State Highway 32 East TIGER Discretionary Grant Application

APPENDIX A - DRAFT ENVIRONMENTAL ASSESSMENT

April 2016

Draft Environmental Assessment SH 32

Pharr District

From 1419 at FM 3068 to SH 4 at Future Port of Brownsville Entrance

CSJs: 3626-02-001; 3626-03-001; 1426-01-043; 0039-10-076
Cameron County, Texas

March 2016

The environmental review, consultation, and other actions required by applicable Federal environmental laws for this project are being, or have been, carried-out by TxDOT pursuant to 23 U.S.C. 327 and a Memorandum of Understanding dated December 16, 2014, and executed by FHWA and TxDOT.

ENVIRONMENTAL ASSESSMENT

STATE HIGHWAY 32

FROM FM 1419 AT FM 3068

TO

STATE HIGHWAY 4
At Future Port of Brownsville Entrance

CSJ's: 3626-02-001, 1426-01-043, 3626-03-001, and 0039-10-076

TEXAS DEPARTMENT OF TRANSPORTATION

CAMERON COUNTY REGIONAL MOBILITY AUTHORITY
CAMERON COUNTY, TEXAS

March 2016

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LIST OF ABBREVIATIONS/ACRONYMS

The following is an alphabetized list of the abbreviations and acronyms found within the text of this document:

AADT	Annual Average Daily Traffic
ACT	Antiquities Code of Texas
ADA	American Disability Act
ADT	Average Daily Traffic
AOI	Area of Influence
APE	Area of Potential Effect
Ave	Avenue
BG	Block Group
B&M	Brownsville and Matamoros International Bridge
BLK	Block
BMP	Best Management Practices
BMPO	Brownsville Metropolitan Planning Organization
BPUB	Brownsville Public Utilities Board
BSIF	Border Safety Inspection Facility
CCRMA	Cameron County Regional Mobility Authority
CAA	Clean Air Act
CEQ	Council on Environmental Quality
CERCLIS	Compensation and Liability Information System
CFR	Code of Federal Regulations
CT	Census Tract
CWA	Clean Water Act
db	Decibel
dBA	A-Weighing
dbh	diameter at breast height
DE	Diesel Exhaust
DHHS	Department of Human Health and Services
DHS	Department of Homeland Security
EA	Environmental Assessment
EFH	Essential Fish Habitat
DEIS	Draft Environmental Impact Statement
EJ	Environmental Justice
EO	Executive Order
EPA	Environmental Protection Agency
ESA	Endangered Species Act of 1973
FE	Federal Listed Endangered
ft.	Feet / Foot
FEMA	Federal Emergency Management Agency
FHWA	Federal Highway Administration
FM	Farm to Market
FONSI	Finding of No Significant Impact
FPPA	Farmland Protection Policy Act

FRS	Facility Registry System
FT	Federal Listed Threatened
HEI	Health Effects Institute
IRIS	Integrated Risk Information System
ISA	Hazardous Materials Initial Site Assessment
LEP	Limited English Proficiency
Leq	Equivalent Sound Level
LPST	Leaking Petroleum Storage Tank
LRGV	Lower Rio Grande Valley
LWCF	Land and Water Conservation Fund
MBTA	Migratory Bird Treaty Act
MOA	Memorandum of Agreement
MOU	Memorandum of Understanding
mph	Miles per hour
MPO	Metropolitan Planning Organization
MS4	Municipal Separate Storm Sewer System
MSAT	Mobile Source Air Toxics
MSFCMA	Magnuson-Stevens Fishery Conservation and Management Act
MSL	Mean Sea Level
MSWLF	Municipal Solid Waste Landfills
MTBE	Methyl Tertiary Butyl Ether
MTP	Metropolitan Transportation Plan
NAAQS	National Ambient Air Quality Standards
NAC	Noise Abatement Criteria
NACHP	National Advisory Council on Historic Preservation
NAFTA	North American Free Trade Agreement
NATA	National Air Toxics Assessment
NCHRP	National Cooperative Highway Research Program
NDD	National Diversity Database
NEPA	National Environmental Policy Act
NFIP	National Flood Insurance Program
NHPA	National Historic Preservation Act
NLEV	National Low Emission Vehicle
NMFS	National Marine Fisheries Service
NMHC	Non-Methane Hydrocarbon
NOI	Notice of Intent
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NWI	National Wetlands Inventory
NWR	National Wildlife Refuge
OHWM	Ordinary High Water Mark
OTHM	Official Texas Historical Markers
PA	Programmatic Agreement
PM	Particulate Matter
PST	Petroleum Storage Tank
RCRA	Resource Conservation and Recovery Act

RFG	Reformulated Gasoline
RIA	Regulatory Impact Analysis
ROE	Right-of-Entry
ROW	Right-Of-Way
RSA	Resource Study Area
Rd	Road
RPST	Registered Petroleum Storage Tanks
RTHL	Recorded Texas Historic Landmarks
SAL	State Archeological Landmarks
SE	State Listed Endangered
SGCN	Species of Greatest Conservation Need
SH	State Highway
SHPO	Texas State Historic Preservation Officer
STIP	Statewide Transportation Improvement Program
ST	State Listed Threatened
SW3P	Storm Water Pollution Prevention Plan
TCEQ	Texas Commission on Environmental Quality
TCMP	Texas Coastal Management Program
TDM	Traffic Demand Management
THC	Texas Historical Commission
TMDL	Total Maximum Daily Loads
TP&P	Transportation Planning and Programming
TPDES	Texas Pollution Discharge Elimination System
TPWD	Texas Parks & Wildlife Department
TSM	Transportation System Management
TxDOT	Texas Department of Transportation
U.S.	United States
USACE	US Army Corps of Engineers
USC	United State Code
USCG	U.S. Coast Guard
USDA	US Department of Agriculture
USFWS	US Fish & Wildlife Service
USGS	United States Geological Survey
VMT	Vehicle Miles Traveled
VPD	Vehicles per Day
WMA	Wildlife Management Area

1.0 PROJECT DESCRIPTION

The Cameron County Regional Mobility Authority (CCRMA), in cooperation with the Texas Department of Transportation (TxDOT), is proposing to construct State Highway (SH) 32 in Cameron County. Proposed SH 32 would improve connectivity between the Port of Brownsville Foreign Trade Zone (FTZ), the Brownsville/South Padre Island International Airport, Airport FTZ, and the Veterans International Bridge while enhancing mobility within the southeast quadrant of Cameron County.

As currently proposed, the project would extend from the intersection of Farm-to-Market Road (FM) 3068 and FM 1419, south of the Brownsville/South Padre Island International Airport, to SH 4 at the future entrance to the Port of Brownsville – a distance of 5.88 miles. Incidental construction would extend to 0.78 of a mile west of FM 3068 to allow for roadway transitioning. The total length of the proposed project, including the transitioning, would be 6.66 miles. The proposed project would be constructed within a 120-foot (ft.) wide (usual) right-of-way (ROW). An overpass is proposed at the SH 4/SH 32 intersection. The proposed ROW at the SH 4 overpass would be increased to 400-ft. FM 3068 and the intersection of SH 4 and Yolanda Road (Rd.) provide logical termini for the proposed project. **Exhibits 1** and **2** provide Vicinity and Location Maps of the area. **Exhibits 3A- 3C** provides the Topographic Maps and **Exhibits 4A-4F2** provides the Aerial Maps of the project area.

This environmental assessment (EA) discloses the level of potential impacts that may occur as a result of implementing the proposed action. The public will be afforded the opportunity to review the information disclosed in the EA, to participate in the public involvement process, and to provide input on the proposed action.

This EA has been developed in accordance with the procedural provisions of the United States Code (USC) Title 42, Chapter 55, Section 4321 (1969) and the National Environmental Policy Act (NEPA), the Council on Environmental Quality (CEQ) regulations (40 Code of Federal Regulations {CFR} 1508.7) *Regulations for Implementing the Procedural Provisions of NEPA*, CFR Title 23 Highways Part *771 Environmental Impact and Related Procedures*, Federal Highway Administration (FHWA) Technical Advisory 6640.8A, the Texas Administrative Code, and the TxDOT toolkits and guidance.

1.1 Need and Purpose of the Project

This project is needed because there is inadequate connectivity to the southeast portion of Brownsville, the Port, and the Airport. Also, congestion in the area is anticipated to increase on surrounding roads due to increasing population and development in the region. The purpose of this project is to increase connectivity to southeast Brownsville and reduce congestion in the project area.

Two major traffic generators in the vicinity of the proposed project include the Port of Brownsville and the Brownsville/South Padre Island International Airport, which are part of the Foreign Trade Zone Number 62 (FTZ No. 62) in Cameron County. The Brownsville/South Padre International Airport is located approximately two mile north of the west project terminus at 601 S. Minnesota Avenue (Ave.), while the Port of Brownsville is located approximately two mile north of the east project terminus. These facilities have experienced growth over the past five to ten years in part due to the North American Free Trade Agreement (NAFTA).

FTZ No. 62 is a political subdivision of the State of Texas for which the Brownsville Navigation District is the grantee and operator. In addition to the Port of Brownsville and the Brownsville/South Padre International Airport, the FTZ No. 62 has sites at the Harlingen Industrial Park and the Airpark located at the Valley International Airport in Harlingen. The Harlingen Industrial Park and the Airpark are located approximately 25 miles northwest from Port of Brownsville in Harlingen and are serviced by three major airlines and several major carriers.

The Port of Brownsville is an inland deep water port, which provides for the movement of cargo to and from the United States (U.S.), Mexico and all parts of the world. The Port of Brownsville provides access to the Gulf of Mexico via the Brownsville Ship Channel and to ship, barge, truck and rail transportation. According to the Port of Brownsville official website, total metric tons of cargo handled by the port increased from 6.7 metric tons in 2013 to 7.6 metric tons in 2014, a 13.4 percent increase (http://www.portofbrownsville.com/facts/). In 2012, the Port of Brownsville handled 7.1 million metric tons of cargo as compared to 4.9 metric tons in 2009, a 44.9 percent increase (Port of Brownsville South Texas Manufacturers Association August 27, 2013 Presentation). These growth trends indicate that the cargo activity in the Brownsville Ship Channel is increasing and would likely continue to occur. http://www.portofbrownsville.com/foreign-trade-zone/.

FM 511, approximately a 3.7 mile roadway between SH 4 and SH 48, currently connects the Airport and Port. The proposed SH 32 project would improve connectivity between the Port of Brownsville FTZ and the Brownsville/South Padre Island International Airport and the Airport FTZ. The proposed project would also minimize commercial traffic along FM 511 and would provide relief to the current overweight corridors within the City of Brownsville. The current overweight corridors are SH48/SH 4 between the Gateway International Bridge and the entrance to the Port of Brownsville; U.S. 77/83; and SH 48/SH 4 between the Veterans International Bridge at Los Tomates and the entrance to the Port of Brownsville. In 2007, approximately 50,000 overweight permits were issued that cover travel between Gateway International Bridge and the Port of Brownsville (http://www.ccjdigital.com/promiles-automates-specialized-permits-in-brownsville-texas/). According to TxDOT's Transportation Planning and Programming (TP&P), the Average Daily Traffic (ADT) from the Port of Brownsville to U.S. 77/83 was 5,000 vehicles per day (VPD) in 2013 and is expected to be 7,100 VPD in 2033.

The Brownsville/South Padre International Airport-Airport FTZ, located at 601 S. Minnesota Ave., provides access to Air Cargo Facilities and is serviced by three major airlines and several major carriers. The City of Brownsville and the Brownsville/South Padre International Airport's Aviation Department are planning to extend the primary runway (13R-31L) to 10,000 linear-ft. in length within the next three years. The airport runway expansion, when completed, would bisect part of FM 511; this would reduce connectivity within the southeast portion of the City of Brownsville. In addition, the airport runway expansion allow for increased airfreight operations and number of aircraft utilizing the airport; this in turn would result in an increase in traffic to and from the airport creating a need for additional roadway access to the airport. The proposed SH 32 would maintain access to the southeast portion of the City of Brownsville and at the same time would improve access and connectivity to the Airport by providing an improved route. See **Exhibit 4F3** for the proposed Airport Right of Way.

The City of Brownsville and Cameron County have grown steadily over the last decade. The population of Cameron County increased approximately 24 percent from 1990 to 1999 (Texas State Library and Archives Commission https://www.tsl.texas.gov/ref/abouttx/popcnty1.html and the Texas Department of State Health and Services http://www.dshs.state.tx.us/chs/popdat/ST1999.shtm), and the population of Brownsville increased by approximately 49 percent during the same time period (Texas State Library and Archives Commission https://www.tsl.texas.gov/ref/abouttx/popcity1.html and https://www.tsl.texas.gov/ref/abouttx/popcity2.html) . The populations of Cameron County and the City of Brownsville are projected to grow, 17.9% and 20.7%, respectively, from 2010 through 2020 as would the number of vehicles using the existing transportation facilities ((Texas State Library and Archives Commission https://www.tsl.texas.gov/ref/abouttx/popcnty12010.html and Texas Water Development Board Population Projections http://www2.twdb.texas.gov/ReportServerExt/Pages/ReportViewer.aspx?%2fProjections%2fpop_county&rs:Command=Render)

The proposed project is located within the southeast portion of the City of Brownsville (See **Exhibit 2** Location Map); it is composed of two Census Tracts (CT), CT 127, and CT 141. Census data shows that the population in this portion of the City has experienced a 92.24 percent increase from 2000-2010. Housing units also have increased in this portion of the City to 83.52 percent from 2000-2010. See **Table 1** and **2** below.

Table 1: Population Trends-Southeast Portion of Brownsville

Census Geographies	2000 Population	2010 Population	% Change from 2000-2010
CT 127	4,287	5,621	31.18 %
CT 141	4,842	11,923	146.24 %
TOTAL	**9,126**	**17,544**	**92.24 %**

Sources: Cubit Planning, U.S. Census Bureau, 2010 Census.

Table 2: Housing Units - Southeast Portion of Brownsville

Census Geographies	2000 Housing Units	2010 Housing Units	% Change from 2000-2010
CT 127	1,208	1,517	25.57 %
CT 141	1,293	3,073	137.66 %
TOTAL	**2,501**	**4,590**	**83.52 %**

Sources: Cubit Planning, U.S. Census Bureau, 2010 Census

According to the City of Brownsville's Imagine Comprehensive Plan, the proposed project area is located on the East Emerging District. According to the plan, the East Emerging District is split between residential and non-residential uses with a greater degree of flexibility allowing this District to be more responsive to the varying demands presented by its close location to the Employment Hub (Imagine Brownsville Comprehensive Plan). Future land use in this area is predicted to be primarily single family homes and some agricultural/ranch properties. In addition, neighborhood office and retail, light and medium industrial, and warehousing uses are expected to be commonly seen in this area in addition to community facilities such as schools, recreation centers, utility and municipal services. The Employment Hub District is a large area in north and east Brownsville with intermodal infrastructure including the shipping port, rail yards, and the international airport. The Employment Hub is organized around neighborhoods that have industrial uses as their anchors and are surrounded by complementary and supporting residential, community facility, institutional and commercial land uses (Imagine Brownsville Comprehensive Plan). The Employment Hub is considered to be a major economic generator for the City of Brownsville.

A major transportation roadway located within the southeast portion of the City of Brownsville includes FM 511. Other major roadways located within the southeast portion of the City of Brownsville include SH 4, SH 48, FM 1491, and FM 3068. According TxDOT's Roadway Functional Classification Map, FM 511 is functionally classified as a rural arterial. As residential and commercial development increases in this area of Brownsville due to increased population and growth, traffic along the existing roadways are also projected to increase. TxDOT's TP&P Division estimated the ADT along FM 511 from SH 48 to FM 3068 to be 10,500 VPD in 2008 and is projected to increase by 16,300 VPD in 2028.

1.1.1 Existing Facility

SH 32 does not currently exist; however, portions of existing FM 1419 from 1.9 miles west of FM 3068 to FM 3068 would be re-designated as SH 32. Existing FM 1419 from approximately 0.4 of a mile north of Dockberry Rd. to approximately 0.7 of a mile south of SH 4, a distance of approximately 1.8 miles, would also be re-designated as SH 32. The remaining portion of the proposed SH 32, approximately 3.1 miles, would be on new location.

Within the project area, FM 1419 is a rural type roadway consisting of two 12-ft. wide travel lanes with 8-ft. wide shoulders within an existing 80-ft. wide ROW. Graded ditches provide drainage for the roadway in the area. SH 4 is a rural type roadway consisting of two 12-ft. wide travel lanes, shoulders with variable width of 2-ft to 4-ft. wide, and a center lane with a variable width of 6-ft to 8-ft. wide within an existing 100-ft. wide ROW. Graded ditches provide drainage for the roadway in the area. For typical sections see **Exhibit 4G** Existing and Proposed Typical Sections.

1.1.2 Proposed Facility

The project would extend from the intersection of FM 3068 and FM 1419, south of the Brownsville/South Padre Island International Airport, to SH 4 at the future entrance to the Port of Brownsville – a distance of 5.88 miles. The proposed project would use

approximately 2.2 miles of existing FM 1419 alignment and approximately 1.5 miles of existing SH 4 alignment. The proposed speed limit would be the same as the current posted speed limit which is 55 mph.

The proposed typical section from FM 3068 to SH 4 would consist of an interim phase (Phase I) and an ultimate phase (Phase II). The interim phase from FM 3068 to SH 4 at the future entrance to the Port of Brownsville would consist of two 12-ft. wide travel lanes, a 4-ft. median, and two 10-ft. wide shoulders within a 120-ft. wide ROW. The FM 3068 approach road at the beginning of the proposed project would consist of a 60-ft. wide rural roadway consisting of two 12-ft. wide travel lanes, ten ft. wide shoulders, and a 16-ft. wide center turn lane within a proposed 100-ft. wide ROW.

The ultimate phase would consist of four 12-ft. wide travel lanes, a 4-ft. wide median, and two 10-ft. wide shoulders within a 120-ft. wide (minimum) ROW. Graded vegetated ditches would provide drainage for the proposed roadway. In addition, an overpass is proposed at the intersection of SH 4 and SH 32 within a proposed ROW of 400-ft. The typical section of the overpass would match the ultimate roadway typical section.

At the intersection of SH 4 and SH 32, SH 4 would be realigned to connect with the proposed SH 32 overpass. The proposed SH 4 connector would consist of a 60-ft. wide rural roadway consisting of two 12-ft. wide travel lanes, ten ft. wide shoulders, and a 16-ft. wide center turn lane within a proposed 100-ft. wide ROW. Refer to **Exhibit 4G** for a copy of the Proposed SH 4 Typical Section. Graded vegetated ditches would provide drainage for the roadway. In addition, a new bridge would be constructed over Drainage Ditch 12 and the typical sections of the bridge would match the SH 4 connector roadway typical section. The existing structure spanning Drainage Ditch 12 would be removed and the existing SH 4 roadway section from the west side of the Drainage Ditch 12 to SH 32 would be removed and the excess SH 4 ROW would be deeded back to adjacent property owners affected by the SH 4/SH32 overpass intersection. See **Exhibit 4G2** to view layout of the proposed SH4/SH32 overpass intersection and connector.

The cross street typical section under the overpass would consist of two 12-ft. wide travel lanes, a 16-ft. wide turn lane, two 10-ft. wide shoulders, and 24.5-ft. wide turn arounds in both directions with curb and gutter. The ROW width at the SH 4 overpass would be 400-ft. See **Exhibit 4G** Existing and Proposed Typical Sections for a typical section of the proposed roadway.

Segments of existing FM 1419 that are not a part of the SH 32 alignment would be re-designated as FM 3550 and FM 3551. The segment of existing FM 1419 from 0.7 of a mile south of SH 4 to SH 4 would be re-designated as FM 3551, a distance of approximately 0.7 of a mile. The segment of existing FM 1419 from FM 3068 to approximately 0.4 of a mile north of Dockberry Rd. would be re-designated as FM 3550, a distance of approximately 4.4 miles (See **Exhibit 2** Location Map). The typical sections for FM 3550 and FM 3551 would be the same as existing FM 1419. For existing and proposed typical sections see **Exhibit 4G. Appendix B** provides photographs of existing conditions.

Re-designated FM 3550 would connect to SH 32 via two connector roads. Connector Road One would be located approximately 0.5 of a mile east of the existing FM 3068 and re-designated FM 3550 intersection. Connector Road Two would be located approximately 0.8 of a mile south of the existing Florida Rd. and re-designated FM 3550 intersection. The connector roads would consist of two 12-ft. wide lanes and two 10-ft. wide outside shoulders within a proposed 80-ft. ROW width. Refer to **Exhibit 4G** Existing and Proposed Typical Sections to view the proposed FM 1419 Connector Typical Section. Refer to **Exhibit 4F4** SH 32 Alternative Layout to view the location of the proposed FM 1419 connectors.

At Resaca de la Palma, the interim typical section would consist of two 12-ft. wide travel lanes, 4-ft. median, and two 10-ft. wide outside shoulders within a 120-ft. wide ROW. The second phase typical section would add lanes and provide an ultimate 4 lane divided roadway that would consist of four 12-ft. wide travel lanes, a 4-ft. wide median, and two 10-ft. wide outside shoulders within a 120-ft. wide ROW. Adjacent property owners would continue to have access to their property via proposed access roads. Refer to **Exhibits 4G3** and **4G4** to view the proposed Interim and Ultimate Typical Sections at Resaca de la Palma respectively.

In order to avoid and minimize potential endangered cats and wildlife mortality due to collisions with vehicles, both phases would include the construction of a wildlife crossing and wildlife fencing at Resaca de la Palma. The at grade wildlife crossing would be placed along the north bank of the resaca and north of the existing below grade Resaca de la Palma drainage culvert. The first phase wildlife crossing would be 5-ft. x 5-ft. x 123-ft. with no grate inlet. The second phase wildlife crossing would be 5-ft. x 5-ft. x 184-ft and include a standard 3-ft by 3-ft grate inlet to allow light into the culvert. The wildlife crossing would be designed and constructed to provide a clear line-of-sight from one end of the culvert to the other. The wildlife crossing would also include 6-ft. high hurricane fencing along the proposed ROW to direct wildlife traveling along the resaca banks through the culvert. Refer to **Exhibits 4G3** and **4G4** to view the proposed wildlife crossing at Resaca de la Palma. Refer to **Exhibit 4G5** to view the Proposed Wildlife Culvert Standards. Plantings would be used to enhance the proposed wildlife crossing and would be similar to those (composition, density) found at the existing riparian area along the Resaca de la Palma. The plantings of 0.008 of an acre would be an extension of the existing riparian area and would utilize plant species and sizes which reflect native riparian vegetation to the extent practicable.

As per TxDOT's Guidelines Emphasizing Bicycle and Pedestrian Accommodations Memorandum (March 23, 2011), pedestrian features were considered during the early planning stage of the project; however, due to the lack of pedestrian traffic evidence and pedestrian traffic generators/attractors within the rural project area, sidewalks are not included in the project design, and although the Brownsville Metropolitan Planning Organization (BMPO) Bicycle and Pedestrian Plan Map (See **Appendix A**) and the City of Brownsville's *Connection Brownsville: The 2013 Bicycle and Trail Master Plan* does not plan or provide for pedestrian/bike paths, or bike lanes for this project, the Plan does recommend shoulders. Therefore, the proposed SH 32 roadway design would include a 10-

ft. wide shoulder in both directions which could be used by bicyclists, but would not be signed as a bicycle lane.

1.2 Project Funding

Funding for the proposed project would be provided through the Pass Through Financing (PTF) Program administered by TxDOT and from the CCRMA. The total project cost for the ultimate four lane divided roadway with overpasses (Phase II) is $22,772,000. **Table 3** shows the Total Estimated Cost and Sources of Funding proposed SH 32 project Contract No. PT. 2010-008-01, which was signed by TxDOT and the CCRMA on January 26, 2011. **Table 3A** shows the Total Estimated Cost by Control Section Job Number (CSJ). A copy of the pages of the fiscal year (FY) 2015-2018 Statewide Transportation Improvement Program (STIP) is included in **Appendix A** of this document.

The start construction date for the interim condition is expected to occur in October 2016. The start construction date for the ultimate condition will be dependent on traffic generated in the future and is unknown at this time.

Table 3: Total Estimated Cost and Sources of Funding

Project Highway Improvement	Estimated Project Cost	Estimated Construction Cost	Allowable Construction Cost for Payment of Pass-Through Toll and % of Total Const. Cost (Department's Proportional Share)	Department's Maximum Pass-Through Reimbursement to Developer (110% of Allowable Construction Cost)	Developer Funding
SH 32	$16,938,410	$10,438,410	89% = 9,293,552	$10,222,907	$16,938,410

Note: Department = TxDOT
Developer = CCRMA
Source: CCRMA Pass-Through Toll Agreement for Payment of Pass-Through Toll by TxDOT, Contract No. PT 2010-008-01

Table 3A: Total Estimated Cost By CSJ Number

CSJ	Limits	Cost
3626-02-001	FM 3068 to FM 3550	$9,845,200
1426-01-043	FM 3550 to FM 3551	$5,065,560
3626-03-001	FM 3551 to SH 4	$3,965,640
0039-10-076	SH 32 to 1.35 mile NE to proposed Port of Brownsville Entrance Rd.	$6,783,301

Source: 2015-2018 STIP

The project area is located within the planning boundaries of the Brownsville Metropolitan Planning Organization (MPO) and is consistent with 2010-2035 Brownsville Metropolitan

Transportation Plan (MTP) and the 2015-2018 STIP. Refer to **Appendix A** for a copy of the pages of the 2015-2018 STIP. The project is located in Cameron County, which is in an area in attainment or unclassifiable for all National Ambient Air Quality Standards (NAAQS); therefore, the transportation conformity rules do not apply.

2.0 ALTERNATIVES

A total of six alternatives were evaluated as potential solutions for addressing the need and purpose of the project. When evaluating the six alternatives, the project team considered the following key objectives:

- Minimization of ROW requirements;
- Minimization of impacts to adjacent properties; and
- Minimization of adverse environmental impacts (including displacements).

The six alternatives included a transportation system management alternative, transportation demand management alternative, three build alternatives and a no-build alternative. The six alternatives are described and discussed below.

2.1 Transportation System Management (TSM) Alternative

The Transportation System Management (TSM) Alternative includes relatively low-cost enhancements to the existing transportation network that can greatly improve operational efficiency. These strategies include freeway bottleneck removal, widening of arterials, intersection improvements, traffic signal improvements, signage improvements, traffic management systems, and other enhancements that make it easier for traffic to flow through the transportation network. These include a variety of Intelligent Transportation System improvements such as communication systems, mobility assistant patrols, and advanced traffic management. TSM Options for this project would consist of the existing and committed facility improvements or transportation projects along with the consideration for additional traffic and demand management programs such as:

- Synchronized traffic signals
- Motorist information systems
- Incident management systems
- Localized channelization/intersection improvements
- Access control strategies

These strategies while strongly encouraged may ease congestion on existing roadways; they would not fully or adequately address the need for the project of increasing connectivity within the southeast Brownsville area. While many aspects of the TSM Alternative may enhance other alternatives, the TSM Alternative alone does not fully meet the need or purpose of the project; therefore, it was dismissed from further study.

2.2 Traffic Demand Management (TDM) Alternative

The Traffic Demand Management (TDM) Alternative is aimed at reducing the volume of vehicles on the transportation network. These strategies include carpooling and ridesharing to combine person-trips into fewer vehicle-trips. This group of improvements also includes bicycle and pedestrian facility improvements. TDM has the potential to increase the efficiency of existing transportation facilities. The TDM Option for this project would consist of the existing and committed improvements or transportation projects along with the consideration for additional traffic and demand management programs such as:

- Additional park-and-pool facilities
- Increased bus service
- Rideshare support programs

While many aspects of the TDM Alternative may enhance other alternatives, these low-to-moderate investment options, as a stand-alone action, would not be able to fully address the project's need for transportation improvements nor would they address the project purpose; therefore, it was dismissed from further study.

2.3 No Build Alternative

The No-Build Alternative assumes no major improvements beyond those included in the 2010-2035 MPO's long range transportation plan. Therefore, the existing facility would operate as it currently does, and normal maintenance activities and rehabilitation of the existing road would continue. There would be no relocations or conversion of land to transportation use, and no adverse environmental impacts associated with this alternative. The No-Build Alternative would not construct SH 32 and would therefore not meet the need and purpose for the project, which is to enhance intermodal connectivity, provide infrastructure necessary to support growth in the project area, address poor connectivity between the Port of Brownsville FTZ and the Brownsville/South Padre Island International Airport and the Airport FTZ. In accordance with regulations implementing NEPA, the No-Build Alternative is evaluated further in this EA for study comparison and utilized as a baseline to provide a comparison for the build alternative.

2.4 Build Alternatives Analysis

The analysis evaluated three build alternatives. The typical sections for all three build alternatives are the same. As previously mentioned, the proposed project would be constructed in phases. The first phase consists of the interim typical section from FM 3068 to SH 4. The typical section would consist of two 12-ft. wide travel lanes, a 4-ft. median, and two 10-ft. wide shoulders within a 120-ft. wide (minimum) ROW. The second phase ultimate typical section would consist of four 12-ft. wide travel lanes, a 4-ft. wide median, and two 10-ft. wide shoulders within a 120-ft. wide (minimum) ROW. Graded vegetated ditches would provide drainage for the proposed roadway. In addition, an overpass is proposed at the intersection of SH 4 and SH 32. The typical section of the overpass would match the ultimate roadway typical section. Graded vegetated ditches would provide drainage for the proposed roadway.

The typical section under the overpass would consist of two 12-ft. wide travel lanes, a 16-ft. wide turn lane, two 10-ft. wide shoulders, and 24.5-ft. wide turn arounds in both directions with curb

and gutter. The proposed ROW width at the overpass would be 400-ft. Refer to **Exhibit 4G** Existing and Proposed Typical Sections for a typical section of the proposed roadway.

Two connector roads connecting SH 32 to existing FM 1419 are proposed. Connector Road One would be located approximately 0.5 of a mile east of the intersection of FM 3068 and FM 1419. Connector Road Two would be located approximately 0.8 of a mile south of intersection of Florida Rd. and FM 1419. The connector roads would consist of two 12-ft. wide lanes and two 10-ft. wide shoulders within a proposed 80-ft. ROW width. Refer to **Exhibit 4G** Existing and Proposed Typical Sections to view the proposed FM 1419 Connector Typical Section. Refer to **Exhibit 4F4** SH 32 Alternative Layout to view the location of the proposed FM 1419 connectors.

Alternative 1

Alternative 1 is depicted as Orange in the Alternatives Layout Map (**Exhibit 4F4** SH 32 Alternatives Layout) and for most of the new alignment section it is located between Alternative 2 and 3. At the intersection of FM 3068 and FM 1419, Alternative 1 begins to gradually curve in a northeasterly direction traversing mainly through farmland, vacant lots, and the edge of a residential community. Alternative 1 continues north for approximately 2.3 miles as a single smooth curve and connects with existing FM 1419 alignment at approximately 0.3 of a mile south of Resaca de la Palma. Alternative 1 continues north on existing FM 1419 alignment to SH 4, a distance of approximately 1.7 miles. At the SH 4 intersection Alternative 1 turns right and continues on existing SH 4 alignment for approximately 1.5 miles terminating at future Port Entrance Rd. Alternative 1 would require 101.35 acres of new ROW, a total ROW cost of approximately $405,400. The construction cost for Alternative 1 is approximately $23,168,000. The total construction and ROW cost is approximately $23,573,400. Alternative 1 is 5.85 miles long from FM 3068 to SH 4. The total length of the proposed project, including the transitioning, would be 6.65 miles.

Alternative 2

Alternative 2 is depicted as Aqua green in the Alternatives Layout Map (**Exhibit 4F4** SH 32 Alternatives Layout) and is the alternative that veers further west. At the intersection of FM 3068 and FM 1419, Alternative 2 begins to quickly curve in a north-northeasterly direction in a series of three curves that traverse mainly through agricultural fields, fallow fields, and rangeland. Alternative 2 then connects with existing FM 1419 alignment at approximately 0.3 of a mile south of Resaca de la Palma. Alternative 2 continues north on existing FM 1419 alignment to 0.25 of mile north of Florida Ave., a distance of 0.93 of a mile. At this point Alternative 2 starts to veer towards the northeast on new alignment until it reaches SH 4 at approximately 0.5 of a mile east of the SH 4 and FM 1419 intersection. The roadway continues northeast along SH 4 alignment terminating at the future Port Entrance Rd. Alternative 2 would require 121.08 acres of new ROW, at a total ROW cost of approximately $484,320. The construction cost for Alternative 2 is approximately $23,471,000. The total construction and ROW cost is approximately $23,955,320. Alternative 2 is 5.76 miles long from FM 3068 to SH 4. The total length of the proposed project, including the transitioning, would be 6.56 miles.

Alternative 3

Alternative 3 is depicted as Red in the Alternatives Layout Map (**Exhibit 4F4** SH 32 Alternatives Layout). Alternative 3 begins at the intersection of FM 3068 and FM 1419 and heads east along FM 1419 for 0.25 of a mile. The roadway gradually veers towards the northeast traversing mainly through farmland and vacant lots and along the east side of a drainage ditch. Alternative 3 then gradually turns northeast again and connects with existing FM 1419 at approximately 0.3 of a mile south of Resaca de la Palma. Alternative 2 continues north on existing FM 1419 alignment to 0.25 of a mile north of Florida Ave., a distance of 0.93 of a mile. At this point the roadway heads northeast on new alignment until it reaches SH 4 at about 0.5 of a mile east of FM 1419. The roadway continues northeast along SH 4 alignment terminating at future Port Entrance Rd. Alternative 3 would require 79.28 acres of ROW, at a total ROW cost of approximately $453,080. The construction cost for Alternative 3 is approximately $23,476,000. The total construction and ROW cost is approximately $23,929,080. Alternative 3 is approximately 5.7 miles long from FM 3068 to SH 4. The total length of the proposed project, including the transitioning, would be approximately 6.5 miles.

Build Alternatives Dismissed

Each alternative was evaluated to determine if they would meet the project's need and purpose for transportation improvements while minimizing the potential for environmental impacts, which includes minimization of ROW requirements, impacts to adjacent properties, and adverse environmental impacts (including displacements). The results of this analysis are summarized in in the Alternative Impact Summary available for review in the TxDOT Pharr District Office. All three alternatives would meet the project's need and purpose for transportation improvements. However, Alternatives 1 and 2 would have a greater impact to the human and natural environment of the area and were therefore dismissed from further consideration. Alternative 3 would displace only 3 residential structures compared to Alternative 1 and 2, which would displace 10 and 11 residential structures, respectively. Further, public input received during the October 26, 2010 open house public meeting favored Alternative 3D. As a result of the public input, CCRMA and TxDOT recommended that Alternative 3 be advanced as the proposed Build Alternative to be evaluated in the EA along with the No-Build Alternative.

2.5 Build Alternative

The proposed Build Alternative (Alternative 3) would consist of an initial phase and future phases. The proposed typical section from FM 3068 to SH 4 would consist of an interim phase (Phase I) and an ultimate phase (Phase II). The interim phase from FM 3068 to SH 4 at the future entrance to the Port of Brownsville would consist of two 12-ft. wide travel lanes, a 4-ft. median, and two 10-ft. wide shoulders within a 120-ft. wide ROW. The FM 3068 approach road at the beginning of the proposed project would consist of a 60-ft. wide rural roadway consisting of two 12-ft. wide travel lanes, ten ft. wide shoulders, and a 16-ft. wide center turn lane within a proposed 100-ft. wide ROW. The ultimate phase would consist of four 12-ft. wide travel lanes, a 4-ft. wide median, and two 10-ft. wide shoulders within a 120-ft. wide (minimum) ROW. In addition, an overpass is proposed at the intersection of SH 4 and SH 32. The ROW width at the intersection of SH 4 and SH 32 would be 400 ft. The typical section of the overpass would match

the ultimate roadway typical section. Graded vegetated ditches would provide drainage for the proposed roadway.

The typical section under the overpass would consist of two 12-ft. wide travel lanes, a 16-ft. wide turn lane, two 10-ft. wide shoulders, and 24.5-ft. wide turn arounds in both directions with curb and gutter. The proposed ROW width at the overpass would be 400-ft. The proposed project would not have a sidewalks or bicycle lane, however; the proposed SH 32 roadway design would have a 10-ft. wide shoulder in both direction which could be used by bicyclists, but would not be signed as a bicycle lane. Due to the lack of pedestrian traffic evidence and pedestrian traffic generators/attractors within the rural project area, sidewalks are not included in the project design. Refer to **Exhibit 4G** Existing and Proposed Typical Sections for a typical section of the proposed roadway.

At the intersection of SH 4 and SH 32, SH 4 would be realigned to connect with the proposed SH 32 overpass and would require 0.84 of an acre of additional ROW. The proposed SH 4 direct connector would consist of a 60-ft. wide rural roadway consisting of two 12-ft. wide travel lanes, ten ft. wide shoulders, and a 16-ft. wide center turn lane within a proposed 100-ft. wide ROW. Refer to **Exhibit 4G** for a copy for Proposed SH 4 Typical Section. Graded vegetated ditches would provide drainage for the roadway. In addition, a new bridge would be constructed over Drainage Ditch 12 and the typical sections of the bridge would match the SH 4 connector roadway typical section. The existing structure spanning Drainage Ditch 12 would be removed and the existing SH 4 roadway section from the west side of the Drainage Ditch 12 to SH 32 would be removed and the excess SH 4 ROW would be deeded back to adjacent property owners affected by the SH 4/SH32 overpass intersection. See **Exhibit 4G2** to view layout of the proposed SH4/SH32 overpass intersection and connector.

Two connector roads connecting the proposed SH 32 to existing FM 1419 are proposed. Connector Road One would be located approximately 0.5 of a mile east of the intersection of FM 3068 and FM 1419. Connector Road Two would be located approximately 0.8 of a mile south of intersection of Florida Rd. and FM 1419.

The connector roads would consists of two 12-ft. wide lanes and two 10-ft. wide shoulders within a proposed 80-ft. ROW width. Refer to **Exhibit 4G** Existing and Proposed Typical Sections to view the proposed FM 1419 Connector Typical Section. Refer to **Exhibit 4F4** SH 32 Alternative Layout to view the location of the proposed FM 1419 connectors.

At Resaca de la Palma a first phase (interim) and second phase (ultimate) typical section is proposed. Refer to **Exhibits 4G3** and **4G4** to view the proposed Interim and Ultimate Typical Sections at Resaca de la Palma respectively. The first phase typical section would consist of two 12-ft. wide travel lanes, 4-ft. wide median, and two 10-ft. wide shoulders within a 120-ft. wide ROW. The second phase would add lanes and a median and provide an ultimate 4 lane divided roadway that would consist of four 12-ft. wide travel lanes, a 4-ft. wide median, and two 10-ft. wide shoulders within a 120-ft. wide ROW. Adjacent property owner would continue to have access to their property via proposed access roads.

In order to avoid and minimize potential endangered cats and wildlife mortality due to collisions with vehicles, both phases would include the construction of a wildlife crossing and wildlife

fencing at Resaca de la Palma. The at grade wildlife crossing would be placed along the north bank of the resaca and north of the existing below grade Resaca de la Palma drainage culvert. The first phase wildlife crossing would be 5-ft. x 5-ft. x 123-ft. with no grate inlet. The second phase wildlife crossing would be 5-ft. x 5-ft. x 184-ft and include a standard 3-ft by 3-ft grate inlet to allow light into the culvert. The wildlife crossing would be designed and constructed to provide a clear line-of-sight from one end of the culvert to the other. The wildlife crossing would also include 6-ft. high hurricane fencing along the proposed ROW to direct wildlife traveling along the resaca banks through the culvert. Refer to **Exhibits 4G3,** and **4G4** to view the proposed wildlife crossing at Resaca de la Palma. Refer to **Exhibit 4G5** to view the Proposed Wildlife Culvert Standard. Plantings of 0.008 of an acre to be used to enhance the proposed wildlife crossing would be similar to those (composition, density) found at the existing riparian area along the Resaca de la Palma. The plantings would be an extension of the existing riparian area and would utilize plant species and sizes readily available at local nurseries.

During the open house public meeting, requests were made by property owners that the proposed Build Alternative (Alternative 3) be revised to avoid or minimize impacts to properties located at the northeast end of the project. The project team met with landowners located in this area to look at ways to minimize and avoid impact. This resulted in refining the northeast segment of Alternative 3 between FM 1419 and the end of the project by adding four additional alignment options (Alternative 3A, Alternative 3B, Alternative 3C, and Alternative 3D) to the proposed build alternative. Alternative 3 from FM 3068 to 0.25 of a mile north of Florida St. would remain the same and would only differ at the northeast end based on Alternative (3A, 3B, 3C, and 3D) alignment option selected. The following paragraphs describe the four refined alignment options added to Alternative 3 at the northeast end of the project. The alignment options are described based on their relative location from the center option and each option is also color coded for easy identification on the Alternatives Layout Map (**Exhibit 4F4** SH 32 Alternatives Layout).

2.5.1 Alternative 3 – Option 3A

Option 3A (farthest east from center) is depicted as Tan color in the Alternatives Layout Map (**Exhibit 4F4** SH 32 Alternatives Layout). At 0.25 of a mile north of Florida St. Option 3A curves east to approximately 0.9 of a mile east of FM 1419 and adjacent to the existing border wall and through mostly agricultural areas. Option 3A curves north through Port property for approximately 0.6 of a mile where it then ties to existing SH 4 at a 90 degree angle. Alternative 3 + Option 3A would be 5.78 miles long and require 114.54 acres of new ROW.

2.5.2 Alternative 3 – Option 3B

Option 3B (east of center) is depicted as Purple in the Alternatives Layout Map (**Exhibit 4F4** SH 32 Alternatives Layout). At 0.25 of a mile north of Florida St. Option 3B curves northeast towards SH 4. Option 3B is located west of 3A and just slightly east of Alternative 3D. Alternative 3 + Option 3B would be 5.86 miles long and require 104.63 acres of new ROW.

2.5.3 Alternative 3 – Option 3C

Option 3C (west of center) is depicted as Light Blue in the Alternatives Layout Map (**Exhibit 4F4** SH 32 Alternatives Layout). At 0.25 of a mile north of Florida St Option 3C curves slightly east then immediately turns and heads north passed SH 4 parallel to and east of an existing drain terminating at the Port of Brownsville. Alternative 3 + Option 3C would be 7.23 miles long and require approximately 140.1 acres of new ROW.

2.5.4 Alternative 3 – Option 3D

Option 3D (center) is depicted as Yellow in the Alternatives Layout Map (**Exhibit 4F4** SH 32 Alternatives Layout). At 0.25 of a mile north of Florida St. Option 3D curves northeast and heads towards SH 4. Option 3D continues north on existing SH 4 alignment to the end of project at the future Port Rd. Option 3D is located west of 3A and east of 3C. Alternative 3 + Option 3D would be 6.68 miles long and require 79.28 acres of new ROW.

2.5.5 Build Alternatives Evaluated in the Environmental Assessment

Based on the analysis of all Build Alternatives including public input, it is recommended that the combination of Alternative 3-Option 3D, hereafter referred to as "the Build Alternative", be advanced for detailed evaluation in this EA. The Build Alternative would require the acquisition of 79.28 acres of additional ROW and would have an estimated construction cost of approximately $22,772,000. The Build Alternative is 6.68 miles in length.

3.0 AFFECTED ENVIRONMENT and ENVIRONMENTAL CONSEQUENCES

This section describes the relevant resources that would potentially be affected by the proposed project and forecasts the changes that the project alternatives would have on these resources.

3.1 Right-of-Way Acquisition

The proposed SH 32 project would be constructed within a proposed 120-ft. wide ROW. The proposed ROW width at the SH 4 overpass would be 400-ft. Portions of the proposed facility would follow existing FM 1419 and utilize the existing 80-ft. state-owned ROW. In these areas, an additional 40-ft. of ROW would be required to accommodate the proposed SH 32 facility. In total, 79.28 acres of additional ROW would be required for the proposed improvements. The proposed ROW would be procured in accordance with the Uniform Act, as described in TxDOT's Real Estate Acquisition Guide for Local Public Agencies. No early acquisition of ROW has taken place for this project. Acquisition of ROW would occur after environmental clearance has been obtained. Existing ROW is 47.62 acres. The total area required for the proposed project (existing and proposed ROW) is approximately 126.9 acres.

The proposed project would impact an approximate total of 126.9 acres which consists of the following: approximately 70.9 acres of cropland and pasture, 0.43 acres of industrial and commercial complexes, 1.92 acres of mixed rangelands, 4.26 acres of residential (single family units), 0.11 acre of residential (other), 47.62 acres of existing ROW, and 1.66 acres of orchards, groves, vineyards, nurseries, and ornamental horticultural areas. The proposed project area does not include critical habitat for any federal listed threatened or endangered species. **Table 4** below shows the different anticipated impacts to land use located within the proposed and existing ROW.

Table : 4 Summary of Land Use Impacts Within the Existing and Proposed ROW

Land use	Approximate Impacts (Acres)
Industrial and Commercial Complexes	0.43
Cropland and Pasture	70.9
Orchards, Groves, Vineyards, Nurseries, and Ornamental Horticultural Areas	1.66
Mixed Rangelands	1.92
Residential (Single Family Units)	4.26
Residential (Other)	0.11
Existing ROW	47.62
Total Potential Impact	126.9

Source: Anderson Land Use Classification System

3.2 Soils/Farmland Protection Act

Cameron County consists of a flat plain that slopes gently to the northeast. The greater portion of the project area is an alluvial plain or delta of the Rio Grande. The average elevation is about 45-ft. above mean sea level (MSL). The elevation varies from approximately 70-ft. above MSL to sea level.

The geomorphology of Cameron County includes such features as depressions, tidal flats, levees, point bars, bank swamps, meander belts, barrier islands and an old sub delta of the Rio Grande. Some of the older meander belts are those of Resaca de Rancho Viejo and Resaca de la Palma (Cameron County Soil Survey), which are within the project area.

Based on the *Soil Survey for Cameron County* by *The National Resource Conservation Service,* the general soil series found within the project area are the Benito, Cameron, Chargo, Grulla, Harlingen, Laredo, Lomalta, Matamoros, Olmito, Rio Grande, and the Sejita soil series. The general types of soil occurring within the project area can be found in **Appendix C.**

Benito Series

This series consists of deep, poorly, drained calcareous, saline soils that are level to slightly depressed and are typically found in deltas and floodplains. Soils in this series are primarily used for improved pasture while a small acreage is used for dry farmed and irrigated crops due to their poor drainage and high degree of salinity.

Cameron Series

The Cameron Series is usually nearly level and found in floodplains and deltas. The series is considered to be deep, moderately well drained, calcareous soils utilized for crop irrigation.

Chargo Series

This series consists of deep, moderately well drained, calcareous, saline soils that are nearly level. Soils in this series are generally found in deltas and floodplains where permeability and runoff are slow.

Grulla Series

The Grulla Series are deep, somewhat poorly drained, calcareous soils and are typically found in partially filled resacas on active floodplains. Soils are almost entirely utilized for irrigated crops; permeability is very slow.

Harlingen Series

The series consists of deep, moderately well drained, calcareous soils that are level to nearly level in deltas and old floodplains. Permeability is very slow and runoff is slow. Soils are used for irrigated crops.

Laredo Series

Soils in this series are deep, well-drained, calcareous soils that are nearly level to gently sloping and are found in deltas and floodplains. Soils are utilized for irrigated crops, pasture and dry farmed crops and are considered to moderate permeability and slow runoff.

Lomalta Series

The Lomalta Series are deep, poorly drained, calcareous, saline clays that are level to slightly depressional and are found in semimarsh areas adjacent to the Gulf of Mexico only a few feet above tide water. Soils are used for range and wildlife habitat. Permeability is very slow and runoff is very slow to ponded.

Matamoros Series

The Matamoros Series consists of deep, moderately well drained, calcareous soils that are nearly level found on floodplains of the Rio Grande. These soils have slow permeability and are used for irrigated crops and pasture.

Olmito Series

This series consists of deep, moderately well drained, calcareous soils that are nearly level and usually found in deltas and flood plains. These soils are used for irrigated crops, pasture and dry farmed crops and are considered to have slow permeability.

Rio Grande Series

These soils are deep, well-drained, calcareous soils that are nearly level to gently sloping and are found on the Rio Grande active floodplains. The soil surface is plane to slightly convex. These soils are used for irrigated crops and pasture and have moderate permeability and slow runoff.

Sejita Series

The Sejita Series consists of deep, poorly drained saline and calcareous soils that are level and generally found on semi marshy areas along the Gulf Coast only in Cameron County, a few feet above the mean high water level. These soils have moderately slow permeability and runoff is slow to ponded. Soils are used for range and wildlife habitat.

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 portion (Natural Resources Conservation Service (NRCS), 1995). The project area has seven soils classified as hydric; Benito clay (BE), Cameron silty clay (CF), Chargo silty clay (CH), Grulla Clay (GR), Harlingen clay saline (HC), Lomalta clay (LM) and Sejita silty clay loam (SE). The majority of hydric soils within the project area are south of Dockberry Rd., and north of Florida Rd.

Prime Farmland Protection

According to the USDA, National Agricultural Statistics Service for the year 2012, there were a total of 1,305 farms in Cameron County with an average farm size of 237 acres. The total land

area in farms is 309,700 acres in Cameron County. The market value of production average per farm was $122,916 in 2012.

Numerous soil types occurring in Cameron County have been listed as prime farmland soils (NRCS website). Several of these prime farmland soils are mapped as occurring within the project area. The proposed SH 32 project would require conversion of prime farmland soil within proposed roadway ROW. See **Exhibit 5-5B** for the Soil Maps.

3.2.1 Environmental Consequences – No Build Alternative

Under the No-Build alternative, there would be no construction of SH 32. There would be no project-related disturbance to any top soil and prime farmland soils within the proposed project area.

3.2.2 Environmental Consequences – Build Alternative

The Build Alternative would directly convert approximately 47.3 acres of prime farmland soil. A Farmland Conversion Impact Rating Form (AD-1006) was completed on the Build Alternative and the "No Build" Alternative. The Build Alternative scored 120 on Part VI of Form AD 1006. The Build Alternative scores less than 160 on Part VI of Form AD 1006; therefore, coordination with the USDA NRCS would not be required. The Farmland Impact Conversion Rating Forms are available for review at the TxDOT Pharr District Office.

3.3 Floodplain

Cameron County is mapped in the regular phase of the National Flood Insurance Program (NFIP) According to Flood Insurance Rate Map Panel Numbers 4801010350B and 4701010400B for Cameron County, Texas, the majority of the project area corridor lies within Zone X, designated as having areas of minimal flooding. Areas within the 100-year flood plain, Zone A, are located along the Resaca de la Palma, the Rio Grande, southwest of FM 1419, west of South Browne Ave., and south of the Brownsville Ship Channel along SH 4.

3.3.1 Environmental Consequences – No Build Alternative

Under the No-Build alternative, there would be no construction of SH 32. The No-Build alternative would result in the continued undisturbed nature of the floodplain within the proposed project area.

3.3.2 Environmental Consequences – Build Alternative

The Build Alternative would cross 30.45 acres of the 100-year floodplain. There is no modeling performed at this point in the design process to quantify the extent of potential floodplain impacts. The hydraulic design for this project would be in accordance with current FHWA and TxDOT design policies. The proposed highway facility would be designed to permit the conveyance of a 100-year flood to an acceptable inundation of the roadway without causing significant damage to the highway, drainage facilities, or other

property. The project would not increase the base flood elevation to a level that would violate applicable floodplain regulations and ordinances. A Floodplain Map is provided in **Exhibit 6-6B**. Coordination with the local floodplain administrator would be required.

3.4 Groundwater Resources

The Gulf Coast Aquifer, in the Brownsville area, is divided into a shallow Gravel Zone, an Intermediate Zone, and the Lower Zone. The Gravel Zone and Intermediate Zone are equivalent to the Chicot Aquifer. The Lower Zone straddles the lower portion of the Chicot Aquifer and the Evangeline Aquifer. The geologic strata are composed of complexly inter bedded sedimentary deposits of gravel, sand, silt, and clay of fluvial and deltaic origin Lower Rio Grande Valley (LRGV) Brownsville Seawater Desalination Demonstration Project 2004). Water quality in the Gulf Coast Aquifer varies with depth and location. It is generally brackish in the southern half and generally tends to deteriorate with depth throughout the extent of the aquifer. The Gulf Coast Aquifer has a large volume of brackish water (Status Report on Brackish Groundwater and Desalination in the Gulf Coast Aquifer of Texas).

According to the GeoSearch Water Well Report, there are five monitoring wells located at the intersection of FM 1419 and FM 3068 and within the proposed project ROW. The GeoSearch Water Well Report indicates that the monitoring wells are owned by TxDOT, and the depth of the monitoring wells range from 7 to 12-ft. However, during the field initial site assessment, no evidence of monitoring wells within the project ROW was noted and the location of the wells identified in the GeoSearch Water Well Report was confirmed as present. Furthermore, the TxDOT Pharr District Office is not aware of any monitoring wells within project ROW at this site.

3.4.1 Environmental Consequences – No Build Alternative

Under the No-Build alternative, there would be no construction of SH 32. There would be no project-related disturbance to any groundwater resources within the proposed project area.

3.4.2 Environmental Consequences – Build Alternative

All appropriate measures would be taken to minimize effects to local groundwater. Consistent with the recommendation of the Texas Commission on Environmental Quality (TCEQ), TxDOT and CCRMA would ensure that prior to initiation of construction; drill holes resulting from on-site core sampling within the proposed ROW would be set up to protect local groundwater quality. No impacts to groundwater are anticipated.

3.5 Water Quality

Clean Water Act Section 303 (d) List, Impaired Waters and Clean Water Act Section 402

The proposed project is located in the Nueces-Rio Grande Coastal Basin. The Nueces-Rio Grande Coastal Basin lies on the coastal plain between the Nueces River and the Rio Grande, and drains into the Laguna Madre, Baffin Bay, and Oso Bay. The total drainage area is 10,442 square

miles. Within the Brownsville area there are two TCEQ designated stream segments, the Rio Grande Tidal Segment Number 2301 and Brownsville Ship Channel Segment Number 2494. The Rio Grande Tidal, Segment Number 2301 is listed in the 2012 Texas Water Quality Inventory Water Bodies Evaluation and is classified as a tidal stream and is located 0.29 of a mile south or southwest of the project area near FM 1419. This segment of the Rio Grande is not listed on the TCEQ 2014 Section 303 (d) list. The Brownsville Ship Channel, Segment Number 2494, is listed as threatened/impaired for bacteria on the TCEQ 2014 Section 303 (d) list under Category 5c. Category 5c signifies that additional data or information will be collected and/or evaluated for one or more parameters before a management strategy is selected. Runoff from the proposed project would discharge within five stream miles upstream of the Brownsville Ship Channel. The TCEQ regulates the discharge of storm water from certain construction sites that disturb one or more acres of land. Since this project would disturb 5 or more acres of land, a TCEQ Texas Pollutant Discharge Elimination System (TPDES) Construction General Permit (CGP) would be required. In addition, the project would require a Notice of Intent (NOI) to be filed with the TCEQ.

The project is located within the boundaries of the City of Brownsville Municipal Separate Storm Sewer System (MS4), and would comply with the applicable MS4 requirements.

3.5.1 Environmental Consequences – No Build Alternative

Under the No-Build alternative, there would be no construction of SH 32. There would be no project-related disturbance to the water quality within the proposed project area.

3.5.2 Environmental Consequences – Build Alternative

During construction of the Build Alternative, storm water runoff would flow directly into the Resaca de la Palma and other drainage canals and eventually into the Rio Grande or to the Brownsville Ship Channel. TCEQ has established this portion of the Rio Grande as having aquatic life use, contact recreation use, general use, and fish consumption use. The Brownsville Ship Channel is described as having aquatic life use, non-contact recreation use, general use, and fish consumption use.

Measures would be taken to prevent or minimize erosion that may develop during construction. All temporary erosion controls, such as silt fences and rock berms, would be in compliance with TxDOT Standard Specifications and would be in place, according to the construction plans, prior to commencement of construction related activities and inspected on a regular basis.

The Build Alternative would result in a disturbance of 5 acres or more and therefore would be required to comply with the large construction project requirements outlined by the TPDES General Permit for Construction Activity. The CCRMA would comply with TCEQ's TPDES CGP. A Storm Water Pollution Prevention Plan (SW3P) would be implemented, and a construction site notice would be posted on the construction site. A NOI would be required. A Notice of Termination would need to be submitted to TCEQ upon completion of construction and final stabilization of the project site.

3.6 Essential Fish Habitat

The Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA) of 1975 as amended in 1996 (16 USC 1801 et seq.) set forth a mandate for the National Marine Fisheries Service (NMFS), regional fishery management councils (FMC), and other federal agencies to identify and protect important marine and anadromous fish habitat. Essential fish habitat (EFH) provisions of MSFCMA support one of the nation's marine resource management goals of maintaining sustainable fisheries. The FMC with assistance from NMFS has delineated EFH for managed species.

Section 305 (b)(2) of the act requires all federal agencies that fund, permit, or carry out activities that may adversely impact EFH are required to consult with NMFS regarding the potential effects of their actions on EFH, and respond in writing to NMFS or FMC recommendations. In addition, NMFS and FMC's may comment on and make recommendations to any state agency on their activities that may affect EFH.

3.6.1 Environmental Consequences – No Build Alternative

Under the No-Build alternative, there would be no construction of SH 32. There would be no project-related disturbance to any essential fish habitat located within the proposed project area.

3.6.2 Environmental Consequences – Build Alternative

The Build Alternative would cross 12 drainage features; however, no essential fish habitat would be impacted by the proposed project and no coordination would be required.

3.7 Coastal Zone Management Coordination

The proposed project area is within Cameron County, which is in the Texas Coastal Management Program (TCMP) boundary. According to the Texas General Land Office TCMP boundary map, the boundary for the TCMP in Cameron County is primarily from FM 1847 east and encompasses the proposed project area.

3.7.1 Environmental Consequences – No Build Alternative

Under the No-Build alternative, there would be no construction of SH 32. There would be no project-related disturbance to any TCMP located within the proposed project area.

3.7.2 Environmental Consequences – Build Alternative

TxDOT and CCRMA have reviewed this proposed action for consistency with the TCMP goals and policies in accordance with the regulations of the Coastal Coordination Council and have determined that the proposed action is consistent with the applicable TCMP goals and policies, and would not have a direct effect on the Coastal Natural Resource Areas (CNRAs) as identified in 31 TAC Chapter 501.31. Within the limits of the proposed project there are no CNRAs as defined in Texas Natural Resources Code, § 33.203 (1).

3.8 U.S. Coast Guard Permit

The project area does not include any navigable Waters of the U.S.; therefore, a U.S. Coast Guard Section 9 Permit is not required.

3.9 Railroad

The project area does not include any railroad crossings; therefore, there are no railroad related issues.

3.10 Utilities

The two major utility providers in the proposed project area include the Brownsville Public Utilities Board (BPUB) and the Brownsville Irrigation District. The BPUB provides electric, water, and wastewater services to the City of Brownsville and adjacent areas in Cameron County. Area utilities include sanitary sewers, lift stations, buried telephone cables, water lines, wastewater lines, fiber optic cables, overhead power and telephone lines, irrigation canals, flumes, irrigation stand pipes, and overhead power utilities line that may require relocation or adjustment.

3.10.1 Environmental Consequences – No Build Alternative

Under the No-Build alternative, there would be no construction of SH 32. There would be no project-related disturbance to any utilities located within the proposed project area.

3.10.2 Environmental Consequences – Build Alternative

The Build Alternative would relocate or reconfigure utilities located within the proposed project area. Utilities within the proposed project ROW would be adjusted or relocated as needed prior to the construction of the proposed project using standard procedures. Erosion and sediment control devices would be implemented and maintained until construction is complete. No additional vegetation removal would occur in order to relocate utilities for this project.

Coordination with the BPUB and the Brownsville Irrigation District would be performed during the design phase to avoid and manage the effect of the project on utilities within the project area. Utility companies would be responsible for moving lines in state-owned ROW. Should utility lines within new location ROW need to be moved as a result of the proposed project, the CCRMA would negotiate the responsibility of the costs with the owners during ROW acquisition.

3.11 Airway-Highway Clearance

There are two airports within four miles of the proposed project, the Brownsville/South Padre International Airport, and the Resaca Airstrip. The Resaca Airstrip is a privately owned runway located approximately four miles to the west of Brownsville. The Brownsville/South Padre International Airport is a public use airport that consists of three runways.

3.11.1 Environmental Consequences – No Build Alternative

Under the No-Build alternative, SH 32 would not be constructed. Airway-highway clearance would not be required according to FWHA-FAPG NS 23 CFR, Part 620A, Non-Regulatory Supplement dated December 9, 199.

3.11.2 Environmental Consequences – Build Alternative

The Build Alternative falls within 2 miles of an airport and should be carefully examined to determine if there is a possibility for conflict and if coordination is required due to the proximity of existing Brownsville/South Padre International Airport. Therefore, airway-highway clearance analysis would be conducted to determine if the proposed project would exceed the airway-highway clearance requirements according to FWHA-FAPG NS 23 CFR, Part 620A, Non- Regulatory Supplement, December 9, 1991 and if any potential aeronautical hazards would be created by the Build Alternative.

As previously mentioned, the City of Brownsville and the Brownsville/South Padre International Airport are planning to extend the primary runway (13R-31L) to 10,000 linear-ft., which would result in placing the runway closer to the proposed SH 32 roadway. The CCRMA would coordinate closely with the City of Brownsville and the Airport to ensure all phases of the proposed SH 32 project meet airway-highway clearance requirements. The Airway Highway Clearance would be done in the design phase of the project once the overpass elevation has been set or determined. At this time, TxDOT has no plans to realign FM 511 when the runway is extended.

3.12 Air Quality

3.12.1 Environmental Consequences – No Build Alternative

The No-Build Alternative would not require construction of SH 32. This would lead to increased traffic and decreased mobility on the roadways near the proposed project area, particularly FM 511. In addition, the trend of improving air quality is expected to continue into the future regardless of the alternative chosen.

3.12.2 Environmental Consequences – Build Alternative

Project Consistency and Conformity

The project is located in an area in attainment or unclassifiable for all NAAQS; therefore, the transportation conformity rules do not apply.

Hot Spot Analysis

The project is not located within a CO or PM nonattainment area; therefore, a project level hot-spot analysis is not required.

Traffic Air Quality Analysis

Traffic data for the estimated time of completion year 2013 and design year 2033 is 5,000 VPD and 7,100 VPD, respectively. A prior TxDOT modeling study and previous analyses of similar projects demonstrated that it is unlikely that the carbon monoxide standard would ever be exceeded as a result of any project with an average annual daily traffic (AADT) below 140,000. The AADT projections for the project do not exceed 140,000 vehicles per day; therefore a Traffic Air Quality Analysis was not required.

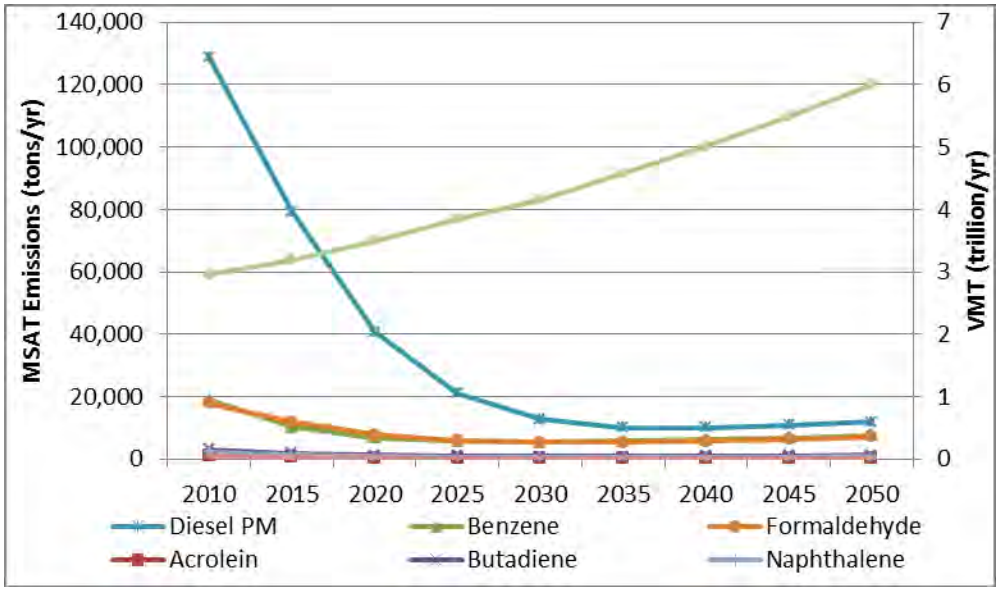
Mobile Source Air Toxics (MSATs)

Background

Controlling air toxic emissions became a national priority with the passage of the Clean Air Act Amendments of 1990, whereby Congress mandated that the U.S. Environmental Protection Agency (EPA) regulate 188 air toxics, also known as hazardous air pollutants. The EPA has assessed this expansive list in their latest rule on the Control of Hazardous Air Pollutants from Mobile Sources (Federal Register, Vol. 72, No. 37, page 8430, February 26, 2007), and identified a group of 93 compounds emitted from mobile sources that are listed in their Integrated Risk Information System (IRIS) (http://www.epa.gov/iris/). In addition, EPA identified seven compounds with significant contributions from mobile sources that are among the national and regional-scale cancer risk drivers from their 1999 National Air Toxics Assessment (http://www.epa.gov/ttn/atw/nata1999/). These are acrolein, benzene, 1,3-butadiene, diesel particulate matter plus diesel exhaust organic gases (diesel PM), formaldehyde, naphthalene, and polycyclic organic matter. While FHWA considers these the priority mobile source air toxics, the list is subject to change and may be adjusted in consideration of future EPA rules. The 2007 EPA Mobile Source Air Toxics (MSAT) rule mentioned above requires controls that will dramatically decrease MSAT emissions through cleaner fuels and cleaner engines. Based on an FHWA analysis using EPA's MOVES2010b model, as shown in **Figure 1** and **Table 5**, even if vehicle-miles travelled (VMT) increases by 102 percent as assumed from 2010 to 2050, a combined reduction of 83 percent in the total annual emissions for the priority MSAT is projected for the same time period.

FHWA analysis using EPA's MOVES2010b model, as shown in **Figure 1** and **Table 5,** even if VMT increases by 102 percent as assumed from 2010 to 2050, a combined reduction of 83 percent in the total annual emissions for the priority MSAT is projected for the same time period.

Figure 1:
PROJECTED NATIONAL MSAT EMISSION TRENDS 2010 – 2050 FOR VEHICLES OPERATING ON ROADWAYS USING EPA's MOVES2010b MODEL



Source: Table 6 below.

Note: Trends for specific locations may be different, depending on locally derived information representing vehicle-miles travelled, vehicle speeds, vehicle mix, fuels, emission control programs, meteorology, and other factors.

Table 5: PROJECTED NATIONAL MSAT EMISSION TRENDS 2010 – 2050 FOR VEHICLES OPERATING ON ROADWAYS USING EPA's MOVES2010b MODEL

Pollutant / VMT	Pollutant Emissions (tons) and Vehicle-Miles Traveled (VMT) by Calendar Year									Change
	2010	2015	2020	2025	2030	2035	2040	2045	2050	2010 to 2050
Acrolein	1,244	805	476	318	258	247	264	292	322	-74%
Benzene	18,995	10,195	6,765	5,669	5,386	5,696	6,216	6,840	7,525	-60%
Butadiene	3,157	1,783	1,163	951	890	934	1,017	1,119	1,231	-61%
Diesel PM	128,847	79,158	40,694	21,155	12,667	10,027	9,978	10,942	11,992	-91%
Formaldehyde	17,848	11,943	7,778	5,938	5,329	5,407	5,847	6,463	7,141	-60%
Naphthalene	2,366	1,502	939	693	607	611	659	727	802	-66%
Polycyclics	1,102	705	414	274	218	207	219	240	262	-76%

Table 5: PROJECTED NATIONAL MSAT EMISSION TRENDS 2010 – 2050 FOR VEHICLES OPERATING ON ROADWAYS USING EPA's MOVES2010b MODEL										
Pollutant / VMT	**Pollutant Emissions (tons) and Vehicle-Miles Traveled (VMT) by Calendar Year**									**Change**
	2010	2015	2020	2025	2030	2035	2040	2045	2050	2010 to 2050
Trillions VMT	2.96	3.19	3.5	3.85	4.16	4.58	5.01	5.49	6	102%

Source: EPA MOVES2010b model runs conducted during May – June 2012 by FHWA.

Air toxics analysis is a continuing area of research. While much work has been done to assess the overall health risk of air toxics, many questions remain unanswered. In particular, the tools and techniques for assessing project-specific health outcomes as a result of lifetime MSAT exposure remain limited. These limitations impede the ability to evaluate how the potential health risks posed by MSAT exposure should be factored into project-level decision-making within the context of the NEPA. The FHWA, EPA, Health Effects Institute, and others have funded and conducted research studies to try to more clearly define potential risks from MSAT emissions associated with highway projects. The FHWA will continue to monitor the developing research in this emerging field.

Project Specific MSAT Information

A qualitative analysis provides a basis for identifying and comparing the potential differences among MSAT emissions, if any, from the various alternatives. The qualitative assessment presented below is derived in part from a study conducted by the FHWA entitled A Methodology for Evaluating Mobile Source Air Toxic Emissions Among Transportation Project Alternatives, found at: http://www.fhwa.dot.gov/environment/air_quality/air_toxics/research_and_analysis/mobile_source_air_toxics/msatemissions.pdf

Proposed SH 32

For each alternative in this *EA*, the amount of MSATs emitted would be proportional to the vehicle miles traveled, or VMT, assuming that other variables such as fleet mix are the same for each alternative. The VMT estimated for each of the Build Alternatives is slightly higher than that for the No Build Alternative, because the additional capacity increases the efficiency of the roadway and attracts rerouted trips from elsewhere in the transportation network. This increase in VMT would lead to higher MSAT emissions for the preferred action alternative along the highway corridor, along with a corresponding decrease in MSAT emissions along the parallel routes. The emissions increase is offset somewhat by lower MSAT emission rates due to increased speeds; according to EPA's MOVES 2010b model, emissions of all of the priority MSAT decrease as speed increases. Because the estimated VMT under each of the Alternatives are nearly the same, varying by less than 1.2 percent, it is expected there would be no appreciable difference in overall MSAT emissions among the various alternatives. Also, regardless of the alternative chosen, emissions will

likely be lower than present levels in the design year as a result of EPA's national control programs that are projected to reduce annual MSAT emissions by over 80 percent between 2010 and 2050. Local conditions may differ from these national projections in terms of fleet mix and turnover, VMT growth rates, and local control measures. However, the magnitude of the EPA-projected reductions is so great (even after accounting for VMT growth) that MSAT emissions in the study area are likely to be lower in the future in nearly all cases.

The additional travel lanes contemplated as part of the project alternatives will have the effect of moving some traffic closer to nearby homes, schools, and businesses; therefore, under each alternative there may be localized areas where ambient concentrations of MSAT could be higher under certain Build Alternatives than the No Build Alternative. The localized increases in MSAT concentrations would likely be most pronounced along the expanded roadway sections that would be built at the SH 32 alignment, under Alternative 3-Option 3D. However, the magnitude and the duration of these potential increases compared to the No-Build alternative cannot be reliably quantified due to incomplete or unavailable information in forecasting project-specific MSAT health impacts. In sum, when a highway is widened, the localized level of MSAT emissions for the Build Alternative could be higher relative to the No Build Alternative, but this could be offset due to increases in speeds and reductions in congestion (which are associated with lower MSAT emissions). Also, MSAT will be lower in other locations when traffic shifts away from them. However, on a regional basis, EPA's vehicle and fuel regulations, coupled with fleet turnover, will over time cause substantial reductions that, in almost all cases, will cause region-wide MSAT levels to be significantly lower than today.

Incomplete or Unavailable Information for Project Specific MSAT Health Impacts Analysis

In FHWA's view, information is incomplete or unavailable to credibly predict the project-specific health impacts due to changes in MSAT emissions associated with a proposed set of highway alternatives. The outcome of such an assessment, adverse or not, would be influenced more by the uncertainty introduced into the process through assumption and speculation rather than any genuine insight into the actual health impacts directly attributable to MSAT exposure associated with a proposed action.

The EPA is responsible for protecting the public health and welfare from any known or anticipated effect of an air pollutant. They are the lead authority for administering the Clean Air Act (CAA) and its amendments and have specific statutory obligations with respect to hazardous air pollutants and MSAT. The EPA is in the continual process of assessing human health effects, exposures, and risks posed by air pollutants. They maintain the IRIS, which is "a compilation of electronic reports on specific substances found in the environment and their potential to cause human health effects" (EPA, http://www.epa.gov/iris/). Each report contains assessments of non-cancerous and cancerous effects for individual compounds and quantitative estimates of risk levels from lifetime oral and inhalation exposures with uncertainty spanning perhaps an order of magnitude.

Other organizations are also active in the research and analyses of the human health effects of MSAT, including the Health Effects Institute (HEI). Two HEI studies are summarized in Appendix D of FHWA's Interim Guidance Update on MSAT Analysis in NEPA Documents. Among the adverse health effects linked to MSAT compounds at high exposures are; cancer in humans in occupational settings; cancer in animals; and irritation to the respiratory tract, including the exacerbation of asthma. Less obvious is the adverse human health effects of MSAT compounds at current environmental concentrations (HEI, http://pubs.healtheffects.org/view.php?id=282) or in the future as vehicle emissions substantially decrease (HEI, http://pubs.healtheffects.org/view.php?id=306).

The methodologies for forecasting health impacts include emissions modeling; dispersion modeling; exposure modeling; and then final determination of health impacts – each step in the process building on the model predictions obtained in the previous step. All are encumbered by technical shortcomings or uncertain science that prevents a more complete differentiation of the MSAT health impacts among a set of project alternatives. These difficulties are magnified for lifetime (i.e., 70 year) assessments, particularly because unsupportable assumptions would have to be made regarding changes in travel patterns and vehicle technology (which affects emissions rates) over that time frame, since such information is unavailable.

It is particularly difficult to reliably forecast 70-year lifetime MSAT concentrations and exposure near roadways; to determine the portion of time that people are actually exposed at a specific location; and to establish the extent attributable to a proposed action, especially given that some of the information needed is unavailable.

There are considerable uncertainties associated with the existing estimates of toxicity of the various MSAT, because of factors such as low-dose extrapolation and translation of occupational exposure data to the general population, a concern expressed by HEI (http://pubs.healtheffects.org/view.php?id=282). As a result, there is no national consensus on air dose-response values assumed to protect the public health and welfare for MSAT compounds, and in particular for diesel PM. The EPA (http://www.epa.gov/risk/basicinformation.htm#g) and the HEI (http://pubs.healtheffects.org/getfile.php?u=395) have not established a basis for quantitative risk assessment of diesel PM in ambient settings.

There is also the lack of a national consensus on an acceptable level of risk. The current context is the process used by the EPA as provided by the CAA to determine whether more stringent controls are required in order to provide an ample margin of safety to protect public health or to prevent an adverse environmental effect for industrial sources subject to the maximum achievable control technology standards, such as benzene emissions from refineries. The decision framework is a two-step process. The first step requires EPA to determine an "acceptable" level of risk due to emissions from a source, which is generally no greater than approximately 100 in a million. Additional factors are considered in the second step, the goal of which is to maximize the number of people with risks less than 1 in a million due to emissions from a source. The results of this statutory two-step process do not guarantee that cancer risks from exposure to air toxics are less than 1 in a million; in some cases, the residual risk determination could result in maximum individual cancer risks

that are as high as approximately 100 in a million. In a June 2008 decision, the U.S. Court of Appeals for the District of Columbia Circuit upheld EPA's approach to addressing risk in its two step decision framework.

Information is incomplete or unavailable to establish that even the largest of highway projects would result in levels of risk greater than deemed acceptable. Because of the limitations in the methodologies for forecasting health impacts described, any predicted difference in health impacts between alternatives is likely to be much smaller than the uncertainties associated with predicting the impacts. Consequently, the results of such assessments would not be useful to decision makers, who would need to weigh this information against project benefits, such as reducing traffic congestion, accident rates, and fatalities plus improved access for emergency response, that are better suited for quantitative analysis.

Conclusion

In this document, a qualitative MSAT assessment has been provided relative to the various alternatives of MSAT emissions and has acknowledged that the Build Alternative of the project alternatives may result in increased exposure to MSAT emissions in certain locations, although the concentrations and duration of exposures are uncertain, and because of this uncertainty, the health effects from these emissions cannot be estimated.

Congestion Management Process

This project is within an attainment or unclassifiable area for ozone and CO, therefore a project level Congestion Management Process analysis is not required.

Air Quality Construction Emissions Reduction Strategies

During the construction phase of this project, temporary increases in PM and MSAT emissions may occur from construction activities. The primary construction-related emissions of PM are fugitive dust from site preparation, and the primary construction-related emissions of MSAT are diesel particulate matter from diesel powered construction equipment and vehicles.

The potential impacts of particulate matter emissions will be minimized by using fugitive dust control measures contained in standard specifications, as appropriate. The Texas Emissions Reduction Plan (TERP) provides financial incentives to reduce emissions from vehicles and equipment. TxDOT encourages construction contractors to use this and other local and federal incentive programs to the fullest extent possible to minimize diesel emissions. Information about the TERP program can be found at: http://www.tceq.state.tx.us/implementation/air/terp/.

However, considering the temporary and transient nature of construction-related emissions, the use of fugitive dust control measures, the encouragement of the use of TERP, and compliance with applicable regulatory requirements; it is not anticipated that emissions from construction of this project will have any significant impact on air quality in the area.

3.13 Traffic Noise

This analysis was accomplished in accordance with TxDOT's (FHWA approved) Guidelines for Analysis and Abatement of Roadway Traffic Noise (2011).

Sound from roadway traffic is generated primarily from a vehicle's tires, engine and exhaust. It is commonly measured in decibels and is expressed as "dB."

Sound occurs over a wide range of frequencies. However, not all frequencies are detectable by the human ear; therefore, an adjustment is made to the high and low frequencies to approximate the way an average person hears traffic sounds. This adjustment is called A-weighting and is expressed as "dBA."

Also, because traffic sound levels are never constant due to the changing number, type and speed of vehicles, a single value is used to represent the average or equivalent sound level and is expressed as "Leq."

The traffic noise analysis typically includes the following elements:

- Identification of land use activity areas that might be impacted by traffic noise.
- Determination of existing noise levels.
- Prediction of future noise levels.
- Identification of possible noise impacts.
- Consideration and evaluation of measures to reduce noise impacts.

The FHWA has established the following Noise Abatement Criteria (NAC) for various land use activity areas that are used as one of two means to determine when a traffic noise impact would occur. **Table 6** provides the FHWA NAC.

Table 6: FHWA Noise Abatement Criteria

Activity Category	FHWA (dB(A)Leq)	Description of Land Use Activity Areas
A	**57 (exterior)**	Lands on which serenity and quiet are of extra ordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose.
B	**67 (exterior)**	Residential
C	**67 (exterior)**	Active sport areas, amphitheaters, auditoriums, campgrounds, cemeteries, day care centers, hospitals, libraries, medical

Table 6: FHWA Noise Abatement Criteria		
Activity Category	**FHWA (dB(A)Leq)**	**Description of Land Use Activity Areas**
		facilities, parks, picnic areas, places of worship, playgrounds, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, recreation areas, Section 4(f) sites, schools , television studios, trails, and trail crossings
D	**52 (interior**	Auditoriums, day care centers, hospitals, libraries, medical facilities, places of worship, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, schools, and television studios
E	**72 (exterior)**	Hotels, motels, offices, restaurants/bars, and other developed lands, properties, or activities not included in A-D or F.
F	**---**	Agricultural, airports, bus yards, emergency services, industrial, logging, maintenance facilities, manufacturing, mining, rail yards, retail facilities, shipyards, utilities (water resources, water treatment, electrical), and warehousing.
G	**---**	Undeveloped lands that are not permitted

A noise impact would occur when either the absolute or relative criterion is met:

Absolute criterion: the predicted noise level at a receiver approaches, equals or exceeds the NAC. "Approach" is defined as one dBA below the FHWA NAC. For example: a noise impact would occur at a Category B residence if the noise level is predicted to be 66 dBA or above.

Relative criterion: the predicted noise level substantially exceeds the existing noise level at a receiver even though the predicted noise level does not approach, equal or exceed the NAC. "Substantially exceeds" is defined as more than 10 dBA. For example: a noise impact would occur at a Category B residence if the existing level is 54 dBA and the predicted level is 65 dBA.

When a traffic noise impact occurs, noise abatement measures must be considered. A noise abatement measure is any positive action taken to reduce the impact of traffic noise on an activity area.

3.13.1 Environmental Consequences – No Build Alternative

Implementation of the No-Build Alternative would not require construction of SH 32; therefore no traffic noise impact would occur.

3.13.2 Environmental Consequences – Build Alternative

The FHWA traffic noise modeling software was used to calculate existing and predicted traffic noise levels. The model primarily considers the number, type and speed of vehicles; highway alignment and grade; cuts, fills and natural berms; surrounding terrain features; and the locations of activity areas likely to be impacted by the associated traffic noise.

Existing and predicted traffic noise levels were modeled at receiver locations (**Table 7** and **Exhibit 5C-5G**) that represent the land use activity areas adjacent to the proposed project that might be impacted by traffic noise and potentially benefit from feasible and reasonable noise abatement. Estimated ADT along the proposed SH 32 from the Port of Brownsville to U.S. 77/83 was 5,000 VPD in 2013 and is expected to be 7,100 VPD in 2033.

Table 7 : Traffic Noise Levels (dBA Leq)

Receiver	NAC Category	NAC Level	Existing 2013	Predicted 2033	Change (+/-)	Noise Impact
R1A-Residential	B	67	60	63	+3	NO
R1-Residential	B	67	51	54	+3	NO
R2-Residential	B	67	55	58	+3	NO
R3-Residential	B	67	51	54	+3	NO
R4-Residential	B	67	57	59	+2	NO
R5-Residential	B	67	60	61	+1	NO
R6-Residential	B	67	59	60	+1	NO
R7-Residential	B	67	62	63	+1	NO
R8-Residential	B	67	59	60	+1	NO
R9-Residential	B	67	61	63	+2	NO
R10-Residential	B	67	58	60	+2	NO
R11-Residential	B	67	61	63	+2	NO
R12-Residential	B	67	59	61	+2	NO
R13-Residential	B	67	61	63	+2	NO
R14-Residential	B	67	57	59	+2	NO
R15-Residential	B	67	57	59	+2	NO

As indicated in **Table 7**, the proposed project would not result in traffic noise impact.

Land use activity areas along the proposed SH 32 route are composed mostly of Category F and G. However, to avoid noise impacts that may result from future development of properties adjacent to the project, local officials responsible for land use control programs

should ensure, to the maximum extent possible, no new activities are planned or constructed along or within the following predicted (2033) noise impact contours. **Table 8** provides the Noise Impact Contours.

Table 8 : Noise Impact Contours			
UNDEVELOPED AREA	**LAND USE**	**IMPACT CONTOUR**	**DISTANCE from PROPOSED RIGHT of WAY (ft.)**
Along the proposed SH 32	NAC Category B & C	66 dBA	15-ft.
	NAC Category E	71 dBA	Within the ROW

Noise associated with the construction of the project is difficult to predict. Heavy machinery, the major source of noise in construction, is constantly moving in unpredictable patterns. However, construction normally occurs during daylight hours when occasional loud noises are more tolerable. None of the receivers are expected to be exposed to construction noise for a long duration; therefore, any extended disruption of normal activities is not expected. Provisions will be included in the plans and specifications that require the contractor to make every reasonable effort to minimize construction noise through abatement measures such as work-hour controls and proper maintenance of muffler systems.

A copy of this traffic noise analysis will be available to local officials. On the date of approval of this document (Date of Public Knowledge), FHWA, TxDOT, and CCRMA are no longer responsible for providing noise abatement for new development adjacent to the project.

3.14 Hazardous Materials on Site

Petroleum Storage Tank (PST) / Leaking Petroleum Storage Tank (LPST)

Petroleum Storage Tanks (PST) are regulated under Subtitle I of the Resource Conservation and Recovery Act (RCRA) and must be registered with TCEQ and its associated PSTs database. Leaking Petroleum Storage Tank (LPST) listing is derived from the PST database and is maintained by the TCEQ. This listing includes aboveground and underground storage tank facilities with reported leaks.

Comprehensive Environmental Response, Compensation, and Liability Act

This act provides a federal “Superfund” to clean up uncontrolled or abandoned hazardous-waste sites as well as accidents, spills, and other emergency releases of pollutants and contaminants into the environment. Through the act, the EPA was given power to seek out those parties responsible for any release and to ensure their cooperation in the cleanup.

Resource Conservation and Recovery Act

This act gives the EPA authority to control hazardous waste from "cradle to grave." This includes the generation, transportation, treatment, storage, and disposal of hazardous waste. The RCRA also set forth a framework for the management of non-hazardous wastes.

Superfund Amendments and Reauthorization Act

This act reauthorized the Comprehensive Environmental Response, Compensation, and Liability Act to continue cleanup activities around the country. Several site-specific amendments, definition clarifications, and technical requirements were added to the legislation, including additional enforcement authorities. Title III of Superfund Amendments and Reauthorizations also authorized the Emergency Planning and Community Right-to-know ACT.

3.14.1 Environmental Consequences – No Build Alternative

Under the No-Build alternative, there would be no construction of SH 32. There would be no project-related disturbance to any hazardous material sites located within the proposed project area.

3.14.2 Environmental Consequences – Build Alternative

Based on the site survey, USGS 7.5 minute topography map(s) (Palmito Hill, Southmost, and East Brownsville) and existing aerial photographs, the existing and previous land use of the project limits and surrounding area is mixed with residential properties, commercial properties, undeveloped land, and farmland.

On August 19, 2015, a Regulatory Database Search was conducted to identify releases or threatened releases of petroleum products or other hazardous substances within the search radii specified in American Society for Testing and Materials Standard E 1527-13. A Hazardous Materials Initial Site Assessment (ISA) was completed and is located in the project file in the TxDOT Pharr District Office.

A total of two PSTs, one spill (SPILLS) site and one Facility Registry Systems (FRSTX) site were located within or adjacent to the proposed project area. **Table 9** provides a Summary of Regulated Facilities within the project area. The SPILL site is located at 800 South FM 1419 and is considered a closed case. Loop Farms Inc. is located adjacent to the existing FM 1419. As currently proposed, additional ROW would be purchased from this property. Loop Farms Inc. is currently listed in both the FRSTX and PST databases. The Village Hut located at 9510, SH 4 is a PST site.

Table 9: Summary of Regulated Facilities

Database Name	Site ID#	Distance from Project	Site Name	Address	Status/ Concern
SPILLS	59783	0.01 mi S		800 South FM 1419	Case Closed
FRSTX	110034101326	0.02 mi W	Loop Farms Inc.	827 South FM 1419	None

Table 9: Summary of Regulated Facilities					
Database Name	**Site ID#**	**Distance from Project**	**Site Name**	**Address**	**Status/ Concern**
PST	58774	0.02 mi W	Loop Farms Inc.	827 South FM 1419	1 aboveground tank, Active
PST	46079	0.22 mi W	The Village Hut	9510 SH 4	3 underground storage tanks, Active
Source: Data compiled from Geosearch Databases 8/19/2015.					

Within the project limits, there is one PST facility. The facility is not listed as LPST site. The site survey and research into the historical land use did not reveal any other abandoned and/or active gasoline service stations. A map showing the location of the sites can be found in **Exhibit 9, 9A,** and **9B**.

There is a potential for contamination to be encountered during utility adjustments. Coordination with utility companies concerning this contamination would be addressed during the ROW stage of project development. It is anticipated that all utility adjustments or relocations would be completed prior to construction.

An analysis of the data indicates that this project would not involve the acquisition of known unresolved contamination where TxDOT or CCRMA could reasonably expect to assume liability for corrective action upon acquisition. In addition, this project does not involve known hazardous material impacts that could be anticipated to adversely affect construction (e.g., cannot resolve before construction).

The contractor would take appropriate measures to prevent, minimize, and control the spill of hazardous materials in the construction staging areas. The use of construction equipment within sensitive areas would be minimized or eliminate entirely. All construction materials used for this project would be removed as soon as work schedules permit. Any unanticipated hazardous materials and/or petroleum contamination encountered during construction would be handled according to applicable Federal and State regulations per TxDOT Standard Specifications.

The proposed project includes the demolition and/or relocation of building structures. The existing bridge at SH 4 and adjacent building would be demolished to accommodate the new bridge structure. The bridge and/or building may contain asbestos containing materials and/or lead paint based concerns. Asbestos inspections, specification, notification, license, accreditation, abatement, and disposal, as applicable, should comply with federal and state regulations. To date, asbestos and lead based testing has not been conducted; however, asbestos and lead based issues would be addressed during the ROW process prior to construction. In addition, the proposed project would comply with TxDOT's Guidance for Handling Asbestos in Construction Project: Summary of Asbestos Procedures for TxDOT Projects released on February 2014.

3.15 Cultural Resources

Cultural resources are structures, buildings, archeological sites, districts (a collection of related structures, buildings, and/or archeological sites), cemeteries, and objects. Both federal and state laws require consideration of cultural resources during project planning. At the federal level, NEPA and the National Historic Preservation Act (NHPA) of 1966, among others, apply to transportation projects such as this one. In addition, state laws such as the Antiquities Code of Texas apply to these projects. Compliance with these laws was conducted in accordance with the provisions of the Programmatic Agreement Among the Federal Highway Administration, TxDOT,the Texas State Historic Preservation Officer, and the Advisory Council of Historic Preservation Regarding the Implementation of Transportation Undertaking effective December 16, 2015 [PA-TU (2015)].

3.15.1 Environmental Consequences – No Build Alternative

Under the No-Build alternative, there would be no construction of SH 32. There would be no project-related disturbance to any cultural resources sites located within the proposed project area.

3.15.2 Environmental Consequences – Build Alternative

Non-Archeological Historical Age Resources

A review of the National Register of Historic Places (NRHP), the State Antiquities Landmarks (SAL), National Historic Landmarks, Recorded Texas Historic Landmarks (RTHL) and the Texas Historic Sites Atlas indicated that no historically significant resources have been previously documented within the Area of Potential Effect (APE) which includes all parcels partially or wholly within 150 ft. on either side of the existing or proposed ROW (whichever is greater) for existing transportation alignment and 300 ft. on either side of the proposed ROW on new alignment as well as the 1300-ft. study area around the APE. A site visit revealed that there are 25 historic-age resources (built 1968 or prior), located on 16 parcels wholly or partially within the project APE. A copy of the Revised Historic Resources Survey for SH 32 from the Intersection of FM 3068 and FM 1419 to SH 4 is on file at the TxDOT Pharr District Office.

Pursuant to the PA-TU (2015), historians of the TxDOT Environmental Affairs Division Historical Studies Department determined that one historic-age resource, the Donna-Brownsville Levee, is eligible for listing in the NRHP. The NRHP-eligible Donna-Brownsville Levee is located along the Rio Grande near Southmost Road (Resource 16). This resource was previously determined NRHP-eligible in 2009. Due to the location of the resource in relation to this project (outside the ROW and separated from the ROW by a canal and a tree screen), it was determined that the proposed project would have no effect to the Donna-Brownsville Levee. Refer to **Appendix D** for a copy of the coordination letter.

Archeology Resources

The APE for archeology consists of the existing as well as the proposed ROW. A search of the THC Atlas did not reveal any previously documented archeological sites, historical markers, cemeteries, or other recorded resources within the APE for archeology. Within 1 km (0.6 of a mile) of the APE, the data query revealed several recorded cultural resource sites (THC 2011). For a list of resources, refer to the Intensive Archeological Survey for SH 32 from the Intersection of FM 3068 and FM 1419 to SH 4 located on the project file in the TxDOT Pharr District office.

Archeological Fieldwork

In April 2011, an intensive archeological survey was carried out along the 5.88-mile-long area of potential effects (APE) under Texas Antiquities Permit 5899. Right of entry was available for approximately half of the APE, which largely consists of active farmland with nearly 100 percent ground surface visibility. Much of the remainder of the APE was found to be highly disturbed by the previous construction of roads, drainage ditches, flood control levees, residential lots, water pipelines, and other utilities. None of the 71 total units excavated yielded materials other than modern debris.

On December 6, 2011, TxDOT obtained SHPO concurrence that no archeological historic properties (36 cfr Part 800.16(1) or SALs (13 TAC 26.12) are present within the 100 acre APE examined by the survey and none would be affected by the proposed undertaking. It was also determined that there is little likelihood of significant or intact prehistoric or historical archeological sites within the APE surveyed and no further archeological investigations are warranted in those areas. The remaining 50 acres with no right of entry (ROE) will require additional archeological investigations. SHPO concurred that there was sufficient documentation that the proposed undertaking, with the exception of the 50 acres without ROE, that the proposed project would have no effect on archeological historic properties or SALs.

In April 2014, an intensive archeological survey was completed in order to inventory and evaluate archeological resources in additional new ROW along the east side of the proposed new location of SH 32. The archeological APE covers an area of 6.6 hectares or 16.2 acres along a 0.62 kilometer or one mile strip with a maximum width of approximately 76 meters or 250 ft. and tapering to elongated, narrow points at its northeast and southwest ends. A total of 10 trenches and 13 shovel texts were excavated along the APE. No burial or evidence suggesting burials were found. Moreover, no subsurface artifacts, deposits, or features of archeological interest were found, even in close proximity to the known cemetery (Southmost Cemetery adjacent to the south side of the ROW at the intersection of FM 3068 and FM 1419). All shovel test units were negative for cultural materials. No further archeological work is recommended within the APE surveyed. Due to a lack of ROE, surveys have not been conducted in approximately 50 acres of proposed new ROW, but those 50 acres would be surveyed prior to construction once ROE is obtained. A copy of the Intensive Archeological Survey of Additional Right of Way for State Highway 32 at the FM 1419 and Levee Cemetery are available in the project file in the TxDOT Pharr District office.

In the event that unanticipated archeological deposits are encountered during construction, work in the immediate area will cease, and TxDOT archeological staff will be contacted to initiate post-review discovery procedures.

3.16 Cemeteries

Three cemeteries located outside the proposed project ROW were identified from the USGS Topographic Map (East Brownsville, Palmito Hill and Southmost Quadrangles), the field reconnaissance survey, and the intensive archeological survey. The following is a list of the cemeteries identified. Refer to **Exhibit 9-9B,** the Environmental Constraints Map, for the location of these cemeteries.

- Cemetery CF-C044 also known as Rabb Plantation Cemetery Ranch is located adjacent to the south side of the APE at the intersection of FM 3068 and FM 1419.
- Levee Cemetery (CF-C032) located 0.1 km (0.06 of a mile) east of the APE south of SH 4.
- Los Sauces Cemetery (CF-C048) is located 1 km (0.6 of a mile) northeast of the north end of the APE.

In the event that burials are found during construction, TxDOT will be notified and all requirements of 8THSC 711 will be followed

3.16.1 Environmental Consequences – No Build Alternative

Under the No-Build alternative, there would be no construction of SH 32. There would be no project-related disturbance to any cemeteries located within the proposed project ROW.

3.16.2 Environmental Consequences – Build Alternative

The three cemeteries are located outside the proposed project ROW; therefore, they would not be directly impacted by the proposed project.

3.17 Community Cohesion

Transportation impacts on neighborhoods focus on the physical integrity of the neighborhood and community cohesion. Community cohesion is defined as the degree to which residents have a sense of belonging to their neighborhood or attachment to community groups and institutions.

3.17.1 Environmental Consequences – No Build Alternative

Under the No-Build alternative, there would be no construction of SH 32. There would be no project-related disturbance to any communities located within the proposed project area.

3.17.2 Environmental Consequences – Build Alternative

The proposed SH 32 project traverses a rural area of southeast Brownsville with the exception of the project termini the existing land use is predominantly undeveloped agricultural land. The proposed project would displace three residential structures; however, no neighborhoods would be bisected or segregated by the project. The proposed project would improve access to southeast Brownsville and to rural residential areas located in or near the project area. No impacts to community cohesion would occur as a result of the proposed project.

3.18 Public Facilities

There is one park, one church, and two schools within the proposed project area. A map showing the location of these public facilities can be found in **Exhibit 9-9B**. The Cameron County Park is located north of California Rd. on Brown Rd. and the Blessed Juan Diego Church is located at 4180 South Browne Ave. The schools within the project area are:

- Palm Grove Elementary School located at 7942, FM 1419.
- Ben L. Brite Elementary School No. 140 located on South Browne Ave.

3.18.1 Environmental Consequences – No Build Alternative

Under the No-Build alternative, there would be no construction of SH 32. There would be no project-related disturbance to any public facilities located within the proposed project area.

3.18.2 Environmental Consequences – Build Alternative

Although there are public facilities located within the vicinity of the proposed project area, they would be avoided and would not be impacted by the proposed project. The proposed project would provide safe and convenient access to the traveling public within and adjacent to the proposed project area.

3.19 Section 4(f) and 6(f)(3)

Section 4(f) of the U.S. Department of Transportation Act of 1966, mandates that special effort be made to reserve significant and publicly owned parks, recreation areas, wildlife and waterfowl refuges and all significant historic sites. There is one park and five Wildlife Management Areas (WMAs) in the vicinity of the project but not within or adjacent to project ROW. A number of these parks have been funded with Land and Water Conservation Fund (LWCF) Act, which protects these lands under Section 6(f). A list of these parks is provided below.

- Pedro Benavides County Park is located at the intersection of California Rd. and South Browne Ave.

- LRGV National Wildlife Refuge (NWR) is located just south of the intersection of Dakota Ave. and FM 1419. A series of United States Fish and Wildlife Service

(USFWS) LRGV NWR tracts (Vista del Mar, Tulosa Ranch, etc.) are located generally northeast of the intersection of SH 4 and South FM 1419, the nearest tract is approximately 1 mile from the project area.

- The Audubon Society's Sabal Palm Grove Sanctuary is located approximately one mile southwest of the intersection of FM 3068 and FM 1419. The sanctuary harbors 527 acres of a native Sabal Palm (*Sabal texana*) forest, one of the last remnants of a critical ecosystem in South Texas and Northern Mexico.

- The Nature Conservancy's Lennox Foundation Southmost Preserve is located less than a mile southeast of the intersection of FM 3068 and FM 1419 at the southern end of Southpoint Rd. and over the Rio Grande levee. This 1,034 acre preserve contains a rich biological diversity of native fauna and flora.

- Texas Parks and Wildlife Department (TPWD) Las Palomas WMA, Voshell Unit, located on Dockberry Rd. and approximately 2,000-ft. west of the intersection of Dockberry Rd. and Dakota Ave.

3.19.1 Environmental Consequences – No Build Alternative

Under the No-Build alternative, there would be no construction of SH 32. There would be no project-related disturbance to any publicly owned parks, recreational areas, wildlife and waterfowl refuge lands, historic sites of national, state, or local significance or other LWCF facilities located within the proposed project area.

3.19.2 Environmental Consequences – Build Alternative

Under the Build Alternative none of the previously named public parks; recreational areas, wildlife and waterfowl refuge lands, historic sites of national, state, or local significance or other LWCF site/facilities would be directly impacted by the proposed roadway improvements; therefore, neither Section 4(f) nor Section 6(f)(3) apply.

3.20 Construction Impact

This section discusses potential construction impacts of the proposed SH 32 roadway project.

3.20.1 Environmental Consequences – No Build Alternative

Under the No-Build alternative, there would be no construction of SH 32. There would be no disturbance related to construction aside from regular maintenance of the existing roadway within the proposed project area.

3.20.2 Environmental Consequences – Build Alternative

The construction of the proposed SH 32 would be phased in such a manner that would allow the roadway to remain open to traffic during construction. If necessary, detours would be developed in the Traffic Control Plan. Commercial traffic would not be directed

through residential areas. During construction, all property owners would have access to their property and customers would have access to each business. Every reasonable effort to minimize construction impacts would be made.

During construction, due to operations normally associated levels with road construction, there is a possibility that noise levels would be above normal in areas adjacent to the ROW. Construction would be limited to daylight hours when occasional loud noises are more tolerable unless there is an emergency situation. The contractors would be required to maintain the mufflers on their construction equipment to minimize noise impacts. Due to relatively short-term exposure periods imposed on any one receiver, extended disruption of normal activities is not considered likely. Every possible effort would be made to minimize construction noise.

Construction may temporarily degrade the air quality through dust and exhaust gasses associated with construction equipment. Measures to control dust would be considered and incorporated into the final design and construction specifications.

3.21 Vegetation and Wildlife Habitat

Vegetation

According to Blair's 1950 classification of eco-regions, the project area lies within the Matamoran District of the Tamaulipan Biotic Province. According to the TPWD *Ecological Mapping Systems of Texas*, the project area lies within the Phase 3 zone which includes most of the Texas coast south to the Rio Grande Valley, including the eastern South Texas Plains. This region is characterized by such avifauna as the Green Jay (*Cyanocorax yncas*), Altamira Oriole (*Icterus gularis*), Pauraque (*Nyctidromus albicollis*), and the Plain Chachalaca (*Ortalis vetula*).

As required in the 2013 Memorandum of Understanding (MOU) between TxDOT and the TPWD, the vegetation in the project area was characterized using *Ecological Mapping Systems of Texas* (TPWD, 2013) March 20, 2015. The Ecological Mapping System of Texas (EMST) database identified a total of 14 vegetation types within the project footprint (see **Exhibits 10A-10S**). Based on the description of each of the vegetation types provided by the EMST, there were six vegetation types observed within the project ROW during the site survey and they are identified with an asterisk in the list below. The area that existing roadways comprise within the project ROW was combined with the Urban High Intensity area and existing ROW maintained vegetation was categorized as Urban Low Intensity area. Although the EMST database did not identify the Open Water type within the project area, this vegetation type was documented within the project area and was therefore added to the list below, therefore, the total number of observed vegetation types is 6. Refer to **Appendix E** for a copy of the Vegetation Summary Table. The existing roadway is categorized as the Urban High type and the Urban Low type is composed of existing and proposed ROW, residential areas and highly disturbed salt flat vegetation type within maintained transportation ROW towards the end of the proposed project adjacent to SH 4.

- Coastal: Salt and Brackish High Tidal Marsh
- Coastal: Sea Ox-eye Daisy Flats
- Gulf Coast: Salty Prairie

- Gulf Coast: Salty Prairie Shrubland
- Row Crops*
- South Texas: Clayey Blackbrush Mixed Shrubland
- South Texas: Clayey Mesquite Mixed Shrubland*
- South Texas: Disturbance Grassland*
- South Texas: Floodplain Evergreen Forest and Woodland
- South Texas: Floodplain Herbaceous Wetland
- South Texas: Floodplain Mixed Deciduous
- South Texas: Loma Evergreen Shrubland
- Urban High Intensity*
- Urban Low Intensity*
- Open Water*

EMST Vegetation/Habitat types that are mapped but which were not observed within the proposed project ROW are discussed below, followed by a description of the Vegetation/Habitat types that were observed within the project ROW. The description of each vegetation/habitat types was taken directly from the *Texas Vegetation Classification Project Booklet for Phase 3* by the TPWD and Texas Natural Resources Information System and was used to determine their presence/absence within the project area. Description of the different vegetation types begins at the start of the project limits.

EMST Vegetation Types Not Observed Within the Project Area

The following vegetation types are shown by the EMST as potentially occurring within the proposed project area. However, these vegetation types were not observed within the proposed project area during any of the field surveys and were therefore determined not to occur within the project ROW. The determination is based on site survey and review of available resources, including infrared photography interpretation to identify and delineate vegetation communities within the proposed new roadway section of the proposed project where no public roads exists.

Coastal: Salt and Brackish High Tidal Marsh- Coastal: Salt and Brackish High Tidal Marsh includes a variety of tidal-influenced marsh types that vary from year to year based primarily on storm events and precipitation, and across small areas due to small variation in elevation. Important species may include marshhay cordgrass (*Spartina patens*), saltgrass (*Distichlis spicata*), and bulrushes (*Schoenoplectus spp.)*

Coastal: Sea Ox-eye Daisy Flats- Sparse, low shrublands with salt-tolerant species such as sea ox-eye daisy (*Borrichia fructenses*), Carolina wolfberry (*Lycium carolinianum*), saltwort (*Batis maritima*), gutta-percha (*Maytenus phyllanthoides*), and tornillo (*Prosopis reptans*) characterize this type. Mesquite (*Prosopis glandulosa*) may be scattered and species such as annual seepweed (*Suaeda linearis*), marshhay cordgrass, Gulf cordgrass (*Spartina spartinae*), saltgrass, shoregrass (*Monanthochloe littoralis*), and glasswort (*Salicornia spp.*) may be present. Some areas at higher elevation, especially loams, are mapped within this type.

Gulf Coast: Salty Prairie- Gulf Cordgrass may form nearly pure stands within this mapped type, or may form mosaics with marshhay cordgrass or saltgrass at slightly lower elevations or

species such as Bermudagrass (*Cynodon dactylon*) and little bluestem (*Schizachyrium scoparium*) at slightly higher elevations. Other common grasses include Gulf muhly (*Muhlenbergia capillaris*), shoregrass, switchgrass (*Panicum virgatum*), and bushy bluestem (*Andropogon glomeratus*), and shrubs such as baccharis (*Baccharis halimifolia*), mesquite, or shrubby sumpweed (*Iva frutescens*) may also occur.

Gulf Coast: Salty Prairie Shrubland- This vegetation type is dominated by a mix of shrubs such as baccharis, mesquite, huisache (*Acacia farnesiana*), Chinese tallow (*Triadica sebifera*), and shrubby sumpweed together with grasses such as Gulf cordgrass, Gulf muhly, and rat-tail smutgrass (*Sporobolus indicus*). Spiny aster (*Aster spinosus*) may also be a conspicuous dominant.

South Texas: Clayey Blackbrush Mixed Shrubland- Relatively dense shrublands with species such as blackbrush *(Acacia rigidula*), mesquite, granjeno (*Celtis ehrenbergiana*), guajillo (*Acacia berlandieri*), lotebush (*Ziziphus obtusifolia*), amargosa (*Castela erecta*), brasil (*Condalia hookeri*), and colima (*Zanthoxylum fagara*) are characteristics of this type.

South Texas: Floodplain Evergreen Forest and Woodland- In the northern part of Phase 3, Live oak together with species such as sugar hackberry (*Celtis laevigata*), cedar elm (*Ulmus crassifolia*), mesquite, huisache, anacua (*Erethia anacua*), granjeno, brasil, retama (*Parkinsonia aculeata*) and Colima are common in this type. In the south, Texas ebony *(Ebenopsis ebano)* and anacua are conspicuous evergreen components of the canopy.

South Texas: Floodplain Herbaceous Wetland- Wetland species such as cattails (*Typha latifolia*), American bulrush (*Scirpus americanus*), sedges (*Cyperaceae var.*), and spike rushes (*Eleocharis var.*) are common components. Some areas may be salty and contain species such as sea ox-eye daisy and wolfberry, and shrubs such as black willow (*Salix nigra*) and buttonbush (*Cephalanthus occidentalis*) may be present.

South Texas: Floodplain Mixed Deciduous- Live oak, anacua, and Texas ebony are common components of this type, along with a variety of deciduous species such as sugar hackberry, cedar elm, Mexican ash (*Fraxinus berlandieriana*), pecan (*Carya illinoinensis*), black willow, tepeguaje (*Leucaena pulverulenta*), and Chinaberry. Shrubs and small tress such as mesquite, huisache, whitebrush (*Aloysia gratissima*), brasil, granjeno, and colima are common components.

South Texas: Loma Evergreen Shrubland- The South Texas: Loma Evergreen Shrublands are mainly low relatively sense shrublands that occur over both slightly saline and non-saline soils. A diversity of shrubs may be important, including species such as mesquite, Spanish dagger (*Yucca gloriosa*), blackbrush, Texas prickly pear (*Opuntia engelmannii)*, Berlandier's fiddlewood (*Citharexylum berlandieri*), Texas ebony, gutta-percha, colima, brasil, and huisachillo. Grasses such as big sacaton (*Sporobolus wrightii*), buffelgrass (*Pennisetum ciliare)*, and gulf cordgrass may be present.

EMST Vegetation Types Observed Within Project Area

This section provides a description of the vegetation types observed within the project area and the description is based on the *Texas Vegetation Classification Project: Interpretive Booklet for Phase 3*. Refer to **Exhibits 11A-11S** for a copy of the maps based on observed vegetation types.

Row Crops- This type includes all cropland where fields are fallow for some portion of the year. Some fields may rotate into and out cultivation frequently, and year-round cover crops and tame hay fields are generally mapped as grassland. This vegetation type was observed throughout the majority of the project area. This vegetation type consists of cultivated row crops and citrus orchards. Commonly grown crops are cotton, grain sorghum, and cool and warm season vegetables. Croplands are irrigated and non-irrigated in the area. Fallow agricultural fields were also observed within the project ROW.

South Texas: Clayey Mesquite Mixed Shrubland- A discontinuous canopy of shrubs and small trees characterize this type, and species such as mesquite, huisache, granjeno, sugar hackberry, brasil, guajillo, blackbrush, lotebush, Texas prickly pear, and whitebrush, are common components. Buffelgrass is common herbaceous dominant. This type of vegetation was observed at Resaca de la Palma and other drainage features.

Riparian vegetation is associated with Resaca de la Palma and the drainage features within the project area and was divided into two main categories, riparian communities and drainage features.

Resacas are unique bodies of water that were at some point connected to the Rio Grande, but were naturally fragmented from the Rio Grande throughout the course of years. Originally, floodwaters from the Rio Grande drained into the resacas, but since the development of irrigation commissions dating to 1906 until present, numerous resacas, including Resaca de la Palma, are now maintained wet by mechanically pumping water into them. The main function of a resaca is to redirect and disperse floodwaters. They play an important role in water retention and detention within Cameron County and the City of Brownsville; however, because resacas occur within populated areas, the current health of many resacas is declining due to increased development along their banks and the accumulation of sediment. In urban areas, resacas have been landscaped as community or residential showplaces, while those in rural areas are often left as marshlands providing habitats for various types of wildlife. Resaca de la Palma (east & west side) is unlined with a silted natural bottom substrate.

- Riparian vegetation found along the resaca and above the OHWM are dominated by Mexican ash, black willow, sugar hackberry, retama, huisache, sabal palm (*Sabal texana*), tepeguaje, Brazilian pepper (*Schinus terebinthifolius*), and giant reed. The canopy of the riparian habitat ranges from 65 to 75 percent areal coverage. The average height of the canopy was estimated to be 25 to 30-ft. with a range of 20 to 35-ft. The average dbh of the woody species was estimated to be 10-15 inches with a range of four to 25 inches. Dominant groundcover consisted of guinea grass and no large woody debris was noted at this area. Riparian vegetation found along the Resaca de la Palma consists of an open

understory and would not meet optimal habitat requirements for the ocelot and Gulf Coast jaguarundi but may serve as a potential travel corridor to areas of suitable habitat.

- Drainage features are areas that are previously disturbed or are routinely maintained. All the drainage ditches within the action area are unlined channels and consists of a natural silted bottom substrate. The location of the drainage ditch crossings is illustrated in **Exhibits 10A -10S** and photographs of the drainage ditches are included in **Appendix B.** Drainage ditch crossings 3, 4, 5, 11, and 12 appear well maintained and as a result the few woody species that occur at these crossings are mostly shrubs and saplings and include mesquite, huisache, retama, Texas prickly pear, sea ox-eye, camphor daisy (*Machaeranthera phyllocephala*), wolfberry (*Lycium sp.*), and dwarf screwbean. Honey mesquite, huisache, and retama shrubs range in height from less than a foot to approximately 12-ft. tall. Common grass and forbs species found on the slopes of these drainage ditches include Bermudagrass, buffelgrass, silver leaf nightshade, and western ragweed. No large woody debris was noted at these drainage features. The habitat found at these drainage ditches does not meet optimal ocelot and Gulf Coast jaguarundi habitat requirements.

- Drainage ditch crossing number one (1) is a smaller roadside lateral ditch that has not been maintained and has larger woody species and more cover. Tree and shrub species found at top of banks and slopes at drainage ditch crossing number one (1) consist of black willow, hackberry, huisache, mesquite, retama, sabal palm, wolfberry spp. The height of trees at drainage ditch crossing number one (1) range in height from approximately 15 to 20-ft. tall with a dbh ranging from approximately two to fifteen inches. Tree canopy cover is approximately 85 percent at drainage ditch crossing number one (1). Common grasses, forbs and vine species at drainage ditch number one (1) include buffelgrass, Bermudagrass, and Kleberg bluestem (*Dichanthium annulatum*), silver leaf nightshade (*Solanum elaeagnifolium*), common sunflower *(Helianthus annus*), old man's beard (*Clematis drummondii*), ivy tree vine (*Cissus incisa*), Alamo vine (*Ipomea sinuate),* cattail, and western ragweed (*Ambrosia psilostachya*). See **Exhibits 10A – 10S** for the Land Use and Vegetation Analysis Maps.

- Drainage ditch crossings 2, 6, 7, 8, 9, and 10 are smaller lateral ditches that also have not been regularly maintained. Tree and shrub species found at these drainage ditches consist of hackberry, huisache, mesquite, retama, and lotebush. Height of trees ranges from approximately 15 to 20-ft. tall with a dbh that ranges from approximately two to fifteen inches. Tree canopy cover ranges from approximately 30 to 65 percent at these drainage ditch crossings. Common grasses and forbs species at these drainage ditches include buffelgrass, Bermudagrass, and Kleberg bluestem, silver leaf nightshade, old man's beard, ivy tree vine, and western ragweed. See **Exhibits 10A – 10S** for the Land Use and Vegetation Analysis Maps.

- Typically, the fencerow vegetation exhibits woody plant species common to the adjacent vegetation communities. Where adjacent vegetation consists of mesquite, dominant

species along the fencerow include mesquite trees and shrubs, Texas prickly pear, and tasajillo. Old-man's beard is a common vine growing on fences and associated shrubs.

South Texas: Disturbance Grassland- A variety of mainly heavily grazed grasslands, including managed exotic pastures, is circumscribed within this type. Common dominant species include buffelgrass, King Ranch Bluestem *(Bothriochloa ischaemum var. songarica)*, pink pappusgrass (*Pappophorum bicolor)*, threeawn species (*Aristida purpurea*), guineagrass (*Urochloa maximum*), and Kleberg bluestem (*Dichanthelium annulatum*). Shrubs and small trees such as mesquite, huisache, lotebush, and granjeno, are common components. South Texas: Disturbance Grasslands are former agricultural fields/row crops that have been fallow for an unknown period of time and where vegetation re-growth has occurred.

These lands support cattle and consist of open areas of grasses with intermittent growths of honey mesquite, huisache and understory vegetation including granjeno, colima, tasajillo (Opuntia leptocaulisi), and Texas prickly pear. This area is located east of Browne Rd. (See Exhibit 10A-10S Vegetation Analysis Map Based on EMST). Mesquite and huisache range in height from approximately 15-ft. to 30-ft. tall. The dbh ranges from approximately three to six inches with a five to 20 percent cover at this area. Brush cover consisting of the same tree species is less than 30 percent. Herbaceous layer is typically dominated by buffelgrass which provide up to approximately 60 to 75 percent of the ground cover and no large woody debris was noted at this site.

The condition of the existing small patches of rangeland habitat ranges from poor to marginal for the ocelot and Gulf Coast jaguarundi. This small patch of honey mesquite-huisache mix consists of open understory and does not meet habitat requirements for the ocelot and Gulf Coast jaguarundi. However, this habitat could be used by ocelot and Gulf Coast jaguarundi to travel to more optimal habitats. Also, this habitat is important for resting, feeding, and nesting for resident and migratory avifauna.

Urban High Intensity- This type consists of built-up areas and wide transportation corridors that are dominated by impervious cover. For the proposed project, Urban High Intensity Type consisted of the Border Patrol Station, existing roadway, maintained transportation vegetation, maintained salt flat vegetation, and wetlands. Maintained vegetation within the project area is generally dominated by Bermudagrass, buffelgrass, sandbur (Cenchrus spinifex), guineagrass, common sunflower, Mexican hat (Ratibida columnifera), and Western ragweed. Road density (km of road/km2) for existing primary paved roads types (FM 1419, FM 3068, and SH 4) within the action area is 0.77 km/km2.

Urban Low Intensity- This type includes areas that are built-up but not entirely covered by impervious cover, and includes most of the non-industrial areas within cities and towns. Urban Low Intensity type is the existing ROW (not including the paved roadway) and residential areas.

Open Water- Large lakes, rivers, marine waters and ephemeral ponds may be mapped as open water. This type may support vegetation with pioneering species such as black willow, cottonwood, Chinese tallow, seepweed, sea ox-eye daisy, saltwort, rushes, sedges, cattails, and spikerushes. Within the project limits, open waters consist of non-jurisdictional waters (drainage ditch waters) and jurisdictional waters (resaca waters).

An approximate total of 126.9 acres would be impacted by the proposed project of which the majority, approximately 40.8 acres would consist of row crops, approximately 0.7 acres of South Texas: Clayey Mesquite Mixed Shrubland, approximately 33.8 acres of South Texas: Disturbance Grassland, approximately 18.2 acres of Urban High Intensity, approximately 32.2 acres of Urban Low Intensity, and approximately 1.2 acres of open water. The action area does not include critical habitat for any federal listed threatened or endangered species. Table 10 shows the summary of potential vegetation/wildlife habitat impacts.

Table 10: Summary of Vegetation Types within the Existing and Proposed ROW Impacted (Build Alternative)

Vegetation Types	Approximate Impacts (Acres)
Row Crops	40.8
South Texas: Clayey Mesquite Mixed Shrubland	0.7
South Texas: Disturbance Grassland	33.8
Urban High Intensity (paved roadway)	18.2
Urban Low Intensity (Incl. residences/maintained ROW)	32.2
Open Water	1.2
Total Potential Impact	**126.9**

Wildlife

Wildlife heard or seen within the project area during the site visits include: Long-tailed Weasel (*Mustella frenata*), Great Egret (*Casmerodius albus*), Northern Bobwhite (*Colinus virginianus*), Red-winged Blackbird (*Agelaius phoeniceus*), Great-tailed Grackle (*Quisccalus mexicanus*), Killdeer (*Charadrius vociferus*), Northern Mockingbird (*Mimus polyglottos*), Olive Sparrow (*Arremonops rufivirgatus*), Common Night hawk (*Chordeiles minor*), Northern Cardinal (*Cardinalis cardinalis*), Mourning Dove (*Zenaida asiatica*), Inca Dove (*Columbina inca*), White-tipped Dove (*Leptotila verreauxi*), Great Kiskadee (*Pitangus sulphuratus*), Black Vulture (*Coragyps atratus*), White-eyed Vireo (*Vireo griseus*), Golden-fronted Woodpecker (*Melanerpes aurifrons*), Brown-headed Cowbird (*Molothrus aeneus*), Black-bellied Whistling-duck (*Dendrocygna autumnalis*), eastern cotton-tail rabbit (*Sylvilagus floridanus*), and North American opossum (*Didelphus virginiana*) (road kill).

Managed lands located near the project area include: Audubon Society's Sabal Palm Grove Sanctuary, the Nature Conservancy's Lennox Foundation Southmost Preserve, several tracts of the LRGV NWR Complex, and the TPWD Las Palomas WMA – Voshell Unit. The closest of these is the Sabal Palm Grove Sanctuary which is located 0.16 of a mile southwest of the intersection of FM 3068 and FM 1419. It provides habitat for a number of endangered, threatened, and rare species that include the Brownsville Common Yellowthroat (*Geothlypis trichas insperata*), Lomita Carolina Wren (*Thyrothorus ludovicianus lomitensis*), southern yellow bat (*Lasiurus ega*), Texas tortoise (*Gopherus berlandieri*), Coues' rice rat (*Oryzomys couesi*), speckled racer (*Drymobius margaritiferus*), black-spotted newt (*Notophthalmus meridionalis*), ocelot, and Gulf Coast jaguarundi (Source: Southmost Preserve website).

Wildlife in the area may include those species typically found in rural settings. No additional displacement or fragmentation of wildlife habitat is expected to occur due to the existing rural

development and current traffic levels within the project limits. To avoid affects to migratory birds and their habitat, construction should be avoided during the peak-nesting season.

3.21.1 Environmental Consequences – No Build Alternative

Under the No-Build, alternative construction of SH 32 would not occur; thus, project-related impacts to vegetation and wildlife habitat would also not occur. Development in the project area would continue as projected and vegetation and wildlife habitat in the project area would continue the ongoing conversion trend from brushland and rangeland to agricultural, residential and commercial properties.

3.21.2 Environmental Consequences –Build Alternative

As presented in **Table 10** Summary of Vegetation Types within the Existing and Proposed ROW Impacted (Build Alternative)

The proposed project would require the conversion of approximately 108.7 acres of wildlife habitat which include approximately 40.8 acres would consist of row crops, approximately 0.7 acres of South Texas: Clayey Mesquite Mixed Shrubland, approximately 33.8 acres of South Texas: Disturbance Grassland, approximately 32.2 acres of Urban Low Intensity, approximately 1.2 acres of open water (1.077 acres drainage waters and 0.123 of an acre of open waters at Resaca de la Palma). The action area does not include critical habitat for any federal listed threatened or endangered species. Potential habitat impacts for threatened/endangered species are discussed in Section 3.22.

Wildlife habitat occurs at Resaca de la Palma and at the drainage features within the limits of the project. Mitigation proposed for impacts to riparian vegetation at the resaca includes replanting with native vegetation to re-establish riparian corridor and would be done in conjunction with a proposed wildlife crossing. Plantings of 0.008 of an acre, to be used would be similar (composition, density) to those found at the existing riparian area along Resaca de la Palma and would be plant species and sizes readily available at local nurseries. Other vegetation types in the project area are widespread in the area surrounding the project and in the South Texas region. Therefore, no mitigation for impacts to common vegetation types are proposed at this time other than the mitigation discussed below.

Mitigation, Minimization and Avoidance

During construction of the project, clearing of vegetation will be avoided or minimized where possible. Areas adjacent to the proposed project that are cleared during construction will be reseeded using native species as quickly as possible upon completion of construction activities. This measure would control soil erosion and re-establish stable vegetation communities designed to prevent the establishment of invasive species (i.e., in accordance with Executive Order 13112). Proposed measures to minimize effects to sensitive habitats include the use of BMPs to reduce erosion and sediment loading of nearby drainages. Where applicable, landscaping measures and practices will be developed in accordance with the Executive Memorandum on Beneficial Landscaping.

3.22 Threatened and Endangered Species

The Endangered Species Act (ESA) of 1973 was designed to protect critically imperiled species from extinction as a "consequence of economic growth and development unhampered by adequate concern and conservation." Through Federal action and by encouraging the establishment of State programs, the 1973 ESA provided for the conservation of ecosystems upon which threatened and endangered species of wildlife depend.

The TPWD Annotated County List of Rare Species for Cameron County (last revised 3/31/2015) was obtained from the TPWD official website on August 13, 2015. **Table 11** summarizes species, which are listed as endangered or threatened by the USFWS or the TPWD, and their federal and state status and project effect. It also includes a number of state listed rare species with known occurrence records within the project area. Each of these species is considered by these agencies as having the potential to occur in Cameron County.

Table 11 : Federal and State listed Threatened and Endangered Species and Species of Concern in Cameron County

Species	Habitat	Habitat Present	Effect	Pertinent Project Information	BMP
AMPHIBIANS					
Black-spotted newt *Notophthalmus meridionalis* ST	can be found in wet or sometimes wet areas, such as arroyos, canals, ditches, or even shallow depressions; aestivates in the ground during dry periods; Gulf Coastal Plain south of the San Antonio River	Yes	May Impact	Suitable habitat for this species occurs within the project limits. NDD EOR: East Brownsville, Palmito Hill, and Southmost Quads. EO Id: 1378, 567, 6392, 2616, 8166	None
Mexican treefrog *Smilisca baudinii* ST	Subtropical region of extreme southern Texas; breeds May-October coinciding with rainfall, eggs laid in temporary rain pools. Wooded or brushy areas along streams, resacas, and roadside ditches.	Yes	May Impact	Suitable habitat for this species occurs within the project limits. NDD EOR: East Brownsville and Southmost Quads. EO Id: 3594, 6149	None
Sheep frog *Hypopachus variolosus* ST	predominantly grassland and savanna; moist sites in arid areas	Yes	May Impact	Suitable habitat for this species occurs within the project limits. NDD EOR: East Brownsville and Palmito Hill Quads. EO Id: 3742, 3536	None
South Texas siren (large form) *Siren sp.1* ST	wet or sometimes wet areas, such as arroyos, canals, ditches, or even shallow depressions; aestivates in the ground during dry periods, but does require some moisture to remain; southern Texas south of Balcones Escarpment; breeds February-June	Yes	May Impact	Suitable habitat for this species occurs within the project limits. NDD EOR: East Brownsville and Southmost Quads. EO Id: 5392, 3355, 1752	None
White-lipped frog *Leptodactylus fragilis* ST	Generally occupies a variety of undisturbed grassland habitats with moist microclimates	No	No Impact	Due to the disturbed conditions within the project area, suitable habitat for this species does not occur within the project limits.	

Table 11 : Federal and State listed Threatened and Endangered Species and Species of Concern in Cameron County					
Species	**Habitat**	**Habitat Present**	**Effect**	**Pertinent Project Information**	**BMP**
BIRDS					
American Peregrine Falcon *Falco peregrinus anatum* DL/ST	Breeds in mountains of West Texas; uses arid grasslands, rivers, estuaries, and lakes during migration	No	No Effect	Occurrence in the project considered incidental during migration.	
Arctic Peregrine Falcon *Falco peregrinus tundrius* DL/SGCN	Uses seacoasts, lakes, rivers, and coastal prairies during migration only	No	No Effect	Occurrence in the project considered incidental during migration.	
Audubon's Oriole *Icterus graduacauda audubonii* SGCN	scrub, mesquite; nests in dense trees, or thickets, usually along water courses	No	No Impact	Suitable habitat for this species does not occur within the project limits.	
Brown Pelican *Pelecanus occidentalis* DL/SGCN	largely coastal and near shore areas, where it roosts and nests on islands and spoil banks	No	No Effect	Suitable habitat for this species does not occur within the project limits.	
Brownsville Common Yellowthroat *Geothlypis trichas insperata* SGCN	tall grasses and bushes near ponds, marshes, and swamps; breeding April to July	Yes	May Impact	Common Yellowthroat was not observer or heard during site visits.	Bird BMPs
Cactus Ferruginous-Pygmy Owl *Glaucidium brasilianum cactorum* ST	Prefers remote oak woodlands and thorn woodlands associated with the Rio Grande	No	No Impact	Suitable habitat for this species does not occur within the project limits.	
Common Black-Hawk *Buteogallus anthracinus* ST	cottonwood-lined rivers and streams; willow tree groves on the lower Rio Grande floodplain; formerly bred in south Texas	No	No Impact	Suitable habitat for this species does not occur within the project limits.	
Eskimo Curlew *Numenius borealis* FE/SE	historic migratory bird; non-breeding; inhabits grasslands, pastures, plowed fields, and less frequently, marshes and mudflats.	No	No Effect	Could migrate over area, but would not be expected to be affect.	

Table 11 : Federal and State listed Threatened and Endangered Species and Species of Concern in Cameron County					
Species	**Habitat**	**Habitat Present**	**Effect**	**Pertinent Project Information**	**BMP**
Gray Hawk *Asturina nitida* ST	locally and irregularly along U.S.-Mexico border; mature riparian woodlands and nearby semiarid mesquite and scrub grasslands; breeding range formerly extended north to southernmost Rio Grande floodplain of Texas.	Yes	No Impact	Species was not observer or heard during site visits. Could migrate over area, but would not be expected to be impacted.	Bird BMPs
Interior Least Tern *Sterna antillarum athalassos* FE/SE	subspecies is listed only when inland (more than 50 miles from a coastline); nests along sand and gravel bars within braided streams, rivers; also know to nest on man-made structures (inland beaches, wastewater treatment plants, gravel mines, etc.); eats small fish and crustaceans, when breeding forages within a few hundred-ft. of colony	No	No effect	Within the limits of the project, there is no typical vegetation or landscapes used for resting or feeding areas. Suitable habitat for this species does not occur within the project limits.	
Northern Aplomado Falcon *Falco femoralis septentrionalis* FE/SE	open country, especially savanna and open woodland, and sometimes in very barren areas; grassy plains and valleys with scattered mesquite, yucca, and cactus; nests in old stick nests of other bird species	Yes	May affect, not likely to adversely affect	Potential suitable habitat for this species occurs at the northern end of the project limits. Species was not observed or heard within the project area during any of the site visits and occurrence in the project would be considered incidental during migration. NDD EOR: East Brownsville and Palmito Hill Quads. EO Id: 5542	None
Northern Beardless-Tyrannulet *Camptostoma imberbe* ST	Riparian woodlands and wooded edges dominated by mesquite	Yes	May Impact	Potential habitat found in the small area of riparian woodlands associated with Resaca de la Palma. The species was not confirmed as present within the project site during any of the site visits.	Bird BMPs

Table 11 : Federal and State listed Threatened and Endangered Species and Species of Concern in Cameron County					
Species	**Habitat**	**Habitat Present**	**Effect**	**Pertinent Project Information**	**BMP**
Peregrine Falcon *Falcon peregrinus* DL/ST	both subspecies migrate across the state from more northern breeding areas in US and Canada to winter along coast and farther south; subspecies (F. p. anatum) is also a resident breeder in west Texas; the two subspecies' listing statuses differ, F.p. tundrius is no longer listed in Texas; but because the subspecies are not easily distinguishable at a distance, reference is generally made only to the species level; see subspecies for habitat.	No	No Effect	The species was not confirmed as present within the project site during any of the site visits. Occurrence in the project considered incidental during migration.	
Piping Plover *Charadrius melodus* FT/ST	wintering migrant along the Texas Gulf Coast; beaches and bayside mud or salt flats	No	No Effect	Suitable habitat for this species does not occur within the project limits.	
Red-crowned Parrot *Amazona viridigenalis* C	Large leafy trees for roosting, prefers high cavities in Washintonian Palms for nest sites, will nest in lower cavities and in other palms and trees	Yes	May Impact	Potential habitat for this species is found in palm trees and riparian vegetation. The species was not confirmed as present within the project site during any of the site visits.	None
Red Knot *Calidris canutus rufa* FT	Tidal flats, shores; tundra (summer).During migration and winter on coastal mudflats and tidal zones, sometimes on open sandy beaches of the sort favored by Sanderlings. Nests on Arctic tundra, usually on rather high and barren areas inland from coast, but typically near a pond or stream.	No	No Effect	Suitable habitat for this species does not occur within the project limits.	
Reddish Egret *Egretta rufescens* ST	Inhabits various estuarine habitats such as mudflats, marshes, and tidal ponds	No	No Impact	Suitable habitat for this species does not occur within the project limits. The species was not confirmed as present within the project sitvee.	
Rose-throated Becard *Pachyramphus aglaiae* ST	Mature riparian woodlands	Yes	May Impact	The species was not confirmed as present within the project site.; however, potential habitat occurs in the area of riparian woodlands associated with Resaca de la Palma	Bird BMPs
Sennett's Hooded Oriole *Icterus cucullatus sennetti* SGCN	Often builds nests in and of Spanish moss; feeds on invertebrates, fruit, and nectar; breeding March to August	No	No Impact	Suitable habitat for this species does not occur within the project limits. The species was not confirmed as present within the project site. EO Id: 10910, 10889, 10928, 10929.	

Table 11 : Federal and State listed Threatened and Endangered Species and Species of Concern in Cameron County					
Species	**Habitat**	**Habitat Present**	**Effect**	**Pertinent Project Information**	**BMP**
Snowy Plover *Charadrius alexanfriunus* SGCN	Two subspecies recognized in North America *Charadrius alexandrinus nivosus* and *C. a. tenuirostris* (see below).	No	No Impact	Suitable habitat for this species does not occur within the project limits.	
Sooty Tern *Sterna fuscata* ST	predominately 'on the wing'; does not dive, but snatches small fish and squid with bill as it flies or hovers over water; breeding April-July	No	No Impact	Suitable habitat for this species does not occur within the project limits.	
Southeastern Snowy Plover *Charadrius alexandrinus tenuirostris* SGCN	wintering migrant along the Texas Gulf Coast beaches and bayside mud or salt flats	No	No Impact	Suitable habitat for this species does not occur within the project limits.	
Sprague's Pipit *Anthus spragueii* C/SGCN	Only in Texas during migration and winter, mid-September to early April; short to medium distance, diurnal migrant; strongly tied to native upland prairie, can be locally common in coastal grasslands, uncommon to rare further west; sensitive to patch size and avoids edges.	Yes	No Impact	Suitable habitat for this species does occur within the project limits. The species was not confirmed as present within the project site. Occurrence in the project considered incidental during migration.	None
Texas Botteri's Sparrow *Aimophila botterii texana* ST	grassland and short-grass plains with scattered bushes or shrubs, sagebrush, mesquite, or yucca; nests on ground of low clump of grasses	Yes	May Impact	The species was not confirmed as present within the project site; however, potential suitable habitat for this species occurs within the project limits.	Bird BMPs
Tropical Parula *Parula pitiayumi* ST	dense or open woods, undergrowth, brush, and trees along edges of rivers and resacas; breeding April to July	Yes	May Impact	The species was not confirmed as present within the project site; potential suitable habitat for this species occurs within the project limits.	Bird BMPs
Western Burrowing Owl *Athene cunicularia hypugaea* SGCN	open grasslands, especially prairie, plains, and savanna, sometimes in open areas such as vacant lot near human habitation or airports; nests and roosts in abandoned burrows	Yes	May Impact	No Burrowing Owls were observed within the project area during any of the site visits. Occurrence in the project considered incidental during migration,	Bird BMPs
Western Snowy Plover *Charadrius alexandrinus nivosus* SGCN	uncommon breeder in the Panhandle; potential migrant; winter along coast	No	No Impact	Suitable habitat for this species does not occur within the project limits.	

Table 11 : Federal and State listed Threatened and Endangered Species and Species of Concern in Cameron County					
Species	**Habitat**	**Habitat Present**	**Effect**	**Pertinent Project Information**	**BMP**
White-faced Ibis *Plegadis chihi* ST	prefers freshwater marshes, sloughs, and irrigated rice fields, but will attend brackish and saltwater habitats; nests in marshes, in low trees, on the ground in bulrushes or reeds, or on floating mats	No	No Impact	Suitable habitat for this species does not occur within the project limits.	
White-tailed Hawk *Buteo albicaudatus* ST	near coast on prairies, cordgrass flats, and scrub-live oak; further inland on prairies, mesquite and oak savannas, and mixed savanna-chaparral; breeding March-May	Yes	May Impact	The species was not confirmed as present within the project site; however, potential suitable habitat for this species occurs within the project limits. Occurrence in the project considered incidental during migration. NDD EOR: Palmito Hill Quad. EO Id: 8274	Bird BMPs
Wood Stork *Mycteria americana* ST	forages in prairie ponds, flooded pastures or fields, ditches, and other shallow standing water, including salt-water; usually roosts communally in tall snags, sometimes in association with other wading birds (i.e. active heronries); breeds in Mexico and birds move into Gulf States in search of mud flats and other wetlands, even those associated with forested areas; formerly nested in Texas, but no breeding records since 1960	Yes	May Impact	The species was not confirmed as present within the project site; however, potential suitable habitat for this species occurs within the project limits. Could use Resaca de la Palma. Occurrence in the project considered incidental during migration	Bird BMPs
Zone-tailed Hawk *Buteo albonotatus* ST	arid open country, including open deciduous or pine-oak woodland, mesa or mountain county, often near watercourses, and wooded canyons and tree-lined rivers along middle-slopes of desert mountains; nests in various habitats and sites, ranging from small trees in lower desert, giant cottonwoods in riparian areas, to mature conifers in high mountain regions	No	No Impact	Suitable habitat for this species does not occur within the project limits. Occurrence in the project considered incidental during migration	

Table 11 : Federal and State listed Threatened and Endangered Species and Species of Concern in Cameron County					
Species	**Habitat**	**Habitat Present**	**Effect**	**Pertinent Project Information**	**BMP**
FISH					
American eel *Anguilla rostrata* SGCN	coastal waterways below reservoirs to gulf; spawns January to February in ocean, larva move to coastal waters, metamorphose, then females move into freshwater; most aquatic habitats with access to ocean, muddy bottoms, still waters, large streams, lakes; can travel overland in wet areas; males in brackish estuaries, diet varies widely, geographically, and seasonally	No	No Impact	Suitable habitat for this species does not occur within the project limits.	
Mexican goby *Ctenogobius claytonii* ST	southern coastal area; brackish and freshwater coastal streams	No	No Impact	Suitable habitat for this species does not occur within the project limits.	
Rio Grande shiner *Notropis jemezanus* SGCN	Rio Grande and upper Pecos River basins; large, open, weedless rivers or large creeks with bottom of rubble, gravel and sand, often overlain with silt	No	No Impact	Suitable habitat for this species does not occur within the project limits.	
Opossum pipefish *Microphis brachyurus* ST	brooding adults found in fresh or low salinity waters and young move or are carried into more saline waters after birth; southern coastal areas	No	No Impact	Suitable habitat for this species does not occur within the project limits.	
Rio Grande silvery minnow *Hybognathus amarus* FE/SE	extirpated; historically Rio Grande and Pecos River systems and canals; pools and backwaters of medium to large streams with low or moderate gradient in mud, sand, or gravel bottom; ingests mud and bottom ooze for algae and other organic matter; probably spawns on silt substrates of quiet coves	No	No Effect	Extirpated species. NDD EOR: East Brownsville, and Southmost Quads. Eo Id: 2794	
River goby *Awaous banana* ST	southern coastal waters; clear water with slow to moderate current, sandy or hard bottom, and little or no vegetation; also enters brackish and ocean waters	No	No Impact	Suitable habitat for this species does not occur within the project limits.	

Table 11 : Federal and State listed Threatened and Endangered Species and Species of Concern in Cameron County					
Species	**Habitat**	**Habitat Present**	**Effect**	**Pertinent Project Information**	**BMP**
Smalltooth sawfish *Pristis pectinata* FE/SE	different life stages have different patterns of habitat use; young found very close to shore in muddy and sandy bottoms, seldom descending to depths greater than 32 ft; in sheltered bays, on shallow banks, and in estuaries or river mouths; adult sawfish are encountered in various habitat types (mangrove, reef, seagrass, and coral), in varying salinity regimes and temperatures, and at various water depths, feed on a variety of fish species and crustaceans	No	No Effect	Suitable habitat for this species does not occur within the project limits.	
MAMMALS					
Coues' rice rat *Oryzomys couesi* ST	cattail-bulrush marsh with shallower zone of aquatic grasses near the shoreline; shade trees around the shoreline are important features; prefers salt and freshwater, as well as grassy areas near water; breeds April-August	Yes	May Impact	The species was not confirmed as present within the project site; however, potential suitable habitat for use by this species occurs within the project limits.	None
Ghost-faced bat *Mormoops megalophylla* SGCN	colonially roosts in caves, crevices, abandoned mines, and buildings; insectivorous; breeds late winter-early spring; single offspring born per year	No	No Impact	Suitable habitat for this species does not occur within the project limits.	
Jaguar *Panthera onca* FE/SE	extirpated; dense chaparral; no reliable TX sightings since 1952	No	No Effect	Extirpated species.	

Table 11 : Federal and State listed Threatened and Endangered Species and Species of Concern in Cameron County					
Species	**Habitat**	**Habitat Present**	**Effect**	**Pertinent Project Information**	**BMP**
Gulf Coast jaguarundi *Herpailurus yagouaroundi cacomitli* FE/SE	thick brushlands, near water favored; six month gestation, young born twice per year in March and August	No	May affect, not likely to adversely affect.	The species was not confirmed as present within the project site and optimal habitat for this species does not occur within project limits, but the species may traverse the project area in order to move between optimal habitats. NDD EOR: East Brownsville and Southmost Quads. Eo Id: 3768, 7020	As recommended by USFWS, a wildlife/cat crossing and fencing would be provided at Resaca de La Palma. In addition, at Resaca de la Palma, replanting would occur with native species to re-establish the riparian corridor.
Mexican long-tongued bat *Choeronycteris Mexicana* SGCN	deep canyons where uses caves and mine tunnels as day roosts; also found in buildings and often associated with big-eared bats (*Plecotus* spp.), most commonly found in desert canyons, where vegetation like ocotillo, yucca, agave, manzanita, evergreen oak, and juniper occurs	No	No Impact	Only a few specimens have been recorded from Texas.	

Table 11 : Federal and State listed Threatened and Endangered Species and Species of Concern in Cameron County					
Species	**Habitat**	**Habitat Present**	**Effect**	**Pertinent Project Information**	**BMP**
Ocelot *Leopardus pardalis* FE/SE	dense chaparral thickets; mesquite-thorn scrub and live oak mottes; avoids open areas; breeds and raises young June-November	No	May affect, not likely to adversely affect.	The species was not confirmed as present within the project area and optimal habitat for this species does not occur within project limits, but the species may traverse the project area in order to move between optimal habitats. NDD EOR: East Brownsville, Southmost, and Palmito Hill Quads. Eo Id: 726, 881, 697	As recommended by USFWS, a wildlife/cat crossing and fencing would be provided at Resaca de La Palma. In addition, at Resaca de la Palma, replanting would occur with native species to re-establish the riparian corridor.
Plains spotted skunk *Spilogale putorius interrupta* SGCN	Catholic; open fields, prairies, croplands, fence rows, farmyards, forest edges, and woodlands; prefers wooded, brushy areas and tallgrass prairie	Yes	May Impact	Since skunks utilize a variety of habitats and could potentially occur within the project area. No Plains Spotted Skunks were observed within the project area during any of the site visits.	Contractors will be advised of potential occurrence in the project area, and to avoid harming the species if encountered, and to avoid unnecessary impacts to dens.

Table 11 : Federal and State listed Threatened and Endangered Species and Species of Concern in Cameron County					
Species	**Habitat**	**Habitat Present**	**Effect**	**Pertinent Project Information**	**BMP**
Southern yellow bat *Lasiurus ega* ST	associated with trees, such as palm trees (*Sabal mexicana*) in Brownsville, which provide them with daytime roosts; insectivorous; breeding in late winter	Yes	May Impact	The species was not confirmed as present within the project area but potential suitable habitat for this occurs within the project limits. NDD EOR: East Brownsville, Palmito Hill, and Southmost Quads. Eo Id: 6796, 2619, 4572	Bridge Bat BMPs, and Tree Bat BMPs
West Indian manatee *Trichechus manatus* FE/SE	Gulf and Bay system; opportunistic, aquatic herbivore	No	No Effect	Suitable habitat for this species does not occur within the project limits.	
White-nosed coati *Nasua narica* ST	woodlands, riparian corridors and canyons; most individuals in Texas probably transients from Mexico; diurnal and crepuscular; very sociable; forages on ground and in trees; omnivorous; may be susceptible to hunting, trapping, and pet trade.	Yes	May Impact	Suitable habitat occurs at Resaca de la Palma.	None
MOLLUSKS					
False spike mussel *Quincuncina mitchelli* ST	substrates of cobble and mud, with water lilies present; Rio Grande, Brazos, Colorado, and Guadalupe (historic) river basins	No	No Impact	Suitable habitat for this species does not occur within the project limits.	
Salina mucket *Potamilus metnecktayi* ST	lotic waters; submerged soft sediment (clay and silt) along river banks; other habitat requirements are poorly understood; Rio Grande Basin	No	No Impact	Suitable habitat for this species does not occur within the project limits.	
Texas hornshell *Popenaias popeii* Federal Candidate Species/State listed Threatened	both ends of narrow shallow runs over bedrock, in areas where small-grained materials collect in crevices, along river banks, and at the base of boulders; not known from impoundments; Rio Grande Basin and several rivers in Mexico	No	No Effect	Suitable habitat for this species does not occur within the project limits.	
REPTILES					
Atlantic hawksbill sea turtle *Eretmochelys imbricata* FE/ST	Gulf and bay system	No	No Effect	Suitable habitat for this species does not occur within the project limits.	

Table 11 : Federal and State listed Threatened and Endangered Species and Species of Concern in Cameron County					
Species	**Habitat**	**Habitat Present**	**Effect**	**Pertinent Project Information**	**BMP**
Black-striped snake *Coniophanes imperialis* ST	extreme South Texas; semi-arid coastal plain, warm, moist micro-habitats and sandy soils; proficient burrower; eggs laid April- June	Yes	May Impact	The species was not confirmed as present within the project site but potential suitable habitat for this species occurs within the project limits. NDD EOR: East Brownsville, Southmost, Palmito Hill Quads. Eo Id: 142, 6261, 1311, 2830, 4311, 6292.	Reptile BMPs
Green sea turtle *Chelonia mydas* FT/ST	Gulf and bay system	No	No Effect	Suitable habitat for this species does not occur within the project limits.	
Keeled earless lizard *Holbrookia propinqua* SGCN	coastal dunes, barrier islands, and other sandy areas; eats insects and likely other small invertebrates; eggs laid underground March-September (most May-August)	No	No Impact	Suitable habitat for this species does not occur within the project limits.	
Kemp's Ridley sea turtle *Lepidochelys kempii* FE/SE	Gulf and bay system	No	No Effect	Suitable habitat for this species does not occur within the project limits.	
Leatherback sea turtle *Dermochelys coriacea* FE/SE	Gulf and bay system	No	No Effect	Suitable habitat for this species does not occur within the project limits.	
Loggerhead sea turtle *Caretta caretta* FT/ST	Gulf and bay system	No	No Effect	Suitable habitat for this species does not occur within the project limits.	
Northern cat-eyed snake *Leptodeira septentrionalis* ST	Gulf Coastal Plain south of the Nueces River; thorn brush woodland; dense thickets bordering ponds and streams; semi-arboreal; nocturnal	Yes	May Impact	The species was not confirmed as present within the project site but potential suitable habitat for the species occurs within the project limits. NDD EOR: East Brownsville and Southmost Quads. Eo Id: 4888	Reptile BMPs

Table 11 : Federal and State listed Threatened and Endangered Species and Species of Concern in Cameron County					
Species	**Habitat**	**Habitat Present**	**Effect**	**Pertinent Project Information**	**BMP**
Speckled racer *Drymobius margaritiferus* ST	extreme south Texas; dense thickets near water, Texas palm groves, riparian woodlands; often in areas with much vegetation litter on ground; breeds April-August	Yes	May Impact	The species was not confirmed as present within the project site, but potential suitable habitat occurs within the project limits. NDD EOR: East Brownsville, Southmost, and Palmito Hill Quads. Eo Id: 5937, 3087, 823, 1626, 5630, 9754.	Reptile BMPs
Texas horned lizard *Phrynosoma cornutum* ST	open, arid and semi-arid regions with sparse vegetation, including grass, cactus, scattered brush or scrubby trees; sandy to rocky soil.	Yes	May Impact	The species was not confirmed as present within the project site, but potential suitable habitat for this species occurs within the project limits. NDD EOR: Southmost and Palmito Hill Quads. EO Id: 1608, 8284, 8285, 8286, 8287, 8288	Contractors will be advised of potential occurrence in the project area, and to avoid harming the species if encountered. This should include avoiding harvester ant mounds in the selection of Project Specific Locations (PSLs) where feasible.

Table 11 : Federal and State listed Threatened and Endangered Species and Species of Concern in Cameron County					
Species	**Habitat**	**Habitat Present**	**Effect**	**Pertinent Project Information**	**BMP**
Texas indigo snake *Drymarchon melanurus erebennus* ST	Texas south of the Guadalupe River and Balcones Escarpment; thornbush-chaparral woodlands of south Texas, in particular dense riparian corridors; can do well in suburban and irrigated croplands if not molested or indirectly poisoned; requires moist microhabitats, such as rodent burrows, for shelter	Yes	May Impact	The species was not confirmed as present within the project site, but suitable habitat for this species occurs within the project limits. NDD EOR: Palmito Hill and Southmost Quads. EO Id: 7926, 4511, 7547	Contractors will be advised of potential occurrence in the project area, and to avoid harming the species if encountered.
Texas scarlet snake *Cemophora coccinea lineri* ST	mixed hardwood scrub on sandy soils; feeds on reptile eggs; semi-fossorial; active April-September	No	No Impact	Suitable habitat for this species does not occur within the project limits.	

Table 11 : Federal and State listed Threatened and Endangered Species and Species of Concern in Cameron County					
Species	**Habitat**	**Habitat Present**	**Effect**	**Pertinent Project Information**	**BMP**
Texas tortoise *Gopherus berlandieri* ST	open brush with a grass understory is preferred; open grass and bare ground are avoided; when inactive occupies shallow depressions at base of bush or cactus, sometimes in underground burrows or under objects; longevity greater than 50 years; active March-November; breeds April-November	Yes	May Impact	The species was not confirmed as present within the project site but suitable habitat for this species occurs within the project limits. NDD EOR: East Brownsville, Palmito Hill and Southmost Quads. EO Id: 5998, 3544, 4711, 5070, 1716, 8278, 8279, 8281, 9397, 9402	Contractors will be advised of potential occurrence in the project area, and to avoid harming the species if encountered. Utility trenches should be covered overnight to prevent tortoises from being trapped. Utility trenches should be visually inspected before filling to avoid burial of the species.
PLANTS					
Bailey's ballmoss *Tillandsia baileyi* SGCN	an epiphytic species on various trees and shrubs; flowering February-May	No	No Impact	Species of trees/shrubs that the species typically grows on do not occur within any area that would be impacted by the project. NDD EOR: Palmito Hill Quad. EO Id: 8199	
Buckley's spiderwort *Tradescantia buckleyi* SGCN	Occurs on sandy loam or clay soils in grasslands or shrublands underlain by the Beaumount Formation.	No	No Impact	Suitable habitat for this species does not occur within the project limits.	

Table 11 : Federal and State listed Threatened and Endangered Species and Species of Concern in Cameron County					
Species	**Habitat**	**Habitat Present**	**Effect**	**Pertinent Project Information**	**BMP**
Green Island echeandia *Echeandia texensis* SGCN	Most commonly encountered among shrubs or in grassy openings in subtropical thorn shrublands on somewhat saline clay of lomas along the Gulf Coast near the mouth of the Rio Grande.	No	No Impact	This species is more likely to be found on clay lomas near the mouth of the Rio Grande. NDD EOR: East Brownsville Quad. EO Id: 4505	
Lila de los llanos *Echeandia chandleri* SGCN	grasslands and openings in subtropical woodlands and brush on clay soils; common in windblown saline clay on lomas near mouth of Rio Grande	No	No Impact	Suitable habitat for this species does not occur within the project limits. NDD EOR: East Brownsville and Palmito Hill Quads. EO Id: 4310, 2736, 7181, 7880, 3961, 7039, 462, 395, 5583, 5582, 1835	
Mexican mud-plantain *Heteranthera Mexicana* SGCN	Wet clay soils of resacas and ephermeral wetlands in South Texas; flowering June-December, only after sufficient rainfall	Yes	May Impact	The species was not confirmed as present within the project site, but suitable habitat for this species occurs within the project limits.	None
Plains gumweed *Grindelia oolepis* SGCN	endemic; prairies and grasslands on black clay soils of the Gulf Coastal Bend	No	No Impact	Suitable habitat for this species does not occur within the project limits. The species was not confirmed as present within the project site; NDD EOR: East Brownsville Quad. EO Id: 1352, 4681, 4326,	
Runyon's cory cactus *Coryphantha macromeris var runyonii* SGCN	endemic; low hills and flats on gravelly soils in Tamaulipan shrub communities along the Rio Grande	No	No Impact	The species was not confirmed as present within the project area and suitable habitat for this species does not occur within the project limits. NDD EOR: East Brownsville and Southmost Quads. EO Id: 5304	
Runyon's water-willow *Justicia runyonii* SGCN	calcareous silt loam, silty clay, or clay in openings in subtropical woodlands on active or former floodplains	No	No Impact	The species was not confirmed as present within the project site and suitable habitat for the species does not occur within the project limits. NDD EOR: East Brownsville and Southmost Quads. EO Id: 5105, 105, 4130, 1331	
Shinners' rocket *Thelypodiopsis shinnersii* SGCN	mostly found along margins of Tamaulipan thornscrub on clay soils of the Rio Grande Delta, including lomas near the mouths of rivers; flowers mostly March and April.	No	No Impact	Suitable habitat for this species does not occur within the project limits. EO Id: 10374	

Table 11 : Federal and State listed Threatened and Endangered Species and Species of Concern in Cameron County					
Species	**Habitat**	**Habitat Present**	**Effect**	**Pertinent Project Information**	**BMP**
South Texas ambrosia *Ambrosia cheiranthifolia* Federal listed Endangered/State listed Endangered	open prairies and various shrublands on deep clay soils; flowering July-November	No	No Effect	Survey result indicates no suitable habitat for the South Texas ambrosia occurs within the project limits. The species was also not confirmed as present within the project site;	
Star cactus *Astrophytum asterias* Federal listed Endangered/State listed Endangered	gravelly saline clays or loams over the Catahoula and Frio formations, on gentle slopes and flats in grasslands or shrublands; flowering in May	No	No Effect	Suitable habitat for this species does not occur within the project limits.	
Texas ayenia *Ayenia limitaris* Federal listed Endangered/State listed Endangered	woodlands on alluvial deposits on floodplains and terraces along the Rio Grande; flowering throughout the year with sufficient rainfall	No	No Effect	Survey result indicates no suitable habitat for the Texas ayenia occurs within the project limits. The species was also not confirmed as present within the project site. NDD EOR: East Brownsville, and Southmost Quads. EO Id: 7196	

Source: Compiled from TPWD Annotated County Lists of Rare Species: Hidalgo and Willacy (last revision: 8/7/2012). Latest revisions added Keeled earless lizard (SGCN) and removed Vasey's adelia (SGCN) from County listing.
Status Key: FE – Federally Listed Endangered; FT – Federally Listed Threatened; DL – Federally Delisted; C – Federal Candidate for Listing, SE – State Listed Endangered; ST – State Listed Threatened; SGCN- Species of Greatest Conservation Need.

The TPWD's Natural Diversity Database (NDD) for Cameron County was received on August 24, 2015. A review of the NDD and the USGS topographic maps (East Brownsville, Southmost, and Palmito Hill Quadrangles) indicated that the black-spotted newt, South Texas siren (large form), Mexican treefrog, sheep frog, Texas horned lizard, Rio Grande silvery minnow, ocelot, Gulf Coast jaguarundi, black-striped snake, speckled racer, northern cat-eyed snake, Texas indigo snake, Texas tortoise, Texas ebony-anacua series, Texas ebony-snake-eyes-berlandier fiddlewood series, Texas palmetto series, Runyon's water-willow, plains gumweed, Runyon's cory cactus, Vasey's adelia (*Adelia vaseyi*), St. Joseph's staff (*Manfreda longiflora*), Texas ayenia, Bailey's ballmoss, northern Aplomado falcon, White-tailed Hawk, Southern yellow bat, Green Island echeandia, Lila de los llanos, Sennett's Hooded Oriole, Texas stonecrop (*Lenophyllum texanum*), marsh-elder dodder (*Cuscuta attenuate*), Texas milk vetch (*Astragalus reflexus)*, Shiner's rocket, and Wright's trichocoronis (*Trichocoronis wrightii*) have occurrence records listed on the East Brownsville, Southmost, and Palmito Hill Quadrangles.

3.22.1 Environmental Consequences – No Build Alternative

Under the No-Build alternative, there would be no construction of SH 32. If the No Build alternative were chosen short-term effects on Threatened and Endangered species within the proposed project area would not be anticipated.

3.22.2 Environmental Consequences – Build Alternative

Potential Impacts on the biodiversity of the ecosystem including species diversity and genetic diversity.

An ecosystem is any geographic area with all of the living organisms present and the nonliving parts of their physical environment. Biodiversity is the range of variation found among microorganisms, plants, fungi, and animals. It is also the richness of species of living organisms. Species diversity refers to all the differences within and between populations of species, as well as between different species. Genetic diversity is all the different genes contained in all individual plants, animals, fungi, and microorganisms. Genetic diversity occurs within a species as well as between species (Ecological Society of America).

A population bottleneck is a significant reduction in the size of a population that causes the extinction of many genetic lineages within that population, thus decreasing genetic diversity. Population bottlenecks have occurred in the evolutionary history of many species, including humans. Present-day bottlenecks are seen in many endangered species. Endangered species that do not become extinct may expand their numbers later, but with a limited amount of genetic diversity with which to adapt to changing conditions (Population Bottleneck Macmillan Genetics Summary).

Projects that impact corridors (connecting tracts) run the risk of cutting off connectivity to other populations and in the long run may cause some populations to become isolated, which may ultimately lead to a reduction in genetic diversity. Genetic diversity may play a large role in the ability for species to survive/adapt in response to altered environments such as those induced by global climate change (i.e. polar bears).

Due to the small amount of vegetation that would be permanently impacted, it is not anticipated that this removal would have a serious impact on either the species diversity or the genetic diversity of this ecosystem. It is anticipated that vegetation, which would be temporarily impacted, would become reestablished upon project completion.

There are five federally-listed endangered species with occurrence records listed on the East Brownsville, Southmost, and Palmito Hill Quadrangles that include the northern Aplomado falcon, ocelot, Gulf Coast jaguarundi, Texas ayenia, and the Rio Grande silvery minnow (considered extirpated). **Table 11** also list 22 SGCN which are tracked by the state and considered important resources.

Texas ayenia was not confirmed as present within the project site and survey results also indicate no suitable habitat for the Texas ayenia occurs within the project limits; therefore, the proposed project would have no effect on this species. Survey results also indicate no suitable habitat for the south Texas ambrosia occurs within the project limits and the species was also not confirmed as present within the project site.

The project area contains some sub optimal habitat for both the ocelot and the Gulf Coast jaguarundi, which they could use to travel between more optimal habitats. Therefore, the

project may affect these two species of cats but is not likely to adversely affect them. Potential habitat also occurs for the northern Aplomado falcon toward the northeast end of the project and although the species was not observed or heard within the project area during any of the site visits, the species could potentially occur in the project area incidentally during migration. Therefore, it was determined that the proposed project may affect but is not likely to adversely affect the northern Aplomado falcon.

Ocelot

The ocelot is federally and state listed as endangered. No critical habitat rules have been published for the ocelot. It typically inhabits dense brushlands. The NDD indicates occurrence records for this species on the East Brownsville, Southmost, and Palmito Hill Quadrangles.

Optimal habitat for the ocelot consists of dense thornscrub woodlands with mesquite, *Acacia*, *Condalia*, *Castela*, granjeno, cenizo, whitebrush, and numerous other woody species of thornshrub. The optimal structure of this habitat is greater than 95 percent horizontal cover that yields a dense vertical wall of cover in the lowermost stratum, usually no more than 1-1.5 meters above the ground. Sub-optimal habitat consists of dense brush with greater than 75 percent horizontal cover in the first meter or so above ground (Tewes 2004).

There are only two known breeding populations of ocelots in the U.S. (both located in Texas); one in Cameron County and the other in Willacy County (Navarro-Lopez, 1985; Tewes and Everett, 1986; Laack, 1991; Haines et. al., 2006a). A study (Harveson et al 2004) identified the type of habitat needed to sustain ocelot populations and the soil types that could sustain the dense vegetation. The study suggested that the more contiguous brush stand is possible when resource managers concentrate their efforts on restoring ocelot habitat on these or similar soils identified in their study. They found that ocelots selected habitat with dense (>95 percent) canopy cover in greater proportion than available and avoided habitat with open (<75 percent) canopy cover. Ocelots also selected Carmargo, Laredo, Olmito, and Point Isabel soil series in greater proportion than available. These selected soils also represented 82 percent of the selected dense canopy cover areas.

The removal of some riparian habitat (temporary vegetation impact) that could serve as potential screening for ocelots would occur. Ocelots will use other habitat types with less dense cover for short periods of time; this suboptimal habitat could be used to travel between more optimal habitats. Therefore the proposed project may affect, but is not likely to adversely affect, this species.

Gulf Coast jaguarundi

The Gulf Coast jaguarundi is federally and state listed as endangered. No critical habitat rules have been published for the Gulf Coast jaguarundi. The NDD indicates occurrence records for this species on the East Brownsville and Southmost Quadrangles. The optimum habitat for the Gulf Coast jaguarundi is similar to the ocelot.

Ocelot and Gulf Coast jaguarundi Local Distribution:

Reliable reports of ocelots and Gulf Coast jaguarundi have been recorded for this general vicinity of the proposed project. The actual occurrence of endangered cats on the immediate project site is difficult to determine. The overlap in the size of tracks and scat/excrement among the different age/sex classes of ocelots and bobcats creates difficult opportunities for definitive species identification. Overlap among tracks between Gulf Coast jaguarundi and feral house cats create similar identification problems.

Usually a time consuming and expensive trap survey is the only reliable and feasible technique to determine cat presence. Trap surveys are not always conclusive regarding absence of endangered cats. Often, project impacts and modifications can be anticipated without the results of a trap survey.

Northern Aplomado Falcon

Historically the habitat for this species in the U.S. included yucca-covered sand ridges in coastal prairies, riparian woodlands in open grasslands, and in desert grasslands with scattered mesquite and yucca. The nest is a platform built of sticks at any height in a bush or tree. Two or three eggs are laid. Until the 1950s it was found in the extreme southwestern U.S., and reintroduction efforts are underway in West and South Texas as well as New Mexico. The NDD indicates occurrence records for this species on the East Brownsville Quad.

Other Studies Relevant to the Area that include Threatened and/or Endangered Species:

- The *Conservation Area Plan for Boscaje de la Palma*; where the protection and restoration of Sabal palm communities is one of the primary conservation objectives.
- Environmental Assessment SH 48 from SH 100 in Port Isabel to the Shrimp Basin Cameron, County, Texas. November 2004.
- Listed Cats of Texas and Arizona Recovery Plan (with emphasis on the ocelot). USFWS. 1990.
- Draft Ocelot (*Leopardus pardalis*) Recovery Plan, First Revision. USFWS, Southwest Region, Albuquerque, New Mexico. 2010.

Formal Consultation with the USFWS was initiated on September 16, 2010 and a Biological Assessment has been prepared due to potential impacts to the ocelot and Gulf Coast jaguarundi. Initial recommendation from the USFWS was to provide a wildlife/cat crossing and fencing at Resaca de La Palma. In February 19, 2015, the USFWS concurred with TxDOT's conclusion that the proposed project may affect, but is not likely to adversely affect the ocelot, Gulf Coast jaguarundi, or northern Aplomado falcon and agreed with TxDOT's voluntary conservation measures to minimize impacts to these species in addition to the installation of the wildlife crossing. Refer to **Appendix D** Agency Coordination for a copy of the letter. The following voluntary conservation measures have been proposed and implemented by TxDOT:

- Construction would be restricted to daylight hours unless there is an emergency, and construction lighting would not be required minimizing potential harassment from noise and construction lights. In addition, construction equipment would meet all Federal muffler requirements.

- To the maximum extent practicable, project specific locations (PSLS) would be located within the existing or proposed ROW in areas that would not require the removal of woody vegetation. The project contractors would be responsible for environmental coordination of any PSLs located outside of the ROW. TxDOT would provide project contractors with educational information on the federally listed species that occur in the area and their habitat requirements.

- The clearing of vegetation or wooded areas would be restricted to the minimum necessary to complete construction and only within the proposed ROW. Vegetation disturbances would be conducted between October and February 15, outside of the general bird nesting season, or the areas proposed for disturbance would be surveyed for nesting birds by a qualified biologist prior to disturbance. Vegetation impacts would be partially mitigated through re-vegetation of exposed areas of the ROW after construction is complete.

- Roadway lighting would be limited to the intersections with existing roads and would be minimized at those intersections, while still addressing safety concerns.

- Construction would occur completely within the existing ROW.

- Maintenance mowing would be limited to previously cleared areas in the ROW and outside of the area where the wildlife crossing is installed. “No mow” signs would be installed in certain areas to ensure that native vegetation is maintained.

- TxDOT would implement a protocol to notify the Service if any federally protected species are sighted during construction. If an ocelot or Gulf Coast jaguarundi is observed, all work activities would cease until the animal has moved away from the construction zone.

Best Management Practices (BMPs)

Implementation of the following BMPs by TxDOT eliminates the need for coordination under the 2013 MOU between TxDOT and TPWD for state-listed species within the range of the proposed project and for which suitable habitat is present. The following is a description of BMPs per taxa in addition to water quality and stream crossing BMPs. Table 12 features a column where applicable BMPs are listed per species based on the BMPs Programmatic Agreement; however, only BMPs for state listed species within range of the proposed project and for which suitable habitat is present will be implemented. Coordination is required if state listed species are within range, suitable habitat is present and species are not covered by BMPs, as per the MOU between TxDOT and TPWD. Coordination would be required for the black-spotted newt, Mexican treefrog, sheep frog, South Texas siren (large form), Red-Crowned Parrot, northern Aplomado falcon, Coues’

rice rat, black-stripped snake, northern cat-eyed snake, white-nose coati, and the speckled racer.

Bird BMPs

- Not disturbing, destroying, or removing active nests, including ground nesting birds, during the nesting season;
- Avoiding the removal of unoccupied, inactive nests, as practicable;
- Preventing the establishment of active nests during the nesting season on TxDOT owned and operated facilities and structures proposed for replacement or repair;
- Not collecting, capturing, relocating, or transporting birds, eggs, young, or active nests without a permit.

Bridge Bat BMPs

- Habitat assessment by a qualified biologist to determine if bats are present.
- If bats are present take appropriate measures as practicable to ensure that bats are not harmed such as exclusion or timing activities. For maternity colonies, exclusion activities should be timed to avoid separating lactating females from nursing pups.
- If structures used by bats are removed as a result of construction, replacement structures should incorporate bat-friendly design, or artificial roosts should be constructed to replace these features as practicable.

Tree Bat BMPs

- Avoid unnecessary removal of dead fronds on native and ornamental palm trees in south Texas (Cameron, Hidalgo, Willacy, Kenedy, Brooks, Kleberg, Nueces, and San Patricio counties)
- Large hollow trees should be surveyed for maternity colonies and, if found, should not be disturbed until after pups fledge.

Water Quality BMPs

- Once construction is complete and disturbed areas have been revegetated, remove silt fence and accumulated sediment to reduce wildlife barriers and hazards.
- Minimize the use of equipment in streams and riparian areas during construction. When possible, equipment access should be from banks, bridge decks, or barges.
- When temporary stream crossings are unavoidable, remove stream crossings once they are no longer needed and stabilize banks, bridge decks, or barges.
- When temporary stream crossings are unavoidable, remove stream crossings once they are no longer needed and stabilize banks and soils around the crossing.
- Wet-bottombed detention ponds are recommend to benefit wildlife and downstream water quality. Consider potential wildlife-vehicle interactions when siting detention ponds.

- Rubbish found near bridges on TxDOT ROW should be removed and disposed of property to minimize the risk of pollution. Rubbish does not include brush piles or snags.

Stream Crossings

- Use spanning bridges rather than culverts when feasible. If using a culvert, staggered culverts that concentrate low flows but provide conveyance of higher flows through staggered culverts placed at higher elevations is recommended.
- Bottomless culverts are recommended to allow for fish and other aquatic wildlife passage in the low flow channel. If bottomless culverts are not feasible, making a low flow channel for fish passage is recommended.
- Avoid placing riprap across stream channels and instead use alternative stabilization such as biotechnical stream bank stabilization methods including live native vegetation or a combination of vegetative and structural materials. When riprap or other bank stabilization devices are necessary, their placement should not impede the movement of aquatic and terrestrial wildlife underneath the bridge, in some instances, rip rap may be buried, back-filled with topsoil and planted with native vegetation.
- Incorporate bat-friendly design into bridges and culverts.
- Design bridges for adequate vertical and horizontal clearances under the roadway to allow for terrestrial wildlife to safely pass under the road.
- A span wide enough to cross the stream and allow for dry ground and a natural surface path under the roadway is encouraged. For culverts, incorporation of an artificial ledge inside the culvert on one or both sides for use by terrestrial wildlife is recommended.
- Riparian buffer zones should remain undisturbed where possible.

Migratory Bird Treaty Act

A visual survey of the project area did not reveal any migratory birds nesting on the ground or within the very few trees located within the project area. In the event that migratory birds are encountered on-site during project construction, every effort would be made to avoid the take of protected birds, active nests, eggs, and/or young to the maximum extent practicable. For a list of migratory birds, refer to **Appendix F**. In order to comply with the Migratory Bird Treaty Act (MBTA), the following commitments, where practicable, would be incorporated:

- The contractor would refrain from removing or destroying active migratory bird nests (nests containing eggs and/or young) at any time of the year (required under MBTA). If there are active nests, removal is prohibited until the nests become inactive, usually between October 1 and February 15.

- If colonial nesting occurs on or in structures, nests will not be removed until all nests in the colony become inactive.
- Utilize measures, to the extent practicable, to prevent or discourage migratory birds from building nests within portions of the project area planned for construction.
- Remove inactive nests from the project area to minimize the potential for reuse by migratory birds.
- When practicable, schedule construction or demolition activities outside the typical nesting season (February 15 to October 1), noting that the prohibitive provisions of the MBTA apply year-round.

All methods would be approved by the TxDOT District Biologist well in advance of planned use. Any nests discovered which may be disturbed or destroyed should be reported to the USFWS for further guidance. The contractor would follow the Bird BMP's for each species as recommended by the 2013 MOU.

3.23 Waters of the U.S., including Wetlands

The two major watersheds within the project area are the Rio Grande and South Laguna Madre. The Rio Grande is located south and east of the project area and is separated from the project area by flood control levees and agricultural fields. The nearest segment of the Rio Grande to the project is located 0.27 of a mile south of the proposed project. South Laguna Madre is approximately 15 miles east of the project area and the Brownsville Ship Channel, which connects to Laguna Madre, is located approximately 2.0 miles north of SH 4.

Named water bodies within the project area include:

- Resaca de la Palma
- Old Main Drain 2 (Cameron County Drainage District # 1) (referred to as DD5 and DD12)

Water bodies just outside the project area are:

- Resaca del Rancho Viejo – approximately 1.2 miles west of the proposed project area
- Brownsville Ship Channel – approximately 2.0 miles north of the proposed project area.
- Rio Grande - approximately 0.5 of mile east of the proposed project area.
- Las Comas Banco - approximately 0.3 of a mile east of the proposed project area.
- San Miguel Banco No. 88 - approximately 0.6 of a mile east of the proposed project area.
- El Rincon Banco No. 126 - approximately 0.5 of a mile east of the proposed project area.

See **Exhibit 3A-3C** for the location of this water bodies.

Prior to conducting fieldwork for jurisdictional determinations and wetland delineations, project area information was reviewed and it included: USGS 7.5 Topographic Maps (Southmost, Palmito Hill, and East Brownsville Quadrangles), the USFWS National Wetlands Inventory

(NWI), and 2004 Aerial Photographs of the project area. The NWI maps indicated that the majority of water bodies located within the project area were classified under the Cowardin classification system as seasonally or temporarily flooded persistent emergent Palustrine or lower perennial riverine systems. The **NWI Maps** are provided in **Exhibit 7-7B.**

Wetlands and other potential waters of the U.S. within the project area include vegetated salt flats associated with broad drainage ways leading to the Brownsville Ship Channel and emergent wetlands associated with Resaca de la Palma. Vegetated salt flats within existing and proposed project ROW area along SH 4 are dominated by halophytes that are dependent on seasonal flooding. Dominant plants in this area are shoregrass, saltwort, Virginia glasswort (*Salicornia virginica*), sea ox-eye, saltgrass, Virginia dropseed (*Sporobolus virginicus*), and annual seepweed (*Sueda linearis*). Small areas of emergent fringe wetlands associated with Resaca de la Palma occur within the proposed ROW of SH 32. Resaca de la Palma does exhibit an OHWM. The vegetated salt flats and parts of Resaca de la Palma are located within the 100-year floodplain. The US Army Corps of Engineers (USACE) has determined that the wetlands associated with Resaca de la Palma are jurisdictional waters subject to USACE regulation under Section 404 of the Clean Water Act. A copy of the Jurisdictional Determination is available in the project file at the district office.

The Build Alternative would cross 12 drainage features. As previously stated none of the drainage ditches were surveyed for wetlands due to lack of Right of Entry (ROE). The following paragraphs describe each of the potential waters of the U.S., including wetlands along existing FM 1419 and SH 4.

Open Waters (OW1-OW2 - Resaca de la Palma)

Resaca de la Palma is a large drainage system that, based on historic aerial photography, holds open water throughout the year (**Exhibit 4A** through **Exhibit 4F2** Aerial Photograph Maps). A culvert pipe under FM 1419 allows for flow from the west side to the east side of the Resaca. The resaca width in the project area varies from approximately 50-ft. to 185-ft. at the OHWM (see **Exhibits 8- 8B** Wetland Delineation Map). At the time of the field visits both sides of the resaca had plenty of water just slightly below the OHWM. A narrow portion of mud flat/open waters is within proposed ROW at the southeast quadrant of the resaca due to receding water levels below the OHWM. The soils within the Resaca system are mapped as Benito clay (BE) in the Cameron County Soil Survey (USDA). There is 0.123 of an acre of open waters occurs within the project area. Riparian vegetation found along the resaca above the OHWM consisted of Mexican ash, black willow, palo blanco, retama, huisache, sabal palm, tepeguaje, Brazilian pepper, and giant reed. Dominant groundcover consisted of guineagrass.

Emergent/Fringe Wetlands (W1-W3 - Resaca de la Palma)

These are emergent/fringe wetland areas associated with Resaca de la Palma along existing FM 1419 and proposed SH 32 (see **Exhibits 8- 8B** Wetland Delineation Maps). Common shrubs and trees include Mexican ash, black willow, huisache, tepeguaje, sabal palm, Chinese tallow, and Brazilian pepper. Common vines include old man's beard and ivy tree vine. Grasses and forbs in the area include common sowthistle (*Sonchus oleraccus)*, false ragweed (*Parthenium hysterophorus*), giant reed, and guineagrass. Hydric soils are indicated by observed low-chroma,

mottled clays. There is 0.02 of an acre of this feature occurs within the project area. The USACE has determined that Resaca de la Palma are jurisdictional waters subject to USACE regulation under Section 404 of the Clean Water Act. A copy of the Jurisdictional Determination report is on file at the TxDOT Pharr District. **Table 12** summarizes the potential Waters of the U.S., including wetlands, identified in the project area.

Table 12 : Summary of Waters of the US Including Wetlands within Proposed ROW

Feature ID	Description	100-year Floodplain?	Hydric Soil?	Water of the U.S.?	NWI?	Area (acres)
OW1 – OW2 Resaca de la Palma	Open waters	No	N/A	Yes	Yes	0.123
W1-W3 Resaca de la Palma	Emergent wetland	Yes	Yes	Yes	Yes	0.02

3.23.1 Environmental Consequences – No Build Alternative

Under the No-Build alternative, there would be no construction of SH 32. There would be no project-related disturbance to any of the potential waters of the U.S., including wetlands within the proposed project area.

3.23.2 Environmental Consequences – Build Alternative

The Build Alternative would impact waters of the U.S., including wetlands at Resaca de la Palma. The proposed first phase typical section at the resaca crossing would permanently impact 0.020 of an acre of wetlands and 0.112 of an acre of jurisdictional open waters at the resaca. The total jurisdictional area that would be impacted at the resaca by the proposed first phase typical is 0.132 of an acre. Refer to **Exhibit 4G3**.

The proposed second phase typical section would permanently impact 0.005 of an acre of wetlands and 0.004 of an acre of jurisdictional open waters. The total jurisdictional area that would be impacted at the resaca by the proposed second phase typical is 0.009 of an acre. Refer to **Exhibit 4G4**. The total waters of the U.S., including wetlands area that would be impacted at the resaca by the proposed first and second phase would be 0.141 of an acre. A Nationwide Permit (NWP) 14 with Pre-Construction Notice (PCN) is anticipated at the resaca crossing. Mitigation for loss of water of the U.S., including wetlands would be determined during the permitting process.

Along SH 4 the proposed project would impact 8.718 acres of vegetated salt flats. **Table 12** summarizes the total potential impacts to open waters and wetlands by the Build Alternative.

This project does not involve work in or over navigable waters of the U.S., therefore Section 9, or 10 of the Rivers and Harbors Act does not apply. In addition, the proposed project is not located within the jurisdiction of the IBWC; therefore, coordination with this agency would not be required.

3.24 Socio-Economic and Environmental Justice

Executive Order (EO) 12898 "Federal Actions to Address Environmental Justice in Minority Populations and Low- Income Populations" requires each Federal agency to "make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies and activities on minority populations and low-income populations." FHWA has identified three fundamental principles of environmental justice:

1. To avoid, minimize or mitigate disproportionately high and adverse human health or environmental effects, including social and economic effects, on minority populations and low-income populations;
2. To ensure full and fair participation by all potentially affected communities in the transportation decision-making process;
3. To prevent the denial of, reduction in or significant delay in the receipt of benefits by minority populations and low-income populations.

Disproportionately high and adverse human health or environmental effects are defined by FHWA as adverse effects that:

1. Are predominately borne by a minority population and/or a low-income population or

2. Will be suffered by the minority population and/or low-income population and are appreciably more severe or greater in magnitude than the adverse effects that will be suffered by the non-minority population and/or non-low-income population.

A minority population is defined as a group of people and/or a community experiencing common conditions of exposure or impact that consists of persons classified by the U.S. Bureau of the Census as Black or African-American; Asian; American Indian or Alaska Native; Native Hawaiian or other Pacific Islander; Hispanic or Latino; or other non-white persons, including those persons of two or more races. A low-income population is defined as a population whose median household income is at or below the U.S. Department of Health and Human Service (DHHS) poverty guidelines. The DHHS poverty guideline for a family of four in the United States in 2016 is $24,300 (U.S. Department of Health and Human Services, 2015). DHHS and the U.S. Census poverty definitions vary. The U.S. Census defines a family as living under the poverty level if the family's total income is less than the family's thresholds which vary by family size and compositions (http://www.census.gov/hhes/www/poverty/methods/definitions.html).

For the purpose of analysis within this EA, disproportionate adverse impacts to minority or low-income populations occurs when the minority population of the affected area exceeds 50 percent or the minority population percentage of the affected area is meaningfully greater than the minority population percentage in the general population or other appropriate unit of geographic analysis.

U.S. Census data from 2010 (**Table 13**) was collected for blocks and block groups within the project limits to provide a comparative representation of the demographic composition

of the project area. **Table 13** provides population, race, ethnicity, percent minority, median family income, and poverty level in the project area.

According to the U.S. Census 2010 database, the population of Cameron County is approximately 10.7 percent White, 88.1 percent Hispanic and 1.2 percent reporting as other. The population of Brownsville is approximately 5.7 percent White, 93.2 percent Hispanic and 1.1 percent reporting as other.

Two CTs (Census Tracts 127 and 141) include four block groups (BG) and 42 blocks (BLK). All numbers represented in **Table 13** were obtained from the 2010 U.S. Census and indicate that all the BLKs, BGs and CTs within the project area are composed of a minority population that ranges from 29.4 percent to 100 percent. The minority population in the project area exceeds 50 percent in all CTs, BGs, and CTs, except for BLK 1030 (in CT 141.00 - BG1) which is 29.4 percent. However, the percent of minority population in the project area is similar to and not meaningfully greater than the minority population percentage of Cameron County and City of Brownsville.

Table 13: U.S. Census Data-2010

Census Geography	Population	Percent White	Percent Hispanic	Percent Reporting as Other	Percent Total Minority Population	Medium Household Income	Percent of Families Living Below Poverty Level
Cameron County	406,220	10.7	88.1	1.2	89.3	$ 26,155	33.1
City of Brownsville	175,023	5.7	93.2	1.1	93.4	$ 24,468	36
Census Tract and Block Group Level							
CT 127	5,621	5.0	94.5	0.5	95	$23,692	40.0
Block Group-2	1,011	18.4	81.3	0.3	81.6	$25,417	29.4
CT 141	11,923	2.8	97.1	0.1	97.2	$25,369	32.4
Block Group-1	5,321	2.9	97	0.1	97.1	$26,599	23.6
Block 1010	1	----	100	----	100	----	----
Block 1095	303	4.6	93.7	1.7	95.4	----	----
Block 1104	389	2.1	97.9	0	97.9	----	----
Block 1110	104	0	100	----	----	----	----
Block 1021	40	20	80	0	80	----	----
Block 1022	172	6.4	93	0.6	93.6	----	----
Block 1028	34	8.8	91.2	0	91.2	----	----
Block 1029	17	29.4	70.6	0	70.6	----	----
Block 1030	17	70.6	29.4	0	29.4	----	----
Block 1077	51	19.6	80.4	0	80.4	----	----
Block 1081	30	26.7	73.3	0	73.3	----	----
Block 1090	16	----	100	----	----	----	----
Block 1094	61	----	100	----	----	----	----
Block Group-2	1,844	2.5	97.4	0.1	97.5	$16,154	41.6
Block 2020	261	0.4	99.6	0	99.6	----	----
Block Group-3	3,180	2.1	97.8	0.1	97.9	$30,250	32.4
Block 3082	6	----	100	----	100	----	----
Block 3036	29	0	100	0	100	----	----
Block 3054	70	2.9	97.1	0	97.1	----	----

Table 13: U.S. Census Data-2010							
Census Geography	**Population**	**Percent White**	**Percent Hispanic**	**Percent Reporting as Other**	**Percent Total Minority Population**	**Medium Household Income**	**Percent of Families Living Below Poverty Level**
Block 3055	72	0	100	----	100	----	----
Block 3056	6	0	100	----	100	----	----
Block 3022	5	0	100	0	----	----	----
Block 3058	141	1.4	97.2	1.4	98.6	----	----
Block 3073	57	3.5	96.5	0	96.5	----	----
Block 3074	31	0	100	0	100	----	----
Source: Cubit Planning, U.S. Census Bureau, 2010 Census Redistricting Data, Table P2.							

According to U.S. Census Bureau data, the median household income in Cameron County is $26,155 and the percent of families living below the poverty level is approximately 33.1 percent. The City of Brownsville had a median household income of $24,468, which is 6.5 percent lower than Cameron County and 38.7 percent lower than the State of Texas. The median household income for Cameron County and the City of Brownsville is slightly above the 2015 DHHS poverty guideline for a family of four of $24,250. The percent of families living below the poverty level in the City of Brownsville is approximately 36 percent (see **Table 13**).

The median household income for the four BGs within the project area ranges from $16,154 to $30,250 and the percent of families living below within these BGs ranges from approximately 23.6 percent to 41.6 percent. Three of the four BGs within the project area have a median household income slightly above the 2015 DHHS poverty guideline of $24,250 for a family of four. According to U.S. Census Bureau data, CT 141.00 - BG2 has a median household income of $16,154, which is the lowest of all four BG and is below the 2015 DHHS poverty guideline for a family of four.

The following BLKs from BGs 1 and 3 in CT 141 all show a population of zero and were not included in **Table 13**. BLKs from BG 1 include 1008, 1011, 1000, 1001, 1078, 1079, 1080 and BLKs from BG 3 include 3083, 3040, 3076, 3048, 3050, 3051, 3052, 3053, and 3057. In addition, CT 127 BG 2 - BLKs 2104, 2190, and 2089 are located within the project area and also show a zero populations and were not included in **Table 13**.

Limited English Proficiency

EO 13166 "Improving Access to Services for Persons with Limited English Proficiency" (LEP) requires agencies to examine the services they provide, identify any need for services to those with LEP, and develop and implement a system to provide those services so that LEP persons can have meaningful access to them.

In compliance with TxDOT guidance, a windshield survey was performed to examine whether the project area has an LEP population. Spanish-language businesses were

identified within the project vicinity**.** To support the windshield survey, U.S. Census Data from 2010 was collected on those within the project area who speak a language other than English and speak English "not well" or "not at all" for ages 5 year and above (See **Table 14**). The U.S. Census Data indicates that the project area is composed primarily of a Spanish-speaking LEP population and the percent of LEP population for languages other than Spanish is negligible. Within the project area, the percent population that does not speak English at all ranges from 10.97 percent to 19.01 percent. Therefore, reasonable steps were taken to ensure that such persons had meaningful access to the programs, services, and TxDOT and CCRMA provided information in the form of bilingual public meeting notices and Spanish translators (see **Table 14**).

Table 14 : Percent Of Population 5 Years And Older Who Speaks English "Not Well" or "Not At All"*

Census Geographies	Total Population 5 Years and Above	Percent(%) of Population Who Speak English "Not Well"		Percent(%) of Population Who Speak English "Not at All"	
		Spanish Language Speakers	Other Language Speakers	Spanish Language Speakers	Other Language Speakers
Brownsville	152,676	11.75	0.12	12.19	0.01
CT 127.00	5,088	2.1	0	10.97	0
CT 141.00	9,969	11.96	0	19.01	0

Data Source: United States Census 2010 American Fact Finder:.B16004: AGE BY LANGUAGE SPOKEN AT HOME BY ABILITY TO SPEAK ENGLISH FOR THE POPULATION 5 YEARS AND OVER
Universe: Population 5 years and over 2006-2010 American Community Survey 5-Year Estimates; B16003: AGE BY LANGUAGE SPOKEN AT HOME FOR THE POPULATION 5 YEARS AND OVER IN HOUSEHOLDS IN WHICH NO ONE 14 AND OVER SPEAKS ENGLISH ONLY OR SPEAKS A LANGUAGE OTHER THAN ENGLISH AT HOME AND SPEAKS ENGLISH "VERY WELL

Displacement and Relocations

Approximately 79.3 acres of new ROW would be required for the proposed project and would result in the potential displacement or relocation of three residential structures.

The residential structure homes that would be relocated/displaced are separate single residential homes. Impacts would not be suffered or predominately borne by a minority population and/or a low-income population and are not more appreciably severe or greater in magnitude than the adverse effects that will be suffered by the non-minority population and/or non-low-income population. **Table 15** provides a description of the three residential properties that would be potentially relocated and or displaced under the build alternative. The anticipated ROW acquisition would not have disproportionate impacts on any minority and/or low-income populations.

Table 15: Description of Potential Relocation/Displacements					
Place	**Property Type**	**Property Location**	**Approximate Assessed Property Value (Lot &Structure)**	**Impact Description**	**Mitigation**
Brownsville	Single Family Residence No.1.	Located approximately 3,090-ft. south of the intersection of SH 4 and FM 1419 along eastside of FM 1419	$51,916	Entire Structure Impacted	Structure can be relocated to any vacant lot adjacent to the structure, if property is available for purchase.
	Single Family Residence No.2	Located approximately 3,200-ft. south of the intersection of SH 4 and FM 1419 along eastside of FM 1419	$ 22,673	Entire Structure Impacted	Structure can be relocated to any vacant lot adjacent to the structure, if property is available for purchase.
	Single Family Residence No. 3 (Appears Abandoned)	Located approximately 100 ft. southeast of the existing bridge at SH 4	$7,511	Entire Structure Impacted	Structure can be relocated on any vacant lot adjacent to the structure, if property is available for purchase.
Source: Cameron County Appraisal District					

Residential home No.1 (See **Table 15**) is a single-family residential home. It is bounded to the north approximately 100-ft. by a mobile home, to the east and south by orchard plantation and to the west by the existing FM 1419. The surrounding area of this residential home is mostly citrus orchards and vacant/undeveloped land.

Residential home No.2 (See **Table 15**) is a mobile home. It is bounded to the north and east by vacant/undeveloped land, to the south approximately 100-ft. by a residential home, and to the west by the existing FM 1419. The surrounding area of this residential home is mostly citrus orchards and vacant/undeveloped land.

Residential home No. 3 (See **Table 15**) is a single-family residential that appears to be abandoned and no longer in use. It is bounded to the north by SH 4, to the west by Old Main Drain No. 2, to the east by a caliche road, and to the south approximately 75-ft. by a mobile home.

The CCRMA would provide relocation assistance without discrimination to all displaced persons as a result of the construction of the proposed SH 32 as mandated by the Uniform Relocation Assistance and Real Properties Acquisitions Act of 1970 and as amended on 1987. When property is acquired, owners are entitled to receive just compensation based upon fair market value of the property. The CCRMA would provide payment and services to aid in movement to a new location through its Relocation Assistance Program. The TxDOT would oversee the relocation assistance and would reimburse payments made by the CCRMA. Information regarding the Relocation Assistance Program was made available at the public meetings held for the proposed project and would be included at the public hearing to be held.

Housing of Last Resort would also be available in the event of a housing shortage or for residents who cannot find comparable housing within their means. Housing of Last Resort is provided according to TxDOT's policies and procedures for replacement housing on a reasonable cost basis when it is determined that comparable replacement housing is not available under normal conditions and cost limitations. Similar provisions in the act would apply to all businesses and nonprofit organizations displaced by the Proposed Action. However, it is anticipated that Housing of Last Resort would not be required for this project.

Colonias

The Office of the Texas Secretary of State defines a colonia as a residential area along the Texas-Mexico border that may lack some of the most basic living necessities, such as potable water and sewer systems, electricity, paved roads, and safe and sanitary housing. Colonias are economically distressed areas as defined by the Texas Water Code Section 17.921 (TWC). The TWC defines an economically distressed area as an area that lacks adequate water supply or sewer services to meet the minimal needs of the residential users as defined by the Texas Water Development Board, lacks the financial resources to provide water supply and existed on June 1, 2005.

Seven colonias are located within one half of a mile of the proposed SH 32. The Build Alternative would not directly impact any of the seven colonias. **Table 16** below show lists the colonias located near the proposed SH 32.

Table 16: List of Colonias					
Name	**Acres**	**Population**	**Location**	**Approximate distance from the proposed SH 32**	**Impact**
Angel Haven	8	196	Between Paloma Blanca Dr and S Dakota Ave	Adjacent to FM 1419	None
Cisneros Estates	10.61	72	North west corner of George Saenz Lane and George Saenz Lane	1900-ft south of proposed SH 32	None
Alabama/ Arkansas	310.79	515	Between South Browne Ave. and FM 1419 on the east, and on the south, FM 1419 north to Alabama Ave.	1,200-ft. east of the proposed SH 32	None
South Point	69.13	50	South west corner of South Browne Ave. and Alabama Rd. extending to FM 1419	950-ft. east of the proposed SH 32	None
Unknown	40.15	128	Southwest Corner of Alaska Road and FM 1419	2,200-ft. east of the proposed SH 32	None
Valle Hermosa	19.91	128	south west corner of South Browne Ave. and Alaska Rd.	300-ft. east of the proposed SH 32	None
Valle Escondido	39.06	202	North side of Alaska Rd. midway between FM 1419 and South Browne Ave.	700-ft. east of the proposed SH 32	None
Source: Texas Office of Attorney General, Colonia Geographic Database, February 9, 2012					

Community Cohesion

Transportation impacts on neighborhoods focus on the physical integrity of the neighborhood and community cohesion. Community cohesion is defined as the degree to which residents have a sense of belonging to their neighborhood or attachment to community groups and institutions.

The proposed SH 32 project traverses a rural area of southeast Brownsville with the exception of the project termini the existing land use is predominantly undeveloped agricultural land. The proposed project would displace three residential structures; however, no neighborhoods would be bisected or segregated by the project. The proposed project would improve access to southeast Brownsville and to rural residential areas located in or near the project area. No impacts to community cohesion would occur as a result of the proposed project.

Travel Patterns and Access

Implementation of the proposed project is not expected to alter travel patterns in a way that would negatively affect Cameron County, the City of Brownville, or the property owners along SH 32. The proposed SH 32 project is expected to improve traffic flow and connectivity between the Port of Brownsville FTZ and the Brownsville/South Padre Island International Airport and the Airport FTZ while enhancing mobility within the southeast quadrant of Cameron County. The existing FM 1419 (future FM 3550 and FM 3551) roadway would remain open to traffic; therefore, reducing effects on residential and business properties adjacent to FM 1419.

Pedestrian and Bicycle Facilities

Shared use lanes for cyclists and pedestrian features were considered during the early planning stage of the project to determine whether they should be incorporated into the project design. The factors considered during the early planning stage included the following:

- Is the proposed facility part of a locally adopted sidewalk planning document;
- Is there evidence of pedestrian traffic (observed pedestrians, beaten down paths, or significant potential for pedestrians to walk in the roadway)
- Is the facility located on a route to school or a transit route; and
- Do pedestrian generators/attractors exist?

The Bicycle and Pedestrian Plan identifies the roadways that will receive pedestrian/bike paths or bike lanes. The plan includes both on-system and off-system roads that would be developed either by TxDOT, local entities, or via a cooperative effort. The Bicycle and Pedestrian Plan (See **Appendix A**) does not provide or recommend for pedestrian/bike paths or bike lanes for FM 1419 and SH 4 but does recommend shoulder. Portions of the proposed SH 32 project are located within the existing FM 1419 and SH 4. As currently designed, the proposed project would not have a bicycle lane, however, the proposed SH 32 roadway design would have a 10-ft. wide shoulder in both directions which could be used by bicyclist, but would not be signed as a bicycle lane. In addition, within the limits of the proposed project, no evidence of pedestrian traffic or generators/attractors was noted and the proposed facility is not located on a route to school or a transit route; therefore, the project design does not include sidewalks.

Public Facilities

There one church, and two schools within the vicinity of the proposed project. A map showing the location of these public facilities can be found in **Exhibit 9-9B**. In addition, there is one county park and four WMAs in the vicinity of the project area. For more information on the park and WMAs, refer to Section 3.19. The Blessed Juan Diego Church is located at 4180 South Browne Ave. The schools within the project vicinity are:

- Palm Grove Elementary School located at 7942 Southmost Rd.
- Ben L. Brite Elementary School No. 140 located on South Browne Ave.

Although there are public facilities located within the vicinity of the proposed project area, they would not be impacted by the proposed project. The proposed project would provide safe and convenient access to the traveling public within and adjacent to the proposed project area.

3.24.1 Environmental Consequences – No Build Alternative

If the No-Build alternative is implemented, the proposed SH 32 would not be constructed. The No Build alternative would not result in any disproportionately high and adverse effects on any minority or low-income populations as discussed in EO 12898. The No-Build Alternative could result in reduced mobility in southeast Brownsville. A reduction in mobility could, in turn, result in adverse effects to all people, including EJ populations. For example, slow travel speeds could require more time to commute to and from work. In addition, the No Build Alternative would not serve the need and purpose of the proposed project.

3.24.2 Environmental Consequences – Build Alternative

Although the minority population in the project area is greater 50 percent, the percent of minority population in the project area is similar to and is not meaningfully greater than the minority population percentage of Cameron County and the City of Brownsville. Therefore, the proposed project is not expected to have a disproportionate adverse impacts on minority or low-income populations.

Environmental justice populations in the study area would be impacted the same as non-minority populations. Impacts to the community would not be disproportionally borne by an EJ community as opposed to a non-EJ community and all demographics within the project area would share in the benefits associated with the proposed transportation facility.

Avoidance, Minimization, Mitigation and Enhancement

The proposed project would require approximately 79.2 acres of new ROW and would result in the displacement/ relocation of three residential structures. Avoidance and minimization measures would be actualized by acquiring only the minimal ROW necessary to meet project goals, distributing ROW requirements evenly throughout the project corridor and by limiting clearing and disturbance to the maximum extent possible. In addition, consistent with the U.S. Department of Transportation (USDOT) policy as mandated by the Uniform Relocation Assistance and Real Property Acquisitions Policies Act, as amended, the CCRMA would provide relocation resources to all displaced persons without discrimination. All property owners from whom property is needed are entitled to receive just compensation for their land and property. Just compensation is based upon the fair market value of the property. The CCRMA would also provide, through its Relocation Assistance Program, payment and services to aid in movement to a new location. In addition, aerial and/or underground utilities would be adjusted and the required utilities would be handled so that no significant disruption of service would take place while the adjustments are being made. Utility adjustments would occur according to standard TxDOT and CCRMA procedures.

The Build Alternative would result in beneficial impacts to neighborhoods and community cohesion in the long term. The proposed project would provide for safer, more efficient traffic operations; maintain access to all existing neighborhood, public facility, and commercial areas; and, ensure that community cohesion remains intact, by not dividing, separating, or isolating any neighborhood or community. Construction activities would result in temporary effects such as temporary relocation of driveways and detours. Prior to construction, a traffic control plan would be prepared to manage and route traffic safely and efficiently and maintain access to driveways and streets. Traffic would not be routed on local streets or through neighborhoods and roadside display signs would alert motorists to the time and day of lane closures. Construction activities would be scheduled to prevent and minimize traffic interruption.

In order to provide meaningful communication to the people living in the demographic study area, project materials were made available in the dominant languages spoken (English and Spanish), and reasonable accommodation was available for speakers of other languages, as detailed in **Chapter 5 - Public Involvement, Coordination and Permit Requirements**. In compliance with EO 13166, the public involvement activities and communications for the SH 32 Project are conducted to ensure full and fair participation. Public outreach efforts will continue throughout the project development process to ensure the full and fair participation of all people, including EJ populations, in the decision-making process.

4.0 INDIRECT AND CUMULATIVE IMPACTS

Indirect impacts are effects caused by the project, but occur later in time, at some distance from the project, and are in the chain of cause-and-effect relationships. Indirect effects may include inducing effects and other effects related to induced changes in the pattern of land use, population density or growth rate, and related effects on air and water and other natural systems, including ecosystems. Cumulative impacts are the impacts on the environment, which result from the incremental impacts of the project's direct or indirect effects 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. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time. Risk assessments for indirect and cumulative impacts were completed based on TxDOT's Environmental Handbook for Indirect and Cumulative Impacts (March 2014).

4.1 Indirect Impacts

This section discusses the indirect impacts of the proposed project. The evaluation of these impacts is based on guidance titled *National Cooperative Highway Research Program (NCHRP) Report 466, Desk Reference for Estimating the Indirect Effects of Proposed Transportation Projects* (National Research Council 2002), TxDOT's Environmental Handbook for Indirect and Cumulative Impacts (March 2014), and TxDOT's *Revised Guidance on Preparing Indirect and Cumulative Impact Analyses* (September 2010).

The CEQ defines indirect effect as, *"…effect, which are caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable. Indirect effects may include growth inducing effects and other effects related to induced changes in the pattern of land use, population density or growth rate, and related effects on air and water and other natural systems, including ecosystems,"* (40 CFR 1508.8).

The following seven-step process provides a method to assess the potential indirect impacts of transportation projects:

1. Scoping
2. Identify the Study Area's Goals and Trends
3. Inventory the Study Area's Notable Features
4. Identify Impact-Causing Activities of Proposed Action and Alternatives
5. Identify Potentially Substantial Indirect Effects for Analysis
6. Analyze Indirect Effects and Evaluate Results
7. Assess Consequences and Consider/Develop Mitigation

4.1.1 Step 1 – Scoping

Scoping is a process used to determine the extent of the analysis required and to define the study area. The scoping process has two overall goals: (1) determining the level of effort and approach needed to complete the analysis, and (2) determining the location and extent of the indirect impacts study area. The scope of issues to be addressed in this section is

based on the direct impacts associated with the SH 32 proposed project and development of the need and purpose.

Methodology

The indirect impacts analysis is based on reasonably foreseeable land development in the project area expressed in development and planning documents and population and growth projections outlined by local government entities. The social, economic and environmental goals in these plans, along with population projections, are expected to result in increased growth in the project area.

Study Area – Area of Influence (AOI)

The NCHRP 466 (2002) states "if the conditions for development are generally favorable in a region, that is, the region is undergoing urbanization, highway and transit projects can become one of the major factors that influence where development will occur," and that development effects are most often found up to one mile around a freeway interchange, and up to two to five miles along major feeder roadways. The report goes on to say, however, that the influence of highway projects "diminishes with successive improvements because each new improvement brings a successively smaller increase in accessibility." Thus, the two- to five mile boundary serves as a guideline, and individual projects are analyzed case-by-case.

The geographical boundaries of the indirect effects Area of Influence (AOI) include the area in which the proposed SH 32 could potentially influence local traffic patterns and land development. Based on the above NCHRP 466 guidance and on a review of the project corridor, it was determined by the project team that a 4,500-ft. buffer around the proposed SH 32 was appropriate for the assessment of indirect impacts. The AOI for considering indirect impacts associated with the proposed SH 32 project is from FM 1419 at Paloma Blanca Boulevard (Blvd.) to approximately 1.1 miles northeast of the intersection of SH 4 and FM 1419. The 4,500-ft. buffer encompasses the proposed SH 32 project vacant land and undeveloped land, which is considered the most likely area to experience induced land development in the future. Because direct impacts associated with the proposed project would largely be restricted to existing and proposed ROW, factors that would encourage induced development in the project vicinity would include improved mobility and access to adjacent properties. Thus, it is expected that indirect impacts would be most likely to occur within the immediate vicinity of the project. . In addition, the Rio Grande, levee, U.S. border fence, floodplains, and the airport expansions act as barriers for further development; therefore, areas within or beyond these barriers would not be subject to SH 32 indirect impacts. The area identified as AOI is approximately 3,660 acres. See **Exhibit 12** Location Map for the AOI.

The pattern and location of growth within the City of Brownsville has largely already been determined by other transportation facilities, including the proposed Brownsville/South Padre Island International Airport expansion. The future land use plans for the City of Brownsville and Brownsville/South Padre Island International Airport depict continuation of current land use development patterns such as retail, commercial, industrial and

residential. The NCHRP 466 (2002) suggests that transportation investments result in major land use changes only in the presence of other factors. These typically include supportive local land use policies, local development incentives, availability of developable land, and a good investment climate. Land within the AOI is either zoned for commercial/retail, industrial, residential and mixed use.

Brownsville/South Padre Island International Airport also plans to extend the runway, which would change land use near the project area from undeveloped/vacant to include airport runways, industrial and commercial uses.

Time Frame

Indirect impacts will be analyzed for the time period from construction of the proposed project until 2035, which is the time frame for the 2010-2035 Metropolitan Transportation Plan.

4.1.2 Step 2 – Identify the Study Area's Goals and Trends

Goals

Indirect effects are commonly related to changes in land use. When a transportation project is constructed, an indirect impact may occur when land in the project area develops. Land development in turn results in the transformation of primarily agricultural uses within the project area to residential and commercial land uses. Increased development can alter the landscape, increase impervious cover, modify species composition of any remaining habitats, and introduce fertilizers and anthropogenic chemicals into the biotic system.

In 2009, the City of Brownsville drafted "The Brownsville Comprehensive Plan" which provides a foundation for guiding the future growth and development of the City consistent with the vision and goals of the community. The Comprehensive Plan provides a blueprint for leveraging the human, natural, technology, capital and institutional resources in order to manage the growth in a sustainable manner while increasing the general welfare and quality of life for their citizens. The plan integrates individual land use, drainage, transportation, utilities, parks, downtown revitalization and economic development plans into a single comprehensive plan. The plan consists of four core elements and six smart growth/ sustainability elements. The four core elements include land use (including public facilities and parks), downtown, economic development, and mobility/infrastructure. The core elements are supported by six smart growth/sustainability elements: Civic, Education, Equity, Healthcare, Emergency Management, and Environment.

The proposed project is part of the mobility/infrastructure general initiatives which aim to pursue the construction of strategic regional corridors that support the cluster-based industrial hub centered at the airport and port. Brownsville's current zoning consists of 12 categories that are applied to the City in a patchwork pattern. Not all of the currently developed portions of the City have zoning designations, as zoning primarily exists along major roadway corridors, in the heart of Downtown Brownsville, in pockets within neighborhoods, and around major uses such as the shipping port and the airport.

The City of Brownsville zoning is one of its many tools used to implement and enforce its vision and goals for its future. Based on the existing land use plan by the City of Brownsville, the proposed project is located in an area classified as mixed, undeveloped, and residential. Existing zoning within the project area and adjacent land consist of mixed residential, manufacturing, and commercial properties. According to the Future Land Use Plan Modules of the plan, the proposed project is located in the East Emerging District. The City of Brownsville plans to use the East Emerging District as residential and non-residential use with a greater degree of flexibility allowing this District to be more responsive to the varying demands presented by its close location to the Employment Hub (Imagine Brownsville Comprehensive Plan). Establishing zoning categories that allow mixed uses is essential to making the goals and vision of the City Brownsville reality. Also stated earlier, Cameron County and the City of Brownsville's main objectives for the project area are to provide increased mobility and safety. By accomplishing these objectives, Cameron County and the City of Brownsville would be able to obtain the goals for both entities.

Trends

Cameron County and the City of Brownsville show a trend of increasing population for each decade since 1990. As shown in **Table 17**, population growth for the City of Brownsville has increased approximately 28.9 percent from 2000-2013 and Cameron County population increased by approximately 24 percent from 2000-2013. The population growth is expected to continue for both the City of Brownsville and Cameron County. The projected population for the City of Brownsville and Cameron County is expected to be approximately 296,637 and 688,532 respectively, by year 2040, which represents a 35.9 and 34.8 percent population increase from 2020-2040. Refer to **Table 18**.

Table 17: Population Trends

Census Geographies	2000 Population	2010 Population	% Change From 2000-2010	2013 Population Estimate	% Change from 2010-2013
Brownsville	139,722	175,023	25.3	181,860	3.9
Cameron County	335,227	406,220	21.2	418,217	3.0

Source: Texas State Library and Archives Commission; 2000 and 2010 Census: Population of Cities, Arranged in Alphabetical Order; 2000: Population of Texas Counties, Arranged in Alphabetical Order; 2000 Census: Population of Texas Cities Arranged in Alphabetical Order; 2000 Census: Population of Texas Counties Arranged in Alphabetical Order. U.S. Census Bureau http://quickfacts.census.gov/qfd/states/48/48061.html and http://quickfacts.census.gov/qfd/states/48/4810768.html.

Table 18: Population Projections

Census Geography	2020	2030	2040	% Change from 2020-2030
Brownsville	218,268	257,460	296,637	35.9
Cameron County	510,697	599,672	688,532	34.8

Source(s): Texas Water Development Board http://www.twdb.state.tx.us/waterplanning/data/projections/2012/popproj.asp.

A comparison of historic aerial photography of Cameron County, Texas, (See **Exhibit 4A-4F2**) indicates development has occurred to the south and east of the project area. Land use within the AOI from the 1950s to 1970s is interpreted as almost entirely agricultural with the exception of some development along FM 1419 and SH 4. Analysis of population change and inspection of historical and recent aerial photographs reveal that the City of Brownsville and unincorporated portions of Cameron County in the project area have experienced population growth and significant land development to accommodate the population increase. Much of the previously vacant and agricultural land shown in the earlier historic aerial photographs has been converted to residential, commercial, and industrial uses.

According to the Brownsville Planning and Zoning Office, between 1996 and 2012 a total of 16,673 single family new homes were build ranging from $55,100 to $97,900 in average total cost during this time period. **Table 19** shows the number of residential permits that have been issued per year from 1996-2012. The City of Brownsville Planning and Zoning Office calculated that approximately 27 percent of the land within the Brownsville City limits was developed in 2007 and they project that approximately 53 percent will be developed by 2017.

Table 19: Residential Permits Issued			
Year	**Single-family new house build**	**Average Cost per House Built**	**Total Average Cost**
1996	722 buildings	$55,100	$39,782,200
1997	656 buildings	$63,700	$41,787,200
1998	846 buildings	$75,100	$63,534,600
1999	835 buildings	$74,100	$61,873,500
2000	1459 buildings	$66,500	$97,023,500
2001	1425 buildings	$72,000	$102,600,000
2002	1723 buildings	$75,300	$129,741,900
2003	1649 buildings	$80,800	$133,239,200
2004	1468 buildings	$82,200	$120,669,600
2005	1428 buildings	$88,700	$126,663,600
2006	1316 buildings	$83,100	$109,359,600
2007	861 buildings	$97,100	$83,603,100
2008	464 buildings	$102,100	$47,374,400
2009	480 buildings	$102,500	$49,200,000
2010	578 buildings	$97,500	$56,355,000
2011	611 buildings	$95,800	$58,533,800
2012	570 buildings	$97,900	$55,803,000
Source: http://www.city-data.com/city/Brownsville-Texas			

As mentioned earlier, the total metric tons of cargo handled by the port increased from 6.7 metric tons in 2013 to 7.6 metric tons in 2014, a 13.4 percent increase (http://www.portofbrownsville.com/facts/). These growth trends indicate that the cargo activity in the Port of Brownsville and ship channel is increasing and likely to continue with or without the proposed SH 32 project.

In addition, the proximity to Mexico and the NAFTA agreement has consolidated Brownsville's role as a gateway for U.S. / Mexico commerce. Merchandise exports have exploded by 88 percent since the agreement was signed in late 1993. Matamoros maquiladoras or assembly plants have added 15,000 jobs over the same period, a growth rate of 8.3 percent a year.

4.1.3 Step 3 – Inventory the Study Area's Notable Features

Notable features that could be indirectly impacted within the project area mirror the list of features identified for the direct impacts in **Section 3 Affected Environment and Environmental Consequences** of the EA. There are six notable features that have been identified within the proposed project AOI.

- **Farmland** – Approximately 402.2 acres of farmland would be affected.
- **Vegetation and Wildlife Habitat –** Riparian vegetation occur primarily at Resaca de la Palma and along drainage ditches within the AOI. Although the majority of the project area is highly disturbed there is potential habitat for wildlife, including federal and state listed species and SGCN within the AOI.

- **Threatened and Endangered Species –** Potential habitat for federal and state listed species and SGCN occur within the AOI.
- **Floodplains –** Floodplains within the AOI occur primarily in conjunction with the vegetated flats.
- **Wetlands –** Resaca de la Palma is a jurisdictional water of the U.S. and occurs within the AOI. Other non-jurisdictional water features and wetland within the AOI include 12 drainage ditches and vegetated salt flats along SH 4.

4.1.4 Step 4 -Impact Causing Activities of the Proposed Action and Alternatives

Impact-causing activities of the proposed actions that are relevant to the indirect effects of the proposed project include those activities that are related to the project design and result in alteration of the behavior or functioning of the physical environment or that cause changes in traffic patterns and influence land uses in the area. Impact Causing Activities are described in **Table 20** below.

Table 20: Impact Causing Activities

Type of Activity	Project Specific Activity	Relevant Details
Land Transformation and Construction	New Transportation Facility	The new transportation facility would be constructed in phases. The proposed typical section from FM 3068 to SH 4 would consist of an interim phase (Phase I) and an ultimate phase (Phase II). The interim typical section would be from FM 3068 to SH4 and would consist of two 12-ft. wide travel lanes and two 10-ft. wide shoulders within a 120-ft. wide (minimum) ROW. The ultimate typical section would consist of four 12-ft. wide travel lanes, a 4-ft. wide median, and two 10-ft. wide shoulders within a 120-ft. wide (minimum) ROW. The typical section of the overpass would match the ultimate roadway typical section. The ROW width at the overpass would be 400-ft.
	Alteration of Land Use	The proposed project would convert 79.28 acres of different land use to transportation use.
	New ROW Acquisitions	ROW acquisition (79.28 acres) would result in the relocation of 3 residential properties.
Resource excavation	Excavation for new roadway and drainage improvements.	The proposed construction would involve excavation for roadbed and drainage construction as well as drilling for column placement. Excavation would also be necessary for relocation of utilities.
Processing	Product/project storage/staging	It is anticipated, based on usual practices, that the contractor would locate a construction field office and construct a secure storage site. The contractor would take appropriate measures to prevent, minimize, and control spill of hazardous materials in the construction staging area. The use of construction equipment within sensitive areas would be minimized or eliminated entirely. All construction materials used for this project would be removed as soon as the work schedule permits. Any unanticipated hazardous materials and/or petroleum contamination encountered during construction would be handled according to applicable federal, state, and local regulations per TxDOT Standard Specifications.

Table 20: Impact Causing Activities		
Type of Activity	**Project Specific Activity**	**Relevant Details**
Resources renewal	Vegetation re-growth	Landscaping would be in accordance with E.O. 13112, Invasive Species and the Executive Memorandum on Beneficial Landscaping.
Modification of Regime	Modification of Vegetation	The proposed project would require the conversion of approximately 108.7 acres of wildlife habitat which include approximately 40.8 acres would consist of row crops, approximately 0.7 acres of South Texas: Clayey Mesquite Mixed Shrubland, approximately 33.8 acres of South Texas: Disturbance Grassland, approximately 32.2 acres of Urban Low Intensity, approximately 1.2 acres of open water (1.077 acres drainage waters and 0.123 of an acre of open waters at Resaca de la Palma).
Changes in Traffic	Traffic Patterns	The proposed project may result in changes in traffic patterns on the east portion of Brownsville and would enhance intermodal connectivity in the area. Automobile and truck traffic would be temporarily disrupted during the construction phase. The project would not require any detours along the existing route; however, potential delays during construction may prompt some travelers to find alternate routes until construction is complete.

4.1.5 Step 5 - Identify Potentially Substantial Indirect Effects for Analysis

Potential indirect effects (both encroachment/alteration and induced development effects) to the notable features are discussed below. Some induced land development is expected as the proposed project would create new access in the east Brownsville area. Greater land use densities may be possible with the improved transportation facilities, but would be subject to local zoning regulations.

The AOI for induced land development exhibits a persistent growth trend despite ever worsening travel delays and safety along the project area. The travel time-cost improvement expected to result from the proposed project could be viewed by prospective land developers as an additional incentive, since the decision to locate/develop in this area appears to be influenced by other factors favorable to growth.

A review of potential indirect impacts due to the proposed SH 32 project, which could occur in the reasonably foreseeable future either later in time or further away in distance than direct project impacts include the following:

Encroachment-Alteration Effects

These effects are those that alter the behavior and functioning of the physical environment. These effects are related to project design features but are separated from the project by time and/or distance.

Ecological Effects

Farmland

The majority of the SH 32 project corridor is largely agricultural, while remaining undeveloped portions are undergoing development. Therefore, conversion of existing land uses to a transportation use as a result of the Build Alternative would not represent a substantial encroachment-alternation effect to notable land uses and agricultural lands. Approximately 70.9 acres of farmland were determined to be within the project area and according to the NRCS, 47.3 acres were determined to be Important Farmland Soils. Results of the Farmland Conversion Impact Rating Form (AD-1006) completed for the Build Alternative were scored at 120 which is less than 160 on Part VI of Form AD 1006. For these reason, farmlands are not carried forward for analysis of encroachment-alteration impacts in Step 6.

Vegetation and Wildlife Habitat

Potential indirect ecological effects could include habitat fragmentation and disruption of ecosystem functioning (direct mortality). Because portions of the proposed SH 32 project would consist of a roadway on new location, the project could contribute to the fragmentation of existing wildlife habitat along the corridor. Fragmentation could occur since the new roadway would encroach upon and alter the existing vegetation, thereby bisecting existing habitat areas. Fragmentation could reduce the total acreage of available habitat, which could cause overcrowding of the remaining high quality habitat areas and increase competition. Wildlife would be expected to either move to areas away from the proposed roadway and other development or to adapt to habitation in the roadway vicinity.

Indirect effects from encroachment-alteration of the existing vegetation and habitat could occur because of an increase in the rate of wildlife-vehicle collisions. Wildlife-vehicle collisions would be expected to increase in the area where the new location roadway would be built due to encroachment-alteration of areas that are currently wildlife habitat.

Although the habitat and vegetation cover types in the project corridor are highly disturbed due to the existing land uses, disturbance of native vegetation and habitat would increase wildlife habitat fragmentation. For these reasons, vegetation and wildlife habitat is carried forward for analysis of encroachment-alteration impacts in Step 6.

Threatened and Endangered Species

Potential habitat for three federally listed species (northern Aplomado falcon, ocelot, and Gulf Coast jaguarundi) was identified within the Build Alternative project area. Northern Aplomado falcon are known to occur in areas of suitable habitat located in the East Brownsville and Palmito Hill Quads. Potential northern Aplomado falcon habitat within the project area have been surveyed however the species was not observed or heard. The ocelot and Gulf Coast jaguarondi have also been documented East Brownsville, Palmito Hill and Southmost Quads. These two species were not confirmed as present within the project site and although optimal habitat for this species does not occur within project

limits, they may traverse the project area when seeking optimal habitats. The CCRMA determined that the proposed project may affect, not likely to adversely affect these species. For these reasons, threatened and endangered species issues are carried forward for further discussion in Step 6.

Floodplains

The Build Alternative would increase impermeable surfaces and have the potential to indirectly affect sediment and pollutant loading in the 100-yr floodplain. However, floodplain management regulations and design standards would require that the Build Alternative be designed so as not to alter base flood elevations and not cause adverse flood impacts to upstream or downstream properties. For these reasons, floodplains are not carried forward for analysis of encroachment-alteration impacts in Step 6.

Wetlands

The Build Alternative would encroach upon open water and wetland areas subject to USACE jurisdiction. These jurisdictional areas are small and would be contained within the existing and proposed ROW, and would be subject to Section 404 permit requirements and conditions. For these reasons, wetlands and jurisdictional waters of the U.S. are not carried forward for analysis of encroachment-alteration impacts in Step 6.

Socio-economic Effects

Encroachment-alteration impacts to socioeconomic resources associated with the proposed project include impacts to travel patterns, increase in traffic noise, and relocation. The Build Alternative would not result in substantial encroachment-alteration effects related to travel patterns, access or business displacements. In addition, the Build Alternatives would not be expected to result in encroachment-alteration effects to EJ populations.

The proposed project is not expected to alter travel patterns in a way that would negatively affect property owners along SH 32. The project is expected to improve traffic flow and connectivity between the Port of Brownsville FTZ and the Brownsville/South Padre Island International Airport and the Airport FTZ while enhancing mobility within the southeast quadrant of Cameron County. The proposed project would provide for safer, more efficient traffic operations; maintain access to all existing neighborhood, public facility, and commercial areas; and, ensure that community cohesion remains intact, by not dividing, separating, or isolating any neighborhood or community. The project would not require any detours along the existing route; however, potential delays during construction may prompt some travelers to find alternate routes until construction is complete.

Noise impact includes increased traffic noise to residential areas near the proposed SH 32 project. Noise impacts would be experienced by the minority and low income population to the same extent and in the same manner (whether positive or negative) as experienced by other populations.

The EJ analysis presented in **Section 3.24** identified several 2010 census blocks with EJ (minority) populations within the study area and AOI. The EJ analysis found that the proposed project and would result in the potential displacement/relocation of three residential structures. The ROW acquisition would not result in disproportionate impacts on any minority and/or low-income populations. The majority of the Block Groups within the EJ/LEP study area had median household incomes slightly above the poverty level. Consistent with the USDOT policy as mandated by the Uniform Relocation Assistance and Real Property Acquisitions Policies Act, as amended, the CCRMA would provide relocation resources to all displaced persons without discrimination. For these reasons, encroachment alteration-effects on EJ or vulnerable populations would not be expected to occur. Based on this information, socioeconomic encroachment will not carried forward for further analysis in Step 6.

Induced Growth Effects

Indirect impacts related to land use that may occur within or adjacent to the project area include development along the proposed SH 32, as well as possible conversion of undeveloped land into commercial or residential uses.

Brownsville is the sixth fastest growing manufacturing region in the U.S., according to a national ranking by Industry Week Magazine (Brownsville Economic Development Council, http://bedc.com/our-initiative). Brownsville is the principal city of the Brownsville–Harlingen Metropolitan Statistical Area, which is part of the larger Brownsville–Harlingen–Raymondville Combined Statistical Area. The proximity with Matamoros, Mexico serves as a pro-business environment that allows smooth commutes from industrial production to destination routes (Brownsville Economic Development Council, http://bedc.com/our-initiative).

Typically, the construction of roadway corridors result in developments in the form of commercial and residential homes; therefore, it is expected that much of the existing agricultural and undeveloped land along SH 32 and surrounding areas would develop into more urban or suburban land uses. Currently, the majority of the proposed project is outside of the City of Brownsville's city limits based on the Zoning Map (http://planning.cob.us/home/downtown-revitalization/ordinances-maps). A segment of the project between Dockberry Rd. and Alaska Rd. is considered to be within the city limits. Zoning adjacent to the proposed project suggests if land adjacent to the proposed project were incorporated into the city limits, adjacent properties would be considered prime land for general retail, medium commercial and residential use. Cameron County's Road Map Displaying FIRM/FEMA Zones depict adjacent properties suitable for development as they are primarily considered Zone C areas. Zone C areas are areas of minimal flooding (http://www.co.cameron.tx.us/dot/maps.htm).

Indirect effects from the conversion of undeveloped land to developed land uses could affect approximately 2,970 acres of undeveloped land (79.1 percent of the AOI). The amount and level of the new development may be considerable as a result of the favorable local economic condition and supportive local land development regulation and policies. One of the goals of the City of Brownsville is to increase the supply of livable, master

planned neighborhoods uniformly throughout the City that have a balanced mix of compatible land uses connected within accessible (i.e., walking or biking) distances by clean, safe, pedestrian-friendly streets and boulevards and enforcing planning and zoning regulations, as well as City ordinances.

The projected increased mobility along the southeast quadrant of Cameron County as a result of the proposed improvements and upgrades is expected to compliment and may facilitate projected growth.

Effects Related to Induced Growth

The third type of indirect impacts is related to induced growth. These are similar to encroachment-alteration effects, but occur as a result of induced growth. Indirect impacts related to land use that may occur within the project area include development along the proposed SH 32, particularly at intersections and roadway connection points, as well as possible conversion of undeveloped land into commercial or residential uses.

The potential indirect effects on wildlife habitat and vegetation from the project would likely result from roadway-induced development. New development could displace additional habitat within the AOI, which includes: Row Crops, South Texas: Clayey Mesquite Mixed Shrubland, South Texas: Disturbance Grassland, Urban Low Intensity (Incl. residences), and Open Water. Development can also fragment habitat, reducing the value of habitat surrounding the development.

Land use conversion would contribute to habitat fragmentation which would affect the ability of mobile species to travel between suitable habitats, confining the species to a particular area. Furthermore, habitat fragmentation contributes to the reduction of habitat for threatened and endangered species. Approximately 2,970 acres of undeveloped land (79.1 percent of the AOI) could be converted to other land uses

4.1.6 Step 6 - Analyze Indirect Effects and Evaluate Results

The purpose of this step is to assess the potential and magnitude of the project-influence effect. The following analysis assumes the proposed project is planned to support the project area's direction and goals. According to NCHRP Report 466, empirical evidence indicates that transportation investment and changes in land use occur only in the presence of other factors, such as supportive local land use policies and development incentives, availability of developable land, and a good investment climate.

The analysis of indirect effects relied primarily on qualitative forecasting tools, including literature reviews, local planning documents, and references of the area's general population and growth projections. The use of planning documents relies on the assumption that future development will follow the trends outlined in long-range plans. However, economic trends and market demand are variables that may have more influence over development in the long term. Thus, the conclusions of this indirect effects analysis must be qualified by the uncertainties involved in predicted growth.

The proposed project area and AOI are located on the East Emerging District based on the City of Brownsville's Imagine Brownsville Comprehensive Plan. According to the plan, the East Emerging District is split between residential and non-residential uses with a greater degree of flexibility allowing this District to be more responsive to the varying demands presented by its close location to the Employment Hub (Imagine Brownsville Comprehensive Plan). Future land use in this area is predicted to be primarily single family homes and some agricultural/ranch properties. In addition, neighborhood office and retail, light and medium industrial, and warehousing uses are expected to be commonly seen in this area in addition to community facilities such as schools, recreation centers, utility and municipal services. The Employment Hub District is a large area in north and east Brownsville with intermodal infrastructure including the shipping port, rail yards, and the international airport. The Employment Hub is organized around neighborhoods that have industrial uses as their anchors and are surrounded by complementary and supporting residential, community facility, institutional and commercial land uses (Imagine Brownsville Comprehensive Plan). The Employment Hub is considered to be a major economic generator for the City of Brownsville.

Potential indirect impacts to vegetation and wildlife habitat, federal and state listed threatened and endangered species habitat would be associated with the potential for development following the completion of the proposed SH 32 project. These impacts would possibly include the removal of vegetation and wildlife habitat.

Vegetation and Wildlife Habitat

Impacts to habitat would still occur under the Build Alternative, due to induced development. Under the Build Alternative, impacts would most likely be to habitats along existing FM 1419, which are highly disturbed habitats. In addition, impacts to specific habitat areas are likely to be different between the two alternatives. Along the Build Alternative, much of the habitat consists of disturbed agricultural lands, but there are also Riparian, Clayey Mesquite Mixed Shrubland, Disturbance Grassland, and Open Waters at Resaca de la Palma. Some riparian habitat also occurs along drainage features within the project areas and where development pressures under the Build Alternative would also occur. The Build Alternative could result in indirect impacts of approximately 2,970 acres of undeveloped land which includes native vegetation and habitat.

Overall, the impact would depend on where individual future developments are built. Often new developments are built on former agricultural land which is typically cleared of vegetation. This type of development would have a minimal impact on high-quality wildlife and vegetation. However, if future development includes single-homes along Resaca's, the impact on high quality undisturbed habitats could be higher. Based on aerial maps, field survey information from along the corridor, and the EMST mapping, there are more habitats likely to be impacted along the SH 32 Build Alternative, particularly the Clayey Mesquite Mixed Shrubland and Riparian areas at Resaca de la Palma.

Threatened and Endangered Species

There are approximately 2,423.4 acres of resaca, floodplains, and farmlands that could be utilized by threatened and endangered species in the AOI. Indirect effects related to encroachment and alteration of the existing habitat from the Build Alternative to threatened and endangered species could include the fragmentation of habitat areas, wildlife-vehicle collisions, and introduction of edge effects (vegetation, structure, habitat use) to areas adjacent to the new roadway. Fragmentation could reduce the total area of available habitat, which could cause overcrowding of the remaining high quality habitat areas and increase competition. Indirect effects to threatened and endangered species habitat could also occur as habitat adjacent to roads and other development could experience a loss of habitat effectiveness. Wildlife would be expected to move to areas away from the roadway and other development, or species would adapt to habitation in the roadway vicinity. Indirect effects to threatened, endangered or rare species habitat could occur because of an increase in the rate of wildlife-vehicle collisions. Specifically, wildlife-vehicle collisions would be expected to increase along the proposed new-location roadway because of encroachment-alteration of areas that are currently wildlife habitat. In addition, operation and maintenance of the proposed project would result in a low level of disturbance from long-term traffic noise and vehicle activity, with higher levels expected during the day and lower levels expected at night.

4.1.7 Step 7 - Assess Consequences and Consider/Develop Mitigation (When Appropriate)

The purpose of this step is to consider the inherent uncertainty in estimating indirect effects and the risk that the actual outcome will differ from that forecasted. Estimates of indirect impacts due to induced growth are difficult to quantify. Quantifying factors affecting growth and how much of the indirect effects study area has been or will be developed are extremely difficult to establish. Historically, roadway projects (particularly large-scale projects or those on new location) have been thought to indirectly spur development in the surrounding areas as a result of the increased access to adjacent land that they provide.

Recent studies of the relationship between land use and transportation projects agree that a link exists. However, the research is mixed as to whether transportation improvements spur development, or if development creates the need for transportation improvements. For widening of existing roadways, studies conducted by the University of Texas Center for Transportation Research (UT CTR) and University of California at Davis (UC Davis) found little relationship between this type of activity (widening) and local development permitting. Real estate professionals interviewed for the UT CTR study agree in their assertions that accessibility provided by roadway projects is a necessary, but not sufficient condition for development of surrounding land; factors such as zoning and development regulations may play a much more important role in the timing and location of development. However, the researchers caution that "*…it would not be prudent to conclude that highway expansions have no impact on development*". Similarly, the UC Davis study concluded that urban highway expansion shows no evidence of generating new growth; however, it affects the pattern or distribution of existing growth.

Local planning documents suggest that localized land development within the AOI study area would occur regardless of whether the proposed project would be constructed, although the development intensity and timing may be accelerated by the proposed project. There is also some uncertainty regarding development location, timing, and amount of development that would take place.

Vegetation and Wildlife Habitat

The proposed project is primarily anticipated to accelerate the pace of development and land use conversion. The proposed project could indirectly impact vegetation and wildlife habitat through habitat fragmentation that may occur due to clearing grassland. These areas of potential land use change would likely be constrained around improved points of access. However, such developments, as well as some new developments such as the airport expansion, are expected to occur regardless of the proposed project's construction, resulting in the same clearing of vegetation and habitat fragmentation as with the proposed project. In the absence of the proposed project, these encroachment impacts would result from land use transformation in response to aging land uses, population growth, community change, and/or other market forces, which have been accounted for within the local planning documents of the affected municipality. As such, project-induced indirect impacts to vegetation are not anticipated to be substantial. Therefore, the requirement for mitigation of environmental impacts would be limited to mitigating only the direct impacts associated with this proposed project; mitigation for indirect impacts would not be required.

The MBTA of 1918 (16 USC § 703-705) is the federal law that affirms, or implements, the U.S.' commitment to four conventions with Canada, Japan, Mexico and Russia for the protection of shared migratory bird resources. The MBTA prohibits the take, possession, import, export, transport, selling, purchase, barter, or offering for sale, purchase, or barter, any migratory bird, their eggs, parts, and nests, except as authorized under a valid permit. The take of all migratory birds is governed by the MBTA's regulation of taking migratory birds for educational, scientific, and recreational purposes, and requiring harvest to be limited to levels that prevent over utilization. USFWS implementing regulations are found at 50 CFR Part 20, Migratory Bird Hunting. The main effect of the MBTA as a mitigating measure with respect to land development activities is that measures to protect active migratory bird nests from harm are required in order to comply with the law if nesting activity occurs within the development site. MBTA requirements would apply to all development activities within the AOI.

In the event that nesting migratory birds are encountered on-site during project construction, every effort would be made to avoid the take of protected birds, active nests, eggs, and/or young. The contractor would remove all old migratory bird nests from any structure where work would be done between February 15 and October 1. In addition, the contractor would be prepared to prevent migratory birds from building nests between February 15 and October 1. All methods would be approved by the TxDOT District Biologist well in advance of planned use. In order to comply with the Migratory Bird Treaty Act; 1) vegetation disturbances will either avoid the general nesting period of March 1st through August 31st, or, 2) areas proposed for disturbance will be inspected for nesting birds immediately prior to construction activities, in order to avoid the inadvertent

destruction of nests, eggs, etc. Any nests discovered which may be disturbed or destroyed should be reported to the USFWS for further guidance.

Disturbed areas would be restored and seeded according to TxDOT's Vegetation Management Guidelines and in compliance with the intent of the Federal Highway Administration's (FHWA) *Executive Memorandum on Beneficial Landscapes* and the FHWA *Executive Order on Invasive Species*. Mitigation proposed for impacts to resaca riparian woodlands includes replanting with native species to re-establish riparian corridor and would be done in conjunction with a proposed wildlife crossing.

Threatened and Endangered Species

Impacts to federally-listed endangered and threatened species are regulated by the USFWS under Sections 7 and 10 of the Endangered Species Act. TPWD has regulatory authority over state-listed wildlife where direct take (killing or injuring) is involved, but the agency does not have authority over indirect take (destruction of habitat) of state-listed wildlife.

The primary indirect effect to potential ocelot and Gulf Coast jaguarundi habitat would occur where the project crosses Resaca de la Palma. The proposed work would cause disturbance to riparian habitat which could potentially be used by felines as travel corridors. Minimization and mitigation would include resaca re-vegetation with native vegetation and the construction of a wildlife crossing. The wildlife crossing would be constructed along proposed SH 32 at Resaca de la Palma in order to minimize potential wildlife and feline mortality due to collisions with vehicles. The wildlife crossing would be placed on the north bank of the resaca and consist of a 5-ft. by 5-ft. wild with a drop inlet that allows light to enter the crossing. The at grade wildlife crossing would be constructed so that wildlife has a clear line-of-sight from one end of the culvert other. The wildlife crossing would be constructed so that federally endangered felines and other wildlife traveling through the area would be able cross the roadway safely and to reduce ocelot and wildlife road kills due to potential vehicle impacts. Indirect effects to endangered bird habitat are not expected to be significant.

4.2 Cumulative Impacts

The CEQ defines cumulative effects as *"the impact on the environment (resource) which results from the incremental impact of the action (project) 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. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time,"* (40 CFR 1508.7).

In order to have a cumulative impact to the resources, the proposed project must have either a direct or indirect impact to that resource. Additionally, the cumulative impact analysis focuses on those resources impacted by the proposed action that are currently in poor or declining health, even if the impacts resulting from the project area are relatively small (less significant).

TxDOT guidance regarding the assessment of cumulative impacts resulting from transportation projects identifies resources that must be considered for the cumulative resource analysis.

According to this guidance, resources for which there are either substantial direct or indirect effects or affected resources that are in poor or declining health (even if impact is less than substantial) must be considered in cumulative analysis.

The cumulative effects analysis of the proposed project was conducted in accordance with TxDOT's *Revised Guidance on Preparing Indirect and Cumulative Impact Analyses* (September 2010). The guidance specifies an eight-step process. Each step of the eight-step process has been applied to the proposed SH 32 project and the findings documented in this report. The following approaches are listed below.

1. Identify the Resources to Consider in the Analysis
2. Define the Study Area for Each Resource
3. Describe the Current Status/Viability and Historical Context for Each Resource
4. Identify Direct and Indirect Impact of the Project that Might Contribute to a Cumulative Impact
5. Identify Other Reasonably Foreseeable Future Effects
6. Identify and Assess Cumulative Impacts
7. Report the results
8. Assess the Needs for Mitigation

4.2.1 Step 1 – Identify the Resources to Consider in the Analysis

Step 1 requires the identification of resources/issues associated with the proposed project that may result in cumulative impacts. The proposed project was reviewed to gather input on substantial issues in the project area, which was determined through scoping with federal, state, and local agencies, and for input on the proposed project and issues of concern as provided at past public meetings. The project team used this information to identify resources/issues to consider in this cumulative impact analysis and to evaluate the potential for cumulative impacts to all project resources and issues.

TxDOT guidance states that "if a project will not cause direct or indirect impacts on a resource, it will not contribute to a cumulative impact on the resource." Therefore, if the proposed project would not have a direct or indirect impact on a resource, then that resource would not be carried forward for detailed cumulative impact analysis. Furthermore, this analysis "should focus on 1) those resources substantially impacted by the project, and 2) resources currently in poor or declining health or at risk even if the project impacts are relatively small."

The results of the Step 1 identified two resources that warrant more detailed discussion. The proposed project would be expected to have substantial direct or indirect effects to the resources identified which include:

- Vegetation and Wildlife Habitat
- Threatened and Endangered Species

The cumulative effect of all reasonably foreseeable actions in the vicinity of the project area, despite the minimal direct and indirect impacts of the proposed project, could have a

substantial impact on area resources. These two resources mentioned above that have been analyzed earlier in this document would be either substantially directly or indirectly affected by the proposed project. These resources are in poor or declining health due to limited distribution, given the past and expected future human population growth and land development pattern except for farmland. These resources could be substantially impacted by even minimal direct and indirect impacts. The health of these resources and consideration of the possible cumulative impacts from the proposed project; although some are unsubstantial and foreseeable future actions by other individuals and entities require further analysis.

4.2.2 Step 2 – Define the Study Area for Each Resource

For the purpose of this analysis, cumulative impacts analysis considered both temporally and geographically study limits, where applicable. A Resource Study Area (RSA) is used to characterize the health condition and trend for each resource and to determine the potential cumulative effect. The RSA for each resource was chosen and determined based on expected indirect effects stemming chiefly from the changes associated with the proposed project, as well as other past, present, and reasonably foreseeable public and private actions that may contribute to cumulative effects. The temporal and geographic components of the RSAs are discussed below.

Temporal Resource Study Area

The temporal component of an RSA is the timeframe in which effects to resources are expected to occur, which for all RSAs in this analysis is 1994 to 2035. Extending the timeframe forward to 2035 for cumulative impacts matches the time frame for current Brownsville MTP and it provides sufficient data to complete a qualitative or quantitative analysis. Extending the timeframe back to 1994 when the NAFTA was signed eliminating most tariffs between Mexico, U.S. and Canada. This forty one-year period should also be sufficient to capture cumulative impacts resulting from those actions for which construction has been initiated, but not yet completed.

Geographic Resource Study Area (Project Level Analysis)

The proposed project is located in an area known as Southeast Brownsville. Based on this, the cumulative impacts analysis RSA for vegetation/wildlife habitat would be the area of Southeast Brownsville. The RSA is bounded by SH 48 to the north, US 77/83 to the West, the Rio Grande to the south and the Port of Brownsville to the East. The RSAs for vegetation and wildlife habitat, and State listed threatened and endangered species (except the ocelot and Gulf Coast jaguarundi which is a larger area) share the same geographical boundaries as per element of occurrence records for USGS Topographic Map (East Brownsville, Palmito Hill and Southmost Quadrangles) of Southeast Brownsville. These resources are not concentrated in one specific area but distributed throughout Southeast Brownsville according to the NDD. The geographical boundary of the RSA encompasses the overall area where these resources occur in relation to the proposed project. In addition, the RSA is compatible with the boundary of the East Emerging District and the

Employment Hub District in southeast Brownsville described in the Imagine Brownsville Comprehensive Plan.

The RSA for the ocelot and Gulf Coast jaguarundi extends to the north to include potential cat travel corridors. The RSA for these two federally listed species was established to include an area with potential cat travel corridors which extends from the Rio Grande in southeast Brownsville to Laguna Atascosa Nation Wildlife Refuge (LANWR) in northeast Cameron County. This coastal corridor has been affected less by agriculture and urban/suburban development than areas located farther inland and a significant amount of dense thornshrub (the ocelots' preferred habitat) occurs in this area. The ocelot and Gulf Coast jaguarundi RSA boundaries are the Rio Grande to the south, to the north the Arroyo Colorado and inland portions of the LANWR, to the west US 77/83, and to the east the Gulf of Mexico. See **Exhibit 12** for a map depicting the RSAs for the above recourses.

As previously mentioned, the RSA for state listed threatened and endangered species and SGCN was established to include NDD element occurrences and is the same as the RSA for vegetation and wildlife habitat. The RSA for the endangered cat species which north to the LANWR. See **Exhibit 12** for a map depicting the RSAs for the above recourses.

4.2.3 Step 3 – Describe the Current Status/Viability and Historical Context for Each Resource

Vegetation and Wildlife Habitat

According to the TPWD's map *Natural Subregions of Texas* the proposed project lies within the subregion known as the Brush Country, which is located within the South Texas Brush Country Natural Region of Texas. It encompasses about 20.5 million acres in an area extending from Del Rio to San Antonio and southeast to Rockport. Although the typical brush community, characterized by mesquite, blackbrush, brasil, and other thorny plants, dominates much of south Texas, as per the TPWD's map *The Vegetation Types of Texas* (1984 McMahan) the vegetation within the proposed project area is classified as [45] Other Native and/or Introduced Grasses. Detailed information to the existing wildlife and vegetation habitat is provided in Section 3.

The South Texas Plains region has been severely disturbed within the past century. Urban development and agricultural practices have resulted in the clearing of native habitat. The main factors for change in vegetation in south Texas included overgrazing by livestock, diminished occurrence of natural fire, relatively poor soil (water penetration, nutritive value, aeration, crusting, etc.), climate and precipitation fluctuations, and plenty of brush for seed stock. The proposed SH 32 project would be built in an area projected to have an increase in development and this trend is most likely to continue and the health of the resources would continue to decline.

Recent attempts to slow down the habitat conversion trend have involved the acquisition of land throughout the Rio Grande Valley for the LRGV NWR. The USFWS had been tasked with acquiring property for an approximately 132,500 acres LRGV NWR corridor that parallels the Rio Grande from the mouth of the Rio Grande in Cameron County to the

Falcon Reservoir Zapata County. This effort, as well as recent additions to the LANWR has resulted in nearly 120, 000 acres in Cameron County being protected in state, federal, or local/non-profit parks and refuges. A large portion of this land is located east of the project between the Rio Grande and the LANWR and is protected from future development as a refuge or is constrained by the presence of large wetland areas.

Threatened and Endangered Species

The resource study area is located within the Matamoran District of the Tamaulipan Biotic Province and the Natural Sub Regions of Texas, which lies within the subtropical zone of the South Texas Brush County Natural Region of Texas. Occurrence Records from the NDD indicate past occurrences of both state and federal listed threatened and endangered rare species list near the project vicinity. A review of foreseeable transportation and development projects in the area indicated that there could be a loss of habitat for rare species.

Fish and wildlife resources, including threatened and endangered rare species, within the RSA have been affected by continuing land-use changes and associated habitat alternations. Such alternations have resulted in the conversion of established native habitat involving mature mixed woodland-grassland communities to urban and suburban landscapes. Wildlife habitat or higher quality is declining in favor of more fragmented, younger, less diverse vegetation communities in both upland and in riparian corridors. Such alternations affect the composition, distribution, and abundance of wildlife species, including threatened and endangered rare species, and have created a trend toward increases in wildlife species that area adaptable to human disturbance and proximity and a decline in those species that occur in larger, undisturbed tracts.

Information concerning the potential occurrence of three federally listed species, the northern Aplomado falcon, ocelot, and Gulf Coast jaguarundi is provided in **Section 3.21**. Preferred habitat requirements for the ocelot and jaguarundi include very heavy dense brush with nearly closed canopy conditions generally free from human disturbance. The existing habitat conditions within the project area for the ocelot and Gulf Coast jaguarundi ranges from poor to marginal. There have been confirmed sightings of the ocelot within the RSA according to state and federal databases and the last confirmed sighting of Gulf Coast jaguarundi in south Texas was a road killed near the intersection of SH 4 and FM 511 (Keller's Corner) in Southeast Brownsville on April 1986 (NDD).

Potential habitat also occurs for the northern Aplomado falcon toward the northeast end of the project and although the species was not observed or heard within the project area during any of the site visits, the species could potentially incidentally occurred in the project area during migration. Texas ayenia and south Texas ambrosia were not confirmed as present within the project site and survey result indicated no suitable habitat for either species occurs within the project area; therefore, the proposed project would have no effect on this species.

4.2.4 Step 4 – Identify Direct and Indirect Impacts of the Project that Might Contribute to a Cumulative Impact

This step identifies the direct and indirect effects that could result from the project that may contribute to a cumulative effect when added to non-project related effects. Indirect impacts that may contribute to cumulative impacts have been reviewed in previous sections of this environmental document. Potential direct effects of the Proposed Action on the resources are summarized in **Table 21** Summary of the Direct and Indirect Impacts. Even though FM 1419 and Alabama Rd. projects would not have direct or indirect impacts on these resources, these roadways are currently undergoing seal coat and overlay and are included in **Table 22**.

Table 21: Summary of the Direct and Indirect Impacts

Resource	Direct Impacts	Indirect Impacts
Vegetation and Wildlife Habitat	The proposed project would require the conversion of approximately 108.7 acres of wildlife habitat which include approximately 40.8 acres would consist of row crops, approximately 0.7 acres of South Texas: Clayey Mesquite Mixed Shrubland, approximately 33.8 acres of South Texas: Disturbance Grassland, approximately 32.2 acres of Urban Low Intensity, approximately 1.2 acres of open water (1.077 acres drainage waters and 0.123 of an acre of open waters at Resaca de la Palma).	New induced development and roadway construction adjacent to or near the proposed project could result in the clearing of maintained rangeland/pastureland, as well as the fragmentation of habitat. The proposed project would indirectly effect undeveloped land (which accounts for approximately 90 percent of the existing land use), or potential wildlife habitat.
Threatened and Endangered Species	Project area contains some sub optimal habitat for both the ocelot and the Gulf Coast jaguarundi, which they could use as travel corridors. Potential habitat also occurs for the northern Aplomado falcon toward the northeast end of the project. The proposed project may affect these species, but not adversely. Marginal habitat for state listed threatened and endangered Species and SGCN; (Mexican mud-plantain, Black-spotted newt, South Texas siren (large form), Mexican treefrog, White-lipped frog, Northern cat-eyed snake, Speckled racer snake, and Texas indigo snake) are present in the project area. Therefore, the proposed project may impact these species, but not adversely.	Because the study area contains potential habitat for federal and state listed threatened or endangered species, the removal or disturbance of native vegetation within the study area associated with future development could result in indirect impacts to these species.

4.2.5 Step 5 – Identify Other Reasonably Foreseeable Future Effects

The cumulative effects analysis required consideration of past, present, and reasonably foreseeable future actions. A review of public documents such as environmental documents, transportation and land use plans identified reasonably foreseeable future actions that would occur within the proposed project area.

(a) Brownsville/South Padre Island Airport Expansion

The City of Brownsville is proposing to expand the Brownsville/South Padre Island International Airport facilities, which are located one mile north-northwest of the proposed SH 32 project. The airport has three hard surface runways. The primary runway is 150-ft. wide by 7,400-ft. long, lighted and served by an instrument landing system. The Aviation Department is seeking to implement expansion of the airport's primary runway (13R-31L) to 10,000 linear-ft. in length. The direct effect of this project would be the conversion and relocation of a portion of FM 511. The existing section of FM 511 between Dockberry Rd and California Rd. would become airport property. Pending the completion and approval of the environmental studies, the proposed project indicates that no significant environmental effects would occur.

(b) Brazos Island Harbor Channel Improvement Project (Deepening of the Brownsville Ship Channel)

The Port of Brownsville is located on the south Texas coast near the U.S. – Mexican border. The project area encompasses the entire Brazos Island Harbor and surrounding region. The entrance channel is located offshore of Cameron County, Texas, in the Gulf of Mexico and ends at the Port of Brownsville Main Harbor in the City of Brownsville. The most recent deepening was authorized by the Water Resources Development Act of 1986. The existing channel is 42-ft. deep. The proposed study will address the feasibility of deepening the entrance and jetty channel (2 miles) to 48-ft., deepen the lower 9 miles of main channel to 48-ft. and deepen the upper 7 miles of main channel and turning basin to 45-ft.

The Port of Brownsville is the only deep draft port available to the industry along the U.S. – Mexico border. Brownsville is primarily a bulk commodity port covering both liquid and dry cargo handling. Current vessel sizes associated with the increased use of container vessels has resulted in inefficient utilization of the Port of Brownsville. The increased traffic is a direct result of NAFTA in that a majority of the increased commodity traffic is to meet industrial needs in Mexico.

The Channel Improvement study will investigate potential restoration opportunities of over 6,500 acres of tidal marsh habitats, as well as brush habitat with the Bahia Grande in collaboration with federal and state agencies. Marsh restoration would provide feeding, breeding, and wintering habitat for colonial and migratory water birds and provide connective habitat to the Atascosa National Wildlife Refuge. The potential impacts of this project to the environment are positive.

(c) Border Safety Inspection Facility (BSIF) – Veterans International Bridge at Los Tomates

This proposed project would construct a Border Safety Inspection Facility (BSIF) at Veterans Bridge at Los Tomates for commercial traffic in order to streamline federal inspections such as customs, agriculture, and immigration, and state inspections targeting safety and weight. The BSIF is needed to improve the safety of trucks entering Texas from Mexico and to help improve and maintain highway infrastructure in Texas and the U.S.

(d) SH 32 (West): From US 77/83 to FM 3068

The proposed SH 32 (West) project would reroute commercial traffic that is currently utilizing SH 48 (International Blvd.), a densely populated area of Brownsville in order to enhance safety, reduce congestion, and improve connectivity. The proposed SH 32 (West) project begins at US 77/83 in the vicinity of the Veterans Bridge at Los Tomates to Azucena Ave. and then from Azucena Ave. to Paloma Blanca. From Paloma Blanca the project parallels the levee along the international border meeting up at FM 3068. The NEPA process for this project is still on-going.

The proposed project area and RSAs are located on the East Emerging District based on the City of Brownsville's Imagine Brownsville Comprehensive Plan. According to the plan, the East Emerging District is split between residential and non-residential uses with a greater degree of flexibility allowing this District to be more responsive to the varying demands presented by its close location to the Employment Hub (Imagine Brownsville Comprehensive Plan). Future land use in this area is predicted to be primarily single family homes and some agricultural/ranch properties. In addition, neighborhood office and retail, light and medium industrial, and warehousing uses are expected to be commonly seen in this area in addition to community facilities such as schools, recreation centers, utility and municipal services. The Employment Hub District is a large area in north and east Brownsville with intermodal infrastructure including the shipping port, rail yards, and the international airport. The Employment Hub is organized around neighborhoods that have industrial uses as their anchors and are surrounded by complementary and supporting residential, community facility, institutional and commercial land uses (Imagine Brownsville Comprehensive Plan). The Employment Hub is considered to be a major economic generator for the City of Brownsville.

4.2.6 Step 6 – Identify and Assess Cumulative Impacts

Cumulative effects on the resource health and trends in the area of effect were evaluated. Incomplete and unavailable information on a resource precluded quantitative assessment in all cases. Where data was incomplete or not available, a qualitative assessment was conducted. Cumulative effect analysis considered the direct and indirect, together with the past, present and reasonably foreseeable future projects.

Vegetation and Wildlife Habitat

Although the proposed project would directly convert approximately 108.7 acres of vegetation none of this is located within or adjacent to a wildlife refuge. Induced development associated with the proposed project may result in impacts to biological communities and natural habitats that, in turn, would result in further habitat fragmentation leading to the disruption of wildlife populations. In conjunction with the reasonable foreseeable actions listed in Section 4.2.5, vegetation and wildlife habitat are likely to be subject to further habitat fragmentation and degradation which would result in a continued decline of the resource. However, as previously stated, the USFWS is continuously acquiring land for protection and expanding the LRGV NWR.

Threatened and Endangered Species

A number of species that are federally-listed endangered and threatened potentially occur within their respective habitats within Cameron County. A number of state-listed species and SGCN also potentially occur in Cameron County. Therefore, it is reasonable to conclude that continued permanent impacts to vegetation and wildlife habitat associated with encroaching development and transportation projects could potentially have cumulative impacts to these species. The existing habitat conditions within the project area for the ocelot and Gulf Coast jaguarundi ranges from poor to marginal. However, there have been confirmed sightings of the ocelot within the RSA according to state and federal databases and the last confirmed sighting of Gulf Coast jaguarundi in south Texas was a road killed near the intersection of SH 4 and FM 511 (Keller's Corner) in Southeast Brownsville on April 1986 (NDD). Due to the existing habitat conditions and confirmed sighting and foreseeable abovementioned projects, the ocelot and Gulf Coast jaguarundi, would be affected by the continued fragmentation of vegetation and wildlife habitat. In addition, even though potential habitat exists for the northern Aplomado falcon, and although this species was not observed or heard during site visits it may occur in the project area during migration. Therefore, the proposed project in conjunction with previously listed transportation projects, the northern Aplomado falcon may be subject to cumulative impacts.

Table 22 below summarizes the potential cumulative effects on resources. The table presents available data on past, present and future actions. Cumulative effects are the sum of direct and indirect effects of other actions.

Table 22: Summary of Potential Cumulative Effects from Past, Present and Future Actions								
Other Actions (Direct and Indirect)								
Resource	**Past Actions**		**Present Actions**		**Future Actions**			**Cumulative Effects (approx..)**
	North FM 1419/ Roadway Improvement	**South FM 1419/ Roadway Improvement**	**Alabama Rd.**	**Alaska Rd.**	**Brownsville/SPI Airport Expansion**	**Brazos Island Harbor Channel Improvements**	**SH 32 (West)**	
Vegetation and Wildlife Habitat	0 acres	0 acres	0 acres	0 acres	0 acres	Unknown	128 acres	128 acres
Threatened and Endangered Species	None	None	None	None	0 acres	Unknown	Unknown	Unknown

4.2.7 Step 7 - Report Results

Vegetation and Wildlife Habitat

The cumulative impacts from the proposed SH 32 project would increase the amount of vegetation converted to urban lands, which may in turn lead to an increase in habitat fragmentation and decrease in wildlife populations.

Threatened and Endangered Species

Impacts to threatened and endangered species would be assessed and addressed for each individual project that might involve federal funds, including TxDOT projects. Although other development projects may not be addressed through public environmental documentation, they would be required to comply with the ESA. Continued development is expected, potentially resulting in the conversion of undeveloped and agricultural land to residential and commercial uses.

4.2.8 Step 8 – Assess the Needs for Mitigation

Vegetation and Wildlife Habitat

Unavoidable vegetation effects are expected to occur as part of construction of the Build Alternative. The direct impact to vegetation for the proposed SH 32 project is approximately 108.7 acres of wildlife habitat which include approximately 40.8 acres of row crops, approximately 0.7 acres of South Texas: Clayey Mesquite Mixed Shrubland, approximately 33.8 acres of South Texas: Disturbance Grassland, approximately 32.2 acres of Urban Low Intensity, approximately 1.2 acres of open water (1.077 acres drainage waters and 0.123 of an acre of open waters at Resaca de la Palma).

Vegetation effects would be partially mitigated through revegetation of exposed areas of the ROW as construction is completed, and landscaping portions of the ROW, as appropriate, with tree, shrub, and grass plantings. Landscaping would be in accordance with *E.O. 13112, Invasive Species and the Executive Memorandum on Beneficial Landscaping*. Soil disturbance would be minimized in order to reduce the colonization of invasive species within the ROW. Habitats given special consideration under the TxDOT-TPWD MOU on Non-Regulatory Mitigation would be avoided to the extent practicable; however, complete avoidance of special habitat features is unlikely. Potential mitigation for direct effects to special habitat features could consist of planting vegetation along disturbed resaca banks and re-establishing riparian vegetation. In addition, a wildlife crossing would be constructed as mitigation for the proposed roadway project.

Continued development is expected, likely resulting in the conversion of undeveloped and agricultural land to residential, commercial, and industrial uses. Impacts to vegetation would be assessed and addressed for each individual project that might involve federal

funds, including CCRMA projects. However, other development projects might not be addressed through public environmental documentation.

Threatened and Endangered Species

USFWS has regulatory authority over federally listed animal species in all cases and coordination with USFWS must occur for impacts to listed animals regardless of the type or funding source of projects (i.e. federally funded, state funded, locally funded, and privately funded projects). In regards to federally listed plant species, coordination with USFWS is only conducted for projects that have a federal nexus (i.e. federally funded projects, projects requiring a federal permit). Impacts to federally-listed plant species do not have to be considered unless a project contains a federal nexus or if the plants in question are on lands managed by TPWD, assuming that the project is an otherwise lawful action.

TPWD has regulatory authority over state-listed animals where direct take (killing or injuring) is involved, but the agency does not have authority over indirect take (destruction of habitat) of state-listed animals. For state-listed plants, TPWD does not regulate either direct or indirect take except for lands owned or managed by TPWD.

The proposed work would impact riparian habitat at Resaca de la Palma, which could potentially be used by tropical felines as travel corridors. Minimization and mitigation would include the re-vegetation the resaca banks with native vegetation and the construction of a wildlife crossing. The wildlife crossing would provide federally endangered felines and other wildlife in the area a means to cross the roadway safely and thus minimize the potential for ocelot and wildlife road kills due to vehicle impacts.

In February 19, 2015, the USFWS concurred with TxDOT's conclusion that the proposed project may affect, but is not likely to adversely affect the ocelot, Gulf Coast jaguarundi, or northern Aplomado falcon and agreed with TxDOT's voluntary conservation measures to minimize impacts to these species in addition to the installation of the wildlife crossing. Refer to **Appendix D** Agency Coordination for a copy of the letter. The following voluntary conservation measures have been proposed and would be implemented by TxDOT:

- Construction would be restricted to daylight hours and construction lighting would not be required minimizing potential harassment from noise and construction lights. In addition, construction equipment would meet all Federal muffler requirements.

- To the maximum extent practicable, project specific locations (PSLS) would be located within the existing or proposed ROW in areas that would not require the removal of woody vegetation. The project contractors would be responsible for environmental coordination of any PSLs located outside of the ROW. TxDOT would provide project contractors with educational information on the federally listed species that occur in the area and their habitat requirements.

- The clearing of vegetation or wooded areas would be restricted to the minimum necessary to complete construction and only within the proposed ROW. Vegetation

disturbances would be conducted between September and February, outside of the general bird nesting season, or the areas proposed for disturbance would be surveyed for nesting birds by a TxDOT biologist prior to disturbance. Vegetation impacts would be partially mitigated through re-vegetation of exposed areas of the ROW after construction is complete.

- Roadway lighting would be limited to the intersections with existing roads and would be minimized at those intersections, while still addressing safety concerns.

- Construction would occur completely within the existing ROW.

- Maintenance mowing would be limited to previously cleared areas in the ROW and outside of the area where the wildlife crossing is installed. “No mow” signs would be installed in certain areas to ensure that native vegetation is maintained.

- TxDOT would implement a protocol to notify the Service if any federally protected species are sighted during construction. If an ocelot or Gulf Coast jaguarundi is observed, all work activities would cease until the animal has moved away from the construction zone.

5.0 PUBLIC INVOLVEMENT, COORDINATION AND PERMIT REQUIREMENTS

5.1 Public Involvement

To date, one public meeting has been held to inform the public, local businesses and organizations about the project and afford them the opportunity to participate in the public process.

The public meeting was held Tuesday, October 26, 2010 at the Dancy Courthouse, Cameron County Commissioner Courtroom, 2nd Floor, 1100 E. Monroe Street, Brownsville, TX. The open house public meeting was from 6:00 pm to 8:00 pm. The purpose of the open house public meeting was to identify local constraints, present the project alternatives, present typical sections of the build alternatives, and solicit public comment/feedback. The meeting was conducted by the representative from TxDOT, CCRMA, and project consultant. During the open house, exhibits showing the preliminary alternatives, proposed typical section and other project information were available for review. A formal presentation was not given during the open house; however, members of the project team and CCRMA were available to answer questions.

Letters were sent to public officials, the general public and to resource agencies. Legal Notices and general display advertisements both in English and Spanish were published in the following newspapers:

- *The Brownsville Herald*– Sunday September 26, 2010.
- *The Brownsville Herald*– Sunday October 16, 2010.

A total of 42 individuals signed the SH 32 Open House sigh-in sheet. Of these 42 individuals, 30 were either property owners, residents, and or business proprietors/owners, 5 individuals were from the City of Brownsville, 4 were from TxDOT, one was from the Texas Department of Public Safety, and one was a consultant representative. CCRMA staff was also present but did not sign the sign-in sheet.

Two written comments were received from an Elected/Local Official. The written comments were from the County Commissioner Sofia Benavides and Mr. Robert Berry of the Brownsville Chamber of Commerce. Both elected/local officials expressed their approval and support of constructing the proposed project.

There were also 11 written comments from the public about the proposed project. The general comments include.

- Expressed concern regarding their property being impacted due to project alignments and project ROW requirements. They preferred changing the alignment to avoid or minimized impacts to their property and requested to have a private meeting to discuss alternatives.
- Property owners requested a more defined map with alternatives.
- Expressed support for the project.

- Requested considering the development of FM 511 to provide access to the Port.
- Prefer the original FM 511.
- Expressed some support to Alternative 2.

After the public meeting, the comments were reviewed and the following project actions were taken into consideration.

- Preferred additions of new alternatives (refinement of Alternative 3) were developed (Alternative 3a-3d) which would straighten and shift the alignment in order to avoid or minimize impacts to property owners.
- Layouts showing the alternatives in relation to their property were sent to the respective property owners.
- A meeting with the project consultant and property owners who had requested a meeting was held to discuss project impacts and potential alternatives to minimize impact to their property.

Meeting with Affected Property Owners (MAPOs)

June 22, 2011 MAPO

Beltran MAPO

A MAPO was held on June 22, 2011 at 10:00 a.m. at the Cameron County Courthouse, Brownsville, Texas. People in attendance were Cameron County representatives, project consultant, and Mr. and Mrs. Beltran on behalf of their daughter (property owner). The meeting was held because the property owner wanted to know the timeline on when the project was going to be constructed. The house being affected is a rental property with the Housing Authority. A brief presentation of the proposed SH 32 project was given to the property owner and booklets were handed to the property owner explaining the ROW process. All correspondence was given in Spanish since the property owner's parents only speak Spanish while owner of the property, (their daughter) speaks English.

August 8, 2013 MAPO

Cavazos MAPO

A MAPO was held on August 8, 2013 at 5:00 p.m. at the Cavazos residence with property owners Mrs. Ardelle Cavazos and Mr. Juan Cavazos. Representatives from TxDOT, Cameron County Commissioner Sofia Benavidez, CCRMA, and the project consultant were in attendance. The property owners expressed concern about the proximity of the ROW to their home. The CCRMA representative, Mr. Pete Sepulveda, Jr., stated that the CCRMA would re-assess the alignment to determine if the proposed ROW could be minimized at the Cavazos property. Aa copy of the Meeting with Affected Property Owners Summary Report is available on file in the TxDOT Pharr District office.

December 9, 2013 MAPOS

Three MAPOs were held with affected property owners on December 9, 2013. The MAPOs were held with several property owners in the area of SH 4 and the proposed SH 32 roadway due to changes in the alignment that affected the ROW in the area.

Loop MAPO

The first MAPO was held at 2:30 p.m. at the Loop Property. People in attendance were representatives from the CCRMA, TxDOT, Brownsville Irrigation District, project consultant, and Leonard Loop and Jeff Loop from Loop Farms (property owner). The meeting was held to explain the changes in alignment that affect the ROW in area. Mr. Leonard Loop had the following inquiries: 1) will the existing segment of FM 1419 that connects to SH 4 would be left as is, 2) property access concerns, and 3) project timeline. The project consultant showed Mr. Loop a project map showing the placement of a cul-de-sac. The TxDOT representative did not provide an official response as to who will be responsible for the remaining FM 1419 roadway; however, it was explained that if the roadway was to become part of the county, the lesser design guidelines from the county could possibly allow for the roadway to curve back into the proposed SH 32 roadway. A schematic showing the entire project was utilized to show property access and overall view of the project. The CCRMA representative explained the project timeline consists of obtaining environmental clearance by mid 2014 which will allow for property acquisition and construction of the project beginning in mid 2015.

Beltran MAPO

The second MAPO was held at 3:30 p.m. at the Beltran Property and conducted in Spanish. People in attendance were representatives from the CCRMA, TxDOT, project consultant, Ms. Griselda Saldivar, Mr. Luis Guerrero Sr. (property owner of adjacent property), and Ms. Maria E. Beltran (property owner). The property owners expressed concerns as to the ROW process and compensation for property loss. It was explained that at the time of ROW acquisition, they would be notified of their rights as property owners and allowed to negotiate the purchase of the ROW with the CCRMA representatives. At that time all the specifics (damages, actual ROW taking, complete buy out, relocation, etc.) would be determined. The CCRMA representative explained the project timeline consists of obtaining environmental clearance by mid 2014 which will allow for property acquisition and construction of the project beginning in mid 2015. Neither property owner is against the proposed project. Mr. Guerrero requested a copy of the map shown.

Cavazos MAPO

The third MAPO was held at 4:00 p.m. at the Cavazos property. People in attendance were representatives from the CCRMA, TxDOT, project consultant, and Mrs. Ardelle Cavazos, and Mr. Juan Cavazos (property owners). The project consultant explained how the ROW line in front of the Cavazos property was adjusted from the line that was shown in a previous meeting. Property owners requested the exact measurements from the front of their house to the closest point of the proposed ROW and how much ROW would be acquired from their property. The

CCRMA representative explained the project timeline consists of obtaining environmental clearance by mid 2014 which will allow for property acquisition and construction of the project beginning in mid-2015. A copy of the Meeting with Affected Property Owners Summary Report is available on file at the TxDOT Pharr District office.

December 20, 2013 MAPOS

Four MAPOs were held with affected property owners on December 20, 2013. The MAPOs were held primarily to deliver a copy of the new draft schematic that depicts the proposed ROW line.

Wittenback MAPO

The first MAPO was held at 10:00 a.m. at the Garza & Garza, L.L.P Office located on 680 E. St. Charles, Suite 300 in Brownsville, Texas. Mr. Richard Butler and Ms. Quita Wittenback (property owners) as well as Cameron County Commissioner Ms. Sofia Benavidez and TxDOT and project consultant representatives were present during the meeting.

Cavazos MAPO

A follow-up MAPO was held with Mr. Cavazos (property owner) at the Cavazos residence after the MAPO with Mr. Butler and Ms. Wittenback. Meeting attendees includes Ms. Sofia Benavides and a representative from TxDOT and the project consultant. Mr. Cavazos stated he wishes to salvage palm trees from within the proposed ROW and relocate them to his remaining property. He inquired about the general timeline in regards to the ROW acquisition and construction. Mr. Cavazos was informed that the ROW acquisition process and construction would occur sometime between late 2014 and mid-2015.

Guerrero MAPO

The third MAPO was held at the residence of Mr. Luis Guerrero Sr.. Persons who attended the MAPO include Ms. Sofia Benavides, and representatives of TxDOT and the project consultant. A copy of the draft schematic was delivered to Mr. Guerrero. No other discussions were held.

Keith MAPO

A MAPO was conducted with Ms. Keith (property owner) at her residence. Attendees to the MAPO included Ms. Keith's daughter and son as well as Ms. Sofia Benavides and representatives from TxDOT and the project consultant. Ms. Keith was informed of the new design changes and changes in ROW requirements. A copy of the draft schematic was displayed and given to her for her records. Ms. Keith raised concerns in regards to the structure being proposed to be taken during ROW acquisition. She suggested the alignment be shifted to avoid impacts to the structure. She was informed that designers would re-assess the alignment to determine if the structure could be feasibly avoided. A copy of the Meeting with Affected Property Owners Summary Report is available on file at the TxDOT Pharr District office.

5.2 Environmental Permit, Issues, and Commitments

If the Build Alternative were implemented, the CCRMA in cooperation with the TxDOT would ensure the following mitigation measures and monitoring commitments would be met.

Relocation/Displacement of people

Relocation benefits and assistance are available to all individuals displaced as a result of this CCRMA project. In accordance with federal policy, no person would be displaced by the proposed project until adequate, decent, safe, and sanitary housing is made available as described in the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended (42 USC). Relocation benefits and assistance are available without regard to race, color, religion, national origin, sex, age, or handicap in accordance with Title VI of the Civil Rights Act of 1964 and Title VIII of the Civil Rights Act of 1968.

Vegetation

As per TxDOT's MOU with the TPWD, a District, at its discretion, may take into consideration compensatory mitigation for unregulated habitats. Compensatory mitigation would not be proposed because the impacts would not be to unique or rare vegetation series. In addition no unusually large specimens of trees were found in the project area. Soil disturbance would be minimized to ensure no invasive species would be established in the ROW.

During construction, efforts would be taken to avoid and minimize disturbance of vegetation and soils. Areas within the existing and proposed ROW, but outside the limits of construction would not be disturbed. All areas disturbed during construction would be re-vegetated, according to TxDOT specifications, as soon as it becomes practicable. In accordance with EO 13112 on Invasive Species, the Executive Memorandum on Beneficial Landscaping, and the 1999 FHWA guidance on invasive species, only non-invasive species would be planted within the ROW.

Migratory Birds

CCRMA and TxDOT will comply with the MBTA and Bird BMPs as per the 2013 MOU between TxDOT and TPWD. Bird BMPs include not disturbing, destroying, or removing active nests, including ground nesting birds, during the nesting season; avoiding the removal of unoccupied, inactive nests, as practicable; preventing the establishment of active nests during the nesting season on TxDOT owned and operated facilities and structures proposed for replacement or repair; and not collecting, capturing, relocating, or transporting birds, eggs, young, or active nests without a permit.

Vegetation disturbances potentially associated with construction activities would be conducted so as to avoid the general nesting period from February 15 through October 1, or that those proposed for disturbance be surveyed first for nesting birds, especially for grassland nesting species, within the project area, in order to avoid impacts to any migratory species. The CCRMA and TxDOT would take measures to avoid the inadvertent take of migratory birds, their occupied nests, eggs, and/or young. All methods would be approved by the TxDOT District Biologist well in advance of planned use. The proposed project is not expected to impact any migratory birds.

The BMPs for SGCN and Threatened Species would be followed throughout the construction period to avoid harming the species if encountered.

In order to comply with the Migratory Bird Treaty Act (MBTA), the following commitments, where practicable, would be incorporated:

- The contractor would refrain from removing or destroying active migratory bird nests (nests containing eggs and/or young) at any time of the year (required under MBTA). If there are active nests, removal is prohibited until the nests become inactive, usually between October 1 and February 15.
- If colonial nesting occurs on or in structures, nests will not be removed until all nests in the colony become inactive.
- Utilize measures, to the extent practicable, to prevent or discourage migratory birds from building nests within portions of the project area planned for construction.
- Remove inactive nests from the project area to minimize the potential for reuse by migratory birds.
- When practicable, schedule construction or demolition activities outside the typical nesting season (February 15 to October 1), noting that the prohibitive provisions of the MBTA apply year-round.

Hazardous Materials

Any hazardous materials and or contaminated soils encountered during construction would be removed in accordance with current hazardous materials guidelines. Should project design or ROW requirements change during project development, the potential for hazardous material impacts would be reassessed. Section 8.10 of the General Provisions of TxDOT's *Standard Specifications for Construction and Maintenance of Highways, Streets and Bridges*, which applies to all highway projects, includes guidelines addressing the contractor's responsibilities regarding the discovery of hazardous materials.

In addition, the proposed project would comply with TxDOT's *Guidance for Handling Asbestos in Construction Project: Summary of Asbestos Procedures for TxDOT Projects* released on February 2014.

Water Quality

The proposed project would disturb one or more acres therefore meeting the criteria of the TCEQ Texas Pollutant TPDES General Permit for Construction Activities. This project would disturb over five acres and would require an NOI to be filed with TCEQ. In addition, the proposed project is located within five miles upstream from Segment Number 2302 and 2494 an impaired and/or threatened stream segment, according to the Section 303(d) list; therefore, coordination with the TCEQ would be required.

A Storm Water Pollution Prevention Program would be prepared and implemented. Where appropriate, these temporary erosion- and sedimentation-control structures would be in place before initiation of work and would be maintained throughout the duration of the project. The

contractor would take appropriate measures to prevent, minimize, and control the spill of hazardous materials in staging areas. All materials being removed and/or disposed of by the contractor would be done in accordance with State and Federal laws and by approval of the supervising engineer.

Permanent erosion and water-pollution controls would be used in all areas disturbed by the contractor's equipment. These controls would consist of the placement of topsoil and permanent seeding with a mix of native and locally-adapted grasses.

Waters of the U.S., Including Wetland

The USACE has regulatory authority regarding the discharge of fill material into Waters of the U.S., and has the enforcement power to stop unauthorized discharges. Proposed impacts to Waters of the U.S., would require the authorization of a NWP and Section 404 permit by the USACE. A NWP 14 with PCN is anticipated at the Resaca crossing and compensatory mitigation for loss of Waters of the U.S., including wetlands, would be determined during the permitting process.

Archeological and Historical Resources

An Intensive Archeological Survey examined 100 acres out of 150 total acres of existing and proposed ROW due to Right-of-Entry (ROE) issues. No further archeological investigation is recommended in the 100 acres where access was obtained but the remaining 50 acres with no ROE will require archeological investigation prior to construction. TxDOT and CCRMA will complete the survey and Section 106/Antiquities Code of Texas consultation of the remaining 50 area once access is acquired and prior to construction.

In the unlikely event that evidence of archeological deposits are encountered during construction, work in the immediate area would cease and TxDOT's archeological staff would be contacted to initiate accidental discovery procedures under the provisions of the Programmatic Agreement among TxDOT, THC, FHWA, and the advisory Council on Historic Preservation and the Memorandum of Understanding between TxDOT and THC.

If unanticipated discoveries of archeological, historic sites, or human remains were discovered prior to or during construction, work would cease immediately. A TxDOT staff archeologist would then survey the site pursuant to the Antiquities Code of Texas (ACT) and the site would be avoided or mitigated according to the procedural provisions of Section 106 of the National Historic Preservation Act. Reasonable efforts would be made to avoid, minimize, or mitigate adverse effects to such properties according the procedural provisions of Section 106 of the National Historic Preservation Act (36 CFR 800.13). Additionally, if human remains were discovered the local police would be notified in accordance with state law.

Best Management Practices

Bird BMPs

- Not disturbing, destroying, or removing active nests, including ground nesting birds, during the nesting season;
- Avoiding the removal of unoccupied, inactive nests, as practicable;
- Preventing the establishment of active nests during the nesting season on TxDOT owned and operated facilities and structures proposed for replacement or repair;
- Not collecting, capturing, relocating, or transporting birds, eggs, young, or active nests without a permit.

Bridge Bat BMPs

- Habitat assessment by a qualified biologist to determine if bats are present.
- If bats are present take appropriate measures as practicable to ensure that bats are not harmed such as exclusion or timing activities. For maternity colonies, exclusion activities should be timed to avoid separating lactating females from nursing pups.
- If structures used by bats are removed as a result of construction, replacement structures should incorporate bat-friendly design, or artificial roosts should be constructed to replace these features as practicable.

Tree Bat BMPs

- Avoid unnecessary removal of dead fronds on native and ornamental palm trees in south Texas (Cameron, Hidalgo, Willacy, Kenedy, Brooks, Kleberg, Nueces, and San Patricio counties)
- Large hollow trees should be surveyed for maternity colonies and, if found, should not be disturbed until after pups fledge.

Water Quality BMPs

- Once construction is complete and disturbed areas have been revegetated, remove silt fence andaccumulated sediment to reduce wildlife barriers and hazards.
- Minimize the use of equipment in streams and riparian areas during construction. When possible, equipment access should be from banks, bridge decks, or barges.
- When temporary stream crossings are unavoidable, remove stream crossings once they are no longer needed and stabilize banks, bridge decks, or barges.

- When temporary stream crossings are unavoidable, remove stream crossings once they are no longer needed and stabilize banks and soils around the crossing.

- Wet-Bottom bed detention ponds are recommend to benefit wildlife and downstream water quality. Consider potential wildlife-vehicle interactions when siting detention ponds.

- Rubbish found near bridges on TxDOT ROW should be removed and disposed of property to minimize the risk of pollution. Rubbish does not include brush piles or snags.

Stream Crossings

- Use spanning bridges rather than culverts when feasible. If using a culvert, staggered culverts that concentrate low flows but provide conveyance of higher flows through staggered culverts placed at higher elevations is recommended.

- Bottomless culverts are recommended to allow for fish and other aquatic wildlife passage in the low flow channel. If bottomless culverts are not feasible, making a low flow channel for fish passage is recommended.

- Avoid placing riprap across stream channels and instead use alternative stabilization such as biotechnical stream bank stabilization methods including live native vegetation or a combination of vegetative and structural materials. When riprap or other bank stabilization devices are necessary, their placement should not impede the movement of aquatic and terrestrial wildlife underneath the bridge, in some instances, rip rap may be buried, back-filled with topsoil and planted with native vegetation.

- Incorporate bat-friendly design into bridges and culverts.

- Design bridges for adequate vertical and horizontal clearances under the roadway to allow for terrestrial wildlife to safely pass under the road.

- A span wide enough to cross the stream and allow for dry ground and a natural surface path under the roadway is encouraged. For culverts, incorporation of an artificial ledge inside the culvert on one or both sides for use by terrestrial wildlife is recommended.

- Riparian buffer zones should remain undisturbed where possible.

To minimize the effects on the ocelot, Gulf Coast jaguarundi, and the northern Aplomado falcon the following conservation measures would be incorporated into the project design, construction, and maintenance of the facility:

- An at grade wildlife crossing would be designed and installed under the proposed SH 32 roadway at Resaca de la Palma in order to minimize potential endangered cats and

wildlife mortality due to collisions with vehicles. The wildlife crossing would be designed and constructed so that wildlife has a clear line-of-sight from one end of the culvert to the other. The at grade wildlife crossing would be placed along the north bank of the resaca and north of the existing below grade Resaca de la Palma drainage culvert. The first phase wildlife crossing would be 5-ft. x 5-ft. x 123-ft. without a grate inlet. The second phase wildlife crossing would be 5-ft. x 5-ft. x 184-ft and would include a standard 3-ft by 3-ft grate inlet that allows light into the wildlife crossing.

- At Resaca de la Palma the CCRMA and TxDOT would design and install 6-ft. high wildlife fencing along the proposed ROW in conjunction with the proposed wildlife crossing to direct wildlife traveling along the resaca banks and through the culvert.

- Roadway illumination would be designed and installed to minimize impacts to the extent practical while still addressing safety concerns.

- CCRMA and TxDOT would include notes in the Environmental Permits, Issues, and Commitments (EPIC) sheets for the developer/contractor to minimize clearing of wooded areas within the existing and proposed ROW.

- For designated Project Specific Locations (PSL's) on project ROW, the CCRMA and TxDOT would obtain all permits and clearance and would be available for use by the Contractor. The Contractor may select alternative PSL's but would be responsible for all permits and clearance.

- To avoid and minimize impacts during construction and maintenance activities, the CCRMA and TxDOT would educate contractors and employees by designing and implementing an instruction program to instruct any current and new TxDOT field personnel in the project area on their duties and obligations under the Endangered Species Act (ESA) to not take federally listed species, including ocelots, Gulf Coast jaguarundi, or northern Aplomado falcon.

- Vegetation disturbances potentially associated with construction activities would be conducted so as to avoid the general nesting period from February 15 and October 1 to minimize potential impacts to the northern Aplomado falcon.

- Vegetation effects would be partially mitigated through re-vegetating of exposed areas of the ROW as construction is completed, and landscaping portions of the ROW, as appropriate, with tree, shrub, and grass plantings. Landscaping would be in accordance with *Executive Order 13112, Invasive Species and the Executive Memorandum on Beneficial Landscaping*.

- Construction and maintenance activities would be scheduled to occur only during daylight hours unless it is an emergency situation.

- Maintenance mowing would be limited to previously cleared areas and no additional clearing of wooded areas (other than trimming of overhang for safety reasons) would occur.

- Vegetation within the wildlife crossings would not be mowed so that brush can establish.

- Wildlife crossing would be checked periodically to ensure water is not standing for prolonged periods in the crossings and chain link fencing at the wildlife crossings would be maintained.

- Vegetation disturbances associated with maintenance activities would be conducted so as to avoid the general nesting period from March through August, or that those areas proposed for disturbance be surveyed first for nesting birds by a qualified biologist in order to avoid impacts to any migratory species.

- The clearing of vegetation or wooded areas would be restricted to the minimum necessary to complete construction and only within the proposed ROW. Vegetation disturbances would be conducted between February 15 and October 1, outside of the general bird nesting season, or the areas proposed for disturbance would be surveyed for nesting birds by a TxDOT biologist prior to disturbance. Vegetation impacts would be partially mitigated through re-vegetation of exposed areas of the ROW after construction is complete.

- Roadway lighting would be limited to the intersections with existing roads and would be minimized at those intersections, while still addressing safety concerns.

- Construction would occur completely within the existing ROW.

- Maintenance mowing would be limited to previously cleared areas in the ROW and outside of the area where the wildlife crossing is installed. “No mow” signs would be installed in certain areas to ensure that TxDOT would implement a protocol to notify the Service if any federally protected species are sighted during construction. If an ocelot or jaguarundi is observed, all work activities would cease until the animal has moved away from the construction zone.

During Construction

Common dust control techniques such as surface chemical treatment or watering of unpaved road surface, and vehicle speed reduction would be implemented to minimize and prevent airborne dust during construction.

The Traffic Control Plans such as detours, temporary traffic signal, signs, and stripes would be included in the engineering design of the proposed roadway and implemented during construction.

6.0 RECOMMENDATION OF THE PREFERRED ALTERNATIVE

This section identifies the rationale for the selection of the preferred alternative and discusses possible requirements for the minimization of environmental impacts.

6.1 Preferred Alternative

The Build Alternative (Alternative 3 - Option 3D) is the preferred alternative for the proposed project. This Alternative would fulfill the need and purpose for the project, which is to enhance intermodal connectivity, provide infrastructure necessary to support growth in the project area and address poor connectivity between the Port of Brownsville FTZ and the Brownsville/South Padre Island International Airport and the Airport FTZ.

6.2 Support Rationale

If constructed, the Build Alternative would fulfill the need for the project, which is to improved intermodal connectivity, and provide infrastructure necessary to support growth in the project area. It would also satisfy the purpose for the project, which is to address poor connectivity between the Port of Brownsville FTZ and the Brownsville/South Padre Island International Airport and the Airport FTZ. The Build Alternative would cause short-term affects such as noise, water and air quality issues relating to construction activities, however, it would comply with all federal, state, county, and city environmental laws, and all required permits would be obtained.

6.3 Conclusion

This environmental document has evaluated a No-Build Alternative and Build Alternative, and recommends the Build Alternative as the proposed action. Based on the evaluation of social, biological, physical, and natural resources of the proposed project area, the proposed action as evaluated in this EA would not cause any significant adverse impacts to any resource. Most impacts to the resources will provide positive benefits, which include access, enhance mobility, and encourage growth and development. This EA concludes that the proposed project would provide for safe and efficient travel within the project corridor and that the means to achieve this can be accomplished through the proposed SH 32 project with minimal impacts to the environment.

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SOURCE - ESRI STREETMAP USA, 2004.

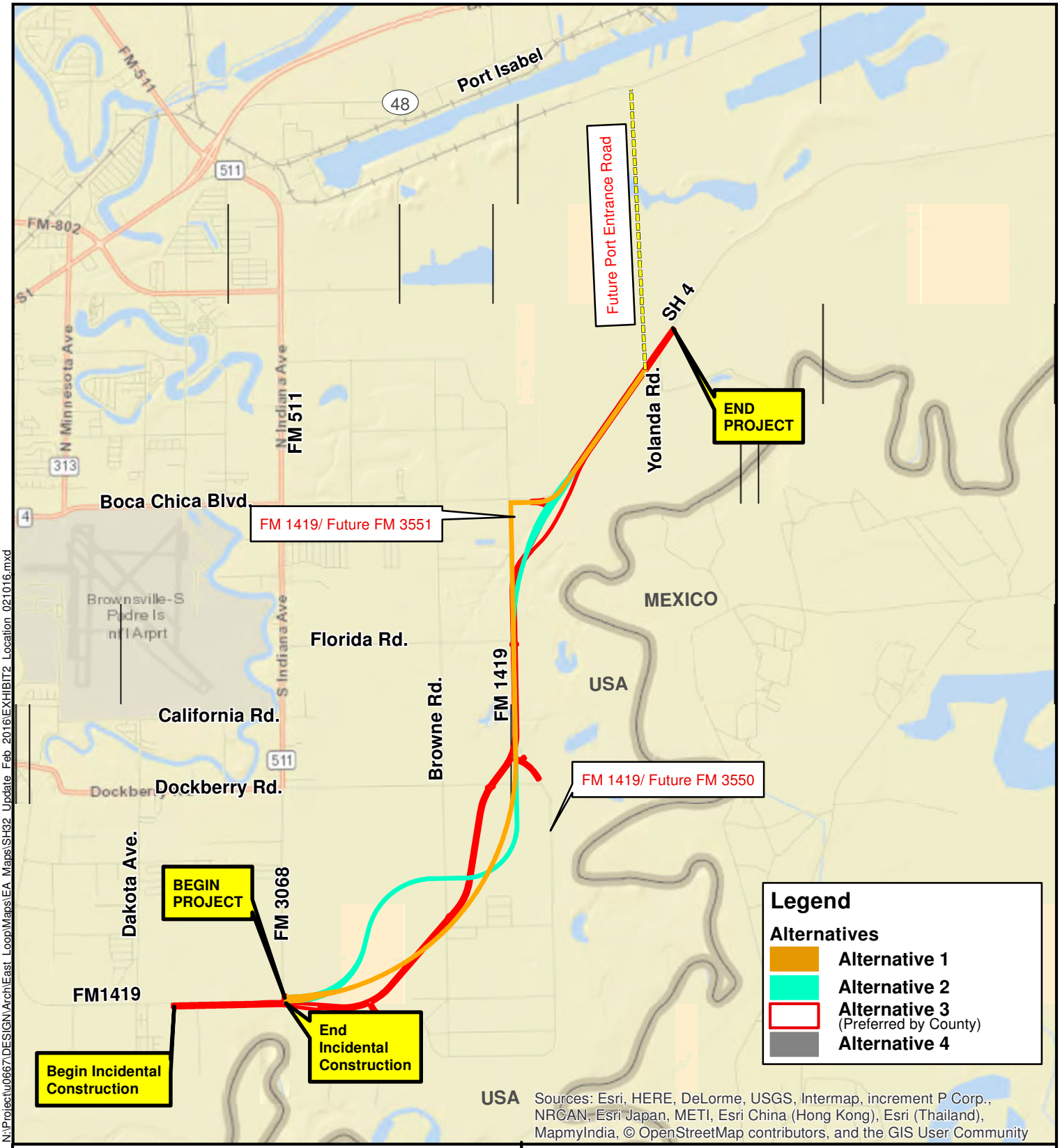
5 2.5 0 5
Miles

N

EXHIBIT 1 VICINITY MAP

CCRMA
CAMERON COUNTY REGIONAL MOBILITY AUTHORITY

STATE HIGHWAY 32
CAMERON COUNTY, TEXAS



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SOURCE - ESRI WORLD STREET MAP, 2015.

0.5 0.25 0 0.5
Miles

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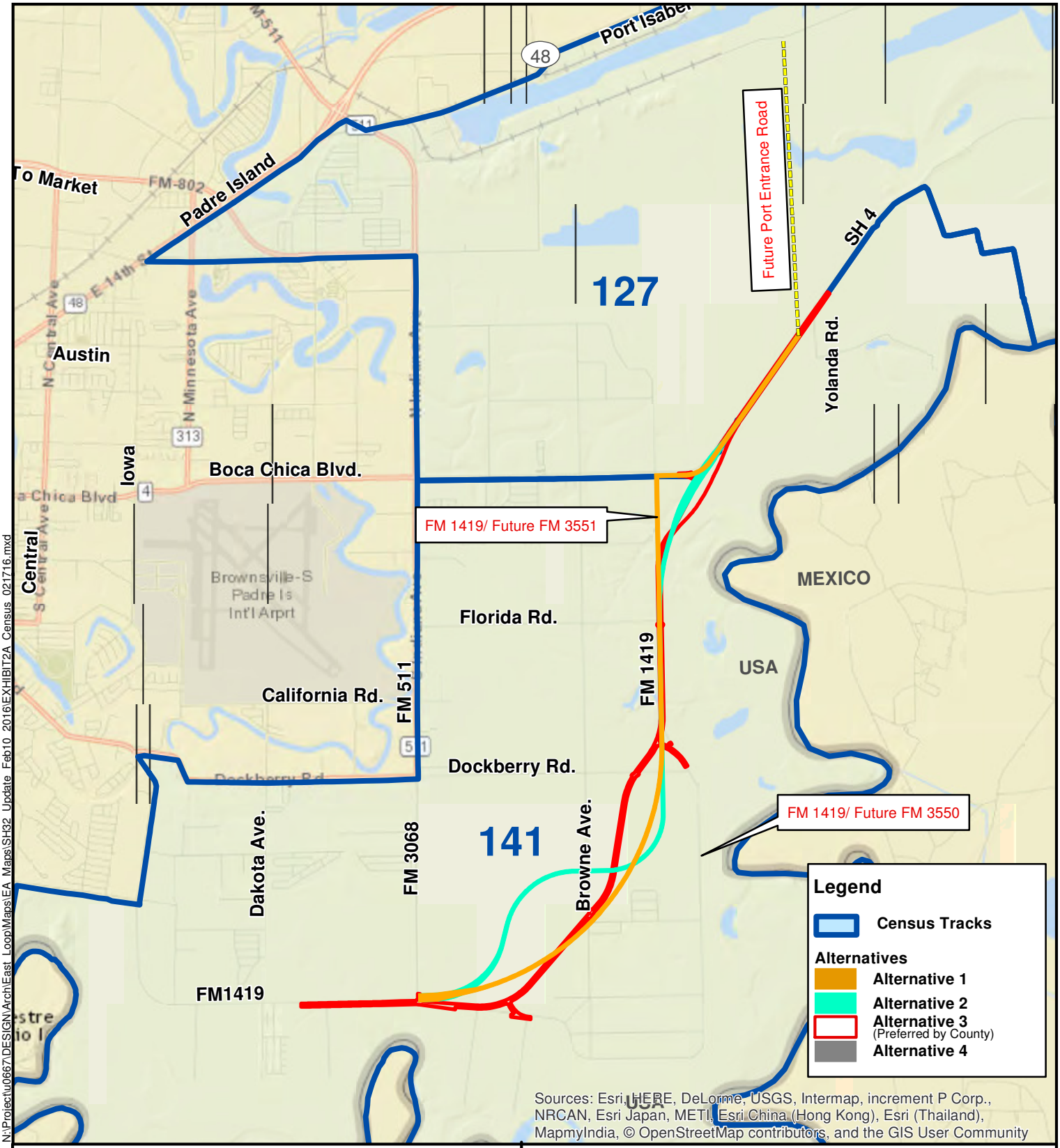
EXHIBIT 2
LOCATION MAP

CCRMA
CAMERON COUNTY REGIONAL MOBILITY AUTHORITY

SH 32
CAMERON COUNTY, TEXAS



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SOURCE - ESRI WORLD STREET MAP, 2015.

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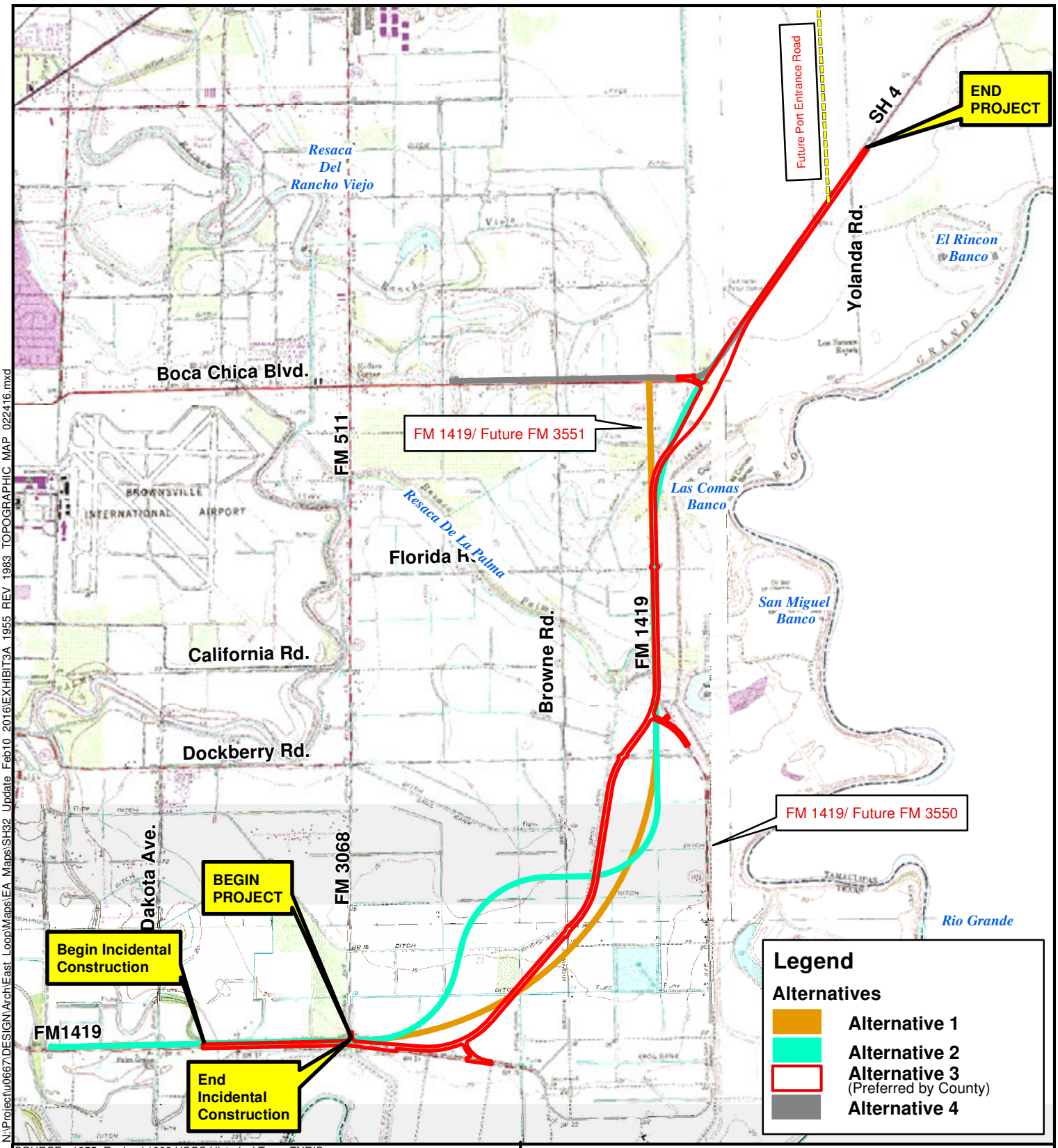
EXHIBIT 2A
CENSUS MAP

CCRMA
CAMERON COUNTY REGIONAL MOBILITY AUTHORITY

SH 32
CAMERON COUNTY, TEXAS



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SOURCE - 1955 -Revised 1983 USGS Historical Topo, TNRIS
(East Brownsville, PalmitoHill, Southmost)

0.5 0.25 0 0.5
Miles

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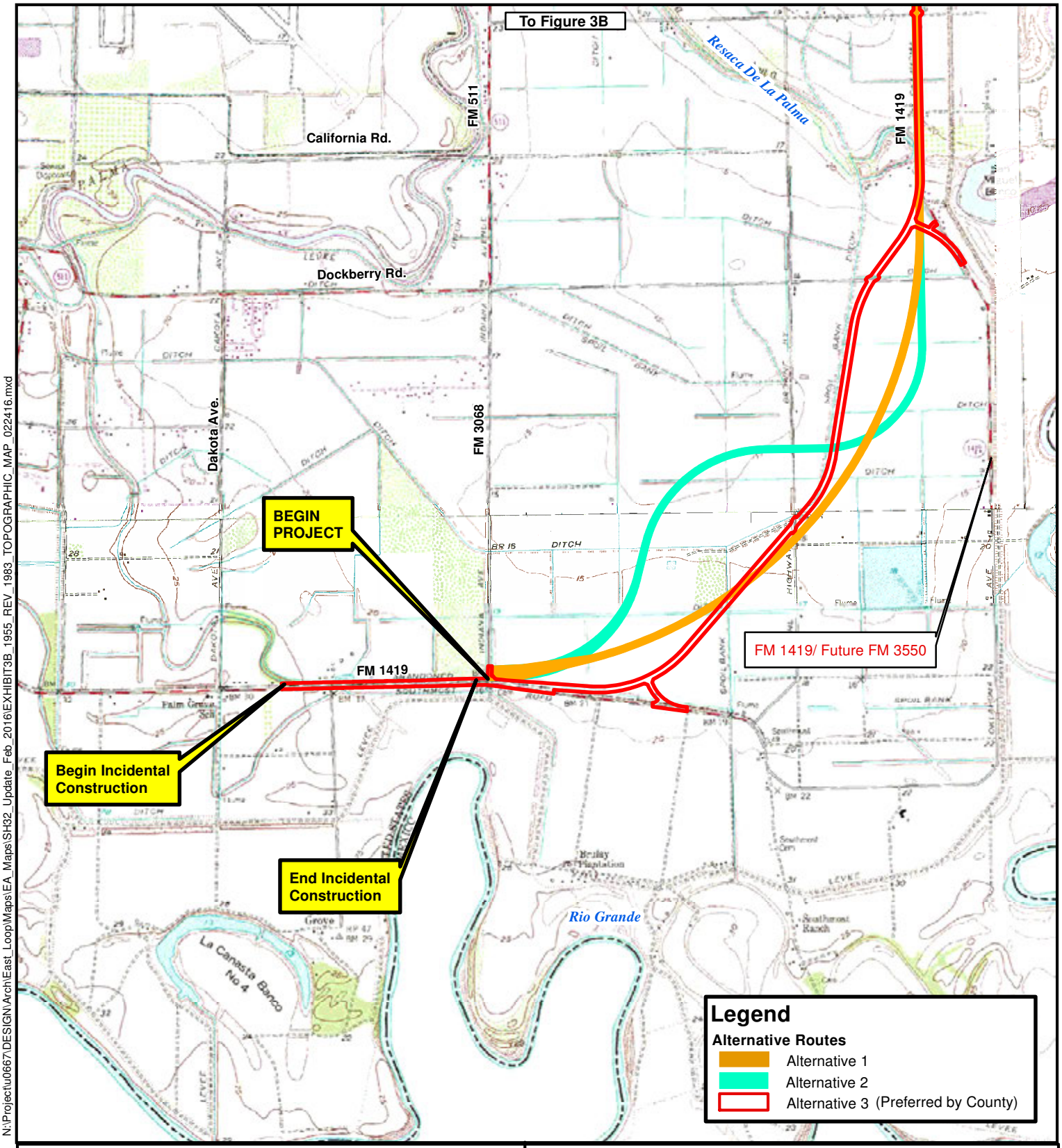
EXHIBIT 3A
1955 PHOTOREVISED 1983 TOPOGRAPHIC MAP

CCRMA
CAMERON COUNTY REGIONAL MOBILITY AUTHORITY

SH 32
CAMERON COUNTY, TEXAS



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SOURCE - 1955 -Revised 1983 USGS Historical Topo, TNRIS
(East Brownsville, PalmitoHill, Southmost)

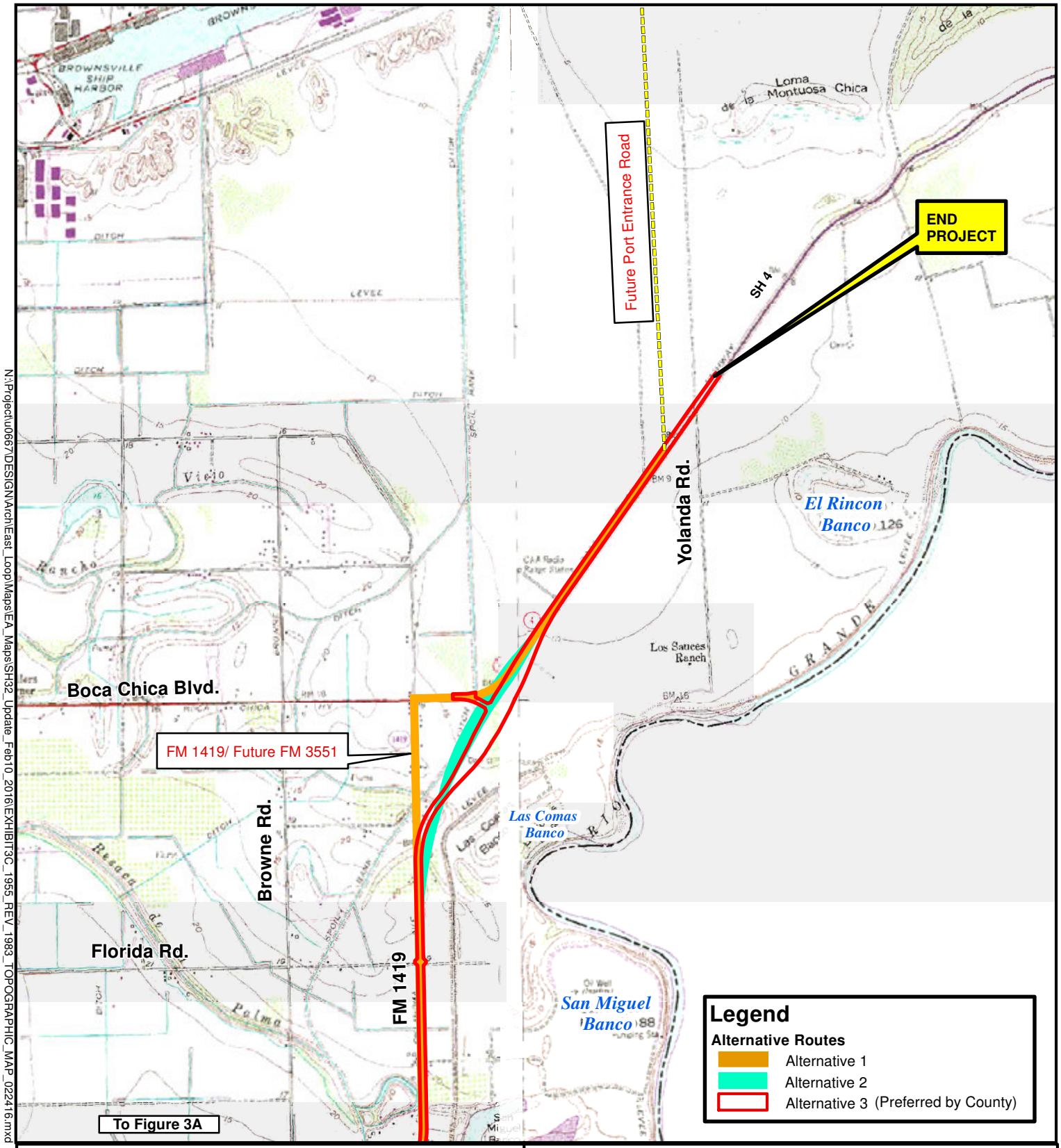
2,000 1,000 0 2,000
Feet

N

EXHIBIT 3B
1955 PHOTOREVISED 1983 TOPOGRAPHIC MAP

CCRMA
CAMERON COUNTY REGIONAL MOBILITY AUTHORITY

SH 32
CAMERON COUNTY, TEXAS



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SOURCE - 1955 -Revised 1983 USGS Historical Topo, TNRIS
(East Brownsville, PalmitoHill, Southmost)

2,000 1,000 0 2,000
Feet

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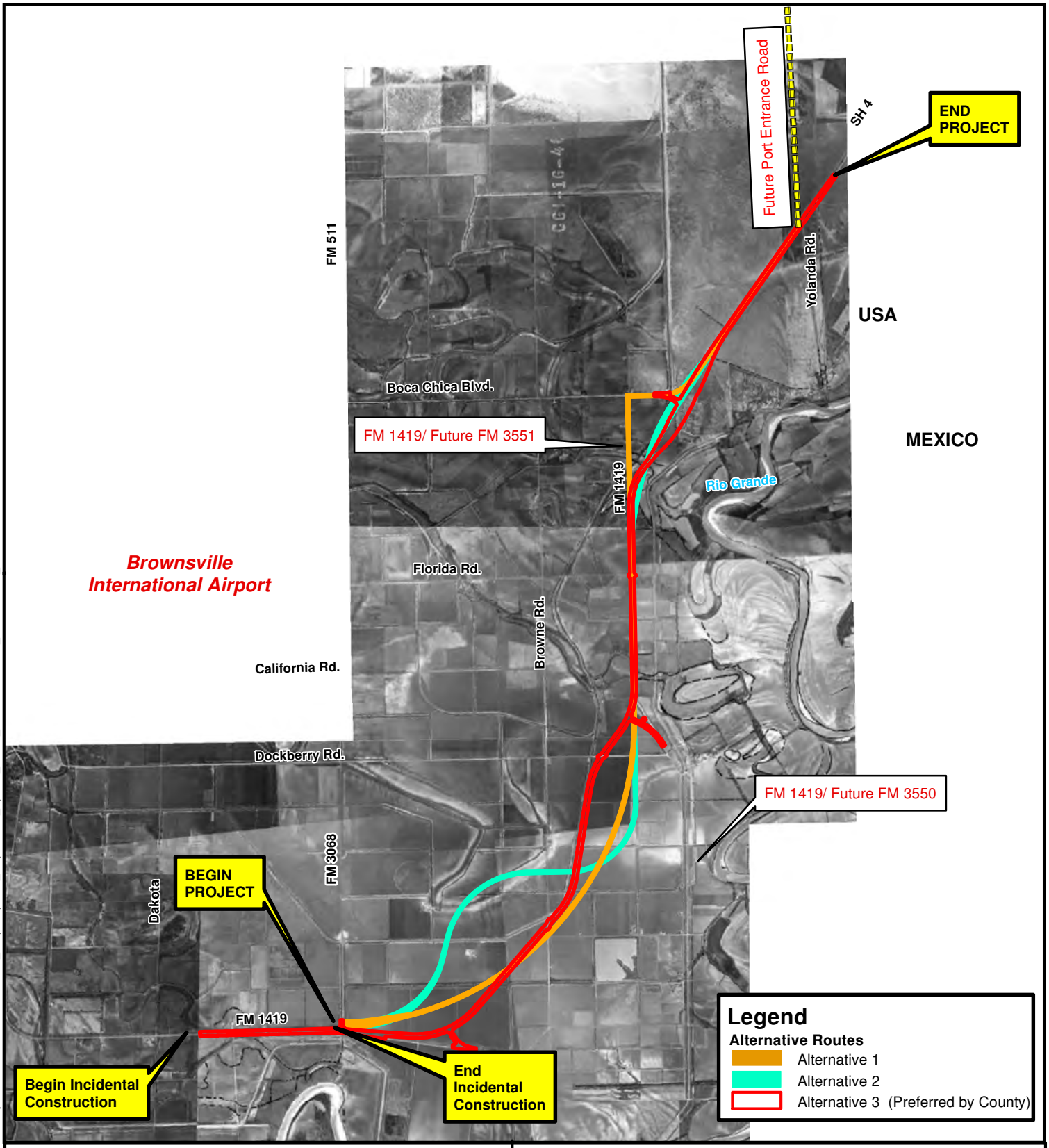
EXHIBIT 3C
1955 PHOTOREVISED 1983 TOPOGRAPHIC MAP

CCRMA
CAMERON COUNTY REGIONAL MOBILITY AUTHORITY

SH 32
CAMERON COUNTY, TEXAS



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USDA 1950 HISTORICAL AERIALS
(1950 AERIAL WAS GEOREFERENCED TO BEST FIT SOUTH TEXAS STATE PLANE (FEET) COORDINATE SYSTEM)

1 0.5 0 1
Miles

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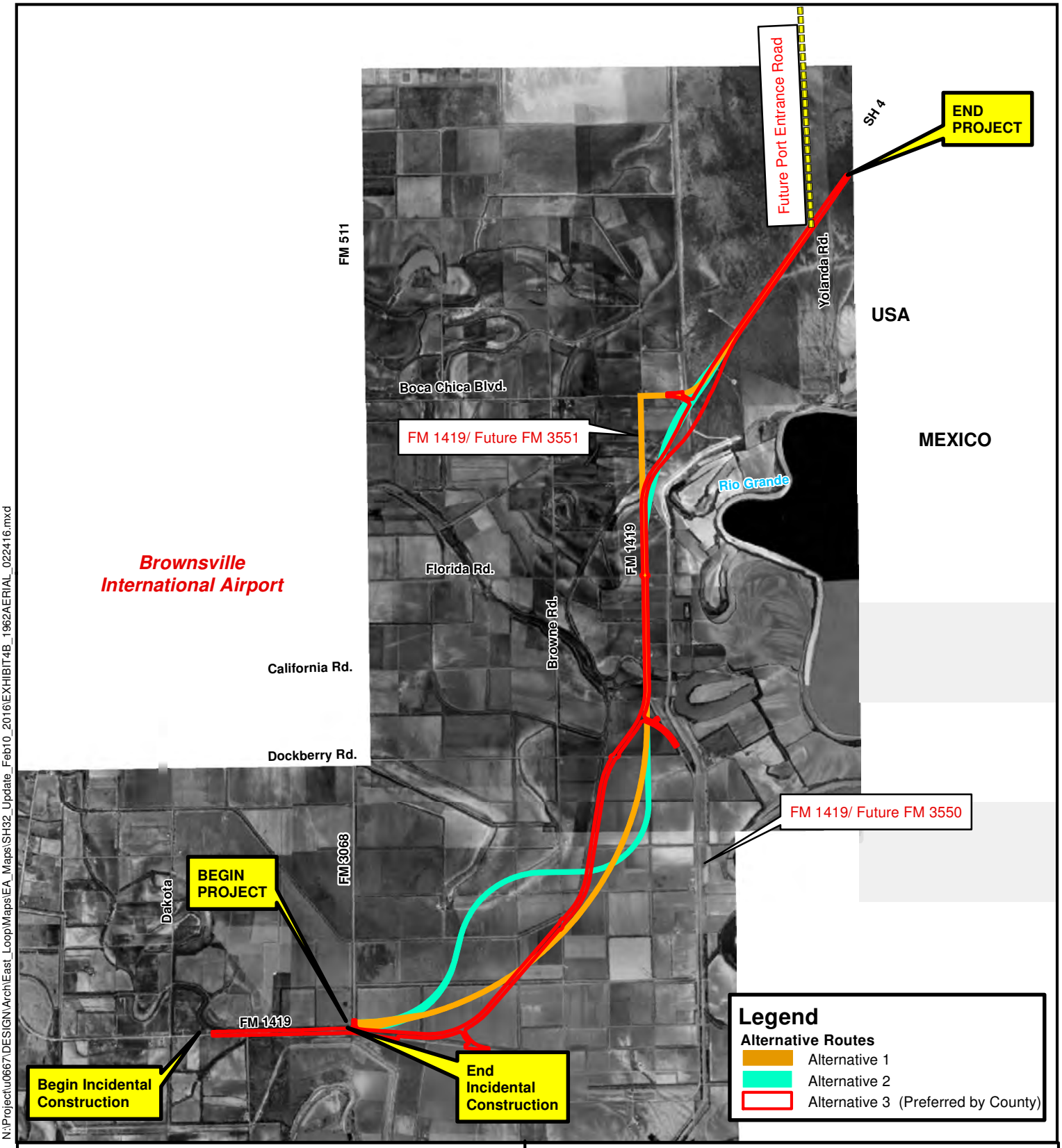
EXHIBIT 4A
1950 AERIAL PHOTOGRAPH MAP

CCRMA
CAMERON COUNTY REGIONAL MOBILITY AUTHORITY

SH 32
CAMERON COUNTY, TEXAS



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USDA 1950 HISTORICAL AERIALS
(1950 AERIAL WAS GEOREFERENCED TO BEST FIT SOUTH TEXAS STATE PLANE (FEET) COORDINATE SYSTEM)

1 0.5 0 1
Miles

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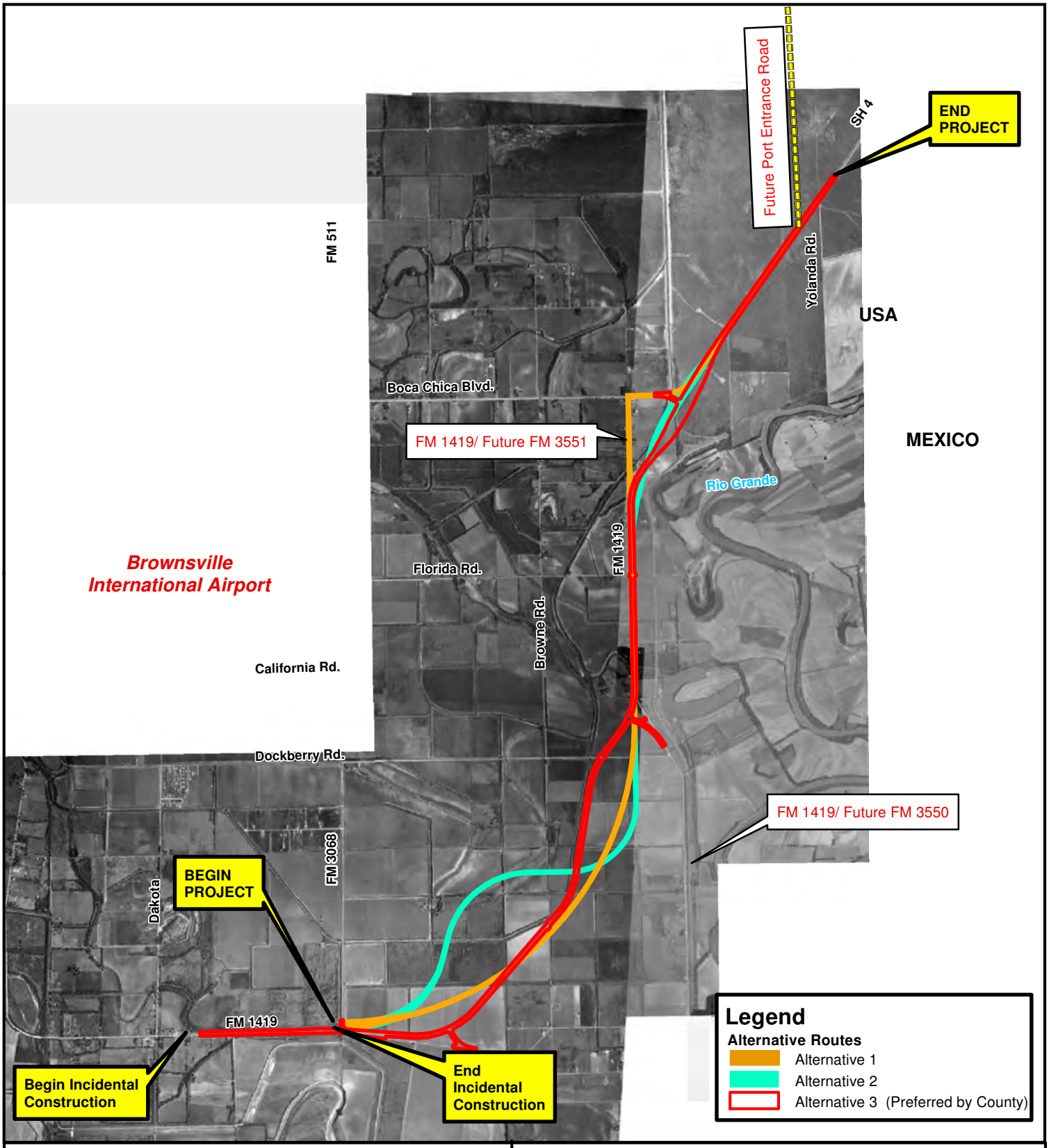
EXHIBIT 4B
1962 AERIAL PHOTOGRAPH MAP

CCRMA
CAMERON COUNTY REGIONAL MOBILITY AUTHORITY

SH 32
CAMERON COUNTY, TEXAS



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USDA 1950 HISTORICAL AERIALS
(1950 AERIAL WAS GEOREFERENCED TO BEST FIT SOUTH TEXAS STATE PLANE (FEET) COORDINATE SYSTEM)

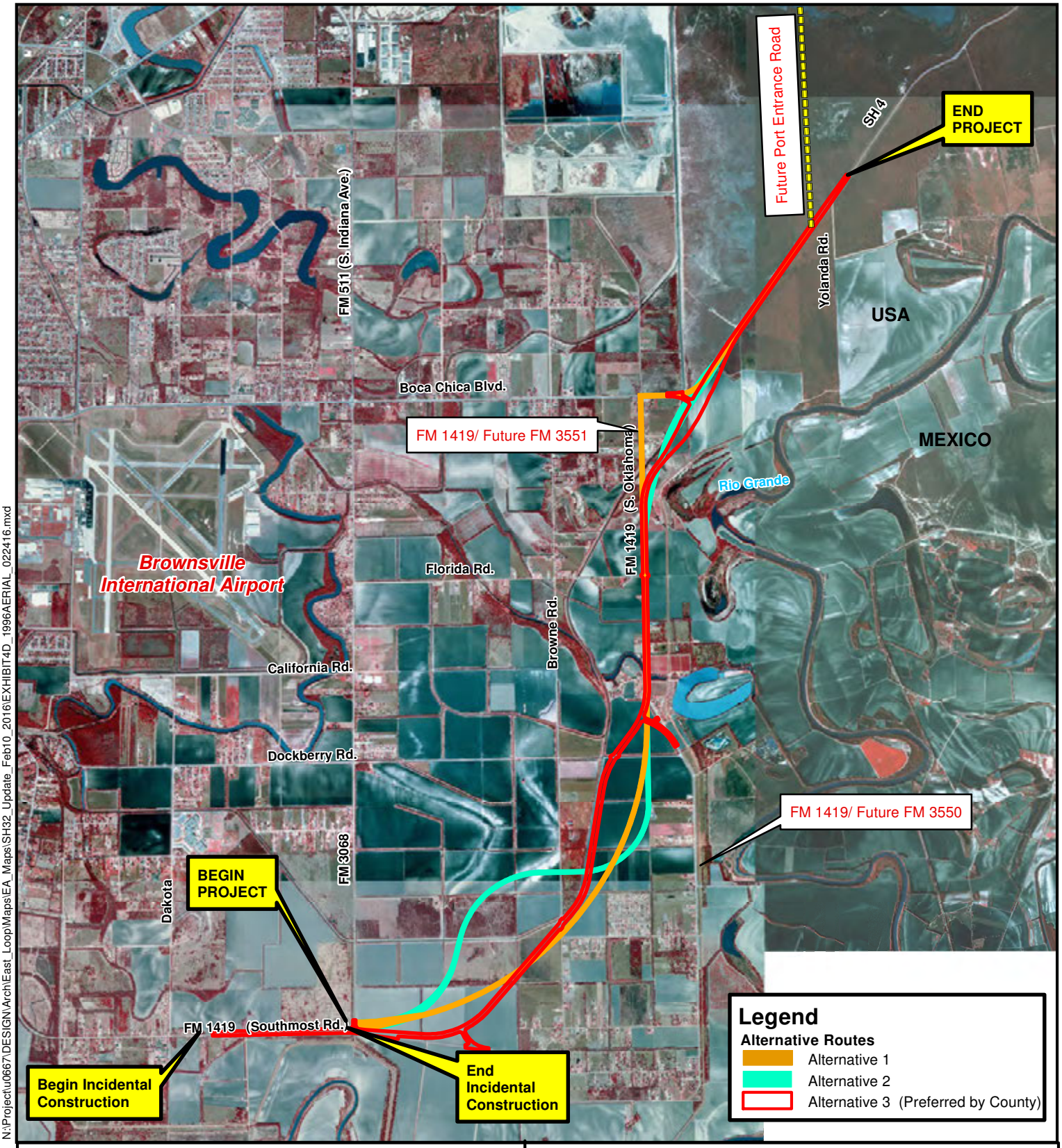
1 0.5 0 1
Miles

N

EXHIBIT 4C
1977 AERIAL PHOTOGRAPH MAP

CCRMA
CAMERON COUNTY REGIONAL MOBILITY AUTHORITY

SH 32
CAMERON COUNTY, TEXAS



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USDA 1950 HISTORICAL AERIALS
(1950 AERIAL WAS GEOREFERENCED TO BEST FIT SOUTH TEXAS STATE PLANE (FEET) COORDINATE SYSTEM)

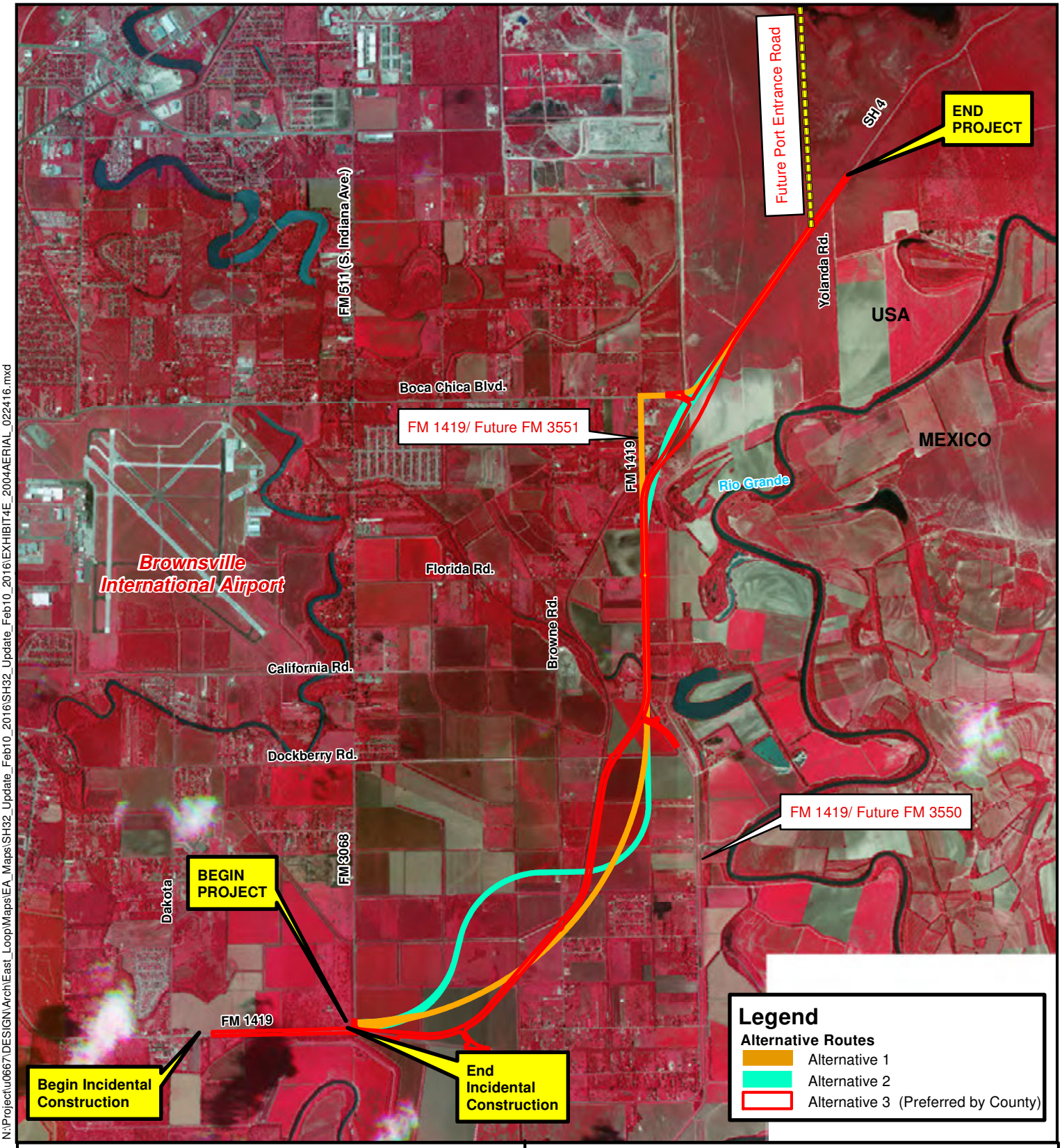
1 0.5 0 1
Miles

N

EXHIBIT 4D
1996 AERIAL PHOTOGRAPH MAP

CCRMA
CAMERON COUNTY REGIONAL MOBILITY AUTHORITY

SH 32
CAMERON COUNTY, TEXAS



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USDA 1950 HISTORICAL AERIALS
(1950 AERIAL WAS GEOREFERENCED TO BEST FIT SOUTH TEXAS STATE PLANE (FEET) COORDINATE SYSTEM)

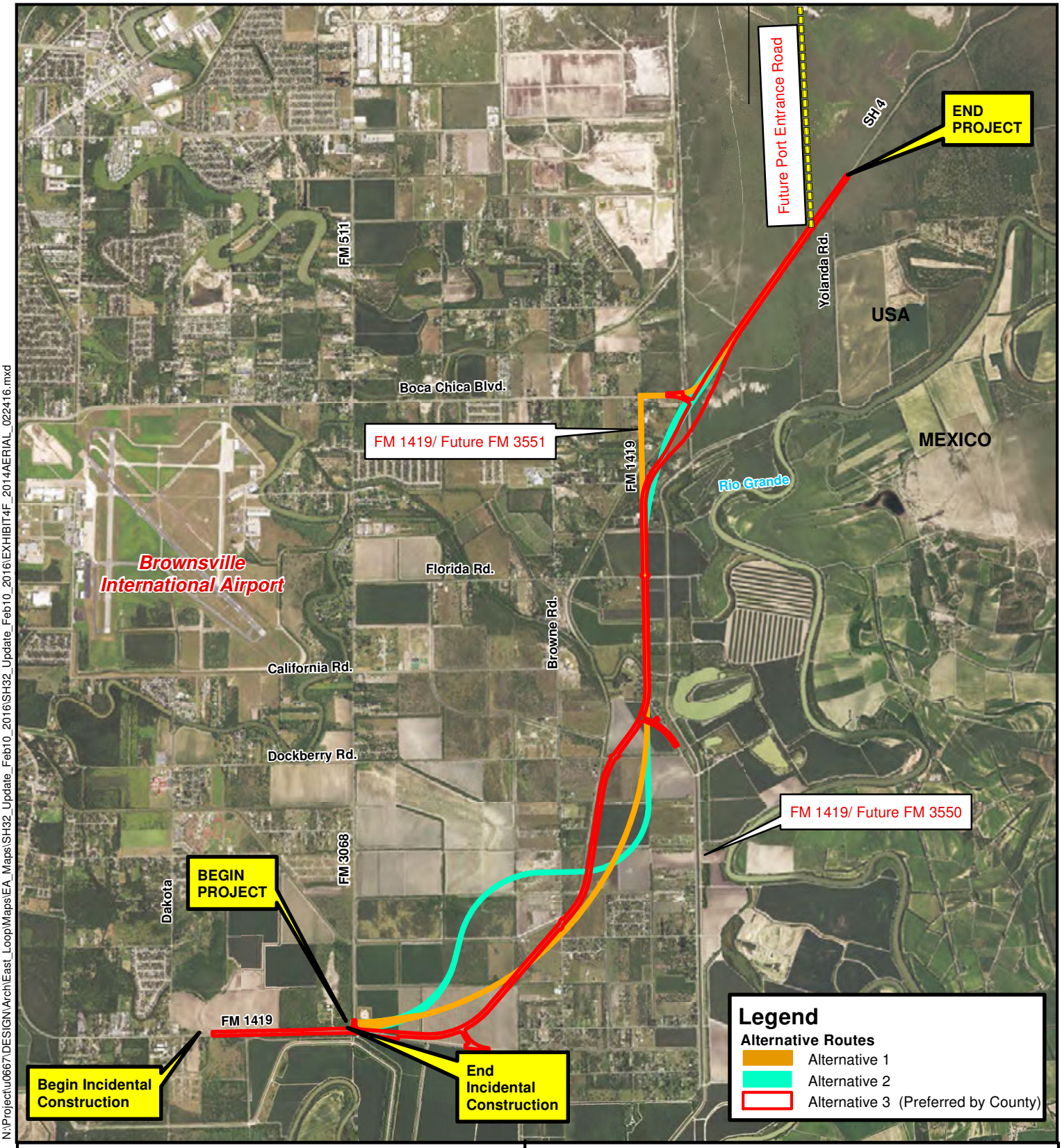
1 0.5 0 1
Miles

N

EXHIBIT 4E
2004 AERIAL PHOTOGRAPH MAP

CCRMA
CAMERON COUNTY REGIONAL MOBILITY AUTHORITY

SH 32
CAMERON COUNTY, TEXAS



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USDA 1950 HISTORICAL AERIALS
(1950 AERIAL WAS GEOREFERENCED TO BEST FIT SOUTH TEXAS STATE PLANE (FEET) COORDINATE SYSTEM)

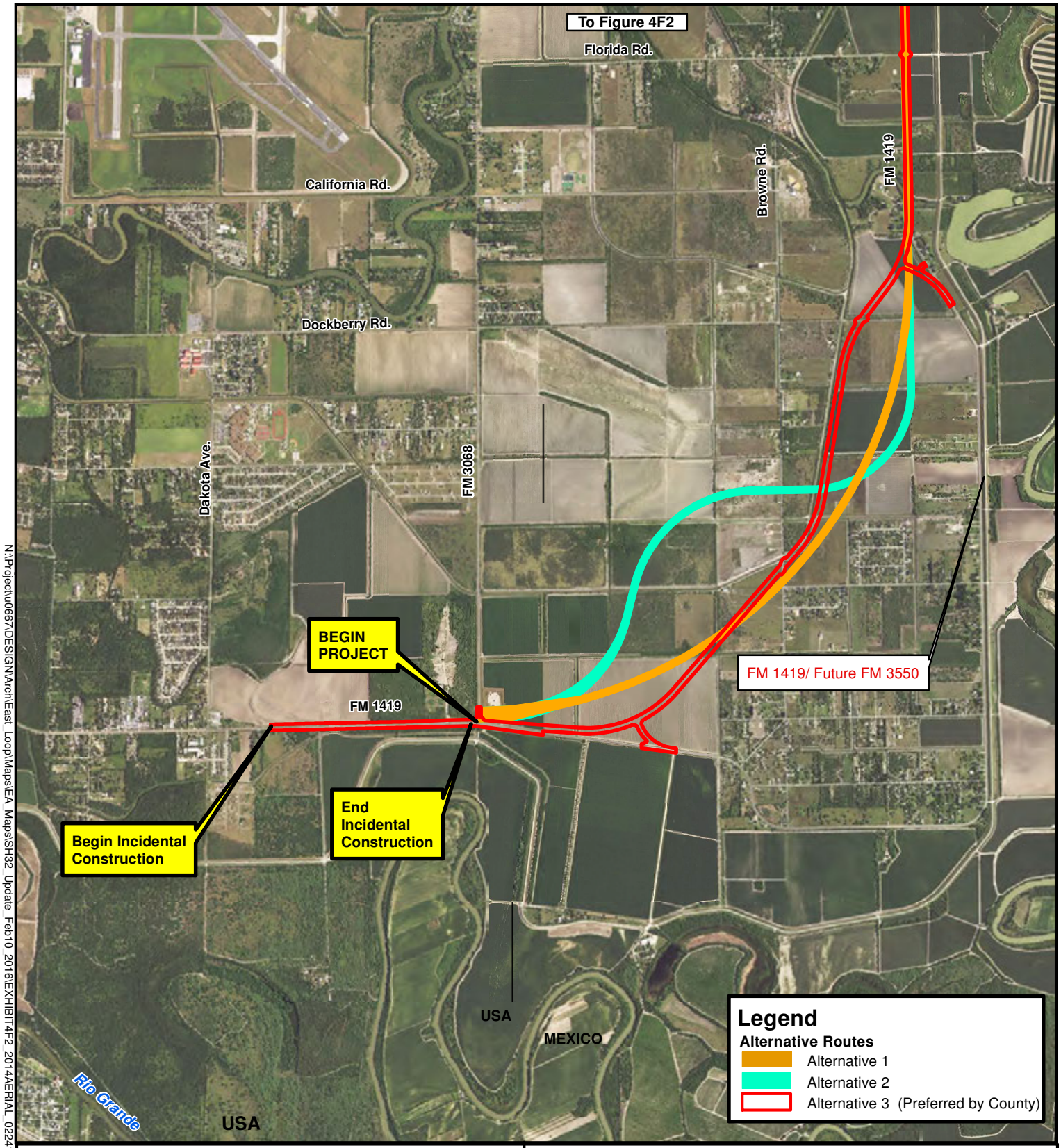
1 0.5 0 1
Miles

N

CCRMA
CAMERON COUNTY REGIONAL MOBILITY AUTHORITY

EXHIBIT 4F
2014 AERIAL PHOTOGRAPH MAP

SH 32
CAMERON COUNTY, TEXAS



SOURCE - USDA NAIP 2014 AERIAL

2,000 1,000 0 2,000
Feet

N

EXHIBIT 4F1
2014 AERIAL PHOTOGRAPH MAP

CCRMA
CAMERON COUNTY REGIONAL MOBILITY AUTHORITY

SH 32
CAMERON COUNTY, TEXAS

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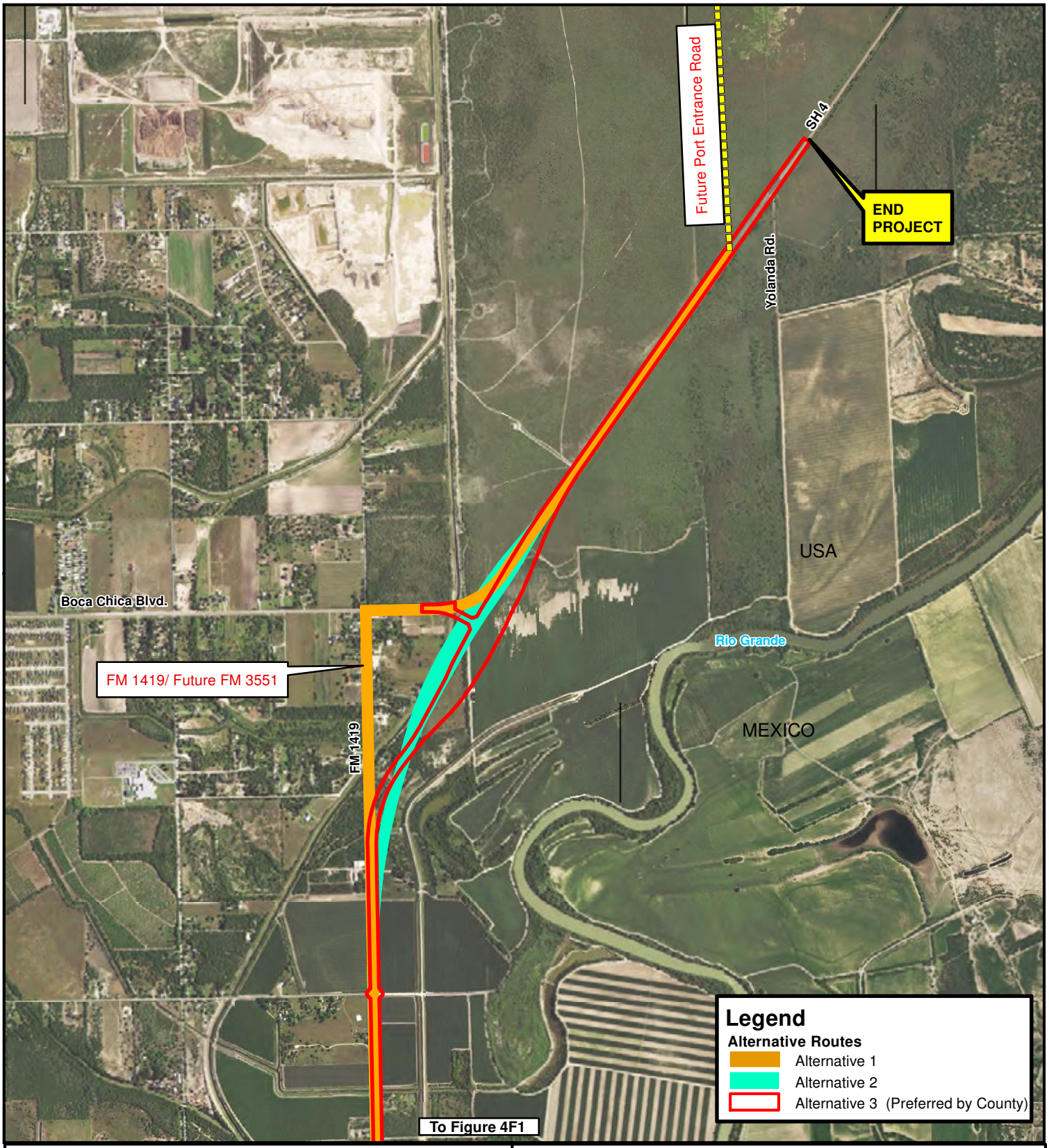

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SOURCE - USDA NAIP 2014 AERIAL

2,000 1,000 0 2,000
Feet

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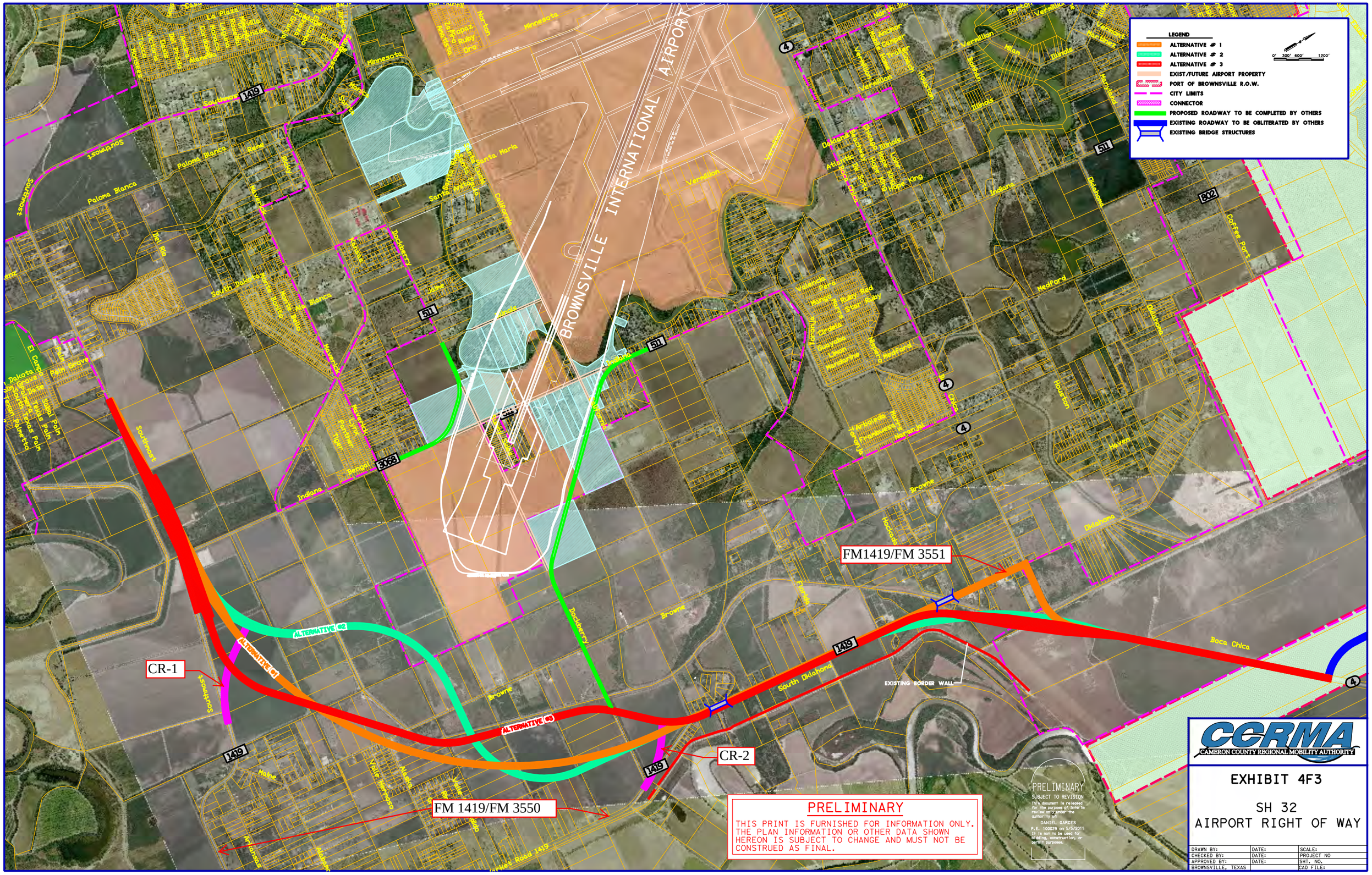
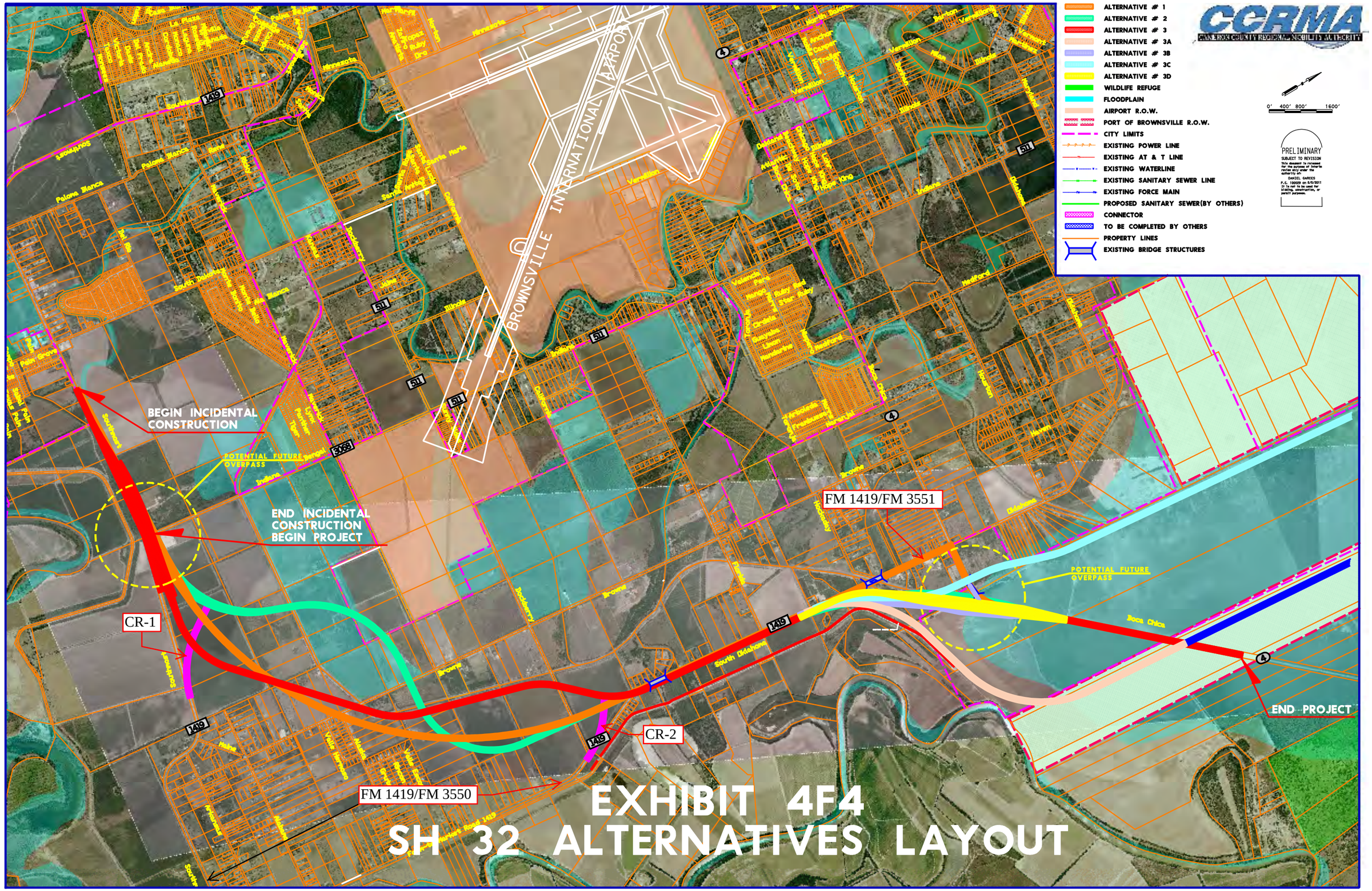
EXHIBIT 4F2
2014 AERIAL PHOTOGRAPH MAP

CCRMA
CAMERON COUNTY REGIONAL MOBILITY AUTHORITY

SH 32
CAMERON COUNTY, TEXAS


LEGEND
ALTERNATIVE # 1
ALTERNATIVE # 2
ALTERNATIVE # 3
EXIST/FUTURE AIRPORT PROPERTY
PORT OF BROWNSVILLE R.O.W.
CITY LIMITS
CONNECTOR
PROPOSED ROADWAY TO BE COMPLETED BY OTHERS
EXISTING ROADWAY TO BE OBLITERATED BY OTHERS
EXISTING BRIDGE STRUCTURES
0' 300' 600' 1200'
BROWNSVILLE INTERNATIONAL AIRPORT
FM1419/FM 3551
FM 1419/FM 3550
CR-1
CR-2
ALTERNATIVE #1
ALTERNATIVE #2
ALTERNATIVE #3
EXISTING BORDER WALL
Southmost
Paloma Blanca
Palm Grove
Dockberry
Caesar
Minnesota
Norton
Santa Maria
Vermillion
Indiana
Oklahoma
Coffee Port
Medford
Houston
Haven
Browne
Hackadio
Florida
South Oklahoma
Boca Chica
Hatne
Valle Verdoso
Alaska
Arizona
Alabama
Mississippi
Northeast Road 1419
Bengal
Lynx
Panther
Tiger
Ocelot
Jaguar
Puma
Ocelot
Ruby Red
Star Ruby
Ruby
Rio Blanca
Rio Rio
Maverick
Palm
Palm Grove
Palm Gardens
Palm Terrace
Palm Lake
Palm Terrace
Palm Lake
Palm Gardens
Palm Grove


LEGEND
ALTERNATIVE # 1
ALTERNATIVE # 2
ALTERNATIVE # 3
ALTERNATIVE # 3A
ALTERNATIVE # 3B
ALTERNATIVE # 3C
ALTERNATIVE # 3D
WILDLIFE REFUGE
FLOODPLAIN
AIRPORT R.O.W.
PORT OF BROWNSVILLE R.O.W.
CITY LIMITS
EXISTING POWER LINE
EXISTING AT & T LINE
EXISTING WATERLINE
EXISTING SANITARY SEWER LINE
EXISTING FORCE MAIN
PROPOSED SANITARY SEWER(BY OTHERS)
CONNECTOR
TO BE COMPLETED BY OTHERS
PROPERTY LINES
EXISTING BRIDGE STRUCTURES
CCRMA
CAMERON COUNTY REGIONAL MOBILITY AUTHORITY
0' 400' 800' 1600'
PRELIMINARY
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P.E. 100029 on 5/5/2011
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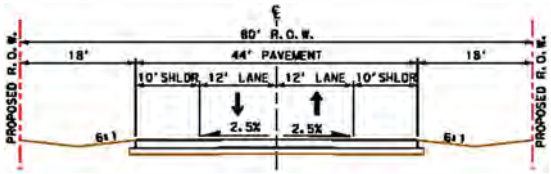
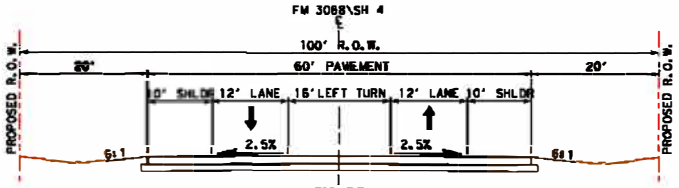
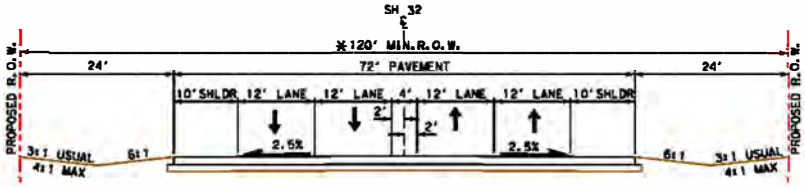
BROWNSVILLE INTERNATIONAL AIRPORT
BEGIN INCIDENTAL CONSTRUCTION
POTENTIAL FUTURE OVERPASS
END INCIDENTAL CONSTRUCTION BEGIN PROJECT
CR-1
CR-2
FM 1419/FM 3550
FM 1419/FM 3551
POTENTIAL FUTURE OVERPASS
END PROJECT
EXHIBIT 4F4
SH 32 ALTERNATIVES LAYOUT



FM 1419 CONNECTOR ROAD
PROPOSED TYPICAL SECTION

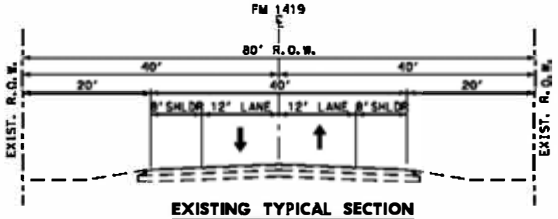


SH 32
PROPOSED TYPICAL SECTION
FM 3068 AND SH 4

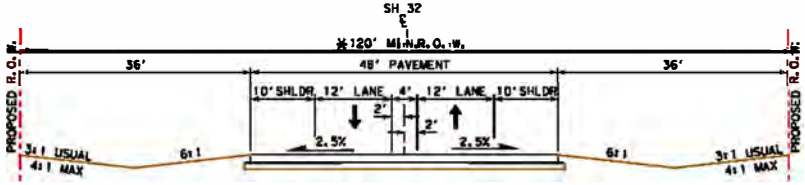


PROPOSED TYPICAL SECTION
FM 3068 TO SH 4 AT PROPOSED PORT ENTRANCE ROAD

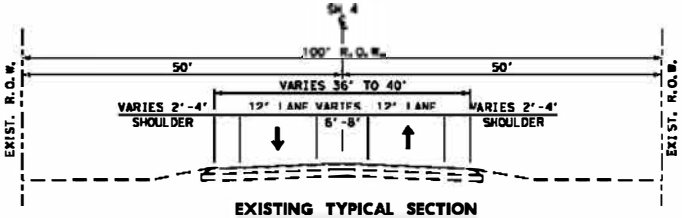
* - ADDITIONAL R.O.W. AT INTERSECTIONS



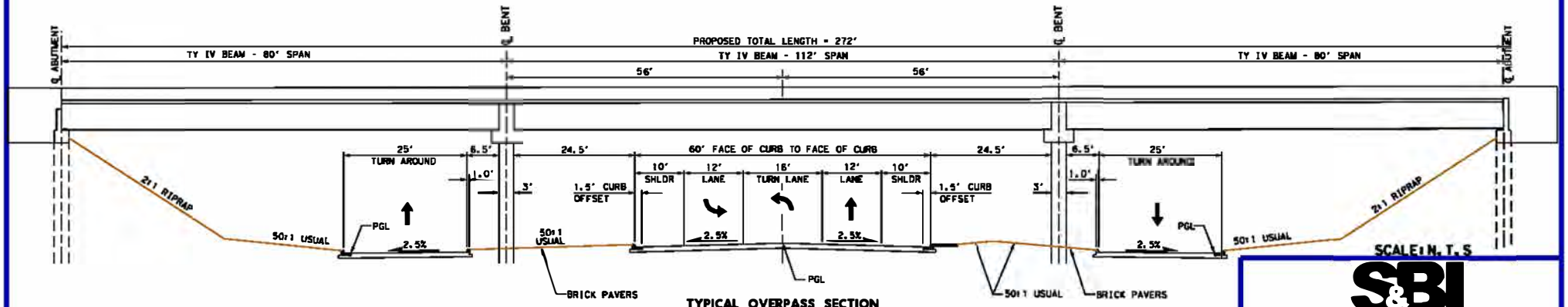
EXISTING TYPICAL SECTION
FROM FM 3068 TO SH 4
FUTURE FM 3550 & FM 3551



PROPOSED TYPICAL SECTION(INTERIM)
FM 3068 TO SH 4 AT PROPOSED PORT ENTRANCE ROAD



EXISTING TYPICAL SECTION
FROM INTERSECTION WITH OKLAHOMA AVE. TO END OF PROJECT



TYPICAL OVERPASS SECTION
SH 4 OVERPASS

SCALE: N.T.S

SH 32 TYPICAL SECTIONS

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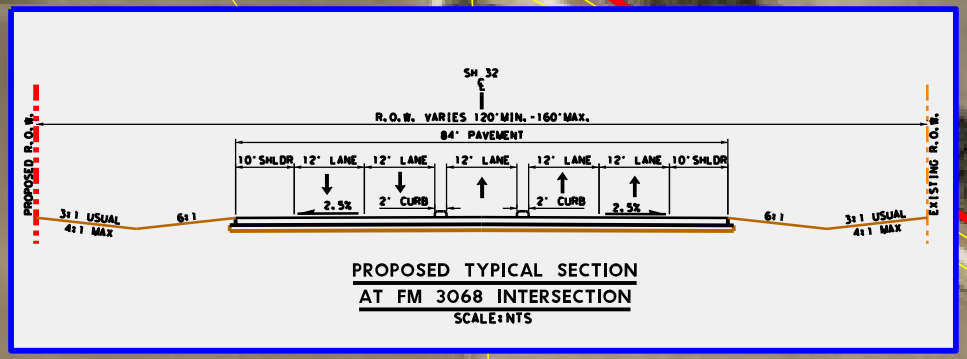
S&B INFRASTRUCTURE, LTD.
TEXAS BOARD OF PROFESSIONAL ENGINEERS #: F-1582

CCRMA
CAMERON COUNTY REGIONAL MOBILITY AUTHORITY

EXHIBIT 4G
EXISTING AND PROPOSED TYPICAL SECTIONS

DRAWN BY:	DATE:	SCALE:
CHECKED BY:	DATE:	PROJECT NO
APPROVED BY:	DATE:	SHT. NO.
BROWNSVILLE, TEXAS		CAD FILE:



PROPOSED TYPICAL SECTION
AT FM 3068 INTERSECTION
SCALE: NTS

PRELIMINARY
SUBJECT TO REVISION
7/8/2015

PRELIMINARY
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CAMERON COUNTY REGIONAL MOBILITY AUTHORITY

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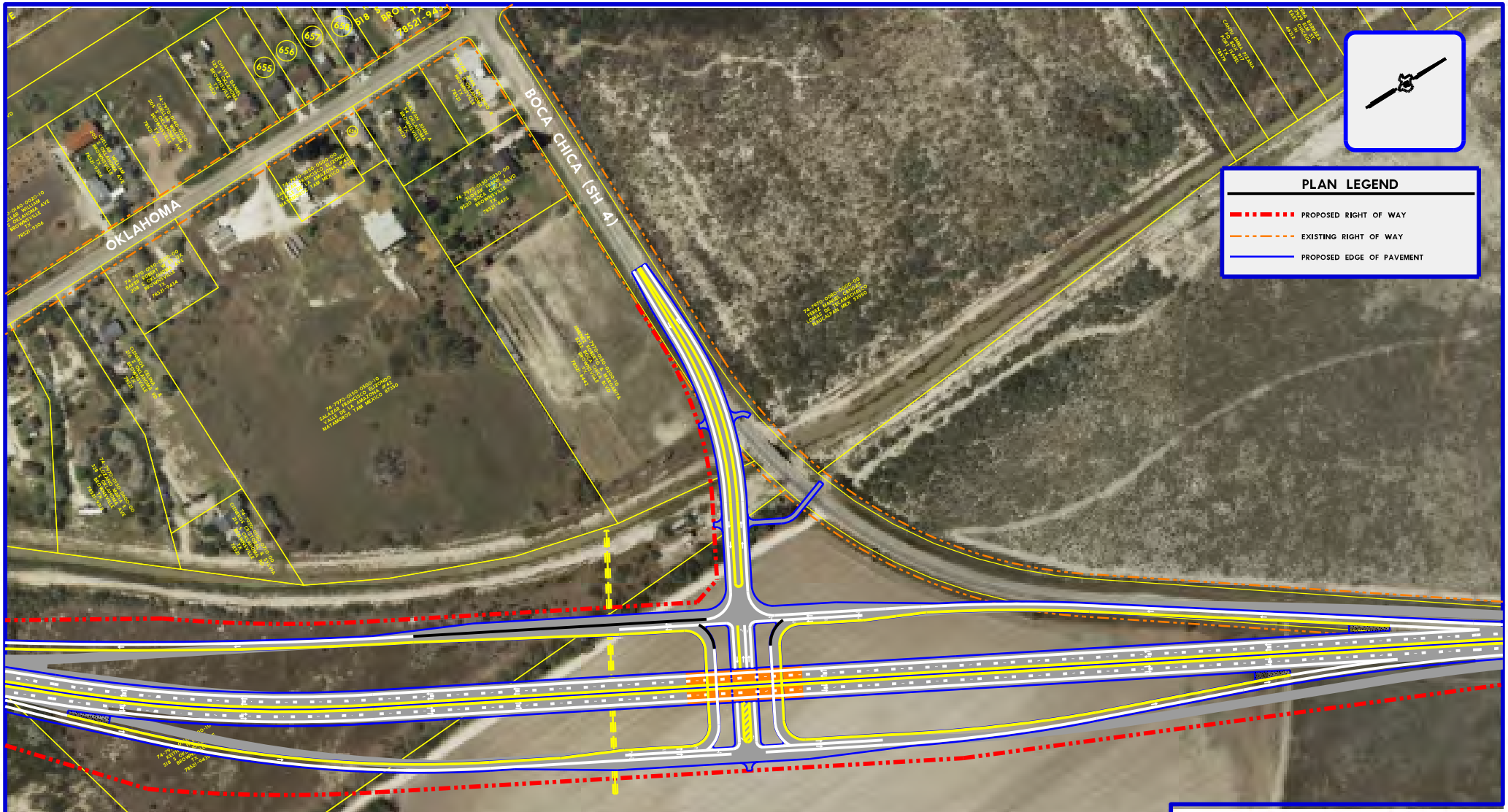
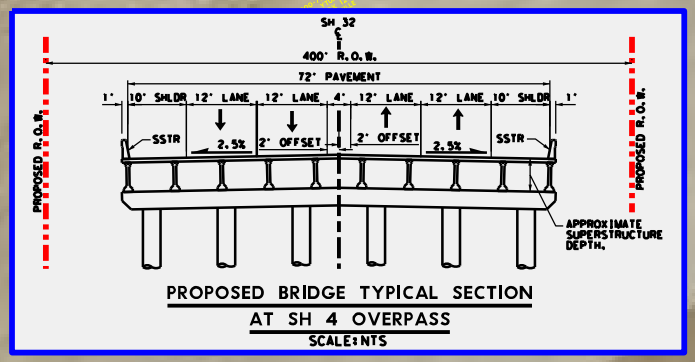
S&B INFRASTRUCTURE, LTD.
TEXAS BOARD OF PROFESSIONAL ENGINEERS #: F-1582

EXHIBIT 4G1
FM 3068
INTERSECTION
LAYOUT

DRAWN		STATE		PROJECT NO.		SHEET NO.
CK		TEXAS				SH 32
DESIGN		DISTRICT	CONTRL	SECT	JOB	HIGHWAY
CK		PHR	CAMERON	3626	02	001
REVISION				3626	01	043
CK				3626	03	001





PROPOSED BRIDGE TYPICAL SECTION
AT SH 4 OVERPASS
SCALE: NTS

PRELIMINARY
SUBJECT TO REVISION
7/8/2015

PRELIMINARY
SUBJECT TO REVISION
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CAMERON COUNTY REGIONAL MOBILITY AUTHORITY

S&B
S&B INFRASTRUCTURE, LTD.
TEXAS BOARD OF PROFESSIONAL ENGINEERS #: F-1582

EXHIBIT 4G2
SH 4
INTERSECTION
LAYOUT

DRAWN		STATE	PROJECT NO.			SHEET NO.
CH		TEXAS				SH 32
DESIGN		DISTRICT	COUNTY	CONT	JOB	HIGHWAY NO.
CH		PHR	CAMERON	3626	02	001
REVISION				1426	01	043
CH				3626	03	001

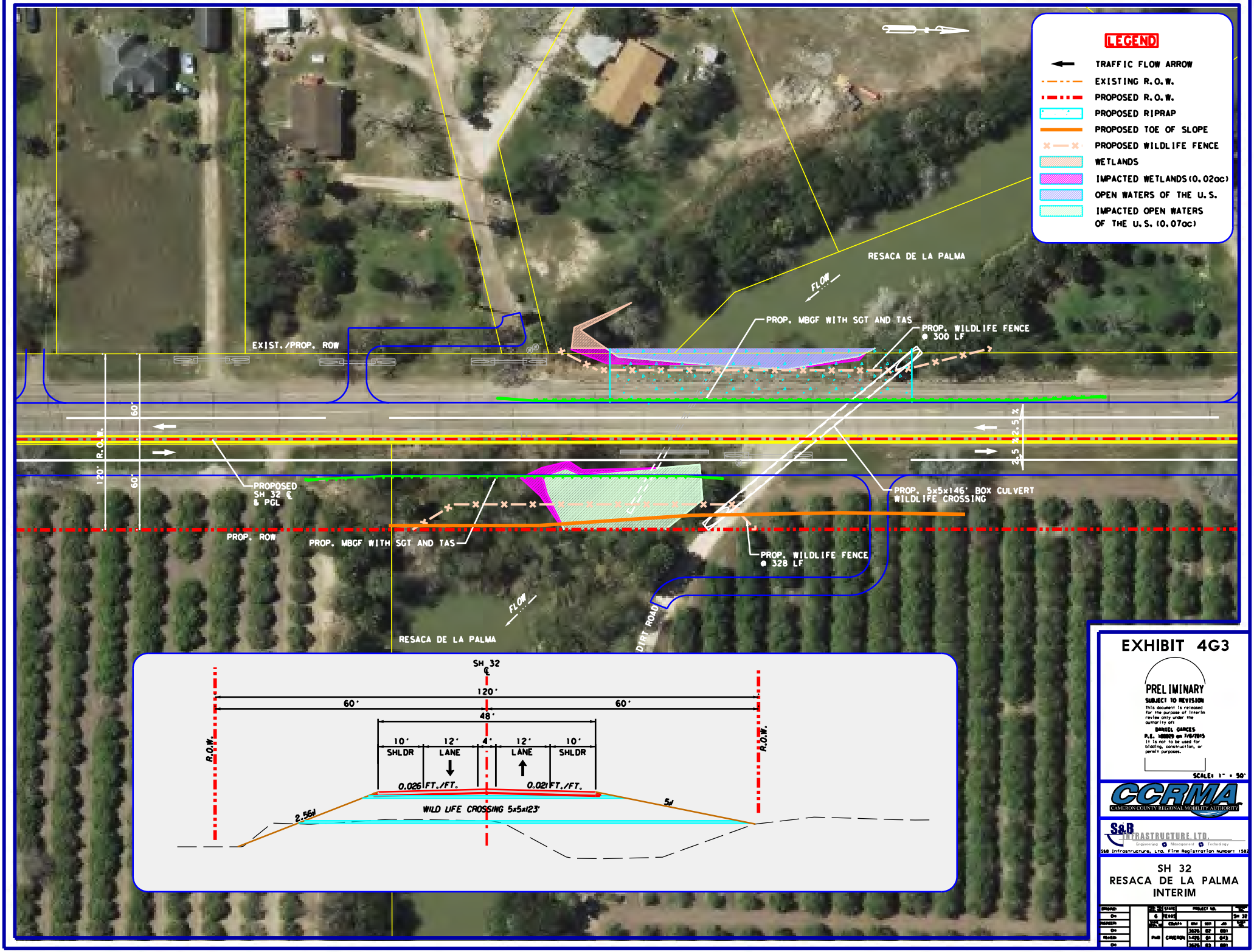

EXHIBIT 4G3

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SUBJECT TO REVISION
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SCALE: 1" = 50'

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CAMERON COUNTY REGIONAL MOBILITY AUTHORITY

S&B INFRASTRUCTURE, LTD.
Engineering • Management • Technology
S&B Infrastructure, Ltd. Firm Registration Number: 1582

SH 32
RESACA DE LA PALMA
INTERIM

DESIGNED		STATE	PROJECT NO.	SHEET NO.
CHK		TEXAS		SH 32
DRAWN				
CHK		DISTRICT	COUNTY	CONTROL	SECTION	JOB	HIGHWAY NO.
REVIEW		PHR	CAMERON	1425	07	001	
CHK				1425	04	043	
				1425	03	001	

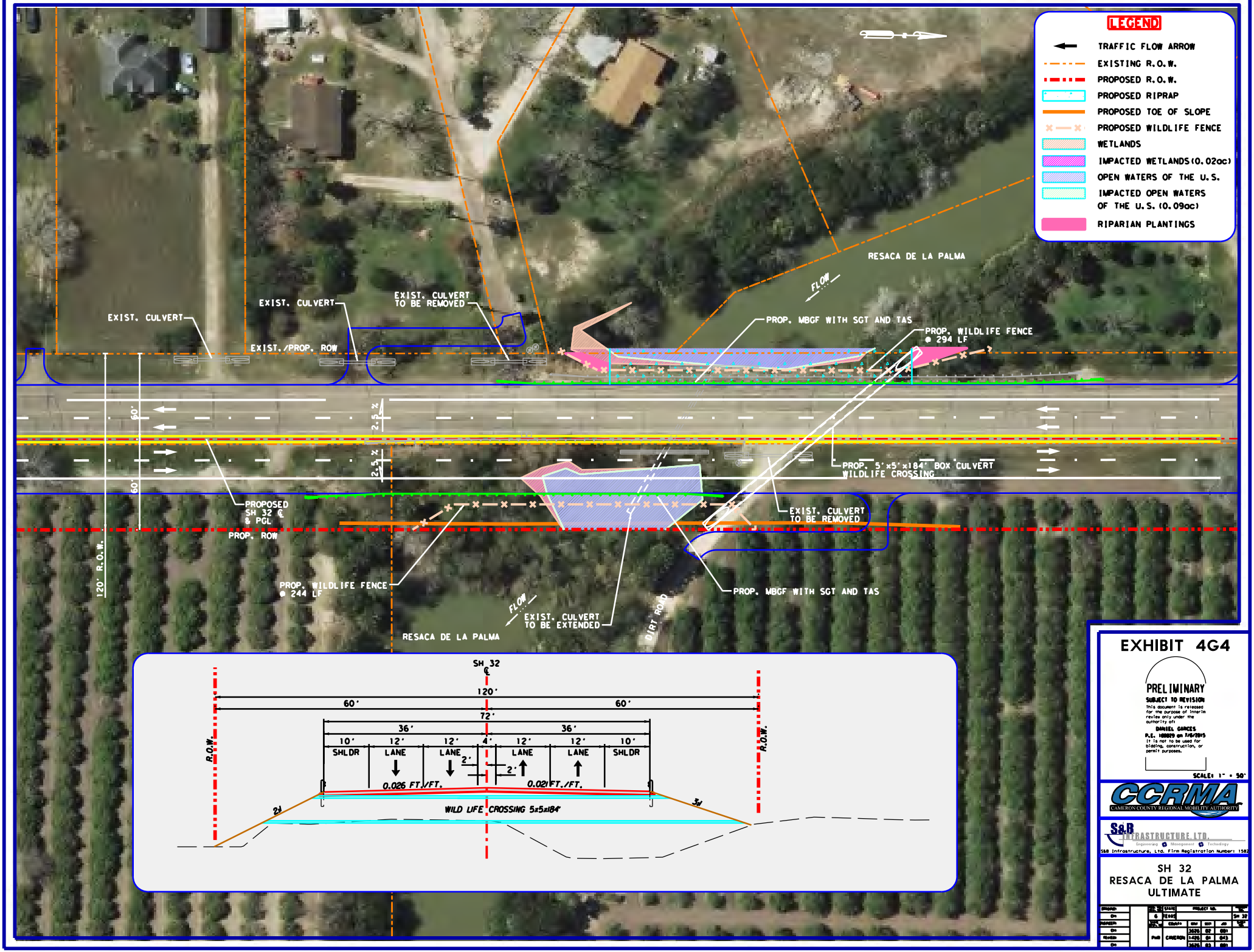


EXHIBIT 4G4

PRELIMINARY
SUBJECT TO REVISION
This document is released for the purpose of interim review only under the authority of:
DANIEL GARCES
P.E. 108879 on 7/8/2015
It is not to be used for bidding, construction, or permit purposes.

SCALE: 1" = 50'

CCRMA
CAMERON COUNTY REGIONAL MOBILITY AUTHORITY

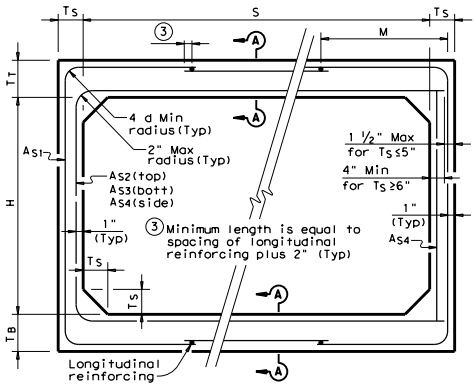
S&B INFRASTRUCTURE, LTD.
Engineering • Management • Technology
S&B Infrastructure, Ltd. Firm Registration Number: 1582

SH 32
RESACA DE LA PALMA
ULTIMATE

DESIGNED		STATE	PROJECT NO.			SHEET NO.
CK		G	REHAB			SH 32
DRAWN		DISTRICT	COUNTY	CONT	SECT	JOB
CK		PHR	CAMERON	1425	07	001
REVIEW				1425	04	043
CK				1425	03	001

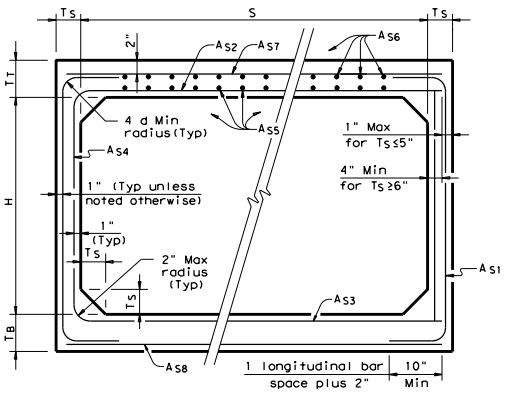
BOX DATA

SECTION DIMENSIONS					Fill Height	M (Min)	REINFORCING (in²/ft) ②								Lift Weight (Tons) ①
S (ft)	H (ft)	T_T (in)	T_B (in)	T_S (in)	(ft)	(in)	A_{S1}	A_{S2}	A_{S3}	A_{S4}	A_{S5}	A_{S6}	A_{S7}	A_{S8}	
5	3	8	7	6	<2	-	0.19	0.31	0.21	0.14	0.19	0.19	0.19	0.17	6.6
5	3	6	6	6	2<3	45	0.18	0.24	0.19	0.14	-	-	-	-	5.7
5	3	6	6	6	3-5	36	0.14	0.17	0.16	0.14	-	-	-	-	5.7
5	3	6	6	6	10	36	0.14	0.16	0.17	0.14	-	-	-	-	5.7
5	3	6	6	6	15	35	0.16	0.21	0.22	0.14	-	-	-	-	5.7
5	3	6	6	6	20	35	0.21	0.27	0.28	0.14	-	-	-	-	5.7
5	3	6	6	6	25	35	0.26	0.34	0.34	0.14	-	-	-	-	5.7
5	3	6	6	6	30	35	0.31	0.41	0.41	0.14	-	-	-	-	5.7
5	4	8	7	6	<2	-	0.19	0.33	0.24	0.14	0.19	0.19	0.19	0.17	7.2
5	4	6	6	6	2<3	45	0.16	0.27	0.22	0.14	-	-	-	-	6.3
5	4	6	6	6	3-5	45	0.14	0.19	0.18	0.14	-	-	-	-	6.3
5	4	6	6	6	10	36	0.14	0.18	0.18	0.14	-	-	-	-	6.3
5	4	6	6	6	15	35	0.14	0.23	0.24	0.14	-	-	-	-	6.3
5	4	6	6	6	20	35	0.17	0.30	0.31	0.14	-	-	-	-	6.3
5	4	6	6	6	25	35	0.21	0.37	0.38	0.14	-	-	-	-	6.3
5	4	6	6	6	30	35	0.25	0.44	0.45	0.14	-	-	-	-	6.3
5	5	8	7	6	<2	-	0.19	0.35	0.26	0.14	0.19	0.19	0.19	0.17	7.8
5	5	6	6	6	2<3	45	0.14	0.29	0.24	0.14	-	-	-	-	6.9
5	5	6	6	6	3-5	45	0.14	0.21	0.20	0.14	-	-	-	-	6.9
5	5	6	6	6	10	45	0.14	0.19	0.20	0.14	-	-	-	-	6.9
5	5	6	6	6	15	36	0.14	0.24	0.25	0.14	-	-	-	-	6.9
5	5	6	6	6	20	35	0.15	0.31	0.32	0.14	-	-	-	-	6.9
5	5	6	6	6	25	35	0.18	0.38	0.39	0.14	-	-	-	-	6.9
5	5	6	6	6	30	35	0.21	0.46	0.47	0.14	-	-	-	-	6.9
5	2	8	7	6	<2	-	0.20	0.31	0.20	0.14	0.22	0.19	0.19	0.17	6.0 ⑤
5	2	6	6	6	30	44	0.39	0.33	0.34	0.14	-	-	-	-	5.1 ⑤



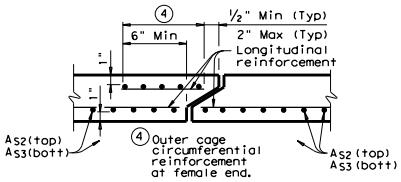
CORNER OPTION "A" CORNER OPTION "B"

FILL HEIGHT 2 FT AND GREATER



CORNER OPTION "A" CORNER OPTION "B"

FILL HEIGHT LESS THAN 2 FT



SECTION A-A

(TOP AND BOTTOM SLAB JOINT REINFORCEMENT)

GENERAL NOTES:

Designs shown conform to ASTM C1577. Refer to ASTM C1577 for information or details not shown.

All concrete shall be Class "H" Concrete with a minimum compressive strength of 5,000 psi.

See SCP-MD standard sheet for miscellaneous details and notes not shown.

In lieu of furnishing the designs shown on this sheet, the contractor may furnish an alternate design that is equal to or exceeds the box design for the design fill height in the table. Shop plans for alternate designs shall be submitted in accordance with Item "Precast Concrete Structures".

① For Box Length = 8'-0"

② A_{S1} thru A_{S4}, A_{S7} and A_{S8} are minimum required areas of reinforcement per linear foot of box length. A_{S6} and A_{S5} are minimum required areas of reinforcement per linear foot of box width.

⑤ These designs were created by TxDOT and are not shown in the ASTM Specifications.

Exhibit 4G5
Proposed Wildlife Culvert Standard

HL93 LOADING

Texas Department of Transportation
Bridge Division

SINGLE BOX CULVERTS PRECAST
5'-0" SPAN

SCP-5

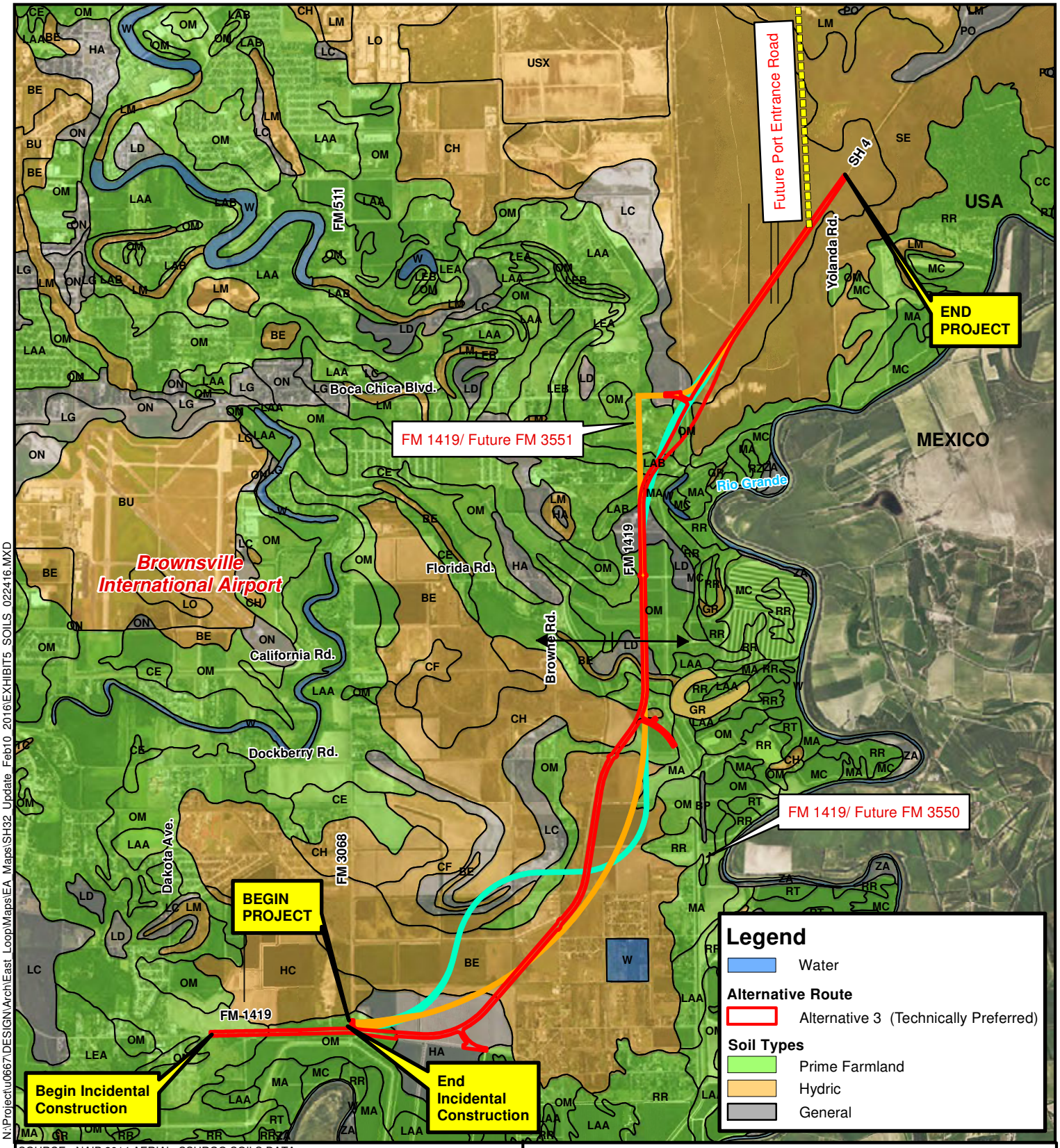
FILE: scp05ste.dgn	DN: GAF	CK: LMW	DW: BWH/TxDOT	CK: GAF
©TxDOT February 2010	DISTRICT	FEDERAL AID PROJECT		SHEET
REVISIONS	PHR			

COUNTY	CONTROL	SECT	JOB	HIGHWAY
CAMERON	3626	02	001	SH32
	1426	01	043	
	3626	03	001	

DISCLAIMER:
The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.

LEVELS DISPLAYED
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32
33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48
49 50 51 52 53 54 55 56 57 58 59 60 61 62 63

ACC:



N:\Project\u0667\DESIGN\Arch\East Loop\Maps\EA Maps\SH32 Update Feb10 2016\EXHIBIT5 SOILS 022416.MXD

SOURCE - NAIP 2014 AERIAL, SSURGO SOILS DATA
MART CAMERON COUNTY.

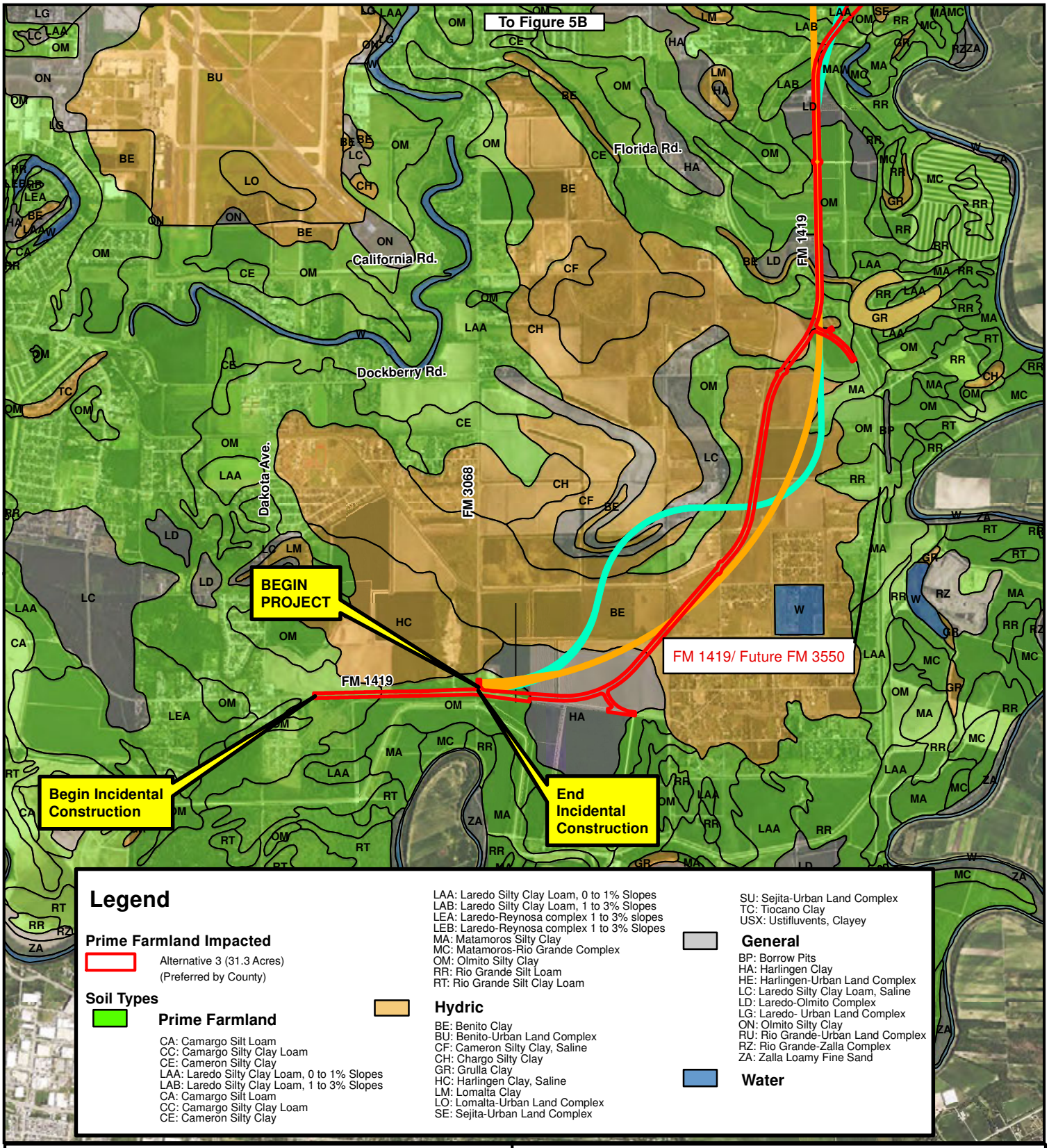
1 0.5 0 1
Miles

N

EXHIBIT 5
SOIL MAP

CCRMA
CAMERON COUNTY REGIONAL MOBILITY AUTHORITY

SH 32
CAMERON COUNTY, TEXAS



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SOURCE - NAIP 2014 AERIAL, SSURGO SOILS DATA
MART CAMERON COUNTY.

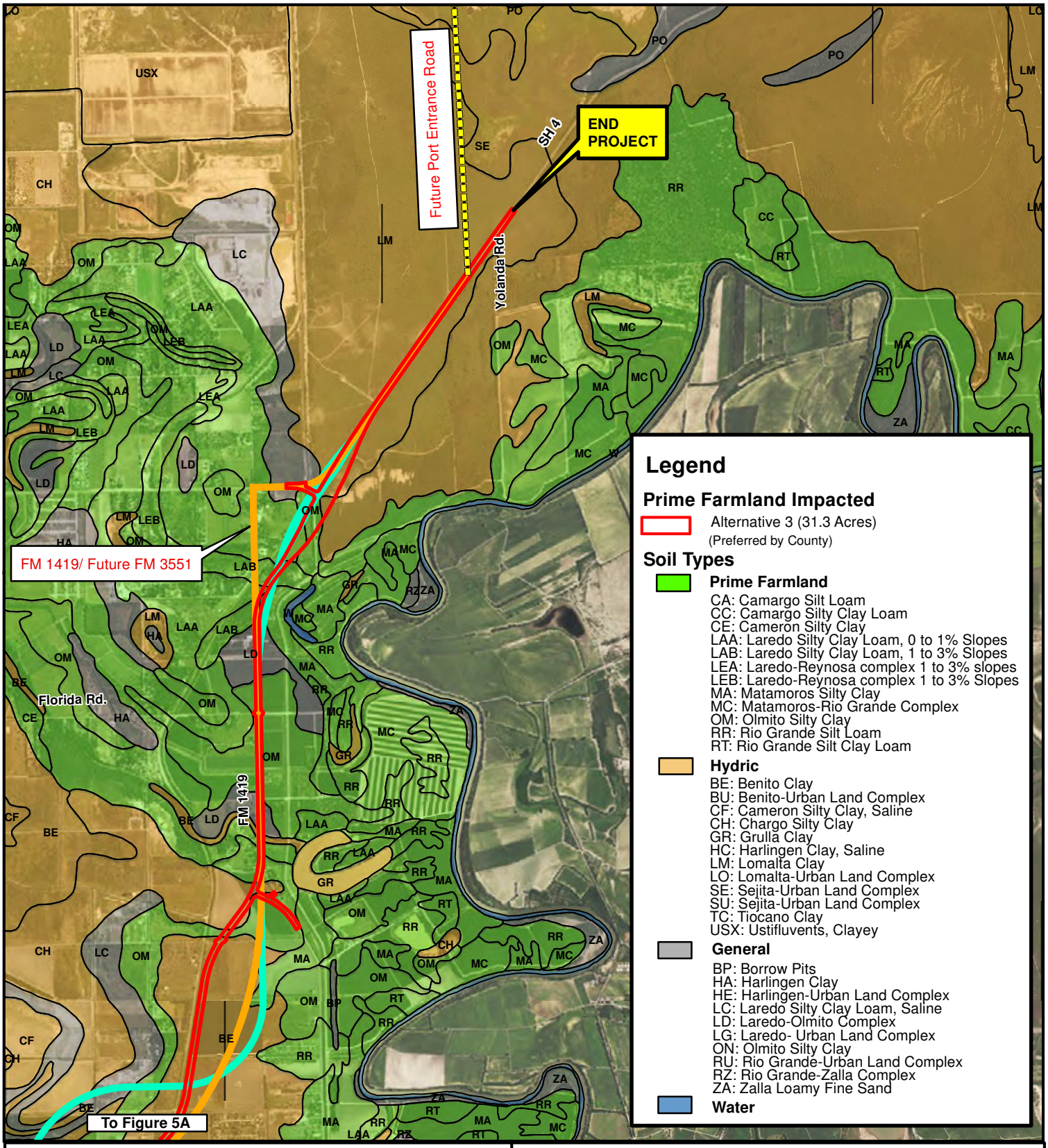
2,000 1,000 0 2,000
Feet

N

EXHIBIT 5A
SOILS MAP

CCRMA
CAMERON COUNTY REGIONAL MOBILITY AUTHORITY

SH 32
CAMERON COUNTY, TEXAS



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SOURCE - NAIP 2014 AERIAL, SSURGO SOILS DATA
MART CAMERON COUNTY.

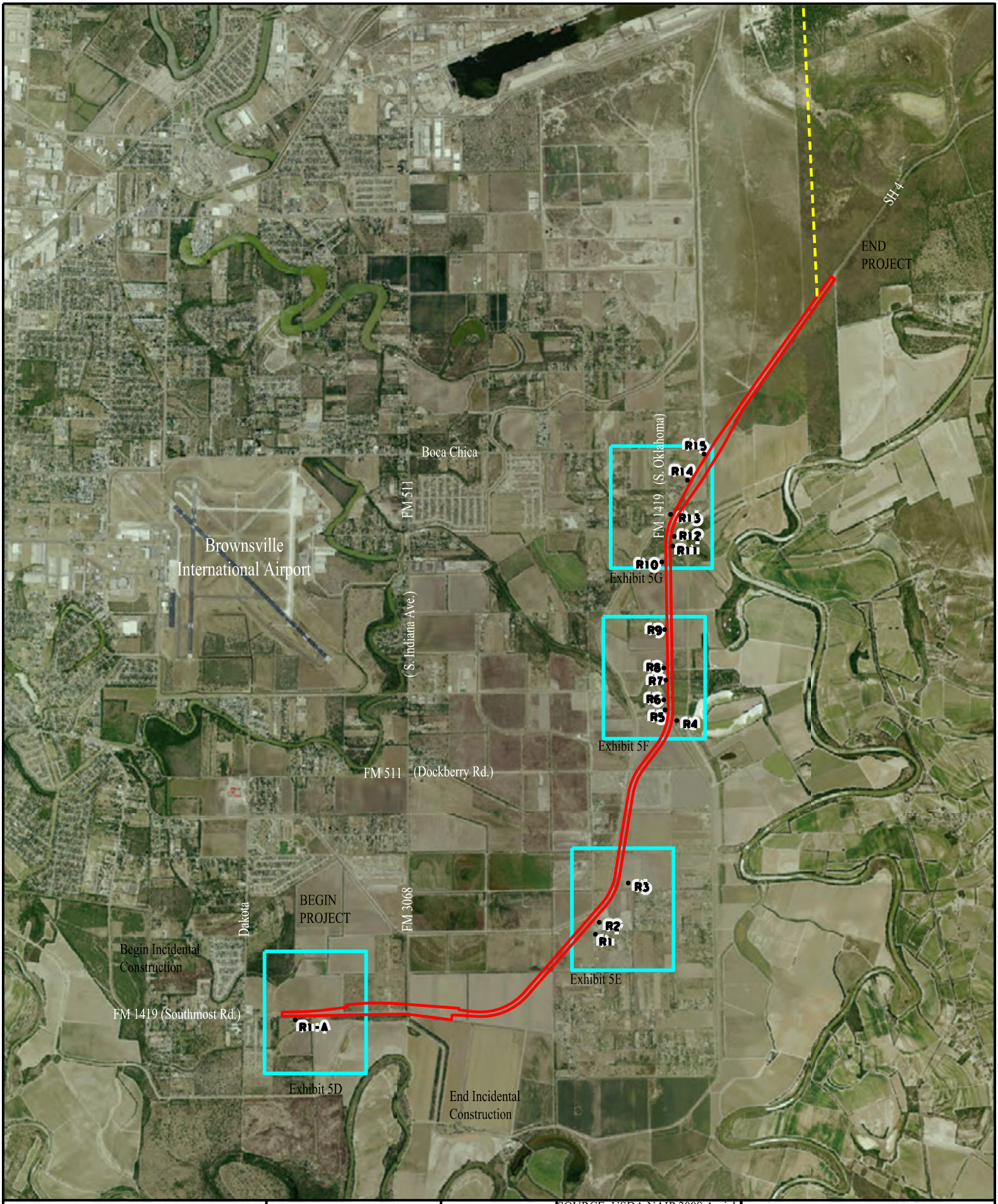
2,000 1,000 0 2,000
Feet

N

EXHIBIT 5B
SOILS MAP

CCRMA
CAMERON COUNTY REGIONAL MOBILITY AUTHORITY

SH 32
CAMERON COUNTY, TEXAS



CCRMA
CAMERON COUNTY REGIONAL MOBILITY AUTHORITY

N

0 2000 4000 FEET

EXHIBIT 5C
Noise Receiver
Map

SOURCE: USDA NAIP 2008 Aerial

SH 32
Cameron County, Texas

Legend

- Non-Impacted Receivers
- Port Entrance Road (To be constructed by others)
- Alternative 3 (Technically Preferred)

CCRMA
CAMERON COUNTY REGIONAL MOBILITY AUTHORITY

N

0 200 400 FEET

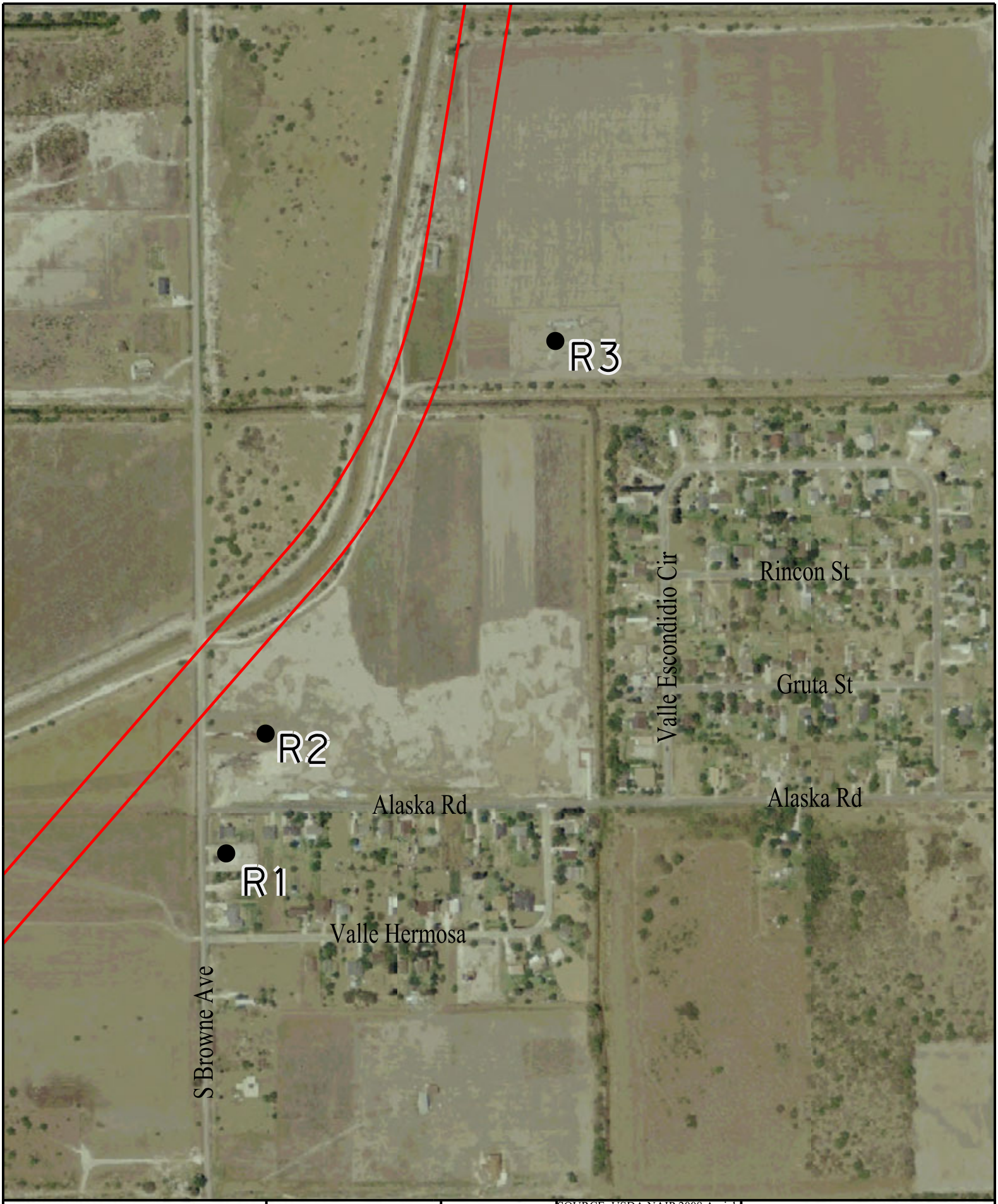
EXHIBIT 5D
Noise Receiver Map

SOURCE: USDA NAIP 2008 Aerial

SH 32
Cameron County, Texas

Legend

- Non-Impacted Receivers
- Alternative 3 (Technically Preferred)



CCRMA
CAMERON COUNTY REGIONAL MOBILITY AUTHORITY

N

0 200 400 FEET

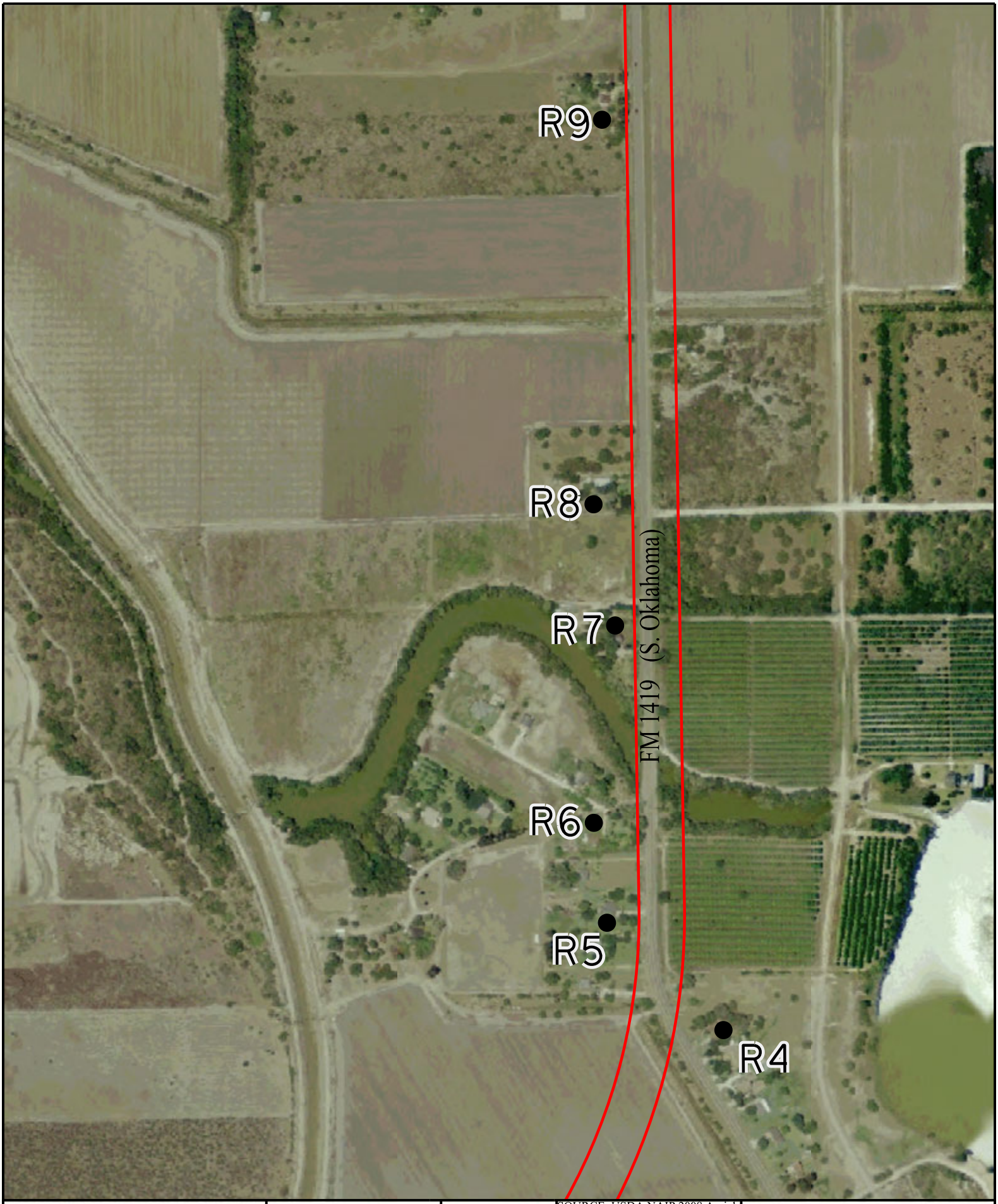
EXHIBIT 5E
Noise Receiver Map

SOURCE: USDA NAIP 2008 Aerial

SH 32
Cameron County, Texas

Legend

- Non-Impacted Receivers
- Alternative 3 (Technically Preferred)



CCRMA
CAMERON COUNTY REGIONAL MOBILITY AUTHORITY

N

0 200 400 FEET

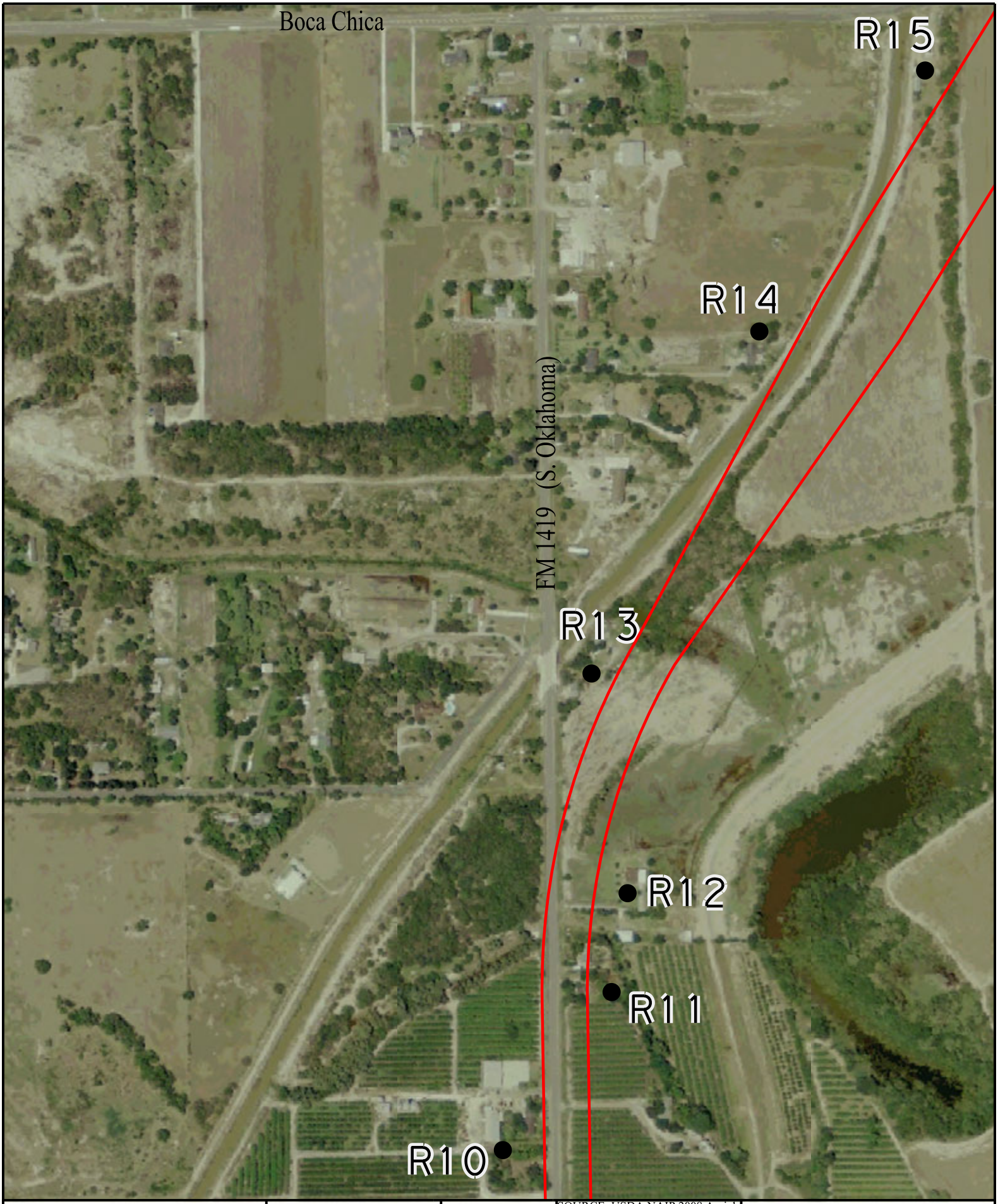
EXHIBIT 5F
Noise Receiver Map

SOURCE: USDA NAIP 2008 Aerial

SH 32
Cameron County, Texas

Legend

- Non-Impacted Receivers
- Alternative 3 (Technically Preferred)



CCRMA
CAMERON COUNTY REGIONAL MOBILITY AUTHORITY

N

0 200 400 FEET

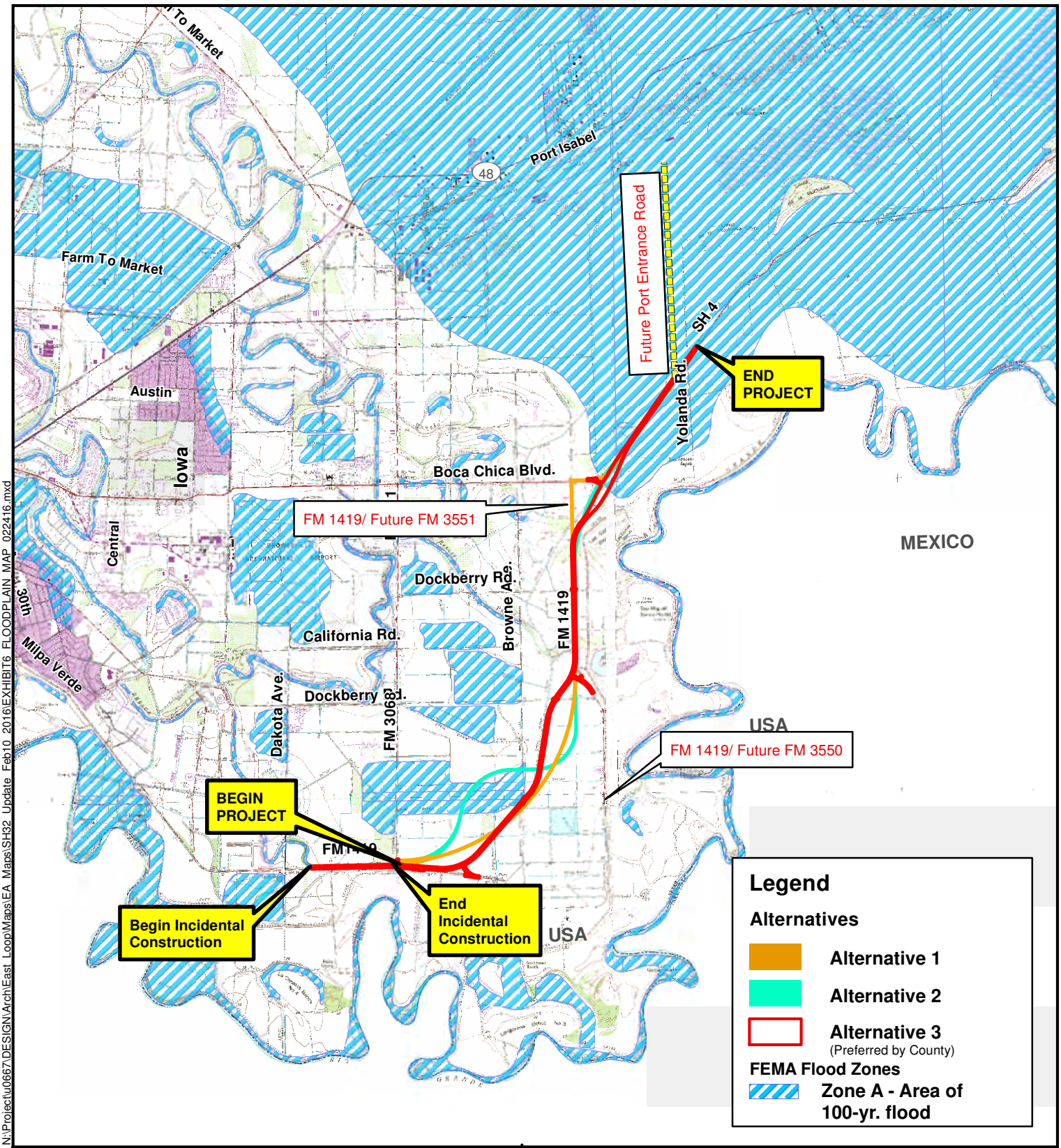
EXHIBIT 5G
Noise Receiver Map

SOURCE: USDA NAIP 2008 Aerial

SH 32
Cameron County, Texas

Legend

- Non-Impacted Receivers
- Alternative 3 (Technically Preferred)



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SOURCE - 1955 -Revised 1983 USGS Historical Topo, TNRIS
(East Brownsville, PalmitoHill, Southmost)

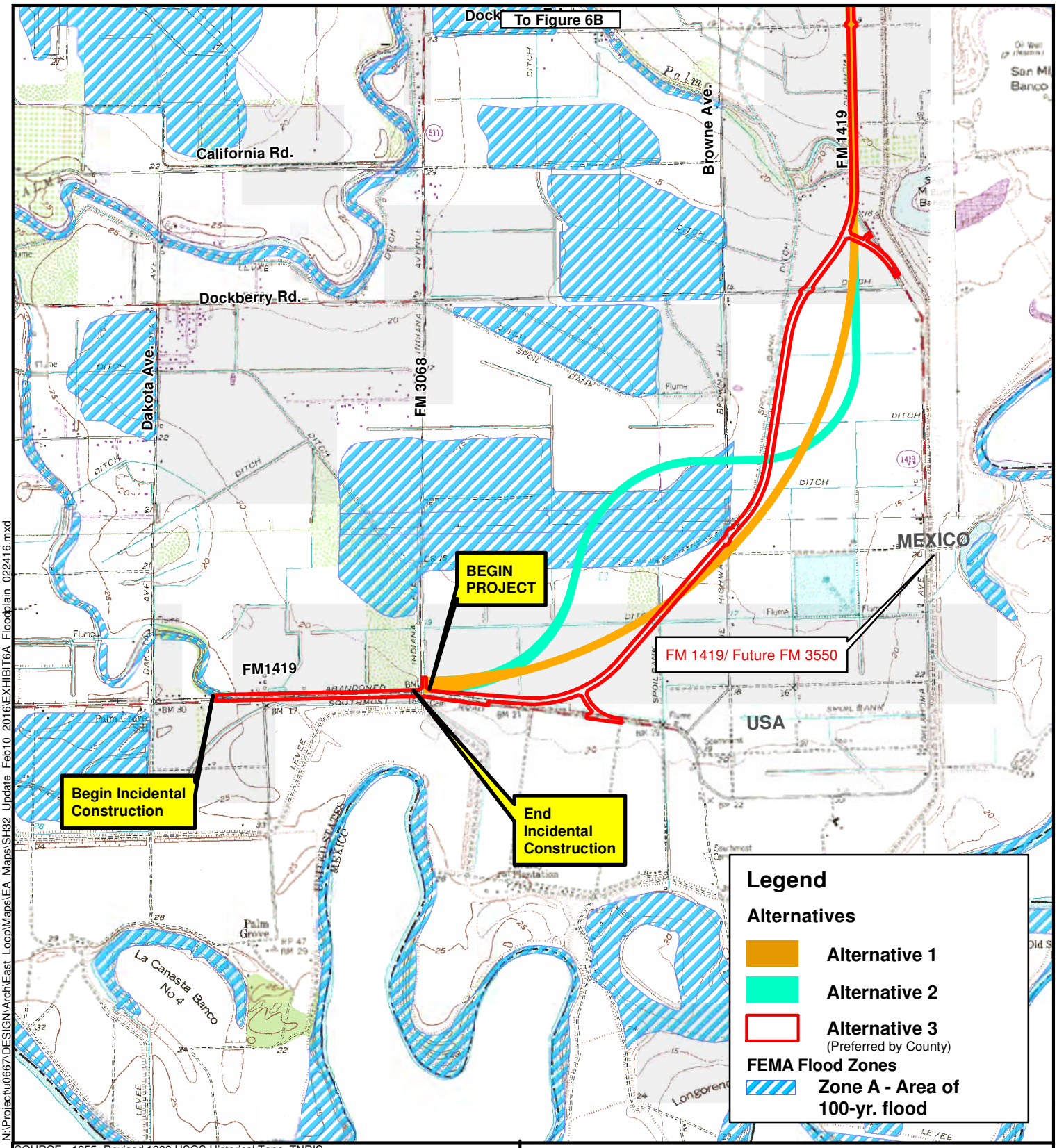
0.5 0.25 0 0.5
Miles

N

EXHIBIT 6
FLOOD PLAIN MAP

CCRMA
CAMERON COUNTY REGIONAL MOBILITY AUTHORITY

SH 32
CAMERON COUNTY, TEXAS



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SOURCE - 1955 -Revised 1983 USGS Historical Topo, TNRIS
(East Brownsville, PalmitoHill, Southmost)

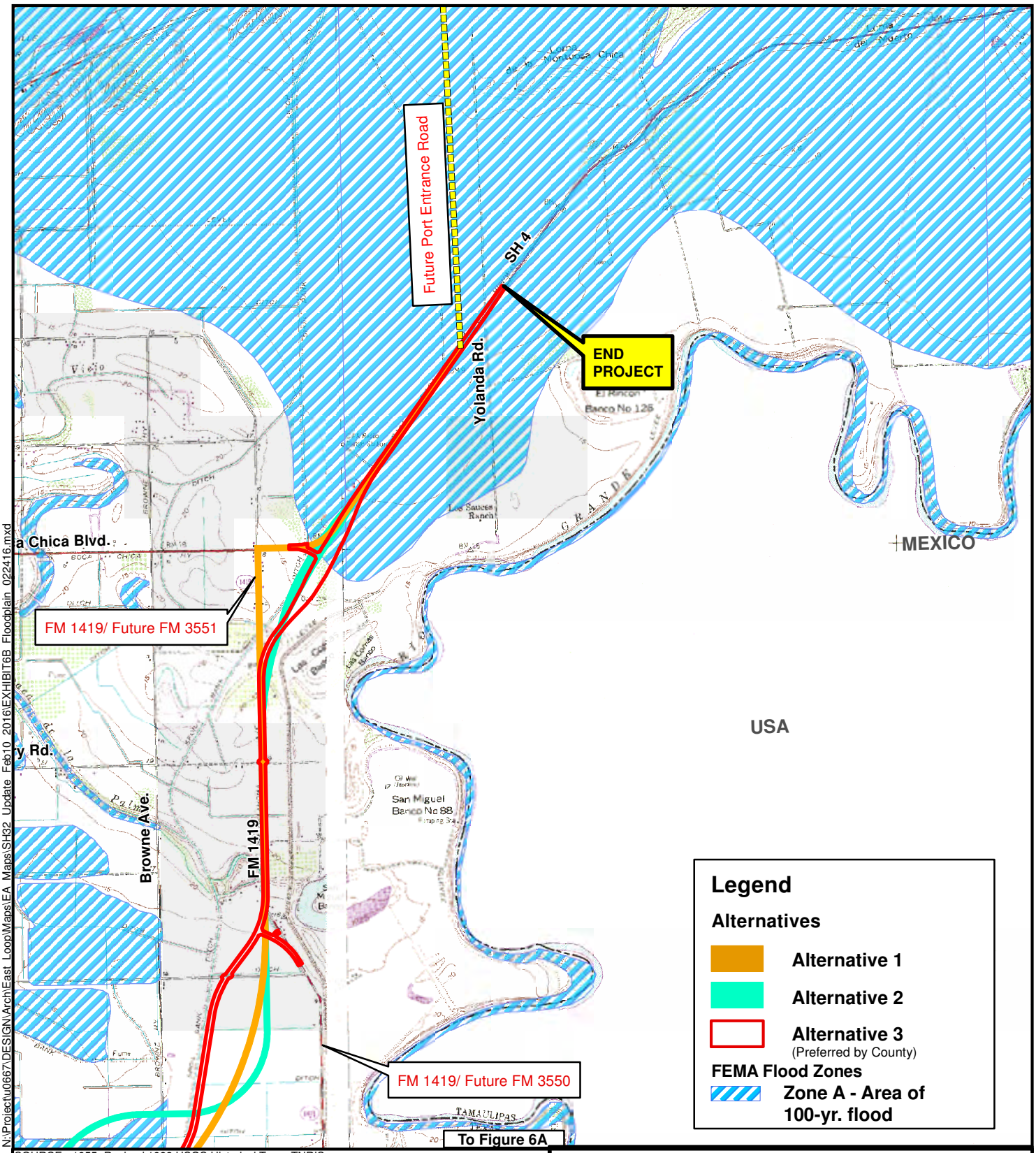
0.5 0.25 0 0.5
Miles

N

EXHIBIT 6A
FLOOD PLAIN MAP

CCRMA
CAMERON COUNTY REGIONAL MOBILITY AUTHORITY

SH 32
CAMERON COUNTY, TEXAS



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SOURCE - 1955 -Revised 1983 USGS Historical Topo, TNRIS (East Brownsville, PalmitoHill, Southmost)

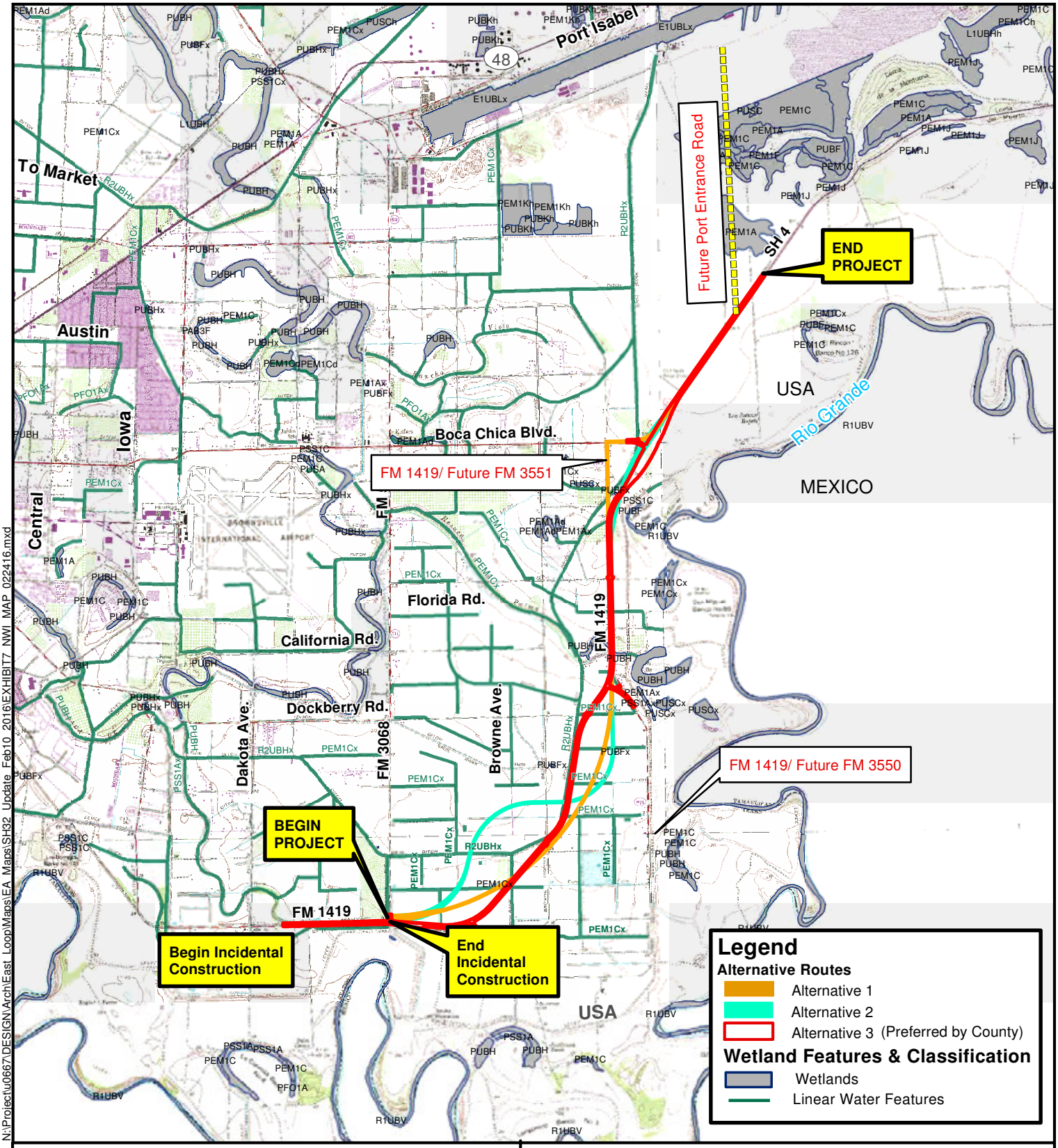
0.5 0.25 0 0.5
Miles

N

EXHIBIT 6B
FLOOD PLAIN MAP

CCRMA
CAMERON COUNTY REGIONAL MOBILITY AUTHORITY

SH 32
CAMERON COUNTY, TEXAS



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SOURCE - 1955 -Revised 1983 USGS Historical Topo,
National Wetland Inventory (East Brownsville, PalmitoHill, Southmost)

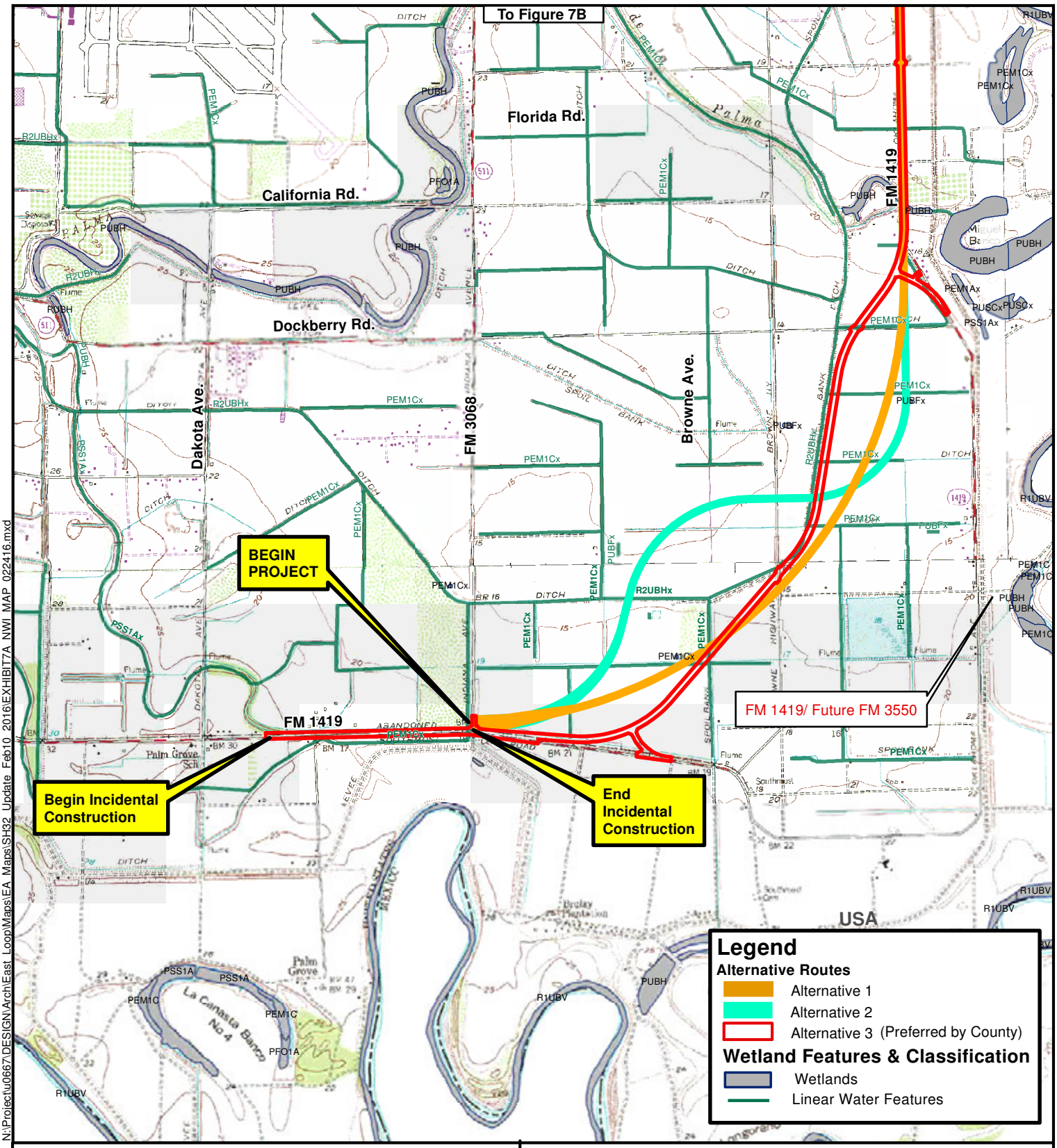
0.5 0.25 0 0.5
Miles

N

EXHIBIT 7
NATIONAL WETLAND INVENTORY MAP

CCRMA
CAMERON COUNTY REGIONAL MOBILITY AUTHORITY

SH 32
CAMERON COUNTY, TEXAS



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SOURCE - 1955 -Revised 1983 USGS Historical Topo,
National Wetland Inventory (East Brownsville, PalmitoHill, Southmost)

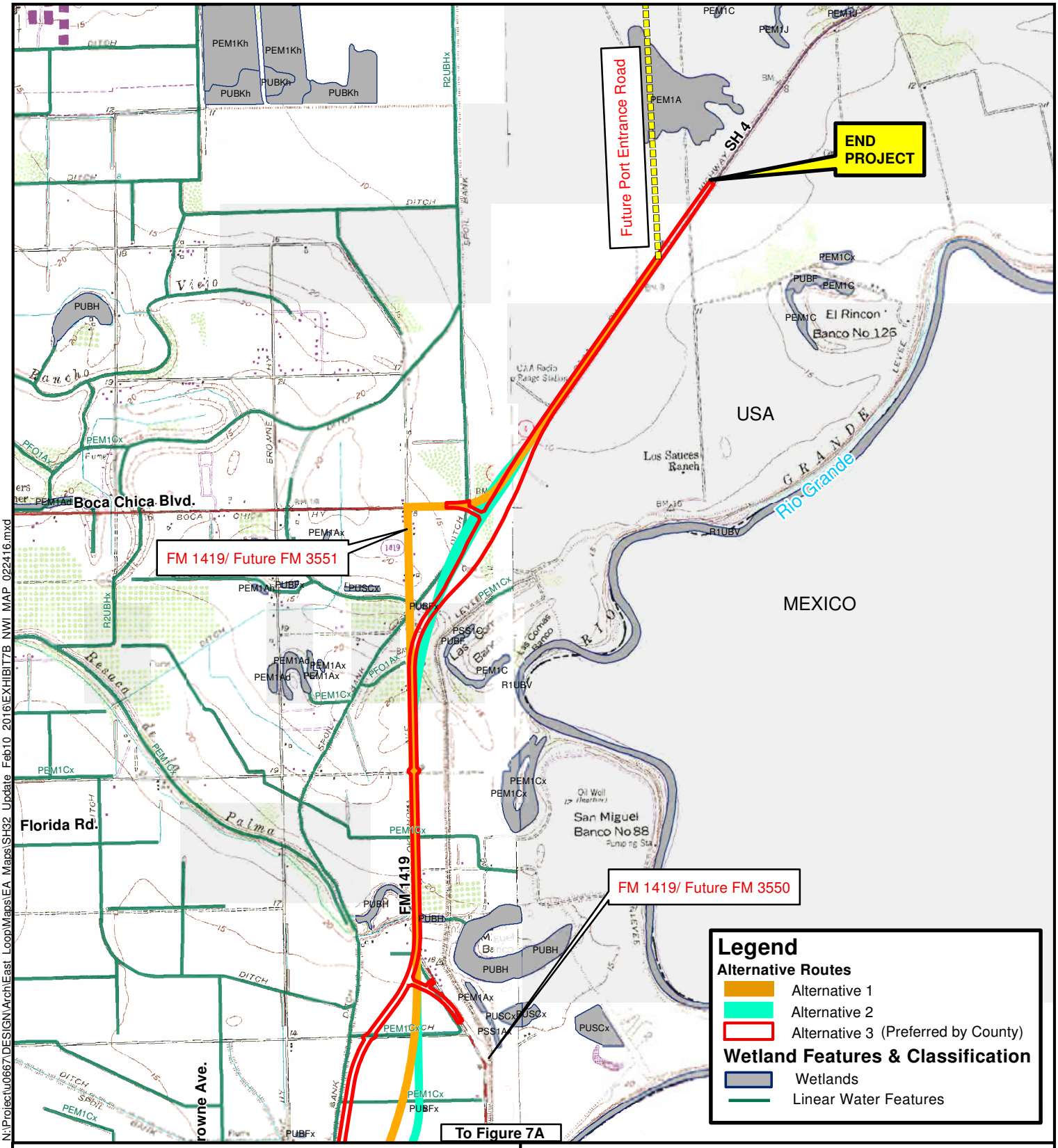
0.5 0.25 0 0.5
Miles

N

EXHIBIT 7A
NATIONAL WETLAND INVENTORY MAP

CCRMA
CAMERON COUNTY REGIONAL MOBILITY AUTHORITY

SH 32
CAMERON COUNTY, TEXAS



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SOURCE - 1955 -Revised 1983 USGS Historical Topo,
National Wetland Inventory (East Brownsville, PalmitoHill, Southmost)

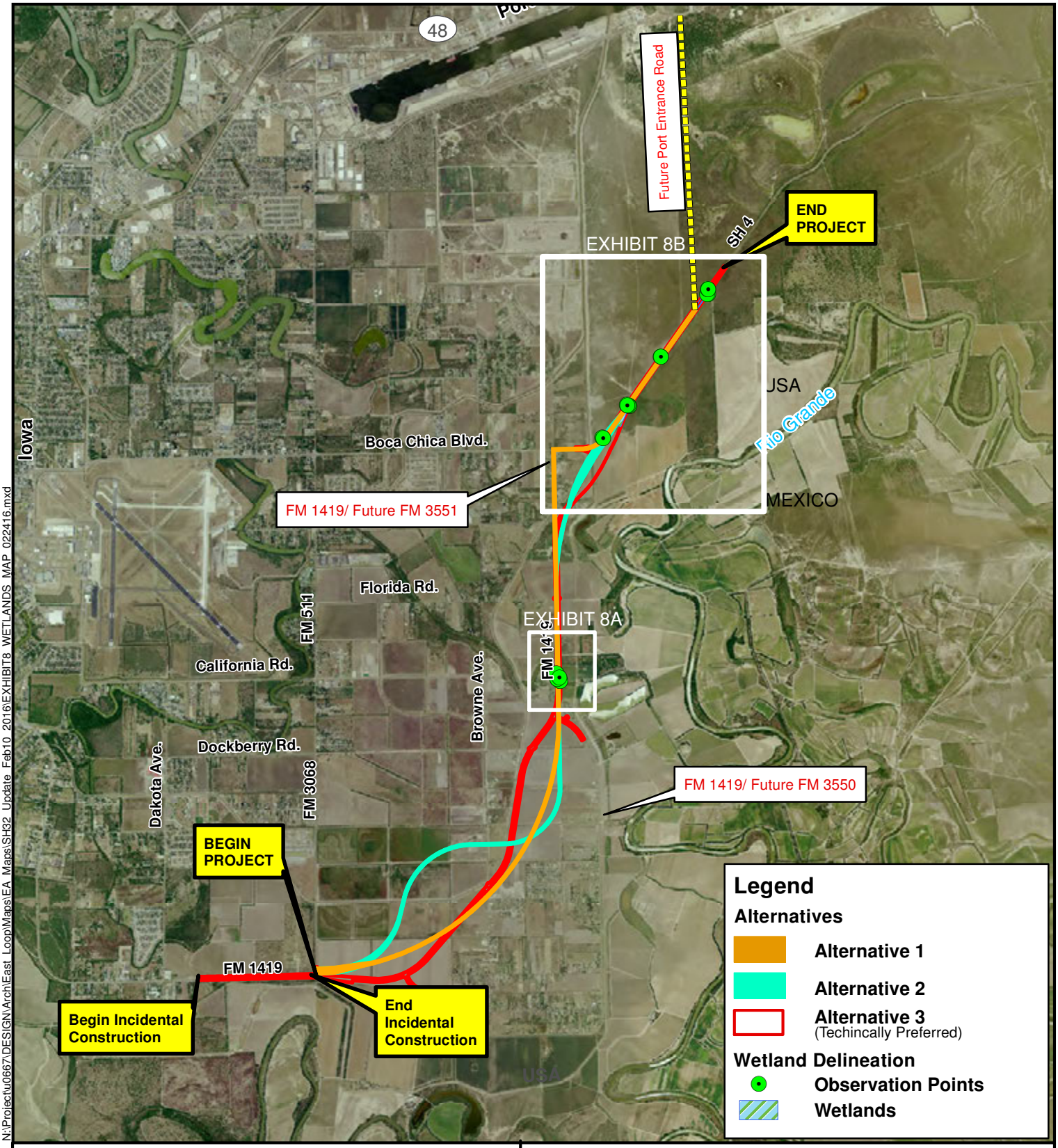
0.5 0.25 0 0.5
Miles

N

EXHIBIT 7B
NATIONAL WETLAND INVENTORY MAP

CCRMA
CAMERON COUNTY REGIONAL MOBILITY AUTHORITY

SH 32
CAMERON COUNTY, TEXAS



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SOURCE - NAIP 2014 AERIAL.

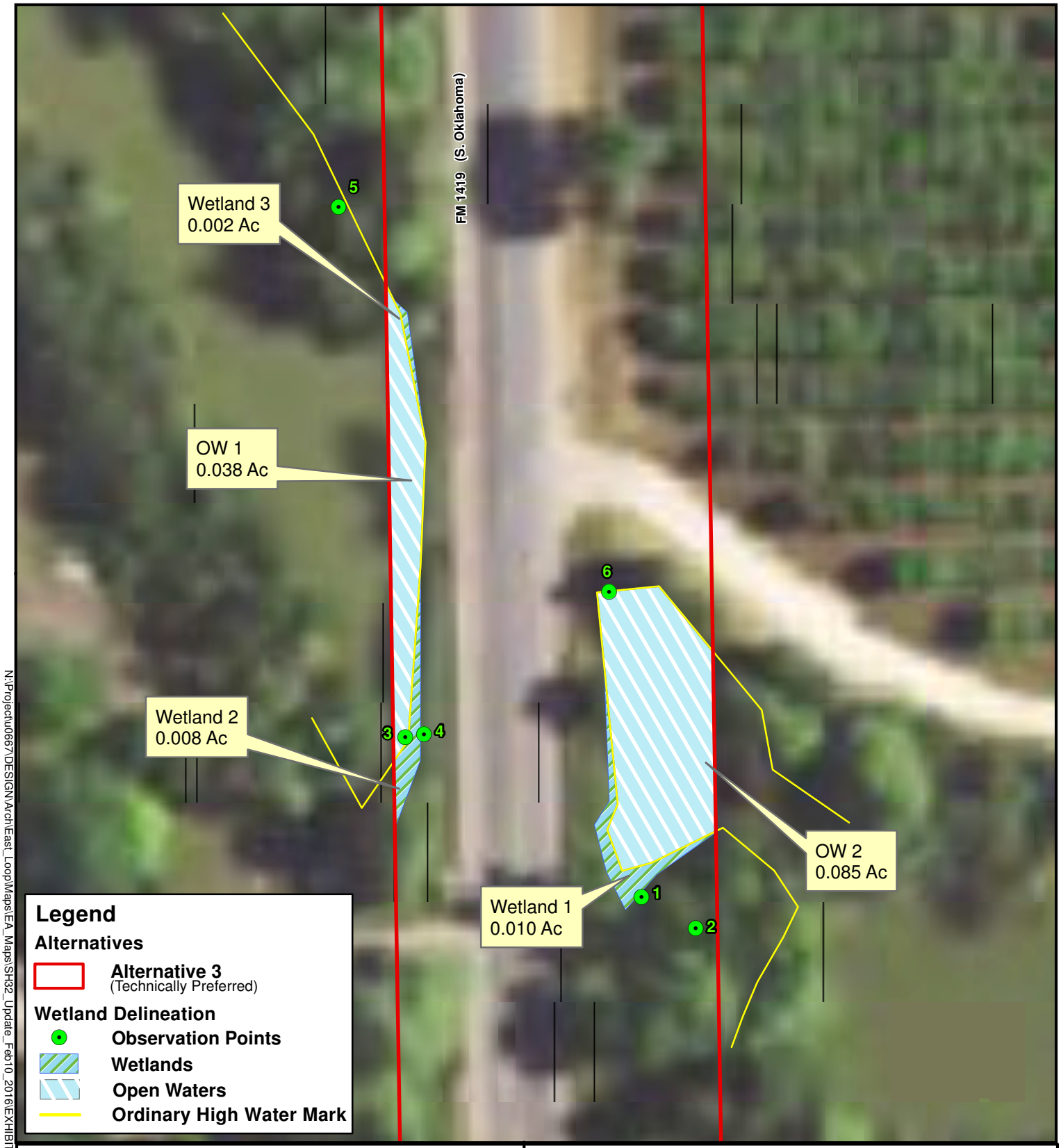
0.5 0.25 0 0.5
Miles

N

EXHIBIT 8
WETLAND DELINEATION MAP

CCRMA
CAMERON COUNTY REGIONAL MOBILITY AUTHORITY

SH 32
CAMERON COUNTY, TEXAS



SOURCE - NAIP 2014 AERIAL

50 25 0 50
Feet

N

EXHIBIT 8A
WETLAND DELINEATION MAP

CCRMA
CAMERON COUNTY REGIONAL MOBILITY AUTHORITY

SH 32
CAMERON COUNTY, TEXAS

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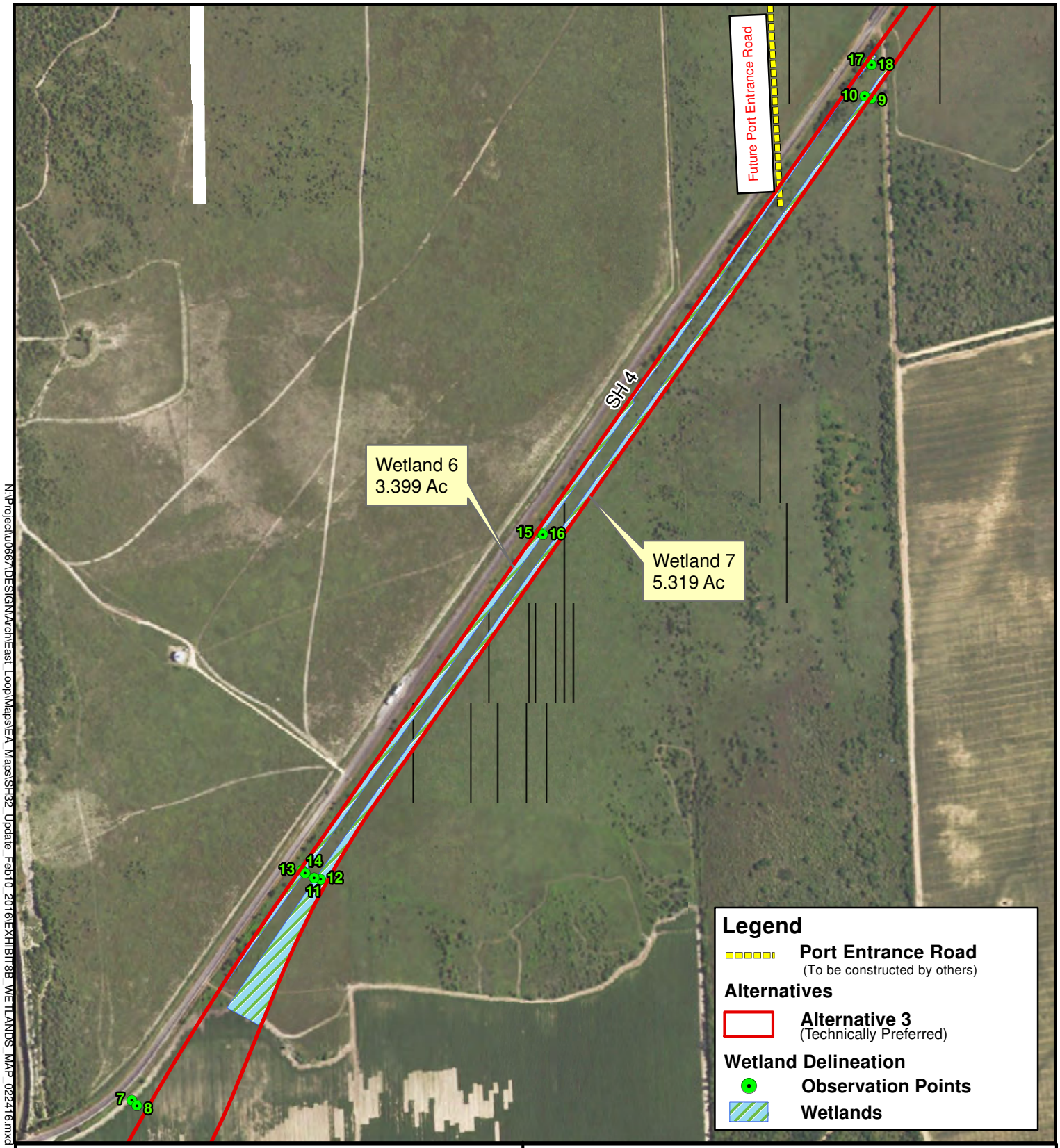

SOURCE - NAIP 2014 AERIAL.

1,000 500 0 1,000
Feet

N

EXHIBIT 8B
WETLAND DELINEATION MAP

CCRMA
CAMERON COUNTY REGIONAL MOBILITY AUTHORITY

SH 32
CAMERON COUNTY, TEXAS

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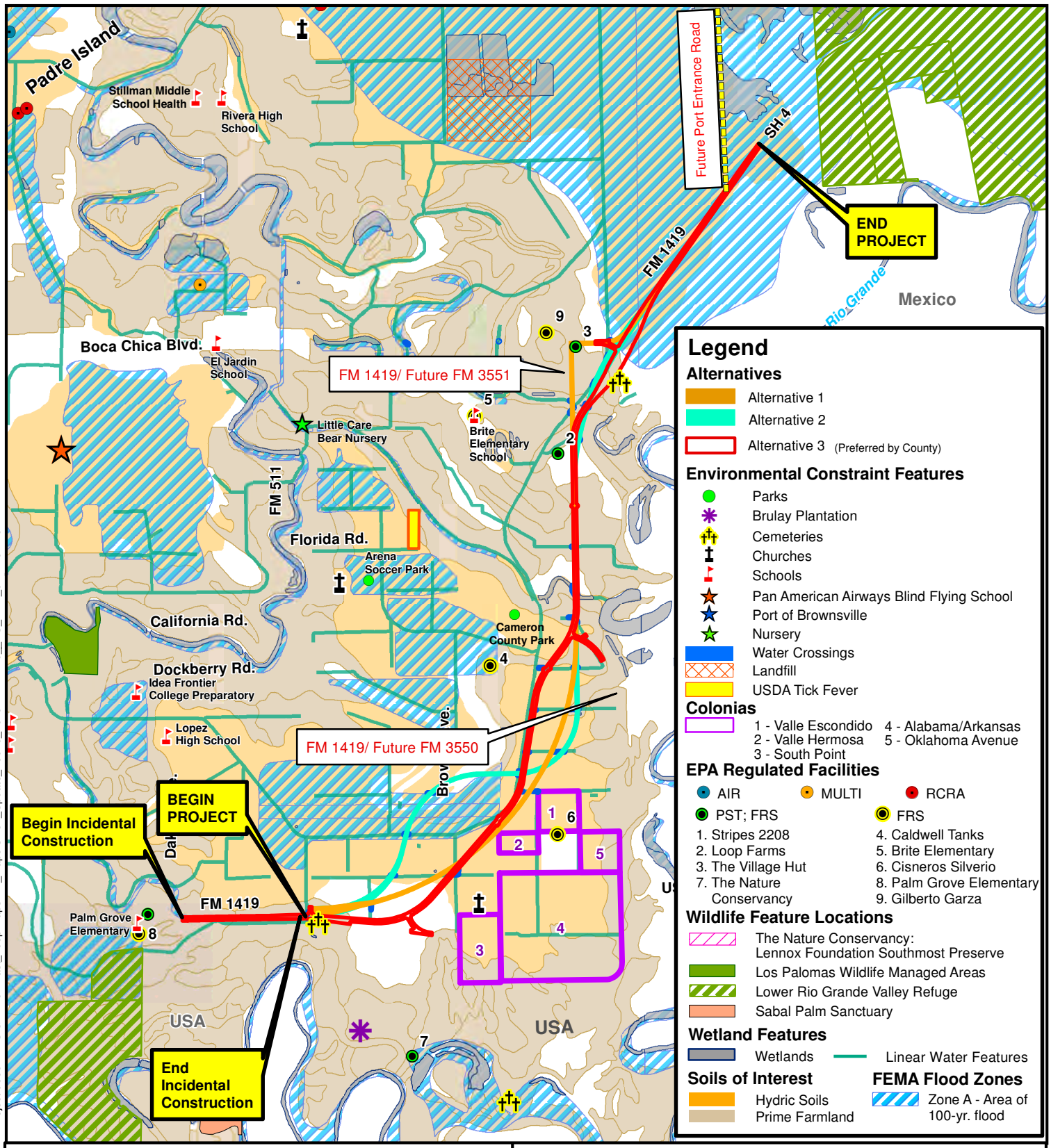


N:\Project\u0667\DESIGN\Arch\East_Loop\Maps\EA_Maps\SH32_Update_Feb10_2016\EXHIBIT9__EC_MAP_022416.mxd

SOURCE - ESRI StreetMap USA, EPA, TCEQ, TPWD, USDA, TNC, NRCS, NWI, FEMA Q3 Data.

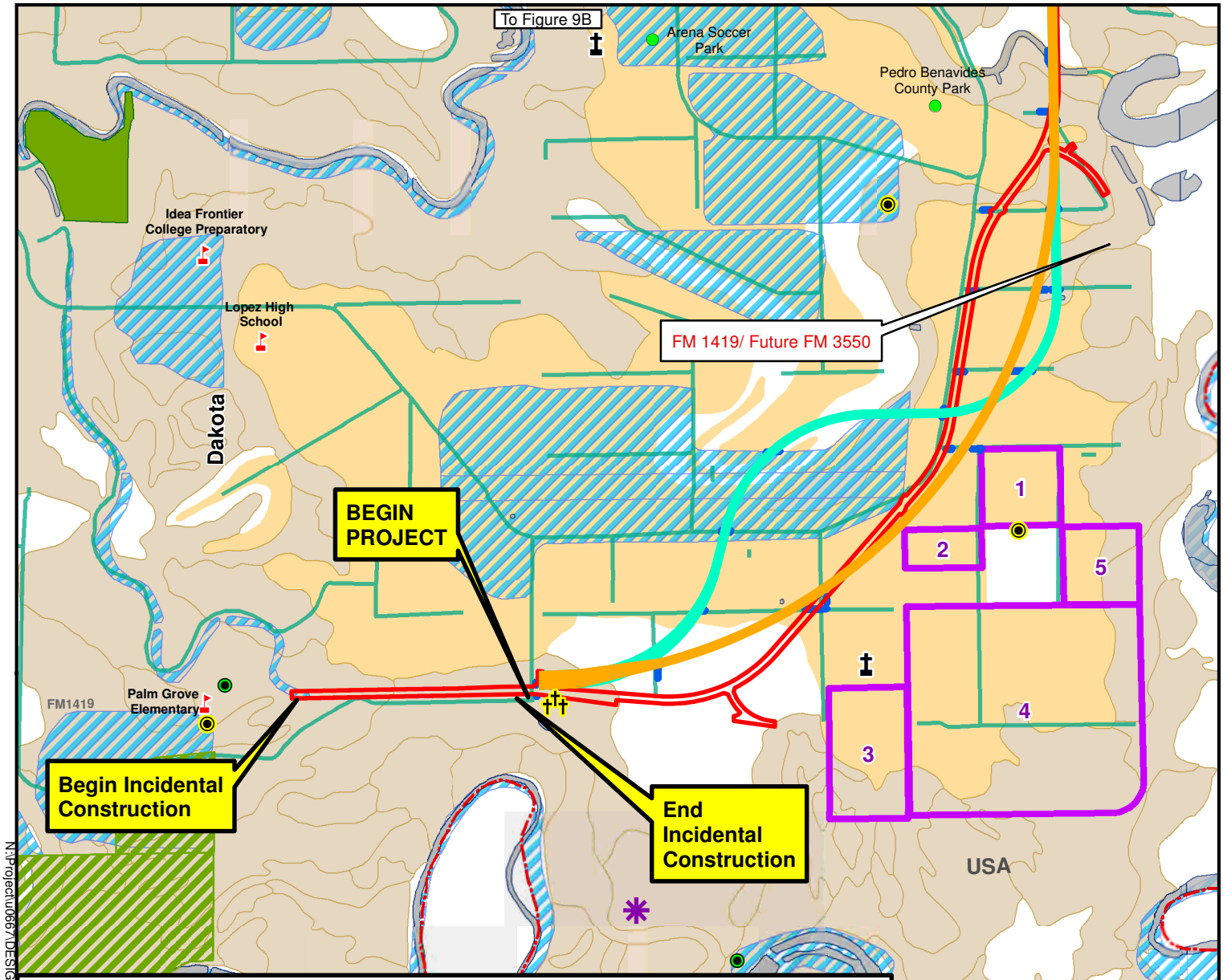
0.5 0.25 0 0.5
Miles

N

EXHIBIT 9
ENVIRONMENTAL CONSTRAINTS MAP

CCRMA
CAMERON COUNTY REGIONAL MOBILITY AUTHORITY

SH 32
CAMERON COUNTY, TEXAS



Legend

Alternative Route

- Alternative 1
- Alternative 2
- Alternative 3 (Preferred by County)

Environmental Constraint Features

- Parks
- Brulay Plantation
- Cemeteries
- Nursery
- Churches
- Schools
- Water Crossings

Soils of Interest

- Hydric Soils
- Prime Farmland

Colonias

1 - Valle Escondido
2 - Valle Hermosa
3 - South Point
4 - Alabama/Arkansas
5 - Oklahoma Avenue

EPA Regulated Facilities

PST; FRS
FRS

1. Stripes 2208
7. The Nature Conservancy
4. Caldwell Tanks
6. Cisneros Silverio
8. Palm Grove Elementary

Wildlife Feature Locations

- The Nature Conservancy: Lennox Foundation Southmost Preserve
- Los Palomas Wildlife Managed Areas
- Lower Rio Grande Valley Refuge

Wetland Features

- Wetlands
- Linear Water Features

FEMA Flood Zones

- Zone A - Area of 100-yr. flood

SOURCE - ESRI StreetMap USA, EPA, TCEQ, TPWD, USDA, TNC, NRCS, NWI, FEMA Q3 Data.

2,000 1,000 0 2,000
Feet

N

EXHIBIT 9A
ENVIRONMENTAL CONSTRAINTS MAP

CCRMA
CAMERON COUNTY REGIONAL MOBILITY AUTHORITY

SH 32
CAMERON COUNTY, TEXAS

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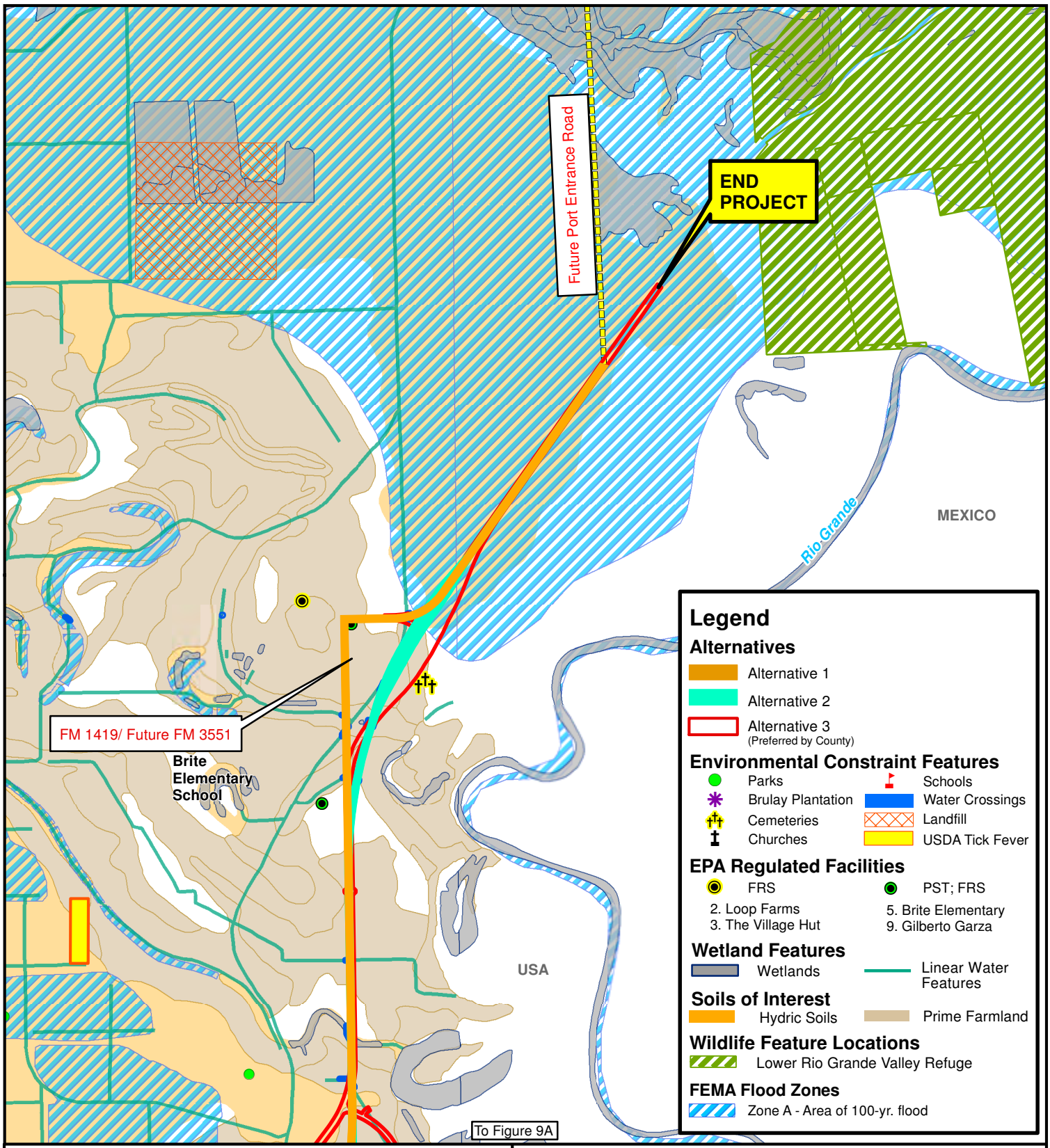

SOURCE - ESRI StreetMap USA, EPA, TCEQ, TPWD, USDA, TNC, NRCS, NWI, FEMA Q3 Data.

0.5 0.25 0 0.5
Miles

N

EXHIBIT 9B
ENVIRONMENTAL CONSTRAINTS MAP

CCRMA
CAMERON COUNTY REGIONAL MOBILITY AUTHORITY

SH 32
CAMERON COUNTY, TEXAS

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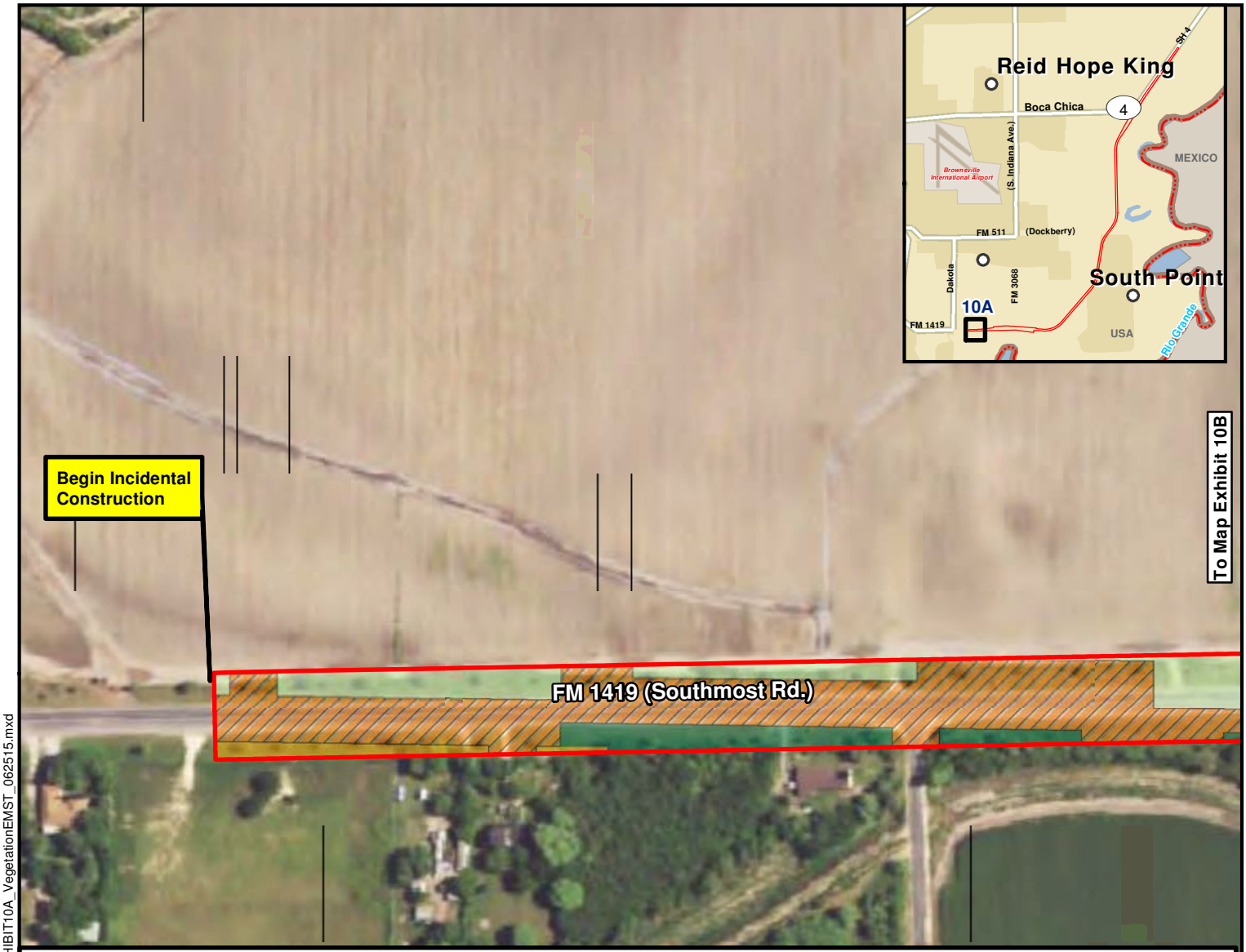

Legend

Alternative Route

Alternative 3 (Technically Preferred)

Vegetation Type Analysis and Quantifications

- Coastal: Salt and Brackish High Tidal Marsh = 0.1 Acre
- Coastal: Sea Ox-eye Daisy Flats = 0.7 Acre
- Gulf Coast: Salty Prairie = 33.8 Acres
- Gulf Coast: Salty Prairie Shrubland = 1 Acre
- Row Crops = 17.2 Acres
- South Texas: Clayey Blackbrush Mixed Shrubland = 3.6 Acres
- South Texas: Clayey Mesquite Mixed Shrubland = 1.2 Acres
- South Texas: Disturbance Grassland = 31 Acres
- South Texas: Floodplain Evergreen Forest and Woodland = 0.01 Acre
- South Texas: Floodplain Herbaceous Wetland = 0.02 Acre
- South Texas: Floodplain Mixed Deciduous - Evergreen Forest and Woodland = 0.1 Acre
- South Texas: Loma Evergreen Shrubland = 1.7 Acres
- Urban High Intensity = 0.9 Acre
- Urban Low Intensity = 35.6 Acres

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SOURCE - ESRI STREETMAP USA, 2013; NAIP, 2014 AERIAL

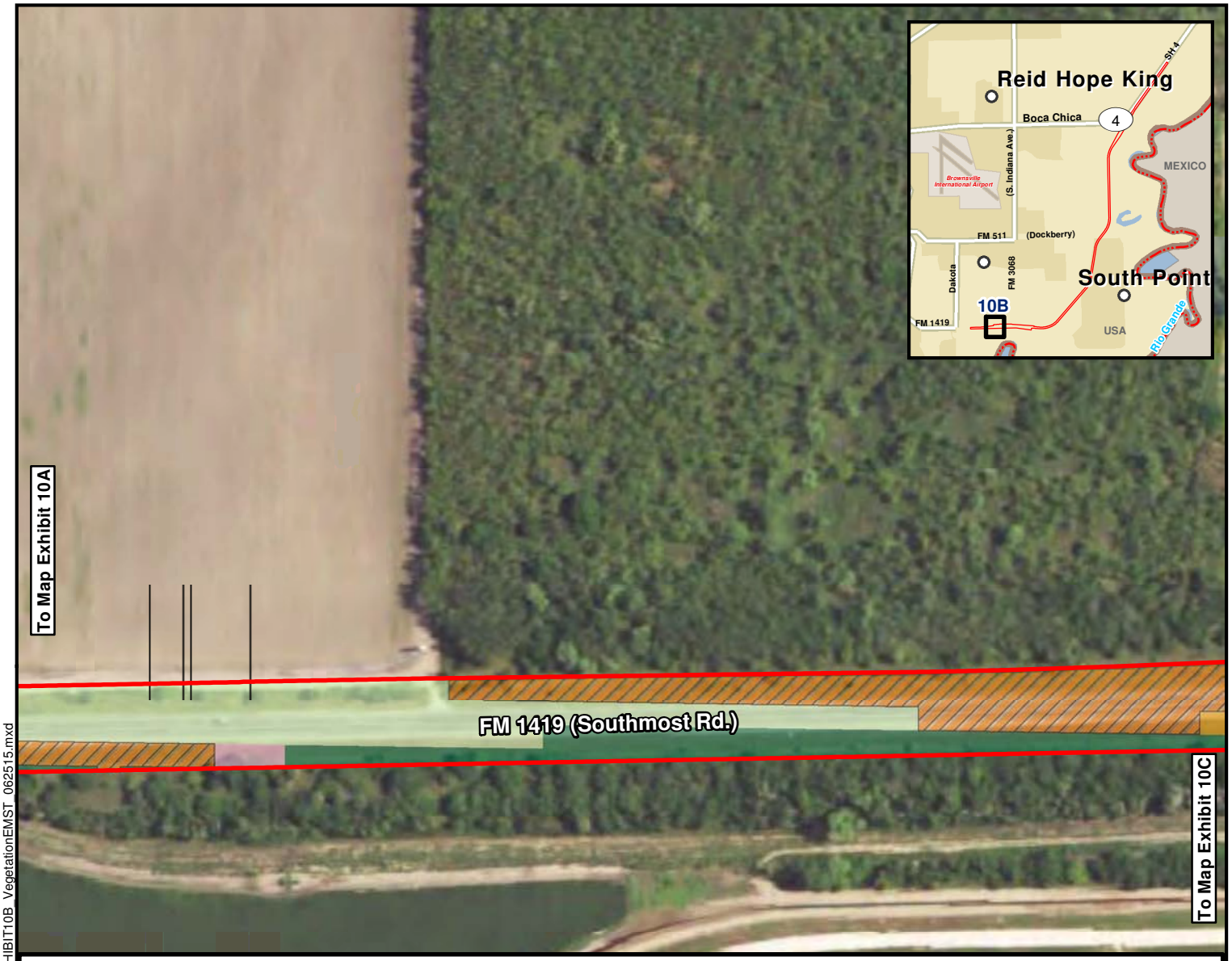
200 100 0 200
Feet

N

EXHIBIT 10A
VEGETATION ANALYSIS MAP BASED ON EMST

CCRMA
CAMERON COUNTY REGIONAL MOBILITY AUTHORITY

SH 32
CAMERON COUNTY, TEXAS



Legend

Alternative Route

Alternative 3 (Technically Preferred)

Vegetation Type Analysis and Quantifications

- Coastal: Salt and Brackish High Tidal Marsh = 0.1 Acre
- Coastal: Sea Ox-eye Daisy Flats = 0.7 Acre
- Gulf Coast: Salty Prairie = 33.8 Acres
- Gulf Coast: Salty Prairie Shrubland = 1 Acre
- Row Crops = 17.2 Acres
- South Texas: Clayey Blackbrush Mixed Shrubland = 3.6 Acres
- South Texas: Clayey Mesquite Mixed Shrubland = 1.2 Acres
- South Texas: Disturbance Grassland = 31 Acres
- South Texas: Floodplain Evergreen Forest and Woodland = 0.01 Acre
- South Texas: Floodplain Herbaceous Wetland = 0.02 Acre
- South Texas: Floodplain Mixed Deciduous - Evergreen Forest and Woodland = 0.1 Acre
- South Texas: Loma Evergreen Shrubland = 1.7 Acres
- Urban High Intensity = 0.9 Acre
- Urban Low Intensity = 35.6 Acres

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SOURCE - ESRI STREETMAP USA, 2013; NAIP, 2014 AERIAL

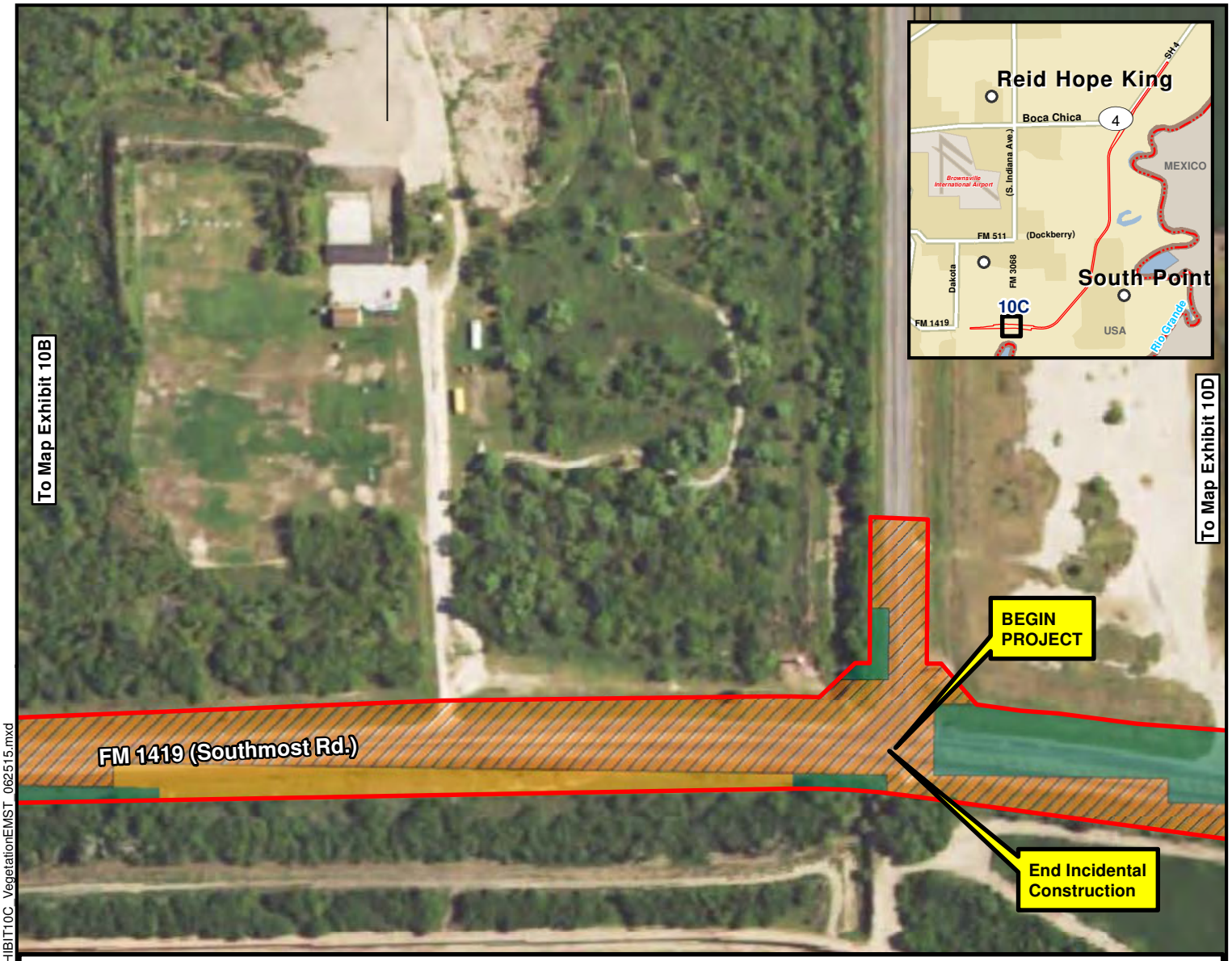
200 100 0 200
Feet

N

EXHIBIT 10B
VEGETATION ANALYSIS MAP BASED ON EMST

CCRMA
CAMERON COUNTY REGIONAL MOBILITY AUTHORITY

SH 32
CAMERON COUNTY, TEXAS



Legend

Alternative Route

Alternative 3 (Technically Preferred)

Vegetation Type Analysis and Quantifications

- Coastal: Salt and Brackish High Tidal Marsh = 0.1 Acre
- Coastal: Sea Ox-eye Daisy Flats = 0.7 Acre
- Gulf Coast: Salty Prairie = 33.8 Acres
- Gulf Coast: Salty Prairie Shrubland = 1 Acre
- Row Crops = 17.2 Acres
- South Texas: Clayey Blackbrush Mixed Shrubland = 3.6 Acres
- South Texas: Clayey Mesquite Mixed Shrubland = 1.2 Acres
- South Texas: Disturbance Grassland = 31 Acres
- South Texas: Floodplain Evergreen Forest and Woodland = 0.01 Acre
- South Texas: Floodplain Herbaceous Wetland = 0.02 Acre
- South Texas: Floodplain Mixed Deciduous - Evergreen Forest and Woodland = 0.1 Acre
- South Texas: Loma Evergreen Shrubland = 1.7 Acres
- Urban High Intensity = 0.9 Acre
- Urban Low Intensity = 35.6 Acres

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SOURCE - ESRI STREETMAP USA, 2013. NAIP, 2014 AERIAL

200 100 0 200
Feet

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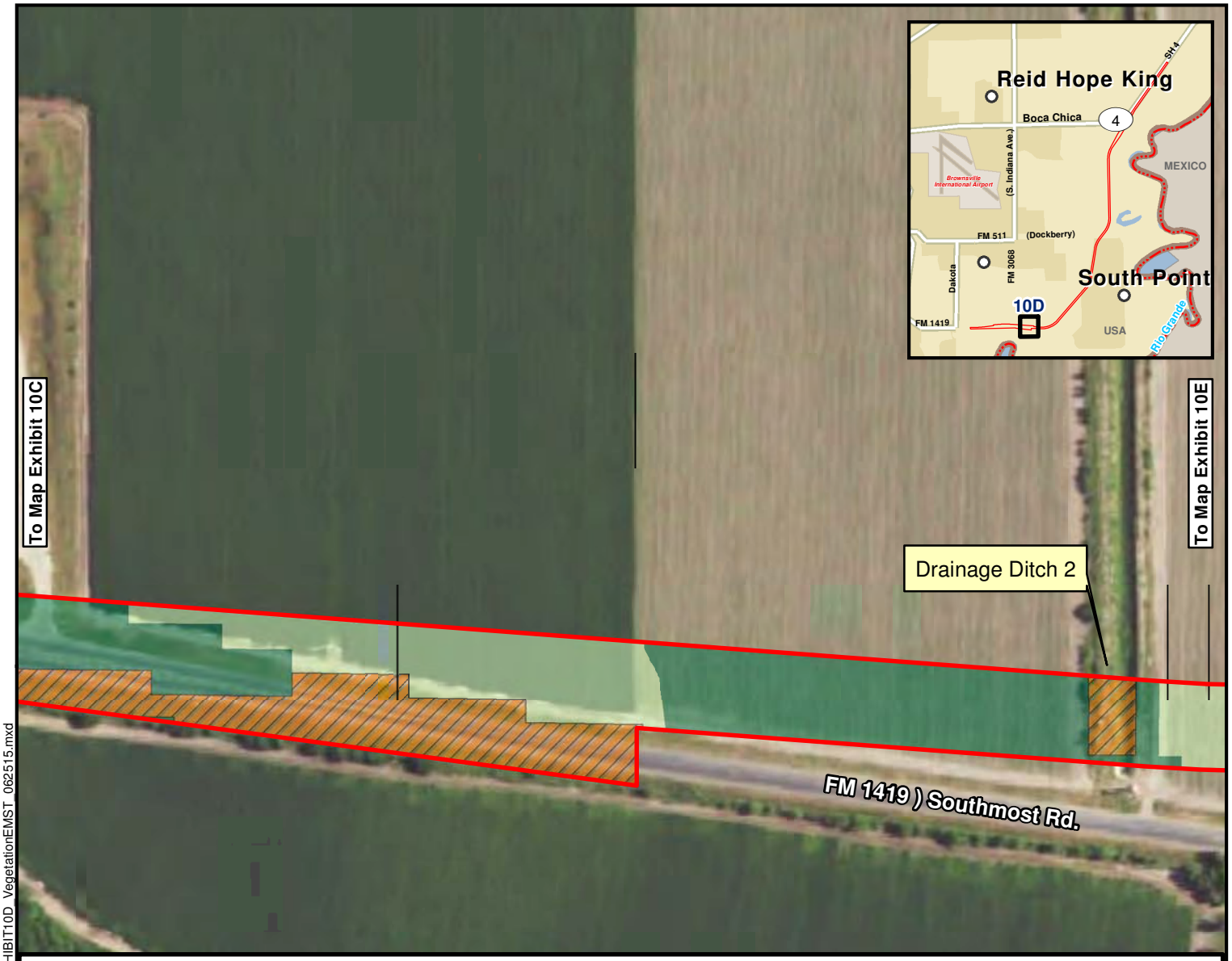
EXHIBIT 10C
VEGETATION ANALYSIS MAP BASED ON EMST

CCRMA
CAMERON COUNTY REGIONAL MOBILITY AUTHORITY

SH 32
CAMERON COUNTY, TEXAS



Legend

Alternative Route

Alternative 3 (Technically Preferred)

Vegetation Type Analysis and Quantifications

- Coastal: Salt and Brackish High Tidal Marsh = 0.1 Acre
- Coastal: Sea Ox-eye Daisy Flats = 0.7 Acre
- Gulf Coast: Salty Prairie = 33.8 Acres
- Gulf Coast: Salty Prairie Shrubland = 1 Acre
- Row Crops = 17.2 Acres
- South Texas: Clayey Blackbrush Mixed Shrubland = 3.6 Acres
- South Texas: Clayey Mesquite Mixed Shrubland = 1.2 Acres
- South Texas: Disturbance Grassland = 31 Acres
- South Texas: Floodplain Evergreen Forest and Woodland = 0.01 Acre
- South Texas: Floodplain Herbaceous Wetland = 0.02 Acre
- South Texas: Floodplain Mixed Deciduous - Evergreen Forest and Woodland = 0.1 Acre
- South Texas: Loma Evergreen Shrubland = 1.7 Acres
- Urban High Intensity = 0.9 Acre
- Urban Low Intensity = 35.6 Acres

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SOURCE - ESRI STREETMAP USA, 2013. NAIP, 2014 AERIAL

200 100 0 200
Feet

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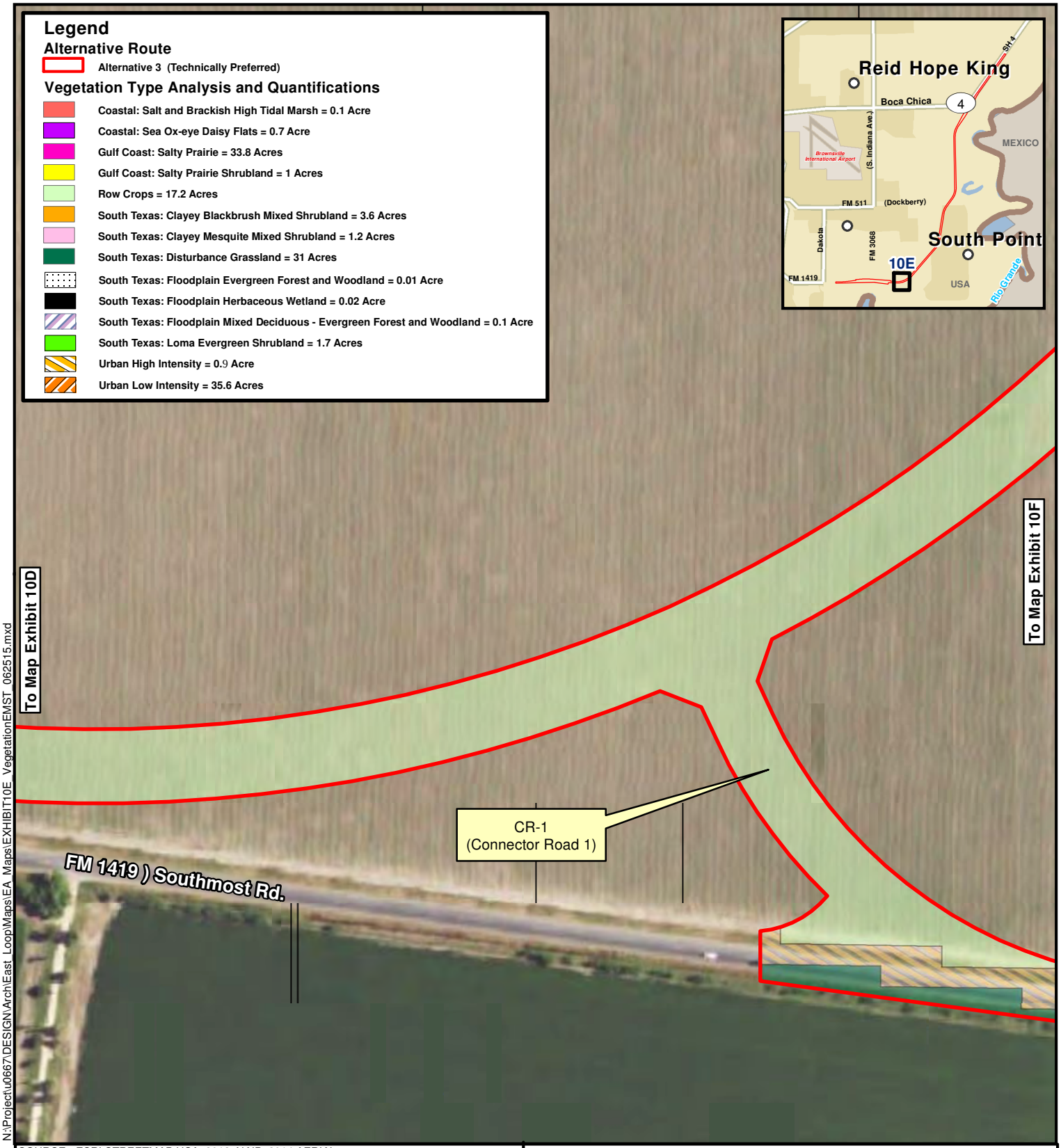
EXHIBIT 10D
VEGETATION ANALYSIS MAP BASED ON EMST

CCRMA
CAMERON COUNTY REGIONAL MOBILITY AUTHORITY

SH 32
CAMERON COUNTY, TEXAS



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SOURCE - ESRI STREETMAP USA, 2013. NAIP, 2014 AERIAL

200 100 0 200
Feet

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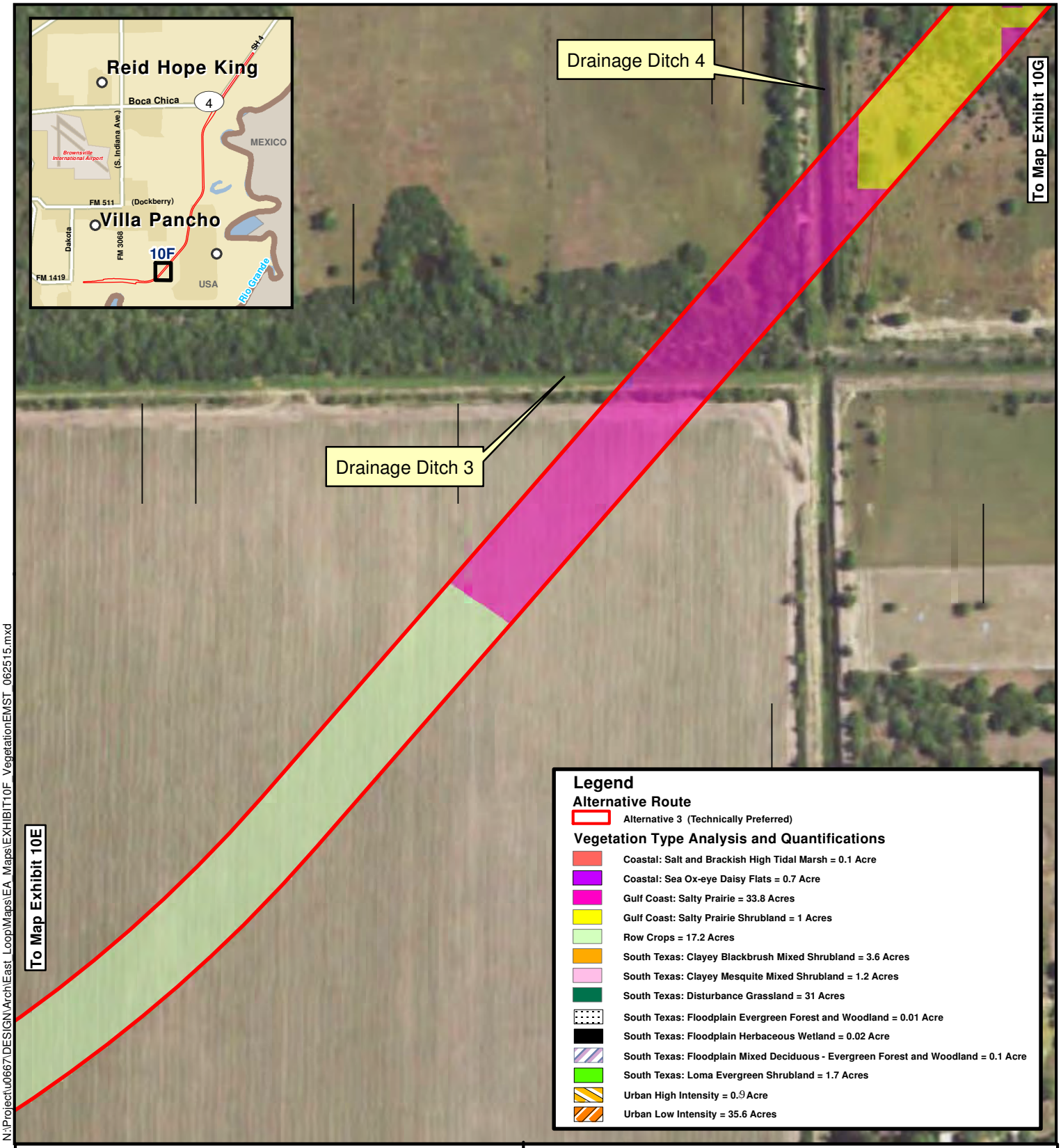
EXHIBIT 10E
VEGETATION ANALYSIS MAP BASED ON EMST

CCRMA
CAMERON COUNTY REGIONAL MOBILITY AUTHORITY

SH 32
CAMERON COUNTY, TEXAS



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SOURCE - ESRI STREETMAP USA, 2013. NAIP, 2014 AERIAL

200 100 0 200
Feet

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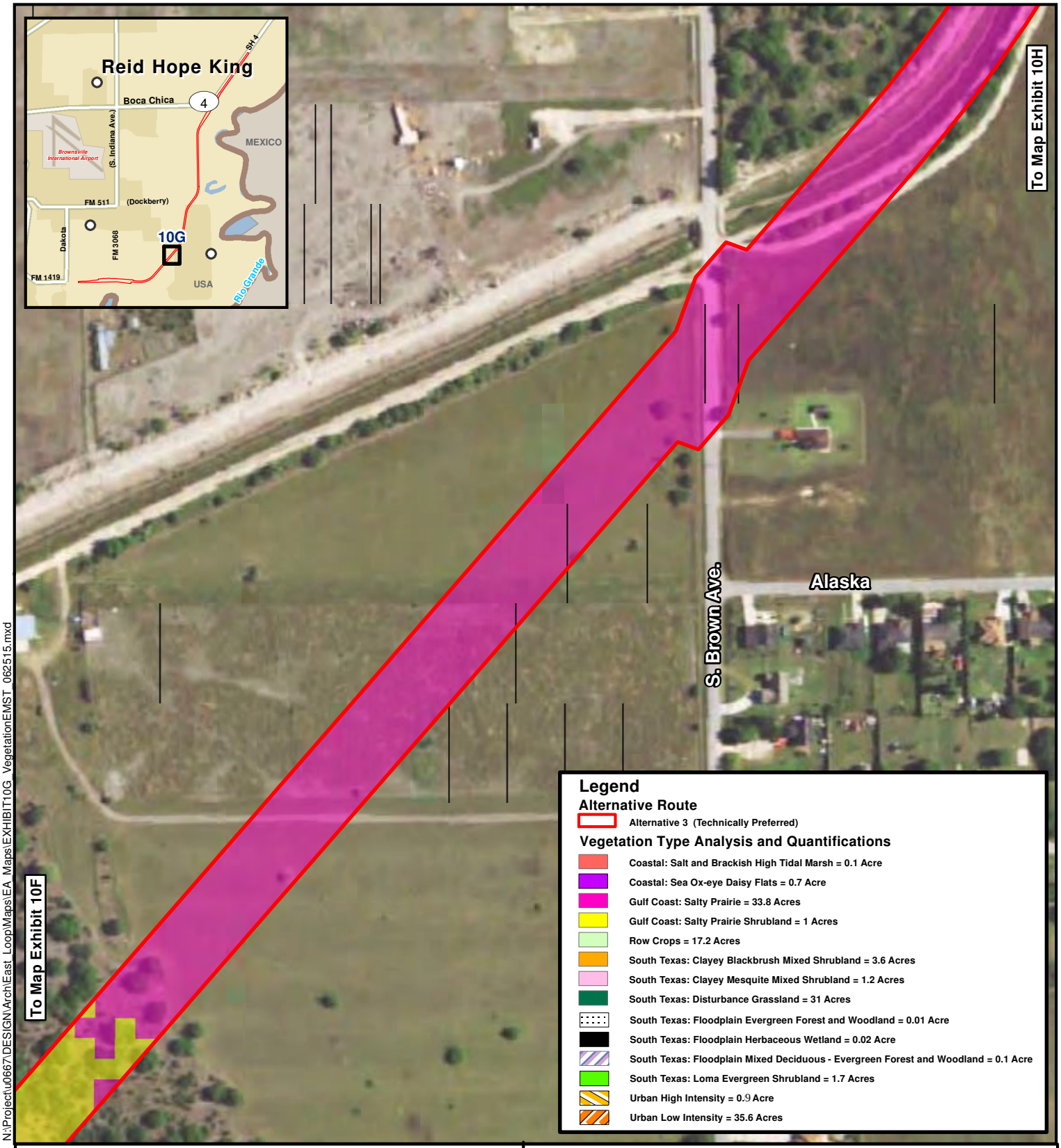
EXHIBIT 10F
VEGETATION ANALYSIS MAP BASED ON EMST

CCRMA
CAMERON COUNTY REGIONAL MOBILITY AUTHORITY

SH 32
CAMERON COUNTY, TEXAS



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SOURCE - ESRI STREETMAP USA, 2013. NAIP, 2014 AERIAL

200 100 0 200
Feet

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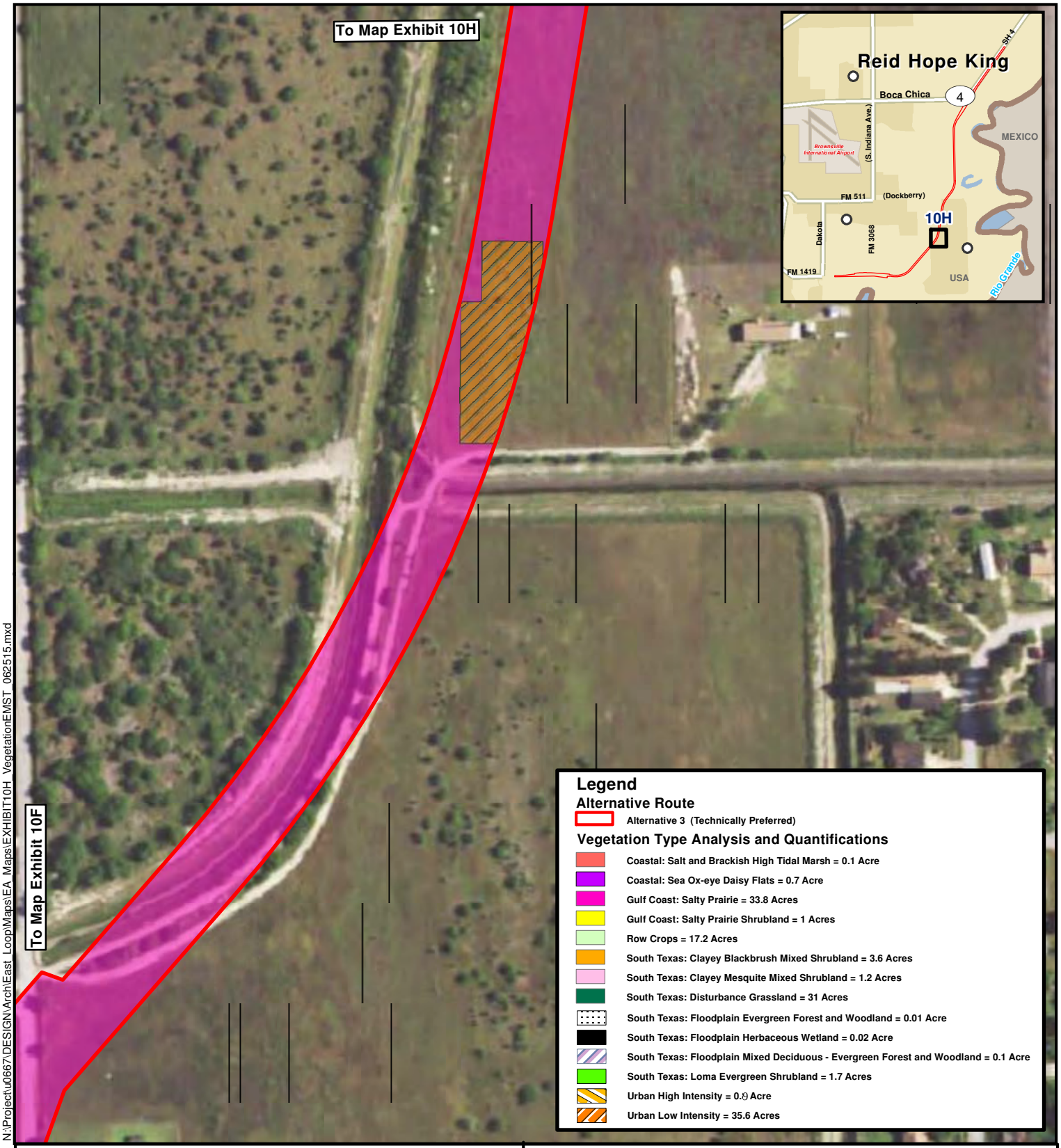
EXHIBIT 10G
VEGETATION ANALYSIS MAP BASED ON EMST

CCRMA
CAMERON COUNTY REGIONAL MOBILITY AUTHORITY

SH 32
CAMERON COUNTY, TEXAS



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SOURCE - ESRI STREETMAP USA, 2013. NAIP, 2014 AERIAL

200 100 0 200
Feet

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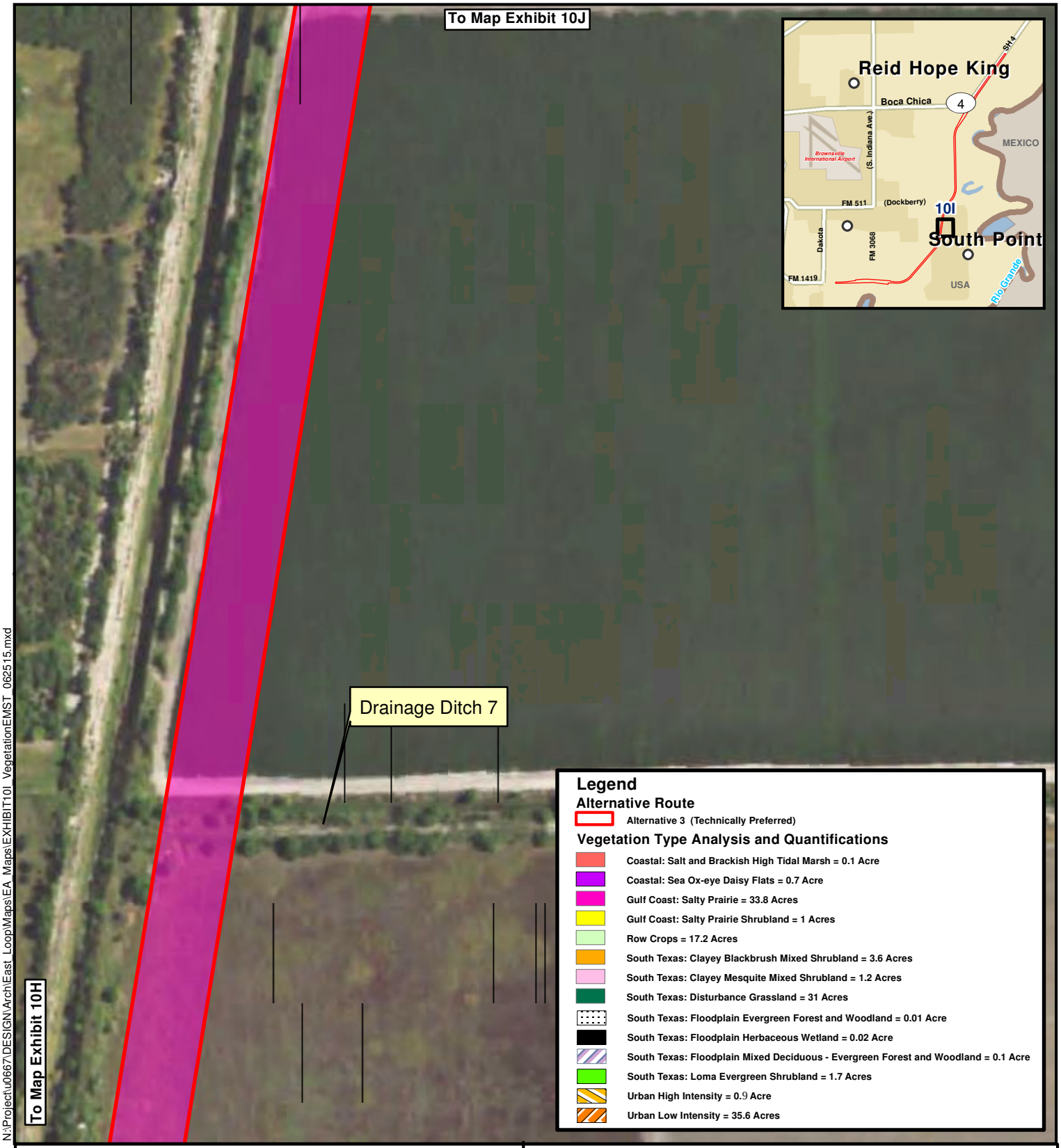
EXHIBIT 10H
VEGETATION ANALYSIS MAP BASED ON EMST

CCRMA
CAMERON COUNTY REGIONAL MOBILITY AUTHORITY

SH 32
CAMERON COUNTY, TEXAS



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SOURCE - ESRI STREETMAP USA, 2013. NAIP, 2014 AERIAL

200 100 0 200
Feet

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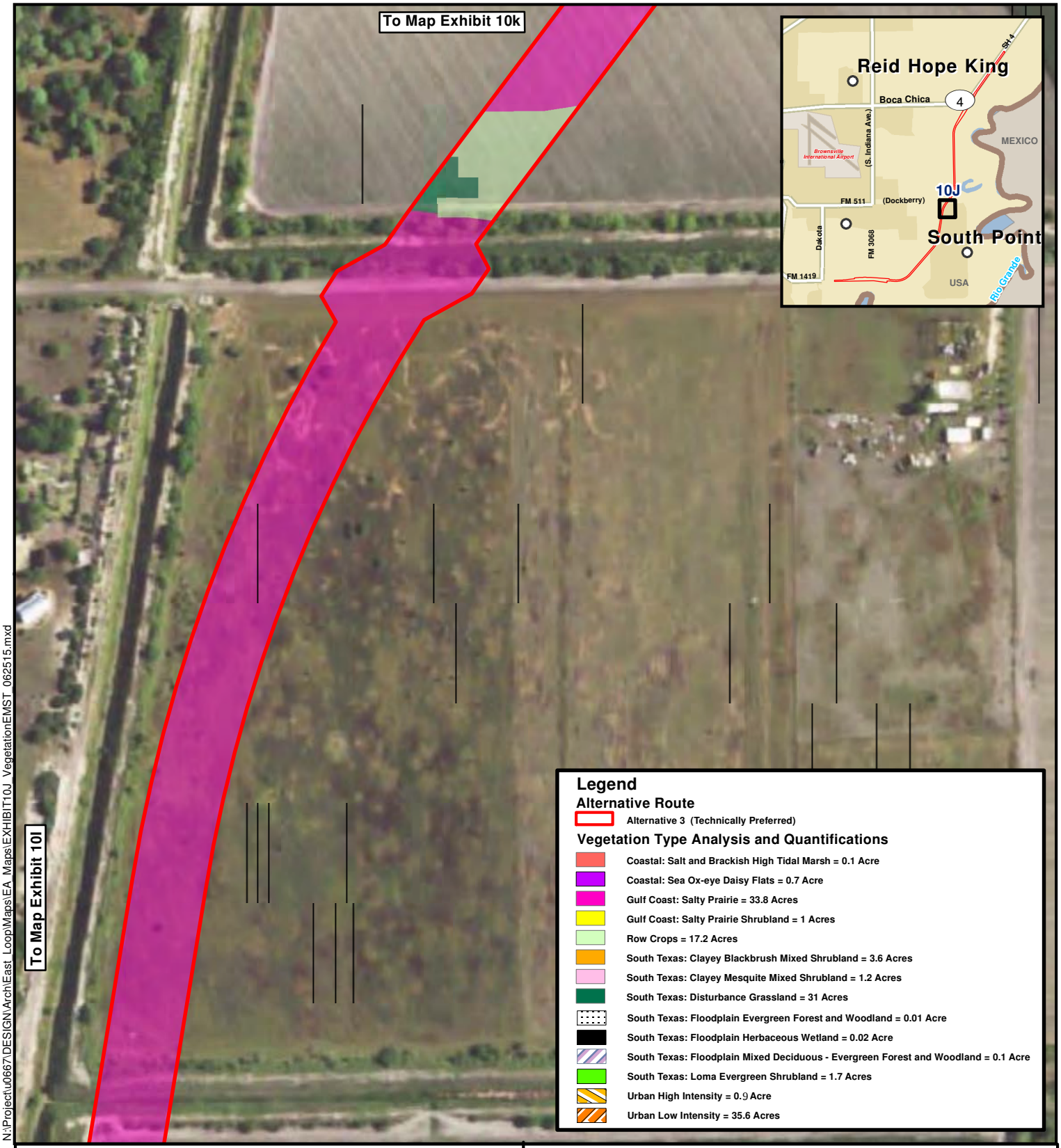
EXHIBIT 10I
VEGETATION ANALYSIS MAP BASED ON EMST

CCRMA
CAMERON COUNTY REGIONAL MOBILITY AUTHORITY

SH 32
CAMERON COUNTY, TEXAS



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SOURCE - ESRI STREETMAP USA, 2013. NAIP, 2014 AERIAL

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Feet

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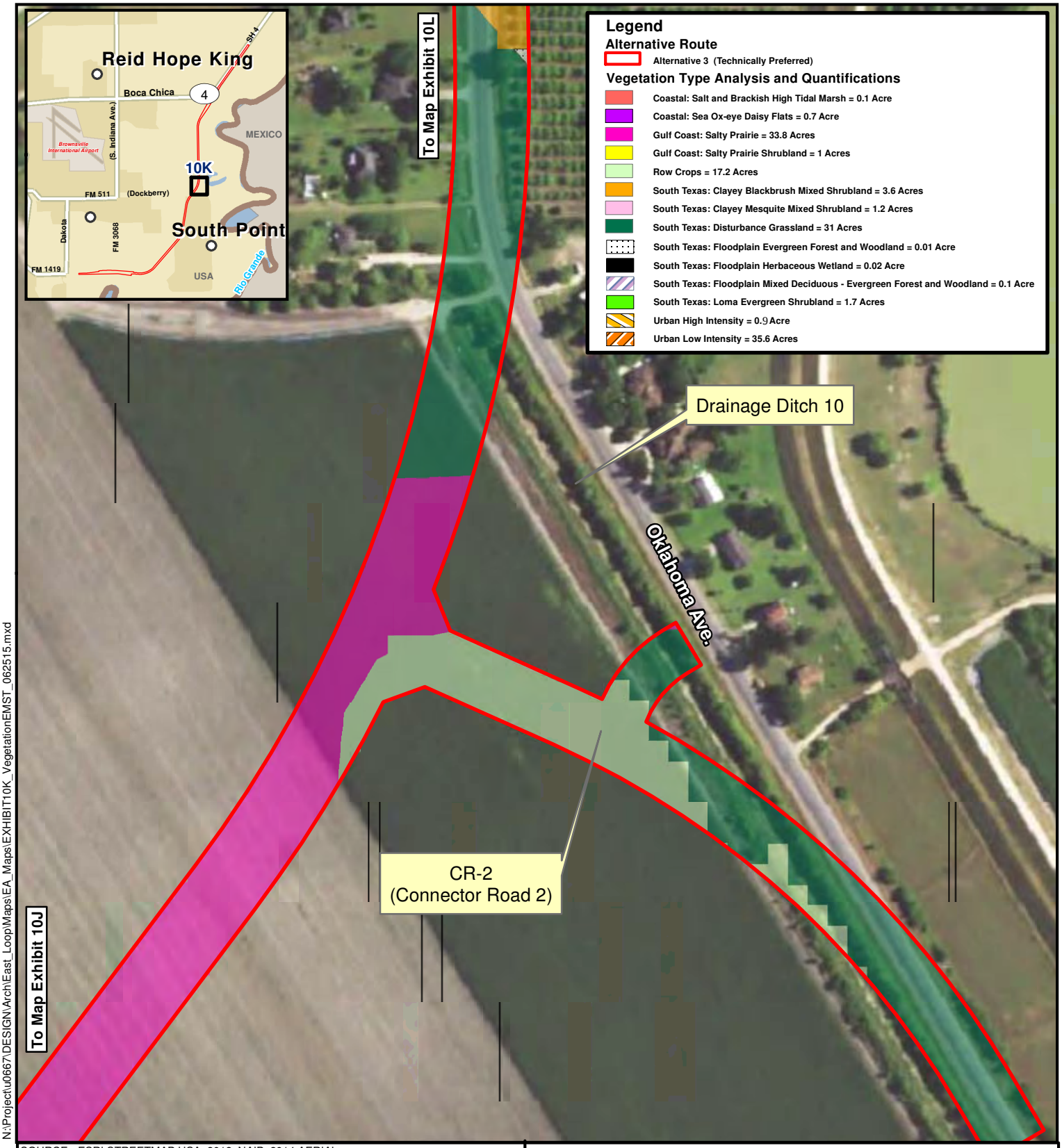
EXHIBIT 10J
VEGETATION ANALYSIS MAP BASED ON EMST

CCRMA
CAMERON COUNTY REGIONAL MOBILITY AUTHORITY

SH 32
CAMERON COUNTY, TEXAS



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SOURCE - ESRI STREETMAP USA, 2013. NAIP, 2014 AERIAL

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Feet

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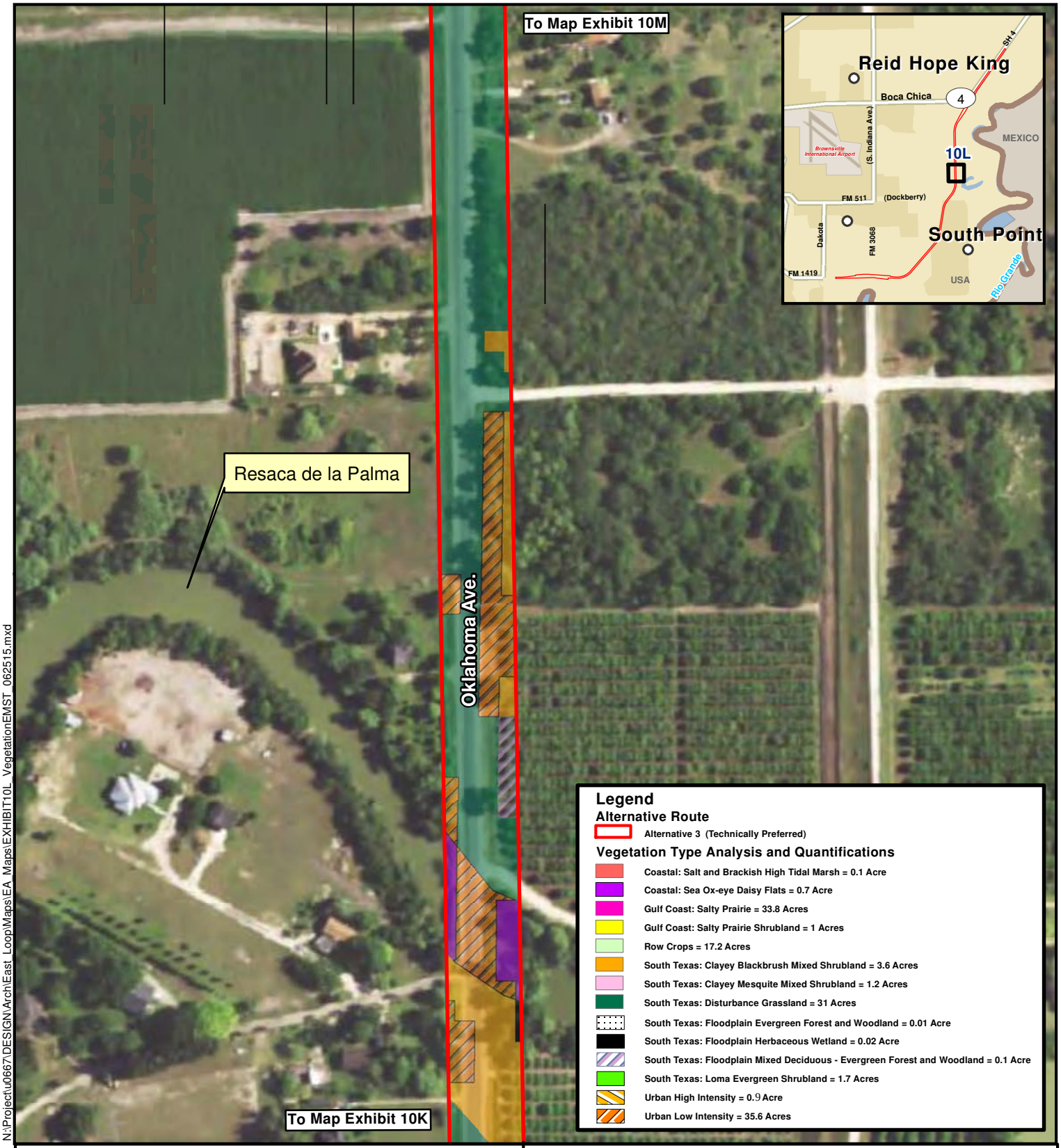
EXHIBIT 10K
VEGETATION ANALYSIS MAP BASED ON EMST

CCRMA
CAMERON COUNTY REGIONAL MOBILITY AUTHORITY

SH 32
CAMERON COUNTY, TEXAS



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SOURCE - ESRI STREETMAP USA, 2013. NAIP, 2014 AERIAL

200 100 0 200
Feet

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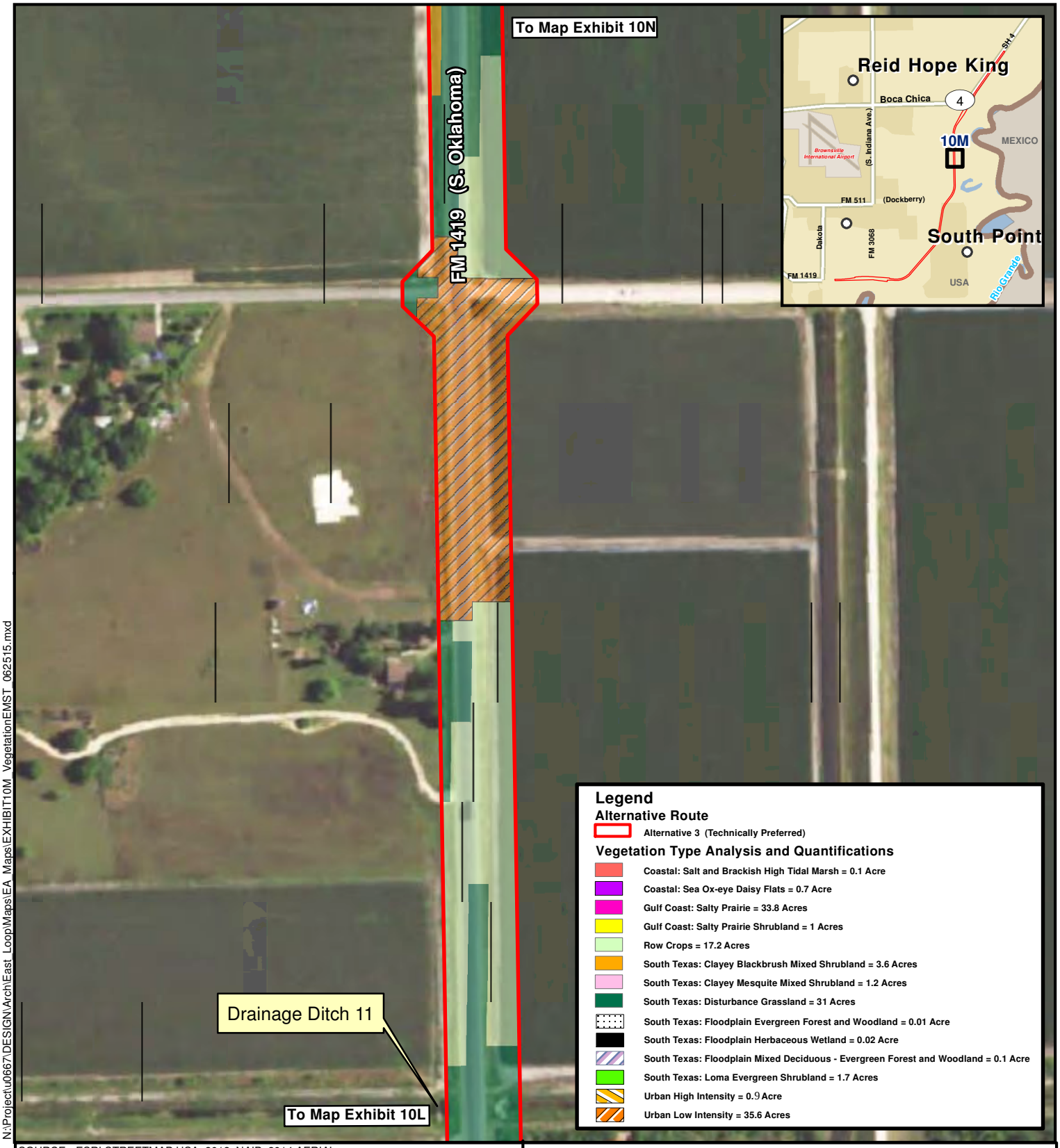
EXHIBIT 10L
VEGETATION ANALYSIS MAP BASED ON EMST

CCRMA
CAMERON COUNTY REGIONAL MOBILITY AUTHORITY

SH 32
CAMERON COUNTY, TEXAS



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SOURCE - ESRI STREETMAP USA, 2013. NAIP, 2014 AERIAL

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Feet

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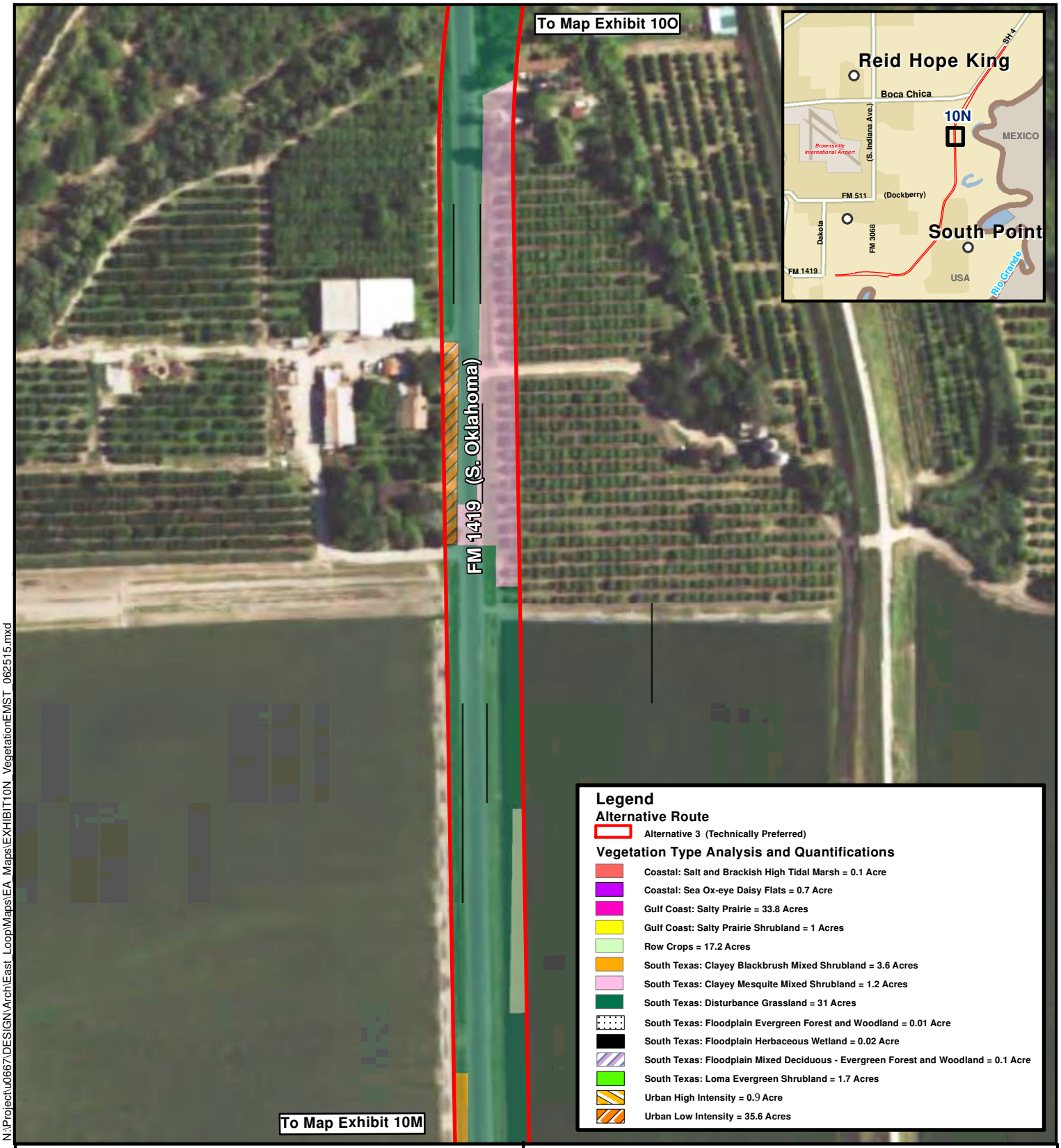
EXHIBIT 10M
VEGETATION ANALYSIS MAP BASED ON EMST

CCRMA
CAMERON COUNTY REGIONAL MOBILITY AUTHORITY

SH 32
CAMERON COUNTY, TEXAS



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SOURCE - ESRI STREETMAP USA, 2013. NAIP, 2014 AERIAL

200 100 0 200
Feet

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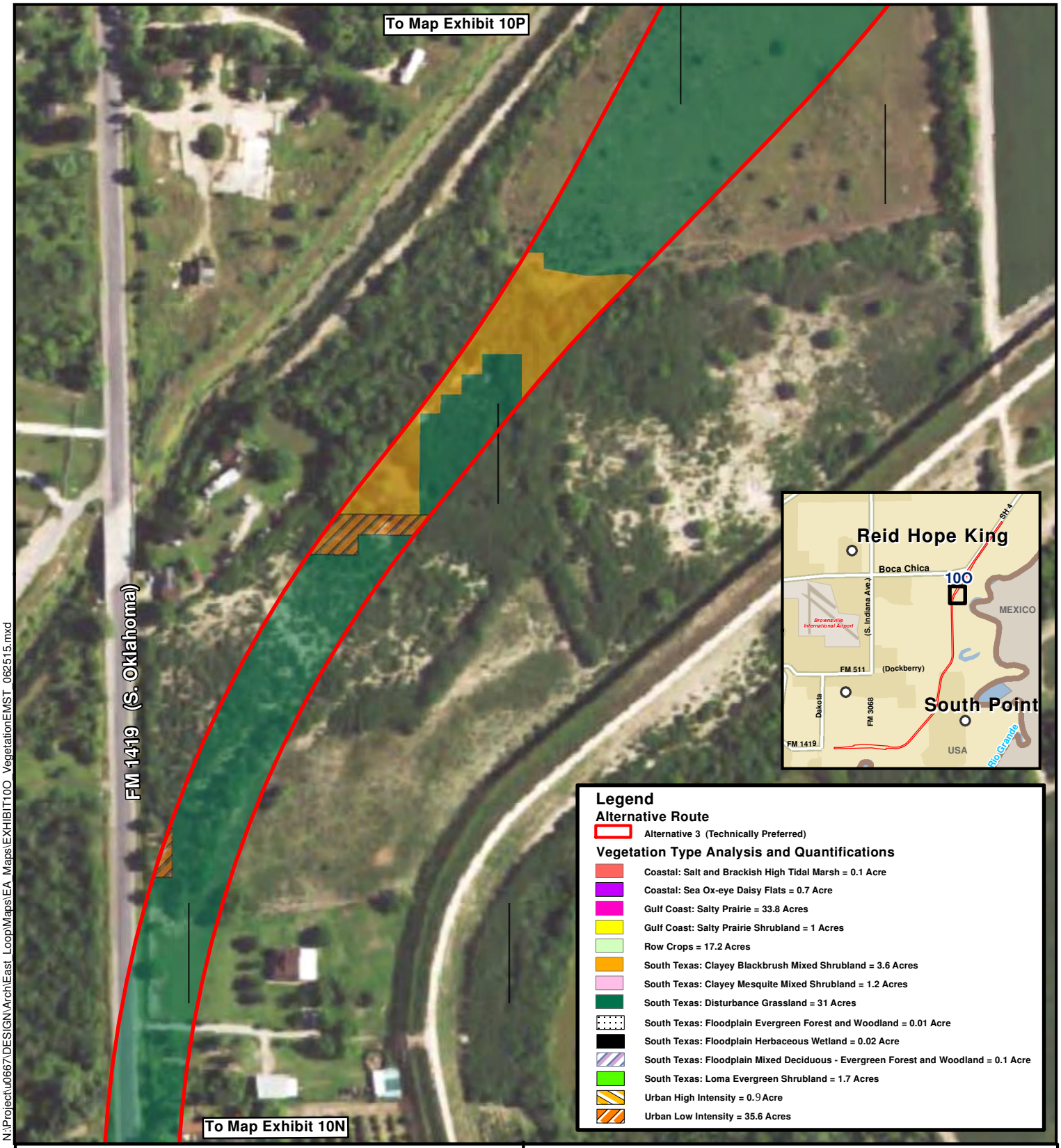
EXHIBIT 10N
VEGETATION ANALYSIS MAP BASED ON EMST

CCRMA
CAMERON COUNTY REGIONAL MOBILITY AUTHORITY

SH 32
CAMERON COUNTY, TEXAS



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SOURCE - ESRI STREETMAP USA, 2013. NAIP, 2014 AERIAL

200 100 0 200
Feet

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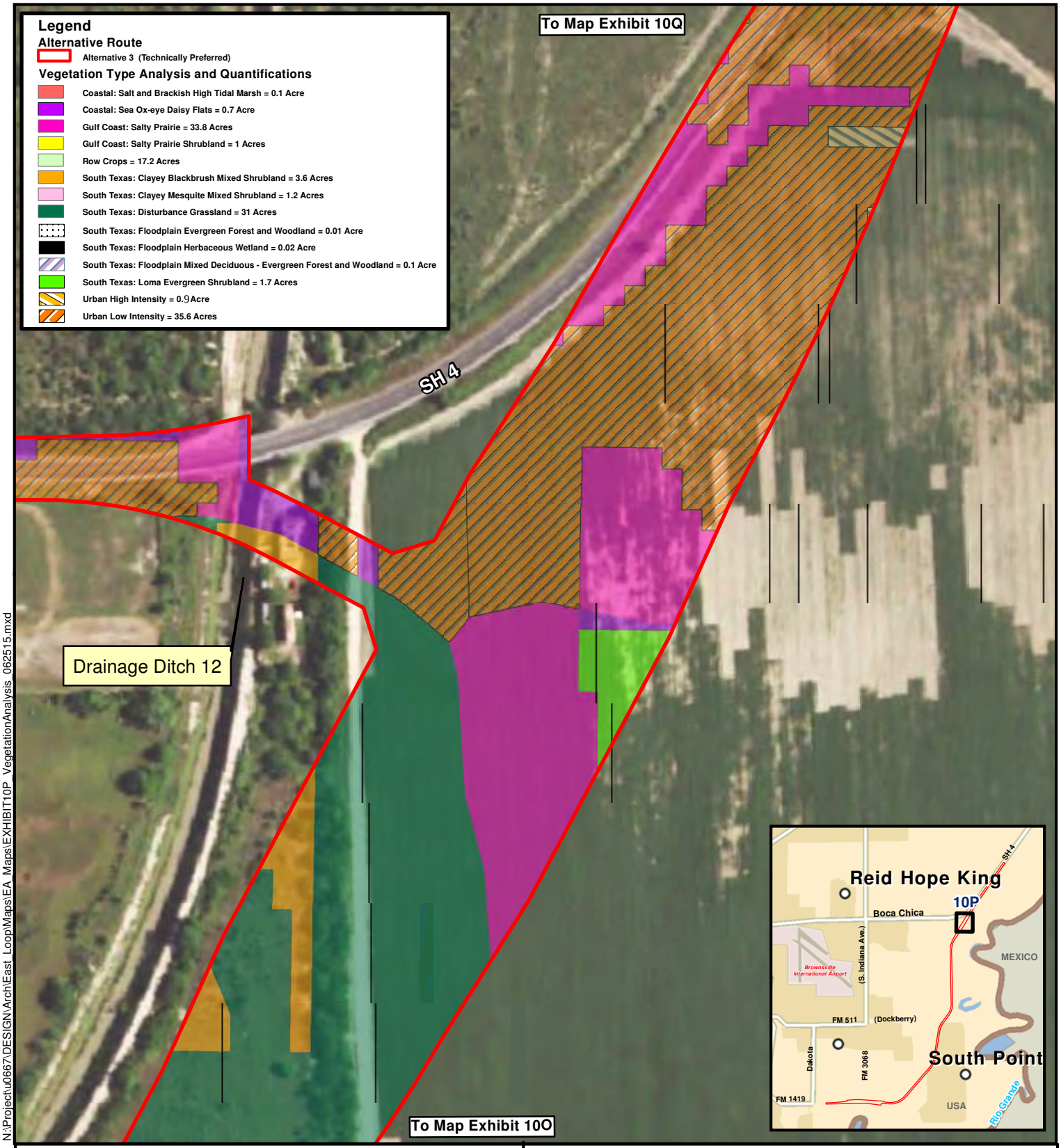
EXHIBIT 10O
VEGETATION ANALYSIS MAP BASED ON EMST

CCRMA
CAMERON COUNTY REGIONAL MOBILITY AUTHORITY

SH 32
CAMERON COUNTY, TEXAS



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SOURCE - ESRI STREETMAP USA, 2013. NAIP, 2014 AERIAL

200 100 0 200
Feet

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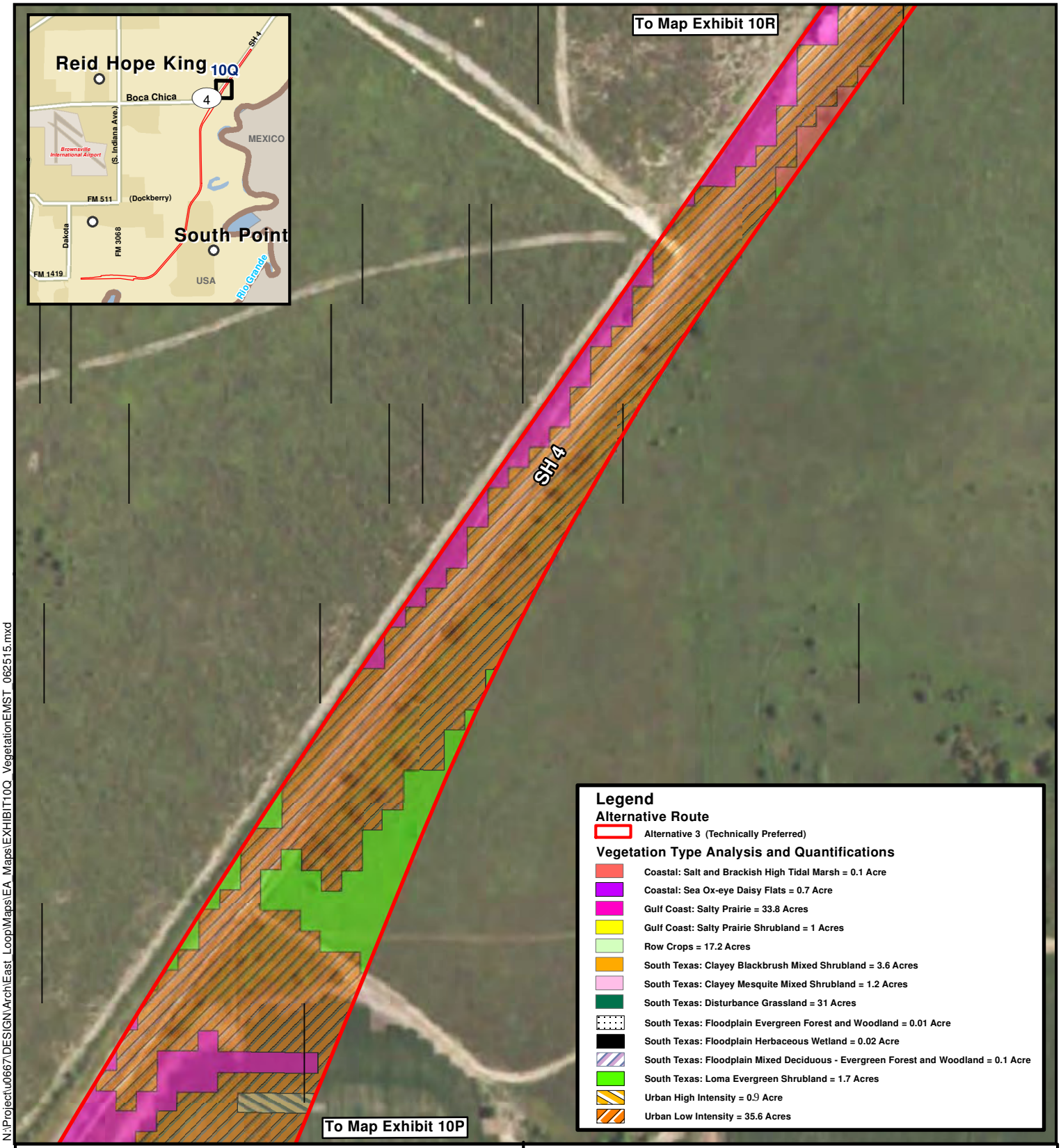
EXHIBIT 10P
VEGETATION ANALYSIS MAP
BASED ON EMST

CCRMA
CAMERON COUNTY REGIONAL MOBILITY AUTHORITY

SH 32
CAMERON COUNTY, TEXAS



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SOURCE - ESRI STREETMAP USA, 2013. NAIP, 2014 AERIAL

200 100 0 200
Feet

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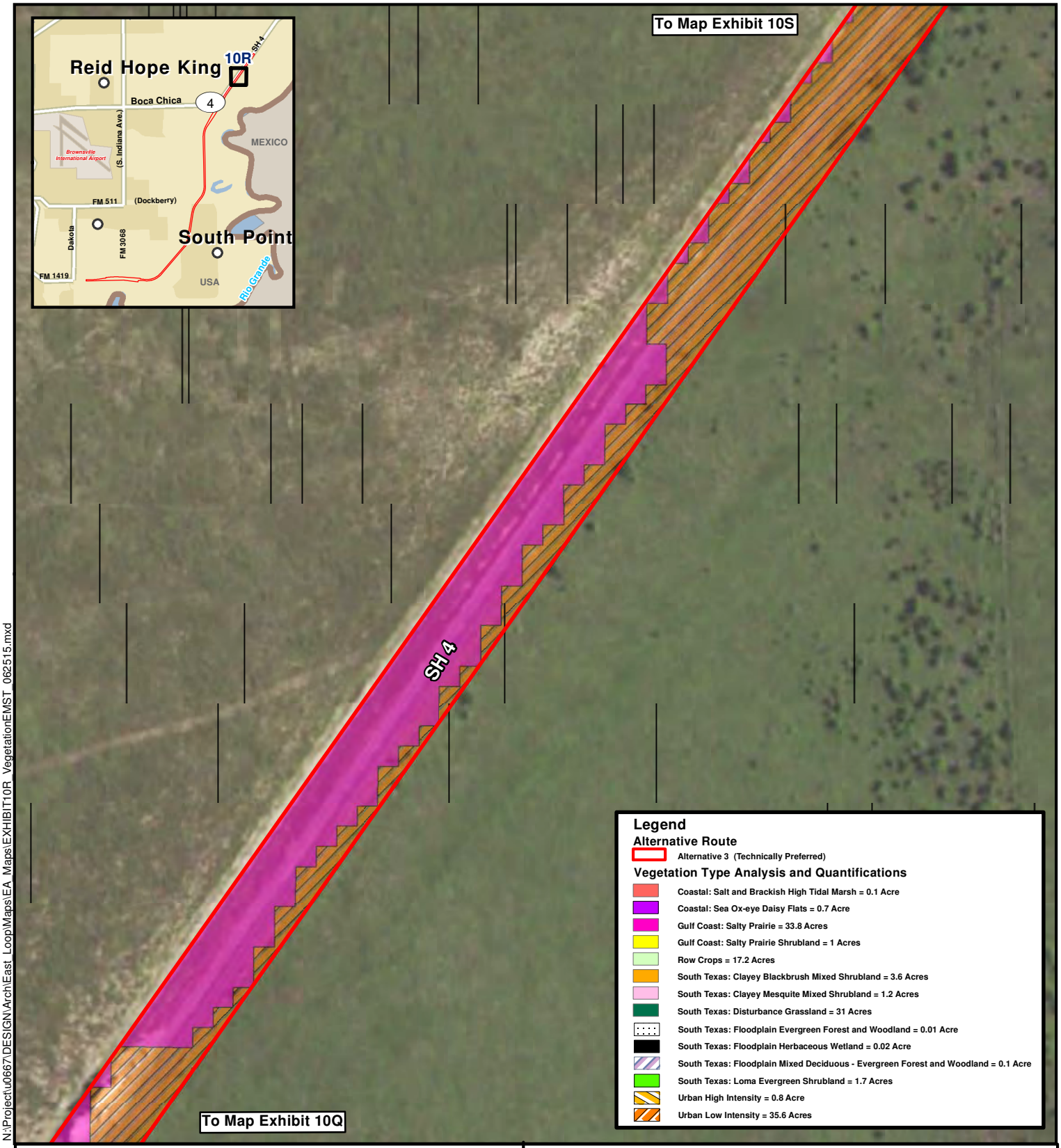
EXHIBIT 10Q
VEGETATION ANALYSIS MAP BASED ON EMST

CCRMA
CAMERON COUNTY REGIONAL MOBILITY AUTHORITY

SH 32
CAMERON COUNTY, TEXAS



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SOURCE - ESRI STREETMAP USA, 2013. NAIP, 2014 AERIAL

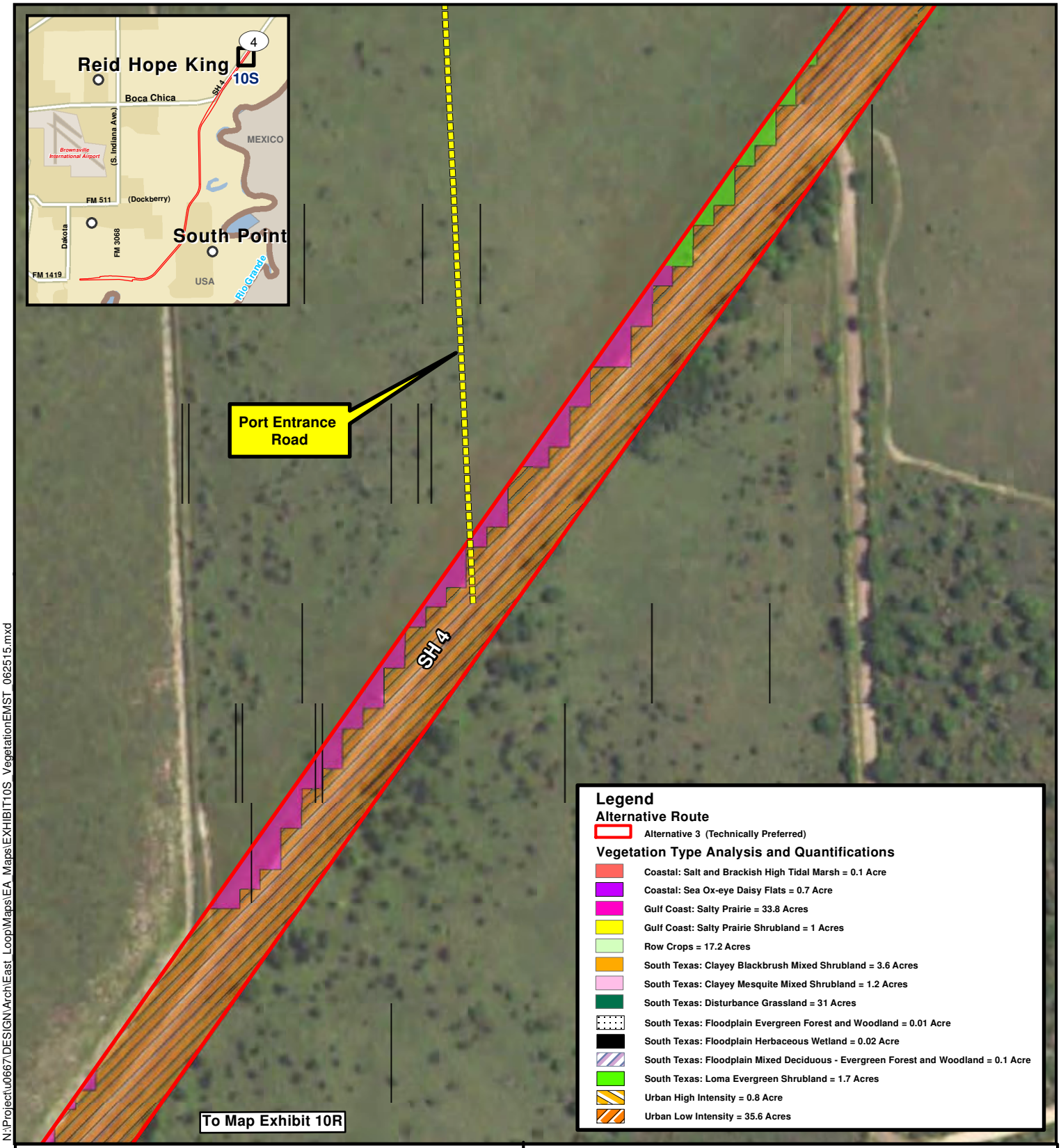
200 100 0 200
Feet

N

EXHIBIT 10R
VEGETATION ANALYSIS MAP BASED ON EMST

CCRMA
CAMERON COUNTY REGIONAL MOBILITY AUTHORITY

SH 32
CAMERON COUNTY, TEXAS



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SOURCE - ESRI STREETMAP USA, 2013. NAIP, 2014 AERIAL

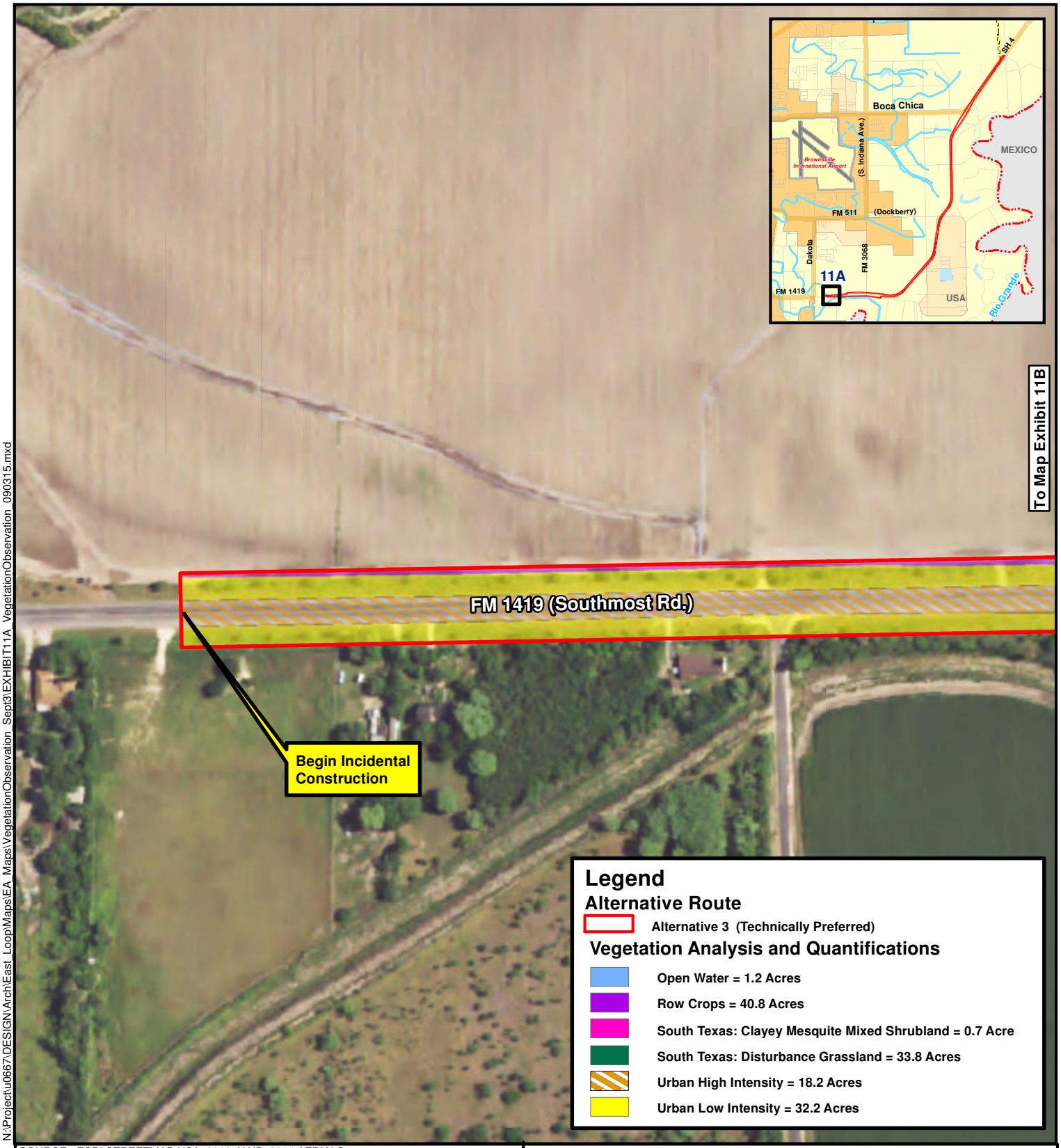
200 100 0 200
Feet

N

EXHIBIT 10S
VEGETATION ANALYSIS MAP BASED ON EMST

CCRMA
CAMERON COUNTY REGIONAL MOBILITY AUTHORITY

SH 32
CAMERON COUNTY, TEXAS



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SOURCE - ESRI STREETMAP USA, 2013; NAIP, 2014 AERIALS

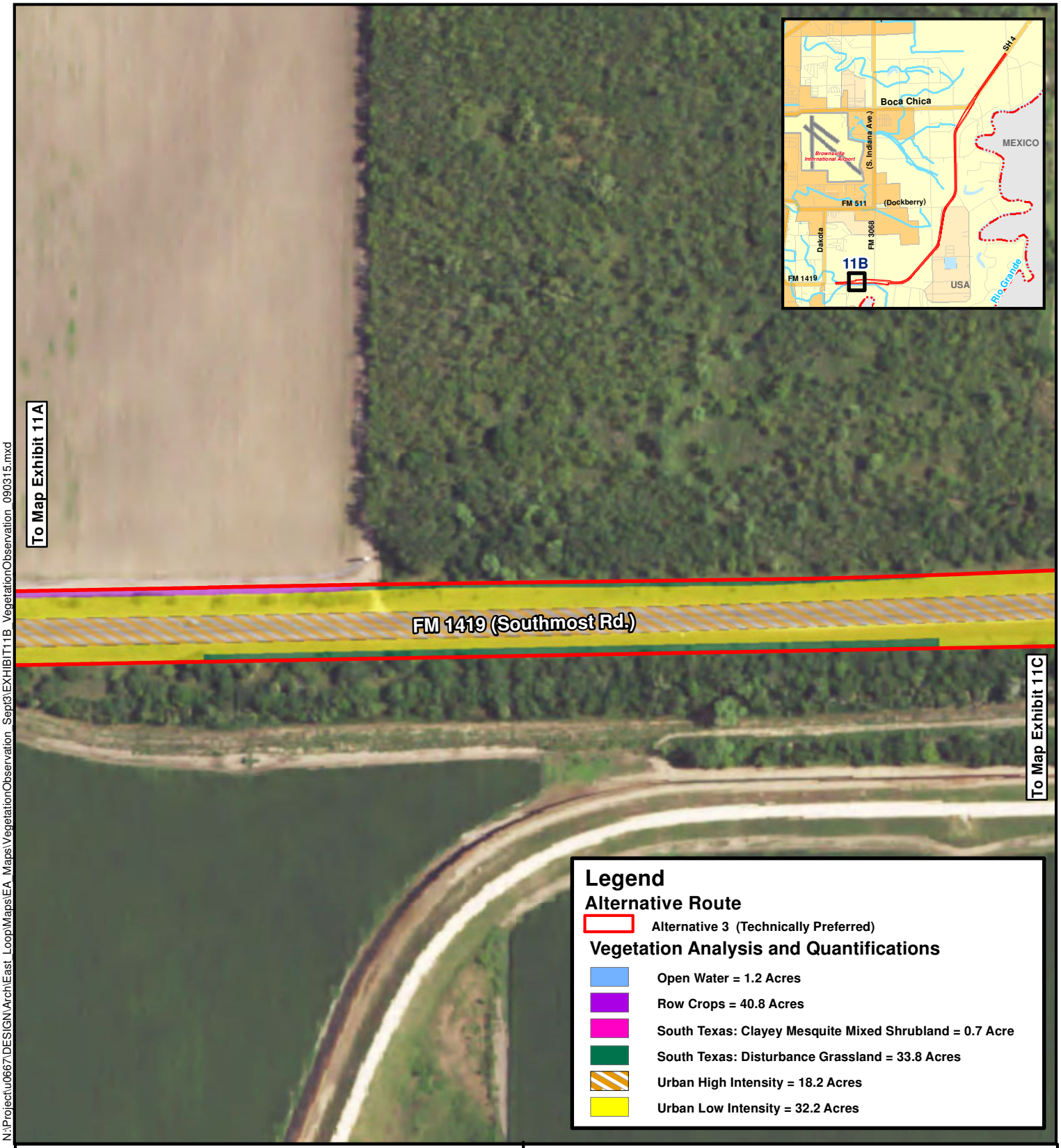
200 100 0 200
Feet

N

EXHIBIT 11A
VEGETATION ANALYSIS MAP BASED ON OBSERVATION

CCRMA
CAMERON COUNTY REGIONAL MOBILITY AUTHORITY

SH 32
CAMERON COUNTY, TEXAS



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SOURCE - ESRI STREETMAP USA, 2013; NAIP, 2014 AERIAL

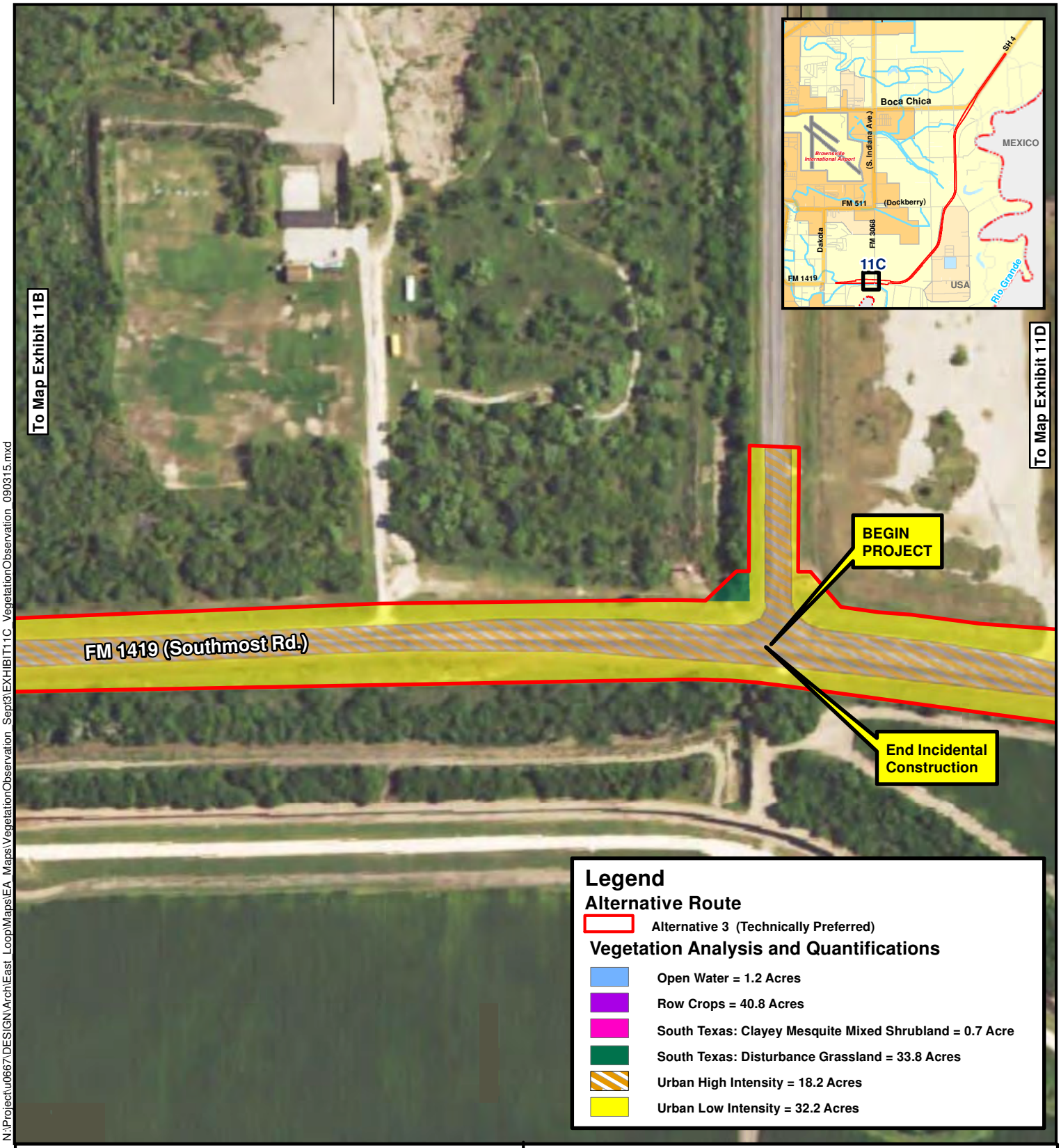
200 100 0 200
Feet

N

EXHIBIT 11B
VEGETATION ANALYSIS MAP BASED ON OBSERVATION

CCRMA
CAMERON COUNTY REGIONAL MOBILITY AUTHORITY

SH 32
CAMERON COUNTY, TEXAS



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SOURCE - ESRI STREETMAP USA, 2013. NAIP, 2014 AERIAL

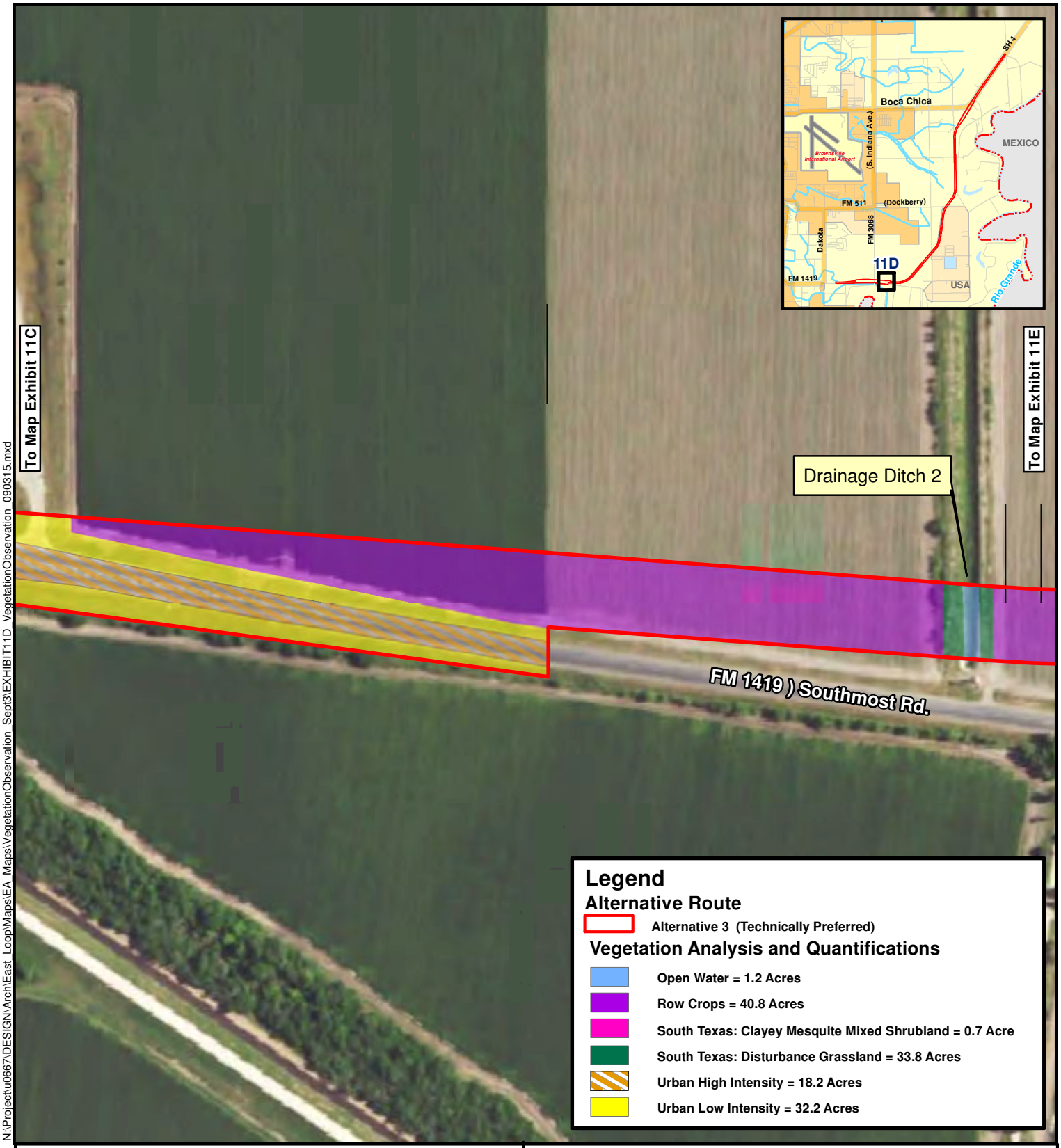
200 100 0 200
Feet

N

EXHIBIT 11C
VEGETATION ANALYSIS MAP BASED ON OBSERVATION

CCRMA
CAMERON COUNTY REGIONAL MOBILITY AUTHORITY

SH 32
CAMERON COUNTY, TEXAS



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SOURCE - ESRI STREETMAP USA, 2013. NAIP, 2014 AERIAL

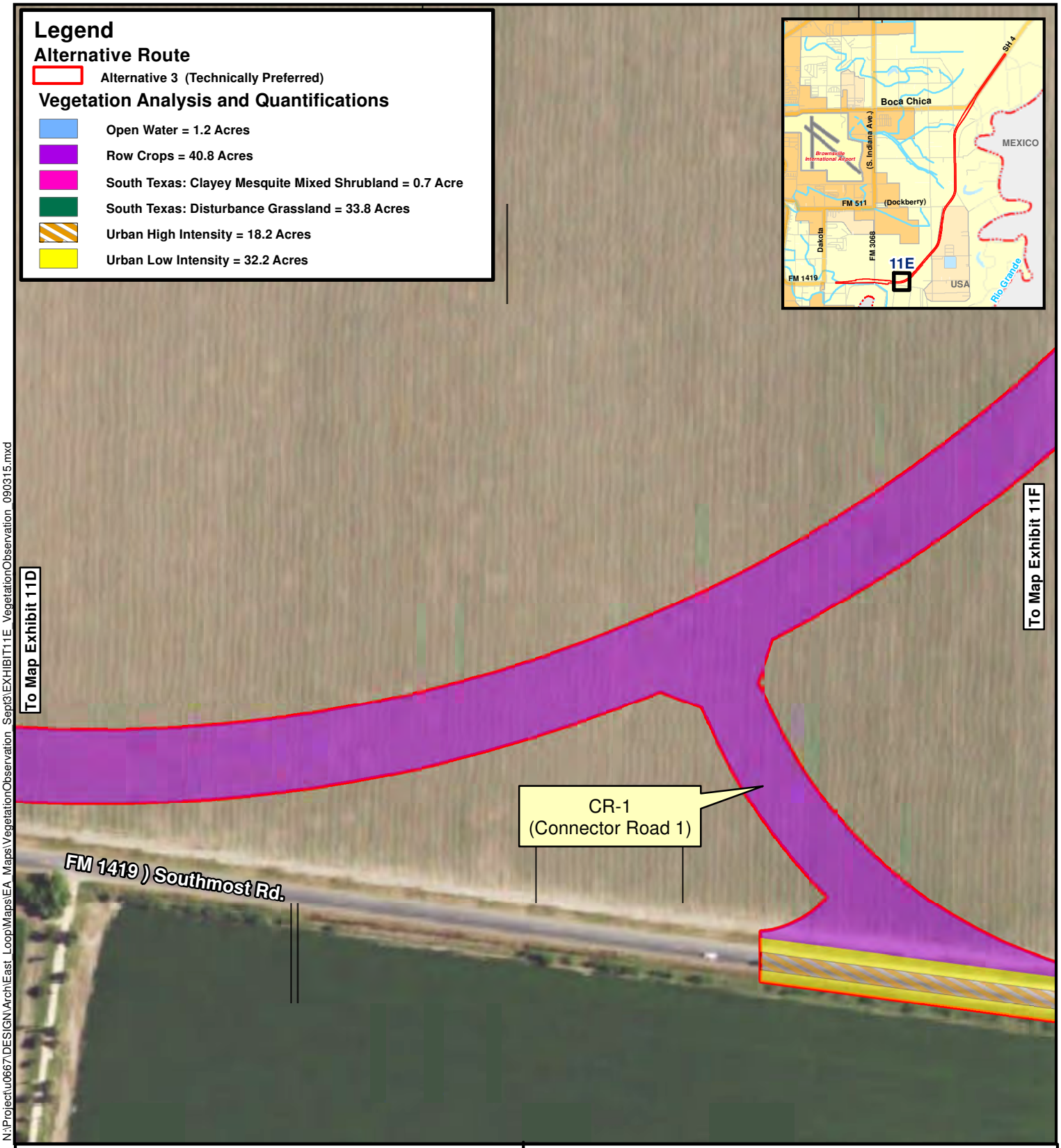
200 100 0 200
Feet

N

EXHIBIT 11D
VEGETATION ANALYSIS MAP BASED ON OBSERVATION

CCRMA
CAMERON COUNTY REGIONAL MOBILITY AUTHORITY

SH 32
CAMERON COUNTY, TEXAS



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SOURCE - ESRI STREETMAP USA, 2013. NAIP, 2014 AERIAL

200 100 0 200
Feet

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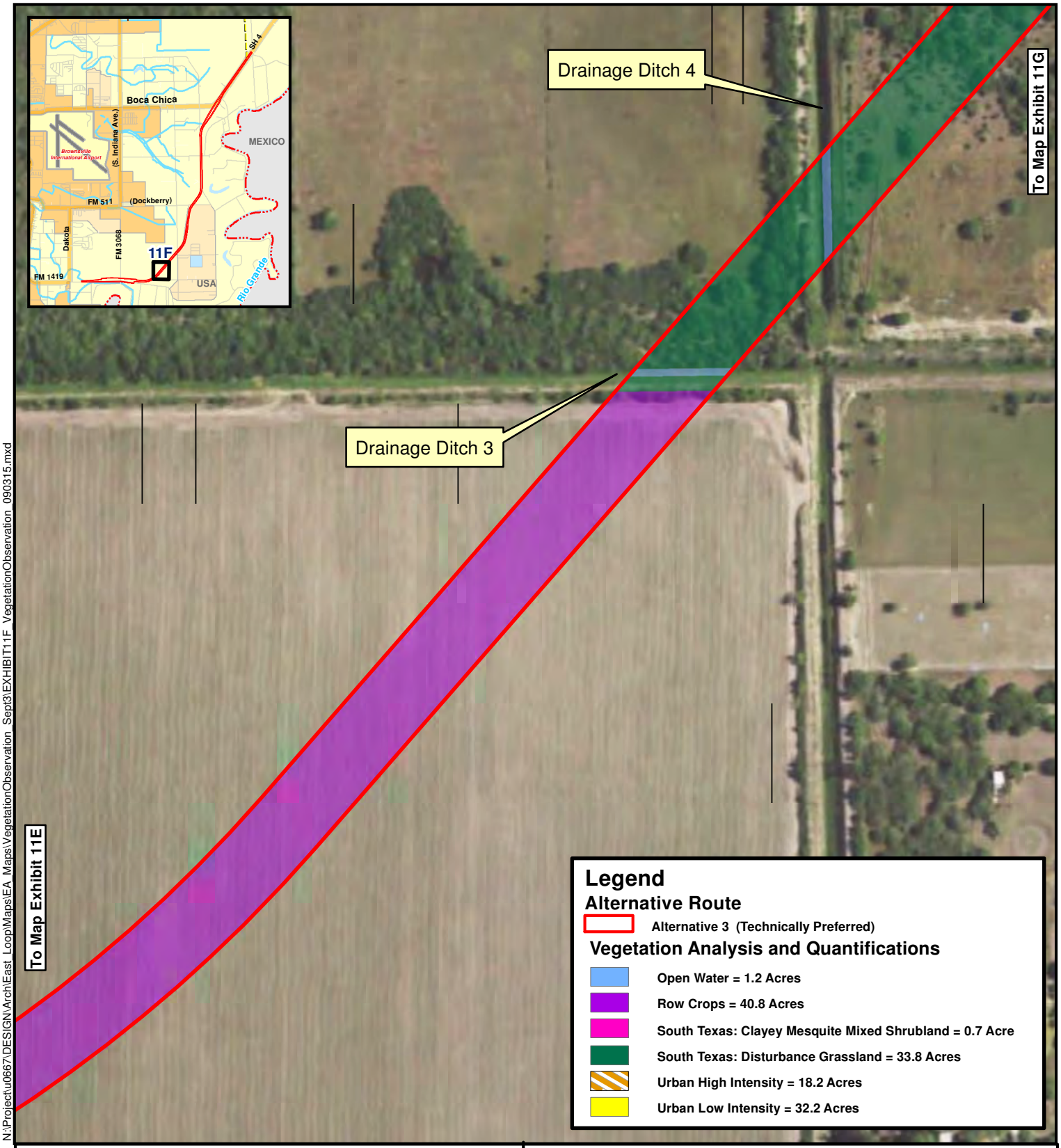
EXHIBIT 11E
VEGETATION ANALYSIS MAP BASED ON OBSERVATION

CCRMA
CAMERON COUNTY REGIONAL MOBILITY AUTHORITY

SH 32
CAMERON COUNTY, TEXAS



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SOURCE - ESRI STREETMAP USA, 2013. NAIP, 2014 AERIAL

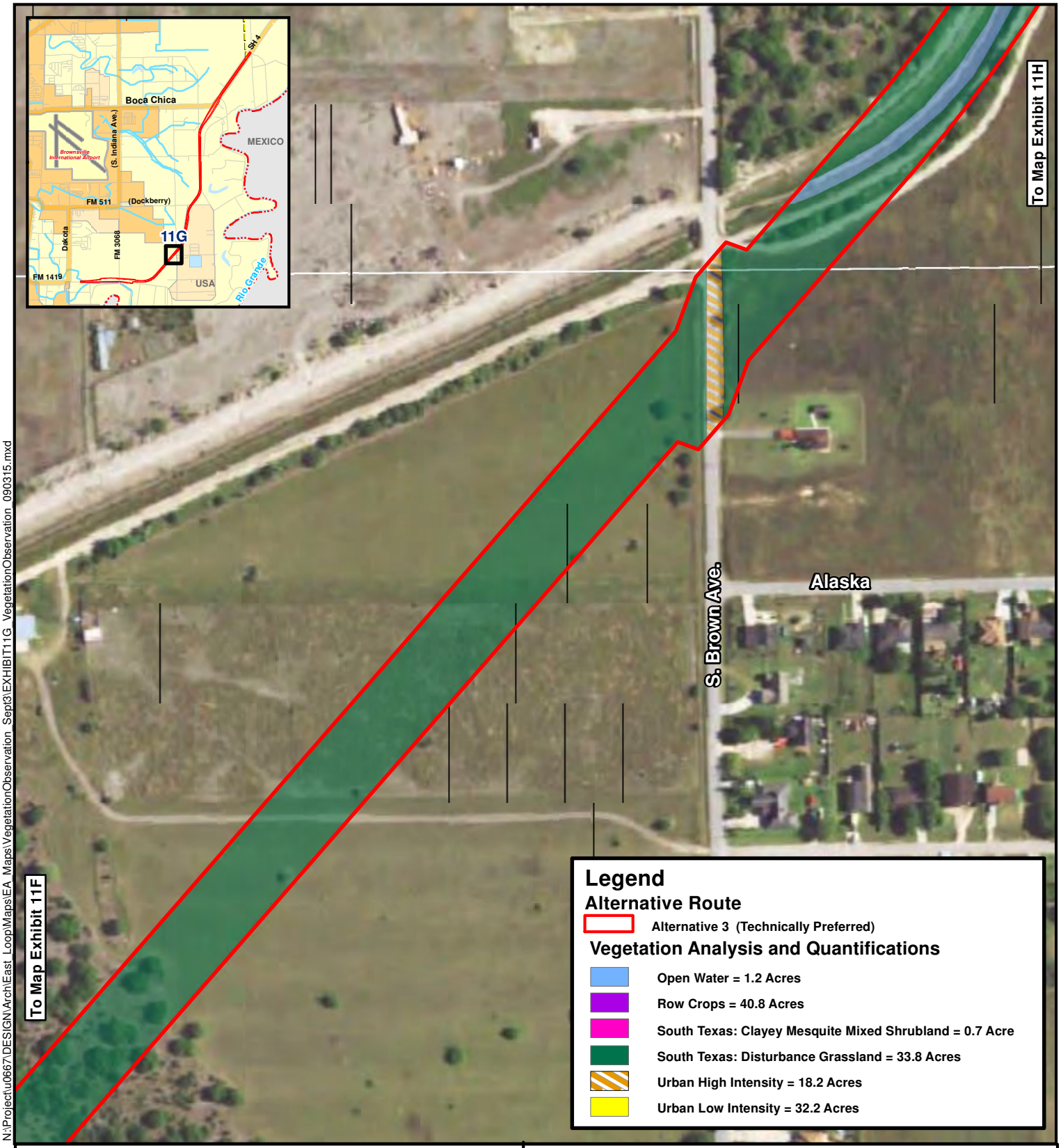
200 100 0 200
Feet

N

EXHIBIT 11F
VEGETATION ANALYSIS MAP BASED ON OBSERVATION

CCRMA
CAMERON COUNTY REGIONAL MOBILITY AUTHORITY

SH 32
CAMERON COUNTY, TEXAS



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SOURCE - ESRI STREETMAP USA, 2013. NAIP, 2014 AERIAL

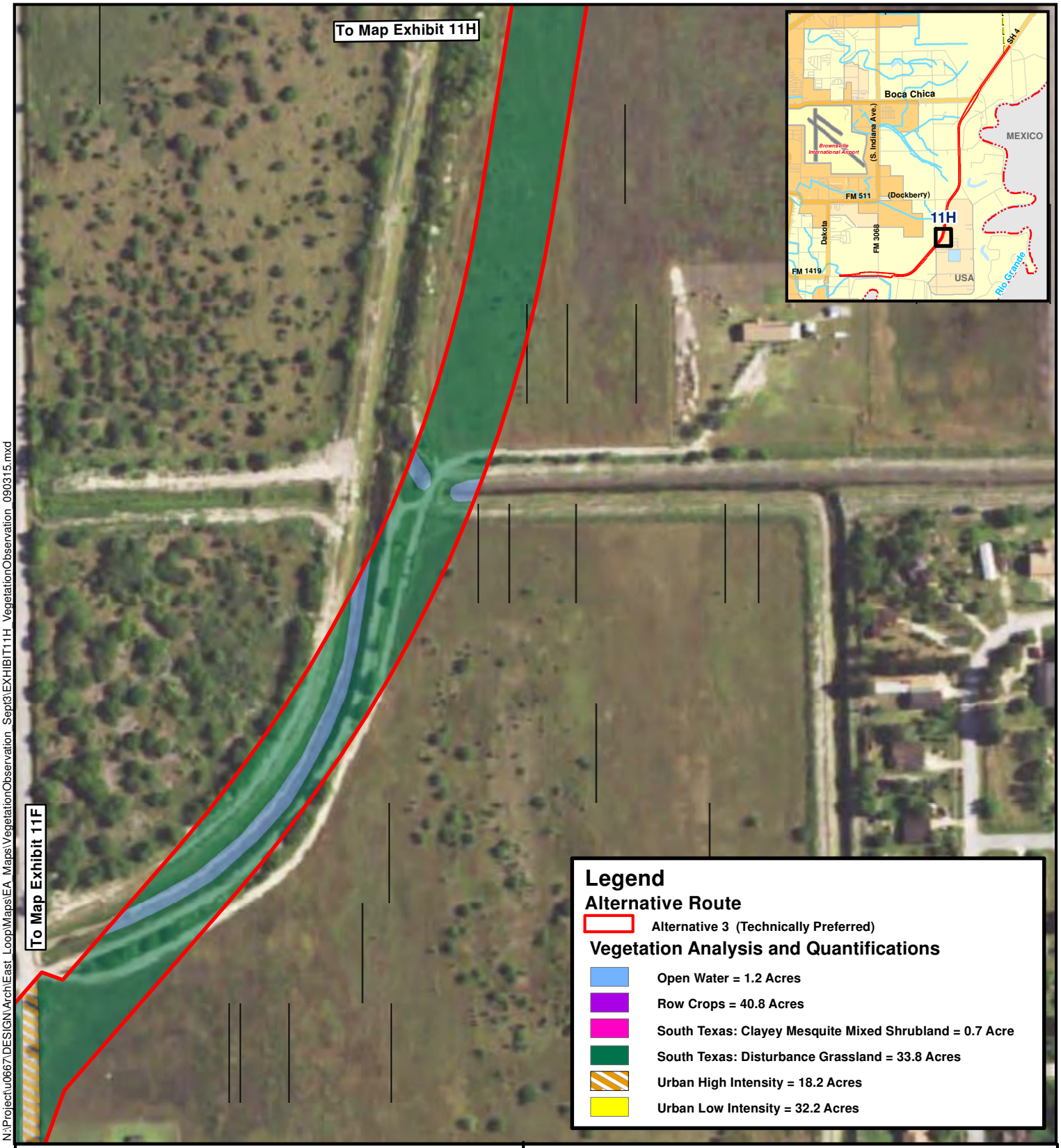
200 100 0 200
Feet

N

EXHIBIT 11G
VEGETATION ANALYSIS MAP BASED ON OBSERVATION

CCRMA
CAMERON COUNTY REGIONAL MOBILITY AUTHORITY

SH 32
CAMERON COUNTY, TEXAS



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SOURCE - ESRI STREETMAP USA, 2013. NAIP, 2014 AERIAL

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EXHIBIT 11H
VEGETATION ANALYSIS MAP BASED ON OBSERVATION

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SH 32
CAMERON COUNTY, TEXAS

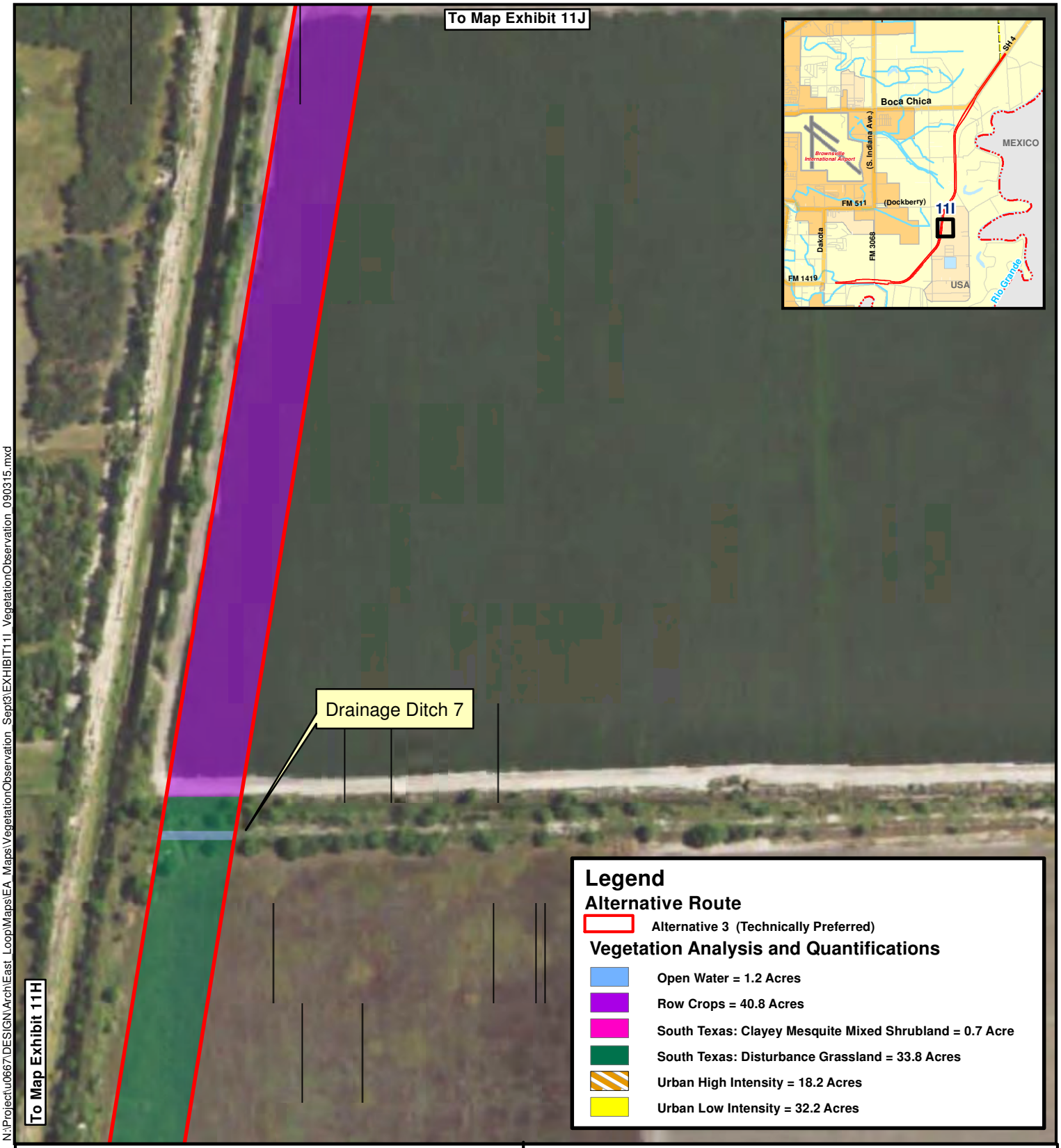

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EXHIBIT 11I
VEGETATION ANALYSIS MAP BASED ON OBSERVATION

CCRMA
CAMERON COUNTY REGIONAL MOBILITY AUTHORITY

SH 32
CAMERON COUNTY, TEXAS

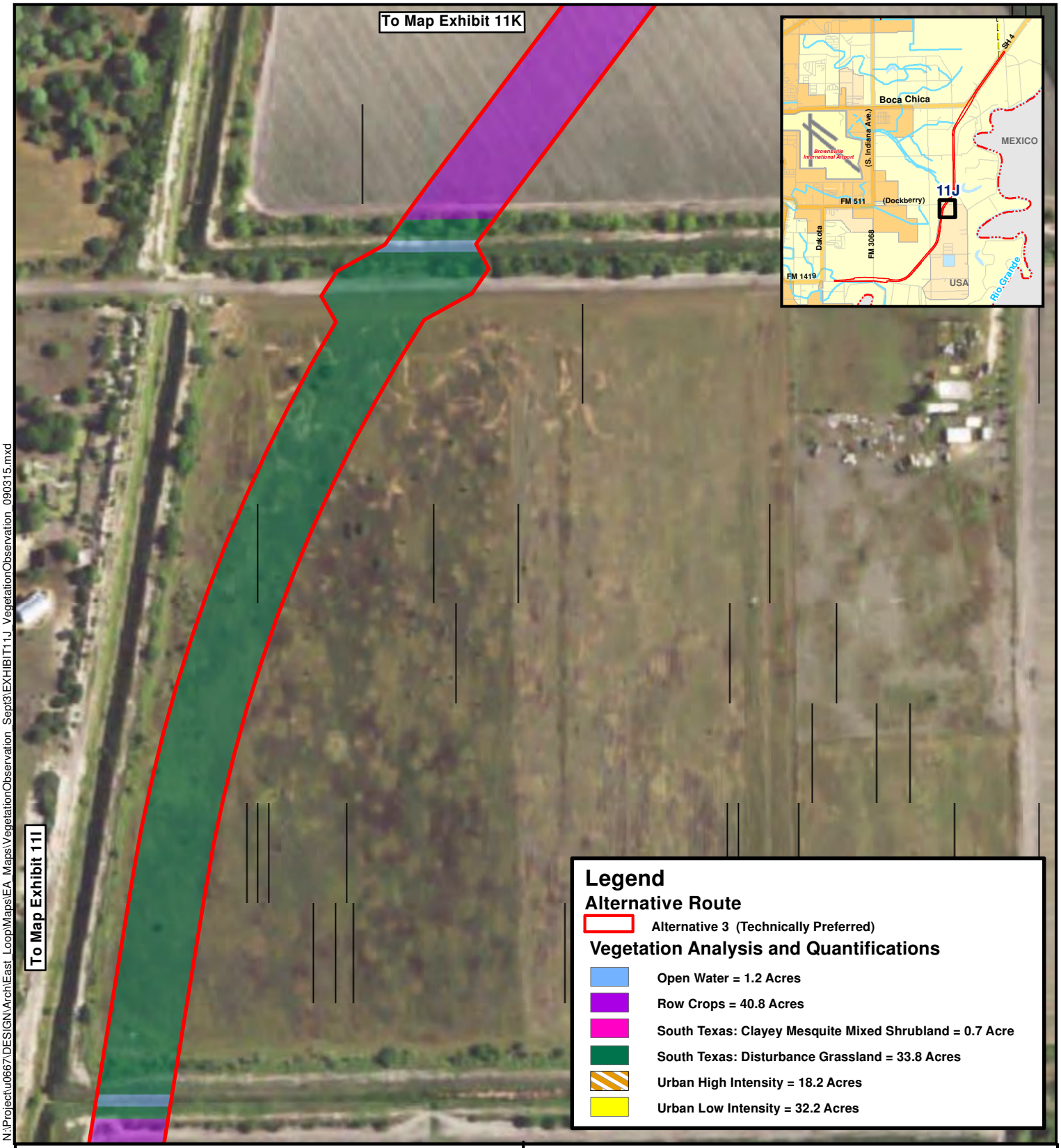

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EXHIBIT 11J
VEGETATION ANALYSIS MAP BASED ON OBSERVATION

CCRMA
CAMERON COUNTY REGIONAL MOBILITY AUTHORITY

SH 32
CAMERON COUNTY, TEXAS

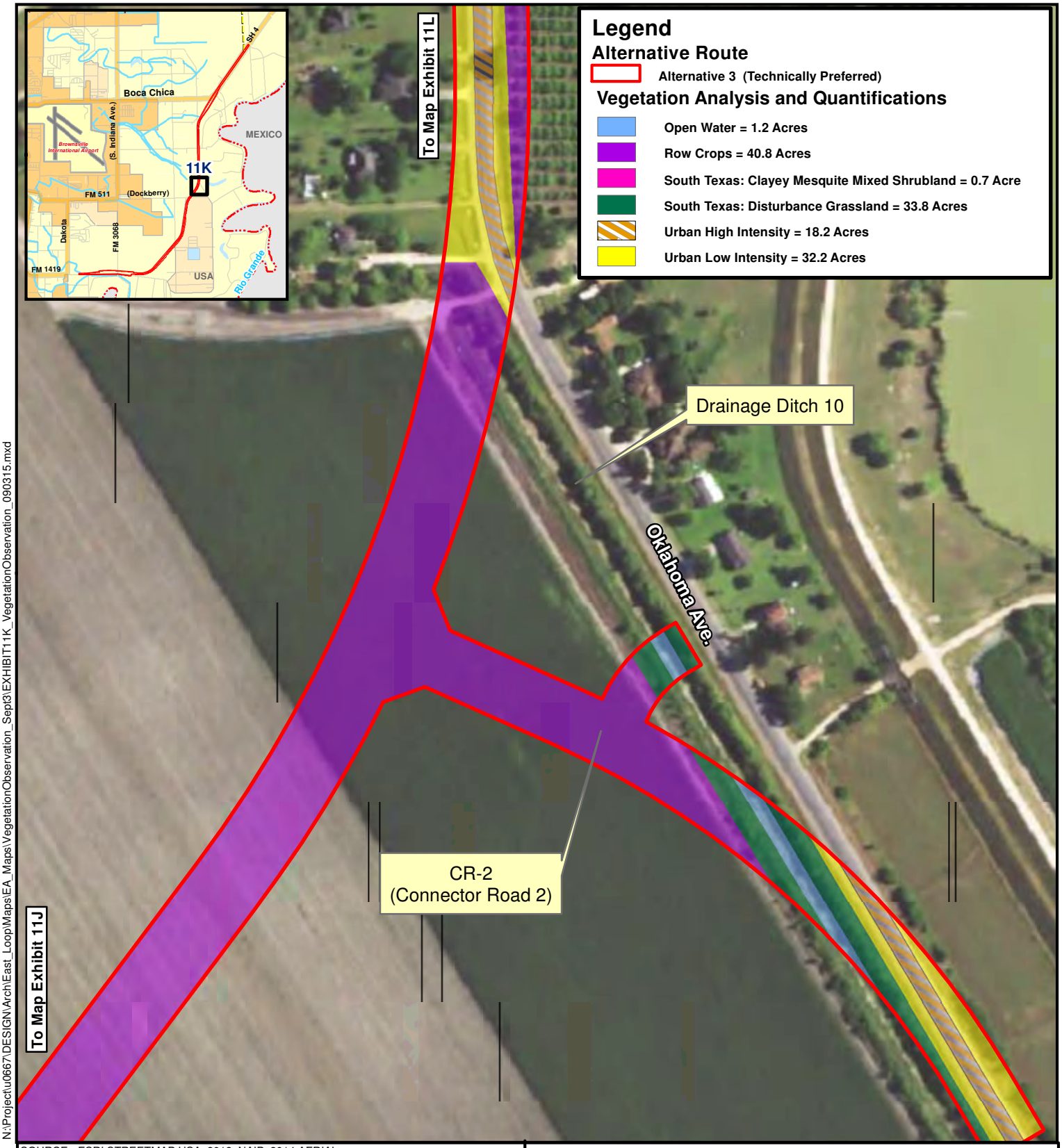

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EXHIBIT 11K
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CAMERON COUNTY REGIONAL MOBILITY AUTHORITY

SH 32
CAMERON COUNTY, TEXAS

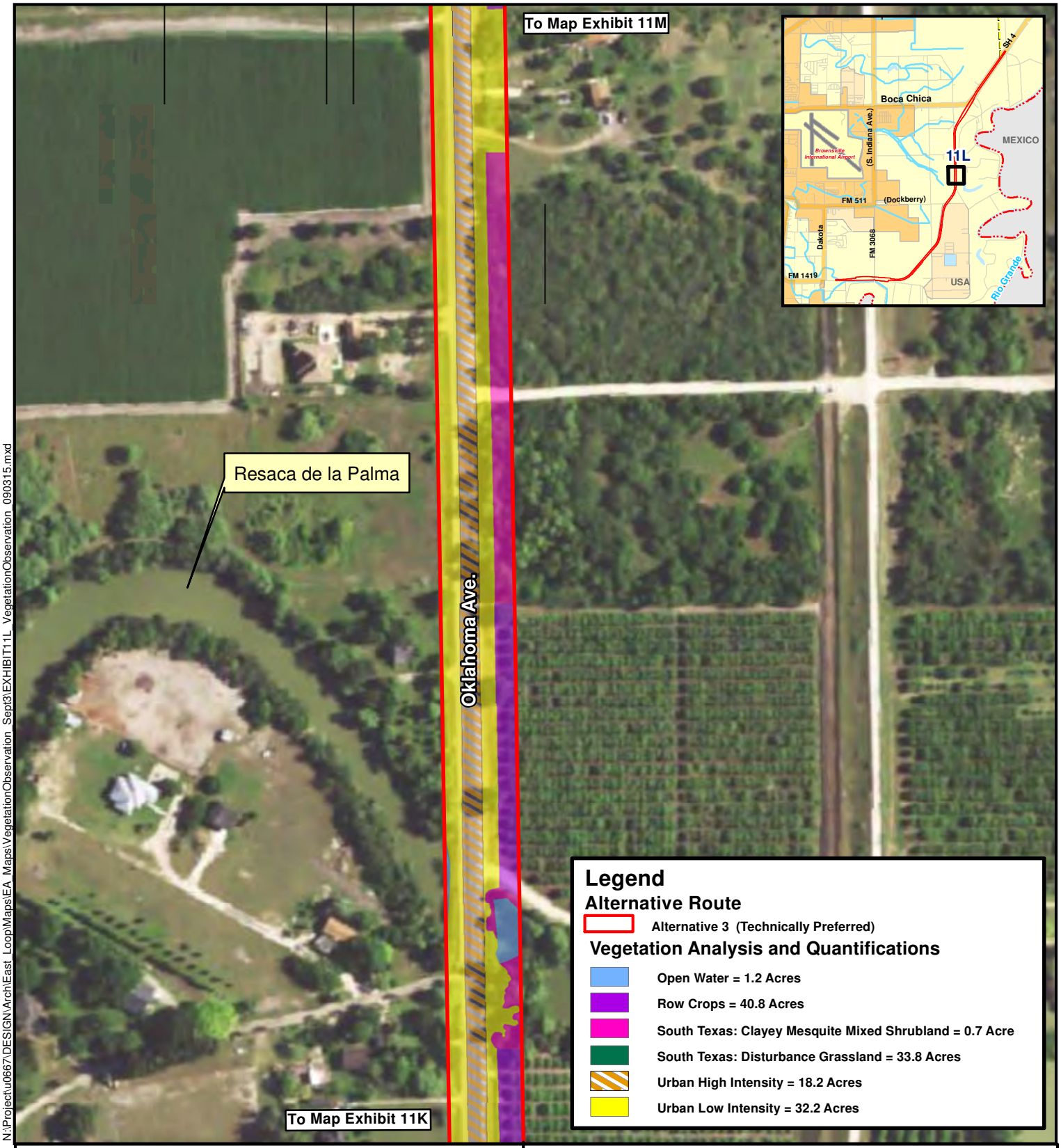

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EXHIBIT 11L
VEGETATION ANALYSIS MAP BASED ON OBSERVATION

CCRMA
CAMERON COUNTY REGIONAL MOBILITY AUTHORITY

SH 32
CAMERON COUNTY, TEXAS

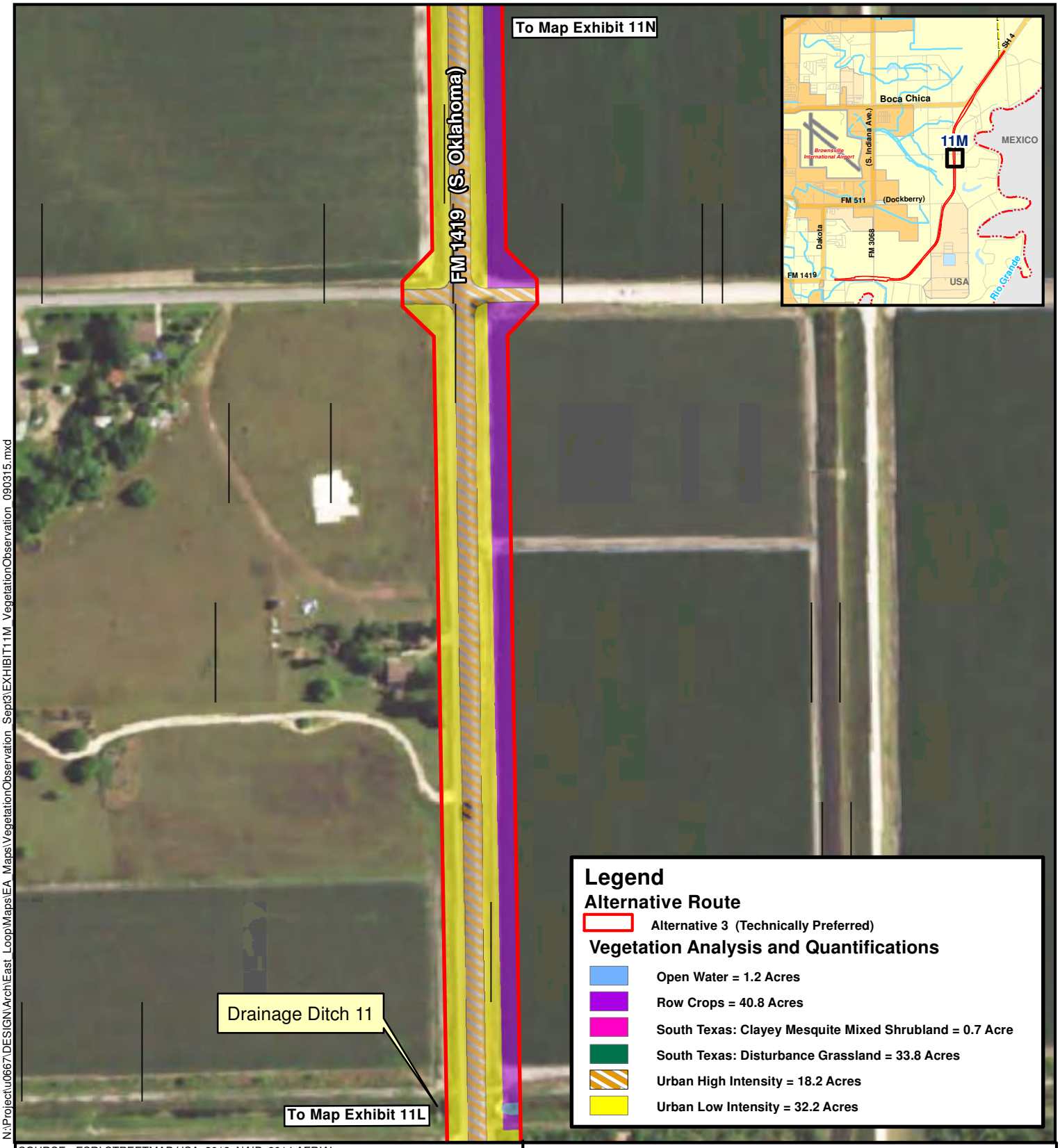

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EXHIBIT 11M
VEGETATION ANALYSIS MAP BASED ON OBSERVATION

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CAMERON COUNTY REGIONAL MOBILITY AUTHORITY

SH 32
CAMERON COUNTY, TEXAS

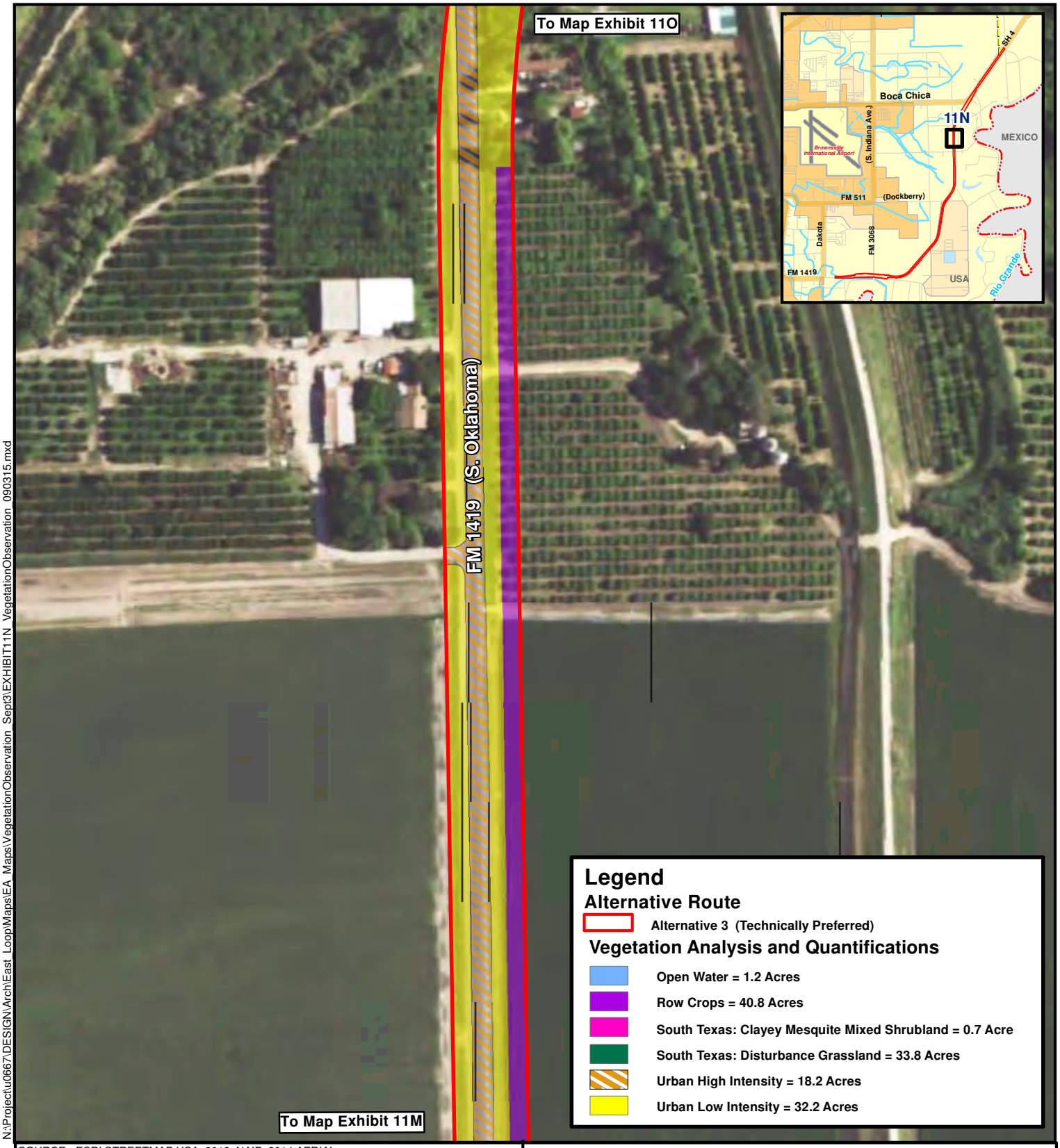

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EXHIBIT 11N
VEGETATION ANALYSIS MAP BASED ON OBSERVATION

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CAMERON COUNTY REGIONAL MOBILITY AUTHORITY

SH 32
CAMERON COUNTY, TEXAS

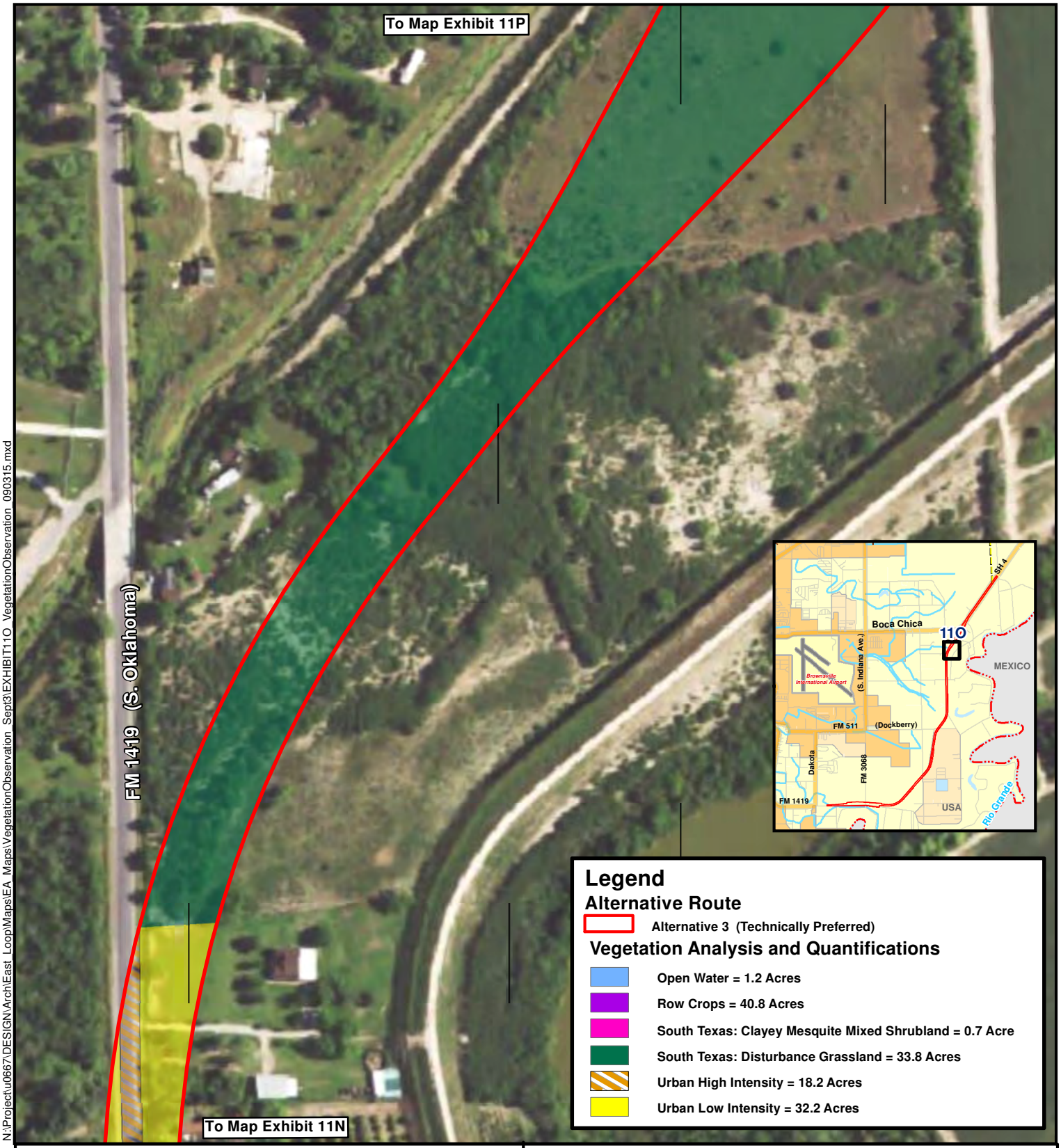

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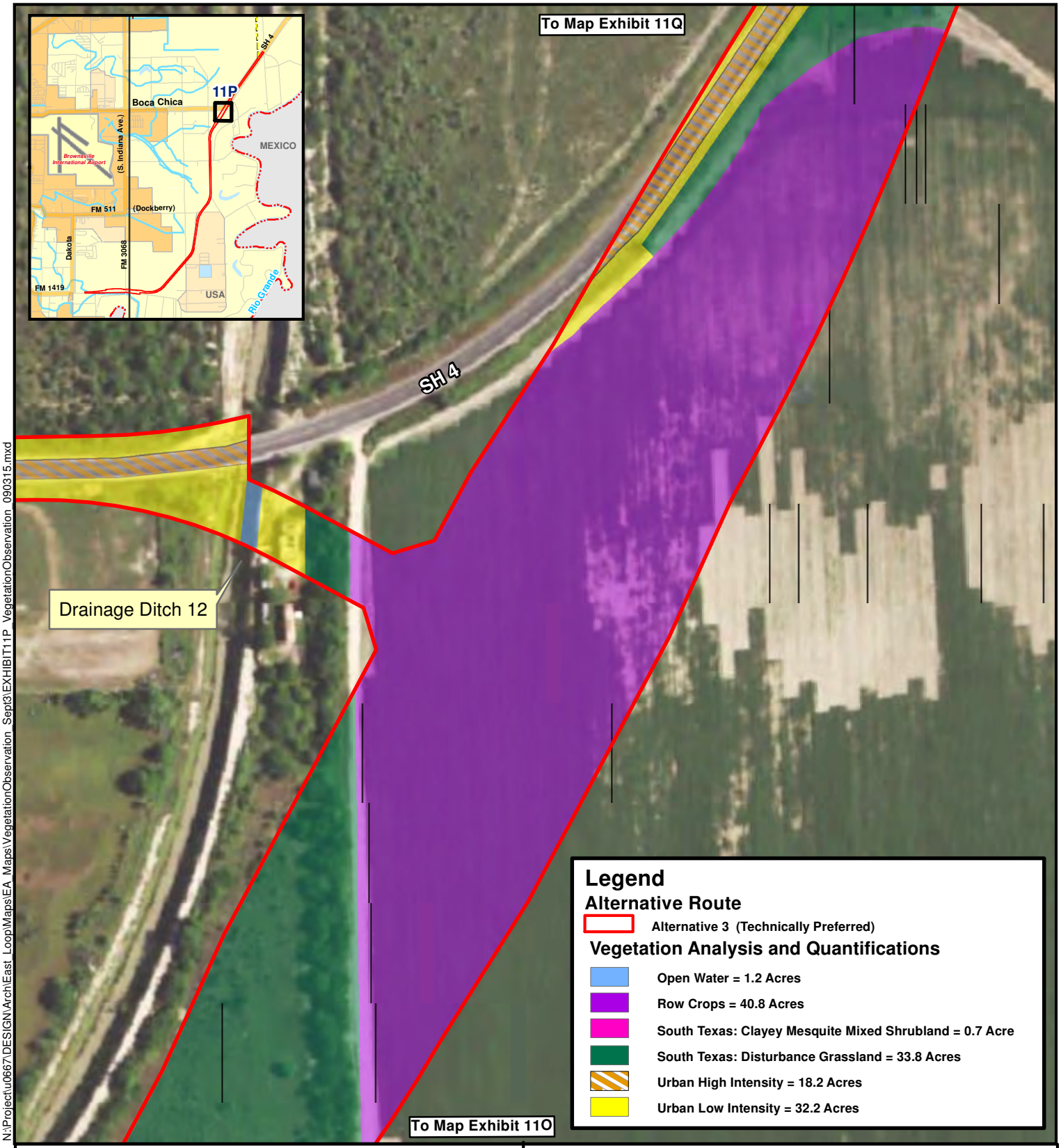
EXHIBIT 11O
VEGETATION ANALYSIS MAP BASED ON OBSERVATION

CCRMA
CAMERON COUNTY REGIONAL MOBILITY AUTHORITY

SH 32
CAMERON COUNTY, TEXAS



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SOURCE - ESRI STREETMAP USA, 2013. NAIP, 2014 AERIAL

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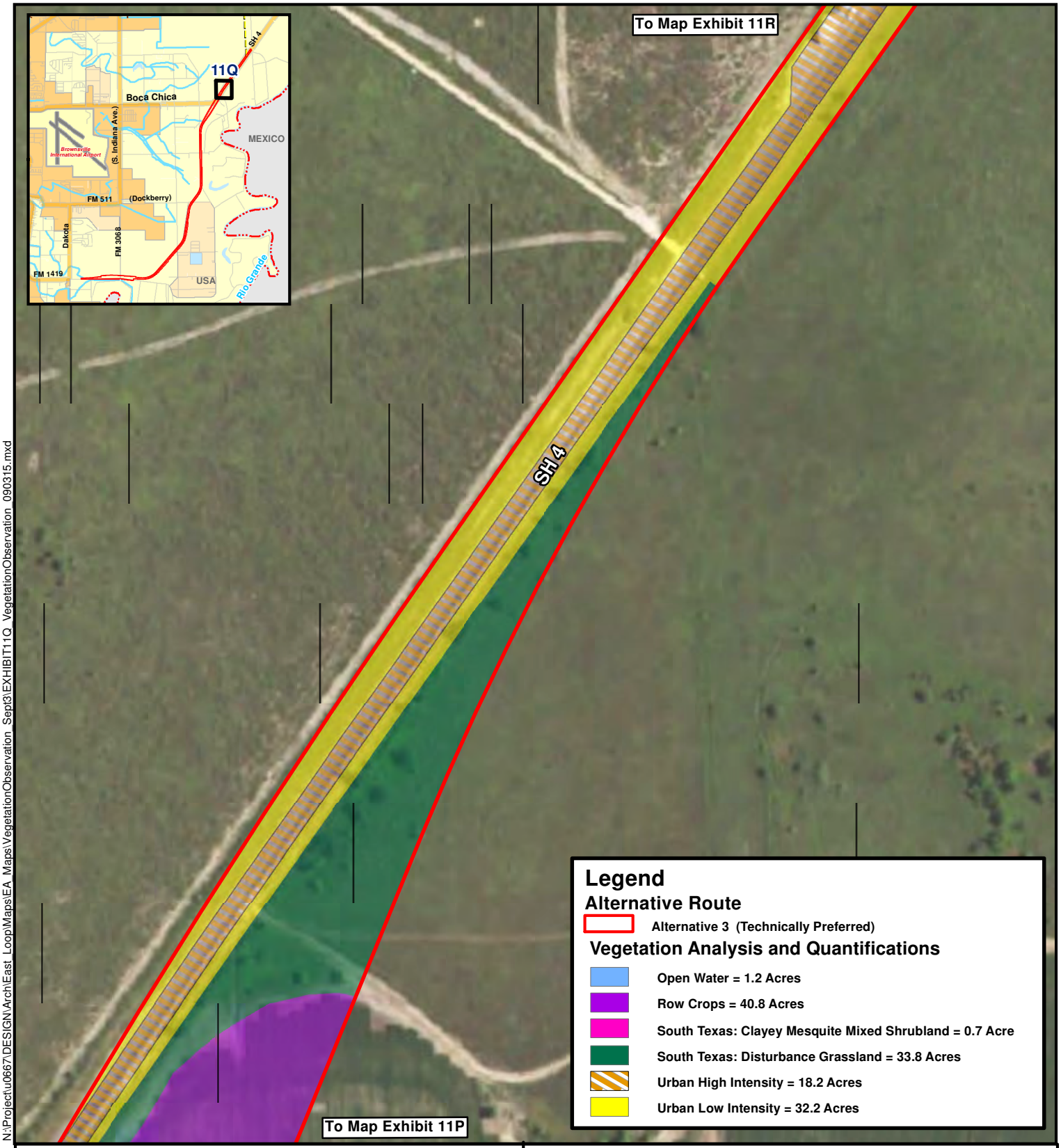
EXHIBIT 11P
VEGETATION ANALYSIS MAP BASED ON OBSERVATION

CCRMA
CAMERON COUNTY REGIONAL MOBILITY AUTHORITY

SH 32
CAMERON COUNTY, TEXAS



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SOURCE - ESRI STREETMAP USA, 2013. NAIP, 2014 AERIAL

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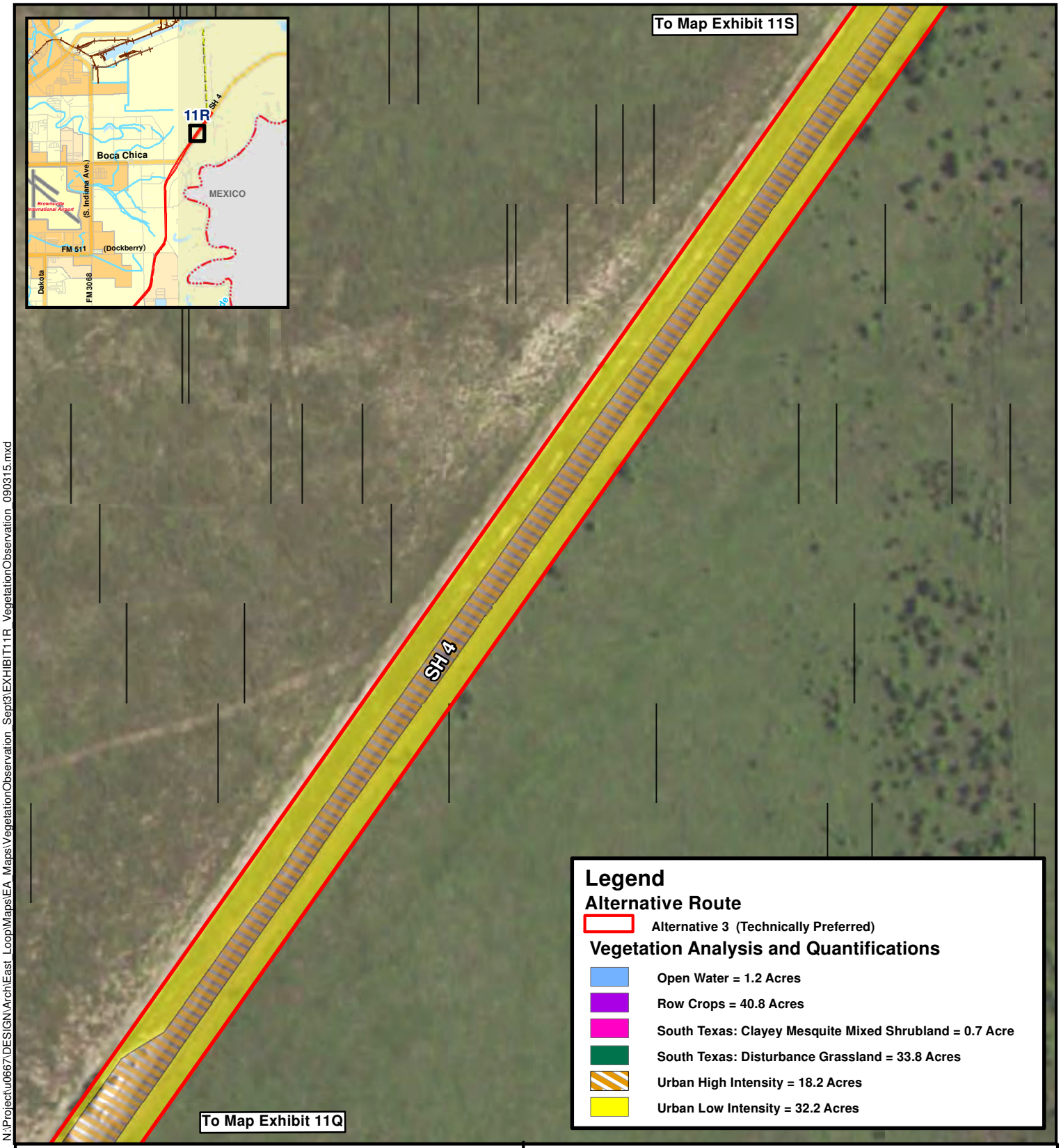
EXHIBIT 11Q
VEGETATION ANALYSIS MAP BASED ON OBSERVATION

CCRMA
CAMERON COUNTY REGIONAL MOBILITY AUTHORITY

SH 32
CAMERON COUNTY, TEXAS



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SOURCE - ESRI STREETMAP USA, 2013. NAIP, 2014 AERIAL

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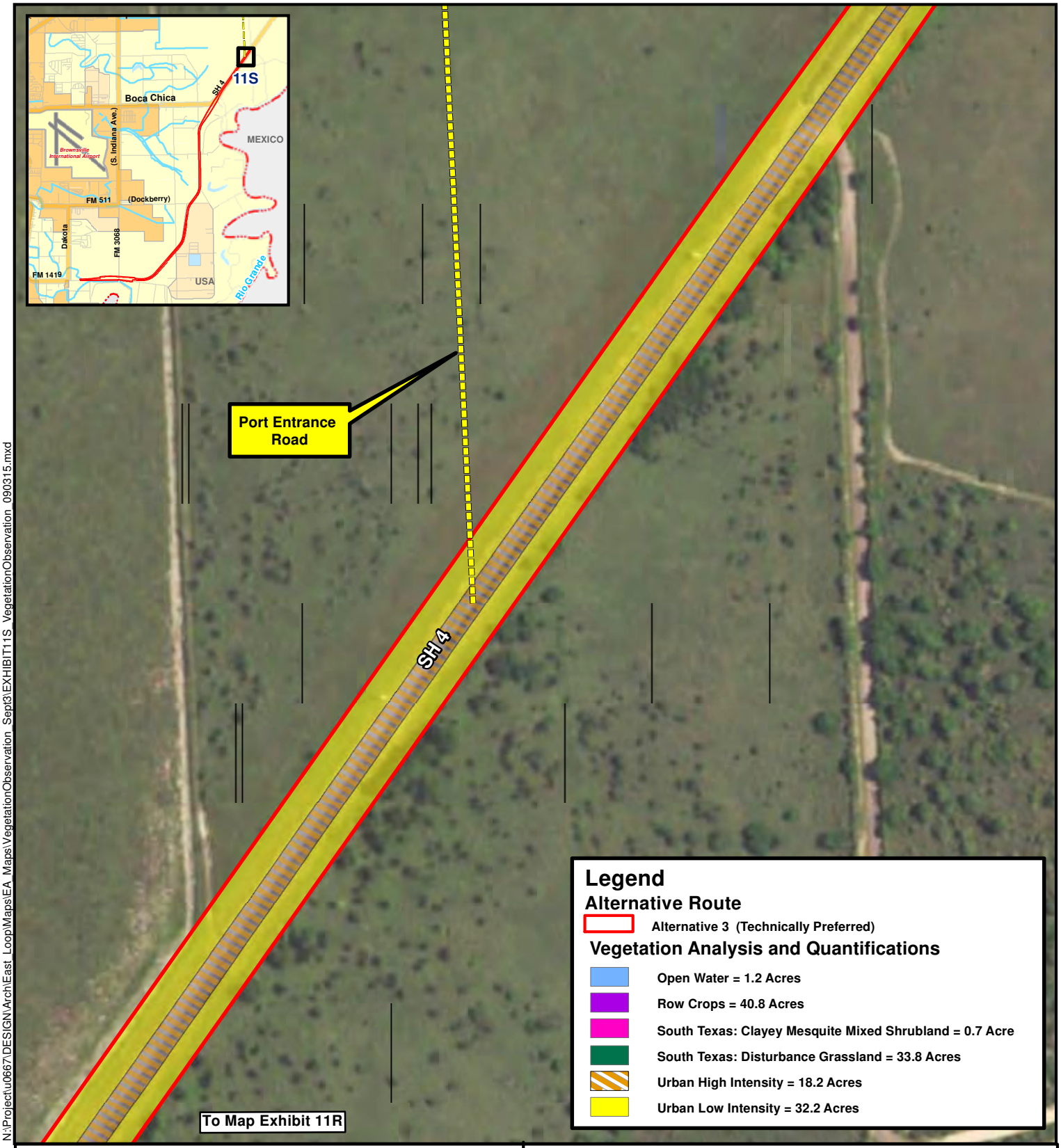
EXHIBIT 11R
VEGETATION ANALYSIS MAP BASED ON OBSERVATION

CCRMA
CAMERON COUNTY REGIONAL MOBILITY AUTHORITY

SH 32
CAMERON COUNTY, TEXAS



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SOURCE - ESRI STREETMAP USA, 2013. NAIP, 2014 AERIAL

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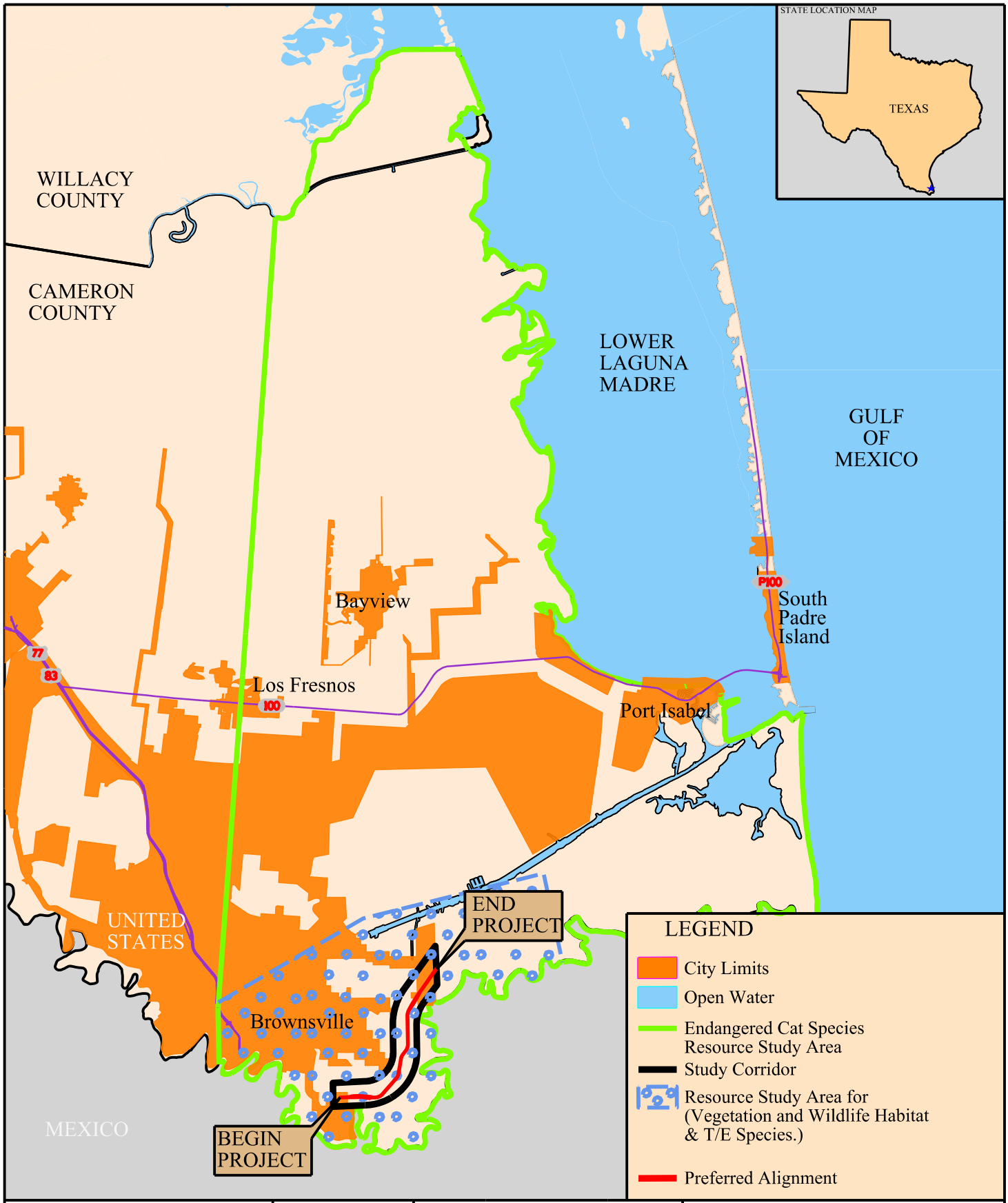
EXHIBIT 11S
VEGETATION ANALYSIS MAP BASED ON OBSERVATION

CCRMA
CAMERON COUNTY REGIONAL MOBILITY AUTHORITY

SH 32
CAMERON COUNTY, TEXAS



CCRMA
CAMERON COUNTY REGIONAL MOBILITY AUTHORITY

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Texas Department of Transportation
PHARR DISTRICT

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EXHIBIT 12
RESOURCE STUDY AREA MAP

SOURCE: TxDOT Urban County Map

SH 32
CAMERON COUNTY, TEXAS

APPENDICES

APPENDIX A

BROWNSVILLE MPO
BICYCLE AND PEDESTRIAN PLAN

AND

STIP

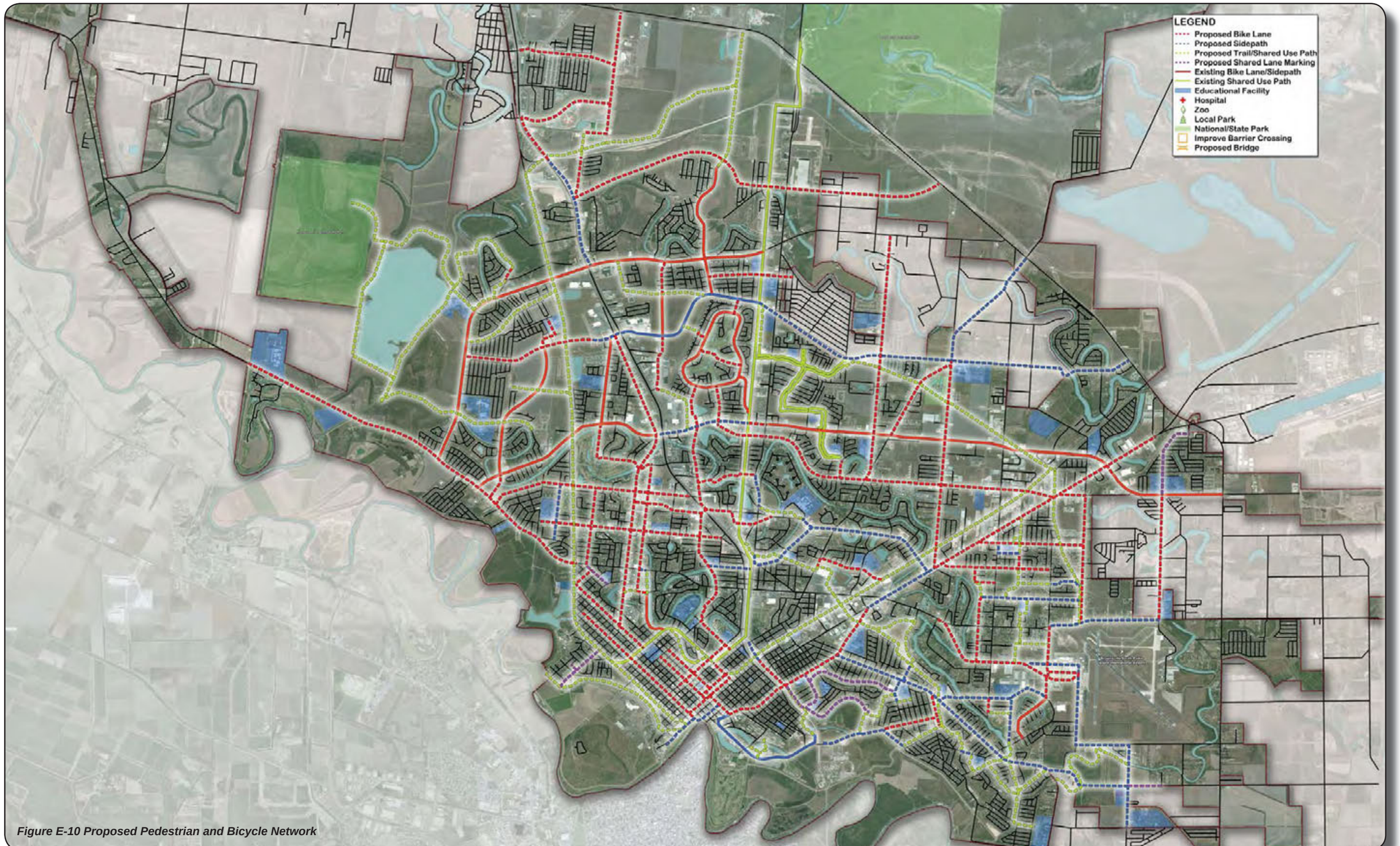
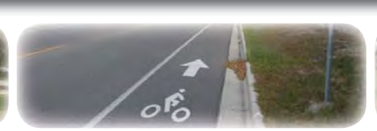


Figure E-10 Proposed Pedestrian and Bicycle Network



TEXAS DEPARTMENT OF TRANSPORTATION

STATEWIDE TRANSPORTATION IMPROVEMENT PROGRAM

STIP
2015-2018

PHARR DISTRICT
2015-2018 TIP

HIGHWAY

Initial 2015-2018 STIP

STATEWIDE TRANSPORTATION IMPROVEMENT PROGRAM

TXDOT PHARR DISTRICT
FY 2015

DISTRICT	COUNTY	CSJ	HWY	PHASE	CITY	PROJECT SPONSOR	YOE COST
21 - Pharr	Cameron	3626-02-001	SH 32 (East Loop)	C,E,R	Brownsville	Cameron County RMA	$9,845,200

LIMITS FROM:	FM 3068	REVISION DATE:	4/9/2014
LIMITS TO:	FM 3550	MPO PROJ NUM:	BMPO-LP5
PROJECT DESCRIPTION:	Construct 2 lane roadway on new location	FUNDING CAT(S):	Local (PT Financing)
REMARKS:	$8,000,000 of these costs to be reimbursed in future Pass-Thru Financing (PTF-using federal and state funds). NOTE: ROW cost includes 75k for utilities.	PROJECT HISTORY:	N/A

TOTAL PROJECT COST INFORMATION

		COST OF APPROVED PHASES:
PRELIM ENG:	$660,000	$9,845,200
ROW PURCHASE:	$700,000	
CONST COST:	$7,225,200	
CONST ENG:	$660,000	
CONTING:	$600,000	
IND COSTS:	$0	
BOND FINANCING:	$0	
TOTAL PROJ COST:	$9,845,200	

AUTHORIZED FUNDING BY CATEGORY SHARE

	FEDERAL	STATE	LOCAL	Local Contribution	TOTAL
Cat. 1 Cost:	$0	$0	$0	$0	$0
Cat. 6 Cost:	$0	$0	$0	$0	$0
Cat. 8 Cost:	$0	$0	$0	$0	$0
Prop. 12 Cost:	$0	$0	$0	$0	$0
Local Contribution:	$0	$0	$0	$9,845,200	$9,845,200
Total Funding by Share:	$0	$0	$0	$9,845,200	$9,845,200

PHASE: C = CONSTRUCTION
E = ENGINEERING
R = ROW
T = TRANSFER

STATEWIDE TRANSPORTATION IMPROVEMENT PROGRAM

TXDOT PHARR DISTRICT
FY 2015

DISTRICT	COUNTY	CSJ	HWY	PHASE	CITY	PROJECT SPONSOR	YOE COST
21 - Pharr	Cameron	3626-03-001	SH 32 (East Loop)	C,E,R	Brownsville	Cameron County RMA	$3,965,640

LIMITS FROM:	FM 3551	REVISION DATE:	4/9/2014
LIMITS TO:	SH 4	MPO PROJ NUM:	BMPO-LP5
PROJECT DESCRIPTION:	Construct 2 lane roadway on new location	FUNDING CAT(S):	Local (PT Financing)
REMARKS:	$1,900,000 of construction to be reimbursed in future Pass-Thru Financing (PTF-using federal and state funds). NOTE: ROW cost includes $75,000 in utilities.	PROJECT HISTORY:	N/A

TOTAL PROJECT COST INFORMATION

		COST OF APPROVED PHASES:
PRELIM ENG:	$242,000	$3,965,640
ROW PURCHASE:	$500,000	
CONST COST:	$2,761,640	
CONST ENG:	$242,000	
CONTING:	$220,000	
IND COSTS:	$0	
BOND FINANCING:	$0	
TOTAL PROJ COST:	$3,965,640	

AUTHORIZED FUNDING BY CATEGORY SHARE

	FEDERAL	STATE	LOCAL	Local Contribution	TOTAL
Cat. 1 Cost:	$0	$0	$0	$0	$0
Cat. 6 Cost:	$0	$0	$0	$0	$0
Cat. 8 Cost:	$0	$0	$0	$0	$0
Prop. 12 Cost:	$0	$0	$0	$0	$0
Local Contribution:	$0	$0	$0	$3,965,640	$3,965,640
Total Funding by Share:	$0	$0	$0	$3,965,640	$3,965,640

PHASE: C = CONSTRUCTION
E = ENGINEERING
R = ROW
T = TRANSFER

STATEWIDE TRANSPORTATION IMPROVEMENT PROGRAM

TXDOT PHARR DISTRICT
FY 2015

DISTRICT	COUNTY	CSJ	HWY	PHASE	CITY	PROJECT SPONSOR	YOE COST
21 - Pharr	Cameron	1426-01-043	SH 32 (East Loop)	C,E,R	Brownsville	Cameron County RMA	$5,065,560

LIMITS FROM:	FM 3550	REVISION DATE:	4/9/2014
LIMITS TO:	FM 3551	MPO PROJ NUM:	BMPO-LP5
PROJECT DESCRIPTION:	Construct 2 lane roadway	FUNDING CAT(S):	Local (PT Financing)

REMARKS: $4,000,000 of these costs to be reimbursed in future Pass-Thru Financing (PTF-using federal and state funds). NOTE: ROW cost includes $100,000 in utilities.

PROJECT HISTORY: N/A

TOTAL PROJECT COST INFORMATION

PRELIM ENG:	$297,000	COST OF APPROVED PHASES:
ROW PURCHASE:	$900,000	
CONST COST:	$3,301,560	
CONST ENG:	$297,000	$5,065,560
CONTING:	$270,000	
IND COSTS:	$0	
BOND FINANCING:	$0	
TOTAL PROJ COST:	$5,065,560	

AUTHORIZED FUNDING BY CATEGORY SHARE

	FEDERAL	STATE	LOCAL	Local Contribution	TOTAL
Cat. 1 Cost:	$0	$0	$0	$0	$0
Cat. 6 Cost:	$0	$0	$0	$0	$0
Cat. 8 Cost:	$0	$0	$0	$0	$0
Prop. 12 Cost:	$0	$0	$0	$0	$0
Local Contribution:	$0	$0	$0	$5,065,560	$5,065,560
Total Funding by Share:	$0	$0	$0	$5,065,560	$5,065,560

PHASE: C = CONSTRUCTION
E = ENGINEERING
R = ROW
T = TRANSFER

BROWNSVILLE METROPOLITAN PLANNING ORGZANIZATION
FY 2015-2018 TRANSPORTATION IMPROVEMENT PROGRAM

PHARR DISTRICT PROJECTS
FY 2016

DISTRICT	COUNTY	CSJ	HWY	PHASE	CITY	PROJECT SPONSOR	YOE COST
21 - Pharr	Cameron	0039-10-076	SH 4	C,E,R	Brownsville	Cameron County RMA	$6,783,301

LIMITS FROM:	SH 32	REVISION DATE:	4/1/2014
LIMITS TO:	1.35 mile NE to proposed Port of Brownsville Entrance Rd	MPO PROJ NUM:	BMPO-LP5
PROJECT DESCRIPTION:	Construct 2 lane, undivided roadway	FUNDING CAT(S):	Cat 3
REMARKS:		PROJECT HISTORY: N/A	

TOTAL PROJECT COST INFORMATION

		COST OF APPROVED PHASES:
PRELIM ENG:	$391,344	$6,783,301
ROW PURCHASE:	$1,304,481	
CONST COST:	$4,348,270	
CONST ENG:	$391,344	
CONTING:	$347,862	
IND COSTS:	$0	
BOND FINANCING:	$0	
TOTAL PROJ COST:	$6,783,301	

AUTHORIZED FUNDING BY CATEGORY SHARE

	FEDERAL	STATE	LOCAL	Local Contribution	TOTAL
Local Contribution:	$0	$0	$0	$6,783,301	$6,783,301
Total Funding by Share:	$0	$0	$0	$6,783,301	$6,783,301

PHASE: C = CONSTRUCTION
E = ENGINEERING
R = ROW
T = TRANSFER

APPENDIX B

PROJECT PHOTOGRAPHS

Appendix B

Photo 1: View of existing FM 1419 (Southmost Rd.) northside ROW vegetation at the start of the project facing west.

Photo 2: View of existing FM 1419 (Southmost Rd.) northside ROW vegetation at the start of the project facing east.

Appendix B

Photo 3: View of existing FM 1419 (Southmost Rd.) northside ROW vegetation and adjacent City of Brownsville property vegetation at the start of the project facing northeast.

Photo 4: View of existing FM 1419 (Southmost Rd.) northside ROW vegetation and adjacent City of Brownsville property vegetation at the start of the project facing northwest.

Appendix B

Photo 5: View of existing FM 1419 (Southmost Rd.) roadway at the start of the project facing west.

Photo 6: View of existing FM 1419 (Southmost Rd.) roadway at the start of the project facing east.

Appendix B

Photo 7: View of existing FM 1419 (Southmost Rd.) southside ROW vegetation near the start of the project facing west.

Photo 8: View of existing FM 1419 (Southmost Rd.) southside ROW vegetation near the start of the project facing east.

Appendix B

Photo 9: View of existing vegetation (guineagrass, morning glory shrub, tepeguaje) within the City of Brownsville property and proposed SH 32 ROW near the start of the project facing north.

Photo 10: View of existing vegetation within the City of Brownsville Police Dept. shooting range near the start of the project facing north.

Appendix B

Photo 11: View of existing vegetation within the City of Brownsville property south of the Police Dept. shooting range near the start of the project, facing east.

Photo 12:View of existing vegetation within the City of Brownsville property (south of the Police Dept. shooting range) and proposed SH 32 ROW near the start of the project, facing west.

Photo 13: View of existing dominant vegetation (guineagrass, retama) within the City of Brownsville property (southwest of the shooting range) and proposed SH 32 ROW near the start of the project.

Photo 14: View of existing dominant vegetation (guineagrass, tepeguaje) within the City of Brownsville property (southwest of the shooting range) and proposed SH 32 ROW near the start of the project.

Photo 15: View of existing vegetation (morning glory) within the City of Brownsville property and proposed SH 32 ROW located southwest of the shooting range near the start of the project.

Photo 16: View of existing dominant vegetation (guineagrass, morning glory shrub, and retama) within the City of Brownsville property and proposed SH 32 ROW southwest of the shooting range near the start of the project.

Appendix B

Photo 17: View of existing dominant vegetation (guineagrass, mesquite, huisache) within the City of Brownsville property and proposed SH 32 ROW at entrance to shooting range near the start of the project facing east.

Photo 18: View of existing FM 3068 westside ROW vegetation at the FM 1419 (Southmost Rd.) and FM 3068 intersection facing north.

Appendix B

Photo 19: View of existing FM 1419 northside ROW vegetation at the FM 1419 (Southmost Rd.) and FM 3068 intersection facing west.

Photo 20: View of FM 1419 (Southmost Rd.) and FM 3068 intersection facing east.

Appendix B

Photo 21: View of existing FM 1419 southside ROW vegetation at the FM 1419 (Southmost Rd.) and FM 3068 intersection facing west.

Photo 22: View of existing FM 1419 southside ROW vegetation at the FM 1419 (Southmost Rd.) and FM 3068 intersection facing east.

Photo 23: View of Drainage Ditch 1 vegetation located at northwest corner of the FM 1419 (Southmost Rd.) and FM 3068 intersection facing north.

Photo 24: View of Drainage Ditch 1 vegetation located at northwest corner of the FM 1419 (Southmost Rd.) and FM 3068 intersection facing south.

Appendix B

Photo 25: View of Drainage Ditch 2 located east of the FM 1419 (Southmost Rd.) and FM 3068 intersection and north of existing FM 1419, facing south.

Photo 26: View of Drainage Ditch 2 located east of the FM 1419 (Southmost Rd.) and FM 3068 intersection and north of existing FM 1419, facing north.

Appendix B

Photo 27: View of Drainage Ditch 2 located east of the FM 1419 (Southmost Rd.) and FM 3068 intersection and north of existing FM 1419, facing south.

Photo 28: View of Drainage Ditch 2 located east of the FM 1419 (Southmost Rd.) and FM 3068 intersection and north of existing FM 1419, facing southwest

Appendix B

Photo 29: View Drainage Ditch 2 vegetation facing north.

Photo 30: View of Drainage Ditch 3 from top of bank facing east.

Appendix B

Photo 31: View of Drainage Ditch 3 vegetation facing east.

Photo 32: View of Drainage Ditch 3 vegetation facing west.

Appendix B

Photo 33: View of existing conditions at Drainage Ditch 3 facing north from top of southside bank.

Photo 34: View of existing conditions at Drainage Ditch 3 facing south from top of southside bank.

Appendix B

Photo 35: View of existing conditions at Drainage Ditch 4 facing north from top of bank.

Photo 36: View of existing vegetation within the fallow field east of Drainage Ditch 4 looking northeast.

Photo 37: View of existing conditions at Drainage Ditch 4 looking northwest from top of eastside bank.

Photo 38: View of existing conditions at Drainage Ditch 4 looking south from top of eastside bank.

Appendix B

Photo 39: View of existing conditions and ditch maintenance road along eastside of Drainage Ditch 4**,** facing north.

Photo 40: View of existing vegetation within the Mesquite-Huisache Rangeland area located west of Drainage Ditch 4 and north of Drainage Ditch 3 looking west.

Photo 41: View of existing vegetation within the Mesquite-Huisache Rangeland area located west of Drainage Ditch 4 and north of Drainage Ditch 3.

Photo 42: View of existing vegetation within the Mesquite-Huisache Rangeland area located west of Drainage Ditch 4 and north of Drainage Ditch 3, facing southeast.

Photo 43: View of existing vegetation within the Mesquite-Huisache Rangeland area located west of Drainage Ditch 4 and north of Drainage Ditch 3 facing west.

Photo 44: View of existing vegetation within the Mesquite-Huisache Rangeland area located west of Drainage Ditch 4 and north of Drainage Ditch 3, facing south.

Photo 45: View of existing vegetation within the fallow field area located east of Drainage Ditch 4. Looking southwest toward Drainage Ditch 4 from the intersection of South Brown Ave and Alaska Rd.

Photo 46: View of residential home at the intersection of South Brown Ave and Alaska Rd. facing northeast.

Photo 47: View of existing vegetation within the fallow field area south of Drainage Ditch 5. Looking southwest toward the intersection of South Brown Ave and Alaska Rd.

Photo 48: View of existing vegetation south of Drainage Ditch 5 looking northeast toward Drainage Ditch 5.

Photo 49: View of existing vegetation at Drainage Ditch 5 facing southwest.

Photo 50: View of existing vegetation at Drainage Ditch 5 facing northeast.

Photo 51: View of existing conditions at Drainage Ditch 6 located east and perpendicular to Drainage Ditch 5, facing east.

Photo 52: View of existing vegetation at Drainage Ditch 6 located east and perpendicular to Drainage Ditch 5, facing west.

Photo 53: View of existing vegetation at Drainage Ditch 7, from the northside top of bank facing west.

Photo 54: View of existing vegetation at Drainage Ditch 7, from the northside top of bank facing east.

Appendix B

Photo 55: View of existing vegetation at Drainage Ditch 8, from the southside top of bank facing east.

Photo 56: View of existing vegetation at Drainage Ditch 8, from the southside top of bank facing north.

Appendix B

Photo 57: View of adjacent land use at Drainage Ditch 8 facing south.

Photo 58: View of Drainage Ditch 9 located parallel to Dockberry Rd. facing northwest.

Appendix B

Photo 59: View of Drainage Ditch 9 located parallel to Dockberry Rd. facing northeast.

Photo 60: View of fallow field south of Drainage Ditch 9 facing southwest.

Appendix B

Photo 61: View of existing vegetation at Resaca de la Palma facing northeast.

Photo 62:View of Resaca de la Palma vegetation/habitat along FM 1419 (Oklahoma Ave.) facing north.

Photo 63: View of dominant ground cover vegetation at Resaca de la Palma, facing northeast.

Photo 64: View of existing vegetation at Resaca de la Palma, facing east.

Photo 65: View of existing westside vegetation at Resaca de la Palma facing northwest/upstream.

Photo 66: View of existing eastside vegetation at Resaca de la Palma facing southeast/downstream.

Photo 67: View of existing Mesquite-Huisache Woodland located south of Drainage Ditch 11and north of Resaca de la Palma along the eastside of FM 1419, looking east.

Photo 68: View of existing vegetation within the Mesquite-Huisache Woodland located south of Drainage Ditch 11and north of Resaca de la Palma along the eastside of FM 1419.

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Photo 69: View of existing conditions at Drainage Ditch 11 located along existing FM 1419 facing east.

Photo 70: View of existing conditions at Drainage Ditch 11 located along existing FM 1419 facing west.

Photo 71: View of existing vegetation at Mesquite-Huisache Rangeland located south of Drainage Ditch 12 and east of existing FM 1419 (Oklahoma Ave.) facing northeast.

Photo 72: View of existing vegetation at Mesquite-Huisache Rangeland located south of Drainage Ditch 12 and east of existing FM 1419 (Oklahoma Ave.) facing east

Photo 73: View of existing conditions at Drainage Ditch 12 from FM 1419 (Oklahoma Ave.) facing northeast/downstream.

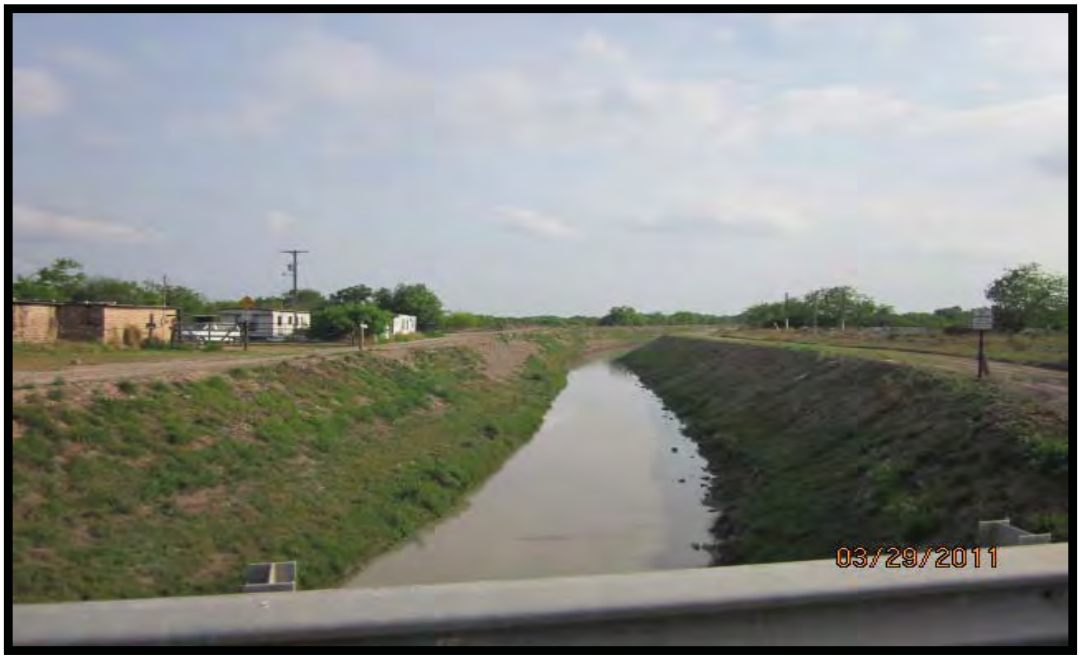

Photo 74: View of existing conditions at Drainage Ditch 12 from SH 4 (Boca Chica Blvd.) facing south/upstream.

Photo 75: View of Mesquite-Huisache Rangeland vegetation located east of Drainage Ditch 12 and south of existing SH 4 facing southwest.

Photo 76: View of Mesquite-Huisache Rangeland vegetation located east of Drainage Ditch 12 and south of existing SH 4 facing northwest.

Photo 77: View of Mesquite-Huisache Rangeland vegetation located east of Drainage Ditch 12 and south of existing SH 4 facing west.

Photo 78: View of current land use south of existing SH 4 facing southeast.

Photo 79: View of existing Vegetated Slat Flats along SH 4 near the northeast end of the project.

Photo 80: View of existing Vegetated Slat Flats along the northside of SH 4 facing northeast, near the northeast end of the project.

Photo 81: View of existing conditions along SH 4 facing northeast near the end of the project.

Photo 82: View of existing conditions along SH 4 facing east near the end of the project.

Appendix B

Photo 83: View of existing conditions south of the existing SH 4 bridge towards the end of the project.

Photo 84: View of the existing conditions north of the existing SH 4 bridge towards the end of the project.

Appendix B

Photo 85: View of SH 4 looking west from the existing bridge towards the end of the project.

Photo 86: View of SH 4 looking east towards the existing bridge located on the near the end of the project.

APPENDIX C

SOILS SUMMARY

Soil Summary					
Soil	**Drainage**	**Permeability**	**Hydric**	**Prime Farmland**	**Comments**
Benito clay (BE)	Poorly	Very slow	Yes	No	This soil is found in broad, slightly depression areas. A few areas of this soil are in long, narrow drainage ways. The surface is crusty and cloddy and poorly drained.
Cameron silty clay (CF)	Moderately Well	Moderately slow	Yes	No	This soil is a nearly level soil on old floodplains and deltas. Most of the acreage is in pasture or left idle because high salinity prevents the growth of field crops.
Chargo silty clay (CH)	Moderately Well	Slow	Yes	No	This soil is nearly level and found on old floodplains and deltas with slow permeability and runoff. Most areas of this soil are idle because high salinity prevents the growth of field crops.
Grulla clay (GR)	Somewhat Poorly	Very slow	Yes	No	This soil is located in Resaca's that have been cut off from the Rio Grande by major floods. Areas of this soil are in level, long oxbows of the active flood plain. Permeability is very slow. Runoff is ponded. This soil is used almost entirely for irrigated crops.
Harlingen clay (HA)	Moderately Well	Very slow	No	Yes – If irrigated	This soil has very slow permeability and runoff is slow. Most areas of this soil are in irrigated crops, and some are used for dry farmed crops and improved pasture.
Harlingen clay, saline (HC)	Moderately Well	Very slow	Yes	No	This is a level soil. The surface layer is crusty and cloddy. Permeability is very slow and runoff is slow. The land is used mostly for irrigated pasture. A small acreage is used for irrigated crops and a few areas are idle
Laredo silty clay loam (LC)	Moderately Well	Moderate	No	No	This soil is located on old floodplains and deltas, generally adjacent to old meanders. Most areas of this soil are in pasture or rangeland. A few areas are used as irrigated cropland.
Laredo-Olmito complex (LD)	Moderately well	Laredo soil is moderate. Olmito soil is slow	No	Yes – If irrigated	This soil has a moderate permeability in the Laredo soil and low permeability in the Olmito soil. Runoff is slow on both soil types. The soils of this complex are mainly used for irrigated crops. The Laredo soil is suited to citrus trees; however, the Olmito soil is not.

Soil Summary					
Soil	**Drainage**	**Permeability**	**Hydric**	**Prime Farmland**	**Comments**
Laredo-Reynosa complex, 0 to 1 percent slopes (LEA)	Well	Moderate	No	No	This soil has 0 to 1 percent slopes and 1 to 3 percent slopes, respectively. The soils of this unit are adjacent to older or larger resacas in narrow, alternating streaks or bands parallel to the resacas. Almost all the acreage of these soils is used for irrigated crops.
Laredo-Reynosa complex, 1 to 3 percent slopes (LEB)	Well	Moderate	No	Yes	This soil has 0 to 1 percent slopes and 1 to 3 percent slopes, respectively. The soils of this unit are adjacent to older or larger resacas in narrow, alternating streaks or bands parallel to the resacas. Almost all the acreage of these soils is used for irrigated crops.
Laredo silty clay loam, 0 to 1 percent slopes (LAA)	Well	Moderate	No	Yes	This soil has 0 to 1 percent slope, moderate permeability and slow runoff. A few areas of this soil have been altered for irrigation by land leveling. The surface layer of this soil varies greatly due to filling and cutting operations in the area. However, this soil is used mainly for irrigated and dry farmed crops, pasture, and citrus trees.
Laredo silty clay loam, 1 to 3 percent slopes (LAB)	Well	Moderate	No	Yes	This soil has a 1 to 3 percent slope. This soil is found in long, narrow areas adjacent to the resacas. Because of the location and size of the areas, this soil generally is left idle, with a few areas used for irrigated crops and pasture.
Lomalta clay (LM)	Poorly	Very slow	Yes	No	This is a level to slightly depressional soil and is generally in broad areas several hundred acres in size, but a few areas occur as long, narrow drainage ways. Areas of this soil are used for rangeland and as wildlife habitat.
Matamoros silty clay (MA)	Moderately Well	Slow	No	Yes	This soil is located on the floodplain of the Rio Grande. Permeability and runoff are slow. It is moderately well drained. Areas of the soil are used for irrigated crops and pasture.
Matamoros -Rio Grande complex (MC)	Moderately Well	Matamoros soil is slow. Rio Grande soil is moderate.	No	Yes	These soils are located on the inside bends of Resaca's, in alternating bands parallel to the river or Resaca's. Permeability is slow in the Matamoros soil and moderate in the Rio Grande soil. Runoff is slow in both soils. These soils are used for irrigated crops.
Olmito silty clay (OM)	Moderately Well	Slow	No	Yes	This soil is found on old floodplains and deltas and is used for irrigated crops, dry farmed crops, and pasture.

Soil Summary					
Soil	**Drainage**	**Permeability**	**Hydric**	**Prime Farmland**	**Comments**
					Permeability and runoff are slow. This soil is a moderately well drained, calcareous soil that is nearly level.
Rio Grande silt loam (RR)	Well	Moderate	No	Yes	This soil is a nearly level soil that is found on the floodplain of the Rio Grande. Permeability is moderate and the runoff is slow. This soil is well drained. This soil is used for irrigated crops and pasture.
Sejita silty clay loam (SE)	Somewhat poorly	Moderately Slow	Yes	No	This soil is only a few ft. above mean sea level. Areas are broad, level, and several hundred acres in size. Permeability is moderately slow. Runoff is slow to ponded. This soil is somewhat poorly drained. Areas of this soil are used for rangeland and as wildlife habitat.

APPENDIX D

AGENCY COORDINATION

Texas Department of Transportation
DEWITT C. GREER STATE HIGHWAY BLDG. • 125 E. 11TH STREET • AUSTIN, TEXAS 78701-2483 • (512) 463-8585

July 23, 2012

SECTION 106: Determination of Eligibility and Effects
SECTION 4(f): Notification of intent to pursue 4(f) *de minimis* determination
Cameron County (Pharr District)
CSJ# 3626-01-001, 3626-02-001, 3626-03-001, 1426-01-037, & 1426-01-043

SH 32: US 77/83 to FM 3068 & SH 32: FM 3068 to SH 4

Ms. Linda Henderson
History Programs
Texas Historical Commission
Austin, Texas 78711

Dear Ms. Henderson:

In accordance with 36 CFR 800 and the First Amended Programmatic Agreement regarding Implementation of Transportation Undertakings (PA-TU), we are initiating Section 106 consultation for the above reference project, which will be carried out with federal funding. We request agency review regarding the eligibility of the following resource within the APE and effects. This letter is notification of intent to pursue a 4(f) *de minimis* determination from FHWA (Federal Highway Authority).

Project Description
SH 32: US 77/83 to FM 3068 (Western Portion):
The Cameron County Regional Mobility Authority, in cooperation with TxDOT, proposes to construct SH 32 as a principal arterial in Brownsville, Cameron County, Texas. The western study limits for this project begin at US 77/83 and end just east of FM 3068 in Brownsville, Cameron County, Texas for a project length of approximately 5.3 miles.

Details of current schematics as of April 2012 are provided in *Appendix D*. The proposed roadway would precede easterly along the existing East Avenue to the Southside Wastewater Treatment Plant (WWTP), and then turn southeast on new location. East of the Impala Outfall Channel, the roadway would be extended on new ROW along a portion of the existing International Boundary and Water Commission (IBWC) levee. This portion of the existing IBWC levee will be reconstructed south of the proposed new alignment and closer to the Rio Grande River, just north of the defined Restricted Use Zone (RUZ). The levee relocation would be approximately 1.84 miles in length. The relocated levee will pass through an existing portion of the Lower Rio Grande Valley National Wildlife Refuge (LRGVNWR) (Jeronimo Banco Tract); a land exchange is proposed to offset the acreage lost due to the proposed construction of the new levee. South of Monsees Road, the preferred proposed roadway (Alternative A) would continue to the southeast on new alignment along an abandoned railroad ROW, which historically has served as a transportation corridor. The roadway would then intersect with FM 1419 and continue to the east along the existing ROW of FM 1419.

The proposed roadway includes an overpass over FM 3068, constructed at a height of approximately 25 feet above grade level, ending at approximately one mile east of FM 3068. A small connector from Monsees Road to the new roadway would be

built mostly along the existing ROW of FM 1419. Additionally, three new detention basins will be constructed to mitigate for increased storm water runoff, including one along the north-south segment of FM 1419. The proposed roadway would require obtaining a combined total of 102.7 acres along the entire new ROW. The proposed levee relocation would require obtaining another 46.2 acres of new ROW.

SH 32: FM 3068 to SH 4 (Eastern Portion):

The eastern study limits for this project begin at FM 3068 and ends at SH 4 in Brownsville, Cameron County, Texas for a project length of approximately 5.88 miles. The project will include transitioning that would extend from east of South Dakota Avenue to Yolanda Del Rio Road. The project would involve a combination of new four-lane roadway construction and upgrades/improvements to existing two-lane roadways. The proposed ROW for this portion of the project generally measures 150 ft. in width – with limited areas up to 370 ft. in width at interchanges and grade separations – and makes variable use of existing 60-80 ft. ROW (see attached schematics in Appendix A). Approximately 109 acres of new ROW would be required for this portion of the project.

Reconnaissance Survey Findings: Western Portion

Previously Designated Sites (NRHP, SAL, RTHL, OTHM):

Research and survey revealed that no resources located within 1,300 feet of the proposed ROW were previously designated as SALs, documented as part of the Texas Historic Sites Inventory or other local survey, designated as an RTHL, or commemorated with an OTHM. One NRHP-listed property, the Brulay Plantation, is associated with a parcel of land that extends into the study area. In addition, there are two documented cemeteries located in the study area. The cemetery documented at the intersection of Southmost Road and Indiana Avenue (FM 3068) (*Resource ID No. 64*), documented in the *Texas Historic Sites Atlas* as the "Indiana and Southmost Cemetery" (*Cemetery Number CF-C044*) (*Resource ID No. 64*). In addition, research indicated that one historic-age cemetery documented in the *Texas Historic Sites Atlas*, the Santa Rosalia Cemetery (*Cemetery Number CF-C031*) (*Resource ID No. 65*) is located in the 1,300-foot study area. Finally, one locally designated resource, *Resource ID No.57*, the Palm Grove Elementary School, is located within the project's APE of 300 ft.

Survey Documented Sites

Reconnaissance survey recorded 100 domestic, 43 agricultural, 4 transportation, 2 funerary, 2 industrial, 1 commercial, 1 public works, and 1 educational resources on 77 properties. Five properties were determined potentially eligible for the NRHP. They include: Property 44 – Piper Plantation, Property 55 Palm Grove Elementary School, Property 65 – Santa Rosalia Cemetery, Property 75 – Rabb Plantation, Property 76 – Brulay Plantation (NRHP listed), Property 77 – Donna-Brownsville Levee (added during the intensive survey).*

Given the potential for impacts to properties, TxDOT requested an intensive on agricultural complexes, including the Piper and Rabb properties, and further research into the potential for a rural historic landscape and any additional information that might be learned about the Brulay property (Brulay did not allow for right-of-entry during either survey). The findings related to that survey are below under Intensive Survey Findings.

Reconnaissance Survey Findings: Eastern Portion

Previously Designated Sites (NRHP, SAL, RTHL, OTHM):

Research and survey revealed that no resources located within 1,300 feet of the proposed ROW were previously listed on the NRHP, designated as SALs, documented as part of the Texas Historic Sites Inventory or other local survey, designated as an RTHL, or commemorated with an OTHM. Two cemeteries were previously documented by the THC. Two cemeteries in the APE, 150 ft. on either side of the proposed ROW and 300 ft. on either side of the proposed ROW at the locations of two proposed overpasses, were previously recorded in the THC Historic Sites Atlas. They are the Oklahoma Road and Levee Cemetery (CF-C032), Property 2, and the Indiana and Southmost Cemetery (CF-C044), Property 14.

**At the time this reconnaissance survey was performed, TxDOT and the consultant was unaware the THC had determined the Donna-Brownsville Levee was eligible for the NRHP. It will be discussed with the Intensive Survey Findings when this fact was learned by all parties.*
***This reconnaissance survey is when TxDOT learned about the THC's eligibility determination concerning the levee. The levee and the potential for impacts to the resource will be discussed in greater depth in the Determinations of Effects section of this letter.*
****A more detailed effects chart is available in the attached intensive survey.*

Survey Documented Sites
Reconnaissance survey recorded 12 domestic, 9 agricultural, 2 transportation, and 2 funerary resources on 16 properties. One property was determined potentially eligible for the NRHP, the Donna-Brownsville Levee (Property 16 in the eastern reconnaissance and Property 77 in the western reconnaissance).**
Other than the levee, none of the historic-age resources possess associations with significant events (Criterion A), are associated with a person of significance (Criterion B), and do not represent the work of a master, possess high artistic value, or embody the distinctive characteristics of a type, period, or method of construction (Criterion C).

Intensive Survey & Updated Findings
Based on these intensive-level evaluations, TxDOT recommends that 27 resources on five parcels of land are *Eligible* for listing in the NRHP. These findings supplement reconnaissance-level investigations completed in 2008, which identified and evaluated a total of 113 historic-age buildings, structures, and objects on 77 parcels within the study area, recommending that 12 resources on three parcels of land are *Eligible* or *Potentially-Eligible* for inclusion in the NRHP.

Piper Plantation (Resource 44)
Criterion A
Evaluated as a whole, *Resource ID No.44* comprises a historic agricultural complex with significant historical associations with local trends and patterns of agriculture in the twentieth century. The Piper Plantation is significant for its associations with the introduction of sugar and citrus farming in Brownsville during the early twentieth century. The Piper Plantation retains numerous buildings and structures that date from the period when sugar and grapefruit were grown and retain their physical integrity. Because *Resource ID No. 44* retains sufficient integrity and meets Criterion A, it is recommended *Eligible* for NRHP listing in the area of Agriculture for its associations with the introduction of sugar and citrus in Brownsville at the local level of significance. The contributing resources on the property were constructed during the periods when sugar or citrus were actively grown, and retain sufficient integrity to convey their association with these significant historic periods. The inventory in *Appendix A* provides a detailed listing of contributing and noncontributing resources. The period of significance for the Piper Plantation for its association with the introduction of sugar in Brownsville is 1906 to 1915.

The cluster of domestic resources located in the northwest corner of the property, *Resource ID Nos. 44a-c*, *44p-q*, and *44s-x* were constructed during the period when grapefruit was the prominent crop grown at the Piper Plantation, therefore they reflect this trend. *Resource ID Nos. 44a-c*, *44q*, *44s*, and *44u-x* retain sufficient integrity in order to convey a sense of the past and the significance of the Piper Plantation. *Resource ID Nos. 44p* and *44t* no longer retain their integrity of *Materials*, *Design*, and *Workmanship*. Therefore, only *Resource ID Nos. 44a-c*, *44q*, and *44u-x* are recommended as contributing resources to the recommended NRHP-eligible Piper Plantation under Criterion A in the area of Agriculture for the their association with the introduction of citrus in Brownsville at the local level of significance. The period of significance for the Piper Plantation for its association with the introduction of citrus in Brownsville is 1916 to 1950.

The proposed boundaries for the recommended NRHP-eligible Piper Plantation include all 895 acres associated with the property. These boundaries closely represent the historic boundaries of the Piper Plantation. Included in these boundaries are the approximately 164.5 acres located in the northeastern and northwestern sections of the property that are no longer under cultivation. Because this land has returned to its native state and is no longer under cultivation, it no longer conveys the history of the plantation, and therefore is considered ***non-contributing*** to the recommended NRHP-eligible property. *Only fields under cultivation are considered* ***contributing*** *within the proposed boundaries because only they can convey the history of the plantation with either their landscape or extant built resources.* The figures presented in the Executive Summary (*Figures i-ii*) outline the proposed boundaries (see also *Appendix D*).

Criterion B
The Piper Plantation was associated with many historic individuals throughout its history, such as Augustus Piper and James English. Despite the plantation's associations with such historical individuals, many of the owners did not live at the plantation

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***This reconnaissance survey is when TxDOT learned about the THC's eligibility determination concerning the levee. The levee and the potential for impacts to the resource will be discussed in greater depth in the Determinations of Effects section of this letter.*
****A more detailed effects chart is available in the attached intensive survey.*

and kept homes elsewhere. Due to the absentee landowner nature of the Piper Plantation, significance with these individuals is better represented by their other homesteads. Therefore, the Piper Plantation does not meet Criterion B.

Criterion C
Two individual buildings, *Resource ID Nos. 44a* and *44e*, are architecturally and historically significant in their own right. The main house, *Resource ID No. 44a*, is an excellent intact example of a distinctive vernacular house form of the region dating from the early twentieth century. The house is a variation on the linear-plan, which was a common domestic building plan found throughout the Valley in the nineteenth and twentieth centuries. As a good local example of this unique, regional building form, *Resource ID No. 44a* holds significance under Criterion C in the area of Architecture. *Resource ID No. 44a* retains a high degree of integrity of *Location*, *Design*, *Materials*, *Workmanship*, and *Feeling*. The building's character-defining features – including its form, porch structure, decorative chimneys, exterior brick walls, wood windows, and roof with exposed rafter ends – remain intact. Therefore, *Resource ID No. 44a* is recommended *Eligible* for NRHP listing in the area of Architecture at the local level of significance.

Resource ID No. 44e, the Mexican laborers' housing, exemplifies the vernacular linear form that was common in the Rio Grande Valley. The tenant building was constructed in a vernacular linear-plan building type that typified domestic development in the region dating back to the time of the earliest Spanish settlers. *ID No. 44e* retains a high degree of integrity of *Location*, *Design*, *Workmanship*, *Materials*, and *Feeling*. The building's character-defining features – its linear plan, doors, fenestration pattern, handmade bricks, and exposed rafters – are intact, and it maintains its ability to convey a sense of the past and its significance. *Resource ID No. 44e* is recommended *Eligible* for NRHP listing in the area of Architecture at the local level of significance.

Summary of other property findings
Intensive survey did not reverse earlier eligibility findings for the ***Palm Grove Elementary School (Resource 57)***. The ca. 1910 building originally served as the elementary and primary school for the Southmost Colonia / Palm Grove area, housing classes for the children of tenants that worked on the area ranches. Although the resource has undergone some alteration, it remains recognizable to its historic appearance from its construction in 1910 through the decline of tenant farming and ranching in the area ca. 1965, and it is able to convey its historic character. The resource remains a tangible representative of the city's efforts, in the early twentieth century, to provide a quality education to the children of the area ranch hands and owners. Therefore, *Resource ID No. 57* is recommended *Eligible* for listing in the NRHP under Criterion A at a local level of significance in the area of Education.

Intensive also did not reverse earlier eligibility findings for the ***Santa Rosalia Cemetery (Resource 65)***. The resource originally served as a cemetery for a ranch that was established by Juan Manuel Perez in the 1850s, though most interments range from 1909 to the 1940s. The cemetery meets Criterion Consideration D for its association with early agricultural development, Criterion A, and its graves' distinctive architectural detailing, Criterion C. Both areas of significance are at the local level.

Intensive survey determined that the ***Rabb Plantation (Resource 75)*** is also eligible for the NRHP. *Resource ID No. 75* includes 16 historic-age resources located on land in Brownsville that historically was part of the Rabb Plantation. Although the current parcel is located outside of the APE, Rabb historically owned over 20,000 acres of land extending north of Southmost Road, within the APE. The 16 resources within this core cluster predominantly date to the 40 year period between the early 1890s and the 1930s, when Frank Rabb owned the property. During this period much of the land was under cultivation and used for agricultural purposes, unlike the vegetated state it is in today.

The Rabb Plantation is a historically important and significant property. The intensive survey determined that the Rabb Plantation does not retain sufficient integrity to convey its past; it is recommended *Not Eligible* for NRHP listing under Criterion A. However, it does retain enough integrity and significance to convey its significance under Criterion B at the local level because it best represents the life of Frank Rabb. Also in a letter dated January 7, 2011, the THC stated that the main house,

**At the time this reconnaissance survey was performed, TxDOT and the consultant was unaware the THC had determined the Donna-Brownsville Levee was eligible for the NRHP. It will be discussed with the Intensive Survey Findings when this fact was learned by all parties.*
***This reconnaissance survey is when TxDOT learned about the THC's eligibility determination concerning the levee. The levee and the potential for impacts to the resource will be discussed in greater depth in the Determinations of Effects section of this letter.*
****A more detailed effects chart is available in the attached intensive survey.*

Resource ID No. 75a, is *Eligible* for listing in the NRHP under Criterion C in the area of Architecture at the local level of significance. *Resource ID No. 75a* is one of the best existing local examples of a late nineteenth century plantation house. TxDOT agrees with this determination of eligibility. Other architecturally significant resources include *Resource ID Nos. 75g, 75j*, and *75k*. These three buildings were all built in the Border Brick tradition. Buildings of this vernacular are confined to the Rio Grande border region and are characterized by locally made brick and masonry and retain enough integrity in order to convey their Criterion C significance.

Intensive survey also made recommendations regarding the NRHP-listed ***Brulay Plantation (Resource 76).*** *It* recommends several updates to the 1972 NRHP nomination. The report recommends clarifying dates of construction of buildings, the period of significance, and the parcel boundaries. The NRHP nomination does not state dates of construction of buildings, nor does it explicitly give a period of significance for the property. Based on research, the period of significance should begin in 1870 when Brulay purchased the first 1,000 acres of the plantation, and end in the 1920s, when the era of large-scale sugarcane cultivation ended. The nomination states, "The site lies between the north or left bank levee of the Rio Grande and a branch of the Southmost Road." However, the nomination lists the acreage of the nominated property as approximately 50 acres, but the parcel boundaries circumscribe approximately 483.5 acres. The map provided in the NRHP nomination also does not extend far enough west to include all resources listed as contributing in the nomination text. TxDOT recommends clarifying the boundaries in order to include the nine historic resources documented and the entire 483.5-acre parcel. The 483.5-acre parcel should be included in the boundaries because nearly the entire parcel is still under cultivation, as it historically was. The associated active agricultural land is one of the character-defining features that contributes to the integrity of the Brulay Plantation.

Finally, The ***Donna-to-Brownsville Levee (Resource 77)*** is an earthen levee constructed by the U.S. Army Corps of Engineers ca. 1926 to manage flooding of the Rio Grande. The levee extends throughout the project area, roughly parallel to the Rio Grande. Although the levee has been modified over time, these alterations have enabled the levee to continue to serve its original purpose, providing flood control. The Donna-to-Brownsville levee was previously evaluated for NRHP eligibility by the International Boundary and Water Commission (IBWC) and its contractor, Geo-Marine, Inc. Following its review of the survey report, the THC concluded that the levee is *Eligible* for the NRHP under Criteria A and C, as documented by Section 106 correspondence from the THC to Michelle D. Wurtz, Departmental Manager, Cultural Resources Division, Geo-Marine, Inc., dated February 26, 2009 and March 17, 2009 (attached).

DETERMINATION OF EFFECTS TO LISTED HISTORIC RESOURCES

In accordance with CFR 800.5, TxDOT Historians applied the *Criteria of Adverse Effect* and determined that the proposed project poses **no adverse effect** to any NRHP-listed or eligible resources in the APE. The following discussion details these findings.

*Potential Impacts Assessments to NRHP-eligible Resources****

Resource ID	Property Type	Applicable NRHP Criteria	Potential Impact	Potential 4(f) Implications?
44	Agricultural Complex	Eligible under Criteria A and C	Potential Direct Impact	(*De minimis*)
57	Educational	Eligible under Criterion A	No Impact	No
65	Cemetery	Eligible under Criteria A and C	No Impact	No
75	Agricultural Complex	Eligible under Criteria B and C	No Impact	No
76	Agricultural Complex	Eligible under Criteria A and C	No Impact	No
77	Irrigation	Eligible under Criterion A and C	No Impact	No

**At the time this reconnaissance survey was performed, TxDOT and the consultant was unaware the THC had determined the Donna-Brownsville Levee was eligible for the NRHP. It will be discussed with the Intensive Survey Findings when this fact was learned by all parties.*
***This reconnaissance survey is when TxDOT learned about the THC's eligibility determination concerning the levee. The levee and the potential for impacts to the resource will be discussed in greater depth in the Determinations of Effects section of this letter.*
****A more detailed effects chart is available in the attached intensive survey.*

Piper Plantation (Resource 44)
Based on current project schematics, the proposed project would have a direct impact on the NRHP-eligible resources on the historic Piper Plantation, *Resource ID No. 44*, as illustrated in the detailed site plans depicted in *Figures 38a and 38b*. Maps illustrating current schematics are included in *Appendix D*. The construction of the new roadway would cut through the northernmost portion of the NRHP-eligible resource, taking approximately 21.3acres of land from within the recommended NRHP-eligible property.
The project also proposes the construction of a connecting road that would link Monsees Road with the proposed SH 32 roadway. The alignment would primarily follow part of the existing ROW for FM 1419, but would take a southwesterly path and cut through the large uncultivated field mentioned in the previous paragraph. This part of the project would require the acquisition of 5.5 acres from the property. Since this area is a non-contributing feature within the property, the proposed connector would not affect the property's character-defining features or the qualities that make it eligible for listing in the NRHP.

A detention pond would also be constructed along the south end of the north-south segment of FM 1419. Most of the detention pond would be confined to existing ROW along the road; however, 4.8 acres of land would need to be acquired from the property including Resource ID No. 44. The land acquisition would be limited to the overgrown field that is listed as a non-contributing element and would not diminish the overall historic character, integrity, or significance of the property.

Overall the preferred alignment follows the historic rail corridor. This would allow the historic circulation patterns to remain in place by keeping the corridor in a transportation use. The path for the proposed roadway extends along a historic transportation corridor that was an integral part of the property's historical development and evolution. Since that spatial relationship has existed historically, the new roadway would not impact the historic character of historic resource clusters. In addition, the buffer of dense vegetation that historically separated the buildings from the transportation corridor will be maintained. Present schematics for the design of the roadway do not indicate the presence of any elevated elements – such as overpasses, railings, or lighting – that might be visible despite the buffer of vegetation. If any such elements are proposed, they should be designed to ensure that they do not visually impact these contributing buildings. While the main house driveway (Resource 44p) would be crossed, the railway corridor also crossed at that location in the past and historically there was always an at-grade crossing.

All takings from this property are within an area that is a ***non-contributing*** element of the property and does not detract from the overall historic character, nor diminish the ability of the plantation to convey its significance and sense of the past. Furthermore, the salient and character-defining features of the property that include the building clusters and cultivated fields, would remain intact, and the property would still retain the qualities that make it eligible for inclusion in the NRHP. For these reasons, the proposed project complies with ***de minimis*** guidelines because the project would not affect or diminish the qualities and characteristics that contribute to the significance of the listed property.

Resources 57, 65, & 75
Based on current schematics for all alternatives, the proposed project will have no direct or indirect impacts on these resources.

Brulay Plantation (Resource 76)
Based on current schematics there will be no takings from Resource 76. However, all alternatives entail the construction of an elevated overpass immediately adjacent to the property. Therefore, the consultant performed a visual effects analysis. The contributing buildings are visible from Southmost Road, and Southmost Road and additional agricultural fields to the north are visible from the contributing buildings (*Figure 39*). The proposed overpass will be constructed along the northern right-of-way of Southmost Road and will rise approximately 25 feet above natural grade, as illustrated in preliminary section drawings (*Figure 40*). However, the overpass will be between 3,375 ft. and 4,050 ft. from extant resources on the property. The proposed overpass will have no significant visual impact upon the view of the Brulay Plantation when looking south from

**At the time this reconnaissance survey was performed, TxDOT and the consultant was unaware the THC had determined the Donna-Brownsville Levee was eligible for the NRHP. It will be discussed with the Intensive Survey Findings when this fact was learned by all parties.*
***This reconnaissance survey is when TxDOT learned about the THC's eligibility determination concerning the levee. The levee and the potential for impacts to the resource will be discussed in greater depth in the Determinations of Effects section of this letter.*
****A more detailed effects chart is available in the attached intensive survey.*

Southmost Road. The historic buildings and associated agricultural land will still be visible when looking south from the overpass, or from Southmost Road east of the overpass.

While the setting is a character-defining feature of the property, the view sheds will not be significantly altered, such that the property would not be able to convey its NRHP significance. Previous changes to the view sheds include construction of the Brownsville Road in ca. 1911 and improvements to make it Southmost Road in ca. 1930. Also, there has been modern domestic development within view northeast of the property. The proposed overpass will have no adverse effect under Section 106 and will not require mitigation. Furthermore, the proposed overpass will not s*ubstantially* impair the features that make the property eligible for the NRHP, therefore it will not meet the standard for constructive use under Section 4(f) and further 4(f) analysis will not be required.

Donna-Brownsville Levee (Resource 77)
Based on current project schematics, the project proposes the relocation of the Donna- Brownsville Levee (*Resource ID No. 77*) between the Impala Outfall Channel and Monsees Road. The levee's integrity, however, has largely been compromised already due to extensive alterations that occurred during the construction of the border security fence; including the removal of most of the gates, raising the levees up to 4 ft. in height, and re-alignment of various sections. In addition, historical research shows the segments of the levee extending through the project area were previously relocated and reconstructed.

The function of the levee will not be impaired. There will be no takings from the levee system and the channel will not be impaired in anyway. The project will not impair the function of the system as a whole. Therefore, changing the alignment would be no adverse effect. The property would still convey its historic significance after the project is complete. These criteria comports similar to the no adverse effect determination process outlined in the July 15, 2004 consensus agreement with SHPO for irrigation. For these reasons, the proposed project complies with ***de minimis*** guidelines because the project would not affect or diminish the qualities and characteristics that contribute to the significance of the listed property.

Effects Summary
TxDOT asserts that the proposed undertaking would have no reasonably foreseeable adverse effects that may occur upon construction of the project, later in time, be farther removed in distance, or be cumulative. Any growth pressures that may or may not exist near the property are already in place and the road construction would not increase the likelihood that these properties' integrity will be diminished as the properties have already experienced modern development in their immediate surroundings. Furthermore, the proposed project would not adversely impact the properties' ability to convey their historical significance or impair their current function. The project therefore would not pose indirect or cumulative adverse effects to the listed and eligible properties.

For these reasons and as defined in Part 774 of the Section 4(f) Final Rule and Section 6009(a) of SAFETEA-LU, TxDOT Historians intend to recommend to FHWA that the proposed right-of-way acquisition and levee re-alignment is *de minimis* for Resources 44 & 77 due to the fact that the road widening would not affect or diminish the qualities and characteristics that contribute to the historic significance of any eligible properties. Furthermore, the project poses no foreseeable indirect or cumulative adverse effects to the NRHP-listed or eligible properties.

Pursuant to Stipulation VI "Undertakings with Potential to Cause Effects" of the PA-TU, TxDOT Historians determined that the proposed project would have no adverse effect to the historic properties and complies with FHWA's de minimis 4(f) guidelines. As a result, TxDOT intends to pursue a de minimis 4(f) determination with FHWA for this project.

**At the time this reconnaissance survey was performed, TxDOT and the consultant was unaware the THC had determined the Donna-Brownsville Levee was eligible for the NRHP. It will be discussed with the Intensive Survey Findings when this fact was learned by all parties.*
***This reconnaissance survey is when TxDOT learned about the THC's eligibility determination concerning the levee. The levee and the potential for impacts to the resource will be discussed in greater depth in the Determinations of Effects section of this letter.*
****A more detailed effects chart is available in the attached intensive survey.*

We request your concurrence with this determination per the terms of our programmatic agreement. Please return a signed copy of this correspondence for our files within 20 days. We look forward to further consultation with your staff and hope to maintain a partnership that will foster effective and responsible solutions for improving transportation, safety and mobility in the state of Texas. Thank you for your cooperation in this federal review process. If you have any questions or comments concerning these evaluations, please call me at (512) 416-2619.

Sincerely,

Summer Chandler

Summer Chandler
Architectural Historian
Environmental Affairs Division

CONCUR: NO ADVERSE EFFECT FOR HISTORIC PROPERTIES
DETERMINATION OF DE MINIMIS IMPACT UNDER SECTION 4(f) GUIDELINES

NAME: _____ DATE: _____

for Mark Wolfe, State Historic Preservation Officer

Original Sonya Hernandez-PD, ENV-HIST
Cc Robin Gelston, Pharr District
Attachments

**At the time this reconnaissance survey was performed, TxDOT and the consultant was unaware the THC had determined the Donna-Brownsville Levee was eligible for the NRHP. It will be discussed with the Intensive Survey Findings when this fact was learned by all parties.*
***This reconnaissance survey is when TxDOT learned about the THC's eligibility determination concerning the levee. The levee and the potential for impacts to the resource will be discussed in greater depth in the Determinations of Effects section of this letter.*
****A more detailed effects chart is available in the attached intensive survey.*

Texas Department of Transportation
DEWITT C. GREER STATE HIGHWAY BLDG. • 125 E. 11TH STREET • AUSTIN, TEXAS 78701-2483 • (512) 463-8585

December 1, 2011

Section 106 Consultation/ Antiquities Code of Texas
Transmittal of Cox McClain Survey Report; *An Intensive Archeological Survey of State Highway 32 from the Intersection of FM 3068 and FM1419 to State Highway 4, Cameron County, Texas*
Pharr District, CSJ: 3626-02-001
THC Antiquities Permit No. 5899

Ms. Pat Mercado-Allinger,
Division of Archeology, Texas Historical Commission
P.O. Box 12276
Austin, Texas 78711

SCANNED
12/7/11 lp

Dear Ms. Mercado-Allinger:

The above proposed project will be undertaken with state and federal funds. As required by the First Amended Programmatic Agreement (PA, 2005) and the Memorandum of Understanding with your agency, we are continuing consultation with your office on this project and are enclosing for your review and processing a draft report of an archeological survey recently conducted by Cox McClain for the undertaking.

Cox Mclain conducted the Intensive Archeological Survey on behalf of TxDOT and examined both the existing ROW and proposed new ROW totaling approximately 150 acres. No previously recorded archeological sites are located within the project area. Based on the negative survey findings and impacts from land use, Cox /McClain Environmental Consulting Inc recommends no further archeological investigations in the 100 acres with Right of Entry (ROE) access but recommends additional archeological investigations in the 50 acres that could not be accessed. A report of investigation is enclosed.

A TxDOT archeologist has reviewed the report by Cox /McClain Environmental Consulting Inc. and concurs with the results. **TxDOT seeks THC concurrence that**:

1.Per our MOU, no archeological historic properties (36 CFR Part 800.16(1) or State Archeological Landmarks (13 TAC 26.12) are present within the 100 acre APE examined by the survey (see attached Figures 1a-1c), and none will be affected by the proposed undertaking. There is little likelihood of significant or intact prehistoric or historical archeological sites within the APE surveyed and no further archeological investigations are warranted in those areas. The remaining 50 acres with no Right of Entry (ROE) will require additional archeological investigations (see Figures 1a-1c). TxDOT will complete the survey and Section 106/ Antiquities Code of Texas consultation of the remaining 50 acres once access is acquired and prior to construction.

2. Despite ROE constraints, Cox McClain has conducted a good faith effort within the 100 acres of the APE surveyed. TxDOT requests your concurrence that Cox McClain be allowed to revise the scope of permit 5899 to the 100 acres examined and the remaining inaccessible 50 acres be examined under a separate Texas Antiquities Permit.

3. Since the survey was conducted under an individual THC Antiquities Permit, we are forwarding the draft for your review and processing in partial fulfillment of THC Antiquities Permit No. 5899. TxDOT finds the report acceptable as a draft and pending any final report review comments from your office, we request your concurrence that the report may proceed toward production and that it provides sufficient documentation that the proposed undertaking will have no affect on an archeological historic properties or State Archeological Landmarks.

In the event that unanticipated archeological deposits are encountered during construction, work in the immediate area will cease and TxDOT archeological staff will be contacted to initiate post-review discovery procedures under the provisions of the PA (2005) and the Memorandum of Understanding between TxDOT and the THC.

Thank you for your consideration of this matter. If you have any questions regarding the survey report, please contact Chris Dayton (512) 338-2223. If you have any other questions or have need of further information, please contact me at 416-2647. Thank you for your consideration in this matter.

Sincerely,

Christopher Ringstaff, Archeological Studies Program
Environmental Affairs Division

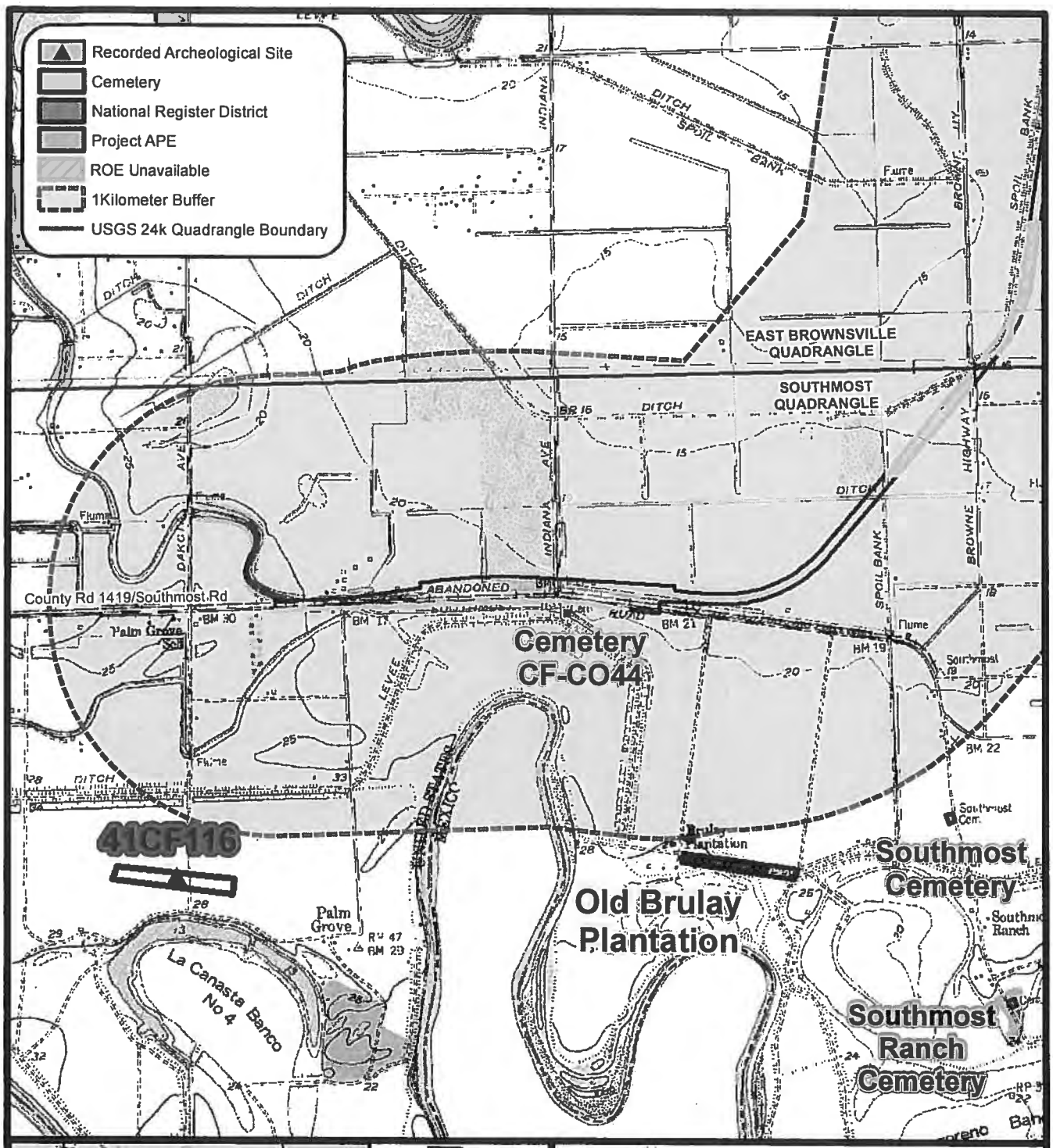
Cc w/attachment: Robin Gelston, TxDOT Pharr District Senior Environmental Scientist; Sonja Hernandez, ENV-PD; Christopher Ringstaff ENV-Arch TxDOT; ENV Arch Project File

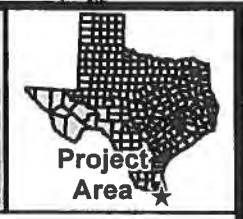
cc w/o attachments: ETS Scan

Concurrence By:

12-6-11

for: Mark Wolfe, Executive Director and SHPO — Date
Texas Historical Commission





Feet 0 2,200

Meters 0 500

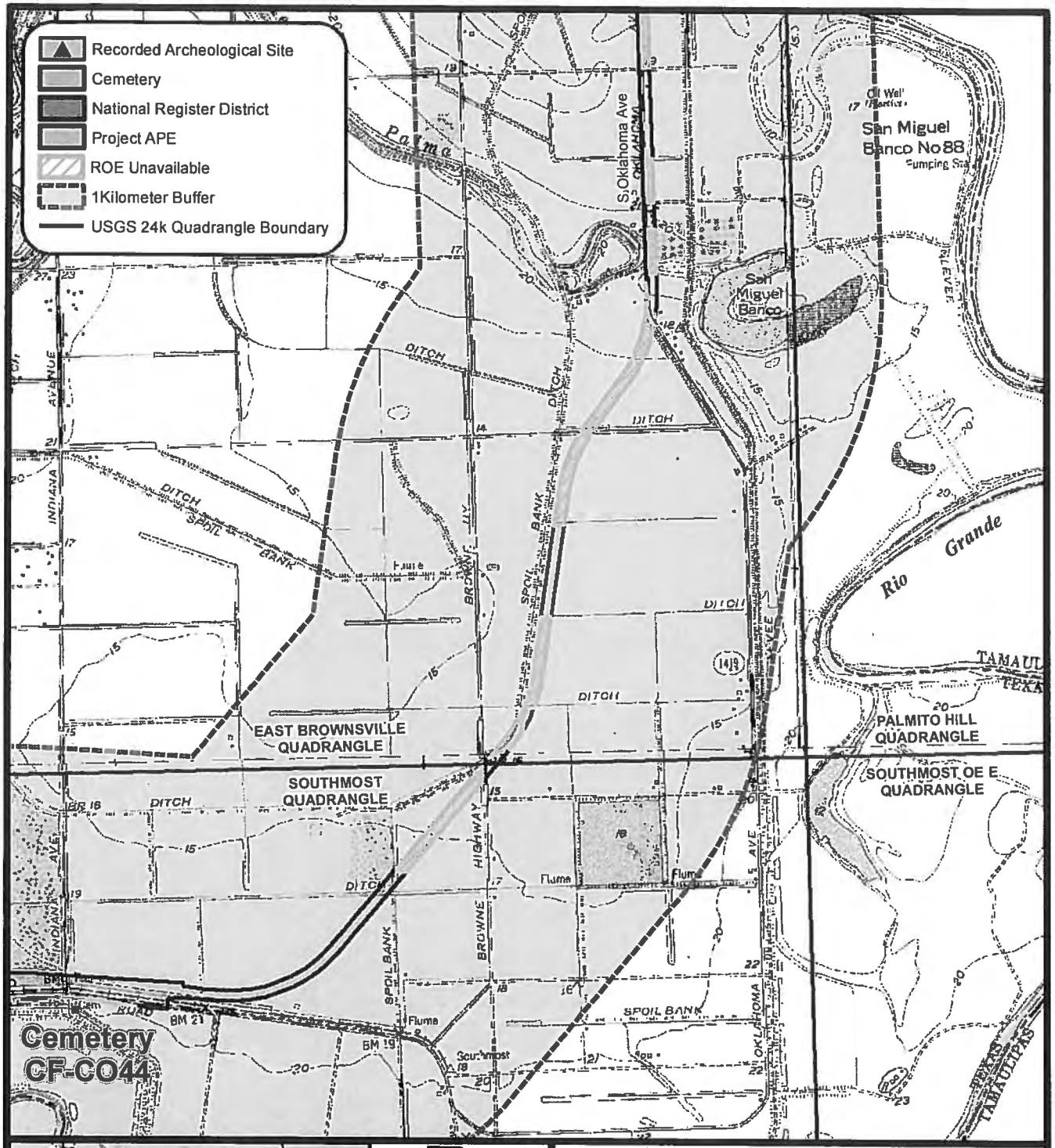
N

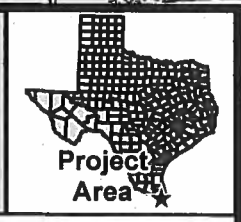
COX | McLAIN
Environmental Consulting

Figure 1a
Location of Project APE

Prepared for: S&B Infastructure	
Project No.:	Scale: 1 in = 2,200 ft
Prepared by: AP	Date: 11/28/2011

File: G:\Projects\S_B\SH32_Bville_E_Loop\Figures\Fig1_ENV_Cov_Letter_20111128.mxd





COX | McLAIN
Environmental Consulting

Figure 1b

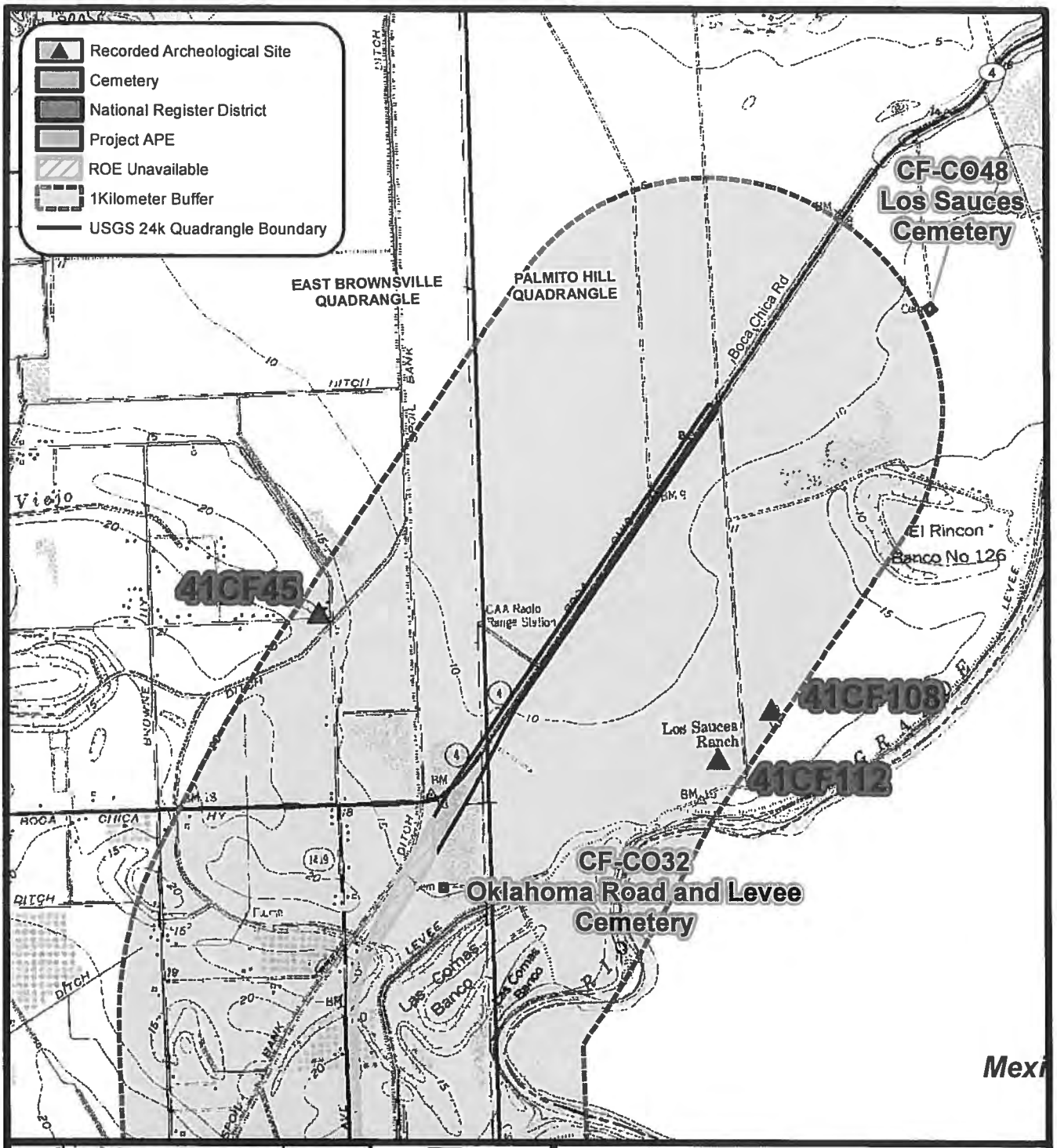
Location of Project APE

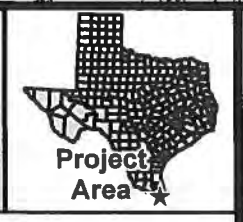
Feet 0 2,200 Meters 0 500

N

Prepared for: S&B Infastructure	
Project No.:	Scale: 1 in = 2,200 ft
Prepared by: AP	Date: 11/28/2011

File: G:\Projects\S_B\SH32_Bville_E_Loop\Figures\Fig1_ENV_Cov_Letter_20111128.mxd





Feet 0 2,200

Meters 0 500

N

COX | McLAIN
Environmental Consulting

Figure 1c
Location of Project APE

Prepared for: S&B Infastructure	
Project No.:	Scale: 1 in = 2,200 ft
Prepared by: AP	Date: 11/28/2011

File: G:\Projects\S_B\SH32_Bville_E_Loop\Figures\Fig1_ENV_Cov_Letter_20111128.mxd

United States Department of the Interior
FISH AND WILDLIFE SERVICE
Ecological Services - LRGV SubOffice
Phone: (956) 784-7560 Fax: (956) 787-0547
Rt. 2 Box 202-A
Alamo, TX 78516
September 20, 2010

S&B
McAllen Office
SEP 28 2010

Mark Iglesias
S&B Infrastructure, LTD.
5408 North 10th Street
McAllen, Texas 78504

Consultation No. 21410-2010-TA-0524

Dear Mr. Iglesias:

This responds to a letter received on September 16, 2010 regarding the effects of the proposed East Loop Project alignment on species federally listed or proposed for listing as threatened or endangered occurring within Cameron County, Texas. In addition, your project was evaluated with respect to wetlands and other important fish and wildlife resources.

It's the Service's understanding that the Cameron County Regional Mobility Authority (CCRMA) is conducting an environmental investigation for the proposed East Loop project located south of the Port of Brownsville and east of Farm-to-Market (FM) 511 in Cameron County, Texas. The proposed East Loop project is from the Paloma Blanca Drive and Southmost Road (FM 1419) intersection, east along FM 1419 and then traverses northeast to approximately 1.1 miles northeast of Sate Highway 4 (SH 4 or Boca Chica Boulevard) and South Oklahoma Avenue (FM 1419) intersection.

The project is in an early development phase and thus far three preliminary alignment alternatives within 4,500 foot wide study corridor have been developed, but a preferred alternative has not yet been identified pending public involvement and additional environmental and engineering analysis. The proposed East Loop facility would be approved 6 miles in length and require a variable right-of-way (ROW) width of 120 feet minimum and 130 feet maximum. The proposed four lane divided roadway with shoulders would vary in width from 84 feet minimum to 88 feet maximum.

There are several tracts of land within the study corridor that belong to the Lower Rio Grande National Wildlife Refuge that include Boscaje de la Palma and Southmost tracts located south of the proposed alignment alternatives along FM 1419. Also, there is the National Audubon Society Sabal Palm Grove Preserve and The Nature Conservancy (TNC Southmost) Preserve within the study corridor.

The ocelot and jaguarundi inhabit dense native brushland, generally occurring near watercourses, throughout South Texas. Population declines in both species of felids are primarily due to habitat loss associated with clearing of brush and loss of connectivity due to roads and expansion of roads without having wildlife crossings. There has been one jaguarundi road kill on S.H. 4 (Boca Chica) just east of FM 511 and S.H. 4 (Keller's Corner) in 1986. Also, there has been another jaguarundi photographed at the Sabal Palm Grove Sanctuary in 1989 (Perez 1992), and an ocelot sited at the National Audubon Society's Sabal Palm Grove (Homerstad 1986). An ocelot was captured on April 27, 1998 approximately 2.3 miles east of the proposed Port of Brownsville International Crossing.

FYI

The Service recommends a cat crossing on FM 1419 where it crosses over Resaca de la Palma to minimize impacts of these two felids by having habitat connectivity on both sides of the Resaca. After receiving more site specific information on the selected alternative, then the Service can give you more specific information on the wildlife crossing and associated fencing for your proposed project. The Service could identify other crossing as needed when more site specific information is received with the preferred alternative.

We will also need an endangered plant survey for the endangered South Texas Ambrosia (*Ambrosia cheiranthifolia*), and the Texas Ayenia (*Ayenia limitaris*) by a qualified botanist. Final survey reports should be sent directly to the coordinating Service office from the actual surveyor(s). Survey results should, at a minimum, include 1) description of the target species, 2) a map indicating the exact areas that were surveyed (such as on a U.S.G.S. topographic map), 3) the dates surveyed, and 4) the weather conditions under which the survey was conducted. In addition, we strongly recommend developing a list of plants/plant communities observed during the survey, survey methodology as well as any other relevant information that will assist in a quick and reliable determination.

Attached is the County by County federally listed species for your consideration, so you can make your determination. The State of Texas protects certain species. Please contact the Texas Parks and Wildlife Department (Endangered Resources Branch), Fountain Park Plaza Building, Suite 100, 3000 South IH-35, Austin, Texas 78704 (telephone 512/912-7011) for information concerning fish, wildlife, and plants of State concern or visit their website at http://www.tpwd.state.tx.us/nature/endangered/animals/mammals/.

We appreciate the opportunity to provide pre-planning information and look forward to providing any further assistance. Once the additional information is received we can review your determinations of effects to each species and determine if other avoidance measures would be recommended.

If we can be of further assistance, please contact Ernesto Reyes at the above letterhead and telephone number.

Sincerely,

Ernesto Reyes Jr.

Ernesto Reyes Jr.
Senior Fish & Wildlife Biologist
For
Allan M. Strand
Field Supervisor

cc:
Field Supervisor, U.S. Fish and Wildlife Service, Corpus Christi, TX
Bryan Winton, Lower Rio Grande Valley National Wildlife Manager, Alamo, TX

Federally Listed as Threatened and Endangered Species of Texas
May 1, 2008

County-by-County lists containing species information is available at the U.S. Fish and Wildlife Service's (Service), Southwest Region, web site http://www.fws.gov/southwest/es/EndangeredSpecies/lists. This list represents species that may be found in counties throughout the state. It is recommended that the field station responsible for a project area be contacted if additional information is needed.

DISCLAIMER

This County by County list is based on information available to the U.S. Fish and Wildlife Service at the time of preparation, date on page 1. This list is subject to change, without notice, as new biological information is gathered and should not be used as the sole source for identifying species that may be impacted by a project.

(Cameron County)

Green sea turtle	(T)	*Chelonia mydas*
Gulf Coast jaguarundi	(E)	*Herpailurus yagouaroundi cacomitli*
Hawksbill sea turtle	(E w/CH‡)	*Eretmochelys imbricata*
Kemp's Ridley sea turtle	(E)	*Lepidochelys kempii*
Leatherback sea turtle	(E w/CH‡)	*Dermochelys coriacea*
Loggerhead sea turtle	(T)	*Caretta caretta*
Northern aplomado falcon	(E)	*Falco femoralis septentrionalis*
Ocelot	(E)	*Leopardus pardalis*
Piping plover	(T w/CH)	*Charadrius melodus*
South Texas ambrosia	(E)	*Ambrosia cheiranthifolia*
Texas ayenia	(E)	*Ayenia limitaris*
West Indian manatee	(E)	*Trichechus manatus*

INDEX

Statewide or area wide migrants are not included by county, except where they breed or occur in concentrations.

E	=	Species in danger of extinction throughout all or a significant portion of its range.
T	=	Species which is likely to become endangered within the foreseeable future throughout all or a significant portion of its range.
DM	=	Delisted, monitoring for 5 years
C	=	Species for which the Service has on file enough substantial information to warrant listing as threatened or endangered.
CH	=	Critical Habitat (in Texas unless annotated ‡)
P/	=	Proposed ...
P/E	=	Species proposed to be listed as endangered.
P/T	=	Species proposed to be listed as threatened.
□	=	with special rule
‡	=	CH designated (or proposed) outside Texas
~	=	protection restricted to populations found in the "interior" of the United States.

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Division of Ecological Services
10711 Burnet Road, Suite 200
Austin, Texas 78758
512 490-0057
FAX 490-0974

February 19, 2015

Mr. Carlos Swonke
Texas Department of Transportation
125 East 11th Street
Austin, TX 78701-2483

Consultation Number 02ETCC00-2015-I-0020

RE: CSJs 3626-02-001, 3626-03-001, 1426-01-043, and 0039-10-076

Dear Mr. Swonke:

Thank you for your letter of January 13, 2015, in which the Texas Department of Transportation (TxDOT) provided information on your proposal to construct the eastern portion of proposed State Highway (SH) 32 in Cameron County, Texas. TxDOT has submitted documentation to the U.S. Fish and Wildlife Service (Service) requesting concurrence that the project may affect, but is not likely adversely affect, the ocelot (*Leopardus pardalis*), Gulf coast jaguarundi (*Herpailurus yaguarondi*), or aplomado falcon (*Falco femoralis*), species listed pursuant to the Endangered Species Act of 1973 (Act), as amended (16 U.S.C. 1531 *et seq.*).

Section 7 of the Act requires that all Federal agencies consult with the Service to ensure that the actions authorized, funded, or carried out by such agencies do not jeopardize the continued existence of any threatened or endangered species or adversely modify or destroy designated critical habitat of such species. The Federal Highway Administration (FHWA) assigned responsibility for compliance with the National Environmental Policy Act (NEPA) and all federal resource agency consultations, including section 7 formal consultations, to TxDOT in an MOU dated December 16, 2014 (23 U.S.C. 327). Therefore, TxDOT is the Federal agency associated with this proposed project.

The project proposal involves the construction of the eastern portion of SH 32, between FM 3068 and SH 4, a distance of about 5.88 miles, in Cameron County, Texas. The development of SH 32 east would be accomplished by redesigning 2.2 and 1.5 mile portions of the existing FM 1419 and SH 4 alignments and constructing an additional 2.18 miles of roadway on a new alignment between the two existing segments. FM 1419 and SH 4 consist of two 12-foot travel lanes, with shoulder width varying between 2 and 8 feet. SH 4 also includes a 6- to 8-foot wide center turn lane. The existing right-of-way (ROW) width for FM 1419 and SH 4 is 80 and 100 feet, respectively. Utilities located within the existing ROW would be adjusted or relocated within the proposed new ROW as needed prior to construction.

The proposed work would be divided into several separate phases; however, this consultation examines the impacts of the action in its entirety. Project maps and typical section drawings are included in Appendix A of the Biological Evaluation (BE). The project is anticipated to begin in late 2015 and Phase 1 would take several years to complete. The construction timing of Phase 2 is currently unknown and would depend on future traffic needs.

The first construction phase would have two typical sections. The first typical section would begin about 0.78 miles west of FM 3068 and end at FM 3068. It would consist of four 12-foot travel lanes, a 16-foot wide raised median, and two 10-foot wide outside shoulders, all within a 150-foot wide ROW. The second typical section would begin at FM 3068 and extend to SH 4, at the future entrance to the Port of Brownsville. This section would consist of two 12-foot wide travel lanes and two 10-foot wide shoulders within a 15-foot ROW. The second phase of construction would add two additional 12-foot travel lanes and a 16-foot median to the road between FM 1604 and SH 4. Overpasses would also be constructed at the intersections at FM 1604 and SH 4. Graded vegetated ditches would be installed along the roadway to provide drainage.

At the intersection of SH 32 and SH 4, SH 4 would be realigned to connect with the new overpass and would require 0.84 acre of additional ROW for construction of a the 60-foot wide connector. The existing structure at Drainage Ditch 12 would be removed and replaced with a bridge, and the existing SH 4 road between Drainage Ditch 12 and SH 32 would be removed. Re-designated FM 3550 would connect to SH 32 via two new connector roads, one located about 0.5-mile east of the existing FM 3068 and the other located about 0.8-mile south of Florida Road. Both connector roads would consist of two 12-foot travel lanes and 10-foot wide outside shoulders.

Vehicle collisions are the leading known cause of ocelot mortality in Texas, accounting for about 45 percent of deaths. As existing roadways are expanded and new roads are constructed, residential and commercial development would also increase. This results in the removal of ocelot/jaguarundi habitat and movement corridors and increases the risk of death by vehicle collision. Many of the known ocelot road kills have occurred within a coastal corridor extending south of Laguna Atascosa National Wildlife Refuge to the Rio Grande. The last confirmed sighting of a Gulf coast jaguarundi in the US was in 1986, when a road killed individual was found about two miles east of Brownsville. TxDOT installed or proposed a number of wildlife crossings in this area for the protection of ocelots and other wildlife.

The existing land use along the proposed SH 32 corridor is predominately cropland, with some livestock grazing and scattered residential development. Very little native thornscrub community, which is preferred by the ocelot, exists within the project corridor. Where thornscrub does exist, it is in very small isolated patches. Riparian vegetation does occur along the Resaca de la Palma. While this habitat is not ideal for ocelot or jaguarundi, it may be used to provide temporary refuge or as a dispersal corridor. However, the closest known ocelot population is at LANWR, approximately 15 miles north of the project site, and barriers, such as the Brownsville Ship Channel, exist between LANWR and the project site, resulting in a low

likelihood of ocelots or jaguarundi being killed on the road. Even without the construction of SH 32 east, the potential for wildlife vehicle interactions exists due to the presence of the existing roads that make up part of the proposed alignment.

Service and TxDOT biologists met in November 2010 and April 2012 to discuss this project and actions that TxDOT could take to avoid or minimize effects to listed species. In order to further minimize the potential for lethal interactions between ocelots or jaguarundi and vehicles on SH 32 east, TxDOT agreed to install a wildlife crossing under SH 32 at Resaca de la Palma. The crossing would consist of a 5x5 foot box culvert placed at grade along the north bank of the Resaca and north of the existing below grade drainage culvert. A qualified biologist would be present to ensure the correct placement of the wildlife crossing and fencing. The crossing would be 123 feet long for the Phase 1 construction and extended to 202 feet long for the final roadway configuration, with a three foot square grate placed in the center median of the final design to provide an inlet for natural light into the culvert. The wildlife crossing would be designed and constructed to provide a clear line of sight from one side of the road to the other. A 6-foot high hurricane fence would be installed along the road ROW to direct wildlife into the crossing. In addition, native plant species would be installed in a 0.032 acre area to extend the existing riparian area along the Resaca.

There are no known occurrences of aplomado falcon within the project area. The closest sighting for the species, according to the Texas Department of Parks and Wildlife's Natural Diversity Database, is about 1.5 miles away. However, there is potential habitat for the falcon towards the northeastern end of the project. If any aplomado falcons were present in this habitat during construction they could be disturbed by construction noise, but that is very unlikely.

In addition to the installation of the wildlife crossing discussed above, TxDOT has proposed to implement the following voluntary conservation measures to minimize impacts to the ocelot, jaguarundi, and aplomado falcon.

- Construction would be restricted to daylight hours and construction lighting would not be required minimizing potential harassment from noise and construction lights. In addition, construction equipment would meet all Federal muffler requirements.
- To the maximum extent practicable, project specific locations (PSLs) would be located within the existing or proposed ROW in areas that would not require the removal of woody vegetation. The project contractors would be responsible for environmental coordination of any PSLs located outside of the ROW. TxDOT would provide project contractors with educational information on the federally listed species that occur in the area and their habitat requirements.
- The clearing of vegetation or wooded areas would be restricted to the minimum necessary to complete construction and only within the proposed ROW. Vegetation disturbances would be conducted between September and February, outside of the general bird nesting season, or the areas proposed for disturbance would be surveyed for nesting birds by a qualified biologist prior to disturbance. Vegetation impacts would be partially mitigated through re-vegetation of exposed areas of the ROW after construction is complete.

- Roadway lighting would be limited to the intersections with existing roads and would be minimized at those intersections, while still addressing safety concerns.
- Construction would occur completely within the existing right-of-way.
- Maintenance mowing would be limited to previously cleared areas in the ROW and outside of the area where the wildlife crossing is installed. "No Mow" signs would be installed in certain areas to ensure that native vegetation is maintained.
- TxDOT would implement a protocol to notify the Service if any federally protected species are sighted during construction. If an ocelot or jaguarundi is observed, all work activities would cease until the animal has moved away from the construction zone.

In addition to the conservation measures proposed by TxDOT, the Service has determined that TxDOT must inspect the wildlife crossing every six months and after every rain event of greater than two inches in a 24 hour period to determine if maintenance/cleaning is needed. While not proposed or required, the Service encourages TxDOT to monitor the wildlife crossing on both sides of the highway, via trail cameras or similar methods, in order to determine if the crossing is being used by ocelots, jaguarundi, or other wildlife species. If monitoring is done, any information gathered should be submitted to the Service on an annual basis to enhance our knowledge of local cat movements.

Based on the information above, we concur with TxDOT's conclusion that the proposed project "may affect, but is not likely to adversely affect" the ocelot, Gulf coast jaguarundi, or aplomado falcon. Therefore, no further endangered species consultation would be required for this project unless: 1) the identified action is subsequently modified in a manner that causes an effect on listed species or designated Critical Habitat; 2) new information reveals the identified action may affect federally protected species or designated Critical Habitat in a manner or to an extent not previously considered; or 3) a new species is listed or Critical Habitat is designated under the Act that may be affected by the identified action.

We appreciate your efforts to conserve these sensitive species. If you have any questions or comments, please contact Darren LeBlanc at 512-490-0057 (ext. 247) or 512-608-7591.

Sincerely,

for David Hoth
Acting Field Supervisor
Coastal Ecological Services Field Office

cc: Robin Gelston, TxDOT Pharr District, Pharr, TX (electronic)
Andy Blair, TxDOT ENV, Austin, TX (electronic)
Meghan Powlowski, TxDOT ENV, Austin, TX (electronic)

DEPARTMENT OF THE ARMY
GALVESTON DISTRICT, CORPS OF ENGINEERS
Corpus Christi Regulatory Field Office
5151 Flynn Parkway, Suite 306
Corpus Christi, Texas 78411-4318

REPLY TO
ATTENTION OF
Regulatory Branch

July 25, 2012

SUBJECT: Jurisdictional Determination No. SWG-2012-00194

S&B
McAllen Office
JUL 27 2012

S&B Infrastructure, Ltd.
Attn: Mark Iglesias
5408 North 10th Street
McAllen, Texas 78504-2616

Gentlemen:

This concerns your letter, dated March 2, 2012, submitted on behalf of Cameron County Regional Mobility Authority, requesting a Jurisdictional Determination for their proposed State Highway 32 project. The proposed project site is located south of the Port of Brownsville and east of FM 511 along a 6.66-mile length that extends from approximately 0.78 mile west from the intersection of Farm-to-Market Road (FM) 3068 and FM 1419 to State Highway 4, Cameron County, Texas as shown on the enclosed map on two sheets.

Based on aerial photography, topographical maps, and information that you submitted, we have determined that your project involves work in waters of the United States, including wetlands. Specifically, Wetlands 1, 2, and 3 along Resaca de la Palma are jurisdictional waters and are subject to U.S. Army Corps of Engineers (Corps) regulation under Section 404 of the Clean Water Act.

Accordingly, any activities that involve the discharge of dredged or fill material into the jurisdictional waters mentioned above will require a Department of Army permit. In addition, best management practices, such as maintaining silt fences around the work area, must be utilized when working in or near any jurisdictional waters of the U.S., such as the Rio Grande and its adjacent tributaries and associated wetlands, to prevent erosion and protect water quality. Should you determine that your project would cause the discharge of fill material into a jurisdictional area, you should submit plans for our review prior to the initiation of the project.

This determination has been conducted to identify the limits of the Corps Clean Water Act jurisdiction for the particular sites identified in this request. This determination may not be valid for the wetland conservation provisions of the Food Security Act of 1985, as amended. If the property owner or his tenant are USDA program participants, or anticipate participation in USDA programs, a certified wetland determination should be requested from the local office of the Natural Resources Conservation Service prior to starting work.

If you object to this determination, you may request an administrative appeal under Corps regulations at 33 CFR Part 331. Enclosed you will find a combined Notification of Administrative Appeal Options and Process (NAP) and Request for Appeal (RFA) form. If you request to appeal this determination you must submit a completed RFA form to the Southwestern Division Office at the following address:

Elliott Carman, Regulatory Appeals Officer
Southwest Division USACE (CESWD-PD-O)
1100 Commerce Street, Suite 831
Dallas TX 75242-1317

Telephone: 469-487-7061; FAX: 469-487-7199

In order for an RFA to be accepted by the Corps, the Corps must determine that it is complete, meets the criteria for appeal under 33 C.F.R. Part 331.5, and that it has been received by the Division Office within 60 days of the date of the NAP. Should you decide to submit an RFA form, it must be received at the above address within 60 days of the date of this letter.

It is not necessary to submit an RFA form to the Division office if you do not object to the determination in this letter.

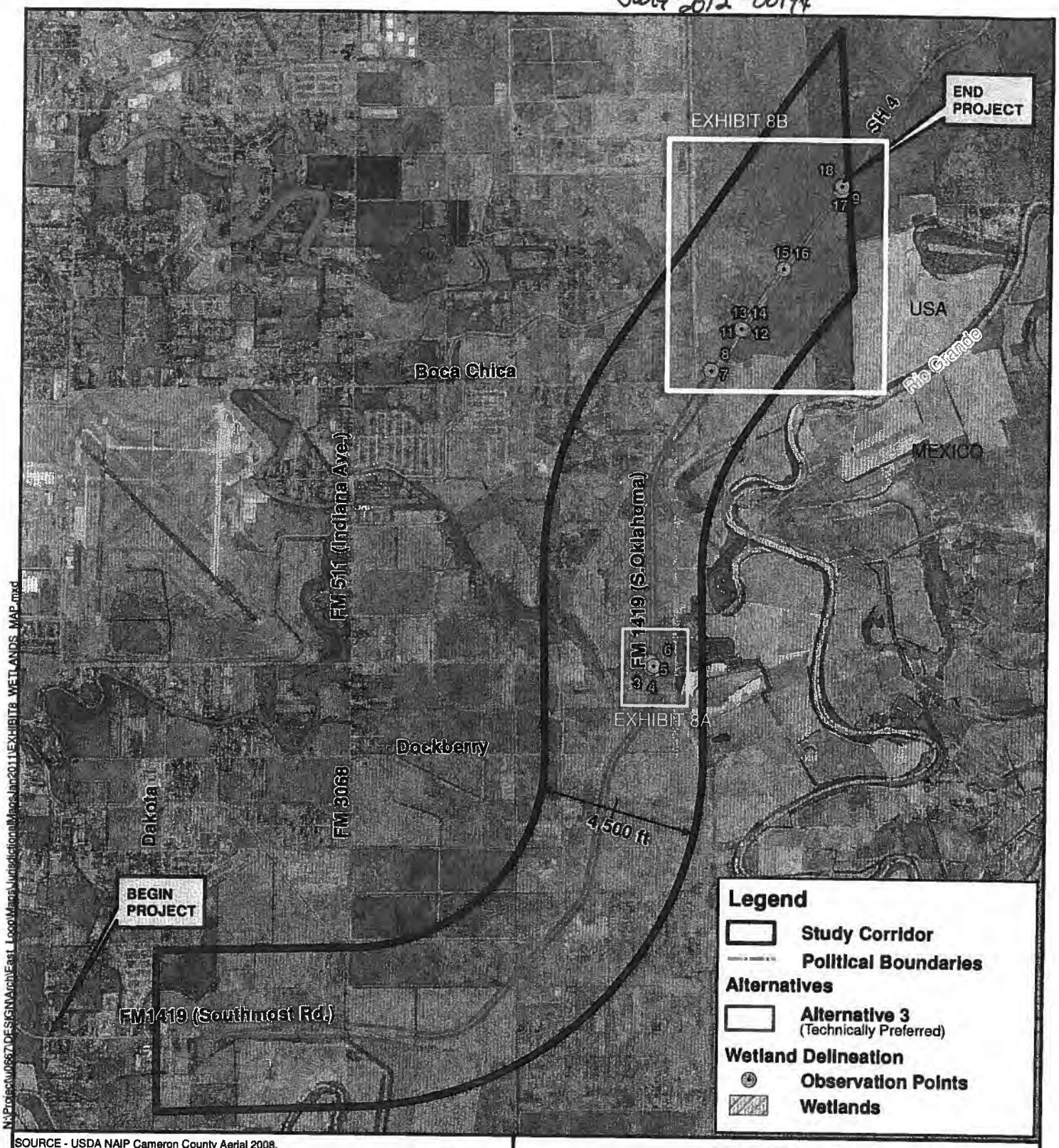
This approved determination is valid for 5 years from the date of this letter unless new information warrants a revision of the determination prior to the expiration date. Please reference the determination **SWG-2012-00194** in future correspondence pertaining to this project. If you have any questions, please contact Mark Pattillo at the letterhead address or by telephone at 361-814-5847. Also, to assist us in improving our service to you, please complete the survey found at: http://per2.nwp.usace.army.mil/survey.html

Sincerely,

Lloyd Mullins, Supervisor
Corpus Christi Regulatory Field Office

MAR 0 5 2012

SWG-2012-00194



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SOURCE - USDA NAIP Cameron County Aerial 2008.

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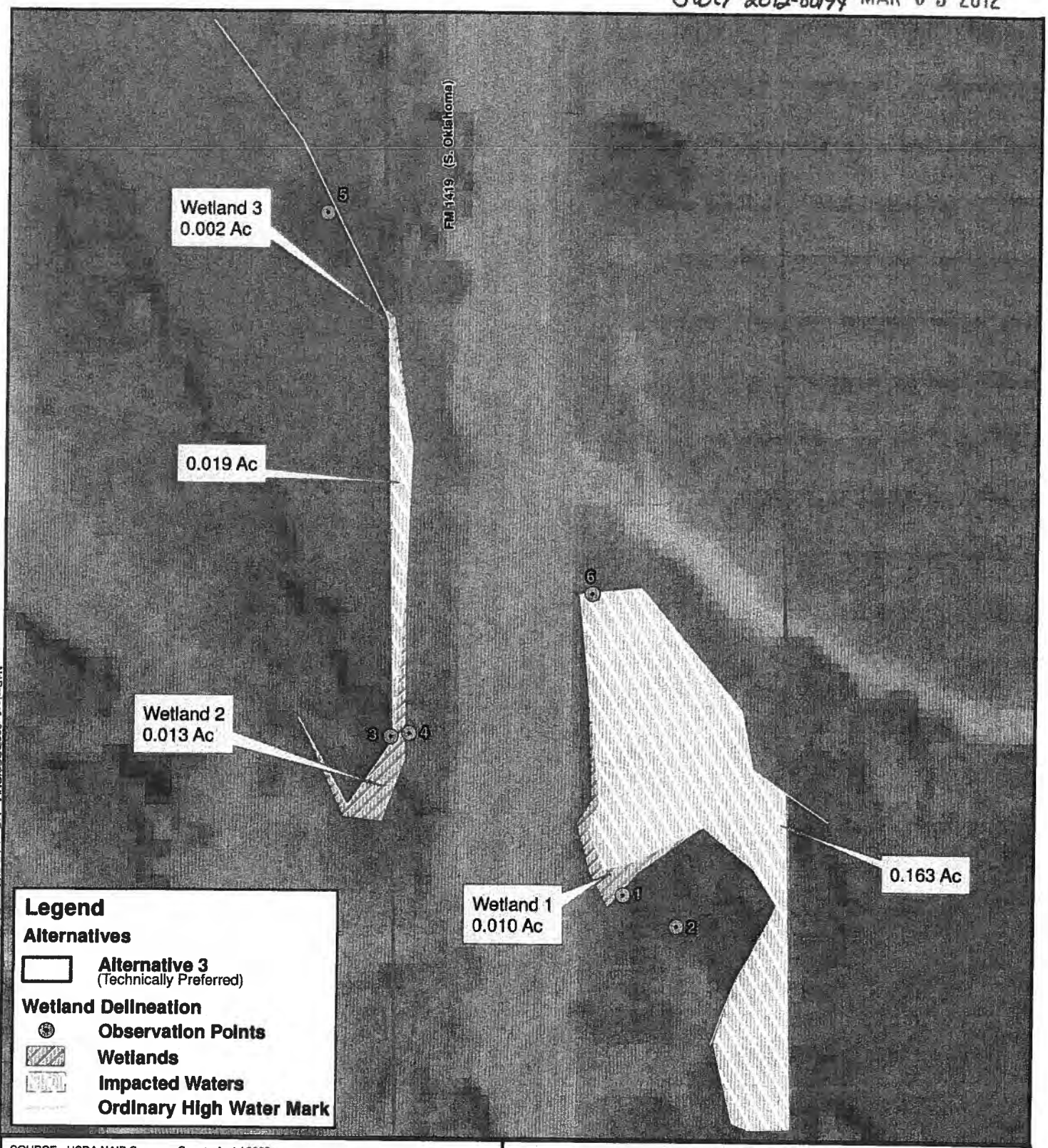
EXHIBIT 8
WETLAND DELINEATION MAP

CCRMA
CAMERON COUNTY REGIONAL MOBILITY AUTHORITY

SH 32
CAMERON COUNTY, TEXAS

pg 1 of 2

SWG-2012-00194 MAR 0 5 2012



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SOURCE - USDA NAIP Cameron County Aerial 2008.

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EXHIBIT 8A
WETLAND DELINEATION MAP

CCRMA
CAMERON COUNTY REGIONAL MOBILITY AUTHORITY

SH 32
CAMERON COUNTY, TEXAS

pg 2 of 2

NOTIFICATION OF ADMINISTRATIVE APPEAL OPTIONS AND PROCESS AND REQUEST FOR APPEAL

Applicant: Cameron Co. Regional Mobility Auth.	Determination: SWG-2012-00194	Date: 25 July 2012
Attached is:		See Section below
	INITIAL PROFFERED PERMIT (Standard Permit or Letter of Permission)	A
	PROFFERED PERMIT (Standard Permit or Letter of Permission)	B
	PERMIT DENIAL	C
X	APPROVED JURISDICTIONAL DETERMINATION	D
	PRELIMINARY JURISDICTIONAL DETERMINATION	E

SECTION I - The following identifies your rights and options regarding an administrative appeal of the above decision. Additional information may be found at http://www.usace.army.mil/CECW/Pages/reg_materials.aspx or Corps regulations at 33 CFR Part 331.

A: INITIAL PROFFERED PERMIT: You may accept or object to the permit.

- ACCEPT: If you received a Standard Permit, you may sign the permit document and return it to the district engineer for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations associated with the permit.

- OBJECT: If you object to the permit (Standard or LOP) because of certain terms and conditions therein, you may request that the permit be modified accordingly. You must complete Section II of this form and return the form to the district engineer. Your objections must be received by the district engineer within 60 days of the date of this notice, or you will forfeit your right to appeal the permit in the future. Upon receipt of your letter, the district engineer will evaluate your objections and may: (a) modify the permit to address all of your concerns, (b) modify the permit to address some of your objections, or (c) not modify the permit having determined that the permit should be issued as previously written. After evaluating your objections, the district engineer will send you a proffered permit for your reconsideration, as indicated in Section B below.

B: PROFFERED PERMIT: You may accept or appeal the permit

- ACCEPT: If you received a Standard Permit, you may sign the permit document and return it to the district engineer for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations associated with the permit.

- APPEAL: If you choose to decline the proffered permit (Standard or LOP) because of certain terms and conditions therein, you may appeal the declined permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

C: PERMIT DENIAL: You may appeal the denial of a permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

D: APPROVED JURISDICTIONAL DETERMINATION: You may accept or appeal the approved jurisdictional determination (JD) or provide new information.

- ACCEPT: You do not need to notify the Corps to accept an approved JD. Failure to notify the Corps within 60 days of the date of this notice, means that you accept the approved JD in its entirety, and waive all rights to appeal the approved JD.

- APPEAL: If you disagree with the approved JD, you may appeal the approved JD under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

E: PRELIMINARY JURISDICTIONAL DETERMINATION: You do not need to respond to the Corps regarding the preliminary JD. The preliminary JD is not appealable. If you wish, you may request an approved JD (which may be appealed), by contacting the Corps district for further instruction. Also you may provide new information for further consideration by the Corps to reevaluate the JD.

SECTION II - REQUEST FOR APPEAL or OBJECTIONS TO AN INITIAL PROFFERED PERMIT

REASONS FOR APPEAL OR OBJECTIONS: (Describe your reasons for appealing the decision or your objections to an initial proffered permit in clear concise statements. You may attach additional information to this form to clarify where your reasons or objections are addressed in the administrative record.)

ADDITIONAL INFORMATION: The appeal is limited to a review of the administrative record, the Corps memorandum for the record of the appeal conference or meeting, and any supplemental information that the review officer has determined is needed to clarify the administrative record. Neither the appellant nor the Corps may add new information or analyses to the record. However, you may provide additional information to clarify the location of information that is already in the administrative record.

POINT OF CONTACT FOR QUESTIONS OR INFORMATION:

If you have questions regarding this decision and/or the appeal process you may contact:
Lloyd Mullins, Leader
U.S. Army Corps of Engineers
Corpus Christi Regulatory Field Office
5151 Flynn Parkway, Suite 306
Corpus Christi, Texas 78411-4318
Telephone: 361-814-5851

If you only have questions regarding the appeal process you may also contact:
Elliott N. Carman, Appeal Review Officer
CESWD-PDS-O, 1100 Commerce Street, Ste. 831
Dallas, Texas 75242-1317
Telephone: 469-487-7061; FAX 469-487-7199
Email: elliott.n.carman@usace.army.mil

RIGHT OF ENTRY: Your signature below grants the right of entry to Corps of Engineers personnel, and any government consultants, to conduct investigations of the project site during the course of the appeal process. You will be provided a 15 day notice of any site investigation, and will have the opportunity to participate in all site investigations.

	Date:	Telephone number:
Signature of appellant or authorized agent.		

APPENDIX E

VEGETATION SUMMARY TABLE

Vegetation Types		MOU Threshold[4] (acres)	Vegetation Within Project ROW		
EMST	**MOU Threshold**		**EMST (# acres and % of total)**	**Observed[1] Vegetation (# acres and % of total)**	**MOU Threshold Table Exceeded?**
Coastal: Salt and Brackish High Tidal Marsh	Tidal and Salt Marsh	0.01	0.1 0.1%	0 0%	No
Coastal: Sea Ox-eye Daisy Flats	Tidal and Salt Marsh	0.01	0.7 0.6%	0 0%	No
Gulf Coast: Salty Prairie	Tidal and Salt Marsh	0.01	33.8 26.7%	0 0%	No
Gulf Coast: Salty Prairie Shrubland	Tidal and Salt Marsh	0.01	1 0.8%	0 0%	No
Row Crops	Agriculture	10	17.2 13.6%	40.8 32.2%	Yes
South Texas: Clayey Blackbrush Mixed Shrubland	Scrub, Thornscrub, Shrubland	2	3.6 2.8%	0 0%	No
South Texas: Clayey Mesquite Mixed Shrubland	Scrub, Thornscrub, Shrubland	2	1.2 0.9%	0.7 0.6%	No
South Texas: Disturbance Grassland	Disturbed Prairie	3	31 24.4%	33.8 26.6%	Yes
South Texas: Floodplain Evergreen Forest and Woodland	Mixed Woodlands and Forests	0.5	0.01 0%	0 0%	No
South Texas: Floodplain Herbaceous Wetland	Floodplain	0.5	0.02 0%	0 %	No
South Texas: Floodplain Mixed Deciduous – Evergreen Forest and Woodland	Mixed Woodlands and Forests	0.5	0.1 0.1%	0 %	No
South Texas: Loma Evergreen Shrubland	Clay Dunes	0.01	1.7 1.3%	0 0%	No
Urban High Intensity[3]	N/A	N/A	0.9 0.7%	18.2 14.3%	No
Urban Low Intensity	N/A	N/A	35.6 28%	32.2 25.4%	No
Open Water[2]	Riparian	0.1	0 0%	1.2 0.9%	Yes
TOTAL			126.9	126.9	

1. Indicates actual conditions observed in the field by a qualified biologist. 2. Although vegetation type is not listed by the EMST as occurring in ROW, vegetation type is present within the project ROW. 3. Observed area includes the existing roadways. 4. From MOU Threshold PA.

APPENDIX F

U.S. FISH AND WILDLIFE MIGRATORY BIRDS OF CONCERN

U.S. Fish and Wildlife Migratory Birds of Concern	
Species Name	**Seasonal Occurrence in Project Area**
Altamira Oriole *(Icterus gularis)*	Year-round
American Oystercatcher *(Haematopus palliates)*	Year-round
Bell's Vireo *(Vireo bellii)*	Breeding
Black Skimmer *(Rynchops niger)*	Year-round
Botteri's Sparrow *(Aimophila botterii)*	Breeding
Buff-bellied Hummingbird *(Amazilia yucatanensis)*	Year-round
Burrowing Owl *(Athene cunicularia)*	Wintering
Chestnut-collared Longspur *(Calcarius ornatus)*	Wintering
Dickcissel *(Spiza Americana)*	Breeding
Green parakeet *(Aratinga holochlora)*	Year-round
Gull-billed Tern *(Gelochelidon nilotica)*	Year-round
Hudsonian Godwit *(Limosa haemastica)*	Migrating
Least tern *(Sterna antillarum)*	Breeding
Lesser Yellowlegs *(Tringa flavipes)*	Wintering
Loggerhead Shrike *(Lanius ludovicianus)*	Wintering
Long-Billed curlew *(Numenius americanus)*	Wintering
Marbled Godwit *(Limosa fedoa)*	Wintering
Mountain plover *(Charadrius montanus)*	Wintering
Northern Beardless-Tyrannulet *(Camptostoma imberbe)*	Year-round
Peregrine Falcon *(Falco peregrinus)*	Wintering
Red Knot *(Calidris canutus rufa)*	Wintering
Red-billed Pigeon *(Patagioenas flavirostris)*	Year-round
Red-crowned Parrot *(Amazona viridigenalis)*	Year-round
Reddish egret *(Egretta rufescens)*	Year-round
Sandwich Tern *(Thalasseus sandvicensis)*	Year-round
Sedge Wren *(Cistothorus platensis)*	Wintering
Short-billed Dowitcher *(Limnodromus griseus)*	Wintering
Snowy Plover *(Charadrius alexandrines)*	Breeding
Solitary Sandpiper *(Tringa solitaria)*	Wintering
Sprague's Pipit *(Anthus spragueii)*	Wintering
Swainson's Warbler *(Limnothlypis swainsonii)*	Migrating
Whimbrel *(Numenius phaeopus)*	Wintering
White-collared Seedeater *(Sporophila torqueola)*	Year-round
White-tailed Hawk (Buteo albicaudatus)	Year-round
Wilson's Plover *(Charadrius wilsonia)*	Breeding
Worm eating Warbler *(Helmitheros vermivorum)*	Migrating