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US 83 La Joya Loop Project, Hidalgo County, Texas

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US 83 La Joya Loop Project, Hidalgo County, Texas

Report for Archeological Survey

US 83 La Joya Loop Project,
Hidalgo County, Texas

Christopher Ringstaff Principal Investigator,
Antiquities Permit No. 8160

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 12-16-14, and executed by FHWA and TxDOT.

Abstract

The proposed US 83 La Joya Loop Project is a new location roadway in southwestern Hidalgo County originating at US 83 and Showers Road near Havana and ending at US 83 approximately 0.8 miles east of FM 886 (El Faro Road) near the town of Peñitas. The Area of Potential Effect (APE) has an approximate length of approximately 10.5 miles with a total area of approximately 462.3 acres. The original survey was conducted between April and October of 2013

The present survey examined two parcels of the APE that were inaccessible due to denied of Right of Entry (ROE). The parcels have a combined area of 54.9 acres. Both were defined high probability areas for the presence of sites though preservation potential in the larger tract is considered poor due to clearing and decades of agriculture impacts. The typical depth of impact will be approximately 3 feet for the roadway construction, 6 feet for culverts, and 50 feet for bridge pilings. The US 83 La Joya Loop Project survey was conducted by TxDOT archeologists between September and October, 2017. A total of 17 shovel tests and 9 backhoe trenches, were excavated largely in the high probability areas although some shovel testing was conducted in the low probability areas Both are within the defined high probability area and will require survey once ROE is granted.

The western parcel, designated Area 1, has an area of 9.3 acres and consists of ranch land with secondary growth scrub woodland and several north south-trending two-track roads that traverse the tract. Investigations at Area 1 included pedestrian survey and subsurface testing. No new archeological sites were recorded but site 41HG242, located immediately east of the tract, was found to extend approximately 175 meters westward into the parcel. The site consists of a surficial lithic scatter and subsurface testing in Area 1 was unable to identify intact subsurface deposits associated with the site.

The eastern tract, Area 2, has an area of 45.6 acres and consists of agricultural lands that are completed cleared and plowed. Investigations at the location included pedestrian survey and subsurface testing. Two new archeological sites were recorded in Area 2 consisting of 41HG261 and 41HG262, A previously recorded site, 41HG239, is located immediately west of the tract and was found to extend approximately 195 meters eastward into Area 2. All three sites consisted of very low density (< 10 non-diagnostic lithic artifacts) surficial lithic scatters, Subsurface testing in Area 2 verified the extensive plow impacts and was unable to identify intact subsurface deposits associated with any of the three sites.

Based on the results of the survey, land-use over the past Century has severely impacted both Area 1 and Area 2. As such, the documented impacts within the APE examined indicates that sites 41HG239, 242, 261, and 262 lack sufficient integrity of location, association, and materials to be able to address important questions of history and prehistory (36 CFR 60.4).

Based on the results of the pedestrian survey and subsurface testing, the cleared and plowed agricultural lands was subjected to pedestrian survey only due to the extensive impacts. The proposed undertaking has no potential to affect archeological historic properties (36 CFR 800.16(l)) or State Antiquities Landmarks (13 TAC 26.12) in the APE and no further work is warranted for the proposed project.

Project Identification

- **Date:** 10/06/2017
- **Date(s) of Survey:** 09/27/2017-9/28/2017
- **Archeological Survey Type:** Reconnaissance ☐ Intensive ☒
- **Report Version:** Draft ☐ Final ☒
- **Jurisdiction:** Federal ☒ State ☒
- **Texas Antiquities Permit Number:** TAC 8160
- **District:** Pharr
- **County or Counties:** Hidalgo
- **USGS Quadrangle(s):** LaJoya and Citrus City
- **Highway:** N/A
- **CSJ:** 0039-02-040
- **Report Author(s):** Christopher Ringstaff, Dan Rodriguez, and Ken Lawrence
- **Principal Investigator:** Christopher Ringstaff

Texas Historical Commission Approval

Signature Date

Project Description

Project Type: Drainage Facility

Total Project Impact Acreage: 54.9 acres

New Right of Way (ROW) Acreage: 54.9 acres

Easement Acreage: 0.0 acres

Area of Pedestrian Survey: approx. 54.9 acres

Project Description and Impacts: As shown in the attached project location map (Figure 1), the Texas Department of Transportation (TxDOT) is completing archeological survey for the US 83 La Joya Loop Project. The survey examined two unsurveyed areas of the overall La Joya Loop APE that were previously inaccessible. The two tracts, shown as Areas 1 and 2, have acreages of 10.2 and 44.7 respectively for a combined area totaling 54.9 acres.

Area of Potential Effects (APE): The Area of Potential Effects (APE) for the proposed US 83 La Joya Loop Survey has a combined length of approximately 1.2 miles with a width that varies from approximately 300 feet to 400 feet and a combined area consisting of 54.9 acres. The western tract, Area 1, has an area of 10.2 acres and consists of secondary growth scrub woodland with several north south-trending two-track roads that traverse the tract. The eastern tract, Area 2, has an area of 45.7 acres and consists of agricultural lands that are completed cleared and plowed.

Parcel Number(s): N/A

Project Area Ownership: State of Texas.

Project Setting

Topography: The project area is located on the rolling uplands of the western Rio Grande Delta.

Geology: An overlay analysis using the digitized Geologic Atlas of Texas McAllen/Brownsville Sheet reveals the project area consists of primarily of Pleistocene Goliad formation in Area 1 and Pleistocene Lissie formation in Area 2 (Figure 3).

Soils: Based on an overlay analysis using the USDA Soil Survey Geographic Database (SSURGO) data reveals the majority of soils in the project area consist McAllen Fine Sandy Loam 0-1 percent slopes. The far eastern portion of Area 2 extends into McAllen Sandy Clay Loam. These soils are largely formed in the ancient deltaic alluvial sediments (Figure 4).

Land Use: Ranchland (Area 1) and Agricultural Lands (Area 2).

Vegetation: Survey Area 2 contains the majority of the project area and consists of fallow farm fields. Areas 1 consist of secondary growth brush and mesquite trees.

Estimated Ground Surface Visibility: Variable. Excellent in open cleared fields and good to moderate in brush cover (brush still retained mostly good surface visibility).

Comments on Project Setting: The project area is located primarily in the uplands north of the western Rio Grande Delta.

Previous Investigations and Known Archeological Sites: As this has been an ongoing project, prior record searches of the Texas Historical Commissions Archeological Sites Atlas (Atlas) were conducted on 9/23/2013 and 6/23/2016. The Atlas revealed no recorded archeological sites within the current APE but did show three sites within one kilometer (0.62 mile) of the APE recorded during an earlier phase of this project under Texas Antiquities Permit #6552. In addition other eight archeological surveys have been conducted within the APE or within one kilometer of the APE (see Table 1).

A GIS query utilizing data using the Texas Historic Overlay (THO) revealed several maps that provided sufficient large-scale project-level resolution to be useful for the background review. These maps include:

1. Garcias, Texas 1938 USACE 1:62,000 topographic quadrangle
2. Monte Christo, Texas 1940 USACE 1:62,000 topographic quadrangle
3. Los Ebanos, Texas 1938 USACE 1:62,000 topographic quadrangle
4. Mission, Texas 1916 USACE 1:62,000 topographic quadrangle

A subsequent overlay analysis using the above listed maps and the vector design schematic revealed no historic cemeteries, homesteads, or historic features within the proposed APE. In addition to the maps listed above, a review of the 1936 Highway Map of Hidalgo County did not indicate any historic cemeteries, homesteads, or historic features within the proposed APE.

Organization/ Sponsor/Survey Date	**Permit**	**Site Number**	**Site Type**	**Project Distance from APE (m)/ Site Distance from APE**
Texas Department of Highways and Public Transportation (TDHPT) on behalf of FHWA: 6/1980	N/A	No Sites Recorded within 1 km of APE	N/A	Project tangent with western terminus/ No Sites
APC on behalf of Houston Gas Pipeline Company: 3/1992	N/A	41HG149	Unknown Prehistoric Lithic Scatter	Project area and site 470m west of eastern APE
APC on behalf of Houston Gas Pipeline Company 3/1992	N/A	41HG150	Unknown Prehistoric Lithic Scatter	Project area and site 540m west of eastern APE
APC on behalf of Houston Gas Pipeline Company: 3/1992	N/A	41HG151	Unknown Prehistoric Lithic Scatter	Project area and site 510m south southwest of eastern terminus
Hicks and Company on behalf of AEP/LCRA:	3422	No Sites Recorded	N/A	Project area traverses central portion of APE/ No Sites

6/2004		within 1 km of APE		
APC on behalf of Valero Logistics/FERC: 5/2005	N/A	No Sites Recorded within 1 km of APE	N/A	Project area traverses central portion of APE/ No Sites
PBS&J on behalf of TxDOT: 12/2005	3966	No Sites Recorded within 1 km of APE	N/A	Project area overlaps central APE and western terminus/ No Sites
TxDOT La Joya Loop Project 1/2014	6552	41HG242	Prehistoric Lithic Scatter	Immediately adjacent to eastern boundary of Area 1
TxDOT La Joya Loop Project 1/2014	6552	41HG243	Prehistoric Lithic Scatter	Immediately adjacent to western boundary of Area 1
TxDOT La Joya Loop Project 1/2014	6552	41HG239	Prehistoric Lithic Scatter	Immediately adjacent to western boundary of Area 2

Table 1. Previous Investigation within one kilometer of APE.

A records review by TxDOT staff archeologists included a review of the Texas Historical Commission's Archeological Sites Atlas (Atlas) was conducted and found three previously recorded sites are located within one kilometer of the APE. Sites 41HG242 and 41HG243 are both located immediately adjacent (west and east respectively) to Area 1. A third previously recorded site, 41HG239, was recorded immediately west Area 2.

Surveyors: Christopher Ringstaff, Ken Lawrence, and Ben Morton.

Survey Methods:

The survey consisted of an Intensive Archeological Survey as defined by 13TAC26. Pedestrian survey was conducted across the entire APE. With all of the project area consisting of Pliocene and Pleistocene upland agricultural and ranch lands, surface visibility was very good (80-100 percent).

Subsurface Excavation:

A combined total of 17 shovel tests and 9 backhoe trenches were excavated across Areas 1 and 2. Shovel testing results in both Areas 1 and 2 are presented in Table 2. The backhoe trenching was only conducted in Area 1 and was performed by by Ken Lawrence and Ben Morton. **The results of the trenching conducted are presented in Appendix B.** Due to the extensive areas of clearing and plow

disturbance and near 100 percent surface visibility documented in Area 2, deviation from the CTA/THC Survey Standard was deemed appropriate for both shovel test intervals and site delineation (see Figure 2).

Collection and Curation: NO ☒ YES ☐ If yes, specify facility.

ST Number	Site	Depth	Recovery	Comments
Shovel Test 1	41HG239	0-70	Negative	Plowed Field
Shovel Test 2	41HG239	0-60	Negative	Plowed Field
Shovel Test 3		0-60	Negative	Plowed Field
Shovel Test 4	41HG261	0-50	Negative	Plowed Field
Shovel Test 5	41HG261	0-70	Negative	Plowed Field
Shovel Test 6	41HG261	0-60	Negative	Plowed Field
Shovel Test 7		0-60	Negative	Plowed Field
Shovel Test 8		0-80	Negative	Plowed Field
Shovel Test 9		0-60	Negative	Plowed Field
Shovel Test 10	41HG262	0-60	Negative	Plowed Field
Shovel Test 11	41HG262	0-70	1 flake 0-20cmbs	Plowed Field
Shovel Test 12	41HG262	0-60	Negative	Plowed Field
Shovel Test 13		0-60	Negative	Ranchland
Shovel Test 14		0-60	Negative	Ranchland
Shovel Test 15		0-70	Negative	Ranchland
Shovel Test 16	41HG242	0-100	FCR 20-40 cmbs	Ranchland
Shovel Test 17	41HG242	0-80	Negative	Ranchland

Table 2. Shovel Testing across Survey Areas 1 and 2 La Joya Loop Project APE.

Survey Results:

For this project, an archeological survey was conducted by TxDOT archeologists on September 20 and 21, 2017 and additional survey on October 25-27, 2017. As shown in Exhibit C the survey examined the remaining unsurveyed APE consisting of two tracts designated Area 1 and Area 2.

The western tract, Area 1, has an area of 9.3 acres and consists of secondary growth scrub woodland with several north south-trending two-track roads that traverse the tract. Investigations at the location included pedestrian survey and subsurface testing. No new archeological sites were recorded but site 41HG242, located immediately east of the tract, was found to extend approximately 175 meters westward into Area 1. The site consisted of a surficial lithic scatter and subsurface testing in Area 1 (**see Appendix B**) was unable to identify intact subsurface deposits associated with the site.
The eastern tract, Area 2, has an area of 45.6 acres and consists of agricultural lands that are completed cleared and plowed. Investigations at the location included pedestrian survey and subsurface testing. Two new archeological sites were recorded in Area 2 consisting of 41HG261 and 41HG262, A previously recorded site, 41HG239, is located immediately west of the tract and was found to extend approximately 195 meters eastward into Area 2. All three sites consisted of very low density (< 10 non-diagnostic lithic artifacts) surficial lithic scatters, Subsurface testing in Area 2 verified the extensive plow impacts and was unable to identify intact subsurface deposits associated with any of the three sites.
Based on the results of the survey, land-use over the past Century has severely impacted both Area 1 and Area 2. As such, the documented impacts within the APE examined indicates that sites 41HG239, 242, 261, and 262 lack sufficient integrity of location, association, and materials to be able to address important questions of history and prehistory (36 CFR 60.4). There is little to no reasonable potential to expect archeological historic properties (36 CFR 800.16(l)) to be located within the current APE.

Recommendations: A TxDOT archeologist evaluated the potential for the proposed undertaking to affect archeological historic properties (36 CFR Part 800.16(1) or State Antiquities Landmarks (13 TAC 26.12). The survey conducted by TxDOT encountered one dense prehistoric lithic scatter. Based on the results of the survey, the portion of the site within the proposed APE is not considered eligible as a State Antiquities Landmark or for Listing to the National Register of Historic Places.

Based on the results of the pedestrian survey, the remaining project area consists of existing canals, ditches, and plowed agricultural lands was subjected to pedestrian survey only due to the extensive impacts. The proposed undertaking has no potential to affect archeological historic properties (36 CFR 800.16(l)) or State Antiquities Landmarks (13 TAC 26.12) in the APE and no further work is warranted for the proposed project.

APPENDIX A. FIGURES

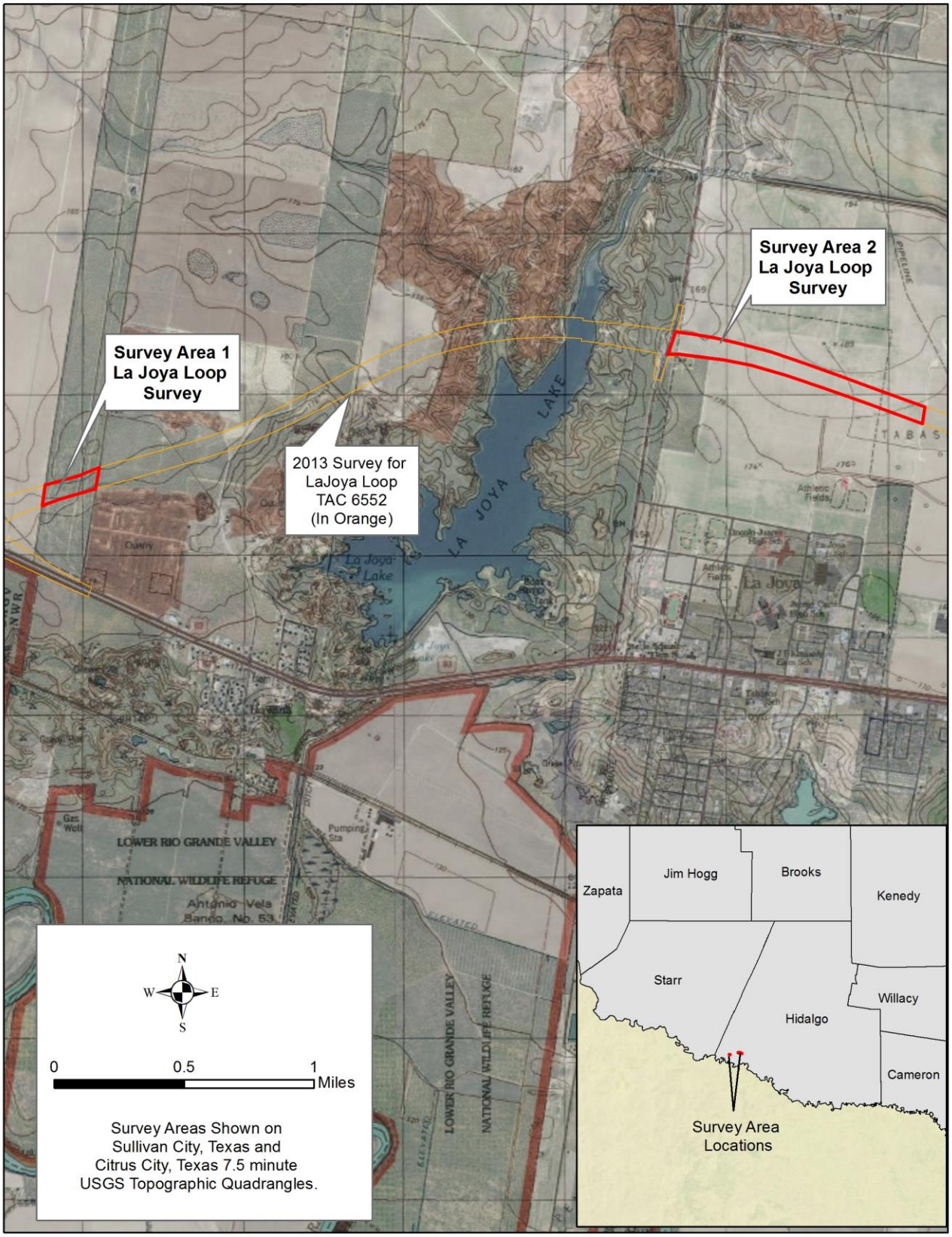

Figure 1. La Joya Loop Drainage Project Location Map, Hidalgo County, Texas.

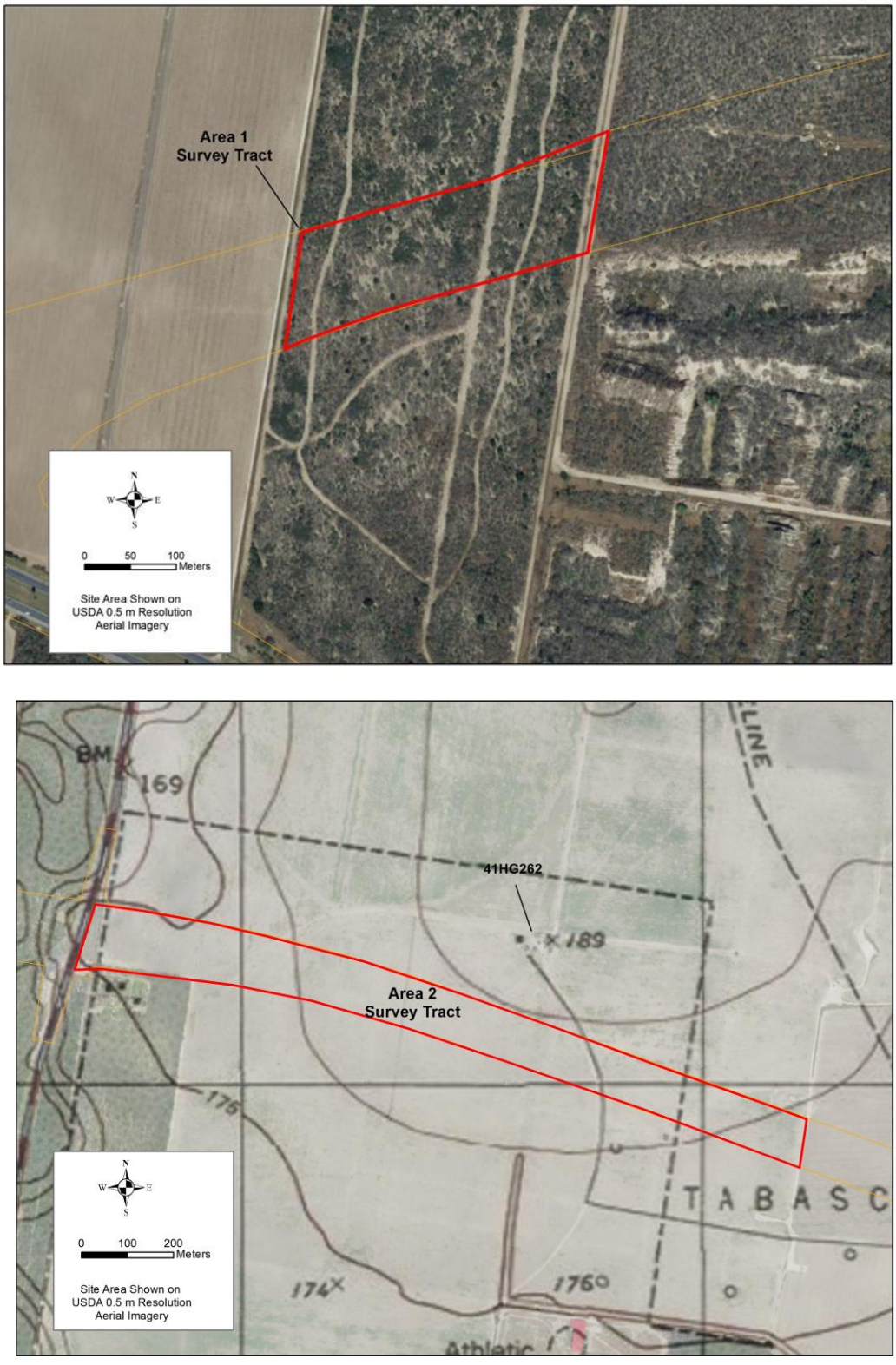

Figure 2. Aerial imagery close-up of the proposed la Joya Loop Drainage Project Area, Hidalgo County.

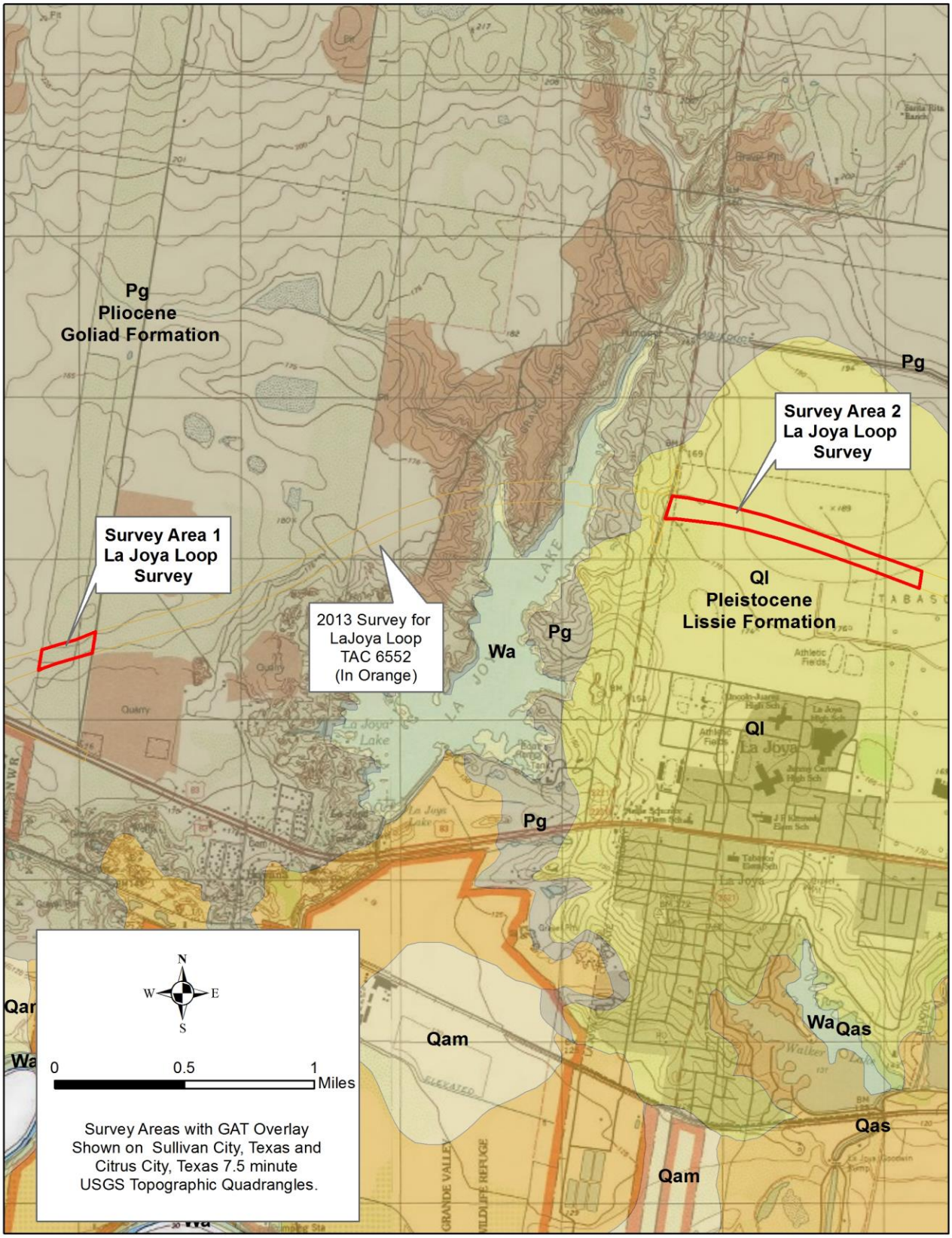

Figure 3. La Joya Loop Drainage Project Area Geology, Hidalgo County, Texas.

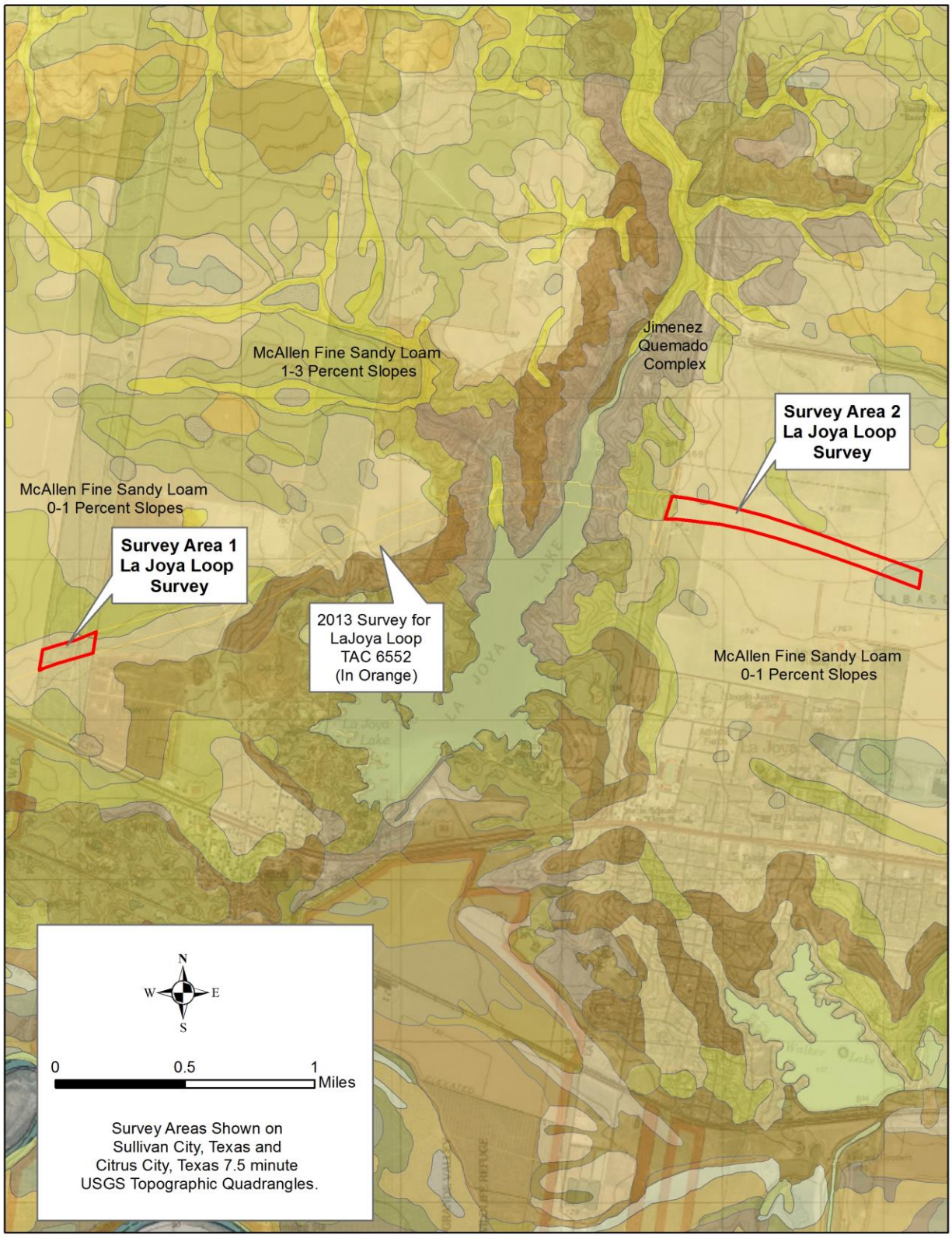

Figure 4. La Joya Loop Project Area Soils, Hidalgo County, Texas.

Figure 5 Map Removed from report
Restricted Cultural Resource Information

Natural Resources Code Title 9 Section 191.004
Texas Administrative Code Title 13, Part 2, Chapter 24

Figure 6 Map Removed from report

Restricted Cultural Resource Information

Natural Resources Code Title 9 Section 191.004

Texas Administrative Code Title 13, Part 2, Chapter 24

Figure 7. Image removed from report Restricted Cultural Resource Information
Natural Resources Code Title 9 Section 191.004
Texas Administrative Code Title 13, Part 2, Chapter 24

Figure 8. Image removed from report Restricted Cultural Resource Information
Natural Resources Code Title 9 Section 191.004
Texas Administrative Code Title 13, Part 2, Chapter 24

Figure 9. Image removed from report Restricted Cultural Resource Information
Natural Resources Code Title 9 Section 191.004
Texas Administrative Code Title 13, Part 2, Chapter 24

Figure 10. Survey Area 1. Looking North along two-track road.

Figure 11. Survey Area 1. Shovel Test 15 Note excellent surface visibility.

Figure 12**.** Survey Area 1. Shovel Test 16.

APPENDIX B.
AREA 1 TRENCHING REPORT

Report for Archeological Survey

Intensive Archeological Survey on 10.2 acres (Area 1) of US 83 La Joya Loop Hidalgo County, Texas

Pharr District

Chris Ringstaff, Principal Investigator, Antiquities Permit No. 8160

CSJ: 0039-02-040

November 14, 2017

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 12-16-14, and executed by FHWA and TxDOT.

Abstract

On behalf of the Texas Department of Transportation (TxDOT), SWCA Environmental Consultants (SWCA) conducted an intensive cultural resources survey with mechanical trenching on September 19, 2017, of 10.2 acres of proposed new right-of-way (ROW) along the United States Highway (US) 83 project corridor in Hidalgo County, Texas. Because the project will receive funding from the Federal Highways Administration, it qualifies as an undertaking as defined in Title 36 Code of Federal Regulations (CFR) Part 800.16(y) and, therefore, survey was conducted in compliance with Section 106 of the National Historic Preservation Act (54 U.S. Code 306108). Furthermore, the project must also comply with the Antiquities Code of Texas (9 Natural Resources Code 191). Chris Ringstaff served as Principal Investigator under Texas Antiquities Permit No. 8160.

The area of potential effects (APE) is defined as a portion of the proposed 400-foot-wide La Joya Loop ROW extending across a 0.2-mile-wide parcel north of US 83, measuring a total of 10.2 acres in extent. According to the project design, the typical depth of impacts will be approximately 3 feet for the roadway construction, 6 feet for culverts, and 50 feet for bridge pilings.

The proposed project, to which this report serves as a supplemental investigation, was previously surveyed by TxDOT and SWCA in 2014. Nine archeological sites were recorded within the project area (i.e., 41HG239–41HG247) and two of these sites, 41HG242 and 41HG243, are located immediately adjacent to the current project area. Site 41HG242 is a highly disturbed lithic scatter with lithic debitage and burned rock observed on the ground surface. Site 41HG243 is a highly disturbed multicomponent artifact scatter consisting of lithic debitage and burned rock with areas of broken historic brick fragments identified on the ground surface.

During the current field investigation of the proposed project ROW, SWCA excavated nine backhoe trenches (i.e., BHT01–BHT09) and three column samples (i.e., CS01–CS03). The proposed project ROW has been modified to varying degrees by vegetation removal and extensive bioturbation extending to the base of the APE. Within BHT04 and BHT05, SWCA identified three chert flakes, one chipped stone tool, and one tested cobble. Therefore, SWCA expanded the boundary of previously recorded site 41HG242 to encompass this area. The sparse quantity of cultural materials identified in BHT04 and BHT05 were in heavily bioturbated and disturbed deposits (Strata II and III). These disturbances are not favorable for the preservation of intact cultural surfaces or site structure.

SWCA made a reasonable and good faith effort as per 36 CFR Part 800.4(b)(1) to identify and locate prehistoric and historic archeological properties within the proposed project APE. The field investigation discovered neither significant historic properties nor cultural resources as defined in the respective legislation; therefore, SWCA recommends that a finding of “no historic properties affected” be made for the current undertaking.

Project Identification

- **Date:** 11/14/2017
- **Date(s) of Survey:** 10/25/2017
- **Archeological Survey Type:** Reconnaissance ☐ Intensive ☒
- **Report Version:** Draft ☒ Final ☐
- **Jurisdiction:** Federal ☒ State ☒
- **Texas Antiquities Permit Number:** 8160
- **District:** Pharr
- **County or Counties:** Hidalgo
- **USGS Quadrangle(s):** Sullivan City (2698-241)
- **Highway:** US Highway 83
- **CSJ:** 0039-02-040
- **Report Author(s):** Dan Rodriguez and Ken Lawrence
- **Principal Investigator:** Chris Ringstaff

Texas Historical Commission Approval

Signature Date

Project Description

- **Project Type:** Road construction
- **Total Project Impact Acreage:** 10.2 acres
- **Area of Pedestrian Survey:** 10.2 acres
- **Project Description and Impacts:** The proposed project would construct a new roadway bypass around the town of La Joya from United States Highway (US) 83 to Interstate Highway (IH) 2/US 83 (Figure 1). The La Joya Loop would connect to US 83 approximately 2.7 miles west of the intersection of US 83 and Farm-to-Market Road (FM) 2221, and extend north around La Joya Lake and the town of La Joya to meet back up with IH 2/US 83 approximately 0.5 mile east of the intersection of 23rd Street and US 83. All work is limited to the proposed new right-of-way (ROW).
- **Area of Potential Effects (APE):** The APE is defined as a portion of the proposed 400-foot-wide La Joya Loop ROW, extending across a 0.2-mile-wide parcel north of US 83 and measuring a total of 10.2 acres (Figure 2). According to project design, the typical depth of impact will be approximately 3 feet for the roadway construction, 6 feet for culverts, and 50 feet for bridge pilings.
- **Parcel Number(s):** No parcel numbers.
- **Project Area Ownership:** The entire APE is owned by the Texas Department of Transportation (TxDOT).

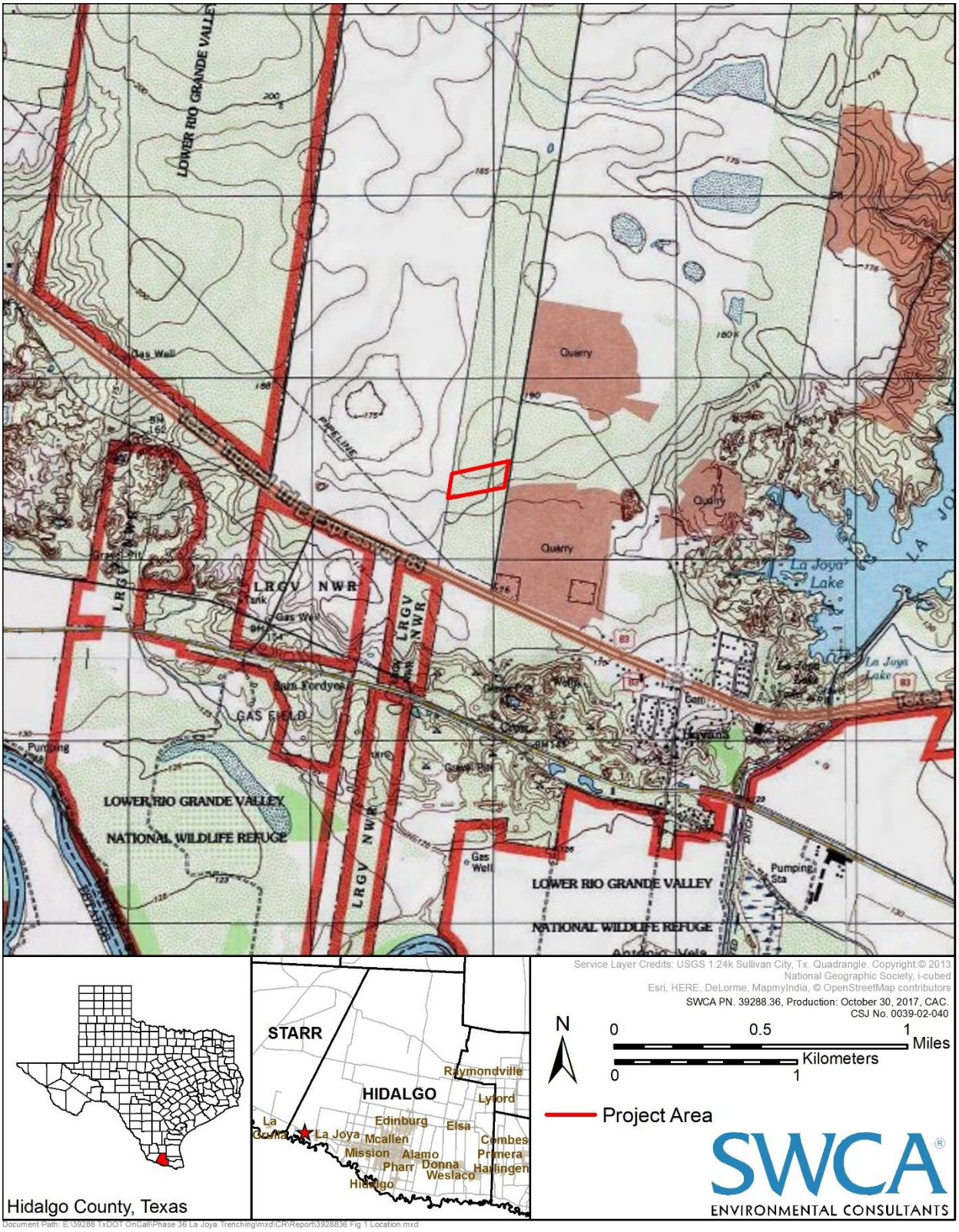

Figure 1. Project location.

Figure 2. Project Area.

Project Setting

- **Topography:** The APE runs roughly southwest to northeast across the flat upland terrain of the Lower Rio Grande Valley ecoregion (Wermund 2017). Elevation ranges from a maximum of 196 feet above mean sea level (amsl) to a low of 190 feet amsl.
- **Geology:** According to the Geologic Atlas of Texas, Seguin sheet, the APE is underlain by the Goliad Formation (Mg). This formation consists of clay, sandstone, marl, caliche, limestone, and conglomerate of Miocene age (Barnes 1974) (Figure 3).
- **Soils:** The APE is underlain completely by the McAllen soil series (Figure 4). The McAllen fine sandy loam consists of deep, well-drained soils formed in calcareous loamy sediments. This soil is located on nearly level to gently sloping uplands with slopes ranging from 0 to 5 percent (Natural Resources Conservation Service [NRCS] 2017).
- **Land Use:** The proposed project is in a rural area of Hidalgo County, just west of Lake La Joya. The APE is primarily a brushy cow pasture surrounded by agricultural fields and quarries.
- **Vegetation:** The proposed ROW contains scattered mixed hardwoods (mesquite), shrubs, and short grasses.
- **Estimated Ground Surface Visibility:** Ground surface visibility ranged from 30 to 100 percent, but was typically 50 percent.
- **Previous Investigations and Known Archeological Sites:** The proposed project, to which this report serves as a supplemental investigation, was previously intensively surveyed by TxDOT in 2014 (Texas Historical Commission [THC] 2017a). During the TxDOT 2014 investigations, nine archeological sites were newly recorded (i.e., 41HG239–41HG247). Following the initial survey, SWCA Environmental Consultants (SWCA) was subcontracted to conduct mechanical trenching of sites 41HG240 and 41HG241 (Carpenter et al. 2015).

  Two of the sites recorded in 2014, 41HG242 and 41HG243, are located immediately adjacent to the current project area. Site 41HG242 is a highly disturbed lithic scatter with lithic debitage and burned rock observed on the ground surface (THC 2017a). Site 41HG243 is a highly disturbed multicomponent artifact scatter consisting of lithic debitage and burned rock with areas of broken historic brick fragments noted on the ground surface (THC 2017a). Both sites are recommended as NOT ELIGIBLE for listing on the National Register of Historic Places (NRHP) or for designation as State Antiquities Landmarks (SAL), and no further archeological investigations are recommended.

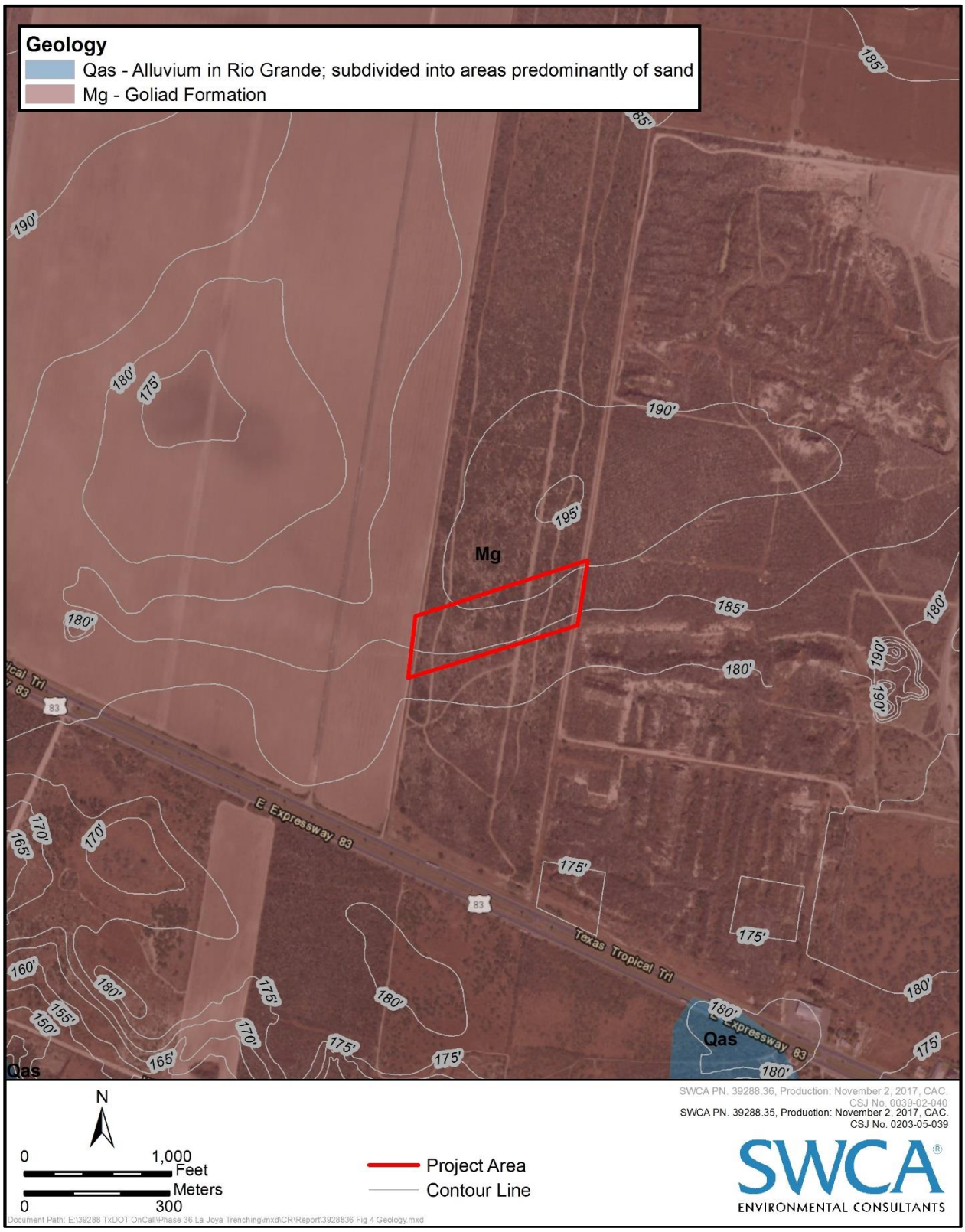

Figure 3. Project area geology.

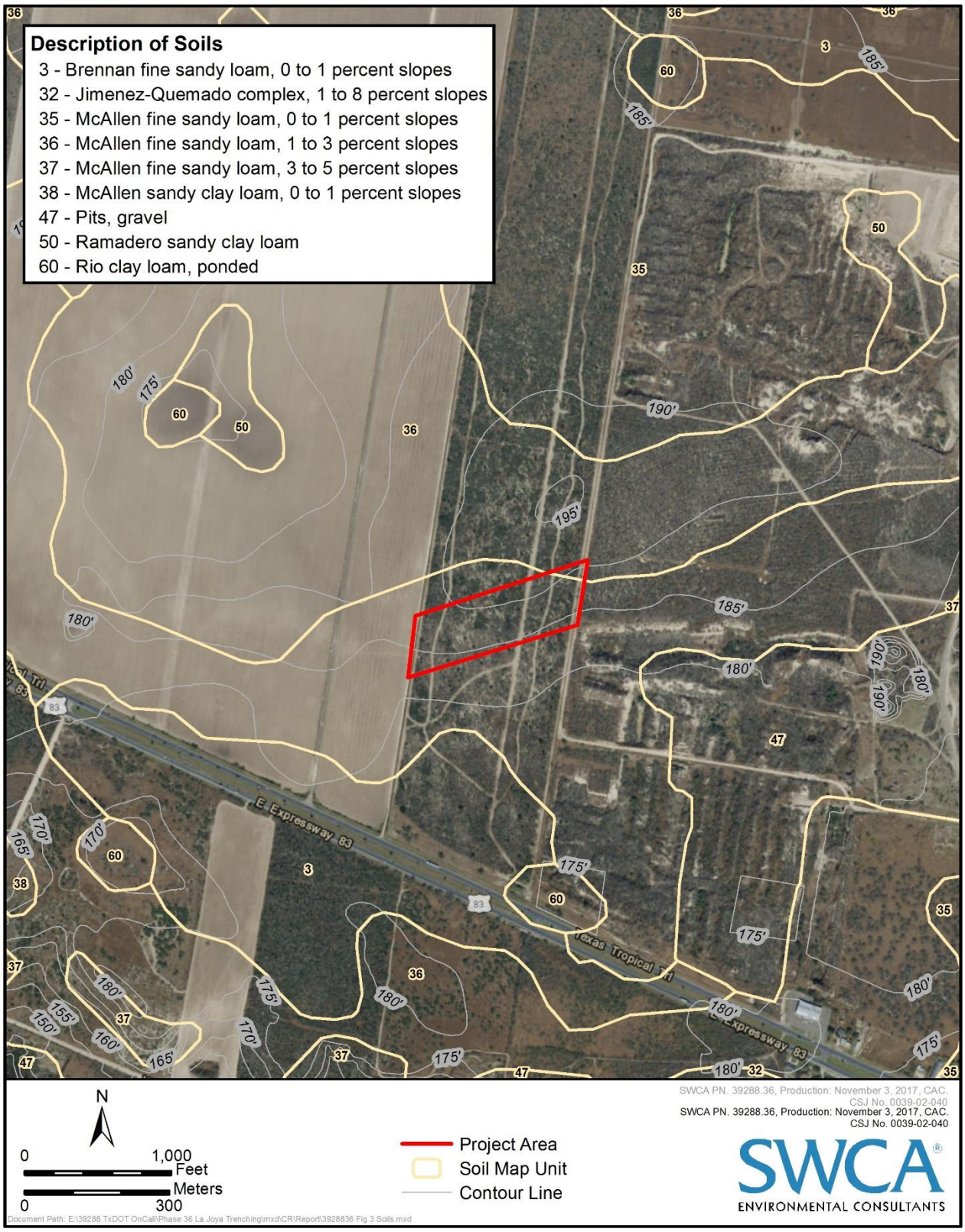

Figure 4. Project area soils.

Survey Methods

- **Surveyors:** Ken Lawrence and Ben Morton
- **Methodological Description:** SWCA conducted mechanical trenching, augmented with column samples across accessible portions of the proposed APE. SWCA archeologists excavated nine mechanical trenches within the APE and three column samples off the walls of select backhoe trenches (Table 1; Appendices A and B).

Table 1. Excavations in Project APE.

Method	Quantity in Existing ROW	Quantity in Proposed New ROW	Quantity in Temporary Easements	Total Number per Acre
Column Samples	0	3	0	0.3
Auger Test Units	0	0	0	0
Mechanical Trenching	0	9	0	0.9

Backhoe trenches (BHTs) were excavated entirely within the proposed APE. The trench locations were chosen at the discretion of the project archeologist and focused on accessible areas with the least disturbance within the APE. Archeologists thoroughly documented, and photographed the entire excavation process. Upon completion of each trench, the BHTs were backfilled, levelled, and returned as much as possible to their original state. SWCA excavated column samples when cultural or potentially cultural materials were identified within the trenches. A column sample consisted of a roughly 30-centimeter (cm) (12-inch) square shovel test excavated on the profile of the BHT, in a position nearest to the potential archeological materials. The column samples were excavated in arbitrary 20-cm (8-inch) levels until pre-Holocene strata were reached. All excavated soils were sifted through ¼-inch mesh. Archeologists recorded column samples on data forms, and included information on texture, consistency, color, and cultural materials encountered.

- **Other Methods:** None
- **Collection and Curation:** NO ☒ YES ☐ If yes, specify facility.

Comments on Methods: THC archeological survey standards do not specify a density of BHTs per unit area (THC 2017b). However, per TXDOT contractual requirements, a total of no more than 15 mechanical trenches could be placed within the project area. Additionally, for those BHTs where cultural materials were encountered, up to 15 shovel test probes (i.e., column sample units) would be excavated. SWCA excavated nine BHTs and three column samples within the proposed project area.

Survey Results

- **Project Area Description:** SWCA archeologists conducted intensive pedestrian survey throughout the proposed project area with backhoe trenching (Figure 5). The investigations determined that the proposed ROW has been modified by the installation and maintenance of a buried utility (Figure 6). Although the extent and magnitude of disturbance is unknown, the proposed ROW has also been affected by vegetation removal by heavy machinery at some point in the recent past. The survey observed disturbance down to roughly 30–40 centimeters below surface (cmbs) from this vegetation removal. Below 40 cmbs within the proposed ROW, the deposits are reasonably intact, but have been disturbed by extensive bioturbation. The proposed ROW contains scattered mixed hardwoods (mesquite), shrubs, and short grasses. Surface visibility within the proposed ROW ranged from 30 to 100 percent, but was typically 50 percent.
- **Backhoe Trenching:** SWCA excavated nine BHTs and three column samples within the project APE (Appendices A and B). Within the proposed 10.2-acre APE, SWCA placed three trenches (i.e., BHT01–BHT03) on the eastern end, four trenches (i.e., BHT04–BHT06 and BHT09) and three column samples (i.e., CS01–CS03) in the central portion, and two trenches (i.e., BHT07–BHT08) at the western end (see Figure 5).

  The BHTs were excavated to varying depths, ranging from a minimum of 1.48 meters (m) (4.8 feet) to a maximum of 1.73 m (5.7 feet) to encounter strata that predated human occupation in the area. The trench dimensions were typically 1.2 m (4 feet) wide, 8 m (26 feet) long, and excavated to a minimum of 1.5 m (4.9 feet) deep.

  The excavations across the proposed APE encountered very similar stratigraphy consisting of five strata, with the most variation noted in the disturbed surface horizons (Figures 7–10). Generally, the surface horizon, Stratum I, consists of a brown (10YR 4/3–5/3) loamy sand to sandy loam with a crumb structure (fine size, weak grade) parting to subangular blocky structure, loose to very friable consistency, and has a clear to abrupt and wavy lower boundary. Inclusions include insect cavities and galleries (15%–20%), roots (5%), and rootlets (15%–20%). Stratum I is interpreted to be an Ap1 horizon, and in all of the trenches is roughly 9 to 20 cm thick.

  Stratum II, typically begins around 11 cmbs and consists of a brown to yellowish brown (10YR 3/3–5/3) sandy loam to loamy sand with a subangular blocky structure (fine-medium size and weak-moderate consistency) and friable consistency. Inclusions consist of insect cavities and galleries (20%–40%), whole *Rabdotus mooreanus* snail (3%–5%) and snail fragments (5%–10%), roots (5%), rootlets (20%), and insect pinhole burrows (20%). Stratum II has a clear and slightly wavy/irregular lower boundary that is occasionally blurred by root casts. Stratum II in one trench (BHT05) contained one chert flake. This stratum is interpreted to be an Ap2 horizon and in all the trenches is roughly 15 to 30 cm thick.

Figure 5. Map Removed from Report

Restricted Cultural Resource Information

Natural Resources Code Title 9 Section 191.004

Texas Administrative Code Title 13, Part 2, Chapter 24

Figure 6. Overview of buried gas line in proposed ROW.

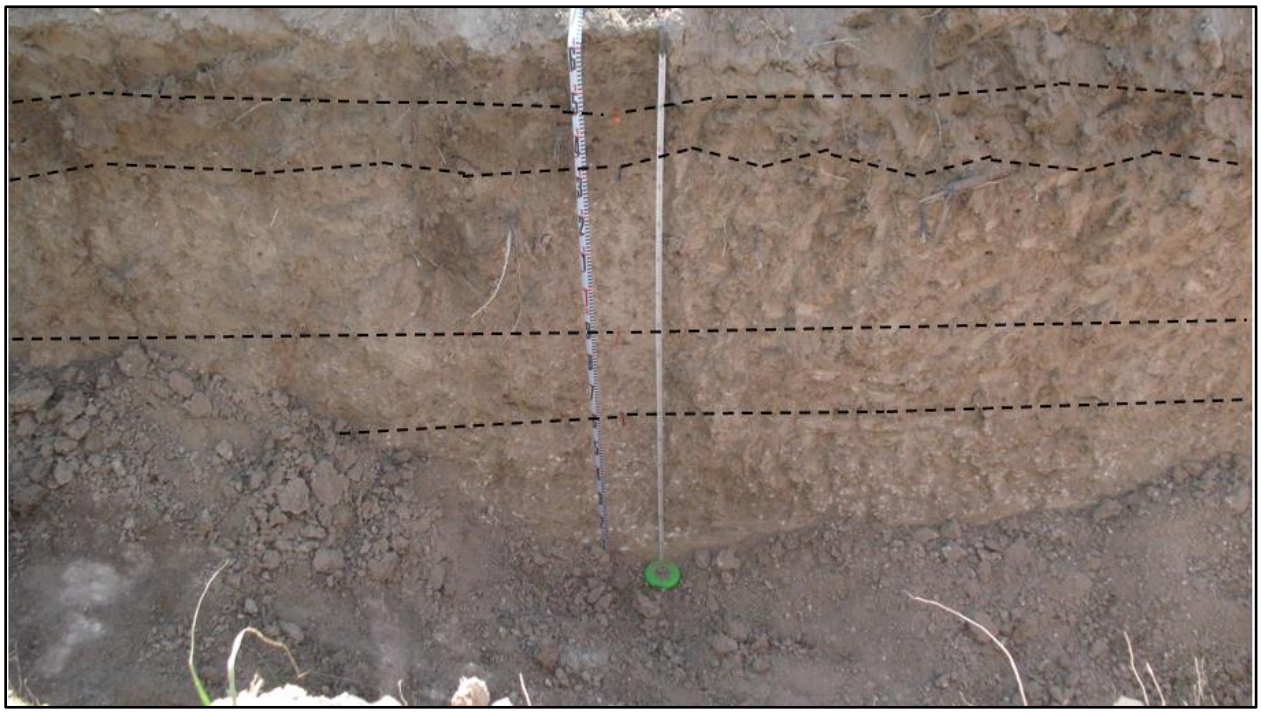

Figure 7. Overview of typical profile (BHT08) in proposed ROW, facing south.

Figure 8. Overview of typical profile (BHT05, CS02) in proposed ROW, facing north.

Figure 9. Overview of typical profile (BHT04, CS01) in proposed ROW, facing northwest.

Figure 10. Overview of typical profile (BHT06) in proposed ROW, facing east.

The underlying Stratum III typically begins around 30 cmbs and consists of a yellowish brown to light yellowish brown (10YR 5/4–6/4) loamy sand with a subangular blocky structure (medium-coarse size and moderate consistency) and a clear and smooth lower boundary. Inclusions consist of insect cavities and galleries (5%–25%), whole *Rabdotus mooreanus* snail (3%–5%) and snail fragments (5%), rootlets (15%), and white calcium carbonate ($CaCO_3$) 0.3-millimeter (mm) diameter filaments dendritically spread. Most of the observed snail in the stratum were encrusted with $CaCO_3$. Stratum III in two trenches (i.e., BHT04 and BHT05) also contains scattered cultural materials (i.e., debitage, a chipped stone tool, and a tested cobble) with no patterning (Figures 11 and 12). The sparse materials (n=4) were found both sloping and horizontal. This stratum is interpreted to be an A/Bk horizon that is roughly 45 to 60 cm thick.

The underlying Stratum IV begins around 90–95 cmbs and consists of a light yellowish brown (10YR 6/4) loamy sand with a subangular blocky structure (medium to coarse size and moderate grade). Inclusions consist of a widely ranging amount of insect cavities and galleries (5%–10%), a notable decrease in whole *Rabdotus mooreanus* snail (<5%) and snail fragments (5%) compared to other strata, small 0.5- to 10-mm-diameter nodules of $CaCO_3$ (2%–5%), and rare (<1%) subrounded pebbles. Stratum IV has a clear/gradual and typically smooth lower boundary and is interpreted to be a Bk1 horizon that is roughly 30 to 45 cm thick.

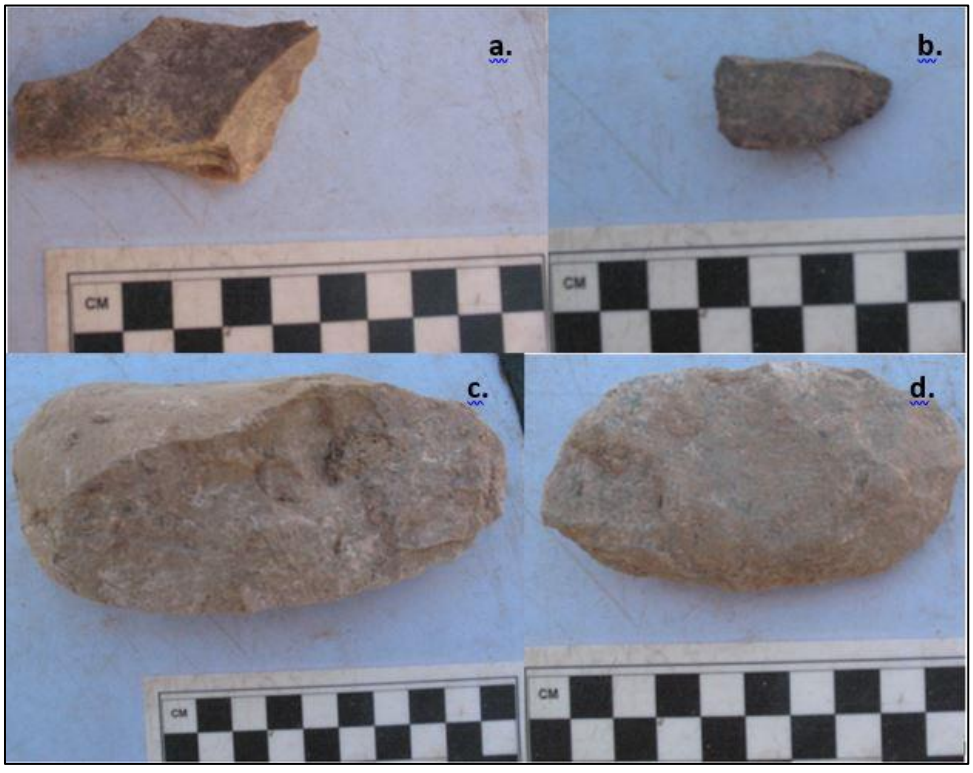

Figure 11. Artifacts from BHT05, CS02: a). and b). chert flakes from Stratum III and Stratum II, respectively, c). tested cobble, and d). chipped stone tool from Stratum III.

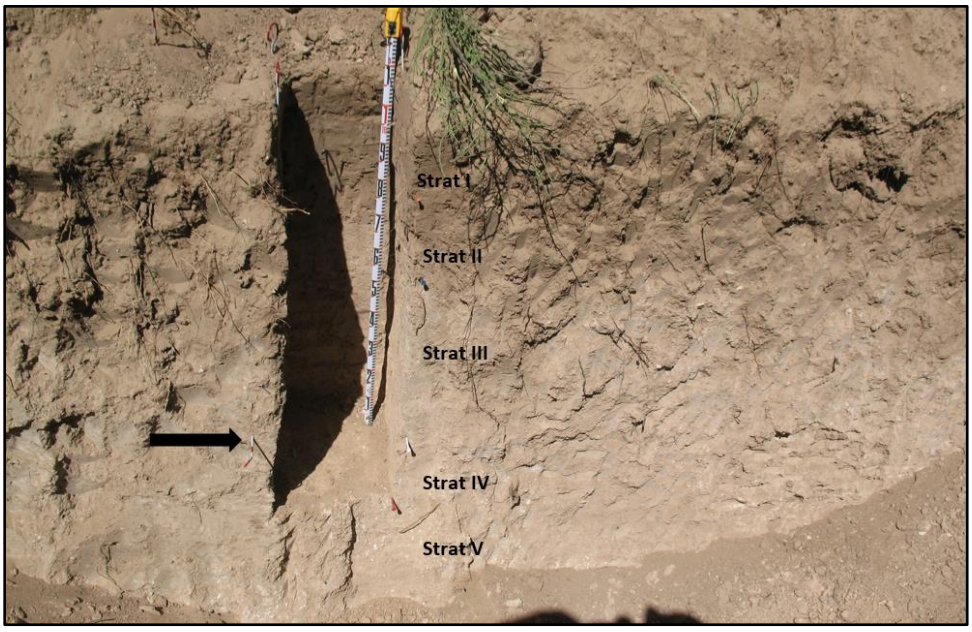

Figure 12. Overview of BHT05 and CS02, arrow indicates location of a chert flake in Stratum III.

The lowest observed horizon (Stratum V) begins around 110–120 cmbs and consists of a light yellowish brown (10YR 7/3–7/4) loamy sand with a subangular blocky, rarely parting to angular blocky structure (medium-coarse size and moderate grade). Inclusions consist of insect cavities (5%), whole *Rabdotus mooreanus* snail shell (3%) with calcined coating, and $CaCO_3$ soft masses and nodules (10–25 mm) (15%–25%). Stratum V has an unobserved lower boundary that extends below 173 cmbs and is interpreted to be a Bk2 horizon.

Comparing the pedon at this area to that of the soil series mapped in the area, the stratigraphy matches that attributed to the McAllen and the Ramadero series. The typical pedon within the proposed ROW is an Ap1, Ap2, A/Bk1, Bk1, and Bk2. The pedon for the Ramadero series is an A1, A2, A3, Bw, Bk1, Bk2, and BCk, whereas the McAllen series is an Ap, A, Bw, BCk (NRCS 2017; SoilWeb 2017). Of the two pedons, the sites seemingly correlate with the upper pedon of the McAllen and the lower portions of the Ramadero series.

Stratigraphically, the cultural deposits observed within the proposed ROW are associated with the Ap2 (Stratum II) and A/Bk (Stratum III) horizon. Based on the clear and wavy lower boundary of Stratum II (Ap2), the surface of the A/Bk horizon may be partially truncated from vegetation clearing in the past.

One major factor affecting the integrity of the cultural deposits at 41HG242 is the prevalent faunalturbation observed in the trench profiles. All the examined horizons exhibited evidence of ongoing or past pedoturbation from insect (e.g., ants and termites) activity. Insects have long been recognized as a common agent of disturbance in soil horizons (Balek 2002; Darwin 2007; Johnson 2002; Wood and Johnson 1982). At 41HG242 in BHT04–BHT05, ant and termite burrows and galleries comprised a significant proportion (25%) of the horizons. This process involves the insect moving particles from as deep as 2 m up to the ground surface, which can homogenize a soil profile (Wood and Johnson 1982:545). Johnson (2002:13–14) notes that this process can also position older deposits stratigraphically above younger deposits, but these must be finer particles. Accordingly, this reworking of clast particles can both disturb and, in some instances, preserve cultural deposits depending on the size of the artifacts and the type of soil (Balek 2002; Johnson 1989, 2002; Morin 2006; Wood and Johnson 1982). Researchers have argued that sites with bioturbation can still provide beneficial information regarding the cultural "memory" of the deposits. These approaches (e.g., Morin 2006) require an assortment of factors, but they consider the size and quantity of the artifacts and typically have time-diagnostic artifacts intermixed.

Notably, the deposits observed in BHT01–BHT09 correlate with the investigations conducted in 2014 at nearby 41HG240 and 41HG241 (Carpenter et al. 2015). The 2014 investigations noted a similar stratigraphy and observed cultural materials at both 41HG240 and 41HG241 in Stratum III, which was identified as an A/Bk horizon (Lawrence and Frederick 2015:53–55). This correlates with that observed in the proposed ROW. The investigations in 2014 at 41HG240 and 41HG241 determined that formation and post-depositional processes were not favorable to preservation of intact cultural surfaces or site structure (Carpenter et al. 2015). The sites within the TxDOT La Joya project corridor were not recommended as eligible for the NRHP or as an SAL. The same factors affect site 41HG242, which has a low quantity of lithic debitage and chipped stone tools.

- Site 41HG242 Revisit

  Site 41HG242 is a previously recorded prehistoric lithic scatter approximately 950 m west of the LaJoya Lake (Creek) and approximately 850 m due north of US 83 on a broad flat western upland of the La Joya Creek drainage. The site, initially recorded in 2013 by TxDOT, consists of lithic flakes, stone tools, and thermally altered rock. Previous investigators observed artifacts only on the surface, with a ground surface visibility of approximately 70 to 90 percent. The site was previously recommended as not eligible within the ROW, due to extensive impacts from agricultural activities, as well as a lack of buried intact deposits (THC 2017a).

  SWCA revisited site 41HG242 on October 25–27, 2017. Investigators conducted nine backhoe trenches and three column samples on the western boundary of the site, two

of which (i.e., BHT04-BHT05) were positive for buried cultural material within Strata II and III. Trench BHT04 revealed a mid-stage thinning flake in a vertical orientation within Stratum II at 78 cmbs. Trench BHT05 contained a tertiary flake within Stratum III at 82 cmbs, also in a vertical orientation.

SWCA excavated column samples (i.e., CS01–CS03) of the walls of both trenches containing cultural materials (i.e., BHT04 and BHT05) and within BHT09, which is located just west of BHT05. No additional cultural materials were encountered within CS01 in BHT04. Within CS02 in BHT05, SWCA encountered one tertiary flake at 25 cmbs within Stratum II, one bifacial blank/early stage biface at 55 cmbs, and one tested cobble at 66 cmbs within Stratum III. The tested cobble was the only artifact observed in a horizontal position. Column sample CS03, excavated in BHT09 just west of BHT05, revealed no cultural materials. In addition to the cultural material recorded in BHT04 and BHT05, SWCA observed a total of five pieces of lithic shatter on the ground surface in the dirt road near BHT01 and BHT03. The total artifact assemblage includes two tertiary flakes, one early-stage reduction flake, five pieces of cultural shatter, one bifacial blank, and one tested cobble.

SWCA's investigations revealed that the portions of the site within the current APE are heavily disturbed by dirt road construction, vegetation clearing, agricultural practices, bioturbation, and the installation of buried utilities (see Figure 7). The upper layers of the site deposits (0–40 cmbs) have been disturbed by modern agricultural practices, as well as buried utilities and dirt road grading. Below this zone, the deposits have been highly disturbed by bioturbation, as indicated by the orientation of the artifacts and geoarcheological analysis (see above).

Summary. Site 41HG242 is a previously recorded lithic scatter consisting of lithic flakes, stone tools, and thermally altered rock. SWCA's investigations focused on mechanically trenching a previously surveyed parcel directly adjacent to the site boundary in the proposed ROW and identified a light lithic scatter of flakes, shatter, and stone tools with subsurface cultural material between 70 and 80 cmbs. Based on the sparse cultural material assemblage, lack of temporally diagnostic artifacts or cultural features, and substantial disturbances from land use practices as well as extensive bioturbation, SWCA recommends the portion of site 41HG242 within the current ROW does not contribute to the site's NRHP or SAL eligibility. No further work is recommended; however, the portions of the site outside the existing ROW are considered unevaluated for NRHP or SAL eligibility.

- Archeological Materials Identified: Archeological materials consisting of chert debitage (n=3), one chipped stone tool, and one tested cobble were identified within BHT04–BHT05 (see Figures 11 and 13). This sparse quantity of artifacts was observed in Stratum II (BHT04) and Stratum III (BHT05), within strata that has been disturbed by vegetation clearing (Stratum II) or by extensive bioturbation (BHT05). In addition, five

pieces of lithic shatter were observed on the ground surface near BHT01 and BHT03 within a disturbed setting (i.e., dirt road).

Figure 13. Chert flake observed in BHT04 at 78 cmbs in Stratum III.

- **APE Integrity:** The upper 40 cm (16 inches) of the survey area within the current TxDOT easement has low stratigraphic integrity, due to vegetation clearing in the recent past. Below 40 cmbs (16 inches), the stratigraphy has been affected by extensive bioturbation (i.e., insect burrows and roots) that are not favorable to preservation of intact cultural surfaces or site structure.

Recommendations

- **Further Work:** No further cultural resources investigations are recommended within the proposed ROW. Should construction impacts extend outside the existing TxDOT ROW, then further investigations are recommended.
- **Justification:** Although cultural materials were encountered in two backhoe trenches (BHT04 and BHT05), this sparse quantity of materials were in heavily bioturbated and disturbed deposits (Strata II and III). These disturbances are not favorable for the preservation of intact cultural surfaces or site structure.

SWCA made a reasonable and good faith effort as per 36 CFR Part 800.4(b)(1) to identify and locate prehistoric and historic archeological properties within the proposed project APE. The field investigation discovered neither significant historic properties nor cultural resources as defined in the respective legislation; therefore, SWCA recommends that a finding of "no historic properties affected" be made for the current undertaking.

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Appendix A. Backhoe Trench Data

BHT	Strat	Depth (cmbs)	Munsell	Soil Color	Soil Texture	Horizon Discussion	Lower boundary	Comments
BHT01	1	0-22	10YR 5/3	Brown	Silt Loam	Friable, subangular, fine to medium, weak to moderate, roots 3%, insect galleries 20%, rootlets 20%, rabdotus 1%, snail fragments 3%	Clear to gradual, Slightly Wavy	No cultural materials
	2	22-44	10YR 5/3-5/4	Brown-Yellowish Brown	Silt Loam	Friable to slightly firm, subangular, medium to coarse, moderate, roots 1%, rootlets 5-10%, insect galleries 20%, worm burrows 5%, rabdotus 3%, snail fragments 3%	Clear, Wavy	Large burrow approximately 22 cm in diameter, lower boundary impacted by burrows/ possible chaining?
	3	44-87	10YR 6/3-6/4	Pale Brown-Light Yellowish Brown	Silt Loam	Firm, subangular to angular, medium to coarse, moderate, roots 1%, rootlets 5%, insect galleries 20%, rabdotus 3-5%, snail fragments 3%	Clear, Smooth	2% white filaments, possible calcium carbonate dendritic formation
	4	87-152+	10YR 7/4	Very Pale Brown	Silt Loam	Firm, angular, medium to coarse, moderate, insect galleries 5-10%, rootlets 5%, pinhole burrows 10%, snail fragments 3-5%, calcium carbonate nodules ~10-20 mm 10%, infilled burrows 3%, worm holes 1-3%	Unobserved	
BHT02	1	0-32	10YR 5/3	Brown	Silt Loam	Friable, subangular, fine to medium, weak to moderate, roots 1%, insect galleries 20%, rootlets 15%, rabdotus 1%, snail fragments 3%	Clear, Slightly Wavy	Increase in infilled burrows from BHT01 approximately 3%
	2	32-55	10YR 5/3-5/4	Brown-Yellowish Brown	Silt Loam	Friable to slightly firm, subangular, medium to coarse, moderate, roots 1%, rootlets 5-10%, insect galleries 20%, worm burrows 5%, rabdotus 1%, snail fragments 3-4%, infilled insect burrows 3%, decomposing vegetation 1%	Clear, Slightly Wavy	Observed a rock fragments at 40 cmbs indeterminate cultural, sub angular, no staining at start of Stratum III
	3	55-92	10YR 6/3-6/4	Pale Brown-Light Yellowish Brown	Silt Loam	Firm, subangular to angular, medium to coarse, moderate, roots 1%, rootlets 5%, insect galleries 20%, rabdotus 1%, snail fragments 3%, calcine coated rabdotus 1%	Clear to Gradual, Smooth	
	4	92-156+	10YR 7/4	Very Pale Brown	Silt Loam	Firm, angular, medium to coarse, moderate, insect galleries 5-10%, rootlets 5%, pinhole burrows 10%, snail fragments 3-5%, calcium carbonate nodules ~10-20 mm 10%, infilled burrows 3%, worm holes 1-3%, large calcine coated rabdotus 3-5%	Unobserved	

Appendix A. Backhoe Trench Data

BHT	Strat	Depth (cmbs)	Munsell	Soil Color	Soil Texture	Horizon Discussion	Lower boundary	Comments
BHT03	1	0-22	10YR 5/3	Brown	Silt Loam	Friable, subangular, fine to medium, weak to moderate, roots 3%, rootlets 25%, rabdotus 3-5%, snail fragments 3-5%, insect galleries 20%	Clear to gradual, Slightly Wavy	
	2	22-38	10YR 5/4	Yellowish Brown	Silt Loam	Friable to firm, subangular, medium to coarse, moderate, worm burrows 5%, insect galleries 15%, rabdotus 5%, snail fragments 10%, decomposing vegetation 1%, white filaments 0.5 mm dendritic (rootlets) 1-2%	Clear, Slightly Wavy	
	3	38-82	10YR 6/3-6/4	Pale Brown-Light Yellowish Brown	Silt Loam	Firm, subangular to angular, medium to coarse, moderate, rabdotus 5-10%, snail fragments 10-15%, white filament increases with depth (dendritic 0.5 mm) 15%, roots 1%, rootlets 5%, insect galleries 20%, worm burrows 5%	Clear, Smooth	Small subangular gravel about 40 cmbs
	4	82-100+	10YR 7/4	Very Pale Brown	Silt Loam	Firm, angular, medium to coarse, moderate, insect galleries 5-10%, rootlets 3%, pinhole burrows 3%, calcium carbonate nodules 10-20 mm 10-15%	Unobserved	
BHT04	1	0-13	10YR 5/3	Brown	Sandy Loam	Loose, crumb, fine, weak, roots 5%, rootlets 20%, snail fragments 5%, rabdotus 1%	Clear, Slightly Wavy	No cultural materials, upper 4 cm stripped during trenching, column sampled
	2	13-29	10YR 5/3-5/4	Brown-Yellowish Brown	Sandy Loam	Friable, subangular, medium, moderate, roots 5%, rootlets 20%, snail fragments 5-10%, rabdotus 3-5%, insect galleries 15-20%, pinhole burrows 20%	Clear, Slightly Wavy	No cultural materials
	3	29-86	10YR 5/4-6/4	Yellowish Brown-Light Yellowish Brown	Sandy Loam	Friable to slightly firm, subangular, medium to coarse, moderate, roots 3%, rootlets 15%, rabdotus 3-5%, snail fragments 5%, white filaments (0.3-0.5 mm) 5-10% increasing and dendritic, insect galleries 15%, worm casings 3%, pinhole burrows 5-10%	Clear, Smooth	1 flake observed at 78 cmbs with tilted orientation
	4	86-101	10YR 6/4	Light Yellowish Brown	Sandy Loam	Firm, subangular, medium, moderate, roots 2%, rabdotus 10%, pinhole burrows 3-5%, insect galleries 5%, snail fragments 5%, worm casings 3%, white nodules 0.5 mm in diameter 2%	Clear, Slightly Wavy	No cultural materials
	5	101-156+	10YR 7/3-7/4	Very Pale Brown	Sandy Loam	Friable to firm, subangular, medium, moderate, rootlets 3-5%, insect galleries 5%, rabdotus 3%, calcine coated snail fragments 3%, white nodules 10-15 mm 10%	Unobserved	No cultural materials

Appendix A. Backhoe Trench Data

BHT	Strat	Depth (cmbs)	Munsell	Soil Color	Soil Texture	Horizon Discussion	Lower boundary	Comments
BHT05	1	0-22	10YR 5/3	Brown	Sandy Loam	Loose, crumb, fine, weak, roots 5%, rootlets 20%, snail fragments 5%, rabdotus 3%	Clear, Slightly Wavy	No cultural materials, upper 2-3 cm stripped during trenching, column sampled
	2	22-43	10YR 5/3-5/4	Brown-Yellowish Brown	Sandy Loam	Friable, subangular, medium, moderate, roots 5%, rootlets 20%, snail fragments 5-10%, rabdotus 3-5%, insect galleries 15-20%, pinhole burrows 20%	Clear, Slightly Wavy	No cultural materials
	3	43-92	10YR 5/4-6/4	Yellowish Brown-Light Yellowish Brown	Sandy Loam	Friable to slightly firm, subangular, medium to coarse, moderate, roots 3%, rootlets 15%, rabdotus calcine coated 5%, snail fragments 5%, white filaments (0.5 mm) 3-5% dendritic, insect galleries 15%, worm casings 3%, pinhole burrows 5-10%	Clear, Smooth	One chert flake early stage reduction at 82 cmbs near base of Stratum 4
	4	92-112	10YR 6/4	Light Yellowish Brown	Sandy Loam	Firm, subangular, medium, moderate, roots 2%, rabdotus 10%, pinhole burrows 3-5%, insect galleries 5%, snail fragments 5%, worm casings 3%, white nodules 0.5 mm in diameter 2%	Clear, Slightly Wavy	No cultural materials
	5	92-163+	10YR 7/3-7/4	Very Pale Brown	Sandy Loam	Friable to firm, subangular, medium, moderate, rootlets 3-5%, insect galleries 5%, rabdotus 3%, calcine coated snail fragments 3%, white nodules 20-25 mm 15% increases to 20% at 150-155 cmbs	Unobserved	No cultural materials
BHT06	1	0-11	10YR 4/3-5/3	Brown	Sandy Loam	Loose, crumb, fine, weak, roots 5%, rootlets 30%, snail fragments 5%, rabdotus 1%, burrows 10%	Gradual to Clear, Slightly Wavy	No cultural materials
	2	11-39	10YR 5/3-5/4	Brown-Yellowish Brown	Sandy Loam	Friable, subangular, medium, moderate, roots 5%, rootlets 30%, snail fragments 5-10%, rabdotus 3-5%, insect galleries 20-25%, pinhole burrows 10%	Clear, Wavy	No cultural materials
	3	39-84	10YR 6/3	Pale Brown	Sandy Loam	Friable to firm, subangular, medium to coarse, moderate, roots 3%, rootlets 15%, rabdotus calcine coated 3-5%, snail fragments 5%, white filaments (0.3-0.5 mm) 5-10% increasing and dendritic, insect galleries 15%, worm casings 3%, pinhole burrows 5-10%	Clear, Smooth	No cultural materials, one subrounded gravel at 81 cmbs
	4	84-112	10YR 6/4	Light Yellowish Brown	Sandy Loam	Friable to firm, subangular, medium, moderate, roots 2%, rabdotus 10%, pinhole burrows 3-5%, insect galleries 5%, snail fragments 5%, worm casings 3%, white nodules 0.5-10 mm in diameter 2%, white filaments 2%	Clear, Slightly Wavy	No cultural materials
	5	112-152+	10YR 7/3-7/4	Very Pale Brown	Sandy Loam	Firm, subangular, medium, moderate, rootlets 3-5%, insect galleries 5%, rabdotus 3%, calcine coated snail fragments 3%, white nodules 20 mm 20%	Unobserved	No cultural materials

Appendix A. Backhoe Trench Data

BHT	Strat	Depth (cmbs)	Munsell	Soil Color	Soil Texture	Horizon Discussion	Lower boundary	Comments
BHT07	1	0-9	10YR 5/3	Brown	Sandy Loam	Loose, crumb, fine, weak, roots 5%, rootlets 20%, snail fragments 5%, rabdotus 1%	Clear, Slightly Wavy	Upper 2-3 cm stripped during trenching, No cultural materials
	2	9-33	10YR 5/3-5/4	Brown-Yellowish Brown	Sandy Loam	Friable, subangular, medium, moderate, roots 20%, rootlets 20%, snail fragments 5-10%, rabdotus 3-5%, insect galleries 20%, pinhole burrows 20%	Clear, Slightly Wavy	No cultural materials
	3	33-94	10YR 5/4-6/4	Yellowish Brown-Light Yellowish Brown	Sandy Loam	Friable to firm, subangular, medium to coarse, moderate, insect galleries 20-30%, rabdotus calcine coated 3-5%, roots 3%, rootlets 15%, pinhole burrows 10%, decomposing vegetation (root) 78-84 cmbs	Clear, Smooth	No cultural materials
	4	94-122	10YR 6/4	Light Yellowish Brown	Sandy Loam	Friable to firm, subangular, medium, moderate, roots 2%, rabdotus <1%, pinhole burrows 10%, insect galleries 15-20%, snail fragments <3%, worm casings 3%, white nodules 0.5 mm in diameter 2%	Clear, Slightly Wavy	No cultural materials
	5	122-173+	10YR 7/3-7/4	Very Pale Brown	Sandy Loam	Firm, subangular, medium, moderate, rootlets 3-5%, insect galleries 5%, rabdotus 3-5%, calcine coated snail fragments 3%, white nodules 10-15 mm 10%	Unobserved	No cultural materials
BHT08	1	0-22	10YR 5/3	Brown	Sandy Loam	Friable, subangular, fine, weak, roots 5%, rootlets 20-25%, rabdotus 1-3%, insect galleries 20%, pinhole burrows 10%, snail fragments 3%, possible worm burrows 3%	Clear, Slightly Wavy	No cultural materials
	2	22-37	10YR 5/3-5/4	Brown-Yellowish Brown	Sandy Loam	Friable, subangular, fine to medium, moderate, roots 3%, rootlets 15-20%, insect galleries 20%, worm burrows <3%, snail fragments 3%, rare rabdotus <1%	Clear, Wavy	No cultural materials
	3	37-87	10YR 5/4-6/4	Yellowish Brown-Light Yellowish Brown	Sandy Loam	Friable to slightly firm, subangular, medium to coarse, moderate to strong, roots 5%, primarily top of horizon, rootlets 15-20%, rabdotus 5-10%, calcine coated snail fragments 10%, insect galleries 20%, pinhole burrows 10%, white filaments 0.5-1 mm size 1-2%	Gradual, Smooth	Sections of prismatic structure throughout the stratum, No cultural materials
	4	87-116	10YR 6/4	Light Yellowish Brown	Sandy Loam	Firm, subangular, medium, moderate, rootlets 5-10%, insect galleries 5-10%, white nodules 0.5-10 mm size 3-5%, increasing pinhole burrows 10%	Clear, Smooth	No cultural materials
	5	116-168+	10YR 7/3-7/4	Very Pale Brown	Sandy Loam	Firm to extremely firm, subangular to angular, medium, moderate, rootlets 5-10%, insect galleries <5%, pinhole burrows 5-10%, calcium carbonate nodules ranging from 10-25 mm increasing 20-25%	Unobserved	No cultural materials

Appendix A. Backhoe Trench Data

BHT	Strat	Depth (cmbs)	Munsell	Soil Color	Soil Texture	Horizon Discussion	Lower boundary	Comments
BHT09	1	0-11	10YR 5/3	Brown	Sandy Loam	Loose, crumb, fine, weak, roots 3%, rootlets 15-20%, insect burrows 10%, snail fragments 5%, rabdotus 1%	Clear, Slightly Wavy	No cultural materials, column sampled
	2	11-44	10YR 5/3-5/4	Brown-Yellowish Brown	Sandy Loam	Friable, subangular, medium, moderate, roots 5%, rootlets 20%, insect galleries 25%, pinhole burrows 15-20%, worm burrows 5%, snail fragments 5%, rabdotus some with calcine 5%,	Clear, Wavy	No cultural materials, 1 piece charcoal 10-20 mm long, 10 mm wide, very dark from tree throw or burrow? (disturbance or veg clear?); lower boundary on north end deeper-extends to 77 cmbs
	3	44-73	10YR 5/4-6/4	Yellowish Brown-Light Yellowish Brown	Sandy Loam	Friable to slightly firm, subangular, medium, moderate, roots 3%, rootlets 15%, insect galleries 15-20%, worm burrows 5%, pinhole burrows 10%, white filaments 0.1-0.3 mm in size dendritic 3-5%, rabdotus 5%, rare Texas liptooth? snail shell <1%	Gradual, Smooth	No cultural materials
	4	73-118	10YR 6/3-6/4	Pale Brown-Light Yellowish Brown	Sandy Loam	Firm, subangular, medium to coarse, moderate, rootlets 10%, insect galleries 10%, pinhole burrows 5%, worm burrows 3%, snail fragments 3-5%, white nodules 0.5 mm in size 2-5%	Gradual, Smooth	Two subrounded pebbles at 116 cmbs
	5	118-148+	10YR 7/3	Very Pale Brown	Sandy Loam	Firm, subangular, medium, moderate, rootlets <3%, insect galleries <5%. pinhole burrows 10%, worm burrows 3%, snail fragments 3%, white nodules 10-25 mm size increasing 10-15%	Unobserved	Brittle consistency, No cultural materials

Appendix B. Column Sample Data

Site	BHT #	Column Sample #	Depth (cmbs)	Munsell	Soil Color	Soil Texture	Inclusions	Comments/Cultural Material
41HG242	BHT04	CS01	0-13	10YR 5/3	Brown	Sandy Loam	roots 5%, rootlets 20%, snail fragments 5%, rabdotus 1%	No cultural materials
			13-29	10YR 5/3-5/4	Brown-Yellowish Brown	Sandy Loam	roots 5%, rootlets 20%, snail fragments 5-10%, rabdotus 3-5%	No cultural materials
			29-86	10YR 5/4-6/4	Yellowish Brown-Light Yellowish Brown	Sandy Loam	roots 3%, rootlets 15%, rabdotus 3-5%, snail fragments 5%	No cultural materials
			86-101	10YR 6/4	Light Yellowish Brown	Sandy Loam	roots 2%, rabdotus 10%	One subrounded gravel at 41 cmbs. No cultural materials
			101-156+	10YR 7/3-7/4	Very Pale Brown	Sandy Loam	rootlets 3-5%, insect galleries 5%, rabdotus 3%, calcine coated snail fragments 3%	No cultural materials
41HG242	BHT05	CS02	0-22	10YR 5/3	Brown	Sandy Loam	roots 5%, rootlets 20%, snail fragments 5%, rabdotus 3%	No cultural materials
			22-43	10YR 5/3-5/4	Brown-Yellowish Brown	Sandy Loam	roots 5%, rootlets 20%, snail fragments 5-10%, rabdotus 3-5%	1 tertiary flake observed at 25 cmbs
			43-92	10YR 5/4-6/4	Yellowish Brown-Light Yellowish Brown	Sandy Loam	roots 3%, rootlets 15%, rabdotus calcine coated 5%, snail fragments 5%	1 chipped stone tool at 55 cmbs, 1 tested cobble at 66 cmbs
			92-112	10YR 6/4	Light Yellowish Brown	Sandy Loam	roots 2%, rabdotus 10%, snail fragments 5%	No cultural materials
			92-163+	10YR 7/3-7/4	Very Pale Brown	Sandy Loam	rootlets 3-5%, rabdotus 3%, calcine coated snail fragments 3%	No cultural materials
N/A	BHT09	CS03	0-11	10YR 5/3	Brown	Sandy Loam	roots 3%, rootlets 15-20%, snail fragments 5%, rabdotus 1%	No cultural materials
			11-44	10YR 5/3-5/4	Brown-Yellowish Brown	Sandy Loam	roots 5%, rootlets 20%, snail fragments 5%, rabdotus some with calcine 5%	No cultural materials
			44-73	10YR 5/4-6/4	Yellowish Brown-Light Yellowish Brown	Sandy Loam	roots 3%, rootlets 15%, insect galleries 15-20%, worm burrows 5%, rabdotus 5%, rare Texas liptooth? snail shell <1%	No cultural materials
			73-118	10YR 6/3-6/4	Pale Brown-Light Yellowish Brown	Sandy Loam	rootlets 10%, insect galleries 10%, snail fragments 3-5%	Two subrounded pebbles at 116 cmbs
			118-148+	10YR 7/3	Very Pale Brown	Sandy Loam	rootlets <3%, snail fragments 3%	No cultural materials

This report was written on behalf of the Texas Department of Transportation by

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