Waters of the U.S. Delineation Report

FM 1173 from FM 156 to IH 35 (CSJs 1059-01-047 and 1059-02-002)

Texas Department of Transportation, Dallas District

May 2020

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 9, 2019, and executed by FHWA and TxDOT.

Table of Contents

List of Tables

1.0 Introduction

The Texas Department of Transportation (TxDOT) conducted a waters of the U.S. (WOTUS) delineation for a proposed road project on Farm-to-Market Road (FM) 1173 from FM 156 to Interstate Highway (IH) 35 in the City of Krum and Denton County, Texas (CSJs 1059-01-047 and 1059-02-002). The delineation was completed on April 16 and 20, 2020.

The delineation was performed to evaluate the presence of jurisdictional WOTUS and identify their boundaries within the project area. It is anticipated that this waters of the U.S. delineation report (WOTUS DR) will be used in support of the jurisdictional determination process for on-site aquatic resources. If it is determined that jurisdictional resources will be impacted, this WOTUSDR will also support applications for regulatory permits that may be required from the United States Army Corps of Engineers (USACE) for proposed construction activities.

Waterbodies were delineated according to USACE Regulatory Guidance Letter (RGL) 05-05 Ordinary High Water Mark (OHWM) Identification for non-tidal waters and the Mean High Tide (MHT) line for tidal waters. As required under Section 404 of the Clean Water Act (CWA), wetlands were delineated using the routine method described in the USACE 1987 Wetlands Delineation Manual (1987 Manual) and the USACE Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Great Plains Region (Version 2.0) (March 2010 Regional Supplement). Wetland types and boundaries were determined through initial map review, followed by fieldwork involving the examination of three (3) parameters: hydrology, vegetation, and soils. Delineation criteria and indicators for each of these parameters are outlined in the 1987 Manual and the March 2010 Regional Supplement. The March 2010 Regional Supplement presents wetland indicators, delineation guidance, and other information that is specific to the Great Plains Region, per the regional supplement. Wetlands were classified according to the Cowardin Classification System used for the United States Fish and Wildlife Service's (USFWS) National Wetlands Inventory (NWI).

This document contains the following five (5) attachments:

- Attachment 1 - Figures: contains maps of the project area
- Attachment 2 - Wetland Determination Data Forms: documents the three (3) criteria for wetlands at all sample points
- Attachment 3 - Historical Aerial Photographs: contains historical aerial imagery, starting with the oldest photographs first
- Attachment 4 - Site Photographs: contains photographs taken during the site visit(s)
- Attachment 5 - Stream Data Forms

2.0 Project Overview

The proposed project improvements would include constructing a new six-lane rural highway with sidewalks on both sides of the existing two-lane undivided roadway. The reconstruction of FM 1173 would be approximately 5,400 feet in length; the new construction portion of FM 1173 would be approximately 3,200 feet and the reconstruction of the existing Barthold Road would be approximately 10,400 feet in length. The proposed 3.6-mile long project would require the acquisition of up to 51.75 acres of right of way (ROW) to widen FM 1173 and Barthold Road.

Attachment 1 - Figures contains seven maps of the project area. Figure 1 provides a vicinity map that depicts the location of the project area, Figure 2 is a 7.5-minute series United States Geological Survey (USGS) topographic overview map, Figure 3 is an aerial overview map of the project area, Figure 4 is the NWI overview map, Figure 5 is the United States Department of Agriculture (USDA) Natural Resources Conservation Service

(NRCS) soil overview map of the project area, Figure 6 is the Federal Emergency Management Agency (FEMA) flood insurance rate map (FIRM) overview map of the project area, and Figure 7 provides the project layout of the proposed project in relation to the potential jurisdictional WOTUS.

3.0 Ecological Site Description

The project area is located within the Southwestern Prairies Cotton and Forage Land Resource Region (LRR J) of the Great Plains and is more specifically located in Major Land Resource Area (MLRA) 86C (Eastern Cross Timbers).

The dominant soil orders in this MLRA are Alfisols, Entisols, and Mollisols. They are moderately deep or deep, medium textured to coarse textured, and moderately well drained to somewhat excessively drained. They have a thermic soil temperature regime, an ustic soil moisture regime, and smectitic, siliceous, or mixed mineralogy. Shallow and moderately deep Haplustalfs (Rayex series) and Paleustalfs (Birome series) formed on sandstone-capped hills and ridges. Deep, well drained and moderately well drained Paleustalfs (Callisburg and Crosstell series) formed in clayey material on hillsides. Very deep, well drained, moderately permeable Ultic Paleustalfs (Gasil and Konsil series) formed in sandy material on hillsides. Very deep, well drained Arenic Paleustalfs (Silstid series) and very deep, somewhat excessively drained Psammentic Paleustalfs (Eufaula series) formed in sandy material and have a thick, sandy surface layer. Deep, gently sloping Paleustalfs (Bastrop and Bastsil series) formed on stream terraces and footslopes on erosional remnants. Nearly level Haplustolls (Whitesboro series) and Ustifluvents (Pulexas and Bunyan series) formed on narrow flood plains along tributaries.

The native vegetation in this area consists of mid and tall grasses interspersed with blackjack oak and post oak. The area supports oak savanna vegetation with an understory of tall grasses. Little bluestem, purpletop tridens, Indiangrass, switchgrass, big bluestem, post oak, blackjack oak, elm, coralberry, American beautyberry, bumelia, greenbrier, and elbowbush are some of the dominant species. Engelmann's daisy, lespedezas, and trailing wildbean are among the numerous perennial forbs.

Some of the major wildlife species in this area are whitetailed deer, javelina, coyote, fox, bobcat, raccoon, skunk, opossum, jackrabbit, cottontail, turkey, bobwhite quail, scaled quail, white-winged dove, and mourning dove.

Most of this area is in farms and ranches, but sizable tracts in the central part of the area are rapidly being converted to urban uses. Some of the large tracts are being fragmented into smaller ranches. Most of this rural area is used as improved pasture, native grass pasture, or noncommercial oak forest and is grazed mainly by beef cattle. Some areas are used for peanuts, small grains, forage sorghum, fruits, or vegetables.

The average annual precipitation in this area is 34 to 41 inches (865 to 1,040 millimeters). Most of the rainfall occurs in spring and fall. The average precipitation during the freeze-free period is about 24 to 26 inches (610 to 660 millimeters). The average annual temperature is 62 to 66 degrees F (17 to 19 degrees C). The freeze-free period averages about 265 days and ranges from 255 to 280 days.

Currently, the project area is located in a rural/suburban setting, with large amount of newly built high-density residential neighborhoods and service establishments. Developed and undeveloped lands are present within the proposed project area. Developed lands include single-family residences, retail, commercial, public facilities, and places of worship. Undeveloped lands comprise of vacant (not utilized), agriculture (ranch and pasture), fenced row vegetation, streams, and ponds. Active agricultural lands exist adjacent to the proposed project. Vegetation in the project vicinity consists primarily of maintained urban grasses, landscaping, and agriculture (crops). Some woodland and mixed shrub areas are also present near the streams. Land use changes would result in Agriculture; Crosstimbers Woodland and Forest; Disturbed Prairie; Open Water; Riparian; and Tallgrass Prairie, Grassland ecological systems being converted to Urban.

3.1 Map and Database Review

The following information sources were considered and, if applicable, consulted prior to and during the field delineation to assist in the identification of potential waters of the U.S. within the project area.

3.1.1 USGS Topographic Maps

USGS topographic maps illustrate elevation contours, drainage patterns, and hydrography. The Sanger, Texas, USGS Quad map was reviewed to determine the likelihood of the project area containing jurisdictional waterbodies.

3.1.2 USFWS NWI Data

NWI data were reviewed as a contributing resource to help identify potential wetland features located within the project area.

3.1.3 NRCS Soil Survey Data

The United States Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) maintains an online Web Soil Survey database. The data provided in the Web Soil Survey provides a good basis for the soil textures and types one can expect to find at a particular delineation area. NRCS-mapped soil types at the project area were reviewed to determine which of the soils exhibit hydric characteristics. NRCS-mapped soil types are assigned a hydric indicator status of “hydric” or “non-hydric” by the National Technical Committee for Hydric Soils.

3.1.4 Aerial Photography

Aerial photography provides good insight to the state and function of land resources. Signs of inundation and vegetative signatures on aerial images indicate whether land might be functioning as a wetland or supporting a stream system. Historic and current aerial photography was reviewed utilizing Google Earth, prior to and during the field delineation, in order to further understand the nature of the project area.

3.1.5 FEMA FIRM

The Federal Emergency Management Agency (FEMA) maintains flood insurance rate maps (FIRMs). The FIRM including the project area was reviewed to determine if the 100-year floodplain is mapped. The USACE utilizes the 100-year floodplain to assist in determining jurisdiction of aquatic features. FEMA FIRM data was reviewed to evaluate the location of any mapped floodplain in relation to aquatic resources located within the project area.

3.1.6 LiDAR

Light detection and ranging (LiDAR) is a remote sensing technique that measures spatial and temporal data. LiDAR information is provided by the TNRIS online database for each USGS Quad. LiDAR data was not available for the project area.

3.2 Waters of the U.S. Delineation

With respect to any non-tidal waterbodies located within the project area, biologists followed the methodology outlined in RGL 05-05. With respect to any tidal waterbodies located within the site, biologists identified the MHT line by observing changes in vegetation, drift deposits of shells and debris, and physical markings or characteristics along the shoreline that may indicate the general height reached by a rising tide.

Data collected for any waterbodies includes average water depth, average width per waterbody, length of linear segments within the project boundary, and water flow classification (i.e., tidal, non-tidal, ephemeral, intermittent, and/or perennial).

Any wetland delineation was conducted based on the 1987 Manual and the March 2010 Regional Supplement, as well as the three (3) parameters described within. The three-parameter approach requires investigation of hydrological characteristics, hydrophytic vegetation, and hydric soils at selected sample points within a project area. Sample points are located to ascertain upland/wetland boundaries and to record significant spatial changes in wetland plant communities. All three (3) indicator parameters must be met in order for the area to be classified as a wetland. See subsections on Hydrology, Vegetation, and Soils, below, for indicator-specific information.

Geospatial data was collected utilizing a Trimble Pathfinder Pro XH Global Positioning System (GPS) receiver and Ranger data logger with sub-meter accuracy.

3.2.1 Hydrology

Wetland hydrology is characterized when, under normal circumstances, the surface is either inundated or the upper horizon(s) of the soil are saturated at a sufficient frequency and duration to create anaerobic conditions. Seasonal and long-term rainfall patterns, local geology and topography, soil type, local water table conditions, and drainage are factors that influence hydrology.

Wetland hydrology indicators include: oxidized rhizospheres along living roots, saturated soils, standing surface water, algal mat, aquatic fauna, high water table, iron deposits, sparsely vegetated concave surface, geomorphic position, moss trim lines, water-stained leaves, crawfish burrows, watermarks, drainage patterns, and surface soil cracks.

During the field survey, these indicators were used to determine if an area exhibited wetland hydrology.

3.2.2 Vegetation

In accordance with the procedure set forth in the 1987 Manual and the March 2010 Regional Supplement, the hydrophytic status of vegetation communities was determined by identifying dominant species and, if necessary, calculating a "Prevalence Index," as defined in the 1987 Manual.

Individual plant species were checked against the current National Wetland Plant List (NWPL), and their regional wetland indicator status was determined. Species are classified as follows:

- Obligate Wetland (OBL) if they almost always occur in wetlands (>99 percent of the time)
- Facultative Wetland (FACW) if they usually occur in wetlands (67-99 percent of the time)
- Facultative (FAC) if they are equally likely to occur in wetlands and non-wetlands (34-66 percent of the time)
- Facultative Upland (FACU) if they usually occur in non-wetlands (67-99 percent of the time)
- Obligate Upland (UPL) if they almost always occur in non-wetlands (>99 percent of the time)
- A no indicator (NI) status is recorded for those species for which insufficient information is available to determine an indicator status.

Hydrophytic (wetland) vegetation is considered prevalent where more than 50% of the dominant species in a plant community have an indicator status of OBL, FACW, or FAC. However, in cases where the vegetation community does not meet this hydrophytic threshold, but indicators of hydric soils and wetlands hydrology are present, the prevalence index can be applied. Calculation of this index is based on consideration of both dominant and non-dominant plants in the vegetation community, whereby each indicator status category is given a numeric code and weighted by absolute percent cover. The prevalence index ranges from 1 to 5 and an index of 3.0 or less signifies that hydrophytic vegetation is present. In the current delineation, and as shown on the wetland determination data forms in Attachment 2, a prevalence index was calculated for each sample point's vegetation community.

3.2.3 Soils

Hydric soils are defined as soils that are saturated, flooded, or ponded long enough during the growing season to develop anaerobic conditions in the upper horizons. Anaerobic conditions created by repeated or prolonged saturation or flooding result in permanent changes in soil color and chemistry. The changes in soil color are used to differentiate hydric from non-hydric soils.

At each sample point, in areas where the absence of inundation or heavy saturation allowed, a pit was excavated to a depth of at least 16 inches to reveal soil profiles and to determine whether or not positive indicators of hydric soils were present. Hydric soil indicators relate to color, structure, organic content, and the presence of reducing conditions. Color characteristics (Hue, Value, and Chroma) were recorded using Munsell® Charts.

4.0 Results

4.1 Map and Database Review

4.1.1 USGS Topographic Maps

A review of the 1978 Sanger, Texas topographic map showed the proposed project is located in the northwest area of Denton County. Jordan Creek, Dry Fork Hickory Creek and its tributaries, tributary to Dry Fork Creek, and tributary to Milam Creek cross the proposed project. The elevation varies in the project area from 700 to 760 feet above sea level (Attachment 1, Figure 2).

4.1.2 USFWS NWI Data

The table below summarizes the NWI features within the project area. Refer to Figure 4 in Attachment 1 for an illustration of the NWI features in and surrounding the project area.

Table 1: NWI Features

Classification Code	Code Description	Wetland Type
PEM1C	Palustrine, Emergent, Persistent, Seasonally Flooded	Freshwater Emergent Wetland
PUBFh	Palustrine, Unconsolidated Bottom, Semipermanently Flooded, Diked/Impounded	Freshwater Pond
PUBHx	Palustrine, Unconsolidated Bottom, Permanently Flooded, Excavated	Freshwater Pond
R4SBC	Riverine, Intermittent, Streambed, Seasonally Flooded	Riverine
R5UBH	Riverine, Unknown Perennial, Unconsolidated Bottom, Permanently Flooded	Riverine

4.1.3 NRCS Soil Survey Data

The table below summarizes the soil units represented within the project area based on information collected from the Web Soil Survey database. Refer to Figure 5 in Attachment 1 for an illustration of the mapped soil units in and surrounding the project area.

Table 2: NRCS Soil Units

Soil Unit	Soil Unit Name	Description	Hydric/Non-hydric
13	Birome-Rayex-Aubrey complex, 2 to 15 percent slopes	The gently sloping to moderately steep soils of this complex are on convex ridges. These soils are moderately deep and well drained. Permeability is slow. Runoff is rapid. The available water capacity is low. The hazard of water erosion is severe.	Non-hydric
22	Burleson clay, 1 to 3 percent slopes	This deep, gently sloping soil is on valley fills and edges of upland terraces. This soil is moderately well drained. Runoff is medium, and permeability is very slow. Available water capacity is high. When dry, this soil has deep cracks that extend to a depth of 30 to 60 inches. Water enters the soil rapidly when it is dry and cracked and very slowly when it is wet and the cracks are sealed.	Non-hydric
54	Lindale clay loam, 1 to 3 percent slopes	This deep, gently sloping soil is on convex ridges. This soil is well drained. Runoff is medium. Permeability is slow. Available water capacity is medium. The hazard of erosion is moderate.	Non-hydric
56	Medlin-Sanger clays, 5 to 15 percent slopes	These sloping to moderately steep soils are on sides of ridges. The soils in this complex are well drained. Permeability is very slow. Available water capacity is high. Runoff is rapid, and the hazard of erosion is severe.	Non-hydric
58	Mingo clay loam, 1 to 3 percent slopes	This moderately deep, gently sloping soil is on convex, slight ridges and side slopes between valley fills and high limestone ridges. This soil is well drained. Runoff is medium. Permeability is very slow. Available water capacity is low.	Non-hydric
66	Ponder loam, 1 to 3 percent slopes	This deep, gently sloping soil is on low convex ridges and in valley fill areas. This soil is well drained. Surface runoff is medium. Permeability is very slow. Available water	Non-hydric

Table 2: NRCS Soil Units

Soil Unit	Soil Unit Name	Description	Hydric/Non-hydric
		capacity is medium. The hazard of erosion is moderate. The surface layer is very hard and difficult to till when it is dry.	
67	Sanger clay, 1 to 3 percent slopes	This deep, gently sloping soil is in valley fill areas between limestone ridges. This soil is well drained. Runoff is medium. Permeability is very slow. Available water capacity is high. The hazard of erosion is moderate.	Non-hydric
68	Sanger clay, 3 to 5 percent slopes	This deep, gently sloping soil is in valley fill areas and on sides of ridges. This soil is well drained. Runoff is medium. Permeability is very slow. Available water capacity is high. The hazard of erosion is severe.	Non-hydric
74	Slidell clay, 1 to 3 percent slopes	This deep, gently sloping soil is in valley fill areas and in the low landscape positions. This soil is well drained. Surface runoff is slow. Permeability is very slow. Available water capacity is high. This soil receives runoff water from the higher slopes, and it is difficult to work during extremes in the moisture content.	Non-hydric
75	Somervell gravelly loam, 1 to 5 percent slopes	This moderately deep, gently sloping soil is on high convex ridges and side slopes. This soil is well drained. Runoff is rapid. Permeability is moderate. Available water capacity is very low. The hazard of erosion is severe where the soil is left bare. The limited rooting depth and available water capacity need to be considered when selecting plants for this soil.	Non-hydric

4.1.4 Aerial Photography

Historic aerial imagery for the project and surrounding areas was evaluated using images provided by Google Earth. The table below summarizes observations for the project area for each year reviewed. Attachment 3 contains copies of the historic aerial photographs reviewed for the project area.

Table 3: Historic Aerial Photography Observations

Year	Observations
1996	FM 1173 in its present location. Majority of the adjacent properties consists of vacant lands, mostly for agricultural and rangeland uses, with single-family homes. Commercial buildings were located at the eastern end and commercial and residential buildings were located at the western end of the proposed project.
2001	No change.
2005	The addition of residential subdivisions adjacent to the proposed project (south-central) was observed.
2007	No change.
2008	Additional single-family homes were built in the subdivisions mentioned in 2005.
2009 - 2014	No change.
2015	Additional commercial buildings were constructed at the eastern end of the proposed project.
2016 - 017	No change.
2018	The addition of residential subdivisions (platted) adjacent to the proposed project (north-central) was observed.
2019	Single-family residential homes were being constructed in the subdivision mentioned in 2018.

4.1.5 FEMA FIRM

Review of FEMA FIRM Panel 48121C0215G (effective 4/18/2011) indicate that the majority of the project area is outside the 100-year floodplain. The sections of the proposed project that cross Jordan Creek and Dry Fork Hickory Creek and its tributary are situated within Zone A (areas subject to inundation by the 1-percent-annual-chance flood event generally determined using approximate methodologies. Because detailed hydraulic analyses have not been performed, no Base Flood Elevations or flood depths are shown. Mandatory flood insurance purchase requirements and floodplain management standards apply). Refer to Figures 3 and 6 in Attachment 1 for an illustration of the FEMA FIRM data within and surrounding the project area.

4.1.6 LiDAR

LiDAR data was not available for the project area.

4.2 Waters of the U.S. Delineation

The table below summarizes the waterbodies/wetlands identified within the project area. Refer to Figure 7 in Attachment 1 for a depiction of the boundaries of each waterbody/wetland feature, as well as the location within the project area where sample point data were collected. Refer to Attachment 2, Wetland Determination Data Forms, for the completed wetland determination data forms for the project. Refer to Attachment 4,

Representative Site Photos, for one or more photographs of each waterbody/wetland feature observed within the project area.

Table 4: Summary of Waterbody/Wetland Features

Waterbody or Wetland Number	Name	Type	Latitude, Longitude	Acres within project area (all waterbodies and wetlands)	Linear feet within project area (waterbodies only)	Potentially Jurisdictional (Section 404)?	Potentially Navigable (Section 10)?
1	Jordan Creek	Intermittent stream	33.259990 -97.2336207	0.06	288	Yes	No
2A	Unnamed tributary to Dry Fork Hickory Creek	Ephemeral stream	33.259438 -97.2265116	0.03	197	Yes	No
2B	Wetland	Palustrine emergent	33.2596031 -97.2267702	0.10	N/A	Yes	No
3A	Dry Fork Hickory Creek	Intermittent stream	33.2603328 -97.2203201	0.07	340	Yes	No
3B	unnamed tributary to Dry Fork Hickory Creek	Intermittent stream	33.2605052 -97.2205481	0.01	104	Yes	No
3C	Wetland	Palustrine emergent	33.2600331 -97.2208974	0.19	N/A	Yes	No
4	unnamed tributary to Dry Fork Hickory Creek	Intermittent stream	33.2602598 -97.2068775	0.004	60	Yes	No
5	unnamed tributary to Milam Creek	Intermittent stream	33.2641318 -97.1794120	0.07	160	Yes	No

4.2.1 Hydrology

Normal circumstances conditions were present within the project area. The table below summarizes wetland hydrological indicators identified within the project area. Refer to the wetland determination data forms in Attachment 2 to see the specific hydrology recorded at each sample point.

Table 5: Wetland Hydrological Indicators

Wetland Type	Sample Point Name(s)	Primary Wetland Hydrological Indicators	Secondary Wetland Hydrological Indicators
Palustrine emergent	DP1	Saturation (A3)	Crayfish burrows (C8) FAC-Neutral Test (D5
Palustrine emergent	DP4	Saturation (A#)	Crayfish burrows

4.2.2 Vegetation

Normal circumstances were present within the project area. Representative dominant taxa for each distinct habitat type encountered within the project area are listed in the tables below. Indicator status for each species was obtained from the current NWPL.

Table 6: Wetland Dominant Plant Species

Strata	Scientific Name	Common Name	NWPL Classification
Herb	*Ranunculus repens*	Creeping Buttercup	FACW
Herb	*Eleocharis palustris*	Common Spike-Rush	OBL
Herb	*Rumex crispus*	Curly Dock	FAC

Table 7: Upland Dominant Plant Species

Strata	Scientific Name	Common Name	NWPL Classification
Herb	*Sorghum halepense*	Johnson Grass	FACU
Herb	*Lolium perenne*	Perennial Rye Grass	FACU
Herb	*Bromus arvensis*	Field Brome	FACU
Herb	*Cynodon dactylon*	Bermuda Grass	FACU

4.2.3 Soils

Brown clay loam soils were found onsite and normal circumstances were present. The table below summarizes hydric soil data identified within the project area. Refer to the wetland determination data forms in Attachment 2 to see the specific soil data recorded at each sample point.

Wetland Type	Sample Point Name(s)	Hydric Soil Indicator(s)
Palustrine emergent	DP1	Redox Dark Surface (F6) Depleted Dark Surface (F7)

Wetland Type	Sample Point Name(s)	Hydric Soil Indicator(s)
Palustrine emergent	DP4	Redox Dark Surface (F6)

5.0 Conclusion

A WOTUS delineation was conducted for the FM 1173 from FM 156 to IH 35 in Krum, Denton County, Texas (CSJs 1059-01-047 and 1059-02-002). The field delineation was completed on April 16 and 20, 2020. Refer to Section 5.2, above, for a table summarizing the aquatic resources (i.e., waterbodies/wetlands) identified within the project area.

Crossings 1 to 5 are relatively permanent waters (RPWs) that exhibit a direct downstream connection to a traditional navigable waters (TNW). Due to Crossing 1 to 5's continuous surface connection to a TNW, the USACE will likely assert jurisdiction over these features.

The professional opinion offered in this report is based on best professional judgement. It should be noted that the USACE makes the final determination on the location of waterbody and wetland boundaries and their jurisdictional status. To obtain an official jurisdictional determination (JD) from the USACE, this report must be submitted to the USACE Fort Worth District Office, along with a JD request form and, if appropriate, a pre-construction notification / permit application.

6.0 References

Cowardin, L. M., V. Carter, F. C. Golet, E. T. LaRoe. 1979. Classification of wetlands and deepwater habitats of the United States. U.S. Department of the Interior, Fish and Wildlife Service, Washington, D.C. Jamestown, ND: Northern Prairie Wildlife Research Center Online. http://www.npwrc.usgs.gov/resource/wetlands/classwet/index.htm (Version 04DEC1998).

Federal Emergency Management Agency (FEMA). 2011. Flood Insurance Rate Maps for Denton County. Accessed April 2020.

Google Inc. (2009). Google Earth (Version 5.1.3533.1731) [Software]. Accessed April 2020.

Lichvar, R.W., D.L. Banks, W.N. Kirchner, and N.C. Melvin. 2016. *The National Wetland Plant List*: 2016 wetland ratings. Phytoneuron 2016-30: 1-17. Published 28 April 2016. ISSN 2153 733X.

Lists of Hydric Soils. National List; all states. United States Department of Agriculture. National Resource Conservation Service. Available online at http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/use/hydric/. Accessed April 2020.

Munsell® Soil Color Charts. 2009. GretagMacbeth, New Windsor, New York

Natural Resources Conservation Service (NRCS). 2006. Land Resource Regions and Major Land Resource Areas of the United States, the Caribbean, and the Pacific Basin. Available online at www.nrcs.usda.gov/Internet/FSE_DOCUMENTS?nrcs142p2-050898.pdf. Accessed April 2020.

Soil Survey Staff, Natural Resources Conservation Service, United States Department of Agriculture. Web Soil Survey. Available online at http://websoilsurvey.nrcs.usda.gov/. Accessed April 2020.

United States Department of Agriculture, Natural Resources Conservation Service. 2010. Field Indicators of Hydric Soils in the United States, Version 7.0. L.M. Vasilas, G.W. Hurt, and C.V. Noble (eds.). USDA, NRCS, in cooperation with the National Technical Committee for Hydric Soils.

U.S. Army Corps of Engineers (USACE). Regulatory Guidance Letter: Ordinary High Water Mark Identification. Available online http://www.usace.army.mil/Portals/2/docs/civilworks/RGLS/rg105-05.pdf. Accessed April 2020.

U.S. Army Corps of Engineers (USACE). 1987. Corps of Engineers Wetland Delineation Manual. Technical Report Y-87-1, U.S. Army Corps of Engineers Waterways Experiment Station, Vicksburg, MS.

U.S. Army Corps of Engineers (USACE). 2010. Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Great Plains Region (Version 2.0), ed. J.S. Wakeley, R.W. Lichvar, and C.V. Noble. ERDC/EL TR-10-1. Vicksburg, MS: U.S. Army Engineer Research and Development Center.

7.0 Attachments

1. Figures
2. Wetland Determination Data Forms
3. Historical Aerial Photographs
4. Site Photographs
5. Stream Data Forms

Attachment 1 - Figures

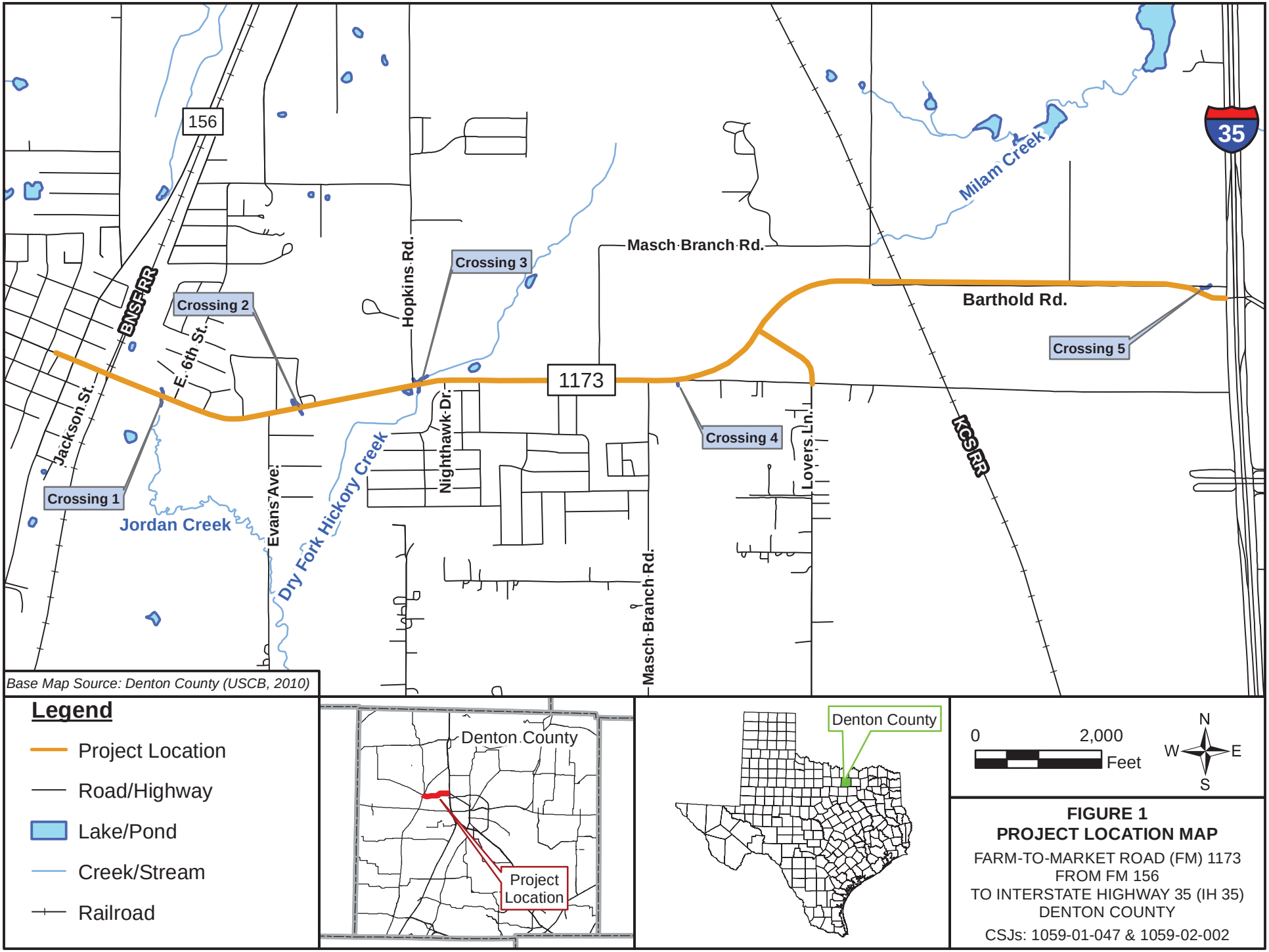
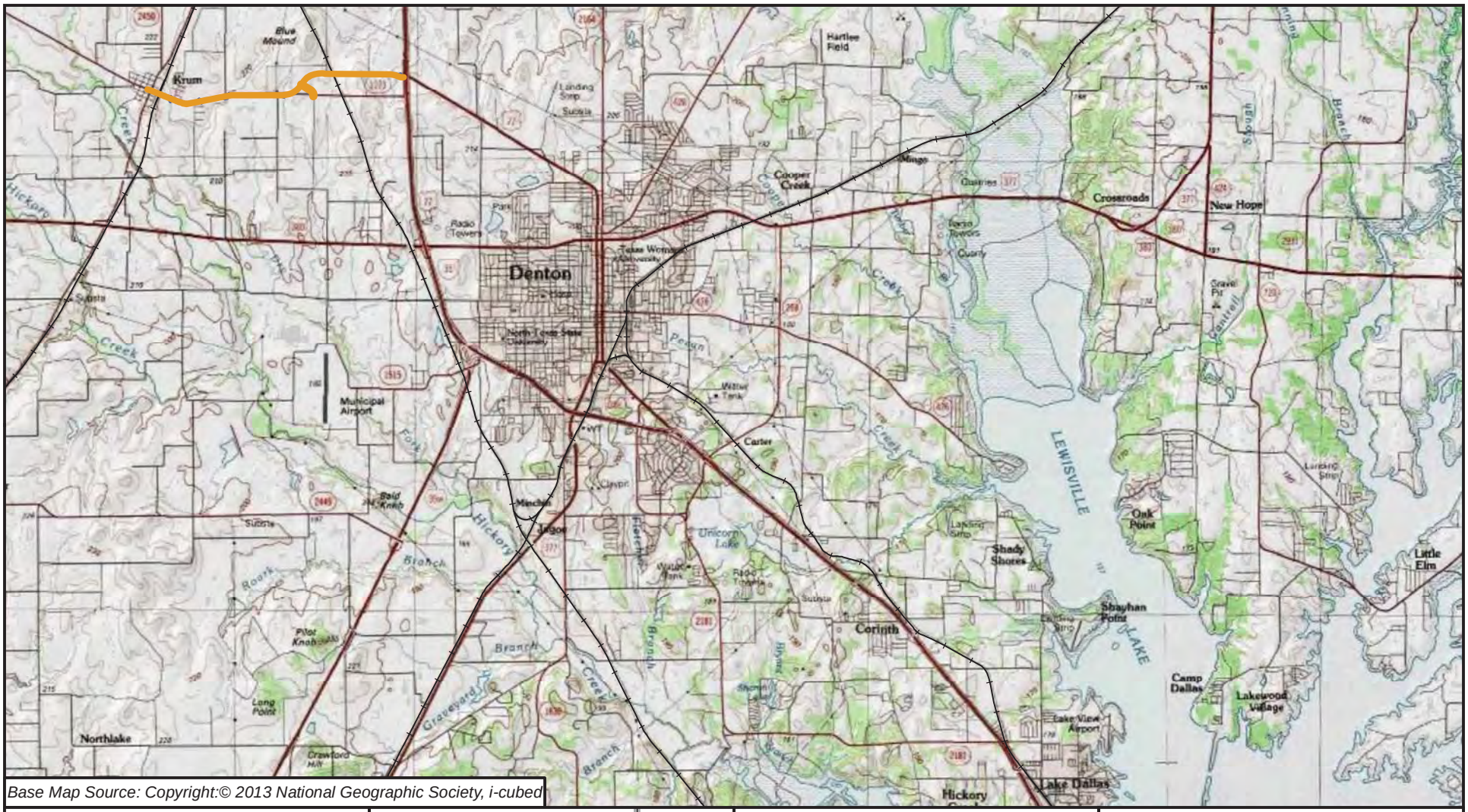


FIGURE 1
PROJECT LOCATION MAP

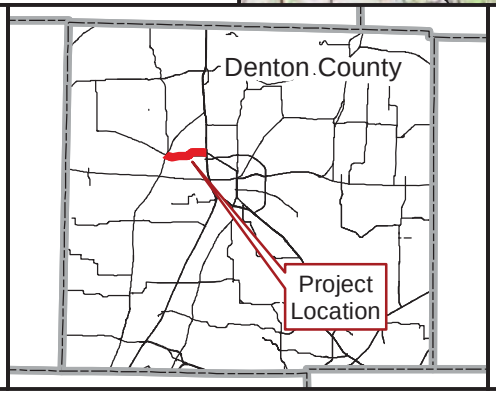
FARM-TO-MARKET ROAD (FM) 1173
FROM FM 156
TO INTERSTATE HIGHWAY 35 (IH 35)
DENTON COUNTY

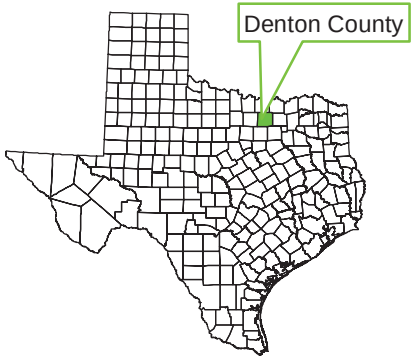
CSJs: 1059-01-047 & 1059-02-002



Legend

- Project Location
- Road/Highway
- Railroad





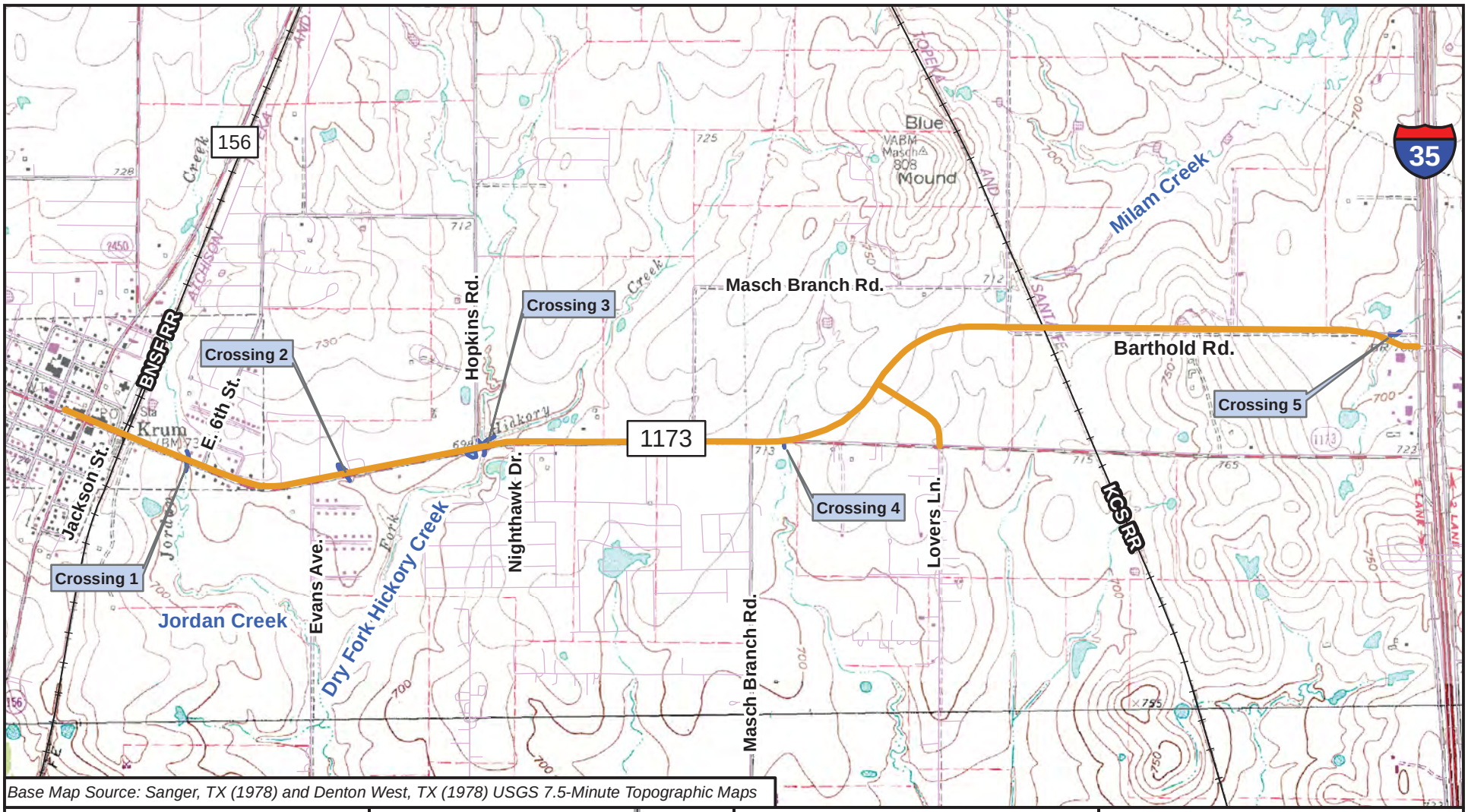
0 2 Miles

N W E S

FIGURE 2A
TOPOGRAPHIC MAP

FARM-TO-MARKET ROAD (FM) 1173
FROM FM 156
TO INTERSTATE HIGHWAY 35 (IH 35)
DENTON COUNTY

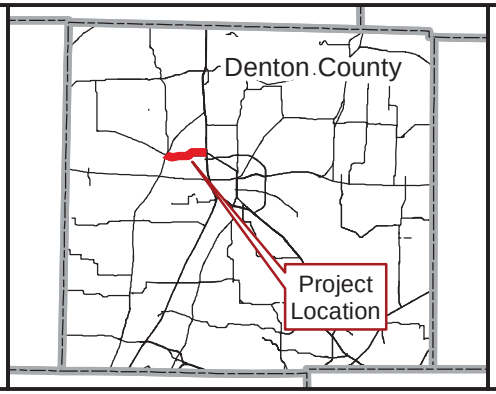
CSJs: 1059-01-047 & 1059-02-002



Base Map Source: Sanger, TX (1978) and Denton West, TX (1978) USGS 7.5-Minute Topographic Maps

Legend

- Project Location
- Road/Highway
- Delineated Stream
- Railroad



0 2,000 Feet

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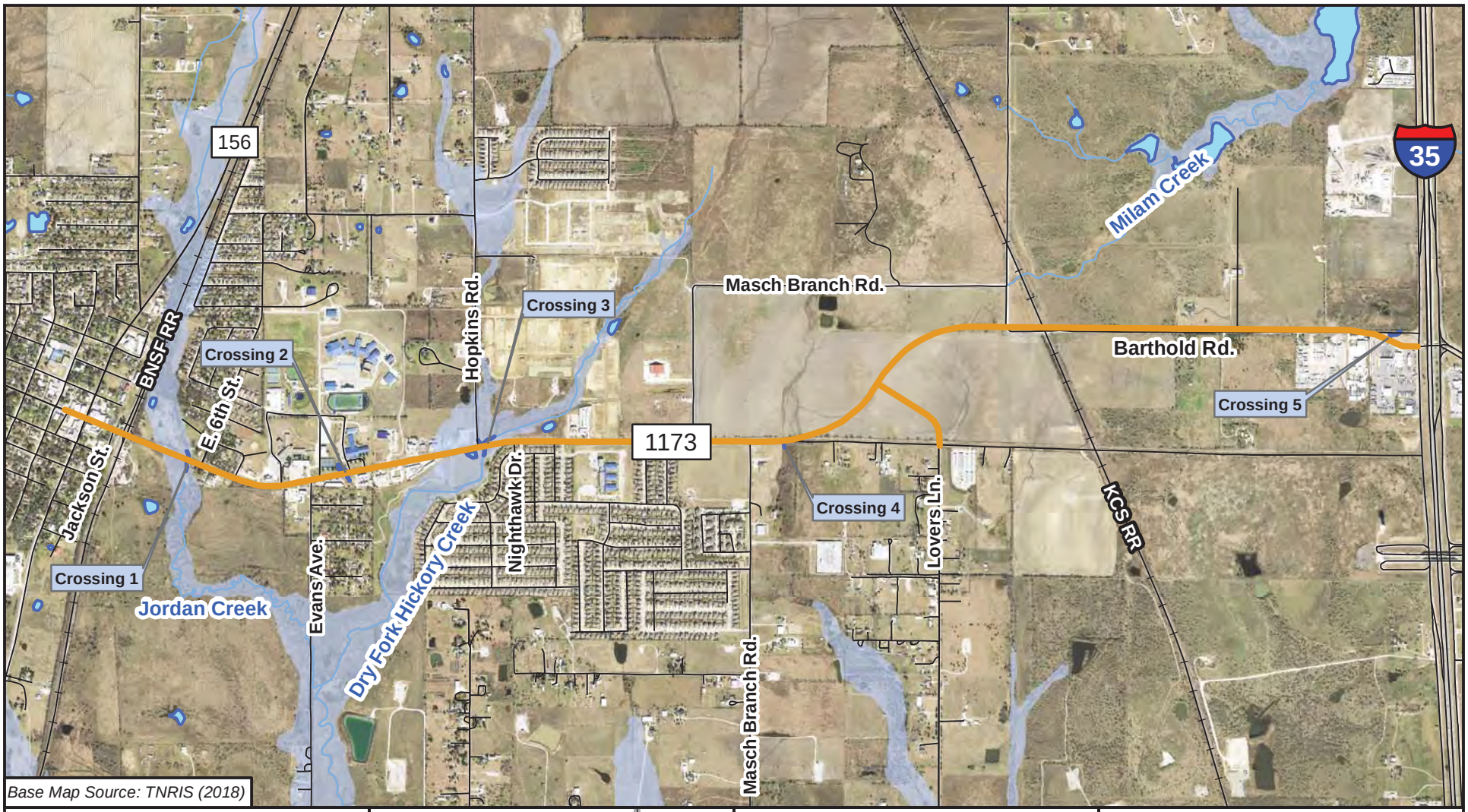
FIGURE 2B
TOPOGRAPHIC MAP

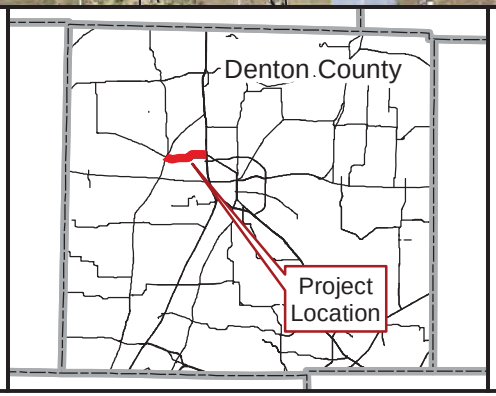
FARM-TO-MARKET ROAD (FM) 1173
FROM FM 156
TO INTERSTATE HIGHWAY 35 (IH 35)
DENTON COUNTY

CSJs: 1059-01-047 & 1059-02-002



Legend

- Project Location
- Road/Highway
- Lake/Pond
- Creek/Stream
- Railroad
- 100-Year Floodplain



0 2,000 Feet

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FIGURE 3
AERIAL MAP

FARM-TO-MARKET ROAD (FM) 1173
FROM FM 156
TO INTERSTATE HIGHWAY 35 (IH 35)
DENTON COUNTY

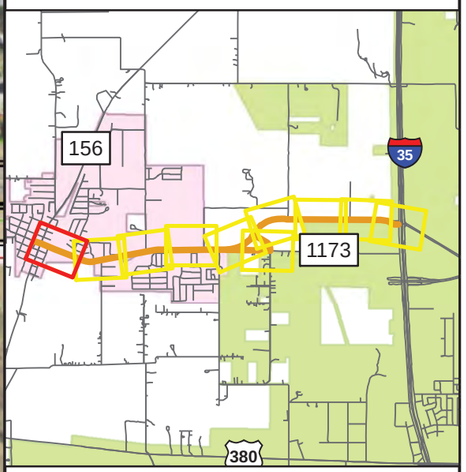
CSJs: 1059-01-047 & 1059-02-002

FIGURE 4

NATIONAL WETLANDS INVENTORY MAP

FM 1173

FARM-TO-MARKET ROAD (FM) 1173
FROM FM 156
TO INTERSTATE HIGHWAY 35 (IH 35)
DENTON COUNTY
CSJs: 1059-01-047
and 1059-02-002



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LEGEND

- Existing Right-of-Way
- Proposed Right-of-Way
- Proposed Easement
- Delineated Stream
- Delineated Wetland
- Existing Culvert
- Proposed Culvert
- Proposed Riprap/Drainage Area
- Freshwater Emergent Wetland
- Freshwater Pond
- Riverine

Base Map Source: TNRIS (2018)

FIGURE 4

NATIONAL WETLANDS INVENTORY MAP

FM 1173

FARM-TO-MARKET ROAD (FM) 1173
FROM FM 156
TO INTERSTATE HIGHWAY 35 (IH 35)
DENTON COUNTY
CSJs: 1059-01-047
and 1059-02-002

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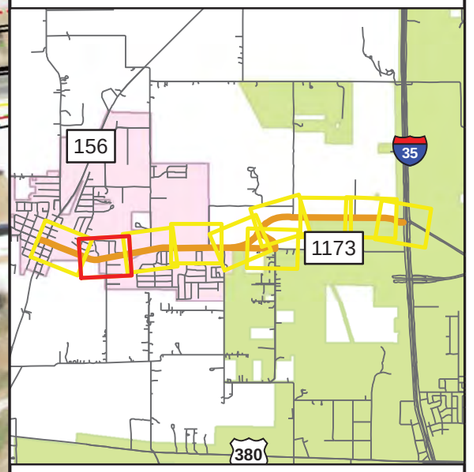

LEGEND

- Existing Right-of-Way
- Proposed Right-of-Way
- Proposed Easement
- Delineated Stream
- Delineated Wetland
- Existing Culvert
- Proposed Culvert
- Proposed Riprap/Drainage Area
- Freshwater Emergent Wetland
- Freshwater Pond
- Riverine

Base Map Source: TNRIS (2018)

FIGURE 4

NATIONAL WETLANDS INVENTORY MAP

FM 1173

FARM-TO-MARKET ROAD (FM) 1173
FROM FM 156
TO INTERSTATE HIGHWAY 35 (IH 35)
DENTON COUNTY
CSJs: 1059-01-047
and 1059-02-002

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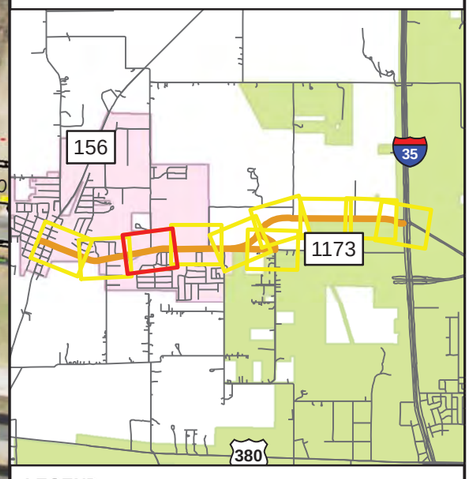

LEGEND

- Existing Right-of-Way
- Proposed Right-of-Way
- Proposed Easement
- Delineated Stream
- Delineated Wetland
- Existing Culvert
- Proposed Culvert
- Proposed Riprap/Drainage Area
- Freshwater Emergent Wetland
- Freshwater Pond
- Riverine

Base Map Source: TNRIS (2018)

FIGURE 4

NATIONAL WETLANDS INVENTORY MAP

FM 1173

FARM-TO-MARKET ROAD (FM) 1173
FROM FM 156
TO INTERSTATE HIGHWAY 35 (IH 35)
DENTON COUNTY
CSJs: 1059-01-047
and 1059-02-002

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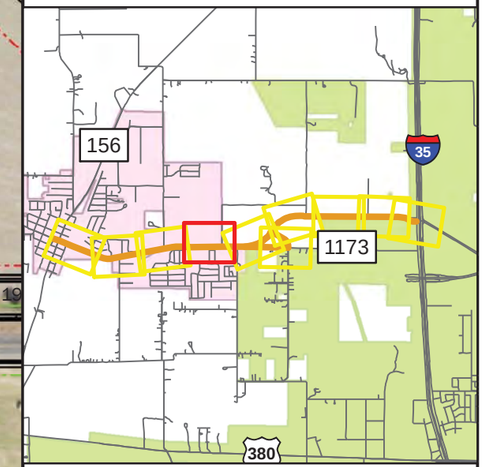

LEGEND

- Existing Right-of-Way
- Proposed Right-of-Way
- Proposed Easement
- Delineated Stream
- Delineated Wetland
- Existing Culvert
- Proposed Culvert
- Proposed Riprap/Drainage Area
- Freshwater Emergent Wetland
- Freshwater Pond
- Riverine

Base Map Source: TNRIS (2018)

FIGURE 4

NATIONAL WETLANDS INVENTORY MAP

FM 1173

FARM-TO-MARKET ROAD (FM) 1173
FROM FM 156
TO INTERSTATE HIGHWAY 35 (IH 35)
DENTON COUNTY
CSJs: 1059-01-047
and 1059-02-002

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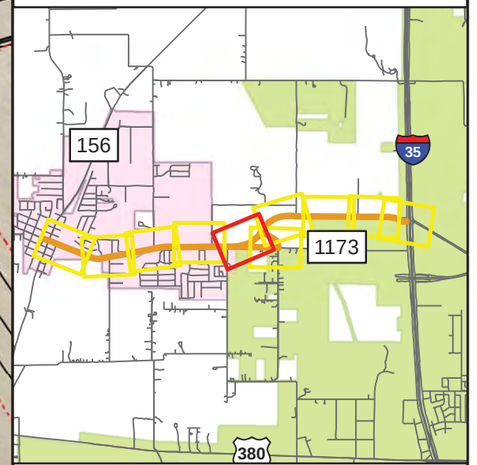

PEM1Ch
R4SBC
15+00
195+00
Crossing 4
200+00
205+00
210+00
215+00
20+00
1173
Masch Branch Rd
PUBHx
tributary to Dry Fork
Surface Drainage
(non-jurisdictional)
1173
PUBFh
R4SBC

LEGEND

- Existing Right-of-Way
- Proposed Right-of-Way
- Proposed Easement
- Delineated Stream
- Delineated Wetland
- Existing Culvert
- Proposed Culvert
- Proposed Riprap/Drainage Area
- Freshwater Emergent Wetland
- Freshwater Pond
- Riverine

Base Map Source: TNRIS (2018)

FIGURE 4

NATIONAL WETLANDS INVENTORY MAP

FM 1173

FARM-TO-MARKET ROAD (FM) 1173
FROM FM 156
TO INTERSTATE HIGHWAY 35 (IH 35)
DENTON COUNTY
CSJs: 1059-01-047
and 1059-02-002

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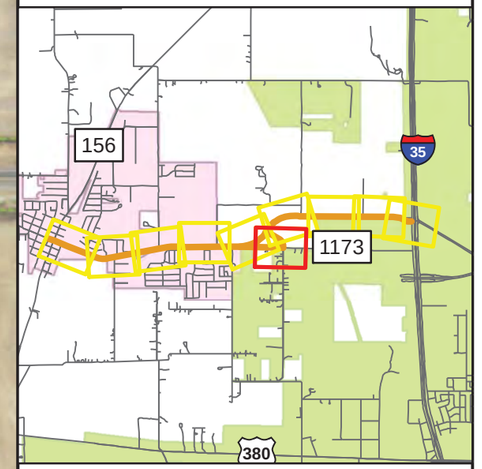

LEGEND

- Existing Right-of-Way
- Proposed Right-of-Way
- Proposed Easement
- Delineated Stream
- Delineated Wetland
- Existing Culvert
- Proposed Culvert
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- Freshwater Emergent Wetland
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- Riverine

Base Map Source: TNRIS (2018)

FIGURE 4

NATIONAL WETLANDS INVENTORY MAP

FM 1173

FARM-TO-MARKET ROAD (FM) 1173
FROM FM 156
TO INTERSTATE HIGHWAY 35 (IH 35)
DENTON COUNTY
CSJs: 1059-01-047
and 1059-02-002

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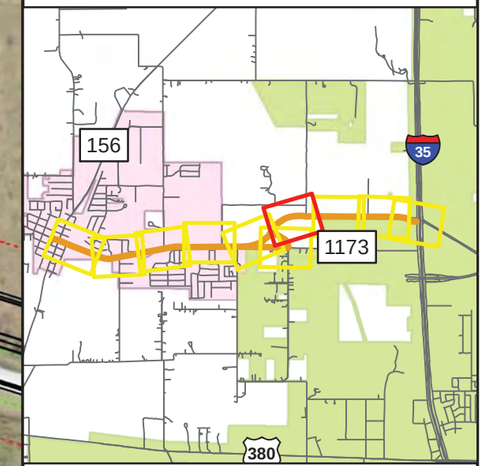


LEGEND

- Existing Right-of-Way
- Proposed Right-of-Way
- Proposed Easement
- Delineated Stream
- Delineated Wetland
- Existing Culvert
- Proposed Culvert
- Proposed Riprap/Drainage Area
- Freshwater Emergent Wetland
- Freshwater Pond
- Riverine

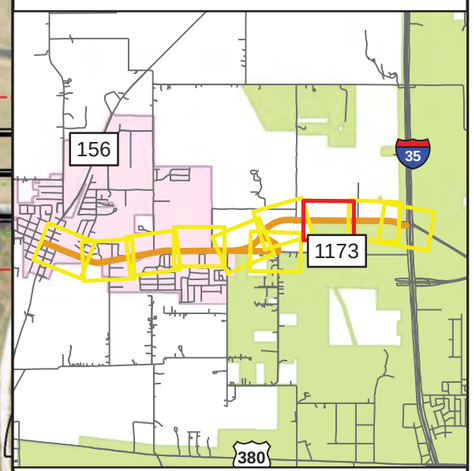
Base Map Source: TNRIS (2018)

FIGURE 4

NATIONAL WETLANDS INVENTORY MAP

FM 1173

FARM-TO-MARKET ROAD (FM) 1173
FROM FM 156
TO INTERSTATE HIGHWAY 35 (IH 35)
DENTON COUNTY
CSJs: 1059-01-047
and 1059-02-002



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LEGEND

- Existing Right-of-Way
- Proposed Right-of-Way
- Proposed Easement
- Delineated Stream
- Delineated Wetland
- Existing Culvert
- Proposed Culvert
- Proposed Riprap/Drainage Area
- Freshwater Emergent Wetland
- Freshwater Pond
- Riverine

Base Map Source: TNRIS (2018)

FIGURE 4

NATIONAL WETLANDS INVENTORY MAP

FM 1173

FARM-TO-MARKET ROAD (FM) 1173
FROM FM 156
TO INTERSTATE HIGHWAY 35 (IH 35)
DENTON COUNTY
CSJs: 1059-01-047
and 1059-02-002

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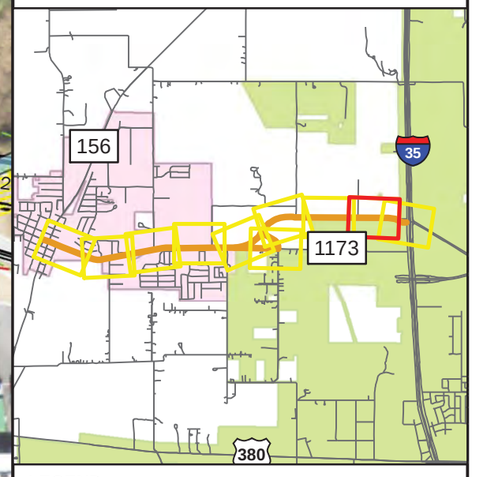


LEGEND

- Existing Right-of-Way
- Proposed Right-of-Way
- Proposed Easement
- Delineated Stream
- Delineated Wetland
- Existing Culvert
- Proposed Culvert
- Proposed Riprap/Drainage Area
- Freshwater Emergent Wetland
- Freshwater Pond
- Riverine

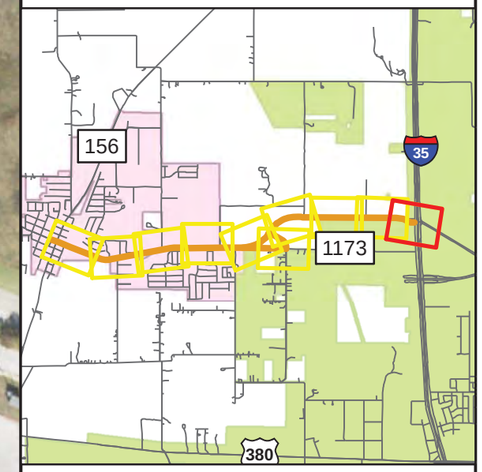
Base Map Source: TNRIS (2018)

FIGURE 4

NATIONAL WETLANDS INVENTORY MAP

FM 1173

FARM-TO-MARKET ROAD (FM) 1173
FROM FM 156
TO INTERSTATE HIGHWAY 35 (IH 35)
DENTON COUNTY
CSJs: 1059-01-047
and 1059-02-002



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LEGEND

- Existing Right-of-Way
- Proposed Right-of-Way
- Proposed Easement
- Delineated Stream
- Delineated Wetland
- Existing Culvert
- Proposed Culvert
- Proposed Riprap/Drainage Area
- Freshwater Emergent Wetland
- Freshwater Pond
- Riverine

Base Map Source: TNRIS (2018)

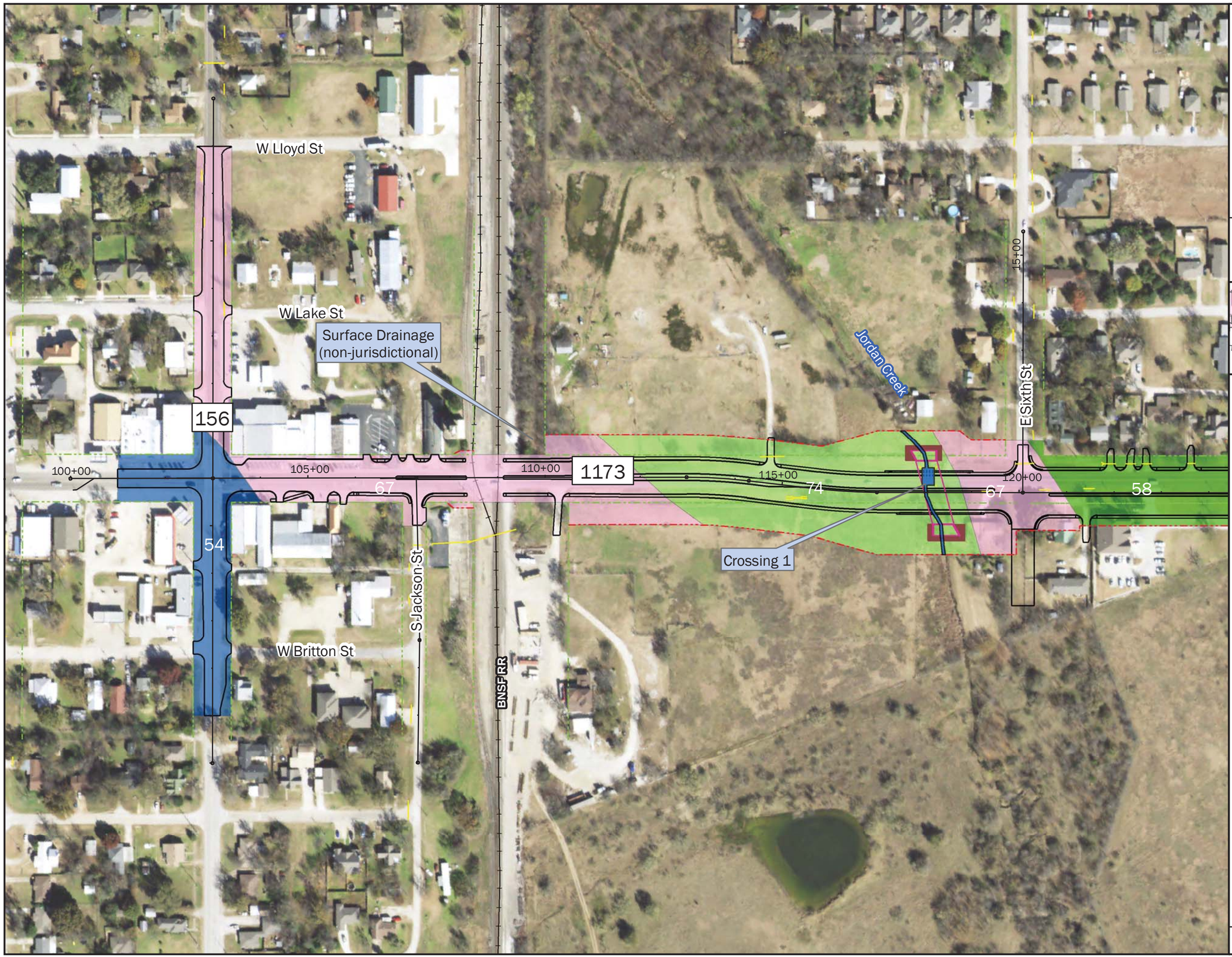
FIGURE 5

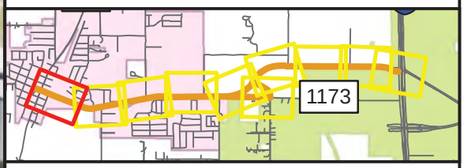
NRCS SOIL MAP

FM 1173

FARM-TO-MARKET ROAD (FM) 1173
FROM FM 156
TO INTERSTATE HIGHWAY 35 (IH 35)
DENTON COUNTY

CSJs: 1059-01-047
and 1059-02-002





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LEGEND

- Existing Right-of-Way
- Proposed Right-of-Way
- Proposed Easement
- Delineated Stream
- Delineated Wetland
- Existing Culvert
- Proposed Culvert
- Proposed Riprap/Drainage Area

Soil Types

- 13 - Birome-Rayex-Aubrey complex, 2 to 15 percent slopes
- 22 - Burleson clay, 1 to 3 percent slopes
- 54 - Lindale clay loam, 1 to 3 percent slopes
- 56 - Medlin-Sanger clays, 5 to 15 percent slopes
- 58 - Mingo clay loam, 1 to 3 percent slopes
- 66 - Ponder loam, 1 to 3 percent slopes
- 67 - Sanger clay, 1 to 3 percent slopes
- 68 - Sanger clay, 3 to 5 percent slopes
- 74 - Slidell clay, 1 to 3 percent slopes
- 75 - Somervell gravelly loam, 1 to 5 percent slopes

Base Map Source: TNRIS (2018)

FIGURE 5

NRCS SOIL MAP

FM 1173

FARM-TO-MARKET ROAD (FM) 1173
FROM FM 156
TO INTERSTATE HIGHWAY 35 (IH 35)
DENTON COUNTY

CSJs: 1059-01-047
and 1059-02-002

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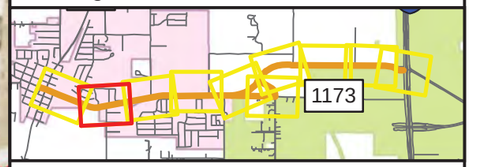

LEGEND

- Existing Right-of-Way
- Proposed Right-of-Way
- Proposed Easement
- Delineated Stream
- Delineated Wetland
- Existing Culvert
- Proposed Culvert
- Proposed Riprap/Drainage Area

Soil Types

- 13 - Birome-Rayex-Aubrey complex, 2 to 15 percent slopes
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- 58 - Mingo clay loam, 1 to 3 percent slopes
- 66 - Ponder loam, 1 to 3 percent slopes
- 67 - Sanger clay, 1 to 3 percent slopes
- 68 - Sanger clay, 3 to 5 percent slopes
- 74 - Slidell clay, 1 to 3 percent slopes
- 75 - Somervell gravelly loam, 1 to 5 percent slopes

Base Map Source: TNRIS (2018)

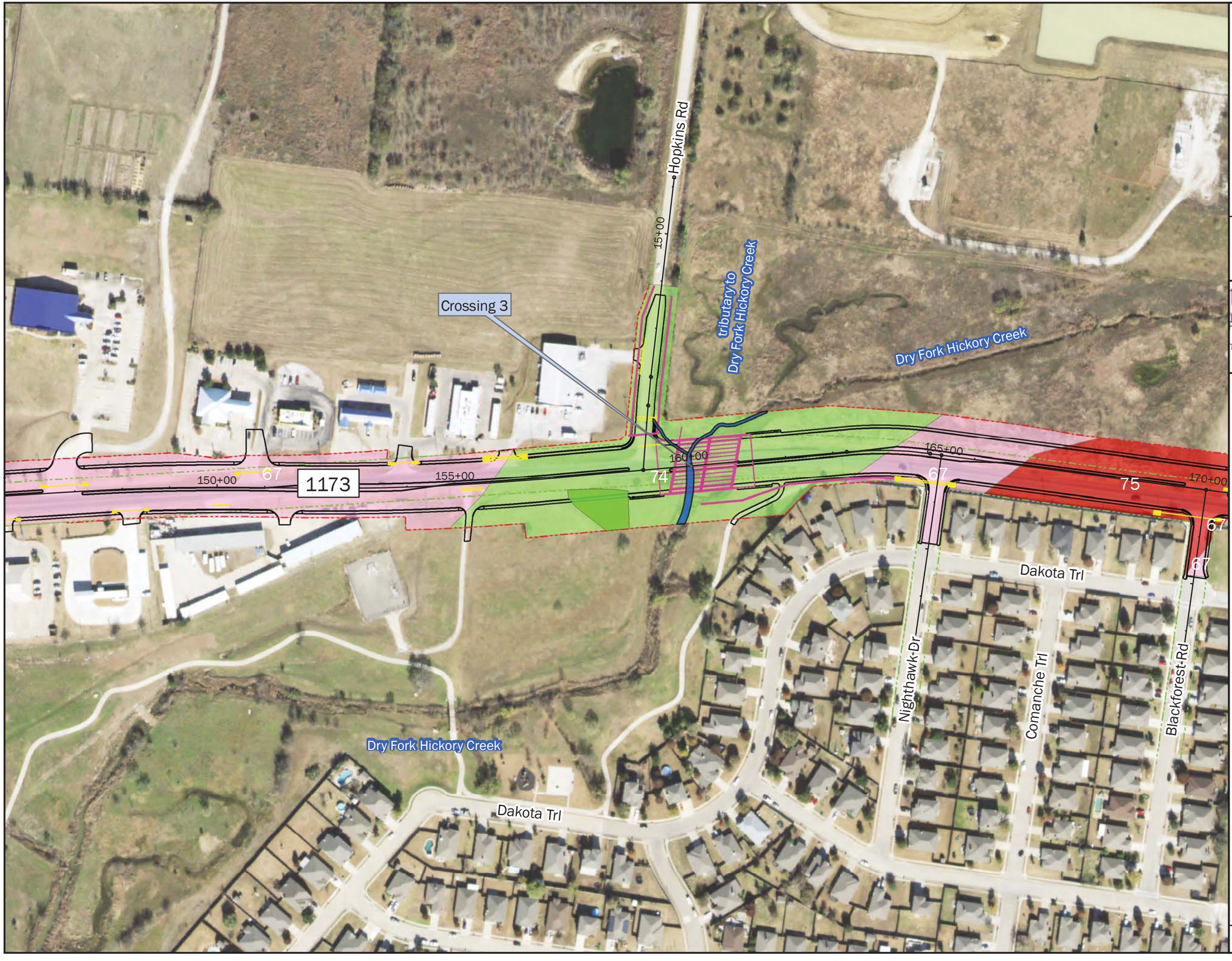
FIGURE 5

NRCS SOIL MAP

FM 1173

FARM-TO-MARKET ROAD (FM) 1173
FROM FM 156
TO INTERSTATE HIGHWAY 35 (IH 35)
DENTON COUNTY

CSJs: 1059-01-047
and 1059-02-002



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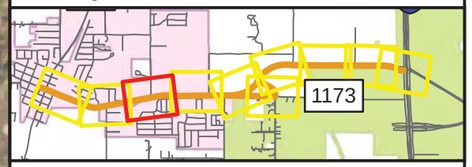

LEGEND

- Existing Right-of-Way
- Proposed Right-of-Way
- Proposed Easement
- Delineated Stream
- Delineated Wetland
- Existing Culvert
- Proposed Culvert
- Proposed Riprap/Drainage Area

Soil Types

- 13 - Birome-Rayex-Aubrey complex, 2 to 15 percent slopes
- 22 - Burleson clay, 1 to 3 percent slopes
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- 67 - Sanger clay, 1 to 3 percent slopes
- 68 - Sanger clay, 3 to 5 percent slopes
- 74 - Slidell clay, 1 to 3 percent slopes
- 75 - Somervell gravelly loam, 1 to 5 percent slopes

Base Map Source: TNRIS (2018)

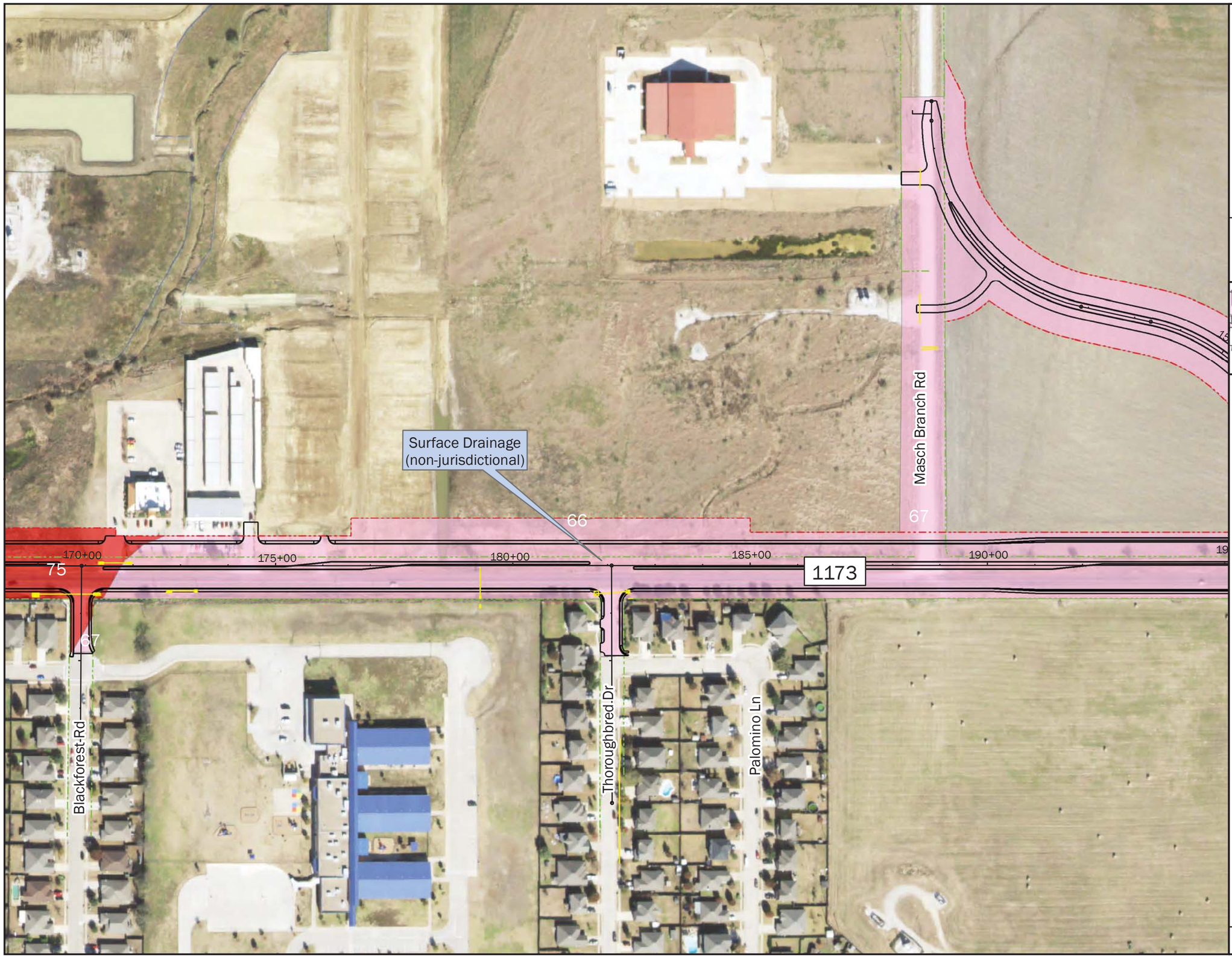
FIGURE 5

NRCS SOIL MAP

FM 1173

FARM-TO-MARKET ROAD (FM) 1173
FROM FM 156
TO INTERSTATE HIGHWAY 35 (IH 35)
DENTON COUNTY

CSJs: 1059-01-047
and 1059-02-002



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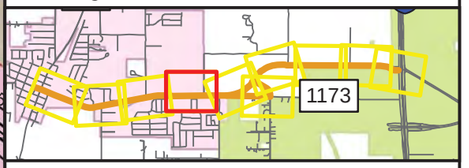

LEGEND

- Existing Right-of-Way
- Proposed Right-of-Way
- Proposed Easement
- Delineated Stream
- Delineated Wetland
- Existing Culvert
- Proposed Culvert
- Proposed Riprap/Drainage Area

Soil Types

- 13 - Birome-Rayex-Aubrey complex, 2 to 15 percent slopes
- 22 - Burleson clay, 1 to 3 percent slopes
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- 56 - Medlin-Sanger clays, 5 to 15 percent slopes
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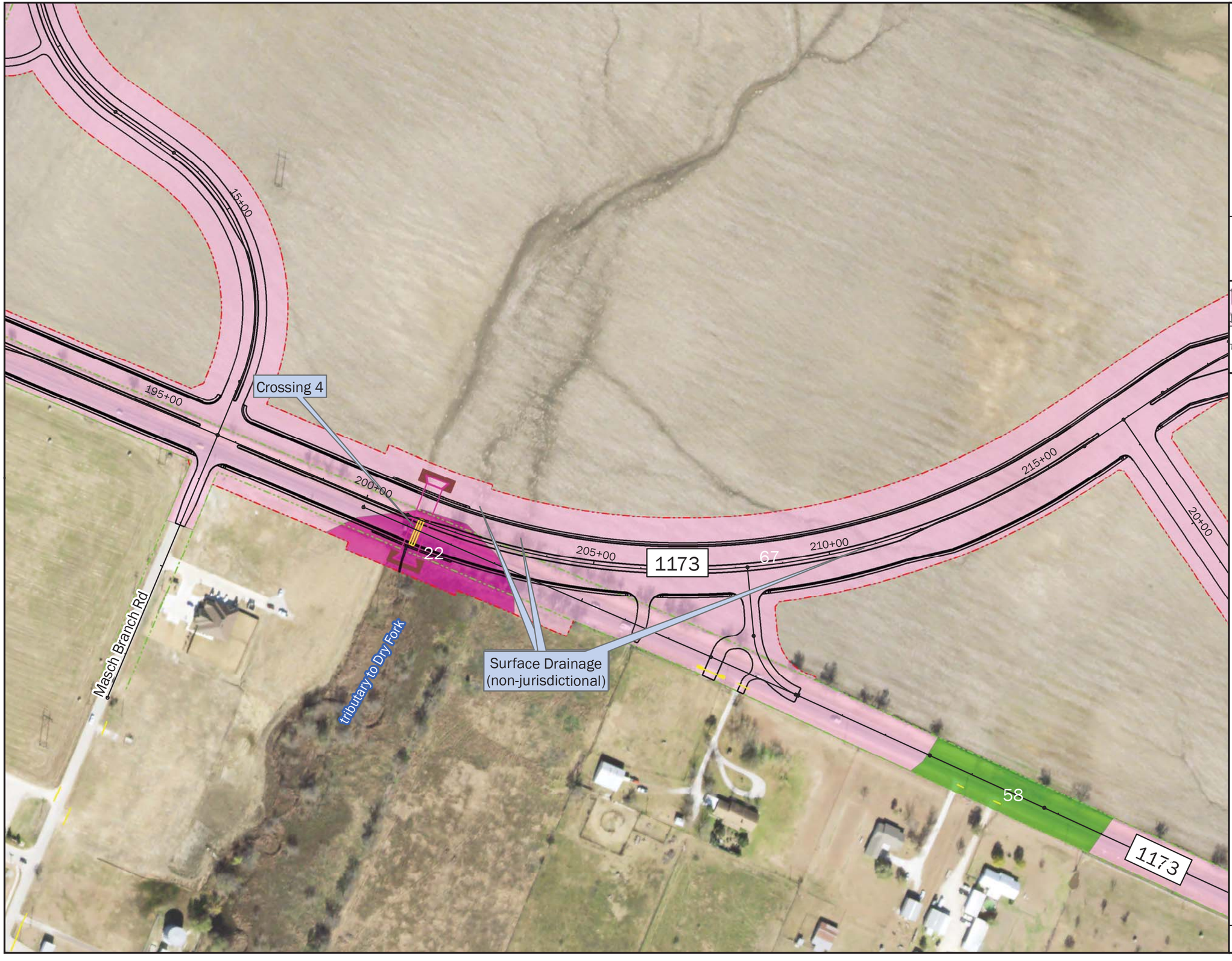
- 66 - Ponder loam, 1 to 3 percent slopes
- 67 - Sanger clay, 1 to 3 percent slopes
- 68 - Sanger clay, 3 to 5 percent slopes
- 74 - Slidell clay, 1 to 3 percent slopes
- 75 - Somervell gravelly loam, 1 to 5 percent slopes

Base Map Source: TNRIS (2018)

FIGURE 5
NRCS SOIL MAP
FM 1173
FARM-TO-MARKET ROAD (FM) 1173
FROM FM 156
TO INTERSTATE HIGHWAY 35 (IH 35)
DENTON COUNTY
CSJs: 1059-01-047
and 1059-02-002



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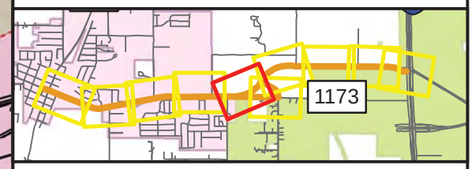

LEGEND

- Existing Right-of-Way
- Proposed Right-of-Way
- Proposed Easement
- Delineated Stream
- Delineated Wetland
- Existing Culvert
- Proposed Culvert
- Proposed Riprap/Drainage Area

Soil Types

- 13 - Birome-Rayex-Aubrey complex, 2 to 15 percent slopes
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- 58 - Mingo clay loam, 1 to 3 percent slopes
- 66 - Ponder loam, 1 to 3 percent slopes
- 67 - Sanger clay, 1 to 3 percent slopes
- 68 - Sanger clay, 3 to 5 percent slopes
- 74 - Slidell clay, 1 to 3 percent slopes
- 75 - Somervell gravelly loam, 1 to 5 percent slopes

Base Map Source: TNRIS (2018)

FIGURE 5

NRCS SOIL MAP

FM 1173

FARM-TO-MARKET ROAD (FM) 1173
FROM FM 156
TO INTERSTATE HIGHWAY 35 (IH 35)
DENTON COUNTY

CSJs: 1059-01-047
and 1059-02-002

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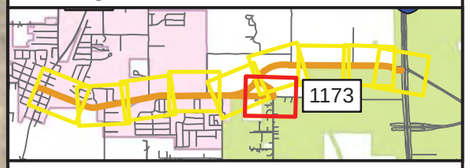

LEGEND

- Existing Right-of-Way
- Proposed Right-of-Way
- Proposed Easement
- Delineated Stream
- Delineated Wetland
- Existing Culvert
- Proposed Culvert
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- 13 - Birome-Rayex-Aubrey complex, 2 to 15 percent slopes
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- 66 - Ponder loam, 1 to 3 percent slopes
- 67 - Sanger clay, 1 to 3 percent slopes
- 68 - Sanger clay, 3 to 5 percent slopes
- 74 - Slidell clay, 1 to 3 percent slopes
- 75 - Somervell gravelly loam, 1 to 5 percent slopes

Base Map Source: TNRIS (2018)

FIGURE 5

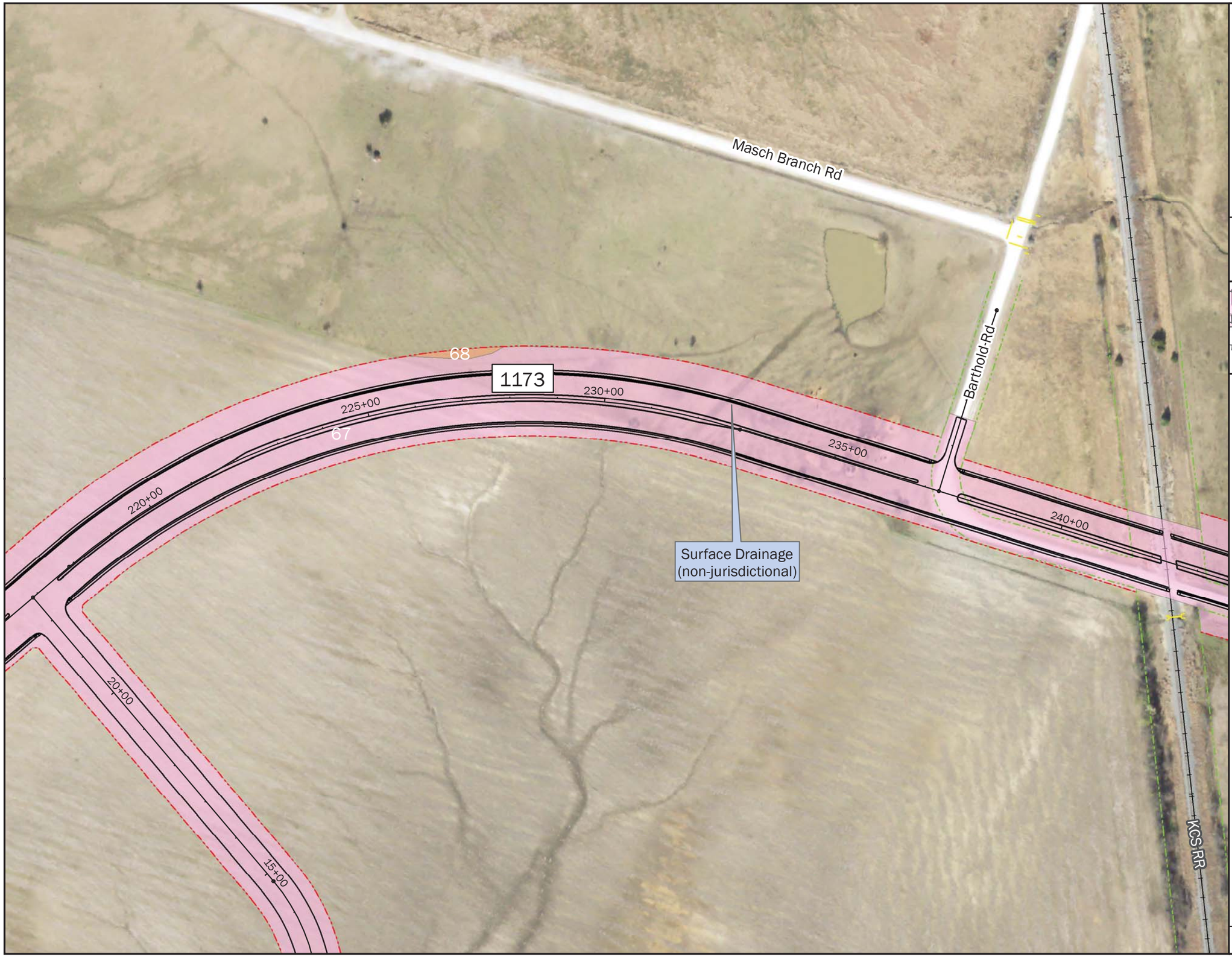
NRCS SOIL MAP

FM 1173

FARM-TO-MARKET ROAD (FM) 1173
FROM FM 156
TO INTERSTATE HIGHWAY 35 (IH 35)
DENTON COUNTY

CSJs: 1059-01-047
and 1059-02-002

Page 7 of 10



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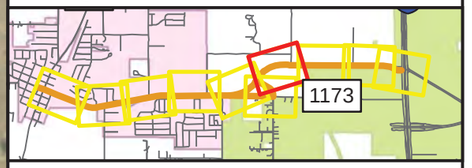

LEGEND

- Existing Right-of-Way
- Proposed Right-of-Way
- Proposed Easement
- Delineated Stream
- Delineated Wetland
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- 56 - Medlin-Sanger clays, 5 to 15 percent slopes
- 58 - Mingo clay loam, 1 to 3 percent slopes
- 66 - Ponder loam, 1 to 3 percent slopes
- 67 - Sanger clay, 1 to 3 percent slopes
- 68 - Sanger clay, 3 to 5 percent slopes
- 74 - Slidell clay, 1 to 3 percent slopes
- 75 - Somervell gravelly loam, 1 to 5 percent slopes

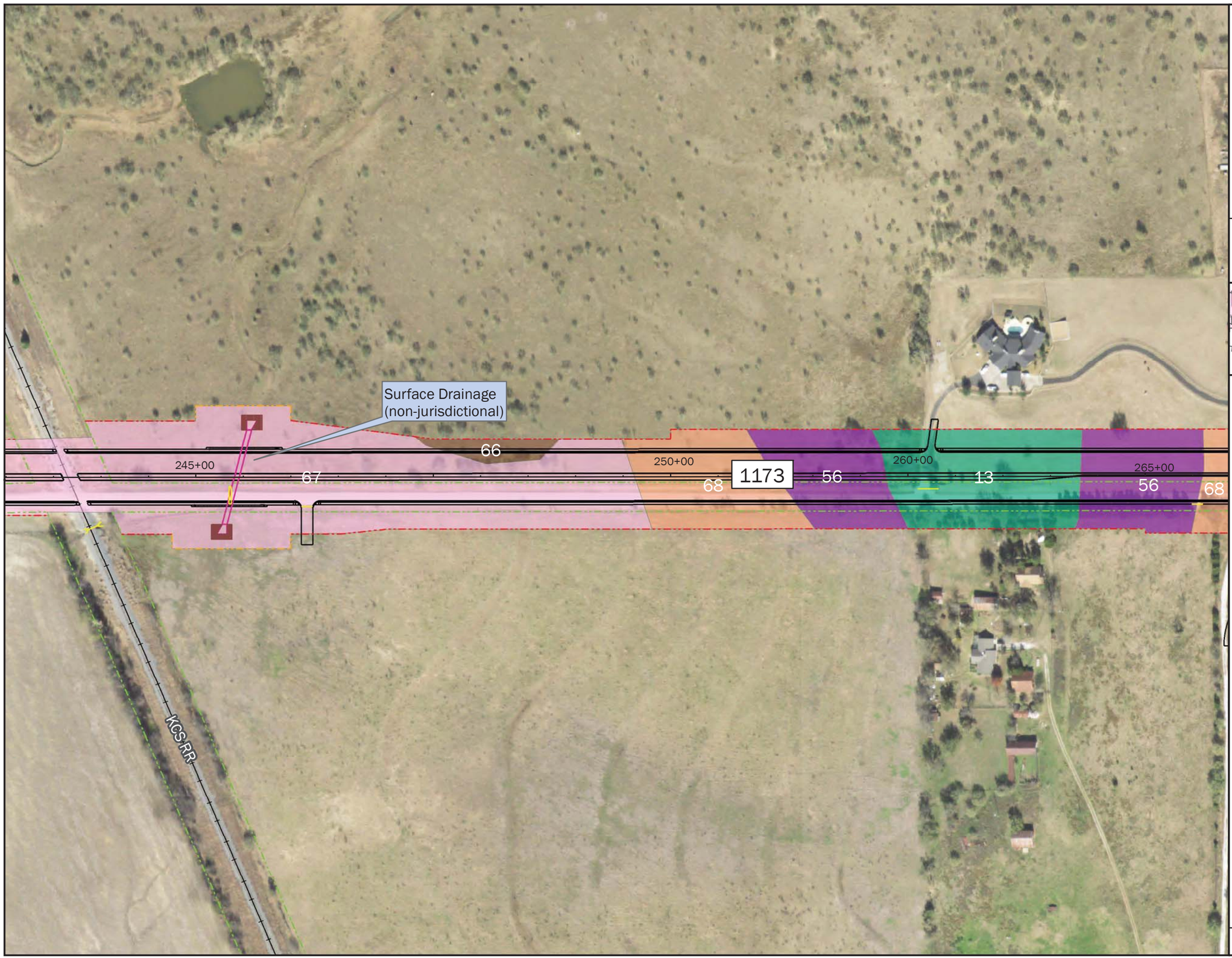
Base Map Source: TNRIS (2018)

FIGURE 5

NRCS SOIL MAP

FM 1173

FARM-TO-MARKET ROAD (FM) 1173
FROM FM 156
TO INTERSTATE HIGHWAY 35 (IH 35)
DENTON COUNTY
CSJs: 1059-01-047
and 1059-02-002



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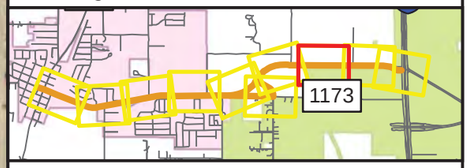

LEGEND

- Existing Right-of-Way
- Proposed Right-of-Way
- Proposed Easement
- Delineated Stream
- Delineated Wetland
- Existing Culvert
- Proposed Culvert
- Proposed Riprap/Drainage Area

Soil Types

- 13 - Birome-Rayex-Aubrey complex, 2 to 15 percent slopes
- 22 - Burleson clay, 1 to 3 percent slopes
- 54 - Lindale clay loam, 1 to 3 percent slopes
- 56 - Medlin-Sanger clays, 5 to 15 percent slopes
- 58 - Mingo clay loam, 1 to 3 percent slopes
- 66 - Ponder loam, 1 to 3 percent slopes
- 67 - Sanger clay, 1 to 3 percent slopes
- 68 - Sanger clay, 3 to 5 percent slopes
- 74 - Slidell clay, 1 to 3 percent slopes
- 75 - Somervell gravelly loam, 1 to 5 percent slopes

Base Map Source: TNRIS (2018)

FIGURE 5

NRCS SOIL MAP

FM 1173

FARM-TO-MARKET ROAD (FM) 1173
FROM FM 156
TO INTERSTATE HIGHWAY 35 (IH 35)
DENTON COUNTY
CSJs: 1059-01-047
and 1059-02-002

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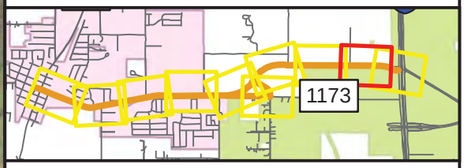

LEGEND

- Existing Right-of-Way
- Proposed Right-of-Way
- Proposed Easement
- Delineated Stream
- Delineated Wetland
- Existing Culvert
- Proposed Culvert
- Proposed Riprap/Drainage Area

Soil Types

- 13 - Birome-Rayex-Aubrey complex, 2 to 15 percent slopes
- 22 - Burleson clay, 1 to 3 percent slopes
- 54 - Lindale clay loam, 1 to 3 percent slopes
- 56 - Medlin-Sanger clays, 5 to 15 percent slopes
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- 66 - Ponder loam, 1 to 3 percent slopes
- 67 - Sanger clay, 1 to 3 percent slopes
- 68 - Sanger clay, 3 to 5 percent slopes
- 74 - Slidell clay, 1 to 3 percent slopes
- 75 - Somervell gravelly loam, 1 to 5 percent slopes

Base Map Source: TNRIS (2018)

FIGURE 5

NRCS SOIL MAP

FM 1173

FARM-TO-MARKET ROAD (FM) 1173
FROM FM 156
TO INTERSTATE HIGHWAY 35 (IH 35)
DENTON COUNTY
CSJs: 1059-01-047
and 1059-02-002

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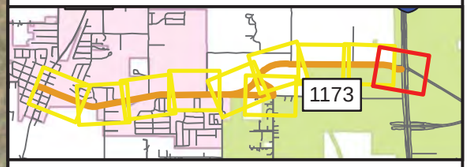

LEGEND

- Existing Right-of-Way
- Proposed Right-of-Way
- Proposed Easement
- Delineated Stream
- Delineated Wetland
- Existing Culvert
- Proposed Culvert
- Proposed Riprap/Drainage Area

Soil Types

- 13 - Birome-Rayex-Aubrey complex, 2 to 15 percent slopes
- 22 - Burleson clay, 1 to 3 percent slopes
- 54 - Lindale clay loam, 1 to 3 percent slopes
- 56 - Medlin-Sanger clays, 5 to 15 percent slopes
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- 66 - Ponder loam, 1 to 3 percent slopes
- 67 - Sanger clay, 1 to 3 percent slopes
- 68 - Sanger clay, 3 to 5 percent slopes
- 74 - Slidell clay, 1 to 3 percent slopes
- 75 - Somervell gravelly loam, 1 to 5 percent slopes

Base Map Source: TNRIS (2018)

FIGURE 6

FEMA FIRM MAP

FM 1173

FARM-TO-MARKET ROAD (FM) 1173
FROM FM 156
TO INTERSTATE HIGHWAY 35 (IH 35)
DENTON COUNTY
CSJs: 1059-01-047
and 1059-02-002

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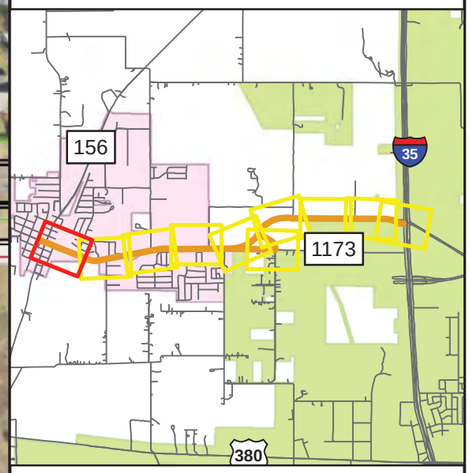

LEGEND

- Existing Right-of-Way
- Proposed Right-of-Way
- Proposed Easement
- Delineated Stream
- Delineated Wetland
- Existing Culvert
- Proposed Culvert
- Proposed Riprap/Drainage Area
- Floodplain Area

Base Map Source: TNRIS (2018)

FIGURE 6

FEMA FIRM MAP

FM 1173

FARM-TO-MARKET ROAD (FM) 1173
FROM FM 156
TO INTERSTATE HIGHWAY 35 (IH 35)
DENTON COUNTY
CSJs: 1059-01-047
and 1059-02-002

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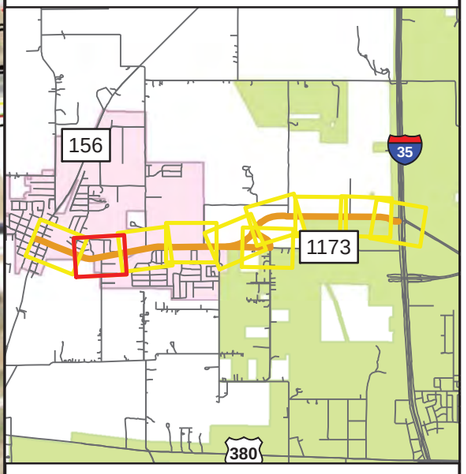

LEGEND

- Existing Right-of-Way
- Proposed Right-of-Way
- Proposed Easement
- Delineated Stream
- Delineated Wetland
- Existing Culvert
- Proposed Culvert
- Proposed Riprap/Drainage Area
- Floodplain Area

Base Map Source: TNRIS (2018)

FIGURE 6

FEMA FIRM MAP

FM 1173

FARM-TO-MARKET ROAD (FM) 1173
FROM FM 156
TO INTERSTATE HIGHWAY 35 (IH 35)
DENTON COUNTY
CSJs: 1059-01-047
and 1059-02-002

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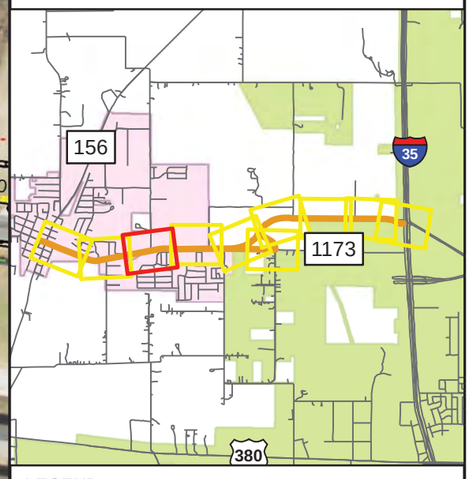


LEGEND

- Existing Right-of-Way
- Proposed Right-of-Way
- Proposed Easement
- Delineated Stream
- Delineated Wetland
- Existing Culvert
- Proposed Culvert
- Proposed Riprap/Drainage Area
- Floodplain Area

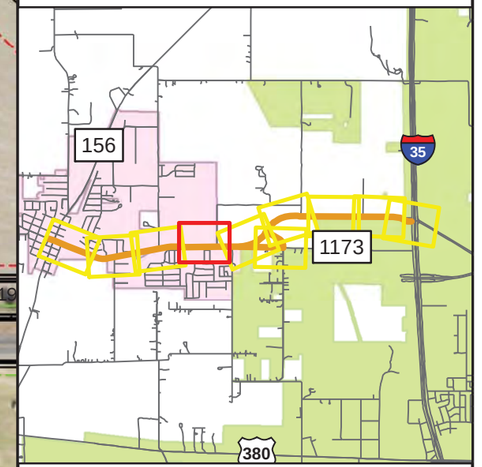
Base Map Source: TNRIS (2018)

FIGURE 6

FEMA FIRM MAP

FM 1173

FARM-TO-MARKET ROAD (FM) 1173
FROM FM 156
TO INTERSTATE HIGHWAY 35 (IH 35)
DENTON COUNTY
CSJs: 1059-01-047
and 1059-02-002



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LEGEND

- Existing Right-of-Way
- Proposed Right-of-Way
- Proposed Easement
- Delineated Stream
- Delineated Wetland
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- Proposed Culvert
- Proposed Riprap/Drainage Area
- Floodplain Area

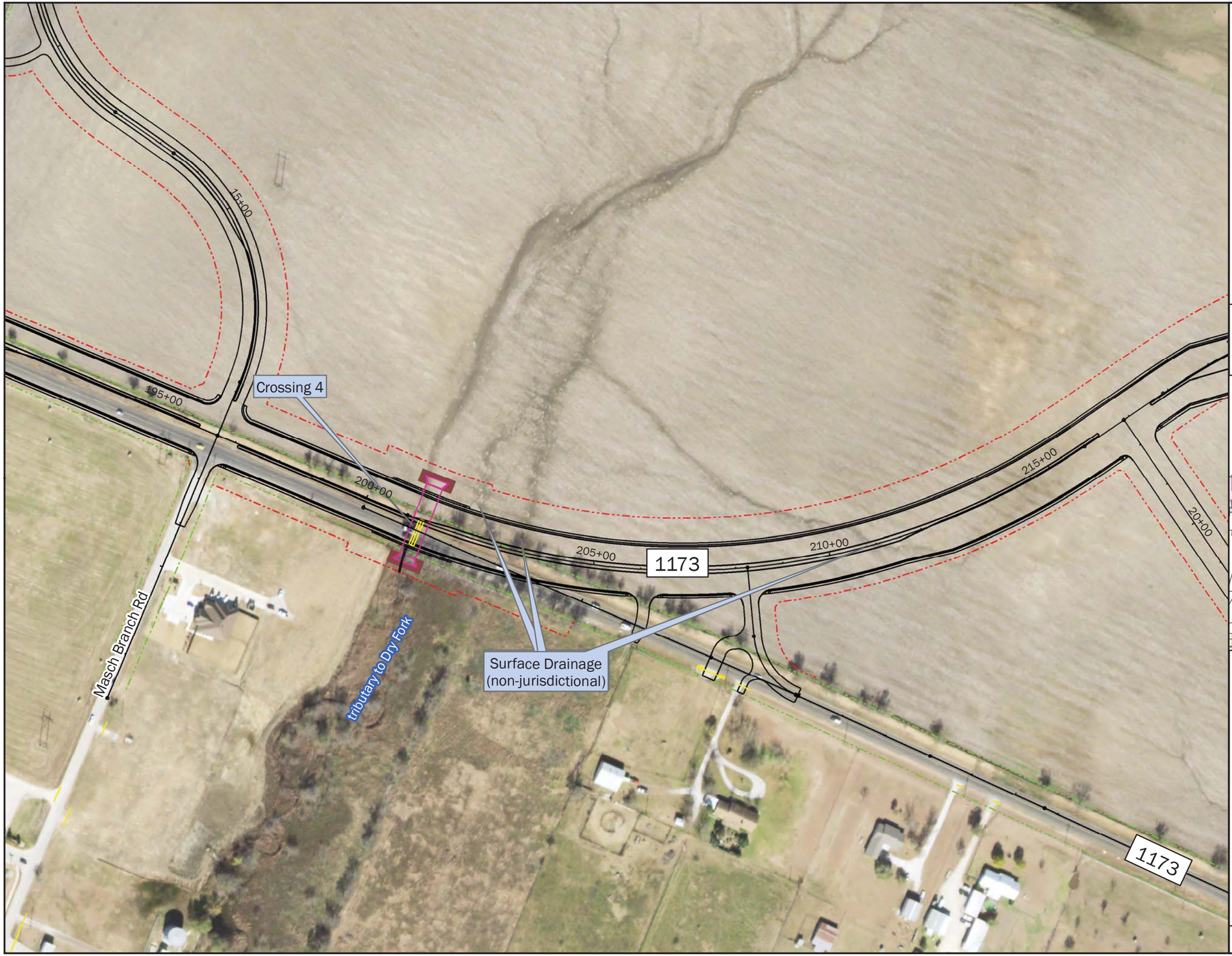
Base Map Source: TNRIS (2018)

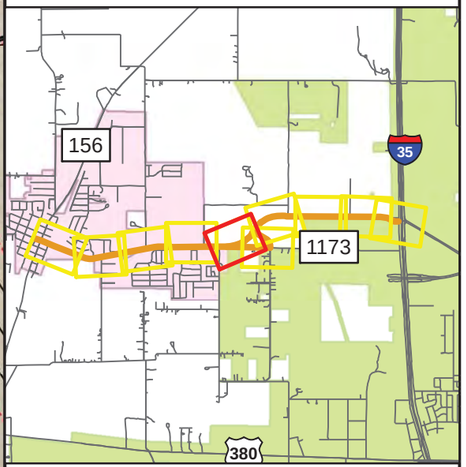
FIGURE 6

FEMA FIRM MAP

FM 1173

FARM-TO-MARKET ROAD (FM) 1173
FROM FM 156
TO INTERSTATE HIGHWAY 35 (IH 35)
DENTON COUNTY
CSJs: 1059-01-047
and 1059-02-002





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LEGEND

- Existing Right-of-Way
- Proposed Right-of-Way
- Proposed Easement
- Delineated Stream
- Delineated Wetland
- Existing Culvert
- Proposed Culvert
- Proposed Riprap/Drainage Area
- Floodplain Area

Base Map Source: TNRIS (2018)

FIGURE 6

FEMA FIRM MAP

FM 1173

FARM-TO-MARKET ROAD (FM) 1173
FROM FM 156
TO INTERSTATE HIGHWAY 35 (IH 35)
DENTON COUNTY
CSJs: 1059-01-047
and 1059-02-002

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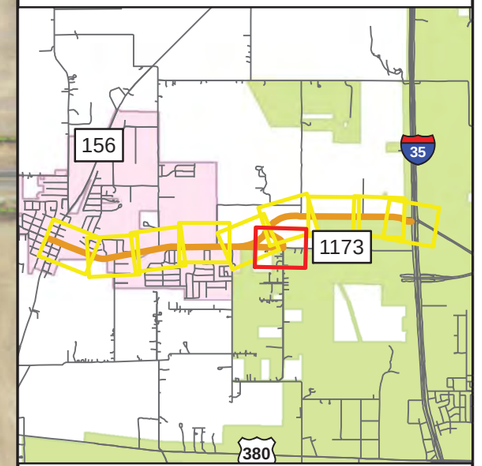


LEGEND

- Existing Right-of-Way
- Proposed Right-of-Way
- Proposed Easement
- Delineated Stream
- Delineated Wetland
- Existing Culvert
- Proposed Culvert
- Proposed Riprap/Drainage Area
- Floodplain Area

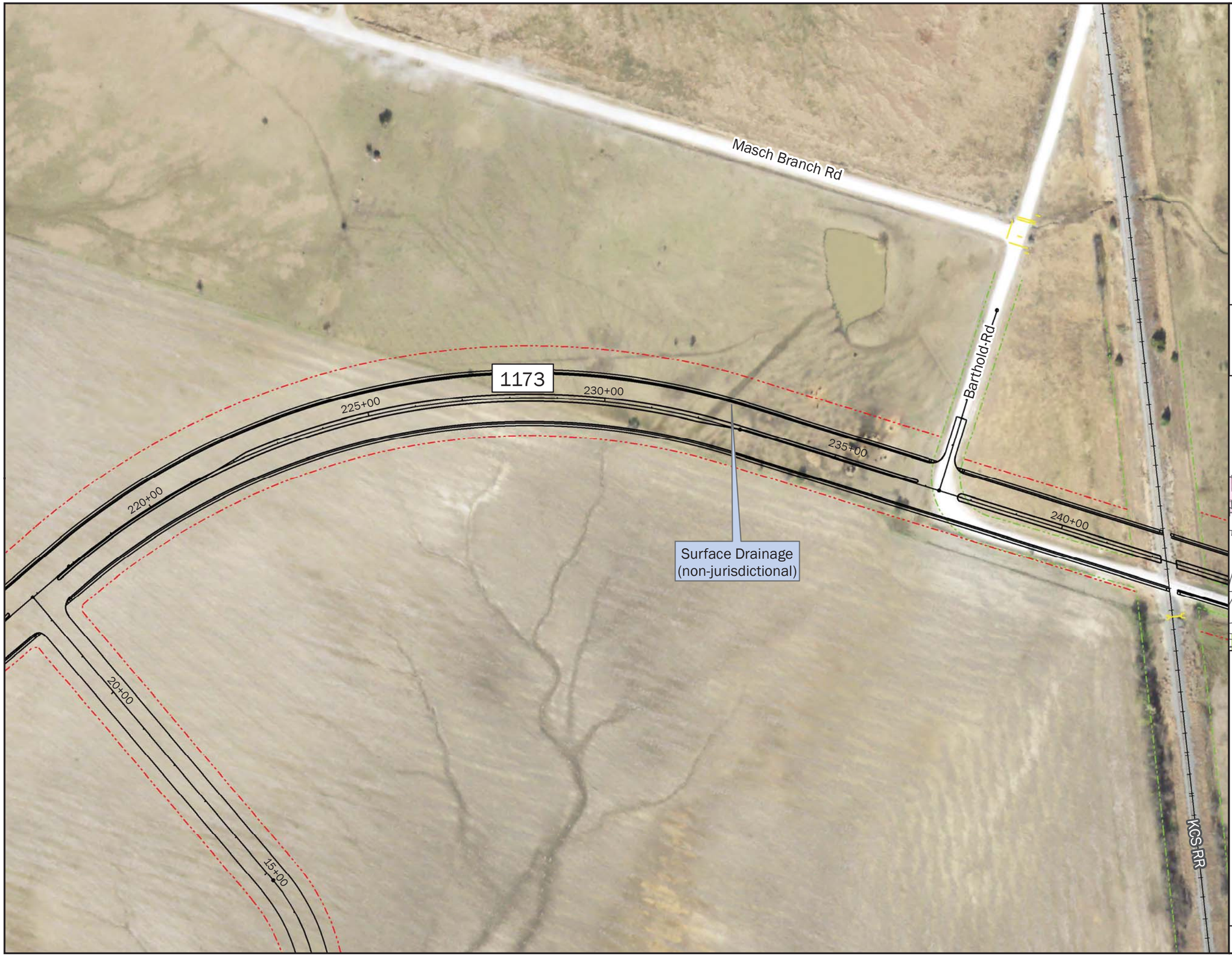
Base Map Source: TNRIS (2018)

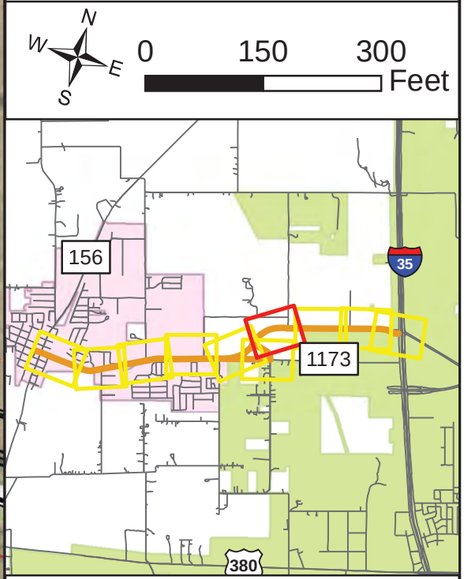
FIGURE 6

FEMA FIRM MAP

FM 1173

FARM-TO-MARKET ROAD (FM) 1173
FROM FM 156
TO INTERSTATE HIGHWAY 35 (IH 35)
DENTON COUNTY
CSJs: 1059-01-047
and 1059-02-002





LEGEND

- Existing Right-of-Way
- Proposed Right-of-Way
- Proposed Easement
- Delineated Stream
- Delineated Wetland
- Existing Culvert
- Proposed Culvert
- Proposed Riprap/Drainage Area
- Floodplain Area

Base Map Source: TNRIS (2018)

FIGURE 6

FEMA FIRM MAP

FM 1173

FARM-TO-MARKET ROAD (FM) 1173
FROM FM 156
TO INTERSTATE HIGHWAY 35 (IH 35)
DENTON COUNTY
CSJs: 1059-01-047
and 1059-02-002

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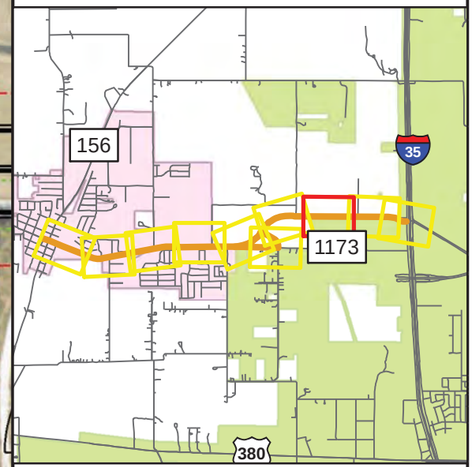

LEGEND

- Existing Right-of-Way
- Proposed Right-of-Way
- Proposed Easement
- Delineated Stream
- Delineated Wetland
- Existing Culvert
- Proposed Culvert
- Proposed Riprap/Drainage Area
- Floodplain Area

Base Map Source: TNRIS (2018)

FIGURE 6

FEMA FIRM MAP

FM 1173

FARM-TO-MARKET ROAD (FM) 1173
FROM FM 156
TO INTERSTATE HIGHWAY 35 (IH 35)
DENTON COUNTY
CSJs: 1059-01-047
and 1059-02-002

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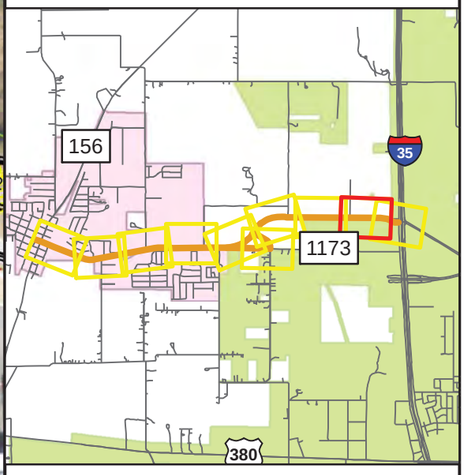

LEGEND

- Existing Right-of-Way
- Proposed Right-of-Way
- Proposed Easement
- Delineated Stream
- Delineated Wetland
- Existing Culvert
- Proposed Culvert
- Proposed Riprap/Drainage Area
- Floodplain Area

Base Map Source: TNRIS (2018)

FIGURE 6

FEMA FIRM MAP

FM 1173

FARM-TO-MARKET ROAD (FM) 1173
FROM FM 156
TO INTERSTATE HIGHWAY 35 (IH 35)
DENTON COUNTY
CSJs: 1059-01-047
and 1059-02-002

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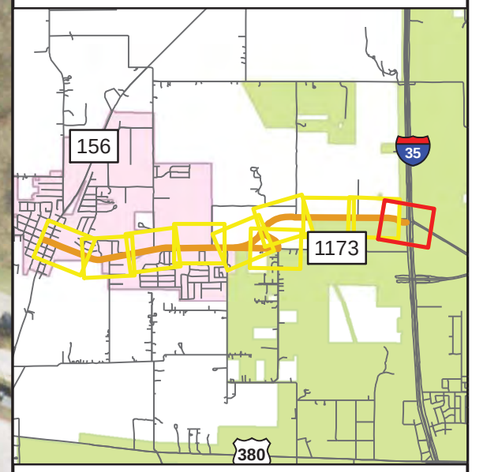
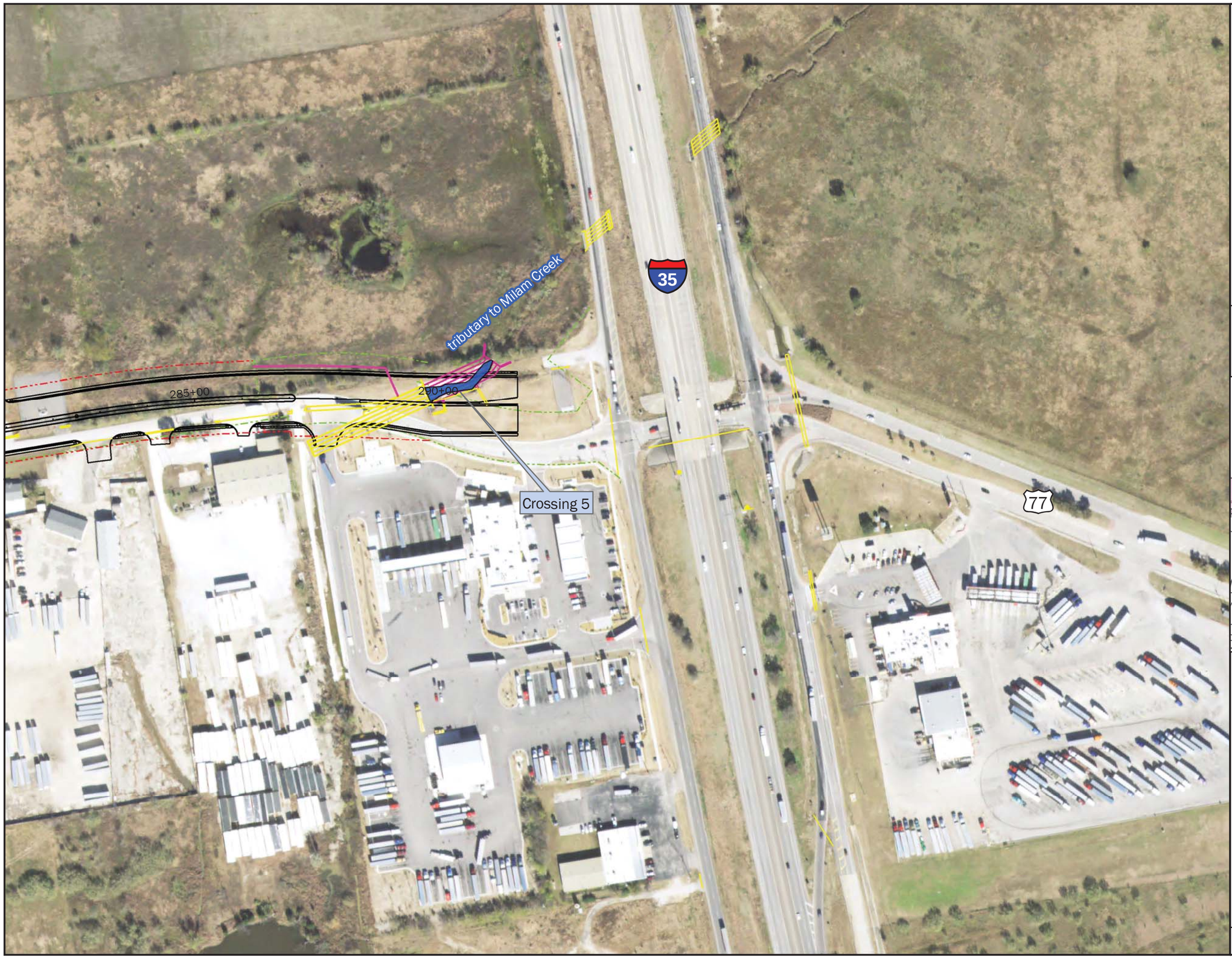
Feet





LEGEND

- Existing Right-of-Way
- Proposed Right-of-Way
- Proposed Easement
- Delineated Stream
- Delineated Wetland
- Existing Culvert
- Proposed Culvert
- Proposed Riprap/Drainage Area
- Floodplain Area

Base Map Source: TNRIS (2018)

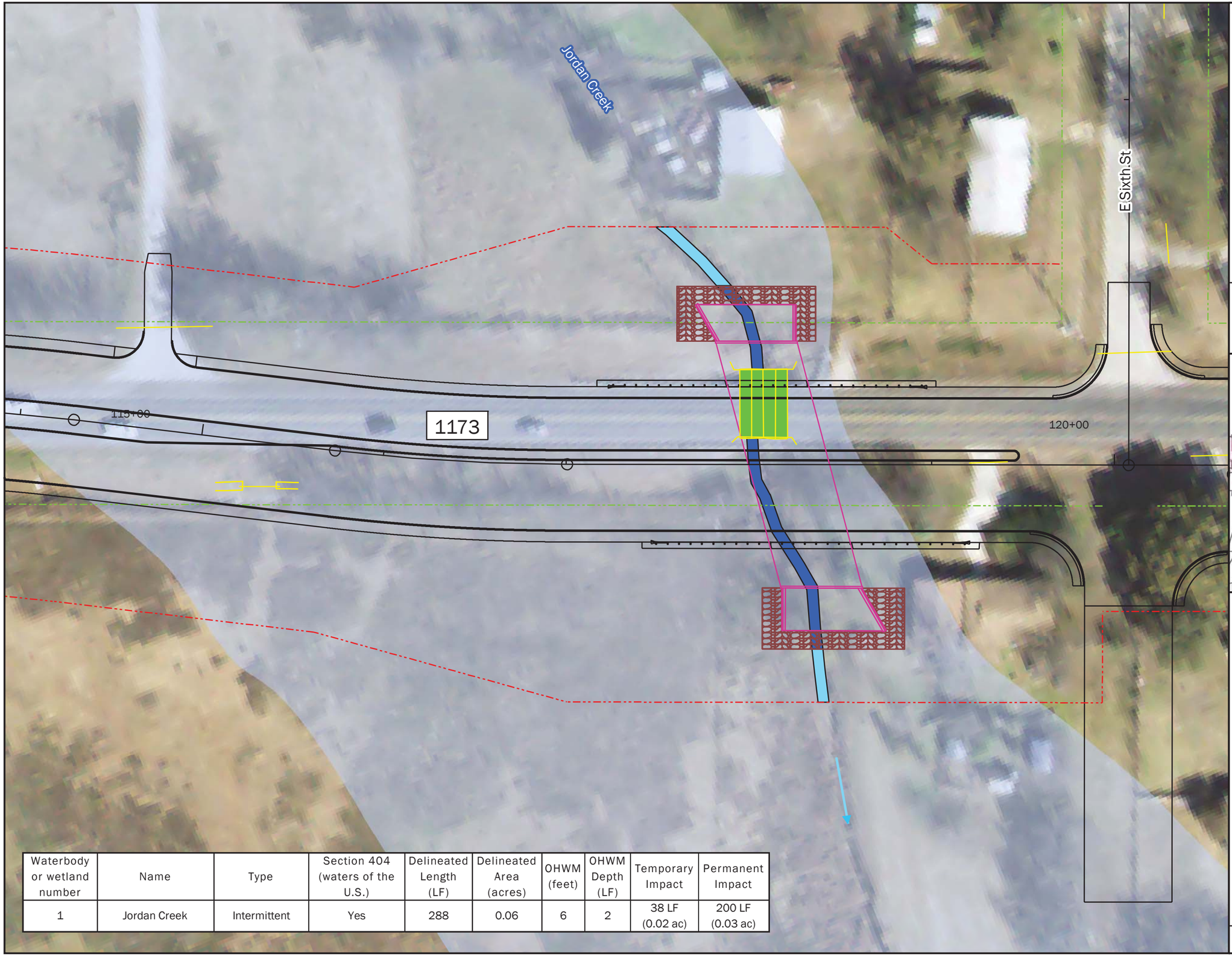
FIGURE 7

PROJECT LAYOUT MAP
CROSSING 1

FM 1173

FARM-TO-MARKET ROAD (FM) 1173
FROM FM 156
TO INTERSTATE HIGHWAY 35 (IH 35)
DENTON COUNTY

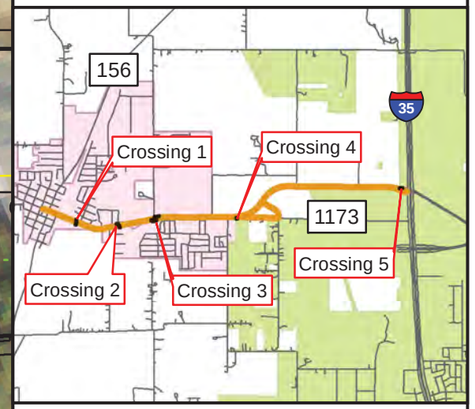
CSJs: 1059-01-047
and 1059-02-002



Waterbody or wetland number	Name	Type	Section 404 (waters of the U.S.)	Delineated Length (LF)	Delineated Area (acres)	OHWM (feet)	OHWM Depth (LF)	Temporary Impact	Permanent Impact
1	Jordan Creek	Intermittent	Yes	288	0.06	6	2	38 LF (0.02 ac)	200 LF (0.03 ac)

N W E S

0 50 Feet



LEGEND

- Existing Right-of-Way
- Proposed Right-of-Way
- Proposed Easement
- Existing Culvert
- Proposed Culvert
- Proposed Riprap/Drainage Area
- Stream (No Impact)
- Stream (Permanent Impact)
- Stream (Temporary Impact)
- Wetland (No Impact)
- Wetland (Permanent Impact)
- Wetland Data Point
- Floodplain Area
- Flow Direction

Base Map Source: TNRIS (2018)

FIGURE 7

PROJECT LAYOUT MAP
CROSSING 2

FM 1173

FARM-TO-MARKET ROAD (FM) 1173
FROM FM 156
TO INTERSTATE HIGHWAY 35 (IH 35)
DENTON COUNTY

CSJs: 1059-01-047
and 1059-02-002

Waterbody or wetland number	Name	Type	Section 404 (waters of the U.S.)	Delineated Length (LF)	Delineated Area (acres)	OHWM (feet)	OHWM Depth (LF)	Temporary Impact	Permanent Impact
2A	unnamed tributary to Dry Fork Creek	Ephemeral	Yes	197	0.03	8	0.5	84 LF (0.02 ac)	84 LF (0.01 ac)
2B	Wetland	Emergent		-	0.10	-	-	0	0.06 ac

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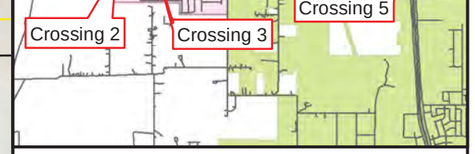

LEGEND

- Existing Right-of-Way
- Proposed Right-of-Way
- Proposed Easement
- Existing Culvert
- Proposed Culvert
- Proposed Riprap/Drainage Area
- Stream (No Impact)
- Stream (Permanent Impact)
- Stream (Temporary Impact)
- Wetland (No Impact)
- Wetland (Permanent Impact)
- Wetland Data Point
- Floodplain Area
- Flow Direction

Base Map Source: TNRIS (2018)

FIGURE 7

PROJECT LAYOUT MAP
CROSSING 3

FM 1173

FARM-TO-MARKET ROAD (FM) 1173
FROM FM 156
TO INTERSTATE HIGHWAY 35 (IH 35)
DENTON COUNTY

CSJs: 1059-01-047
and 1059-02-002

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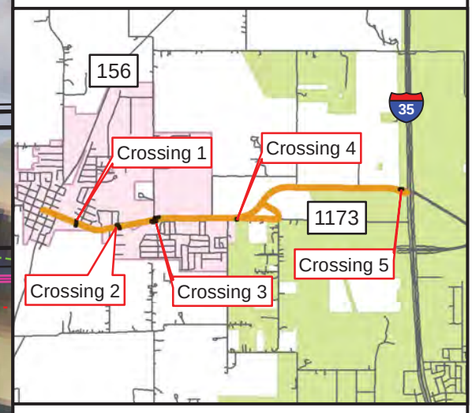

LEGEND

- Existing Right-of-Way
- Proposed Right-of-Way
- Proposed Easement
- Existing Culvert
- Proposed Culvert
- Proposed Riprap/Drainage Area
- Stream (No Impact)
- Stream (Permanent Impact)
- Stream (Temporary Impact)
- Wetland (No Impact)
- Wetland (Permanent Impact)
- Wetland Data Point
- Floodplain Area
- Flow Direction

Base Map Source: TNRIS (2018)

Hopkins Rd

Dry Fork Hickory C

Surface drainage ends
Delineation begins

Crossing 3B

Crossing 3C

160+00

1173

DP3

DP4

Crossing 3A

Waterbody or wetland number	Name	Type	Section 404 (waters of the U.S.)	Delineated Length (LF)	Delineated Area (acres)	OHWM (feet)	OHWM Depth (LF)	Temporary Impact	Permanent Impact
3A	Dry Fork Hickory Creek	Intermittent	Yes	340	0.07	10	1	124 LF (0.03 ac)	0
3B	unnamed tributary to Dry Fork Hickory Creek	Intermittent		104	0.01	6	0.5	24 LF (0.003 ac)	80 LF (0.009 ac)
3C	Wetland	Emergent		-	0.19	-	-	0	0.06 ac

FIGURE 7

PROJECT LAYOUT MAP
CROSSING 4

FM 1173

FARM-TO-MARKET ROAD (FM) 1173
FROM FM 156
TO INTERSTATE HIGHWAY 35 (IH 35)
DENTON COUNTY

CSJs: 1059-01-047
and 1059-02-002

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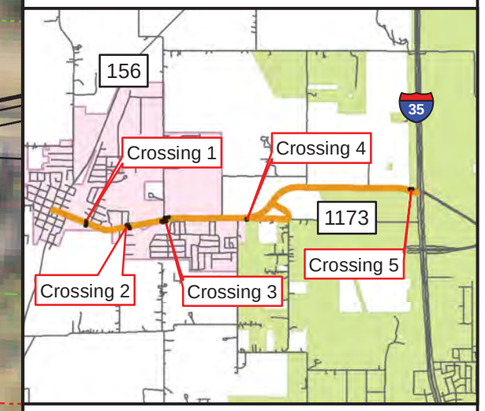


Drainage ditch
(non-jurisdictional)

Drainage ditch
(non-jurisdictional)

205

200+00

Surface drainage ends
Delineation begins

1173

tributary to Dry Fork

Waterbody or wetland number	Name	Type	Section 404 (waters of the U.S.)	Delineated Length (LF)	Delineated Area (acres)	OHWM (feet)	OHWM Depth (LF)	Temporary Impact	Permanent Impact
4	unnamed tributary to Dry Fork Hickory Creek	Intermittent	Yes	60	0.004	3	2	0	47 LF (0.003 ac)

LEGEND

- Existing Right-of-Way
- Proposed Right-of-Way
- Proposed Easement
- Existing Culvert
- Proposed Culvert
- Proposed Riprap/Drainage Area
- Stream (No Impact)
- Stream (Permanent Impact)
- Stream (Temporary Impact)
- Wetland (No Impact)
- Wetland (Permanent Impact)
- Wetland Data Point
- Floodplain Area
- Flow Direction

Base Map Source: TNRIS (2018)

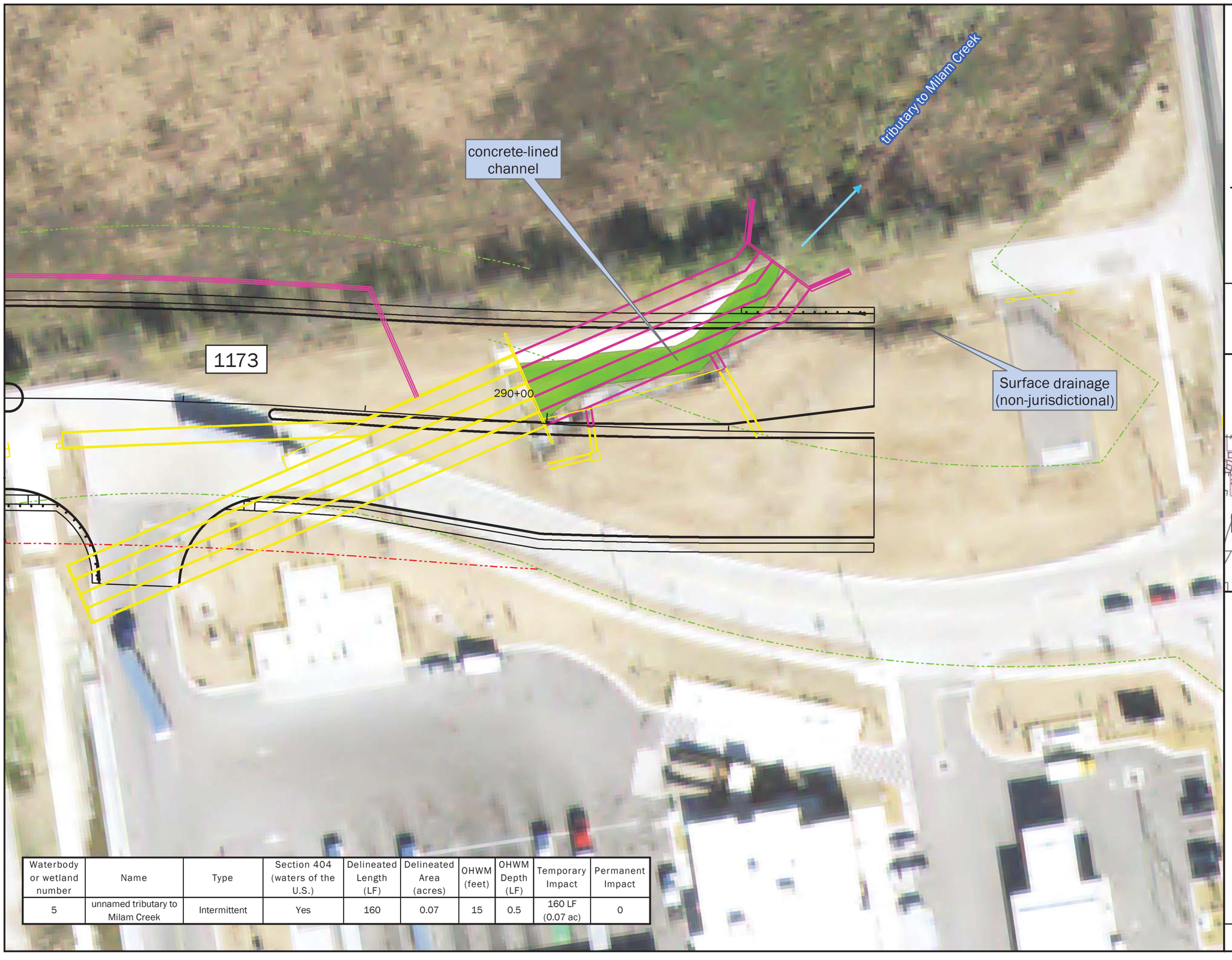
FIGURE 7

PROJECT LAYOUT MAP
CROSSING 5

FM 1173

FARM-TO-MARKET ROAD (FM) 1173
FROM FM 156
TO INTERSTATE HIGHWAY 35 (IH 35)
DENTON COUNTY

CSJs: 1059-01-047
and 1059-02-002



Waterbody or wetland number	Name	Type	Section 404 (waters of the U.S.)	Delineated Length (LF)	Delineated Area (acres)	OHWM (feet)	OHWM Depth (LF)	Temporary Impact	Permanent Impact
5	unnamed tributary to Milam Creek	Intermittent	Yes	160	0.07	15	0.5	160 LF (0.07 ac)	0

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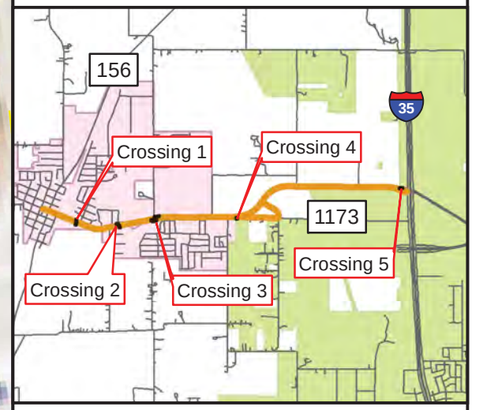


LEGEND

- Existing Right-of-Way
- Proposed Right-of-Way
- Proposed Easement
- Existing Culvert
- Proposed Culvert
- Proposed Riprap/Drainage Area
- Stream (No Impact)
- Stream (Permanent Impact)
- Stream (Temporary Impact)
- Wetland (No Impact)
- Wetland (Permanent Impact)
- Wetland Data Point
- Floodplain Area
- Flow Direction

Base Map Source: TNRIS (2018)

Attachment 2 - Wetland Determination Data Forms

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: FM 1173 from FM 156 to IH 35 (Crossing 2A) City/County: Krum/Denton Sampling Date: 4-16-20

Applicant/Owner: TxDOT State: **TX** Sampling Point: DP1

Investigator(s): AC, JS, AG Section, Township, Range: **Not Applicable**

Landform (hillslope, terrace, etc.): Plain Local relief (concave, convex, none): Concave Slope (%): 0

Subregion (LRR): **J** Lat: 33.25958888 Long: -97.22667323 Datum: **NAD83**

Soil Map Unit Name: Slidell clay, 1 to 3 percent slopes NWI Classification: Palustrine emergent

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation No , Soil No , or Hydrology No Significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation No , Soil No , or Hydrology No Naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ____	Is the Sampled Area		
Hydric Soil Present?	Yes X	No ____	Within a Wetland?	Yes X	No ____
Wetland Hydrology Present?	Yes X	No ____			

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: **30' rad**)	Absolute% Cover	Dominant Species?	Indicator Status
1. *None*			
2.			
3.			
4.			
	= % Total Cover		
Sapling/Shrub Stratum (Plot size: **15' rad**)			
1. *None*			
2.			
3.			
4.			
5.			
	= % Total Cover		
Herb Stratum (Plot size: **5' rad**)			
1. *Ranunculus repens*	35	Yes	FACW
2. *Eleocharis palustris*	35	Yes	OBL
3. *Rumex crispus*	20	Yes	FAC
4. *Sorghum halepense*	10	No	FACU
5.			
6.			
7.			
8.			
9.			
10.			
	100 = % Total Cover		
Woody Vine Stratum (Plot size: **30' rad**)			
1. *None*			
2.			
	= % Total Cover		

% Bare Ground in Herb Stratum 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC-): 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species		x 3 =	
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:	(A)		(B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

____ 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

____ 3 - Prevalence Index is ≤3.0[1]

____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on separate sheet)

____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes X** **No** ____

Remarks:

SOIL

Sampling Point: DP1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-16	7.5YR 3/1	50	10YR 3/2	25	D	M	Clay loam	
			2.5YR 4/3	25	C	M	Clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histols (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR F**)
- ___ 1 cm Muck (A9) (**LRR F, G, H**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- X Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR 1, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Dark Surface Unit (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic

Restrictive Layer (if present):

Type: ___

Depth (inches): ___

Hydric Soil Present? **Yes** X **No** ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Agal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where not tilled**)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indictors (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where tilled**)
- X Crayfish burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- X FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (**LRR F**)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): ___

Water Table Present? Yes ___ No X Depth (inches): ___

Saturation Present? (includes capillary fringe) Yes X No ___ Depth (inches): 16

Wetland Hydrology Present? **Yes** X **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: FM 1173 from FM 156 to IH 35 (Crossing 2A) City/County: Krum/Denton Sampling Date: 4-16-20

Applicant/Owner: TxDOT State: **TX** Sampling Point: DP2

Investigator(s): AC, JS, AG Section, Township, Range: **Not Applicable**

Landform (hillslope, terrace, etc.): Plain Local relief (concave, convex, none): None Slope (%): 0

Subregion (LRR): **J** Lat: 33.25962751 Long: -97.22664715 Datum: **NAD83**

Soil Map Unit Name: Slidell clay, 1 to 3 percent slopes NWI Classification: Uplad

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation No , Soil No , or Hydrology No Significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation No , Soil No , or Hydrology No Naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	Is the Sampled Area		
Hydric Soil Present?	Yes ____	No X	Within a Wetland?	Yes ____	No X
Wetland Hydrology Present?	Yes ____	No X			

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: **30' rad**)	Absolute% Cover	Dominant Species?	Indicator Status
1. *None*			
2.			
3.			
4.			
	= % Total Cover		
Sapling/Shrub Stratum (Plot size: **15' rad**)			
1. *None*			
2.			
3.			
4.			
5.			
	= % Total Cover		
Herb Stratum (Plot size: **5' rad**)			
1. *Sorghum halepense*	90	Yes	FACU
2. *Solidago gigantea*	5	No	FAC
3. *Stenotaphrum secundatum*	5	No	FAC
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	100 = % Total Cover		
Woody Vine Stratum (Plot size: **30' rad**)			
1. *None*			
2.			
	= % Total Cover		

% Bare Ground in Herb Stratum 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC-): 0 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

	Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0	
FACW species	0	x 2 =	0	
FAC species	10	x 3 =	30	
FACU species	90	x 4 =	360	
UPL species	0	x 5 =	0	
Column Totals:	100	(A)	390	(B)

Prevalence Index = B/A = 3.9

Hydrophytic Vegetation Indicators:

____ 1 - Rapid Test for Hydrophytic Vegetation

____ 2 - Dominance Test is >50%

____ 3 - Prevalence Index is ≤3.0[1]

____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on separate sheet)

____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** ____ **No** **X**

Remarks:

SOIL

Sampling Point: DP2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-16	7.5YR 3/2	100	None				Clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- _____ Histols (A1)
- _____ Histic Epipedon (A2)
- _____ Black Histic (A3)
- _____ Hydrogen Sulfide (A4)
- _____ Stratified Layers (A5) (**LRR F**)
- _____ 1 cm Muck (A9) (**LRR F, G, H**)
- _____ Depleted Below Dark Surface (A11)
- _____ Thick Dark Surface (A12)
- _____ Sandy Mucky Mineral (S1)
- _____ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- _____ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- _____ Sandy Gleyed Matrix (S4)
- _____ Sandy Redox (S5)
- _____ Stripped Matrix (S6)
- _____ Loamy Mucky Mineral (F1)
- _____ Loamy Gleyed Matrix (F2)
- _____ Depleted Matrix (F3)
- _____ Redox Dark Surface (F6)
- _____ Depleted Dark Surface (F7)
- _____ Redox Depressions (F8)
- _____ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- _____ 1 cm Muck (A9) (**LRR 1, J**)
- _____ Coast Prairie Redox (A16) (**LRR F, G, H**)
- _____ Dark Surface (S7) (**LRR G**)
- _____ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- _____ Reduced Vertic (F18)
- _____ Red Parent Material (TF2)
- _____ Very Dark Surface Unit (TF12)
- _____ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** _____ **No** X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- _____ Surface Water (A1)
- _____ High Water Table (A2)
- _____ Saturation (A3)
- _____ Water Marks (B1)
- _____ Sediment Deposits (B2)
- _____ Drift Deposits (B3)
- _____ Agal Mat or Crust (B4)
- _____ Iron Deposits (B5)
- _____ Inundation Visible on Aerial Imagery (B7)
- _____ Water-Stained Leaves (B9)
- _____ Salt Crust (B11)
- _____ Aquatic Invertebrates (B13)
- _____ Hydrogen Sulfide Odor (C1)
- _____ Dry-Season Water Table (C2)
- _____ Oxidized Rhizospheres on Living Roots (C3) (**where not tilled**)
- _____ Presence of Reduced Iron (C4)
- _____ Thin Muck Surface (C7)
- _____ Other (Explain in Remarks)

Secondary Indictors (minimum of two required)

- _____ Surface Soil Cracks (B6)
- _____ Sparsely Vegetated Concave Surface (B8)
- _____ Drainage Patterns (B10)
- _____ Oxidized Rhizospheres on Living Roots (C3) (**where tilled**)
- _____ Crayfish burrows (C8)
- _____ Saturation Visible on Aerial Imagery (C9)
- _____ Geomorphic Position (D2)
- _____ FAC-Neutral Test (D5)
- _____ Frost-Heave Hummocks (D7) (**LRR F**)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): _____

Wetland Hydrology Present? **Yes** _____ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: FM 1173 from FM 156 to IH 35 (Crossing 3C) City/County: Krum/Denton Sampling Date: 4-20-20

Applicant/Owner: TxDOT State: **TX** Sampling Point: DP3

Investigator(s): AC, JS, AG Section, Township, Range: **Not Applicable**

Landform (hillslope, terrace, etc.): Floodplain Local relief (concave, convex, none): None Slope (%): 0

Subregion (LRR): **J** Lat: 33.2600533 Long: -97.22070215 Datum: **NAD83**

Soil Map Unit Name: Slidell clay, 1 to 3 percent slopes NWI Classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation No , Soil No , or Hydrology No Significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation No , Soil No , or Hydrology No Naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	Is the Sampled Area		
Hydric Soil Present?	Yes ____	No X	Within a Wetland?	Yes ____	No X
Wetland Hydrology Present?	Yes ____	No X			

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: **30' rad**)	Absolute% Cover	Dominant Species?	Indicator Status
1. *None*			
2.			
3.			
4.			
	= % Total Cover		
Sapling/Shrub Stratum (Plot size: **15' rad**)			
1. *None*			
2.			
3.			
4.			
5.			
	= % Total Cover		
Herb Stratum (Plot size: **5' rad**)			
1. *Lolium perenne*	30	Yes	FACU
2. *Bromus arvensis*	30	Yes	FACU
3. *Cynodon dactylon*	20	Yes	FACU
4. *Geranium carolinianum*	10	No	UPL
5. *Stenotaphrum secundatum*	10	No	FAC
6.			
7.			
8.			
9.			
10.			
	100 = % Total Cover		
Woody Vine Stratum (Plot size: **30' rad**)			
1. *None*			
2.			
	= % Total Cover		

% Bare Ground in Herb Stratum 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC-): 0 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

	Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0	
FACW species	0	x 2 =	0	
FAC species	10	x 3 =	10	
FACU species	80	x 4 =	320	
UPL species	10	x 5 =	50	
Column Totals:	100	(A)	370	(B)

Prevalence Index = B/A = 3.7

Hydrophytic Vegetation Indicators:

____ 1 - Rapid Test for Hydrophytic Vegetation

____ 2 - Dominance Test is >50%

____ 3 - Prevalence Index is ≤3.0[1]

____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on separate sheet)

____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** ____ **No** **X**

Remarks:

SOIL

Sampling Point: DP3

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-16	7.5YR 2.5/1	None					Clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- _____ Histols (A1)
- _____ Histic Epipedon (A2)
- _____ Black Histic (A3)
- _____ Hydrogen Sulfide (A4)
- _____ Stratified Layers (A5) (**LRR F**)
- _____ 1 cm Muck (A9) (**LRR F, G, H**)
- _____ Depleted Below Dark Surface (A11)
- _____ Thick Dark Surface (A12)
- _____ Sandy Mucky Mineral (S1)
- _____ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- _____ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- _____ Sandy Gleyed Matrix (S4)
- _____ Sandy Redox (S5)
- _____ Stripped Matrix (S6)
- _____ Loamy Mucky Mineral (F1)
- _____ Loamy Gleyed Matrix (F2)
- _____ Depleted Matrix (F3)
- _____ Redox Dark Surface (F6)
- _____ Depleted Dark Surface (F7)
- _____ Redox Depressions (F8)
- _____ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- _____ 1 cm Muck (A9) (**LRR 1, J**)
- _____ Coast Prairie Redox (A16) (**LRR F, G, H**)
- _____ Dark Surface (S7) (**LRR G**)
- _____ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- _____ Reduced Vertic (F18)
- _____ Red Parent Material (TF2)
- _____ Very Dark Surface Unit (TF12)
- _____ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** _____ **No** X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- _____ Surface Water (A1)
- _____ High Water Table (A2)
- _____ Saturation (A3)
- _____ Water Marks (B1)
- _____ Sediment Deposits (B2)
- _____ Drift Deposits (B3)
- _____ Agal Mat or Crust (B4)
- _____ Iron Deposits (B5)
- _____ Inundation Visible on Aerial Imagery (B7)
- _____ Water-Stained Leaves (B9)
- _____ Salt Crust (B11)
- _____ Aquatic Invertebrates (B13)
- _____ Hydrogen Sulfide Odor (C1)
- _____ Dry-Season Water Table (C2)
- _____ Oxidized Rhizospheres on Living Roots (C3) (**where not tilled**)
- _____ Presence of Reduced Iron (C4)
- _____ Thin Muck Surface (C7)
- _____ Other (Explain in Remarks)

Secondary Indictors (minimum of two required)

- _____ Surface Soil Cracks (B6)
- _____ Sparsely Vegetated Concave Surface (B8)
- _____ Drainage Patterns (B10)
- _____ Oxidized Rhizospheres on Living Roots (C3) (**where tilled**)
- _____ Crayfish burrows (C8)
- _____ Saturation Visible on Aerial Imagery (C9)
- _____ Geomorphic Position (D2)
- _____ FAC-Neutral Test (D5)
- _____ Frost-Heave Hummocks (D7) (**LRR F**)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): _____

Wetland Hydrology Present? **Yes** _____ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: FM 1173 from FM 156 to IH 35 (Crossing 3C) City/County: Krum/Denton Sampling Date: 4-20-20

Applicant/Owner: TxDOT State: **TX** Sampling Point: DP4

Investigator(s): AC, JS, AG Section, Township, Range: **Not Applicable**

Landform (hillslope, terrace, etc.): Floodplain Local relief (concave, convex, none): None Slope (%): 0

Subregion (LRR): **J** Lat: 33.26005317 Long: -97.22075824 Datum: **NAD83**

Soil Map Unit Name: Slidell clay, 1 to 3 percent slopes NWI Classification: Palustrine emergent

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation No , Soil No , or Hydrology No Significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation No , Soil No , or Hydrology No Naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ____	Is the Sampled Area		
Hydric Soil Present?	Yes X	No ____	Within a Wetland?	Yes X	No ____
Wetland Hydrology Present?	Yes X	No ____			

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: **30' rad**)	Absolute% Cover	Dominant Species?	Indicator Status
1. *None*			
2.			
3.			
4.			
	= % Total Cover		
Sapling/Shrub Stratum (Plot size: **15' rad**)			
1. *None*			
2.			
3.			
4.			
5.			
	= % Total Cover		
Herb Stratum (Plot size: **5' rad**)			
1. *Eleocharis palustris*	90	Yes	OBL
2. *Carex texensis*	10	No	UPL
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	100 = % Total Cover		
Woody Vine Stratum (Plot size: **30' rad**)			
1. *None*			
2.			
	= % Total Cover		

% Bare Ground in Herb Stratum 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC-): 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species		x 3 =	
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:	(A)		(B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

____ 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

____ 3 - Prevalence Index is ≤3.0[1]

____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on separate sheet)

____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes X** **No** ____

Remarks:

SOIL

Sampling Point: DP4

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-16	10YR 2/2	90	5YR 4/3	10	C	M	Clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histols (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR F**)
- ___ 1 cm Muck (A9) (**LRR F, G, H**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR 1, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Dark Surface Unit (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic

Restrictive Layer (if present):

Type: ___

Depth (inches): ___

Hydric Soil Present? **Yes** X **No** ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Agal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where not tilled**)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indictors (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where tilled**)
- X Crayfish burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (**LRR F**)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): ___

Water Table Present? Yes ___ No X Depth (inches): ___

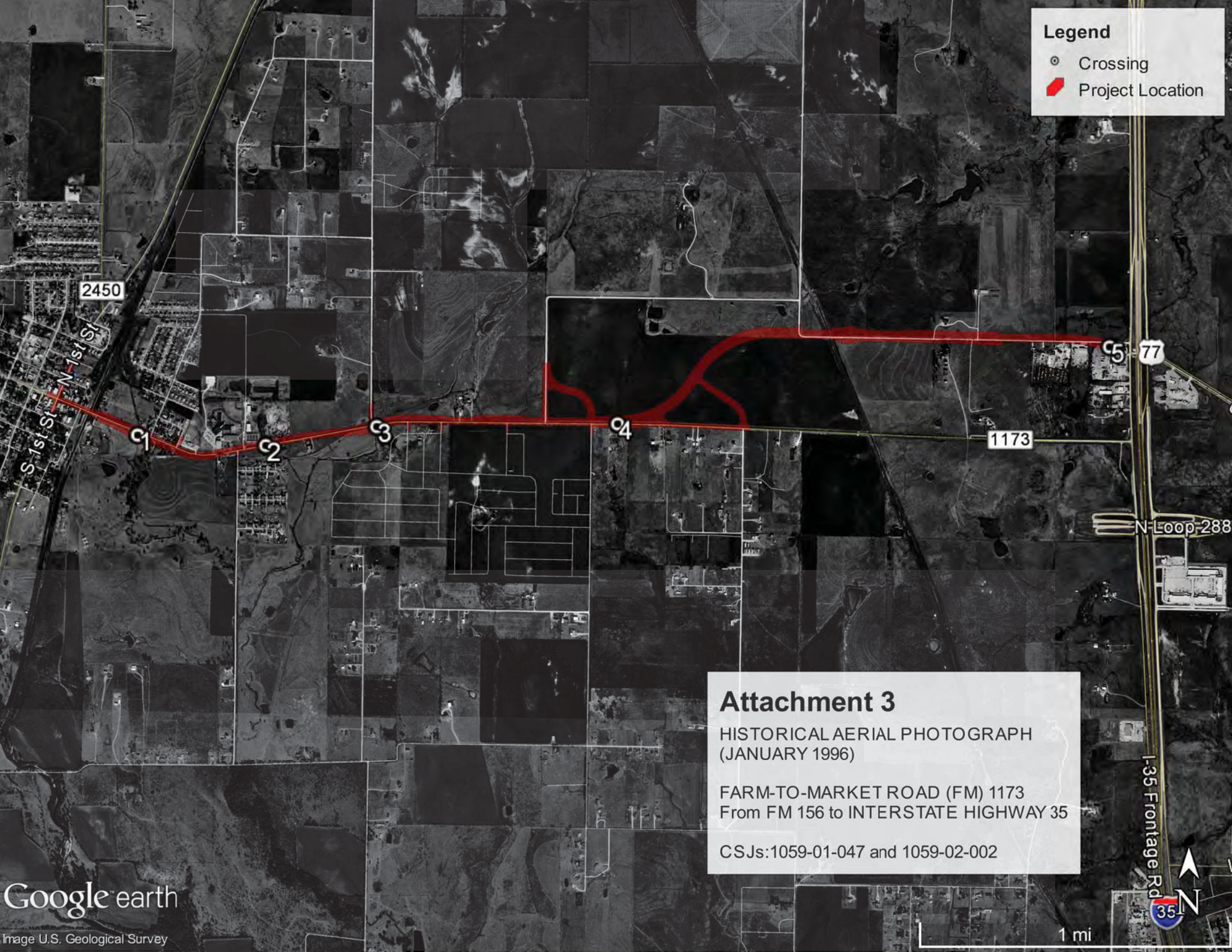
Saturation Present? (includes capillary fringe) Yes X No ___ Depth (inches): 16

Wetland Hydrology Present? **Yes** X **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Attachment 3 – Historical Aerial Photographs

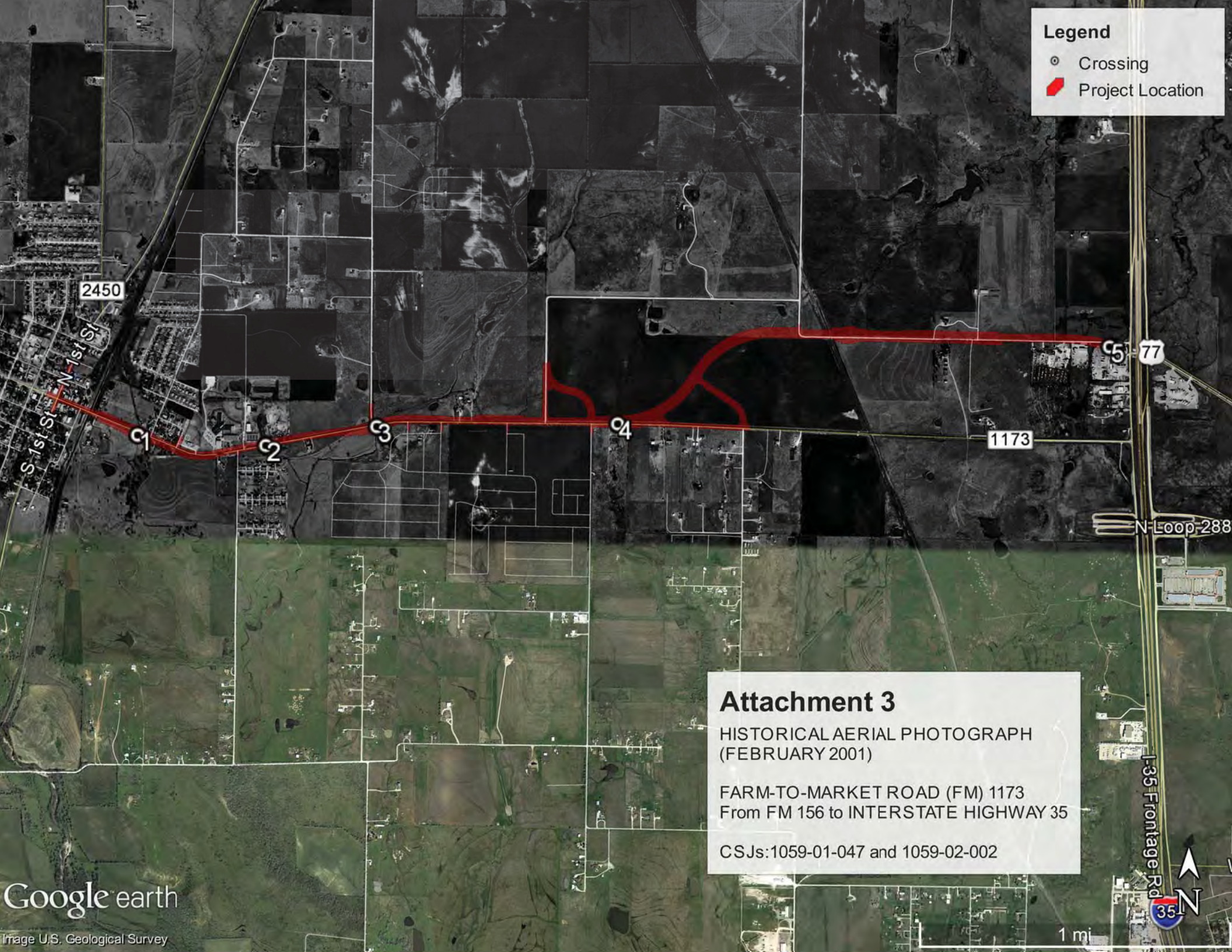


Attachment 3

HISTORICAL AERIAL PHOTOGRAPH
(JANUARY 1996)

FARM-TO-MARKET ROAD (FM) 1173
From FM 156 to INTERSTATE HIGHWAY 35

CSJs:1059-01-047 and 1059-02-002

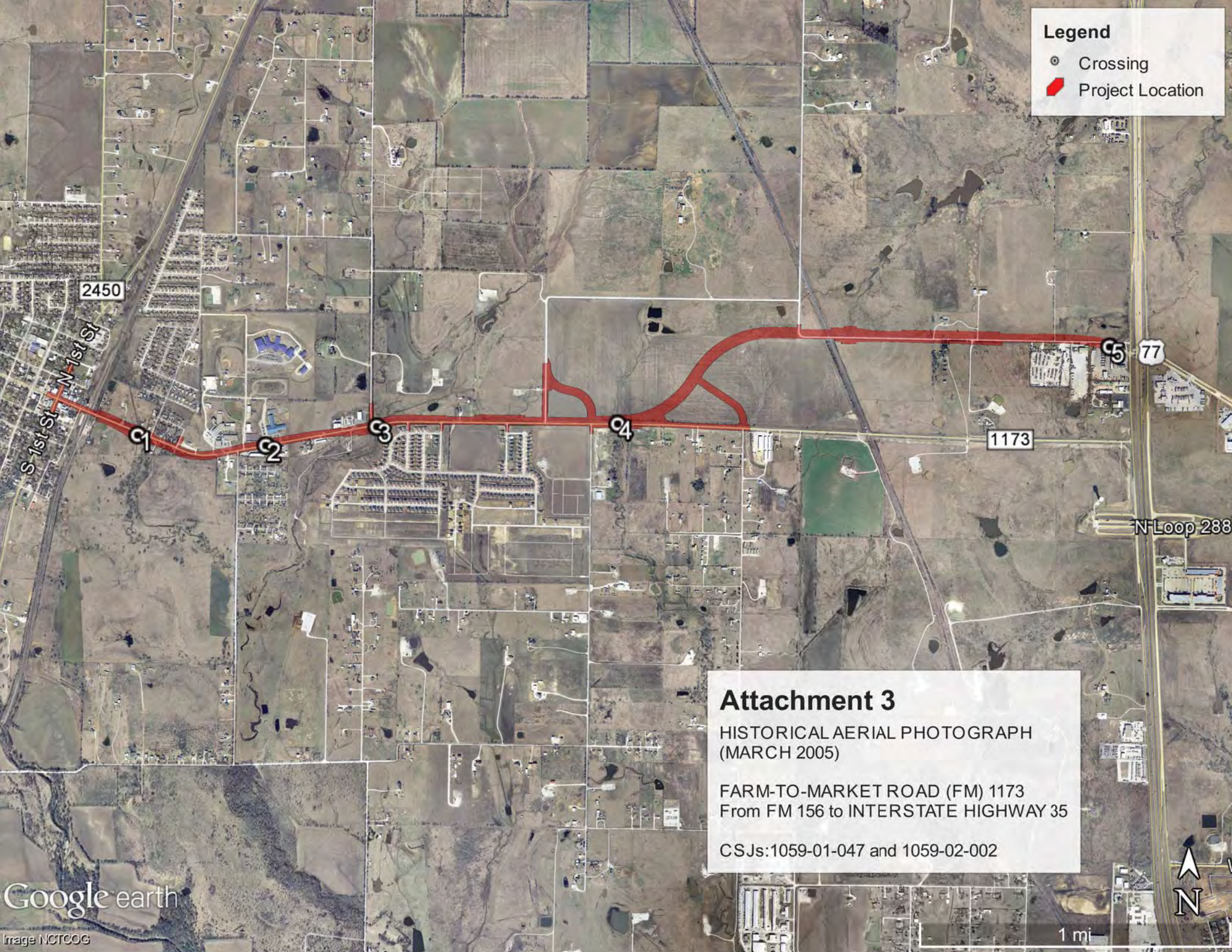


Attachment 3

HISTORICAL AERIAL PHOTOGRAPH
(FEBRUARY 2001)

FARM-TO-MARKET ROAD (FM) 1173
From FM 156 to INTERSTATE HIGHWAY 35

CSJs:1059-01-047 and 1059-02-002


Legend
Crossing
Project Location
2450
S 1st St
N 1st St
C1
C2
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C4
C5
1173
77
N Loop 288
Attachment 3
HISTORICAL AERIAL PHOTOGRAPH
(MARCH 2005)
FARM-TO-MARKET ROAD (FM) 1173
From FM 156 to INTERSTATE HIGHWAY 35
CSJs:1059-01-047 and 1059-02-002
Google earth
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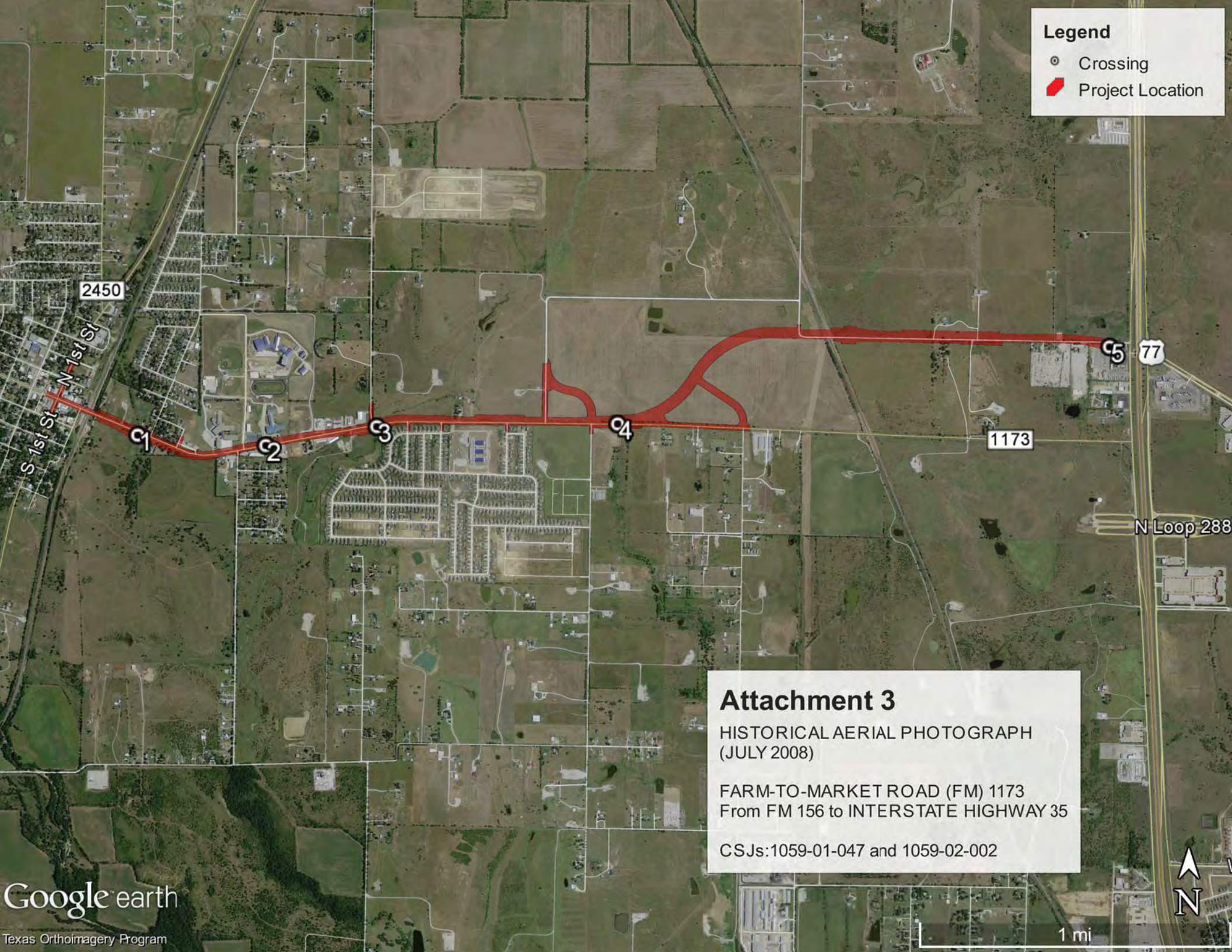
Attachment 3

HISTORICAL AERIAL PHOTOGRAPH
(OCTOBER 2007)

FARM-TO-MARKET ROAD (FM) 1173
From FM 156 to INTERSTATE HIGHWAY 35

CSJs:1059-01-047 and 1059-02-002


Legend
Crossing
Project Location
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1173
N Loop 288
Attachment 3
HISTORICAL AERIAL PHOTOGRAPH
(JULY 2008)
FARM-TO-MARKET ROAD (FM) 1173
From FM 156 to INTERSTATE HIGHWAY 35
CSJs:1059-01-047 and 1059-02-002
Google earth
Texas Orthoimagery Program
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Legend
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N Loop 288
Attachment 3
HISTORICAL AERIAL PHOTOGRAPH
(DECEMBER 2009)
FARM-TO-MARKET ROAD (FM) 1173
From FM 156 to INTERSTATE HIGHWAY 35
CSJs:1059-01-047 and 1059-02-002
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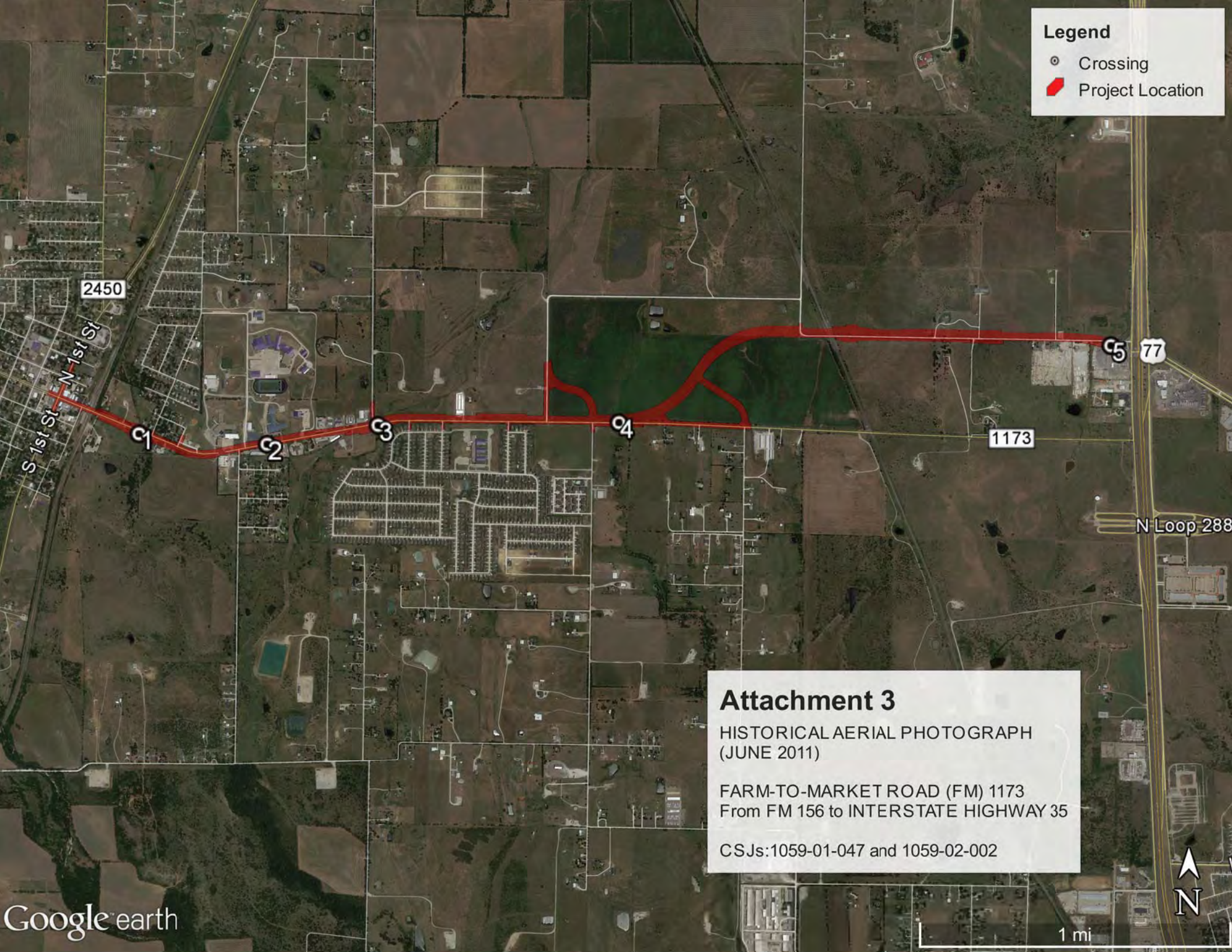
1 mi
Google earth


Legend
Crossing
Project Location
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C4
C5
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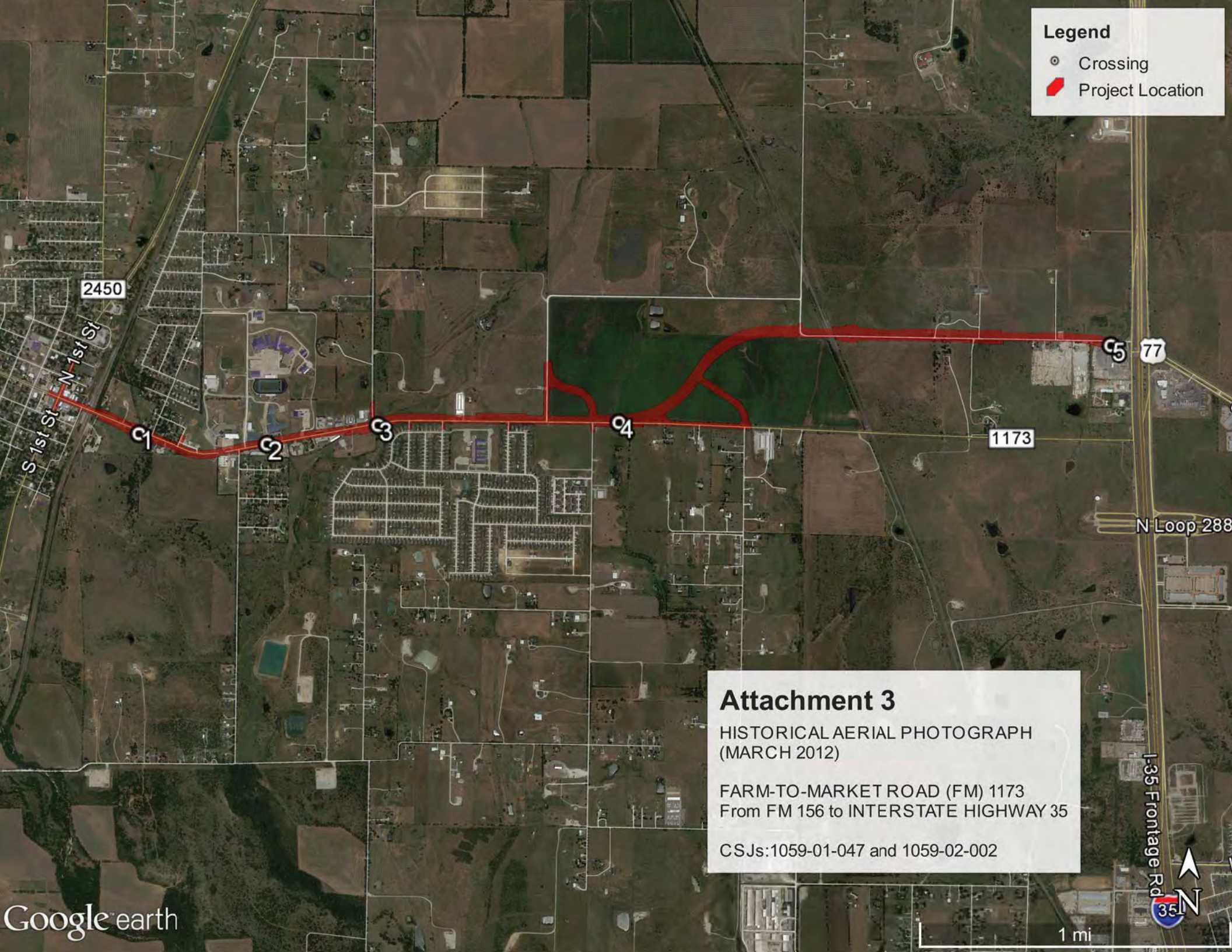
1173
N Loop 288
Attachment 3
HISTORICAL AERIAL PHOTOGRAPH
(JUNE 2011)
FARM-TO-MARKET ROAD (FM) 1173
From FM 156 to INTERSTATE HIGHWAY 35
CSJs:1059-01-047 and 1059-02-002
N
1 mi
Google earth

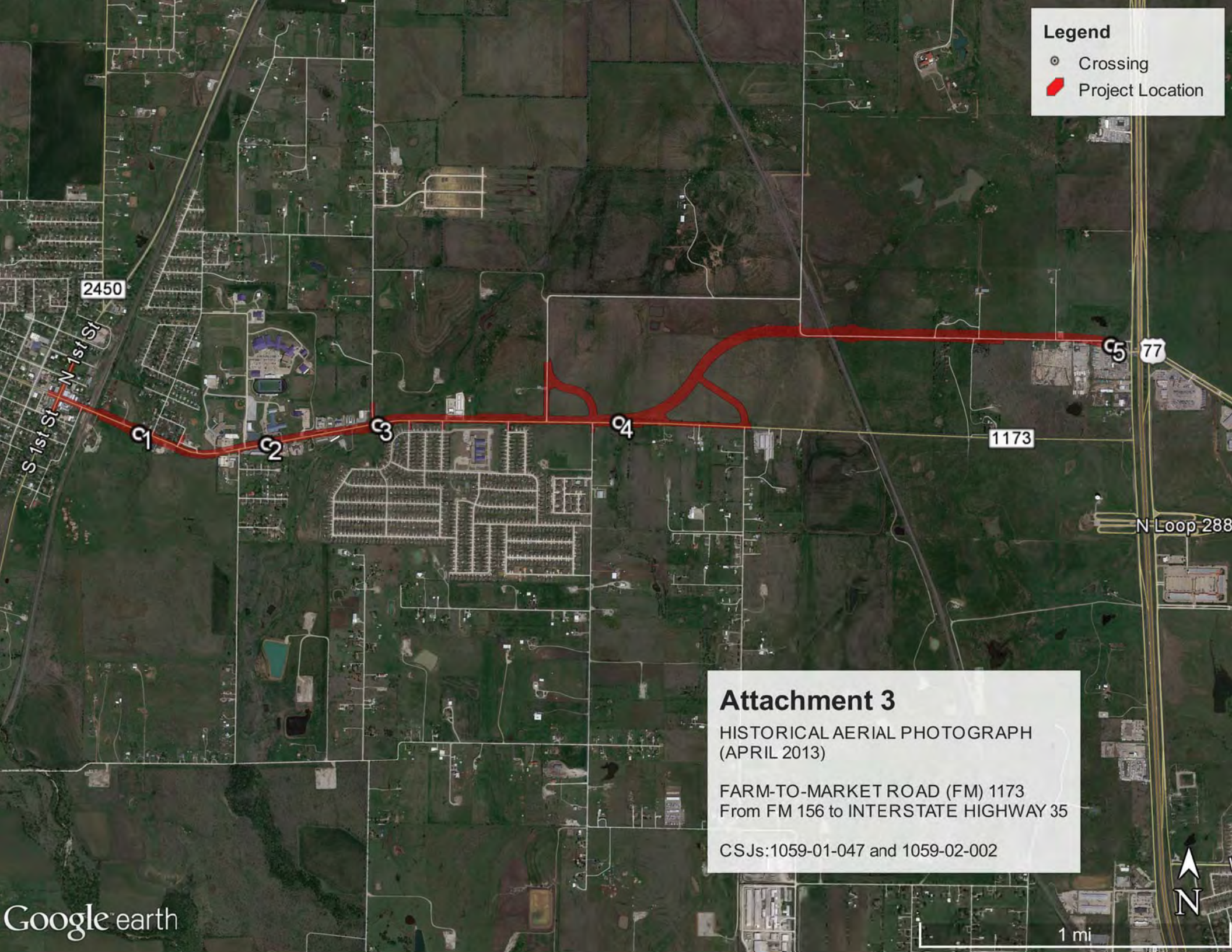


Attachment 3

HISTORICAL AERIAL PHOTOGRAPH
(MARCH 2012)

FARM-TO-MARKET ROAD (FM) 1173
From FM 156 to INTERSTATE HIGHWAY 35

CSJs:1059-01-047 and 1059-02-002


Legend
Crossing
Project Location
2450
S 1st St
N 1st St
C1
C2
C3
C4
C5
77
1173
N Loop 288
Attachment 3
HISTORICAL AERIAL PHOTOGRAPH
(APRIL 2013)
FARM-TO-MARKET ROAD (FM) 1173
From FM 156 to INTERSTATE HIGHWAY 35
CSJs:1059-01-047 and 1059-02-002
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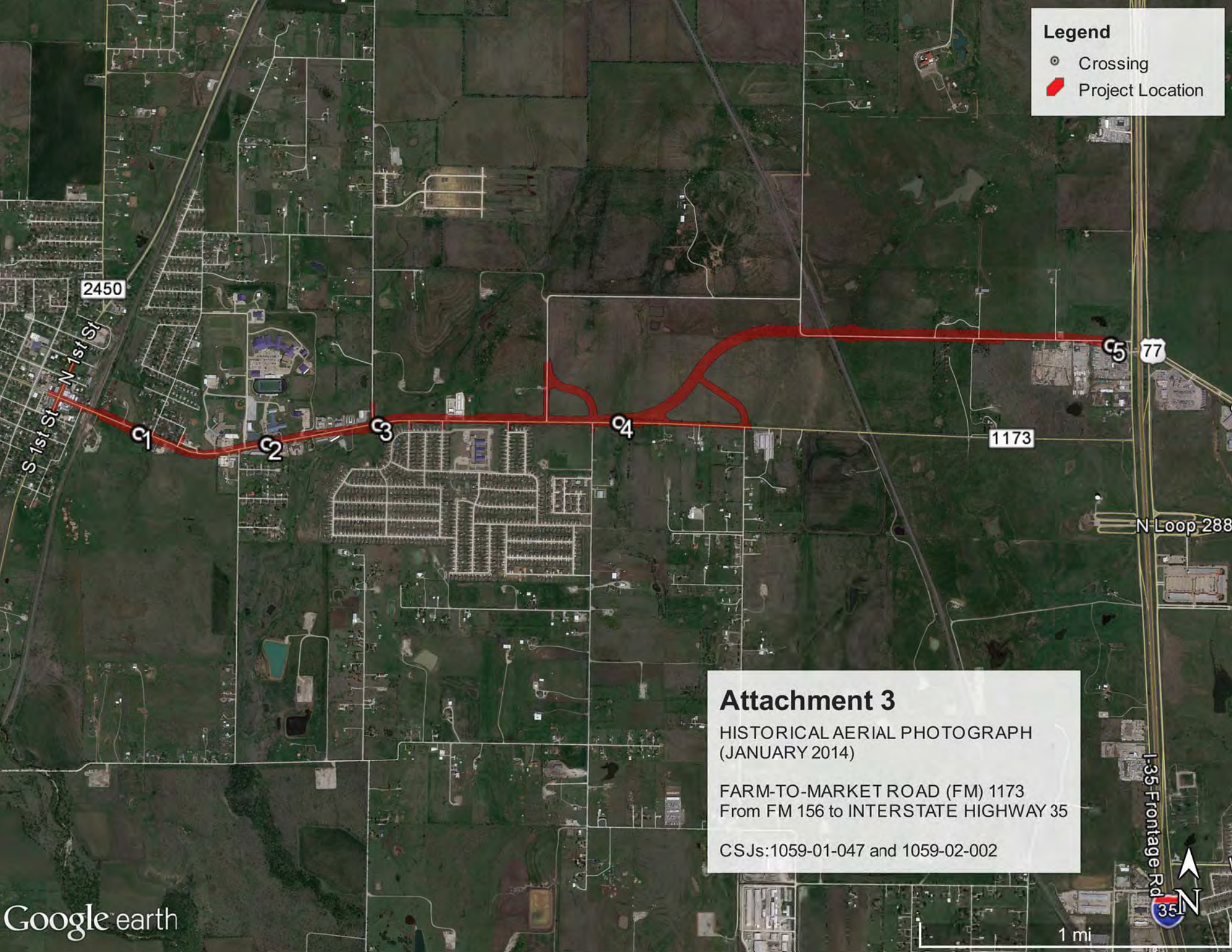
1 mi
Google earth

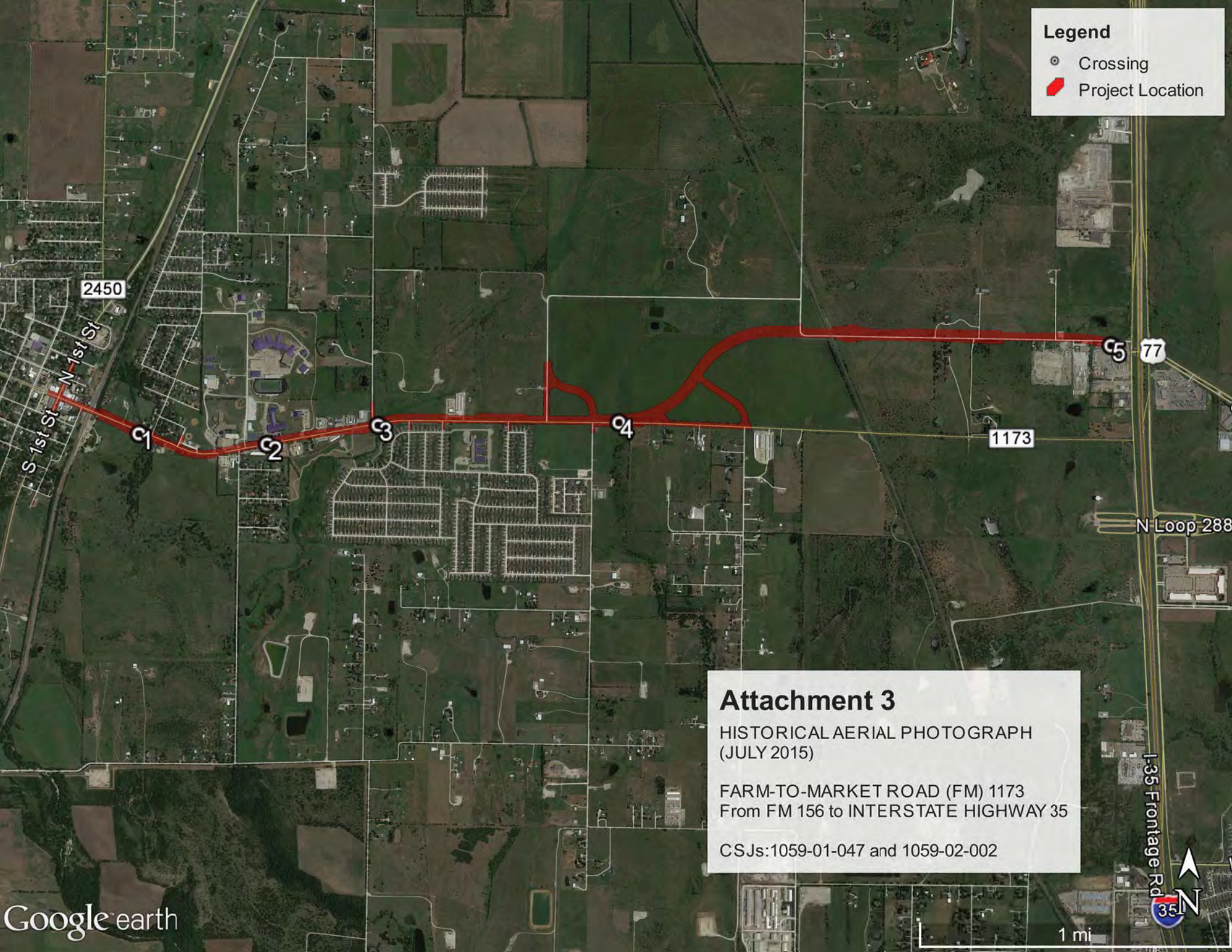


Attachment 3

HISTORICAL AERIAL PHOTOGRAPH
(JANUARY 2014)

FARM-TO-MARKET ROAD (FM) 1173
From FM 156 to INTERSTATE HIGHWAY 35

CSJs:1059-01-047 and 1059-02-002

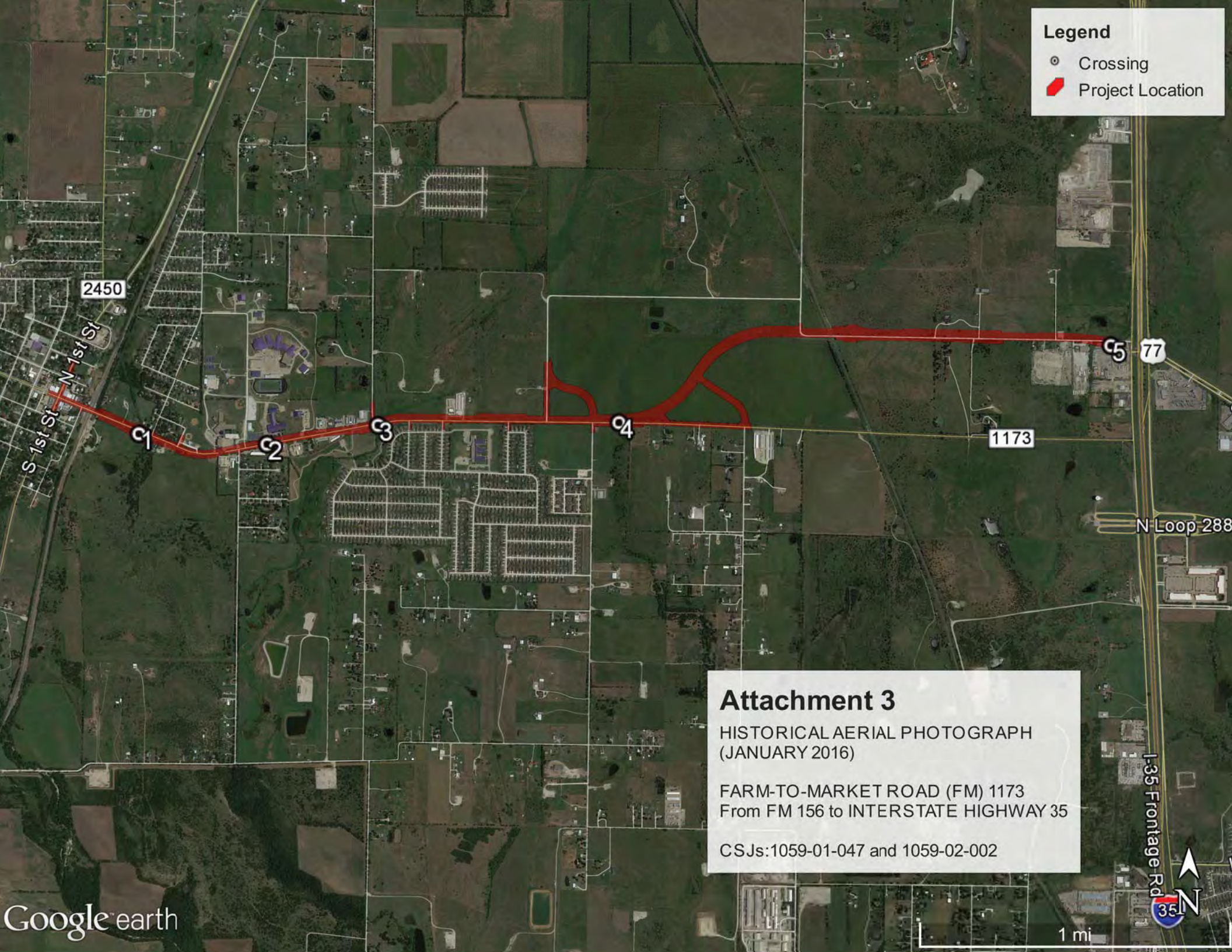


Attachment 3

HISTORICAL AERIAL PHOTOGRAPH
(JULY 2015)

FARM-TO-MARKET ROAD (FM) 1173
From FM 156 to INTERSTATE HIGHWAY 35

CSJs:1059-01-047 and 1059-02-002

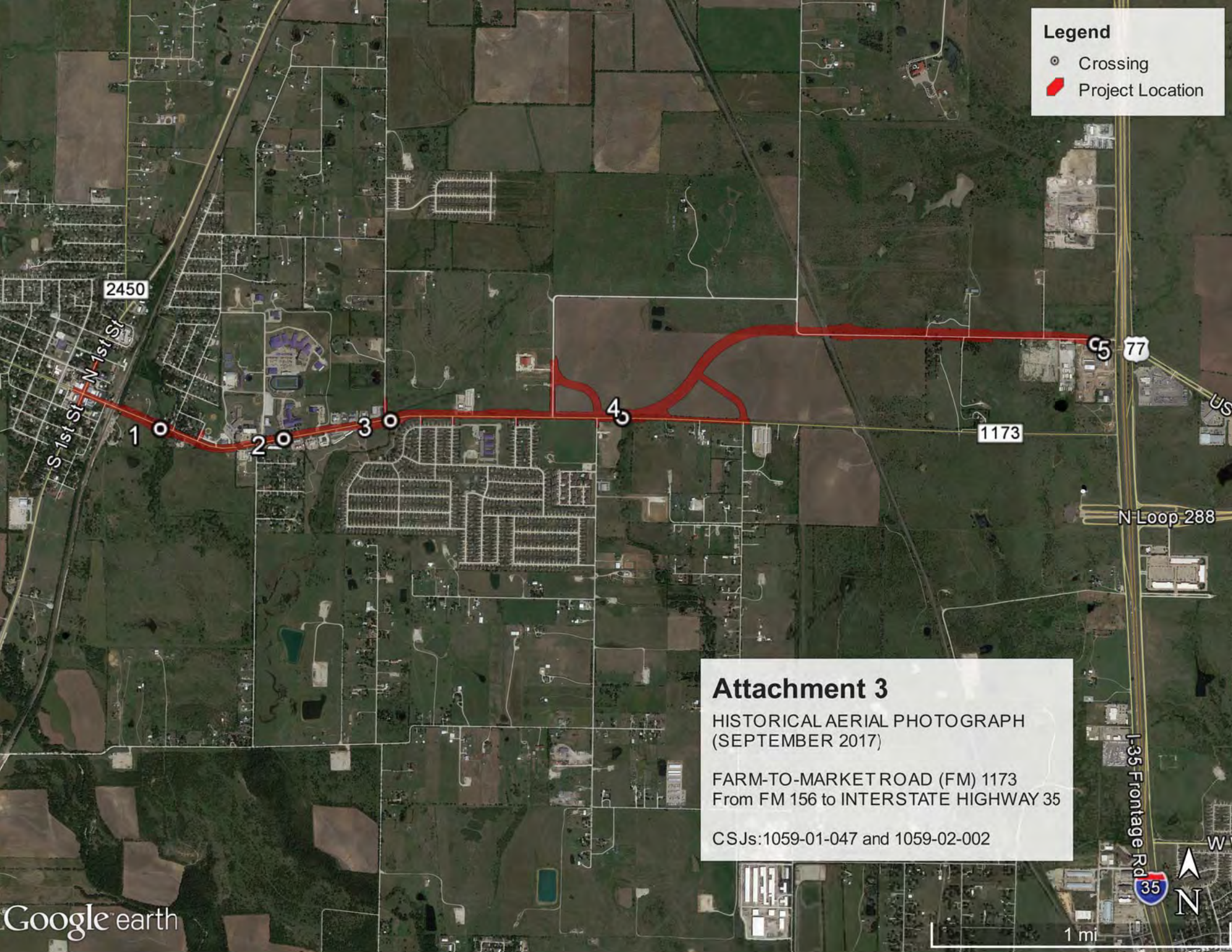


Attachment 3

HISTORICAL AERIAL PHOTOGRAPH
(JANUARY 2016)

FARM-TO-MARKET ROAD (FM) 1173
From FM 156 to INTERSTATE HIGHWAY 35

CSJs:1059-01-047 and 1059-02-002

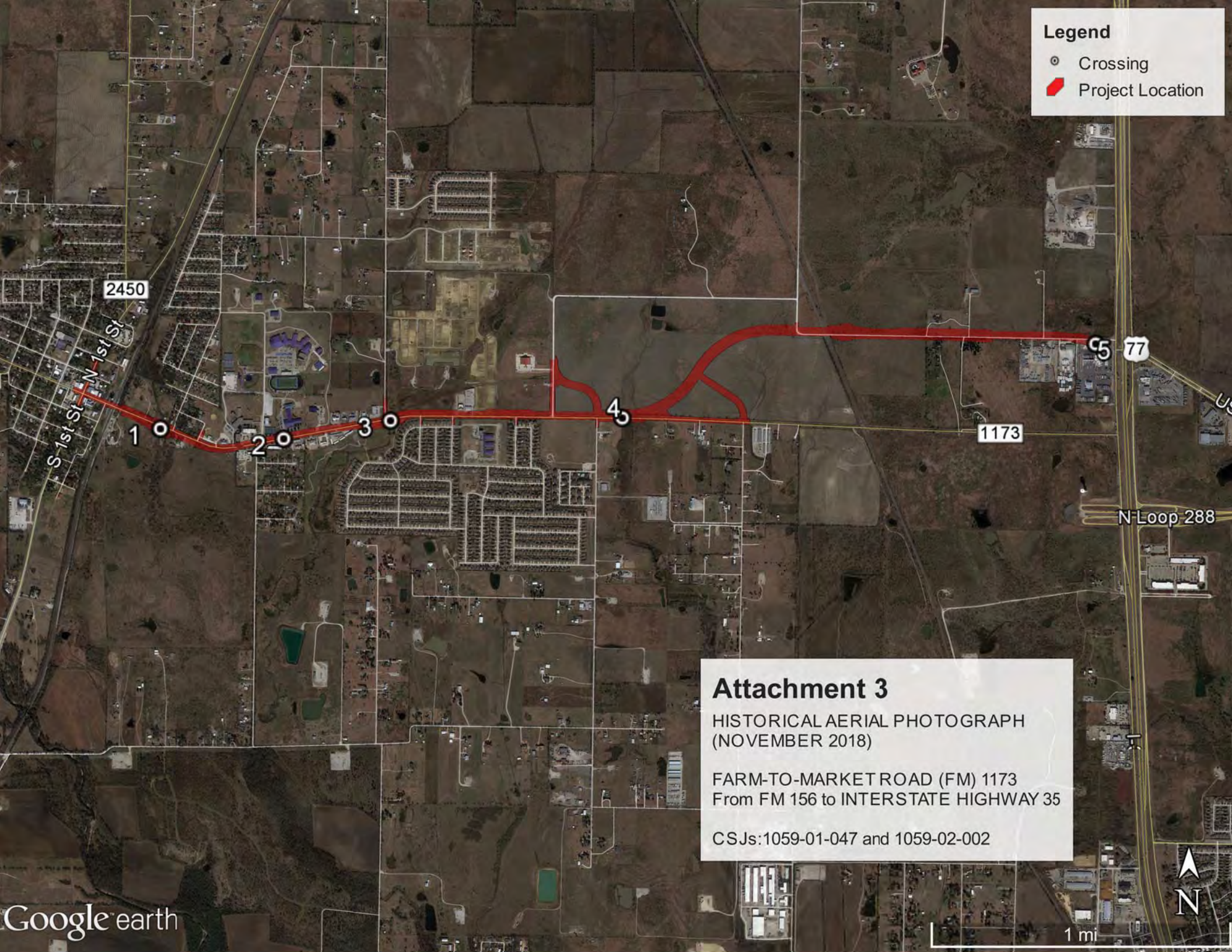


Attachment 3

HISTORICAL AERIAL PHOTOGRAPH
(SEPTEMBER 2017)

FARM-TO-MARKET ROAD (FM) 1173
From FM 156 to INTERSTATE HIGHWAY 35

CSJs:1059-01-047 and 1059-02-002


Legend
Crossing
Project Location
2450
S 1st St
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Attachment 3
HISTORICAL AERIAL PHOTOGRAPH
(NOVEMBER 2018)
FARM-TO-MARKET ROAD (FM) 1173
From FM 156 to INTERSTATE HIGHWAY 35
CSJs:1059-01-047 and 1059-02-002
Google earth
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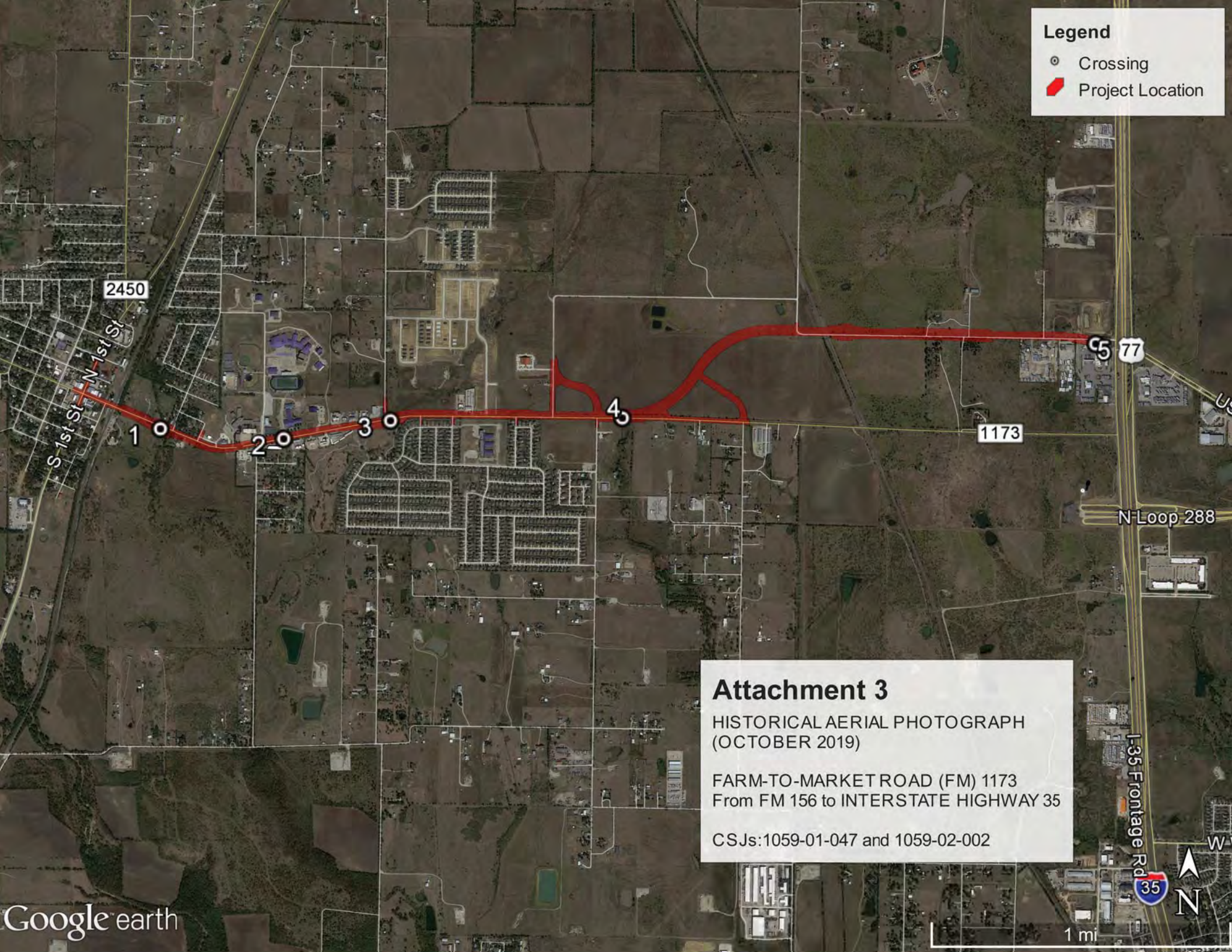
1 mi



Attachment 3

HISTORICAL AERIAL PHOTOGRAPH
(OCTOBER 2019)

FARM-TO-MARKET ROAD (FM) 1173
From FM 156 to INTERSTATE HIGHWAY 35

CSJs:1059-01-047 and 1059-02-002

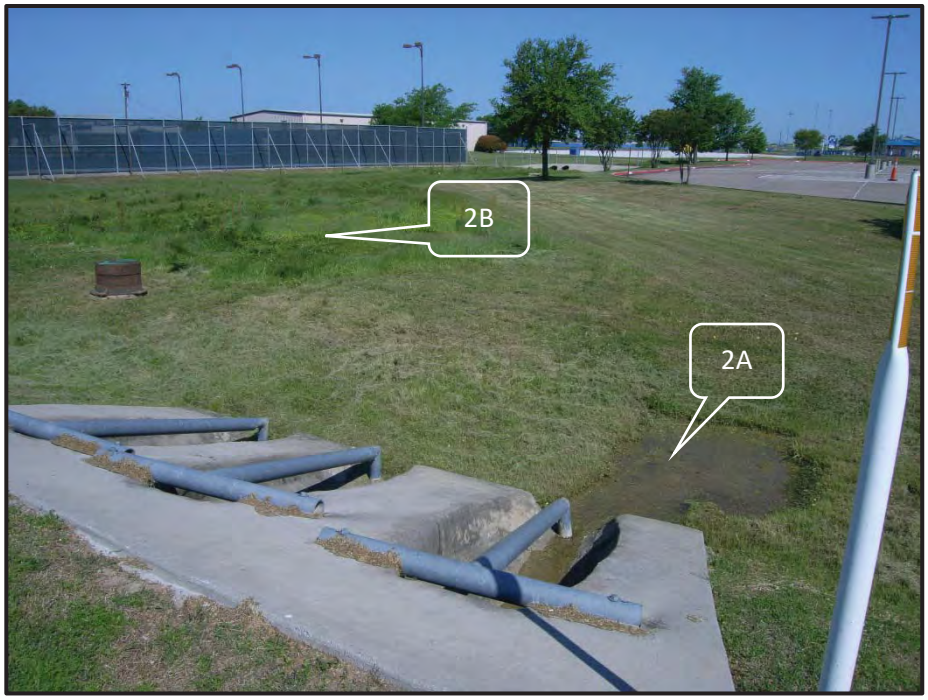
Attachment 4 - Site Photographs

Photograph 1: View looking south toward Crossing 1 – Jordan Creek (intermittent stream).

Photograph 2: View looking north toward Crossing 1 – Jordan Creek (intermittent stream).

Photograph 3: View looking north toward Crossing 1 – Jordan Creek (intermittent stream).

Photograph 4: View looking south toward Crossing 1 – Jordan Creek (intermittent stream).



Photograph 5: View looking northwest toward Crossing 2A – ephemeral tributary to Dry Fork Creek and Crossing 2B – emergent wetland area.

Photograph 6: View looking south toward Crossing 2A – ephemeral tributary to Dry Fork Creek.

Photograph 7: View looking southwest toward Crossing 2B – emergent wetland area.

Photograph 8: View looking northwest toward Crossing 2B – emergent wetland area.

Photograph 9: View looking south toward Crossing 3A – Dry Fork Hickory Creek (intermittent stream).

Photograph 10: View looking south toward Crossing 3A – Dry Fork Hickory Creek (intermittent stream).

Photograph 11: View looking northeast toward Crossing 3A – Dry Fork Hickory Creek (intermittent stream).

Photograph 12: View looking southeast toward Crossing 3B – intermittent tributary to Dry Fork Hickory Creek.

Photograph 13: View looking northwest at Crossing 3B – intermittent tributary to Dry Fork Hickory Creek.

Photograph 14: View looking west toward Crossing 3C – emergent wetland area.

Photograph 15: View looking west toward Crossing 3B – emergent wetland area.

Photograph 16: View looking southwest toward Crossing 3C – emergent wetland area.

Photograph 17: View looking north toward an upland non-jurisdictional drainage area north of Crossing 4.

Photograph 18: View looking north toward Crossing 4 - intermittent tributary to Dry Fork Hickory Creek.

Photograph 19: View looking south at Crossing 4 - intermittent tributary to Dry Fork Hickory Creek.

Photograph 20: View looking northwest toward Crossing 5 – intermittent tributary to Milam Creek.

Photograph 21: View looking southeast toward Crossing 5 – intermittent tributary to Milam Creek.

Photograph 22: View looking southwest at Crossing 5 – intermittent tributary to Milam Creek.

Attachment 5 – Stream Data Forms

Stream Data Form #: 1
Project Name: FM 1173
CSJ: 1059-01-047 and 1059-02-002

Stream Data Form

Surveyor(s): AC, AG, JS
Date of Field Work: 4-16-20
USGS Stream Name: Jordan Creek
County/State: Denton, TX
USGS Topo Quad Name: Sanger, TX
Stream Number [303(d) List]: N/A
Associated Wetland(s): None
GPS Data: 33.25999 N -97.23362 W

Stream Type: Intermittent Characteristics: Natural
Bank Stability (e.g. highly eroding, sloughing banks, etc.): Stable
Stream Flow Direction: S
OHWM Width (ft): 6
OHWM Height (in): 24
Stream Bottom composition:

- ☒ Silts ☐ Cobbles ☐ Concrete ☐ Other:
- ☒ Sands ☐ Bedrock ☐ Muck
- ☐ Gravel ☐ Vegetation Type: Percent Cover:

Aquatic Habitat: Indicate all types present within proposed ROW/project limits.

- ☐ Sand bar ☐ Sand/Gravel beach/bar ☐ Gravel riffles ☐ Aquatic vegetation
- ☒ Overhanging trees/shrubs ☐ Deep pool/ hole/ channel ☐ Other:

Stream has the following characteristics:

- ☐ Bed and banks
- ☒ OHWM (check all indicators that apply):
  - ☒ clear, natural line impressed on the bank
  - ☐ changes in the character of soil
  - ☐ shelving
  - ☐ vegetation matted down, bent, or absent
  - ☐ leaf litter disturbed or washed away
  - ☐ sediment deposition
  - ☐ water staining
  - ☐ other (list):
  - ☐ the presence of litter and debris
  - ☐ destruction of terrestrial vegetation
  - ☐ the presence of wrack line
  - ☐ sediment sorting
  - ☐ scour
  - ☐ multiple observed or predicted flow events
  - ☐ abrupt change in plant community

Water Quality:

- ☐ Clear ☐ Slightly Turbid ☒ Turbid ☐ Very Turbid ☐ Oily film ☐ High organic content
- ☐ Other characteristics (pollutants, etc.)

Aquatic Organisms: List all species observed. This would include waterfowl, fish, snakes, turtles, frogs, invertebrates, etc.
Fish, minnows

Riparian Vegetation: List species observed.
Black willow (*Salix nigra*) saplings, Sugar-Berry (*Celtis laevigata*), Sticky-Willy (*Galium aparine*), Field Brome (*Bromus arvensis*), Johnson Grass (*Sorghum halepense*), White-Mouth Day flower (*Commelina erecta*), Great Ragweed (*Ambrosia trifida*)

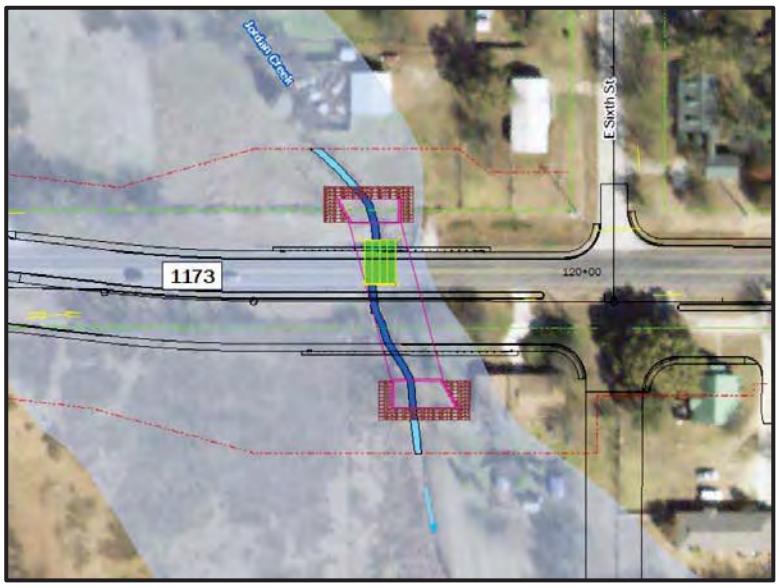
T&E Species/Suitable Habitat: List T&E species observed or which species the habitat is suitable for.
None.

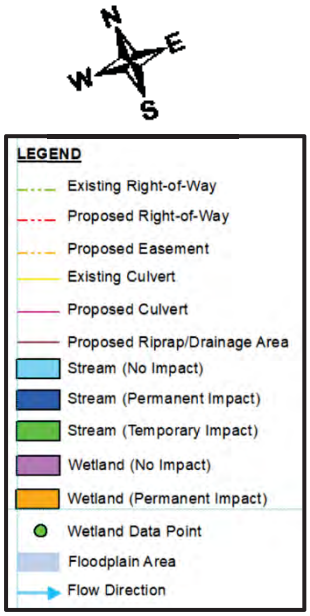
Stream Data Form #:	1
Project Name:	FM 1173
CSJ:	1059-01-047 and 1059-02-002

Stream Data Form (continued)
Please provide a plan and section view sketch of the stream channel.
Sketch should include:

- Directional arrow;
- Width of channel from top of bank to top of bank;
- Depth of channel,
- Approximate side slope; and,
- Width of stream from water edge to water edge.

Plan View (NTS)





Sectional View (NTS)

View looking south toward Crossing 1 – Jordan Creek

OHWM ≈ 6 feet
Depth of channel ≈ 24 inches

Stream Data Form #: 2A
Project Name: FM 1173
CSJ: 1059-01-047 and 1059-02-002

Stream Data Form

Surveyor(s): AC, AG, JS
Date of Field Work: 4-16-20
USGS Stream Name: Unnamed tributary to Dry Fork Creek
County/State: Denton, TX
USGS Topo Quad Name: Sanger, TX
Stream Number [303(d) List]: N/A
Associated Wetland(s): Yes (Palustine Emergent)
GPS Data: 33.25944 N -97.22651 W

Stream Type: Ephemeral Characteristics Natural
Bank Stability (e.g. highly eroding, sloughing banks, etc.): Highly eroding
Stream Flow Direction: SE
OHWM Width (ft): 8
OHWM Height (in): 6
Stream Bottom composition:

- ☒ Silts ☐ Cobbles ☐ Concrete ☐ Other:
- ☒ Sands ☐ Bedrock ☐ Muck
- ☒ Gravel ☐ Vegetation Type: Percent Cover:

Aquatic Habitat: Indicate all types present within proposed ROW/project limits.

- ☐ Sand bar ☐ Sand/Gravel beach/bar ☐ Gravel riffles ☐ Aquatic vegetation
- ☐ Overhanging trees/shrubs ☐ Deep pool/ hole/ channel ☐ Other:

Stream has the following characteristics:

- ☐ Bed and banks
- ☒ OHWM (check all indicators that apply):
  - ☒ clear, natural line impressed on the bank
  - ☐ changes in the character of soil
  - ☐ shelving
  - ☐ vegetation matted down, bent, or absent
  - ☐ leaf litter disturbed or washed away
  - ☐ sediment deposition
  - ☐ water staining
  - ☐ other (list):
  - ☐ the presence of litter and debris
  - ☐ destruction of terrestrial vegetation
  - ☐ the presence of wrack line
  - ☐ sediment sorting
  - ☐ scour
  - ☐ multiple observed or predicted flow events
  - ☐ abrupt change in plant community

Water Quality:

- ☒ Clear ☐ Slightly Turbid ☐ Turbid ☐ Very Turbid ☐ Oily film ☐ High organic content
- ☐ Other characteristics (pollutants, etc.)

Aquatic Organisms: List all species observed. This would include waterfowl, fish, snakes, turtles, frogs, invertebrates, etc.
None observed.

Riparian Vegetation: List species observed.
None.

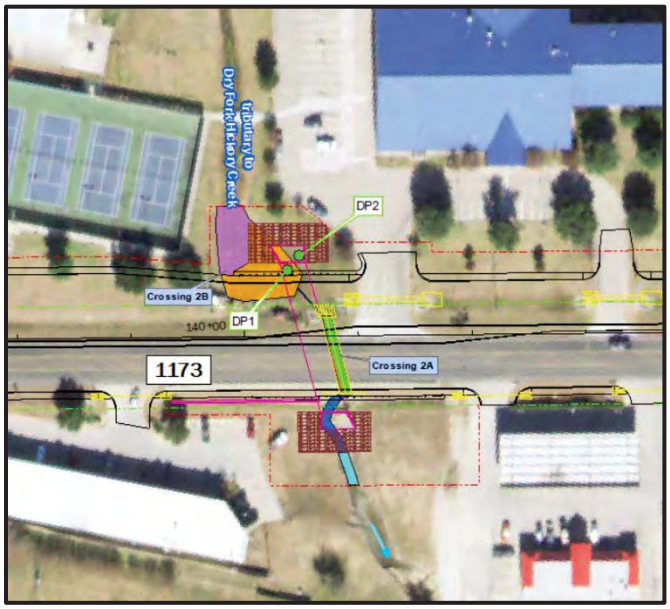
T&E Species/Suitable Habitat: List T&E species observed or which species the habitat is suitable for.
None.

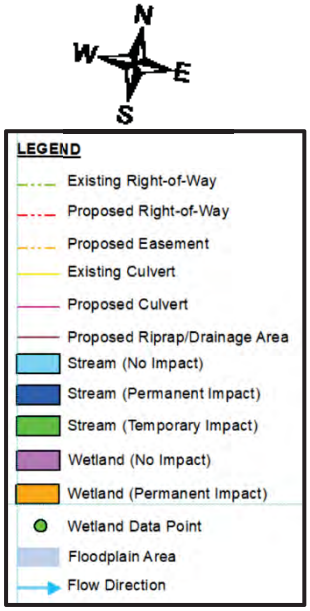
Stream Data Form #:	2A
Project Name:	FM 1173
CSJ:	1059-01-047 and 1059-02-002

Stream Data Form (continued)
Please provide a plan and section view sketch of the stream channel.
Sketch should include:

- Directional arrow;
- Width of channel from top of bank to top of bank;
- Depth of channel,
- Approximate side slope; and,
- Width of stream from water edge to water edge.

Plan View (NTS)





Sectional View (NTS)

View looking north toward Crossing 2A – Unnamed tributary to Dry Fork Creek

OHWM ≈ 8 feet
Depth of channel ≈ 6 inches

Stream Data Form #: 3A
Project Name: FM 1173
CSJ: 1059-01-047 and 1059-02-002

Stream Data Form

Surveyor(s): AC, AG, JS
Date of Field Work: 4-20-20
USGS Stream Name: Dry Fork Hickory Creek
County/State: Denton, TX
USGS Topo Quad Name: Sanger, TX
Stream Number [303(d) List]: N/A
Associated Wetland(s): Yes (Palustine Emergent)
GPS Data: 33.26033 N -97.22032 W

Stream Type: Intermittent Characteristics Natural
Bank Stability (e.g. highly eroding, sloughing banks, etc.): Slightly eroding
Stream Flow Direction: S
OHWM Width (ft): 10
OHWM Height (in): 12
Stream Bottom composition:

- ☒ Silts ☐ Cobbles ☐ Concrete ☐ Other:
- ☒ Sands ☐ Bedrock ☐ Muck
- ☐ Gravel ☐ Vegetation Type: Percent Cover:

Aquatic Habitat: Indicate all types present within proposed ROW/project limits.

- ☐ Sand bar ☐ Sand/Gravel beach/bar ☐ Gravel riffles ☐ Aquatic vegetation
- ☒ Overhanging trees/shrubs ☐ Deep pool/ hole/ channel ☐ Other:

Stream has the following characteristics:

- ☐ Bed and banks
- ☒ OHWM (check all indicators that apply):
  - ☒ clear, natural line impressed on the bank
  - ☐ changes in the character of soil
  - ☐ shelving
  - ☐ vegetation matted down, bent, or absent
  - ☐ leaf litter disturbed or washed away
  - ☐ sediment deposition
  - ☐ water staining
  - ☐ other (list):
  - ☐ the presence of litter and debris
  - ☐ destruction of terrestrial vegetation
  - ☐ the presence of wrack line
  - ☐ sediment sorting
  - ☐ scour
  - ☐ multiple observed or predicted flow events
  - ☐ abrupt change in plant community

Water Quality:

- ☐ Clear ☒ Slightly Turbid ☐ Turbid ☐ Very Turbid ☐ Oily film ☐ High organic content
- ☐ Other characteristics (pollutants, etc.)

Aquatic Organisms: List all species observed. This would include waterfowl, fish, snakes, turtles, frogs, invertebrates, etc.
Minnows, mollusk.

Riparian Vegetation: List species observed.
Sugar-Berry (*Celtis laevigata*), Pale Dock (*Rumex altissimus*), Field Brome (*Bromus arvensis*), Great Ragweed (*Ambrosia trifida*), Carolina geranium (*Geranium carolinianum*), Annual Ryegrass (*Lolium multiflorum*), White-Mouth Day flower (*Commelina erecta*), Wild Onion (*Allium drummondii*), Sticky-Willy (*Galium aparine*), Texas Dandelion (*Pyrrhopappus carolinianus*), Annual Ragweed (*Ambrosia artemisiifolia*), Wand Panic Grass (*Panicum virgatum*), Mouse-ear Chickweed (*Cerastium vulgatum*)

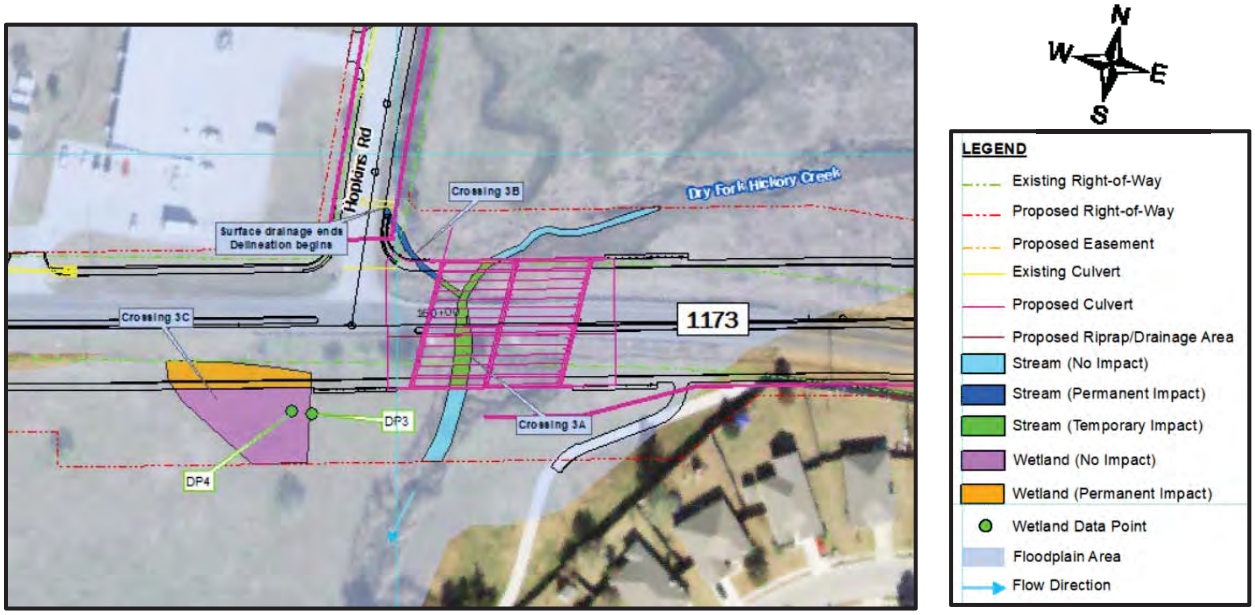
T&E Species/Suitable Habitat: List T&E species observed or which species the habitat is suitable for.
None.

Stream Data Form #:	3A
Project Name:	FM 1173
CSJ:	1059-01-047 and 1059-02-002

Stream Data Form (continued)
Please provide a plan and section view sketch of the stream channel.
Sketch should include:

- Directional arrow;
- Width of channel from top of bank to top of bank;
- Depth of channel,
- Approximate side slope; and,
- Width of stream from water edge to water edge.

Plan View (NTS)



Sectional View (NTS)

View looking north toward Crossing 3A – Unnamed tributary to Dry Fork Hickory Creek

OHWM ≈ 10 feet
Depth of channel ≈ 12 inches

Stream Data Form #: 3B
Project Name: FM 1173
CSJ: 1059-01-047 and 1059-02-002

Stream Data Form

Surveyor(s): AC, AG, JS
Date of Field Work: 4-20-20
USGS Stream Name: Unnamed tributary to Dry Fork Hickory Creek
County/State: Denton, TX
USGS Topo Quad Name: Sanger, TX
Stream Number [303(d) List]: N/A
Associated Wetland(s): Yes (Palustine Emergent)
GPS Data: 33.26051 N -97.22055 W

Stream Type: Intermittent
Characteristics: Natural
Bank Stability (e.g. highly eroding, sloughing banks, etc.): Slightly eroding
Stream Flow Direction: SE
OHWM Width (ft): 6
OHWM Height (in): 6

Stream Bottom composition:

- ☒ Silts ☐ Cobbles ☐ Concrete ☐ Other:
- ☒ Sands ☐ Bedrock ☐ Muck
- ☐ Gravel ☐ Vegetation Type: Percent Cover:

Aquatic Habitat: Indicate all types present within proposed ROW/project limits.

- ☐ Sand bar ☐ Sand/Gravel beach/bar ☐ Gravel riffles ☐ Aquatic vegetation
- ☒ Overhanging trees/shrubs ☐ Deep pool/ hole/ channel ☐ Other:

Stream has the following characteristics:

- ☐ Bed and banks
- ☒ OHWM (check all indicators that apply):
  - ☒ clear, natural line impressed on the bank
  - ☐ changes in the character of soil
  - ☐ shelving
  - ☐ vegetation matted down, bent, or absent
  - ☐ leaf litter disturbed or washed away
  - ☐ sediment deposition
  - ☐ water staining
  - ☐ other (list):
  - ☐ the presence of litter and debris
  - ☐ destruction of terrestrial vegetation
  - ☐ the presence of wrack line
  - ☐ sediment sorting
  - ☐ scour
  - ☐ multiple observed or predicted flow events
  - ☐ abrupt change in plant community

Water Quality:

- ☐ Clear ☒ Slightly Turbid ☐ Turbid ☐ Very Turbid ☐ Oily film ☐ High organic content
- ☐ Other characteristics (pollutants, etc.)

Aquatic Organisms: List all species observed. This would include waterfowl, fish, snakes, turtles, frogs, invertebrates, etc.
Minnows.

Riparian Vegetation: List species observed.
Sugar-Berry (*Celtis laevigata*), Pale Dock (*Rumex altissimus*), Field Brome (*Bromus arvensis*), Great Ragweed (*Ambrosia trifida*), Carolina geranium (*Geranium carolinianum*), Annual Ryegrass (*Lolium multiflorum*), White-Mouth Day flower (*Commelina erecta*), Wild Onion (*Allium drummondii*), Sticky-Willy (*Galium aparine*), Texas Dandelion (*Pyrrhopappus carolinianus*), Annual Ragweed (*Ambrosia artemisiifolia*), Wand Panic Grass (*Panicum virgatum*), Mouse-ear Chickweed (*Cerastium vulgatum*)

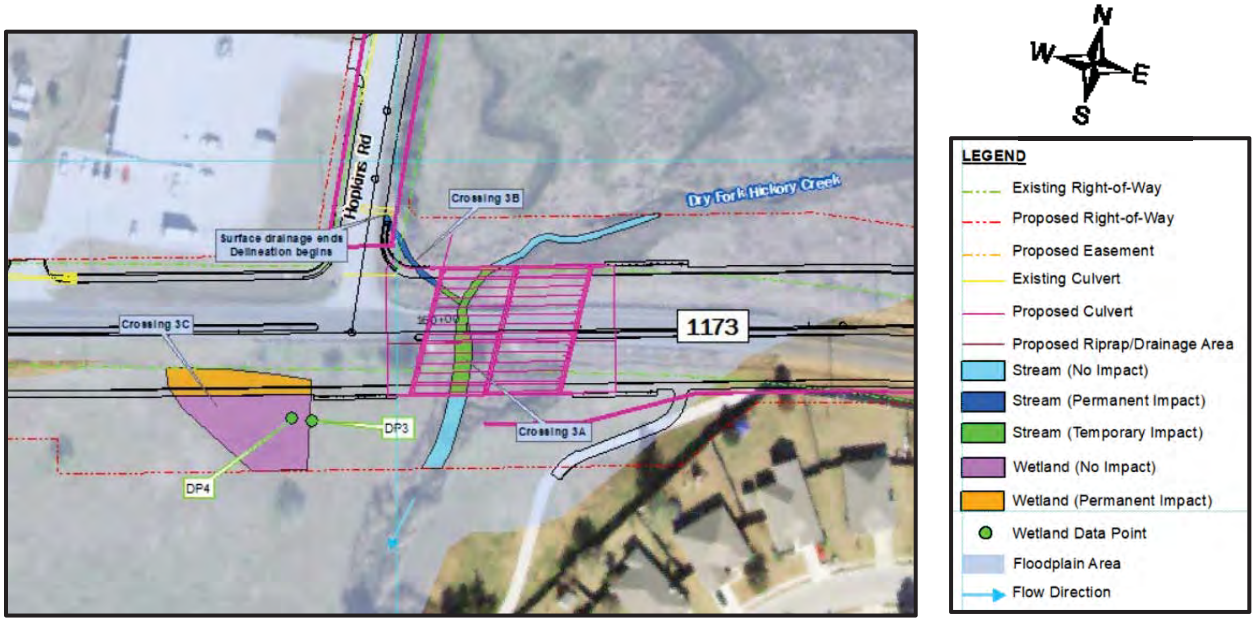
T&E Species/Suitable Habitat: List T&E species observed or which species the habitat is suitable for.
None.

Stream Data Form #:	3B
Project Name:	FM 1173
CSJ:	1059-01-047 and 1059-02-002

Stream Data Form (continued)
Please provide a plan and section view sketch of the stream channel.
Sketch should include:

- Directional arrow;
- Width of channel from top of bank to top of bank;
- Depth of channel,
- Approximate side slope; and,
- Width of stream from water edge to water edge.

Plan View (NTS)



Sectional View (NTS)

View looking northwest toward Crossing 3B – Unnamed tributary to Dry Fork Hickory Creek

OHWM ≈ 6 feet
Depth of channel ≈ 6 inches

Stream Data Form #: 4
Project Name: FM 1173
CSJ: 1059-01-047 and 1059-02-002

Stream Data Form

Surveyor(s): AC, AG, JS
Date of Field Work: 4-20-20
USGS Stream Name: Unnamed tributary to Dry Fork Hickory Creek
County/State: Denton, TX
USGS Topo Quad Name: Sanger, TX
Stream Number [303(d) List]: N/A
Associated Wetland(s): Yes (Palustine Emergent)
GPS Data: 33.26026 N -97.20688 W

Stream Type: Intermittent
Characteristics
Natural
Bank Stability (e.g. highly eroding, sloughing banks, etc.): Slightly eroding
Stream Flow Direction: S
OHWM Width (ft): 3
OHWM Height (in): 24

Stream Bottom composition:

- ☒ Silts ☐ Cobbles ☐ Concrete ☐ Other:
- ☒ Sands ☐ Bedrock ☐ Muck
- ☐ Gravel ☐ Vegetation Type: Percent Cover:

Aquatic Habitat: Indicate all types present within proposed ROW/project limits.

- ☐ Sand bar ☐ Sand/Gravel beach/bar ☐ Gravel riffles ☐ Aquatic vegetation
- ☒ Overhanging trees/shrubs ☐ Deep pool/ hole/ channel ☐ Other:

Stream has the following characteristics:

- ☐ Bed and banks
- ☒ OHWM (check all indicators that apply):
  - ☒ clear, natural line impressed on the bank
  - ☐ changes in the character of soil
  - ☐ shelving
  - ☐ vegetation matted down, bent, or absent
  - ☐ leaf litter disturbed or washed away
  - ☐ sediment deposition
  - ☐ water staining
  - ☐ other (list):
  - ☐ the presence of litter and debris
  - ☐ destruction of terrestrial vegetation
  - ☐ the presence of wrack line
  - ☐ sediment sorting
  - ☐ scour
  - ☐ multiple observed or predicted flow events
  - ☐ abrupt change in plant community

Water Quality:

- ☐ Clear ☒ Slightly Turbid ☐ Turbid ☐ Very Turbid ☐ Oily film ☐ High organic content
- ☐ Other characteristics (pollutants, etc.)

Aquatic Organisms: List all species observed. This would include waterfowl, fish, snakes, turtles, frogs, invertebrates, etc.
None.

Riparian Vegetation: List species observed.
Sugar-Berry (*Celtis laevigata*), Pale Dock (*Rumex altissimus*), Field Brome (*Bromus arvensis*), Annual Ragweed (*Ambrosia artemisiifolia*), Mouse-ear Chickweed (*Cerastium vulgatum*), Great Ragweed (*Ambrosia trifida*)

T&E Species/Suitable Habitat: List T&E species observed or which species the habitat is suitable for.
None.

Stream Data Form #:	4
Project Name:	FM 1173
CSJ:	1059-01-047 and 1059-02-002

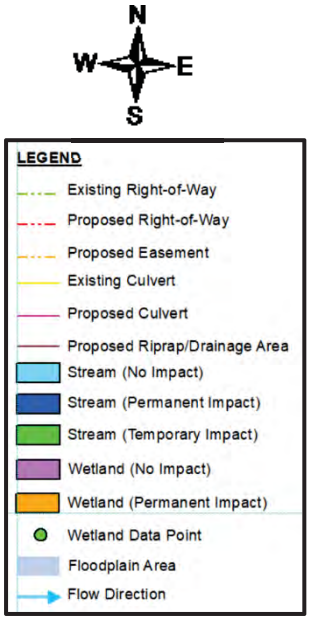
Stream Data Form (continued)

Please provide a plan and section view sketch of the stream channel.

Sketch should include:

- Directional arrow;
- Width of channel from top of bank to top of bank;
- Depth of channel,
- Approximate side slope; and,
- Width of stream from water edge to water edge.

Plan View (NTS)



Sectional View (NTS)

View looking north toward Crossing 4 – Unnamed tributary to Dry Fork Hickory Creek

OHWM ≈ 3 feet
Depth of channel ≈ 24 inches

Stream Data Form #: 5
Project Name: FM 1173
CSJ: 1059-01-047 and 1059-02-002

Stream Data Form

Surveyor(s): AC, AG, JS
Date of Field Work: 4-20-20
USGS Stream Name: unnamed tributary to Milam Creek
County/State: Denton, TX
USGS Topo Quad Name: Sanger, TX
Stream Number [303(d) List]: N/A
Associated Wetland(s): Yes (Palustine Emergent)
GPS Data: 33.26413 N -97.17941 W

Stream Type: Intermittent Characteristics Natural
Bank Stability (e.g. highly eroding, sloughing banks, etc.): Stable
Stream Flow Direction: NE
OHWM Width (ft): 15
OHWM Height (in): 6
Stream Bottom composition:

- ☒ Silts ☐ Cobbles ☒ Concrete ☐ Other:
- ☒ Sands ☐ Bedrock ☐ Muck
- ☐ Gravel ☐ Vegetation Type: Herbaceous Percent Cover: 30

Aquatic Habitat: Indicate all types present within proposed ROW/project limits.

- ☐ Sand bar ☐ Sand/Gravel beach/bar ☐ Gravel riffles ☐ Aquatic vegetation
- ☐ Overhanging trees/shrubs ☐ Deep pool/ hole/ channel ☐ Other:

Stream has the following characteristics:

- ☐ Bed and banks
- ☒ OHWM (check all indicators that apply):
  - ☒ clear, natural line impressed on the bank
  - ☐ changes in the character of soil
  - ☐ shelving
  - ☐ vegetation matted down, bent, or absent
  - ☐ leaf litter disturbed or washed away
  - ☐ sediment deposition
  - ☐ water staining
  - ☐ other (list):
  - ☐ the presence of litter and debris
  - ☐ destruction of terrestrial vegetation
  - ☐ the presence of wrack line
  - ☐ sediment sorting
  - ☐ scour
  - ☐ multiple observed or predicted flow events
  - ☐ abrupt change in plant community

Water Quality:

- ☒ Clear ☐ Slightly Turbid ☐ Turbid ☐ Very Turbid ☐ Oily film ☐ High organic content
- ☐ Other characteristics (pollutants, etc.)

Aquatic Organisms: List all species observed. This would include waterfowl, fish, snakes, turtles, frogs, invertebrates, etc.
None observed.

Riparian Vegetation: List species observed.
None.

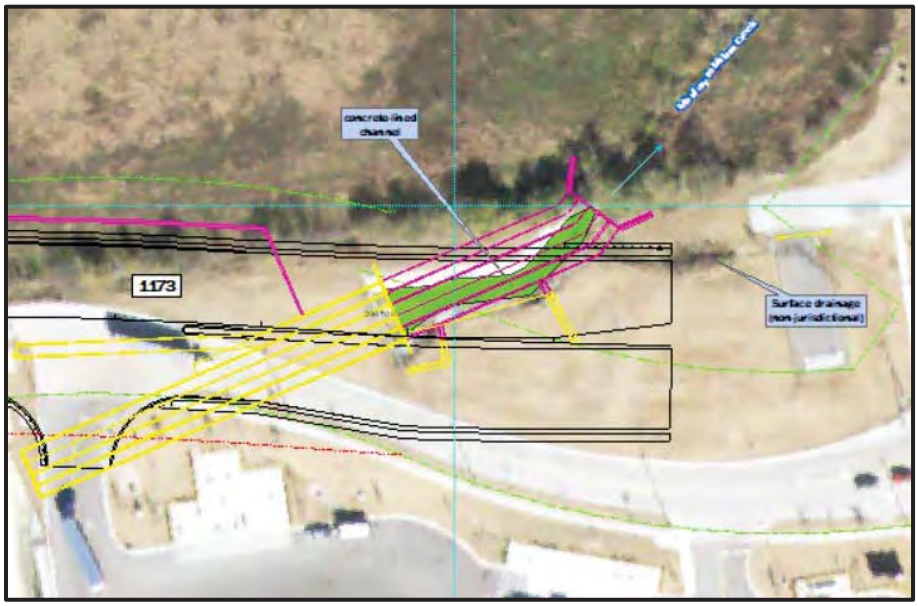
T&E Species/Suitable Habitat: List T&E species observed or which species the habitat is suitable for.
None.

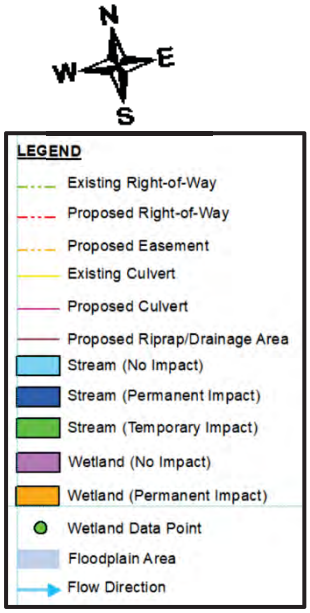
Stream Data Form #:	5
Project Name:	FM 1173
CSJ:	1059-01-047 and 1059-02-002

Stream Data Form (continued)
Please provide a plan and section view sketch of the stream channel.
Sketch should include:

- Directional arrow;
- Width of channel from top of bank to top of bank;
- Depth of channel,
- Approximate side slope; and,
- Width of stream from water edge to water edge.

Plan View (NTS)





Sectional View (NTS)

View looking south toward Crossing 5 – Unnamed tributary to Milam Creek

OHWM ≈ 15 feet
Depth of channel ≈ 6 inches

Project Name: **Farm-to-Market Road (FM) 1173**

CSJ(s): **1059-01-047 and 1059-02-002**

County(ies): **Denton**

Date Analysis Completed: **5/1/2020**

Prepared by: **Alma Canning, Civil Associates, Inc.**

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 9, 2019, and executed by FHWA and TxDOT.

I. Section 402 of the Clean Water Act

No project-specific analysis is required as part of the environmental review process under Section 402 of the Clean Water Act for the reasons provided below:

> Since TPDES Construction General Permit (CGP) authorization and compliance (and the associated documentation) occur outside of the environmental clearance process, compliance is ensured by the policies and procedures that govern the design and construction phases of the project. The Project Development Process Manual and the Plans, Specifications, and Estimates (PS&E) Preparation Manual require a storm water pollution prevention plan (SWP3) be included in the plans of all projects that disturb one or more acres. The Construction Contract Administration Manual requires that the appropriate CGP authorization documents (notice of intent or site notice) be completed, posted, and submitted, when required by the CGP, to TCEQ and the municipal separate storm sewer system (MS4) operator. It also requires that projects be inspected to ensure compliance with the CGP.
>
> The PS&E Preparation Manual requires that all projects include Standard Specification Item 506 (Temporary Erosion, Sedimentation, and Environmental Controls), and the "Required Specification Checklists" require Special Provision 506-003 on all projects that need authorization under the CGP. These documents require the project contractor to comply with the CGP and SWP3, and to complete the appropriate authorization documents.

For more information regarding Section 402 of the Clean Water Act, see **ENV's Water Resources Handbook**.

II. Section 404 of the Clean Water Act

Select the appropriate statement(s) below:

☐ This project will not involve any regulated activity in any jurisdictional waters and therefore does not require a United States Army Corps of Engineers (USACE) "dredge and fill" permit under Section 404 of the Clean Water Act.

☐ Some or all regulated activity in jurisdictional waters will be authorized under a non-reporting nationwide permit (i.e., no pre-construction notification required). If this statement applies, indicate which non-reporting nationwide permit(s) will be used below.

Non-reporting NWP no(s): **<enter non-reporting NWP no(s)>**

☒ Some or all regulated activity in jurisdictional waters cannot be authorized under a non-reporting nationwide permit; therefore, a nationwide permit with pre-construction notification will be required.

For more information regarding Section 404 of the Clean Water Act, see **ENV's Water Resources Handbook**.

III. Section 14 of the Rivers and Harbors Act (33 USC 408)

No project-specific analysis is required as part of the environmental review process under Section 14 of the Rivers and Harbors Act (33 USC 408) ("Section 408") for the reasons provided below:

> Any project that involves alterations to, or will temporarily or permanently occupy or use, a USACE federally authorized civil works project (e.g., sea walls, bulkheads, reservoirs, levees, wharfs, or other federal civil works projects, or associated federal land (fee simple) or easements) will require USACE authorization under Section 408 prior to construction of the project. Obtaining any required authorization under Section 408 from the USACE is generally handled by hydraulic and/or design engineers. For any project that requires authorization under both Section 404 and Section 408, the Section 404 authorization cannot be issued until the Section 408 authorization is issued.

For more information regarding Section 408, see **ENV's Water Resources Handbook**.

IV. Section 303(d) of the Clean Water Act

For a CE project, no project-specific analysis is required as part of the environmental review process under Section 303(d) of the Clean Water Act for the reasons provided below:

> To date, TCEQ has not identified (through either a total maximum daily load (TMDL) or the review of projects under the TCEQ MOU) a need to implement control measures beyond those required by the construction general permit (CGP) on road construction projects. Therefore, compliance with the project's CGP, along with coordination under the TCEQ MOU for certain transportation projects, collectively meets the need to address impaired waters during the environmental review process. As required by the CGP, the project and associated activities will be implemented, operated, and maintained using best management practices to control the discharge of pollutants from the project site.

For an EA or EIS project, further analysis regarding impaired waters is required under TxDOT's MOU with TCEQ for inclusion in the body of the environmental assessment or environmental impact statement. To do this further analysis, determine whether the project is located within five linear miles (not stream miles) of, is within the watershed of, and drains to, an impaired assessment unit under Section 303(d) of the federal Clean Water Act.

For an EA or EIS project only, provide the date of the Section 303(d) list consulted: **April 24, 2020**

For an EA or EIS project only, check the appropriate box below:

☒ This project is not located within five linear miles (not stream miles) of, is not within the watershed of, or does not drain to, an impaired assessment unit under Section 303(d) of the federal Clean Water Act.

☐ This project is located within five linear miles (not stream miles) of, is within the watershed of, and drains to, an impaired assessment unit under Section 303(d) of the federal Clean Water Act.

For an EA or EIS project only, if the second box is checked, fill-in the table below for any impaired assessment units within five miles of the project and within the same watershed as the project:

Watershed	Segment name	Segment number	Assessment unit number
<enter text>	**<enter text>**	**<enter text>**	**<enter text>**
<enter text>	**<enter text>**	**<enter text>**	**<enter text>**
<enter text>	**<enter text>**	**<enter text>**	**<enter text>**
<enter text>	**<enter text>**	**<enter text>**	**<enter text>**
<enter text>	**<enter text>**	**<enter text>**	**<enter text>**
<enter text>	**<enter text>**	**<enter text>**	**<enter text>**

For more information regarding Section 303(d) of the Clean Water Act, see **ENV's Water Resources Handbook**.

V. General Bridge Act/Section 9 of the Rivers and Harbors Act

Select the appropriate statement below:

☒ This project will not require a permit, bridge lighting authorization, or exemption from the United States Coast Guard under Section 9 of the Rivers and Harbors Act, which outlines the requirements for approval to construct dams, dikes, bridges, or causeways in or over a navigable waterway.

☐ This project will require a permit, bridge lighting authorization, or exemption from the United States Coast Guard under Section 9 of the Rivers and Harbors Act, which outlines the requirements for approval to construct dams, dikes, bridges, or causeways in or over a navigable waterway.

For more information regarding the General Bridge Act/Section 9 of the Rivers and Harbors Act, see **ENV's Water Resources Handbook**.

VI. Section 10 of the Rivers and Harbors Act

Select the appropriate statement(s) below:

☒ This project does not require authorization from the USACE under Section 10 of the Rivers and Harbors Act, which outlines the requirements for approval to construct smaller structures in a navigable waterway.

☐ This project does require authorization from the USACE under Section 10 of the Rivers and Harbors Act. Some or all regulated activity in a navigable waterway will be authorized under a non-reporting nationwide permit (i.e., no pre-construction notification required). If this statement applies, indicate which non-reporting nationwide permit(s) will be used below.

Non-reporting NWP no(s): **<enter number or numbers of any non-reporting NWPs used>**

☐ This project does require authorization from the USACE under Section 10 of the Rivers and Harbors Act. Some or all regulated activity in a navigable waterway cannot be authorized under a non-reporting nationwide permit; therefore, a nationwide permit with pre-construction notification, individual permit, letter of permission, regional general permit, or individual Section 10 permit will be required.

For more information regarding Section 10 of the Rivers and Harbors Act, see **ENV's Water Resources Handbook**.

VII. Section 401 of the Clean Water Act

No project-specific analysis is required as part of the surface water analysis under Section 401 of the Clean Water Act for the reasons provided below:

For a project that will use a NWP under Section 404 or Section 10, regardless of whether the NWP is non-reporting (i.e., assumed) or reporting (i.e., requires submittal of a PCN), TxDOT complies with Section 401 of the Clean Water Act by implementing TCEQ's conditions for NWPs. For projects that require authorization under Section 404 or Section 10 beyond a NWP, TxDOT complies with Section 401 of the Clean Water Act by including a Tier I or Tier II checklist (depending upon the amount of disturbance/impact) in the individual permit, letter of permission, or regional general permit application that is submitted to the USACE, and then complying with the conditions of the Tier I or Tier II checklist.

For more information regarding Section 401 of the Clean Water Act, see **ENV's Water Resources Handbook**.

VIII. Executive Order 11990, Protection of Wetlands

Select the appropriate statement below:

☐ This project is not federally funded and therefore is not subject to Executive Order 11990, Protection of Wetlands.

☐ This project is federally funded and therefore is subject to Executive Order 11990, Protection of Wetlands, and will not involve construction in any wetlands.

☒ This project is federally funded and therefore is subject to Executive Order 11990, Protection of Wetlands, and will involve construction in one or more wetlands. Explanation of how the project will comply with Executive Order 11990 is provided below.

Explanation of why there is no practicable alternative to such construction:

The proposed project consists of the expansion and realignment of an existing roadway. There are no technical and logistical factors that could avoid impacts to the waters of the U.S., including wetlands, within the proposed project limits as these resources are located perpendicular to and parallel with the existing roadway.

Explanation of how the project includes all practicable measures to minimize harm to wetlands:

There are no immediate design alternatives or facility re-configurations that have avoided affecting surface waters, while still satisfying the capacity improvement objectives. The existing linear transportation project runs perpendicular to and parallel with waters of the U.S., including wetlands. The No-Build Alternative would be the least environmentally damaging because it would not involve any construction activities that would impact waters of the U.S. However, this will not meet the need and purpose of the proposed project. The proposed project is needed because the existing FM 1173 within the project limits is inadequate to meet current and future traffic volumes, resulting in congestion and reduced mobility, and it fails to meet the current safety design standards due to the existing facility lacking ROW for pedestrians. The purpose of the proposed project is to provide infrastructure options to reduce traffic congestion on the existing roadways; to increase mobility (including pedestrian and bicycle accommodations); and, to address design deficiencies. Avoiding impacts to the waters of the U.S., including wetlands, is not possible because they run perpendicular to or parallel with the existing roadway. There are no other design alternatives or facility required reconfigurations that could avoid impacts to the waters of the U.S., including wetlands, while still satisfying the improvement objectives. An alternate location would require extensive land purchase and displacements, and would be inconsistent with the local and regional mobility plans. No alternative geographic area is supportable. The proposed ROW is the least amount required in order to meet the minimum requirements of the project.

For more information regarding Executive Order 11990, Protection of Wetlands, see **ENV's Water Resources Handbook**.

IX. Executive Order 11988, Floodplain Management

No project-specific analysis is required as part of the environmental review process under Executive Order 11988, Floodplain Management for the reasons provided below:

The department implements this Executive Order on a programmatic basis through its Hydraulic Design Manual. Design of this project will be conducted in accordance with the department's Hydraulic Design Manual. Adherence to the TxDOT Hydraulic Design Manual ensures that this project will not result in a "significant encroachment" as defined by FHWA's rules implementing Executive Order 11988 at 23 CFR 650.105(q).

For more information regarding Executive Order 11988, Floodplain Management, see **ENV's Water Resources Handbook**.

X. Drinking Water Systems

No project-specific analysis is required as part of the environmental review process for drinking water systems for the reasons provided below:

> In accordance with TxDOT's Standard Specifications for Construction and Maintenance of Highways, Streets and Bridges (Item 103, Disposal of Wells), any drinking water wells would need to be properly removed and disposed of during construction of the project.

XI. Resources Consulted

Indicate which resources were consulted/actions were taken to make the surface water determinations recorded in this form (DO NOT ATTACH TO THIS FORM OR UPLOAD TO ECOS ANY RESOURCES CONSULTED – JUST CHECK THE APPROPRIATE BOX(ES)):

☒ Aerial Photography (list dates mm/yyyy): 1996-2019

☒ Topographic Maps	☒ Floodplain Maps	
☒ Site Visit	☒ USFWS NWI Maps	☒ NRCS Soil Survey
☐ NHD	☒ TCEQ Streams/Waterbodies	☐ LIDAR
☐ USACE Approved JDs	☐ USACE Section 10 waters	☐ USACE 408 data

☒ TCEQ 303(d) Impaired Waters

☐ Contacted resource agency (list agency and reason):_____

☐ Other (list):_____

Section 404/10 Impacts Table

FM 1173

1059-01-047 and 1059-02-002

6/4/2020

Waterbody or wetland characteristics							Potentially Jurisdictional?		Total Section 404 impacts for WATERBODY OR WETLAND						Total section 404 impacts for CROSSING						Authorization			
									Temporary			Permanent			Temporary			Permanent						
Crossing number	Waterbody or wetland number	Name	Type	Latitude, Longitude	Acres within project area (all waterbodies and wetlands)	Linear feet within project area (streams only)	Section 404 (waters of the U.S.)	Section 10 (navigable waters)	Temporary waterbody or wetland impacts (acres)	Temporary stream impacts (linear feet/acres)	Cubic yards (CY) of fill material to be temporarily discharged	Permanent waterbody or wetland impacts (acres)	Permanent stream impacts (linear feet/acres)	Cubic yards (CY) of fill material to be permanently discharged	Temporary waterbody or wetland impacts (acres)	Temporary stream impacts (linear feet/acres)	Cubic yards (CY) of fill material to be temporarily discharged	Permanent waterbody or wetland impacts (acres)	Permanent stream impacts (linear feet/acres)	Cubic yards (CY) of fill material to be permanently discharged	Authorization Type	Number (NWP and RGP only)	Reason (PCN only)	Mitigation Required?
1	1	Jordan Creek	Intermittent stream	33.2599907455811 -97.2336207724162	0.06	288	Yes	No	0	0.02/38	64.53	0	0.03/200	96.8	0	0.02/38	64.53	0	0.03/200	96.8	NWP - No PCN	14		No
2	2A	unnamed tributary to Dry Fork Creek	Ephemeral stream	33.2594384850471 -97.2265116899424	0.03	197	Yes	No	0	0.01/84	8.07	0	0.02/84	16.13	0	0.01/84	8.07	0.06	0.02/84	112.93	NWP with PCN	14	wetlands impact	Yes
2	2B	wetland	Palustrine emergent	33.2596031989415 -97.2267702253102	0.10	N/A	Yes	No	0	0	0	0.06	0	96.80										
3	3A	Dry Fork Hickory Creek	Intermittent stream	33.2603328880305 -97.2203201141843	0.07	340	Yes	No	0	0.03/124	48.4	0	0	0	0	0.03/148	50.82	0.06	0.009/80	104.06	NWP with PCN	14	wetlands impact	Yes
3	3B	unnamed tributary to Dry Fork Hickory Creek	Intermittent stream	33.2605052883512 -97.2205481951735	0.01	104	Yes	No	0	0.003/24	2.42	0	0.009/80	7.26										
3	3C	wetland	Palustrine emergent	33.2600331350783 -97.2208974545305	0.19	N/A	Yes	No	0	0	0	0.06	0	96.80										
4	4	unnamed tributary to Dry Fork Hickory Creek	Intermittent stream	33.260259818802 -97.206877559057	0.004	60	Yes	No	0	0	0	0	0.03/47	96.80	0	0	0	0	0.03/47	96.80	NWP - No PCN	14		No
5	5	unnamed tributary to Milam Creek	Intermittent stream	33.2641318281219 -97.1794120643894	0.07	160	Yes	No	0	0.07/160	56.47	0	0	0	0	0.07/160	56.47	0	0	0	NWP - No PCN	14		No