to meet the screening criteria of USBP operational requirements, is not a viable alternative, and was not carried forward for further detailed analysis.

2.3.4 Fence Within the Rio Grande

Another alternative considered was to construct a fence in the middle of the Rio Grande. This alternative would consist of installing poles in the river with cables stretched between the poles. A screen fence could be suspended from the cables and anchored to the river bottom. This alternative was not considered in detail due to multiple concerns, including infeasibility due to technical uncertainty, cost considerations, the likelihood of significantly altering the natural flow of the river and affecting additional aquatic resources, and the potential to cause violations of international treaty obligations. Therefore, this alternative would not meet the screening criteria of USBP operational requirements and will not be carried forward for additional analysis.

2.4 SUMMARY COMPARISON OF ALTERNATIVES

Table 2-2 presents a summary comparison of the alternatives carried forward for analysis in the EA.

2.5 IDENTIFICATION OF THE PREFERRED, LEAST-DAMAGING PRACTICABLE ALTERNATIVE

CEQ's implementing regulation for NEPA under 40 CFR 1502.14(c) instructs preparers to "Identify the agency's preferred alternative or alternatives, if one or more exists, in the draft statement and identify such alternative in the final statement unless another law prohibits the expression of such a preference." CBP has identified Alternative 2, Route B as the environmentally preferred, least-damaging and most practicable alternative considered.

Implementation of Alternative 2, Route B would meet USBP's purpose and need described in **Section 1.2**. The No Action Alternative would not meet USBP's purpose and need. Alternative 3 would meet USBP's purpose and need as described in **Section 1.2** but would have greater environmental impacts compared to the Preferred Alternative. CBP might need to implement this alternative at some point in the future depending on future USBP operational requirements. While USBP believes that this level of tactical infrastructure is not required at this time, it is a viable alternative and will be carried forward for detailed analysis.

Table 2-2. Comparison of Alternatives

	Alternative 2		Alternative 3: Secure Fence Act Alignment Alternative
	Route A	Route B	
Description	Two individual tactical infrastructure sections composed of primary pedestrian fence, concrete retaining wall, patrol roads, access roads, and lights	Two individual tactical infrastructure sections composed of primary pedestrian fence, concrete retaining wall, patrol roads, access roads, and lights	Two individual tactical infrastructure sections composed of primary and secondary pedestrian fence constructed 130 feet apart, concrete retaining wall, patrol roads between fences, access roads, and lights
Proposed Total Route Length	M-1: 3.0 miles M-2A: 0.9 miles	M-1: 2.4 miles M-2A: 0.8 miles	M-1: 2.4 miles M-2A: 0.8 miles
Proposed Project Corridor	M-1: 150 feet M-2A: 60 feet	M-1: 150 feet M-2A: 60 feet	150 feet
Acreage of Proposed Project Corridor	61.4 acres	48.7 acres	57.3 acres

THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 3

Affected Environment and Environmental Consequences

3. AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

All potentially relevant resource areas were initially considered in this EA. In accordance with NEPA, CEQ regulations, and DHS MD 5100.1, the following evaluation of environmental effects focuses on those resources and conditions potentially subject to effects, on potentially significant environmental issues deserving of study, and deemphasizes insignificant issues. Some environmental resources and issues that are often analyzed in an EA have been omitted from detailed analysis. The following provides the basis for such exclusions.

Climate. The project area climate is generally considered semi-arid continental (NOAA 2007) and has been further described as subtropical steppe within the Modified Marine climatic type, e.g., summers are long and hot and winters are short, dry, and mild (Larkin and Bomar 1983, Bailey 1995). The marine climate forms in response to the predominant onshore flow of tropical maritime air from the Gulf of Mexico. Onshore air flow is modified by a decrease in moisture content from east to west and by intermittent seasonal intrusions of continental air.

Average temperatures in Del Rio range from a low of 39 degrees Fahrenheit (°F) in January to 74 °F in July, and a high of 62 °F in January to a high of 96 °F in July. The average annual precipitation is 18 inches and approximately 80 percent occurs as showers and thunderstorms from the late spring through early fall seasons. A long growing season is experienced for the area, approximately 300 days. The evaporation rate during the summer season is high and the average relative humidity is 44 percent, measured in the afternoon.

The construction and maintenance of tactical infrastructure would neither affect nor be affected by the climate. However, emissions, including greenhouse gases, and their effect on air quality are discussed in **Section 3.1**.

Roadways and Transportation. Numerous highway systems are in the vicinity of the proposed project corridor, including U.S. Highway 277, Business U.S. Highways 277 North/South, U.S. Highway 90, U.S. Highway 377, State Highway Spur 239, State Highway Spur 297, U.S. Highway 57, and State Highway Spur 240 (TxDOT 2006). In addition to the above highways, there are numerous municipal city roads, farm roads, county roads, and unpaved roads.

The construction of the proposed tactical infrastructure would require delivery of materials to and removal of debris from the construction site. Construction traffic would compose a small percentage of the total existing traffic and many of the vehicles would be driven to and kept onsite for the duration of construction activities, resulting in relatively few additional trips. Potential increases in traffic volume associated with proposed construction activities would be temporary. Heavy vehicles are frequently driven on local roadways. Therefore, the vehicles necessary for construction would not be expected to have an effect on local transportation systems. No road or lane closures would be anticipated at this time. However, if roadways or lanes would be required to be closed, CBP would coordinate with Texas Department of Transportation (TxDOT) and local municipalities to reduce potential effects on local transportation systems. Therefore, roadways and transportation have been eliminated from further consideration.

Hazardous Materials and Wastes. Products containing hazardous materials (such as fuels, oils, lubricants, pesticides, and herbicides) would be procured and used during the proposed construction and for maintenance activities. Herbicides would be used for vegetation removal during proposed construction and maintenance activities. Herbicides would be applied according to USEPA standards and regulations. It is anticipated that the quantity of products containing hazardous materials used for construction and maintenance would be minimal and that the quantity of hazardous and petroleum wastes generated from proposed construction would be negligible. Accidental spills could occur as a result of the proposed construction and maintenance. A spill could potentially result in adverse effects on wildlife, soils, water, and vegetation. However, the amount of hazardous materials at the construction site would be limited and the equipment necessary to quickly contain any spill would be present when refueling. Impacts would be negligible. Construction contractors would be responsible for the management of hazardous materials and wastes, which would be handled in accordance with Federal and state regulations. Pesticides and herbicides could have been used in agricultural areas along the proposed project corridor. However, there are no known above- or underground storage tanks, or hazardous waste clean-up sites within the proposed construction corridor. Additional information on the proposed hazardous wastes at the proposed project corridor will be determined after the *Environmental Due Diligence Assessment for the Construction of Proposed Tactical Infrastructure*. A Spill Prevention Control and Countermeasures (SPCC) Plan would be developed and implemented to avoid impacts associated with hazardous materials and wastes. Therefore, hazardous materials and wastes have been eliminated from further consideration.

Sustainability and Greening. EO 13423, *Strengthening Federal Environmental, Energy, and Transportation Management* (January 24, 2007), promotes environmental practices, including acquisition of biobased, environmentally preferable, energy-efficient, water-efficient, and recycled-content products, and the maintenance of cost-effective waste prevention and recycling programs in Federal facilities. Construction and maintenance of tactical infrastructure would use minimal amounts of resources during construction and maintenance. Therefore, negligible effects on sustainability and greening would be expected.

Construction Safety. Construction site safety is largely a matter of adherence to regulatory requirements imposed for the benefit of employees and implementation of operational practices that reduce risks of illness, injury, death, and property damage. The Occupational Safety and Health Administration (OSHA) and the USEPA issue standards that specify the amount and type of training required for industrial workers, the use of protective equipment and clothing, engineering controls, and maximum exposure limits with respect to workplace stressors.

Construction workers are exposed to safety risks from the inherent dangers at any construction site. Contractors would be required to establish and maintain safety programs at the construction site. The proposed construction would not expose members of the general public to increased safety risks. Because the proposed construction would not introduce new or unusual safety risks, and assuming construction protocols would be carefully followed, detailed examination of safety is not included in this EA.

3.1 AIR QUALITY

3.1.1 Definition of the Resource

In accordance with Federal CAA requirements, the air quality in a given region or area is measured by the concentrations of various pollutants in the atmosphere. The CAA directed USEPA to develop National Ambient Air Quality Standards (NAAQS), for pollutants that have been determined to affect human health and the environment. USEPA established both primary and secondary NAAQS under the provisions of the CAA. NAAQS are currently established for six criteria air pollutants: ozone (O_3), carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), respirable particulate matter (including particulate matter equal to or less than 10 microns in diameter [PM_{10}] and particulate matter equal to or less than 2.5 microns in diameter [$PM_{2.5}$]), and lead (Pb). The primary NAAQS represent maximum levels of background air pollution that are considered safe, with an adequate margin of safety to protect public health. Secondary NAAQS represent the maximum pollutant concentration necessary to protect vegetation, crops, and other public resources along with maintaining visibility standards.

The Federal CAA and USEPA delegated responsibility for ensuring compliance with NAAQS to the states and local agencies. The State of Texas has adopted the NAAQS as the Texas Ambient Air Quality Standards (TAAQS) for the entire State of Texas. **Table 3.1-1** presents the primary and secondary USEPA NAAQS that apply to the air quality in the State of Texas.

USEPA classifies the air quality in an air quality control region (AQCR), or in subareas of an AQCR, according to whether the concentrations of criteria pollutants in ambient air exceed the primary or secondary NAAQS. All areas within each AQCR are therefore designated as either “attainment,” “nonattainment,” “maintenance,” or “unclassified” for each of the six criteria pollutants. Attainment means that the air quality within an AQCR is better than

Table 3.1-1. National Ambient Air Quality Standards

Pollutant	Standard Value		Standard Type
CO			
8-hour Average [a]	9 ppm	(10 mg/m^3)	Primary and Secondary
1-hour Average [a]	35 ppm	(40 mg/m^3)	Primary
NO_2			
Annual Arithmetic Mean	0.053 ppm	(100 µg/m^3)	Primary and Secondary
O_3			
8-hour Average [b]	0.08 ppm	(157 µg/m^3)	Primary and Secondary
1-hour Average [c]	0.12 ppm	(240 µg/m^3)	Primary and Secondary
Pb			
Quarterly Average		1.5 µg/m^3	Primary and Secondary
PM_{10}			
Annual Arithmetic Mean [d]		50 µg/m^3	Primary and Secondary
24-hour Average [a]		150 µg/m^3	Primary and Secondary
$PM_{2.5}$			
Annual Arithmetic Mean [e]		15 µg/m^3	Primary and Secondary
24-hour Average [f]		35 µg/m^3	Primary and Secondary
SO_2			
Annual Arithmetic Mean	0.03 ppm	(80 µg/m^3)	Primary
24-hour Average [a]	0.14 ppm	(365 µg/m^3)	Primary
3-hour Average [a]	0.5 ppm	(1,300 µg/m^3)	Secondary

Source: USEPA 2007a

Notes: Parenthetical values are approximate equivalent concentrations.

[a] Not to be exceeded more than once per year.

[b] To attain this standard, the 3-year average of the fourth-highest daily maximum 8-hour average ozone concentrations measured at each monitor within an area over each year must not exceed 0.08 ppm.

[c] The standard is attained when the expected number of days per calendar year with maximum hourly average concentrations above 0.12 ppm is ≤ 1. As of June 15, 2005, USEPA revoked the 1-hour ozone standard in all areas except the 14 8-hour ozone nonattainment Early Action Compact Areas.

[d] To attain this standard, the expected annual arithmetic mean PM_{10} concentration at each monitor within an area must not exceed 50 µg/m^3.

[e] To attain this standard, the 3-year average of the annual arithmetic mean $PM_{2.5}$ concentrations from single or multiple community-oriented monitors must not exceed 15.0 µg/m^3.

[f] To attain this standard, the 3-year average of the 98th percentile of 24-hour concentrations at each population-oriented monitor within an area must not exceed 35 µg/m^3.

the NAAQS, nonattainment indicates that criteria pollutant levels exceed NAAQS, maintenance indicates that an area was previously designated nonattainment but is now in attainment, and unclassified means that there is not enough information to appropriately classify an AQCR, so the area is considered in attainment.

Many chemical compounds found in the Earth's atmosphere act as "greenhouse gases." These gases allow sunlight to enter the atmosphere freely. When sunlight strikes the Earth's surface, some of it is reflected back towards space as infrared radiation (heat). Greenhouse gases absorb this infrared radiation and trap the heat in the atmosphere. Over time the trapped heat results in the phenomenon of global warming.

In April 2007, the U.S. Supreme Court declared that carbon dioxide (CO_2) and other greenhouse gases are air pollutants under the CAA. The Court declared that the USEPA has the authority to regulate emissions from new cars and trucks under the landmark environment law.

Many gases exhibit these "greenhouse" properties. The sources of the majority of greenhouse gases come mostly from natural sources but are also contributed to by human activity. Additional information on sources of greenhouse gases is included in **Appendix E**.

3.1.2 Affected Environment

Route A

The Proposed Action is within Maverick and Val Verde counties, Texas, within the Metropolitan San Antonio Intrastate Air Quality Control Region (MSAI AQCR). The MSAI AQCR is composed of 21 counties in western Texas. Although portions of the MSAI AQCR are classified as being in nonattainment for 8-hour ozone, Maverick and Val Verde counties are classified as being in attainment/unclassified for all criteria pollutants.

Route B

Route B would also be within the MSAI AQCR. Therefore, the affected environment for air quality associated with Route B is the same as described for Route A.

3.1.3 Environmental Consequences

3.1.3.1 Alternative 1: No Action Alternative

Under the No Action Alternative, CBP would not construct or maintain new tactical infrastructure along two sections in the USBP Del Rio Sector and operational activities would remain unchanged. Therefore, the No Action

Alternative would not create any additional effects on air quality beyond those that are already occurring, as described in **Section 3.1.2**.

3.1.3.2 Alternative 2: Proposed Action Alternative

Route A

Regulated pollutant emissions associated with Alternative 2, Route A would not contribute to or affect local or regional NAAQS attainment status. Alternative 2, Route A activities would generate air pollutant emissions from the proposed construction, maintenance activities, and the operation of generators to supply power to construction equipment and portable lights. BMPs would include a Dust Control Plan to minimize fugitive dust emissions.

Proposed Construction Projects. Minor short-term adverse effects would be expected from construction emissions and land disturbance associated with Alternative 2, Route A. The proposed project would affect air quality primarily from site-disturbing activities and operation of construction equipment. The proposed construction would generate total suspended particulate and PM_{10} emissions as fugitive dust from ground-disturbing activities (e.g., grading, trenching, soil piles) and from combustion of fuels in construction equipment. Fugitive dust emissions would be greatest during the initial site preparation activities and would vary from day to day depending on the construction phase, level of activity, and prevailing weather conditions. The quantity of uncontrolled fugitive dust emissions from a construction site is proportional to the area of land being worked and the level of construction activity.

Construction operations would also result in emissions of criteria pollutants as combustion products from construction equipment. These emissions would be of a temporary nature. The NAAQS emissions factors and estimates were generated based on guidance provided in USEPA AP-42, Volume II, *Mobile Sources*. Fugitive dust emissions for various construction activities were calculated using emissions factors and assumptions published in USEPA's AP-42 Section 11.9. The emissions for CO_2 were calculated using emissions coefficients reported by the Energy Information Administration (EIA 2007).

For purposes of this analysis, the project duration and proposed project corridor that would be disturbed (presented in **Section 2**) were used to estimate fugitive dust and all other pollutant emissions. The construction emissions presented in **Table 3.1-2** include the estimated annual construction PM_{10} emissions associated with Route A. These emissions would produce slightly elevated short-term PM_{10} ambient air concentrations. However, the effects would be temporary, and would fall off rapidly with distance from the proposed construction sites. As seen in **Table 3.1-2**, the emissions of NAAQS are not significant and would not contribute to the deterioration of the air quality in the region. In addition, the effect of this alternative on air quality would not exceed 10 percent of the regional values.

Table 3.1-2. Estimates of Total Proposed Construction Emissions from Alternative 2 in Tons Per Year

Description	NO_x	VOC	CO	CO_2	SO_x	PM_{10}
Construction Emissions	0.518	0.077	0.605	11.711	0.001	0.0171
Construction Fugitive Emissions	0.000	0.000	0.000	0.000	0.000	17.73
Maintenance Emissions	0.042	0.005	0.021	0.20	0.010	0.005
Generator Emissions	8.02	0.655	1.728	274	0.053	0.564
Total Alternative 2 Emissions	**8.58**	**0.74**	**2.35**	**285.9**	**0.055**	**18.32**
Federal *de minimis* Threshold	NA	NA	NA	NA	NA	NA
MSAI AQCR Regional Emissions	111,196	112,137	671,869	1,395,000	50,220	192,504
Project Percent of MSAI AQCR Regional Emissions	**0.008**	**0.001**	**>0.001**	**0.021**	**>0.001**	**0.010**

Source: USEPA 2007b

The construction emissions presented in **Table 3.1-2** include the estimated annual emissions from construction equipment exhaust and operation of agricultural mowers and diesel-powered generators associated with Alternative 2 in Calendar Year (CY) 2008. Early phases of construction projects typically involve heavier diesel equipment and earthmoving, resulting in higher NO_x and PM_{10} emissions. Later phases of construction projects typically involve more light gasoline equipment and surface coating, resulting in more CO and volatile organic compound (VOC) emissions. However, the effects would be temporary, fall off rapidly with distance from the proposed construction sites, and would not result in any long-term effects.

Proposed Operations and Maintenance Activities. The proposed tactical infrastructure would require mowing approximately two times per year to maintain vegetation height and allow enhanced visibility and security. It was assumed that two 40-horsepower (hp) agricultural mowers would mow the vegetation in the proposed project corridor approximately 14 days per year. No adverse effects on local or regional air quality would be expected from these maintenance activities. It is anticipated that future maintenance of tactical infrastructure would be conducted by contractors, and would primarily consist of welding and fence section replacements, as needed. Maintenance activities would result in criteria pollutant air emissions well below the *de minimis* thresholds and would have a negligible contribution to the overall air quality. Negligible long-term adverse impacts on air quality would be expected.

After construction is completed, USBP Del Rio Sector would begin patrols along Sections M-1 and M-2A. The vehicles used for surveillance of the existing border area are currently generating criteria pollutants and would not introduce new pollutant sources. Therefore, no net increase of criteria pollutant emissions would be expected from these border-patrol operations.

Generators. Alternative 2, Route A activities would require six diesel-powered generators to power construction equipment. It is assumed that these generators would be approximately 75 hp and operate approximately 8 hours per day for 120 working days. The emissions factors and estimates shown in **Appendix E** were generated based on guidance provided in USEPA AP-42, Volume I, *Stationary Internal Combustion Sources*. According to Texas Administrative Code (TAC) Title 30, internal combustion engines greater than 500 brake horsepower require an operating permit (TAC 2007). Therefore, an operating permit from the Texas Commission on Environmental Quality (TCEQ) would not be needed to operate the generators.

Greenhouse Gases. USEPA has estimated that the total greenhouse emissions for Texas were 189 million metric tons of carbon equivalent (MMTCE) in 1999. Of this, an estimated 1,395,000 tons of CO_2 were associated with the MSAI AQCR regions. Therefore, proposed estimates of construction emissions of CO_2 would represent less than 10 percent of the regional emissions, as shown in **Table 3.1-2** (USEPA 2007c).

Current USBP operational activities would continue during and after construction. Vehicles that would patrol Sections M-1 and M-2A are currently in use and generate CO_2; therefore, no net increase of CO_2 emissions would be expected from Alternative 2. Therefore, no net increase of greenhouse emissions would be expected. Emissions factors, calculations, and estimates of emissions are shown in detail in **Appendix E**.

Summary. **Table 3.1-2** illustrates that the emissions from Alternative 2, Route A would be minor adverse and much less than 10 percent of the emissions inventory for MSAI AQCR (USEPA 2007b). Therefore, no adverse effects on regional or local air quality would be expected from implementation of Alternative 2, Route A. A conformity determination in accordance with 40 CFR 93-153(1) is not required, as the total of direct and indirect emissions from Alternative 2 would not be regionally significant (e.g., the emissions are not greater than 10 percent of the MSAI AQCR emissions inventory). Emissions factors, calculations, and estimates of emissions for Alternative 2 are shown in detail in **Appendix E**.

Route B

The air quality effects associated with Alternative 2, Route B would be expected to be the same as those for Route A. This is because the overall length of the proposed project corridors and construction emissions for Route A and Route B would be similar. Therefore, the analysis presented for Route A is applicable to Route B. **Table 3.1-2** illustrates that the emissions from proposed construction and maintenance of tactical infrastructure associated with Alternative 2, Route B would be minor, adverse and less than 10 percent of the MSAI AQCR inventory (USEPA 2007b).

3.1.3.3 Alternative 3: Secure Fence Act Alignment Alternative

Alternative 3 would generate air pollutant emissions from the proposed construction projects, maintenance activities (including mowing), and the operation of generators to supply power to construction equipment and portable lights. Minor short-term adverse effects would be expected from construction site-disturbing activities and operation of construction equipment. For purposes of this analysis, the project duration and proposed project corridor that would be disturbed (presented in **Table 2-2**) was used to estimate fugitive dust and all other criteria pollutant emissions. The construction emissions presented in **Table 3.1-3** include the estimated annual construction PM_{10} emissions associated with Alternative 3. These emissions would produce slightly elevated short-term PM_{10} ambient air concentrations. However, the effects would be temporary and would fall off rapidly with distance from the proposed construction sites. Emissions factors, calculations, and estimates of emissions are shown in detail in **Appendix E**.

Summary. Since the MSAI AQCR is within an area classified as being in attainment for all NAAQS criteria pollutants, General Conformity Rule requirements are not applicable to Alternative 3. **Table 3.1-3** illustrates that the emissions from Alternative 3 would be higher than Alternative 2, but much less than 10 percent of the MSAI AQCR inventory (USEPA 2007b).

3.2 NOISE

3.2.1 Definition of the Resource

Noise and sound share the same physical properties, but noise is considered a disturbance while sound is defined as an auditory effect. Sound is defined as a particular auditory effect produced by a given source, for example the sound resulting from rain hitting a metal roof. Noise is defined as any sound that is undesirable because it interferes with communication, is intense enough to damage hearing, or is otherwise annoying. Sound or noise (depending on one's perception) can be intermittent or continuous, steady or impulsive, and can involve any number of sources and frequencies. It can be readily identifiable or

Table 3.1-3. Estimates of Total Proposed Construction Emissions from Alternative 3 in Tons Per Year

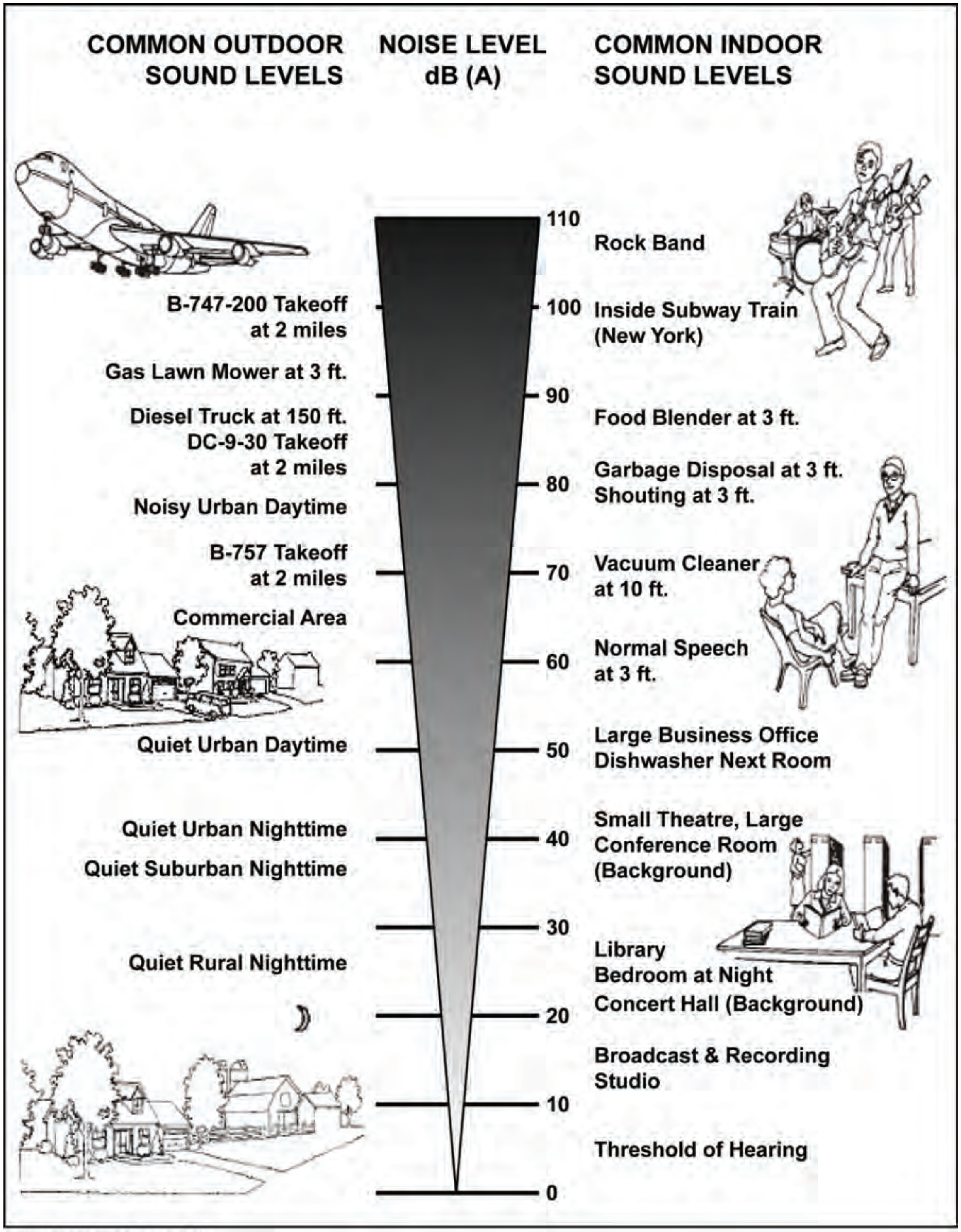
Description	NO_x	VOC	CO	CO_2	SO_x	PM_{10}
Construction Emissions	2.588	0.386	3.02	23.4	0.05	0.876
Construction Fugitive Emissions	0.000	0.000	0.000	0.000	0.000	44.33
Maintenance Emissions	0.127	0.015	0.064	0.20	0.030	0.015
Generator Emissions	10.69	0.87	2.30	366.5	0.703	0.752
Total Alternative 3 Emissions	**13.41**	**1.27**	**5.39**	**390.1**	**0.785**	**45.18**
Federal *de minimis* Threshold	NA	NA	NA	NA	NA	NA
MSAI AQCR Regional Emissions	111,196	112,137	671,869	1,395,000	50,220	192,504
Percent of MSAI AQCR Regional Emissions	0.012	0.001	>0.001	0.028	0.002	0.023

Source: USEPA 2007b

generally nondescript. Human response to increased sound levels varies according to the source type, characteristics of the sound source, distance between source and receptor, receptor sensitivity, and time of day. How an individual responds to the sound source will determine if the sound is viewed as music to one's ears or an annoying noise. Affected receptors are specific (e.g., schools, churches, or hospitals) or broad (e.g., nature preserves or designated districts) in which occasional or persistent sensitivity to noise above ambient levels exists.

Sound is measured with instruments that record instantaneous sound levels in decibels (dB). A-weighted decibels (dBA) are sound level measurements used to characterize sound levels that can be sensed by the human ear. "A-weighted" denotes the adjustment of the frequency content of a sound-producing event to represent the way in which the average human ear responds to the audible event. Construction and vehicle noise levels are analyzed using dBA.

Noise levels in residential areas vary depending on the housing density, location, and surrounding use. As shown in **Figure 3.2-1**, a quiet urban area in the daytime is about 50 dBA, a commercial area is about 65 dBA, and a noisy urban area is about 80 dBA.



Source: Landrum & Brown 2002

Figure 3.2-1. Common Noise Levels

Construction activities can cause an increase in sound that is well above the ambient level. A variety of sounds come from graders, pavers, trucks, welders, and other work processes. **Table 3.2-1** lists noise levels associated with common types of construction equipment that are likely to be used under the Proposed Action. Construction equipment usually exceeds the ambient sound levels by 20 to 25 dBA in an urban environment and up to 30 to 35 dBA in a quiet suburban area.

Table 3.2-1. Noise Levels for Construction Equipment

Construction Category and Equipment	Predicted Noise Level at 50 feet (dBA)
Bulldozer	80
Grader	80-93
Truck	83-94
Roller	73-75
Backhoe	72-93
Jackhammer	81-98
Concrete mixer	74-88
Welding generator	71-82
Pile driver	91-105
Crane	75-87
Paver	86-88

Source: USEPA 1971

3.2.2 Affected Environment

Route A

The two proposed sections of tactical infrastructure would be in areas with different acoustical environments. Del Rio, Texas, directly abuts the U.S./Mexico international border, and sits across the Rio Grande from Ciudad Acuña, Mexico. The ambient acoustical environment near Del Rio is primarily affected by vehicle traffic, agricultural equipment, aircraft operations, and industrial noise sources. Noise levels for the majority of Del Rio are likely to be equivalent to a quiet rural or suburban area (30 to 50 dBA). The dominant noise sources adjacent to the border likely originate from residential or commercial sources.

Major transportation routes in the vicinity of Del Rio include State Route (SR) 277, SR 90, and County Road 239. SR 277 passes through the northern side of Del Rio, running southeast to northwest and abuts several residential communities as it passes through the city. SR 90 runs north to south through central Del Rio and continues east from the city. SR 90 runs through many residential communities both to the north and east of Del Rio. County Road 239 runs northeast to southwest from central Del Rio to the U.S./Mexico international border, and passes by several residential areas on the southwestern side of the city. County Road 239 handles a heavy volume of traffic that crosses the border in both directions. Additionally, there are several trucking companies along County Road 239, Garza Lane, and Rio Grande Road. Traffic from these businesses contributes to the ambient acoustic environment along the proposed project corridor in Section M-1.

Industrial and commercial facilities in the vicinity of Del Rio are present mainly on the western side of the city with some on the northern side. However, there are several commercial and industrial businesses along Garza Lane in the southwestern section of Del Rio as well. Noise from these facilities contributes to the ambient acoustic environment along the proposed project corridor in Section M-1.

Del Rio International Airport is approximately 1.5 miles northwest of downtown Del Rio. There are an average of 48 aircraft operations at Del Rio International Airport each day (AirNav 2007). Consequently, noise from aircraft operations contributes slightly to the ambient acoustic environment in the vicinity of Del Rio, especially in close proximity to the airport.

Along the U.S./Mexico international border in areas south of Del Rio, agricultural activities are prominent. Noise from agricultural equipment can reach up to 100 dBA for the operator (OSU 2007). Irrigation activities occurring at these farm sites would also contribute to the ambient acoustical environment at times when they are in operation. While farms are generally spread out, noise from agricultural activities is likely to extend past the farm boundaries. Noise generated by small farms near the proposed project corridor would have an effect on the acoustic environment of Section M-1.

Eagle Pass, Texas, directly abuts the U.S./Mexico international border, and sits across the Rio Grande from Piedras Negras, Mexico. The ambient acoustical environment near Eagle Pass is primarily affected by vehicular traffic and industrial noise sources. Noise levels in Eagle Pass are likely to be equivalent to a quiet suburban or urban area (40 to 65 dBA). Noise sources directly adjacent to the border likely originate from residential sources.

Major transportation routes in the vicinity of Eagle Pass include SR 57, SR 277, and Ranch Road 1021. SR 57 runs east to west through central Eagle Pass, and connects Eagle Pass to Pedras Negras. Cross-border traffic on SR 57 would contribute heavily to the ambient acoustical environment in the vicinity of the border station. SR 277 traverses north-south in Eagle Pass and then continues east from the city. Ranch Road 1021 runs northwest to southeast, passing through the town of Las Quintas Fronterizas, Texas. Each of these major transportation routes passes by several residential areas in the vicinity of Eagle Pass. Traffic along these roads contributes to the ambient acoustical environment. USBP currently uses patrol roads along the border and, therefore, USBP activities contribute to the acoustic environment along the border.

Industrial activities in Eagle Pass are concentrated mainly on the northeastern side of the city. There are several commercial operations in southwestern Eagle Pass. Noise from industrial activities and commercial operations, as well as traffic entering and leaving the facilities, contributes to the ambient acoustic environment of Section M-2A.

Route B

Alternative 2, Route B would be within the same ambient acoustic environment as described for Route A. Therefore, the affected environment associated with Route B is the same as described for Route A.

3.2.3 Environmental Consequences

3.2.3.1 Alternative 1: No Action Alternative

Under the No Action Alternative, there would be no change to the current noise environment; no effects would occur under the No Action Alternative.

3.2.3.2 Alternative 2: Proposed Action Alternative

Route A

Short-term moderate adverse effects would be expected. Temporary sources of noise would include operation of construction equipment and vehicles. Noise from construction activities and vehicle traffic can affect wildlife as well as humans. Noise effects on wildlife, particularly birds and mid- to large-sized mammals, are described in **Section 3.9**.

Construction of the proposed tactical infrastructure would result in noise effects on populations in the vicinity of the proposed sites. Proposed construction would result in increased noise levels associated with construction equipment used for grading, building, and possible pile-driving activities. Populations that could be affected by construction noise include adjacent residents; people visiting the adjacent recreation areas; or patrons and employees in nearby office, retail, or commercial buildings.

Noise from construction activities varies depending on the type of construction equipment being used, the area that the project would occur in, and the distance from the source. To predict how these activities would affect adjacent populations, noise from the proposed construction was estimated. For example, as shown on **Table 3.2-1**, construction usually involves several pieces of equipment (e.g., a backhoe and haul truck) that can be used simultaneously. Under Alternative 2, Route A, cumulative noise from construction equipment used during the busiest day was estimated to determine the total effect of noise from building activities at a given distance. Since noise attenuates over distance, a gradual decrease in noise level occurs the further a receptor is away from the source of noise. The closest residence in Del Rio and Eagle Pass would be approximately 100 feet from Section M-1. At this distance, anticipated noise from construction during daytime hours would be approximately 79 dBA. Possible pile-driving noise from the construction of the proposed tactical infrastructure could reach 95 dBA for residents 100 feet from the construction.

Implementation of Alternative 2, Route A would have temporary adverse effects on the acoustic environment from the use of heavy equipment during construction activities. However, noise generation would last only for the duration of construction activities and would be isolated to normal working hours (i.e., between 7:00 a.m. and 5:00 p.m.).

Increased noise levels from construction activities would affect residents as well as populations using recreational facilities. In general, users of recreational areas anticipate a quiet environment. Noise from construction would affect the ambient acoustical environment around these sites but would be temporary.

Noise effects from increased construction traffic would be temporary in nature. These effects would be confined to normal working hours (i.e., between 7:00 a.m. and 5:00 p.m.) and would last only as long as the construction activities were ongoing. Most of the major roadways in the vicinity pass by residential areas. Therefore, short-term minor adverse noise effects would result from an increase in traffic, most notably in the areas around SRs 277, 90, and 57.

Long-term, negligible, adverse effects on the acoustical environment would result from vehicle traffic patrols. Patrols would consist of a single vehicle driving along Sections M-1 and M-2A on the U.S. side. While adjustments to USBP operations due to tactical infrastructure construction would be anticipated to be negligible, shifts in operation pattern, location, or frequency would affect the noise environment in the vicinity of the tactical infrastructure.

Route B

Noise effects associated with Alternative 2, Route B would be expected to be the same as those described for Alternative 2, Route A. The overall length of the proposed construction corridor and duration of construction activities for Route A and Route B would be similar.

3.2.3.3 Alternative 3: Secure Fence Act Alignment Alternative

Short-term moderate adverse effects would be expected. Under Alternative 3, primary and secondary fences would be constructed 130 feet apart on the same route as Alternative 2, Route B. Noise effects from Alternative 3 would be similar to those discussed under Alternative 2. However, residents would be closer to the secondary fence; therefore, noise effects from construction equipment would be slightly higher than under Alternative 2.

3.3 LAND USE

3.3.1 Definition of the Resource

The term land use refers to real property classifications that indicate either natural conditions or the types of human activity occurring on a parcel. In many cases, land use descriptions are codified in local zoning laws. There is, however, no nationally recognized convention or uniform terminology for describing land use categories. As a result, the meanings of various land use descriptions, labels, and definitions vary among jurisdictions.

Two main objectives of land use planning are to ensure orderly growth and compatible uses among adjacent property parcels or areas. Compatibility among land uses fosters the societal interest of obtaining the highest and best uses of real property. Tools supporting land use planning include written master plans/management plans and zoning regulations. In appropriate cases, the location and extent of a proposed action needs to be evaluated for its potential effects on the proposed project corridor and adjacent land uses. The foremost factor affecting a proposed action in terms of land use is its compliance with any applicable land use or zoning regulations. Other relevant factors include matters such as existing land use in the proposed project corridor, the types of land uses on adjacent properties and their proximity to a proposed action, the duration of a proposed activity, and its permanence.

3.3.2 Affected Environment

The existing land use in the vicinity of the proposed project corridor includes well-developed urban centers of commerce (i.e., Del Rio and Eagle Pass), and open natural land. For the purposes of this EA, a land use analysis was conducted using the National Land Cover Dataset. The National Land Cover Dataset is the first land cover mapping project with a national scope. Land cover and land use are closely related in that land uses commonly have similarly associated cover types, such as agricultural and residential. The National Land Cover Dataset provides 21 different land cover classes for the lower 48 states. The 21 land cover classes were generalized into the following 4 land classification categories: agricultural, developed, undeveloped, and water. The definitions of each category are defined below.

- *Agricultural* – Areas characterized by herbaceous vegetation that have been planted or are intensively managed for the production of food, feed, or fiber; or are maintained in developed settings for specific purposes. Specific land cover classes grouped for the Agricultural classification include pasture/hay; row crops; small grains; fallow areas used for the production of crops that are temporarily barren or with sparse vegetative cover; and urban/recreational grasses consisting of vegetation planted in developed settings for recreation, erosion control, or aesthetic purposes.

- *Developed* – Areas characterized by a high percentage (30 percent or greater) of constructed materials such as asphalt, concrete, and buildings. These include low- and high-intensity residential uses (e.g., single-family housing units and apartment complexes/row houses, respectively), and commercial/industrial/transportation infrastructure, which consists of all highly developed areas not classified as high-intensity residential and transportation infrastructure such as roads and railroad.
- *Water* – This land classification consists of all areas of open water (typically 25 percent or greater cover of water), including naturally occurring and man-made lakes, reservoirs, gulfs, bays, rivers, and streams; and perennial ice/snow, although no ice or snow was detected within the area analyzed for this EA.
- *Undeveloped* – This land classification consists of the remaining 11 land cover classes not used for the agricultural, developed, and water land use classifications. These land cover classes include barren (bare rock/sand/clay, quarries/strip mines/gravel pits, and transitional), forested upland (deciduous forest, evergreen forest, and mixed forest), shrubland, nonnatural woody (orchards/vineyards/other), herbaceous upland (grasslands/herbaceous), and wetlands (woody wetlands and emergent herbaceous wetlands).

Route A

The following is a brief description of the land classifications and associated land uses within and adjacent to the proposed project corridor of Alternative 2, Route A. The proposed project corridor traverses 17 land parcels in Section M-1 and 3 private and public land parcels in Section M-2A and is classified by approximately 0.3 percent agricultural, 34 percent developed land, 3.7 percent water, and 62 percent undeveloped land (see **Table 3.3-1**).

- *Agricultural* – Approximately 0.3 percent of Section M-1 and M-2A consists of agricultural land.
- *Developed* – Approximately 34.1 percent of Section M-1 and M-2A consists of developed lands. A majority of the developed land within Section M-1 is immediately north of Garza Lane, Rio Grande Road, and Qualia Drive, and consists of private residences, commercial entities, and other structures such as the Silver Lake Wastewater Treatment Plant.
- *Water* – There is no water within the proposed project corridor of Section M-1, however there are approximately 2 acres of water within Section M-2A, representing approximately 3.7 percent of the proposed project corridor.

Table 3.3-1. Land Classifications Within the Proposed Project Corridor of Route A

Proposed Tactical Infrastructure Section Number	Land Classification (acres)				Total Acres	Total Percent
	Agricultural	Developed	Water	Undeveloped		
M-1	0.2	20.5	-	34.7	**55.3**	**90.1%**
M-2A	-	0.5	2.2	3.3	**6.1**	**9.9%**
Total Acres	**0.2**	**21.0**	**2.2**	**38.0**	**61.4**	
Total Percent	**0.3%**	**34.1%**	**3.7%**	**61.9%**		

- *Undeveloped* – The majority (61.9 percent) of the proposed project corridor consists of undeveloped land. The undeveloped land is privately and publicly owned.

Appendix D presents detailed maps of the areas surrounding the proposed tactical infrastructure. **Section 3.12** describes the aesthetics and visual resources of the project area.

Route B

The proposed project corridor of Alternative 2, Route B would traverse the same parcels and land uses as described for Route A. Therefore, the affected environment associated with Route B is the same as described for Route A; however the amount (acreage) of land affected would be different. Similar to the analysis prepared for Route A, a land use analysis of Route B was prepared using the National Land Cover Dataset. The proposed project corridor of Route B is classified by approximately 43 percent developed land, 53 percent undeveloped land, and 4 percent water (see **Table 3.3-2**).

Table 3.3-2. Land Classifications Within the Proposed Project Corridor of Route B

Proposed Tactical Infrastructure Section Number	Land Classification (acres)				Total Acres	Total Percent
	Agricultural	Developed	Water	Undeveloped		
M-1	-	20.2	-	23.2	**43.3**	**89.0%**
M-2A	-	0.9	2.1	2.4	**5.4**	**11.0%**
Total Acres	**0.0**	**21.0**	**2.1**	**25.5**	**48.7**	
Total Percent	**0%**	**43.2%**	**4.3%**	**52.5%**		

3.3.3 Environmental Consequences

3.3.3.1 Alternative 1: No Action Alternative

The No Action Alternative would result in continuation of the existing land uses and their associated impacts, as described in **Section 3.3.2**. No additional effects on land use would be expected as a result of the Proposed Action not being implemented.

3.3.3.2 Alternative 2: Proposed Action Alternative

Route A

Constructing the proposed tactical infrastructure would result in long-term minor to major adverse effects on land use based on private structures that would remain south of the proposed tactical infrastructure. CBP might be required to obtain a permit or zoning variance based on local restrictions and ordinances. Short-term minor adverse effects would occur from construction. Effects on land use would vary depending on potential changes in land use and the land use of adjacent properties.

Construction of the proposed tactical infrastructure would require the government to acquire various interests in land. Section M-1 would traverse 17 private and public land parcels in Del Rio, Texas, and Section M-2A would traverse 3 private and public land parcels in Eagle Pass, Texas (see **Appendix D**). Property owners and residents could be directly, adversely affected by restricted access, visual effects (see **Section 3.12.3**), noise effects during construction (see **Section 3.2.3**), and other disruptions during construction. Under current law, the Secretary of Homeland Security has the authority to contract for or buy an interest in land that is adjacent to or in the vicinity of the U.S./Mexico international border when the Secretary deems the land essential to control and guard the boundaries and borders of the United States (8 U.S.C. 1103(b)).

Because the proposed tactical infrastructure would traverse both public and private lands, various methods could be used to acquire the necessary interests in land. These methods include, among other things, acquiring permanent easements, rights-of-way (ROWs), or outright purchase in fee simple. There would be long-term major adverse effects on property owners who do not wish to sell their property or relocate, but the effects would be mitigated by compensating fair market value for the property.

On private land, the government would likely purchase the land or some interest in land from the relevant landowner. Acquisition from private landowners would be a negotiable process that would be carried out between the government and the landowner on a case-by-case basis. The government also has the statutory authority to acquire such interests through eminent domain.

Under Alternative 2, Route A, Section M-1, some land uses on private parcels, including private residences and other structures, would be located south of the proposed tactical infrastructure, resulting in a major adverse impact on land use. Additionally, agricultural lands within the proposed Section M-1 corridor might not be available for future crop production or grazing. Gates could be installed in the primary pedestrian fence to provide landowners whose properties would be affected access to other portions of their property to reduce potential inconvenience. Private and public developed and undeveloped lands within the proposed project corridor would not be available for future development.

Route B

Alternative 2, Route B would have similar effects as those described for Route A, with the exception of the private residences and structures south of the proposed tactical infrastructure in Section M-1. These private residences and structures would be north of the proposed tactical infrastructure under Route B. Therefore, impacts would be minor under Route B. Additionally, no land designated as agricultural would be affected under Route B. The figures in **Appendix D** show the locations of the proposed tactical infrastructure and the proximity of adjacent and intersecting land.

3.3.3.3 Alternative 3: Secure Fence Act Alignment Alternative

Alternative 3 would have similar effects as Alternative 2, Route B; however the proposed project corridor would affect more land and a greater percentage of this land would be undeveloped. The figures in **Appendix D** show the location of the proposed tactical infrastructure and the proximity of adjacent and intersecting land.

3.4 GEOLOGY AND SOILS

3.4.1 Definition of the Resource

Geology and soils resources include the surface and subsurface materials of the earth. Within a given physiographic province, these resources typically are described in terms of topography, soils, geology, minerals, and paleontology, where applicable.

Topography is defined as the relative positions and elevations of the natural or human-made features of an area that describe the configuration of its surface. Regional topography is influenced by many factors, including human activity, seismic activity of the underlying geological material, climatic conditions, and erosion. Information describing topography typically encompasses surface elevations, slope, and physiographic features (i.e., mountains, ravines, or depressions).

Site-specific geological resources typically consist of surface and subsurface materials and their inherent properties. Principal factors influencing the ability of geological resources to support structural development are seismic properties (i.e., potential for subsurface shifting, faulting, or crustal disturbance), topography, and soil stability. Soils are the unconsolidated materials overlying bedrock or other parent material. They develop from weathering processes on mineral and organic materials and are typically described in terms of their landscape position, slope, and physical and chemical characteristics. Soil types differ in structure, elasticity, strength, shrink-swell potential, drainage characteristics, and erosion potential, which can affect their ability to support certain applications or uses. In appropriate cases, soil properties must be examined for compatibility with particular construction activities or types of land use.

Prime and unique farmland is protected under the Farmland Protection Policy Act (FPPA) of 1981. The implementing procedures of the FPPA and Natural Resources Conservation Service (NRCS) require Federal agencies to evaluate the adverse effects (direct and indirect) of their activities on prime and unique farmland, as well as farmland of statewide and local importance, and to consider alternative actions that could avoid adverse effects.

3.4.2 Affected Environment

Route A

Physiography and Topography. Section M-1 in Del Rio, Texas, is on Edwards Plateau. The Edwards Plateau is known for the extent and quality of its groundwater aquifer system. Landforms around Del Rio include rolling hills. Most of the landscape features in the area have been the result of erosion caused by the Rio Grande and its tributaries (USACE 1994).

Section M-2A in Eagle Pass, Texas, is on the Balcones Escarpment of the Blackland Prairies which is the innermost section of the Gulf Coastal Plains. The blacklands have a gentle undulating surface where the majority of natural vegetation has been cleared for crops (University of Texas 2006).

Geology. The proposed project corridor for Alternative 2, Route A lies on recent floodplain deposits adjacent to the Rio Grande. The soils are composed of sediments that include unconsolidated mixed gravel, sand, silt, and clay. The predominant rock types are mixed shales and sandstones. Some areas include bedrock along the channels of the Rio Grande. The landforms reflect the different rock types with the sandstones forming gentle hills and the shales forming valleys. The soils along the Del Rio Sector are subject to periodic flooding (NRCS 1982).

Section M-1 is underlain by hard limestone that is resistant to erosion. Val Verde County's surface geology is dominated by sedimentary rock derived from deposits of three geologic periods (NRCS 1982). Section M-2A is underlain by the Navarro and Taylor Groups of the Quaternary Period including undivided Quaternary materials.

Soils. Section M-1 would cross over four soil units. Three soil units (Lagloria loam, Rio Grande silt loam, and Rio Grande soils) are derived from Rio Grande alluvium and are nearly level to sloping soils on floodplains and low terraces. The other soil unit (Pits) includes areas that have been excavated for mining of caliche, gravel, and limestone (NRCS 1982). The pits are a few feet to about 25 feet deep. They range from less than an acre to 20 acres in size.

The proposed location for Route A lies on the boundary of Lagloria and Rio Grande soils for the majority of its length, while the proposed location for Route B lies primarily in Rio Grande soils and crosses over two excavation pits (see **Appendix F**).

Rio Grande soils (Ro) are deep, nearly level to gently sloping soils found on the bottom lands of the Rio Grande that are frequently flooded. Along the Del Rio Sector below Amistad Reservoir, these soils are flooded every 4 to 20 years when the floodgates are opened. Slopes range from 0 to 3 percent with an average of 1 percent. Mapped areas are long and parallel the Rio Grande. The surface layer is composed of silt loam, very fine sandy loam, loam, and very fine sand with no regular pattern. The surface layer is light brownish gray, very fine sandy loam about 8 inches thick. The underlying layer is light brownish gray. The Rio Grande soils are well-drained with slow surface runoff and are susceptible to erosion. Rio Grande soils are considered hydric soils. Hydric soils are defined as soils that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper layer (NRCS 1982).

Lagloria loam (LaB) is a deep, nearly level to gently sloping soil found on the low terraces of the Rio Grande. Slopes average 0.3 percent. The surface layer is brown loam and the subsoil is light yellowish brown loam. The soil is moderately alkaline and calcareous throughout. The soil is well-drained and surface runoff is medium. This soil is susceptible to erosion (NRCS 1982).

The Rio Grande silt loam (Rg) is a deep, nearly level to gently sloping soil found on the bottom lands of the Rio Grande. The soil below the Amistad Reservoir is occasionally flooded when the floodgates are opened. However, the dam protects these soils from the majority of flood events. Slopes range from 0 to 3 percent. The surface layer is pale brown silt loam and the subsoil is light brownish gray loam. The soil is well-drained with slow surface runoff (NRCS 1982).

The Rio Grande silt loam is the only soil map unit listed as prime farmland. Prime farmland has the combination of soil properties, growing season, and moisture supply needed to produce sustained high yields of crops in an economic manner if it is treated and managed according to acceptable farming methods (NRCS 2007). Although the soil type indicates it could be prime farmland, area mapped as prime farmland soils is mostly located under the Del Rio POE. Therefore, no part of the proposed project corridor for Section M-1 is considered prime farmland.

The proposed routes for Section M-2A would cross over four soil map units according to the Web Soil Survey. They are Copita sandy clay loam, Lagloria very fine sandy loam (0 to 1 percent slope), Lagloria very fine sandy loam (1 to 3 percent slope), and Rio Grande and Zalla soils, frequently flooded (NRCS 2007).

Rio Grande and Zalla soils (Rz) are found on the Rio Grande terrace adjacent to the river. These soils are flooded when sufficient water is released from Amistad Reservoir. Slopes range from 0 to 1 percent. The surface layer is 10 inches thick and is a very fine sandy loam while the subsoil (10 to 80 inches thick) is a stratified silt loam. The soil is well-drained to somewhat excessively drained (NRCS 2007).

The Copita sandy clay loam (CoB) forms linear bands in interfluves. The slope ranges from 1 to 3 percent. The surface soil layer and subsoil layer are both sandy clay loams. Between 20 and 40 inches, the soil reaches a restrictive paralithic bedrock layer. The soil is well-drained (NRCS 2007).

The Lagloria very fine sandy loam, 0 to 1 percent slope (LgA), forms linear bands on the upper reaches of the Rio Grande terrace. The slope ranges from 0 to 1percent. The surface soil layer is very fine sandy loam and the subsoil layer is stratified silty clay loam. The Lagloria very fine sandy loam, 1 to 3 percent slope (LgB) has identical soil characteristics as LgA, but is found further from the Rio Grande on slight slopes (NRCS 2007). Both Lagloria very fine sandy loam soil types (LgA and LgB) are considered prime farmland when properly irrigated. However, the project area is not irrigated. Therefore, no part of the proposed project corridor for Section M-2A is considered prime farmland.

Route B

The physiographic, topographic, and geologic resources associated with the proposed project corridor for Alternative 2, Route B are similar to Route A. The soil resources of Route B are largely similar to Route A. An exception is that the Pits (Pt) map unit does not occur on Route B (see **Appendix F**).

3.4.3 Environmental Consequences

3.4.3.1 Alternative 1: No Action Alternative

The No Action Alternative would result in the continuation of existing conditions for geologic resources and soils, as characterized in **Section 3.4.2**. Soil resources would continue to be degraded by cross-border violators who often damage habitat, cut vegetation, and increase erosion through repeated use of footpaths. Soils within the project area are extremely susceptible to erosion due in part to their fine texture and alluvial nature.

3.4.3.2 Alternative 2: Proposed Action

Route A

Physiography and Topography. Short- and long-term minor adverse effects on the natural topography would occur as a result of implementing the Proposed Action. Grading, contouring, and trenching associated with the installation of the proposed tactical infrastructure would affect approximately 55 acres for Section M-1 and approximately 6 acres for Section M-2A, which would alter the existing topography.

Geology. Short- and long-term negligible to minor adverse effects on geologic resources could occur at locations where bedrock is at the surface and grading would be necessary for tactical infrastructure placement or patrol road development. Geologic resources could affect the placement of the primary pedestrian fence or patrol roads due to the occurrence of bedrock at the surface, or as a result of structural instability. Project design and engineering practices would be implemented to mitigate geologic limitations to site development to the extent practicable.

Soils. Short-term minor direct adverse effects on soils would be expected. Soil disturbance and compaction due to grading, contouring, and trenching associated with the installation of the proposed tactical infrastructure would affect approximately 55 acres for Section M-1 and approximately 6 acres for Section M-2A.

The proposed construction activities would be expected to result in an increase in soil erosion due to the fine texture and alluvial nature of the soils. Wind erosion has the potential to affect disturbed soils where vegetation has been removed due to the semi-arid climate of the region. Storm Water Pollution Prevention Plans (SWPPPs) and sediment- and erosion-control plans would be developed to minimize sediment runoff. Construction activities would be expected to directly affect the existing soils as a result of grading, excavating, placement of fill, compaction, and mixing or augmentation necessary to prepare the site for development of the proposed tactical infrastructure.

Because proposed construction would result in a soil disturbance of greater than 5 acres, authorization under the TCEQ Construction Storm Water Permit (Construction General Permit, TXR150000) would be required. Construction activities subject to this permit include clearing, grading, and disturbances to the ground, such as stockpiling or excavation, but do not include regular maintenance activities performed to restore the original line, grade, or capacity of a facility. The Construction General Permit requires the development and implementation of an SWPPP.

The SWPPP should contain site maps which show the construction site perimeter, existing and proposed buildings, lots, roadways, storm water collection and discharge points, general topography both before and after construction, and drainage patterns across the project. The SWPPP must list BMPs the discharger will use to protect storm water runoff along with the locations of those BMPs. Additionally, the SWPPP must contain a visual monitoring program, a chemical monitoring program for nonvisible pollutants to be implemented if there is a failure of BMPs, and a sediment monitoring plan if the site discharges directly to a water body. Part III of the Construction General Permit describes the elements that must be contained in an SWPPP.

Additional soil disturbance could occur during and following construction as a result of periodic patrols. Compaction and erosion of soil would be expected as a result of patrol operations and possible off-road vehicle use that could decrease vegetation cover and soil permeability.

The Rio Grande silt loam for Section M-1 and the Lagloria soil types for Section M-2A are designated as prime farmland. However, no area within the proposed project corridor for either Section M-1 or M-2A would be considered prime farmland.

Route B

Alternative 2, Route B would result in similar environmental effects on physiographic, topographic, geologic, and soils resources as described for Route A. However, approximately 43 acres in Section M-1 and approximately 5 acres in Section M-2A would be affected by grading contouring and trenching.

3.4.3.3 Alternative 3: Secure Fence Act Alignment Alternative

Alternative 3 would result in similar environmental effects on geologic and soil resources as Alternative 2, Route B. However, the magnitude of the effects would be greater due to the additional fence and overall larger (wider) corridor. Approximately 43 acres would be affected within Section M-1 and approximately 14 acres within Section M-2A. BMPs and mitigation measures outlined for the Proposed Action would be implemented for the entire area of effect.

3.5 HYDROLOGY AND GROUNDWATER

3.5.1 Definition of the Resource

Hydrology consists of the redistribution of water through the processes of evapotranspiration, surface runoff, and subsurface flow. Hydrology results primarily from temperature and total precipitation that determine evapotranspiration rates, topography which determines rate and direction of surface flow, and soil properties that determine rate of subsurface flow and recharge to the groundwater reservoir. Groundwater consists of subsurface hydrologic resources. It is an essential resource that functions to recharge surface water and is used for drinking, irrigation, and industrial processes. Groundwater typically can be described in terms of depth from the surface, aquifer or well capacity, water quality, recharge rate, and surrounding geologic formations.

3.5.2 Affected Environment

Route A

Alternative 2, Route A is in the Middle Rio Grande Valley Subbasin in the Rio Grande Basin. The Rio Grande Basin drains an area of more than 330,000 square miles in Colorado, New Mexico, and Texas in the United States and Chihuahua, Durango, Coahuila, Nuevo Leon, and Tamaulipas in Mexico. It is the international boundary between the United States and Mexico along the last 1,254 miles from the Colorado Rockies to the Gulf of Mexico. In Texas, the Rio Grande Basin drains an area of 86,720 square miles. Water development projects in the Middle Rio Grande Valley have disrupted natural flow regimes, including structures such as Falcon Dam and Amistad Dam. Substantial quantities of surface water are diverted from the Rio Grande to meet municipal, industrial, and agricultural demands in Texas and Mexico, with a significant portion used in the Middle Rio Grande Valley for farming and urban applications. The International Amistad Reservoir impounds water upstream of Del Rio and the release of water is based on allocation of water rights in the United States and Mexico (USIBWC 2003).

The northwestern portion of Section M-1 in Del Rio, Texas, starts at Cienegas Creek which is a tributary of the Rio Grande. The northwestern portion of Section M-2A is adjacent to an arroyo. Both sections are parallel to the Rio Grande (see **Appendix D**).

The City of Del Rio obtains water from both the Rio Grande and the Edwards-Trinity Aquifer. The land beneath the proposed corridor for Section M-1 lies adjacent to the Rio Grande and does not recharge the Edwards-Trinity Aquifer. The City of Eagle Pass obtains its water exclusively from the Rio Grande. The depth to the water table for the soil map units for Sections M-1 and M-2A is more than 80 inches.

Route B

The hydrology and groundwater associated with the proposed project corridor of Route B would be identical to Route A. The primary difference is that Section M-1, Route B would avoid the arroyo at the northwestern end of Section M-1 (see **Appendix D**).

3.5.3 Environmental Consequences

3.5.3.1 Alternative 1: No Action Alternative

Under the No Action Alternative, CBP would not implement the Proposed Action. As a result, there would be no change from the baseline conditions and no effects on surface hydrology or groundwater would be expected to occur. The No Action Alternative would result in continuation of the existing condition of hydrology and groundwater, as discussed in **Section 3.5.2**.

Effects on hydrology and groundwater would be expected as a result of erosion, sedimentation, and soil compaction associated with repeated crossings by cross-border violators

3.5.3.2 Alternative 2: Proposed Action

Route A

Short- and long-term negligible direct adverse effects on the hydrology of the Rio Grande would be expected to occur as a result of the grading and contouring associated with Alternative 2, Route A. Grading and contouring would be expected to alter the topography and remove vegetation of approximately 6 acres within the floodplain of the Rio Grande (in Section M-2A), which could in turn increase erosion potential and increase runoff during heavy precipitation events. Revegetating the area following construction along with other BMPs to abate runoff and wind erosion could reduce the effects of erosion and runoff. Additionally, the small increase in impervious surface within the floodplain would result in negligible increases in the quantity and velocity of storm water flows to the Rio Grande. As required by the Texas Construction General Permit (TXR150000), BMPs would be developed as part of the required SWPPPs to manage storm water both during and after construction. Therefore, effects would be expected to be negligible. Potential impacts on the arroyo are discussed in **Section 3.6.3.2**.

Short-term minor direct adverse construction-related effects on groundwater resources in Maverick and Val Verde counties would also be expected. During construction, water would be required for pouring concrete, watering of road and ground surfaces for dust suppression during construction, and for washing construction vehicles. Water use for construction would be temporary, and the volume of water used for construction would be minor when compared to the amount used annually in the area for municipal, agricultural, and industrial purposes. The source for this water is currently unknown; prior to construction a water source with a current allocation and all appropriate permits would be identified. Development of spill prevention practices as part of the SWPPP would minimize potential for adverse effects on groundwater quality resulting from spills or leakage from construction equipment

Route B

Effects on hydrology and groundwater under Alternative 2, Route B would be expected to be similar to those under Route A. Grading and contouring would be expected to alter the topography and remove vegetation of approximately 49 acres within the floodplain of the Rio Grande, which could in turn increase erosion potential and increase runoff during heavy precipitation events.

3.5.3.3 Alternative 3: Secure Fence Act Alignment Alternative

Effects on hydrology in Sections M-1 and M-2A under Alternative 3 would be similar, but slightly greater than the effects described under Alternative 2. Grading and contouring would be expected to alter the topography and remove vegetation of approximately 57 acres within the floodplain of the Rio Grande, which could in turn increase erosion potential and increase runoff during heavy precipitation events. The primary and secondary fence sections proposed under Alternative 3 would result in a larger increase in impervious surface.

Effects on groundwater under Alternative 3 would be slightly greater than the effects under Alternative 2 because the area of surface disturbance would be greater. Disturbance at the ground surface would not affect groundwater aquifers directly. Reestablishment of pre-construction runoff patterns following project development would be expected to minimize effects on groundwater recharge associated with modification of natural flows.

3.6 SURFACE WATERS AND WATERS OF THE UNITED STATES

3.6.1 Definition of the Resource

Surface water resources generally consist of wetlands, lakes, rivers, and streams. Surface water is important for its contributions to the economic, ecological, recreational, and human health of a community or locale.

The CWA (33 U.S.C. 1251 et seq.) established the Federal authority for regulating discharges of pollutants into waters of the United States. Section 404 of the CWA (33 U.S.C. 1344) establishes a Federal program to regulate the discharge of dredged and fill material into waters of the United States. The USACE administers the permitting program for authorization of actions under Section 404 of the CWA. Section 401 of the CWA (33 U.S.C. 1341) requires that proposed dredge and fill activities permitted under Section 404 be reviewed and certified by the designated state agency that the proposed project will meet state water quality standards. The Federal permit under Section 404 is not valid until it has received Section 401 water quality certification. Section 402 of the CWA authorizes the discharge of any pollutant, or combination of pollutants, into navigable waters of the United States under an NPDES permit. On September 17, 1998, control over storm water permitting shifted from the Federal NPDES program to the Texas Pollutant Discharge Elimination System (TPDES). Before the permits were merged, applicants were required to comply with both the Federal and Texas permitting systems. TPDES is now the one permit that governs Federal and state surface water discharge standards in the state. Pursuant to Texas Water Code 26.040 and CWA Section 402, all construction that would result in a soil disturbance of greater than 5 acres requires authorization under the TCEQ Construction General Permit (TXR150000). Section 303(d) of the CWA requires states and USEPA to identify waters not meeting state water-quality standards and to develop Total Maximum Daily Loads (TMDLs) and an implementation plan to reduce contributing sources of pollution.

Waters of the United States are defined in 33 CFR 328.3. Navigable waters are defined in 33 CFR 329.4. In addition, the Supreme Court issued a decision on June 19, 2006, that addresses the scope of the CWA jurisdiction over certain waters of the United States, including wetlands. On June 5, 2007, USEPA and the USACE issued joint guidance clarifying CWA jurisdiction in light of the court decision.

The CWA (as amended in 1977) established the basic structure for regulating discharges of pollutants into the waters of the United States. The objective of the CWA is restoration and maintenance of chemical, physical, and biological integrity of U.S. waters. To achieve this objective, several goals were enacted, including (1) eliminate discharge of pollutants into navigable waters by 1985; (2) achieve water quality which provides for the protection and propagation of fish, shellfish, and wildlife and provides for recreation in and on the water by 1983; (3) prohibit discharge of toxic pollutants in toxic amounts; (4) provide Federal financial assistance to construct publicly owned waste treatment works; (5) develop and implement the national policy for areawide waste treatment management planning processes to ensure adequate control of sources of pollutants in each state; (6) establish the national policy that a major research and demonstration effort be made to develop technology necessary to eliminate the discharge of pollutants into navigable waters, waters of the contiguous zone, and the oceans; and (7) establish the national policy that programs be developed and implemented in an expeditious manner so as to enable the goals to be met through the control of both point and nonpoint sources of pollution. The USACE regulates the discharge of dredged and fill material (e.g., concrete, riprap, soil, cement block, gravel, sand) into waters of the United States including wetlands under Section 404 of the CWA and work on or structures in or affecting navigable waters of the United States under Section 10 of the Rivers and Harbors Act of 1899.

Wetlands are an important natural system and habitat, performing diverse biologic and hydrologic functions. These functions include water quality improvement, groundwater recharge and discharge, pollution mitigation, nutrient cycling, wildlife habitat provision, unique flora and fauna niche provision, storm water attenuation and storage, sediment detention, and erosion protection. Wetlands are considered as a subset of the waters of the United States under

Section 404 of the CWA. The term "waters of the United States" has a broad meaning under the CWA and incorporates deepwater aquatic habitats and special aquatic habitats (including wetlands). The USACE defines wetlands as "those areas that are inundated or saturated with ground or surface water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted to life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas" (33 CFR Part 328).

3.6.2 Affected Environment

Route A

Surface Waters and Other Waters of the United States. Surface water features that could be potentially classified as waters of the United States in the proposed project corridor include arroyos, Cienegas Creek, and wetlands. The northwestern portion of Section M-1 starts at Cienegas Creek which is a tributary of the Rio Grande. The northwestern portion of Section M-2A is adjacent to an arroyo. Both sections of tactical infrastructure would parallel the Rio Grande. According to a reconnaissance survey conducted in November 2007, wetlands were identified along the eastern end of Section M-1 based on vegetation and hydrology (see **Appendix G**). These wetlands are potentially jurisdictional waters of the United States.

Wetland indicator species are listed in **Appendix G** and include the following vegetation associations: sugarberry riparian woodland and giant reed herbaceous vegetation. The sugarberry riparian woodland is a rare vegetation association found in narrow bands on the outer floodplain margin of the Rio Grande and the banks of its tributaries within Sections M-1 and M-2A. Dense giant reed stands were observed on saturated soils of Rio Grande floodplain terraces, floodplains of tributary drainages, pond edges, and ditch banks of Sections M-1 and Section M-2A. The location of potential wetlands identified during the November 2007 natural resources survey is presented in **Appendix G**. Formal delineation or jurisdictional determination of the extent of wetlands or other waters of the United States has not yet been conducted. The most current information available to identify wetlands is the National Wetlands Initiative (NWI) (USFWS 2007a). However, NWI digital data are not available for Maverick and Val Verde counties, Texas.

During construction, water would be required for pouring concrete, watering of road and ground surfaces for dust suppression during construction, and for washing construction vehicles. Water use for construction would be temporary, and the volume of water used for construction would be minor when compared to the amount used annually in the area for municipal, agricultural, and industrial purposes. A water source with a current allocation and all appropriate permits would be used.

Surface Water Quality. The Rio Grande is used for drinking water, irrigation, and recreation. The water quality in the Middle Rio Grande Valley Subbasin is better than other sections of the Rio Grande drainage (USIBWC 2003). The primary concern for the area is the high levels of bacteria and nutrient loading. The increases are found below return drains and tributaries where wastewater discharges enter the Rio Grande. Cities along the Rio Grande, including Del Rio and Eagle Pass and their sister cities in Mexico, Ciudad Acuña and Piedras Negras, are addressing the issue by constructing or upgrading wastewater treatment facilities (USIBWC 2003).

Water tested upstream of the SR 277 bridge in Del Rio had high levels of phosphorus, although these levels had decreased during the sampling period. Water tested 4.5 miles downstream of Del Rio, Texas, at Moody Ranch had increased levels of fecal coliform bacteria. Similar trends are observed for water sampled upstream and downstream of Eagle Pass where bacteria levels increased above the surface water standard for water that has passed through the City of Eagle Pass (USIBWC 2003).

Route B

The surface water and waters of the United States associated with the proposed project corridor of Route B would be identical to Route A. The primary difference is that Section M-2A, Route B avoids the arroyo at the northwestern end of Section M-2A (see **Appendix D**).

3.6.3 Environmental Consequences

3.6.3.1 Alternative 1: No Action Alternative

Under the No Action Alternative, CBP would not implement the Proposed Action. As a result, there would be no change from the baseline conditions and no effects on surface waters and waters of the United States would be expected. The No Action Alternative would result in continuation of the existing condition of surface water and waters of the United States, as discussed in **Section 3.6.2**.

Surface waters and waters of the United States would also continue to be degraded by cross-border violators from the increase in sedimentation caused by erosion of repeatedly used footpaths.

3.6.3.2 Alternative 2: Proposed Action

Route A

Surface Waters and Waters of the United States. Short-term and long-term minor adverse effects on surface water and waters of the United States would be expected. Effects on surface water and wetlands that are potentially jurisdictional waters of the United States would be avoided to the maximum extent practicable. Effects that cannot be avoided would be minimized and BMPs enacted that would comply with all applicable Federal, state, and local regulations. Potential effects include dredging or the placement of fill into wetlands of other waters of the United States and moving the alignment of irrigation canals and drainage ditches.

If effects on waters of the United States cannot be avoided, the CBP would obtain any necessary CWA Section 404 permits and Rivers and Harbors Act Section 10 Permits. As part of the permitting process, CBP would develop, submit, and implement a compensatory mitigation plan to reduce effects and compensate for unavoidable effects. The plan would be developed in accordance with USACE guidelines and in cooperation with USEPA. The plan would outline BMPs from preconstruction to post-construction activities to reduce the effect on wetlands and water bodies. The USACE Fort Worth District would also obtain a Section 401 (a) CWA Permit from TCEQ, to ensure that action would comply with state water quality standards.

A Texas Construction General Permit would be required to address the development and implementation of an SWPPP with BMPs to reduce the effects of storm water runoff. Additionally, any required CWA Section 404 and Section 401, and Rivers and Harbors Act Section 10 permits would be obtained prior to all unavoidable effects on jurisdictional waters of the United States. A compensatory mitigation plan to lessen unavoidable effects would be developed, submitted, and implemented. The plan would outline BMPs from preconstruction to post-construction activities to reduce the effect on waters of the United States, including wetlands.

Surface Water Quality. Short-term negligible adverse effects on water quality would be expected. The Proposed Action would increase runoff potential in the proposed project corridor. Approximately 55 acres of disturbance in Section M-1, Route A and approximately 6 acres of disturbance in Section M-2A, Route A would occur as a result of grading, contouring, and trenching. The soil disturbance associated with the Proposed Action would disturb more than 5 acres of soil; therefore, a TCEQ Construction Storm Water Permit (TXR150000) would be required. Erosion and sediment control and storm water management practices during and after construction would be implemented consistent with the SWPPP developed under the Construction General Permit. Based on these requirements, adverse effects on surface water quality would be reduced to negligible.

Route B

Effects on surface water, waters of the United States, and surface water quality under Alternative 2, Route B would be expected to be similar to those described for Route A. Approximately 43 acres for Section M-1 and approximately 5 acres for M-2A would be affected by grading, contouring, and trenching associated with

Alternative 2, Route B. Additionally, Section M-2A, Route B would avoid an arroyo that could be considered waters of the United States.

3.6.3.3 Alternative 3: Secure Fence Act Alignment Alternative

Effects on surface waters, waters of the United States, and surface water quality would be expected to be similar to those described in Alternative 2. However, the magnitude of the effects would be greater due to the additional fence and wider corridor. Approximately 43 acres for Section M-1 and approximately 14 acres for Section M-2A would be affected by the proposed grading, contouring, and trenching associated with Alternative 3. As described in **Section 3.6.3.2**, a Texas Construction General Permit including a SWPPP would be required. Additionally, any required CWA Section 404 or Section 401, and Rivers and Harbors Act Section 10 permits would be obtained prior to all unavoidable effects on jurisdictional waters of the United States. A compensatory mitigation plan to lessen unavoidable effects would be developed, submitted, and implemented. The plan would outline BMPs from preconstruction to post-construction activities to reduce the effect on waters of the United States, including wetlands.

3.7 FLOODPLAINS

3.7.1 Definition of the Resource

Floodplains are areas of low-level ground and alluvium adjacent to rivers, stream channels, or coastal waters. The living and nonliving parts of natural floodplains interact with each other to create dynamic systems in which each component helps to maintain the characteristics of the environment that supports it. Floodplain ecosystem functions include natural moderation of floods, flood storage and conveyance, groundwater recharge, nutrient cycling, water quality maintenance, and a diversity of plants and animals. Floodplains provide a broad area to spread out and temporarily store floodwaters. This reduces flood peaks and velocities and the potential for erosion. In their natural vegetated state, floodplains slow the rate at which the incoming overland flow reaches the main water body (FEMA 1986).

Floodplains are subject to periodic or infrequent inundation due to runoff of rain or melting snow. Risk of flooding typically hinges on local topography, the frequency of precipitation events, and the size of the watershed upstream from the floodplain. Flood potential is evaluated by FEMA, which defines the 100-year floodplain. The 100-year floodplain is the area that has a 1 percent chance of inundation by a flood event in a given year. Certain facilities inherently pose too great a risk to be constructed in either the 100- or 500-year floodplain, including hospitals, schools, or storage buildings for irreplaceable records. Federal, state, and local regulations often limit floodplain development to passive uses, such as recreational and preservation activities, to reduce the risks to human health and safety.

EO 11988, *Floodplain Management*, requires Federal agencies to determine whether a proposed action would occur within a floodplain. This determination typically involves consultation of appropriate FEMA Flood Insurance Rate Maps (FIRMs), which contain enough general information to determine the relationship of the project area to nearby floodplains. EO 11988 directs Federal agencies to avoid floodplains unless the agency determines that there is no practicable alternative. Where the only practicable alternative is to site in a floodplain, a specific step-by-step process must be followed to comply with EO 11988. This process is outlined in Section 1.5 and discussed in the FEMA document *Further Advice on EO 11988 Floodplain Management*. As a planning tool, the NEPA process incorporates floodplain management through analysis and public coordination of the EA.

3.7.2 Affected Environment

Route A

Section M-1 for Alternative 2, Route A occurs in FEMA FIRM Panel No. 4806310010A for Val Verde County, Texas, effective June 1, 1987 (FEMA undated a). Route A is mapped in Zone X or “areas determined to be outside the 500-year floodplain.”

Section M-2A for Alternative 2, Route A occurs in FEMA FIRM Panel No. 4804710004C for Eagle Pass, Texas, effective October 19, 2005. The section is mapped in Zone AE which lies in the 100-year floodplain of the Rio Grande.

Route B

Section M-1 for Alternative 2, Route B is mapped in Zone A (100-year floodplain). No Base Flood Elevations or depths are shown on the FIRM (FEMA undated c). In addition to FEMA mapping, detailed hydraulic studies have determined base flood elevations. Site-specific surveys have determined that Route B is in the FEMA 100-year floodplain, but not in the USIBWC floodplain (See Map 1 in **Appendix D**).

Section M-2A for Alternative 2, Route B is in the same flood zone as Route A.

3.7.3 Environmental Consequences

3.7.3.1 Alternative 1: No Action Alternative

Under the No Action Alternative, CBP would not implement the Proposed Action. As a result, there would be no change from the baseline conditions and no effects would be expected. The No Action Alternative would result in continuation of the existing condition of water resources, as discussed in **Section 3.7.2**.

Floodplains would also continue to be degraded by cross-border violators from the increase in sedimentation caused by erosion of repeatedly used footpaths.

3.7.3.2 Alternative 2: Proposed Action

Route A

Effects on floodplains would be avoided to the maximum extent practicable. Potential short- and long-term minor adverse effects on the Rio Grande floodplain in Section M-2A would occur as a result of construction activities associated with Alternative 2, Route A. Approximately 6 acres of the FEMA 100-year floodplain would be affected in Section M-2A. Placement of the tactical infrastructure and removal of vegetation in Section M-2A would increase the volume and velocity of sheet flow and runoff in the floodplain. Section M-1 Route A would not directly affect the FEMA 100-year floodplain.

The Proposed Action would disturb more than 5 acres of soil; therefore, a TCEQ Construction Storm Water Permit (TXR150000) would be required. Erosion and sediment control and storm water management practices during and after construction would be implemented consistent with the SWPPP. Based on these requirements, adverse effects on floodplains would be minimized.

A tactical infrastructure within the floodplain would have the potential to affect flood flows if the tactical infrastructure is not maintained to remove blockages to flow (debris and wrack) following high flow events. Periodic maintenance of the primary pedestrian fence to remove debris would minimize the potential for it to modify flood flows.

Hydraulic modeling indicates that no impacts on the USIBWC international floodplain would be expected for Section M-1, Route A. Hydraulic modeling will be conducted to determine if Section M-2A, Route A would have an impact on the USIBWC international floodplain. Increased impervious areas and loss of vegetation associated with the tactical infrastructure would have minor adverse impact on groundwater recharge, nutrient cycling, and water quality.

In accordance with the FEMA Document, *Further Advice on EO 11988, Floodplain Management*, CBP has determined that Section M-2A, Route A cannot be practicably located outside the floodplain. The current floodplain extends inland past local communities and roads strategic to the operations of USBP. CBP would mitigate unavoidable impacts associated with floodplains using planning guidance developed by the USACE. Properly designed erosion and sediment controls and storm water management practices would be implemented to minimize potential for adverse impacts.

Route B

Effects on floodplains would be avoided to the maximum extent practicable. Potential short- and long-term minor adverse effects on the Rio Grande floodplain in Sections M-1 and M-2A would occur as a result of construction activities associated with Alternative 2, Route B. Approximately 43 acres in Section M-1 and approximately 5 acres in Section M-2A of the FEMA 100-year floodplain would be affected. Placement of the primary pedestrian fence and removal of vegetation in Sections M-1 and M-2A would increase the volume and velocity of sheet flow and runoff in the floodplain.

The Proposed Action would disturb more than 5 acres of soil; therefore, authorization under the TCEQ Construction Storm Water Permit (TXR150000) would be required. Erosion and sediment control and storm water management practices during and after construction would be implemented consistent with the SWPPP developed under the Construction General Permit. Based on these requirements, adverse effects on floodplain resources would be minimized.

A primary pedestrian fence within the floodplain would have the potential to affect flood flows if the fence is not maintained to remove blockages to flow (debris and wrack) following high flow events. Periodic maintenance of the primary pedestrian fence to remove debris would minimize the potential for it to modify flood flows.

Hydraulic modeling indicates that no impacts on the USIBWC international floodplain would be expected for Section M-1, Route B. Hydraulic modeling will be conducted to determine if Section M-2A, Route B would have an impact on the USIBWC international floodplain

In accordance with the FEMA Document, *Further Advice on EO 11988, Floodplain Management*, CBP has determined that Route B of Sections M-1 and M-2A cannot be practicably located outside the floodplain since the current floodplain extends inland past local communities and roads strategic to the operations of USBP. CBP would mitigate unavoidable impacts associated with floodplains using planning guidance developed by the USACE. Properly designed erosion and sediment controls and storm water management practices would be implemented to minimize potential for adverse impacts.

3.7.3.3 Alternative 3: Secure Fence Act Alignment Alternative

Effects on floodplains under Alternative 3 would be slightly greater than those described under Alternative 2, Route B. The primary and secondary sections proposed under Alternative 3 would result in an increase in impervious surface, contributing slightly more surface runoff to the Rio Grande and its associated floodplain. Approximately 43 acres in Section M-1 and approximately 14 acres in Section M-2A of the FEMA 100-year floodplain would be affected. No effects on floodplains or USIBWC international floodplains would be expected for Section M-1, Route A.

3.8 VEGETATION RESOURCES

3.8.1 Definition of the Resource

The vegetation resources section describes the vascular plants or vegetated earth cover of the project area. Structurally, the vegetation occurs as forest, woodland, shrubland, and herbaceous communities or smaller stands with various mixes of canopy heights and plant species composition. The various vegetation types observed consisted of native and nonnative plant species that have become established. Sufficient cover data and field photographs were collected during field visits to accurately inventory, describe, illustrate, and map the various vegetation types that occur. This approach is in accord with the national vegetation classification system, a standard of the Federal Geographic Data Committee (FGDC 2007). Vegetation classifications were prepared using national (NatureServe 2007) and State of Texas hierarchies to appropriately present the information to ecologists, botanists, wildlife biologists, and others. Collectively the vegetation represents an important portion of the wildlife habitat for the project area providing forage and hiding cover in particular.

3.8.2 Affected Environment

Route A

The vegetation near Del Rio and Eagle Pass has been classified as Dry Domain (300), Tropical/Subtropical Steppe Division (310) (Bailey 1995). The proposed project corridor is more finely classified as the Southwestern Plateau and Plains Dry Steppe and Shrub Province (315). The Texas Parks and Wildlife Department (TPWD) provides discussion and describes vegetation geography of biotic provinces and natural regions using topographic features, climate, vegetation types, and terrestrial vertebrates. This system places the proposed project corridor in the Tamaulipan Biotic Province, South Texas Brush Country (Rio Grande Basin) Natural Region, Brush Country Sub-region, and the Level III Ecoregion of the Southern Texas Plains. The climate for the area is described in **Section 3**.

Tamaulipan Brushland represents a unique ecosystem (USFWS 1988). The characteristic natural vegetation is dense and thorny, and plant species distribution can be correlated with geologic formations. The Rio Grande floodplain supports tall, dense riparian forest, woodland, shrubland, and herbaceous vegetation while the xeric upland areas support mostly spiny shrubs, short-stature trees, and dense nonnative grasslands. Between the 1920s and 1980s, more than 95 percent of the native brushland and 90 percent of the riparian vegetation had been converted to agriculture and urban land use (USFWS 1988). In 1988, it was estimated that 98 percent of the lush, subtropical region of the Rio Grande Valley had been cleared of native vegetation in the United States and a large but unknown percentage cleared in Mexico. This section describes and illustrates the existing condition and distribution of vegetation as it occurred in the 2007 Biological Resources Survey (see **Appendix G**) within Sections M-1 and M-2A.

In general, the vegetation of Sections M-1 and M-2A consists of small stands of native sugarberry, black willow, granjeno, huisache, and honey mesquite woodlands; honey mesquite and retama shrublands regrowing from nonnative Bermuda grass pastures; and nonnative Bermuda grass, giant reed, and Russian-thistle stands. Some agriculture, mostly pastures of Bermuda grass, occur along the northeastern side of Garza Lane of Section M-1. Emergent and forested wetland communities (identified by type in **Section 3.6.2**) occur rarely within the corridor in seep and spring sites and giant reed wetland stands are common; project-related effects on wetlands are presented under **Section 3.6.3**.

Route B

Vegetation that occurs in the proposed project corridor for Alternative 2, Route B is the same as Route A. The proposed project corridor is similar for both routes.

3.8.3 Environmental Consequences

3.8.3.1 Alternative 1: No Action Alternative

Under the No Action Alternative native sugarberry, granjeno, huisache, and honey mesquite woodland strips and patches would continue to be managed by private and public landowners and would likely remain unchanged. Honey mesquite woodlands and shrublands and retama shrublands that have become reestablished in Bermuda grass pastures would be managed by private landowners and could be cleared to continue to support grazing livestock resulting in low, long-term, adverse effects on biodiversity and wildlife habitat structure. Bermuda grass stands that occur near the POE would continue to be mowed by USBP, as would those stands managed by public land managers resulting in negligible, long-term, adverse effects on native plant species. Forblands of Section M-2A dominated by Russian-thistle and being reinvaded by some native plant species could be removed to support future earthwork and construction for a housing development resulting in an negligible to minor, long-term, adverse effect due to poor quality habitat being converted to housing.

Dust generated from the existing access roads traveled by a variety of public, agency, recreation, and illegal vehicles would result in negligible to minor, short- and long-term adverse effects on downwind vegetation due to interference with pollination and photosynthesis.

3.8.3.2 Alternative 2: Proposed Action Alternative

Route A

Approximately 61 acres of grading, contouring, and trenching would be associated with Alternative 2, Route A. Approximately 9 acres are already cleared of vegetation and there would be no effects on vegetation within this portion of the proposed project corridor. Proposed construction grading for this alternative would result in approximately 52 acres of vegetation clearing and removal. Vegetation clearing and removal within this section would result in moderate short- and long-term adverse effects on strips and patches of sugarberry, huisache, granjeno, and honey mesquite woodland; honey mesquite shrubland; Bermuda grassland; Russian-thistle forbland; and giant reed communities. The 150-foot corridor in Section M-1 would also be maintained clear of giant reed and other woodland, shrubland, and other grassland vegetation. Dust generated from vehicles on access roads would result in negligible to minor, short- and long-term adverse effects on downwind vegetation due to interference with pollination and photosynthesis.

Route B

Approximately 49 acres of grading, contouring, and trenching would be associated with Alternative 2, Route B. There are no areas in Route B that have been completely cleared of vegetation; therefore proposed construction grading for this alternative would result in approximately 49 acres of direct, adverse impacts on vegetation. Vegetation clearing and removal within this section would result in moderate, short- and long-term, adverse effects on strips and patches of sugarberry, granjeno, and honey mesquite woodland; honey mesquite and retama shrubland; Bermuda grassland; Russian-thistle forbland; and giant reed communities. The 150-foot corridor in Section M-1 would also be maintained clear of giant reed, woodland, shrubland, and other grassland vegetation. Dust generated from vehicles on access roads would result in minor short- and long-term adverse effects on downwind vegetation due to interference with pollination and photosynthesis.

3.8.3.3 Alternative 3: Secure Fence Act Alignment Alternative

Under this alternative a 150-foot-wide corridor containing the proposed tactical infrastructure would be cleared (approximately 57 acres). Additionally, a portion would be maintained following construction to support long-term maintenance, sight distance, and patrol activities. Vegetation clearing and removal within this section would result in moderate, short- and long-term, adverse effects on strips and patches of sugarberry, granjeno, and honey mesquite woodland; honey mesquite and retama shrubland; Bermuda grassland; Russian-thistle forbland communities; and giant reed stands. Dust generated from vehicles on access roads would result in short- and long-term minor adverse effects on downwind vegetation due to interference with pollination and photosynthesis.

3.9 WILDLIFE AND AQUATIC RESOURCES

3.9.1 Definition of the Resource

Wildlife and aquatic resources are native or naturalized animals, including migratory birds, and the habitats in which they exist. Federal- and state-listed species and designated critical habitats are discussed in further detail in **Section 3.10**.

3.9.2 Affected Environment

Route A

Wildlife. Sections M-1 and M-2A of Alternative 2, Route A is in the South Texas Brush Country Natural Region within the Tamaulipan Biotic Province, in a transition zone with the Chihuahuan Biotic Province boundary a few miles northwest and the Balconian Biotic Province boundary a few miles north. Wildlife species from all three biotic provinces are likely to frequent the proposed project corridor. Both sections border the Rio Grande. Additionally, the Rio Grande is a major migratory flyway for numerous bird species, particularly waterfowl, shore birds, and those associated with riparian habitats.

The Chihuahuan Biotic Province includes the northwestern region of Texas that borders Mexico. The antelope (*Antilocapra americana*) and mule deer (*Odocoileus hemionus*) are the most widely distributed large game animals. The collared peccary or javelina (*Pecari tajacu*) is common in the southern part of the region. The blacktail jackrabbit (*Lepus californicus*), desert cottontail (*Sylvilagus audubonii*), kangaroo rat (*Dipodomys* spp.), wood rat (*Neotoma floridana*), and numerous smaller rodents compete with domestic and wild herbivores for available forage. Mammalian predators include the coyote (*Canis latrans*) and bobcat (*Lynx rufus*). The black-throated sparrow (*Amphispiza bilineata*) is one of the most abundant birds of the province. Greater roadrunner (*Geococcyx californianus*), curve-billed thrasher (*Toxostoma curvirostre*), and Chihuahuan raven (*Corvus cryptoleucus*) are also common. Scaled quail (*Callipepla squamata*) and Gambel's quail (*Callipepla gambelii*) occupy most of the area, and northern bobwhite (*Colinus virginianus*) populations reach into its eastern portion. Raptors include the golden eagle (*Aquila chrysaetos*), great horned owl (*Bubo virginianus*), red-tailed hawk (*Buteo jamaicensis*), ferruginous hawk (*Buteo regalis*), and the rare zone-tailed hawk (*Buteo albonotatus*). The many reptiles include the common chuckwalla (*Sauromalus ater*), Texas horned lizard (*Phrynosoma cornutum*), desert spiny lizard (*Sceloporus magister*), and various species of rattlesnakes (*Crotalus* spp.) (Bailey 1995).

The Balconian Biotic Province includes the Edwards Plateau north of the Del Rio Sector. The Mexican ground squirrel (*Spermophilus mexicanus*) and gray fox (*Urocyon cinereoargenteus*) are found in this province. Whitetail deer (*Odocoileus virginianus*) are abundant, and nine-banded armadillo (*Dasypus *novemcinctus*) are present. The fox squirrel (*Sciurus niger*) is hunted in wooded areas along streams. Chief furbearers are the ringtail (*Bassariscus astutus*) and raccoon (*Procyon lotor*). Wild turkey (*Meleagris gallopavo*), mourning dove (*Zenaida macroura*), scaled quail, and bobwhite are common game birds, and several species of hawks and owls are present (Bailey 1995).

The Tamaulipan Biotic Province includes a variety of wildlife species. Common species of amphibians in the region include spadefoot toads (*Scaphiopus* spp.), chorus frogs (*Pseudacris* spp.), true toads (*Bufo* spp.), and true frogs (*Rana* spp.). Common snakes include rat snakes (*Elaphe* spp.), water snakes (*Nerodia* spp.), western diamondback rattlesnakes (*Crotalus atrox*), and Texas coral snakes (*Micrurus fulviustener*). Common turtles in the region include eastern river cooter (*Pseudemys concinna*), ornate box turtle (*Terrapene ornata*), yellow mud turtle (*Kinosternon flavescens*), Texas tortoise (*Gopherus berlandieri*), smooth softshell (*Apalone mutica*), and spiny softshell (*A. spinifera*). Mammal species likely to occur within or near the project area include coyote (*Canis latrans*), raccoon (*Procyon lotor*), cottontail (*Sylvilagus floridanus*), eastern fox squirrel (*Sciurus niger*), bobcat (*Lynx rufus*), and the nine-banded armadillo (*Dasypus novemcinctus*) (CBP 2007).

During a November 2007 survey, habitats observed within the proposed project corridor were native and nonnative woodlands, desert shrublands, riparian communities, and nonnative pastures and forblands (See **Section 3.8**). The riparian community is dominated by giant reed along the banks and undeveloped natural floodplains of the Rio Grande. Giant reed has become highly invasive, colonizing vast areas of riparian zones and displacing native vegetation along the Rio Grande and its tributaries. Because the proposed project corridor lies adjacent to densely populated urban areas, the riparian habitat could be used as a corridor for some wildlife species to travel through to less-disturbed habitat (CBP 2007). Wildlife species observed during the survey are presented in **Table 3.9-1**. During the survey 21 bird species, 1 mammal species, 2 amphibian species, 1 reptile species, and 3 invertebrates were recorded.

Aquatic Resources. The aquatic ecosystems are restricted to the Rio Grande and the tributaries that flow into the Rio Grande. In the Rio Grande, the dominant fish species include alligator gar (*Lepisosteus spatula*), thread-fin shad (*Dorosoma petenense*), common carp (*Cyprinus carpio*), bullhead minnow (*Pimephales vigilax*), striped bass (*Roccus saxatilus*), and Rio Grande perch (*Cichlasoma cyanoguttatum*) (CBP 2007).

Route B

Wildlife and aquatic resources that occur in Route B are the same as Route A. The proposed project corridor for both routes is similar.

1 **Table 3.9-1. Wildlife Species Observed in November 2007 Survey**

Common Name	Scientific Name	Species Status	M-1	M-2A
Insects				
Cloudless sulfur	*Phoebis sennae eubule*	C	X	
Monarch butterfly	*Danaus plexippus*	C	X	
Painted lady butterfly	*Vanessa cardui*	C	X	
Amphibians				
Bullfrog	*Rana catesbiena*	C	X	
Rio Grande leopard frog	*Rana berlandieri*	C	X	
Reptiles				
Indigo snake	*Drymarchon corais*	ST	X	
Birds				
Baltimore oriole	*Icterus galbula*	C	X	X
Barn swallow	*Riparia riparia*	C		X
Black-bellied whistling duck	*Dendrocygna autumnalis*	C	X	
Bufflehead	*Bucephala albeola*	C	X	
Couch’s kingbird	*Tyrannus couchii*	C	X	X
Double-crested cormorant	*Phalacrocorax auritus*	C	X	
Gadwall	*Anas Strepera*	C	X	
Great egret	*Ardea alba*	C		X
Great-tailed grackle	*Quiscalus mexicanus*	C	X	X
Inca dove	*Columbina inca*	C		X
Kingfisher	*Megaceryle sp.*	C	X	
Mallard	*Anas platyrhynchos*	C	X	
Mourning dove	*Zenaida macroura*	C	X	
Northern cardinal	*Cardinalis cardinalis*	C	X	
Northern shoveler	*Anas clypeata*	C	X	
Red-shouldered hawk	*Buteo lineatus*	C	X	
Says phoebe	*Sayornis saya*	C		X
Scissor-tailed flycatcher	*Tyrannus forticatus*	C		X
Sparrow	*Spizella sp.*	C	X	X
Vermilion flycatcher	*Pyrocephalus rubinus*	C		X
Wild turkey	*Meleagris gallopavo*	C	X	
Mammals				
Raccoon	*Procyon lotor*	C		X

2 Notes: ST = State Threatened; C = Common

3.9.3 Environmental Consequences

3.9.3.1 Alternative 1: No Action Alternative

Under the No Action Alternative, new tactical infrastructure would not be built and there would be no change in fencing, access roads, or other facilities along the U.S./Mexico international border in the proposed project locations within the Del Rio Sector. The No Action Alternative would not directly affect wildlife in the proposed project corridor. However, wildlife species and their habitat would continue to be indirectly affected through habitat alteration and loss due to trails and erosion from illegal cross-border activities.

3.9.3.2 Alternative 2: Proposed Action

Route A

Wildlife. Alternative 2, Route A would permanently affect approximately 46 acres in Section M-1 and approximately 6 acres in Section M-2A. Potential threats to wildlife along the Del Rio Sector include barrier to movement, interruption of corridors, increased human activity, impacts of lights on nocturnal species, and loss of habitat. Some wildlife deaths, particularly reptiles and amphibians could increase due to the improved accessibility of the area and increased vehicle traffic. Although some incidental take might occur, wildlife populations within the proposed project corridor would not be significantly affected through the implementation of the Proposed Action Alternative.

Noise created during construction would be anticipated to result in short-term, moderate, adverse effects on wildlife, particularly birds and mid- to large-sized mammals. Noise levels after construction are anticipated to return to close to current ambient levels. Elevated noise levels during construction could result in reduced communication ranges, interference with predator/prey interactions, or habitat avoidance. More intense effects, potentially resulting with intense pulses of noise associated with blasting, could include behavioral change, disorientation, or hearing loss. Predictors of wildlife response to noise include noise type (i.e., continuous or intermittent), prior experience with noise, proximity to a noise source, stage in the breeding cycle, activity, and age. Prior experience with noise is the most important factor in the response of wildlife to noise, because wildlife can become accustomed (or habituate) to the noise. The rate of habituation to short-term construction is not known, but it is anticipated that wildlife would be permanently displaced from the areas where the habitat is cleared and the primary pedestrian fence and associated tactical infrastructure constructed, and temporarily dispersed from areas adjacent to the project areas during construction periods. See **Section 3.2** for additional details on expected noise levels associated with the Proposed Action.

For the proposed length of approximately 4 miles, the area within the proposed construction corridor that would be cleared of vegetation is approximately 52 acres for Sections M-1 and M-2A. The 52 acres of vegetation removed for Sections M-1 and M-2A are dominated by sugarberry, huisache, granjeno, and honey mesquite woodlands; honey mesquite and retama shrublands; giant reed wetlands; and nonnative grasslands and forblands. This vegetation removal would result in short- and long-term, minor adverse effects on wildlife due to habitat conversion.

Lights along the fence corridor may behaviorally exclude nocturnal wildlife such as the bobcat from the illuminated zone, although potential use of these areas by bobcat is likely minimal given their proximity to urban development. Lights would be anticipated to have only minor adverse impacts on nocturnal wildlife depending on the species examined. Potential impacts of lights on ocelot and jaguarundi are addressed in section 3.10.3

Effects on migratory birds could be substantial and are highly dependent upon the timing of tactical infrastructure construction. Implementing a series of BMPs to avoid or minimize adverse effects could markedly reduce their intensity. Standard BMPs to reduce or avoid adverse effects on migratory birds include the following:

- Any groundbreaking construction activities should be performed before migratory birds return to the area (approximately 1 March) or after all young have fledged (approximately 31 July) to avoid incidental take.
- If construction is scheduled to start during the period in which migratory bird species are present, steps should be taken to prevent migratory birds from establishing nests in the proposed project corridor. These steps could include covering equipment and structures, and use of various excluders (e.g., noise). Birds can be harassed to prevent them from nesting on the site. Once a nest is established, they cannot be harassed until all young have fledged and left the nest site.
- If construction is scheduled to start during the period when migratory birds are present, a supplemental site-specific survey for nesting migratory birds should be performed immediately prior to site clearing.
- If nesting birds are found during the supplemental survey, construction should be deferred until the birds have left the nest. Confirmation that all young have fledged should be made by a competent biologist.

Because not all of the above BMPs can be fully implemented due to time constraints of tactical infrastructure construction, a Migratory Bird Depredation Permit would be obtained from USFWS.

Assuming implementation of the above BMPs to the fullest extent feasible, effects of the Proposed Action on migratory birds is anticipated to be short- and long-term, minor, and adverse due to construction disturbance and associated loss of habitat, and long-term, minor, and beneficial due to reduction of foot traffic through migratory bird habitat north of the proposed project corridor.

Aquatic Resources. Removal of vegetation and grading during construction could temporarily increase siltation in the river and therefore have short-term minor adverse effects on fish and aquatic resources within the Rio Grande.

Route B

Wildlife. Effects on wildlife associated with Alternative 2, Route B would be similar to those described for Route A. The proposed project corridor would include approximately 43.3 acres of vegetation removal for Section M-1 and approximately 5.4 acres of vegetation removal for Section M-2A.

For the proposed length of approximately 3.3 miles, the area within the corridor that would be cleared of vegetation is approximately 49 acres for Sections M-1 and M-2A. The approximate 49 acres of vegetation that would be removed are dominated by sugarberry, granjeno, and honey mesquite woodlands; honey mesquite and retama shrublands; giant reed wetlands; and nonnative grasslands and forblands. This vegetation removal would result in short- and long-term, minor adverse effects on wildlife due to habitat conversion.

Aquatic Resources. Removal of vegetation and grading during construction could temporarily increase siltation in the river and therefore have short-term minor adverse impacts on fish and other aquatic resources within the Rio Grande.

3.9.3.3 Alternative 3: Secure Fence Act Alignment Alternative

Effects on wildlife and aquatic resources associated with Alternative 3 would be similar to those described for Alternative 2, Route B; however, the area impacted would be greater because the area disturbed would be greater. This alternative would also include construction and maintenance of access and patrol roads. Vegetation would be cleared and grading would occur where needed. Increased threats to wildlife in these areas include barrier to movement, interruption of corridors, increased human activity, and loss of habitat. Wildlife populations within the project area would not be significantly affected by vehicular traffic because the patrol road would be located between the fences. However, vehicle traffic would continue to cause a disruption of wildlife. These long-term intermittent adverse effects would be negligible to minor.

3.10 THREATENED AND ENDANGERED SPECIES

3.10.1 Definition of the Resource

Federal and state threatened and endangered species are addressed in this EA. Each group has its own definitions, and legislative and regulatory drivers for consideration during the NEPA process; these are briefly described below.

The ESA, as amended (16 U.S.C. 1531–1544 et seq.) provides broad protection for species of fish, wildlife, and plants that are listed as threatened or endangered in the United States or elsewhere. Provisions are made for listing species, as well as for recovery plans and the designation of critical habitat for listed species. Section 7 of the ESA outlines procedures for Federal agencies to follow when taking actions that can jeopardize listed species, and contains exceptions and exemptions. Criminal and civil penalties are provided for violations of the ESA.

Section 7 of the ESA directs all Federal agencies to use their existing authorities to conserve threatened and endangered species and, in consultation with the USFWS, to ensure that their actions do not jeopardize listed species or destroy or adversely modify critical habitat. Section 7 applies to management of Federal lands as well as other Federal actions that might affect listed species, such as approval of private activities through the issuance of Federal permits, licenses, or other actions.

Under the ESA, a Federal endangered species is defined as any species which is in danger of extinction throughout all or a significant portion of its range. The ESA defines a Federal threatened species as any species which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.

In 1973, the Texas legislature authorized the TPWD to establish a list of endangered animals in the state. State endangered species are those species which the Executive Director of the TPWD has named as being ‘threatened with statewide extinction.” Threatened species are those species which the TPWD has determined are likely to become endangered in the future (TPWD 2007a).

In 1988 the Texas legislature authorized TPWD to establish a list of threatened and endangered plant species for the state. An endangered plant is one that is “in danger of extinction throughout all or a significant portion of its range.” A threatened plant is one that is likely to become endangered within the foreseeable future (TPWD 2007b).

TPWD regulations prohibit the taking, possession, transportation, or sale of any of the animal species designated by state law as endangered or threatened without the issuance of a permit. State laws and regulations prohibit commerce in threatened and endangered plants and the collection of listed plant species from public land without a permit issued by TPWD. Listing and recovery of endangered species in Texas is coordinated by the TPWD. The TPWD Wildlife Permitting Section is responsible for the issuance of permits for the handling of listed species (TPWD 2007a).

3.10.2 Affected Environment

Route A

Eleven federally listed species have the potential to occur within the proposed project corridor of Alternative 2, Route A (see **Table 3.10-1**). An additional 15 species that are listed by the State of Texas as threatened or endangered have the potential to be present (see **Table 3.10-1**). Further information on the natural history of the federally listed species is presented in **Appendix G**.

Table 3.10-1. Federal- and State-Listed Species Potentially Occurring in the Proposed Project Corridor

Common Name	Scientific Name	County	Federal Status	State Status
Plants				
Texas snowbells	*Styrax texana*	VV	**E**	**E**
Tobusch fishhook cactus	*Ancistrocactus tobuschii*	VV	**E**	**E**
Mussels				
Texas hornshell (clam)	*Popenaias popeii*	VV	**C**	
Fish				
Blotched gambusia	*Gambusia senilis*	VV		**T**
Blue sucker	*Cycleptus elongates*	M		**T**
Conchos pupfish	*Cyprinodon eximius*	VV		**T**
Devils River minnow	*Dionda diabolic*	VV	**T**	**T**
Pecos pupfish	*Cyprinodon pecosensis*	VV		**T**
Proserpine shiner	*Cyprinella Proserpina*	M		**T**
Rio Grande darter	*Etheostoma graham*	M		**T**
Rio Grande silvery minnow	*Hybognathus amarus*	M	**E**	**E**
Amphibians				
South Texas siren (Large form)	*Siren sp. 1*	M		**T**
Reptiles				
Indigo snake	*Drymarchon corais*	M		**T**
Reticulate collared lizard	*Crotaphytus reticulatus*	M		**T**
Texas horned lizard	*Phrynosoma cornutum*	M		**T**
Texas tortoise	*Gopherus berlandieri*	M		**T**

Common Name	Scientific Name	County	Federal Status	State Status
Reptiles (continued)				
Trans-Pecos black-headed snake	*Tantilla cucullata*	VV		**T**
Birds				
American peregrine falcon	*Falco peregrines anatum*	M	**DL**	**E**
Arctic peregrine falcon	*Falco peregrines tundrius*	M	**DL**	**T**
Interior least tern	*Sterna antillarum athalassos*	M, VV	**E**	**E**
Black-capped vireo	*Vireo atricapilla*	VV	**E**	**E**
Brown pelican	*Pelecanus occidentalis*	VV	**E**	
Common black hawk	*Buteogallus anthracinus*	VV		**T**
Peregrine flacon	*Falco peregrines*	M	**DL**	**ET**
Zone-tailed hawk	*Buteo albonotatus*	VV		**T**
Mammals				
Gulf Coast jaguarundi	*Herpailurus yaguarondi*	M	**E**	**E**
Gray wolf	*Canis lupus*	M	**E**	**E**
Black bear	*Ursus americanus*	M	**T/SA;NL**	**T**
White-nosed coati	*Nasus narica*	M		**T**
Ocelot	*Leopardus pardalis*	M	**E**	**E**

Source: TPWD 2007a, USFWS 2007b

Notes:

E = Endangered; T = Threatened; C = Candidate; T/SA = Threatened by Similarity of Appearance; NL = Not Listed; DL = De-listed

M = Maverick County (Section M-1)

VV = Val Verde County (Section M-2A)

A biological survey of the project area, conducted November 5, 2007, recorded the presence of only one state-listed species, indigo snake (*Drymarchon corais*); and the presence of potential habitat for ocelot and jaguarundi. These two species are further discussed here. Detailed information on the methods and results of the November 5, 2007, survey and further information on the other Federal threatened or endangered species are provided in **Appendix G**.

The indigo snake is listed as threatened by TPWD. This species occupies a range that includes Texas south of the Guadalupe River and the Balcones Escarpment. It inhabits thornbush-chaparral woodlands of south Texas, in particular dense riparian corridors. The indigo snake can do well in suburban and irrigated croplands if not molested or indirectly poisoned. It requires moist microhabitats, such as rodent burrows, for shelter. An indigo snake was observed near wetland habitat in Section M-1.

The habitat of the jaguarundi is similar to that of the ocelot and is found within the Tamaulipan Biotic Province which includes several variations of subtropical thornscrub brush. Jaguarundi and ocelot both prefer dense thornscrub habitats with greater than 95 percent canopy cover. Habitat for the ocelot and jaguarundi occurs within Section M-1, although no records for either species are known from this area.

Route B

Federally and state-listed species that occur in the project corridor for Alternative 2, Route B are the same as Route A. The proposed project corridor for both routes is similar.

3.10.3 Environmental Consequences

Section 7 of the ESA requires Federal agencies to consult with the USFWS when actions might affect federally listed species or designated critical habitat. Pre-consultation coordination with the USFWS is underway for this project. The USFWS has provided critical feedback on the location and design of tactical infrastructure to avoid, minimize, or mitigate potential effects on listed species or designated critical habitat. CBP is developing the BA in coordination with the USFWS. Potential effects of tactical infrastructure construction, operation, and maintenance will be analyzed in both the BA and response document (BO or Letter of Concurrence/ Nonconcurrence, as appropriate) to accompany the Final EA.

Potential effects on federally listed species are based on currently available data. Effects are developed from a NEPA perspective and are independent of any effect determinations made for the Section 7 consultation process. Effect categories used in this document cannot be assumed to correlate to potential effects determinations which have not yet been made. Potential effects on state and federally listed species would be due to direct mortality during construction and operation, and loss of habitat (quality or quantity).

3.10.3.1 Alternative 1: No Action Alternative

Under the No Action Alternative, new tactical infrastructure would not be built and there would be no change in fencing, access roads, or other facilities along the U.S./Mexico international border in the proposed project locations within the Del Rio Sector. There would be no direct effects on threatened and endangered species and there would be no loss or alteration of habitat due to construction. However, threatened and endangered species and their habitats would continue to be indirectly affected through habitat alteration and loss due to erosion and the movement of cross-border violators through the riparian zones.

3.10.3.2 Alternative 2: Proposed Action Alternative

Under the Proposed Action, a 150-foot-wide corridor (Section M-1) and 60-foot-wide corridor (Section M-2A) containing the proposed new primary pedestrian fence, access/patrol roads, lights, and construction staging areas would be cleared along approximately 4 miles using proposed Route A (approximately 61 acres) or approximately 3 miles using proposed Route B (approximately 49 acres) during construction and a portion maintained following construction to support long-term maintenance, sight distance, and patrol activities. For the period of construction, lay-down areas for materials and equipment would be identified within the disturbed corridor.

Direct mortality during construction activities is unlikely for the ocelot, jaguarundi, or indigo snake, but the indigo snake would be the most susceptible of the three. Operational effects such as road kill of indigo snakes or disturbance of ocelots or jaguarundi potentially using the corridor, would not be anticipated to increase measurably above current conditions. The use of lights for nighttime construction and the operational use of lights would have the potential to adversely affect any ocelot and jaguarundi in the vicinity of M-2A. However, the dense habitat through which these cats tend to move resists substantial light penetration. Lights used for construction and operations would be shielded to avoid unnecessary illumination of potential habitat for these two species. Finally, the Proposed Action for M-2A is proximal to a POE and runs along the edge of Eagle Pass, areas that already experience above-normal illumination. Therefore, it is not anticipated that impacts of lights (used during construction or operations) would have more than minor adverse impacts on any ocelot or jaguarundi inhabiting the area.

Route A

Proposed construction grading for this alternative would result in 52 acres of clearing and removal of vegetation including approximately 5 acres of giant reed wetlands (habitat for the indigo snake, and movement corridor for ocelots and jaguarundi), and strips and patches of sugarberry, granjeno, and honey mesquite woodland, and honey mesquite and retama shrubland (habitat for ocelot and jaguarundi); Bermuda grassland; and Russian-thistle forbland communities. This loss of habitat within this section would result in negligible to minor (for cats and the indigo snake, respectively) short- and long-term, adverse effects on state- and Federal-listed species.

Route B

Proposed construction grading for this alternative would result in approximately 49 acres of vegetation clearing and removal (including approximately 9 acres of giant reed wetlands). Habitat loss resulting from implementation of this alternative would result in the greater potential for adverse effects on both cats and the indigo snake; however these effects would still fall within the negligible to minor range for ocelot and jaguarundi and minor to moderate for indigo snake.

3.10.3.3 Alternative 3: Secure Fence Act Alignment Alternative

Under this alternative a 150-foot-wide corridor containing the proposed new primary and secondary fences, lighting, access/patrol roads, and construction staging areas would be cleared along approximately 4 miles (approximately 57 acres) during construction and a portion maintained following construction to support long-term maintenance, sight distance, and patrol activities. For the period of construction, lay-down areas for materials and equipment would be identified within the disturbed corridor. Proposed construction grading for this alternative would result in approximately 57 acres of habitat loss (including approximately 9 acres of giant reed wetlands). Implementation of this alternative would result in moderate, short- and long-term, adverse effects on ocelot, jaguarundi, and the indigo snake and their habitats as a result of habitat loss.

3.11 CULTURAL, HISTORICAL, AND ARCHAEOLOGICAL RESOURCES

3.11.1 Definition of the Resource

Cultural resources is an umbrella term for many heritage-related resources. The NHPA focuses on historic properties, specifically, prehistoric or historic districts, sites, buildings, or structures included in, or eligible for, the National Register of Historic Places (NRHP), including related artifacts, records, and material remains. Traditional, religious, and cultural properties holding significance for Native American tribes, and Native Alaskan and Native Hawaiian organizations can also be considered NRHP-eligible. Depending on the condition and historic use, such resources might provide insight into living conditions in previous civilizations or might retain cultural and religious significance to modern groups.

Several Federal laws and regulations govern protection of cultural resources, including the NHPA (1966), the Archaeological and Historic Preservation Act (1974), the American Indian Religious Freedom Act (1978), the Archaeological Resources Protection Act (1979), and the Native American Graves Protection and Repatriation Act (NAGPRA) (1990).

Typically, cultural resources are subdivided into archaeological resources (prehistoric or historic sites where human activity has left physical evidence of that activity but no structures remain standing); architectural resources (buildings or other structures or groups of structures, or designed landscapes that are of historic or aesthetic significance); or resources of traditional, religious, or cultural significance to Native American tribes. Archaeological resources are locations containing evidence of human activity. In the Rio Grande Valley, archaeological resources dating to the prehistoric period (prior to European contact) typically consist of deposits of artifacts, such as flaked and ground stone tools; fragments of ceramic vessels; and, less commonly, bone or shell ornaments or tools; dietary refuse such as bone, shells, or burned seeds, features such as house floors, hearths, or, rarely, human remains. Archaeological resources dating to the historic period might consist of structural remains such as foundations, cisterns, or privies; features such as roads, railroad grades, levees, or water canals; or deposits of artifacts representing domestic, commercial, or other activities.

Architectural resources include standing structures such as buildings, dams, canals, bridges, transmission lines, and other structures of historic or aesthetic value. Although architectural resources generally must be more than 50 years old to be considered for protection, exceptions can be made where the structures are likely to gain value in the future.

Resources of traditional, religious, or cultural significance to Native American tribes are those that relate to the traditional practices, beliefs, and religions of a living community, and are considered essential to maintaining the identity of that culture. Traditional cultural resources might include the locations of historical or mythological events, traditional hunting or gathering areas, sacred areas, or any other location of traditional cultural importance.

3.11.2 Affected Environment

Information presented on cultural, historical, and archaeological resources is based largely upon data gathered from the THC's Texas Historic Sites Atlas and Texas Archaeological Sites Atlas. This information was supplemented by other sources, including the Bureau of Land Management's General Land Office (GLO), and regional historical and archaeological syntheses. The THC atlases provide summary information about archaeological sites and surveys, markers describing historical sites and events, neighborhood surveys, and individual properties and historic districts listed in the NRHP. Because the atlases include only architectural resources that are listed in the NRHP and none that have been determined eligible for the NRHP without having been listed, it is not a complete data set for architectural resources. It is expected that further archival research will reveal a large number of additional buildings and other resources that have been previously determined to be eligible for listing in the NRHP, and that survey and evaluation efforts will identify additional ones that have not been surveyed or evaluated. Moreover, the atlases might not reflect the results of recent archaeological surveys, and additional recorded archaeological sites, as well as previously unrecorded archaeological resources, might exist. Further research and cultural resources surveys are being conducted.

Area of Potential Effect

According to 36 CFR Part 800, the Area of Potential Effect (APE) of a Federal undertaking is defined as the geographical area within which effects on historic properties might occur if such properties hypothetically exist. The APE should account for both direct and indirect effects. 36 CFR 800.5(a)(2) specifically cites visual effects and changes to the setting of a historic property where the setting contributes to the significance of the property as adverse. Other possible adverse effects include damage or destruction of historic properties due to grading, construction, noise, or vibrations.

Under Alternative 2 (Routes A and B), direct effects would occur within a 150-foot-wide corridor in Section M-1 and a 60-foot-wide corridor in Section M-2A from proposed grading of vegetation and tactical infrastructure construction. Under Alternative 3, the proposed project corridor APE would be 150 feet wide. A larger APE has been developed for both Alternative 2 (Routes A and B) and Alternative 3 for effects on architectural resources. Topography, type, and density of vegetation and intervening development, orientation of streets and properties in relation to the alternatives, traffic patterns, and surrounding development all are factors to be considered in the definition of this latter APE.

Several Native American tribes with ancestral ties to lands within the Del Rio Sector have been contacted for input into the cultural resources survey as required under NHPA (see **Appendix C**).

Known Resources

In the following discussion, archaeological sites, historic districts, and individual properties in or near the APE that are listed in the NRHP are described. These descriptions are based on information contained in the THC Texas Historic Sites Atlas and Texas Archaeological Sites Atlas. As noted, additional resources likely occur within the APEs for Alternative 2 (Routes A and B) and Alternative 3. Further research and survey efforts to identify these resources are currently in progress.

The prehistory and history of the Del Rio area of the Rio Grande Valley are rich, unique, and important. The river has been a critical conduit for trade and transportation, and a natural border between interests to the north and the south. This is true from the earliest times. Evidence of human occupation in the region is abundant. A review of the prehistory and history of the area is presented in **Appendix H.**

Previously reported prehistoric archaeological resources within a mile of the proposed project corridor include open air campsites and lithic scatters. Temporal and cultural affiliations for these sites are unclear, and few sites are very extensive. Historic properties include a fort, courthouse, church, and residences.

Historic Property Surveys

An archaeological survey of a 150-foot-wide corridor for each proposed tactical infrastructure section (inclusive of the direct effect APEs for both Alternative 2

[Routes A and B] and Alternative 3) is in progress, as well as an architectural survey. The goal of these surveys is to identify historic properties potentially affected by the Proposed Action. The completed surveys and final findings will be provided in the Final EA. Information about previously recorded archaeological, historical, and architectural sites within the 150-foot survey corridor and within a 1-mile radius of the corridor was gathered from the THC Historic Sites Atlas and Archaeological Sites Atlas. This information was plotted on project maps, aerial photographs, and topographic maps to identify areas of interest for further identification and evaluation.

Consultations with tribes is ongoing; as of November 2007, no resources of traditional, religious, or cultural significance to Native American tribes have been identified within the APE (direct construction effects) (see **Appendix C**).

Route A

Section M-1, Route A passes through one previously recorded archaeological site. Site 41VV1714 was recorded in 1994 by a TxDOT employee but a site form was never submitted. Other than location and site number, there is no further information about this site.

There are three archaeological sites and one historic marker within one mile of Section M-1, Route A. Two of the archaeological sites are prehistoric (41WI198 and 41WI1601). The third site (41WI1713) was recorded in 1994 by the TxDOT; no site form was submitted. The marker was erected in 2003 to commemorate the Brinkley Mansion, built in 1934 by the infamous John R. Brinkley, also known as the "Goat-Gland Doctor."

Section M-2A, Route A passes through one prehistoric site. Site 41MV65 is an open-air lithic scatter of unknown cultural or temporal affiliation. No eligibility recommendation has been made.

Section M-2A, Route A passes near two properties of historical significance. These properties are summarized in **Table 3.11-1**.

Table 3.11-1. Historic Properties near the M-2A Proposed Project Corridor

Section	Historic Property	NRHP Status
M-2A	Fort Duncan National Register District	NRHP Listed 1971
M-2A	Maverick County Courthouse	NRHP Listed 1980

The Fort Duncan National Register District was listed on the NRHP by the Secretary of the Interior in 1971. The 1,000-acre historic district includes three contributing buildings that are typical examples of mid-19th-century frontier military architecture. The Maverick County Courthouse was erected in 1885 when Eagle Pass was the Maverick County Seat. The courthouse was listed on the NRHP by the Secretary of the Interior in 1980. Additional information on these historic properties is presented in **Appendix H**.

In addition to these NRHP properties and districts there are five Recorded Texas Historic Landmarks near Section M-2A. These properties are summarized in **Table 3.11-2**.

Table 3.11-2. Texas Historic Landmarks near M-2A

Section	Historic Property	Brief Description	Marker Number
M-2A	420 Commercial Street	Two-story Victorian residence constructed in the 1880s	N/A
M-2A	Church of the Redeemer	1887 Gothic Revival church	862
M-2A	Eagle Pass Post Office	1912 Renaissance Revival building currently used as library	1328
M-2A	S.P. Simpson Jr. House	1883 residence built by pioneer banker and civic leader	4402
M-2A	Lee Building	Built before 1875 and named for Gen. Robert E. Lee; originally used as sergeant quarters, now serves as a museum	5370

Local neighborhood surveys in Eagle Pass have recorded four historic homes in the area of Section M-2A. Information on the construction dates and architectural styles for these resources is incomplete. Several historic markers within Section M-2A speak to the important military history of the area including the varying designations of Fort Duncan and the men associated with them. It is assumed that with more thorough survey and evaluation, these properties and locations might be determined eligible for local or state recognition.

Route B

Section M-1, Route B does not pass through any previously recorded archaeological sites or historic properties. The three sites listed above as occurring within one mile of Section M-1, Route A, 41WI198, 41WI1601, and 41WI1713, also are within one mile of Section M-1, Route B.

Section M-2, Route B is nearly identical to Route A. It also passes through Site 41MV65, an open-air prehistoric site with no eligibility recommendation. The Fort Duncan National Historic District and the Maverick County Courthouse are within one mile of the route, as are the five Texas Historic Landmarks presented in **Table 3-11.2**.

3.11.3 Environmental Consequences

3.11.3.1 Alternative 1: No Action Alternative

Under Alternative 1, proposed tactical infrastructure would not be built and there would be no change in the Del Rio Sector. Since there would be no tactical infrastructure built, there would be no change to cultural, historical, and archaeological resources. No historic properties would be affected.

3.11.3.2 Alternative 2: Proposed Action Alternative

Minor to major long-term adverse effects would be expected under Alternative 2, Routes A and B. However, the differences in the routes in section M-1 would affect historic properties differently. Cultural resources surveys were completed for M-1 and the portion of M-2A for which Right of Entry has been obtained. Two sites were found. Both are prehistoric artifact scatters that are recommended as eligible for nomination to the NRHP under criterion D. Additional archaeological investigations and consultation with the SHPO would occur prior to construction. An historic structure survey is also being completed.

Route A

Major long-term adverse effects would be expected under Route A. Section M-1, Route A passes through one poorly known archaeological site (Site 41VV1714). No site record was ever submitted for this site and the effect of the Proposed Action cannot be known except in the event that the site is relocated and documented during archaeological survey.

Section M-2A, Route A passes through one prehistoric site (Site 41MV65), which is an open-air lithic scatter of unknown cultural or temporal affiliation. The project corridor passes near two NRHP-listed properties, the Fort Duncan National Register District and the Maverick County Courthouse (see **Appendix H**). An architectural survey is underway that will evaluate potential impacts of Alternative 2, Route A on contributing buildings of the Fort Duncan National Register District. The alternative could present long-term adverse effects on the setting and viewshed of the historic district. In addition, the construction corridor could include archaeological remains related to the early fort.

Route B

Minor to major long-term adverse effects would be expected under Route B. Section M-1, Route B would not pass through any known archaeological sites or historic properties. If no historic properties are discovered during the archaeological and architectural surveys, or through consultation with Native

American tribes, Section M-1, Route B would have no significant effect on cultural resources.

Section M-2A, Route B would follow a nearly identical route to M2-A, Route A and would be expected to affect cultural resources in the same way. M-2A, Route B would pass through Site 41MV65, a prehistoric open-air lithic scatter. The project corridor would also pass near two NRHP-listed properties, the Fort Duncan National Register District and the Maverick County Courthouse (see **Appendix H**). An architectural survey is underway that will evaluate potential impacts of Alternative 2, Route B on contributing buildings of the Fort Duncan National Register District. The alternative could present long-term adverse effects on the setting and viewshed of the historic district. In addition, the construction corridor could include archaeological remains related to the early fort.

Treatment of Historic Properties

CBP would identify measures to avoid, minimize, or mitigate adverse effects on historic properties in consultation with the THC and other parties by complying with Section 106 of the NHPA. Other consulting parties, including the THC, federally recognized Native American tribes that might attach religious and cultural significance to historic properties affected by the project, representatives of local governments, landowners, and historic preservation groups and individuals, would be involved.

Mitigation measures could include recordation of affected architectural resources to the standards outlined by the Historic American Building Survey (HABS) or Historic American Engineering Record (HAER), or recovering archaeological data through a data recovery effort. The latter might include partial or complete excavation of archaeological sites, and would be determined through consultation with the THC. Additionally, there are other treatment options that would be investigated. Methods for avoiding, minimizing, or mitigating effects on resources of traditional, religious, or cultural significance to Native American tribes would be determined in consultation with tribes having ancestral ties to the Del Rio Sector. An Unanticipated Discovery Plan would also be implemented to protect historic properties.

3.11.3.3 Alternative 3: Secure Fence Act Alignment Alternative

Effects on historic properties from Alternative 3 would be similar to Alternative 2, Route B and would be expected to be long-term and adverse.

3.12 AESTHETIC AND VISUAL RESOURCES

3.12.1 Definition of the Resource

CBP does not currently have a standard methodology for analysis and assessment of effects on visual resources. Accordingly a standard methodology developed by another Federal agency was adopted for the analysis and assessment of effects on visual resources for this EA. Methodologies reviewed included those developed by the National Park Service (NPS), the Bureau of Land Management (BLM), and the Federal Highway Administration (FHWA). It was determined that the FHWA methodology was the most applicable for this analysis due to its focus on linear corridors that include a variety of features and cross-cut a variety of landscapes. The FHWA methodology examines visual resources in similar ways (texture, contrast, visual quality) as those of NPS and BLM, but unlike those methodologies, the FHWA does not tie the assessment to the management goals for a given parcel of land (i.e., BLM- and NPS-owned land parcels typically have specific management goals and the assessment of effects on visual resources within a given parcel is tied to the management priorities for those parcels).

The discussion in the following paragraphs summarizes the methology presented in FHWA Publication No. FHWA-HI-88-054: *Visual Impact Assessment for Highway Projects* (USDOT undated). Under the FHWA approach, the major components of the visual analysis process include establishing the visual environment of the project, assessing the visual resources of the project area, and identifying viewer response to those resources.

Establishing a Visual Environment. Two related steps are performed to characterize the visual environment: (1) develop a framework for visual assessment that will help compare project alternatives, and (2) define the physical limits of the visual environment that each alternative might affect. The landscape classification process establishes the general visual environment of a project and its place in the regional landscape. The starting point for the classification is an understanding of the landscape components that make up the regional landscape, which then allows comparisons between landscapes. Regional landscapes consist of landforms (or topography) and land cover. It should be noted that land cover is not equivalent to land use, as that term is defined and used in **Section 3.3**. Land cover is essential to the identification of what features (e.g., water, vegetation, type of man-made development) dominate the land within a given parcel. Examples of land cover would include agricultural field, residential development, airport, forest, grassland, and reservoir. While there is some overlap with land use, land cover does not distinguish function or ownership of parcels.

Relatively homogenous combinations of landforms and land cover that recur throughout a region can be considered landscape types. To provide a framework for comparing the visual effects of the project alternatives, regional landscape is divided into distinct landscape units; these are usually enclosed by clear landform or land cover boundaries and many of the views within the unit are inward-looking. Landscape units are usually characterized by diverse visual resources, and it is common for several landscape types to be in view at any one time.

Assessing the Visual Resources. An assessment of the visual resources within a project area involves characterization of the character and quality of those resources. Descriptions of visual character can distinguish at least two levels of attributes: pattern elements and pattern character. Visual pattern elements are primary visual attributes of objects; they include form, line, color, and texture. Awareness of these pattern elements varies with distance. The visual contrast between a project and its visual environment can frequently be traced to four aspects of pattern character: dominance, scale, diversity, and continuity.

Visual quality is subjective, as it relies on the viewer's enjoyment or interpretation of experience. For example, there is a clear public agreement that the visual resources of certain landscapes have high visual quality and that plans for projects in those areas should be subject to careful examination. Approaches to assessing visual quality include identifying landscapes already recognized at the national, regional, or local level for their visual excellence (e.g., National Historic Landmarks [NHLs], National Scenic Rivers); asking viewers to identify quality visual resources; or looking to the regional landscape for specific resource indicators of visual quality. One evaluative approach that has proven useful includes three criteria: vividness (the visual power or memorable character of the landscape), intactness (the visual integrity of the natural and man-made landscape and its freedom from encroaching elements), and unity (the visual coherence and compositional harmony of the landscape considered as a whole). A high value for all three criteria equates to a high visual quality; combinations of lesser values indicate moderate or low visual quality. It should be noted that low visual quality does not necessarily mean that there will be no concern over the visual effects of a project. In instances such as urban settings, communities might ask that projects be designed to improve existing visual quality.

Identifying Viewer Response. An understanding of the viewers who might see the project and the aspects of the visual environment to which they are likely to respond is important to understanding and predicting viewer response to the appearance of a project. The receptivity of different viewer groups to the visual environment and its elements is not equal. Viewer sensitivity is strongly related to visual preference; it modifies visual experience directly by means of viewer activity and awareness, and indirectly by means of values, opinions, and preconceptions. Because viewers in some settings are more likely to share common distractions, activities, and awareness of their visual environment, it is reasonable to distinguish among project viewers located in residential, recreational, and industrial areas.

Visual awareness is the extent to which the receptivity of viewers is heightened by the immediate experience of visual resource characteristics. Visual change heightens awareness, for example, a landscape transition, such as entering a mountain range or a major city, can heighten viewer awareness within that particular viewshed. Measures that modify viewer exposure, such as selective clearing or screening, can also be deliberately employed to modify viewer awareness. Viewers also tend to notice and value the unusual, so they might see more value in preserving the view towards a particularly dramatic stand of trees than the view towards more ubiquitous landscape features.

Local values and goals operate indirectly on viewer experience by shaping view expectations, aspirations, and appreciations. For example, at a regional or national level, viewers might be particularly sensitive to the visual resources and appearance of a particular landscape due to its cultural significance, and any visual evidence of change might be seen as a threat to these values or resources. Concern over the appearance of the proposed action often might be based on how it will affect the visual character of an area rather than on the particular visual resources it will displace.

Aesthetics is the science or philosophy concerned with the quality of visual experience. One cannot meaningfully assess the effects of an action on visual experience unless one considers both the stimulus (visual resources) and the response (viewers) aspects of that experience.

3.12.2 Affected Environment

Route A

Visual Environment. Primary landform types present within the APEs include the Rio Grande channel and that of a stream that intersects the Rio Grande on the south side of Del Rio in Section M-1, the floodplains and terraces of those waterways, and the bluff along the river in Section M-2A. Within the Rio Grande terrace are a number of abandoned meander loops, some containing water (ponds) and some only visible as traces on aerial photographs.

Land cover overlying these landforms can be simplified into four primary types: agricultural, developed, undeveloped, and water with developed composing the dominant land cover type in both Sections M-1 and M-2A (see **Section 3.3**). There are also certain features that cross-cut or link land cover types, such as transportation features (e.g., highways, paved and unpaved roads, bridges).

Although there is significant development in both Sections M-1 and M-2A, views that contain only agricultural and undeveloped areas remain within each section. Accordingly, the most applicable landscape unit types that can be defined for these sections are agricultural/undeveloped and urban/industrial. **Figures 3.12-1** and **3.12-2** show the range of variation of views within these landscape units.

Figure 3.12-1. Photograph View of Del Rio Residential Areas (Section M-1)

Figure 3.12-2. Photograph View of Rio Grande Channel from Bluff (Section M-2A)

The agricultural/undeveloped unit includes the terraces and floodplain of the Rio Grande where they are overlain by agricultural fields, grazing areas, or undeveloped, open areas. The underlying landforms are clearly visible and play the primary role in the layout or location of overlying features. Typical features include field breaks, irrigation features, dirt roads, and isolated structures such as electrical transmission lines or water tanks.

The urban/industrial unit includes the terraces of the Rio Grande where they are overlain by moderate- to high-density mixed use development. The underlying landforms are almost completely masked by man-made features and play little or no role in the layout or location of overlying features. Typical features include buildings of varying heights, sizes, and materials; a mixture of gridded and nongridded road networks (primarily paved); planned park areas (often near water sources); open paved areas (e.g., parking areas); the larger POEs; industrial and commercial areas; overhead utility lines on poles; elevated roadways and overpasses; and elevated signage.

Character and Quality of Visual Resources. **Tables 3.12-1** and **3.12-2** provide summaries of the visual character and quality, respectively, of visual resources observed within the landscape units within the Del Rio Sector. Values reflect visual character and visual quality of resources visible from distances of 50 feet to 1,000 feet (see **Figure 3.12-3**). Typically, the amount of visual clutter between the viewer and the proposed project corridors would increase with distance.

Table 3.12-1. Character of Visual Resources within Typical Del Rio Sector Landscape Units (Current Conditions)

Landscape Unit	Line	Color	Form	Texture
Agricultural/ Undeveloped	Primarily horizontal lines (fields, roads, canals), with occasional vertical elements (silos, utility towers, tree lines, buildings)	Earthy colors (bare earth and crops)	Mixture of angled and curved forms (roads and buildings vs. rolling hills and meandering river)	Relatively subtle variations in texture (mostly bare earth or crops)
Urban/ Industrial	Vertical lines more prominent than horizontal, except for viewers on the river side of Del Rio in Section M-1 (view of levee and agricultural fields has more horizontal lines)	Often a high variety of colors associated with buildings, signs, green spaces	Primarily rectilinear forms but can be punctuated by curves from more elaborate architecture or organic shapes of natural elements	Variety of textures related to different building materials against natural textures in green spaces

Table 3.12-2. Quality of Visual Resources within Typical Del Rio Sector Landscape Units (Current Conditions)

Landscape Unit	Vividness	Intactness	Unity	Rating
Agricultural/ Undeveloped	Moderate	Moderate/High	Moderate/High	Moderate/High
Urban/Industrial	Low to High	Moderate	Low to High	Moderate

In terms of visual quality, the analysis presumes that any view that includes the Rio Grande constitutes a high-quality view, except for views dominated by industrial or commercial elements (e.g., views of the POEs). Similarly, given that quality of view can be somewhat subjective, it is possible to find at least one low- and one high-quality view within any landscape unit type. Rather than simply provide a range of ratings of low to high for each, the quality of the most common views within a given landscape unit type was used.

In addition to these averaged assessments of visual character and quality of resources within each landscape unit type, there are a number of specific visual resources considered to be of particular importance because of their natural or cultural value, such as those listed in the following:

- Brinkley Mansion historical marker (Section M-1)
- Fort Duncan Historic District and Park (Section M-2A)
- Maverick County Courthouse (Section M-2A)
- 420 Commercial Street (Texas Historical Landmark, Section M-2A)
- Church of the Redeemer (Texas Historical Landmark, Section M-2A)
- Eagle Pass Post Office (Texas Historical Landmark, Section M-2A)
- S.P. Simpson Jr. House (Texas Historical Landmark, Section M-2A)
- Lee Building (Texas Historical Landmark, Section M-2A)
- Shelby Park (Section M-2A)
- Eagle Pass Golf Course (Section M-2A).

Viewer Response. The pool of viewers making up the affected environment includes single individuals, such as rural landowners on whose property the primary pedestrian fence would be constructed, and groups of individuals such as residents and business owners in the cities of Del Rio and Eagle Pass, or recreational users of public access recreation areas. Viewers could also include avocational groups such as local historical societies or local chapters of the National Audubon Society that have interests in preserving the settings of cultural or natural resources. These viewers are likely to have both individual responses to specific resources related to their experiences and emotional connection to those resources, as well as collective responses to visual resources considered to be important on a regional, state, or national level. Although individual viewer responses will be captured where possible from viewer comments, for the

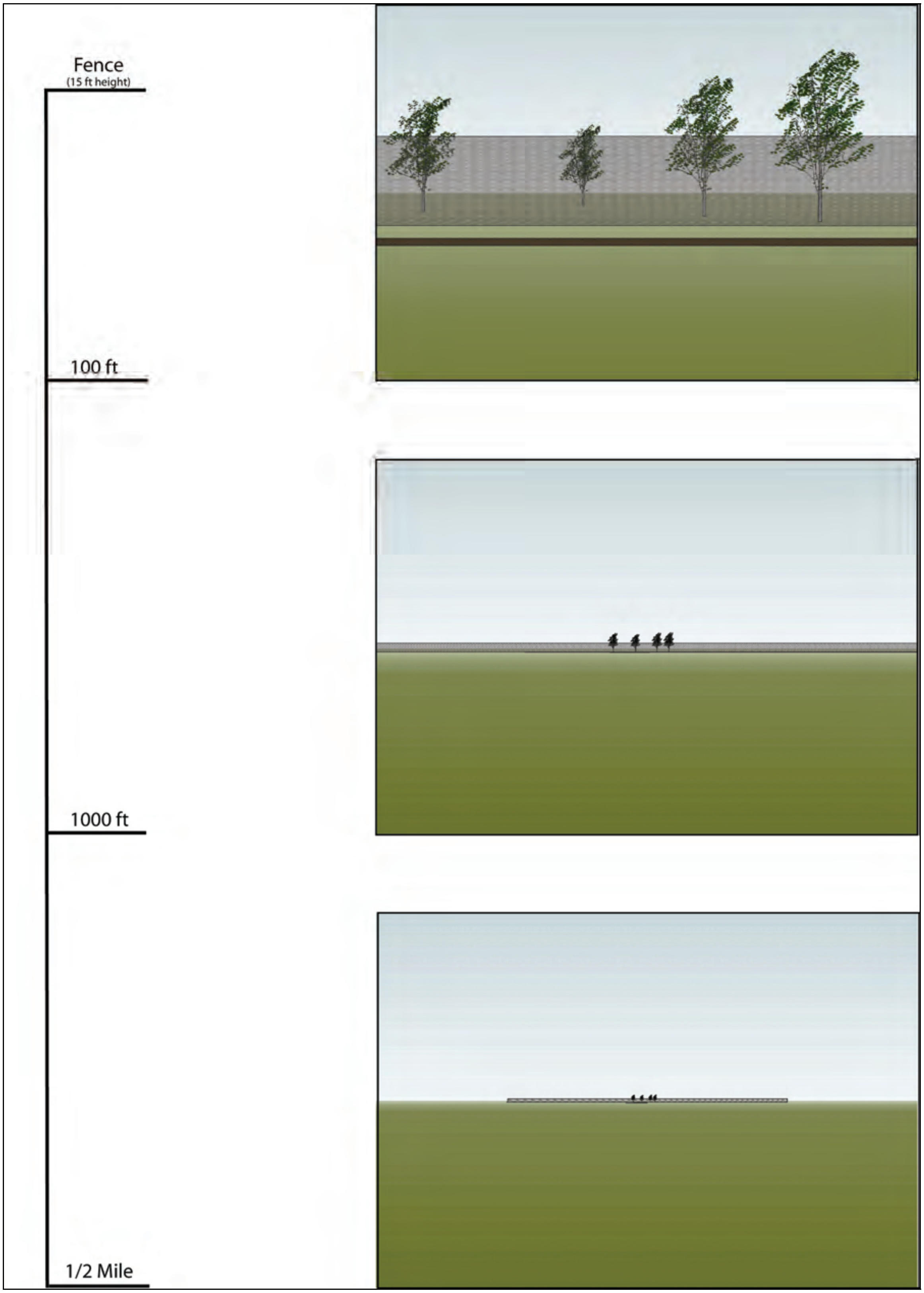


Figure 3.12-3. Schematic Showing Visibility of Fencing at Various Distances

purposes of this analysis, the pool of affected viewers will be grouped into the following general categories:

- Residential viewers
  - Urban residents
- Commercial viewers
  - Urban businesses
- Industrial viewers
  - Town and urban
- Recreational viewers
  - Tourists visiting towns and cities
- Special interest viewers
  - Native American tribes
  - Local historical societies
  - Local chapters of conservation societies (e.g., Audubon Society)
  - Park commissions
  - Regulatory agencies (e.g., USFWS, THC)
- Intermittent viewers (view primarily from transportation corridors)
  - Commuters
  - Commercial (e.g., truck drivers).

Within each of these categories, viewer response will also vary depending on the typical duration of exposure to visual resources and the typical distance from which they view those resources. For example, a residential viewer who currently has an unobstructed view of a high-quality resource from their backyard would be affected differently than a residential viewer who lives several streets away and already has an obstructed view of those resources, or a viewer that only views the resource from the highway as they pass through the region.

Route B

The character and quality of visual resources would be same for Route B as it is for Route A. The pool of viewers and viewer response would be expected to be similar. Route B would be similar to Route A.

3.12.3 Environmental Consequences

The Proposed Action would affect visual resources both directly and indirectly. Construction of tactical infrastructure would result in the introduction of both temporary (e.g., heavy equipment, supplies) and permanent (e.g., fencing and patrol roads) visual elements into existing viewsheds. Clearing and grading of the landscape during construction would result in the removal of visual elements from existing viewsheds. Finally, the primary pedestrian fence sections would create a physical barrier potentially preventing access to some visual resources.

Effects on aesthetic and visual resources would include short-term effects associated with the construction phase of the project and use of staging areas, recurring effects associated with monitoring and maintenance, and long-term effects associated with the completed action. Effects can range from minor, such as the effects on visual resources adjacent to the proposed project corridor when seen from a distance or when views of primary pedestrian fences are obstructed by intervening elements (e.g., trees, buildings) to major, such as the intrusion of primary pedestrian fence sections into high-quality views of the Rio Grande or the setting of an NHL. The nature of the effects would range from neutral for those land units containing lower quality views or few regular viewers, to adverse, for those land units containing high-quality views, important cultural or natural resources, or viewers who would have constant exposure to the primary pedestrian fence at close distances. Beneficial effects are also possible (e.g., addition of the primary pedestrian fence increases the unity or dramatic effect of a view, removal of visual clutter within the proposed project corridor clarifies a view, or a viewer positively associates the primary pedestrian fence with a feeling of greater security), but are considered to be less common.

3.12.3.1 Alternative 1: No Action Alternative

Under Alternative 1, proposed tactical infrastructure would not be built and there would be no change in fencing, patrol roads, or other facilities along the U.S./Mexico international border in the proposed project locations within the USBP Del Rio Sector. Therefore, there would be no adverse effects attributable to construction, operation, or maintenance of the proposed tactical infrastructure. Conversely, the potential beneficial effects of unifying a cluttered landscape in some areas would not be realized, however minor or subjective this beneficial effect might be.

3.12.3.2 Alternative 2: Proposed Action Alternative

Under Alternative 2, a single line of primary pedestrian fence and an associated patrol road would be constructed along either the routing depicted as Route A or as Route B (see **Appendix D**). Although the choice of routing might alter the effects on specific visual resources within the proposed project corridor (e.g., avoidance of a section of park/refuge or culturally significant resource), the broader visual effects associated with the two routes are comparable.

Route A

Project Characteristics. The primary introduced visual elements associated with Route A in Section M-1 would be the single line of fencing, gates, patrol roads, access roads, and construction clutter (stockpiles of supplies and heavy equipment during construction). Route A would also potentially remove existing visual elements, such as buildings, vegetation, and subtle landforms (through grading or filling) that occur within the proposed project corridor. Finally, the primary pedestrian fence would act as a physical barrier between viewers and those views that can only be viewed from vantage points on the other side of the fence.

Addition of fencing and the associated patrol road, removal of existing elements from the proposed project corridor in Section M-1, and the loss of access to specific visual resources due to the fact that the primary pedestrian fence is a barrier would have long-term effects on visual resources, while the remaining elements would have temporary or short-term effects limited to the period of construction. The nature (adverse or beneficial) and degree (minor to major) of the long-term effects can be affected by the appearance of the fencing (width, height, materials, color), the patrol road (paved or unpaved, width), the lighting configuration (number of lighting poles, number of lights per pole, angle and screening of lights), and the access roads (number, paved or unpaved, width).

Removal of existing visual elements in Section M-1 and the northern portion of Section M-2A would also constitute a long-term effect. Where the existing element adds to the visual character and quality of the resource, such as the giant reed, the effect of its removal would be adverse. In the case of the giant reed, the replacement of the reed with native vegetation might eventually mitigate this effect and could even improve the quality of the views in this area. Where the existing element detracts from the visual character and quality of the resource (e.g., rusted equipment or dead trees), the effect of removal could be beneficial. In all cases, removal of existing elements would have the net result of exposing more of the primary pedestrian fence, patrol road, and other tactical infrastructure; in settings where the addition of the fence is considered to have a major adverse effect on visual resources, any benefit occurring from removal of existing elements would be outweighed by the more dominant adverse visual effect of the primary pedestrian fence.

The effects associated with the loss of access to specific visual resources in Section M-1 and the northern portion of Section M-2A can be affected primarily by the placement of the primary pedestrian fence relative to those resources and inclusion of gates that allow access to those resources. CBP has already included provisions for a number of gates to allow access to agricultural fields, businesses, and cemeteries. These gates also allow access to some of the visual resources that would otherwise be blocked.

The patrol road would be the existing road between the bluff and the river bank. The primary new visual addition to the corridor would be lighting poles, placed at approximately 100-yard intervals along the patrol road. Clearing of vegetation and some cutting of the bluff would likely be required as part of the retaining wall construction.

Visual Resource Concerns. In **Section 3.12.2**, **Tables 3.12-1** and **3.12-2** provided a summary of the character and quality of visual resources currently present within the proposed project corridor. **Tables 3.12-3** and **3.12-4** show how implementation of Route A would likely alter the character and quality of existing visual resources within each landscape unit. **Figures 3.12-4** and **3.12-5** provide examples of typical effects; these images show the effects associated with the addition of a fence constructed using a type of primary pedestrian fence currently being constructed in other USBP sectors. These photographs provide approximations of the degree of alteration that would result from introduction of the primary pedestrian fence and patrol road to these viewsheds.

In Section M-1, most viewers look out across agricultural fields towards the Rio Grande and, beyond that, to an urban landscape backed by mountains. In Section M-2A, viewers are closer to the Rio Grande, but views on the opposite bank are primarily natural vegetation backed by mountains. Views in the southern portion of Section M-2A could also include Shelby Park or the Eagle Pass Golf Course in the foreground, the international bridge and Eagle Pass POE and the Rio Grande in the mid-ground, and an urban landscape backed by mountains in the far ground.

From within Del Rio or Eagle Pass, typically greater screening of the primary pedestrian fence would be expected due to the greater variety of lines, colors, forms, and textures present. More common occurrences of other tactical infrastructures and tall or massive forms would also increase the ability of the tactical infrastructure to blend with its surroundings in Section M-1 and the northern part of Section M-2A. The effect of the tactical infrastructure at closer distances would vary depending on its immediate setting; the more exposed the primary pedestrian fence is the greater the contrast between it and surrounding elements, the greater the visual effect. For Section M-1 and the northern part of Section M-2A, the impacts would range from minor to major, and neutral to adverse. The FHWA guidance (USDOT undated) cites examples where addition of a consistent aesthetic element to an urban setting helps create greater unity to the views within the land unit, thus resulting in a beneficial effect. Although this outcome is possible within this land unit type, a review of the settings along the proposed project corridor suggests that the best-case scenario would be a neutral or minor adverse effect.

In the southern part of Section M-2A, where the primary pedestrian fence would consist of a retaining wall on the river side of the existing bluff, the primary effect related to the Proposed Action would be from the lighting along the patrol road. The poles themselves should blend with existing visual clutter at a distance, but would be noticeable intrusions in the backyards of people living along the bluff. Perhaps more importantly, though, the pool of light generated by the lights would be a new visual element in the nighttime view for anyone looking towards the Rio Grande in this direction; depending on the intensity of the light and the amount of background lighting associated with the POE and the development across the

Table 3.12-3. Effect on the Character of Visual Resources within Typical Del Rio Sector Landscape Units

Landscape Units	Line	Color	Form	Texture
Agricultural/ Undeveloped	At short distances the fence would introduce a primarily horizontal line that might blend with other dominant horizontal lines. With greater distance, the vertical posts of the fence might blend where other vertical elements are present (power poles, silos, remote video surveillance system) depending on the height of those elements in each area. The regularity of the lines could contrast with less regular lines.	The current fence design parameters call for fencing to be black. Although the vertical posts in the fence might blend with tree trunks, choice of a color scheme that matches the dominant vegetation would reduce the impact.	The fence and patrol road are rectilinear in form and might result in greater domination of rectilinear forms compared to organic forms when viewed at a distance.	As a man-made, synthetic element, the fence would contrast with the dominant textures of this land unit. The patrol roads and access roads would not significantly alter the viewshed for most rural landscapes, as a number of roads and field breaks are already present in this land unit.
Urban/ Industrial	In Section M-1, views include a mix of vertical and horizontal lines. In Section M-2A, linear elements are more typically horizontal. The introduction of additional linear features would be consistent with the existing landscape from a distance. In closer proximity, however, the height and regularity of the fence line would likely contrast with existing lines.	The pedestrian fence proposed for all sections except the southern portion of Section M-2A is black, which might blend or contrast with its surroundings depending on the colors in the foreground and background.	Against a more natural or organic background, such as what viewers see in Section M-2A, the fence would be a noticeable contrast. Against a more developed background (Section M-1), the form and massing of the fence would be less of a contrast.	Except where the fence would be constructed within or immediately adjacent to existing development, the texture of the fence would contrast with natural elements around it. From a distance, the texture of the fence would blend against urban backgrounds that contain mixed textures, but would stand out relative to more natural backgrounds.

Table 3.12-4. Quality of Visual Resources within Typical Del Rio Sector Landscape Units After Proposed Construction

Land Units	Vividness	Intactness	Unity	Rating
Agricultural/ Undeveloped	Moderate	Moderate/High	Moderate	Moderate
Urban/Industrial	Low to Moderate	Low/Moderate	Low to Moderate	Moderate

Figure 3.12-4. Typical Views towards Proposed Project Corridor, Section M-1

Figure 3.12-5. Typical Views towards Proposed Project Corridor, Section M-2A (Northern Portion)

river in Mexico, the pool of light might blend or stand in stark contrast to a typically dark setting. Accordingly, effects on visual resources in the southern part of Section M-2A would range from minor to major, and neutral to adverse.

Finally, with respect to the effects on the specific visual resources listed in **Section 3.12.2**, implementation of Route A would likely have short- or long-term adverse effects on the settings of those resources. The greater the distance between the resource and the intrusive visual elements (primarily the primary pedestrian fence), and the more intervening visual elements between them, the less the degree of the effect. For example, construction of the primary pedestrian fence at a distance of 60 feet from a historic building would typically constitute a major adverse effect, while construction of the primary pedestrian fence several hundred feet from the resource with intervening vegetation or buildings would reduce the effect to moderate or minor. Placement of the fence within the boundaries of an NHL or historic district, particularly where there is a high degree of visual continuity between resources (few noncontributing elements) would also be considered a major adverse effect on that resource. A more detailed discussion of the effects on the settings or viewsheds of specific cultural resources is provided in **Section 3.11.3**.

Intrusions into the settings or viewshed of many of these resources would need to be avoided, minimized, or mitigated depending on the extent and duration of the effect. Mitigation measures could include HABS documentation of historic resources, use of different fence materials (e.g., use of brick facing on a fence where surrounding buildings are brick construction) or change of color of fencing to blend into natural settings.

Viewer Response Concerns. In many respects, the principle of “not in my backyard” has a strong correlation with the responses of viewers for whom view of the primary pedestrian fence would be regular or constant (i.e., residential, commercial, or industrial viewers). Where the primary pedestrian fence would directly affect private property, the viewer response from the landowner would likely to be that Route A would represent a major adverse effect on visual resources visible from their property. In the case of the properties in Eagle Pass, however, the use of a retaining wall on the backside of the bluff might be considered less of an adverse effect than the clearing of vegetation (including the giant reeds) from the proposed project corridor. As vegetation is reestablished along the banks of the Rio Grande, the long-term effect might become neutral. There is also a possibility that the viewer response in this instance could be beneficial, based on a feeling of increased safety or security (e.g., fence as protection). Responses from viewers located a greater distance from the primary pedestrian fence, particularly if their view of the fence is obstructed by other elements or is simply part of the overall visual clutter, would typically be less intense (minor) and more likely neutral, unless the fence would obstruct a visual resource considered to be of high quality or cultural importance. In general, the closer the proximity of the viewer to the fence, the more likely the response is to be major and adverse.

For viewers likely to view the primary pedestrian fence on a less-regular basis (i.e., recreational viewers, special interest viewers, intermittent viewers), viewer responses would be tied to perception of how the proposed tactical infrastructure would alter their access (impede existing views or impede physical access to views) to valued visual resources. Although any of these groups might object on principal to any type of alteration or feel a beneficial response due to a sense of increased security, responses would be more intense and adverse where alterations downgrade the quality or character of existing visual resources.

As a final point, for viewers accustomed to accessing views available from settings other than parks or refuges, the construction of the tactical infrastructure would place a permanent barrier between the viewer and the visual resources in those locales. By presumption, any visual resource regularly sought out by a viewer would constitute a moderate- or high-quality visual resource; and restricting physical access to those resources would thus constitute a long-term major adverse effect for those viewers.

Route B

Route B was developed to decrease the extent to which the primary pedestrian fence would physically affect certain cultural and natural resources. This route would reduce or remove some of the effects related to access when compared to Route A.

Project Characteristics. The physical characteristics of Route B are similar to those for Route A, discussed above.

Visual Resource Concerns. To the extent that Route B mirrors Route A, the concerns regarding visual resources would be expected to be identical to those discussed for Route A. Where Route B deviates from Route A, the deviation is typically done to minimize an effect on a natural or cultural resource, resulting in a lesser visual effect relative to that resource.

Viewer Response Concerns. Implementation of Route B would improve viewer responses relative to effects on specific sensitive resources, since Route B would avoid some of those resources. Otherwise, the viewer response concerns would be expected to be comparable to those discussed for Route A.

3.12.3.3 Alternative 3: Secure Fence Act Alignment Alternative

Project Characteristics. In addition to those physical characteristics already noted for Alternative 2, Alternative 3 would involve addition of a second line of tactical infrastructure (permanent element, long-term effect) and remove a greater number of existing visual elements due to the larger proposed project corridor compared to Alternative 2, Route A. As with the single line of fencing in Alternative 2, choice of fence colors and material types could affect the nature (adverse, neutral, beneficial) or intensity (minor to major) of the effects on visual resources in certain land units or viewshed, as could removal of existing visual elements. In general, however, having two lines of fencing would amplify the overall visual effect of Alternative 2, as would the larger proposed project corridor. Effects related to the physical characteristics of Alternative 3 would be, therefore, likely to be major and adverse compared to those of Alternative 2.

Visual Resource Concerns. Implementation of Alternative 3 would also amplify the effects on the character and quality of visual resources within each of the land units compared to Alternative 2. The additional line of tactical infrastructure would have a greater visual contrast and a greater chance of dominating the view in most settings, although one could argue that parallel lines of tactical infrastructure would potentially add more visual unity to some settings. Long-term effects on the visual environment associated with Alternative 3 (permanent construction elements) would range from neutral to adverse, and moderate to major. Short-term effects would also be more adverse and intense (moderate to major) given that construction of a double fence and wider corridor could take more time.

Viewer Response Concerns. Implementation of Alternative 3 would also amplify viewer responses, in most cases changing minor or neutral responses to moderate or major adverse responses. For viewers with constant or close proximity exposure, a double line of tactical infrastructure and larger corridor would be perceived as doubly intrusive. The proposed project corridor would intrude more closely on many landowners, increase the number of viewers that would have regular exposure, and further complicate access to visual resources behind the far line of fencing. For viewers with less regular exposure, Alternative 3 would likely be perceived as having a greater effect than Alternative 2, simply because it makes effects on various visual resources more difficult to avoid.

3.13 SOCIOECONOMIC RESOURCES, ENVIRONMENTAL JUSTICE, AND PROTECTION OF CHILDREN

3.13.1 Definition of the Resource

Socioeconomics. Socioeconomics is defined as the basic attributes and resources associated with the human environment, particularly characteristics of population and economic activity.

Socioeconomic data in this section are presented at census tract, county, and state levels to characterize baseline socioeconomic conditions in the context of regional and state trends. Census tracts are designed to be relatively homogenous units with respect to population characteristics, economic status, and living conditions at the time of establishment. Data have been collected from previously published documents issued by Federal, state, and local agencies; and from state and national databases (e.g., U.S. Census Bureau).

Environmental Justice and Protection of Children. There are no Federal regulations specifically addressing socioeconomics; however there are two EOs that pertain to environmental justice issues. These are included in the socioeconomics analysis because they relate to specific socioeconomic groups and the health effects that could be imposed on them. On February 11, 1994, President Clinton issued EO 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*. This EO requires that Federal agencies' actions substantially affecting human health or the environment do not exclude persons, deny persons benefits, or subject persons to discrimination because of their race, color, or national origin. The purpose of the EO is to ensure the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. Fair treatment means that no groups of people, including racial, ethnic, or socioeconomic groups, should bear a disproportionate share of the adverse environmental consequences resulting from industrial, municipal, and commercial operations or the execution of Federal, state, tribal, and local programs and policies. Consideration of environmental justice concerns includes race, ethnicity, and the poverty status of populations in the vicinity of a proposed action. Such information aids in evaluating whether a proposed action would render vulnerable any of the groups targeted for protection in the EO.

EO 13045, *Protection of Children From Environmental Health Risks and Safety Risks*, addresses the Federal policy of protection of children from exposure to disproportionate environmental health and safety risks. This EO established that each agency has a responsibility to ensure that its policies, programs, activities, and standards address risk to children that results from environmental health risks or safety risks.

3.13.2 Affected Environment

Route A

Socioeconomics. Proposed tactical infrastructure would occur adjacent to residential and commercial areas in the United States. The most current census tract data are from Census 2000. Section M-1 is within Val Verde County, Census Tract 9507 and Section M-2A is within Maverick County, Census Tract 9505. For the purposes of this project, Census Tracts 9507 is considered the Region of Influence (ROI) in Val Verde County and Census Tract 9505 is considered the ROI in Maverick County.

The largest employment type in Census Tract 9507, Val Verde County, Census Tract 9505, Maverick County, and Texas is educational, health, and social services, which accounts for 25.0, 21.4, 32.5, 26.7, and 19.3 percent, respectively, of employed persons (see **Table 3.13-1**) (U.S. Census Bureau 2002). Construction accounts for 5.9 percent of the employed persons in Census

Tract 9507, 7.5 percent in Val Verde County, 2.7 in Census Tract 9505, 6.8 percent in Maverick County, and 8.1 percent in the State of Texas.

In 2006, Val Verde and Maverick counties had unemployment rates of 6.1 percent and 13 percent, respectively, compared to a 4.9 percent unemployment rate for Texas (Fedstats 2007a, 2007b). **Table 3.13-2** shows demographic data and economic indicators of the ROI, Val Verde and Maverick counties, and the State of Texas.

The populations of Ciudad Acuña and Piedras Negras, Mexico, are approximately 124,232 and 142,011, respectively. The Del Rio POE connects Ciudad Acuña and Del Rio (TxDOT 2007a). There are two POEs (Camino Real International Bridge and Eagle Pass Bridge I) and one international rail bridge that connect Eagle Pass to Piedras Negras.

Environmental Justice and Protection of Children. The ROI is considered to have a disproportionately high percentage of low-income or minority residents under either of two conditions: (1) the percentage of low-income or minority populations within each census tract is greater than its perspective county's minority percentage or low-income percentage, or (2) the percentage of persons in low-income or minority populations within each census tract is greater than 50 percent. Census Tract 9507 has a higher percentage of low-income residents than the county. **Table 3.13-2** shows that 28.9 percent of the population in Census Tract 9507 is living below the poverty level as compared to 26.1 percent in Val Verde County and 15.4 percent in Texas. Census Tract 9505 has a higher percentage of minority and low-income residents than Maverick County (see **Table 3.13-2**). Approximately 32 percent of residents in Census Tract 9505 reported to be a minority (i.e., race other than "white alone") compared to 29.1 percent in Maverick County. In addition, approximately 37.2 percent of the population in Census Tract 9505 live below the poverty line, as compared to 34.8 percent in Maverick County and 15.4 percent in the State of Texas.

Residents living in the ROI have a lower median household income than that of their respective county and the State of Texas (see **Table 3.13-2**). However, the per capita incomes of Census Tracts 9507 and 9505 are higher than Val Verde and Maverick counties, respectively, but lower than the State of Texas.

Route B

Socioeconomics, Environmental Justice, and Protection of Children is the same for Route B as Route A. The primary difference between Route B and Route A is that Route B would be south of the existing residential and commercial structures along Garza Lane and Rio Grande Road (in Section M-1).

Table 3.13-1. Employed Persons by Industry Type in Census Tracts, Val Verde and Maverick Counties, and the State of Texas (Percent)

Economic and Social Indicators	Census Tract 9507	Val Verde County	Census Tract 9505	Maverick County	State of Texas
Employed Persons in Armed Forces	0.6	4.0	0.4	0.1	0.7
Employed Persons in Civilian Labor Force (By Industry)					
Agriculture, forestry, fishing and hunting, and mining	1.8	2.8	5.0	3.8	2.7
Construction	5.9	7.5	2.7	6.8	8.1
Manufacturing	10.6	10.7	8.6	10.1	11.8
Wholesale trade	1.3	2.1	2.9	2.0	3.9
Retail trade	8.8	13.8	14.8	14.7	12.0
Transportation and warehousing, and utilities	6.6	6.0	5.5	9.6	5.8
Information	0.4	1.0	1.2	1.2	3.1
Finance, insurance, real estate, and rental and leasing	5.9	3.6	4.0	3.7	6.8
Professional, scientific, management, administrative, and waste management services	5.3	5.5	3.6	3.3	9.5
Educational, health and social services	25.0	21.4	32.5	26.7	19.3
Arts, entertainment, recreation, accommodation and food services	10.1	8.4	6.5	5.8	7.3
Other services (except public administration)	7.9	5.3	2.9	4.7	5.2
Public administration	10.5	11.9	10.0	7.6	4.5

Source: U.S. Census Bureau 2002

Note: Census 2000 data are the most recent comprehensive employment data for the ROI.

Table 3.13-2. Demographic and Economic Characteristics of Census Tracts, Val Verde and Maverick Counties, and the State of Texas

	Census Tract 9507	Val Verde County	Census Tract 9505	Maverick County	Texas
Total Population	6,397	44,856	5,685	47,297	20,851,820
Percent White	81.1	76.4	68.0	70.9	71.0
Percent Black or African American	0.9	1.5	0.4	0.3	11.5
Percent American Indian Alaska Native	0.7	0.7	0.5	1.3	0.6
Percent Asian	0.1	0.6	1.0	0.4	2.7
Percent Native Hawaiian and Other Pacific Islander	0.1	0.1	0.0	<0.1	0.1
Percent "Some other race"	14.7	18.2	26.5	24.1	11.7
Percent Reporting 2 or more races	2.4	2.6	3.7	2.9	2.5
Percent Below Poverty	28.9	26.1	37.2	34.8	15.4
Per Capita Income	$13,070	$12,096	$9,644	$8,758	$19,617
Median Household Income	$23,667	$28,376	$17,218	$21,232	$39,927

Source: U.S. Census Bureau 2002

Note: Census 2000 data are the most recent comprehensive economic and demographic data for the ROI.

3.13.3 Environmental Consequences

3.13.3.1 Alternative 1: No Action Alternative

Alternative 1 would result in continuation of the existing baseline socioeconomic conditions, as discussed in **Section 3.13.2**. Under this alternative, illegal immigration, narcotics trafficking, and opportunities for terrorists and terrorist weapons to enter the United States would remain. Over time, the number of crimes committed by smugglers and some cross-border violators would increase, and an increase in property damage would also be expected.

3.13.3.2 Alternative 2: Proposed Action

Route A

Socioeconomics. Short-term minor direct beneficial effects would be expected as a result of construction associated with Alternative 2, Route A. The construction activities would occur from Spring 2008 to December 2008. Some local materials, supplies, and contractors would be used, providing a minor beneficial effect on the local economy through new jobs and increased local spending. Construction of the proposed tactical infrastructure would require up to 75 workers consisting of one fabrication crew (35 workers) and one installation crew (40 workers) completing one mile of tactical infrastructure per month. Based upon U.S. Census data, there are 1,051 and 872 construction workers in Val Verde and Maverick counties, respectively, which represents approximately 7 percent and 9 percent of the number of workers required to construct the proposed tactical infrastructure in the USBP Del Rio Sector, respectively (U.S. Census Bureau 2002). Due to the existing supply of construction workers in each of these counties, it would likely not be necessary for workers from other locations to participate in the construction activities. The temporary nature of the construction (approximately 4 miles) and new employment (up to 75 workers) associated with Alternative 2 would have a minor indirect beneficial effect on local businesses and the local economy from the temporary influx of construction workers.

Environmental Justice and Protection of Children. Minor adverse disproportionate effects on minority or low-income populations could occur. Direct beneficial effects on safety and the protection of children would be expected from the projected deterrence of cross-border violators, smugglers, terrorists, and terrorist weapons from entering the United States. Therefore, border communities would be safer for minority and low-income populations and children.

The proposed infrastructure runs through or adjacent to 17 private and public land parcels in Del Rio and 3 private and public land parcels in Eagle Pass. In Section M-1, some private residences and other structures, would be located south of the proposed tactical infrastructure. Property owners and residents could be directly, adversely affected by restricted access, visual effects (see **Section 3.12.3**), noise (see **Section 3.2.3**) effects during construction, and other disruptions during construction. In some cases, the Government would acquire the property or property would be substantially impaired. This would be a long-term, major, adverse effect on property owners, but the effect would be mitigated by compensation of fair market value for the property and relocation assistance. The proposed tactical infrastructure under Route A would have short- to long-term direct beneficial effects on children and safety in the surrounding areas. The addition of tactical infrastructure could increase the safety of USBP agents in the Del Rio Sector. In addition, this alternative would help to deter cross-border violators in the immediate area, which could prevent drug smugglers, terrorists, and terrorist weapons from entering nearby neighborhoods.

Route B

Socioeconomics. Short-term minor direct beneficial effects would be expected as a result of the construction, operation, and maintenance of Route B. The primary difference between Route B and Route A is that Route B would be south of the existing residential and commercial structures along Garza Lane and Rio

Grande Road (in Section M-1), thus lessening the severity of adverse impact on those residents. However, Route B would still intersect the 17 parcels, running behind the structures.

Environmental Justice and Protection of Children. Route B would avoid the existing residential and commercial structures along Garza Lane and Rio Grande Road (in Section M-1) that would be directly and adversely affected under Route A. However, Route B would still intersect the 17 parcels, running behind the structures. Indirect adverse effects associated with the visual effects (see **Section 3.12.3**) and noise effects (see **Section 3.2.3**) would still occur. Otherwise, effects on minority or low-income populations and children would be generally the same as described for Route A.

3.13.3.3 Alternative 3: Secure Fence Act Alignment Alternative

Socioeconomics. Short-term minor direct beneficial effects would be expected as a result of the construction, operation, and maintenance of Alternative 3. The effects of Alternative 3 on socioeconomic groups would be expected to be similar to Alternative 2, Route B; however the effects on the local economy would be slightly greater due to the construction of two layers of pedestrian fence rather than one. Furthermore, two layers of fence would be more effective in preventing illegal entry into the United States, thereby decreasing the potential for degradation to grazing operations in the area.

Environmental Justice and Protection of Children. Effects under Alternative 3 would be similar to those discussed for Alternative 2, Route B. Direct beneficial effects on safety and the protection of children would be expected as Alternative 3 would be designed with two layers of pedestrian fence along each section. The additional layer of fencing would deter drug smugglers, terrorists, and cross-border violators, and therefore provide for a generally safer area. Environmental justice issues would be greater for Alternative 3 than for Alternative 2, Route B. Alternative 3 has a more intrusive visual presence affecting any potential low-income, minority residents who live adjacent to the proposed infrastructure.

3.14 UTILITIES AND INFRASTRUCTURE

3.14.1 Definition of the Resource

Infrastructure consists of the systems and physical structures that enable a population in a specified area to function. Infrastructure is wholly human-made, with a high correlation between the type and extent of infrastructure and the degree to which an area is characterized as “urban” or developed. The availability of infrastructure and its capacity to support growth are generally regarded as essential to the economic growth of an area. The infrastructure components discussed in this section include municipal water systems, sanitary sewer systems, storm water drainage systems, solid waste management, and utilities, including electrical and natural gas systems.

Solid waste management primarily relates to the availability of landfills to support a population's residential, commercial, and industrial needs. Alternative means of waste disposal might involve waste-to-energy programs or incineration. In some localities, landfills are designed specifically for, and limited to, disposal of construction and demolition debris. Recycling programs for various waste categories (e.g., glass, metals, papers, asphalt, and concrete) reduce reliance on landfills for disposal.

3.14.2 Affected Environment

Route A

Municipal Water Systems. The Rio Grande and several aquifers, reservoirs, and springs are the main sources of water for many communities and cities in Maverick and Val Verde counties. Municipal water infrastructure within the proposed project corridor includes the Eagle Pass Regional Water Treatment Plant (WTP) and associated interceptor, collector, distribution, or transmission pipelines; pumps; and storage tanks (see **Table 3.14-1**), which are located at the northern terminus of Section M-2A. This WTP removes and treats water from the Rio Grande for drinking water for the City of Eagle Pass, portions of Maverick County, and the Kickapoo Indian Nation.

Table 3.14-1. Water/Sewer Systems Infrastructure Within the Proposed Project Corridor by Section

Section	Water/Sewer Systems Infrastructure
M-1	Silver Lake Wastewater Treatment Plant (includes associated infrastructure)
M-2A	Eagle Pass Regional Water Treatment Plant (includes associated infrastructure)

Municipal Sanitary Sewer Systems. Some municipal sanitary sewer systems in Maverick and Val Verde counties discharge through the land application method, while others discharge into water bodies, including the Rio Grande and San Felipe Creek (USEPA 1998, BECC undated). The Silver Lake Wastewater Treatment Plant (WWTP) and its associated pipelines, pumps, and storage tanks is located within the proposed project corridor, approximately 0.5 miles south of Cienegas Creek at the northern terminus of Section M-1 (see **Table 3.14-1**). This WWTP provides sewerage services for the City of Del Rio, and discharges into the Rio Grande and through the land application method.

Storm Water Drainage Systems. No storm water drainages are known to occur within the proposed project corridor; however the number of storm water drainage systems along the proposed project corridor has not been inventoried.

Solid Waste Management. As of 2005, there was one active municipal landfill in Maverick County and one active municipal landfill in Val Verde County. The remaining capacity in terms of years for these landfills was determined based on compaction rate and the amount disposed of in 2005 (TCEQ 2006). The remaining capacity of these landfills as of 2005 is reported in **Table 3.14-2**.

Table 3.14-2. Remaining Capacity of Municipal Landfills as of 2005

Landfill Name	County	Remaining Capacity* (Years)
City of Eagle Pass Type IV Landfill Site	**Maverick**	**90.54**
City of Del Rio Municipal Landfill	Val Verde	15.20

Source: TCEQ 2006
Note: * Based on rate of compaction and amount disposed of in 2005.

Electrical and Natural Gas Systems. There are overhead electric lines adjacent and perpendicular to Section M-2A, and natural gas pipelines run along the Rio Grande and the roadway (Garza Lane and Rio Grande Road) at Section M-1. Lights that would be installed along Sections M-1 and M-2A would connect into existing electric distribution infrastructure in the area.

Route B

The general description of utilities and infrastructure is the same for Route B as it is for Route A.

3.14.3 Environmental Consequences

3.14.3.1 Alternative 1: No Action Alternative

Under the No Action Alternative, no impact on utilities and infrastructure would be expected because the tactical infrastructure would not be built and therefore there is no potential for impacts on utilities and infrastructure as a result of Alternative 1.

3.14.3.2 Alternative 2: Proposed Action Alternative

Route A

No effects on storm water drainage systems, or electrical and natural gas systems would be expected due to the absence of these systems' infrastructure within the proposed project corridor. However, if infrastructure was identified during design, short-term minor adverse effects on these systems could occur. The primary pedestrian fence line and patrol road would avoid most storm water drainage culverts or reroute the project around this infrastructure. Any infrastructure that would be affected by the proposed construction would be moved, and temporary interruptions to these systems could be experienced. No long-term effects would be expected.

Alternative 2, Route A would not substantially increase impervious surface area that could potentially affect local storm water management. Adherence to proper engineering practices and applicable codes and ordinances would reduce storm water runoff-related effects to a level of insignificance. In addition, erosion and sedimentation controls would be in place during construction to reduce and control siltation or erosion effects on areas outside of the construction site.

Short-term minor adverse effects on municipal water and sanitary sewer systems would be expected due to the presence of the Silver Lake WWTP and the Eagle Pass Regional WTP and the associated infrastructure (e.g., pipelines, pumps, and tanks) along Section M-1 and Section M-2A. Any infrastructure that would be affected by the proposed construction would be moved. No long-term effects would be expected.

Short-term minor adverse effects on solid waste management would be expected. Solid waste generated from the proposed construction activities would consist of building materials such as concrete and metals (conduit and piping). The contractor would recycle construction materials to the greatest extent possible. Nonrecyclable construction debris would be taken to either the City of Eagle Pass Type IV Landfill Site or the City of Del Rio Municipal Landfill, which are both permitted to take this type of waste. Both landfills have sufficient capacity. Therefore, solid waste generated as a result of Alternative 2, Route A would be expected to be negligible compared to the solid waste currently generated in Maverick and Val Verde counties, and would not exceed the capacity of either landfill.

Route B

The effects of Alternative 2, Route B would be similar to those described for Alternative 2, Route A.

3.14.3.3 Alternative 3: Secure Fence Act Alignment Alternative

The potential effects of Alternative 3 on infrastructure and utilities would be expected to be similar to the potential effects of Alternative 2, Route A. Additional solid waste would be generated under Alternative 3 because two pedestrian fences would be built rather than one.

THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 4

Cumulative and Other Impacts

4. CUMULATIVE AND OTHER IMPACTS

CEQ defines cumulative impacts as the "impacts on the environment that result from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions" (40 CFR 1508.7). Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time by various agencies (Federal, state, and local) or individuals. Informed decisionmaking is served by consideration of cumulative impacts resulting from projects that are proposed, under construction, recently completed, or anticipated to be implemented in the reasonably foreseeable future.

This cumulative impacts analysis summarizes expected environmental effects from the combined effects of past, current, and reasonably foreseeable future projects in accordance with CEQ regulations implementing NEPA and CEQ guidance on cumulative effects (CEQ 1997, 2005). The geographic scope of the analysis varies by resource area. For example, the geographic scope of cumulative impacts on resources such as noise, visual resources, soils, and vegetation is very narrow and focused on the location of the resource. The geographic scope of air quality, wildlife and threatened and endangered species, and socioeconomics is much broader and considers more county- or region-wide activities. Projects that were considered for this analysis were identified by reviewing CBP documents, news releases, and published media reports, and through consultation with planning and engineering departments of local governments, and state and Federal agencies. Projects that do not occur in close proximity (i.e., within several miles) to the proposed infrastructure would not contribute to a cumulative impact and are generally not evaluated further.

Cumulative Fencing, Southern Border. There are currently 62 miles of landing mat fence at various locations along the U.S./Mexico international border (CRS 2006); 14 miles of single, double, and triple fence in San Diego, California; 70 miles of new pedestrian fence approved and currently under construction at various locations along the U.S./Mexico international border; and fences at POE facilities throughout the southern border. In addition, 225 miles of proposed new fence (including the 4 miles proposed in this EA) are currently being evaluated for sites in Texas, New Mexico, Arizona, and California.

***Past Actions*.** Past actions are those actions that occurred within the geographic scope of cumulative impacts prior to the development of this EA. Past actions have shaped the current environmental conditions in close proximity (i.e., within several miles) to the proposed infrastructure. Therefore, the effects of identified past actions are now part of the existing environment, and are generally included in the affected environment described in **Section 3**.

Present Actions. Present actions include current or funded construction projects, CBP or other agency operations in close proximity to the proposed infrastructure locations, and current resource management programs and land use activities within the affected areas. Ongoing actions considered in the cumulative effects analysis include the following:

- U.S. Border Patrol. The Del Rio POE facility is currently being expanded by the General Services Administration (GSA), and is scheduled for completion in early 2008 (TxDOT 2007a). The project will bring the primary inspection facilities and possibly toll booths further into the City of Del Rio, as well as expand the bridge over the Rio Grande from four to six lanes (PPTCC 2007).
- Texas Department of Transportation. TxDOT has several ongoing road construction and improvement projects scheduled for the counties potentially impacted by the Proposed Action. However, the geographic scope of cumulative impacts would tend to be small, as the majority of the construction would be within existing ROWs. These projects are in various stages of completion:
  - *Rehabilitation Projects.* Several rehabilitation projects in the area include resurfacing of an approximate 3-mile section of U.S. Highway 277 south of U.S. Highway 377 in Del Rio, and a 0.6-mile section of U.S. Highway 277 in Eagle Pass.
  - *Ports to Plains Corridor.* This project consists of a proposed 1,400-mile highway route stretching from the U.S./Mexico international border in Laredo, Texas, to Denver, Colorado. The route was designated a High Priority Corridor under the *Transportation Equity Act for the 21st Century*. The project is a joint effort by the state departments of transportation from Colorado, Texas, Oklahoma, and New Mexico to evaluate transportation improvement needs along the existing corridor to facilitate and enhance trade between the United States and Mexico. Currently, a Feasibility Study and a Corridor Development and Management Plan have been completed for this project. The proposed route would utilize U.S. Highway 277 through Del Rio and Eagle Pass, Texas, and would include the construction of relief routes and other upgrades in these areas (TxDOT 2007b).
  - *State Loop 480.* Construction of an outer loop from the Camino Real International Bridge around the City of Eagle Pass was scheduled to begin in 2007. Phase I includes construction of a four-lane divided highway on a new location with two grade separated interchanges, and will extend from the Camino Real International Bridge to U.S. Highway 57. Phase II construction is in the process of being coordinated, and will include building a connecting highway from U.S. Highway 57 to U.S. Highway 277 North (TxDOT 2007a).

- *Eagle Pass Truck Route.* Several phases of this project have been completed to date; however construction of an overpass is scheduled to begin in May 2009 (TxDOT 2007a).

- North American Development Bank (NADB). The NADB is funding several projects in Maverick County, Texas, as well as Piedras Negras and Ciudad Acuña, Mexico, which are south of the cities of Del Rio and Eagle Pass, respectively (NADB 2007).
  - *Water and Wastewater Regional System Improvements (Eagle Pass, Texas).* Construction of a new wastewater treatment plant, including transmission mains and sewer lines began in August 2007.
  - *Water Conservation Improvement Project (Maverick County, Texas).* The lining of lateral canals within the Maverick County Water Control and Improvement District No. 1 is scheduled to be undertaken in December 2007.
  - *Comprehensive Sanitation Project (Piedras Negras, Coahuila, Mexico).* Phase I of this project is complete; however construction of three collector and sewer line elements is currently underway. This project will allow wastewater to be adequately treated, and eliminate raw sewage discharges into the Rio Grande.
  - *Comprehensive Sanitation Project (Ciudad Acuña, Coahuila, Mexico).* Phase I of this project is complete; however construction of 14 collector and sewer line elements is currently underway. This project will allow wastewater to be adequately treated, and eliminate raw sewage discharges into the Rio Grande.

- Maverick County Detention Facility. The GEO Group, Inc., will develop, manage, and operate a 654-bed detention facility in Eagle Pass, Texas, which is expected to be used by Maverick County and other state and Federal detention agencies. The project is expected to be complete in 2008. GEO estimates that the facility will generate approximately $10 million in annual operating revenues at full occupancy (All Business 2007).

***Reasonably Foreseeable Future Actions*.** Reasonably foreseeable future actions consist of activities that have been proposed or approved and can be evaluated with respect to their effects. The following are reasonably foreseeable future actions that are related to securing the southern international border:

- SBI is a comprehensive program focused on transforming border control through technology and infrastructure. The goal of the program is to field the most effective proven technology, infrastructure, staffing, and response platforms, and integrate them into a single comprehensive border security suite for DHS. Potential future SBI*net* projects include deployment of sensor technology, communications equipment, command and control equipment, fencing, barriers capable of stopping a vehicle, and any required road or components such as lighting and all-weather access roads (Boeing 2007).

- Texas Department of Transportation. In addition to TxDOT's ongoing construction and maintenance projects, there are several TxDOT projects in the planning phases. The Del Rio Outer Loop (also known as the Del Rio Relief Loop) is a four-lane, 12.1-mile highway segment. Phase I will consist of a two-lane highway connecting U.S. Highway 277 South and U.S. Highway 90 West with overpass spans and an additional highway connection to Laughlin Air Force Base (TxDOT 2007a). Construction of the project is expected to begin in mid to late 2008, with completion scheduled for 2011 (Southwest Texas Live 2007).

- Giant Reed Removal Project. CBP proposes to remove giant reed along Section M-2A from the primary pedestrian fence to the Rio Grande in order to decrease cover, which is used by cross-border violators, and increase the USBP agents' line of sight towards the Rio Grande.

- Eagle Pass Road and Various Infrastructure Projects. CBP proposes improvements to 1.3 miles of existing patrol roads along the eastern bank of the Rio Grande and construction and maintenance of 1.1 miles of primary pedestrian fence (aesthetic fencing) in Eagle Pass, Texas. The Proposed Action includes the installation of 15 permanent lights along the eastern boundary of Eagle Pass Golf Course and the removal of giant reed along the eastern bank of the Rio Grande.

- Expansion of Eagle Pass Border Station. Phase II of the expansion of the Eagle Pass POE border station at the Camino Real International Bridge will be designed and constructed by GSA on land donated by the City of Eagle Pass (TxDOT 2007a).

- Proposed Housing Development (Northern end of Section M-2A). A housing development has been proposed for the area north of the western terminus of Section M-2A. The development would include the construction of new residences, streets, and other public works/utility infrastructure.

Cumulative Analysis by Resource Area. This section presents the resource-specific impacts related to the past, present, and reasonably foreseeable actions previously discussed. Only those actions that are additive to the potential impacts associated with the Proposed Action are further considered. **Table 4.0-1** presents the cumulative effects by resource area that might occur from implementation of the Proposed Action when combined with other past, present, and future activities. Resource area cumulative effects are discussed more fully in the narrative following the summary table.

Table 4.0-1. Summary of Potential Cumulative Effects

Resource	Past Actions	Current Background Activities	Proposed Action	Known Future Actions	Cumulative Effects
Air Quality	Attainment criteria for all criteria pollutants.	Existing emissions sources continue to adversely affect regional air quality.	Fugitive dust and combustion emissions generation during construction.	Existing emissions sources continue to adversely affect regional air quality.	Continued attainment.
Noise	Commercial and residential development, vehicles dominate ambient noise near urban areas.	Commercial and residential development, vehicles dominate ambient noise near urban areas.	Short-term noise from construction equipment and increased traffic.	Commercial and residential development near urban areas contributes to ambient noise.	Existing sources would be the dominant noise source. Negligible cumulative impacts.
Land Use	Agricultural/open lands impacted by development.	Development of open and agricultural lands.	Government would purchase land or easements to construct tactical infrastructure. Natural areas developed for tactical infrastructure.	Commercial development permanently alters natural areas and agricultural lands.	Moderate adverse impacts on open and agricultural lands.

Resource	Past Actions	Current Background Activities	Proposed Action	Known Future Actions	Cumulative Effects
Geology and Soils	Installation of infrastructure and other features.	Installation of infrastructure; continued cross-border violator activities adversely affect soils.	Minor grading and recontouring would disturb soils; installation of primary pedestrian fence might affect geology.	Continued cross-border violator's activities and new development adversely affect soils.	Minor long-term impact from new development.
Hydrology and Groundwater	Degradation of aquifers due to historical pollution.	Continued degradation of aquifers from pollution.	Short-term minor adverse effects on hydrology from grading and contouring. Short-term minor adverse effects from possible use of groundwater.	Improvements to the WWTP should reduce current adverse impacts on water quality.	Minor short- and long-term impacts.
Surface Waters and Waters of the United States	Point and nonpoint discharges including wastewater treatment effluent, agricultural runoff, and storm water have impacted water quality. Removal of wetland vegetation and fill of waters of the United States, including wetlands.	Point and nonpoint discharges including wastewater treatment effluent, agricultural runoff, and storm water have impacted water quality.	Construction erosion and sediment runoff, potential oil spills and leaks. Removal of wetland vegetation and fill of waters of the United States, including wetlands, and temporary degradation of water quality.	Construction erosion and sediment runoff, potential oil spills and leaks. Removal of wetland vegetation and fill of waters of the United States, including wetlands, and temporary degradation of water quality.	Moderate short-term impacts from construction activities, including removal of wetland vegetation and fill of waters of the United States, and temporary degradation of water quality. Minor long-term erosion impacts from infrastructure.

Resource	Past Actions	Current Background Activities	Proposed Action	Known Future Actions	Cumulative Effects
Floodplains	Permanently altered by development.	None.	Adverse impacts due to installation of tactical infrastructure in floodplain.	New development could add impervious areas and alter peak flow or floodplain capacity during high-volume storm events.	Minor contribution to cumulative impacts from construction of tactical infrastructure in floodplain.
Vegetation Resources	Degraded historic habitat of sensitive and common wildlife species.	Continued urbanization results in reduction of landscape area, loss of native species, and introduction of nonnative species.	Minor to moderate loss of native species and habitat, and creation of corridors for nonnative species establishment.	Development causes minor to moderate loss of native species and habitat and introduction of nonnative species.	Moderate contribution to adverse impacts on native habitats and vegetation.
Wildlife and Aquatic Resources	Urbanization and loss of green corridors impacted habitat and food sources.	Minor to moderate loss of green corridor for wildlife.	Minor loss of green corridor and water access for wildlife.	Loss of green corridor for wildlife.	Moderate loss of green corridor and water access for wildlife.
Threatened and Endangered Species	Degraded water quality and urbanization impacted threatened and endangered species.	Urbanization degraded habitat for threatened and endangered species.	Minor loss of green corridor/habitat and water access for wildlife.	Development reduces suitable habitat for threatened and endangered species and water quality degradation.	Current and future activities would continue to decrease green corridor/habitat and water access for wildlife.

Resource	Past Actions	Current Background Activities	Proposed Action	Known Future Actions	Cumulative Effects
Cultural, Historical, and Archaeological Resources	Development and infrastructure improvements adversely affected cultural resources.	Development and infrastructure improvements adversely affect cultural resources.	Moderate to major long-term adverse impacts on cultural resources.	Continued development and infrastructure improvements adversely affect cultural resources.	Moderate to major long-term adverse impacts on cultural resources.
Aesthetic and Visual Resources	Past development affected natural viewshed.	Development of natural areas for community and industry infrastructure.	Constant static visual interruption at fixed points.	Constant static visual interruption at fixed points.	Minor to moderate long-term impacts from permanent infrastructure.
Socioeconomic Resources, Environmental Justice, and Protection of Children	Commercial and residential development affected local economies.	Commercial and residential development.	Minor to moderate short-term and long-term beneficial impacts on local economy and safety.	Commercial development and infrastructure improvements around urban areas.	Minor stimulation of local economy from construction projects and improvement of roadways. Minor adverse impacts on environmental justice or protection of children and human health and safety.
Utilities and Infrastructure	Historical development and maintenance of utilities and infrastructure in area.	Utilities and infrastructure have been upgraded as necessary.	Minor short-term adverse impacts on local utilities and infrastructure during construction.	Continued development and maintenance of utilities and infrastructure in area.	Major benefit to infrastructure and utilities from addition and upgrade of facilities.

4.1 AIR QUALITY

Short-term, minor, adverse cumulative impacts on air quality would be expected from the construction of proposed tactical infrastructure in combination with other reasonably foreseeable future actions. As discussed in **Section 3.1.3**, emissions from construction, operation, and maintenance activities would not contribute to or affect local or regional attainment status with the NAAQS, and would be below thresholds established by the USEPA for CAA cumulative impact analysis. Construction equipment would temporarily increase fugitive dust and operation emissions from combustion fuel sources. Since there would be no substantive change in USBP operations, emissions from vehicles would remain constant and no cumulative impacts on air quality would be expected.

4.2 NOISE

Minor cumulative impacts on ambient noise would be expected from the additive impacts of construction, operation, and maintenance of tactical infrastructure, and anticipated residential and commercial development activities and infrastructure improvement projects that routinely occur throughout the project area. Noise intensity and duration from construction, operation, and maintenance of tactical infrastructure would be similar to construction activities from other development activities and road construction and maintenance. Because noise attenuates over distance, a gradual decrease in noise levels occurs the farther a receptor is away from the source of noise. Construction, operation, and maintenance of tactical infrastructure would be distant from most other substantial noise-generating activities. Increased noise from construction of tactical infrastructure could combine with existing noise sources or other construction activities to produce a temporary cumulative impact on sensitive noise receptors. Construction noise would not be louder, but might be heard over a greater distance or over a longer time period.

4.3 LAND USE

Construction of tactical infrastructure would result in minor changes to land use. Recent activities that have affected land use near the proposed tactical infrastructure are increased commercial and residential development of agricultural and open lands. Moderate cumulative impacts on land use are expected from the additive effects of the past, present, and reasonably foreseeable future actions, but changes in local land use would continue to be dominated by development. For example, the proposed conversion of approximately 49 to 61 acres to support tactical infrastructure would be minimal when compared to other development occurring in Val Verde and Maverick counties. Residential areas and agricultural lands would be displaced by the Proposed Action. Future development of residential areas would further alter the current land use.

4.4 GEOLOGY AND SOILS

Additive effects include minor changes in topography due to grading, contouring, and trenching; minor soil disturbance; a minor increase in erosion; and a minor loss of prime farmland. Construction of most of the tactical infrastructure would not be in close proximity to residential and commercial development and would not cumulatively affect geological resources, including soils. However, each present or reasonably foreseeable future action identified has the potential for temporary erosion from construction activities.

4.5 HYDROLOGY AND GROUNDWATER

Moderate impacts on hydrology and groundwater would occur from the construction of tactical infrastructure when combined with other past, present, and reasonably foreseeable future actions due to increased erosion and stream sedimentation.

4.6 SURFACE WATERS AND WATERS OF THE UNITED STATES

Moderate impacts on surface water and waters of the United States could occur from increased erosion and stream sedimentation. Disturbance from construction and operation of the tactical infrastructure along with residential and commercial development have the potential for additional erosion and stream sedimentation and adverse cumulative effects. However, as discussed in **Section 3.6.3**, a Texas Construction General Permit would be obtained to include an SWPPP and sediment control and storm water BMPs to minimize potential impacts. Past actions, including sewage, agricultural runoff, and industrial discharges, have generally degraded the quality of water in the Middle Rio Grande basin and have resulted in long-term direct moderate impacts on water quality. The Rio Grande is a CWA Section 303(d) impaired water. Upgrades to existing wastewater facilities and construction of new wastewater facilities in Maverick County, Texas, and Piedras Negras and Ciudad Acuña, Mexico, could produce a moderate beneficial effect on water quality of the Rio Grande.

Wetland losses in the United States have resulted from draining, dredging, filling, leveling, and flooding for urban, agricultural, and residential development. An unknown amount of wetlands could be permanently impacted by construction of the tactical infrastructure. Formal delineation or jurisdictional determination of the extent of wetlands or other waters of the United States has not yet been conducted. CBP would obtain CWA Section 404 permits and mitigate the loss of wetlands. The cumulative impacts on wetlands would be long-term and adverse.

4.7 FLOODPLAINS

Floodplain resources can be adversely impacted by development, increases in impervious areas, loss of vegetation, changes in hydrology, and soil compaction.

Construction, operation, and maintenance of tactical infrastructure has the potential for negligible to minor impacts on floodplains from further loss of vegetation, soil compaction on access roads and patrol roads, and the placement of structures in the floodplains. When added to other past, present, and reasonably foreseeable future actions, impacts from the proposed tactical infrastructure would be minor due to the relatively small impact within floodplains. As discussed in **Sections 1.5** and **3.7**, CBP would follow the FEMA process to floodproof the structures and minimize adverse impacts on floodplain resources.

4.8 VEGETATION RESOURCES

Moderate impacts on native species vegetation and habitat and introductions of nonnative species are observable from past and present development and land use and are expected from reasonably foreseeable future actions. Urbanization and agricultural use of the area has directly reduced and modified habitat for common, sensitive, and rare plant species and resulted in the introduction of nonnative species. Indirect impacts from urbanization and agricultural land use include changes in drainage patterns, water quality and volume, and maintenance actions to sustain managed landscapes.

Development of land for urban/industrial use would continue at an unknown pace resulting in continued loss and alteration of plant communities and wildlife habitat. Expansion and upgrade of existing POEs and other border facilities, and construction of the proposed tactical infrastructure would contribute to future development effects.

4.9 WILDLIFE AND AQUATIC RESOURCES

Minor to moderate effects on wildlife species would be expected from the additive effects of the past, present, and reasonably foreseeable future actions. Urbanization of the area has reduced green corridor and water access for wildlife. Cumulative impacts would mainly result from loss of habitat as described in **Section 3.9.3**, habitat disturbance and degradation, construction traffic, and permanent loss of green corridors. Displaced wildlife would move to adjacent habitat if sufficient habitat exists. Since residential, commercial, and industrial development has occurred in close proximity (i.e., within several miles) to the proposed infrastructure and such development is projected to continue, the amount of potentially suitable habit is likely to decrease, producing a long-term, minor to moderate adverse cumulative effect. Wildlife could also be adversely impacted by noise during construction, operational lighting, and loss of potential prey species. The permanent lighting could have minor, adverse cumulative impacts on migration, dispersal, and foraging activities of nocturnal species. Species would also be impacted by equipment spills and leaks. Cumulative, adverse impacts on migratory birds could be substantial depending on the time of year of construction of the proposed tactical infrastructure. However, implementation of BMPs presented in **Section 3.9.3** could reduce the intensity of such impacts.

4.10 THREATENED AND ENDANGERED SPECIES

As discussed in **Section 3.10**, CBP has begun Section 7 preconsultation coordination with the USFWS regarding potential effects on listed species or designated critical habitat. Potential effects of construction, operation, and maintenance of the proposed tactical infrastructure will be analyzed in both a BA and a BO that will accompany the Final EA. Potential direct and indirect impacts on federally listed species presented in this EA are based on currently available data. Effects developed for NEPA are independent of any impact determinations made for the Section 7 consultation process.

Threatened and endangered species are commonly protected because their historic range and habitat has been reduced and will only support a small number of individuals. Pedestrian surveys of the project area recorded the presence of only one state-listed species, indigo snake (*Drymarchon corais*); and the presence of potential habitat for the Federal- and state-listed endangered species, ocelot and jaguarundi. Construction, operation, and maintenance of tactical infrastructure, when combined with past, present, and future residential and commercial development, has the potential to result in long-term minor to major adverse cumulative impacts on these species. However, the Proposed Action would contribute only a small portion of this impact. Potential threats to federally listed species within the proposed project corridor include trampling (for plants), habitat conversion, and potential changes to ocelot and jaguarundi movements due to loss of corridor habitat and noise.

4.11 CULTURAL, HISTORICAL, AND ARCHAEOLOGICAL RESOURCES

Long-term, moderate to major, adverse impacts on cultural resources are expected from the additive effects of past, present, and reasonably foreseeable future actions. Past, current, and future commercial and residential development, improvements to infrastructure such as highway and water/wastewater projects, and the clearing of land for other development projects have caused significant impacts on cultural resources and can be expected to continue to do so. Cumulative effects on historic properties are expected to be moderate to major, adverse, and long-term.

In compliance with Section 106 of the NHPA, cultural resources surveys are underway to identify and evaluate properties listed on or eligible for listing on the NRHP that might be affected by the proposed tactical infrastructure. Consultation with Native American tribes would ensure that properties of religious and cultural significance to the tribes are addressed. It is anticipated that additional properties determined as eligible for listing in the NRHP will be identified that would be affected. Known historic properties would also be affected.

Impacts on cultural resources (including resources potentially eligible for inclusion in the NRHP) would be avoided, minimized, or reduced through careful planning, siting, and design of the proposed tactical infrastructure and development of special measures. In other cases, special designs could be developed to reduce effects on historic properties.

4.12 AESTHETIC AND VISUAL RESOURCES

Minor to moderate impacts on aesthetics and visual resources would be expected from the additive effects of past, present, and reasonably foreseeable future actions. The presence of construction equipment would produce a short-term adverse impact on visual resources. Once installed, the proposed tactical infrastructure would create a permanent visual interruption at fixed points. Adverse cumulative effects could include temporary construction impacts and the introduction of light poles and increased night illumination during construction. Other development activities would introduce night illumination into previously open or agricultural lands. Recreational activities such as star-gazing would be adversely affected by this cumulative impact in night illumination.

4.13 SOCIOECONOMICS, ENVIRONMENTAL JUSTICE, AND PROTECTION OF CHILDREN

Short-term beneficial impacts on local and regional socioeconomic resources would be expected from the additive effects of past, present, and reasonably foreseeable future actions. Economic benefits would be realized by construction companies, their employers and suppliers, and by Val Verde and Maverick counties through a minor increase in tax receipts for the purchase of goods and services. Construction of the proposed tactical infrastructure has the potential for minor beneficial effects from temporary increases in construction jobs and the purchase of goods and services in Val Verde and Maverick counties. Approximately 975 workers are employed in the construction industry in the two counties. An increase of 75 construction jobs would represent only about 8 percent of construction jobs, so the cumulative effect would be minimal. Since the construction jobs would be temporary, negligible cumulative effects on population growth, income, or other services would be expected.

Val Verde and Maverick counties have experienced some growth, including residential and commercial development. The permanent conversion of approximately 49 to 61 acres to support the proposed tactical infrastructure would be a minimal cumulative impact compared to other development occurring in Val Verde and Maverick counties.

Some privately owned land would be used to support tactical infrastructure, and these affected residents might be adversely impacted by the construction and government purchase of their property.

As discussed in **Sections 3.3 and 3.13**, some tactical infrastructure would be constructed on or adjacent to private property. At several proposed locations along Section M-1, residences and other structures would need to be relocated due to their encroachment on the route of the proposed tactical infrastructure. Census Tract 9507 that encompasses Section M-1 has a high percentage of low-income residents. However, the number of structures requiring removal, and the amount of potential low-income residents in close proximity to the proposed project corridor that would be affected would be low. Tactical infrastructure proposed for Section M-2A, which has high percentages of minority and low-income residents, would be adjacent to private residences and commercial properties, however relocation would be required. Therefore, while the two affected census tracts do have disproportionately higher minority and low-income residents, the amount of residents that would actually be affected by the Proposed Action would be low, and the overall effects of the proposed tactical infrastructure on these populations would be minor.

4.14 UTILITIES AND INFRASTRUCTURE

Residential and commercial development and accompanying population increases in Val Verde and Maverick counties have increased demand for utilities such as drinking water, wastewater treatment, and natural gas and electric power distribution. New infrastructure has been constructed to rehabilitate and upgrade aging infrastructure that is defective and has inadequate capacity. The construction, operation, and maintenance of tactical infrastructure would have minimal demand for utilities and infrastructure, and, therefore, a minimal adverse cumulative effect.

4.15 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES

An irreversible or irretrievable commitment of resources refers to effects on or losses to resources that cannot be reversed or recovered, even after an activity has ended and facilities have been decommissioned. A commitment of resources is related to the use or destruction of nonrenewable resources and the effects those losses will have on future generations. For example, if prime farmland is developed there would be a permanent loss of agricultural productivity. Construction, operation, and maintenance of tactical infrastructure involve the irreversible and irretrievable commitment of material resources and energy, land and wetland resources, biological resources, and human resources. The effects on these resources would be permanent.

***Material Resources*.** Material resources used and irreplaceable for the Proposed Action include steel, concrete, and other building materials (for construction of the primary pedestrian fence). Such materials are not in short supply, would not limit other unrelated construction activities, and their use would not be considered significant.

Energy Resources. Energy resources used for the Proposed Action would be irretrievably lost. These include petroleum-based products (e.g., gasoline and diesel) and electricity. During construction, gasoline and diesel would be used for the operation of construction vehicles. During operations, gasoline and diesel would be used to maintain the tactical infrastructure, including mowing. USBP operations would not change, and the amount of fuel used to operate government-owned vehicles might decrease slightly due to increased operational efficiencies. Consumption of these energy resources would not place a significant demand on their availability in the region. Therefore, no significant effects would be expected.

***Biological Resources*.** The Proposed Action would result in the irretrievable loss of vegetation and wildlife habitat. In the long term, construction of the tactical infrastructure would result in the loss of increasingly scarce habitat, force the relocation of wildlife, obstruct passage of wildlife, and require the removal of natural vegetation. This result would be a permanent loss or conversion of decreasing open spaces. Additionally, wetlands could be permanently affected by the Proposed Action. However, it is possible to mitigate wetland loss by re-creation of functionally equivalent wetlands elsewhere.

Human Resources. The use of human resources for construction is considered an irretrievable loss, only in that it would preclude such personnel from engaging in other work activities. However, the use of human resources for the Proposed Action represents employment opportunities, and is considered beneficial.

4.16 RELATIONSHIP BETWEEN THE SHORT-TERM USE OF THE ENVIRONMENT AND LONG-TERM PRODUCTIVITY

Short-term uses of the biophysical components of the human environment include direct construction-related disturbances and direct effects associated with an increase in population and activity that occurs over a period of less than 5 years. Long-term uses of the human environment include those effects that occur over a period of more than 5 years, including permanent resource loss.

Activities that could result in short-term resource uses that compromise long-term productivity include filling of wetlands and development in floodplains. Adverse effects include destruction of cultural resources, or loss of habitats for threatened or endangered species. Although no direct effects on threatened or endangered species or significant adverse effects on migratory birds or other wildlife are expected, the short- and long-term loss of potential habitat could result in long-term, negligible to minor adverse effects.

THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 5

Mitigation and Best Management Practices

5. MITIGATION AND BEST MANAGEMENT PRACTICES

CBP applied various design criteria to reduce adverse environmental impacts associated with the Proposed Action, including selecting a route that would avoid or minimize effects on environmental and cultural resources. Nonetheless, CBP has determined that construction, operation, and maintenance of tactical infrastructure in USBP Del Rio Sector would result in adverse environmental impacts. These impacts would be most adverse during the period of construction. CBP has concluded, however, that the Proposed Action would be an environmentally acceptable action and overall result in insignificant environmental impacts. Although many factors were considered in this determination, the principal reasons are as follows:

- An SPCC Plan would be developed and implemented to avoid impacts associated with hazardous materials and wastes (see **Section 3**).
- A Dust Control Plan would be implemented to minimize fugitive dust emissions (see **Section 3.1**).
- BMPs and an SWPPP would be implemented to minimize effects on soils, hydrology, groundwater, surface waters, waters of the United States, floodplains, and storm water (see **Sections 3.4.3**, **3.5.3**, **3.6.3**, and **3.7.3)**. Authorization under TCEQ Construction Storm water Permit (TXR 150000) would be required.
- Effects, including physical disturbance and construction of solid barriers, on wetlands, riparian areas, streambeds, and floodplains would be avoided or mitigated.
- A compensatory mitigation plan would be implemented to reduce and compensate for unavoidable effects on waters of the United States (see **Section 3.6.3**). CBP would obtain necessary CWA Section 404 and Rivers and Harbors Act Section 10 permits and a CWA Section 401 permit from TCEQ.
- A Fire Prevention and Suppression Plan and Unanticipated Discovery Plan to protect natural and cultural resources.
- Additional BMPs would be used to avoid, minimize, or mitigate impacts on biological resources, including potential impacts on migratory birds and threatened and endangered species (see **Sections 3.9.3** and **3.10.3**).
- CBP would complete appropriate consultations with the USFWS, the TPWD, TCEQ, the State Historic Preservation Office (SHPO), and Native American tribes to determine all necessary mitigation measures before construction would begin in any given area.
- Fair market value would be paid for all property that needs to be acquired or for property that would be substantially impaired by the Proposed Action (see **Section 3.13.3**).

- An environmental inspection, CM&R Plan, and Mitigation and Monitoring Plan would be prepared to ensure compliance with all mitigation measures.

SECTION 6

References

6. REFERENCES

AirNav 2007	AirNav. 2007. Airport Information for Del Rio International Airport. Available online <*http://www.airnav.com/airport/KDRT*>. Accessed 1 November 2007.
All Business 2007	All Business. 2007. “The GEO Group, Inc. Signs Contract with Maverick County, Texas for the Development and Operation of a 654-Bed Detention Facility.” July 24, 2007. Available online <*http://www.allbusiness.com/services/business-services/4515917-1.html*>. Accessed November 13, 2007.
Bailey 1995	Bailey, Robert F. 1995. Ecoregions of the United States. U.S. Forest Service. Accessed online at: <*http://www.fs.fed.us/colorimagemap/images/300.html*>. Accessed October
BECC undated	Border Environment Cooperation Commission (BECC). Undated. “Water and Wastewater Regional System Improvements for the City of Eagle Pass, Texas.” Available online <*http://www.cocef.org/aproyectos/ExComEaglePass2002_01ing.htm*>. Accessed October 30, 2007.
Boeing 2007	Boeing Integrated Defense System. 2007. *SBInet Backgrounder.* March 2007.
CBP 2007	CBP. 2007. *Environmental Assessment for the Eagle Pass Road and Various Infrastructures Project , Del Rio Sector, Office of Border Patrol, Maverick County, Texas*.
CBP undated	CBP. Undated. Border Patrol Sectors, Del Rio Sector. Available online: <*http://www.cbp.gov/xp/cgov/border_security/border_patrol/border_patrol_sectors/delrio_sector_tx/*>. Accessed October 2, 2007.
CEQ 1997	Council on Environmental Quality, Executive Office of the President (CEQ). 1997. *Considering Cumulative Effects Under the National Environmental Policy Act.* January 1997.
CEQ 2005	CEQ. 2005. *Guidance on the Consideration of Past Actions in Cumulative Effects Analysis*. 24 June 2005.
CRS 2006	Congressional Research Service (CRS). 2006. “Report For Congress.” *Border Security: Barriers Along the U.S. International Border*. December 12, 2006.
EIA 2007	Energy Information Administration (EIA). 2007. *Voluntary Reporting of Greenhouse Gases Program*. Available online: <*www.eis.doe.gov/oiaf/1605/coefficients*>. Accessed 4 November 2007.

Fedstats 2007a	Fedstats. 2007. "Mapstats, Val Verde County, Texas." Available online <*http://www.fedstats.gov/qf/states/48/48465.html*>. Accessed November 5, 2007.
Fedstats 2007b	Fedstats. 2007. "Mapstats, Maverick County, Texas." Available online <*http://www.fedstats.gov/qf/states/48/48323.html*>. Accessed November 5, 2007.
FEMA undated a	Federal Emergency Management Agency (FEMA). FEMA FIRM Panel No. 4806310010A.
FEMA undated b	Federal Emergency Management Agency (FEMA). Managing Floodplain Development in Approximate Zone A Areas: A Guide for Obtaining and Developing Base (100-Year) Flood Elevations.
FEMA undated c	Federal Emergency Management Agency (FEMA). FEMA FIRM Panel No. 4804710004C
FEMA 1983	Federal Emergency Management Agency (FEMA). 1983. Further Advice on Executive Order 11988 Floodplain Management. 24 October 1983.
FEMA 1986	Federal Emergency Management Agency. 1986. A Unified National Program for Floodplain Management, March 1986.
FGDC 2007	Federal Geographic Data Committee (FGDC). 2007. FGDC Standards Information page. Available online: <http://fgdc.gov/standards>. Accessed 5 December 2007.
Hester et al 1989	Hester, T. R., S. L. Black, D. G. Steele, B. W. Olive, A. A. Fox, K. J. Reinhard and L. C. Bement. 1989. From the Gulf to the Rio Grande: Human Adaptation in Central, South, and Lower Pecos Texas. Arkansas Archaeology Survey Research Series No. 33, Wrightsville, Arkansas.
Landrum & Brown 2002	Landrum & Brown, Inc. 2002. "Common Noise Sources." Available online <*www.landrum-brown.com/env/PVD/EIS/Jan%202002%20Chapter%204/ 4%201-1%20%20common_noise_sources.pdf*>. Accessed 6 July 2004.
Larkin and Bomar 1983	Larkin, Thomas J. and George W. Bomar. 1983. Climatic Atlas of Texas. Texas Department of Water Resources. Austin, TX.
NADB 2007	North American Development Bank (NADB). 2007. Summary of Financing Activities, Active Projects. September 30, 2007. Available online <*http://www.nadbank.org/pdfs/ProjectMatrix_Eng.pdf*>. Accessed November 8, 2007.
NatureServe 2007	NatureServe Explorer. 2007. Ecological System, Vegetation Alliance, and Plant Association Comprehensive Reports. Accessed online: <*http://www.natureserve.org/explorer/*>.

NOAA 2007	National Oceanic and Atmospheric Administration. 2007. Del Rio Val Verde Airport Weather Station. Accessed online: <*http://www4.ncdc.noaa.gov/*>.
NRCS 1982	Natural Resources Conservation Service (NRCS). 1982. Soil Survey of Val Verde County, Texas.
NRCS 2007	NRCS 2007. Soil Survey Staff, Natural Resources Conservation Service (NRCS), United States Department of Agriculture. Web Soil Survey. Available online: <http://websoilsurvey.nrcs.usda.gov/>. Accessed November 14, 2007.
OSU 2007	Ohio State University (OSU). 2007. Noise on the Farm Can Cause Hearing Loss. Available online <*http://ohioline.osu.edu/aex-fact/0590.html*>*.* Accessed 20 October 2007.
PPTCC 2007	Ports to Plains Trade Corridor Coalition (PPTCC). 2007. "Ports to Plains Information Highway" Newsletter, Volume 5, Issue 4. April 2007. Available online: <*http://portstoplains.com/Newsletter/apr2007_news.pdf*>. Accessed 8 November 2007.
Southwest Texas Live 2007	Southwest Texas Live. 2007. Civic leaders on economic development: Can they cooperate long enough to collaborate? Available online: <*http://www.swtexaslive.com/node/5419*>. Accessed 13 November 2007.
TAC 2007	Texas Administrative Code (TAC). 2007. "Chapter 106, Subchapter W: Turbines and Engines." Available online: <*http://info.sos.state.tx.us/pls/pub/readtac$ext.ViewTAC?tac_view=5&ti=30&pt=1&ch=106&sch=W&rl=Y*>. Accessed 15 October 2007.
TCEQ 2006	Texas Commission on Environmental Quality (TCEQ). 2006. *Municipal Solid Waste in Texas: A Year in Review*. June 2006.
TPWD 2007a	Texas Parks and Wildlife Department (TPWD). 2007. "Texas Wildlife Action Plan, Section II-Introduction and Purpose." Last updated 9 February 2007. Available online: <*http://www.tpwd.state.tx.us/business/grants/wildlife/wildlife_action_plan/*>*.* Accessed 9 October 2007.
TPWD 2007b	Texas Parks and Wildlife Department. 2007. The Vegetation Types of Texas. Accessed online: <*http://www.tpwd.state.tx.us/publications*>.

TxDOT 2006	Texas Department of Transportation (TxDOT). 2006. County Grid Search Map. Available online <*http://www.dot.state.tx.us/services/transportation_planning_and_programming/county_grid_search.htm*>. Accessed October 30, 2007.
TxDOT 2007a	TxDOT. 2007. *Texas-Mexico International Bridges and Border Crossings Existing and Proposed 2007*. Available online: <*ftp://ftp.dot.state.tx.us/pub/TDOT-info/iro/2007final.pdf*>. Accessed October 31, 2007.
TxDOT 2007b	TxDOT. 2007. Ports to Plains Corridor Study Reports. Available online: <*http://www/dot.state.co.us/ports2plains/reports/reports.html*>. Accessed 13 November 2007.
U.S. Census Bureau 2002	U.S. Census Bureau. 2002. "Decennial, Census 2000." Available online <*http://factfinder.census.gov/servlet/DatasetMainPageServlet?_program=DEC&_submenuId=datasets_0&_lang=en*>. Accessed November 5, 2007.
University of Texas 2006	University of Texas. 2006. "The Physiography of Texas." University of Texas Library System, the Walter Geology Library. 24 July 2006. Available online: <*http://www.lib.utexas.edu/geo/physiography.html*>. Accessed 15 October 2007.
USACE 1994	U.S. Army Corps of Engineers (USACE). 1994. Environmental Baseline Document in Support of the Supplemental Programmatic Environmental Impact Statement for INS and JTF-6 Activities Along the U.S./Mexico Border. Volume 2: Texas Land Border Study Area. USACE Fort Worth District. March 1999.
USACE 2000	USACE. 2000. *Environmental Assessment for the Proposed JTF-6 Levee Road Maintenance and Repair Project, Brownsville, Texas.* USACE Fort Worth District. April 2000.
USDOT undated	U.S. Department of Transportation (USDOT). Undated. *Visual Impact Assessment for Highway Projects*.
USEPA 1971	U.S. Environmental Protection Agency (USEPA). 1971. "Noise from Construction Equipment and Operations, Building Equipment, and Home Appliances." NTID 300-1.
USEPA 1974	USEPA. 1974. *Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety*. March 1974.

USEPA 1998	USEPA. 1998. *Finding of No Significant Impact/Environmental Assessment for the Awarding of U.S. Environmental Protection Agency Grant Funds from the Border Environmental Infrastructure Fund for the Water Treatment Plant Project for the City of Del Rio, Val Verde County, Texas*. May 16. Available online <*http://www.epa.gov/earth1r6/6en/xp/delrio.pdf*>. Accessed October 30, 2007.
USEPA 2007a	USEPA. 2007. "National Ambient Air Quality Standards (NAAQS)." Available online: <*http://www.epa.gov/air/criteria.html*>. Accessed 13 November 2007.
USEPA 2007b	USEPA. 2007. "AirData NET Tier Report for MSAI AQCR." Available online: <*http://www.epa.gov/air/data/geosel.html*>. Accessed 13 November 2007.
USEPA 2007c	USEPA. 2007. Texas Greenhouse Gas Emissions and Sinks Inventory. November 2007.
USFWS 1988	U.S. Department of the Interior, Fish and Wildlife Service (USFWS). 1988. Tamaulipan Brushland of the Lower Rio Grande Valley of South Texas: Description, Human Impacts, and Management Options. Biological Report 88(36). S. E. Jahradoerfer and D. M. Leslie, Jr. Washington, D.C.
USFWS 2007a	U.S. Fish and Wildlife Service (USFWS). 2007. National Wetland Inventory. 24 September 2007. United States Department of the Interior, U.S. Fish and Wildlife Service.
USFWS 2007b	USFWS. 2007. *Wetlands Online Mapper*. Last Modified October 24, 2007. Available online: <http://wetlandsfws.er.usgs.gov/wtlnds/launch.html.> Accessed November 6, 2007.
USIBWC 2003	U.S. Section of International Boundary and Water Commission (USIBWC). 2003. Regional Assessment of Water Quality in the Rio Grande Basin.
USIBWC 2007a	USIBWC. 2007. "The International Boundary and Water Commission, Its Mission, Organization and Procedures for Solution of Boundary and Water Problems." Available online: <*www.ibwc.state.gov/About_Us/About_Us.html*>. Accessed 20 September 2007.
USIBWC 2007b	USIBWC. 2007. Letter to Mr Keith Tharp (CBP) from Richard Peace (USIBWC), regarding USIBWC comments on fence design. 16 July 2007.

THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 7

List of Preparers

7. LIST OF PREPARERS

This EA has been prepared under the direction of CBP and the U.S. Army Corps of Engineers, Fort Worth District Engineering and Construction Support Office (ECSO). Following are the individuals who assisted in resolving and providing agency guidance for this document.

Christopher Oh
Chief, CBP Environmental Branch

Charles H. McGregor, Jr.
USACE Fort Worth District ECSO

This EA has been prepared by engineering-environmental Management, Inc. (e^{2}M) under the direction of CBP. The individual contractors that contributed to the preparation of this document are listed below.

Domenick Alario
B.A. Geography
Years of Experience: 2

Louise Baxter
M.P.A. Public Administration
B.S. Political Science
Years of Experience: 7

Don Beckham
M.P.A. Public Administration
B.S. Engineering Physics
Years of Experience: 33

David Boyes, REM, CHMM
M.S. Natural Resources
B.S. Applied Biology
Years of Experience: 31

Suanne Collinsworth
M.S. Environmental Sciences and Engineering
B.S. Geology
Certificate of Water Quality Management
Years of Experience: 10

Shannon Cauley
B.S. Geology
USACE Certified Wetland Delineator
Certified Professional Soil Scientist
Years of Experience: 23

Laurence D. Gale
Michael Baker Corporation
M.S. Marine Biology
B.S. Natural Resources
Years of Experience: 20

Megan Griffin
M.S. Biology
B.S. Environmental Studies
Years of Experience: 3

Sue Goodfellow, Ph.D.
Ph.D. Anthropology
B.A. Anthropology and Archaeology
Years of Experience: 21

Stuart Gottlieb
B.A. Geography
GIS Professional Certificate
Years of Experience: 5

Shawn Gravatt
M.S. Environmental Studies
B.S. Earth Science and Geography
Years of Experience: 10

Leigh Hagan
M.E.S.M. Environmental Science and Management
B.S. Biology
Years of Experience: 4

Gustin Hare
B.S. Environmental Science
Registered Environmental Professional
Years of Experience: 12

Jeff Hokanson
M.A. Anthropology
Years of Experience: 15

Brian Hoppy
B.S. Biology
Certificate of Environmental Management
Years of Experience: 17

David Kilby
M.A. Anthropology
Years of Experience: 17

Daniel Koenig
B.S. Environmental Policy and Planning
Years of Experience: 3

Ronald E. Lamb, CEP
M.S. Environmental Science
M.A. Political Science/International Economics
B.A. Political Science
Years of Experience: 22

Sean McCain
M.B.A. Business Administration
B.S. Forestry and Natural Resources Management
Years of Experience: 11

Michael Moran, Ph.D.
Ph.D. Biochemistry
B.S. Chemistry
Registered Environmental Manager
Years of Experience: 23

Cheryl Myers
A.A.S. Nursing
Years of Experience: 17

Margie Nowick
M.S. Historic Preservation
M.S. Anthropology
B.S. Anthropology
Years of Experience: 24

Tanya Perry
B.S. Environmental Science
B.A. Communications
Years of Experience: 6

Andrea Poole
B.S. Environmental Science
B.A. Business Administration
Years of Experience: 9

Steve Pyle, J.D.
J.D. with Certificate in Environmental Law
B.S. Natural Resource Management
Years of Experience: 11

Christopher Roche
B.S. Environmental Studies
Years of Experience: 8

Devin Scherer
B.S. Biology
Years of Experience: 4

Cheryl Schmidt, Ph.D.
Ph.D. Biology
M.S. Biology
B.S. Biology
Years of Experience: 22

Sue Sill, Ph.D.
Ph.D. Botany
B.S. Biology
Years of Experience: 24

Sarah Smith
B.S. Geography
Years of Experience: 2

Sarah Spratlen
M.S. Engineering
B.S. Biology
Years of Experience: 5

Karen Stackpole
M.S. Environmental Science and Education
B.S. Biology
Years of Experience: 9

Charles Thornton-Kolbe
M.S. Public Policy
B.A. Economics and Political Science
Years of Experience: 14

Adam Turbett
B.S. Environmental Studies
Years of Experience: 3

Jim Von Loh
M.S. Biology
B.S. Biology
Years of Experience: 32

Lauri Watson
B.S. Environmental Science
Years of Experience: 5

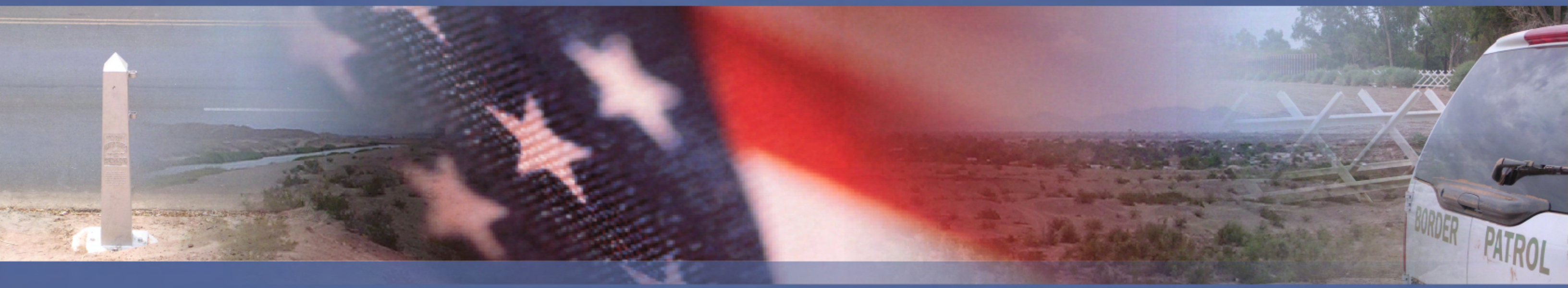
Jeffrey Weiler
M.S. Resource Economics/Environmental Management
B.A. Political Science
Years of Experience: 32

Valerie Whalon
M.S. Fisheries Science
B.S. Marine Science
Years of Experience: 15

THIS PAGE INTENTIONALLY LEFT BLANK

← *continued from front cover*

NHPA	National Historic Preservation Act
NO_2	nitrogen dioxide
NOA	Notice of Availability
NO_x	nitrogen oxide
NPDES	National Pollutant Discharge Elimination System
NPS	National Park Service
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NWI	National Wetlands Initiative
O_3	ozone
OSHA	Occupational Safety and Health Administration
P.L.	Public Law
Pb	lead
PM_{10}	particle matter equal to or less than 10 microns in diameter
$PM_{2.5}$	particle matter equal to or less than 2.5 microns in diameter
POE	Port of Entry
ROI	Region of Influence
ROW	right-of-way
SBI	Secure Border Initiative
SHPO	State Historic Preservation Office
SO_2	sulfur dioxide
SPCC	Spill Prevention Control and Countermeasures
SR	State Route
SWPPP	Storm Water Pollution Prevention Plan
TAAQS	Texas Ambient Air Quality Standards
TAC	Texas Administrative Code
TCEQ	Texas Commission on Environmental Quality
TxDOT	Texas Department of Transportation
THC	Texas Historical Commission
TMDL	Total Maximum Daily Load
TPDES	Texas Pollutant Discharge Elimination System
TPWD	Texas Parks and Wildlife Department
U.S.C.	United States Code
USACE	U.S. Army Corps of Engineers
USBP	U.S. Border Patrol
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
USIBWC	United State Section, International Boundary and Water Commission
VOC	volatile organic compound
WTP	Water Treatment Plant
WWTP	Wastewater Treatment Plant



APPENDIX A

Standard Design for Tactical Infrastructure

APPENDIX A

STANDARD DESIGN FOR TACTICAL INFRASTRUCTURE

A properly designed tactical infrastructure system is an indispensable tool in deterring those attempting to illegally cross the U.S. border. Tactical infrastructure is also integral to maintaining USBP's flexibility in deploying agents and enforcement operations. A formidable infrastructure acts as a force multiplier by slowing down illegal entrants and increasing the window of time that agents have to respond. Strategically developed tactical infrastructure should enable USBP managers to better utilize existing manpower when addressing the dynamic nature of terrorists, illegal aliens, and narcotics trafficking (INS 2002).

USBP apprehension statistics remain the most reliable way to codify trends in illegal migration along the border. Based on apprehension statistics, in a 2006 report on border security, the Congressional Research Service concluded that "the installation of border fencing, in combination with an increase in agent manpower and technological assets, has had a significant effect on the apprehensions made in the San Diego sector" (CRS 2006).

Since effective border enforcement requires adequate scope, depth, and variety in enforcement activity, any single border enforcement function that significantly depletes USBP's ability to satisfactorily address any other enforcement action creates exploitable opportunities for criminal elements. For example, the intense deployment of personnel resources necessary to monitor urban border areas without tactical infrastructure adversely affects the number of agents available for boat patrol, transportation check points, patrolling remote border areas, and other tasks. Tactical infrastructure reduces this effect by reinforcing critical areas, allowing the agents to be assigned to other equally important border enforcement roles (INS 2002).

Fencing

Two applications for fencing have been developed in an effort to control illegal cross-border traffic: primary pedestrian fences that are built on the border, and secondary fences that are constructed parallel to the primary pedestrian fences. These fences present a formidable physical barrier which impede cross-border violators and increases the window of time USBP agents have to respond (INS 2002).

There are several types of primary pedestrian fence designs USBP can select for construction depending on various site conditions and law enforcement tactics employed. Each option offers relative advantages and disadvantages. Fencing composed of concrete panels, for example, is among the more cost-effective options, but USBP agents cannot see through it. USBP prefers fencing structures offering visual transparency, allowing observation of activities developing on the other side of the border.

Over the past decade, USBP has deployed a variety of types of fencing, such as primary pedestrian fence (see **Figures A-1** through **A-4**), primary pedestrian fence with wildlife migratory portals (see **Figures A-5** and **A-6**), and bollard fencing (see **Figure A-7**).

Figure A-1. Typical Primary pedestrian fence Foundation

Figure A-2. Typical Primary pedestrian fence Design

Figure A-3. Typical Primary pedestrian fence Design

Figure A-4. Typical Primary pedestrian fence Design

Figure A-5. Primary pedestrian fence with Wildlife Migratory Portals

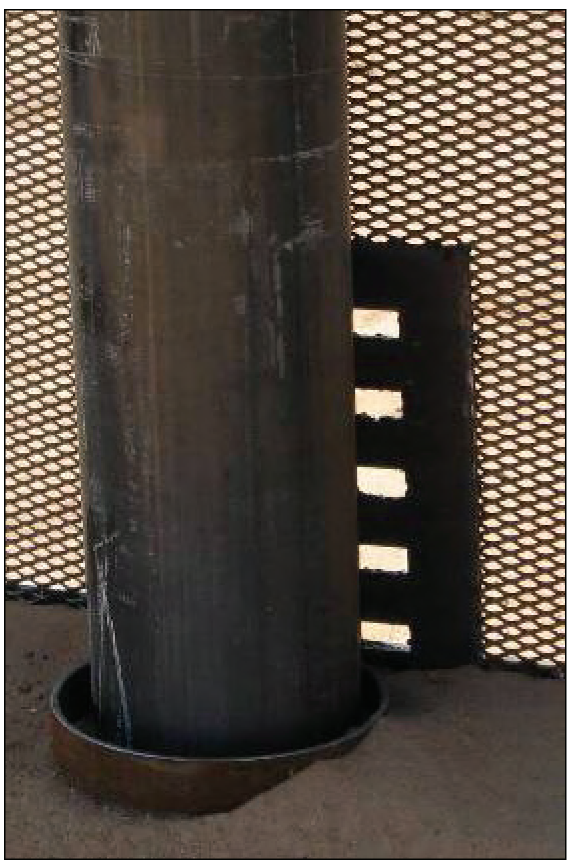


Figure A-6. Wildlife Migratory Portals

Figure A-7. Bollard Fence

Bollard fencing has been effective in its limited deployment and can also be seen through. However, it is expensive to construct and to maintain. Landing mat fencing is composed of Army surplus carbon steel landing mats which were used to create landing strips during the Vietnam War. Chain-link fencing is relatively economical, but more easily compromised. In selecting a particular fencing design, USBP weighs various factors such as its effectiveness as a law enforcement tool, the costs associated with construction and maintenance, potential environmental impacts, and other public interest concerns. USBP continues to develop fence designs to best address these objectives and constraints.

Patrol Roads

Patrol roads provide USBP agents with quick and direct access to anyone conducting illegal activity along the border, and allow agents access to the various components of the tactical infrastructure system. Patrol roads typically run parallel to and a few feet north of the primary pedestrian fence. Patrol roads are typically unpaved, but in some cases “all-weather” roads are necessary to ensure continual USBP access (INS 2002).

Lighting

Two types of lighting (permanent and portable) might be constructed in specific urban locations. Illegal entries are often accomplished by using the cover of darkness, which would be eliminated by lighting. Lighting acts as a deterrent to cross-border violators and as an aid to USBP agents in capturing illegal aliens, smugglers, terrorists, or terrorist weapons after they have entered the United States (INS 2001). Lighting locations are determined by USBP based on projected operational needs of the specific area.

The permanent lighting would be stadium-type lights on approximately 30- to 40-foot high poles with two to four lights per pole. Each light would have a range of 400 to 1,000 watts, with lower-wattage bulbs used where feasible. Wooden poles, encased in concrete and steel culvert pipe to prevent them from being cut down, would most often be used, although steel poles with concrete footings might also be used. The poles might be existing poles or they might need to be installed. Electricity would be run in overhead lines unless local regulations require the lines to be underground (DHS 2004). Lights would operate from dusk to dawn. Light poles adjacent to U.S. IBWC levees would be coordinated with and approved by the U.S. IBWC. The final placement and direction of lighting has been and would continue to be coordinated with the USFWS, with the USFWS having final review over both placement and direction along each fence section.

Portable lights are self-contained units with generators that can be quickly moved to meet USBP operational requirements. Portable lights are powered by a 6-kilowatt self-contained diesel generator. Portable lights would generally operate continuously every night and would require refueling every day prior to the next night's operation. The portable light systems can be towed to the desired location by USBP vehicles, but they are typically spaced approximately 100 to 400 feet apart, depending upon topography and operational needs. Each portable light would have a light fan directed toward the fence to produce an illuminated area of 100 ft^2. The lighting systems would have shields placed over the lamps to reduce or eliminate the effects of backlighting. Effects from the lighting would occur along the entire corridor where they could be placed; however, in reality, only parts of the fence would be illuminated at a given time since the portable lights would be periodically relocated to provide the most effective deterrent and enforcement strategy (INS 2001).

References

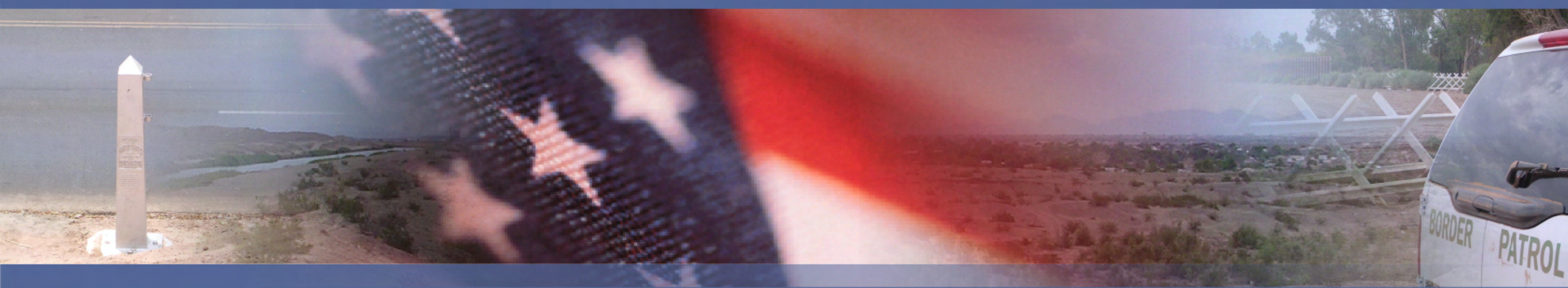
CRS 2006 — Congressional Research Service (CRS). 2006. "Report For Congress." *Border Security: Barriers Along the U.S. International Border*. 12 December 2006.

DHS 2004 — U.S. Department of Homeland Security (DHS). 2004. *Environmental Impact Statement for Operation Rio Grande*. CBP, Washington D.C. April 2004.

INS 2001 — Immigration and Naturalization Service (INS). 2001. *Final Environmental Assessment, Portable Lights within the Naco Corridor*. Cochise County, Arizona. December 2001.

INS 2002 — Immigration and Naturalization Service (INS). 2002. *Draft Environmental Impact Statement for the Completion of the 14-Mile Border Infrastructure System, San Diego, CA*. Immigration and naturalization Service. January 2002

THIS PAGE INTENTIONALLY LEFT BLANK



APPENDIX B

Applicable Laws and Executive Orders

Table B-1. Applicable Laws and Executive Orders [1]

Title, Citation	Summary
Archaeological and Historical Preservation Act, 16 U.S.C. 469	Protects and preserves historical and archaeological data. Requires Federal agencies to identify and recover data from archaeological sites threatened by a proposed action(s).
Clean Air Act, 42 U.S.C. 7401–7671q, as amended	Establishes Federal standards for air pollutants. Prevents significant deterioration in areas of the country where air quality fails to meet Federal standards.
Clean Water Act, 33 U.S.C. 1251–1387 (also known as the Federal Water Pollution Control Act)	Comprehensively restores and maintains the chemical, physical, and biological integrity of the nation's waters. Implemented and enforced by the U.S. Environmental Protection Agency (USEPA).
Comprehensive Environmental Response, Compensation, and Liability Act of 1980, 42 U.S.C. 9601–9675 (also known as "Superfund")	Provides for liability, compensation, cleanup, and emergency response for hazardous substances released into the environment and cleanup of inactive hazardous substances disposal sites. Establishes a fund financed by hazardous waste generators to support cleanup and response actions.
Endangered Species Act of 1973, 16 U.S.C. 1531–1543, as amended	Protects threatened, endangered, and candidate species of fish, wildlife, and plants and their designated critical habitats. Prohibits Federal action that jeopardizes the continued existence of endangered or threatened species. Requires consultation with U.S. Fish and Wildlife Service (USFWS) and National Oceanic and Atmospheric Administration (NOAA) Fisheries and a biological assessment when such species are present in an area affected by government activities.
Fish and Wildlife Coordination Act, 16 U.S.C. 661–667e, as amended	Authorizes the Secretaries of the Interior and Commerce to provide assistance to and cooperate with Federal and state agencies to protect, rear, stock, and increase the supply of game and fur-bearing animals, as well as to study the effects of domestic sewage, trade wastes, and other polluting substances on wildlife. The 1946 amendments require consultation with the USFWS and the state fish and wildlife agencies involving any waterbodies that are proposed or authorized, permitted, or licensed to be impounded, diverted, or otherwise controlled or modified by any agency under a Federal permit or license.
Migratory Bird Treaty Act, 16 U.S.C. 703–712	Implements various treaties for protecting migratory birds; the taking, killing, or possession of migratory birds is unlawful.

Title, Citation	Summary
National Environmental Policy Act of 1969, 42 U.S.C. 4321–4370e, as amended	Requires Federal agencies to use a systematic approach when assessing environmental impacts of government activities. Proposes an interdisciplinary approach in a decisionmaking process designed to identify unacceptable or unnecessary impacts to the environment.
National Historic Preservation Act, 16 U.S.C. 470–470x-6	Requires Federal agencies to consider the effect of any federally assisted undertaking or licensing on any district, site, building, structure, or object eligible for inclusion, or listed in the National Register of Historic Places (NRHP). Provides for the nomination, identification (through NRHP listing), and protection of significant historical and cultural properties.
Noise Control Act of 1972, 42 U.S.C. 4901–4918	Establishes a national policy to promote an environment free from noise that jeopardizes health and welfare. Authorizes the establishment of Federal noise emissions standards and provides relevant information to the public.
Occupational Safety and Health Act of 1970, 29 U.S.C. 651–678	Establishes standards to protect workers, including standards on industrial safety, noise, and health standards.
Resource Conservation and Recovery Act, 42 U.S.C. 6901–6992k	Establishes requirements for safely managing and disposing of solid and hazardous waste and underground storage tanks.
Executive Order (EO) 12372, *Intergovernmental Review of Federal Programs*, July 14, 1982, 47 FR 30959 (6/16/82), as supplemented	Requires Federal agencies to consult with state and local governments when proposed Federal financial assistance or direct Federal development impacts interstate metropolitan urban centers or other interstate areas.
EO 12898, *Environmental Justice,* February 11, 1994, 59 FR 7629 (2/16/94), as amended	Requires certain Federal agencies, to the greatest extent practicable permitted by law, to make environmental justice part of their missions by identifying and addressing disproportionately high and adverse health or environmental effects on minority and low-income populations.

Title, Citation	Summary
EO 13148, *Greening the Government Through Leadership in Environmental Management*, April 21, 2000, 65 FR 24595 (4/26/00)	Designates the head of each Federal agency to ensure that all necessary actions are taken to integrate environmental accountability into agency day-to-day decision making and long-term planning processes, across all agency missions, activities, and functions. Establishes goals for environmental management, environmental compliance, right-to-know (informing the public and their workers of possible sources of pollution resulting from facility operations) and pollution prevention, and similar matters.
EO 13175*, Consultation and Coordination with Indian Tribal Governments,* November 6, 2000, 65 FR 67249 (11/09/00)	Requires Federal agencies to establish an accountable process that ensures meaningful and timely input from tribal officials in developing policies that have tribal implications.
EO 13186*, Responsibilities of Federal Agencies to Protect Migratory Birds,* January 10, 2001, 66 FR 3853 (1/17/01)	Requires each agency to ensure that environmental analyses of Federal actions (required by the National Environmental Policy Act or other established environmental review processes) evaluate the effects of actions and agency plans on migratory birds, emphasizing species of concern. Agencies must support the conservation intent of migratory bird conventions by integrating bird conservation principles, measures, and practices into agency activities, and by avoiding or minimizing, to the extent practicable, adverse impacts on migratory bird resources when conducting agency actions.
EO 11593, *Protection and Enhancement of the Cultural Environment*, May 13, 1971, 36 FR 8921 (5/15/71)	Requires all Federal agencies to locate, identify, and record all cultural resources, including significant archeological, historical, or architectural sites.

Note: [1] This table only reflects those laws and EOs that might reasonably be expected to apply to the Proposed Action and alternatives addressed in this EIS.

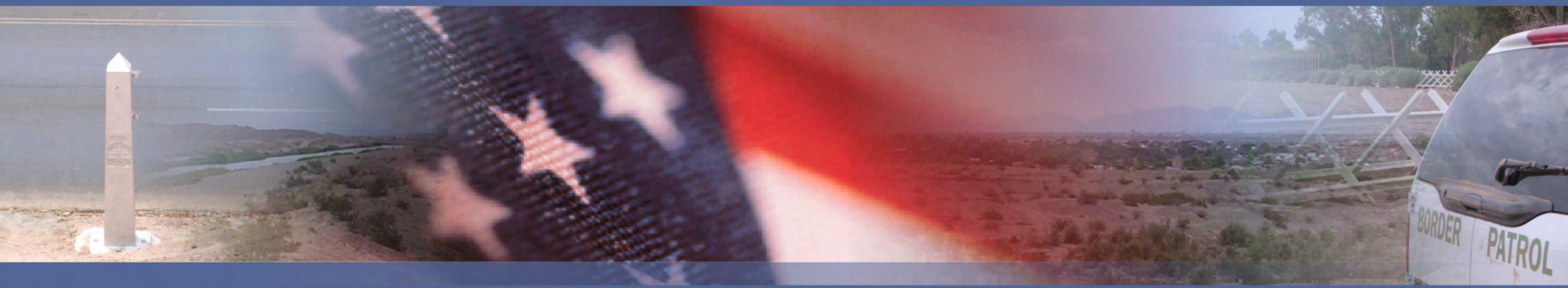
Other laws and Executive Orders potentially relevant to the construction, maintenance, and operation of tactical infrastructure include, but are not limited to, the following:

- American Indian Religious Freedom Act, 42 U.S.C. 1996, et seq.
- Antiquities Act, 16 U.S.C. 433, et seq.; Archeological Resources Protection Act, 16 U.S.C. 470 aa-ll, et seq.
- Architectural Barriers Act, 42 U.S.C. 4151, et seq.

- Community Environmental Response Facilitation Act, 42 U.S.C. 9620, et seq.
- Department of Transportation Act, P.L. 89-670, 49 U.S.C. 303, Section 4(f), et seq.
- Emergency Planning and Community Right-to-Know Act, 42 U.S.C. 11001–11050, et seq.
- Environmental Quality Improvement Act, P.L. 98-581, 42 U.S.C. 4371, et seq.
- Farmlands Protection Policy Act, P.L. 97-98, 7 U.S.C. 4201, et seq.
- Federal Insecticide, Fungicide, and Rodenticide Act, P.L. 86-139, 7 U.S.C. 135, et seq.
- Federal Records Act, 44 U.S.C. 2101-3324, et seq.
- Fish and Wildlife Act of 1956, P.L. 85-888, 16 U.S.C. 742, et seq.
- Flood Disaster Protection Act, 42 U.S.C. 4001, et seq.
- Native American Graves Protection and Repatriation Act, 25 U.S.C. 3001, et seq.
- Pollution Prevention Act of 1990, 42 U.S.C. 13101-13109, et seq.
- Safe Drinking Water Act, P.L. 93-523, 42, U.S.C. 201, et seq.
- Toxic Substances Control Act, 7 U.S.C. 136, et seq.
- Wild and Scenic Rivers Act, P.L. 90-542, 16 U.S.C. 1271, et seq.
- EO 12114, dated January 9, 1979, Environmental Effects Abroad of Major Federal Actions, 44 FR 1957
- EO 12088, dated October 13, 1978, *Federal Compliance with Pollution Control Standards*, 43 FR 47707, as amended by EO 12580, dated January 23, 1987, and revoked (in part) by EO 13148, dated April 21, 2000
- EO 13132, dated August 4, 1999, *Federalism*, 64 FR 43255
- EO 11988, dated May 24, 1977, *Floodplain Management and Protection*, 42 FR 26951, as amended by EO 12148, dated July 20, 1979, 44 FR 43239
- EO 13007, dated May 24, 1996, *Historic Sites Act*, 16 U.S.C. 46, et seq.; Indian Sacred Sites, 61 FR 26771
- EO 12372, dated July 14, 1982, *Intergovernmental Review of Federal Programs*, 47 FR 30959, as amended by EO 12416, April 8, 1983, 48 FR 15587; supplemented by EO 13132, August 4, 1999, 64 FR 43255
- EO 13112, dated February 3, 1999, *Invasive Species*, 64 FR 6183, as amended by EO 13286, February 28, 2003, 68 FR 10619

- EO 11514, dated March 5, 1970, *Protection and Enhancement of Environmental Quality*, 35 FR 4247, as amended by EO 11541, July 1,1970, 35 FR 10737 and EO 11991, May 24, 1977, 42 FR 26967
- EO 13045, dated April 21, 1997, *Protection of Children from Environmental Health and Safety Risks*, 62 FR 19885, as amended by EO 13229, October 9, 2001, 66 FR 52013 and EO 13296, April 18, 2003, 68 FR 19931
- EO 11990, dated May 24, 1977, *Protection of Wetlands*, 42 FR 26961, as amended by EO 12608, September 9, 1987, 52 FR 34617

THIS PAGE INTENTIONALLY LEFT BLANK



APPENDIX C

Public Involvement and Agency Coordination

INTERNATIONAL BOUNDARY AND WATER COMMISSION
UNITED STATES AND MEXICO

OFFICE OF THE COMMISSIONER
UNITED STATES SECTION

July 16, 2007

Mr. Keith Tharp
U.S. Customs and Border Protection
6650 Telecom Drive
Indianapolis, Indiana, 46278-2009

Dear Mr. Tharp,

The International Boundary and Water Commission, U.S. Section, acknowledges receipt of the requirements for three (3) types of border fence, provided by the U.S. Army Corps of Engineers (USACE) under their email of July 3, 2007.

Listed below are the comments generated during our review.

Primary Fencing

1. Item 5, Threshold – If the fence is located within the flood plain and is not parallel to the flow of the river, it is required that a collapsible or removable fence be designed to assure that the proposed fence project is consistent with the stipulations in Article IV-B of the 1970 Boundary Treaty between the United States and Mexico. Revise accordingly.

2. Item 7, Performance Requirement – Change to read, "Site adaptable where necessary to permit water and debris to flow freely and not allow ponding or cause changes in drainage patterns on either side of the border."

Pedestrian Fencing

1. Item 4, Threshold – same comment as Primary Fencing Item 5.

2. Item 6, Performance Requirement – same comment as Primary Fencing Item 7.

Ornamental Fencing

1. Item 5, Threshold – same comment as Primary Fencing Item 5.

2. Item 6, Performance Requirement – same comment as Primary Fencing Item 7.

Other Comments

1. Add a new item for ability to sustain wind gusts of up to 30 miles/hr or as determined by the USACE. Additional structural support may be deemed necessary for non-see through fences.

The Commons, Building C, Suite 100 • 4171 N. Mesa Street • El Paso, Texas 79902
(915) 832-4100 • (FAX) (915) 832-4190 • http://www.ibwc.state.gov

2. The fence gate installation shall provide dual locks in order for the different agencies to have access to the monuments, levees and floodplains.

3. The location of the fence needs to address clear access to the levees and floodplains by IBWC personnel and heavy equipment transport needed for normal and flood control operations. The gate opening shall be a minimum of 20 feet wide in order to accommodate the access of a truck tractor/trailer combination for hauling heavy equipment during normal and flood control operations.

4. There shall be a gate at every existing levee access (ramps, bridges, railroad crossings, etc.), at every monument, at every structure in the flood plain and river to include access by ranchers to their irrigation pumps and access by U.S. Section to existing boat ramps.

5. The installation of the fence shall have a minimum 3 foot offset, measured from the closest corner of the monument base to the fence, at all IBWC land monuments.

6. The location of the fence needs to address clear access to the levees and floodplains by IBWC personnel and heavy equipment transport needed for normal and flood control operations.

7. IBWC requires a minimum of 15 feet access past the upstream and downstream toe of the levee for normal mowing maintenance.

Note: The USIBWC prefers for the fence to be installed on the landside of the levee toe, as close to the limit of our easement as possible, versus the levee or flood plain for several reasons;

- There will not be penetration on levee (underdigging), and the integrity of the levee will not be affected.
- Transporting a dozer (14 foot -10 inches wide) on the levee will not become an issue due to constricting area due to a fence.
- There will be no need to coordinate and get approval from Mexico.
- This would minimize the obstruction of flows during large floods or flash flooding
- This would also minimize obstruction for normal levee operation and maintenance if the fence were not on the levee.

It is important that the integrity of the levee be maintained at all times for flood protection. Therefore, we recommend that construction of fence on levees be in strict compliance with the agency's "Criteria for Construction Activities within the Limits of Existing Floodways." This guide is available on our website.

We request that engineering drawings be submitted to our office for review and approval before beginning construction of the proposed project infrastructure on USIBWC property or property that we have jurisdiction on. The drawings must show the location of each component in relationship to the Rio Grande, Colorado River, and/or land boundary.

Normal maintenance, major repairs of the fence, and clearance of debris (weeds, trash) in the vicinity of the fence shall be the responsibility of the Department of Homeland Security.

If you have any concerns or questions, please do not hesitate to call me at 915-832-4158.

Sincerely,

Michael P. Evans

for Richard E. Peace
Division Engineer, O&M

INTERNATIONAL BOUNDARY AND WATER COMMISSION
UNITED STATES AND MEXICO

OFFICE OF THE COMMISSIONER
UNITED STATES SECTION

November 5, 2007

Mr. Charles McGregor
United States Army Corps of Engineers
Fort Worth District
Engineering Construction Support Office
P.O. Box 17300
Fort Worth, TX 76102-0300

Dear Mr. McGregor:

Reference is made to various letters dated October 18, 2007, from Mr. Robert F. Janson, U.S. Customs and Border Protection, requesting us to become a cooperating agency with regard to the development of National Environmental Policy Act (NEPA) environmental documentation for the proposed construction, maintenance, and operation of tactical infrastructure throughout the international boundary. According to the letters, the following projects are being considered:

1) Environmental Impact Statement for Proposed Construction, Maintenance, and Operation of Tactical Infrastructure, U.S. Department of Homeland Security, U.S. Customs and Border Protection, U.S. Border Patrol San Diego Sector;

2) Environmental Assessment for Proposed Construction, Maintenance, and Operation of Tactical Infrastructure, U.S. Department of Homeland Security, U.S. Customs and Border Protection, U.S. Border Patrol San Diego Sector;

3) Environmental Assessment for Proposed Construction, Maintenance, and Operation of Tactical Infrastructure, U.S. Department of Homeland Security, U.S. Customs and Border Protection, U.S. Border Patrol El Centro Sector;

4) Environmental Assessment for Proposed Construction, Maintenance, and Operation of Tactical Infrastructure, U.S. Department of Homeland Security, U.S. Customs and Border Protection, U.S. Border Patrol Yuma Sector;

5) Supplemental Environmental Assessment for Proposed Construction, Maintenance, and Operation of Tactical Infrastructure, U.S. Department of Homeland Security, U.S. Customs and Border Protection, U.S. Border Patrol El Paso Sector;

6) Environmental Assessment for Proposed Construction, Maintenance, and Operation of Tactical Infrastructure, U.S. Department of Homeland Security, U.S. Customs and Border Protection, U.S. Border Patrol Marfa Sector;

7) Environmental Assessment for Proposed Construction, Maintenance, and Operation of Tactical Infrastructure, U.S. Department of Homeland Security, U.S. Customs and Border Protection, U.S. Border Patrol Del Rio Sector; and

8) Environmental Impact Statement for Proposed Construction, Maintenance, and Operation of Tactical Infrastructure, U.S. Department of Homeland Security, U.S. Customs and Border Protection, U.S. Border Patrol Rio Grande Valley Sector.

The United States Section, International Boundary and Water Commission (USIBWC) accepts your request to become a cooperating agency in the NEPA process. We look forward to working with you on issues related to the international boundary, specifically international treaties and agreements, issues related to USIBWC jurisdiction, and USIBWC real property. Due to the overwhelming list of Border Patrol initiatives along the international boundary, I have designated Mr. Richard Peace, Division Engineer, Operations and Maintenance Division, as the agency single point of contact for matters related to these projects. Mr. Peace can be reached at (915) 832-4158 for overall project coordination. If you have any questions feel free to contact me at (915) 832-4101.

Sincerely,

Carlos Marin, P.E.
Commissioner

U.S. Department of Homeland Security
Washington, DC 20229

U.S. Customs and Border Protection

OCT 18 2007

Commissioner Carlos Marin
International Boundary and Water Commission
U.S. Section
4111 North Mesa, Suite C-100
El Paso, TX 79902-1441

Subject: Environmental Assessment (EA) for Proposed Construction, Maintenance, and Operation of Tactical Infrastructure, U.S. Department of Homeland Security, U.S. Customs and Border Protection, U.S. Border Patrol Del Rio Sector

Dear Commissioner Marin:

While no final decisions on the fence locations have been made, U.S. Customs and Border Protection (CBP), U.S. Border Patrol (USBP), a component of the Department of Homeland Security, is preparing an Environmental Assessment (EA) to address the potential environmental impacts and feasibility of constructing, maintaining, and operating tactical infrastructure in segments totaling approximately 5 miles in length within USBP's Del Rio Sector, Texas. In preparing the EA, CBP will be working directly with the United States Army Corps of Engineers, Fort Worth District (USACE), who will provide technical expertise and other support to CBP.

To assist USBP in gaining and maintaining operational control of the border, CBP proposes to construct, maintain, and operate tactical infrastructure to include primary pedestrian fence and access and patrol roads along the U.S./Mexico international border. Individual segments would range from approximately 0.9 to 3.0 miles in length. Maps presenting the proposed project sites are enclosed.

Based on Congressional and Executive mandates, CBP and USBP are assessing operational requirements and land issues along the entire Southwest border. Preparing the EA does not necessarily mean the 5 miles of tactical infrastructure will be installed within USBP Del Rio Sector. Rather, this EA is a prudent part of the planning process needed to assess any environmental concerns in accordance with the National Environmental Policy Act of 1969 (NEPA), the National Historic Preservation Act (NHPA), the Clean Water Act (CWA), and other applicable environmental laws and regulations.

Your agency has been identified as a Federal authority with responsibilities for resources that may be affected by the Proposed Action. In accordance with the Council on Environmental Quality (CEQ) regulations addressing cooperating agencies (40 CFR 1501.6 and 1508.5) and CEQ's January 30, 2002, guidance, CBP is inviting you to participate in the development of the EA as a cooperating agency. Please contact Mr. Charles McGregor of the USACE, Fort Worth District, Engineering Construction Support Office by mail at P.O Box 17300, Forth Worth, Texas 76102-0300 if your agency would like to be a cooperating agency.

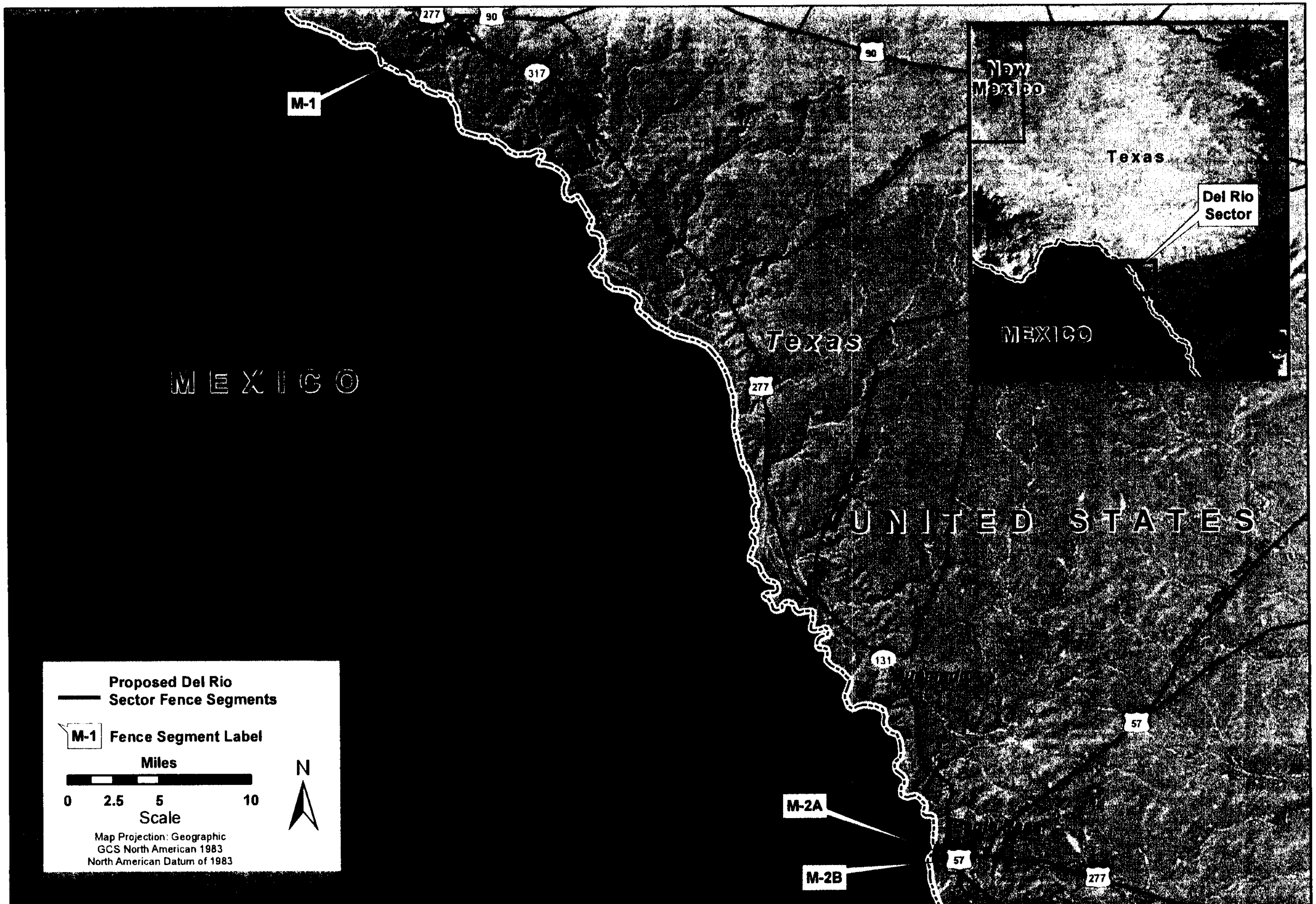
Your prompt attention to this request would be greatly appreciated. If you have any questions, please call Mr. Charles McGregor at (817) 886-1585 or Assistant Chief Patrol Agent Alan Langford or Randy Clark, USBP Del Rio Sector at (830) 778-7110.

Sincerely,

R. Janson

Robert F. Janson
Acting Executive Director
Asset Management
U.S. Customs and Border Protection

Enclosure



Source: ESRI StreetMap USA 2005

U.S. Department of Homeland Security
Washington, DC 20229

U.S. Customs and
Border Protection

OCT 18 2007

Mr. Richard Greene
Regional Administrator, Region 6
U.S. Environmental Protection Agency
1445 Ross Avenue, Suite 1200
Dallas, TX 75202

Subject: Environmental Assessment (EA) for Proposed Construction, Maintenance, and Operation of Tactical Infrastructure, U.S. Department of Homeland Security, U.S. Customs and Border Protection, U.S. Border Patrol Del Rio Sector

Dear Mr. Greene:

While no final decisions on the fence locations have been made, U.S. Customs and Border Protection (CBP), U.S. Border Patrol (USBP), a component of the Department of Homeland Security, is preparing an Environmental Assessment (EA) to address the potential environmental impacts and feasibility of constructing, maintaining, and operating tactical infrastructure in segments totaling approximately 5 miles in length within USBP's Del Rio Sector, Texas. In preparing the EA, CBP will be working directly with the United States Army Corps of Engineers, Fort Worth District (USACE), who will provide technical expertise and other support to CBP.

To assist USBP in gaining and maintaining operational control of the border, CBP proposes to construct, maintain, and operate tactical infrastructure to include primary pedestrian fence and access and patrol roads along the U.S./Mexico international border. Individual segments would range from approximately 0.9 to 3.0 miles in length. Maps presenting the proposed project sites are enclosed.

Based on Congressional and Executive mandates, CBP and USBP are assessing operational requirements and land issues along the entire Southwest border. Preparing the EA does not necessarily mean the 5 miles of tactical infrastructure will be installed within USBP Del Rio Sector. Rather, this EA is a prudent part of the planning process needed to assess any environmental concerns in accordance with the National Environmental Policy Act of 1969 (NEPA), the National Historic Preservation Act (NHPA), the Clean Water Act (CWA), and other applicable environmental laws and regulations.

Your agency has been identified as a Federal authority with responsibilities for resources that may be affected by the Proposed Action. In accordance with the Council on Environmental Quality (CEQ) regulations addressing cooperating agencies (40 CFR 1501.6 and 1508.5) and CEQ's January 30, 2002, guidance, CBP is inviting you to participate in the development of the EA as a cooperating agency. Please contact Mr. Charles McGregor of the USACE, Fort Worth District, Engineering Construction Support Office by mail at P.O Box 17300, Forth Worth, Texas 76102-0300 if your agency would like to be a cooperating agency.

Your prompt attention to this request would be greatly appreciated. If you have any questions, please call Mr. Charles McGregor at (817) 886-1585 or Assistant Chief Patrol Agent Alan Langford or Randy Clark, USBP Del Rio Sector at (830) 778-7110.

Sincerely,

RJanson

Robert F. Janson
Acting Executive Director
Asset Management
U.S. Customs and Border Protection

Enclosure

U.S. Department of Homeland Security
Washington, DC 20229

U.S. Customs and
Border Protection

Dr. Benjamin Tuggle
Regional Director
U.S. Fish and Wildlife Service
Southwest Region
P.O. Box 1306
Albuquerque, NM 87103-1306

OCT 18 2007

Subject: Environmental Assessment (EA) for Proposed Construction, Maintenance, and Operation of Tactical Infrastructure, U.S. Department of Homeland Security, U.S. Customs and Border Protection, U.S. Border Patrol Del Rio Sector

Dear Dr. Tuggle:

While no final decisions on the fence locations have been made, U.S. Customs and Border Protection (CBP), U.S. Border Patrol (USBP), a component of the Department of Homeland Security, is preparing an Environmental Assessment (EA) to address the potential environmental impacts and feasibility of constructing, maintaining, and operating tactical infrastructure in segments totaling approximately 5 miles in length within USBP's Del Rio Sector, Texas. In preparing the EA, CBP will be working directly with the United States Army Corps of Engineers, Fort Worth District (USACE), who will provide technical expertise and other support to CBP.

To assist USBP in gaining and maintaining operational control of the border, CBP proposes to construct, maintain, and operate tactical infrastructure to include primary pedestrian fence and access and patrol roads along the U.S./Mexico international border. Individual segments would range from approximately 0.9 to 3.0 miles in length. Maps presenting the proposed project sites are enclosed.

Based on Congressional and Executive mandates, CBP and USBP are assessing operational requirements and land issues along the entire Southwest border. Preparing the EA does not necessarily mean the 5 miles of tactical infrastructure will be installed within USBP Del Rio Sector. Rather, this EA is a prudent part of the planning process needed to assess any environmental concerns in accordance with the National Environmental Policy Act of 1969 (NEPA), the National Historic Preservation Act (NHPA), the Clean Water Act (CWA), and other applicable environmental laws and regulations.

Your agency has been identified as a Federal authority with responsibilities for resources that may be affected by the Proposed Action. In accordance with the Council on Environmental Quality (CEQ) regulations addressing cooperating agencies (40 CFR 1501.6 and 1508.5) and CEQ's January 30, 2002, guidance, CBP is inviting you to participate in the development of the EA as a cooperating agency. Please contact Mr. Charles McGregor of the USACE, Fort Worth District, Engineering Construction Support Office by mail at P.O Box 17300, Forth Worth, Texas 76102-0300 if your agency would like to be a cooperating agency.

Your prompt attention to this request would be greatly appreciated. If you have any questions, please call Mr. Charles McGregor at (817) 886-1585 or Assistant Chief Patrol Agent Alan Langford or Randy Clark, USBP Del Rio Sector at (830) 778-7110.

Sincerely,

R Janson

Robert F. Janson
Acting Executive Director
Asset Management
U.S. Customs and Border Protection

Enclosure

Cc: Mike Horton

U.S. Department of Homeland Security
Washington, DC 20229

U.S. Customs and
Border Protection

Deputy Commissioner

OCT 18 2007

COL Christopher W. Martin
US Army Corps of Engineers
Fort Worth District
819 Taylor Street
Fort Worth, TX 76102

Subject: Environmental Assessment (EA) for Proposed Construction, Maintenance, and Operation of Tactical Infrastructure, U.S. Department of Homeland Security, U.S. Customs and Border Protection, U.S. Border Patrol Del Rio Sector

Dear COL Martin:

While no final decisions on the fence locations have been made, U.S. Customs and Border Protection (CBP), U.S. Border Patrol (USBP), a component of the Department of Homeland Security, is preparing an Environmental Assessment (EA) to address the potential environmental impacts and feasibility of constructing, maintaining, and operating tactical infrastructure in segments totaling approximately 5 miles in length within USBP's Del Rio Sector, Texas. In preparing the EA, CBP will be working directly with the United States Army Corps of Engineers, Fort Worth District (USACE), who will provide technical expertise and other support to CBP.

To assist USBP in gaining and maintaining operational control of the border, CBP proposes to construct, maintain, and operate tactical infrastructure to include primary pedestrian fence and access and patrol roads along the U.S./Mexico international border. Individual segments would range from approximately 0.9 to 3.0 miles in length. Maps presenting the proposed project sites are enclosed.

Based on Congressional and Executive mandates, CBP and USBP are assessing operational requirements and land issues along the entire Southwest border. Preparing the EA does not necessarily mean the 5 miles of tactical infrastructure will be installed within USBP Del Rio Sector. Rather, this EA is a prudent part of the planning process needed to assess any environmental concerns in accordance with the National Environmental Policy Act of 1969 (NEPA), the National Historic Preservation Act (NHPA), the Clean Water Act (CWA), and other applicable environmental laws and regulations.

Your agency has been identified as a Federal authority with responsibilities for resources tha may be affected by the Proposed Action. In accordance with the Council on Environmental Quality (CEQ) regulations addressing cooperating agencies (40 CFR 1501.6 and 1508.5) anc CEQ's January 30, 2002, guidance, CBP is inviting you to participate in the development of EA as a cooperating agency. Please contact Mr. Charles McGregor of the USACE, Fort Wo District, Engineering Construction Support Office by mail at P.O Box 17300, Forth Worth, Texas 76102-0300 if your agency would like to be a cooperating agency.

Your prompt attention to this request would be greatly appreciated. If you have any questior please call Mr. Charles McGregor at (817) 886-1585 or Assistant Chief Patrol Agent Alan Langford or Randy Clark, USBP Del Rio Sector at (830) 778-7110.

Sincerely,

RF Janson

Robert F. Janson
Acting Executive Director
Asset Management
U.S. Customs and Border Protection

Enclosure

U.S. Department of Homeland Security
Washington, DC 20229

U.S. Customs and
Border Protection

OCT 18 2007

COL David C. Weston
U.S. Army Corps of Engineers
Galveston District
P.O. Box 1229
Galveston, TX 77553-1229

Subject: Environmental Assessment (EA) for Proposed Construction, Maintenance, and Operation of Tactical Infrastructure, U.S. Department of Homeland Security, U.S. Customs and Border Protection, U.S. Border Patrol Del Rio Sector

Dear COL Weston:

While no final decisions on the fence locations have been made, U.S. Customs and Border Protection (CBP), U.S. Border Patrol (USBP), a component of the Department of Homeland Security, is preparing an Environmental Assessment (EA) to address the potential environmental impacts and feasibility of constructing, maintaining, and operating tactical infrastructure in segments totaling approximately 5 miles in length within USBP's Del Rio Sector, Texas. In preparing the EA, CBP will be working directly with the United States Army Corps of Engineers, Fort Worth District (USACE), who will provide technical expertise and other support to CBP.

To assist USBP in gaining and maintaining operational control of the border, CBP proposes to construct, maintain, and operate tactical infrastructure to include primary pedestrian fence and access and patrol roads along the U.S./Mexico international border. Individual segments would range from approximately 0.9 to 3.0 miles in length. Maps presenting the proposed project sites are enclosed.

Based on Congressional and Executive mandates, CBP and USBP are assessing operational requirements and land issues along the entire Southwest border. Preparing the EA does not necessarily mean the 5 miles of tactical infrastructure will be installed within USBP Del Rio Sector. Rather, this EA is a prudent part of the planning process needed to assess any environmental concerns in accordance with the National Environmental Policy Act of 1969 (NEPA), the National Historic Preservation Act (NHPA), the Clean Water Act (CWA), and other applicable environmental laws and regulations.

Your agency has been identified as a Federal authority with responsibilities for resources that may be affected by the Proposed Action. In accordance with the Council on Environmental Quality (CEQ) regulations addressing cooperating agencies (40 CFR 1501.6 and 1508.5) and CEQ's January 30, 2002, guidance, CBP is inviting you to participate in the development of the EA as a cooperating agency. Please contact Mr. Charles McGregor of the USACE, Fort Worth District, Engineering Construction Support Office by mail at P.O Box 17300, Forth Worth, Texas 76102-0300 if your agency would like to be a cooperating agency.

Your prompt attention to this request would be greatly appreciated. If you have any questions, please call Mr. Charles McGregor at (817) 886-1585 or Assistant Chief Patrol Agent Alan Langford or Randy Clark, USBP Del Rio Sector at (830) 778-7110.

Sincerely,

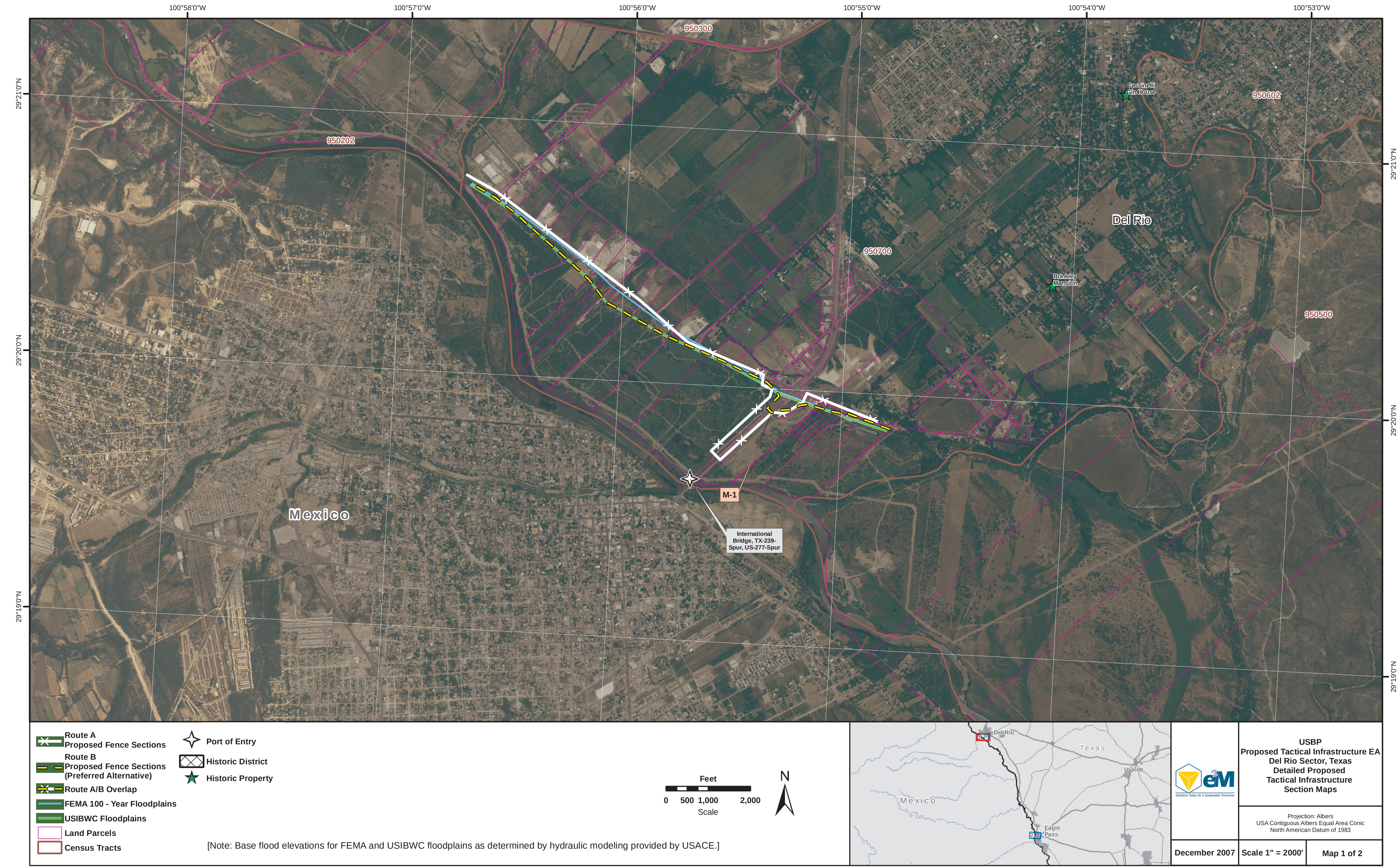
RF Janson

Robert F. Janson
Acting Executive Director
Asset Management
U.S. Customs and Border Protection

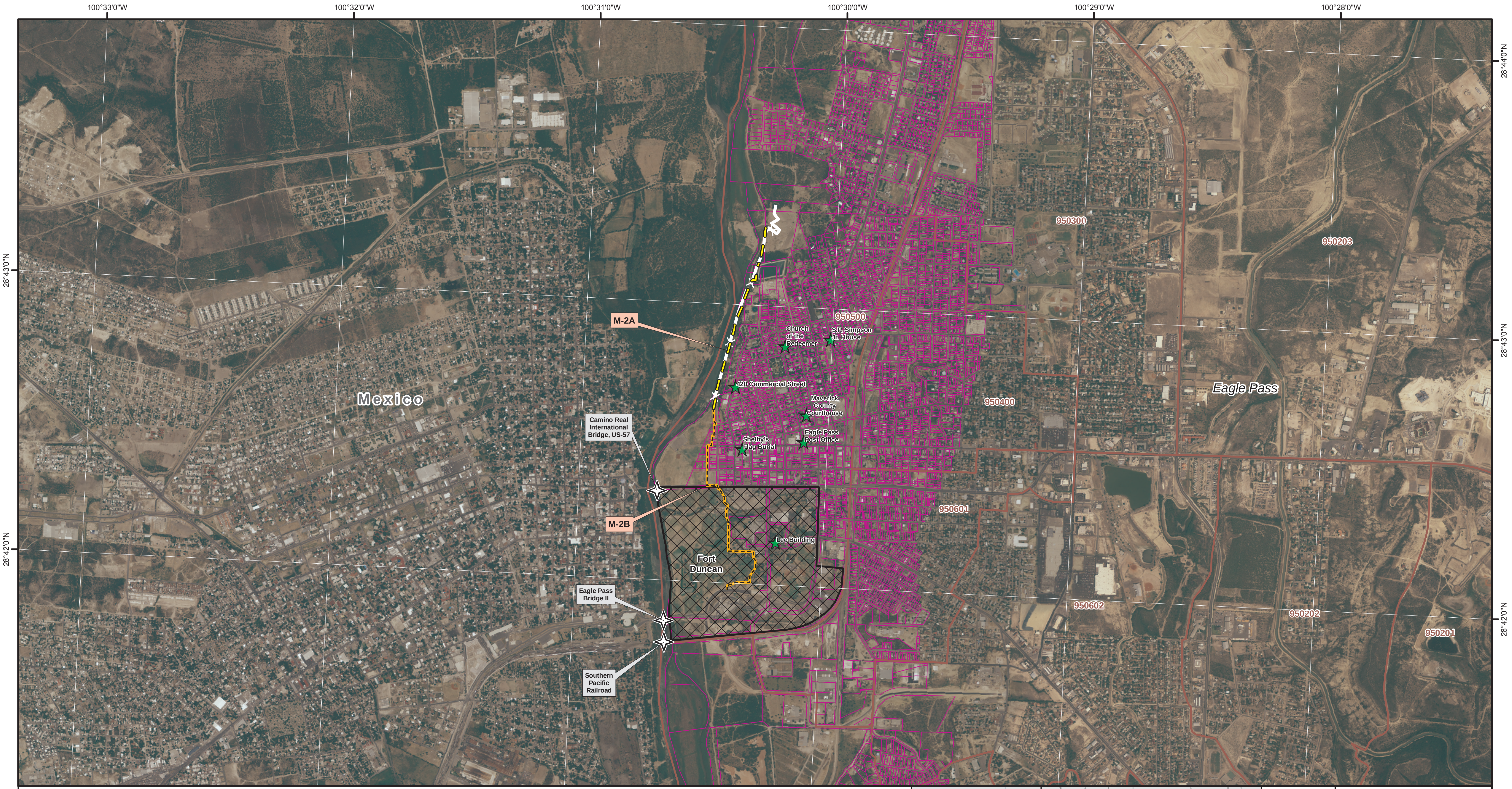
Enclosure

APPENDIX D

Detailed Maps of the Proposed Tactical Infrastructure Sections Showing Land Use and Water



100°58'0"W
100°57'0"W
100°56'0"W
100°55'0"W
100°54'0"W
100°53'0"W
29°21'0"N
29°20'0"N
29°19'0"N
950300
950202
950700
950602
950500
Cassinelli Gin House
Brinkley Mansion
Del Rio
Mexico
M-1
International Bridge, TX-239-Spur, US-277-Spur
Route A Proposed Fence Sections
Route B Proposed Fence Sections (Preferred Alternative)
Route A/B Overlap
FEMA 100 - Year Floodplains
USIBWC Floodplains
Land Parcels
Census Tracts
Port of Entry
Historic District
Historic Property
Feet
0 500 1,000 2,000
Scale
N
[Note: Base flood elevations for FEMA and USIBWC floodplains as determined by hydraulic modeling provided by USACE.]
Del Rio
Texas
Uvalde
Mexico
Eagle Pass
Solutions Today for a Sustainable Tomorrow
USBP
Proposed Tactical Infrastructure EA
Del Rio Sector, Texas
Detailed Proposed
Tactical Infrastructure
Section Maps
Projection: Albers
USA Contiguous Albers Equal Area Conic
North American Datum of 1983
December 2007
Scale 1" = 2000'
Map 1 of 2



Route A
Proposed Fence Sections

Route B
Proposed Fence Sections
(Preferred Alternative)

Route A/B Overlap

Previously Approved Fence Section - M-2B,
Not Part of Proposed Action

Land Parcels

Census Tracts

Port of Entry

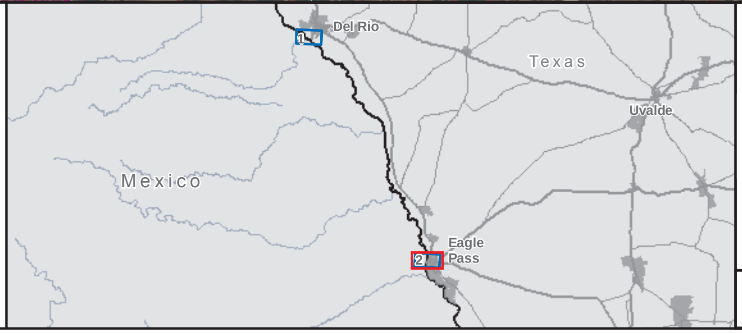
Historic District

Historic Property

[Preparer's Note: USIBWC and FEMA 100-year floodplain data
will be added once it is received.]

Feet
0 500 1,000 2,000
Scale

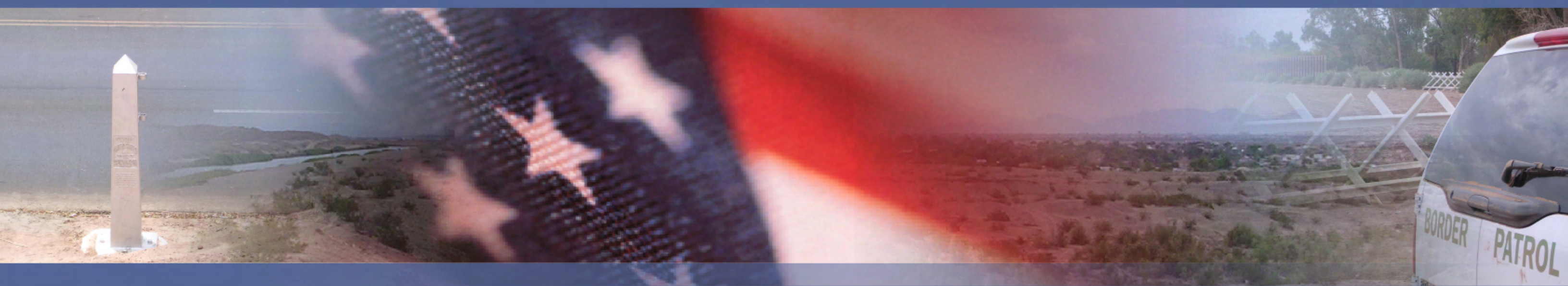
N



USBP
Proposed Tactical Infrastructure EA
Del Rio Sector, Texas
Detailed Proposed
Tactical Infrastructure
Section Maps

Projection: Albers
USA Contiguous Albers Equal Area Conic
North American Datum of 1983

December 2007 | Scale 1" = 2000' | Map 2 of 2



APPENDIX E

Air Quality Information

APPENDIX F

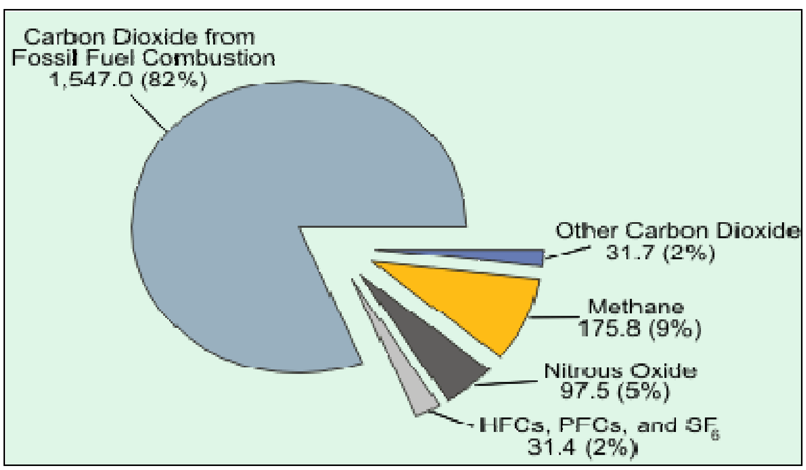
AIR QUALITY INFORMATION

Greenhouse Gases

In April 2007, the U.S. Supreme Court declared that carbon dioxide (CO_2) and other greenhouse gases are air pollutants under the Clean Air Act (CAA). The Court declared that the U.S. Environmental Protection Agency (USEPA) has the authority to regulate emissions from new cars and trucks under the landmark environment law.

Many chemical compounds found in the Earth's atmosphere act as "greenhouse gases." These gases allow sunlight to enter the atmosphere freely. When sunlight strikes the Earth's surface, some of it is reflected back towards space as infrared radiation (heat). Greenhouse gases absorb this infrared radiation and trap the heat in the atmosphere. Over time, the trapped heat results in the phenomenon of global warming.

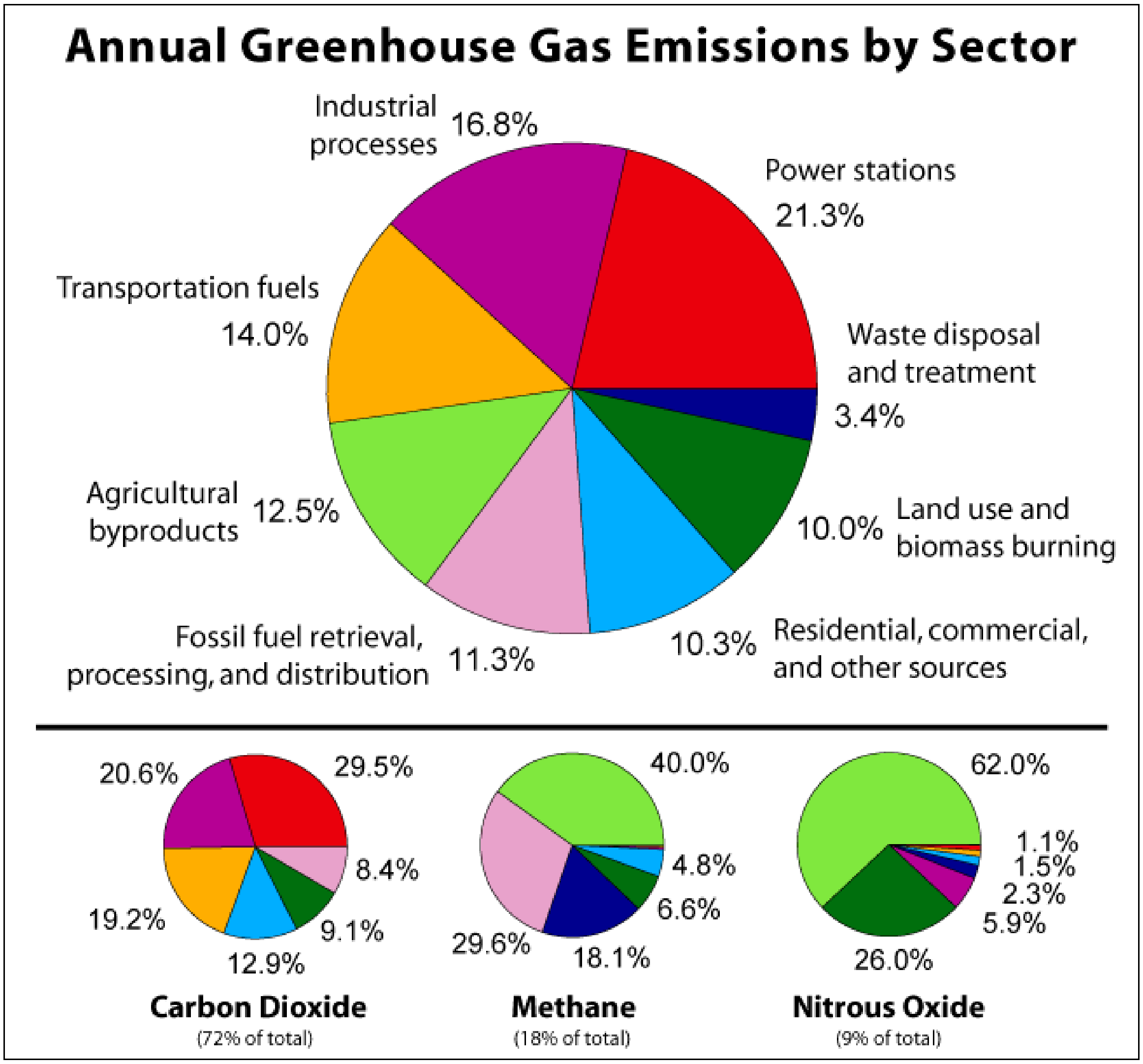
Many gases exhibit these "greenhouse" properties. The sources of the majority of greenhouse gases come mostly from natural sources but are also contributed to by human activity and are shown in **Figure F-1**. It is not possible to state that a specific gas causes a certain percentage of the greenhouse effect because the influences of the various gases are not additive.



Source: Energy Information Administration 2003

Figure F-1. Greenhouse Gas Emissions From Burning of Gas (Million Metric Tons of Carbon Equivalent)

Figure F-2 displays the annual greenhouse gas emissions by sector in the United States. Most government agencies and military installations are just beginning to establish a baseline for their operations and their impact on the greenhouse effect. Since the USEPA has not promulgated an ambient standard or *de minimis* level for CO_2 emissions for Federal actions, there is no standard value to compare an action against in terms of meeting or violating the standard. Hence, we shall attempt to establish the effects on air quality as a result of the amount of CO_2 produced by the Federal action and what could be done to minimize the impact of these emissions.



Source: Rosmarino 2006

Figure F-2. Annual Greenhouse Gas Emissions by Sector

References

Energy Information Administration. 2003. "Greenhouse Gases, Climate Change, and Energy." EIA Brochure. 2003. Available online: <*http://www.eia.doe.gov/oiaf/1605/ggccebro/chapter1.html*>. Last updated April 2, 2004. Accessed November 4, 2007.

Tanyalynnette Rosmarino, Director of Field Engineering, Northeast, BigFix, Inc. 2006. "A Self-Funding Enterprise Solution to Reduce Power Consumption and Carbon Emissions." Slide presentation for the NYS Forum's May Executive Committee Meeting Building an Energy Smart IT Environment. 2006. Available online: <*http://www.nysforum.org/documents/html/2007/execcommittee/may/enterprisepowerconsumptionreduction_files/800x600/slide1.html*>. Accessed November 4, 2007.

THIS PAGE INTENTIONALLY LEFT BLANK

Summary	Summarizes total emissions by calendar year.
Combustion	Estimates emissions from non-road equipment exhaust as well as painting.
Fugitive	Estimates fine particulate emissions from earthmoving, vehicle traffic, and windblown dust
Grading	Estimates the number of days of site preparation, to be used for estimating heavy equipment exhaust and earthmoving dust emissions
Maintenance Emissions	Estimates the total emissions from future maintenance of fencelines and access roads from mowers.
Generator Emissions	Estimates the total emissions from emergency generators to power construction equipment.
AQCR Tier Report	Summarizes total emissions for the Metropolitan San Antonio Intrastate AQCR Tier Reports for 2001, to be used to compare project to regional emissions.

Air Quality Emissions from Proposed Action

		NO_x (ton)	VOC (ton)	CO (ton)	SO_2 (ton)	PM_{10} (ton)
CY2008	Construction Combustion	0.518	0.077	0.605	0.010	0.017
	Construction Fugitive Dust	0.000	0.000	0.000	0.000	17.732
	Maintenance Emissions	0.042	0.005	0.021	0.010	0.005
	Generator Emissions	8.020	0.655	1.728	0.527	0.564
	TOTAL CY2008	8.580	0.737	2.353	0.548	18.318

Since future year budgets were not readily available, actual 2001 air emissions inventories for the counties were used as an approximation of the regional inventory. Because the Proposed Action is several orders of magnitude below significance, the conclusion would be the same, regardless of whether future year budget data set were used.

Metropolitan San Antonio Intrastate AQCR

	Point and Area Sources Combined				
Year	NO_x (tpy)	VOC (tpy)	CO (tpy)	SO_2 (tpy)	PM_{10} (tpy)
2001	111,196	112,137	671,869	50,220	192,504

Source: USEPA-AirData NET Tier Report (http://www.epa.gov/air/data/geosel.html). Site visited on 13 November 2007.

Determination Significance (Significance Threshold = 10%) for Construction Activities

	Point and Area Sources Combined				
	NO_x (tpy)	VOC (tpy)	CO (tpy)	SO_2 (tpy)	PM_{10} (tpy)
Minimum - 2001	111,196	112,137	671,869	50,220	192,504
2008 Emissions	8.580	0.737	2.353	0.548	18.318
Proposed Action %	**0.008%**	**0.001%**	**0.000%**	**0.001%**	**0.010%**

Construction Combustion Emissions for CY 2008

Combustion Emissions of VOC, NO_x, SO_2, CO and PM_{10} Due to Construction

Includes:

100% of Construct Pedestrian Fences and Patrol Road	1,241,856 ft^2	28.51 acres
Construction area planned per month	310,464 ft^2	7.13 acres

Assumptions:

Total ground disturbance for pedestrian fence and patrol road would be 3.92 miles long by 60 feet wide (1,241,856 ft^2).
No grading would be required in construction staging areas.
Patrol road would be graded and lined with gravel. No paving would be included in Alternative 2.
Construction would occur between April and July 2008 for a total of 120 working days (Assumes working 7 days/week).

Total Building Construction Area:	0 ft^2	
Total Demolished Area:	0 ft^2	
Total Paved Area:	0 ft^2	
Total Disturbed Area per month:	310,464 ft^2	7.13 acres
Construction Duration:	0.3 year(s)	
Annual Construction Activity:	120 days/yr	

Emission Factors Used for Construction Equipment

Reference: Guide to Air Quality Assessment, SMAQMD, 2004

Emission factors are taken from Table 3-2. Assumptions regarding the type and number of equipment are from Table 3-1 unless otherwise noted.

Grading

Equipment	No. Reqd.[a] per 10 acres	NO_x (lb/day)	VOC[b] (lb/day)	CO (lb/day)	SO_2[c]	PM_{10} (lb/day)
Bulldozer	1	29.40	3.66	25.09	0.59	1.17
Motor Grader	1	10.22	1.76	14.98	0.20	0.28
Water Truck	1	20.89	3.60	30.62	0.42	0.58
Total per 10 acres of activity	3	60.51	9.02	70.69	1.21	2.03

Paving

Equipment	No. Reqd.[a] per 10 acres	NO_x (lb/day)	VOC[b] (lb/day)	CO (lb/day)	SO_2[c]	PM_{10} (lb/day)
Paver	1	7.93	1.37	11.62	0.16	0.22
Roller	1	5.01	0.86	7.34	0.10	0.14
Total per 10 acres of activity	2	12.94	2.23	18.96	0.26	0.36

Demolition

Equipment	No. Reqd.[a] per 10 acres	NO_x (lb/day)	VOC[b] (lb/day)	CO (lb/day)	SO_2[c]	PM_{10} (lb/day)
Loader	1	7.86	1.35	11.52	0.16	0.22
Haul Truck	1	20.89	3.60	30.62	0.42	0.58
Total per 10 acres of activity	2	28.75	4.95	42.14	0.58	0.80

Building Construction

Equipment[d]	No. Reqd.[a] per 10 acres	NO_x (lb/day)	VOC[b] (lb/day)	CO (lb/day)	SO_2[c]	PM_{10} (lb/day)
Stationary						
Generator Set	1	11.83	1.47	10.09	0.24	0.47
Industrial Saw	1	17.02	2.12	14.52	0.34	0.68
Welder	1	4.48	0.56	3.83	0.09	0.18
Mobile (non-road)						
Truck	1	20.89	3.60	30.62	0.84	0.58
Forklift	1	4.57	0.79	6.70	0.18	0.13
Crane	1	8.37	1.44	12.27	0.33	0.23
Total per 10 acres of activity	6	67.16	9.98	78.03	2.02	2.27

Note: Footnotes for tables are on following page

Architectural Coatings

Equipment	No. Reqd.[a] per 10 acres	NO_x (lb/day)	VOC[b] (lb/day)	CO (lb/day)	SO_2[c]	PM_{10} (lb/day)
Air Compressor	1	6.83	0.85	5.82	0.14	0.27
Total per 10 acres of activity	1	6.83	0.85	5.82	0.14	0.27

a) The SMAQMD 2004 guidance suggests a default equipment fleet for each activitiy, assuming 10 acres of that activity, (e.g., 10 acres of grading, 10 acres of paving, etc.). The default equipment fleet is increased for each 10 acre increment in the size of the construction project. That is, a 26 acre project would round to 30 acres and the fleet size would be three times the default fleet for a 10 acre project.

b) The SMAQMD 2004 reference lists emission factors for reactive organic gas (ROG). For the purposes of this worksheet ROG = VOC.

c) The SMAQMD 2004 reference does not provide SO_2 emission factors. For this worksheet, SO_2 emissions have been estimated based on approximate fuel use rate for diesel equipment and the assumption of 500 ppm sulfur diesel fuel. For the average of the equipment fleet, the resulting SO_2 factor was found to be approximately 0.04 times the NOx emission factor for the mobile equipment (based upon 2002 USAF IERA "Air Emissions Inventory Guidance") and 0.02 times the NOx emission factor for all other equipment (based on AP-42, Table 3.4-1)

d) Typical equipment fleet for building construction was not itemized in SMAQMD 2004 guidance. The equipment list above was assumed based on SMAQMD 1994 guidance.

PROJECT-SPECIFIC EMISSION FACTOR SUMMARY

Source	Equipment Multiplier*	SMAQMD Emission Factors (lb/day)				
		NO_x	VOC	CO	SO_2**	PM_{10}
Grading Equipment	1	43.127	6.429	50.383	0.863	1.447
Paving Equipment	1	0.000	0.000	0.000	0.000	0.000
Demolition Equipment	1	0.000	0.000	0.000	0.000	0.000
Building Construction	1	0.000	0.000	0.000	0.000	0.000
Air Compressor for Architectural Coating	1	0.000	0.000	0.000	0.000	0.000
Architectural Coating**			0.000			

*The equipment multiplier is an integer that represents units of 10 acres for purposes of estimating the number of equipment required for the project

**Emission factor is from the evaporation of solvents during painting, per "Air Quality Thresholds of Significance", SMAQMD, 1994

Example: SMAQMD Emission Factor for Grading Equipment NOx = (Total Grading NOx per 10 ac*((total disturbed area/43560)/10))*(Equipment Multiplier)

Summary of Input Parameters

	Total Area (ft^2)	Total Area (acres)	Total Days	
Grading:	310,464	7.13	6	(from "CY2008 Grading" worksheet)
Paving:	0	0.00	0	
Demolition:	0	0.00	0	
Building Construction:	0	0.00	0	
Architectural Coating	0	0.00	0	(per the SMAQMD "Air Quality of Thresholds of Significance", 1994)

NOTE: The 'Total Days' estimate for paving is calculated by dividing the total number of acres by 0.21 acres/day, which is a factor derived from the 2005 MEANS Heavy Construction Cost Data, 19th Edition, for 'Asphaltic Concrete Pavement, Lots and Driveways - 6" stone base', which provides an estimate of square feet paved per day. There is also an estimate for 'Plain Cement Concrete Pavement', however the estimate for asphalt is used because it is more conservative. The 'Total 'Days' estimate for demolition is calculated by dividing the total number of acres by 0.02 acres/day, which is a factor also derived from the 2005 MEANS reference. This is calculated by averaging the demolition estimates from 'Building Demolition - Small Buildings, Concrete', assuming a height of 30 feet for a two-story building; from 'Building Footings and Foundations Demolition - 6" Thick, Plain Concrete'; and from 'Demolish, Remove Pavement and Curb - Concrete to 6" thick, rod reinforced'. Paving is double-weighted since projects typically involve more paving demolition.
The 'Total Days' estimate for building construction is assumed to be 230 days, unless project-specific data is known.

Project Emissions per Month (lbs)

	NO_x	VOC	CO	SO_2	PM_{10}
Grading Equipment	258.76	38.57	302.30	5.18	8.68
Paving	-	-	-	-	-
Demolition	-	-	-	-	-
Building Construction	-	-	-	-	-
Architectural Coatings	-	-	-	-	-
Total Emissions (lbs):	**258.76**	**38.57**	**302.30**	**5.18**	**8.68**

Results: Total Project Annual Emissions (4 months of activity)

	NO_x	VOC	CO	SO_2	PM_{10}
Total Project Emissions (lbs)	1,035.05	154.29	1,209.18	20.70	34.72
Total Project Emissions (tons)	0.52	0.08	0.60	0.01	0.02

CO2 Emissions

Construction Fugitive Dust Emissions for CY 2008

Calculation of PM_{10} Emissions Due to Site Preparation (Uncontrolled).

User Input Parameters / Assumptions

Acres graded per year:	28.51	acres/yr	(From "CY2008 Combustion" worksheet)
Grading days/yr:	5.59	days/yr	(From "CY2008 Grading worksheet)
Exposed days/yr:	45	assumed days/yr graded area is exposed	
Grading Hours/day:	8	hr/day	
Soil piles area fraction:	0.10	(assumed fraction of site area covered by soil piles)	
Soil percent silt, s:	8.5	%	(mean silt content; expected range: 0.56 to 23, AP-42 Table 13.2.2-1)
Soil percent moisture, M:	85	%	(http://www.cpc.noaa.gov/products/soilmst/w.shtml)
Annual rainfall days, p:	70	days/yr rainfall exceeds 0.01 inch/day (AP-42 Fig 13.2.2-1)	
Wind speed > 12 mph %, I:	17	%	Ave. of wind speed at San Antonio, TX (http://www.epa.gov/ttn/naaqs/ozone/areas/windr/12921.gif)
Fraction of TSP, J:	0.5	per California Environmental Quality Act (CEQA) Air Quality Handbook, SCAQMD, 1993, p. A9-99	
Mean vehicle speed, S:	5	mi/hr	(On-site)
Dozer path width:	8	ft	
Qty construction vehicles:	8.55	vehicles	(From "CY2008 Grading worksheet)
On-site VMT/vehicle/day:	5	mi/veh/day	(Excluding bulldozer VMT during grading)
PM_{10} Adjustment Factor k	1.5	lb/VMT	(AP-42 Table 13.2.2-2 12/03 for PM_{10} for unpaved roads)
PM_{10} Adjustment Factor a	0.9	(dimensionless)	(AP-42 Table 13.2.2-2 12/03 for PM_{10} for unpaved roads)
PM_{10} Adjustment Factor b	0.45	(dimensionless)	(AP-42 Table 13.2.2-2 12/03 for PM_{10} for unpaved roads)
Mean Vehicle Weight W	40	tons	assumed for aggregate trucks

TSP - Total Suspended Particulate
VMT - Vehicle Miles Traveled

Emissions Due to Soil Disturbance Activities

Operation Parameters (Calculated from User Inputs)

Grading duration per acre	1.6	hr/acre	
Bulldozer mileage per acre	1	VMT/acre	(Miles traveled by bulldozer during grading)
Construction VMT per day	43	VMT/day	
Construction VMT per acre	8.4	VMT/acre	(Travel on unpaved surfaces within site)

Equations Used (Corrected for PM10)

Operation	Empirical Equation	Units	AP-42 Section (5th Edition)
Bulldozing	$0.75(s^{1.5})/(M^{1.4})$	lbs/hr	Table 11.9-1, Overburden
Grading	$(0.60)(0.051)s^{2.0}$	lbs/VMT	Table 11.9-1,
Vehicle Traffic (unpaved roads)	$[(k(s/12)^{a}(W/3)^{b})]\ [(365-P)/365]$	lbs/VMT	Section 13.2.2

Source: Compilation of Air Pollutant Emission Factors, Vol. I, USEPA AP-42, Section 11.9 dated 10/98 and Section 13.2 dated 12/03

Calculation of PM_{10} Emission Factors for Each Operation

Operation	Emission Factor (mass/ unit)	Operation Parameter	Emission Factor (lbs/ acre)
Bulldozing	0.04 lbs/hr	1.6 hr/acre	0.10 lbs/acre
Grading	0.77 lbs/VMT	1 VMT/acre	0.80 lbs/acre
Vehicle Traffic (unpaved roads)	2.85 lbs/VMT	8.4 VMT/acre	24.00 lbs/acre

Emissions Due to Wind Erosion of Soil Piles and Exposed Graded Surface

Reference: California Environmental Quality Act (CEQA) Air Quality Handbook, SCAQMD, 1993.

Soil Piles EF = 1.7(s/1.5)[(365 - p)/235](I/15)(J) = (s)(365 - p)(I)(J)/(3110.2941), p. A9-99.

Soil Piles EF = 6.9 lbs/day/acre covered by soil piles

Consider soil piles area fraction so that EF applies to graded area

Soil piles area fraction: 0.10 (Fraction of site area covered by soil piles)
Soil Piles EF = 0.69 lbs/day/acres graded

Graded Surface EF = 26.4 lbs/day/acre (recommended in CEQA Manual, p. A9-93).

Calculation of Annual PM_{10} Emissions

Source	Emission Factor		Graded Acres/yr	Exposed days/yr	Emissions lbs/yr	Emissions tons/yr
Bulldozing	0.10	lbs/acre	28.51	NA	3	0.001
Grading	0.80	lbs/acre	28.51	NA	23	0.011
Vehicle Traffic	24.00	lbs/acre	28.51	NA	684	0.342
Erosion of Soil Piles	0.69	lbs/acre/day	28.51	45	885	0.443
Erosion of Graded Surface	26.40	lbs/acre/day	28.51	45	33,869	16.934
TOTAL					35,464	17.73

Soil Disturbance EF: 24.90 lbs/acre
Wind Erosion EF: 27.09 lbs/acre/day

Back calculate to get EF: 222.71 lbs/acre/grading day

Construction (Grading) Schedule for CY 2008

Estimate of time required to grade a specified area.

Input Parameters
Construction area: 28.51 acres/yr (from "CY2008 Combustion" Worksheet)
Qty Equipment: 8.55 (calculated based on 3 pieces of equipment for every 10 acres)

Assumptions.
Terrain is mostly flat.
An average of 6" soil is excavated from one half of the site and backfilled to the other half of the site; no soil is hauled off-site or borrowed.
200 hp bulldozers are used for site clearing.
300 hp bulldozers are used for stripping, excavation, and backfill.
Vibratory drum rollers are used for compacting.
Stripping, Excavation, Backfill and Compaction require an average of two passes each.
Excavation and Backfill are assumed to involve only half of the site.

Calculation of days required for one piece of equipment to grade the specified area.

Reference: Means Heavy Construction Cost Data, 19th Ed., R. S. Means, 2005.

Means Line No.	Operation	Description	Output	Units	Acres per equip-day)	equip-days per acre	Acres/yr (project-specific)	Equip-days per year
2230 200 0550	Site Clearing	Dozer & rake, medium brush	8	acre/day	8	0.13	28.51	3.56
2230 500 0300	Stripping	Topsoil & stockpiling, adverse soil	1,650	cu. yd/day	2.05	0.49	28.51	13.94
2315 432 5220	Excavation	Bulk, open site, common earth, 150' haul	800	cu. yd/day	0.99	1.01	14.25	14.37
2315 120 5220	Backfill	Structural, common earth, 150' haul	1,950	cu. yd/day	2.42	0.41	14.25	5.90
2315 310 5020	Compaction	Vibrating roller, 6 " lifts, 3 passes	2,300	cu. yd/day	2.85	0.35	28.51	10.00
TOTAL								47.77

Calculation of days required for the indicated pieces of equipment to grade the designated acreage.

(Equip)(day)/yr: 47.77
Qty Equipment: 8.55
Grading days/yr: 5.59

Maintenance Activities Emissions for CY 2008

Combustion Emissions of VOC, NO_x, SO_2, CO and PM_{10} Due to Maintenance Activities

The fenceline and access road would require mowing approximately two times per year to maintain vegetation height and allow enhanced visibility and security.

Assumptions:
Approximately 28.51 acres of land would be mowed twice per year.
Two agricultural mowers (40 horsepower) would operate for approximately 14 days.
Each working day would be 8 hours.
Agricultural mowers operate at 43% load capacity (17.2 horsepower).

Emission Factors Used for Maintenance Equipment

Reference: USAF IERA "Air Emissions Inventory Guidance", July 2001, Table 7-6. Criteria Pollutant Emission Factors for Nonroad Diesel Engines.

Emission Factors

Equipment	Rated Power (hp)	Loading Factor (% of Max Power)	Operating Time (hr/yr)	BSFC (lb/hp-hr)	NO_x (g/hp-hr)	VOC (g/hp-hr)	CO (g/hp-hr)	SO_2 (g/hp-hr)	PM_{10} (g/hp-hr)
Agricultural Mower (Diesel)	40	43	224	0.408	5.0	0.6	2.5	1.19	0.6

BSFC = Brake Specific Fuel Consumption

Results: Total Maintenance Annual Emission Rates

	NO_x	VOC	CO	SO_2	PM_{10}
Total Maintenance Emissions (lbs)	84.954	10.195	42.477	20.219	10.195
Total Maintenance Emissions (tons)	0.042	0.005	0.021	0.010	0.005

Example:
Total Maintenance Emissions (lbs of NO_x) =
(Rated power output of equipment engine)*(Loading Factor/100)*(Operating Time)*(Number of Equipment)*(Emission Factor)*(Conversion factor)

Total Maintenance Emissions (lbs of NO_x) = (40 hp)*(43/100)*(224 hr/yr)*(2 Equipment)*(5.0 g/hp-hr)*(0.002205 lb/g) = 84.95 lbs/yr

Emissions from Diesel Powered Generators for Construction Equipment

The Proposed Action would require six diesel powered generators to power construction equipment. These generators would operate approximately 8 hours per day for 120 working days.

Number of Generators	6	
Maximum Hours of Operation	8	hrs/day
Number of Construction Days	120	

Total Generator Capacity	75	hp
Hourly Rate	0.5262	MMBtu/hr
Annual Use	3,031	MMBtu/yr

Example: 1hp=0.002546966 MMBtu/Hr
Hourly Rate (MMBtu) = (75 Hp/0.363)*(0.002546699 MMBtu/hr) =0.5262 MMBtu/hr
Annual Use (MMBtu) = (Number of Generator * Hours Operation/Day * Number of Construction Days) = (6*8*120*0.5262) = 3,030.9 MMBtu/yr

Note: Generators horsepower output capacity is only 0.363 percent efficient (AP-42 Chapter 3.3).
Source: USEPA AP-42 Volume I, Stationary Internal Combustion Sources, Table 3.3-1 (http://www.epa.gov/ttn/chief/ap42/ch03/final/c03s03.pdf)

Generator Emission Factors (Diesel)

NO_x	4.41	lb/MMBtu
VOC	0.36	lb/MMBtu
CO	0.95	lb/MMBtu
SO_x	0.29	lb/MMBtu
PM_{10}	0.31	lb/MMBtu

Emissions (Diesel)

NO_x	6.683	tpy
VOC	0.546	tpy
CO	1.440	tpy
SO_x	0.439	tpy
PM_{10}	0.470	tpy

Example: Total NOx Emissions = (Annual MMBtu/year*(EF)/2000 = (3,030.9*4.41)/2000 = 6.68 tpy

Source: Emission Factors: USEPA AP-42 Volume I, Stationary Internal Combustion Sources, Table 3.3-1 (http://www.epa.gov/ttn/chief/ap42/ch03/final/c03s03.pdf)

Emissions from Diesel Powered Generators for Portable Lights

The Proposed Action would require 10 portable light units to meet USBP operational requirements. These portable lights are powered by a 6-kilowatt self-contained diesel generators. Portable lights would generally operate continuously every night (approximately 12 hours) 365 days per year.

Number of Generators	10	
Maximum Hours of Operation	12	hrs/day
Number of Operational Days	120	

Total Generator Capacity	6	hp
Hourly Rate	0.0421	MMBtu/hr
Annual Use	606	MMBtu/yr

Example: 1hp=0.002546966 MMBtu/Hr
Hourly Rate (MMBtu) = (6 Hp/0.363)*(0.002546699 MMBtu/hr) =0.0421 MMBtu/hr
Annual Use (MMBtu) = (Number of Generator * Hours Operation/Day * Number of Construction Days) = (10*12*120*0.0421) = 606.2MMBtu/yr

Note: Generators horsepower output capacity is only 0.363 percent efficient (AP-42 Chapter 3.3).
Source: USEPA AP-42 Volume I, Stationary Internal Combustion Sources, Table 3.3-1 (http://www.epa.gov/ttn/chief/ap42/ch03/final/c03s03.pdf)

Generator Emission Factors (Diesel)

NO_x	4.41	lb/MMBtu
VOC	0.36	lb/MMBtu
CO	0.95	lb/MMBtu
SO_x	0.29	lb/MMBtu
PM_{10}	0.31	lb/MMBtu

Emissions (Diesel)

NO_x	1.337	tpy
VOC	0.109	tpy
CO	0.288	tpy
SO_x	0.088	tpy
PM_{10}	0.094	tpy

Example: Total NOx Emissions = (Annual MMBtu/year*(EF)/2000 = (606*4.41)/2000 = 1.337 tpy

Source: Emission Factors: USEPA AP-42 Volume I, Stationary Internal Combustion Sources, Table 3.3-1 (http://www.epa.gov/ttn/chief/ap42/ch03/final/c03s03.pdf)

CO2 Emissions

0.140 MMBTU/gallons of diesel fuel used
3,606 MMBTU/Year*gallons/0.140 = 25,757 gallons
25,757 gallons*21.3 pounds CO2/gallon = 548,624 pounds
548,624/2000 = 274 tons/year

Metropolitan San Antonio Intrastate Air Quality Control Region

			Area Source Emissions						Point Source Emissions					
Row # SORT	State	County	CO	NOx	PM10	PM2.5	SO2	VOC	CO	NOx	PM10	PM2.5	SO2	VOC
1	TX	Atascosa Co	17,009	2,742	9,974	1,814	157	4,814	705	7,664	2,051	1,567	15,987	185
2	TX	Bandera Co	6,260	627	5,554	1,008	38.3	1,100	32.4	234	0	0	0	14.3
3	TX	Bexar Co	426,880	43,688	59,970	13,679	2,634	64,911	4,544	19,916	4,103	2,549	28,324	1,336
4	TX	Comal Co	27,725	3,251	9,634	1,932	201	3,894	2,490	5,024	507	287	120	220
5	TX	Dimmit Co	4,546	418	2,815	574	36.3	877	146	240	0.12	0.11	21.2	28.4
6	TX	Edwards Co	3,909	270	1,825	516	381	552	23.8	15.5	0.03	0.03	0	7.15
7	TX	Frio Co	11,648	1,888	4,122	846	103	2,474	95.7	260	16.6	12	379	31.1
8	TX	Gillespie Co	8,917	1,079	5,918	1,078	64.4	1,210	0	0	0	0	0	0
9	TX	Guadalupe Co	34,281	5,277	17,912	3,241	249	7,853	375	114	103	88.2	51.9	99.1
10	TX	Karnes Co	3,243	405	4,506	844	36.7	1,169	149	649	0.59	0.58	343	257
11	TX	Kendall Co	10,599	1,340	5,916	1,085	69.4	1,394	0	0	0	0	0	0.64
12	TX	Kerr Co	22,083	2,448	9,693	1,720	132	2,793	0	0	0	0	0	0
13	TX	Kinney Co	2,680	608	1,984	444	43.9	279	0	0	0	0	0	0
14	TX	La Salle Co	11,437	2,129	1,921	492	111	1,310	0	0	0	0	0	0
15	TX	Maverick Co	14,065	1,714	8,524	1,543	109	2,254	0	0	0	0	0	0
16	TX	Medina Co	17,175	3,174	10,562	1,944	191	5,179	0	0	0	0	0	0
17	TX	Real Co	1,869	139	1,621	339	13.3	307	0	0	0	0	0	0
18	TX	Uvalde Co	9,374	1,982	6,792	1,380	140	1,789	0	0	129	26.7	0	103
19	TX	Val Verde Co	14,146	1,905	3,649	912	152	2,726	0	0	0	0	0	0
20	TX	Wilson Co	11,757	1,622	9,752	1,712	94.1	2,023	0	0	0	0	0	0
21	TX	Zavala Co	3,705	373	2,950	617	37.9	947	0	0	0	0	0	0
Grand Total			663,308	77,079	185,594	37,720	4,994	109,855	8,561	34,117	6,910	4,531	45,226	2,282

SOURCE:
http://www.epa.gov/air/data/geosel.html
USEPA - AirData NET Tier Report
*Net Air pollution sources (area and point) in tons per year (2001)
Site visited on 13 November 2007.

Metropolitan San Antonio Intrastate AQCR (40 CFR 81.40):
In the State of Texas: Atascosa County, Bandera County, Bexar County, Comal County, Dimmit County, Edwards County, Frio County, Gillespie County, Guadalupe County, Karnes County, Kendall County, Kerr County, Kinney County, La Salle County, Maverick County, Medina County, Real County, Uvalde County, Val Verde County, Wilson County, and Zavala County

Summary	Summarizes total emissions by calendar year.
Combustion	Estimates emissions from non-road equipment exhaust as well as painting.
Fugitive	Estimates fine particulate emissions from earthmoving, vehicle traffic, and windblown dust
Grading	Estimates the number of days of site preparation, to be used for estimating heavy equipment exhaust and earthmoving dust emissions
Maintenance Emissions	Estimates the total emissions from future maintenance of fencelines and access roads from mowers.
Generator Emissions	Estimates the total emissions from emergency generators to power construction equipment.
AQCR Tier Report	Summarizes total emissions for the Metropolitan San Antonio Intrastate AQCR Tier Reports for 2001, to be used to compare project to regional emissions.

Air Quality Emissions from Proposed Action

		NO_x (ton)	VOC (ton)	CO (ton)	SO_2 (ton)	PM_{10} (ton)
CY2008	Construction Combustion	2.588	0.386	3.023	0.052	0.087
	Construction Fugitive Dust	0.000	0.000	0.000	0.000	44.326
	Maintenance Emissions	0.127	0.015	0.064	0.030	0.015
	Generator Emissions	10.693	0.873	2.303	0.703	0.752
	TOTAL CY2008	13.408	1.274	5.390	0.785	45.180

Since future year budgets were not readily available, actual 2001 air emissions inventories for the counties were used as an approximation of the regional inventory. Because the Proposed Action is several orders of magnitude below significance, the conclusion would be the same, regardless of whether future year budget data set were used.

Metropolitan San Antonio Intrastate AQCR

	Point and Area Sources Combined				
Year	NO_x (tpy)	VOC (tpy)	CO (tpy)	SO_2 (tpy)	PM_{10} (tpy)
2001	111,196	112,137	671,869	50,220	192,504

Source: USEPA-AirData NET Tier Report (http://www.epa.gov/air/data/geosel.html). Site visited on 13 November 2007.

Determination Significance (Significance Threshold = 10%) for Construction Activities

	Point and Area Sources Combined				
	NO_x (tpy)	VOC (tpy)	CO (tpy)	SO_2 (tpy)	PM_{10} (tpy)
Minimum - 2001	111,196	112,137	671,869	50,220	192,504
2008 Emissions	13.408	1.274	5.390	0.785	45.180
Proposed Action %	**0.012%**	**0.001%**	**0.001%**	**0.002%**	**0.023%**

Construction Combustion Emissions for CY 2008

Combustion Emissions of VOC, NO_x, SO_2, CO and PM_{10} Due to Construction

Includes:

100% of Construct Pedestrian Fences and Patrol Road	3,104,640	ft^2	71.27 acres
Construction area per month	776,160	ft^2	17.82 acres

Assumptions:

Total ground disturbance for pedestrian fence and patrol road would be 3.92 miles long by 150 feet wide (3,104,640 ft^2).
No grading would be required in construction staging areas.
Patrol road would be graded and lined with gravel. No paving would be included in Alternative 3.
Construction would occur between April and July 2008 for a total of 120 working days.

Total Building Construction Area:	0	ft^2	(none)
Total Demolished Area:	0	ft^2	(none)
Total Paved Area:	0	ft^2	(none)
Total Disturbed Area per month:	776,160	ft^2	
Construction Duration:	0.3	year(s)	
Annual Construction Activity:	120	days/yr	

Emission Factors Used for Construction Equipment

Reference: Guide to Air Quality Assessment, SMAQMD, 2004

Emission factors are taken from Table 3-2. Assumptions regarding the type and number of equipment are from Table 3-1 unless otherwise noted.

Grading

Equipment	No. Reqd.[a] per 10 acres	NO_x (lb/day)	VOC[b] (lb/day)	CO (lb/day)	SO_2[c]	PM_{10} (lb/day)
Bulldozer	1	29.40	3.66	25.09	0.59	1.17
Motor Grader	1	10.22	1.76	14.98	0.20	0.28
Water Truck	1	20.89	3.60	30.62	0.42	0.58
Total per 10 acres of activity	3	60.51	9.02	70.69	1.21	2.03

Paving

Equipment	No. Reqd.[a] per 10 acres	NO_x (lb/day)	VOC[b] (lb/day)	CO (lb/day)	SO_2[c]	PM_{10} (lb/day)
Paver	1	7.93	1.37	11.62	0.16	0.22
Roller	1	5.01	0.86	7.34	0.10	0.14
Total per 10 acres of activity	2	12.94	2.23	18.96	0.26	0.36

Demolition

Equipment	No. Reqd.[a] per 10 acres	NO_x (lb/day)	VOC[b] (lb/day)	CO (lb/day)	SO_2[c]	PM_{10} (lb/day)
Loader	1	7.86	1.35	11.52	0.16	0.22
Haul Truck	1	20.89	3.60	30.62	0.42	0.58
Total per 10 acres of activity	2	28.75	4.95	42.14	0.58	0.80

Building Construction

Equipment[d]	No. Reqd.[a] per 10 acres	NO_x (lb/day)	VOC[b] (lb/day)	CO (lb/day)	SO_2[c]	PM_{10} (lb/day)
Stationary						
Generator Set	1	11.83	1.47	10.09	0.24	0.47
Industrial Saw	1	17.02	2.12	14.52	0.34	0.68
Welder	1	4.48	0.56	3.83	0.09	0.18
Mobile (non-road)						
Truck	1	20.89	3.60	30.62	0.84	0.58
Forklift	1	4.57	0.79	6.70	0.18	0.13
Crane	1	8.37	1.44	12.27	0.33	0.23
Total per 10 acres of activity	6	67.16	9.98	78.03	2.02	2.27

Note: Footnotes for tables are on following page

Architectural Coatings

Equipment	No. Reqd.[a] per 10 acres	NO_x (lb/day)	VOC[b] (lb/day)	CO (lb/day)	SO_2[c]	PM_{10} (lb/day)
Air Compressor	1	6.83	0.85	5.82	0.14	0.27
Total per 10 acres of activity	1	6.83	0.85	5.82	0.14	0.27

a) The SMAQMD 2004 guidance suggests a default equipment fleet for each activitiy, assuming 10 acres of that activity, (e.g., 10 acres of grading, 10 acres of paving, etc.). The default equipment fleet is increased for each 10 acre increment in the size of the construction project. That is, a 26 acre project would round to 30 acres and the fleet size would be three times the default fleet for a 10 acre project.

b) The SMAQMD 2004 reference lists emission factors for reactive organic gas (ROG). For the purposes of this worksheet ROG = VOC.

c) The SMAQMD 2004 reference does not provide SO_2 emission factors. For this worksheet, SO_2 emissions have been estimated based on approximate fuel use rate for diesel equipment and the assumption of 500 ppm sulfur diesel fuel. For the average of the equipment fleet, the resulting SO_2 factor was found to be approximately 0.04 times the NOx emission factor for the mobile equipment (based upon 2002 USAF IERA "Air Emissions Inventory Guidance") and 0.02 times the NOx emission factor for all other equipment (based on AP-42, Table 3.4-1)

d) Typical equipment fleet for building construction was not itemized in SMAQMD 2004 guidance. The equipment list above was assumed based on SMAQMD 1994 guidance.

PROJECT-SPECIFIC EMISSION FACTOR SUMMARY

Source	Equipment Multiplier*	SMAQMD Emission Factors (lb/day)				
		NO_x	VOC	CO	SO_2**	PM_{10}
Grading Equipment	2	215.636	32.144	251.913	4.313	7.234
Paving Equipment	1	0.000	0.000	0.000	0.000	0.000
Demolition Equipment	1	0.000	0.000	0.000	0.000	0.000
Building Construction	1	0.000	0.000	0.000	0.000	0.000
Air Compressor for Architectural Coating	1	0.000	0.000	0.000	0.000	0.000
Architectural Coating**			0.000			

*The equipment multiplier is an integer that represents units of 10 acres for purposes of estimating the number of equipment required for the project

**Emission factor is from the evaporation of solvents during painting, per "Air Quality Thresholds of Significance", SMAQMD, 1994

Example: SMAQMD Emission Factor for Grading Equipment NOx = (Total Grading NOx per 10 ac*((total disturbed area/43560)/10))*(Equipment Multiplier)

Summary of Input Parameters

	Total Area (ft^2)	Total Area (acres)	Total Days	
Grading:	776,160	17.82	6	(from "CY2008 Grading" worksheet)
Paving:	0	0.00	0	
Demolition:	0	0.00	0	
Building Construction:	0	0.00	0	
Architectural Coating	0	0.00	0	(per the SMAQMD "Air Quality of Thresholds of Significance", 1994)

NOTE: The 'Total Days' estimate for paving is calculated by dividing the total number of acres by 0.21 acres/day, which is a factor derived from the 2005 MEANS Heavy Construction Cost Data, 19th Edition, for 'Asphaltic Concrete Pavement, Lots and Driveways - 6" stone base', which provides an estimate of square feet paved per day. There is also an estimate for 'Plain Cement Concrete Pavement', however the estimate for asphalt is used because it is more conservative. The 'Total 'Days' estimate for demolition is calculated by dividing the total number of acres by 0.02 acres/day, which is a factor also derived from the 2005 MEANS reference. This is calculated by averaging the demolition estimates from 'Building Demolition - Small Buildings, Concrete', assuming a height of 30 feet for a two-story building; from 'Building Footings and Foundations Demolition - 6" Thick, Plain Concrete'; and from 'Demolish, Remove Pavement and Curb - Concrete to 6" thick, rod reinforced'. Paving is double-weighted since projects typically involve more paving demolition.
The 'Total Days' estimate for building construction is assumed to be 230 days, unless project-specific data is known.

Project Emissions per monthy (lbs)

	NO_x	VOC	CO	SO_2	PM_{10}
Grading Equipment	1,293.81	192.86	1,511.48	25.88	43.41
Paving	-	-	-	-	-
Demolition	-	-	-	-	-
Building Construction	-	-	-	-	-
Architectural Coatings	-	-	-	-	-
Total Emissions (lbs):	**1,293.81**	**192.86**	**1,511.48**	**25.88**	**43.41**

Results: Total Project Annual Emission (4 months of project activity)

	NO_x	VOC	CO	SO_2	PM_{10}
Total Project Emissions (lbs)	5,175.26	771.46	6,045.92	103.51	173.62
Total Project Emissions (tons)	2.59	0.39	3.02	0.05	0.09

CO2 Emissions

Construction Fugitive Dust Emissions for CY 2008

Calculation of PM_{10} Emissions Due to Site Preparation (Uncontrolled).

User Input Parameters / Assumptions

Acres graded per year:	71.27	acres/yr	(From "CY2008 Combustion" worksheet)
Grading days/yr:	5.59	days/yr	(From "CY2008 Grading worksheet)
Exposed days/yr:	45	assumed days/yr graded area is exposed	
Grading Hours/day:	8	hr/day	
Soil piles area fraction:	0.10	(assumed fraction of site area covered by soil piles)	
Soil percent silt, s:	8.5	%	(mean silt content; expected range: 0.56 to 23, AP-42 Table 13.2.2-1)
Soil percent moisture, M:	85	%	(http://www.cpc.noaa.gov/products/soilmst/w.shtml)
Annual rainfall days, p:	70	days/yr rainfall exceeds 0.01 inch/day (AP-42 Fig 13.2.2-1)	
Wind speed > 12 mph %, I:	17	%	Ave. of wind speed at San Antonio, TX (http://www.epa.gov/ttn/naaqs/ozone/areas/windr/12921.gif)
Fraction of TSP, J:	0.5	per California Environmental Quality Act (CEQA) Air Quality Handbook, SCAQMD, 1993, p. A9-99	
Mean vehicle speed, S:	5	mi/hr	(On-site)
Dozer path width:	8	ft	
Qty construction vehicles:	21.38	vehicles	(From "CY2008 Grading worksheet)
On-site VMT/vehicle/day:	5	mi/veh/day	(Excluding bulldozer VMT during grading)
PM_{10} Adjustment Factor k	1.5	lb/VMT	(AP-42 Table 13.2.2-2 12/03 for PM_{10} for unpaved roads)
PM_{10} Adjustment Factor a	0.9	(dimensionless)	(AP-42 Table 13.2.2-2 12/03 for PM_{10} for unpaved roads)
PM_{10} Adjustment Factor b	0.45	(dimensionless)	(AP-42 Table 13.2.2-2 12/03 for PM_{10} for unpaved roads)
Mean Vehicle Weight W	40	tons	assumed for aggregate trucks

TSP - Total Suspended Particulate
VMT - Vehicle Miles Traveled

Emissions Due to Soil Disturbance Activities

Operation Parameters (Calculated from User Inputs)

Grading duration per acre	0.6	hr/acre	
Bulldozer mileage per acre	1	VMT/acre	(Miles traveled by bulldozer during grading)
Construction VMT per day	107	VMT/day	
Construction VMT per acre	8.4	VMT/acre	(Travel on unpaved surfaces within site)

Equations Used (Corrected for PM10)

Operation	Empirical Equation	Units	AP-42 Section (5th Edition)
Bulldozing	$0.75(s^{1.5})/(M^{1.4})$	lbs/hr	Table 11.9-1, Overburden
Grading	$(0.60)(0.051)s^{2.0}$	lbs/VMT	Table 11.9-1,
Vehicle Traffic (unpaved roads)	$[(k(s/12)^{a}(W/3)^{b})]\ [(365-P)/365]$	lbs/VMT	Section 13.2.2

Source: Compilation of Air Pollutant Emission Factors, Vol. I, USEPA AP-42, Section 11.9 dated 10/98 and Section 13.2 dated 12/03

Calculation of PM_{10} Emission Factors for Each Operation

Operation	Emission Factor (mass/ unit)	Operation Parameter	Emission Factor (lbs/ acre)
Bulldozing	0.04 lbs/hr	0.6 hr/acre	0.00 lbs/acre
Grading	0.77 lbs/VMT	1 VMT/acre	0.80 lbs/acre
Vehicle Traffic (unpaved roads)	2.85 lbs/VMT	8.4 VMT/acre	24.00 lbs/acre

Emissions Due to Wind Erosion of Soil Piles and Exposed Graded Surface

Reference: California Environmental Quality Act (CEQA) Air Quality Handbook, SCAQMD, 1993.

Soil Piles EF = 1.7(s/1.5)[(365 - p)/235](I/15)(J) = (s)(365 - p)(I)(J)/(3110.2941), p. A9-99.

Soil Piles EF = 6.9 lbs/day/acre covered by soil piles

Consider soil piles area fraction so that EF applies to graded area

Soil piles area fraction: 0.10 (Fraction of site area covered by soil piles)
Soil Piles EF = 0.69 lbs/day/acres graded

Graded Surface EF = 26.4 lbs/day/acre (recommended in CEQA Manual, p. A9-93).

Calculation of Annual PM_{10} Emissions

Source	Emission Factor		Graded Acres/yr	Exposed days/yr	Emissions lbs/yr	Emissions tons/yr
Bulldozing	0.00	lbs/acre	71.27	NA	0	0.000
Grading	0.80	lbs/acre	71.27	NA	57	0.029
Vehicle Traffic	24.00	lbs/acre	71.27	NA	1,711	0.855
Erosion of Soil Piles	0.69	lbs/acre/day	71.27	45	2,213	1.107
Erosion of Graded Surface	26.40	lbs/acre/day	71.27	45	84,672	42.336
TOTAL					88,653	44.33

Soil Disturbance EF: 24.80 lbs/acre
Wind Erosion EF: 27.09 lbs/acre/day

Back calculate to get EF: 222.70 lbs/acre/grading day

Emissions Due to Soil Disturbance Activities

Operation Parameters (Calculated from User Inputs)

Grading duration per acre	0.6	hr/acre	
Bulldozer mileage per acre	1	VMT/acre	(Miles traveled by bulldozer during grading)
Construction VMT per day	107	VMT/day	
Construction VMT per acre	8.4	VMT/acre	(Travel on unpaved surfaces within site)

Equations Used (Corrected for PM10)

Operation	Empirical Equation	Units	AP-42 Section (5th Edition)
Bulldozing	$0.75(s^{1.5})/(M^{1.4})$	lbs/hr	Table 11.9-1, Overburden
Grading	$(0.60)(0.051)s^{2.0}$	lbs/VMT	Table 11.9-1,
Vehicle Traffic (unpaved roads)	$[(k(s/12)^{a}\,(W/3)^{b})]\;[(365\text{-}P)/365]$	lbs/VMT	Section 13.2.2

Source: Compilation of Air Pollutant Emission Factors, Vol. I, USEPA AP-42, Section 11.9 dated 10/98 and Section 13.2 dated 12/03

Calculation of PM_{10} Emission Factors for Each Operation

Operation	Emission Factor (mass/ unit)		Operation Parameter		Emission Factor (lbs/ acre)	
Bulldozing	0.04	lbs/hr	0.6	hr/acre	0.00	lbs/acre
Grading	0.77	lbs/VMT	1	VMT/acre	0.80	lbs/acre
Vehicle Traffic (unpaved roads)	2.85	lbs/VMT	8.4	VMT/acre	24.00	lbs/acre

Maintenance Activities Emissions for CY 2008

Combustion Emissions of VOC, NO_x, SO_2, CO and PM_{10} Due to Maintenance Activities

The fenceline and access road would require mowing approximately two times per year to maintain vegetation height and allow enhanced visibility and security.

Assumptions:
Approximately 71.27 acres of land would be mowed twice per year.
Six agricultural mowers (40 horsepower) would operate for approximately 14 days.
Each working day would be 8 hours.
Agricultural mowers operate at 43% load capacity (17.2 horsepower).

Emission Factors Used for Maintenance Equipment

Reference: USAF IERA "Air Emissions Inventory Guidance", July 2001, Table 7-6. Criteria Pollutant Emission Factors for Nonroad Diesel Engines.

Emission Factors

Equipment	Rated Power (hp)	Loading Factor (% of Max Power)	Operating Time (hr/yr)	BSFC (lb/hp-hr)	NO_x (g/hp-hr)	VOC (g/hp-hr)	CO (g/hp-hr)	SO_2 (g/hp-hr)	PM_{10} (g/hp-hr)
Agricultural Mower (Diesel)	40	43	224	0.408	5.0	0.6	2.5	1.19	0.6

BSFC = Brake Specific Fuel Consumption

Results: Total Maintenance Annual Emission Rates

	NO_x	VOC	CO	SO_2	PM_{10}
Total Maintenance Emissions (lbs)	254.863	30.584	127.431	60.657	30.584
Total Maintenance Emissions (tons)	0.127	0.015	0.064	0.030	0.015

Example:
Total Maintenance Emissions (lbs of NO_x) =
(Rated power output of equipment engine)*(Loading Factor/100)*(Operating Time)*(Number of Equipment)*(Emission Factor)*(Conversion factor)

Total Maintenance Emissions (lbs of NO_x) = (40 hp)*(43/100)*(224 hr/yr)*(2 Equipment)*(5.0 g/hp-hr)*(0.002205 lb/g) = 84.95 lbs/yr

Emissions from Diesel Powered Generators for Construction Equipment

The Proposed Action would require six diesel powered generators to power construction equipment. These generators would operate approximately 8 hours per day for 190 working days.

Number of Generators	6	
Maximum Hours of Operation	8	hrs/day
Number of Construction Days	120	

Total Generator Capacity	75	hp
Hourly Rate	0.5262	MMBtu/hr
Annual Use	3,031	MMBtu/yr

Example: 1hp=0.002546966 MMBtu/Hr
Hourly Rate (MMBtu) = (75 Hp/0.363)*(0.002546699 MMBtu/hr) =0.5262 MMBtu/hr
Annual Use (MMBtu) = (Number of Generator * Hours Operation/Day * Number of Construction Days) = (6*8*120*0.5262) = 3,031 MMBtu/yr

Note: Generators horsepower output capacity is only 0.363 percent efficient (AP-42 Chapter 3.3).
Source: USEPA AP-42 Volume I, Stationary Internal Combustion Sources, Table 3.3-1 (http://www.epa.gov/ttn/chief/ap42/ch03/final/c03s03.pdf)

Generator Emission Factors (Diesel)

NO_x	4.41	lb/MMBtu
VOC	0.36	lb/MMBtu
CO	0.95	lb/MMBtu
SO_x	0.29	lb/MMBtu
PM_{10}	0.31	lb/MMBtu

Emissions (Diesel)

NO_x	6.683	tpy
VOC	0.546	tpy
CO	1.440	tpy
SO_x	0.439	tpy
PM_{10}	0.470	tpy

Example: Total NOx Emissions = (Annual MMBtu/year*(EF)/2000 = (3,031*4.41)/2000 = 6.68 tpy

Source: Emission Factors: USEPA AP-42 Volume I, Stationary Internal Combustion Sources, Table 3.3-1 (http://www.epa.gov/ttn/chief/ap42/ch03/final/c03s03.pdf)

Emissions from Diesel Powered Generators for Portable Lights

The Proposed Action would require **30** portable light units to meet USBP operational requirements. These portable lights are powered by a 6-kilowatt self-contained diesel generators. Portable lights would generally operate continuously every night (approximately 12 hours) 365 days per year.

Number of Generators	30	
Maximum Hours of Operation	12	hrs/day
Number of Operational Days	120	

Total Generator Capacity	6	hp
Hourly Rate	0.0421	MMBtu/hr
Annual Use	1,818	MMBtu/yr

Example: 1hp=0.002546966 MMBtu/Hr
Hourly Rate (MMBtu) = (6 Hp/0.363)*(0.002546699 MMBtu/hr) =0.042 MMBtu/hr
Annual Use (MMBtu) = (Number of Generator * Hours Operation/Day * Number of Construction Days) = (30*12*120*0.0421) = 1,818 MMBtu/yr

Note: Generators horsepower output capacity is only 0.363 percent efficient (AP-42 Chapter 3.3).
Source: USEPA AP-42 Volume I, Stationary Internal Combustion Sources, Table 3.3-1 (http://www.epa.gov/ttn/chief/ap42/ch03/final/c03s03.pdf)

Generator Emission Factors (Diesel)

NO_x	4.41	lb/MMBtu
VOC	0.36	lb/MMBtu
CO	0.95	lb/MMBtu
SO_x	0.29	lb/MMBtu
PM_{10}	0.31	lb/MMBtu

Emissions (Diesel)

NO_x	4.010	tpy
VOC	0.327	tpy
CO	0.864	tpy
SO_x	0.264	tpy
PM_{10}	0.282	tpy

Example: Total NOx Emissions = (Annual MMBtu/year*(EF)/2000 = (1,818*4.41)/2000 = 4045 tpy

Source: Emission Factors: USEPA AP-42 Volume I, Stationary Internal Combustion Sources, Table 3.3-1 (http://www.epa.gov/ttn/chief/ap42/ch03/final/c03s03.pdf)

CO2 Emissions
0.140 MMBTU/gallons of diesel fuel used
4,818 MMBTU/Year*gallons/0.140 = 34,414.3 gallons
34,414.3 gallons*21.3 pounds CO2/gallon = 730,018.2 pounds
730018.2/2000 = 366.5 tons

Metropolitan San Antonio Intrastate Air Quality Control Region

			Area Source Emissions						Point Source Emissions					
Row # SORT	State	County	CO	NOx	PM10	PM2.5	SO2	VOC	CO	NOx	PM10	PM2.5	SO2	VOC
1	TX	Atascosa Co	17,009	2,742	9,974	1,814	157	4,814	705	7,664	2,051	1,567	15,987	185
2	TX	Bandera Co	6,260	627	5,554	1,008	38	1,100	32	234	0	0	0	14
3	TX	Bexar Co	426,880	43,688	59,970	13,679	2,634	64,911	4,544	19,916	4,103	2,549	28,324	1,336
4	TX	Comal Co	27,725	3,251	9,634	1,932	201	3,894	2,490	5,024	507	287	120	220
5	TX	Dimmit Co	4,546	418	2,815	574	36	877	146	240	0	0	21	28
6	TX	Edwards Co	3,909	270	1,825	516	381	552	24	16	0	0	0	7
7	TX	Frio Co	11,648	1,888	4,122	846	103	2,474	96	260	17	12	379	31
8	TX	Gillespie Co	8,917	1,079	5,918	1,078	64	1,210	0	0	0	0	0	0
9	TX	Guadalupe Co	34,281	5,277	17,912	3,241	249	7,853	375	114	103	88	52	99
10	TX	Karnes Co	3,243	405	4,506	844	37	1,169	149	649	1	1	343	257
11	TX	Kendall Co	10,599	1,340	5,916	1,085	69	1,394	0	0	0	0	0	1
12	TX	Kerr Co	22,083	2,448	9,693	1,720	132	2,793	0	0	0	0	0	0
13	TX	Kinney Co	2,680	608	1,984	444	43.9	279	0	0	0	0	0	0
14	TX	La Salle Co	11,437	2,129	1,921	492	111	1,310	0	0	0	0	0	0
15	TX	Maverick Co	14,065	1,714	8,524	1,543	109	2,254	0	0	0	0	0	0
16	TX	Medina Co	17,175	3,174	10,562	1,944	191	5,179	0	0	0	0	0	0
17	TX	Real Co	1,869	139	1,621	339	13.3	307	0	0	0	0	0	0
18	TX	Uvalde Co	9,374	1,982	6,792	1,380	140	1,789	0	0	129	26.7	0	103
19	TX	Val Verde Co	14,146	1,905	3,649	912	152	2,726	0	0	0	0	0	0
20	TX	Wilson Co	11,757	1,622	9,752	1,712	94.1	2,023	0	0	0	0	0	0
21	TX	Zavala Co	3,705	373	2,950	617	37.9	947	0	0	0	0	0	0
Grand Total			663,308	77,079	185,594	37,720	4,994	109,855	8,561	34,117	6,910	4,531	45,226	2,282

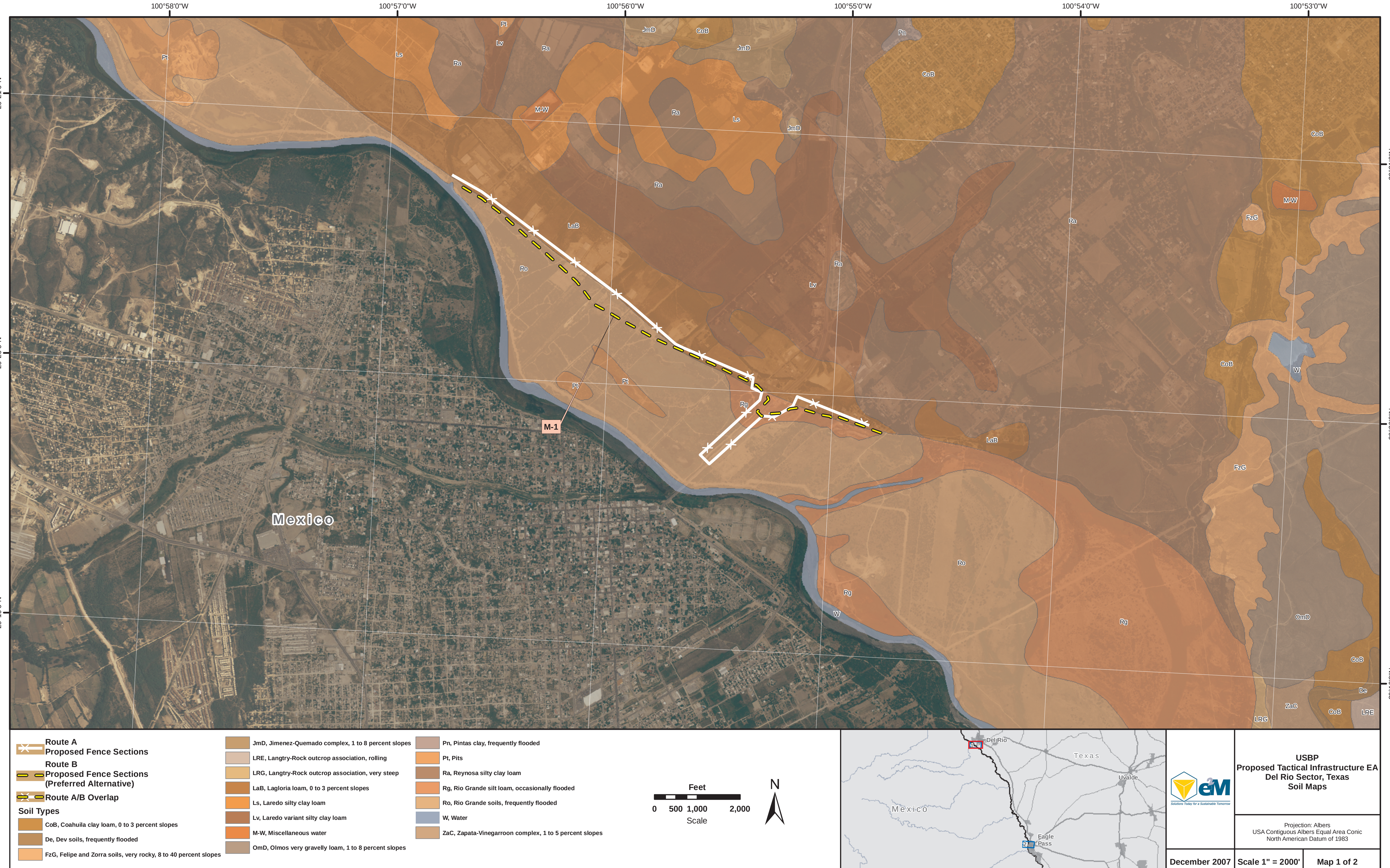
SOURCE:
http://www.epa.gov/air/data/geosel.html
USEPA - AirData NET Tier Report
*Net Air pollution sources (area and point) in tons per year (2001)
Site visited on 13 November 2007.

Metropolitan San Antonio Intrastate AQCR (40 CFR 81.40):
In the State of Texas: Atascosa County, Bandera County, Bexar County, Comal County, Dimmit County, Edwards County, Frio County, Gillespie County, Guadalupe County, Karnes County, Kendall County, Kerr County, Kinney County, La Salle County, Maverick County, Medina County, Real County, Uvalde County, Val Verde County, Wilson County, and Zavala County

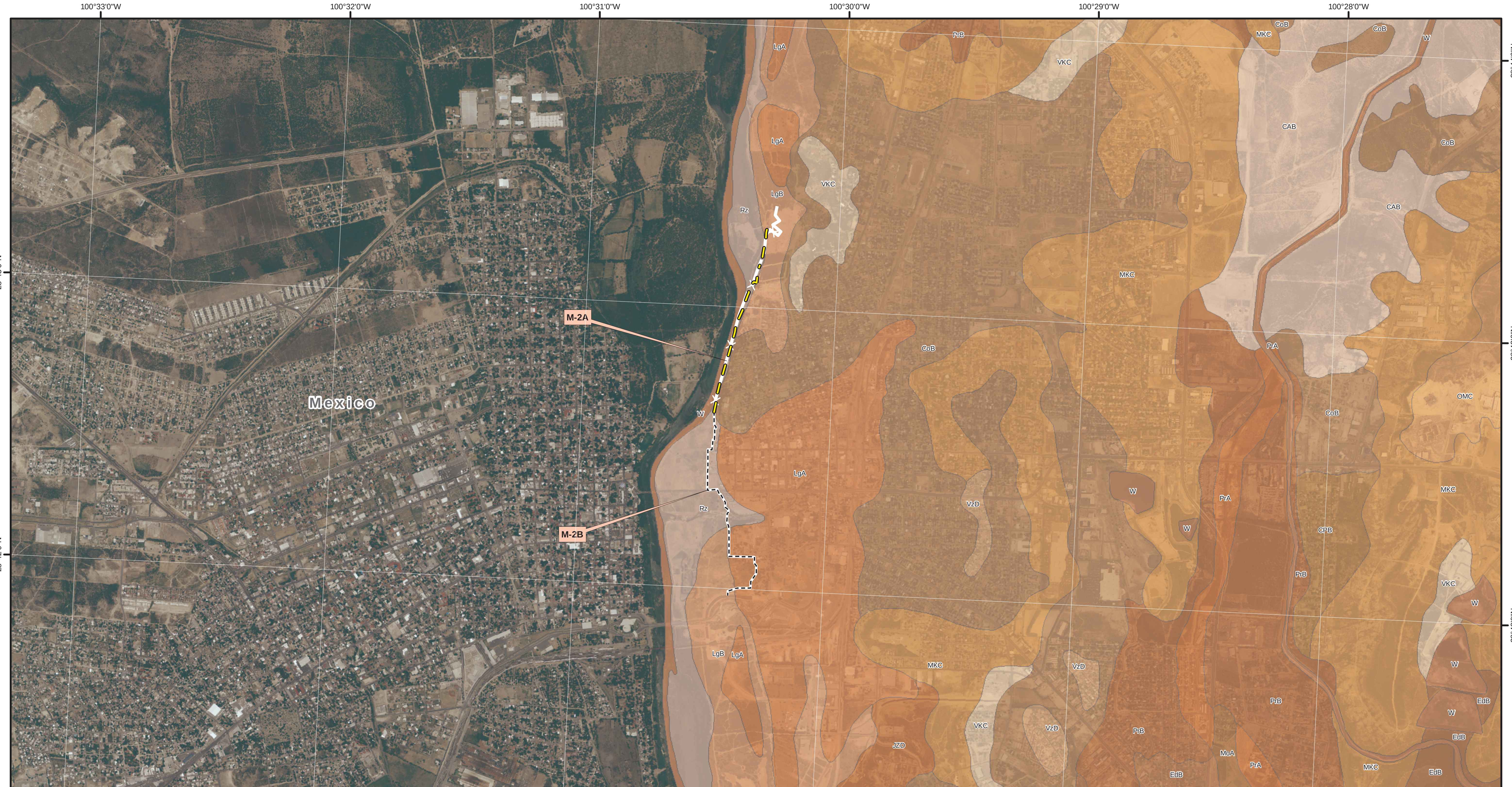
Alternative 3 *AQCR Tier Report*

APPENDIX F

Detailed Maps of the Proposed Tactical Infrastructure Sections Showing Soils



100°58'0"W
100°57'0"W
100°56'0"W
100°55'0"W
100°54'0"W
100°53'0"W
29°21'0"N
29°20'0"N
29°19'0"N
Mexico
M-1
Route A
Proposed Fence Sections
Route B
Proposed Fence Sections
(Preferred Alternative)
Route A/B Overlap
Soil Types
CoB, Coahuila clay loam, 0 to 3 percent slopes
De, Dev soils, frequently flooded
FzG, Felipe and Zorra soils, very rocky, 8 to 40 percent slopes
JmD, Jimenez-Quemado complex, 1 to 8 percent slopes
LRE, Langtry-Rock outcrop association, rolling
LRG, Langtry-Rock outcrop association, very steep
LaB, Lagloria loam, 0 to 3 percent slopes
Ls, Laredo silty clay loam
Lv, Laredo variant silty clay loam
M-W, Miscellaneous water
OmD, Olmos very gravelly loam, 1 to 8 percent slopes
Pn, Pintas clay, frequently flooded
Pt, Pits
Ra, Reynosa silty clay loam
Rg, Rio Grande silt loam, occasionally flooded
Ro, Rio Grande soils, frequently flooded
W, Water
ZaC, Zapata-Vinegarroon complex, 1 to 5 percent slopes
Feet
0 500 1,000 2,000
Scale
N
Del Rio
Texas
Uvalde
Mexico
Eagle Pass
USBP
Proposed Tactical Infrastructure EA
Del Rio Sector, Texas
Soil Maps
Projection: Albers
USA Contiguous Albers Equal Area Conic
North American Datum of 1983
December 2007
Scale 1" = 2000'
Map 1 of 2



Route A
Proposed Fence Sections

Route B
Proposed Fence Sections
(Preferred Alternative)

Route A/B Overlap

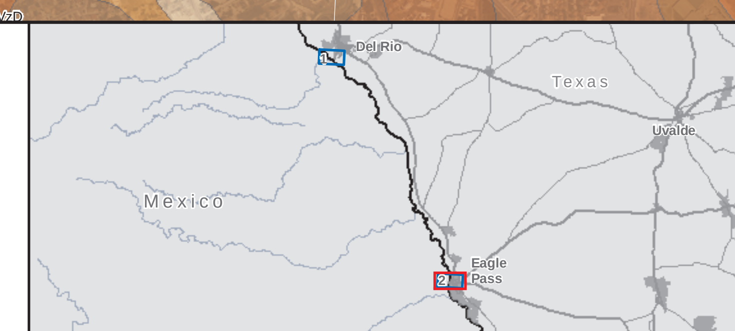
Route B
Proposed Fence Sections
(Preferred Alternative)

Soil Types

CAB, Catarina association, gently undulating
CPB, Copita association, gently undulating
CoB, Copita sandy clay loam, 1 to 3 percent slopes
EdA, Elindio silty clay loam, 0 to 1 percent slopes
EdB, Elindio silty clay loam, 1 to 3 percent slopes
JZD, Jimenez association, rolling
LgA, Lagloria very fine sandy loam, 0 to 1 percent slopes
LgB, Lagloria very fine sandy loam, 1 to 3 percent slopes
MKC, Maverick association, undulating
MdB, Maverick clay, 1 to 3 percent slopes
MoA, Montell clay, 0 to 1 percent slopes
OMC, Olmos association, undulating
PrA, Pryor clay loam, 0 to 1 percent slopes
PrB, Pryor clay loam, 1 to 3 percent slopes
Rz, Rio Grande and Zalla soils, frequently flooded
VKC, Verick association, undulating
VzD, Verick and Zapata soils, 1 to 8 percent slopes
W, Water

Feet
0 500 1,000 2,000
Scale

N



USBP
Proposed Tactical Infrastructure EA
Del Rio Sector, Texas
Soil Maps

Projection: Albers
USA Contiguous Albers Equal Area Conic
North American Datum of 1983

December 2007	Scale 1" = 2000'	Map 2 of 2

APPENDIX G

Draft Biological Survey Report

DRAFT

BIOLOGICAL SURVEY REPORT

SUPPORTING THE

ENVIRONMENTAL ASSESSMENT FOR

CONSTRUCTION, OPERATION, AND MAINTENANCE OF TACTICAL INFRASTRUCTURE

DEL RIO SECTOR, TEXAS

Prepared for

U.S. Customs and Border Patrol

Prepared by

e2M

Solutions Today for a Sustainable Tomorrow

DECEMBER 2007

Abbreviations and Acronyms

°F	degrees Fahrenheit
BMP	Best Management Practice
BO	Biological Opinion
CBP	U.S. Customs and Border Protection
CFR	Code of Federal Regulations
CWA	Clean Water Act
DHS	U.S. Department of Homeland Security
EA	Environmental Assessment
ESA	Endangered Species Act
FE	Federally Endangered
FT	Federally Threatened
IBWC	International Boundary and Water Commission
MBTA	Migratory Bird Treaty Act
mph	miles per hour
NEPA	National Environmental Policy Act
NWR	National Wildlife Refuge
RAMP	Recreation Area Management Plan
ROW	right-of-way
SE	State Endangered
ST	State Threatened
SFA	Secure Fence Act
USACE	U.S. Army Corps of Engineers
USBP	U.S. Border Patrol
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
WOUS	Waters of the United States

DRAFT BIOLOGICAL SURVEY REPORT
SUPPORTING THE
DEL RIO SECTOR TACTICAL INFRASTRUCTURE ENVIRONMENTAL ASSESSMENT

TABLE OF CONTENTS

APPENDICES

FIGURES

TABLES

1. Introduction

This biological survey report has been prepared to support the development of an Environmental Assessment addressing proposed construction, operation, and maintenance of tactical infrastructure at the international border with Mexico, Del Rio Sector, Texas. The report synthesizes information collected by engineering-environmental Management, Inc (e²M) from a variety of sources, including field surveys, to describe the biological resources of the project areas. Information was gathered from publicly available literature, data provided by relevant land management agencies, review of aerial photography and U.S. Geological Survey (USGS) topographic maps, data from NatureServe, the National Wetlands Inventory, and field surveys conducted on November 5 and 6, 2007. Best management practices (BMPs) for avoiding or reducing impacts on the identified resources are included in this report.

This report was developed to support National Environmental Policy Act (NEPA) and Endangered Species Act (ESA) requirements for analyzing potential effects on biological resources resulting from the proposed project. This report was developed as an independent document but will be included as an appendix in the Environmental Assessment addressing the proposed project.

2. Project Description

U.S. Border Patrol (USBP) within the Department of Homeland Security (DHS), U.S. Customs and Border Protection (CBP), is proposing to install and operate tactical infrastructure consisting of primary pedestrian fence; access roads; patrol roads; lights; and other tools along the U.S./Mexico international border within the Del Rio Sector, Texas. **Appendix E** (of the EA) illustrates the proposed location of the new tactical infrastructure within the USBP Del Rio Sector. **Table 2-1** provides the general location of tactical infrastructure and length for each section in the USBP Del Rio Sector.

Table 2-1. Tactical Infrastructure Sections, Del Rio Sector

Section Number	USBP Station	General Location	Length of Section (miles)	
			Route A	Route B
M-1	Del Rio	Del Rio, Texas	3.0	2.4
M-2A	Eagle Pass	Eagle Pass, Texas	0.9	0.8
		Total	**3.9**	**3.2**

The following is a general description of each section and the alternative routes considered. Route A is the route initially identified by USBP Del Rio Sector as meeting its operational requirements. Route B was developed through coordination with Federal and state agencies to identify an alignment for the infrastructure that would continue to meet current operational requirements with fewer environmental effects. Detailed maps of both routes are in **Appendix E** of the EA.

In Del Rio, Section M-1, Route A would follow Garza Lane and Rio Grande Road and Route B would follow the U.S. Section of the International Boundary and Water Commission (USIBWC) floodplain. Route B would be located outside the IBWC floodway but inside the Federal Emergency Management Agency (FEMA) 100-year floodplain. The proposed project also includes removing giant reed and other brush in a 150-foot wide corridor and constructing an access and patrol road along the entire length of the primary pedestrian fence section, south of the primary pedestrian fence.

The proposed tactical infrastructure would affect approximately a 150-foot-wide corridor along Section M-1. This corridor would include primary pedestrian fences, access roads, and patrol roads. In addition, a 150-foot-wide corridor would be maintained free of giant reed (to the extent practical) along Section M-1. This corridor would include giant reed (*Arundo donax*) removal from 100 feet south to 50 feet north of the primary pedestrian fence.

In Eagle Pass, Section M-2A, Routes A and B would generally follow the bank of the Rio Grande. Section M-2A would connect to a previously evaluated and approved primary pedestrian fence section, Section M-2B, which is addressed in separate existing NEPA document (see **Appendix E of the EA**) (CBP 2007). Approximately 0.5 miles of Section M-2A would be a 15- to 18-foot-high concrete retaining wall and the remaining would be aesthetic fencing (see **Appendix E of the EA**). The proposed project also includes improving patrol roads along the entire length of the primary pedestrian fence sections and managing giant reed growth.

The proposed tactical infrastructure would affect approximately a 60-foot-wide corridor along Section M-2A. This corridor would include a primary pedestrian fence, concrete retaining wall, improvement of the existing access and patrol road, and lights.

During the biological surveys on November 5 and 6, 2007, crews surveyed both routes A and B. Because the routes overlap or are very close in many areas, survey crews were able to assess biological conditions for both routes concurrently.

3. Survey Methods and Limitations

To provide flexibility in placing tactical infrastructure within these section corridors, and to ensure consideration of potential effects of construction and use, the biological resources surveys examined an area extending 150 feet north and 150 feet south of the proposed alignment. The surveys also extended at least 0.5 miles past the proposed ends of each section.

Intuitive controlled surveys of the potential impact areas were conducted on November 5 and 6, 2007, by James Von Loh (Senior Ecologist, e²M), Valerie Whalon (Biologist, e²M), Karen Stackpole (Senior Ecologist, e²M), and Gena Jannsen of Jannsen Biological (a subcontractor to e²M and a U.S. Fish and Wildlife Service [USFWS]-approved botanist in Texas, specifically for Tamaulipan brushland/south Texas brush country). The survey personnel walked most of the length of the potential impact corridor for each proposed tactical infrastructure section where right of entry was allowed, and examined in more detail areas containing species compositions or habitat that might be conducive to sensitive species. Plot data (i.e., GPS coordinates, photographs, and plant community composition) were recorded at regular intervals along the corridor and where plant communities presented substantial shifts in species composition. These data were used to generate vegetation classifications and maps to support delineation of habitat types, analysis of potential sensitive species occurrences, and analysis of potential project effects on biological resources. Although surveyors did not conduct protocol surveys, they did specifically look for evidence indicating the presence of state and Federal listed species (see **Table 3-1**), and habitats that might support them. **Appendix A** contains a species description of each federally listed species.

Table 3-1. Federal- and State-Listed Species Potentially Occurring in the Project Area

Common Name	Scientific Name	County	Federal Status	State Status
Plants				
Texas snowbells	*Styrax texana*	VV	**E**	**E**
Tobusch fishhook cactus	*Ancistrocactus tobuschii*	VV	**E**	**E**
Mussels				
Texas hornshell (clam)	*Popenaias popeii*	VV	**C**	
Fish				
Blotched gambusia	*Gambusia senilis*	VV		**T**
Blue sucker	*Cycleptus elongates*	M		**T**
Conchos pupfish	*Cyprinodon eximius*	VV		**T**
Devils River minnow	*Dionda diabolic*	VV	**T**	**T**

Common Name	Scientific Name	County	Federal Status	State Status
Fish (continued)				
Pecos pupfish	*Cyprinodon pecosensis*	VV		**T**
Proserpine shiner	*Cyprinella Proserpina*	M		**T**
Rio Grande darter	*Etheostoma graham*	M		**T**
Rio Grande silvery minnow	*Hybognathus amarus*	M	**E**	**E**
Amphibians				
South Texas siren (Large form)	*Siren sp. 1*	M		**T**
Reptiles				
Indigo snake	*Drymarchon corais*	M		**T**
Reticulate collared lizard	*Crotaphytus reticulatus*	M		**T**
Texas horned lizard	*Phrynosoma cornutum*	M		**T**
Texas tortoise	*Gopherus berlandieri*	M		**T**
Trans-Pecos black-headed snake	*Tantilla cucullata*	VV		**T**
Birds				
American peregrine falcon	*Falco peregrines anatum*	M	**DL**	**E**
Arctic peregrine falcon	*Falco peregrines tundrius*	M	**DL**	**T**
Interior least tern	*Sterna antillarum athalassos*	M, VV	**E**	**E**
Black-capped vireo	*Vireo atricapilla*	VV	**E**	**E**
Brown pelican	*Pelecanus occidentalis*	VV	**E**	
Common black hawk	*Buteogallus anthracinus*	VV		**T**
Peregrine flacon	*Falco peregrines*	M	**DL**	**ET**
Zone-tailed hawk	*Buteo albonotatus*	VV		**T**
Mammals				
Gulf Coast jaguarundi	*Herpailurus yaguarondi*	M	**E**	**E**
Gray wolf	*Canis lupus*	M	**E**	**E**
Black bear	*Ursus americanus*	M	**T/SA;NL**	**T**
White-nosed coati	*Nasus narica*	M		**T**
Ocelot	*Leopardus pardalis*	M	**E**	**E**

Sources: Texas Parks and Wildlife Department (TPWD) 2007; U.S. Fish and Wildlife Service (USFWS) 2007.

Notes: E = Endangered; DL = De-listed; NL = Not Listed; SA = Similar Appearance to a Threatened or Endangered Species; T = Threatened; C = Species for which USFWS has on file enough substantial information to warrant listing as threatened or endangered. M = Maverick County (Section M-1); VV = Val Verde County (Section M-2A)

4. Environmental Setting

The potential impact areas surveyed extend 150 feet north and 150 feet south from the proposed tactical infrastructure alignment. This 300-foot-wide corridor allows sufficient room to accommodate temporary construction impacts, permanent effects of installing and using tactical infrastructure, and for clearing dense, invasive stands of giant reed that borders the edge of the Rio Grande.

The project area climate is generally considered semi-arid continental (NOAA 2007) and has been further described as subtropical steppe within the modified marine climatic type, meaning that summers are long and hot and winters are short, dry, and mild (Larkin and Bomar 1983, Bailey 1995). The marine climate forms in response to the predominant onshore flow of tropical maritime air from the Gulf of Mexico. Onshore air flow is modified by a decrease in moisture content from east to west and by intermittent seasonal intrusions of continental air. Temperatures in Del Rio occur in an average range of lows from 39°F (January) to 74°F (July) to an average range of highs from 62°F (January) to 96°F (July). The average annual precipitation is 18 inches, and approximately 80 percent occurs as showers and thunderstorms from the late spring through early fall seasons. The area experiences a long growing season of approximately 300 days. The evaporation rate during the summer season is high, and the average relative humidity is 44 percent, measured in the afternoon.

Occurring within the Lower Rio Grande Valley of southern Texas and northern Mexico, Tamaulipan Brushland represents a unique ecosystem (USFWS 1988). The characteristic natural vegetation is dense and thorny, and plant species distribution can be correlated with geologic formations. The Rio Grande floodplain supports tall and dense riparian forest, woodland, shrubland, and herbaceous vegetation, while the xeric upland areas support mostly spiny shrubs, short-stature trees, and dense non-native grasslands. Between the 1920s and 1980s, more than 95 percent of the native brushland and 90 percent of the riparian vegetation had been converted to agriculture and urban land use (USFWS 1988). In 1988, it was estimated that 98 percent of the lush, subtropical region of the Rio Grande Delta had been cleared of native vegetation in the United States and a large but unknown percentage cleared in Mexico.

5. Biological Resources

This section describes and illustrates the existing conditions and distributions of vegetation as it occurred in 2007 within the proposed project corridor in Sections M-1 and M-2A. **Table 5-1** provides common and scientific names for the plant species observed. Common names are used in the following text descriptions of the plant communities to facilitate readability.

Vegetation Overview

The vegetation of the Rio Grande Floodplain and Delta of southern Texas generally, and near Del Rio and Eagle Pass specifically, has been classified under the Dry Domain (300), Tropical/Subtropical Steppe Division (310) of Bailey (1995). The project area is more finely classified as the Southwestern Plateau and Plains Dry Steppe and Shrub Province (315). The Texas Parks and Wildlife Department (2007) provides discussion and describes vegetation geography to biotic provinces and natural regions using topographic features, climate, vegetation types, and terrestrial vertebrates. This system places the project area in the Tamaulipan Biotic Province; South Texas Brush Country (Rio Grande Basin) Natural Region; Brush Country Sub-region; and the Level III Ecoregion of the Southern Texas Plains.

5.1 Vegetation Classification

The U.S. Fish and Wildlife Service (1988) recognized 11 biotic communities in the Lower Rio Grande Valley characterized by a combination of plant species dominance, wildlife use, topography, hydrology, and geology. Proposed Sections M-1 and M-2A lie within the Chihuahuan Thorn Forest biotic community, as described by USFWS ecologists. NatureServe (2007) has defined ecological systems that represent recurring groups of biological communities that are found in similar physical environments and are influenced by similar dynamic ecological processes such as fire or flooding. Ecological systems represent classification units that are readily identifiable by conservation and resource managers in the field. The project area ecological systems include:

1. Tamaulipan Floodplain Ecological System (CES301.990)
2. Tamaulipan Mesquite Upland Scrub Ecological System (CES301.984)
3. Tamaulipan Mixed Deciduous Thornscrub Ecological System (CES301.983)
4. Tamaulipan Savanna Grassland Ecological System (CES301.985)
5. North-American Arid West Emergent Marsh Vegetation Alliances and Associations (CES300.729).

The following sections describe each plant community observed within the proposed project sections. Communities are distinguished using the

NatureServe Vegetation Alliance level of classification or an approximation (a provisional community name). To the extent possible, each community is illustrated and supported by representative ground photographs and foliar cover information for dominant species. Some vegetation patches and stands consist of introduced non-native species and do not readily fit into a recognized vegetation alliance or ecological system designed for native vegetation; they are discussed after the recognized communities.

5.1.1 Tamaulipan Floodplain Ecological System (CES301.990)

Sugarberry Riparian Woodland

Sugarberry riparian woodland stands have persisted as rare, narrow bands on the outer floodplain margin of the Rio Grande and the banks of its tributaries within Sections M-1 and M-2A (see **Figure 5-1**). Canopy cover for the mature sugarberry trees (10–15 meters tall) is approximately 10–20 percent. Honey mesquite trees are commonly present and often co-dominant in the canopy layer and provided 10–15 percent cover. In one stand a subcanopy layer of granjeno, retama, and honey mesquite, 2–5 meters tall, provides approximately 15–20 percent cover. The herbaceous layer provides low to moderate cover, up to 30 percent, and includes Bermuda grass, cow-pen daisy, and the vine old man's beard. Another stand that has become established around seeps and a small pond includes 15 percent cover each by sugarberry and black willow trees 15–20 meters tall (see also discussions under Black Willow Woodland and Emergent Wetlands types). Giant reed and Bermuda grass are co-dominant at this site, each providing 15–25 percent cover.

Black Willow Woodland

Small stands of black willow trees mixed with a variety of other riparian trees (typically sugarberry and Mexican sabal palms) and shrubs occur on the eastern portion of Section M-1 where seeps and springs emerge to the ground surface and ponds occur(see **Figure 5-2**). Small pools of standing water support elephant ears, swamp lily, arrow-weed, and small duckweed, which are described more completely under the Emergent Wetlands type. Black willow trees to 15 meters tall provide 5–15 percent cover in the canopy layer and are co-dominant with sugarberry, eastern cottonwood, and Mexican sabal palm that together provide approximately 20–40 percent cover. Non-native Chinese tallow trees occur in one stand. The common tall shrub or graminoid is giant reed or carrizo, which contributes up to 25 percent cover in these stands.

Giant Reed Herbaceous Vegetation

Giant reed or Carrizo occurs in dense stands 5–10 meters tall and provides cover of 40–95 percent. Stands have become established on saturated soils of Rio Grande floodplain terraces, floodplains of tributary drainages, pond edges, and ditchbanks in Sections M-1 and M-2A (see **Figure 5-3**). Understory vegetation is typically excluded due to shading; however, scattered emergent trees occur, including sugarberry and honey mesquite to 20 meters tall. Bermuda grass is a common associate in openings along the margins of giant reed stands, providing 2–5 percent cover, and the trees sugarberry, honey mesquite, and/or white mulberry, 10–20 meters tall, each provided up to 5 percent cover in sampled stands. The tall shrubs Chinaberry and huisache each provide 3 percent cover in one stand within a shallow arroyo. Giant reed has been identified for removal from Section M-2A under another project because it serves as an effective hiding place for aliens crossing the border; however, it would not be necessary to remove the native trees and shrubs that have become established.

Figure 5-1. Photographs of Representative Sugarberry Habitat

Figure 5-2. Photographs of Representative Black Willow Habitat

Figure 5-3. Photographs of Representative Giant Reed Habitat

5.1.2 Tamaulipan Mesquite Upland Scrub Ecological System (CES301.984)

Granjeno Woodland and Shrubland

Granjeno or spiny hackberry forms stands of moderate-stature trees to 15 meters tall or is a dominant understory component in the subcanopy or tall shrub layers, 5–10 meters tall in Sections M-1 and M-2A. In representative stands granjeno cover is 20–60 percent (see **Figure 5-4**). Associated emergent and canopy trees provide low cover, up to 12 percent, and include honey mesquite and sugarberry. Retama tall shrubs provide 2 percent cover in one stand. The herbaceous layer provides low cover, 5–15 percent where canopy openings occur, and include Bermuda grass and switchgrass.

Figure 5-4. Photographs of Representative Granjeno Habitat

Honey Mesquite Woodland

Honey mesquite woodlands with small trees 5–15 meters tall were sampled in Sections M-1 and M-2A, where they occur in linear strips growing from bedrock exposures at the edge of the first or second Rio Grande floodplain terrace and where they have re-invaded pastures. In the canopy layer, honey mesquite cover is 25–30 percent (see **Figure 5-5**). Associated canopy tree species when present include huisache and in one stand athel tamarisk, which provides low cover of 1–15 percent. The tall and short shrub layers provides low cover, 3–20 percent, and includes granjeno, Texas prickly pear, and honey mesquite saplings. The herbaceous layer contributes low to moderate cover of 7–45 percent and is dominated by Bermuda grass, buffelgrass, switchgrass, and cowpen daisy. Honey mesquite trees and tall shrubs are common invaders of former and current pastureland planted to Bermuda grass.

Figure 5-5. Photographs of Representative Honey Mesquite Woodland Habitat

5.1.3 Tamaulipan Mixed Deciduous Thornscrub Ecological System (CES301.983)

Honey Mesquite Shrubland

Honey mesquite tall shrubs are distributed throughout Sections M-1 and M-2A sections and recently have become re-established in non-native Bermuda grass pastures over the past 10 years. Honey mesquite 2–5 meters in height in the tall shrub layer typically provides up to 15 percent cover in shrub herbaceous stands (see **Figure 5-6**). The herbaceous layer is dominated by non-native Bermuda grass, which provides up to 80 percent cover.

Figure 5-6. Photographs of Representative Honey Mesquite Shrub Herbaceous Vegetation Habitat

Huisache Woodland

Huisache is distributed throughout Sections M-1 and M-2A, occurring as tall shrubs in the understory of woodlands and rarely as short-stature woodlands along drainages and fencerows, where re-establishment within or around non-native Bermuda grass pastures has occurred over several years. Huisache trees range up to 15 meters tall and provide up to 25 percent cover in one stand along Cienegas Creek (see **Figure 5-7**). The canopy tree honey mesquite provides 5 percent cover in the sampled stand, and the tall shrub giant reed provides moderate cover (30 percent). The herbaceous layer is dominated by non-native Bermuda grass, which provides 15 percent cover. Sparse cover, up to 2 percent, by bushy bluestem occurs on steep banks in the Cienegas Creek stand.

Figure 5-7. Photographs of Representative Huisache Woodland Habitat

5.1.4 Tamaulipan Savanna Grassland Ecological System (CES301.985)

Retama Shrubland

Retama has invaded grassland habitat along an access road to Cienegas Creek, forming tall shrublands. Where retama has become established the tall shrub provides moderate cover, up to 35 percent within Section M-1 (see **Figure 5-8**). Texas prickly-pear cactus provides 3 percent cover in the short shrub layer of the sampled stand, and lanceleaf sumac provides sparse cover. The herbaceous layer in this type is relatively monotypic and dominated by the non-native Bermuda grass, which provides up to 45 percent cover. The forbs cowpen daisy, stinking gourd, and common horehound provide sparse cover.

Figure 5-8. Photographs of Representative Retama Habitat

5.1.5 North-American Arid West Emergent Marsh Vegetation Alliances and Associations (CES300.729)

Emergent Wetlands

Small patches of emergent wetlands occur within Sections M-1 and M-2A and are typically sampled as herbaceous components of larger woodland vegetation stands (see **Figure 5-9**). Emergent wetland patches occupy shallow ponds, stream banks, resaca margins, saturated soils, and seeps. Observed in particular are narrow-leaved cattail, elephant-ear, swamp lily, arrow-head, flat sedge, small duckweed, pickerelweed, and algae. In the backwaters of Cienegas Creek, the emergent wetland species water-pennywort, Indian swampweed, and water lettuce occur.

Figure 5-9. Photographs of Representative Emergent Wetland Habitat

5.1.6 Non-Native Herbaceous Vegetation Alliances and Associations

Bermuda Grass Semi-Natural Herbaceous Vegetation

A large stand of Bermuda grass has become established in a historic pasture or corral in the vicinity of the port of entry in Section M-1 and has apparently not been grazed for more than a year (see **Figure 5-10**). The port-of-entry stand is regularly mown and resembles a large lawn. Typical stands/pastures of this non-native rhizomatous grass in the vicinity of Del Rio and Eagle Pass have become invaded by honey mesquite, huisache, and retama tall shrubs and trees and are described above under the woodland and shrubland types. On one stand adjacent to a homestead, Bermuda grass provides 90 percent cover. Associated species that individually provide 2–5 percent cover included old man's beard vines and honey mesquite shrubs and the forbs annual sunflower, cocklebur, and spiny aster.

Figure 5-10. Photographs of Representative Bermuda Grass Habitat

Russian-thistle Semi-Natural Herbaceous Vegetation

One large area that appears to be a former agricultural field occupied the terrace north of the Rio Grande in proposed Section M-2A near Eagle Pass and predominantly supports the non-native annual forb Russian-thistle. This floodplain second-terrace is elevated above the Rio Grande first terrace by approximately 15 meters. The fine-textured soils seal following precipitation to create shallow ponded water, as indicated by mud cracks. Russian-thistle tumbleweeds, providing up to 45 percent cover, dominate this disturbed site (see **Figure 5-11**), along with low cover of the non-native grasses buffelgrass (4 percent cover), switchgrass (2 percent cover), and giant reed (2 percent cover). Low cover, up to 5 percent, is provided by the native forb annual sunflower. The site has several small access roads up to 4 meters wide traversing it and is apparently under planning to be developed into single family dwellings in future years.

Figure 5-11. Photographs of Representative Russian-thistle Habitat

5.2 Plant Species Identified

Table 5-1 provides a complete plant list of all species identified during the field surveys, including its wetland status and the section in which it was identified.

Table 5-1. Plant Species Observed in Del Rio Sector Sections M-1 and M-2A

Section		Scientific Name/Common Name	Wetland Indictor Status
M-1	M-2A		
	X	*Acacia berlandieri*/Guajillo	—
X	X	*Acacia farnesiana*/Huisache	—
	X	*Acacia rigidula*/Chaparro Prieto	—
	X	*Agave americana/*Century Plant	—
X	X	*Aloysia gratissima*/Whitebrush	—
X		*Ambrosia cumanensis*/Perennial Ragweed	—
	X	*Ambrosia trifida/*Giant Ragweed	FAC
X		*Ampelopsis arborea/*Peppervine	FAC
X		*Andropogon glomeratus/*Bushy Bluestem	—
X	X	*Arundo donax*/Giant Reed, Carrizo	FAC+
X	X	*Aster spinosus (Leucosyris spinosa)/*Mexican Devil-weed	FACW-
X	X	*Baccharis neglecta/*Jara Dulce, Roosevelt Weed	FAC
X		*Bothriochloa laguroides*/Silver Bluestem	—
X		*Callirhoe involucrata/*Winecup	—
X		*Calyptocarpus vialis/*Straggler Daisy	FAC
X		*Campsis radicans/*Trumpet Creeper	FAC
X		*Capsicum annuum/*Chilipiquin	—
	X	*Castela erecta*/Amargosa, Goatbush	—
	X	*Castela texana/*Amargosa	—
X	X	*Celtis laevigata*/Palo blanco, Texas Sugarberry	FAC
X	X	*Celtis laevigata* var. *reticulata*/Palo Blanco, Netleaf Hackberry	UPL
X	X	*Celtis pallida*/Granjeno, Spiny Hackberry	—

Section		Scientific Name/Common Name	Wetland Indictor Status
M-1	M-2A		
X		*Cissus incisa (Cissus trifoliata)*/Hierba del Buey, Ivy Treebine, Possum Grape	FACU-
X	X	*Clematis drummondii*/Barbas de Chivato, Old Man's Beard	—
X		*Colocasia esculenta/*Elephant Ears, Coco Yam	OBL
	X	*Condalia spathulata*/Costilla, Knifeleaf Condalia	—
X		*Crinum americanum/*Swamp Lily	OBL
X		*Cucurbita foetidissima*/Stinking Gourd	—
X	X	*Cynodon dactylon*/Pato de Gallo, Bermuda Grass	FACU+
X		*Cyperus tenuis/*Flat Sedge	—
X		*Datura inoxia/*Indian Apple	—
	X	*Ehretia anacua*/Anacua	—
	X	*Guaiacum angustifolium*/Guayacan, Soap-bush, Ironwood	—
X	X	*Gutierrezia sarothrae/*Broom Snakeweed	—
X	X	*Helianthus annuus*/Annual Sunflower	FAC
X		*Hydrocotyle umbellata/*Water-pennywort	OBL
X		*Hygrophila polysperma/*Indian Swampweed	OBL
	X	*Lantana camara*/Lantana	FACU
X		*Lantana urticoides/*Texas Lantana	—
X		*Lemna minuta/*Small Duckweed	OBL
X		*Leucophyllum frutescens*/Cenizo, Purple Sage	—
X		*Marrubium vulgare/*Common Horehound	FACW-
X	X	*Melia azedarach/*Paraiso, Chinaberry-tree	—
X	X	*Morus alba/*Mulberry	FACU*
X	X	*Nicotiana glauca/*Tree Tobacco	FAC
X	X	*Opuntia engelmannii*/Nopal, Texas Prickly Pear	—
X	X	*Panicum virginatum*/Switchgrass	—
X	X	*Parkinsonia aculeata*/Retama	FACW-
X	X	*Pennisetum ciliare (Cenchrus ciliaris)*/Buffelgrass	—
	X	*Phoradendron tomentosum*/Mistletoe	—

Section		Scientific Name/Common Name	Wetland Indictor Status
M-1	M-2A		
X		*Phytolacca americana*/Pokeweed	FAC-
X		*Pistia stratiotes*/Water Lettuce	OBL
X		*Platanus occidentalis*/Sycamore	FAC+
X		*Pontederia cordata*/Pickerelweed	OBL
X		*Populus deltoides*/Eastern Cottonwood	FAC
X	X	*Prosopis glandulosa*/Mesquite, Honey Mesquite	—
X		*Rhus lanceolata*/Flameleaf (Lanceleaf) Sumac	—
X		*Rivina humilis*/Coralito, Pigeonberry	—
X		*Sabal mexicana*/Palm	—
X		*Sagittaria longiloba*/Arrow-head	OBL
X	X	*Salix nigra*/Sauz, Black Willow	FACW+
X	X	*Salsola australis*/Russian-thistle	FACU
X		*Sapium sebiferum*/Chinese Tallow Tree	—
X		*Sida abutifolia*/Spreading Sida	—
X		*Solanum elaeagnifolium*/Trompillo, Silverleaf Nightshade	—
X	X	*Sorghum halepense*/Johnsongrass	FACU
X	X	*Sphaeralcea angustifolia*/Globe-mallow	—
X		*Talinum angustissimum*/Flame Flower	—
X	X	*Tamarix aphylla*/Athel Tamarisk, Saltcedar	FACW
X	X	*Typha domingensis*/Tule, Narrow-leaf Cattail	OBL
X	X	*Verbesina encelioides*/Cow-pen Daisy	FAC
X		*Xanthium strumarium*/Cocklebur	FAC-
	X	*Ziziphus obtusifolia*/Clepe, Lotebush	—
61	40	Total number of species in each section	
33	18	Total number of FACW- to OBL species per section	

Note: Wetland Indicator Status (NRCS 2007): Facultative Upland (FACU) – usually occurs in non-wetlands, but occasionally found in wetlands; Facultative (FAC) – equally likely to occur in wetlands or non-wetlands; Facultative Wetland (FACW) – usually occurs in wetlands but occasionally found in non-wetlands; Obligate Wetland (OBL) – occurs almost always under natural conditions in wetlands; Upland (UPL) – Occurs in wetlands in another region, but occurs almost always (estimated probability 99%) under natural conditions in non-wetlands in the regions specified; (*) = tentative assignments based on limited information, (-) = less frequently found in wetlands).

5.3 Proposed Section Characteristics and Description of Habitat Quality

The following are general descriptions of the habitat quality and characteristics of each section.

5.3.1 Section M-1

County	Val Verde
Potential Listed Plant Species	*Sclerocactus brevihamatus* ssp. *tobuschii (*formerly *Ancistrocactus tobuschii)* Tobusch fishhook cactus (FE, SE) *Styrax platanifolius* spp. *texanus* (formerly *Styrax texana*) Texas snowbells (FE, SE)
Listed Plants Observed	None
Suitable Listed Plant Habitat Present	No
If so, Habitat Quality	NA

Section M-1 consists of multiple privately owned tracts of land, many with active cattle grazing and other various activities. Although generally the species assemblage remains consistent from tract to tract, varying stages of succession or regrowth are evident. Southeast of the port of entry is a residential street that runs parallel with the proposed project corridor and is bounded immediately to the south by a mesic wetland area consisting of springs, shallow pools, and ponds.

The northern-most boundary of this section begins at Cienegas Creek and traverses relatively mature mesquite-hackberry woodland. Some areas of this woodland are dense enough to create a dark understory with mostly leaf litter and very little understory vegetation. Woody tree species along this area are hackberry, sugarberry, spiny hackberry, mesquite, huisache, retama, flameleaf (or lanceleaf) sumac, and one sycamore tree. Other species encountered were lantana, common horehound, chilipiquin, pokeweed, jimson weed, pigeonberry, cocklebur, stinking gourd, cowpen daisy, Bermuda grass, and buffelgrass. With the exception of the sumac and the sycamore, this same species assemblage (in varying stages of succession or regrowth) continued southeastward to the port of entry. There was also one large stand of giant reed in the section.

Southeast of the port of entry, the proposed project corridor runs between a line of residences and a wetland. This wetland area consists of springs, seeps, pools, and ponds, which extend within approximately 100 feet of several homes. Woody species observed were cottonwood, black willow, mesquite, tree tobacco, Chinese tallow, Chinaberry, hackberry, sugarberry, mulberry, retama, and huisache. Herbaceous plants along the mesic zone were cattails, giant reed, water-pennywort, flatsedge, swamp lily, hygrophila, small duckweed, water lettuce, pickerelweed, arrowhead, elephant ears, and straggler daisy. The southernmost ponds or impoundments were surrounded by Bermuda grass, cattails, retama, and huisache.

There was no suitable habitat for the endangered Tobusch fishhook cactus or the endangered Texas snowbells along this section.

5.3.2 Section M-2A

County	Maverick
Potential Listed Plant Species	None
Listed Plants Observed	None
Suitable Listed Plant Habitat Present	No
If so, Habitat Quality	NA

Section M-2A consists of mostly a dense stand of giant reed along the riverside, with a thin ridge (higher in elevation) of brush just to the east, and highly disturbed open tracts or residential areas just beyond and to the east of the ridge line. The unpaved access road used for border patrol consists of very fine, powdery soil. The dense giant reed stand contains the occasional tree tobacco, Roosevelt weed, and retama, along with abundant Bermuda grass. The ridge line consists of brushy species such as mesquite, guayacan, whitebrush, and spiny hackberry, with scattered prickly pear throughout. The highly disturbed tracts along the northern extent of this section are dominated by Russian-thistle and broom snake weed, along with areas of globe mallow, buffelgrass, and switchgrass.

5.4 Wildlife Observed

Table 5-2 below lists wildlife observed during the field surveys. The table gives a general indication of species richness in each section.

Table 5-2. Wildlife Observed During Natural Resources Surveys November 5 and 6, 2007

Common Name	Scientific Name	Species Status	M-1	M-2A
Insects				
Cloudless sulfur	*Phoebis sennae eubule*	C	X	
Monarch butterfly	*Danaus plexippus*	C	X	

Common Name	Scientific Name	Species Status	M-1	M-2A
Painted lady butterfly	*Vanessa cardui*	C	X	
Amphibians				
Bullfrog	*Rana catesbiena*	C	X	
Rio Grande leopard frog	*Rana berlandieri*	C	X	
Reptiles				
Indigo snake	*Drymarchon corais*	ST	X	
Birds				
Baltimore oriole	*Icterus galbula*	C	X	X
Barn swallow	*Riparia riparia*	C		X
Black-bellied whistling duck	*Dendrocygna autumnalis*	C	X	
Bufflehead	*Bucephala albeola*	C	X	
Couch's kingbird	*Tyrannus couchii*	C	X	X
Double-crested cormorant	*Phalacrocorax auritus*	C	X	
Gadwall	*Anas strepera*	C	X	
Great egret	*Ardea alba*	C		X
Great-tailed grackle	*Quiscalus mexicanus*	C	X	X
Inca dove	*Columbina inca*	C		X
Kingfisher	*Megaceryle* sp.	C	X	
Mallard	*Anas platyrhynchos*	C	X	
Mourning dove	*Zenaida aurtia*	C	X	
Northern cardinal	*Cardinalis cardinalis*	C	X	
Northern shoveler	*Anas clypeata*	C	X	
Red-shouldered hawk	*Buteo lineatus*	C	X	
Says phoebe	*Sayornis saya*	C		X
Scissor-tailed flycatcher	*Tyrannus forticatus*	C		X
Sparrow	*Spizella* sp.	C	X	X
Vermilion flycatcher	*Pyrocephalus rubinus*	C		X
Wild turkey	*Meleagris gallopavo*	C	X	
Mammals				
Raccoon	*Procyon lotor*	C		X

Notes:
C = Common
ST = State threatened

6. Avoidance and Minimization Measures

[Preparer's note: Add Texas BMPs once approved by CBP and USFWS.]

7. Permits, Technical Studies, and Notifications

In compliance with state and Federal regulations, the following permit applications should be investigated or conducted to assess the potential that regulatory requirements have been met. Additional permits, studies, or notifications not listed herein may be required.

Permits			
Permit Type	**Issuing Agency**	**Reason**	**Legislation**
404 Permit	U.S. Army Corps of Engineers (USACE)	Wetland and waters of the United States (WOUS) delineation	Section 404 of the Clean Water Act authorizes the USACE to issue permits regulating the discharge of dredged or fill material into the waters of the United States, including wetlands. General permits are often issued by USACE for categories of activities that are similar in nature and would have only minimal individual or cumulative adverse environmental effects. A general permit can also be issued on a programmatic basis ("programmatic general permit") to avoid duplication of permits for state, local or other federal agency programs.
401 Water Quality Certification	Texas Commission on Environmental Quality (TCEQ)	Wetland and WOUS delineation	Section 401(a)(1) of the Clean Water Act (CWA) specifies that any applicant for a federal license or permit to conduct any activity, including but not limited to the construction or operation of facilities that may result in any discharge into navigable waters, shall provide the federal licensing or permitting agency a certification from the state in which the discharge originates or will originate, or, if appropriate, from the interstate water pollution control agency having jurisdiction over the navigable water at the point where the discharge originates or will originate, that any such discharge will comply with the applicable provisions of Sections 301, 302, 303, 306, and 307 of the Clean Water Act.

Permits			
Permit Type	**Issuing Agency**	**Reason**	**Legislation**
Section 10 Rivers and Harbors Act Permit	USACE	Construction over in or navigable WOUS	Section 10 of the Rivers and Harbors Act (33 U.S.C. 401 *et seq.*) requires authorization from the USACE for the construction of any structure in or over any navigable water of the United States, the excavation/dredging or deposition of material in these water or any obstruction or alteration in a "navigable water." Structure or work outside the limits defined for navigable waters of the U.S. require a Section 10 permit if the structure or work affects the course, location, condition, or capacity of the water body.
Section 7 (ESA) consultation	USFWS	Allow the proposed action to proceed while avoiding effects on listed species	Section 7 of the ESA directs all federal agencies to use their existing authorities to conserve threatened and endangered species and, in consultation with the USFWS, to ensure that their actions do not jeopardize listed species or destroy or adversely modify critical habitat. Section 7 applies to the management of federal lands as well as other federal actions that may affect listed species, such as federal approval of private activities through the issuance of federal funding, permits, licenses, or other actions.

Permits			
Permit Type	**Issuing Agency**	**Reason**	**Legislation**
Migratory Bird Treaty Act (MBTA) coordination (Migratory Bird Depredation Permit)	USFWS	Fence constructed during breeding season	The MBTA established a federal prohibition, unless permitted by regulations, to pursue, hunt, take, capture, kill, attempt to take, capture or kill, possess, offer for sale, sell, offer to purchase, purchase, deliver for shipment, ship, cause to be shipped, deliver for transportation, transport, cause to be transported, carry, or cause to be carried by any means whatever, receive for shipment, transportation or carriage, or export, at any time, or in any manner, any migratory bird,. . . or any part, nest, or egg of any such bird. The Migratory Bird Depredation Permit is USFWS Form 3-200-13.
Take Permit	State of Texas, Texas Parks and Wildlife Department	Texas Endangered Species Act compliance	Animals: Laws and regulations pertaining to endangered or threatened animal species are contained in Chapters 67 and 68 of the Texas Parks and Wildlife (TPW) Code and Sections 65.171 - 65.176 of Title 31 of the Texas Administrative Code (TAC). Plants: Laws and regulations pertaining to endangered or threatened plant species are contained in Chapter 88 of the TPW Code and Sections 69.01 - 69.9 of the TAC.

Notification	
Agency	**Contact Information**
USFWS—Regional	Larisa Ford, PhD, MPA Fish & Wildlife Biologist, Ecological Services United States Fish & Wildlife Service Texas A&M University at Corpus Christi 6300 Ocean Drive, USFWS Unit 5837 Corpus Christi, TX 78412-5837 361-994-9005 361-994-8262 (fax)
Texas Department of Parks and Wildlife	No contact available at this time.

Additional Studies	
Agency	**Study**
USACE	Jurisdictional determination for WOUS, including wetlands.

8. List of Preparers

Domenick Alario
B.A. Geography
Years of Experience: 2

Stuart Gottlieb
B.A. Geography
GIS Professional Certificate
Years of Experience: 5

Shawn Gravatt
M.S. Environmental Studies
B.S. Earth Science and Geography
Years of Experience: 10

Brian Hoppy
B.S. Biology
Certified Environmental Manager
Years of Experience: 17

Gena Jannsen
M.S. Biology
B.S. Geography
Years of Experience: 17

Ronald E. Lamb
M.S. Environmental Science
M.A. Political Science/International Economics
B.A. Political Science
Years of Experience: 22

Cheryl Myers
A.A.S. Nursing
Years of Experience: 17

Cheryl Schmidt, Ph.D.
Ph.D. Biology
M.S. Biology
B.S. Biology
Years of Experience: 22

Sarah Spratlen
Masters of Engineering
Years of Experience: 5

Karen Stackpole
M.S. Environmental Science and Education
B.S. Biology
Years of Experience: 9

Jim Von Loh
M.S. Biology
B.S. Biology
Years of Experience: 32

Lauri Watson
B.S. Environmental Science
Years of Experience: 5

Valerie Whalon
M.S. Fisheries Science
B.S. Marine Science
Years of Experience: 15

9. References

Bailey, Robert F. 1995	Bailey, Robert F. 1995. *Ecoregions of the United States.* U.S. Forest Service. Accessed on-line at: <*http://www.fs.fed.us/colorimagemap/images/300.html*>.
Correll, 1970	Correll, Donavan S., and Marshall C. Johnston. 1970. *Manual of the Vascular Plants of Texas.* Texas Research Foundation. Renner, TX.
Larkin, 1983	Larkin, Thomas J., and George W. Bomar. 1983. *Climatic Atlas of Texas.* Texas Department of Water Resources. Austin, TX.
NatureServe Explorer. 2007	NatureServe Explorer. 2007. *Ecological System Comprehensive Reports.* Accessed on-line at: <*http://www.natureserve.org/explorer*>.
NRCS 2007	U.S. Department of Agriculture, Natural Resources Conservation Service. 2007. PLANTS Database. Accessed on-line at: <*http://plants.usda.gov/*>.
TPWD 2007	Texas Parks and Wildlife. 2007. *State of Texas Threatened and Endangered Species.* Available on-line at: <*http://www.tpwd.state.tx.us/huntwild/wild/species/endang/regulations/texas/index.phtml*>. Accessed 15 November 2007.
USFWS 1988	U.S. Fish and Wildlife Service. 1988. *Tamaulipan Brushland of the Lower Rio Grande Valley of South Texas: Description, Human Impacts, and Management Options.* Biological Report 88(36). S. E. Jahradoerfer and D. M. Leslie, Jr. Washington, D.C.
USFWS 2007	U.S. Fish and Wildlife Service, Southwest Region. 2007. List titled “For Customs and Border Protection, Federally Listed as Threatened and Endangered Species Potentially Occurring Within 25 Miles of the Border.”

THIS PAGE INTENTIONALLY LEFT BLANK

BIOLOGICAL SURVEY
APPENDIX A

DESCRIPTION OF FEDERALLY LISTED SPECIES

(*IN ALPHABETICAL ORDER BY COMMON NAME*)

Black-Capped Vireo (*Verio atricapilla*)

Val Verde County

The black-capped vireo was listed as a federally endangered bird on October 6, 1987.

Distribution: They are found through the Edwards Plateau and eastern Trans-Pecos region of Texas.

Natural History: The black-capped vireo is 4.5 inches long. The male black-capped vireo has a black cap and has red eyes surrounded by white spectacles that are interrupted with black above the eye. The back is olive green, and underparts are mostly white with olive- and yellow-tinged flanks. Wings and back are dark olive to blackish with two pale yellow wingbars. Females and juveniles are similar to males but have a gray cap and a brown iris.

Habitat: Preferred habitat is rangelands with scattered clumps of shrubs separated by open grassland.

Breeding: Black-capped vireos nest in Texas during April through July, and spend the winter on the western coast of Mexico. They build a cup-shaped nest in the fork of a branch 2 to 4 feet above the ground. Nests are usually built in shrubs such as shin oak or sumac. Females lay 3–4 eggs, which hatch in 14–17 days. Both parents incubate the eggs and feed the chicks. Their diet consists of insects. Black-capped vireos have a lifespan of 5–6 years. Males sing to attract mates and defend territories, which are usually 2 to 4 acres. Vireos return year after year to the same area to nest.

Threats: Black-capped vireos are endangered because the low growing woody cover they need for nesting has been cleared or overgrazed by livestock and deer. One of the primary threats to black-capped vireos is the brown-headed cowbird, which lays its eggs in vireo nests and causes vireos to abandon their nest (brood parasitism) (TPWD).

Texas Parks and Wildlife Department on-line fact sheet accessed at:
http://www.tpwd.state.tx.us/huntwild/wild/species/bcv/

Brown Pelican (*Pelecanus occidentalis*)

Val Verde County

The brown pelican was listed as endangered on October 13, 1970.

Distribution: The brown pelican's historical range included the Atlantic and Gulf coasts from South Carolina to Florida and west to Texas. Currently, the brown pelican occurs throughout its historic range but in greatly reduced numbers. Within Texas, numbers dropped drastically from an estimated 5,000 birds in 1918 to less than 100 individuals and only 10 breeding pairs in 1974. According to a 2003 survey, there were 8 colonies and 3,895 active nests in Texas. Today, brown pelicans are found along the Texas coast from Chambers County on the upper coast to Cameron County on the lower coast. Most of the breeding birds nest on Pelican Island in Corpus Christi Bay and Sundown Island near Port O'Connor.

Habitat: The brown pelican is a coastal bird that is rarely seen inland or far out at sea. It feeds in shallow estuarine waters usually less than 40 miles from shore. Pelicans use sand spits, offshore sand bars, and islets for roosting and rest.

Breeding: Egg laying times vary with the location of the brown pelican. In Texas, brown pelican populations nest irregularly, usually beginning in late fall and extending through June. The clutch size averages 2–3, and incubation lasts 28–30 days. The young pelicans leave the nests around 35 days after hatching, fledge around 63 days after hatching, and fly around 71–88 days after hatching. Reproductive success is highly variable and susceptible to disturbance by humans, starvation of young, and/or flooding of nests. In Texas, brown pelicans build their nests on small isolated coastal islands that are safe from predators such as raccoons and coyotes.

Diet: The brown pelican is a piscivore that primarily feeds upon menhaden and mullet in Texas. They spot the fish from above and the dive beak-first into the water to scoop up the fish.

Threats: The brown pelican has undergone several sharp population declines in Texas. The first decline occurred in the 1920–1930s, when local fishermen would kill the birds because of incorrect assumptions that the brown pelican competed with humans for fish. The second sharp decline occurred in the 1960s and 1970s when the brown pelicans ate menhaden tainted with DDT and Endrin, causing a severe decline in reproductive success. Currently, human encroachment and development of the Texas coast provides the most significant threat to brown pelican populations.

Devils River Minnow (*Dionda diaboli*)

Val Verde County

The Devils River minnow was listed as federally threatened on March 20, 1999.

Distribution: The Devils River minnow is found in channels of fast-flowing, spring-fed waters over gravel substrates. It most often occurs where spring flow enters a stream. Historically, it was known to occur in Del Rio in the Rio Grande. Its last occurrence in the Rio Grande as it flows though Del Rio is not reported.

Natural History: It is a small fish, with adults reaching approximately 2 inches in length. It occurs with other similar minnows and is believed to feed on algae. Little is known about its life history. They spawn from January to August, depositing eggs near the stream bottom. Life expectancy is estimated to be 1 to 2 years.

Threats: The primary threats for this species are habitat loss, water quality degradation, and impacts from non-native species.

Texas parks and Wildlife Department on-line fact sheet accessed at: *http://www.tpwd.state.tx.us/publications/pwdpubs/media/pwd_bk_w7000_0013_devils_river_minnow.pdf*

Gray Wolf (*Canis lupus*)

Maverick County

The Gray wolf was listed as federally endangered on March 11, 1967.

Distribution: Currently extirpated from Texas.

Description: The gray wolf is a close relative of domestic dogs. Its thick fur ranges in color from creamy white or reddish-brown to shades of gray and black. Gray wolves are the largest species of wolf and can reach 50–90 pounds and 4–5 feet long. Adult males are larger than adult females.

Gray wolves breed once a year. They mate in late winter, and pups are born in the spring. Dens are usually ground burrows excavated in slopes where rocks will function to support the roof of the tunnel and burrow. Both parents and other pack members, if present, will bring food to the young, which average about 5 pups in a litter. The bond between mated wolves is very strong and commonly lasts their lifetime. Gray wolves can live up to 15 years.

Gray wolves are carnivores that prey on large herbivores such as deer and Pronghorn antelope, but they will also eat rabbits, ground squirrels, and mice. The decline of the gray wolf has been attributed mostly to predator control by humans. In the late 1800s and early 1900s, ranchers killed wolves to prevent loss of livestock and wild ungulates such as deer. In those days, even people living in the towns and cities feared wolves and applauded their demise. Predator control was so successful that few individuals remained. Reintroduction efforts of captive-bred individuals have been difficult to initiate due to residual fears for livestock and people, as well as a lack of large, remote tracts of suitable habitat.

Habitat: Gray wolves are found in forests, brushlands, or grasslands where suitable cover and denning sites are available.

Threats: The primary factors behind extirpation of the gray wolf from its range was loss of habitat and widespread hunting, both for sport and to protect livestock.

Texas Parks and Wildlife Department, Gray Wolf Species Profile. 2007. Accessed on-line at: *http://www.tpwd.state.tx.us/huntwild/wild/species/graywolf/*

Gulf Coast Jaguarundi (*Herpailurus yagouaroundi cacomitli*)

Maverick County

The Gulf Coast jaguarundi was listed as endangered on June 14, 1976.

Distribution: Because of the secretive nature of the jaguarundi, little is known about its exact distribution within Texas. The only documented sighting of a jaguarundi in Texas was a road killed specimen found in Cameron County. Jaguarundi still roam Central and South America in greater numbers than seen in the United States (USFWS 1990).

Habitat: The habitat of the jaguarundi is similar to the ocelot's. It is found within the Tamaulipan Biotic Province, which includes several variations of sub-tropical thornscrub brush. Potential habitat includes four different areas of the Lower Rio Grande Valley: Mesquite-Granjeno Parks, Mesquite-Blackbrush Brush, Live Oak Woods/Parks, and Rio Grande Riparian. Jaguarundi prefer dense thornscrub habitats with greater than 95 percent canopy cover. Their minimal home range is about 40 hectares (ha) (USFWS 1990).

Breeding: The jaguarundi mates in November or December, and gestation lasts 9–10 weeks. There may be two litters of 1–4 (average 2) young per year. In Mexico, the young are born between March and August. Little is known of the breeding habits within the United States.

Diet: The jaguarundi is active at night and preys primarily on birds, small rodents, and rabbits.

Threats: The largest threat to jaguarundi populations in the United States is habitat loss and fragmentation in southern Texas. The jaguarundi requires a large hunting area, and appropriate habitat is being lost to development and agriculture. This creates islands of habitat where the jaguarundi cannot migrate from area to area, leaving them vulnerable.

U.S. Fish and Wildlife Service. 1990. *Listed Cats of Texas and Arizona Recovery Plan (With Emphasis on the Ocelot).* U.S. Fish and Wildlife Service, Albuquerque, New Mexico. 131 pp.

Interior Least Tern (*Sterna antillarum athalassos*)

Maverick and Val Verde County

The interior population of the least tern was listed as endangered on June 27, 1985.

Distribution: The historic breeding range of the least tern included the Mississippi and Red Rivers and the Rio Grande. The breeding range extended from Texas to Montana, and from eastern Colorado and New Mexico to southern Indiana. Currently, the least tern maintains breeding grounds on all these river systems, although suitable habitat has dwindled. In Texas, populations have been observed on the Red River system and along the Texas/Oklahoma border as far east as Burkburnett, Texas. Least terns have been observed on three reservoirs (including Amistad Reservoir in Val Verde County) along the Rio Grande and along the Pecos River at the Bitter Lake National Wildlife Refuge, New Mexico (USFWS 1990).

Natural History:

Habitat: Along river systems such as the Rio Grande, least terns nest on sparsely vegetated sand and gravel bars along a wide, unobstructed river channel or salt flats along lake shorelines. Least terns also have been observed to nest on artificial habitats such as sand and gravel pits and dredge islands (USFWS 1990).

Breeding: Least terns reside on the breeding grounds for 4–5 months, arriving from late April to early June. Nests are shallow depressions in open, sandy areas, gravelly patches, or exposed flats. The tern nests in colonies. Clutch size is usually 2–3 eggs, and the eggs are laid by late May. Incubation lasts 20–25 days, and fledging occurs after three weeks. Parental attention continues until migration at the end of the breeding season (USFWS 1990).

Diet: The least tern is a fish eater that hunts in the shallow waters of rivers, streams, and lakes. Fish prey is small-sized and include the following genera: *Fundulus, Notropis, Campostoma, Pimephales, Gambusia, Blonesox, Morone, Dorosoma, Lepomis* and *Carpiodes.* They usually hunt near their nesting sites (USFWS 1990).

Threats: The taming of wild river systems for irrigation, navigation, hydroelectric power, and recreation has altered the river channels that the least tern depends on for breeding grounds. Stabilized river systems eliminate most of the sandbars that terns utilize for breeding grounds by channeling wide, braided rivers into single, narrow navigation channels.

U.S. Fish and Wildlife Service. 1990. *Recovery plan for the interior population of the least tern (Sterna antillarum).* U.S. Fish and Wildlife Service, Twin Cities, Minnesota. 90 pp.

Ocelot (*Leopardus [=Felis] pardalis*)

Maverick County

The ocelot was listed as endangered on March 28, 1972.

Distribution: The ocelot is found from northern Mexico into the southern extremes of Texas and Arizona to northern Argentina, Paraguay, and Uruguay. Little is known of the exact distribution of the ocelot in Texas. Ocelots recorded by trapping or photo documentation include several areas within five counties in Texas: Cameron, Willacy, Kenedy, Jim Wells, and Hidalgo.

Natural History:

Habitat: The habitat of the ocelot is found within the Tamaulipan Biotic Province, which includes several variations of sub-tropical thornscrub brush. Potential habitat includes four different areas of the Lower Rio Grande Valley: Mesquite-Granjeno Parks, Mesquite-Blackbrush Brush, Live Oak Woods/Parks, and Rio Grande Riparian. Ocelots prefer dense thornscrub habitats with greater than 95 percent canopy cover. Their average home range is about 15 km^2 (USFWS 1990).

Breeding: In Texas, the ocelot breeds in late summer, with gestation lasting about 70 days. Births occur in fall and winter, and the litter size is 2–4. Dens are found in caves, hollow trees, thickets, or the spaces between closed buttress roots of large trees (NatureServe). Juveniles appear to travel with their mother even after lactation has ceased, and one study found two young females up to 2 years old with home ranges that significantly overlapped their mother's home range (USFWS 1990).

Diet: The ocelot is active at night and preys primarily on birds, small rodents, and rabbits, but may also eat reptiles, fish, and invertebrates. Other potential prey species include other rodents, opossum, raccoon, javelina, white-tailed deer, skunks, nine-banded armadillo, feral swine, poultry, quail, doves, chachalaca, numerous passerine birds and waterfowl, snakes, and lizards.

Threats: Habitat loss and fragmentation, especially along the Rio Grande, pose a critical threat to the long-term survival of the ocelot. Efforts need to be taken to preserve key habitat and biological corridors necessary for ocelot survival (USFWS 1990).

U.S. Fish and Wildlife Service. 1990. *Listed Cats of Texas and Arizona Recovery Plan (With Emphasis on the Ocelot).* U.S. Fish and Wildlife Service, Albuquerque, New Mexico. 131 pp.

Rio Grande Silvery Minnow (*Hybognathus amarus)*

Maverick County

The Rio Grande silvery minnow was listed as a federally endangered fish on July 20, 1994.

Distribution: Historically the Rio Grande silvery minnow occurred in the Rio Grande and Pecos River systems in Texas, New Mexico, and Mexico. Its range is currently drastically reduced, and it occurs only in perennial sections of the Rio Grande in New Mexico (NatureServe 2007).

Natural History:

Habitat: This minnow prefers large freshwater streams with slow to moderate current over mud, sand, or gravel bottoms, perennial sections of the Rio Grande, and irrigation canals (Sublette et al. 1990). It spawns probably in still waters over sandy-silt bottoms (Sublette et al. 1990) (NatureServe).

Diet: The diet of the Rio Grande silvery minnow is assumed to be the same as others in the Genus Hybognathus: diatoms, algae, larval insect skins, and plant material scraped from ooze in bottom sediment (Sublette et al. 1990) (NatureServe).

Threats: Survival continues to be threatened by habitat degradation and flow modifications, introduction of non-native fishes, and lack of adequate refugia during periods of low or no flow (NatureServe).

NatureServe. 2007. Rio Grande Silvery Minnow. Accessed on-line at: *http://www.natureserve.org*

USFWS. 2007. Draft Revised Recovery Plan. *http://ecos.fws.gov/docs/recovery_plan/070118a.pdf*

Texas Hornshell (*Popenaias popeii*)

Val Verde County

The Texas hornshell mollusk is federally listed as a candidate species—that is, a species for which the USFWS has enough substantial information to warrant listing as threatened or endangered.

Distribution: The Texas hornshell has only been confirmed in Texas in the Laredo area of the Rio Grande. Historically, it occurred in the lower Pecos River of New Mexico, and downstream throughout the lower Rio Grande.

Natural History: The Texas hornshell is a freshwater mussel. The shell has a length to height ratio of 1.8, is anteriorly rounded and narrow, and posteriorly slightly truncated and wider. Adults are filter feeders, whereas juveniles use foot feeding, thereby being suspension feeders that feed on algae and detritus. The Texas hornshell can live up to a maximum of 200 years.

Threats: The primary threat to Texas hornshells and other freshwater mussels is the destruction or modification of the physical conditions of the river. Modifications include impoundments, water diversions, dams, agriculture irrigation, and levees that modify riffle and shoal habitats; alter the natural flow regime of the river; and prevent natural reproductive grounds for the mussel. Increased siltation, contaminants, and salinity caused by agriculture returns to the river and other human activities create unsuitable conditions for the mussel (USFWS 2005).

U.S. Fish and Wildlife Service. *Species Assessment and Listing Priority Assignment Form.* Accessed on-line at: *http://ecos.fws.gov/docs/candforms_pdf/r2/F02M_I01.pdf*

Texas Snowbells (*Styrax texana*)

Val Verde County

The Texas snowbells shrub or small tree was federally listed as endangered on October 12, 1984.

Distribution: Western Edwards Plateau in Edwards, Real, and Val Verde Counties.

General Description: This shrub or small deciduous tree grows about 5 to 15 feet tall. It has light green leaves that are silver-white underneath. This contrast in colors on the leaves make the plant appear to shimmer when the wind blows. The flowers are clustered at the end of the branch and hang upside down.

Natural History:

Morphology: Flower buds develop in March and open during the third and fourth weeks of April. Flowering peaks during the last week in April. Fruit capsules, containing up to 3 seeds, swell in late July and early August, and split open in late August through September, dropping the shiny brown, pea-sized seeds. The tree is often found growing with Texas ash, sycamore, little walnut, Mexican silktassel, Lacey oak, Texas oak, Mexican-buckeye, Texas mountain laurel, Texas persimmon, guajillo, and Ashe juniper (TPWD 2007).

Habitat: Texas snowbells grow out of crevices on steep limestone bluffs or cliff faces along streams and dry creek beds. They can also grow in the dry gravels of streambeds or on thin soils overlying limestone ledges.

Threats: Texas snowbells are readily eaten by livestock, exotic ungulates, and deer. Over-browsing by these animals is a serious threat to its survival. Young seedlings are often eaten by browsing animals or insects.

Texas parks and Wildlife Department. On-line fact sheet accessed at: *http://www.tpwd.state.tx.us/huntwild/wild/species/snowbell/*

Texas A&M Ornamental Gardening. On-line fact sheet access at: *http://aggie-horticulture.tamu.edu/ornamentals/nativeshrubs/styrax percent20texan.htm*

Tobusch Fishhook Cactus (*Ancistrocactus tobuschii*)

Val Verde County

The Tobusch fishhook cactus was federally listed as endangered in November 1979. It was listed as a state of Texas endangered species in April 1983.

Distribution: This cactus is endemic to Edwards Plateau of central Texas and known to occur in eight counties in Texas. As of February 1996, fewer than 50 populations are known in Texas.

General Description: The stem of the cactus is generally one dark green, flattened hemisphere, growing up to 4 inches in diameter and height. The stem is covered with tubercules. The spines are yellowish, and can be red-tipped and turn gray as the cactus ages.

Natural History:

Morphology: The Tobusch fishhook cactus can flower from mid-January to late March. The flowers are clear, bright yellow, and can be a creamy yellow or yellowish-green when first opening.

Habitat: The habitat for the Tobusch fishhook cactus consists of patchy openings scattered within woodlands, shrublands, and grasslands. It tends to occur on shallow, gravelly soil over limestone within openings among live oak-juniper woodlands.

Threats: The conversion of plant communities to improve pastures, overgrazing, and vulnerability due to low population numbers are all threats.

Texas Parks and Wildlife Department. Tobusch Fishhook Cactus. Accessed on-line at: *http://www.tpwd.state.tx.us/publications/pwdpubs/media/pwd_lf_w7000_0019b.pdf*

THIS PAGE INTENTIONALLY LEFT BLANK

APPENDIX H

Preliminary Cultural Resources Findings

PRELIMINARY CULTURAL RESOURCES FINDINGS

SUPPORTING THE

ENVIRONMENTAL ASSESSMENT FOR

CONSTRUCTION, MAINTENANCE, AND OPERATION OF TACTICAL INFRASTRUCTURE DEL RIO SECTOR, TEXAS

Prepared for

U.S. Customs and Border Patrol

Prepared by

e2M

Solutions Today for a Sustainable Tomorrow

NOVEMBER 2007

PRELIMINARY CULTURAL RESOURCES FINDINGS
DEL RIO TACTICAL INFRASTRUCTURE EA

TABLE OF CONTENTS

THIS PAGE INTENTIONALLY LEFT BLANK

1. INTRODUCTION

This report has been prepared to present the results of a preliminary cultural resources investigation addressing the construction of tactical infrastructure at the international border with Mexico. Information presented in this report on cultural, historical, and archaeological resources is based largely upon data gathered from the Texas Historical Commission (THC) *Texas Historic Sites Atlas* and *Texas Archaeological Sites Atlas*. This information was supplemented by other sources, including information from the Bureau of Land Management (BLM) General Land Office, and regional historical and archaeological syntheses. The THC atlases provide summary information about archaeological sites and surveys, markers describing historical sites and events, neighborhood surveys, and individual properties and historic districts listed in the National Register of Historic Places (NRHP). Because the atlases include only architectural resources that are listed in the NRHP and none that have been determined eligible for the NRHP without having been listed, it is not a complete data set for architectural resources. It is expected that further archival research will reveal a number of additional buildings and other resources that have been previously determined to be eligible for listing in the NRHP, and that survey and evaluation efforts will identify additional ones that have not been surveyed or evaluated. Moreover, the atlases may not reflect the results of recent archaeological surveys, and additional recorded archaeological sites are expected, as well as previously unrecorded archaeological resources. Further research and cultural resource surveys are being conducted at this time.

[Preparers Notes: The information provided below is drawn from the final cultural resources survey, which is currently under development.]

2. REGIONAL CULTURAL SEQUENCE

The Lower Pecos region, the location of the Del Rio survey area, is defined by the confluence of the Pecos River and the Rio Grande. The region includes Val Verde County, the southwest corner of Crockett County, and eastern Terrell County including Meyers Canyon and Geddis Canyon.

2.1 PREHISTORIC

The area's prehistory falls into three periods: Paleoindian, Archaic, and Late Prehistoric. Transitions between these periods are generally identified by changes in artifacts, especially projectile point styles. The Paleoindian period is defined by the presence of basally ground lanceolate projectile points, especially the highly distinctive Clovis and Folsom types. The period marks the first documented human settlement of the Western hemisphere. Paleoindian economy appears focused upon large mammal hunting, but certainly included smaller game and the gathering of plant resources. Clovis, the earliest Paleoindian occupation in the project area, dates to approximately 10,000–9,500 B.C. Only a small number of Clovis points have been found in the proposed project area (Hester et al. 1989;

Simmons et al. 1989; Winchell, Brown, and Edwards 1992). However, two rock shelters in the Lower Pecos region, Bonfire Shelter and Cueva Quebrada, have yielded radiocarbon dates of 12,500–10,100 B.C. (Turpin 1994). Folsom, the next Paleoindian subperiod, is also poorly documented in the area. The Folsom subperiod began about 9,500 B.C. Folsom culture is more common in the study area than Clovis, and includes a cluster of sites near Van Horn (Simmons et al 1989). Folsom sites have also been encountered in the Big Bend area and in the Guadalupe Mountains. The late Paleoindian period is associated with a change in projectile point styles, with unfluted Plainview, Golondrina, Meserve, Angostura, and Lerma points replacing Folsom points in the archaeological record. Late Paleoindian peoples also developed an expanded suite of fiber technologies, including sandals, baskets, mats, and cord.

The long Archaic period in southern Texas is divided into Early, Middle, and Late subperiods. The Archaic period economy is marked by the continuation of hunting and gathering, but also by the utilization of a greater range of plant and animal resources and geographic settings. It is also characterized by adaptations to changes in climate. Specifically, the Early and Middle Archaic periods overlap with the Altithermal (ca. 6000–2000 B.C.), a warm and dry climate episode. By the Late Archaic, modern climate conditions prevailed.

The Early Archaic (approximately 6,900–3,500 B.C.) is identified primarily by the occurrence of new corner- or side-notched projectile point styles. In the Lower Pecos region, these points include Early Barbed, Baker, Bandy, Gower, and Early Triangular (Hester et al. 1989, Turpin 1994). The environmental trends begun in the late Paleoindian period continue into the Early Archaic; resulting in continued drying and replacement of woodlands and plains with desert environments. Although more common than Paleoindian sites, Early Archaic sites are rare in the project area. In the Lower Pecos region, burned rock middens have been observed in Early Archaic occupations in rock shelters, where they are associated with prickly pear remains (Turpin 1994). These features show a continuation of the trend in the late Paleoindian period toward exploiting a wide range of foodsstuffs beyond big game.

As with preceding periods, the Middle Archaic is defined primarily by a change in projectile point style to large-stemmed, corner- or side-notched points, and some basally notched points. In the Lower Pecos area, these points include Pandale points (4,000–1,900 B.C.) and Val Verde, Arledge, and Almagre points (1,900–1,200 B.C.). There is evidence of increasing use of desert succulents and other xeric flora and fauna (Hester et al. 1989, Mallouf 1981). Parts of the region may have seen an increase in population density during the Middle Archaic (Simmons et al. 1989), and this increasing population density may have spurred conflict. Possible manifestations of this population density and conflict include the appearance of the complex, polychrome Pecos River rock art style in the Lower Pecos region (Turpin 1994). This rock art features human figures holding weapons and with some animal characteristics. Also in the Lower Pecos, the increasing use of rock shelters during the Middle Archaic could reflect a concern for defense.

The beginning of the Late Archaic (1,000 B.C.–A.D. 1000) is defined by the appearance of smaller side- and corner-notched point styles. In the Lower Pecos area, these include Muntell, Castroville, and Marshall points from 1,200–400 B.C., Marcos and Shumla points from 400 B.C.–A.D. 250, and Ensor and Frio points from A.D. 250–1000 (Hester et al 1989). The Late Archaic is also associated with the appearance of Red Linear pictographs, which consist of stick figure people and full-body animals (Turpin 1994). At least one bison jump has been identified in the Lower Pecos region, a hunting technique not observed in the area since the Paleoindian period (Turpin 1994). The Late Archaic is also associated with sharp population growth and intensified resource extraction. Sites are found at a wide range of elevations and geographic settings (Simmons et al 1989) and show repeated reoccupation (Mallouf 1985). Toward the very end of the Late Archaic, cultigens appear in the Lower Pecos region. Late Archaic sites include rock shelters, lithic artifact scatters, quarries, hearths, burned rock and ring middens, rock circles, and petroglyphs. Late Archaic sites are relatively common in the Trans-Pecos and Lower Pecos regions (Hester et al. 1989; Simmons et al. 1989; Winchell, Brown, and Edwards 1992), making it relatively likely that they will be encountered in the Areas of Potential Effects (APEs) for Alternatives 2 and 3 addressed in the EA.

The start of the Late Prehistoric period is tied to the initial appearance of bow and arrow technology in some areas. For much of the Pecos region, the Late Prehistoric time period also signals the first appearance of ceramics and the wider dispersal of horticulture, although the timing varies dramatically. The period ends with sustained Spanish contact around A.D. 1600.

In the Lower Pecos, the period from A.D. 1000–1500 is distinguished by the occurrence of Scallorn and Perdiz points, which are later replaced by Livermore and Toyah points. Sites from this period are also characterized by the Red Monochrome style of pictographs, which feature realistic, full-bodied people and animals (Hester et al. 1989; Winchell, Brown, and Edwards 1992; Turpin 1994). The bow and arrow may have spread slowly in the Lower Pecos region: Late Archaic projectile points are found in Late Prehistoric sites, possibly because of scavenging of Archaic points by later peoples, but possibly because of the persistence of atlatl technology (Turpin 1994). The tail end of the Late Prehistoric period in the Lower Pecos, A.D. 1500–1700, is distinguished by the appearance of beveled knives, brownware and bone-tempered ceramics, and stone “tipi rings” (Hester et al. 1989).

2.2 HISTORIC

In the nearly 500 years since initial Spanish exploration, the area has been claimed and influenced by four nations: Spain, Mexico, the Republic of Texas, and the United States. Each has pursued its own interests and left its mark as historic landmarks or patterns of land use. During the Spanish Period (ca. 1535–1821), a presidio, or garrison, was founded (1738), 30 miles south of Del Rio. A second presidio was founded in 1760 at La Junta. These facilities were built both to solidify Spanish claims to the area and at the request of local indigenous populations seeking protection from the Apache groups.

The Mexican Period (ca. 1621–1636), which began with Mexican independence from Spain, likely left little trace in the Lower Pecos region. The weak Mexican government and the lack of official incentives to settle western Texas gave indigenous and Hispanic populations little reason to establish settlements here. Where settlements did exist along the Rio Grande, they became increasingly independent of Mexico (Winchell, Brown, and Edwards 1992).

The Republic of Texas and American periods (1636–present) are characterized by increased economic stabilization of the region and increasing permanent settlement, trends that were facilitated by the arrival of the railroad in 1882. The 20th century saw the expansion of cattle, sheep, and goat ranching, still an important element of the area's economy today. Irrigation agriculture also spread to the area. A U.S. military presence in the region started in 1942 with the opening of Laughlin Field 8 miles east of Del Rio to train pilots. This installation remained in use after World War II as Laughlin Air Force Base and was home to a U-2 spy plane unit (Thompson 1985, Zertuche 1985).

3. HISTORIC RESOURCES

3.1 FORT DUNCAN

Fort Duncan was established on the east side of the Rio Grande on March 27, 1849. Initially called Camp Eagle Pass, it was renamed Fort Duncan on November 14, 1849 (THC 2007a).

In the 1850s, the fort was located on a significant Mexico/U.S. trade crossing route and also served to protect travelers on the California Road, as well as to scout for hostile Native Americans in the area. Fort Duncan was ordered abandoned in 1859, only to be re-garrisoned in 1860 because of uprisings by Mexico's Juan N. Cortina. It was abandoned by Federal troops in March 1861 when the Civil War began. Confederate troops renamed the fort Rio Grande Station while it served the Frontier Regiment. The fort was again significant because of its use as a customs point for the cotton and munitions trade with Mexico. Federal troops reoccupied the fort in 1869 and it remained in use to some extent until the 1920s. In 1933, the city of Eagle Pass began using the fort as a public park and officially acquired the property in 1935, converting it to Fort Duncan Park (Texas Online 2007a). Archaeological site 41MV2 is the archaeological component of the fort and is smaller than the historic district.

3.2 MAVERICK COUNTY COURTHOUSE

The Maverick County Courthouse was listed on the National Register of Historic Places by the Secretary of the Interior in 1980. Maverick County was organized in 1871 with Eagle Pass as the county seat. The first courthouse and jail were constructed in 1878, but the facilities soon proved to be inadequate and, in 1884, plans for a new courthouse were accepted from the architectural firm Wahrenberger and Beckman of San Antonio. The courthouse, erected in 1885, is of Romanesque Revival style with Second Empire influences (THC 2007a).

Among the important historical events that took place at the courthouse was the Dick Duncan trial of 1889. Duncan was convicted of killing four members of the San Saba family. He appealed to state and Federal courts but to no avail. His hanging in 1891 was to be the only capital execution in Maverick County (Texas Online 2007b).

In 1930, the county made small additions to the courthouse and "updated" its interiors. In 1978, a new courthouse was built, and the former stood vacant. In 2004 Maverick County received grant money to proceed with a full exterior and interior restoration of the facility (THC Undated).

4. REFERENCES

Hester et al 1989	Hester, T. R., S. L. Black, D. G. Steele, B. W. Olive, A. A. Fox, K. J. Reinhard, and L. C. Bement. 1989. *From the Gulf to the Rio Grande: Human Adaptation in Central, South, and Lower Pecos Texas.* Arkansas Archaeology Survey Research Series No. 33, Wrightsville, Arkansas.
Mallouf 1985	Mallouf, R. J. 1985. "A Synthesis of Eastern Trans-Pecos Prehistory." Master's Thesis, University of Texas.
Simmons et al 1989	Simmons, A. H., A. L. Wiener Stodder, D. D. Dykeman, and P. A. Hicks. 1989. *Human Adaptation and Cultural Change in the Greater Southwest.* Arkansas Archaeology Survey Research Series No. 32, Arkansas Archaeology Survey, Wrightsville, Arkansas.
Texas State Historical Association 2007a	Texas State Historical Association. "Fort Duncan." In the Handbook of Texas Online. Available online: <*www.tsha.utexas.edu/handbook/online/articles/FF/qbf17.html*>. Accessed 9 November 2007.
Texas State Historical Association 2007b	Texas State Historical Association. "Maverick County." In the Handbook of Texas Online. Available online: <*www.tsha.utexas.edu/handbook/online/articles/MM/hcm6.html*>. Accessed 9 November 2007.
THC 2007a	Texas Historical Commission (THC). "Texas Historic Sites Atlas." Public access database. Available online: <*http://atlas.thc.state.tx.us/*>. Accessed 24 September 2007.
THC 2007b	THC. "Texas Archeological Sites Atlas." Restricted access database. Available online: <*http://nueces.thc.state.tx.us/*>. Accessed 24 September 2007.
Thompson 1985	Thompson, C. *History of Marfa and Presidio County, 1535-1946.* Austin, Nortex.
Turpin 1994	Turpin, S. A. "Lower Pecos Prehistory: The View from the Caves." In *The Caves and Karst of Texas,* edited by W. R. Elliott and G. Veni, pp. 69–84. National Speleological Society, Huntsville, Alabama.

Winchell, Brown and Edwards 1992	Winchell, F., G. Brown, M. B. Cliff, and S. K. Edwards. *Cultural Resources Monitoring/Survey of a JTF-6 Action, Van Horn, Texas Sector.* Report submitted to U.S. Army Corps of Engineers, Fort Worth District.
Zertuche 1985	Zertuche, D. S. *The Spirit of Val Verde.* Diana Sotelo Zertuche, Del Rio, Texas.

THIS PAGE INTENTIONALLY LEFT BLANK