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CSJ 0221-05-065, US 271 South of Talco Intensive Archaeological Survey, Titus County, Atlanta District

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CSJ 0221-05-065, US 271 South of Talco Intensive Archaeological Survey, Titus
County, Atlanta District

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Report for Archeological Survey

*CSJ 0221-05-065, US 271 South
of Talco Intensive Archaeological
Survey, Titus County, Atlanta
District*

Jon Budd, Principal Investigator

Antiquities Permit No. 8699

Date June 14, 2019

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.

Abstract

On May 20-23, 2019, an Intensive archeological resources survey was conducted south of Talco, northwest Titus County, Texas, along US 271 for the Titus County Improvement Project (CSJ-0221-05-065). The survey area is an irregularly-shaped linear area measuring 0-feet-wide at its northern extent, 83-feet-wide (25-m) at its approximate center, and 67-feet-wide (21-m) at its southern extent. Its average width is 70 feet (21 m). The total survey area is comprised of approximately 2.02 acres of new right-of-way (ROW) and 0.37 acres of new easement and was surveyed for cultural resources in advance of road improvements and bridge removal and replacement. The new right-of-way is located on an existing alignment that is oriented south-southeast-to-north-northwest west and commences 2.2 miles southeast of the intersection of US 271 and SH 71. Investigations were limited to a 1,508-foot-long (0.46-km) segment of the approximately 1.741 mile-long (2.8-km) project area.

Survey consisted of intensive shovel testing delineation of site 41TT922 and the excavation of six backhoe trenches. Two trenches were placed within the limits of 41TT922 in an attempt to locate archeological features, and the remaining four trenches were placed on hills and toe slopes of the north valley wall of Big Slough. No archeological features were encountered during backhoe trenching. During shovel testing, subsurface prehistoric lithics were recovered from 0 to 33 cm below surface in 10 out of 16 shovel tests. As a result of the survey, site 41TT922 was further documented and its site boundaries were expanded to the eastern edge of the current APE. The site likely continues east beyond the current APE.

Although the investigation discovered a shallow depth of archeological deposits (33 centimeters), a lack of features, ceramics, floral, and faunal remains, the investigators recommend that further archeological work should be conducted to determine the eligibility of the site to be listed on the National Register of Historic Places and the potential for the site to be designated as a State Antiquities Landmark. The justification for this recommendation is based upon the general paucity of Late Archaic archeological deposits in Eastern Texas.

Project Information

- **This survey is:**
 - the initial survey for this project
 - X A continuation of previous survey(s) due to:
 - X access issues and/or
 - design changes
- **Date:** June 14, 2019
- **Date(s) of Survey:** May 20-22, 2019
- **Archeological Survey Type:** Reconnaissance Intensive
- **Report Version:** Draft Final
- **Jurisdiction:** Federal State
- **District:** Atlanta District
- **County or Counties:** Titus County
- **USGS Quadrangle(s):** Talco, Texas. (3395-141)
- **Highway:** Along the eastern side of US 271 at the floodplain of Big Slough/Dickson Creek, located ca. 2.2 miles (3.5 kilometers [km]) south of the intersection of US 271 and SH 71, south of Talco, Texas, and extending northwestward along the roadway for approximately 1,508 feet (ft) (0.46 km) (**Figure 1**). The survey area was conducted within the eastern side of the roadway within 2.02 acres of newly acquired right-of-way (ROW).
- **CSJ:** 0221-05-065
- **Report Author(s):** Charles D. Neel
- **Texas Antiquities Permit Number:** 8699
- **Principal Investigator:** Jon Budd (TxDOT)
- **Estimated Percentage of Time that the Principal Investigator Was in the Field:** 0



Figure 1. Project location map.

Project Description

- **Project Type:** Road widening, bridge replacements, curve correction, and reconstruction.
- **Total Project Acreage:** 47.5 acres
- **Existing ROW Acreage:** 13.9 acres
- **New Right of Way (ROW) Acreage:** 2.02 acres
- **New Easement Acreage (includes temporary and permanent easements):** 0.37 acres
- **Survey Area:** 2.02 acres
- **Project Description and Impacts:** The Atlanta District proposes to reconstruct and widen the existing two-lane US 271 highway with minor curve corrections and to remove and replace four bridges south of Talco, Texas in northwest Titus County. The survey area commences at the Big Slough and Dickson Creek floodplains and extends northward for 1,508 feet (0.28 miles/0.46 km). Average depths of impact for the proposed project will be less than 4 feet (1.2 meters [m]), but may exceed 25 feet (7.6 m) for bridge pier replacements.
- **Area of Potential Effects (APE):**

The survey area comprises approximately 2.02 acres of an approximately 47.5-acre APE that is centered on US 271 and begins approximately 0.72 mile (1.15 km) north of the intersection of US 271 and Farm-to-Market Road 1896 and extends north for approximately 1.22 mile (1.96 km), terminating approximately 0.39 mile (0.62 km) south of the intersection of 1820 Road/NW 48 Road (**Figure 2**). The survey area is located in the northern extent of the APE and begins in the Big Slough and Dickson Creek floodplains, extending northward for a distance of 1,508 feet (0.46 km) (**see Figure 2**). The survey area is an irregularly shaped linear polygon that measures 0-foot-wide at its northern extent, 83-foot-wide (25-m) at its approximate center, and 67-foot-wide (21-m) at its southern extent. The western boundary of the survey area follows the current ROW fence line. The survey area is comprised of 2.02 acres of new right-of-way (ROW) and 0.37 acres of new easement, and was surveyed for cultural resources via intensive pedestrian survey and backhoe trenching. The vertical APE averages less than 4 feet (1.21 m) below surface throughout the majority of the project area; however, new bridge replacement vertical impacts at Big Slough Creek and White Oak Creek may extend more than 25 feet (7.6 m) below surface to allow for the installation of new bridge pier footings.
- **No Survey Area:**

The southern approximately 497 feet (151 m) of the survey area, comprising approximately 37 percent of the survey area (0.74 acres), was not intensively surveyed, as this was an area of swampy ground that is subject to frequent flooding and had drift piles of vegetation debris and silt located on the ground surface (**Figure 3**). Additionally, the northern approximately 476 feet (145 meters) of the survey area, comprising approximately 14 percent (0.30 acres) of the survey area, had standing water covering the ground surface and could not be

surveyed (**Figure 4**). These areas were pedestrian surveyed as much as field conditions allowed with negative results.

- **Access Denied Area:** Access was available for the entire survey area. No areas were denied access.
- **Survey Area:** The central upland portion of the project area, approximately 535 feet (163 m) in length, accounting for approximately 49 percent (.98 acres) of the area that was surveyed for cultural resources.
- **Project Area Ownership:** The survey area consists of land owned by TxDOT.
- **Parcel Number(s):** N/A **Access Denied Area:**

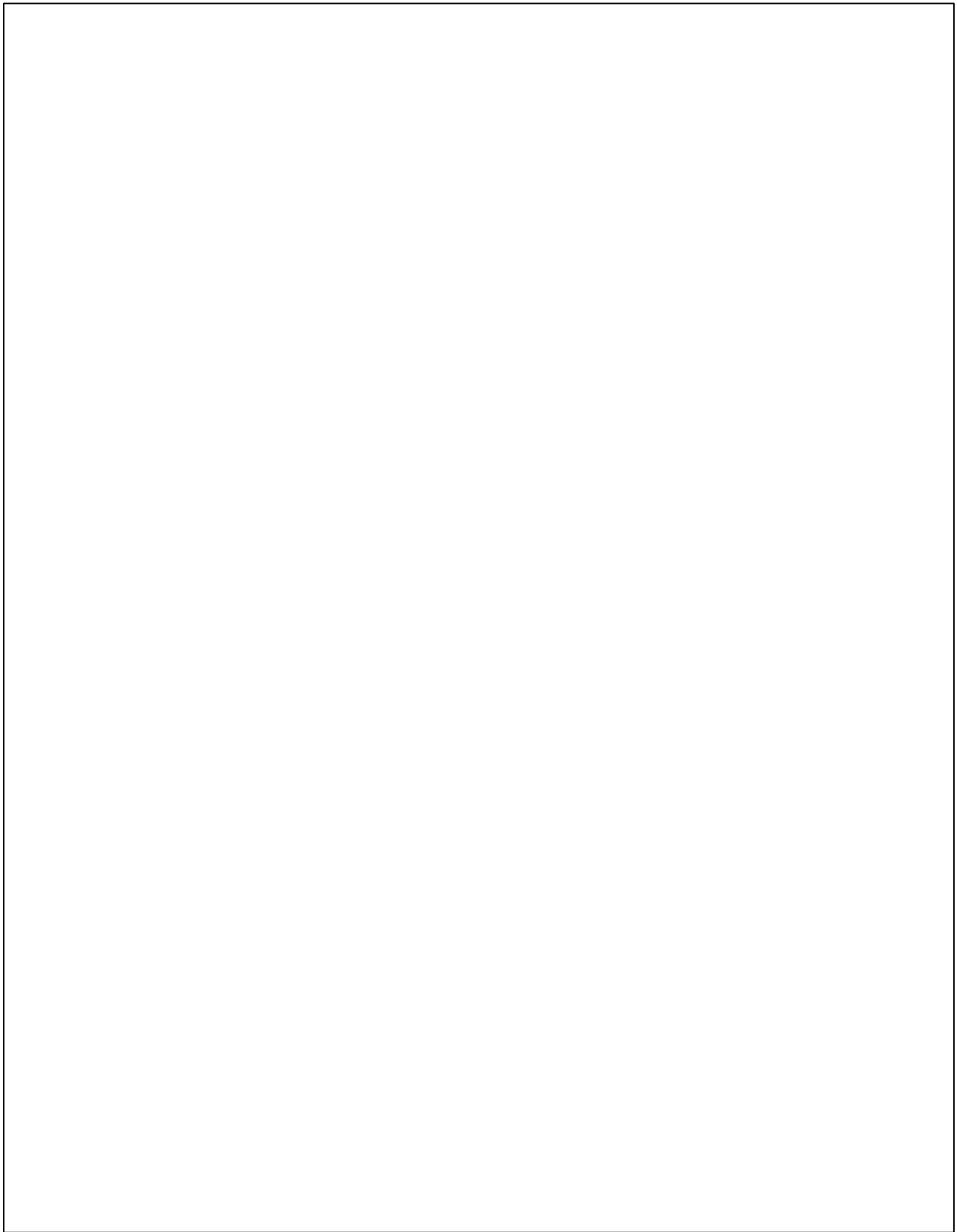


Figure 2. APE and survey area depicted on the Talco, Tex. (3395-141), Texas USGS 7.5-minute topographic quadrangle map, Titus County, Texas.



Figure 3. Edge of floodplain with site 41TT922 on valley wall in background, facing northeast. Note silt deposits on grass in foreground, delineating edge of recent flood.



Figure 4. Standing water adjacent to gravel road within the northern extent of the survey area, facing north.

Project Setting

▪ Natural Setting

Topography: Topography of the survey area is generally flat and comprised of the floodplain of Big Slough/Dickson Creek, the dissected north valley wall of Big Slough, and a swampy toe slope beyond the valley wall to the northwest (see **Figure 3** and **Figure 4**). The elevation of the survey area ranges from 310 feet (94 m) above mean sea level (AMSL) at the channel banks of Big Slough to 360 feet (110 m) AMSL at the top of the valley wall, a vertical distance of 50 feet (16 m).

The project area is within the Big Slough catchment zone, which is immediately north of and contributes to White Oak Creek. Big Slough Creek is a former channel of White Oak Creek that now serves as an overflow channel during flood events. White Oak Creek is a major eastern-flowing tributary contributing to Sulfur River.

Geology: The northern approximately 877 feet (267 m) of the survey area is underlain by Lower Tertiary-age Midway Group (Emi), undivided, (U.S. Geological Survey (Bureau of Economic Geology 1979) and the southern approximately 631 feet (192 m) is underlain by Holocene-age alluvium (Qal) within its central and southern extent (**Figure 5**). Midway Group, undivided, is comprised of pale brown to brownish gray massive blocky clay, sometimes containing glauconitic sands layers (MROSD 2019). This geologic unit was not encountered in backhoe trench excavations. Alluvium deposits of the APE are formed from the deposition of clay, silt, sand, and gravel and silty on alternatively dry and flooded barren flats along streams. This geologic unit was not encountered in backhoe trench excavations.

Soils: Survey area soils have been mapped as Woodtell fine sandy loam, 2 to 5 percent slopes (WoC) and Woodtell fine sandy loam, 5 to 20 percent slopes (WoE) on the valley wall and upper ridge line of Big Slough Creek, as Estes clay loam, frequently flooded (Es) on the TO terrace of Big Slough and Dickson Creek (California Soils Resource Lab (CSRL 2019a, 2019b, 2019c) (**Table 1; Figure 6**). The Woodtell soils are loamy and clayey in situ developed soils from sandstone and shale and occur on interfluvial and side slopes of ridges. A typical horizon exhibits an Ap/Bt/Btss1/Btss2/C horizon sequence to 183 cm with depths of 15/30/74/114/and 183 cm, respectively. The Estes soil unit is a clayey and loamy alluvium of the Coastal Plain. A typical horizon exhibits an A/Bw/Bg/Bsg/BCg horizon sequence to 203 cm with depths of 10/30/97/165/and 203 cm, respectively.

Potential Archeological Liability Map: There is no PALM data for the Atlanta District.

Table 1. Soils within the Surveyed Parcels.

Mapping Unit	Soils Description	Parent Material	Percentage of the Survey Area
WoC	Woodtell fine sandy loam, 2 to 5 percent slopes	Loamy and clayey residuum derived from sandstone and shale	15
WoE	Woodtell fine sandy loam, 5 to 20 percent slopes	Loamy and clayey residuum derived from sandstone and shale	39
Es	Estes clay loam, frequently flooded	Clayey and loamy alluvium of the Coastal Plain	46

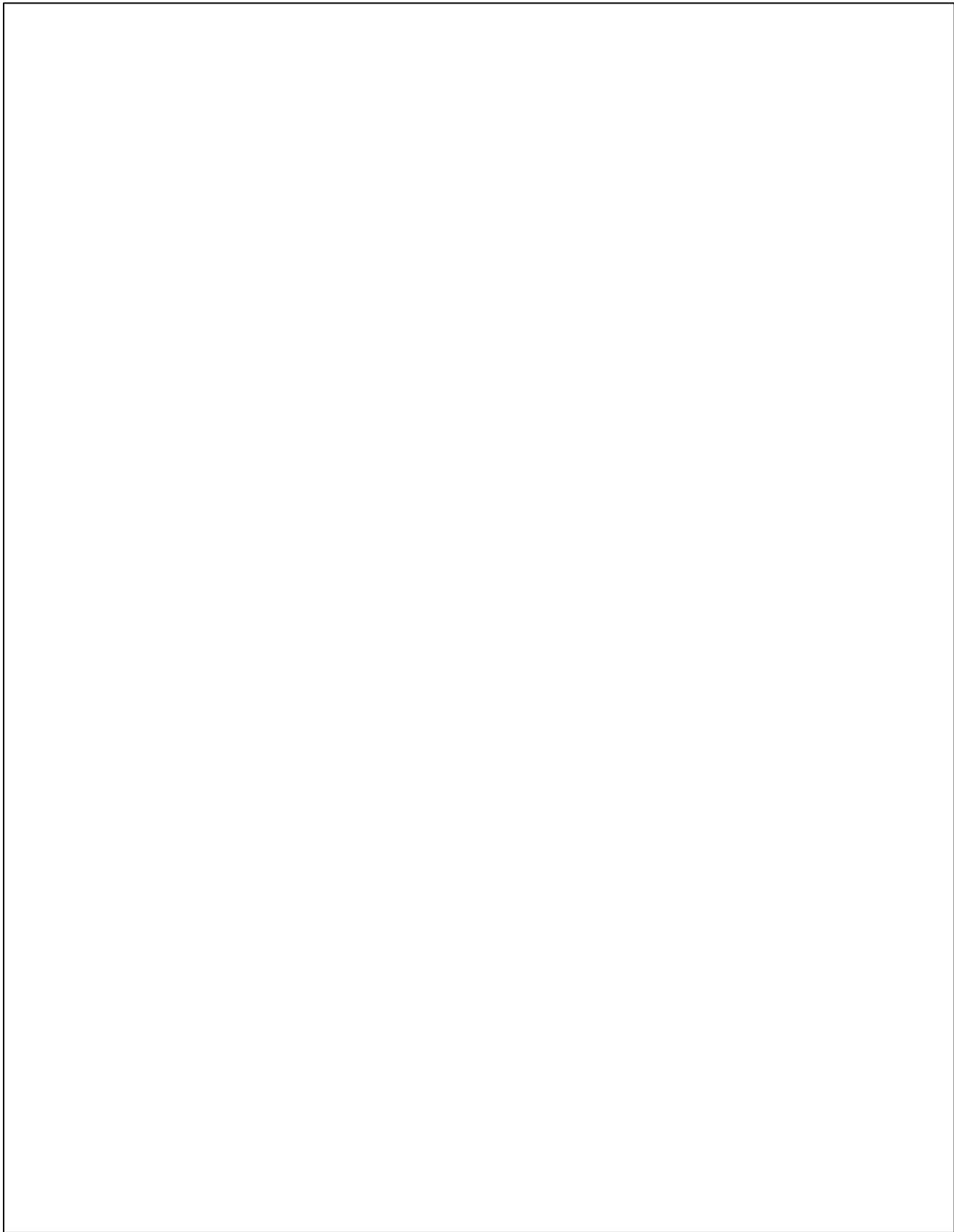


Figure 5. Geology of the survey area.

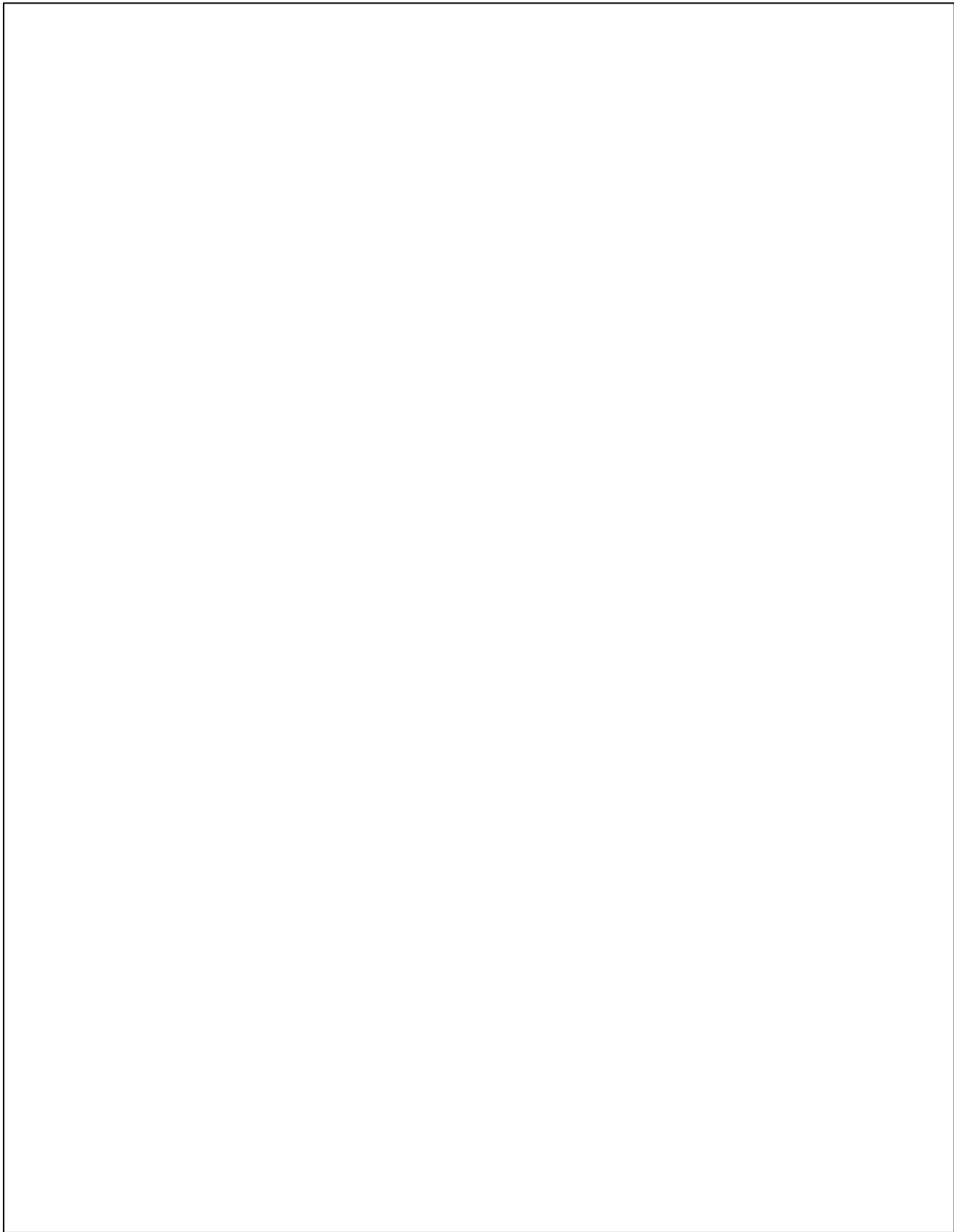


Figure 6. Soils of the survey area.

Historic Land Use: Based on a review of historic imagery of maps and aerial photographs, the project area is located in the vicinity of rural woodland and was cleared for cattle pasture by at least 1964.

Land Use: Current land use is short grass pasture for cattle ranching.

Vegetation: The APE consists primarily of short grass pasture with woodland of hackberry, oak, and sycamore along fence rows and oak woodland on hilltops beyond the APE.

Estimated Ground Surface Visibility: The ground surface visibility (GSV) was 0 percent

Previous Investigations and Known Archeological Sites: A review of the Texas Archeological Sites Atlas (Atlas) was completed on 15 May 2019 for an area within 1 kilometer (km) of the survey area. One archeological site (41TT922) is recorded within the survey area, and seven archeological investigations are recorded within 1-km of the survey area, one of which intersects the survey area (**Figure 7**). Site 41TT922 is a subsurface prehistoric site that was discovered during the ROW survey of the US 271 roadway project in 2012 by Brazos Valley Research Associates, conducted under TAC permit No. 6353 (Moore et al. 2013), however, right of entry (ROE) to the current property was not available at the time of the 2012 survey. 41TT922 is an Archaic-period camp with tool rejuvenation as the primary site activity that was determined to be ineligible for the NRHP within the ROW in 2013. A total of 29 fragments of debitage and one Yarbrough dart point were recovered from 11 positive shovel tests with cultural material extending to 33 centimeters below surface (cmbs) during initial investigations in 2012.

Six additional surveys are recorded within 1 km of the survey area. In 1982, a linear survey was conducted approximately 0.99 km south of the survey area under the sponsorship of THD; no further details regarding this survey are available. A linear survey was conducted approximately 0.99 km south of the survey area under the sponsorship of the Federal Energy Regulatory Commission in 1988; no further details regarding this survey are available. In 2006, PBS&J completed an area survey 329 m south of the APE under the sponsorship of the Federal Housing Administration under TAC Permit 4198 in advance of widening FM 1896 (Cliff et al. 2007). In 2007, Christopher Goodwin Associated conducted an area survey under the sponsorship of the Federal Energy Regulatory Commission on behalf of the Gulf Crossing Pipeline Company approximately 895 m southwest of the APE (no TAC Permit number. available). An area survey was conducted by R. Christopher Goodwin and Associates in 2008 under the sponsorship of the Federal Energy Regulatory Commission approximately 0.91 km south of the survey area on behalf of Gulf Crossing Pipeline Co. (No TAC Permit number. available). In 2015, a linear survey was conducted approximately 495 southwest of the project APE by Sphere 3 Environmental for an unidentified gas line (no TAC Permit number available).

- **Evaluation of Project Setting:** The project setting encompasses former woodland that has been cleared and converted to non-native grass species for cattle ranching. The setting appeared to be

relatively intact, excepting some disturbance along the eastern edge of the APE due to the construction of a gravel driveway and installation of a fiber optic line which parallels the driveway on its western and southern edges (**see Figure 4**). The major detrimental effect to the APE is natural erosion and dissection of the valley wall of Big Slough, which now consists of three small, low hills separated by narrow runoff drainages. These hill-and-slope landforms with a sandy mantle, located in close proximity to the Big Slough and Dickson Creek bottoms, offer a high potential for shallow prehistoric deposits. No potential historic structures are depicted on historic imagery and historic occupations were not expected and were not encountered.



REDACTED

Figure 7. Cultural resources and previous investigations with a 1-kilometer (0.62-mile) radius of the survey area.

Survey Methods

- **Surveyors:** Charles D. Neel.

Description of Methods: Two survey methods were utilized for the fieldwork: shovel test excavations and backhoe trenches. An Intensive shovel test grid was established at the site centroid of 41TT922, located within the survey area. An east-west base line was extended from the shovel test of the site centroid and extended eastward to the edge of the survey area. Shovel tests were excavated at 5 m and 10 m intervals depending on the width of the survey area. Shovel tests were then extended north and south of the base line tests until a negative shovel test were encountered. Two additional shovel tests (CN-1 and CN-2) were placed outside of the cruciform grid to ensure adequate investigation of the survey area.

In addition to shovel testing, six backhoe trenches were excavated on the valley wall/hill and slope landforms, with two trenches (BHT-1 and BHT-2) placed within the limits of site 41TT922 as delineated by shovel testing. The remaining four trenches (BHT-3 through BHT-6) were placed on hill and slope landforms to east of the previous site boundaries. Positive backhoe trenches had shovel tests placed within their profile walls (shovel tests CN-3, associated with BHT-1, shovel test CN-4, associated with BHT-2, and shovel tests CN-5 and CN-6, associated with BHT-3) (Figures 8–13).

- **Subsurface Probes:** see Figures 8 and 13, Tables 2–4

Table 2. Subsurface probes.

Method	Quantity in Existing ROW	Quantity in Proposed New ROW	Quantity in Proposed New Easements	Total Number per Acre
Shovel Test Pits	0	22	0	10.89
Power Auger Probes	0	0	0	0
Mechanical Trenches/Scrapes	0	6	0	2.97

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

Comments on Methods: Sixteen shovel tests (E5, E10, E20, E30, E35, N10E5, N10E10, N10E15, N10E20, N10E30, N20E10, S10E10, S10E20, S10E30, S10E35, and S20E20) were placed within a cruciform grid on the landform east of site 41TT922 to determine boundaries, depth, and cultural materials present. The cruciform grid was oriented to magnetic north and shovel tests were excavated at 5 m and 10 m intervals. Soil profile descriptions of soil color (Munsell values), texture, and inclusions were compiled for all shovel tests. All shovel test excavated soil was

screened through ¼ inch hardware cloth for recovery of artifacts. The location of all shovel tests were recorded using a Garmin Montana 650t unit with accuracy of ±2 m utilizing North American Datum 83 (NAD 83). Two additional shovel tests (CN-1 and CN-2) were excavated south of the cruciform shovel test grid in order to fully assess the accessible survey area; the absent-to-thin topsoil on these hills precluded any further shovel testing of this area. Four additional shovel tests (CN-3 through CN-6) were excavated within the walls of positive backhoe trenches. See below for details on CN-1 through CN-6.

Six backhoe trenches (BHT-1 through BHT-6) were excavated on the valley wall/hill landforms and slopes and prehistoric material was documented in the soil profile of three of the trenches (BHT-1, BHT-2, and BHT-3), resulting in the expansion of the site boundaries of 41TT922 to the northeast, south of the negative shovel tests, based on BHT-3. Four additional shovel tests (CN-3, associated with BHT-1, CN-4, associated with BHT-2, and CN-5 and CN-6, associated with BHT-3) were excavated immediately adjacent to these backhoe trenches due to the presence of artifacts within soil profiles of these trenches (**see Figures 8–13**).

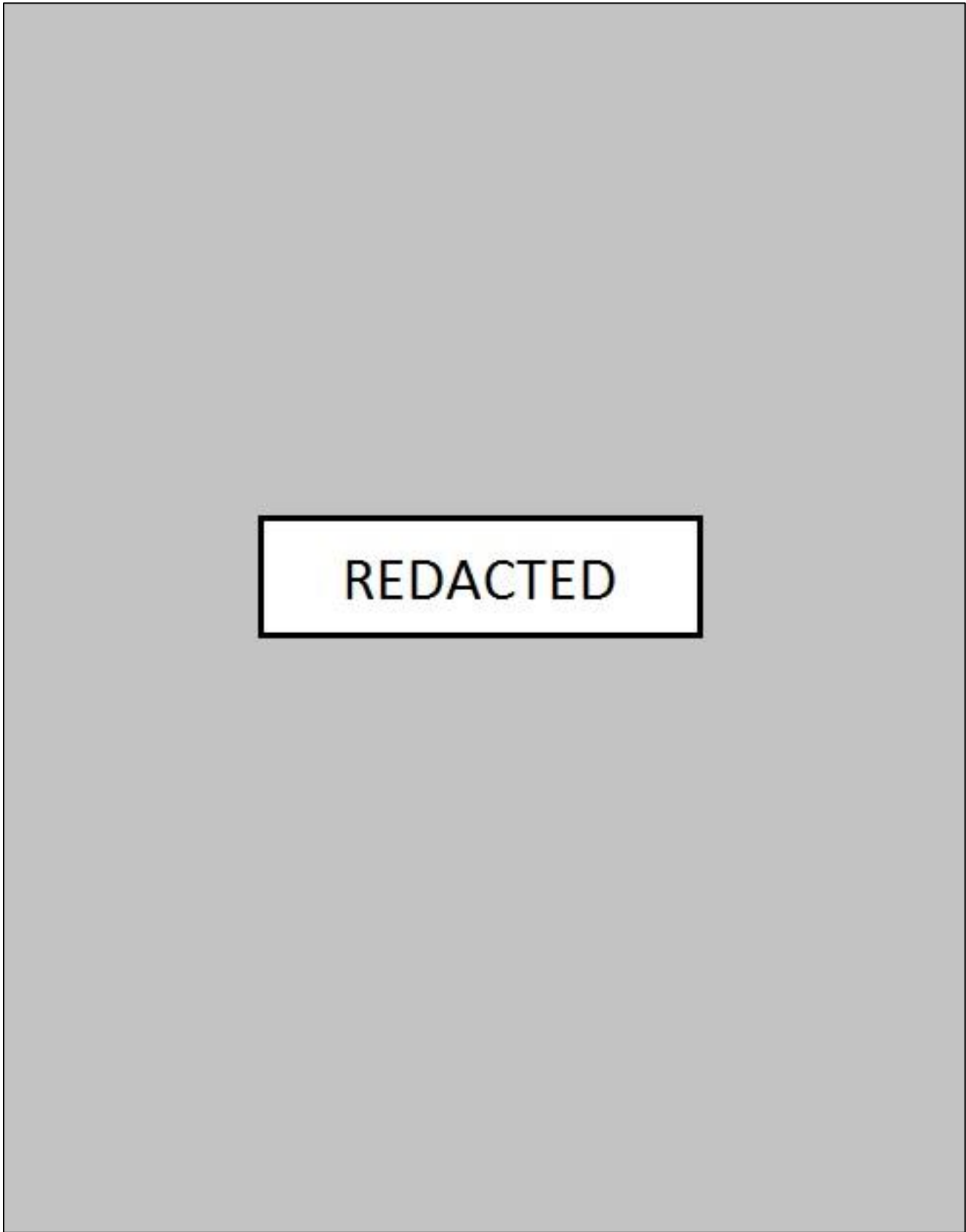


Figure 8. Survey area, northern APE, and positive and negative subsurface probe locations.



Figure 9. Representative shovel test (CN-3) at artifact location in profile of south wall of BHT-2, facing south



Figure 10. Average backhoe trench overview at BHT-2, facing east.



Figure 11. Typical trench profile showing thin sandy mantle over clay horizons (south wall, BHT-2), view south.



Figure 12. Positive backhoe trench example. BHT-1, showing cultural material up to 27 cmbs within the south wall of the trench, facing south.

Survey Results

- **Survey Area Description:** From south to north, the survey area consisted of the flat swampy floodplain of Big Slough and Dickson Creek, dissected hill slopes of the north valley wall, and a low, flat swampy ridge toe slope to the north, resulting from the impoundment of a drainage. The dissected hillslopes/valley wall are planted with non-native grasses and are additionally vegetated with a natural woodland of oak, hackberry, and sweet gum along fence lines. Native vegetation of the survey area is recorded as Post Oak Woods, Forest and Grassland Mosaic (Bureau of Economic Geology 2000).
- **Buffer Zone Description:** The buffer zone was comprised of similar to identical landforms and vegetation as the survey area.
- **Archeological Materials Identified:** Previously recorded site 41TT922 was delineated during the intensive shovel testing and backhoe trenching of the survey area, resulting in expansion of the previously existing site boundaries approximately 45 feet (14 m) to the northeast along roughly 132 feet (40m) of its approximate center (**Figures 13–15. See also Figure 8**). A total of 77 prehistoric artifacts were encountered in 10 of the 16 grid shovel tests (E10, E20, E30, E35, N10E10, N10E15, N10E20, N10E30, S10E30, and S10E35), three of the six backhoe trenches (BHT-1 through BHT-3), and in the soil profiles of four shovel tests that were placed in association with the positive backhoe trenches (CN-3,) associated with BHT-1, CN-4, associated with BHT-2, and CN-5 and CN-6, associated with BHT-3 (**Figures 16–18**).
- Cultural material was found from 0 to 33 cmbs. Lithic debitage consisted of one small ovate bifacial core, five core fragments, 11 primary flakes, 24 secondary flakes, 19 tertiary flakes, 13 biface thinning flake/pressure flakes, and one fragment of shatter. One small Gary dart point with end shock fracture was found in shovel test N10E10 from 0–4 cmbs, a Yarbrough dart point base of novaculite with partial grinding on the stem was found in CN-2 (excavated in the south wall of BHT-1) at 25 cmbs, and a gray chert biface midsection fragment was found in shovel test CN-5 from 0 to 10 cmbs; this indicates that finished tools of non-local lithic materials were transported to the site from other source areas. The vast majority of the lithic material is reduced stream rolled cobbles of fine grained quartzite with thin cortex that range in color from a dusky to weak red (2.5YR 4/2), possibly indicating an acquisition source nearby. A few of the flakes have a pale brown (10YR 6/3) to light yellowish brown (2.5Y6/4) interiors with red cortex, and are likely from the same source area. One blocky core fragment is of petrified wood and another core fragment is a distinctive gray quartzite with large silica grains.
- **Survey area Integrity:** The integrity of the survey area has been slightly compromised by the construction of a gravel driveway, installation of fiber optic cable along the edge of the driveway, and natural erosion (**see Figure 4**).

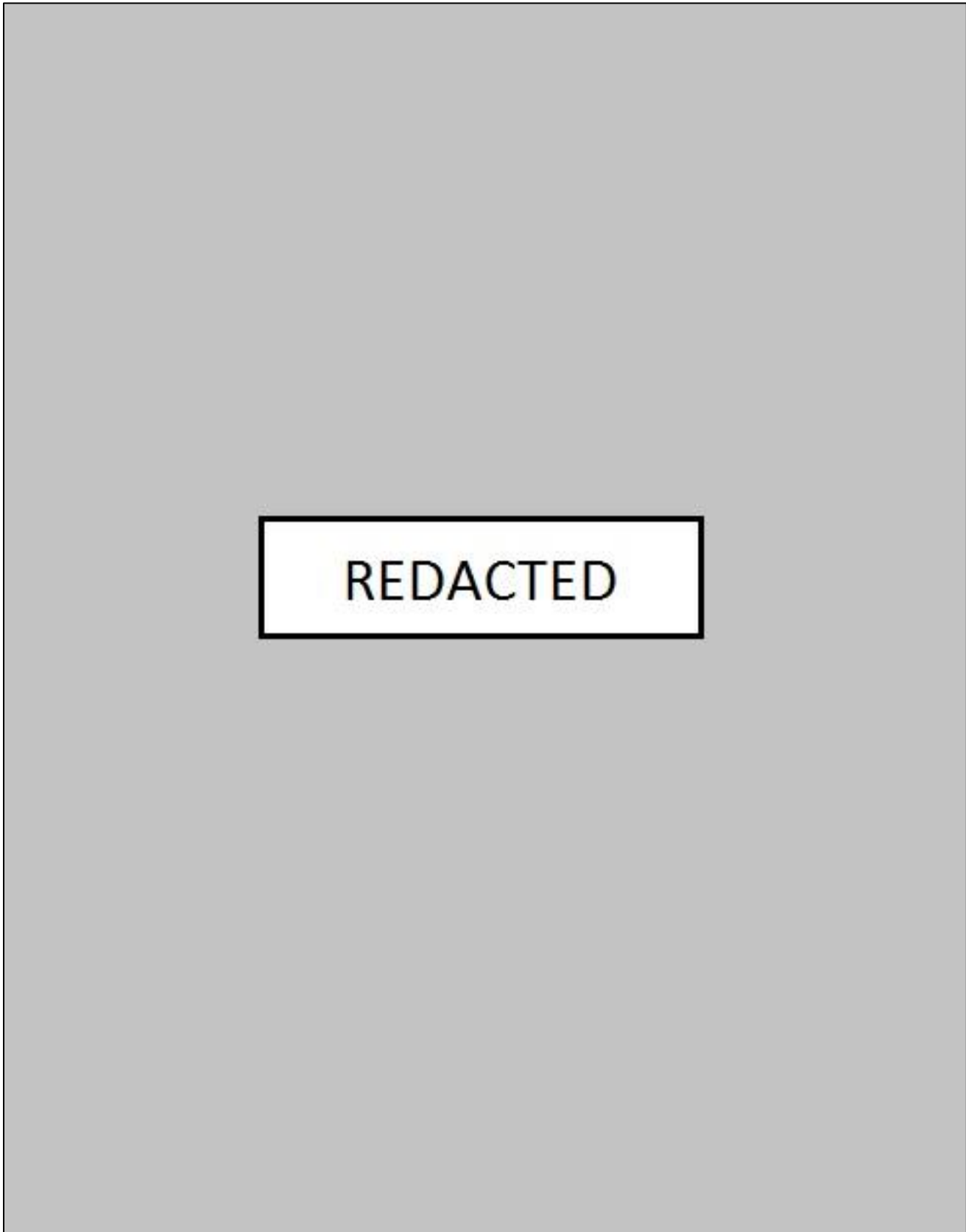


Figure 13. Survey area detail depicting subsurface probes, partial previous site boundary of 41TT922 and newly expanded boundary of site 41TT922.



Figure 14. Site 41TT922 overview, facing south.



Figure 15. Landform east of the survey area and new eastern boundary of site 41TT922, facing east. Site 41TT922 likely continues east beyond the current survey area and APE.



Figure 16. Cores and core fragments recovered from 41TT922, 0 to 33 cmbs.



Figure 17. Debitage sample and point fragments recovered from 0 to 33 cmbs within 41TT922.



Figure 18. Gary base recovered from 0–4 cmbs within shovel test N10E10 and Yarborough base made with novaculite recovered from shovel test CN-2/BHT-1 from 10 to 27 cmbs.

Recommendations

- **Results Valid Within (check all that apply to define the buffer zone):**

No Survey Area (NSA)

Survey Area

Either

50 feet of NSA

50 feet of survey area

Variable, see map

0 feet of NSA

0 feet of survey area

- **The Definition and Evaluation of this Horizontal Buffer Zone Is Based on One or More of the Following Considerations (check all that apply):**

The integrity of the areas within and adjacent to the setting is affected by prior development.

The survey shows that archeological materials are unlikely to exist in this area.

Other (specify): The flat ridge landform to the northeast of the APE is likely to contain a continuation of the site area.

The findings documented in this report apply to all areas within the horizontal buffer zone, as specified in the previous section. Any design change within this area would not require additional review or investigation. Design changes that either extend beyond the buffer zone or result in potential impacts deeper than the impacts considered in this report would require additional review.

- **Archeological Site Evaluations:** Site 41TT922, previously recorded in 2013, was delineated via shovel testing and backhoe trench excavations. The site is a Late Archaic base camp occupation where the reduction of stream-rolled cobbles and the retooling of dart shafts were the primary site activities. The site is shallow, with artifacts confined to the upper sandy mantle of the landform to 33 cmbs. No evidence of features was noted; however, one probable root burn was documented in the south wall of BHT-4 and a large 14C sample was recovered from 48 cmbs. The sixteen shovel tests excavated on the delineation grid and the four shovel tests excavated at positive locations adjacent to backhoe trenches represents 0.498 cubic meters of soil screened for artifacts. Potential artifact representation for the site as a whole, based on these statistics indicate a potential of 154 artifacts per cubic meter.
- **Comments on Evaluations:** The flat-topped ridge to the east of the survey area is likely the primary occupation of the site and may offer a deeper sand mantle and more potential for feature preservation.
- **Further Work:** Further work is recommended within the current survey area.
- **Justification:** Due to the paucity of archeological deposits dating from the Late Archaic time period in east Texas, additional archeological work is recommended to determine the eligibility of the site for listing to the National Register of Historic Places (NRHP) or as a State Archeological landmark (SAL).

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Table 3. Shovel test unit results.

Shovel Test Pit Number	Depth (cmbs) of level	Sediment color (Munsell)	Sediment Texture	Cultural Material*
E5	0-6	Very dark gray 10YR 3/1	Very clayey loam	No
	6-23	Dark yellowish brown 10YR 4/6	Clayey loam	No
	23+	Yellowish red 5YR4/6	Clay	No
E10	0-3	Very dark grayish brown 10YR 3/2	Very silty loam	No
	3-13	Brown 10YR 4/3	Coarse sandy clayey loam	1 primary flake, 1 tertiary flake
	13+	Yellowish red 5YR4/6	Clay	No
E20	0-15	Very dark grayish brown 10YR 4/3	Very silty loam	3 tertiary flakes, 1 core fragment
	15-22	Mixed zones i and ii	Loamy clay	None
	22+	Strong brown 7.5YR 4/6	Clay	None
E30	0-5	Brown 10YR 4/3	Silty loam	Level 1 (0-10 cm) 1 large core reduction flake, 1 secondary flake, 1 primary flake with white interior
	5-42	Brown 7.5YR 3/2	Silty loam	Level 2 (10-20 cm) 1 secondary flake, 1 tertiary flake, 1 shatter
	42+	Brown 7.5 YR 4/4	Loamy clay	None

Shovel Test Pit Number	Depth (cmbs) of level	Sediment color (Munsell)	Sediment Texture	Cultural Material*
E35	0-7	Brown 10YR 4/3	Silty loam	Level 1 (0-20cm) 3 secondary flakes
	7-28	Brown 7.5YR 3/2	Silty loam	See above
	28+	Brown 7.5 YR 4/4	Loamy clay	None
N10E5	0-9	Black 10YR 2/1	Clay	None
	9-15+	Strong brown 7.5YR 4/6	Clay	None
N10E10	0-4	Very dark grayish brown 10YR 3/2	Clayey loam	Level 1 (0-10 cm) 4 secondary flakes, one primary flake, 2 tertiary flakes, 1 small Gary dart base with end shock fracture
	4-26	Brown 7.5YR 4/4	Sandy loam	Level 2 (10-20 cm) 4 secondary flakes, 2 tertiary flakes 2 biface thinning flakes; Level 3 (20-26 cm) 4 secondary flakes
	26-30+	Strong brown 7.5YR 4/6	Clay	None
N10E15	0-7	Very dark brown 7.5YR 3/3	Coarse sandy loam	Level 1 (0-10 cm) 1 tertiary flake
	7-34	Strong brown 7.5YR 4/6	Silty loam	Level 2 (10-20 cm) 2 secondary flakes, 2 biface thinning flakes; Level 3 (20-30 cm) 2 secondary flakes, 2 tertiary flakes, 1 biface thinning flake

Shovel Test Pit Number	Depth (cmbs) of level	Sediment color (Munsell)	Sediment Texture	Cultural Material*
	34-43+	Reddish brown 5YR 4/4	Very clayey loam	None
N10E20	0-15	Very dark grayish brown 10YR 3/2	Silty clay loam	Level 1 (0-15 cm) 1 secondary flake, 2 pressure flakes
	15-27	Brown 7.5YR 4/4	Sandy loam	Level 2 (15-27 cm) 1 primary flake, 2 secondary flakes
	27-30+	Yellowish red 2.5YR 4/6	Very sandy clay	None
N10E30	0-4	Very dark gray 10YR 2/2	Slightly clayey loam	Level 1 (0-10 cm) 3 secondary flakes, 3 tertiary flakes
	4-15	Dark yellowish brown 10YR 4/6	Coarse sandy loam	See above
	15-27	Dark yellowish brown 10YR 4/6	Silty clay loam	Level 2 (10-20 cm) 1 secondary flake
	27+	Dark yellowish brown 10YR 4/6	Clay	None
N20E10	0-6	Very dark grayish brown 10YR 3/2	Clayey loam	Level 1 (0-10 cm) 1 modern pale green glass shard, one plastic bottle fragment, 1 thin gray hard plastic
	6-13	Brown 7.5YR 4/4	Sandy loam	None
	13-22+	Yellowish brown 10YR 5/4 With redoximorphic features of red	Very clayey silt	None

Shovel Test Pit Number	Depth (cmbs) of level	Sediment color (Munsell)	Sediment Texture	Cultural Material*
		clay and black manganese specks		
S10E10	0-3	Black 10YR 3/1	Wet clayey loam	None
	3-14	Gray 10YR 5/1	Clay	None
	14-20+	Grayish brown 10YR 5/2 With brown redoximorphic features of 7.5YR 5/4	Loamy clay	None
S10E20	0-5	Dark grayish brown 10YR 4/2	Coarse sandy loam	None
	5-18	Brown 10YR 5/3	Very silty loam	None
	18+	Brown 10YR 5/3 With strong brown redoximorphic features of 7.5YR 4/6	Clay	None
S10E30	0-6	Very dark gray 10YR 2/2	Slightly clayey loam	Level 1 (0-10 cm) 1 secondary flake, 1 pressure flake
	6-21	Dark yellowish brown 10YR 4/6	Coarse sandy loam	None
	21+	Dark yellowish brown 10YR 4/6	Clay	None

Shovel Test Pit Number	Depth (cmbs) of level	Sediment color (Munsell)	Sediment Texture	Cultural Material*
S10E35	0-10	Dark grayish brown 10YR 4/2	Coarse sandy loam	Level 1 (0-10 cm) 1 tertiary flake
	10-21	Brown 10YR 5/3	Very silty loam	None
	21+	Brown 10YR 5/3 With strong brown redoximorphic features of 7.5YR 4/6	Clay	None
S20E20	0-3	Very dark grayish brown 10YR 2/2	Silty clay loam	None
	3-5	Grayish brown 10YR 5/2	Very clayey loam	None
	5+	Dark yellowish brown 10YR 4/6	Clay	None
CN-1	0-4	Very dark grayish brown 10YR 3/2	Silty clay loam	None
	4-9	Dark yellowish brown 10YR 4/4	Clayey loam	None
	9+	Yellowish red 10YR 4/6	Clay	None
CN-2	0-10	Very dark grayish brown 10YR 3/2	Silty clay loam	None
	10+	Yellowish red 10YR 4/6	Clay	None

Shovel Test Pit Number	Depth (cmbs) of level	Sediment color (Munsell)	Sediment Texture	Cultural Material*
CN-3 (south wall BHT-1)	0-29 cm	Dark yellowish brown 10YR 4/4	Coarse sandy loam	Level 2 (10-29 cm) Small core at 11 cmbs; novaculite dart base at 25 cmbs
CN-4 (east wall BHT-2)	0-33	Dark yellowish brown 10YR 4/4	Coarse sandy loam	Level 2 (20-33 cm) Petrified wood core, gray quartzite tertiary flake, tertiary flake, core fragment
CN-5 (north wall BHT-3)	0-30	Dark yellowish brown 10YR 4/4	Coarse sandy loam	Level 1 (0-10 cm) 1 red secondary flake, 1 gray chert biface midsection, 1 shatter; Level 2 (10-20 cm) 1 tertiary flake, 1 secondary flake, 1 primary flake Level 3 (20-30 cm) No artifacts
CN-6 (north wall of BHT-3)	0-26	Dark yellowish brown 10YR 4/4	Coarse sandy loam	Level 1 (0-10 cm) 1 shatter at 7 cmbs; Level 2 (10-26 cm) 1 primary flake at 17 cmbs

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Table 4. Backhoe trench unit results.

Backhoe trench number	Depth (cmbs) of level/zone	Sediment color (munsell)	Sediment texture	Structure, inclusions	Lower boundary	Cultural material
BHT-1	0-29 cm	Dark yellowish brown 10YR 4/4	Coarse sandy loam	Very friable	Very abrupt	(ST-CN-3: Level 1 (0-10 cm) Small core; Level 2 (10-27 cm) Novaculite dart base)
	29-78 cm	Yellowish red 5YR 4/6	Silty clay	Friable	Very abrupt	None
	78-101	Light grayish brown 10YR 6/2	Clay	Firm	Abrupt	None
	101-135+	Light grayish brown 10YR 6/2 With few, distinct, medium redoximorphic features of yellowish brown clay 10YR 5/4	Clay	Firm	Not observed	None
BHT-2	0-33	Dark yellowish brown 10YR 4/4	Coarse sandy loam	Moderate, medium, granular; one small stream rolled rounded pebble of red quartzite in	Abrupt	(ST CN-4: Level 2 (20-33 cm) Petrified wood core, gray quartzite tertiary

Backhoe trench number	Depth (cmbs) of level/zone	Sediment color (munsell)	Sediment texture	Structure, inclusions	Lower boundary	Cultural material
				wall at 15 cmbs		flake, tertiary flake, core fragment
	33-53	Yellowish red 5YR 4/6	Silty clay	Friable	Very abrupt	None
	53-83	Pale brown 10YR 6/32 with few, distinct, medium redoximorphic features in lower part of yellowish brown clay 10YR 5/4	Slightly clayey loam	Moderate, medium, granular	Very abrupt	None
	83-104	Light grayish brown 10YR 6/2 with common, distinct, medium redoximorphic features of red clay 2.5YR 4/6	Clay	Firm	Abrupt	None
	104-152+	Light grayish brown 10YR 6/2 With few, distinct, medium redoximorphic features of	Clay	Firm	Not observed	None

Backhoe trench number	Depth (cmbs) of level/zone	Sediment color (munsell)	Sediment texture	Structure, inclusions	Lower boundary	Cultural material
		yellowish brown clay 10YR 5/4				
BHT-3	0-26 cm	Dark yellowish brown 10YR 4/4	Coarse sandy loam	Very friable	Very abrupt	<p>ST CN-5: Level 1 (0-10 cm) 1 red secondary flake, 1 gray chert biface midsection, 1 shatter Level 2 (10-20 cm) 1 tertiary flake, 1 secondary flake, 1 primary flake Level 3 (20-30 cm) No artifacts.</p> <p>(ST-CN-6: Level 1 (0-10 cm) 1 shatter; Level 2 (10-26 cm) 1 primary flake)</p>
	26-55 cm	Yellowish red	Silty clay	Friable	Very abrupt	None

Backhoe trench number	Depth (cmbs) of level/zone	Sediment color (munsell)	Sediment texture	Structure, inclusions	Lower boundary	Cultural material
		5YR 4/6				
	55-94	Light grayish brown 10YR 6/2	Clay	Firm	Abrupt	None
	94-153+	Light grayish brown 10YR 6/2 With few, distinct, medium redoximorphic features of yellowish brown clay 10YR 5/4	Clay	Firm	Not observed	None
BHT-4	0-11	Brown 10YR 4/3	Slightly clayey loam	Moderate, medium, granular	Abrupt	None
	11-34	Yellowish red 5YR 4/6	Silty clay	Friable	Very abrupt	None
	34-74	Light grayish brown 10YR 6/2	Clay	Firm	Abrupt	None
	74-97+	Light grayish brown 10YR 6/2 With few, distinct, medium redoximorphic features of yellowish brown clay 10YR 5/4	Clay	Very firm (trench terminated shallow due to hardness on this lower unit)	Not observed	None

Backhoe trench number	Depth (cmbs) of level/zone	Sediment color (munsell)	Sediment texture	Structure, inclusions	Lower boundary	Cultural material
BHT-5	0-8	Brown (10YR 4/3)	Silty clay loam	Friable, moderate, medium, granular	Clear	None
	8-46	Brown (7.5YR 4/4)	Clayey loam	Moderate, medium, granular	Very abrupt	None
	46-74	Gray (10YR 6/1) with many prominent coarse redoximorphic features of red clay 2.5YR 4/6	Clay	Firm, moderate, medium, granular	Very abrupt	None
	74-97+	Pinkish gray (7.5YR 6/2) with common, distinct coarse redoximorphic features of strong brown clay 7.5YR 5/6	Slightly clayey coarse sandy loam	Firm, moderate, medium, granular (trench terminated shallow due to hardness of this soil unit)	Not observed	None
BHT-6	0-6	Brown (10YR 4/3)	Sandy loam	Very friable; moderate, medium granular	Abrupt	None
	6-16	Brown (7.5YR 4/4)	Sand	Weak, medium, granular	Abrupt	None

Backhoe trench number	Depth (cmbs) of level/zone	Sediment color (munsell)	Sediment texture	Structure, inclusions	Lower boundary	Cultural material
	16-43	Yellowish red (5YR 4/6)	Loamy clay	Strong, coarse, granular	Abrupt	None
	43-81	Yellowish red (5YR 5/6)	Sandy loam	Very friable; moderate, medium, granular	Abrupt	None
	81-96	Strong brown (7.5YR 4/6) With common, distinct, medium redoximorphic features of brown sand 10YR 4/3	Sand	Very friable; weak, fine, granular	Very abrupt	None
	96-190+	A stack of eight thin c horizon flood zones varying from 5 to 24 cm thick and ranging from light yellowish brown 10YR 6/4 to brown 10YR 5/3	Sand	Loose; friable, single grain	Water infiltration at 190 cmbs; not observed	None

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