Volume 2016 Article 122

2016

Green Valley Energy Center Cultural Resources Survey Denton County, Texas

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Green Valley Energy Center Cultural Resources Survey Denton County, Texas

BURNS McDONNELL

Green Valley Energy Center
Cultural Resources Survey
Denton County, Texas

DENTON MUNICIPAL ELECTRIC

Denton Municipal Electric

Denton Energy Center
Project No. 85894

February 2016

Green Valley Energy Center Cultural Resources Survey Denton County, Texas

prepared for

Denton Municipal Electric
Denton Energy Center
Denton, Texas

Project No. 85894

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Report Authors: Casey Hanson and Shelly Fischbeck

prepared by

Burns & McDonnell Engineering Company, Inc.
Austin, Texas

ABSTRACT

Denton Municipal Electric (DME) contracted Burns & McDonnell Engineering Company, Inc. (Burns & McDonnell) to perform a background review and cultural resources survey for the Green Valley Energy Center (Project), a proposed 132-megawatt (MW) reciprocating engine power plant located in the northern city limits of Denton near the community of Green Valley in Denton County, Texas. The following report provides information regarding the Project and includes the methods and results of the cultural resources background review and survey of a 92-acre Survey Area (Survey Area). The cultural resources survey was performed under Antiquities Permit #7443.

No previously recorded archaeological sites or designated historic resources were identified within the Survey Area during the background review. One new archaeological site, 41DN591, a twentieth century farmstead site was recorded within the Survey Area during the cultural resources survey. Burns & McDonnell recommends that site 41DN591 has very limited research potential and that it does not meet the eligibility criteria of the National Register of Historic Places (NRHP). No further evaluation of the Survey Area is recommended.

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LIST OF ABBREVIATIONS

Abbreviation	Term/Phrase/Name
Burns & McDonnell	Burns & McDonnell Engineering Company, Inc.
CTA	Council of Texas Archeologists
DME	Denton Municipal Electric
MW	megawatt
NHPA	National Historic Preservation Act
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
SAL	State Antiquities Landmark
TASA	Texas Archaeological Sites Atlas
THC	Texas Historical Commission

1.0 INTRODUCTION

Denton Municipal Electric (DME) contracted Burns & McDonnell Engineering Company, Inc. (Burns & McDonnell) to perform a background review and cultural resources survey for the Green Valley Energy Center (Project), a proposed 132-megawatt (MW) reciprocating engine power plant located in the northern city limits of Denton, Denton County, Texas (Appendix A: Figure A-1). The following report provides information regarding the Project and includes the results of the cultural resources background review and the methods and results of the cultural resources survey of a 92-acre area (Survey Area) (Appendix A: Figure A-2). The report is presented in the full report format developed by the Council of Texas Archaeologists (CTA) (CTA 2015).

1.1 Project Description

The Project is an energy generation center that will be located on a site in the northern city limits of Denton near the historic community of Green Valley in Denton County, Texas. The Project would include the construction of an energy generation facility, a permanent driveway, electrical substation, and electrical and gas interconnections. No Federal funding, licensing, or permitting is anticipated for the Project; therefore, it is anticipated that the Project will not be subject to Section 106. The site is currently privately owned, but may be acquired by the City of Denton, at which time the Antiquities Code of Texas (ACT) may apply. The cultural resources survey was performed under Antiquities Permit #7443, obtained through coordination with the Texas Historical Commission (THC) (Appendix C).

1.2 Project History and Personnel

Burns & McDonnell archaeologists conducted a background review for the Survey Area, including a one-mile buffer, prior to the commencement of field work. A pedestrian survey was conducted for the Survey Area October 13-15, 2015. Casey Hanson served as the Principal Investigator and the field work was performed by Shelly Fischbeck and Stephanie Martin.

2.0 RESEARCH DESIGN

The overall objective of the background review and the cultural resources survey was to locate and assess historic-age (50 years of age or older) properties or archaeological sites listed or eligible for listing as State Antiquities Landmarks (SALs) within or in close proximity to the Survey Area that could potentially be affected by Project construction. The following chapter provides information regarding the sources consulted during the initial background review, which took place before the start of fieldwork, as well as the methods used during the cultural resources survey.

2.1 Background Review Methods

An initial background review was performed by Burns & McDonnell archaeologists and included an examination of the Texas Archaeological Sites Atlas (TASA) to identify previously recorded archaeological sites and other previously designated historic-age resources. This includes Official State of Texas Historical Markers, such as Recorded Texas Historic Landmarks, National Register of Historic Places (NRHP)-listed sites and districts, SALs, and historic-age cemeteries within a Study Area extending one mile from the Survey Area. The TASA review was also used to identify previous cultural resources surveys performed within or near the Survey Area.

Additionally, the online Texas Geologic Map Data provided by U.S. Geologic Survey, the Soil Web Survey supplied by the Natural Resources Conservation Service (NRCS), and historic maps and aerial photographs provided by Nationwide Environmental Title Research were consulted. These resources were accessed in order to review available geology and soils data as well as historic-age maps covering the Survey Area.

2.2 Cultural Resources Survey Methods

Burns & McDonnell proposed to conduct the survey according to the minimum archaeological survey standards agreed upon by the THC and the CTA posted online at www.thc.state.tx.us. Following a review of geology, soils, topographic maps, and previous investigations, it was determined that the Survey Area was located in a setting with very little soil deposition and very good ground visibility. Burns & McDonnell performed a pedestrian survey of the Survey Area with subsurface testing in areas where ground visibility was lower than 30 percent or where soil deposition was present. Shovel tests were excavated 30 centimeters (cm) into clay and screened through ¼-inch hardware cloth or hand sorted when sediments would not pass through the screen.

Field notes were recorded and the Survey Area was photo-documented. Shovel tests were recorded on standardized forms and using Global Positioning System equipment. A full list of subsurface tests is included in Appendix D.

2.3 Archival Research Methods

Prior to initiation of archaeological fieldwork, the Principal Investigator reviewed historic maps and aerial photographs of the Survey Area in order to identify potential historic-age resources and to develop historic high probability areas. Subsequent to recording site 41DN591, the Principal Investigator obtained photocopies of recent deed records and consulted historic Denton County deed and appraisal district records available online at http://216.60.44.147/TX/Denton/D/Default.aspx and https://www.dentoncad.com/. The Principal Investigator also consulted Texas General Land Office records as well as Denton County and other Texas population census records (1880-1940) in an effort to correlate landowners with the recorded archaeological site and determine if individuals associated with the site were significant to local community development patterns.

3.0 ENVIRONMENTAL SETTING AND SOILS

The Project is located in the Cross Timbers ecoregion of Texas and along the border between the Grand Prairie and Eastern Cross Timber sub-regions (Griffith et al. 2007). The Cross Timber ecoregion is characterized as a transitional area between prairie lands to the west and the forested hills of eastern Oklahoma and Texas to the east (Griffith et al. 2007). The Survey Area is a good example of this transitional setting as it sits along the eastern edge of the Grand Prairie sub-region near its transition to the Eastern Cross Timbers sub-region. The Grand Prairie sub-region is defined by undulating plains underlain by Cretaceous-age limestones with interbedded marl and clay. Prairie grasses originally dominated the uplands in the region and included big bluestem (*Andropogon gerardii*), yellow Indiangrass (*Sorghastrum nuntans*), little bluestem (*Schizachyrium scoparium*), sideoats grama (*B. curtipendula*), and Texas cupgrass (*Eriochloa* sericea), although intensive grazing has led to the increase in Buffalograss (*Buchloe dactyloides*), texas wintergrass (*Stipa leucotricha*), and gramas (*Boutrloua* spp.) (Griffith et al. 2007). Elm (*Ulmus* spp.), pecan (*Carya illinoensis*), and hackberry (*Celtis* spp.) were common in floodplains and other riparian areas, but invasive species including Ashe juniper (*Juniperus ashei*) and honey mesquite (*Prosopis glandulosa*) have become common across the landscape since European settlement (Griffith et al. 2007).

The Eastern Cross Timbers sub-region immediately to the east of the Project is situated along a band of Upper Cretaceous sandstone, the Woodbine Sand, and is characterized by their sandy soils that have the potential to support oak woodland (Griffith et al. 2007). Post oaks (*Quercus stellata*) and blackjack oaks (*Q. marilandica*) dominate the sub-region, but black hickory (*Carya texana*), live oak (*Quercus fusiformis*), eastern redcedar (*Juniperus virginiana*) and sumac (*Rhus* spp.) are also present (Griffith et al. 2007).

The Survey Area is primarily situated on an upland landform that is underlain by Cretaceous-age marl and limestone although a smaller portion of the Survey Area is located on terrace deposits that parallel an unnamed drainage to the north and Culp Branch to the east (Appendix A: Figure A-3). The Denton County soil survey maps seven soil units within the Survey Area. The dominant soils in the Survey Area are Wilson, Burleson, Navo, Branyon, and Sanger Clays clays, although Justin fine sandy loams are also present (Appendix A: Figure A-3; NRCS 2015). The upland soils were formed in-situ from Cretaceous-age parent material while the alluvial deposits are Pleistocene-age. Given the age and formation of the soils, the geoarchaeological potential for encountering buried prehistoric sites is relatively low.

4.0 CULTURAL BACKGROUND

The Project lies within the north-central Texas Archaeological Region (Kenmotsu and Perttula 1993). Researchers have identified multiple archeological time periods based on material culture remains, which are detailed below.

4.1 Chronology of the North-Central Texas Archeological Region

4.1.1 Paleoindian Period (ca. 11500–8500 B.P.)

The first indication of prehistoric Native American settlement in Denton County is evidenced by paleo-projectile points discovered at the Lewisville site (Crook and Harris 1957) and the Aubrey Clovis site (Ferring 2001). These earliest inhabitants were likely constantly on the move as is indicated by the use of non-local lithic raw materials. The early Denton County inhabitants were also likely following larger game such as mammoth, mastodons, bison, camel, and horse (Black 1989). Over time, as the climate shifted from wetter and cooler to drier and warmer conditions, megafauna died off and subsistence patterns changed to include smaller game and plants.

4.1.2 Archaic Period (ca. 8500–1250 B.P.)

The Archaic period is commonly divided into the Early, Middle, and Late Archaic subperiods. The archaeological evidence associated with the Archaic suggests that there is an increased reliance on local floral resources and a surge in the number of projectile point styles being produced.

Prikryl (1990) suggests that during the Early Archaic (8500-6000 B.P.) there are little regional variances in the way groups adjusted to their environment. However, evidence of subsistence patterns during this time is fairly limited (Ferring and Yates 1997). Nonetheless, researchers still agree that as the megafauna herds disappeared there was a shift to include deer, fish, and plants in the diet. Black (1989) indicates that around 8000 B.P. projectile point styles transitioned from unstemmed to stemmed and include varieties such as Martindale and Uvalde.

While the subsistence pattern appears to be relatively the same during the Late Archaic (6000-3500 B.P.) the climate continued to become drier and warmer. An assortment of diagnostic points from the Middle Archaic has been identified in north-central Texas. These include Dawson, Wells, Carrolton, Morrill, and Basal Notched types (Prikryl 1990).

The Late Archaic (3500-1250 B.P.) appears to have been more populated and regional variations seem to increase (Prikryl 1990). Subsistence patterns perceived in the prior subperiods continues; however, there appears to be an increase in the processing of plants as is evidenced by an increase in certain types of lithic tools encountered during the Late Archaic (Brownlow et al. 1999).

4.1.3 Late Prehistoric Period (ca. 1250–250 B.P.)

The Late Prehistoric period in north-central Texas has been divided into two phases (Prikryl 1990). The Late Prehistoric I (1250-750 B.P.) phase is denoted by the introduction of the bow and arrow. The bow and arrow allowed groups the flexibility to engage in hunting practices not afforded by the atlatl. The use of the bow and arrow is indicated by the presence of projectile points, which were smaller in size, such as the Alba, Catahoula, and Scallorn types (Prikryl 1990:58). The Late Prehistoric II (750-250 B.P.) phase saw an increase in populations paired with the introduction of the Perdiz point and lithic toolkits designed for processing the bounty from thriving bison populations. Early horticulture is also indicative of the Late Prehistoric II phase as are early ceramics, unique burial practices, and mound building.

4.1.4 Historic (A.D. 1528–Present)

While Europeans had been visiting Texas since A.D. 1528, it was not until the eighteenth century that the Spanish, who controlled Texas, established missions in response to Apache and Comanche raids. After the Mexican revolution, which ended in 1821, the Mexican government granted impresario contracts to Anglo individuals to establish residency in the state. The Mexican government aimed to spur development in the state and push out the French and Indian populations. This colonization effort continued after the Texas Revolution of 1836.

One such organized effort was Peter's Colony, which was established in 1841. William S. Peters was an English musician and businessman that traveled to the United States in 1827. He originally settled in Louisville, Kentucky where he and several others founded a company called the Texian Land and Immigration Company. He gathered support from investors and immigrants from England and France. Peter's Colony included Denton County and the surrounding area (Wade 2015).

Denton County, named after John Bunyan Denton, was formed in 1846 when it was carved out of what had been the larger county of Fannin. Pinckneyville was the first county seat, which was located near the present day city of Denton. The county seat was later moved three to four miles southeast of Pinckneyville to Alton. The city of Denton was not established as the county seat until 1857 and did not officially become a city until 1866 (Odom 2015).

Green Valley, originally named Toll Town, is located adjacent to the southeast portion of the proposed Project location. Green Valley was an area that attracted settlers to its plentiful timber and water resources. In 1874 Henry Clay Wilmoth, a local teacher, applied for a post office for the community, which was granted. During this same period the town population was 50 and consisted of a blacksmith shop and three stores. In 1881 the Texas and Pacific Railway bypassed Green Valley and the post office closed. Subsequently, the town started to decline and many businesses began to move to the neighboring town of Aubrey. The Green Valley school district was annexed by Denton in 1919. Despite the town's decline, remnants of the settlement remained in the early 1980s. An old school building was used for social gatherings and a small church and cemetery were located in the area during this time. Much of the local land to the north of Green Valley was eventually turned into Ray Roberts Lake (Aubrey Reservoir) by the United States Army Corps of Engineers (Fuller 2015).

5.0 RESULTS OF BACKGROUND REVIEW

Review of the records at TARL and on the TASA website revealed one previous archaeological investigation within one mile of the Survey Area (Table 5-1; Appendix A: Figure A-2). The TARL and TASA reviews also revealed one previously recorded archaeological site located within one mile of the Survey Area, site 41DN536, a historic scatter and small well that was recommended as having minimal research value (Table 5-2; Appendix A: Figure A-2). However, the NRHP eligibility of this site is unknown.

Table 5-1: Previous Cultural Resources Investigations within One Mile of the Survey Area

Date	Consultant	Project Planner	Agency	Within Survey Area
1988	Unknown	Unknown	TxDOT	No

Table 5-2: Previously Recorded Archaeological Sites within One Mile of the Survey Area

Trinomial	Site Type	NRHP Eligibility	Within Survey Area
41DN536	Historic scatter and small well	Unknown	No

The majority of the Survey Area is situated on an upland landform that is underlain by Cretaceous-age marl and limestone and is mapped as containing clayey soils that were formed in-situ, and as such, this portion of the Survey Area displays a low probability for buried cultural materials (Appendix A: Figure A-3). A small portion of the Survey Area is located on terrace deposits that parallel an unnamed drainage to the north and Culp Branch to the east. Based on their proximity to water sources, these portions of the Survey Area would have a higher potential for cultural materials (Appendix A: Figure A-3). However, a review of the Survey Area's geology and soil data reveals that these terrace deposits are Pleistocene-age, and if cultural resources were present, they would not be deeply buried.

A review of the 1960 Green Valley quadrangle map indicates that the farmstead currently located in the Survey Area is a historic-age resource that may be associated with the historic community of Green Valley (see discussion above; Appendix A: Figure A-2).

6.0 RESULTS OF THE CULTURAL RESOURCES SURVEY

Burns & McDonnell archaeologists performed a pedestrian survey with shovel testing of the 92-acre Survey Area on October 13-15, 2015. Due to good to excellent ground surface visibility, pedestrian survey was utilized for most of the Survey Area. Burns & McDonnell archaeologists excavated 21 shovel tests within the Survey Area and identified one archaeological site, 41DN591, a twentieth century farmstead.

The majority of the Survey Area (approximately 72 acres or 78 percent) was gently sloping or terraced cattle pasture composed of cheatgrass (*Bromus tectorum*) and bermudagrass (*Cynodon dactylon*) interspersed with sugarberry (*Celtis laevigata*), honey mesquite (*Prosopis glandulosa*), and honey locust (*Gleditsia triacanthos*) (Appendix B; Photo B-1). Ground surface visibility was generally greater than 30 percent. Areas with ground surface visibility greater than 30 percent were pedestrian surveyed at 30 to 50 meter (m) transects. Shovel tests were excavated in areas with low ground surface visibility or with a higher probability of containing cultural resources, such as uplands and areas near creeks. Twenty-one shovel tests were excavated. Shovel tests revealed dark yellowish brown to dark greyish brown clay at the surface or shallow yellow brown sandy loam overlying clay. The remaining 20 acres (22 percent) was recently plowed agricultural land with excellent ground surface visibility (75 to 100 percent) (Appendix B; Photo B-2). Plowed areas were pedestrian surveyed at 30 m transects.

6.1 Site 41DN591

One archeological site, 41DN591, was identified during the current investigation. The site represents the remnants of a 1950s farm/ranch including a circa 1955 Vernacular/Ranch Style dwelling, a large gable-roofed pole barn, wooden cattle pens, the remnants of a metal windmill, and a concrete slab foundation. Seven shovel tests were excavated at 41DN591; 2 contained cultural materials (Appendix A; Figure A-4; Appendix B; Photo B-3 through B-9; Appendix D). Shovel Test SM7 contained 5 fragments of amber bottle glass and 1 piece of barbed wire from 0-20 cmbs (Appendix B: Photo B-10). Shovel Test SM8 contained one piece of wire from 0-20 cmbs (Appendix B: Photo B-11). Both artifact classes are still in use today and neither is particularly useful in determining site components. Further archaeological investigation is unlikely to yield information that would contribute to our understanding of local or regional history; therefore, 41DN591 is not recommended for designation as a SAL or listing on the NRHP under Criterion D.

The main dwelling has a side-gabled roof and is clad in concrete masonry units and vertical wood paneling (Appendix B: Photos B-3 and B-4). The primary façade features a centralized, front-gabled,

portico-style entry with replacement door and two pairs of symmetrically-placed window openings with replacement metal sash window units (Appendix B: Photo B-3). The simple, linear-plan dwelling lacks architectural or design distinction and has suffered from deterioration due to its abandonment and subsequent neglect. Due to replacement or missing window and door units and loss of sections of its original cladding, the dwelling lacks integrity of materials, workmanship, and feeling. It also lacks integrity of association.

The property also includes a mid-twentieth century front-gabled metal pole barn clad in corrugated metal sheeting (Appendix B: Photo B-5). It has open central and lateral bay entries on the primary (eastern) façade, and appears to have been used to support cattle farming operations on the property. The barn has lost sections of its original cladding and lacks integrity of materials, workmanship, feeling, and association.

The remaining structural components of the site include wooden cattle pens, metal lattice work and the concrete foundation of a former windmill, a concrete trough, and a small foundation associated with a former domestic or agricultural outbuilding (Appendix B: Photo B-6 through B-9). None of these elements possess architectural distinction, and most lack integrity due to loss of structural elements, etc. As none of the structural components associated with the site possess architectural significance or integrity, they do not meet the qualifications for designation on the NRHP or as SALs based on their architectural qualities.

6.1.1 41DN591 Archival Results

41DN591 is situated on a 203.84-acre tract within the original W.A. Thompson Survey (Abstract 1238) in northeast Denton County, Texas. W.A. Thompson's heirs patented his survey in 1878 and subsequently subdivided the land into four blocks. The subject tract was a part of the southeastern block (Block 4) that included 658.3 acres inherited by Thompson's daughter, Susan Hamilton (Denton County Deed Records J:269). Despite the nineteenth century patent date, map, deed, and census evidence suggest the tract was not occupied until the 1950s. This occupation date correlates with the architectural and archaeological evidence recorded at the site.

The Principal Investigator consulted five historic maps that depict the site vicinity between 1864 and 1960, and the 1960 Green Valley quadrangle map is the only map that depicts structures in the vicinity of 41DN591 (Table 6-1; Appendix A: Figure A-2). According to Denton County Central Appraisal District (CAD) records, the dwelling situated at 41DN591 was constructed in 1951, and deed research indicates

that W.R. Waggoner purchased the subject tract from Homer and Werdna Kerley in 1945 (Denton County Deed Records 316:423).

Table 6-1: Historic Maps Consulted

Map Date	Map Title	Agency
1864	Department of the Gulf Map No. 14 Eastern and Central Texas	Department of the Gulf
1879	Denton County, Texas	Texas & Pacific Railway Co.
1909	Sectional Map of Texas	Theo. F. Koch Land Co.
1918	Soil Map of Denton County, Texas	U.S. Department of Agriculture
1960	Green Valley Quadrangle	U.S. Geological Survey

Census research revealed that in 1940, Homer Kerley (41) was a manager at an industrial plant and lived in the same address as he did in 1935 in the City of Denton with his wife, Werdna Kerley (39) and son, Homer Jr. (14). Their residence in Denton during their tenure of ownership suggests they did not live on the subject tract prior to selling it to W.R. Waggoner in 1945. Weldon Waggoner (24) and his wife Susie (22) appear as residents of Clovis, Curry County, New Mexico in the 1930 census, but do not appear in the 1940 census. However, Susie Waggoner's parents, Joseph and Dora McCollum, appear in the 1940 census as residents of Cooke County, Texas, just north of the Project, where the Valley View cemetery is located, the final resting place of Weldon and Susie Waggoner (Bolivar Cemetery 2006).

According to the deed record, W.R. Waggoner and his wife, Susie Waggoner, sold the subject tract to Kenneth Craver, a resident of Harris County in 1959 (Denton County Deed Records 449:45). It is unlikely that Kenneth Craver occupied the subject tract subsequent to his acquisition of the parcel. Deed research reveals he also purchased large tracts adjacent to the subject tract during this period and maintained large landholdings in the county under Craver Ranch LLC. This entity continues to hold interests in the subject tract today. As a result, Craver may have used the property as part of his cattle ranching operation from the mid-twentieth century through the present.

According to the deed and CAD records the dwelling at 41DN591 was constructed in 1951 during the period when the Waggoner family owned the subject tract. Burns & McDonnell did not identify archaeological or additional evidence indicating an earlier occupation of the subject tract or within the Survey Area. As such, 41DN591 likely represents a brief occupation of the property by the Waggoner family during the mid-twentieth century. As a result, 41DN591 is not recommended for designation as a SAL or listing on the NRHP under Criterion A, B, or C.

7.0 CONCLUSIONS AND RECOMMENDATIONS

The background review and cultural resources survey of DME's proposed Green Valley Energy Center was completed during October 13-15, 2015. Due to excellent ground visibility and limited soil deposition, the majority of the Survey Area was subjected to a pedestrian survey with limited shovel testing. No previously recorded archaeological sites or previously designated historic resources listed or eligible for listing as SALs were identified within the Survey Area during the background review and one new archaeological site, 41DN591, was recorded during the survey.

Site 41DN591 is a 1950s farm/ranch that is likely associated with the Waggoner family's occupation of the parcel between 1945 and 1959. The site includes a Vernacular/Ranch Style dwelling built in 1951, a large gable-roofed pole barn, wooden cattle pens, the remnants of a metal windmill, and a concrete slab foundation. None of the structural components associated with the site possess architectural significance or integrity, and they do not meet the qualifications for designation on the NRHP or as SALs based on their architectural qualities. Two of the seven shovel tests excavated at the site yielded cultural material, but contained only amber bottle glass and wire. Burns & McDonnell archaeologists did not recover any evidence indicating that the Waggoner family was particularly significant to local development patterns and further archaeological investigation is unlikely to yield information that would contribute to our understanding of local or regional history. Therefore, 41DN591 is not recommended for listing on the NRHP or designation as SAL. Burns & McDonnell recommends no further evaluation of the current Survey Area.

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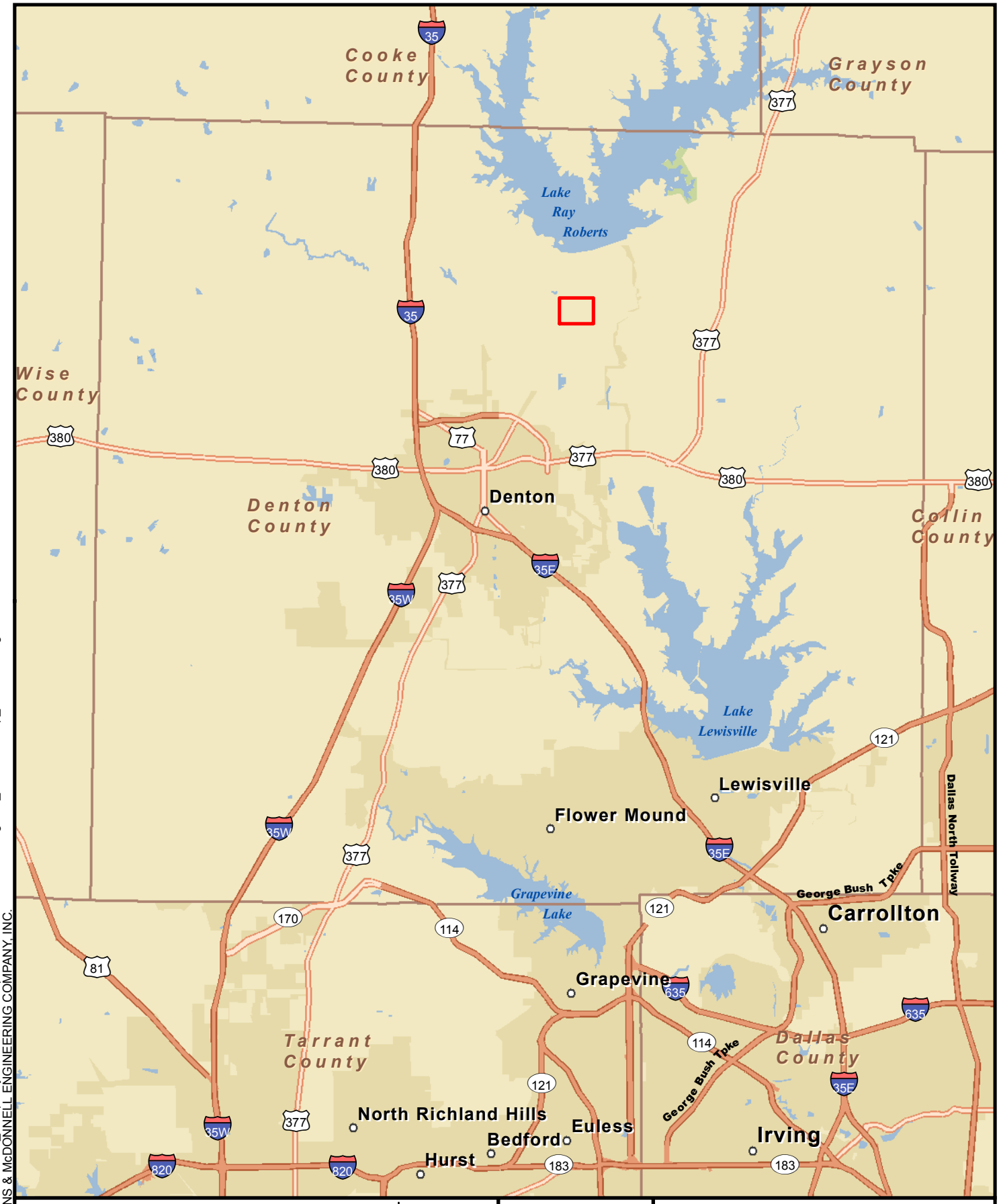
APPENDIX A - FIGURES



Project Location

NORTH

0 2.5 5

Miles

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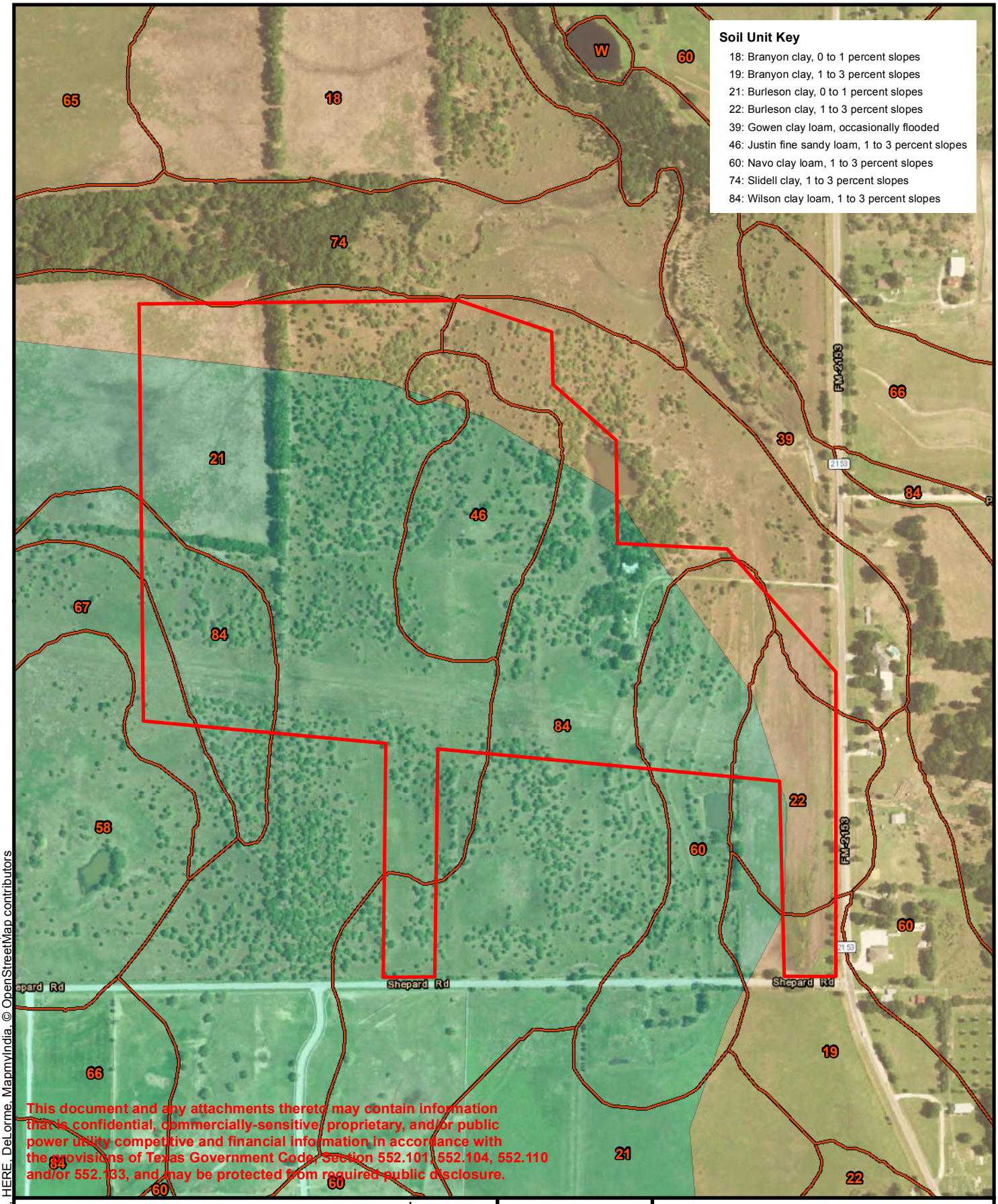
Figure A-1
Project Overview Map
Green Valley Energy Center
Denton County, Texas

Sources: THC; Burns & McDonnell Engineering

Issued: 11/12/2015



Survey Area
NRCS Soil Unit
Cretaceous-age Marl and Limestone
Terrace Deposits

NORTH

0 250 500
Scale in Feet

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Figure A-3
Geologic and Soil Units Map
Green Valley Energy Center
Denton County, Texas

Path: Z:\Clients\ESP\DentonTX\85894_RecipProject\Studies\Geospatial\DataFiles\ArcDocs\FigureA-3_Geology_Soils_Map_Site2.mxd gacox 11/12/2015

Service Layer Credits: Esri, HERE, DeLorme, MapmyIndia, © OpenStreetMap contributors

Sources: USDA NAIP 2014, Burns & McDonnell Engineering

Issued: 11/12/2015

APPENDIX B - PHOTOGRAPHS

Photograph B-1: Overview of terraced slope, camera facing northwest.

Photograph B-2: Overview of plowed area, camera facing north.

Photograph B-3: House at 41DN591, camera facing west.

Photograph B-4: House at 41DN591, camera facing south.

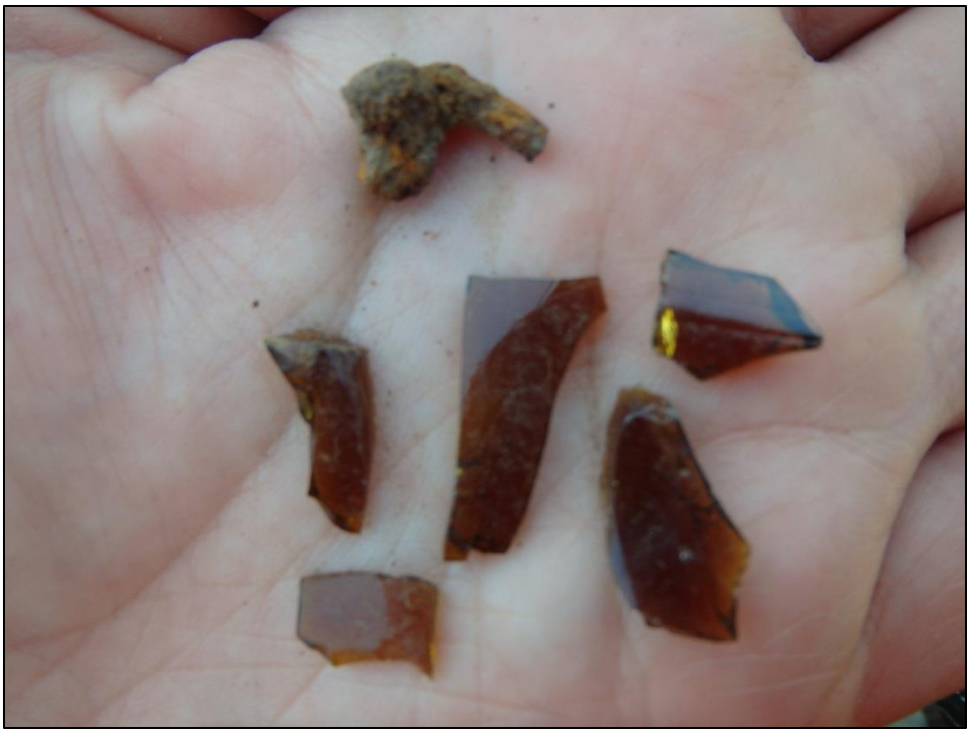
Photograph B-5: Barn at 41DN591, camera facing west.

Photograph B-6: Cattle pens at 41DN591, camera facing northwest.

Photograph B-7: Windmill at 41DN591, camera facing southwest.

Photograph B-8: Trough at 41DN591, camera facing northeast.

Photograph B-9: Foundation at 41DN591, camera facing northwest.



Photograph B-10: Artifacts from Shovel Test SM7.

Photograph B-11: Artifacts from Shovel Test SM8.

APPENDIX C - ANTIQUITIES PERMIT APPLICATION

TEXAS HISTORICAL COMMISSION
real places telling real stories

October 19, 2015

Casey Hanson
Burns & McDonnell Engineering Company, Inc.
8911 Capital of Texas Highway, Building 4, Suite 4260
Austin, TX 78759

Re: Project review under the Antiquities Code of Texas
Green Valley Energy Center Project, Denton County, Texas
Texas Antiquities Permit Application **#7443**

Dear Colleague:

Thank you for your Antiquities Permit Application for the above referenced project. This letter presents the final copy of the permit from the Executive Director of the Texas Historical Commission (THC), the state agency responsible for administering the Antiquities Code of Texas.

Please keep this copy for your records. The Antiquities Permit investigations requires the production and submittal of one printed copy of the final report, a completed abstract form submitted via our online system, two copies of the tagged PDF final report on CD (one with site location information & one without), and verification that any artifacts recovered and records produced during the investigations are curated at the repository listed in the permit. The abstract form maybe submitted via the THC website (www.thc.state.tx.us) or use url: http://xapps.thc.state.tx.us/Abstract/login.aspx Additionally, you must send the THC shapefiles showing the boundaries of the project area *and* the areas actually surveyed via email to archeological_projects@thc.state.tx.us.

If you have any questions concerning this permit or if we can be of further assistance, please contact Lillie Thompson at 512/463-1858. The reviewer for this project is Rebecca Shelton, 512/463-6096.

Sincerely,

for
Mark Wolfe
Executive Director

MW/lft

Enclosures

Cc: Michael Grim, City of Denton

State of Texas

TEXAS ANTIQUITIES COMMITTEE

ARCHEOLOGY PERMIT # 7443

This permit is issued by the Texas Historical Commission, hereafter referred to as the Commission, represented herein by and through its duly authorized and empowered representatives. The Commission, under authority of the Texas Natural Resources Code, Title 9, Chapter 191, and subject to the conditions hereinafter set forth, grants this permit for:

Intensive Survey

To be performed on a potential or designated landmark or other public land known as:

Title: ***Green Valley Energy Center Project***

County: ***Denton***

Location: ***The proposed project is located adjacent to and extending northwest of CR 2153 and Shepard Road north of Denton, Texas***

Owned or Controlled by: (hereafter known as the Permittee):

Private

Sponsored by (hereafter known as the Sponsor

City of Denton
1659 Spencer Road
Denton, TX 76205

The Principal Investigator/Investigation Firm representing the Owner or Sponsor is:

Casey Hanson
Burns & McDonnell, Inc.
8911 Capital of Texas Highway Building 4, Suite 4260
Austin, TX 78759

This permit is to be in effect for a period of:

1 Years and 0 Months

and Will Expire on:

10/12/2016

During the preservation, analysis, and preparation of a final report or until further notice by the Commission, artifacts, field notes, and other data gathered during the investigation will be kept temporarily at:

Burns & McDonnell Engineering Company, Inc.

Upon completion of the final permit report, the same artifacts, field notes, and other data will be placed in a permanent curatorial repository at:

Texas Archeological Research Lab.

Scope of Work under this permit shall consist of:

An intensive pedestrian archaeological survey with shovel testing of high probability areas that meets or exceeds the State Archeological Survey Standards for Texas. This includes, subsurface shovel testing of pedestrian survey transects and mechanical testing in appropriate alluvial areas. For details, see scope of work submitted with permit application.

ARCHEOLOGY PERMIT # 7443

This permit is granted on the following terms and conditions:

1) This project must be carried out in such a manner that the maximum amount of historic, scientific, archeological, and educational information will be recovered and preserved and must include the scientific, techniques for recovery, recording, preservation and analysis commonly used in archeological investigations. All survey level investigations must follow the state survey standards and the THC survey requirements established with the projects sponsor(s).

2) The Principal Investigator/Investigation Firm, serving for the Owner/Permittee and/or the Project Sponsor, is responsible for insuring that specimens, samples, artifacts, materials and records that are collected as a result of this permit are appropriately cleaned, and cataloged for curation. These tasks will be accomplished at no charge to the Commission, and all specimens, artifacts, materials, samples, and original field notes, maps, drawings, and photographs resulting from the investigations remain the property of the State of Texas, or its political subdivision, and must be curated at a certified repository. Verification of curation by the repository is also required, and duplicate copies of any requested records shall be furnished to the Commission before any permit will be considered complete.

3) The Principal Investigator/Investigation Firm serving for the Owner/Permittee, and/or the Project Sponsor is responsible for the publication of results of the investigations in a thorough technical report containing relevant descriptions, maps, documents, drawings, and photographs. A draft copy of the report must be submitted to the Commission for review and approval. Any changes to the draft report requested by the Commission must be made or addressed in the report, or under separate written response to the Commission. Once a draft has been approved by the Commission, one (1) printed, unbound copy of the final report containing at least one map with the plotted location of any and all sites recorded and two copies of the report in tagged PDF format on an archival quality CD or DVD shall be furnished to the commission. One copy must include the plotted location of any and all sites recorded and the other should not include the site location data. A paper copy and an electronic copy of the completed Abstracts in Texas Contract Archeology Summary Form must also be submitted with the final report to the Commission. (Printed copies of forms are available from the Commission or also online at www.thc.state.tx.us.)

4) If the Owner/Permittee, Project Sponsor or Principal Investigator/Investigation Firm fails to comply with any of the Commission's Rules of Practice and Procedure or with any of the specific terms of this permit, or fails to properly conduct or complete this project within the allotted time, the permit will fall into default status. A notification of Default status shall be sent to the Principal Investigator/Investigation Firm, and the Principal Investigator will not be eligible to be issued any new permits until such time that the conditions of this permit are complete or, if applicable, extended.

5) The Owner/Permittee, Project Sponsor, and Principal Investigator/Investigation Firm, in the conduct of the activities hereby authorizes, must comply with all laws, ordinances and regulations of the State of Texas and of its political subdivisions including, but not limited to, the Antiquities Code of Texas; they must conduct the investigation in such a manner as to afford protection to the rights of any and all lessees or easement holders or other persons having an interest in the property and they must return the property to its original condition insofar as possible, to leave it in a state which will not create hazard to life nor contribute to the deterioration of the site or adjacent lands by natural forces.

6) Any duly authorized and empowered representative of the Commission may, at any time, visit the site to inspect the fieldwork as well as the field records, materials, and specimens being recovered.

7) For reasons of site security associated with historical resources, the Project Sponsor (if not the Owner/Permittee), Principal Investigator, Owner, and Investigation Firm shall not issue any press releases, or divulge to the news media, either directly or indirectly, information regarding the specific location of, or other information that might endanger those resources, or their associated artifacts without first consulting with the Commission, and the State agency or political subdivision of the State that owns or controls the land where the resource has been discovered.

8) This permit may not be assigned by the Principal Investigator/Investigation Firm, Owner/Permittee, or Project Sponsor in whole, or in part to any other individual, organization, or corporation not specifically mentioned in this permit without the written consent of the Commission.

9) Hold Harmless: The Owner/Permittee hereby expressly releases the State and agrees that Owner/Permittee will hold harmless, indemnify, and defend (including reasonable attorney's fees and cost of litigation) the State, its officers, agents, and employees in their official and/or individual capacities from every liability, loss, or claim for damages to persons or property, direct or indirect of whatsoever nature arising out of, or in any way connected with, any of the activities covered under this permit.The provisions of this paragraph are solely for the benefit of the State and the Texas Historical Commission and are not intended to create or grant any rights, contractual or otherwise, to any other person or entity.

10) Addendum: The Owner/Permittee, Project Sponsor and Principal Investigator/Investigation Firm must abide by any addenda hereto attached.

Upon a finding that it is in the best interest of the State, this permit is issued on 10/12/2015.

Pat Mercado-Allinger

Pat Mercado-Allinger, for the
Texas Historical Commission

TEXAS HISTORICAL COMMISSION

ANTIQUITIES PERMIT APPLICATION FORM
ARCHEOLOGY

GENERAL INFORMATION

I. PROPERTY TYPE AND LOCATION

Project Name (and/or Site Trinomial) Green Valley Energy Center Project
County (ies) Denton
USGS Quadrangle Name and Number Green Valley 3397-141
UTM Coordinates Zone 14 S E 679856.64 N 3688065.52
Location The proposed project is located adjacent to and extending northwest of CR 2153 and Shepard Road north of Denton, Texas.
Federal Involvement ☐ Yes X No
Name of Federal Agency
Agency Representative

II. OWNER (OR CONTROLLING AGENCY)

Owner Privately Owned, but may be acquired by the City of Denton
Representative
Address
City/State/Zip
Telephone (include area code) Email Address

III. PROJECT SPONSOR (IF DIFFERENT FROM OWNER)

Sponsor City of Denton
Representative Michael S. Grim
Address 1659 Spencer Road
City/State/Zip Denton, Texas 76205
Telephone (include area code) 940-349-7565 Email Address mike.grim@dmepower.com

PROJECT INFORMATION

I. PRINCIPAL INVESTIGATOR (ARCHEOLOGIST)

Name Casey Hanson
Affiliation Burns & McDonnell Engineering Company, Inc.
Address 8911 Capital of Texas Highway Building 4, Suite 4260
City/State/Zip Austin, Texas 78759
Telephone (include area code) 512-872-7137 Email Address cjhanson@burnsmcd.com

(OVER)

ANTIQUITIES PERMIT APPLICATION FORM (CONTINUED)

II. PROJECT DESCRIPTION

Proposed Starting Date of Fieldwork October 12, 2015
Requested Permit Duration 1 Years _____ Months (1 year minimum)
Scope of Work (Provided an Outline of Proposed Work) Refer to attached scope of work letter

III. CURATION & REPORT

Temporary Curatorial or Laboratory Facility Burns & McDonnell Engineering Company, Inc.
Permanent Curatorial Facility Texas Archaeological Research Laboratory (TARL)

IV. LAND OWNER'S CERTIFICATION

I, _____, as legal representative of the Land Owner, _____, do certify that I have reviewed the plans and research design, and that no investigations will be preformed prior to the issuance of a permit by the Texas Historical Commission. Furthermore, I understand that the Owner, Sponsor, and Principal Investigator are responsible for completing the terms of the permit.
Signature _____ Date _____

V. SPONSOR'S CERTIFICATION

I, Michael S. Grim, as legal representative of the Sponsor, City of Denton, do certify that I have review the plans and research design, and that no investigations will be performed prior to the issuance of a permit by the Texas Historical Commission. Furthermore, I understand that the Sponsor, Owner, and Principal Investigator are responsible for completing the terms of this permit.
Signature Michael S. Grim Date 10/6/2015

VI. INVESTIGATOR'S CERTIFICATION

I, Casey Hanson, as Principal Investigator employed by Burns & McDonnell Engineering Company, Inc. (Investigative Firm), do certify that I will execute this project according to the submitted plans and research design, and will not conduct any work prior to the issuance of a permit by the Texas Historical Commission. Furthermore, I understand that the Principal Investigator (and the Investigative Firm), as well as the Owner and Sponsor, are responsible for completing the terms of this permit.
Signature _____ Date 10/6/2015

Principal Investigator must attach a research design, a copy of the USGS quadrangle showing project boundaries, and any additional pertinent information. Curriculum vita must be on file with the Archeology Division.

FOR OFFICIAL USE ONLY

Reviewer _____ Date Permit Issues _____
Permit Number _____ Permit Expiration Date _____
Type of Permit _____ Date Received for Data Entry _____

Texas Historical Commission
Archeology Division
P.O. Box 12276, Austin, TX 78711-2276
Phone 512/463-6096
www.thc.state.tx.us
3/3/09

TEXAS HISTORICAL COMMISSION
The State Agency for Historic Preservation

BURNS McDONNELL

October 6, 2015

Rebecca Shelton
Regional Archaeologist/ Project Reviewer
Texas Historical Commission
1511 Colorado Street
Austin, TX 78701

Re: Antiquities Permit Application
Denton Municipal Electric – Green Valley Energy Center Project
Denton County, Texas

Dear Ms. Shelton:

Enclosed is a Texas Antiquities Permit Application for the 132-MW Reciprocating Engine Power Plant project (Project) that is being proposed by Denton Municipal Electric (DME) in the City of Denton, Denton County, Texas (Appendix A: Figures 1, and 2). DME has requested that Burns & McDonnell Engineering Company, Inc. (Burns & McDonnell) assist them with fulfilling their obligations to consider potential impacts to Cultural Resources under the Antiquities Code of Texas. The following scope of work outlines our recommendations for an archaeological pedestrian survey for the proposed Project.

PROJECT DESCRIPTION

The proposed Project is an energy generation center that will be situated on an approximate 100-acre site located in northern Denton County, Texas (Appendix A: Figure 2). No Federal funding, licensing, or permitting is anticipated for the Project; therefore, it is anticipated that the Project will not be subject to Section 106. The site is currently privately owned, but may be acquired by the City of Denton and, as a result, the State Antiquities Code of Texas may apply. The site is partially wooded and several structures are present within the central portion of the proposed Project area. The Project impacts will include the construction of an energy generation facility, a permanent driveway, electrical substation, and electrical and gas interconnections.

BACKGROUND REVIEW

An initial background review was performed by Burns & McDonnell archaeologists and included an examination of the Texas Archaeological Sites Atlas (TASA) to identify previously recorded archaeological sites and other previously designated historic-age resources. This includes Official State of Texas Historical Markers (OTHMs), such as Recorded Texas Historic Landmarks (RTHLs), National Register of Historic Places (NRHP) listed sites and districts, State Antiquities Landmarks (SALs), and historic-age cemeteries within a Study Area extending one (1) mile from the Project Area. The records review at TARL and the TASA review were also

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O 512-872-7137 \ burnsmcd.com

used to identify if previous cultural resources surveys were performed within or near the Project area.

Additionally, the online Texas Geologic Map Data provided by U.S. Geologic Survey (USGS), the Soil Web Survey supplied by the Natural Resources Conservation Service (NRCS), and historic topographic maps provided by the USGS Historical Topographic Map Explorer were consulted. These resources were accessed in order to review available geology and soils data as well as historic-age maps covering the Project area.

Review of the records at TARL and on the TASA website revealed one previous archaeological investigation within one mile of the Project (Table 1; Appendix A: Figure 2). The TARL and TASA reviews also revealed one previously recorded archaeological site located within one mile of the Project area, 41DN536, a historic scatter and small well that was recommended as having minimal research value (Table 1; Appendix A: Figure 2). However, the NRHP eligibility of this site is unknown.

Table 1: Previous Cultural Resources Investigations within 1 mile of the Study Area

Date	Consultant	Project Planner	Agency	Within Project Area
1988	Unknown	Unknown	TxDOT	No

Table 2: Previously Recorded Archaeological Sites within 1 mile of the Study Area

Trinomial	Site type	NRHP eligibility	Within Project Area
41DN536	Historic scatter and small well	Unknown	No

The majority of the Project is situated on an upland landform that is underlain by Cretaceous-age marl and limestone and is mapped as containing clayey soils that were formed in-situ, and as such, this portion of the Project displays a low probability for buried cultural materials (Appendix A: Figure 3). A small portion of the Project is located on terrace deposits that parallel an unnamed drainage to the north and Culp Branch to the east. Based on their proximity to water sources, these portions of the Project may have a higher potential for cultural materials (Appendix A: Figure 3). However, a review of the Project's geology and soil data reveals that these terrace deposits are Pleistocene-age, and if cultural resources are present, they are not deeply buried.

A review of the 1960 *Green Valley* quadrangle map indicates that the farmstead currently located in the Project area is a historic-age resource that may be associated with the historic community of Green Valley (Appendix A: Figure 2). Originally a crossroads community situated on the stagecoach line between Sherman to Fort Worth and McKinney to Fort Richardson, the community was first called Toll Town until the Green Valley post office was established in 1874 (Fuller 2015). After a short period of prosperity, the Texas and Pacific Railway bypassed Green Valley in 1881 and the majority of the community relocated to nearby Aubrey (Fuller 2015).

SCOPE OF WORK

Burns & McDonnell proposes to survey the Project area according to the minimum archaeological survey standards agreed upon by the Texas Historical Commission (THC) and the Council of Texas Archaeologists posted online at www.thc.state.tx.us. The survey effort will include a pedestrian survey of the Project, as well as the documentation of the historic-age resource within the Project area.

Following the completion of the field survey, a report documenting the investigation will be submitted to the THC for review and comment.

Thank you for your time and if you have any questions, please feel free to contact me at (512) 689-4695 or by email at cjhanson@burnsmcd.com.

Sincerely,

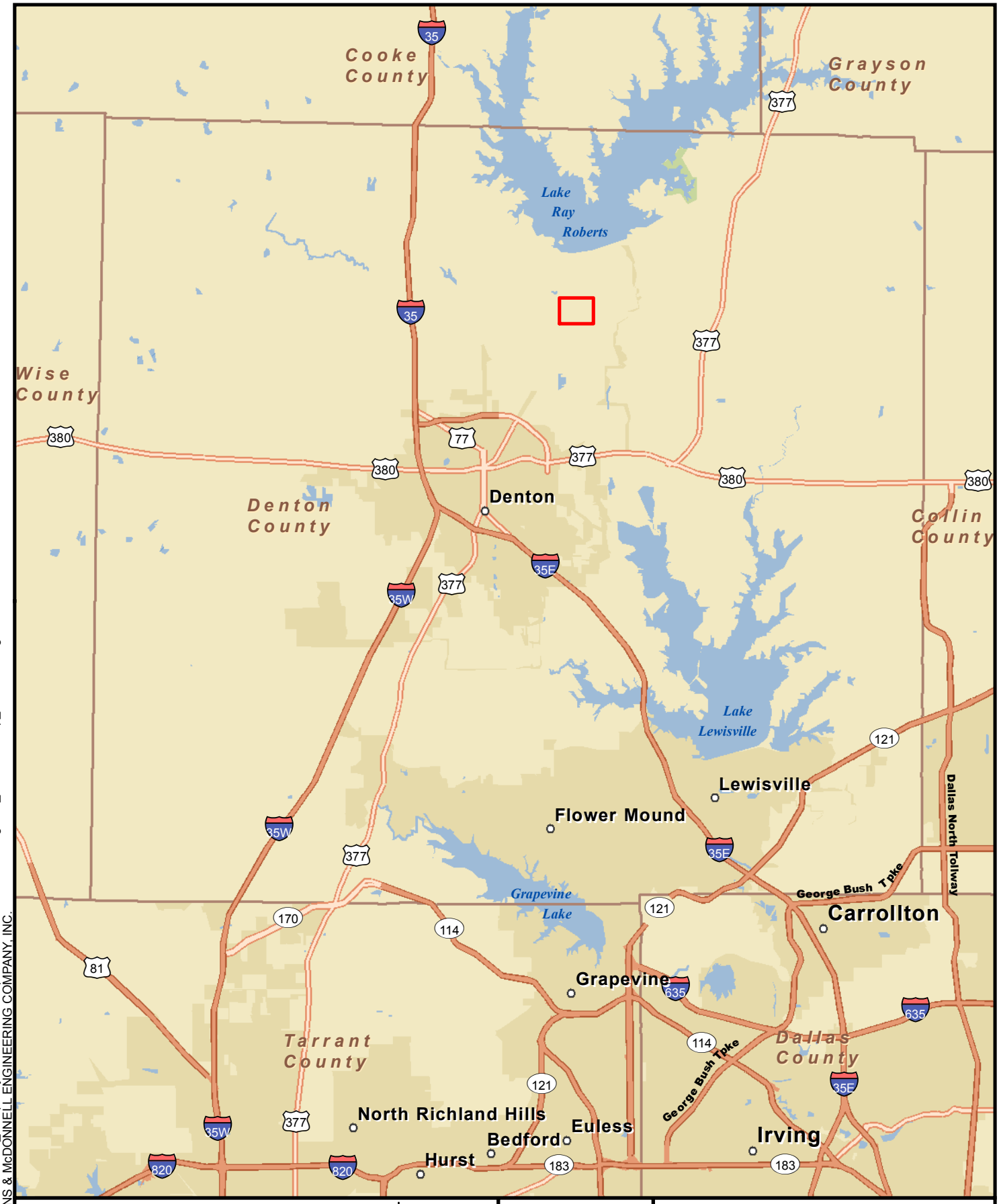
Casey Hanson
Cultural Resources Specialist

Encl.

Cc: Michael S. Grim, Denton Municipal Electric
Robert Everard, Burns & McDonnell

References

Fuller, Jackie B.
2010 Green Valley, TX (Denton County). *Handbook of Texas Online* (https://tshaonline.org/handbook/online/articles/hvg46), accessed September 22, 2015.



Project Location

This document and any attachments thereto may contain information that is confidential, commercially-sensitive, proprietary, and/or public power utility competitive and financial information in accordance with the provisions of Texas Government Code, Section 552.101, 552.104, 552.110 and/or 552.133, and may be protected from required public disclosure.

NORTH

0 2.5 5

Miles

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Figure 1
Project Overview Map
Green Valley Energy Center
Denton County, Texas

Sources: THC; Burns & McDonnell Engineering

Issued: 10/5/2015

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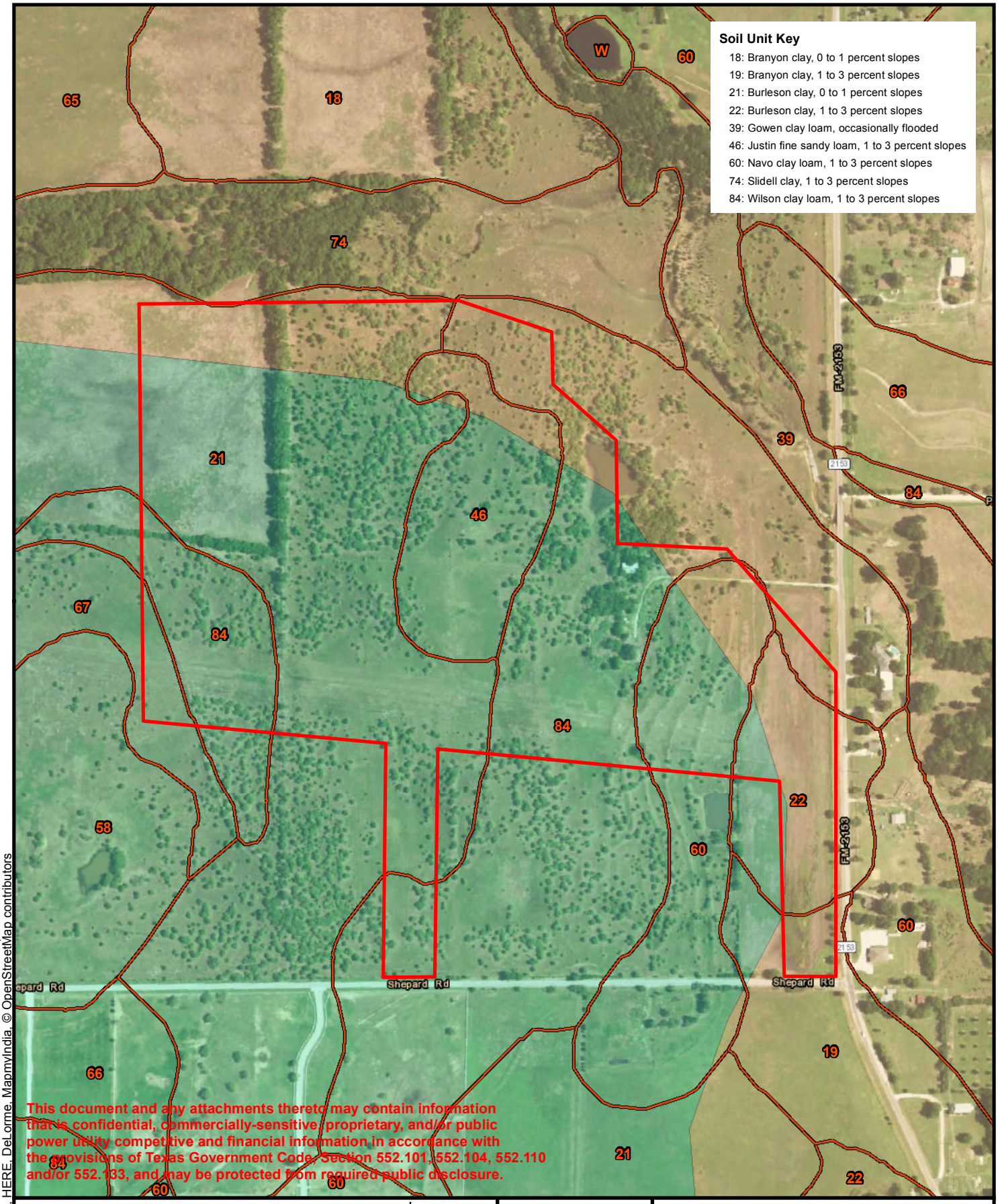

Survey Area
NRCS Soil Unit
Cretaceous-age Marl and Limestone
Terrace Deposits

NORTH

0 250 500
Scale in Feet

BURNS McDONNELL

Figure 3
Geologic and Soil Units Map
Green Valley Energy Center
Denton County, Texas

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Service Layer Credits: Esri, HERE, DeLorme, MapmyIndia, © OpenStreetMap contributors

Sources: USDA NAIP 2014, Burns & McDonnell Engineering

Issued: 10/5/2015

APPENDIX D - SHOVEL TEST DATA

Appendix D – Shovel Test Data

Temp Site	Shovel Test Number	Level 1	Level 2	Level 3	Level 4	Profile
n/a	SF1	NR	NR	NR	NE	0-30 cm – 10YR 4/4 dark yellowish brown fine sandy loam with gravel
n/a	SF2	NR	NR	NR	NE	0-30 cm – 10YR 4/4 dark yellowish brown fine sandy loam with gravel
n/a	SF3	NR	NR	NR	NE	0-30 cm – 10YR 2/1 black clay loam with gravel
n/a	SF4	NR	NR	NR	NE	0-15 cm – 10YR 3/2 very dark grayish brown clay very compact clay with gravel
n/a	SF5	NR	NR	NR	NE	0-20 cm – 10YR 3/2 very dark grayish brown clay very compact clay
n/a	SF6	NR	NR	NR	NE	0-20 cm – 10YR 3/2 very dark grayish brown clay very compact clay
n/a	SM1	NR	NR	NR	NE	0-30 cm – 10YR 4/4 dark yellowish brown fine sandy loam
n/a	SM2	NR	NR	NR	NE	0-30 cm – 10YR 4/4 dark yellowish brown fine sandy loam with gravel
n/a	SM3	NR	NR	NR	NE	0-30 cm – 10YR 4/4 dark yellowish brown fine sandy loam with gravel
n/a	SM4	NR	NR	NR	NE	0-25 cm – 10YR 4/3 dark yellowish brown compact clay loam
n/a	SM5	NR	NR	NR	NE	0-30 cm – 10YR 3/2 very dark grayish brown clay
n/a	SM6	NR	NR	NR	NE	0-30 cm – 10YR 3/2 very dark grayish brown clay
SM7	SM7	5 amber glass; 1 barbed wire	NR	NR	NE	0-25 cm – 10YR 3/4 dark yellowish brown compact silty loam with gravel
SM7	SM8	1 barbed wire	NR	NR	NE	0-20 cm – 10YR 3/2 very dark grayish brown very compact silty clay with gravel
SM7	SM9	NR	NR	NR	NE	0-30 cm – 10YR 3/2 very dark grayish brown very compact silty clay with gravel
SM7	SM10	NR	NR	NR	NE	0-15 cm – 10YR 3/2 very dark grayish brown compact clay with gravel
SM7	SM11	NR	NR	NR	NE	0-30 cm – 10YR 4/4 dark yellowish brown silty clay
SM7	SM12	NR	NR	NR	NE	0-25 cm – 10YR 4/4 dark yellowish brown silty clay with gravel
SM7	SM13	NR	NR	NR	NE	0-30 cm – 10YR 3/2 very dark grayish brown compact silty clay with gravel
n/a	SM14	NR	NR	NR	NE	0-30 cm – 10YR 2/2 very dark brown compact clay
n/a	SM15	NR	NR	NR	NE	0-30 cm – 10YR 4/4 dark yellowish brown compact clay with gravel

NR = No Recovery; NE = Not Excavated

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CREATE AMAZING.

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