IH 35W Frontage Roads Technical Reports

Table of Contents

Click a Report to Access

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

Air Quality Resources Technical Report

Interstate Highway (IH) 35W Frontage Roads

From: Dale Earnhardt Way
To: South of the IH 35E/IH35W Interchange

Denton County, Texas
Control-Section-Job (CSJ) 0081-13-065

Date: October 2019

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

THIS PAGE INTENTIONALLY LEFT BLANK

Table of Contents

Figures

Tables

Appendices

Appendix A: Exhibits – Project Location Map, USGS Topographic Map, Aerial Map, and Project Design Schematic.

- See the IH 35W Frontage Roads Environmental Assessment Appendix A – Maps
- See the IH 35W Frontage Roads Environmental Assessment Appendix C – Project Schematic
- See the IH 35W Frontage Roads Environmental Assessment Appendix D – Typical Sections

Appendix B: MTP and STIP Pages

- See the IH 35W Frontage Roads Environmental Assessment Appendix E - Plan and Program Excerpts

Appendix C: Traffic Data

1. PROJECT DESCRIPTION

The Texas Department of Transportation (TxDOT) is proposing improvements to Interstate Highway 35 West (IH 35W) from Dale Earnhardt Way in the City of Fort Worth to south of the IH 35E/IH35W interchange in the City of Denton, Denton County, Texas; a distance of approximately 12.3 miles. The proposed project consists of the construction of continuous, one-way, two-lane urban, northbound and southbound frontage roads, along IH 35W. Other improvements would include changing the IH 35W ramp configuration from a conventional diamond to a reverse diamond (X ramp); flipping the Farm-to-Market (FM) 1171 (Cross Timbers Road), Old Justin Road, and John Paine Road/Allred Road interchanges so that the IH 35W mainlanes cross over these streets; constructing an interchange for the future Denton Creek Road, and expanding the Cleveland Gibbs Road, FM 407, Robson Ranch Road/Crawford Road, and proposed Loop 288/Vintage Road interchanges. The proposed project would require approximately 106.45 acres of additional right-of-way (ROW). See **Appendix A: Exhibits – Project Location Map, USGS Topographic Map, Aerial Map,** and **Project Design Schematic**.

1.1 Need and Purpose

The proposed project is needed to address transportation issues associated with travel safety, population and employment growth, and access to development in the project corridor. The purpose of the project is to improve safety and provide access to adjacent land uses along IH 35W.

1.2 Existing Facility

1.2.1 Mainlanes

The existing IH 35W within the project limits does not contain frontage roads and consists of two 12-foot wide mainlanes in each direction with 4-foot to 6-foot wide inside shoulders and 9-foot to 12-foot wide outside shoulders separated by a 35-foot to 40-foot wide median.

1.2.2 Entrance/ Exit Ramps

The existing northbound and southbound entrance and exit ramps consist of one 14-foot wide lane with 2-foot wide inside shoulders and 10-foot wide outside shoulders. All of the existing ramp configurations at interchanges are of a conventional diamond design.

1.2.3 Interchanges

The existing Dale Earnhardt Way at IH 35W consists of two 12-foot wide eastbound and westbound travel lanes separated by 14-foot wide two-way left-turn lane, and 10-foot wide outside shoulders. Dale Earnhardt Way crosses over the IH 35W mainlanes.

The existing FM 1171 (Cross Timbers Road) at IH 35W consists of one 12-foot wide travel lane in each direction. FM 1171 (Cross Timbers Road) crosses over the IH 35W mainlanes.

The existing Cleveland Gibbs Road at IH 35W consists of one 12-foot wide travel lane in each direction. Cleveland Gibbs Road crosses over the IH 35W mainlanes.

The existing FM 407 at IH 35W consists of one 12-foot wide travel lane in each direction separated by 14-foot wide two-way left-turn lane. FM 407 crosses under the IH 35W mainlanes.

The existing Old Justin Road at IH 35W consists of one 12-foot wide travel lane in each direction. Old Justin Road crosses over the IH 35W mainlanes. There is no access to IH 35W from Old Justin Road.

The existing Robson Ranch Road west of IH 35W consists of one eastbound 12-foot wide travel lane, one eastbound 12-foot wide dedicated right-turn lane, and two westbound 12-foot wide travel lanes. The existing Crawford Road at IH 35W consists of one eastbound 12-foot wide travel lane and one westbound 12-foot wide travel lane. The IH 35W mainlanes cross over Robson Ranch Road/Crawford Road.

The existing John Paine/Allred Road at IH 35W consists of one eastbound 12-foot wide travel lane and one westbound 12-foot wide travel lane. John Paine/Allred Road crosses over the IH 35W mainlanes. There is no access to IH 35W from John Paine/Allred Road.

The existing FM 2449/Vintage Road at IH 35W consists of one eastbound 12-foot wide travel lane and one westbound 12-foot wide travel lane. FM 2449/Vintage Road crosses over the IH 35W mainlanes.

The typical sections for the existing mainlanes, ramps, and interchanges are shown on **Appendix A: Exhibits – Project Design Schematic**.

1.3 Proposed Facility

1.3.1 Mainlanes

The proposed project includes replacement of the existing IH 35W cross-street overpasses with new overpasses at IH 35W/Cross Timbers Road, IH 35W/FM 407, IH 35W/Old Justin Road, IH 35W/Robson Ranch Road/Crawford Road, and IH 35W/John Paine Road/Allred Road. The width of the bridge structures is based on the ultimate IH 35W mainlanes. Constructing the ultimate bridge structures along with changing the IH 35W ramp configuration from a conventional diamond to a reverse diamond (X ramp), requires portions of the ultimate IH 35W mainlanes to be constructed with transition pavement sections to tie back to the existing. The proposed mainlanes at the interchanges would consist of three 12-foot wide lanes in each direction with 10-foot wide inside shoulders and 12-foot wide outside shoulders.

1.3.2 Frontage Roads

The proposed northbound and southbound frontage roads would consist of one 12-foot wide inside travel lane, one 14-foot wide outside shared use lane with 2-foot wide curb offsets, and a 6-foot wide sidewalk in each direction.

The proposed northbound and southbound frontage road bridges would consist of one 12-foot-wide inside travel lane, one 14-foot wide outside shared use lane with two-foot wide inside and outside shoulders, and an 8-foot wide sidewalk in each direction.

1.3.3 Entrance/ Exit Ramps

The proposed northbound and southbound entrance and exit ramps would consist of one 14-foot wide lane with 4-foot wide inside shoulders and 8-foot wide outside shoulders. All of the proposed ramp configurations at interchanges would be of a reverse diamond (X ramp) design.

1.3.4 Interchanges

The proposed Dale Earnhardt Way at IH 35W would consist of one inside 12-foot wide travel lane, one 14-foot wide outside shared use lane with a 2-foot wide curb offset, a 10-foot wide outside median, and a 20-foot wide U-turn lane with 2-foot wide inside and outside curb offsets in each direction. The eastbound and westbound roadways would be separated by a 14-foot wide two-way left-turn lane.

The proposed FM 1171 (Cross Timbers Road) at IH 35W would consist of one inside 12-foot wide dedicated left-turn lane with a 2-foot wide inside curb offset, two 12-foot wide travel lanes, one 14-foot wide outside shared use lane with a 2-foot wide outside curb offset, an 18 foot wide outside median, and a 20-foot wide U-turn lane with 2-foot wide inside and outside curb offsets in each direction. FM 1171 (Cross Timbers Road) would be flipped so that the IH 35W mainlanes cross over FM 1171 (Cross Timbers Road).

The proposed eastbound Cleveland Gibbs Road at IH 35W would consist of one inside 12-foot wide dedicated left-turn lane with a 2-foot wide inside curb offset, one 12-foot wide travel lane, and one outside 14-foot wide shared use lane. The westbound roadway would consist of one inside 12-foot wide dedicated left-turn lane with a 2-foot wide inside curb offset, one 12-foot wide travel lane, one 14-foot wide outside shared use lane with a 2-foot wide outside curb offset, an 18-foot wide outside median, and a 20-foot wide U-turn lane with 2-foot wide inside and outside curb offsets. The interchange would be relocated approximately 400 feet north of its existing location and would tie into a future Cleveland Gibbs Road designed and constructed by others.

The proposed eastbound Denton Creek Road at IH 35W is a new interchange and would consist of one inside 12-foot wide dedicated left-turn lane with a 2-foot wide inside curb offset, one 12-foot wide travel lane, one 14-foot wide outside shared use lane with a 2-foot wide

outside curb offset, an 18-foot wide outside median, and a 20-foot wide U-turn lane with 2-foot wide inside and outside curb offsets. The westbound roadway would consist of one inside 12-foot-wide dedicated left-turn lane with a 2-foot wide inside curb offset, one 12-foot wide travel lane, and one outside 14-foot wide shared use lane. The new interchange would tie into a future Denton Creek Road designed and constructed by others.

The proposed FM 407 at IH 35W would consist of one inside 12-foot wide dedicated left-turn lane with a 2-foot wide inside curb offset, two 12-foot wide travel lanes, one 14-foot wide outside shared use lane with a 2-foot wide outside curb offset, an 18-foot wide outside median, and a 20-foot wide U-turn lane with 2-foot wide inside and outside curb offsets in each direction.

The proposed Old Justin Road at IH 35W interchange would consist of one inside 12-foot wide dedicated left-turn lane with a 2-foot wide inside curb offset, one 12-foot wide travel lane, one 14-foot wide outside shared use lane with a 2-foot wide outside curb offset, an 18-foot wide outside median, and a 20-foot wide U-turn lane with 2-foot wide inside and outside curb offsets in each direction. Old Justin Road would be flipped so that the IH 35W mainlanes cross over Old Justin Road and access from Justin Road to IH 35W would be provided via ramps.

The proposed Robson Ranch Road/Crawford Road at the IH 35W interchange would consist of one inside 12-foot wide dedicated left-turn lane with a 2-foot wide inside curb offset, one 12-foot wide travel lane, one 14-foot wide outside shared use lane with a 2-foot wide outside curb offset, an 18-foot wide outside median, and a 20-foot wide U-turn lane with 2-foot wide inside and outside curb offsets in each direction.

The proposed Loop 288/Vintage Road (FM 2499) at the IH 35W interchange would consist of one inside 12-foot wide dedicated left-turn lane with a 2-foot wide inside curb offset, one 12-foot wide travel lane, one 14-foot wide outside shared use lane with a 2-foot wide outside curb offset, an 18-foot wide outside median, and a 20-foot wide U-turn lane with 2-foot wide inside and outside curb offsets in each direction.

The proposed improvements and typical sections are shown on **Appendix A: Exhibits – Project Design Schematic**.

2. AIR QUALITY ASSESSMENT

2.1 Transportation Conformity

This project is located within an area designated by the U.S. Environmental Protection Agency (EPA) as a serious and marginal nonattainment area for the 2008 and 2015 ozone national ambient air quality standards (NAAQS), respectively; therefore, transportation conformity rules apply. Conformity for older standards is satisfied by conformity to the more stringent 2008 and 2015 ozone NAAQS.

The MTP and TIP were found to conform to the TCEQ State Implementation Plan (SIP) by FHWA and FTA on November 21, 2018 and September 28, 2018, respectively; however, the proposed project is not consistent with this conformity determination. The proposed project is consistent with the current NCTCOG financially constrained Mobility 2045, but is not currently listed in the 2019-2022 TIP. This project has been submitted for inclusion in the August 2019 State Transportation Improvement Program (STIP) revision cycle (expected approval November 2019). TxDOT will not take final action on this environmental document until the proposed project is consistent with a currently conforming MTP and TIP. Copies of the MTP and NCTCOG Appendix D pages are included in **Appendix B**

2.2 CO Traffic Air Quality Analysis (TAQA)

Traffic data for the estimated time of completion (ETC) year 2028 and design year 2045 is 96,120 vehicles per day and 126,850 vehicles per day, respectively (**Appendix C: Traffic Data**). A prior TxDOT modeling study and previous analyses of similar projects demonstrated that it is unlikely that the carbon monoxide standard would ever be exceeded as a result of any project with an average annual daily traffic (AADT) below 140,000. The AADT projections for the project do not exceed 140,000 vehicles per day; therefore, a Traffic Air Quality Analysis was not required.

2.3 Mobile Source Air Toxics (MSAT)

Background

Controlling air toxic emissions became a national priority with the passage of the Clean Air Act Amendments (CAAA) of 1990, whereby Congress mandated that the U.S. Environmental Protection Agency (EPA) regulate 188 air toxics, also known as hazardous air pollutants. The EPA has assessed this expansive list in their latest rule on the Control of Hazardous Air Pollutants from Mobile Sources (Federal Register, Vol. 72, No. 37, page 8,430, February 26, 2007), and identified a group of 93 compounds emitted from mobile sources that are listed in their Integrated Risk Information System (IRIS)[1]. In addition, EPA identified nine compounds with significant contributions from mobile sources that are among the national and regional-scale cancer risk drivers or contributors and non-cancer hazard contributors from the 2011 National Air Toxics Assessment (NATA)[2]. These are 1,3-butadiene, acetaldehyde, acrolein, benzene, diesel particulate matter (diesel PM), ethylbenzene, formaldehyde, naphthalene, and polycyclic organic matter. While FHWA considers these the priority mobile source air toxics, the list is subject to change and may be adjusted in consideration of future EPA rules.

[1] http://www.epa.gov/iris/

[2] https://www.epa.gov/national-air-toxics-assessment

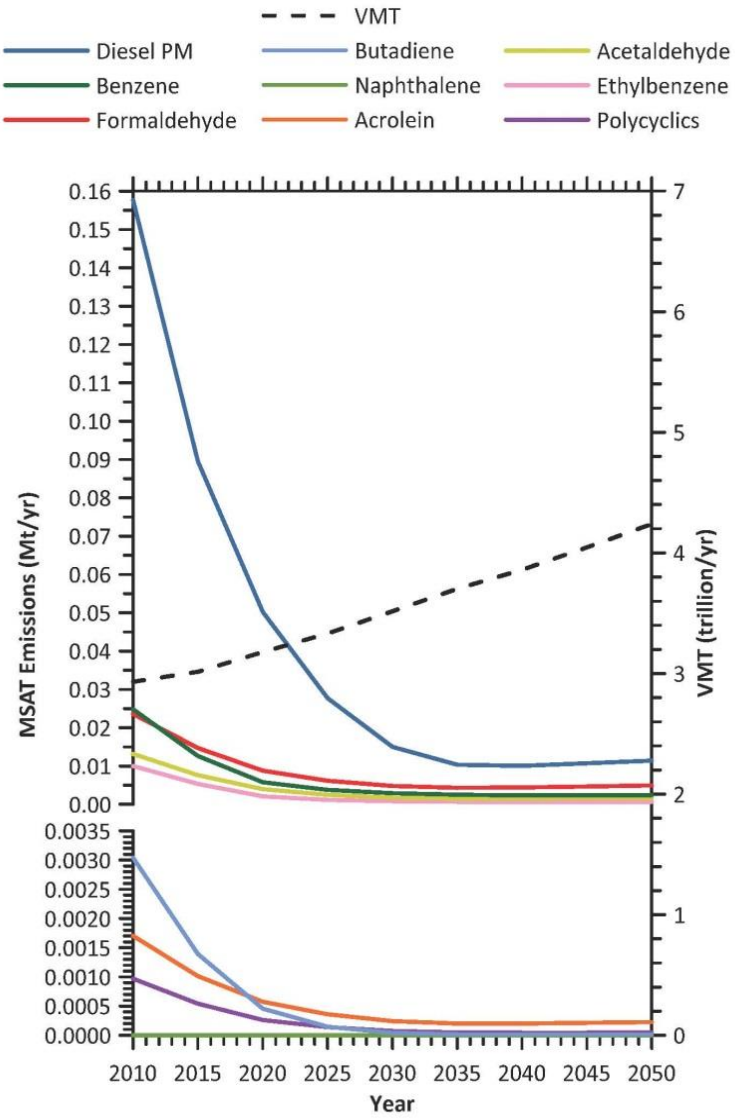
Motor Vehicle Emissions Simulator (MOVES)

According to EPA, MOVES2014 is a major revision to MOVES2010 and improves upon it in many respects. MOVES2014 includes new data, new emissions standards, and new functional improvements and features. It incorporates substantial new data for emissions, fleet, and activity developed since the release of MOVES2010. These new emissions data are for light- and heavy-duty vehicles, exhaust and evaporative emissions, and fuel effects. MOVES2014 also adds updated vehicle sales, population, age distribution, and vehicle miles travelled (VMT) data. MOVES2014 incorporates the effects of three new Federal emissions standard rules not included in MOVES2010. These new standards are all expected to impact MSAT emissions and include Tier 3 emissions and fuel standards starting in 2017 (79 FR 60344), heavy-duty greenhouse gas regulations that phase in during model years 2014-2018 (79 FR 60344), and the second phase of light duty greenhouse gas regulations that phase in during model years 2017-2025 (79 FR 60344). Since the release of MOVES2014, EPA has released MOVES2014a. In the November 2015 MOVES2014a Questions and Answers Guide[3]. EPA states that for on-road emissions, MOVES2014a adds new options requested by users for the input of local VMT, includes minor updates to the default fuel tables, and corrects an error in MOVES2014 brake wear emissions. The change in brake wear emissions results in small decreases in PM emissions, while emissions for other criteria pollutants remain essentially the same as MOVES2014.

Using EPA's MOVES2014a model, as shown in **Figure 1**, FHWA estimates that even if VMT increases by 45 percent from 2010 to 2050 as forecast, a combined reduction of 91 percent in the total annual emissions for the priority MSAT is projected for the same time period.

[3] https://nepis.epa.gov/Exe/ZyPDF.cgi?Dockey=P100NNR0.txt

Figure 1: Projected National MSAT Emission Trends 2010 – 2050 for Vehicles Operating on Roadways Using EPA's Moves2014a Model



Source: EPA MOVES2014a model runs conducted by FHWA, September 2016.
Note: Trends for specific locations may be different, depending on locally derived information representing vehicle-miles travelled, vehicle speeds, vehicle mix, fuels, emission control programs, meteorological, and other factors.

Diesel PM is the dominant component of MSAT emissions, making up 50 to 70 percent of all priority MSAT pollutants by mass, depending on calendar year. Users of MOVES2014a will notice some differences in emissions compared with MOVES2010b. MOVES2014a is based on updated data on some emissions and pollutant processes compared to MOVES2010b, and also reflects the latest Federal emissions standards in place at the time of its release. In addition, MOVES2014a emissions forecasts are based on lower VMT projections than

MOVES2010b, consistent with recent trends suggesting reduced nationwide VMT growth compared to historical trends.

MSAT Research

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

Project Specific MSAT Information

A qualitative analysis provides a basis for identifying and comparing the potential differences among MSAT emissions, if any, from the various alternatives. The qualitative assessment presented below is derived in part from a study conducted by FHWA entitled A Methodology for Evaluating Mobile Source Air Toxic Emissions Among Transportation Project Alternatives[4].

The VMT estimated for each of the Build Alternatives is slightly higher than that for the No Build Alternative, because the additional capacity increases the efficiency of the roadway and attracts rerouted trips from elsewhere in the transportation network. The additional travel lanes contemplated as part of the project alternatives will have the effect of moving some traffic closer to nearby homes, schools, and businesses; therefore, under each alternative there may be localized areas where ambient concentrations of MSAT could be higher under certain Build Alternatives than the No Build Alternative. The localized increases in MSAT concentrations would likely be most pronounced along the expanded roadway sections that would be built at the IH 35W at the Dale Earnhardt Way, FM 1171 (Cross Timbers Road), Cleveland Gibbs Road, Denton Creek Road, FM 407, Old Justin Road, Robson Ranch Road/Crawford Road, John Paine Road/Allred Road, and proposed Loop 288/Vintage Road intersections. However, the magnitude and the duration of these potential increases cannot be reliably quantified due to incomplete or unavailable information in forecasting project-specific MSAT health impacts. Also, MSAT will be lower in other locations when traffic shifts away from them. However, on a regional basis, EPA's vehicle and fuel regulations, coupled with fleet turnover, will over time cause substantial reductions that, in almost all cases, will cause region- wide MSAT levels to be significantly lower than today.

[4] https://www.fhwa.dot.gov/environment/air_quality/air_toxics/research_and_analysis/mobile_source_air_toxics/msatemissions.cfm.

Incomplete or Unavailable Information for Project-Specific MSAT Health Impacts Analysis

In FHWA's view, information is incomplete or unavailable to credibly predict the project-specific health impacts due to changes in MSAT emissions associated with a proposed set of highway alternatives. The outcome of such an assessment, adverse or not, would be influenced more by the uncertainty introduced into the process through assumption and speculation rather than any genuine insight into the actual health impacts directly attributable to MSAT exposure associated with a proposed action. Consistent with 40 CFR 1502.22 (regarding incomplete and unavailable information) FHWA does not conduct MSAT health impacts for the reasons described below.

The U.S. Environmental Protection Agency (EPA) is responsible for protecting the public health and welfare from any known or anticipated effect of an air pollutant. They are the lead authority for administering the Clean Air Act and its amendments and have specific statutory obligations with respect to hazardous air pollutants and MSAT. The EPA is in the continual process of assessing human health effects, exposures, and risks posed by air pollutants. They maintain the Integrated Risk Information System (IRIS), which is "a compilation of electronic reports on specific substances found in the environment and their potential to cause human health effects"[5]. Each report contains assessments of non-cancerous and cancerous effects for individual compounds and quantitative estimates of risk levels from lifetime oral and inhalation exposures with uncertainty spanning perhaps an order of magnitude.

Other organizations are also active in the research and analyses of the human health effects of MSAT, including the Health Effects Institute (HEI). A number of HEI studies are summarized in Appendix D of FHWA's Updated Interim Guidance on Mobile Source Air Toxic Analysis in NEPA Documents[6]. Among the adverse health effects linked to MSAT compounds at high exposures are; cancer in humans in occupational settings; cancer in animals; and irritation to the respiratory tract, including the exacerbation of asthma. Less obvious is the adverse human health effects of MSAT compounds at current environmental concentrations[7] or in the future as vehicle emissions substantially decrease.

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

[5] EPA, http://www.epa.gov/iris/

[6] http://www.fhwa.dot.gov/environment/air_quality/air_toxics/policy_and_guidance/msat/index.cfm

[7] HEI Special Report 16, https://www.healtheffects.org/publication/mobile-source-air-toxics-critical-review-literature-exposure-and-health-effects

vehicle technology (which affects emissions rates) over that time frame, since such information is unavailable.

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

There are considerable uncertainties associated with the existing estimates of toxicity of the various MSAT, because of factors such as low-dose extrapolation and translation of occupational exposure data to the general population, a concern expressed by HEI[8]. As a result, there is no national consensus on air dose-response values assumed to protect the public health and welfare for MSAT compounds, and in particular for diesel PM. The EPA states that with respect to diesel engine exhaust, "[t]he absence of adequate data to develop a sufficiently confident dose-response relationship from the epidemiologic studies has prevented the estimation of inhalation carcinogenic risk[9].

There is also the lack of a national consensus on an acceptable level of risk. The current context is the process used by the EPA as provided by the Clean Air Act to determine whether more stringent controls are required in order to provide an ample margin of safety to protect public health or to prevent an adverse environmental effect for industrial sources subject to the maximum achievable control technology standards, such as benzene emissions from refineries. The decision framework is a two-step process. The first step requires EPA to determine an "acceptable" level of risk due to emissions from a source, which is generally no greater than approximately 100 in a million. Additional factors are considered in the second step, the goal of which is to maximize the number of people with risks less than 1 in a million due to emissions from a source. The results of this statutory two-step process do not guarantee that cancer risks from exposure to air toxics are less than 1 in a million; in some cases, the residual risk determination could result in maximum individual cancer risks that are as high as approximately 100 in a million. In a June 2008 decision, the U.S. Court of Appeals for the District of Columbia Circuit upheld EPA's approach to addressing risk in its two-step decision framework. Information is incomplete or unavailable to establish that even the largest of highway projects would result in levels of risk greater than deemed acceptable[10].

---

[8] Special Report 16, https://www.healtheffects.org/publication/mobile-source-air-toxics-critical-review-literature-exposure-and-health-effects

[9] EPA IRIS database, Diesel Engine Exhaust, Section II.C. https://cfpub.epa.gov/ncea/iris/iris_documents/documents/subst/0642_summary.pdf

[10] https://www.cadc.uscourts.gov/internet/opinions.nsf/284E23FFE079CD59852578000050C9DA/$file/07-1053-1120274.pdf

2.4 Congestion Management Process (CMP)

The CMP is a systematic process for managing congestion that provides information on transportation system performance and on alternative strategies for alleviating congestion and enhancing the mobility of persons and goods to levels that meet state and local needs. The project was developed from the NCTCOG's CMP, which meets all requirements of 23 CFR 450.320 and 500.109, as applicable. The CMP was adopted by NCTCOG on January 2014.

The region commits to operational improvements and travel demand reduction strategies at two levels of implementation: program level and project level. Program level commitments are inventoried in the regional CMP, which was adopted by NCTCOG; they are included in the financially constrained MTP, and future resources are reserved for their implementation.

The CMP element of the plan carries an inventory of all project commitments (including those resulting from major investment studies) that details type of strategy, implementing responsibilities, schedules, and expected costs. At the project's programming stage, travel demand reduction strategies and commitments will be added to the regional TIP or included in the construction plans. The regional TIP provides for programming of these projects at the appropriate time with respect to the single occupancy vehicle (SOV) facility implementation and project-specific elements.

Committed congestion reduction strategies and operational improvements within the study boundary will consist of addition of shared use lanes; dedicated left-turn and right-turn lanes, and sidewalks. Individual projects are listed in **Table 1**.

Table 1: Congestion Process Management Strategies

Operational Improvements in Travel Corridor			
Location	Type	Project Code	Implementation Date
SH 114 From East of FM 156 to West of IH 35W	New Roadway	53195.00	2028
US 377 From Crawford Road to North of Hickory Creek	Addition of Lanes	55242.00	2045
IH 35W From SH 114 to IH 35W/IH 35E Interchange	Addition of Lanes	55242.00	2045
FM 1515 From Bonnie Brae to Masch Branch	Addition of Lanes	55239.00	2045
IH 35W From Tarrant County Line to SH 114	Addition of Lanes	55230.00	2045

Source: NCTCOG Transportation Improvement Program Information System (TIPINS). Accessed September 2, 2019.

In an effort to reduce congestion and the need for SOV lanes in the region, TxDOT and NCTCOG will continue to promote appropriate congestion reduction strategies through the Congestion Mitigation and Air Quality Improvement (CMAQ) program, the CMP, and the MTP. The congestion reduction strategies considered for this project would help alleviate congestion in the SOV study boundary, but would not eliminate it.

Therefore, the proposed project is justified. The CMP analysis for added SOV capacity projects in the Transportation Management Area (TMA) is on file and available for review at NCTCOG.

2.5 Air Quality Construction Emissions Reduction Strategies

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

The potential impacts of PM emissions will be minimized by using fugitive dust control measures contained in standard specifications, as appropriate. The Texas Emissions Reduction Plan (TERP) provides financial incentives to reduce emissions from vehicles and equipment. TxDOT encourages construction contractors to use this and other local and federal incentive programs to the fullest extent possible to minimize diesel emissions. Information about the TERP program can be found on TCEQ's TERP website[11].

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

[11] http://www.tceq.texas.gov/airquality/terp/

Appendix C
Traffic Data

Texas Department of Transportation

MEMO

August 27, 2019

To: Mohamed "Mo" K. Bur, P.E., District Engineer
Attention: Lacey G. Rodgers, P.E., Director of TPD

Through: William E. Knowles, P.E.
Traffic Analysis Section Director, TPP

From: James Burnett
Planner, TPP

Subject: Traffic Data
CSJ: 0081-13-065
I-35W:
From Dale Earnhardt Way
To I-35E/I-35W Split
Denton County

Attached are diagrams depicting 2025, 2045 and 2055 average daily traffic volumes and turning movements on I-35W from Dale Earnhardt Way to I-35E/I-35W Split for no-build and build conditions. Also attached are tabulations showing traffic analysis for highway design for the 2025 to 2045 twenty year period and 2025 to 2055 thirty year period for the described limits of the route. Also included are tabulations showing data for use in air and noise analysis.

Please refer to your original request memorandum dated June 13, 2018.

If you have any questions or need additional information, please contact James Burnett at (512) 486-5165.

Attachments

CC: Nelson L. Underwood, P.E.
Transportation Engineer, Dallas District

TRAFFIC ANALYSIS FOR HIGHWAY DESIGN

Dallas District

August 16, 2019

Description of Location	Average Daily Traffic 2025	Average Daily Traffic 2045	Base Year Dir Dist %	Base Year K Factor	Base Year Percent Trucks ADT	Base Year Percent Trucks DHV	ATHWLD	Percent Tandem Axles in ATHWLD	Total Number of Equivalent 18k Single Axle Load Applications One Direction Expected for a 20 Year Period (2025 to 2045) Flexible Pavement	SN	Rigid Pavement	SLAB
I-35W - Phase 1 - No-Build Conditions - MLs From Dale Earnhardt Way To I-35E/I-35W Split Denton County	72,600	101,300	50 - 50	8.6	10.7	4.8	12,900	40	33,940,000	3	47,926,000	8"

Data for Use in Air & Noise Analysis

Vehicle Class	Base Year % of ADT	Base Year % of DHV
Light Duty	89.3	95.2
Medium Duty	2.3	1.0
Heavy Duty	8.4	3.8

Description of Location	Average Daily Traffic 2025	Average Daily Traffic 2055	Base Year Dir Dist %	Base Year K Factor	Base Year Percent Trucks ADT	Base Year Percent Trucks DHV	ATHWLD	Percent Tandem Axles in ATHWLD	Total Number of Equivalent 18k Single Axle Load Applications One Direction Expected for a 30 Year Period (2025 to 2055) Flexible Pavement	SN	Rigid Pavement	SLAB
I-35W - Phase 1 - No-Build Conditions - MLs From Dale Earnhardt Way To I-35E/I-35W Split Denton County	72,600	113,500	50 - 50	8.6	10.7	4.8	13,000	40	54,481,000	3	76,930,000	8"

NOT INTENDED FOR CONSTRUCTIO
BIDDING OR PERMIT PURPOSES
William Erick Knowles, P.E
Serial Number 84704

TRAFFIC ANALYSIS FOR HIGHWAY DESIGN

Dallas District

August 16, 2019

Description of Location	Average Daily Traffic 2025	Average Daily Traffic 2045	Base Year Dir Dist %	Base Year K Factor	Base Year Percent Trucks ADT	Base Year Percent Trucks DHV	ATHWLD	Percent Tandem Axles in ATHWLD	Total Number of Equivalent 18k Single Axle Load Applications One Direction Expected for a 20 Year Period (2025 to 2045) Flexible Pavement	S N	Rigid Pavement	SLAB
I-35W - Phase 1 - Build Conditions - MLs From Dale Earnhardt Way To I-35E/I-35W Split Denton County	78,800	110,250	50 - 50	8.6	10.7	4.8	13,000	40	36,897,000	3	52,101,000	8"

Data for Use in Air & Noise Analysis

Vehicle Class	Base Year % of ADT	Base Year % of DHV
Light Duty	89.3	95.2
Medium Duty	2.3	1.0
Heavy Duty	8.4	3.8

Description of Location	Average Daily Traffic 2025	Average Daily Traffic 2055	Base Year Dir Dist %	Base Year K Factor	Base Year Percent Trucks ADT	Base Year Percent Trucks DHV	ATHWLD	Percent Tandem Axles in ATHWLD	Total Number of Equivalent 18k Single Axle Load Applications One Direction Expected for a 30 Year Period (2025 to 2055) Flexible Pavement	S N	Rigid Pavement	SLAB
I-35W - Phase 1 - Build Conditions - MLs From Dale Earnhardt Way To I-35E/I-35W Split Denton County	78,800	123,300	50 - 50	8.6	10.7	4.8	13,000	40	59,161,000	3	83,539,000	8"

TRAFFIC ANALYSIS FOR HIGHWAY DESIGN

Dallas District

August 16, 2019

Description of Location	Average Daily Traffic 2025	Average Daily Traffic 2045	Base Year Dir Dist %	Base Year K Factor	Base Year Percent Trucks ADT	Base Year Percent Trucks DHV	ATHWLD	Percent Tandem Axles in ATHWLD	Total Number of Equivalent 18k Single Axle Load Applications One Direction Expected for a 20 Year Period (2025 to 2045) Flexible Pavement	SN	Rigid Pavement	SLAB
I-35W - Phase 1 - Build Conditions - FRs From Dale Earnhardt Way To I-35E/I-35W Split Denton County	11,900	16,600	50 - 50	8.6	10.9	8.2	11,600	40	4,457,000	3	5,834,000	8"

Data for Use in Air & Noise Analysis

Vehicle Class	Base Year % of ADT	Base Year % of DHV
Light Duty	89.1	91.8
Medium Duty	2.3	1.7
Heavy Duty	8.6	6.5

Description of Location	Average Daily Traffic 2025	Average Daily Traffic 2055	Base Year Dir Dist %	Base Year K Factor	Base Year Percent Trucks ADT	Base Year Percent Trucks DHV	ATHWLD	Percent Tandem Axles in ATHWLD	Total Number of Equivalent 18k Single Axle Load Applications One Direction Expected for a 30 Year Period (2025 to 2055) Flexible Pavement	SN	Rigid Pavement	SLAB
I-35W - Phase 1 - Build Conditions - FRs From Dale Earnhardt Way To I-35E/I-35W Split Denton County	11,900	18,600	50 - 50	8.6	10.9	8.2	11,700	40	7,155,000	3	9,365,000	8"

Archeological Background Study

Interstate Highway 35 West (IH35W) Frontage Roads From Dale Earnhardt Way to south of the IH35E/IH35W Interchange Denton County, Texas CSJ: 0081-13-065

Prepared by: Dean T. Sather, RPA, Jacobs Engineering Group Inc.

September 2019

Contents

List of Exhibits

1 Introduction

1.1 Proposed Project Overview

The Texas Department of Transportation (TxDOT) is proposing improvements to approximately 12.3 miles along the eastern and western margins of Interstate Highway (IH) 35 West (35W) from Dale Earnhardt Way in the City of Fort Worth to south of the IH 35 East (35E)/IH35W interchange in the City of Denton, Denton County, Texas (**Exhibits 1, 2, 3, and 5**). The proposed project consists of the construction of continuous, one-way, two-lane urban, northbound and southbound frontage roads, along the IH 35W corridor. Other improvements would include: 1) altering the IH 35W ramp configuration from a conventional diamond to a reverse diamond (X ramp); 2) flipping the interchanges for Farm-to-Market (FM) 1171 (Cross Timbers Road), Old Justin Road, and John Paine Road/Allred Road to allow the IH 35W mainlanes to cross over these streets; 3) constructing an interchange for the future Denton Creek Road, and 4) expanding the Cleveland Gibbs Road, FM 407, Robson Ranch Road/Crawford Road, and proposed Loop 288/Vintage Road interchanges. The proposed project would require approximately 106.45 acres of additional right-of-way (ROW). The purpose of this technical report was to evaluate the potential impacts to archeological resources in relation to the current proposed project ROW.

1.2 Purpose and Need

The proposed project is needed to address transportation issues associated with travel safety, population and employment growth, and access to development in the project corridor. The purpose of the project is to improve safety and provide access to adjacent land uses.

1.2.1 Travel Safety

The proposed project would improve safety on IH 35W by reconstructing the interchanges to current design standards, changing the IH 35W ramp configurations from a conventional diamond to a reverse diamond (X ramp), and adding continuous, one-way, two-lane urban, northbound and southbound frontage roads. The reconstructed interchanges would have added capacity and improved traffic flow. Reversing the entrance ramps with exit ramps or vice versa to an X ramp configuration reduces ramp queue spillback onto the mainlanes. The

addition of frontage roads would provide an alternative route for emergency services to access crashes or other incidents on IH 35W. In addition, traffic on IH 35W could bypass the freeway closure by using the frontage roads.

1.2.2 Population and Employment

According to North Central Texas Council of Governments (NCTCOG) population projections, the 2017 population of Denton County was 804,396 persons and the 2045 population is projected to be 1,346,316 persons; an increase in growth of approximately 67.3%. The 2020 projected populations for five of the six cities or towns in the IH 35W project area are anticipated to grow from 23.1 to 589.1% by 2040.

According to the NCTCOG, 4,584,235 persons were employed in the 12-county Dallas-Fort Worth (DFW) – Metropolitan Planning Area (MPA) in 2017. By 2045, 7,024,227 persons are expected to be employed in the same 12-county DFW MPA. This represents an increase of approximately 53.2 percent. In Denton County, 298,071 persons were forecasted to be employed in 2017. By 2045, Denton County employment is projected to be 479,619 persons; an increase in growth of approximately 60.9%.

1.2.3 Access to Development

The IH 35W corridor is one of the last areas north of DFW with capacity for the development of large master planned communities with access to major employment centers. Several existing and planned residential and commercial developments are under construction or are pending along the IH 35W corridor. The proposed frontage roads would facilitate access to these developments and employment centers.

2 Archeological Resources

2.1 Previous Cultural Resource Investigations

Jacobs' archeologists conducted background research online through the Texas Historical Commission (THC) Archeological Sites Atlas in August 2019. That research was done to search identify previously executed cultural resource surveys within the Area of Potential Effects (APE) or the 1 km-wide search area. The APE is defined as the area within which a project may physically or visually change the character or use of an historic property and includes the full extent of the project elements described above.

Nine previously completed cultural resource surveys were identified within the 1 km-wide search area. Only one of these surveys (THC Atlas # 8400010580) intersected the project APE. A summary of the previously completed cultural surveys are provided in **Table 1-1**.

Table 1-1: Previously Completed Cultural Resource Surveys

THC Atlas #	County	Type of Survey	Survey Date	Report Author	Sponsor Agency	Intersect APE
8400010580	Denton	Line	2003	Huhnke (GMI, Inc.)	USACE-Fort Worth	Yes
8400010803	Denton	Line	2003	Huhnke (GMI, Inc.)	USACE-Fort Worth	No
8500008839	Denton	Area	1982	NA	USACE-Fort Worth	No
8500012389	Denton	Area	2004	Largent, Huhnke & Wurz (GMI, Inc.)	TxDOT	No
8500019887	Denton	Area	2009	Dowling & Feit (Ecological Communications Corp.)	TxDOT	No
8500025593	Denton	Area	2012	Brandon (Blanton & Associates)	City of Denton, USACE	No
8500058347	Denton	Area	2012	Jesse (AJC Environmental)	BLM	No
8500066377	Denton	Area	2010	Dowling (Ecological Communications Corp.)	TxDOT	No
8500076577	Denton	Area	2015	Hanselka, Kevin	TxDOT	No

Source: Texas Historical Commission (THC)

Survey **8400010580** consisted of a linear survey completed in 2003 for the United States Army Corps of Engineers (USACE) Fort Worth District. As indicated in Table 1-1 above, portions of Survey **8400010580** intersect with the current Project APE. There is no indication that any cultural resource sites were recorded as the result of this surveys.

Two of the surveys, **8500008839** and **8500058347** consist of block area surveys located near the southern terminus of the Project Area. Both are situated entirely within the 1 km-wide search area and abut to, but do not intersect with the APE. Survey **8500008839** was conducted in 1982 for the USACE Fort Worth District. Survey **8500058347** was conducted in 2012 for the Bureau of Land Management (BLM). While both surveys are located within the 1 km-wide search area, there is no indication that any cultural resource sites were recorded as the result of these surveys.

The remaining five surveys (**8500012389**, **8500019887**, **8500025593**, **8500066377**, and **8500076577**) consist of block area surveys located throughout the 1 km-wide search area. Survey **8500012389** was conducted in 2004 in support of the TxDOT proposed realignment of IH 35E. Survey **8500019887** was conducted in 2009 in support of the TxDOT proposed replacement of eight off-system bridges in Denton County. Survey **8500025593** was conducted in 2012 in support of the USACE and City of Denton proposed road improvements along Bonnie Brae Street. Survey **8500066337** was conducted in 2010 in support of the TxDOT proposed new segment Loop 288. Survey **8500076577** was conducted in 2015 in support of the TxDOT proposed tree planting mitigation project associated with the FM 1171 widening project. No cultural resource sites were documented within the APE or the 1 km-wide search area as a result of these five surveys.

2.2 Previously Recorded Archeological Sites

Jacobs' archeologists conducted background research online through the THC Archeological Sites Atlas in August 2019. That research was done to search for previously recorded sites, NRHP-listed sites, and SALs within 1 km of the APE. Two previously recorded sites were found in the 1 km-wide search area (**Exhibit 4**). The sites are described in detail below with information obtained from the THC Sites Atlas.

2.2.1 Site 41DN544

Site 41DN544 was recorded in 2006 by Jesse Todd during a survey for a private development project. The site is a stone lined fire hearth situated along the bank of an intermittent drainage feature. The site is located approximately 1km (3,350 feet) west of the APE. Radiocarbon dates the site to the Late Prehistoric / Neo American period. Cultural materials found at the site included shell fragments, fire-cracked rock (FCR), a metate, and charcoal. The recording archeologist recommended that the site requires additional investigation to determine the extent of the site and to determine if additional cultural deposits were present. The site has not been evaluated for National Register of Historic Places eligibility.

2.2.2 Site 41DN546

Site 41DN546 was recorded in 2006 by Jesse Todd during a survey for a private development project. The site is a buried site situated in deposits along the bank of an intermittent drainage tributary of Hickory Creek. The site is located approximately 1.1km (3,600 feet) west of the APE. The age of the site is undetermined. Cultural materials found at the site included shell fragments, fire-cracked rock (FCR), burned bone fragments, a mano, and charcoal. The recording archeologist recommended that the site requires additional investigation to determine the extent of the site and to determine if additional cultural deposits were present. The site has not been evaluated for National Register of Historic Places eligibility.

2.3 Physiography

Denton County is in the Cross Timbers and Prairies Ecological Region, as defined by Texas Parks and Wildlife Department (2012) and the Eastern Cross Timbers and Grand Prairie sub-regions described by the U.S. Environmental Protection Agency (Griffith, et. al. 2004). Historically, this sub-region was vegetated in woodlands dominated by post oak, blackjack oak, cedar elm, hickory, Osage orange (Bois D'Arc), eastern red cedar and a variety of brush and grass species. Much of the woodlands of this region have been cleared for pasture, cropland and residential and commercial development, making it the most fragmented vegetative region in Texas (TPWD 2012). The project area exhibits a relatively level

topography with elevations ranging from approximately 560ft to 770ft above mean sea level (msl).

2.4 Geology

According to the Geological Atlas of Texas, Sherman Sheet (McGowen et. al. 1967, revised 1991), the APE intersects three geologic formations; 1) Pleistocene/Holocene Alluvium, 2) the Lower Cretaceous Pawpaw Formation, and 3) Lower to Upper Cretaceous Grayson Marl.

The Pleistocene/Holocene Alluvium consists of sand, silt, clay and gravel alluvium and terrace deposits of variable thickness located along streams These deposits are concentrated along the major water crossings. In the southern portion of the APE, the alluvial deposits are adjacent to Denton Creek and cover approximately 1.5 miles. In the northern portion of the APE, the alluvial deposits are adjacent to Hickory Creek and also cover approximately 1.5 miles. While these alluvium derived deposits may have potential to have preserved archeological materials left by early inhabitants, the portion of the APE containing these deposits is located within previously disturbed ROW.

The Lower Cretaceous Pawpaw Formation consists of calcareous marl and soft ledge-forming limestone beds. This formation includes the Weno Limestone and Denton clay. The Lower to Upper Cretaceous Grayson Marl Grayson Marl consists of greenish-gray to gray marls with thin interbeds of Main Street Limestone. The Pawpaw and Grayson formations are situated along the upland along the approximately 8-mile-long central segment of the APE and the approximately 1.5-mile northern-most APE segment. These deposits date to the Cretaceous and do not have the potential to contain intact buried cultural deposits.

2.5 Soils

Within the APE, there are five soil associations including the Birome-Gasil-Callisburg Association, the Sanger-Somervell Association, the Slidell-Sanger Association, the Ponder-Lindale Association, and the Frio-Ovan Association (NRCS, 2019).

The Birome-Gasil-Callisburg Association is a moderately deep to deep soil located on upland savannahs. The soils in this association are well drained with gently sloping to moderately

steep surfaces that are covered by loamy soils with moderate to slow permeability. This soil association is located near the central portion of the APE, near the highest elevation point along the APE. These upland soils are situated in a non-depositional environment and are unlikely to contain buried cultural deposits.

The Sanger-Somervell Association is a moderately deep to deep soil located on upland prairies. The soils in this association are well drained with gently sloping to moderately steep surfaces that are covered by clayey and loamy soils with moderate to slow permeability. This soil association is located along the majority of central portion of the APE.

The Slidell-Sanger Association is a moderately deep to deep soil located on upland prairies. The soils in this association are well drained with gently sloping to moderately steep surfaces that are covered by clayey soils with very slow permeability. This soil association is located along the majority of central portion of the APE, along the southern margins of the previously noted Sanger-Somervell Association. These upland soils are situated in a non-depositional environment and are unlikely to contain buried cultural deposits.

The Ponder-Lindale Association is a moderately deep to deep soil located on upland prairies. The soils in this association are well drained with nearly level to gently sloping surfaces that are covered by loamy soils with slow to very slow permeability. This soil association is located near the southern terminus of the APE. These upland soils are situated in a non-depositional environment and are unlikely to contain buried cultural deposits.

The Frio-Ovan Association is a deep soil located on bottom lands. The soils in this association are well drained to moderately well drained with nearly level surfaces that are covered by clayey soils with moderately slow to very slow permeability. This soil association is located along the watercourses (Denton and Hickory Creeks) of the APE. While these alluvium derived soils may have potential to have preserved archeological materials left by early inhabitants,

the portion of the APE containing the Frio-Ovan soils is located within previously disturbed ROW.

2.6 Cemeteries

According to THC Archeological Sites Atlas there is one known cemetery within the 1 km-wide search area. The Prairie Mound Cemetery was in use by 1882 by the congregation of the Prairie Mound Methodist Episcopal Church. The earliest grave is that of Edgar Myers (1875-1878). Church services at the church were discontinued prior to 1920 and the church appears to have been removed from the site in 1961.

2.7 Historic Markers

According to THC Archeological Sites Atlas there is a single Historic Marker within the 1 km-wide search area. This marker is for the Prairie Mound Cemetery (see above). Church services at the church were discontinued prior to 1920 and the church appears to have been removed from the site in 1961.

2.8 Existing Conditions

Previous disturbance within the APE consists primarily of grading for construction and on-going maintenance of IH 35W and its associated infrastructural features.

2.9 Recommendations

There are no known prehistoric or historic archeological sites within the proposed APE. Additionally, local geologic and soil conditions are not conducive to the preservation of buried archeological materials. Since no sites were identified in the APE or areas adjacent to the currently proposed improvements and the subject area would be considered low probability for containing intact archeological materials, no additional survey is recommended at this time.

Pursuant to Stipulation VI of the Programmatic Agreement (PA-TU) and 43 TAC 2.24(f)(1)(C) of the Memorandum of Understanding (MOU), TxDOT finds that the proposed undertaking would

not affect archeological historic properties on or eligible for listing in the NRHP (36 CFR 800.16(l)) or as SALs. No further investigations are warranted. If unanticipated archeological deposits are encountered during construction, work in the immediate area will cease, and TxDOT archeological staff will be contacted to initiate post-review discovery procedures under the provisions of the PA-TU and MOU.

3 References

Griffith, G.E., S.A. Bryce, J.M. Omernik, J.A. Comstock, A.C. Rogers, B. Harrison. S.L. Hatch, and D. Bezanson Ecoregions of Texas , U.S. Environmental Protection Agency, Corvallis, OR. 2004

McGowen, J.H., T.F. Hentz, D.E. Owen, M.K. Pieper, C.A. Shelby, and V.E. Barns. Geologic Atlas of Texas, Sherman Sheet. Virgil E. Barnes, Project Director. University of Texas At Austin, Bureau of Economic Geology, 1967 (Rev. 1991).

Natural Resource Conservation Service
Natural Resources Conservation Service. Web Soil Survey for Denton County, Texas. http://websoilsurvey.nrcs.usda.gov. U.S. Department of Agriculture Accessed August 14, 2019.

Texas Parks and Wildlife Department (TPWD)
2012 Map of Texas Ecoregions. http://www.tpwd.state.tx.us/landwater/land/habitats/cross_timbers/ecoregions/cross_timbers.phtml. Accessed August 2019.

Texas Historical Commission
Texas Historical Commission Archeological Sites Atlas. https://atlas.thc.state.tx.us/Account/Login. Access Restricted. Accessed August 13, 2019.

Species Analysis Form and Tier I Site Assessment

Interstate Highway (IH) 35W Frontage Roads

From: Dale Earnhardt Way
To: South of the IH 35E/IH35W Interchange

Denton County, Texas
Control-Section-Job (CSJ) 0081-13-065

Date: January 2020

Form
Species Analysis

Project Name: **IH 35W Frontage Roads**

CSJ(s): **0081-13-065**

County(ies): **Denton**

Date Analysis Completed: **1/23/2019**

Prepared by: **Chris Hagar, Jonathan Stewart, 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 16, 2014, and executed by FHWA and TxDOT.

I. Endangered Species Act

Select the appropriate statement below based on the determinations recorded in the completed project-specific species analysis spreadsheet:

☒ This project does not require consultation with or authorization from the USFWS under the Endangered Species Act.

☐ This project requires consultation with or authorization from the USFWS under the Endangered Species Act.

For a project that requires federal authorization or approval, if the completed project-specific species analysis spreadsheet indicates, “May affect,” for any species, then consultation with the USFWS is required under section 7 of the Endangered Species Act and the second checkbox above must be checked.

For more information regarding the Endangered Species Act, see **ENV’s Endangered Species Act Handbook**.

II. TPWD Coordination

Select the appropriate statement below:

☐ This project consists solely of maintenance activities that are of a type or type(s) covered by the Maintenance Program Environmental Assessment, and therefore no coordination with TPWD is required.

☒ This project does not consist solely of maintenance activities that are of a type or type(s) covered by the Maintenance Program Environmental Assessment, and therefore a Tier I Site Assessment is required.

III. Bald and Golden Eagle Protection Act (BGEPA)

Select the appropriate statement below:

☒ This project is not within 660 feet of an active or inactive Bald or Golden Eagle nest. Therefore, no coordination with USFWS is required.

☐ This project is within 660 feet of an active or inactive Bald or Golden Eagle nest; however, construction activities within 660 feet will not occur during the nesting season, and the project will adhere to the National Bald Eagle Management Guidelines of 2007. Therefore, no coordination with USFWS is required.

☐ This project is within 660 feet of an nest or inactive Bald or Golden Eagle nest, and construction within 660 feet will occur during the nesting season or the project will not adhere to the National Bald Eagle Management Guidelines of 2007. Therefore, coordination with USFWS to obtain a Non-Purposeful Take Permit is required.

For more information regarding BGEPA, see Section 7.0 of **ENV's Ecological Resources Handbook**.

IV. Migratory Bird Protections

This project will comply with applicable provisions of the Migratory Bird Treaty Act (MBTA) and Texas Parks and Wildlife Code Title 5, Subtitle B, Chapter 64, Birds. It is the department's policy to avoid removal and destruction of active bird nests except through federal or state approved options. In addition it is the department's policy to, where appropriate and practicable:

- use measures to prevent or discourage birds from building nests on man-made structures within portions of the project area planned for construction, and
- schedule construction activities outside the typical nesting season.

For more information regarding migratory bird protections, see **ENV's Guidance: Avoiding Migratory Birds and Handling Potential Violations** and Section 3.0 of **ENV's Ecological Resources Handbook**.

V. Resources Consulted

Indicate which resources were consulted/actions were taken to make the species analysis 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 ☒ Topographic Map ☒ Natural Diversity Database (NDD)
☐ Karst Zone Maps ☒ Ecological Mapping System of Texas (EMST)
☒ Site Visit ☐ Species Expert Consulted ☐ Species Habitat or Presence/absence Survey
☒ Other:USDA Soil Report

Tier I Site Assessment

Main CSJ: 0081-13-065
Form Prepared By: Chris Hagar, Civil Associates, Inc.
Date of Evaluation: January 23, 2020
Proposed Letting Date: January 2025
District(s): Dallas
County(ies): Denton
Roadway Name: Interstate Highway (IH) 35W Frontage Roads
Limits From: Dale Earnhardt Way
Limits To: South of the IH 35E/IH 35W Interchange
Project Description: Please see the Environmental Clearance Project Description available in ECOS in the Work Plan Development Section 1.

☐ *Project is classified as a Categorical Exclusion*

☐ *Project not assigned to TxDOT under the NEPA Assignment MOU*

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

1. No — Is the project limited to a maintenance activity exempt from coordination?
   http://txdot.gov/inside-txdot/division/environmental/maintenance-program.html

2. No — Has the project previously completed coordination with TPWD?

3. Yes — Is the project within range of a state threatened or endangered species or SGCN and suitable habitat is present?

*Explain:

There is suitable habitat present within the proposed project area for following state threatened species: Louisiana pigtoe (Pleurobema riddellii), sandbank pocketbook (Lampsillis satura), Texas heelsplitter (Potamilus amphichaenus), and timber rattlesnake (Crotalus horridus). Presence/absence survey and , if applicable, relocation for Louisiana pigtoe, sandbank pocketbood, and Texas heelsplitter would be done prior to construction at Catherine Branch, Denton Creek and Hickory Creek in order to avoid and minimize impacts.

SGCN were analyzed and only those included on the Tier 1 may be impacted. All other SGCN will not be impacted by the project. There is potential suitable habitat present within the proposed project area for the following SGCN species that might be impacted by the proposed project: Strecker's chorus frog (Pseudacris streckeri), Woodhouse's toad (Anaxyrus woodhousii), Western Burrowing Owl (Athene cunicularia hypugaea), eastern spotted skunk (Spilogale putorius), long-tailed weasel (Mustela frenata), mink (Neovison vison), mountain lion (Puma concolor), southern short-tailed shrew (Blarina carolinensis), swamp rabbit (Sylvilagus aquaticus), thirteen-lined ground squirrel (Ictidomys tridecemlineatus), western hog-nosed skunk (Conepatus leuconotus), woodland vole (Microtus pinetorum), eastern box turtle (Terrapene carolina), slender glass lizard (Ophisaurus attenuatus), smooth softshell (Apolone mutica), Texas garter snake (Thamnophis sirtalis annectens), western box turtle (Terrapene ornata), and Topeka purple-coneflower (Echinacea atrorubens).

Date TPWD County List Accessed: December 3, 2019

Date that the NDD was accessed: December 20, 2019

What agency performed the NDD search? TPWD

NDD Search Results for EOIDs and Tracked Managed Areas

EOID Number	Common Name	Scientific Name	Listing Status	Buffer Zone
11570	Mollisol Blackland Prairie	*Schizachyrium scoparium - Andropogon gerardii - Sorghastrum nutans - Bifora americana Mollisol Grassland*	NA	1.5 Mile

No — Does the BMP PA eliminate the requirement to coordinate for all species?

Comments:

The implementation of the following BMPs by TxDOT eliminates the need for coordination for species impacts under section 2.206(i) of the MOU:

Louisiana pigtoe, sandbank pocketbook, and Texas heelsplitter - Freshwater Mussel BMPs - a) When work is in the water; survey project footprints for state listed species where appropriate habitat exists. b) When work is in the water and mussels are discovered during surveys; relocate state listed and SGCN mussels under TPWD authorization and implement Water Quality BMPs. c) When work is adjacent to the water; Water Quality BMPs implemented as part of the SWPPP for a construction general permit or any conditions of the 401 water quality certification for the project will be implemented. (Note, SWPPP and 401 BMPS are not listed in this PA). No TPWD Coordination required.

Timber rattlesnake and Texas garter snake - Terrestrial Reptile BMPs: a) Apply hydro-mulching and/or hydroseeding in areas for soil stabilization and/or revegetation of disturbed areas where feasible. If hydro-mulching and/or hydroseeding are not feasible due to site conditions, utilize erosion control blankets or mats that contain no netting or contain loosely woven, natural fiber netting is preferred. Plastic netting should be avoided to the extent practicable. b) For open trenches and excavated pits, install escape ramps at an angle of less than 45 degrees (1:1) in areas left uncovered. Visually inspect excavation areas for trapped wildlife prior to backfilling. c) Inform contractors that if reptiles are found on project site allow species to safely leave the project area. d) Avoid or minimize disturbing or removing downed trees, rotting stumps, and leaf litter where feasible. e) Contractors will be advised of potential occurrence in the project area, and to avoid harming the species if encountered.

Western Burrowing Owl - Bird BMPs: In addition to complying with the Migratory Bird Treaty Act (MBTA) perform the following BMPs:
• Prior to construction, perform daytime surveys for nests including under bridges and in culverts to determine if they are active before removal. Nests that are active should not be disturbed.
• Do not disturb, destroy, or remove active nests, including ground nesting birds, during the nesting season;
• Avoid the removal of unoccupied, inactive nests, as practicable;
• Prevent the establishment of active nests during the nesting season on TxDOT owned and operated facilities and structures proposed for replacement or repair;
• Do not collect, capture, relocate, or transport birds, eggs, young, or active nests without a permit.

There are no approved species BMPs for Strecker's chorus frog, Woodhouse's toad, eastern spotted skunk, long-tailed weasel, mink, mountain lion, southern short-tailed shrew, swamp rabbit, thirteen-lined ground squirrel, western hog nosed skunk, woodland vole, eastern box turtle, slender glass lizard, smooth softshell, western box turtle, and Topeka purple-coneflower.

4. Yes — NDD and TCAP review indicates adverse impacts to remnant vegetation?

*Explain:

According to the MOU with TPWD, important remnant vegetation includes communities listed as suitable habitat and within the range of Species of Greatest Conservation Need (SGCN). General habitat types listed for Cross Timbers SGCN present within the proposed project footprint include savanna/open woodland. These general habitat types apply to multiple species. See the attached Cross Timbers SGCN spreadsheet for general habitat types and associated SGCN. Plant species from the TPWD Annotated County Lists of Rare Species for Denton County with potential suitable habitat present in the proposed project's action area that may be impacted consist of the Topeka purple-coneflower (Echinacea atrorubens).

According to NDD data (12/20/19), one EOID for Mollisol Blackland Prairie was recorded within 1.5 miles of the proposed project. The proposed project would not impact this plant community. No Tracked or Managed Areas were recorded within 10 miles of the proposed project.

5. Yes — Does the project require a NWP with PCN or IP by USACE?

*Explain:

According to preliminary investigation, the proposed project would require PCNs at12 wetlands and one intermittent stream.

6. Yes — Does the project include more than 200 linear feet of stream channel for each single and complete crossing of one or more of the following that is not already channelized or otherwise maintained:

Yes — Channel realignment; or

No — Stream bed or stream bank excavation, scraping, clearing, or other permanent disturbance.

*Explain:

The proposed project would impact greater than 200-linear feet of stream (Crossing #35, tributary to Roark Branch, an ephemeral stream) due to proposed paving and culvert extensions.

7. No — Does the project contain known isolated wetlands outside the TxDOT ROW that will be directly impacted by the project?

8. Yes — Would the project impact at least 0.10 acre of riparian vegetation?

*Explain:

The proposed project would impact approximately 7.1 acres of riparian vegetation.

9. Yes — Does project disturb a habitat type in an area equal to or greater than the area of disturbance indicated in the Threshold Table Programmatic Agreement?

*Explain:

The approximately 16.1 acres of Crosstimbers Woodland and Forest MOU Type habitat disturbance exceeds the 2.0-acre threshold indicated in the Threshold Table PA for Crosstimbers Woodland and Forest (CRTB).

The approximately 77.2 acres of Disturbed Prairie MOU Type habitat disturbance exceeds the 3.0-acre CRTB threshold indicated in the Threshold Table PA for Disturbed Prairie.

The approximately 7.1 acres of Riparian MOU Type habitat disturbance exceeds the 0.1 acre area of threshold indicated in the Threshold Table PA for Riparian.

*Attach associated file of EMST output (Mapper Report or other Excel File which includes MOU Type, Ecosystem Name, Common/Vegetation Type Name) in ECOS

Excel File Name:

APPROVED 07 0081-13-065 IH 35W EMSTandObservedVegTable 1-23-20.xlsx

9.1. Yes Is there a discrepancy between actual habitat(s) and EMST mapped habitat(s)?

*Explain:

MOU Type	Actual Area (ac)	EMST Area (ac)
Agriculture	1.2	5.0
Crosstimbers Woodland and Fores	16.1	53.1
Disturbed Prairie	77.2	12.4
Edwards Plateau Savannah, Woodland, and Shrubland	0.1	14.5
Open Water	2.1	0
Riparian	7.1	47.9
Tallgrass Prairie, Grassland	0	78.8
Urban	659.7	552.0
Total	763.7	763.7

Attach file showing discrepancy between actual and EMST mapped habitat(s).
File Name:

APPROVED 07 0081-13-065 IH 35W EMSTandObservedVegTable 1-23-20.xlsx
APPROVED 08 0081-13-065 IH 35W EMSTandObservedVegFigures 1-23-20.pdf
APPROVED 10 0081-13-065 IH 35W Photos 1-23-20.pdf

Is TPWD Coordination Required?

Yes

☒ Early Coordination

☐ Administrated Coordination - Must be conducted through ENV-NRM

BMPs Implemented or EPICs included (as necessary):

The implementation of the following BMPs by TxDOT eliminates the need for coordination for species impacts under section 2.206(i) of the MOU:

Louisiana pigtoe, sandbank pocketbook, and Texas heelsplitter - Freshwater Mussel BMPs (at Catherine Branch, Denton Creek, Hickory Creek, and Dry Branch Hickory Creek) - a) When work is in the water; survey project footprints for state listed species where appropriate habitat exists. b) When work is in the water and mussels are discovered during surveys; relocate state listed and SGCN mussels under TPWD authorization and implement Water Quality BMPs. c) When work is adjacent to the water; Water Quality BMPs implemented as part of the SWPPP for a construction general permit or any conditions of the 401 water quality certification for the project will be implemented. (Note, SWPPP and 401 BMPS are not listed in this PA). No TPWD Coordination required.

Timber rattlesnake and Texas garter snake - Terrestrial Reptile BMPs: a) Apply hydro-mulching and/or hydroseeding in areas for soil stabilization and/or revegetation of disturbed areas where feasible. If hydro-mulching and/or hydroseeding are not feasible due to site conditions, utilize erosion control blankets or mats that contain no netting or contain loosely woven, natural fiber netting is preferred. Plastic netting should be avoided to the extent practicable. b) For open trenches and excavated pits, install escape ramps at an angle of less than 45 degrees (1:1) in areas left uncovered. Visually inspect excavation areas for trapped wildlife prior to backfilling. c) Inform contractors that if reptiles are found on project site allow species to safely leave the project area. d) Avoid or minimize disturbing or removing downed trees, rotting stumps, and leaf litter where feasible. e) Contractors will be advised of potential occurrence in the project area, and to avoid harming the species if encountered.

Western Burrowing Owl - Bird BMPs: In addition to complying with the Migratory Bird Treaty Act (MBTA) perform the following BMPs:
• Prior to construction, perform daytime surveys for nests including under bridges and in culverts to determine if they are active before removal. Nests that are active should not be disturbed.
• Do not disturb, destroy, or remove active nests, including ground nesting birds, during the nesting season;
• Avoid the removal of unoccupied, inactive nests, as practicable;
• Prevent the establishment of active nests during the nesting season on TxDOT owned and operated facilities and structures proposed for replacement or repair;
• Do not collect, capture, relocate, or transport birds, eggs, young, or active nests without a permit.

TxDOT proposes the following for species that do not have approved species BMPs:

Eastern spotted skunk and western hog-nosed skunk - Contractors will be advised of potential occurrence in the project area, and to avoid harming the species if encountered, and to avoid unnecessary impacts to dens.

Eastern box turtle, slender glass lizard, and western box turtle - Terrestrial Reptile BMPs (see above).

Strecker's chorus frog, Woodhouse's toad, and smooth softshell - Amphibian and Aquatic Reptile BMPs:
a) Contractors will be advised of potential occurrence in the project area, and to avoid harming the species if encountered. b) Minimize impacts to wetland, temporary and permanent open water features, including depressions, and riverine habitats. c) Maintain hydrologic regime and connections between wetlands and other aquatic features. d) Use barrier fencing to direct animal movements away from construction activities and areas of potential wildlife-vehicle collisions in construction areas directly adjacent, or that may directly impact, potential habitat for the target species. e) Apply hydromulching and/or hydroseeding in areas for soil stabilization and/or revegetation of disturbed areas where feasible. If hydromulching and/or hydroseeding are not feasible due to site conditions, using erosion control blankets or mats that contain no netting, or only contain loosely woven natural fiber netting is preferred. Plastic netting should be avoided to the extent practicable. f) Project specific locations (PSLs) proposed within state-owned ROW should be located in uplands away from aquatic features. g) When work is directly adjacent to the water, minimize impacts to shoreline basking sites (e.g., downed trees, sand bars, exposed bedrock) and overwinter sites (e.g., brush and debris piles, crayfish burrows) where feasible. h) Avoid or minimize disturbing or removing downed trees, rotting stumps, and leaf litter, which may be refugia for terrestrial amphibians, where feasible. i) If gutters and curbs are part of the roadway design, where feasible install gutters that do not include the side box inlet and include sloped (i.e. mountable) curbs to allow small animals to leave roadway. If this modification to the entire curb system is not possible, install sections of sloped curb on either side of the storm water drain for several feet to allow small animals to leave the roadway. Priority areas for these design recommendations are those with nearby wetlands or other aquatic features. j) For sections of roadway adjacent to wetlands or other aquatic features, install wildlife barriers that prevent climbing. Barriers should terminate at culvert openings in order to funnel animals under the road. The barriers should be of the same length as the adjacent feature or 80-feet long in each direction, or whichever is the lesser of the two. k) For culvert extensions and culvert replacement/installation, incorporate measures to funnel animals toward culverts such as concrete wingwalls and barrier walls with

overhangs. l) When riprap or other bank stabilization devices are necessary, their placement should not impede the movement of terrestrial or aquatic wildlife through the water feature. Where feasible, biotechnical streambank stabilization methods using live native vegetation or a combination of vegetative and structural materials should be used.

Long-tailed weasel, mink, mountain lion, southern short-tailed shrew, swamp rabbit, thirteen-lined ground squirrel, woodland vole, Topeka purple coneflower - Contractors will be advised of potential occurrence in the project area, and to avoid harming the species if encountered.

TxDOT Contact Information

Name: Leslie Mirise

Phone Number: (214) 320-6162

E-mail: Leslie.Mirise@txdot.gv

Suggested Attachments

Aerial Map (with delineated project boundaries)

USFWS T&E List

TPWD T&E List

Species Impact Table

NDD EOID List and Tracked Managed Areas (Required for TPWD Coordination)

EMST Project MOU Summary Table (Required for TPWD Coordination)

TPWD SGCN List

Photos (Required for TPWD Coordination)

Previous TPWD Coordination Documentation (if applicable)

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Arlington Ecological Services Field Office
2005 Ne Green Oaks Blvd
Suite 140
Arlington, TX 76006-6247
Phone: (817) 277-1100 Fax: (817) 277-1129
http://www.fws.gov/southwest/es/arlingtontexas/
http://www.fws.gov/southwest/es/EndangeredSpecies/lists/

In Reply Refer To: December 03, 2019
Consultation Code: 02ETAR00-2020-SLI-0384
Event Code: 02ETAR00-2020-E-00799
Project Name: 2652 IH35W Frontage Roads

Subject: List of threatened and endangered species that may occur in your proposed project location, and/or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed, and candidate species, as well as proposed and final designated critical habitat, which may occur within the boundary of your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 et seq.).

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under section 7(a)(1) of the Act, Federal agencies are directed to utilize their authorities to carry out programs for the conservation of threatened and endangered species. Under and 7(a)(2) and its implementing regulations (50 CFR 402 et seq.), Federal agencies are required to determine whether their actions may affect threatened and endangered species and/or designated critical habitat. A Federal action is an activity or program authorized, funded, or carried out, in whole or in part, by a Federal agency (50 CFR 402.02).

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For Federal actions other than major construction activities, the Service suggests that a biological evaluation (similar to a Biological Assessment) be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

After evaluating the potential effects of a proposed action on federally listed species, one of the following determinations should be made by the Federal agency:

1. *No effect* - the appropriate determination when a project, as proposed, is anticipated to have no effects to listed species or critical habitat. A "no effect" determination does not require section 7 consultation and no coordination or contact with the Service is necessary. However, the action agency should maintain a complete record of their evaluation, including the steps leading to the determination of affect, the qualified personnel conducting the evaluation, habitat conditions, site photographs, and any other related information.
2. *May affect, but is not likely to adversely affect* - the appropriate determination when a proposed action's anticipated effects are insignificant, discountable, or completely beneficial. Insignificant effects relate to the size of the impact and should never reach the scale where "take" of a listed species occurs. Discountable effects are those extremely unlikely to occur. Based on best judgment, a person would not be able to meaningfully measure, detect, or evaluate insignificant effects, or expect discountable effects to occur. This determination requires written concurrence from the Service. A biological evaluation or other supporting information justifying this determination should be submitted with a request for written concurrence.
3. *May affect, is likely to adversely affect* - the appropriate determination if any adverse effect to listed species or critical habitat may occur as a direct or indirect result of the proposed action, and the effect is not discountable or insignificant. This determination requires formal section 7 consultation.

The Service recommends that candidate species, proposed species, and proposed critical habitat be addressed should consultation be necessary. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at: http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

Please be aware that bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 et seq.), and projects affecting these species may require development of an eagle conservation plan (http://www.fws.gov/windenergy/eagle_guidance.html). Additionally, wind energy projects should follow the wind energy

guidelines (http://www.fws.gov/windenergy/) for minimizing impacts to migratory birds and bats.

Guidance for minimizing impacts to migratory birds for projects including communications towers (e.g., cellular, digital television, radio, and emergency broadcast) can be found at: http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers.htm; http://www.towerkill.com; and http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow.html.

For additional information concerning migratory birds and eagle conservation plans, please contact the Service's Migratory Bird Office at 505-248-7882.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List

Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

Arlington Ecological Services Field Office
2005 Ne Green Oaks Blvd
Suite 140
Arlington, TX 76006-6247
(817) 277-1100

Project Summary

Consultation Code: 02ETAR00-2020-SLI-0384

Event Code: 02ETAR00-2020-E-00799

Project Name: 2652 IH35W Frontage Roads

Project Type: TRANSPORTATION

Project Description: Adding Frontage Roads and reconstructing interchanges.

Project Location:

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/place/33.12356107709746N97.21186965578941W

Counties: Denton, TX

Endangered Species Act Species

There is a total of 4 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species. Note that 2 of these species should be considered only under certain conditions.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

---

1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

Birds

NAME	STATUS
Least Tern *Sterna antillarum*	Endangered
Piping Plover *Charadrius melodus*	Threatened
Red Knot *Calidris canutus rufa*	Threatened
Whooping Crane *Grus americana*	Endangered

Least Tern *Sterna antillarum* — Endangered

Population: interior pop.

No critical habitat has been designated for this species.

Species profile: https://ecos.fws.gov/ecp/species/8505

Piping Plover *Charadrius melodus* — Threatened

Population: [Atlantic Coast and Northern Great Plains populations] - Wherever found, except those areas where listed as endangered.

There is **final** critical habitat for this species. Your location is outside the critical habitat.

This species only needs to be considered under the following conditions:

- Wind Energy Projects

Species profile: https://ecos.fws.gov/ecp/species/6039

Red Knot *Calidris canutus rufa* — Threatened

No critical habitat has been designated for this species.

This species only needs to be considered under the following conditions:

- Wind Energy Projects

Species profile: https://ecos.fws.gov/ecp/species/1864

Whooping Crane *Grus americana* — Endangered

Population: Wherever found, except where listed as an experimental population

There is **final** critical habitat for this species. Your location is outside the critical habitat.

Species profile: https://ecos.fws.gov/ecp/species/758

Critical habitats

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

Last Update: 7/17/2019

DENTON COUNTY

AMPHIBIANS

Strecker's chorus frog *Pseudacris streckeri*

Wooded floodplains and flats, prairies, cultivated fields and marshes. Likes sandy substrates.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G5	State Rank: S3

Woodhouse's toad *Anaxyrus woodhousii*

Extremely catholic up to 5000 feet, does very well (except for traffic) in association with man.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G5	State Rank: SU

BIRDS

bald eagle *Haliaeetus leucocephalus*

Found primarily near rivers and large lakes; nests in tall trees or on cliffs near water; communally roosts, especially in winter; hunts live prey, scavenges, and pirates food from other birds

Federal Status:	State Status: T	SGCN: Y
Endemic: N	Global Rank: G5	State Rank: S3B,S3N

black rail *Laterallus jamaicensis*

Salt, brackish, and freshwater marshes, pond borders, wet meadows, and grassy swamps; nests in or along edge of marsh, sometimes on damp ground, but usually on mat of previous years dead grasses; nest usually hidden in marsh grass or at base of Salicornia

Federal Status: PT	State Status:	SGCN: Y
Endemic: N	Global Rank: G3G4	State Rank: S2

Franklin's gull *Leucophaeus pipixcan*

Habitat description is not available at this time.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G4G5	State Rank: S2N

interior least tern *Sternula antillarum athalassos*

Sand beaches, flats, bays, inlets, lagoons, islands. Subspecies is listed only when inland (more than 50 miles from a coastline); nests along sand and gravel bars within braided streams, rivers; also know to nest on man-made structures (inland beaches, wastewater treatment plants, gravel mines, etc); eats small fish and crustaceans, when breeding forages within a few hundred feet of colony

Federal Status: LE	State Status: E	SGCN: Y
Endemic: N	Global Rank: G4T2Q	State Rank: S1B

DENTON COUNTY

BIRDS

mountain plover *Charadrius montanus*

Breeding: nests on high plains or shortgrass prairie, on ground in shallow depression; nonbreeding: shortgrass plains and bare, dirt (plowed) fields; primarily insectivorous

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G3	State Rank: S2

piping plover *Charadrius melodus*

Beaches, sandflats, and dunes along Gulf Coast beaches and adjacent offshore islands. Also spoil islands in the Intracoastal Waterway. Based on the November 30, 1992 Section 6 Job No. 9.1, Piping Plover and Snowy Plover Winter Habitat Status Survey, algal flats appear to be the highest quality habitat. Some of the most important aspects of algal flats are their relative inaccessibility and their continuous availability throughout all tidal conditions. Sand flats often appear to be preferred over algal flats when both are available, but large portions of sand flats along the Texas coast are available only during low-very low tides and are often completely unavailable during extreme high tides or strong north winds. Beaches appear to serve as a secondary habitat to the flats associated with the primary bays, lagoons, and inter-island passes. Beaches are rarely used on the southern Texas coast, where bayside habitat is always available, and are abandoned as bayside habitats become available on the central and northern coast. However, beaches are probably a vital habitat along the central and northern coast (i.e. north of Padre Island) during periods of extreme high tides that cover the flats. Optimal site characteristics appear to be large in area, sparsely vegetated, continuously available or in close proximity to secondary habitat, and with limited human disturbance.

Federal Status: LT	State Status: T	SGCN: Y
Endemic: N	Global Rank: G3	State Rank: S2N

red knot *Calidris canutus rufa*

Red knots migrate long distances in flocks northward through the contiguous United States mainly April-June, southward July-October. A small plump-bodied, short-necked shorebird that in breeding plumage, typically held from May through August, is a distinctive and unique pottery orange color. Its bill is dark, straight and, relative to other shorebirds, short-to-medium in length. After molting in late summer, this species is in a drab gray-and-white non-breeding plumage, typically held from September through April. In the non-breeding plumage, the knot might be confused with the omnipresent Sanderling. During this plumage, look for the knot's prominent pale eyebrow and whitish flanks with dark barring. The Red Knot prefers the shoreline of coast and bays and also uses mudflats during rare inland encounters. Primary prey items include coquina clam (Donax spp.) on beaches and dwarf surf clam (Mulinia lateralis) in bays, at least in the Laguna Madre. Wintering Range includes- Aransas, Brazoria, Calhoun, Cameron, Chambers, Galveston, Jefferson, Kennedy, Kleberg, Matagorda, Nueces, San Patricio, and Willacy. Habitat: Primarily seacoasts on tidal flats and beaches, herbaceous wetland, and Tidal flat/shore.

Federal Status: LT	State Status:	SGCN: Y
Endemic: N	Global Rank: G4T2	State Rank: SNRN

western burrowing owl *Athene cunicularia hypugaea*

Open grasslands, especially prairie, plains, and savanna, sometimes in open areas such as vacant lots near human habitation or airports; nests and roosts in abandoned burrows

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G4T4	State Rank: S2

white-faced ibis *Plegadis chihi*

Prefers freshwater marshes, sloughs, and irrigated rice fields, but will attend brackish and saltwater habitats; currently confined to near-coastal rookeries in so-called hog-wallow prairies. Nests in marshes, in low trees, on the ground in bulrushes or reeds, or on floating mats.

Federal Status:	State Status: T	SGCN: Y
Endemic: N	Global Rank: G5	State Rank: S4B

DENTON COUNTY

BIRDS

whooping crane *Grus americana*

Small ponds, marshes, and flooded grain fields for both roosting and foraging. Potential migrant via plains throughout most of state to coast; winters in coastal marshes of Aransas, Calhoun, and Refugio counties.

Federal Status: LE	State Status: E	SGCN: Y
Endemic: N	Global Rank: G1	State Rank: S1N

INSECTS

American bumblebee *Bombus pensylvanicus*

Habitat description is not available at this time.

Federal Status:	State Status:	SGCN: Y
Endemic:	Global Rank: G3G4	State Rank: SNR

No accepted common name *Arethaea ambulator*

Habitat description is not available at this time.

Federal Status:	State Status:	SGCN: Y
Endemic:	Global Rank: GNR	State Rank: SNR

MAMMALS

American badger *Taxidea taxus*

Habitat description is not available at this time.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G5	State Rank: S5

big brown bat *Eptesicus fuscus*

Any wooded areas or woodlands except south Texas. Riparian areas in west Texas.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G5	State Rank: S5

big free-tailed bat *Nyctinomops macrotis*

Habitat data sparse but records indicate that species prefers to roost in crevices and cracks in high canyon walls, but will use buildings, as well; reproduction data sparse, gives birth to single offspring late June-early July; females gather in nursery colonies; winter habits undetermined, but may hibernate in the Trans-Pecos; opportunistic insectivore

Federal Status:	State Status:	SGCN: Y
Endemic:	Global Rank: G5	State Rank: S3

black-tailed prairie dog *Cynomys ludovicianus*

Dry, flat, short grasslands with low, relatively sparse vegetation, including areas overgrazed by cattle; live in large family groups

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G4	State Rank: S3

DENTON COUNTY

MAMMALS

eastern red bat *Lasiurus borealis*

Found in a variety of habitats in Texas. Usually associated with wooded areas. Found in towns especially during migration.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G3G4	State Rank: S4

eastern spotted skunk *Spilogale putorius*

Catholic; open fields prairies, croplands, fence rows, farmyards, forest edges & woodlands. Prefer wooded, brushy areas & tallgrass prairies. S.p. ssp. interrupta found in wooded areas and tallgrass prairies, preferring rocky canyons and outcrops when such sites are available.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G4	State Rank: S1S3

hoary bat *Lasiurus cinereus*

Known from montane and riparian woodland in Trans-Pecos, forests and woods in east and central Texas.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G3G4	State Rank: S4

long-tailed weasel *Mustela frenata*

Includes brushlands, fence rows, upland woods and bottomland hardwoods, forest edges & rocky desert scrub. Usually live close to water.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G5	State Rank: S5

Mexican free-tailed bat *Tadarida brasiliensis*

Roosts in buildings in east Texas. Largest maternity roosts are in limestone caves on the Edwards Plateau. Found in all habitats, forest to desert.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G5	State Rank: S5

mink *Neovison vison*

Intimately associated with water; coastal swamps & marshes, wooded riparian zones, edges of lakes. Prefer floodplains.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G5	State Rank: S4

mountain lion *Puma concolor*

Rugged mountains & riparian zones.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G5	State Rank: S2S3

DENTON COUNTY

MAMMALS

plains spotted skunk *Spilogale putorius interrupta*

Catholic; open fields, prairies, croplands, fence rows, farmyards, forest edges, and woodlands; prefers wooded, brushy areas and tallgrass prairie

Federal Status:	State Status:	SGCN: N
Endemic: N	Global Rank: G4T4	State Rank: S1S3

southern short-tailed shrew *Blarina carolinensis*

Habitat description is not available at this time.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G5	State Rank: S4

swamp rabbit *Sylvilagus aquaticus*

Habitat description is not available at this time.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G5	State Rank: S5

thirteen-lined ground squirrel *Ictidomys tridecemlineatus*

Habitat description is not available at this time.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G5	State Rank: S5

tricolored bat *Perimyotis subflavus*

Forest, woodland and riparian areas are important. Caves are very important to this species.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G2G3	State Rank: S3S4

western hog-nosed skunk *Conepatus leuconotus*

Habitats include woodlands, grasslands & deserts, to 7200 feet, most common in rugged, rocky canyon country; little is known about the habitat of the ssp. telmalestes

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G4	State Rank: S4

woodland vole *Microtus pinetorum*

Include grassy marshes, swamp edges, old-field/pine woodland ecotones, tallgrass fields; generally sandy soils.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G5	State Rank: S3

DENTON COUNTY

MOLLUSKS

Louisiana pigtoe *Pleurobema riddellii*

Streams and moderate-size rivers, usually flowing water on substrates of mud, sand, and gravel; not generally known from impoundments; Sabine, Neches, and Trinity (historic) River basins

Federal Status:	State Status: T	SGCN: Y
Endemic: N	Global Rank: G1G2	State Rank: S1

sandbank pocketbook *Lampsilis satura*

Small to large rivers with moderate flows and swift current on gravel, gravel-sand, and sand bottoms; east Texas, Sulfur south through San Jacinto River basins; Neches River

Federal Status:	State Status: T	SGCN: Y
Endemic:	Global Rank: G2	State Rank: S1

Texas heelsplitter *Potamilus amphichaenus*

Quiet waters in mud or sand and also in reservoirs. Sabine, Neches, and Trinity River basins

Federal Status:	State Status: T	SGCN: Y
Endemic: N	Global Rank: G1G2	State Rank: S1

REPTILES

American alligator *Alligator mississippiensis*

Coastal marshes; inland natural rivers, swamps and marshes; manmade impoundments.

Federal Status:	State Status:	SGCN: N
Endemic: N	Global Rank: G5	State Rank: S4

common garter snake *Thamnophis sirtalis*

Irrigation canals and riparian-corridor farmlands in west; marshy, flooded pastureland, grassy or brushy borders of permanent bodies of water; coastal salt marshes.

Federal Status:	State Status:	SGCN: N
Endemic:	Global Rank: G5	State Rank: S2

eastern box turtle *Terrapene carolina*

Eastern box turtles inhabit forests, fields, forest-brush, and forest-field ecotones. In some areas they move seasonally from fields in spring to forest in summer. They commonly enters pools of shallow water in summer. For shelter, they burrow into loose soil, debris, mud, old stump holes, or under leaf litter. They can successfully hibernate in sites that may experience subfreezing temperatures. In Maryland bottomland forest, some hibernated in pits or depressions in forest floor (usually about 30 cm deep) usually within summer range; individuals tended to hibernate in same area in different years (Stickel 1989). Also attracted to farms, old fields and cut-over woodlands, as well as creek bottoms and dense woodlands. Egg laying sites often are sandy or loamy soils in open areas; females may move from bottomlands to warmer and drier sites to nest. In Maryland, females used the same nesting area in different years (Stickel 1989).

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G5	State Rank: S3

DENTON COUNTY

REPTILES

slender glass lizard *Ophisaurus attenuatus*

Prefers relatively dry microhabitats, usually associated with grassy areas. Habitats include open grassland, prairie, woodland edge, open woodland, oak savannas, longleaf pine flatwoods, scrubby areas, fallow fields, and areas near streams and ponds, often in habitats with sandy soil. This species often appears on roads in spring. During inactivity, it occurs in underground burrows. In Kansas, slender glass lizards were scarce in heavily grazed pastures, increased as grass increased with removal of grazing, and declined as brush and trees replaced grass (Fitch 1989). Eggs are laid underground, under cover, or under grass clumps (Ashton and Ashton 1985); in cavities beneath flat rocks or in abandoned tunnels of small mammals (Scalopus, Microtus) (Fitch 1989).

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G5	State Rank: S3

smooth softshell *Apalone mutica*

Any permanent body of water.Large rivers and streams; in some areas also found in lakes, impoundments, and shallow bogs (Ernst and Barbour 1972). Usually in water with sandy or mud bottom and few aquatic plants. Often basks on sand bars and mudflats at edge of water. Eggs are laid in nests dug in high open sandbars and banks close to water, usually within 90 m of water (Fitch and Plummer 1975).

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G5	State Rank: S3

Texas garter snake *Thamnophis sirtalis annectens*

Irrigation canals and riparian-corridor farmlands in west; marshy, flooded pastureland, grassy or brushy borders of permanent bodies of water; coastal salt marshes. Wet or moist microhabitats are conducive to the species occurrence, but is not necessarily restricted to them; hibernates underground or in or under surface cover; breeds March-August.

Federal Status:	State Status:	SGCN: Y
Endemic: Y	Global Rank: G5T4	State Rank: S1

Texas horned lizard *Phrynosoma cornutum*

Occurs to 6000 feet, but largely limited below the pinyon-juniper zone on mountains in the Big Bend area. Open, arid and semi-arid regions with sparse vegetation, including grass, cactus, scattered brush or scrubby trees; soil may vary in texture from sandy to rocky; burrows into soil, enters rodent burrows, or hides under rock when inactive; breeds March-September.

Federal Status:	State Status: T	SGCN: Y
Endemic: N	Global Rank: G4G5	State Rank: S3

timber (canebrake) rattlesnake *Crotalus horridus*

Swamps, floodplains, upland pine and deciduous woodland, riparian zones, abandoned farmland. Limestone bluffs, sandy soil or black clay. Prefers dense ground cover, i.e. grapevines, palmetto.

Federal Status:	State Status: T	SGCN: Y
Endemic: N	Global Rank: G4	State Rank: S4

DENTON COUNTY

REPTILES

western box turtle *Terrapene ornata*

Ornate or western box trutles inhabit prairie grassland, pasture, fields, sandhills, and open woodland. They are essentially terrestrial but sometimes enter slow, shallow streams and creek pools. For shelter, they burrow into soil (e.g., under plants such as yucca) (Converse et al. 2002) or enter burrows made by other species; winter burrow depth was 0.5-1.8 meters in Wisconsin (Doroff and Keith 1990), 7-120 cm (average depth 54 cm) in Nebraska (Converse et al. 2002). Eggs are laid in nests dug in soft well-drained soil in open area (Legler 1960, Converse et al. 2002). Very partial to sandy soil.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G5	State Rank: S3

western hognose snake *Heterodon nasicus*

Habitat consists of areas with sandy or gravelly soils, including prairies, sandhills, wide valleys, river floodplains, bajadas, semiagricultural areas (but not intensively cultivated land), and margins of irrigation ditches (Degenhardt et al. 1996, Hammerson 1999, Werler and Dixon 2000, Stebbins 2003). Also thornscrub woodlands and chaparral thickets. Seems to prefer sandy and loamy soils, not necessarily flat. Periods of inactivity are spent burrowed in the soil or in existing burrows. Eggs are laid in nests a few inches below the ground surface (Platt 1969).

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G5	State Rank: S4

western rattlesnake *Crotalus viridis*

Grassland, both desert and prairie; shrub desert rocky hillsides; edges of arid and semi-arid river breaks.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G5	State Rank: S5

PLANTS

Glen Rose yucca *Yucca necopina*

Grasslands on sandy soils and limestone outcrops; flowering April-June

Federal Status:	State Status:	SGCN: Y
Endemic: Y	Global Rank: G1G2	State Rank: S1S2

Topeka purple-coneflower *Echinacea atrorubens*

Occurring mostly in tallgrass prairie of the southern Great Plains, in blackland prairies but also in a variety of other sites like limestone hillsides; Perennial; Flowering Jan-June; Fruiting Jan-May

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G3	State Rank: S3

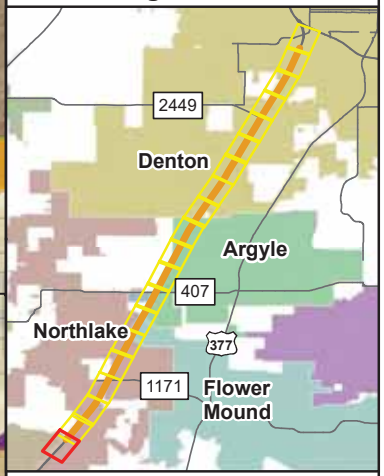
EMST VEGETATION MAP

IH 35W FRONTAGE ROADS

From Dale Earnhardt Way
to south of the IH 35E/IH 35W
Interchange
Denton County, Texas

CSJ: 0081-13-065

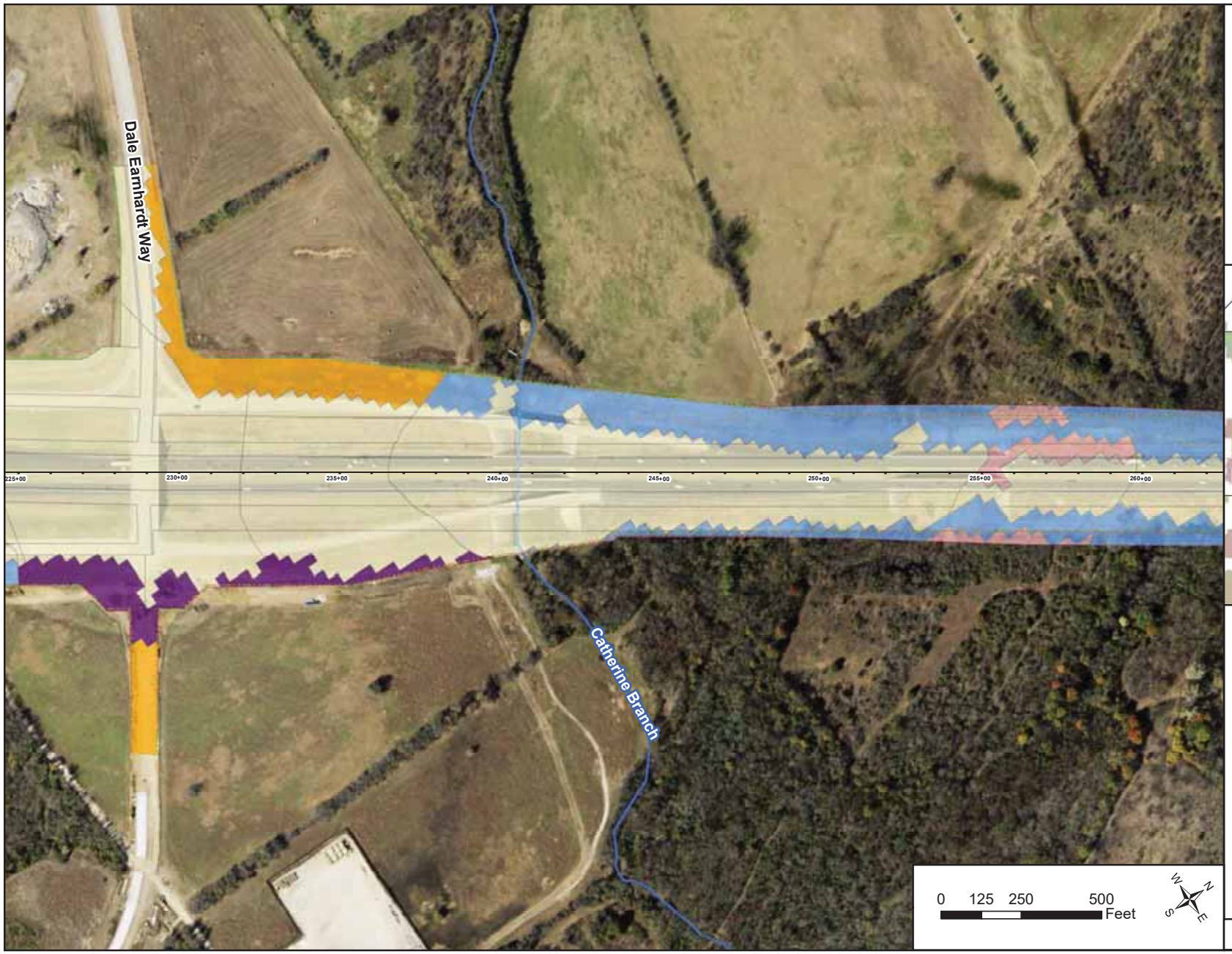
Page 1 of 20



Legend

- Proposed Right-of-Way
- Proposed Easements
- Existing Right of Way
- Agriculture
- Crosstimbers Woodland and Forest
- Disturbed Prairie
- Edwards Plateau Savannah, Woodland, and Shrubland
- Floodplain/Riparian
- Tallgrass Prairie, Grassland
- Urban

Base Map Source: TNRIS (2018)



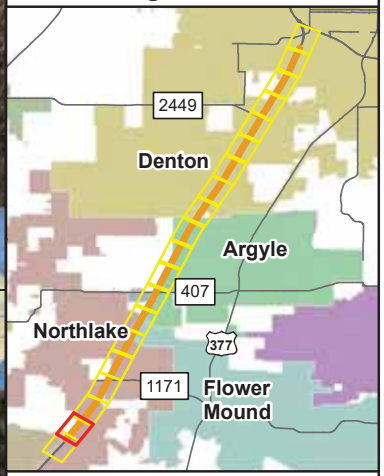
EMST VEGETATION MAP

IH 35W FRONTAGE ROADS

From Dale Earnhardt Way
to south of the IH 35E/IH 35W
Interchange
Denton County, Texas

CSJ: 0081-13-065

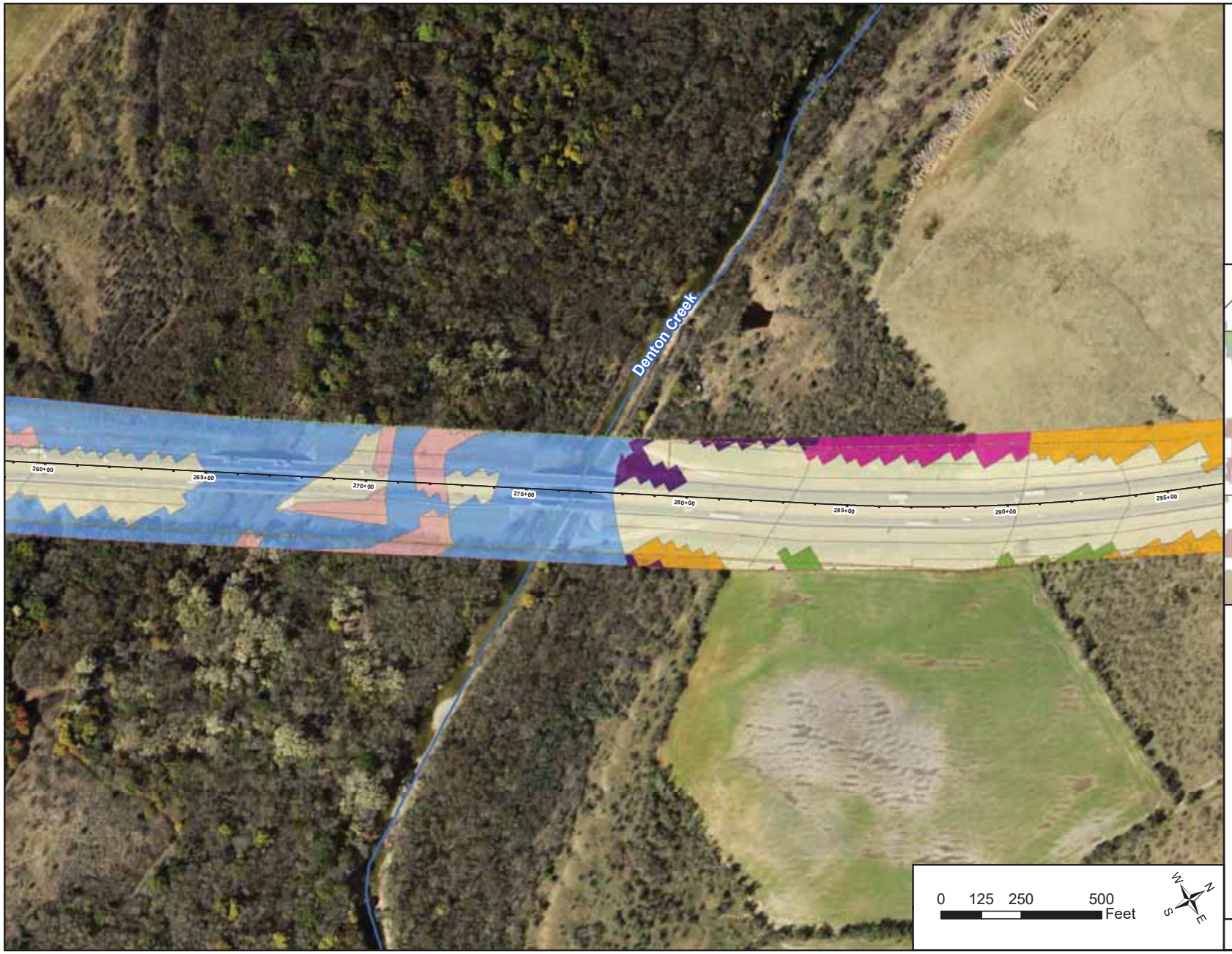
Page 2 of 20



Legend

- Proposed Right-of-Way
- Proposed Easements
- Existing Right of Way
- Agriculture
- Crosstimbers Woodland and Forest
- Disturbed Prairie
- Edwards Plateau Savannah, Woodland, and Shrubland
- Floodplain/Riparian
- Tallgrass Prairie, Grassland
- Urban

Base Map Source: TNRIS (2018)



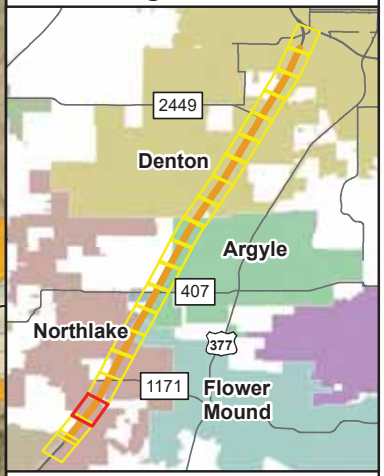
EMST VEGETATION MAP

IH 35W FRONTAGE ROADS

From Dale Earnhardt Way
to south of the IH 35E/IH 35W
Interchange
Denton County, Texas

CSJ: 0081-13-065

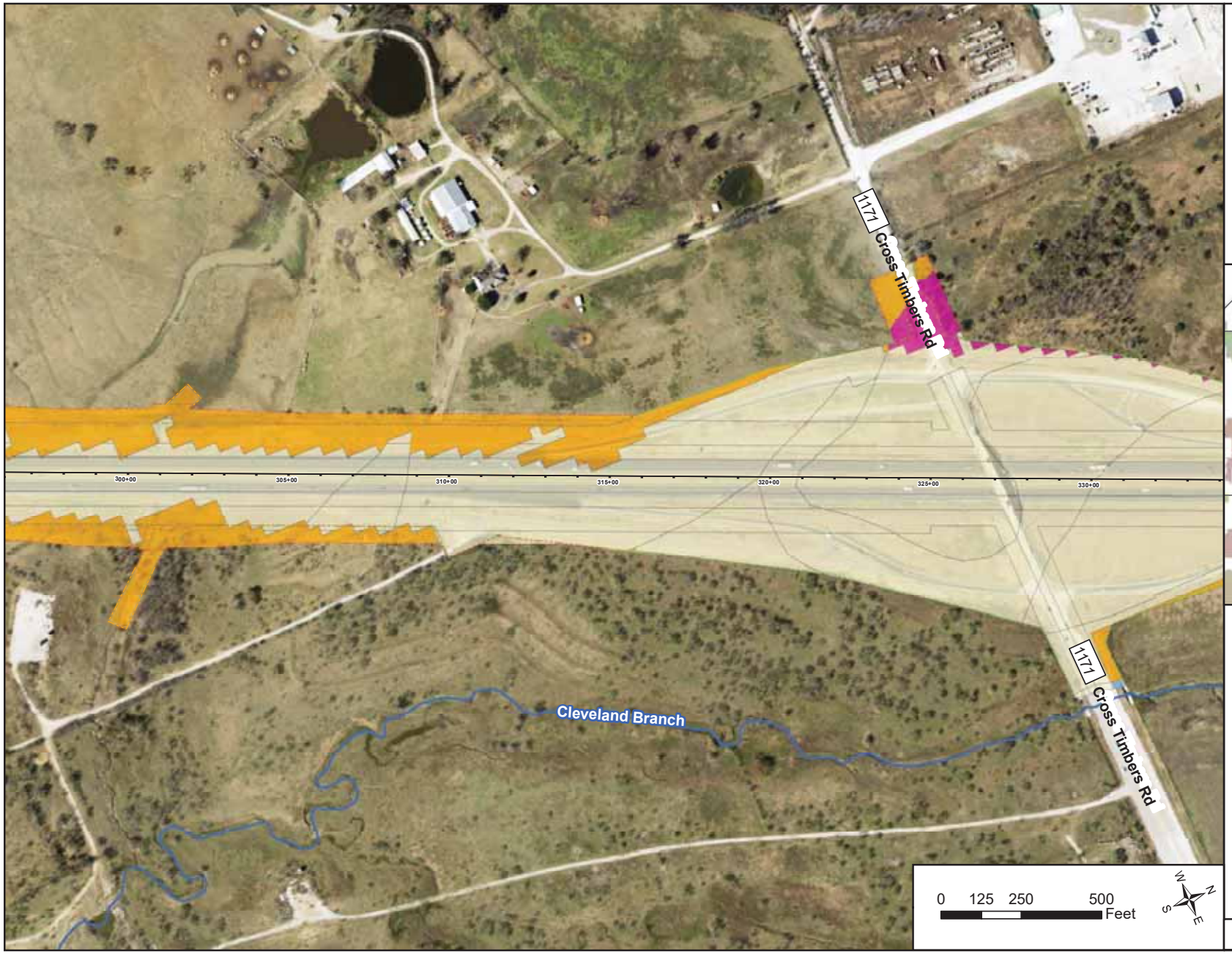
Page 3 of 20



Legend

- Proposed Right-of-Way
- Proposed Easements
- Existing Right of Way
- Agriculture
- Crosstimbers Woodland and Forest
- Disturbed Prairie
- Edwards Plateau Savannah, Woodland, and Shrubland
- Floodplain/Riparian
- Tallgrass Prairie, Grassland
- Urban

Base Map Source: TNRIS (2018)



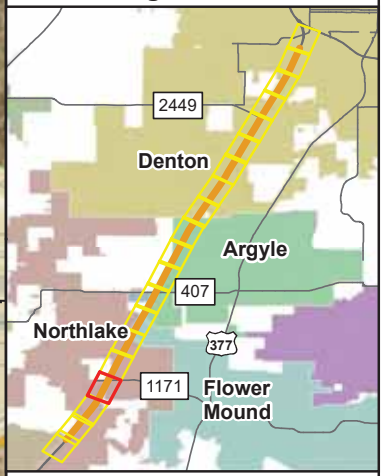
EMST VEGETATION MAP

IH 35W FRONTAGE ROADS

From Dale Earnhardt Way
to south of the IH 35E/IH 35W
Interchange
Denton County, Texas

CSJ: 0081-13-065

Page 4 of 20



Legend

- Proposed Right-of-Way
- Proposed Easements
- Existing Right of Way
- Agriculture
- Crosstimbers Woodland and Forest
- Disturbed Prairie
- Edwards Plateau Savannah, Woodland, and Shrubland
- Floodplain/Riparian
- Tallgrass Prairie, Grassland
- Urban

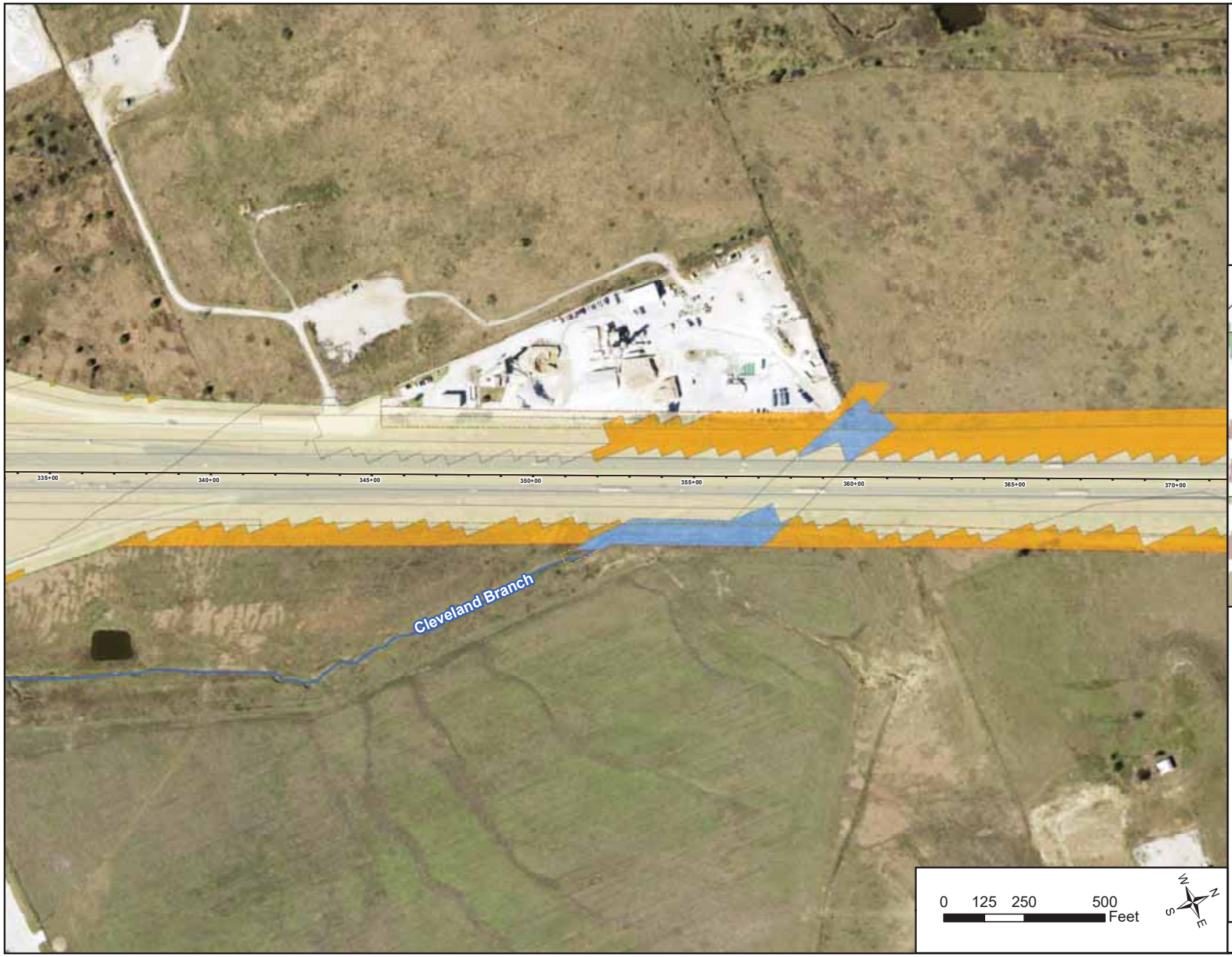
Base Map Source: TNRIS (2018)

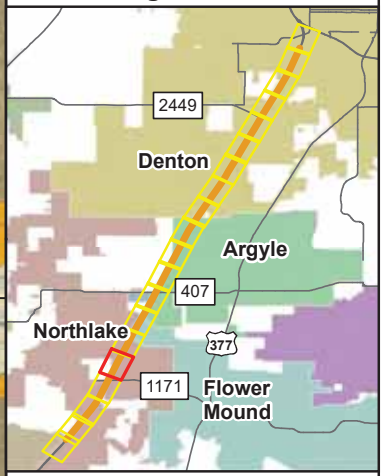
EMST VEGETATION MAP

IH 35W FRONTAGE ROADS

From Dale Earnhardt Way
to south of the IH 35E/IH 35W
Interchange
Denton County, Texas

CSJ: 0081-13-065





Legend

- Proposed Right-of-Way
- Proposed Easements
- Existing Right of Way
- Agriculture
- Crosstimbers Woodland and Forest
- Disturbed Prairie
- Edwards Plateau Savannah, Woodland, and Shrubland
- Floodplain/Riparian
- Tallgrass Prairie, Grassland
- Urban

Base Map Source: TNRIS (2018)

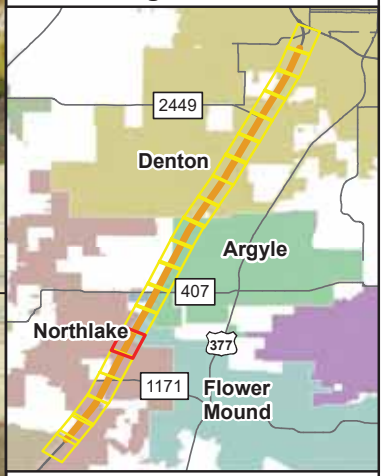
EMST VEGETATION MAP

IH 35W FRONTAGE ROADS

From Dale Earnhardt Way
to south of the IH 35E/IH 35W
Interchange
Denton County, Texas

CSJ: 0081-13-065

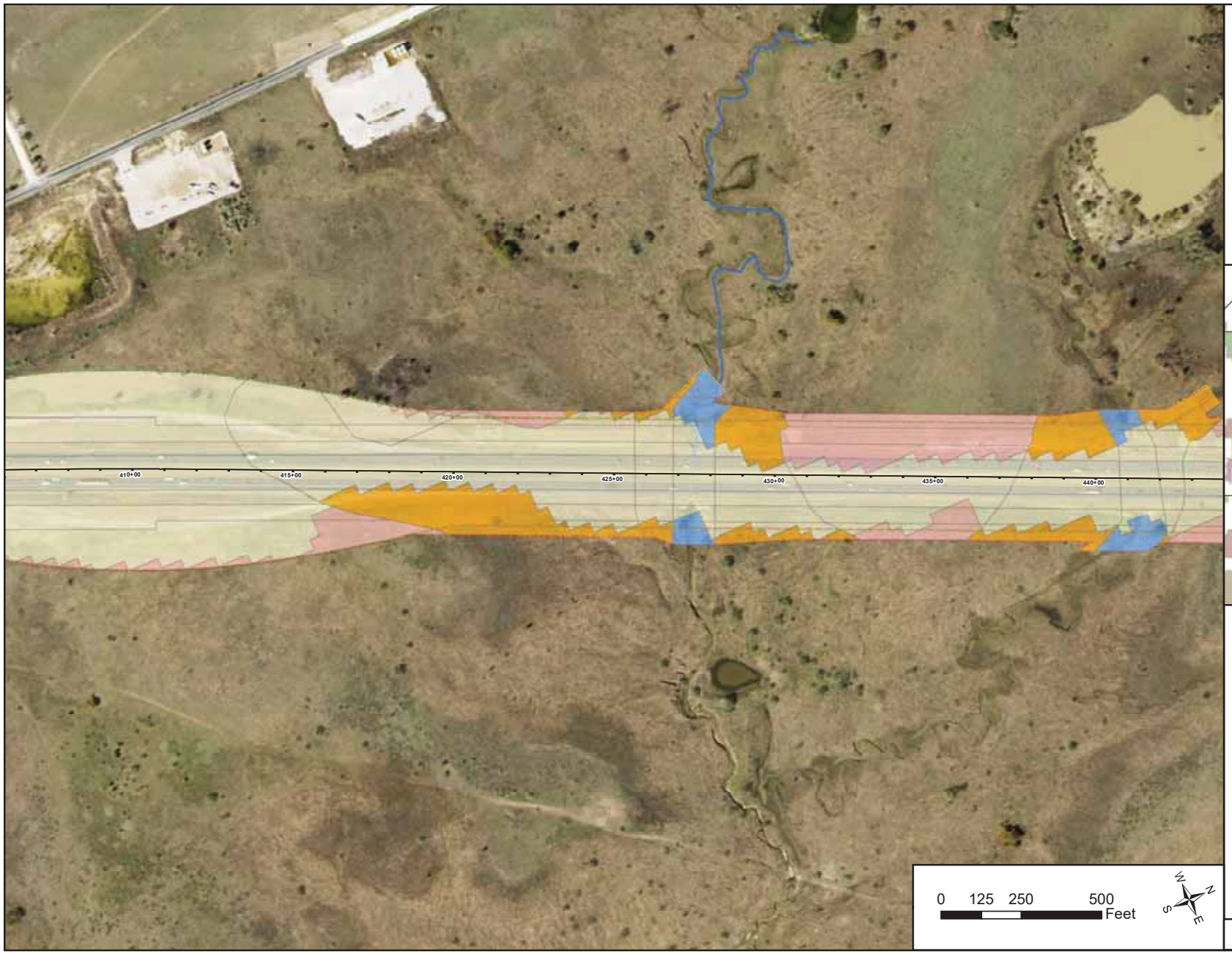
Page 6 of 20



Legend

- Proposed Right-of-Way
- Proposed Easements
- Existing Right of Way
- Agriculture
- Crosstimbers Woodland and Forest
- Disturbed Prairie
- Edwards Plateau Savannah, Woodland, and Shrubland
- Floodplain/Riparian
- Tallgrass Prairie, Grassland
- Urban

Base Map Source: TNRIS (2018)

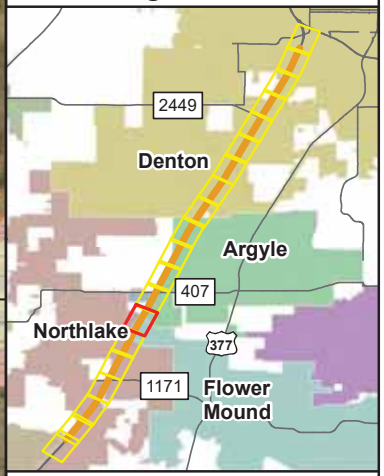


EMST VEGETATION MAP

IH 35W FRONTAGE ROADS

From Dale Earnhardt Way
to south of the IH 35E/IH 35W
Interchange
Denton County, Texas

CSJ: 0081-13-065



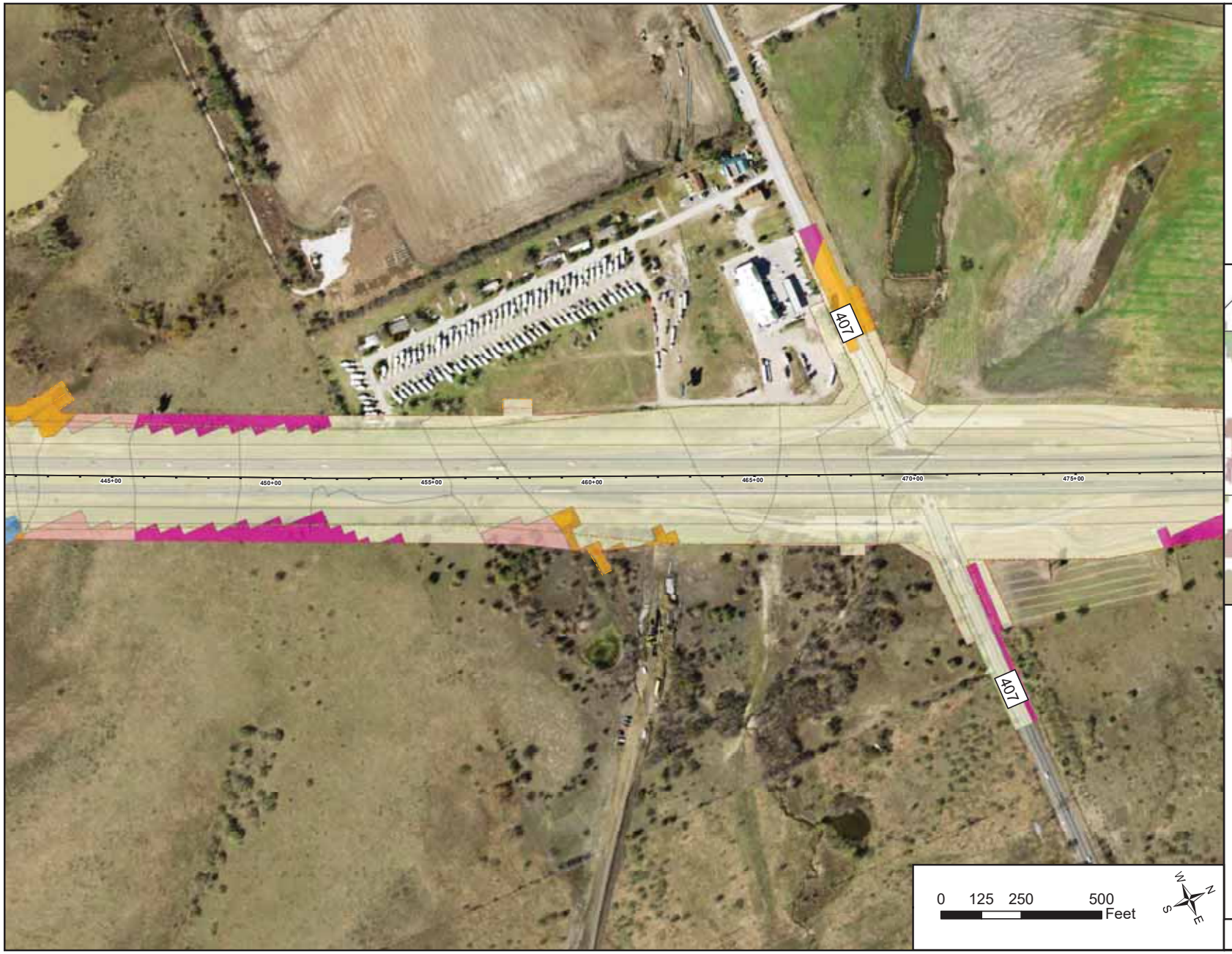
Legend

- Proposed Right-of-Way
- Proposed Easements
- Existing Right of Way
- Agriculture
- Crosstimbers Woodland and Forest
- Disturbed Prairie
- Edwards Plateau Savannah, Woodland, and Shrubland
- Floodplain/Riparian
- Tallgrass Prairie, Grassland
- Urban

0 125 250 500 Feet

N W E S

Base Map Source: TNRIS (2018)



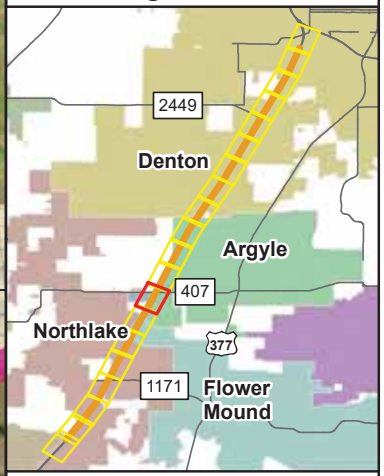
EMST VEGETATION MAP

IH 35W FRONTAGE ROADS

From Dale Earnhardt Way
to south of the IH 35E/IH 35W
Interchange
Denton County, Texas

CSJ: 0081-13-065

Page 8 of 20



Legend

- Proposed Right-of-Way
- Proposed Easements
- Existing Right of Way
- Agriculture
- Crosstimbers Woodland and Forest
- Disturbed Prairie
- Edwards Plateau Savannah, Woodland, and Shrubland
- Floodplain/Riparian
- Tallgrass Prairie, Grassland
- Urban

0 125 250 500 Feet

N W E S

Base Map Source: TNRIS (2018)

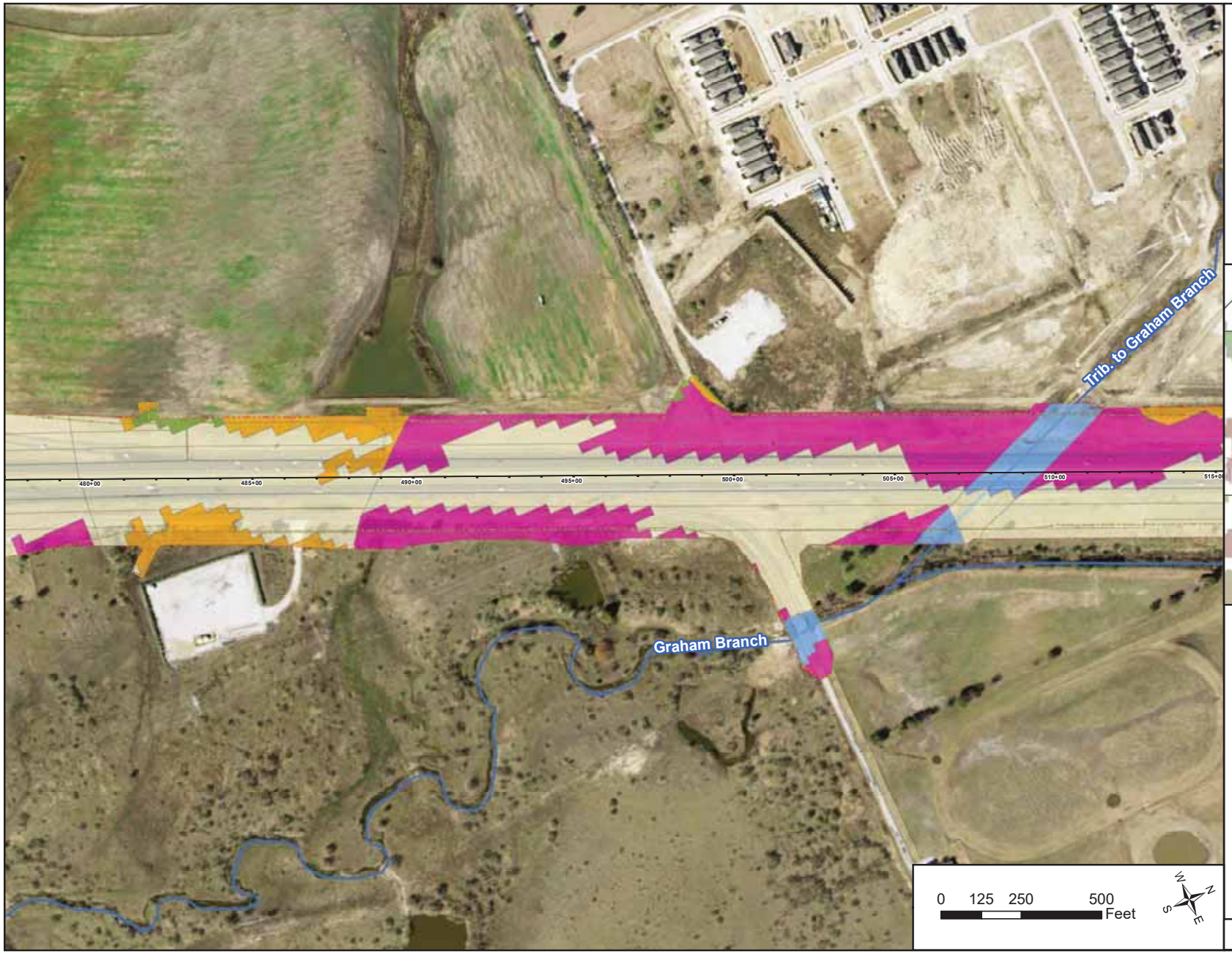
EMST VEGETATION MAP

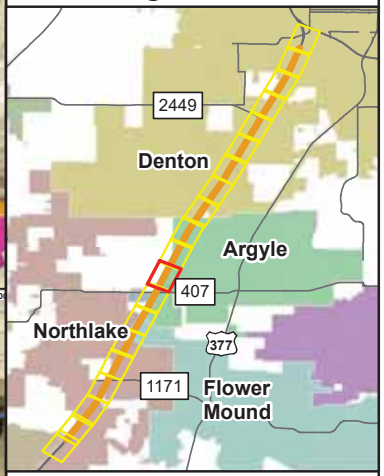
IH 35W FRONTAGE ROADS

From Dale Earnhardt Way
to south of the IH 35E/IH 35W
Interchange
Denton County, Texas

CSJ: 0081-13-065

Page 9 of 20

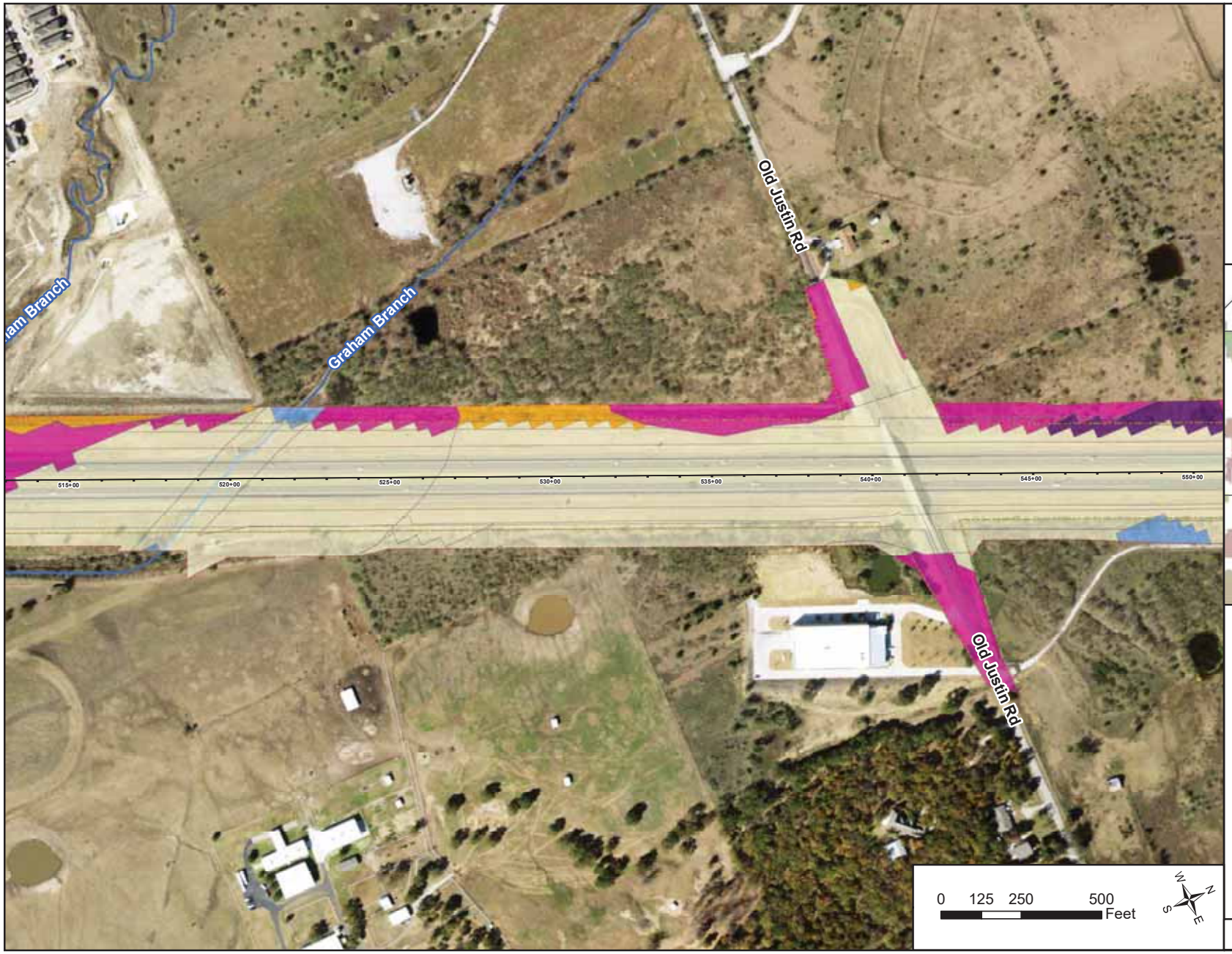




Legend

- Proposed Right-of-Way
- Proposed Easements
- Existing Right of Way
- Agriculture
- Crosstimbers Woodland and Forest
- Disturbed Prairie
- Edwards Plateau Savannah, Woodland, and Shrubland
- Floodplain/Riparian
- Tallgrass Prairie, Grassland
- Urban

Base Map Source: TNRIS (2018)



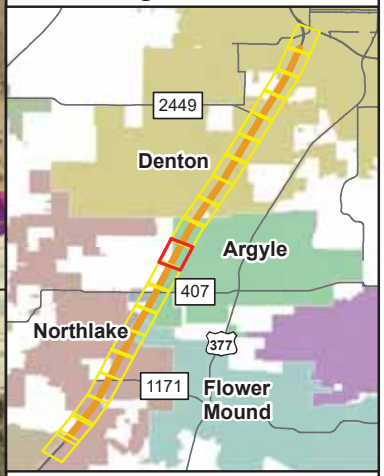
EMST VEGETATION MAP

IH 35W FRONTAGE ROADS

From Dale Earnhardt Way
to south of the IH 35E/IH 35W
Interchange
Denton County, Texas

CSJ: 0081-13-065

Page 10 of 20



Legend

- Proposed Right-of-Way
- Proposed Easements
- Existing Right of Way
- Agriculture
- Crosstimbers Woodland and Forest
- Disturbed Prairie
- Edwards Plateau Savannah, Woodland, and Shrubland
- Floodplain/Riparian
- Tallgrass Prairie, Grassland
- Urban

Base Map Source: TNRIS (2018)

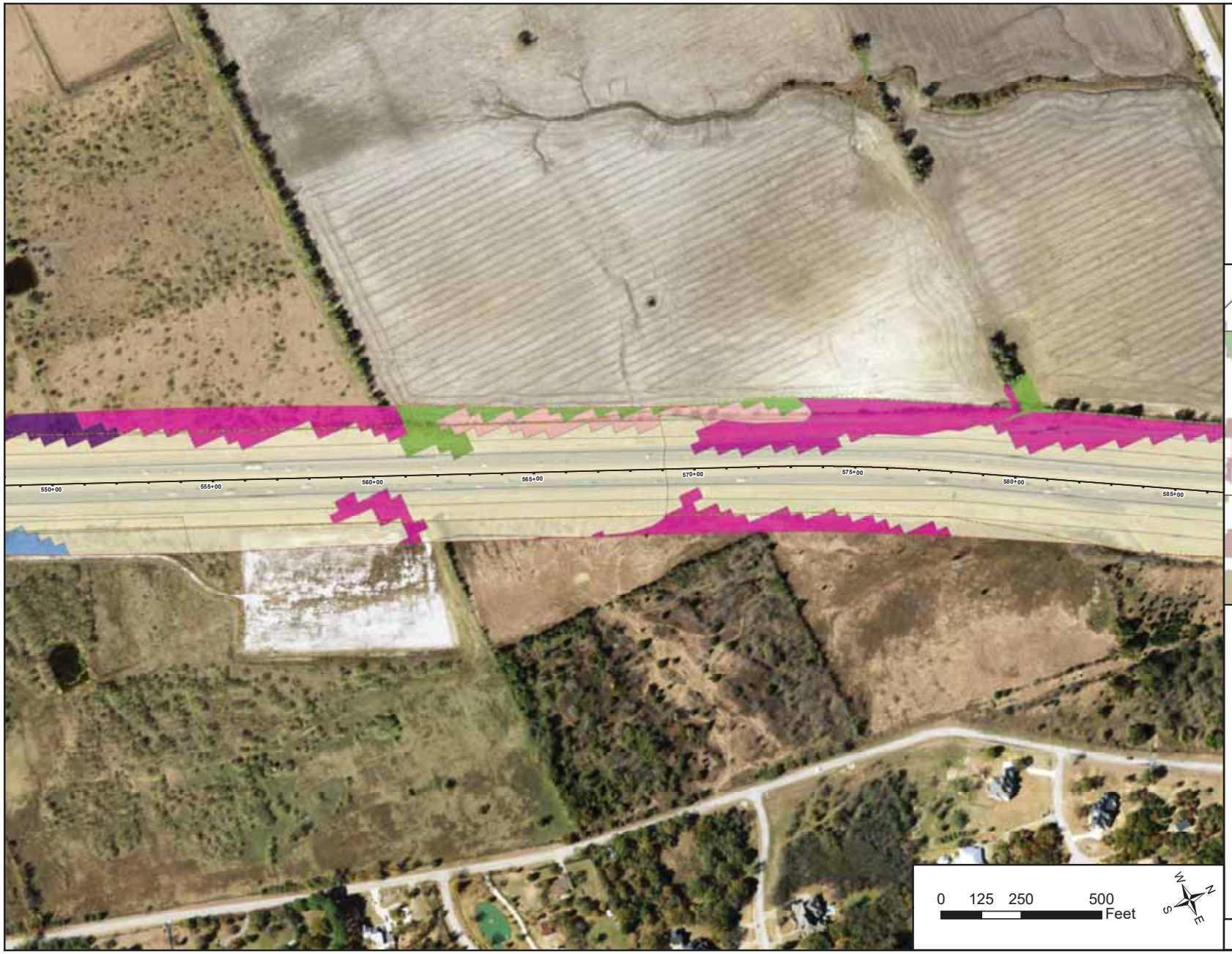
EMST VEGETATION MAP

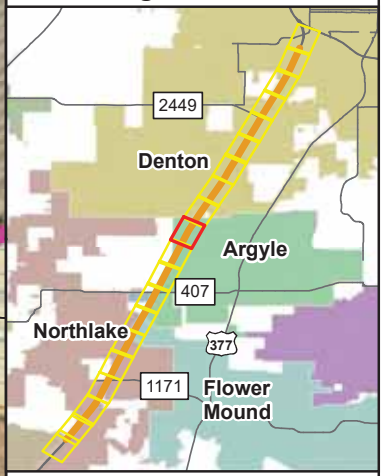
IH 35W FRONTAGE ROADS

From Dale Earnhardt Way
to south of the IH 35E/IH 35W
Interchange
Denton County, Texas

CSJ: 0081-13-065

Page 11 of 20





Legend

- Proposed Right-of-Way
- Proposed Easements
- Existing Right of Way
- Agriculture
- Crosstimbers Woodland and Forest
- Disturbed Prairie
- Edwards Plateau Savannah, Woodland, and Shrubland
- Floodplain/Riparian
- Tallgrass Prairie, Grassland
- Urban

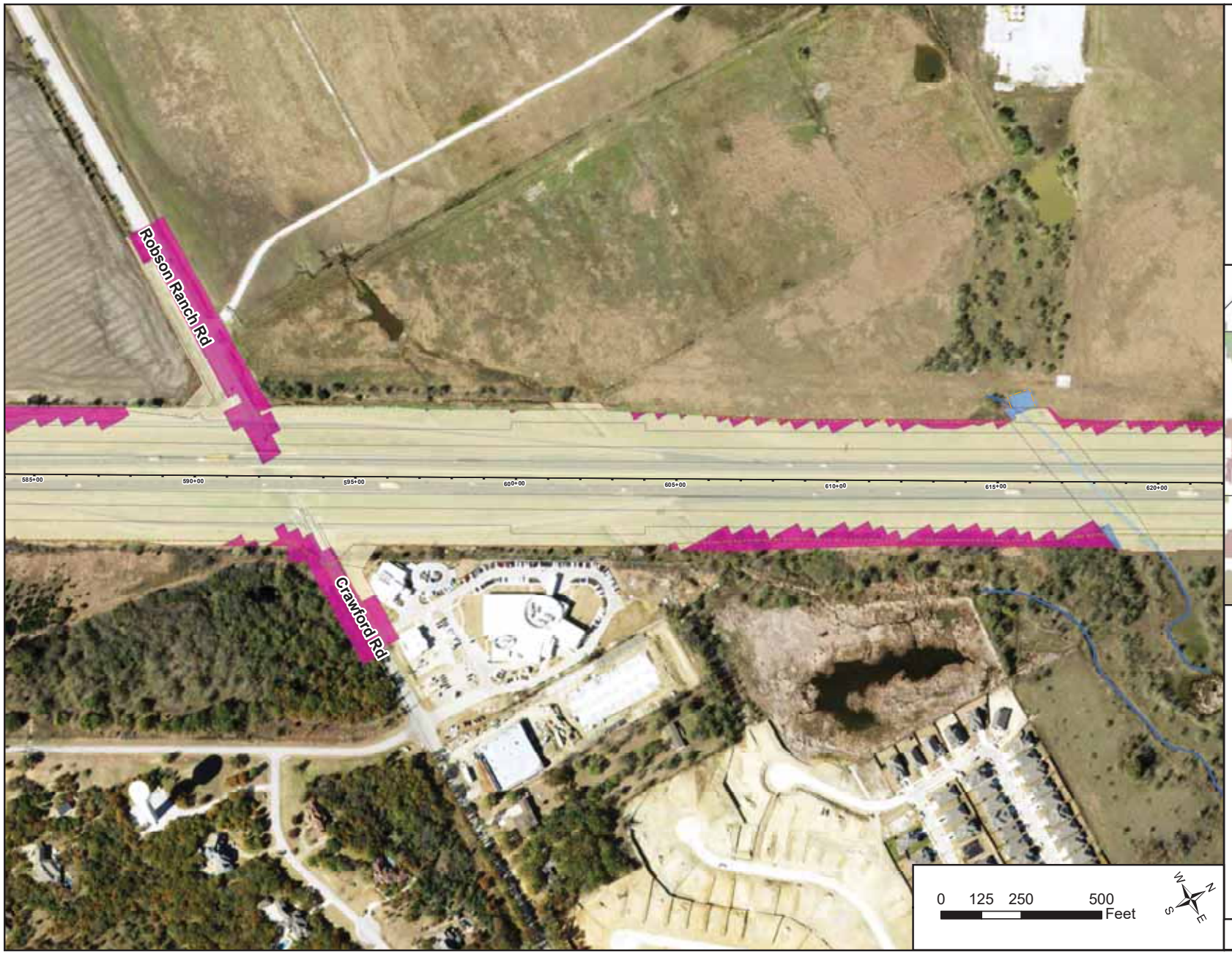
Base Map Source: TNRIS (2018)

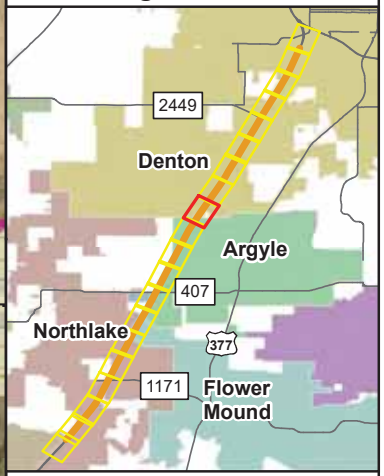
EMST VEGETATION MAP

IH 35W FRONTAGE ROADS

From Dale Earnhardt Way
to south of the IH 35E/IH 35W
Interchange
Denton County, Texas

CSJ: 0081-13-065

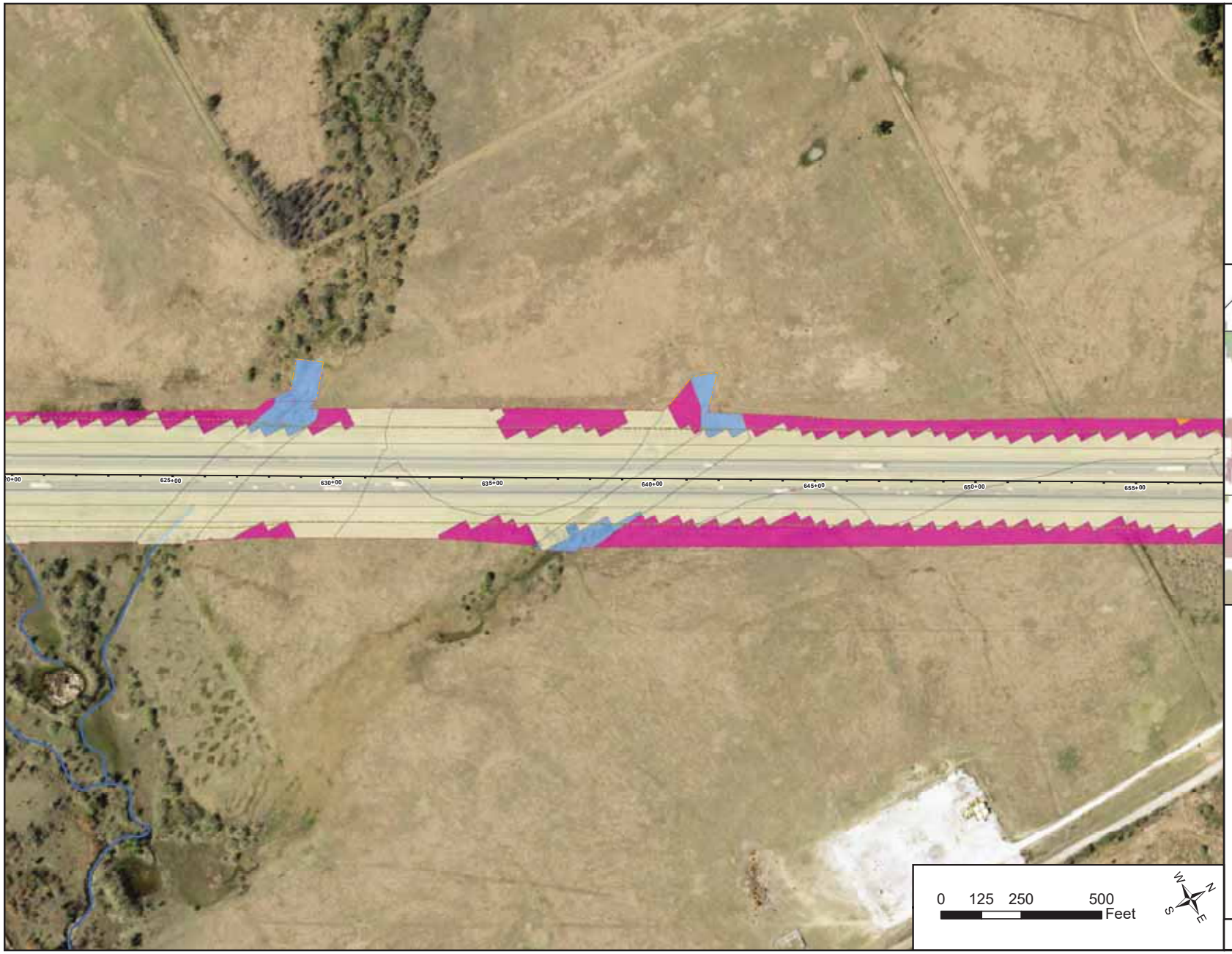




Legend

- Proposed Right-of-Way
- Proposed Easements
- Existing Right of Way
- Agriculture
- Crosstimbers Woodland and Forest
- Disturbed Prairie
- Edwards Plateau Savannah, Woodland, and Shrubland
- Floodplain/Riparian
- Tallgrass Prairie, Grassland
- Urban

Base Map Source: TNRIS (2018)

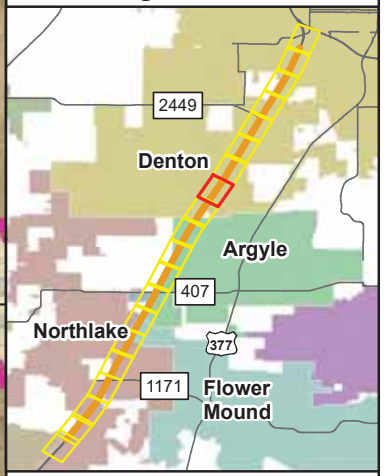


EMST VEGETATION MAP

IH 35W FRONTAGE ROADS

From Dale Earnhardt Way
to south of the IH 35E/IH 35W
Interchange
Denton County, Texas

CSJ: 0081-13-065



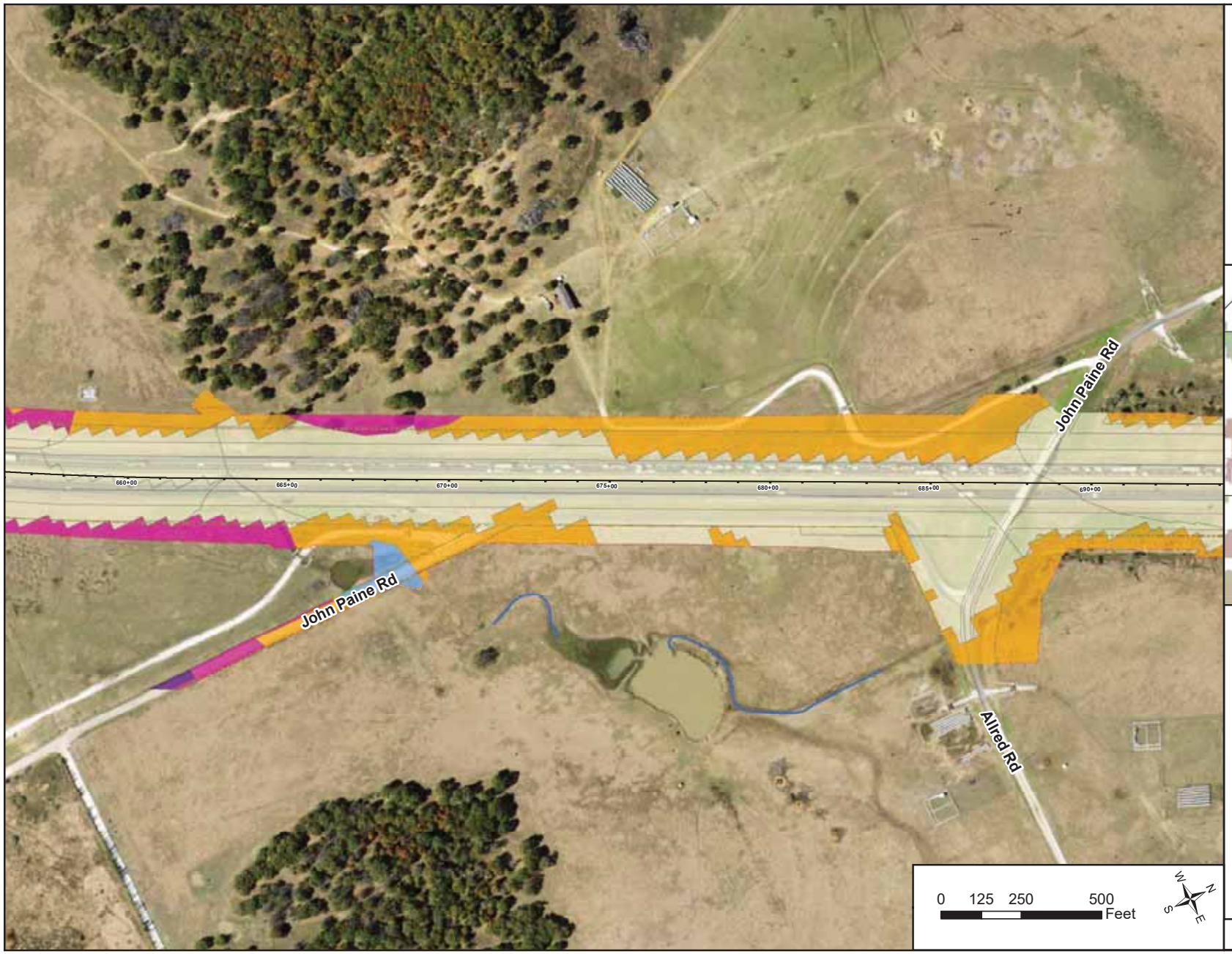
Legend

- Proposed Right-of-Way
- Proposed Easements
- Existing Right of Way
- Agriculture
- Crosstimbers Woodland and Forest
- Disturbed Prairie
- Edwards Plateau Savannah, Woodland, and Shrubland
- Floodplain/Riparian
- Tallgrass Prairie, Grassland
- Urban

0 125 250 500 Feet

N E S W

Base Map Source: TNRIS (2018)



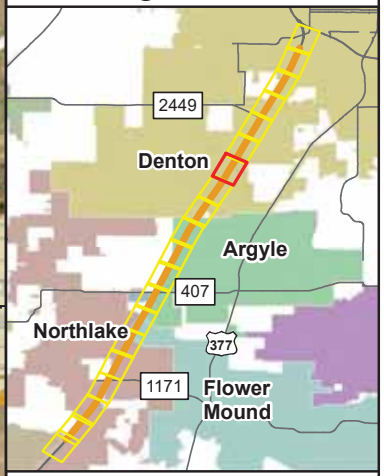
EMST VEGETATION MAP

IH 35W FRONTAGE ROADS

From Dale Earnhardt Way
to south of the IH 35E/IH 35W
Interchange
Denton County, Texas

CSJ: 0081-13-065

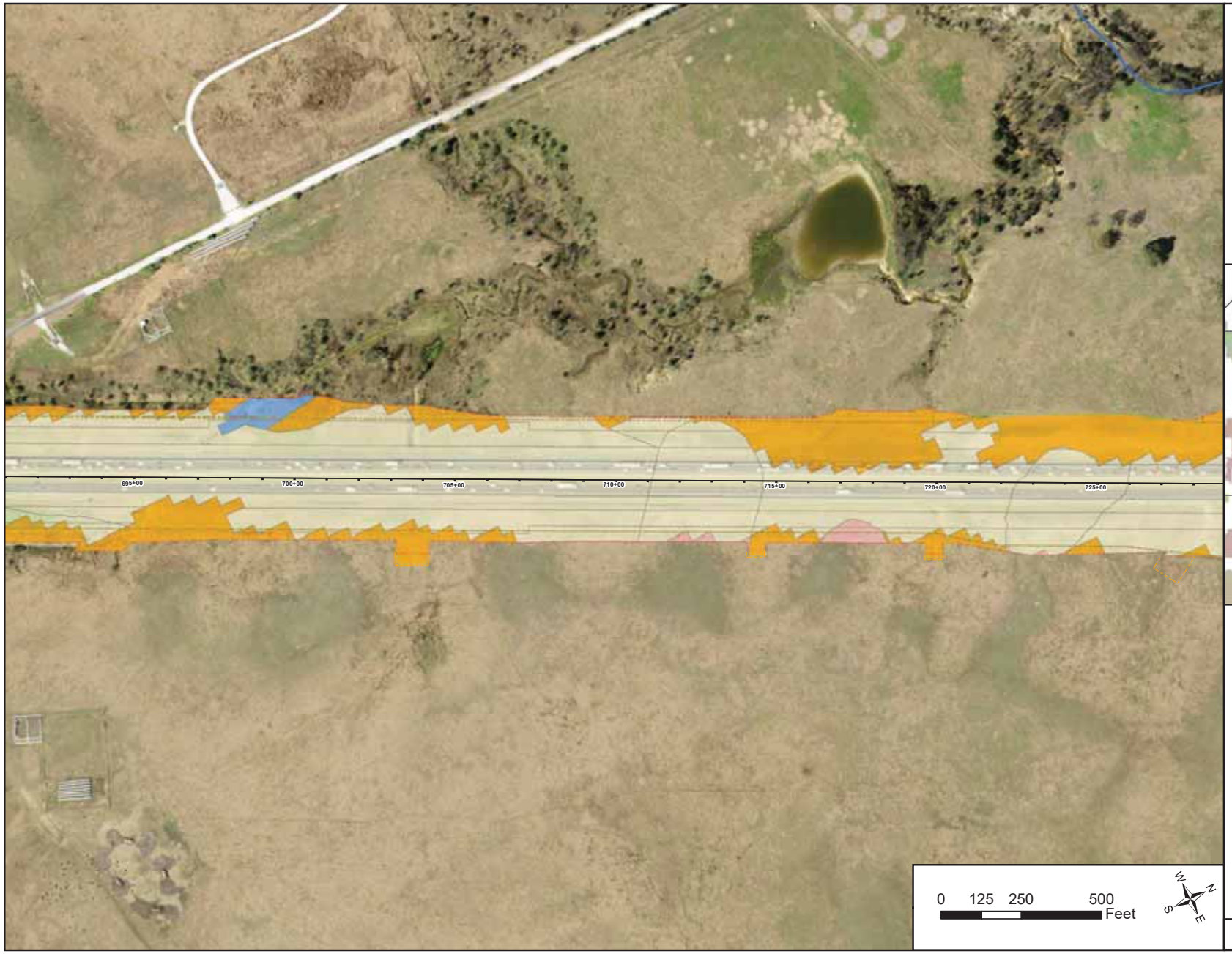
Page 14 of 20



Legend

- Proposed Right-of-Way
- Proposed Easements
- Existing Right of Way
- Agriculture
- Crosstimbers Woodland and Forest
- Disturbed Prairie
- Edwards Plateau Savannah, Woodland, and Shrubland
- Floodplain/Riparian
- Tallgrass Prairie, Grassland
- Urban

Base Map Source: TNRIS (2018)

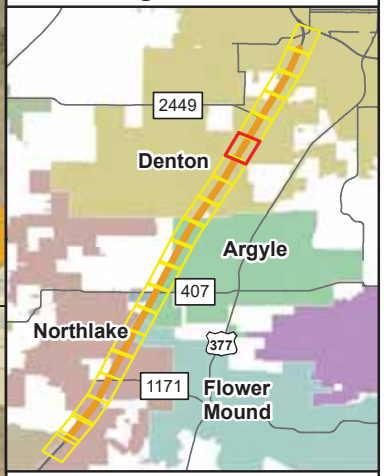


EMST VEGETATION MAP

IH 35W FRONTAGE ROADS

From Dale Earnhardt Way
to south of the IH 35E/IH 35W
Interchange
Denton County, Texas

CSJ: 0081-13-065



Legend

- Proposed Right-of-Way
- Proposed Easements
- Existing Right of Way
- Agriculture
- Crosstimbers Woodland and Forest
- Disturbed Prairie
- Edwards Plateau Savannah, Woodland, and Shrubland
- Floodplain/Riparian
- Tallgrass Prairie, Grassland
- Urban

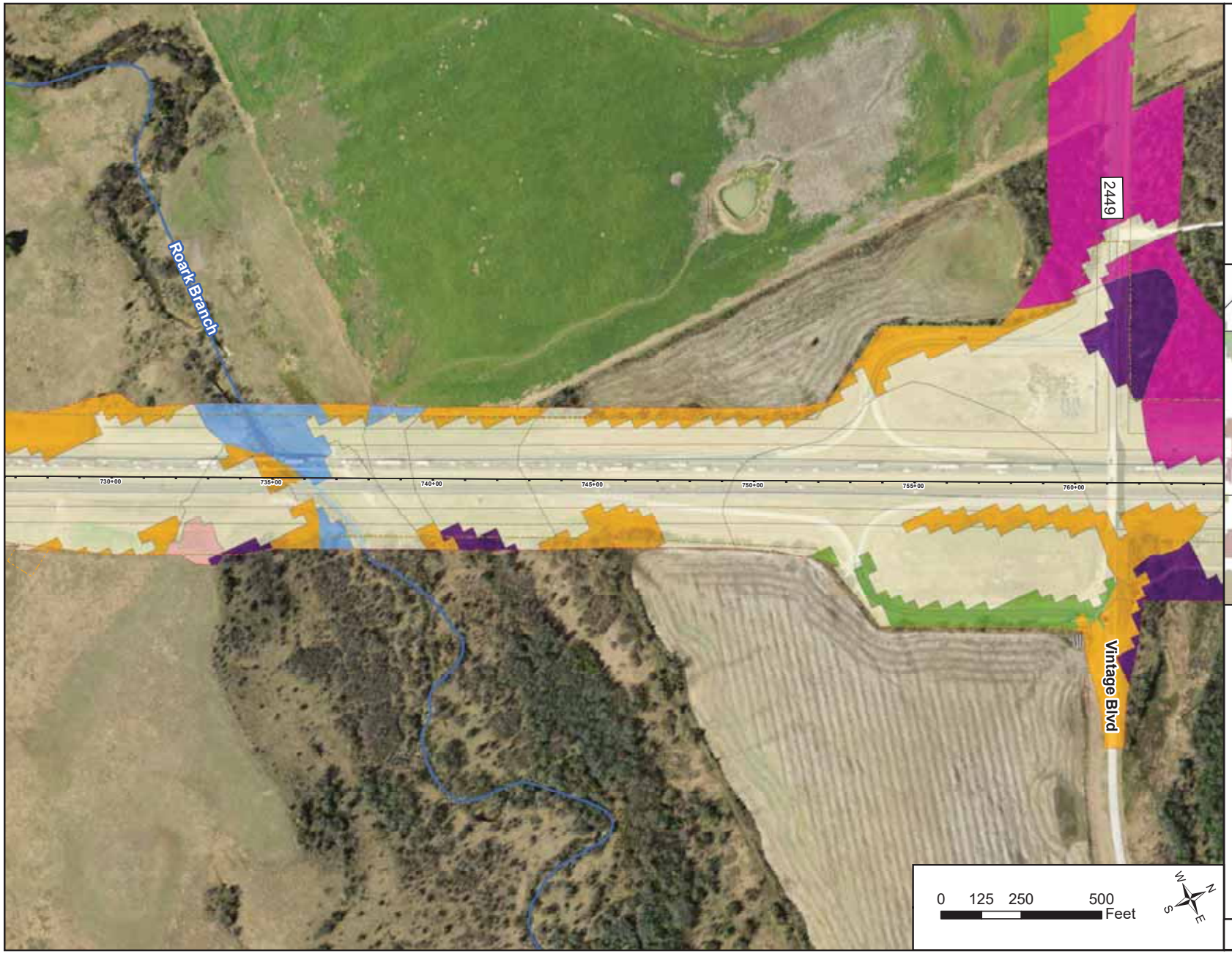
Base Map Source: TNRIS (2018)

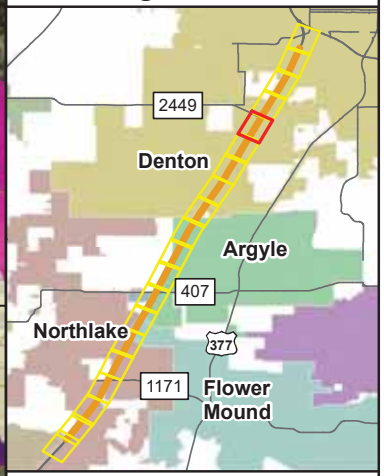
EMST VEGETATION MAP

IH 35W FRONTAGE ROADS

From Dale Earnhardt Way
to south of the IH 35E/IH 35W
Interchange
Denton County, Texas

CSJ: 0081-13-065

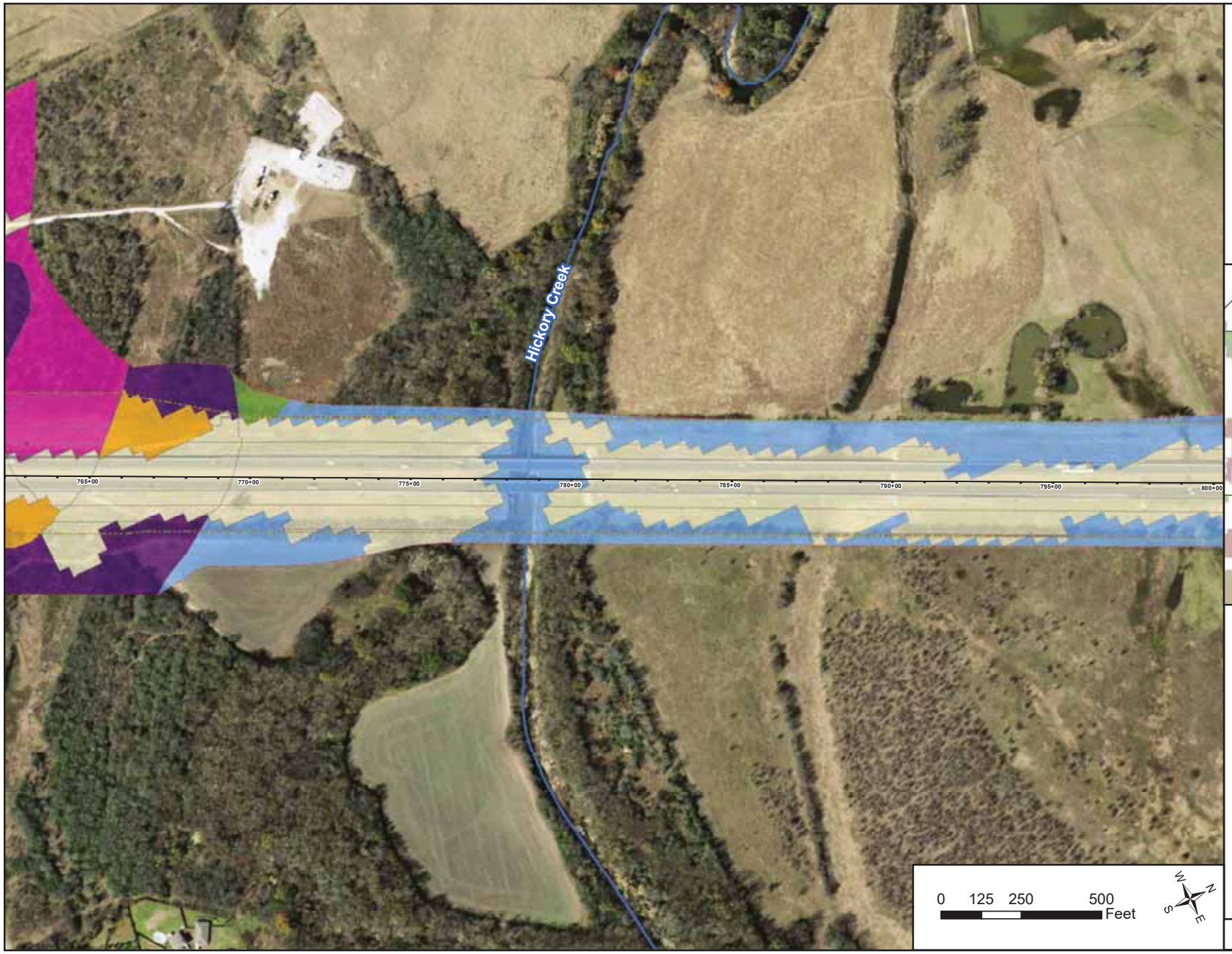




Legend

- Proposed Right-of-Way
- Proposed Easements
- Existing Right of Way
- Agriculture
- Crosstimbers Woodland and Forest
- Disturbed Prairie
- Edwards Plateau Savannah, Woodland, and Shrubland
- Floodplain/Riparian
- Tallgrass Prairie, Grassland
- Urban

Base Map Source: TNRIS (2018)



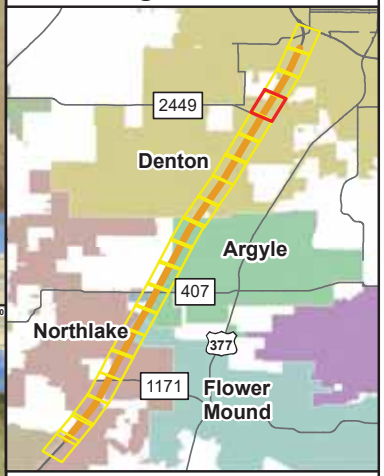
EMST VEGETATION MAP

IH 35W FRONTAGE ROADS

From Dale Earnhardt Way
to south of the IH 35E/IH 35W
Interchange
Denton County, Texas

CSJ: 0081-13-065

Page 17 of 20



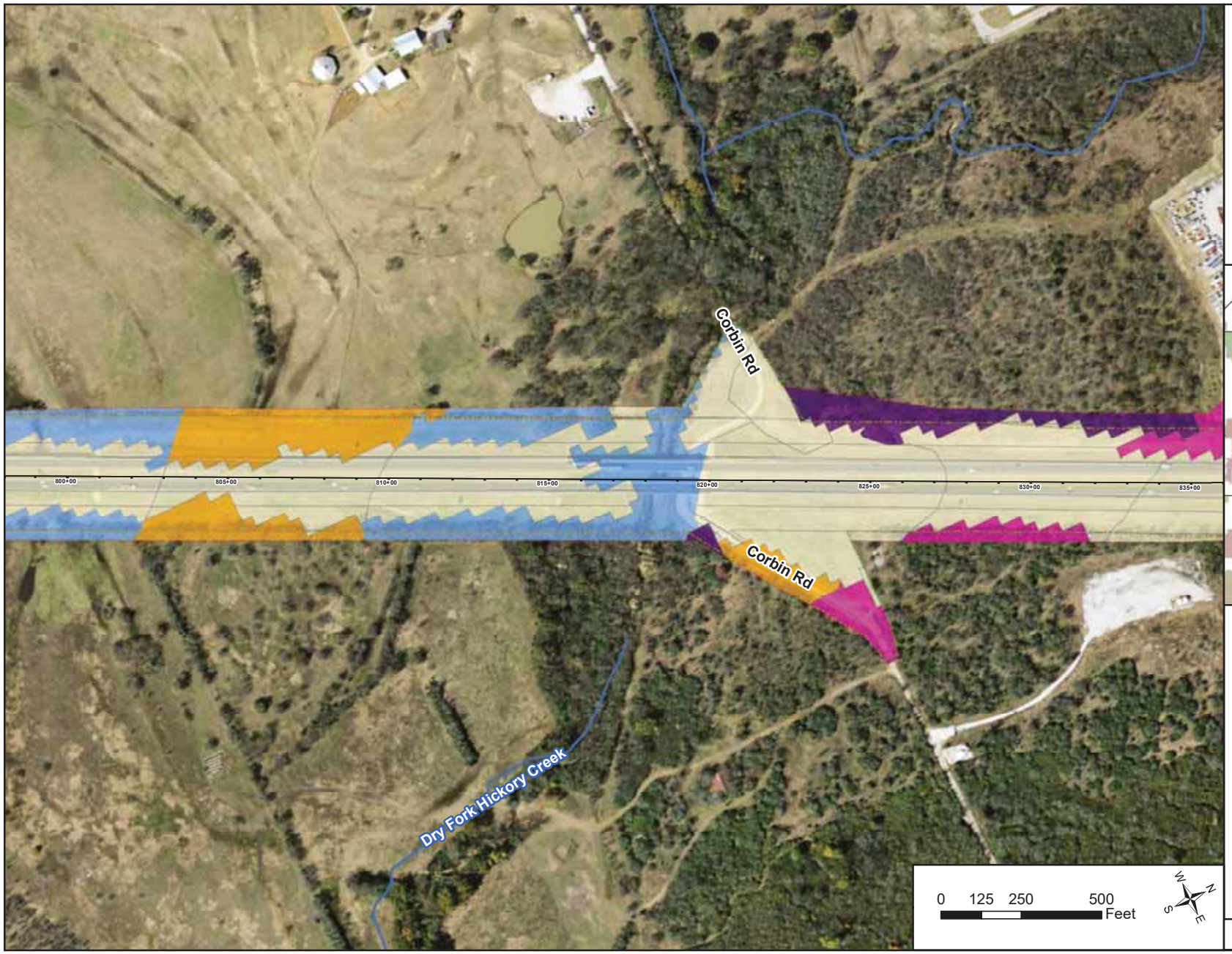
Legend

- Proposed Right-of-Way
- Proposed Easements
- Existing Right of Way
- Agriculture
- Crosstimbers Woodland and Forest
- Disturbed Prairie
- Edwards Plateau Savannah, Woodland, and Shrubland
- Floodplain/Riparian
- Tallgrass Prairie, Grassland
- Urban

0 125 250 500 Feet

N
S
E
W

Base Map Source: TNRIS (2018)



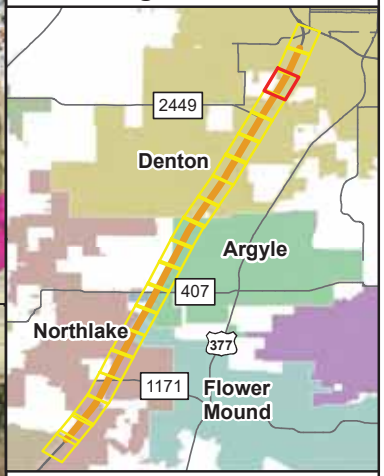
EMST VEGETATION MAP

IH 35W FRONTAGE ROADS

From Dale Earnhardt Way
to south of the IH 35E/IH 35W
Interchange
Denton County, Texas

CSJ: 0081-13-065

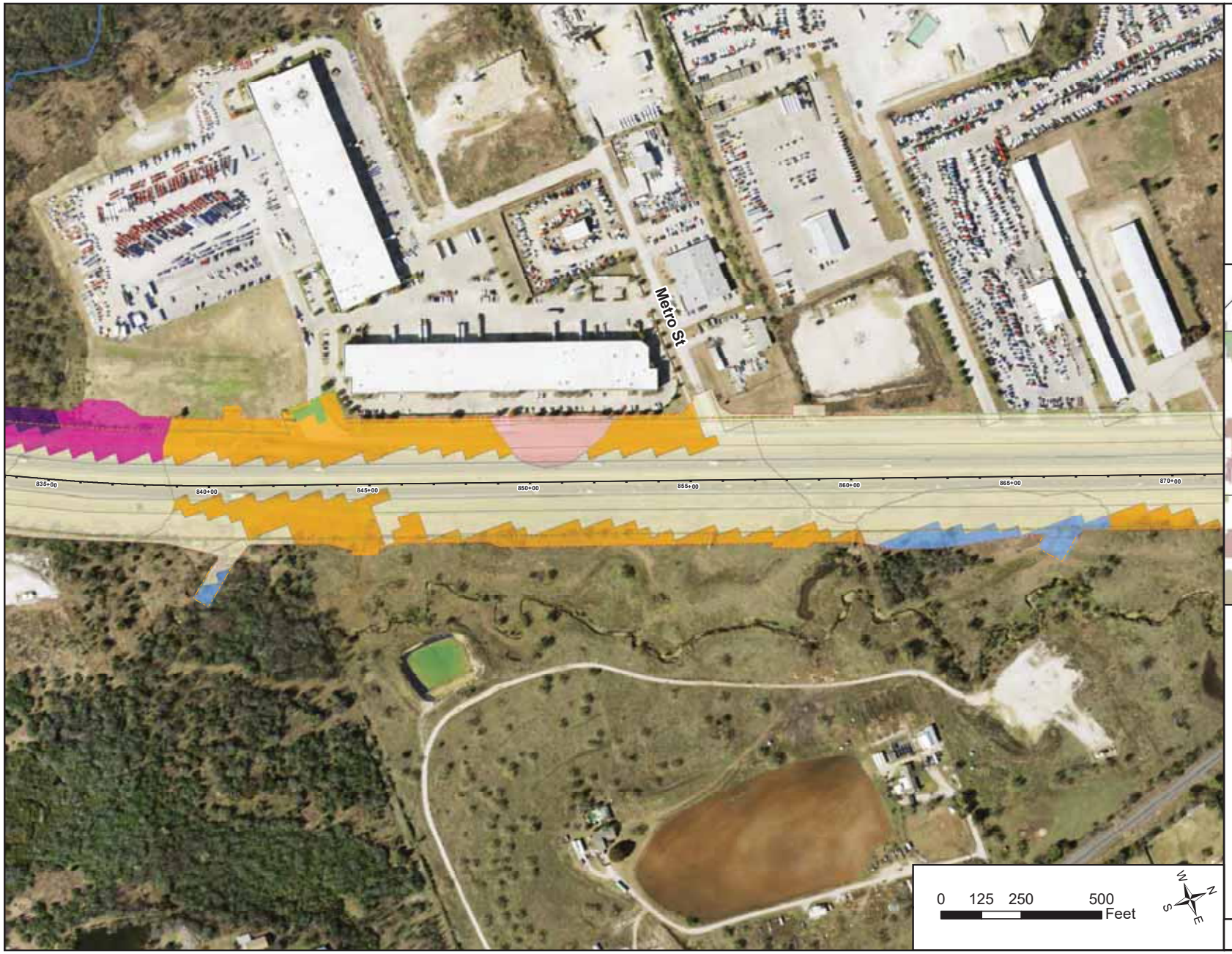
Page 18 of 20



Legend

- Proposed Right-of-Way
- Proposed Easements
- Existing Right of Way
- Agriculture
- Crosstimbers Woodland and Forest
- Disturbed Prairie
- Edwards Plateau Savannah, Woodland, and Shrubland
- Floodplain/Riparian
- Tallgrass Prairie, Grassland
- Urban

Base Map Source: TNRIS (2018)



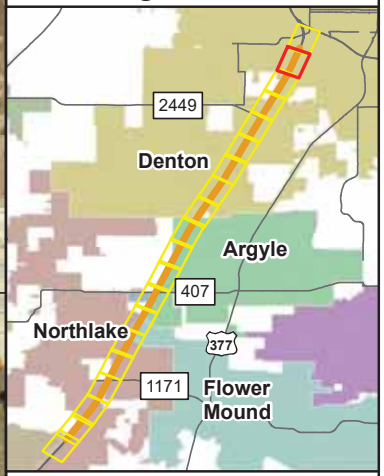
EMST VEGETATION MAP

IH 35W FRONTAGE ROADS

From Dale Earnhardt Way
to south of the IH 35E/IH 35W
Interchange
Denton County, Texas

CSJ: 0081-13-065

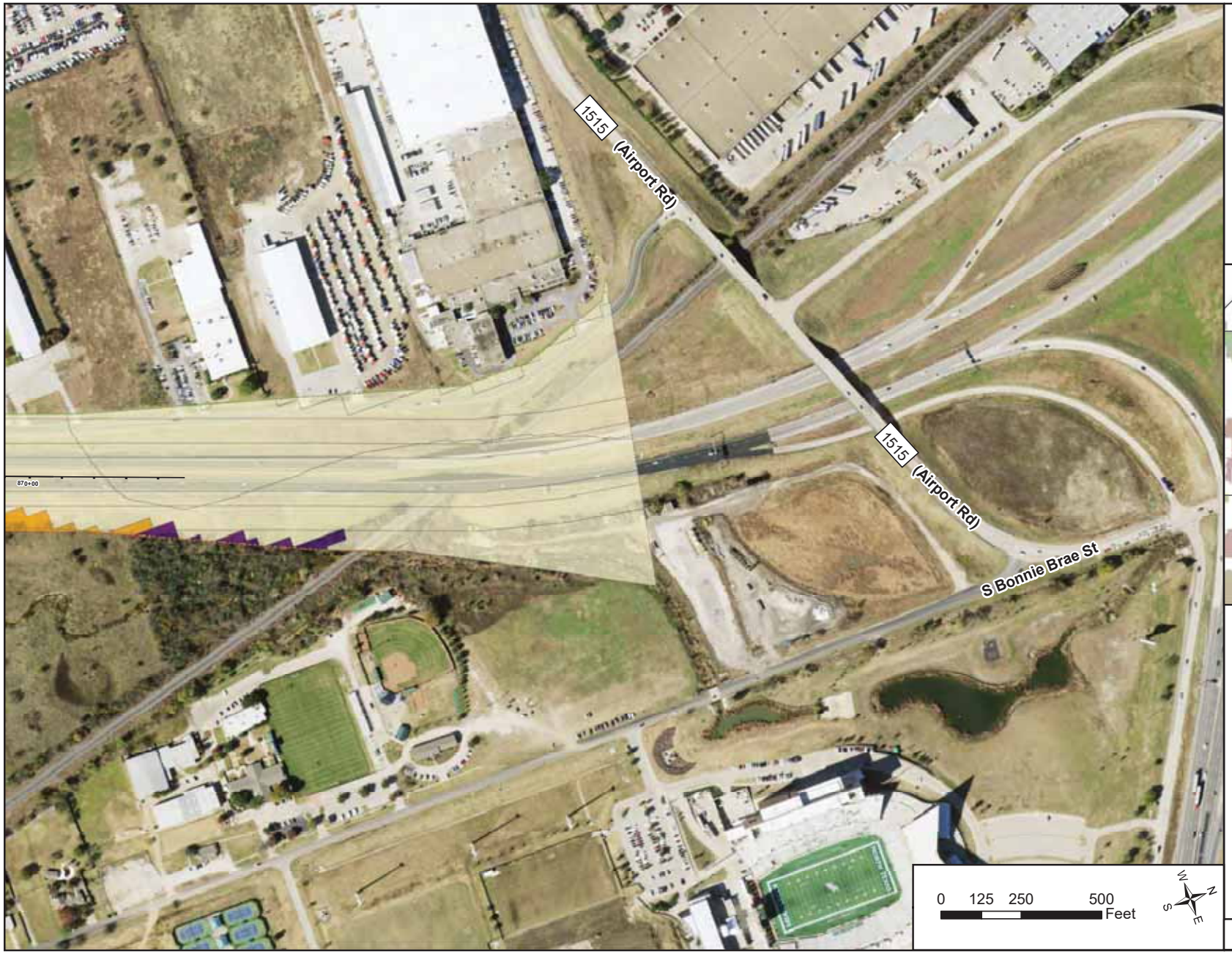
Page 19 of 20



Legend

- Proposed Right-of-Way
- Proposed Easements
- Existing Right of Way
- Agriculture
- Crosstimbers Woodland and Forest
- Disturbed Prairie
- Edwards Plateau Savannah, Woodland, and Shrubland
- Floodplain/Riparian
- Tallgrass Prairie, Grassland
- Urban

Base Map Source: TNRIS (2018)



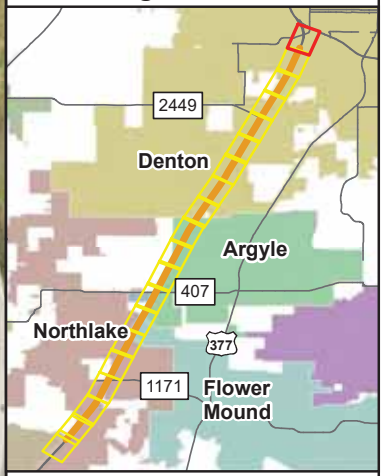
EMST VEGETATION MAP

IH 35W FRONTAGE ROADS

From Dale Earnhardt Way
to south of the IH 35E/IH 35W
Interchange
Denton County, Texas

CSJ: 0081-13-065

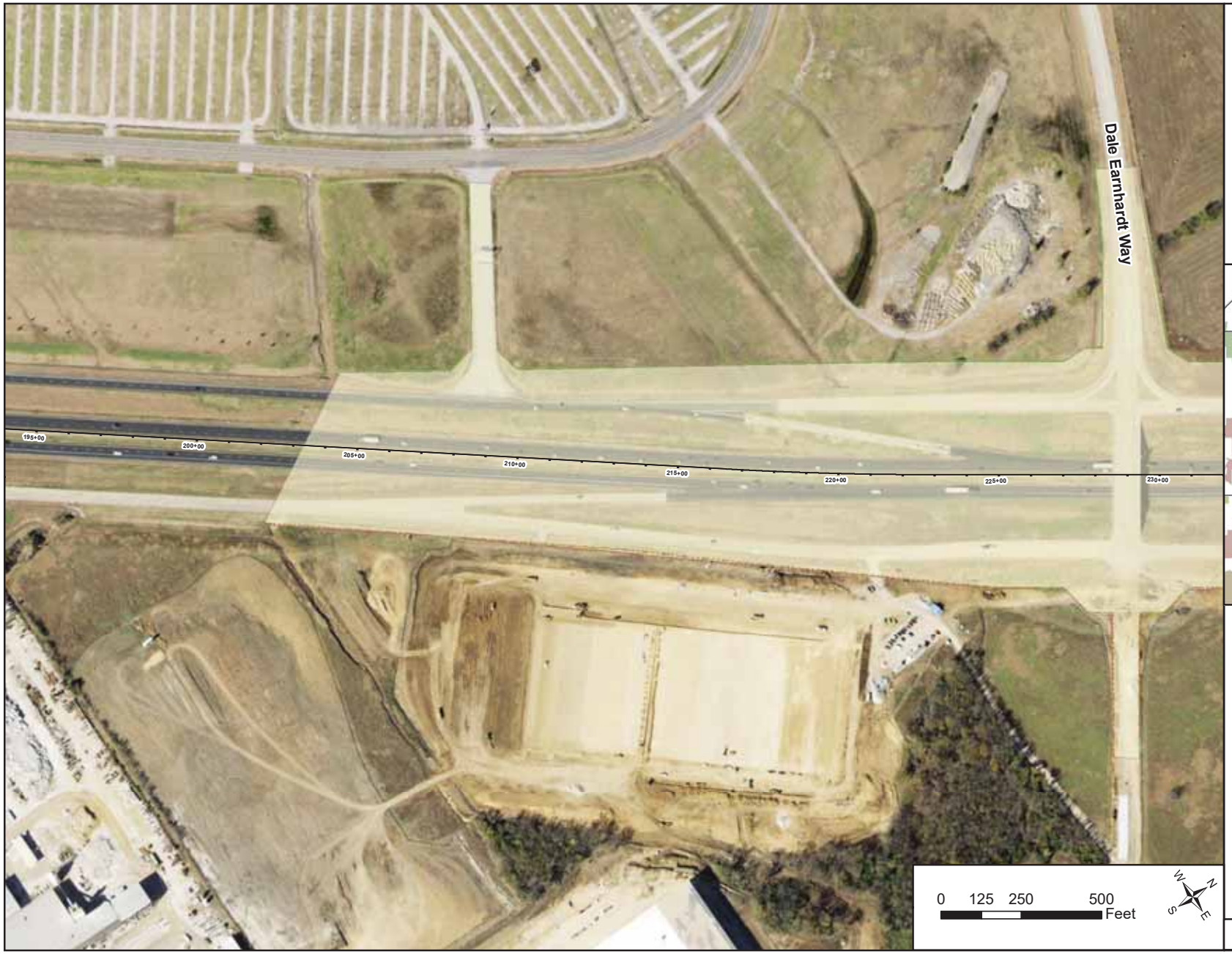
Page 20 of 20



Legend

- Proposed Right-of-Way
- Proposed Easements
- Existing Right of Way
- Agriculture
- Crosstimbers Woodland and Forest
- Disturbed Prairie
- Edwards Plateau Savannah, Woodland, and Shrubland
- Floodplain/Riparian
- Tallgrass Prairie, Grassland
- Urban

Base Map Source: TNRIS (2018)



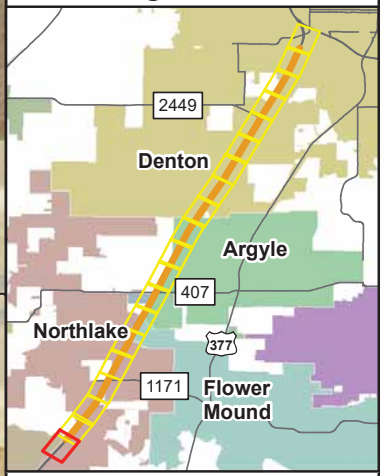
ACTUAL VEGETATION MAP

IH 35W FRONTAGE ROADS

From Dale Earnhardt Way
to south of the IH 35E/IH 35W
Interchange
Denton County, Texas

CSJ: 0081-13-065

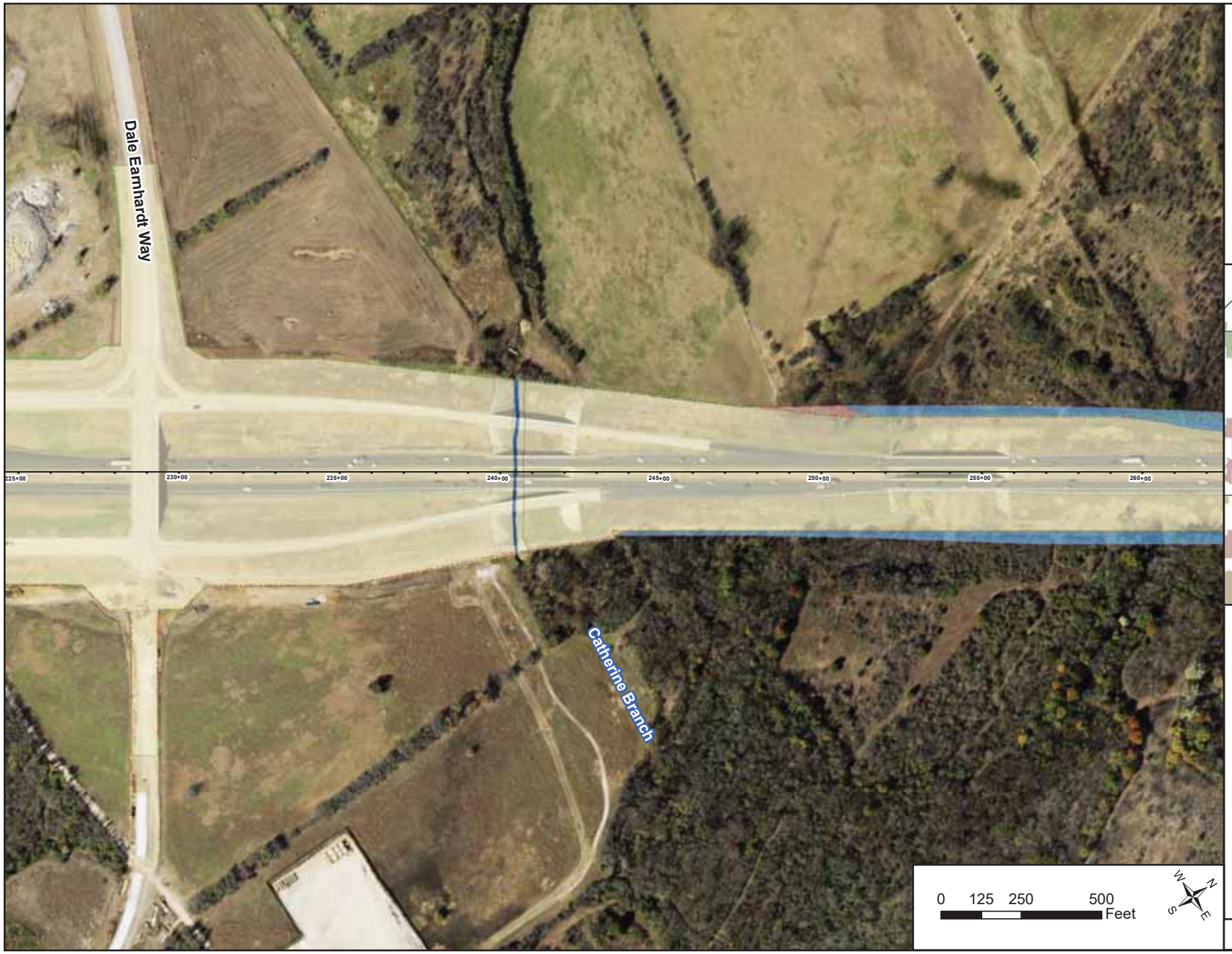
Page 1 of 20



Legend

- Proposed Right of Way
- Proposed Easement
- Existing Right of Way
- Agriculture
- Crosstimbers Woodland and Forest
- Disturbed Prairie
- Edwards Plateau Savannah, Woodland, and Shrubland
- Riparian
- Open Water
- Urban

Base Map Source: TNRIS (2018)



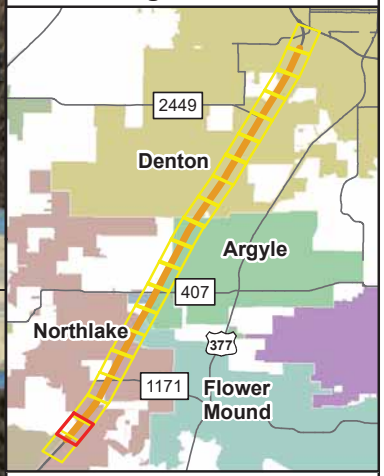
ACTUAL VEGETATION MAP

IH 35W FRONTAGE ROADS

From Dale Earnhardt Way
to south of the IH 35E/IH 35W
Interchange
Denton County, Texas

CSJ: 0081-13-065

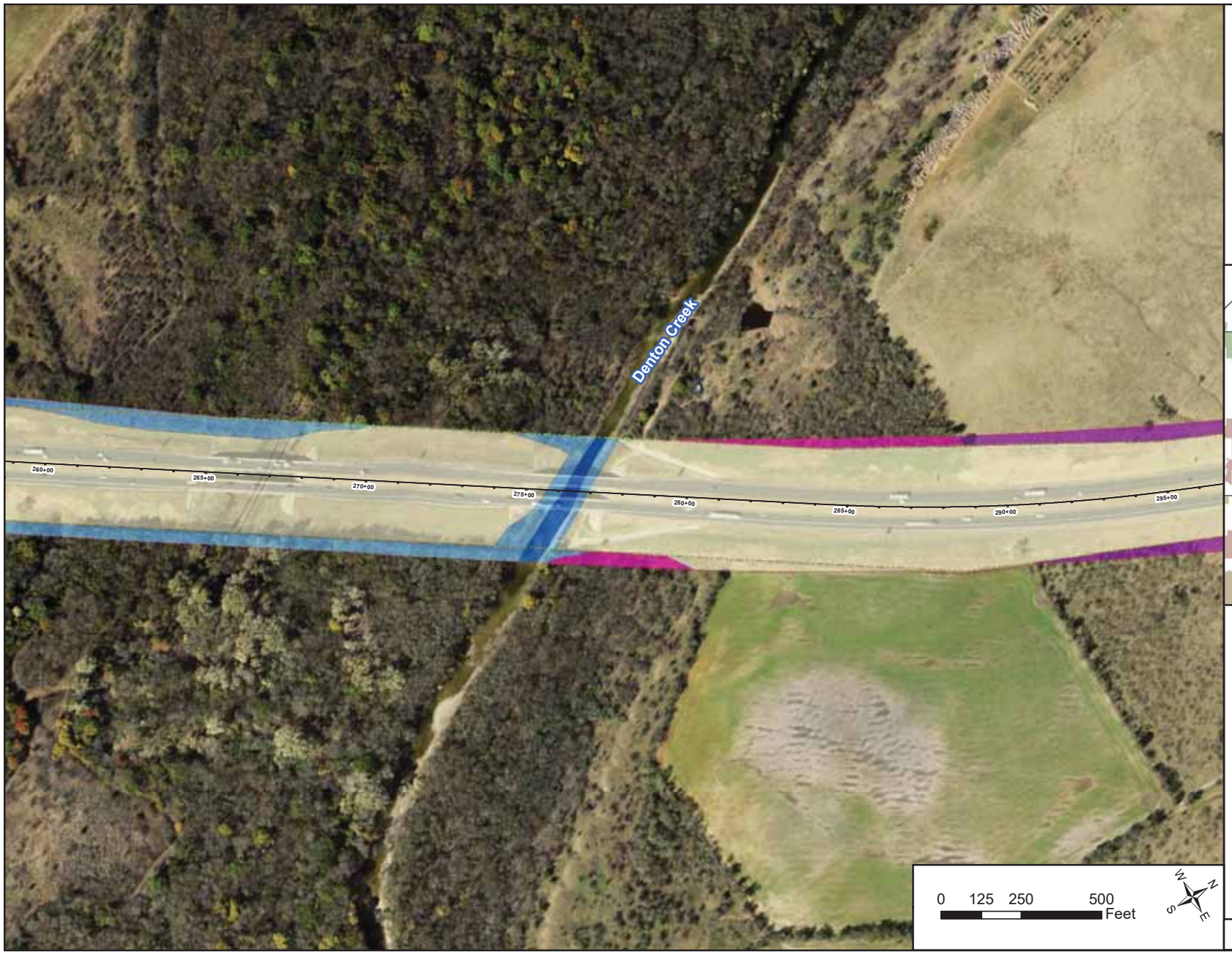
Page 2 of 20



Legend

- Proposed Right of Way
- Proposed Easement
- Existing Right of Way
- Agriculture
- Crosstimbers Woodland and Forest
- Disturbed Prairie
- Edwards Plateau Savannah, Woodland, and Shrubland
- Riparian
- Open Water
- Urban

Base Map Source: TNRIS (2018)



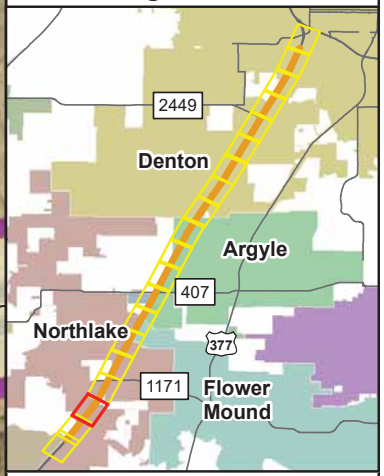
ACTUAL VEGETATION MAP

IH 35W FRONTAGE ROADS

From Dale Earnhardt Way
to south of the IH 35E/IH 35W
Interchange
Denton County, Texas

CSJ: 0081-13-065

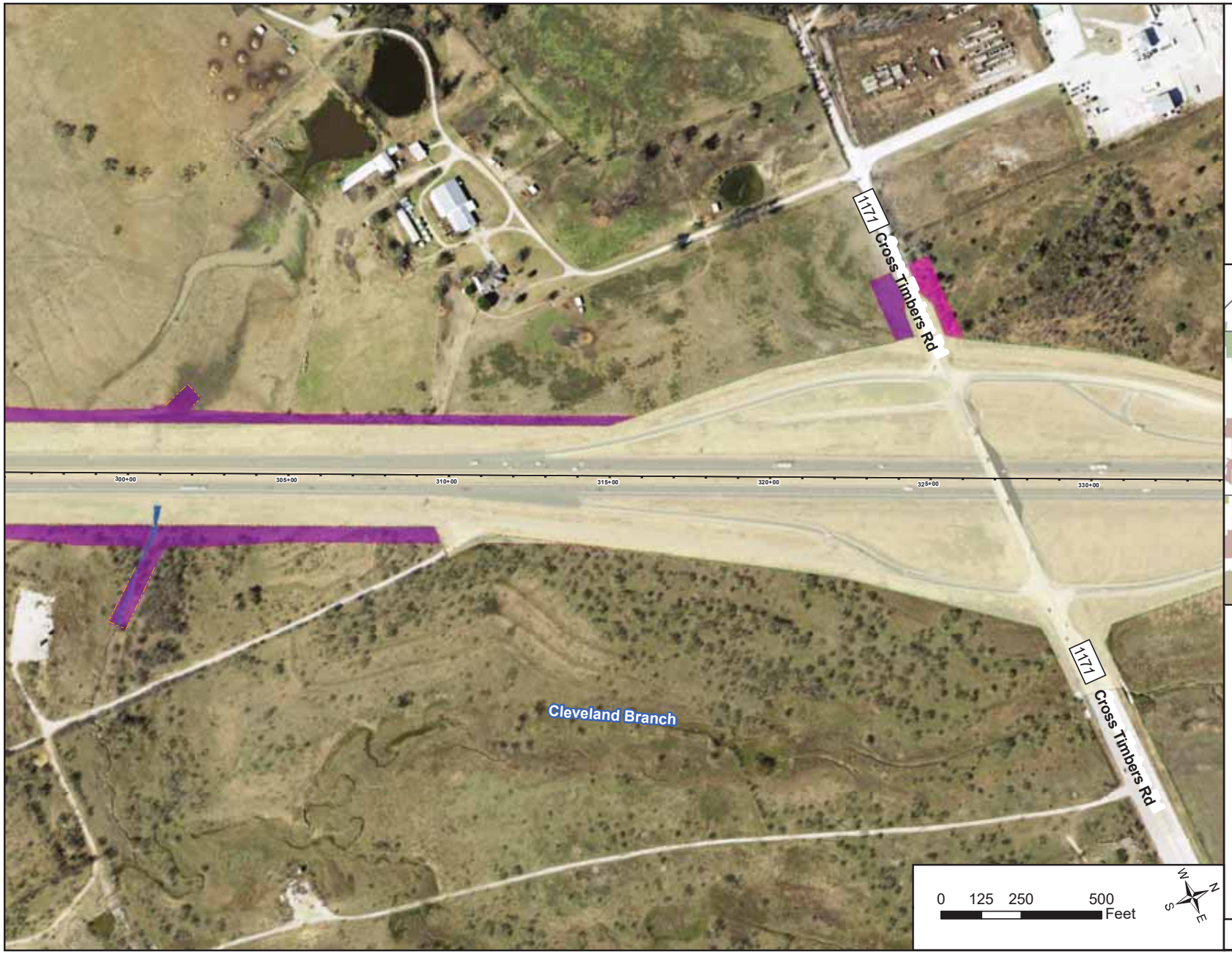
Page 3 of 20



Legend

- Proposed Right of Way
- Proposed Easement
- Existing Right of Way
- Agriculture
- Crosstimbers Woodland and Forest
- Disturbed Prairie
- Edwards Plateau Savannah, Woodland, and Shrubland
- Riparian
- Open Water
- Urban

Base Map Source: TNRIS (2018)



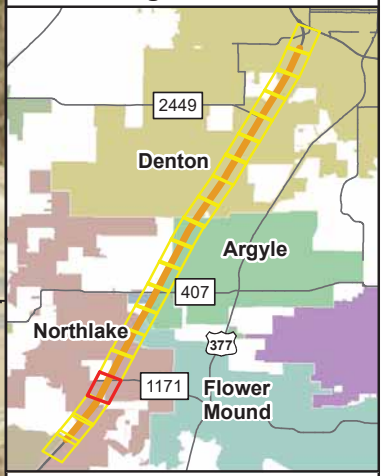
ACTUAL VEGETATION MAP

IH 35W FRONTAGE ROADS

From Dale Earnhardt Way
to south of the IH 35E/IH 35W
Interchange
Denton County, Texas

CSJ: 0081-13-065

Page 4 of 20



Legend

- Proposed Right of Way
- Proposed Easement
- Existing Right of Way
- Agriculture
- Crosstimbers Woodland and Forest
- Disturbed Prairie
- Edwards Plateau Savannah, Woodland, and Shrubland
- Riparian
- Open Water
- Urban

Base Map Source: TNRIS (2018)

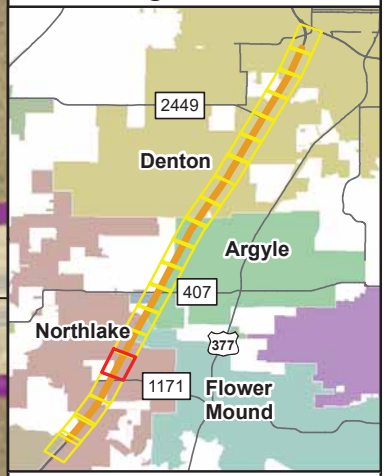
ACTUAL VEGETATION MAP

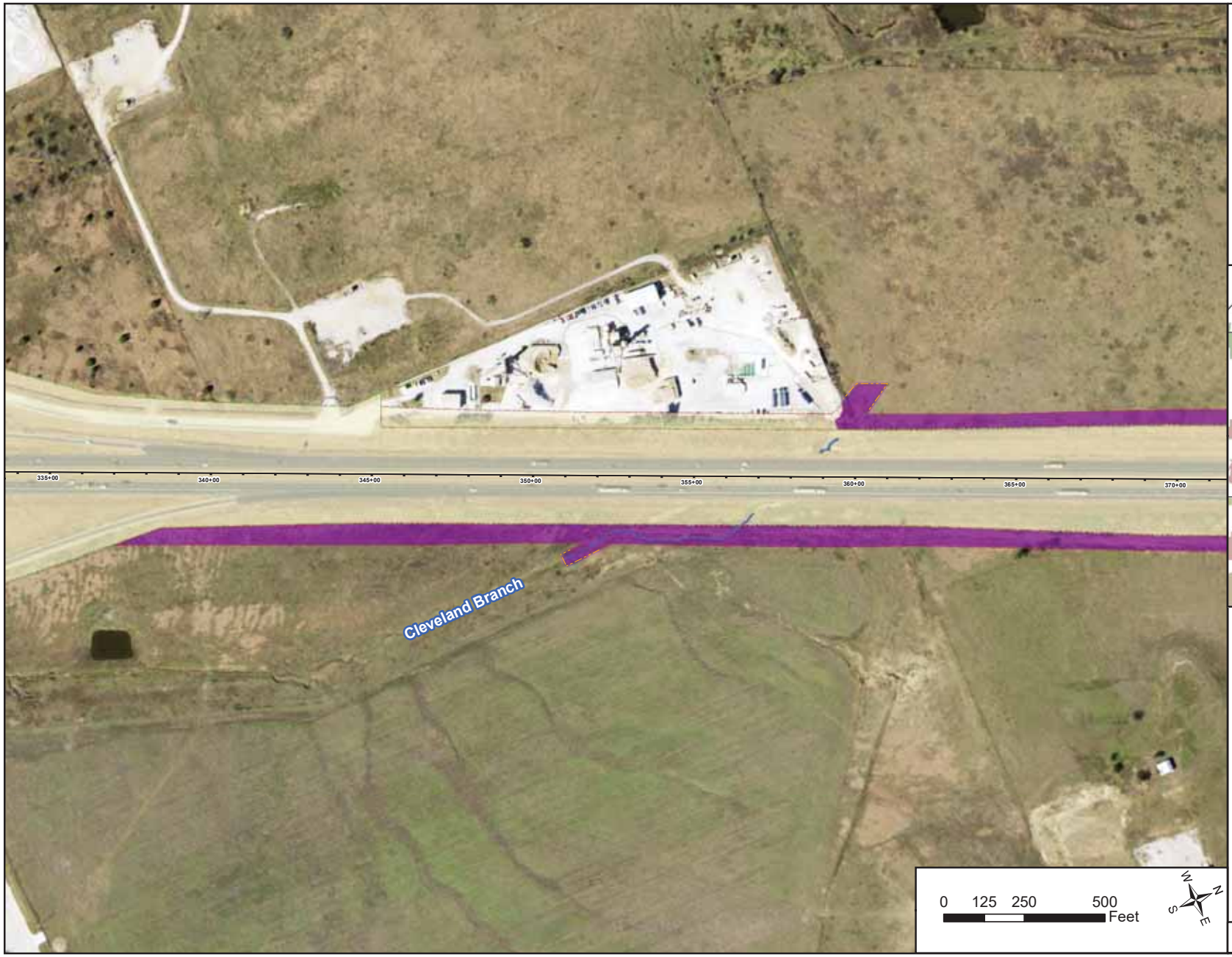
IH 35W FRONTAGE ROADS

From Dale Earnhardt Way
to south of the IH 35E/IH 35W
Interchange
Denton County, Texas

CSJ: 0081-13-065

Page 5 of 20

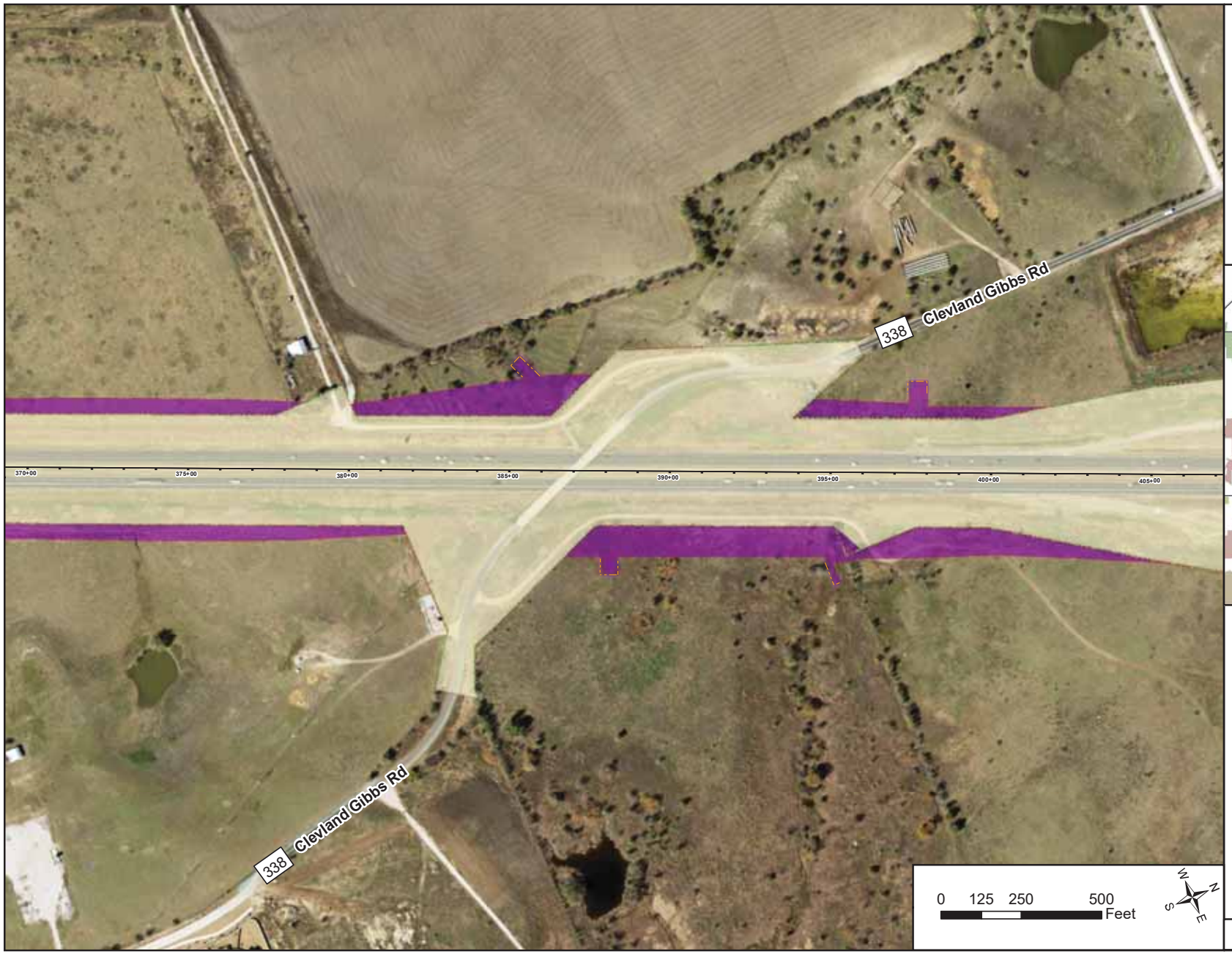




Legend

- Proposed Right of Way
- Proposed Easement
- Existing Right of Way
- Agriculture
- Crosstimbers Woodland and Forest
- Disturbed Prairie
- Edwards Plateau Savannah, Woodland, and Shrubland
- Riparian
- Open Water
- Urban

Base Map Source: TNRIS (2018)

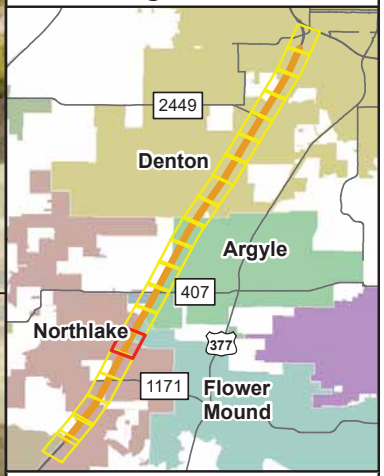


ACTUAL VEGETATION MAP

IH 35W FRONTAGE ROADS

From Dale Earnhardt Way
to south of the IH 35E/IH 35W
Interchange
Denton County, Texas

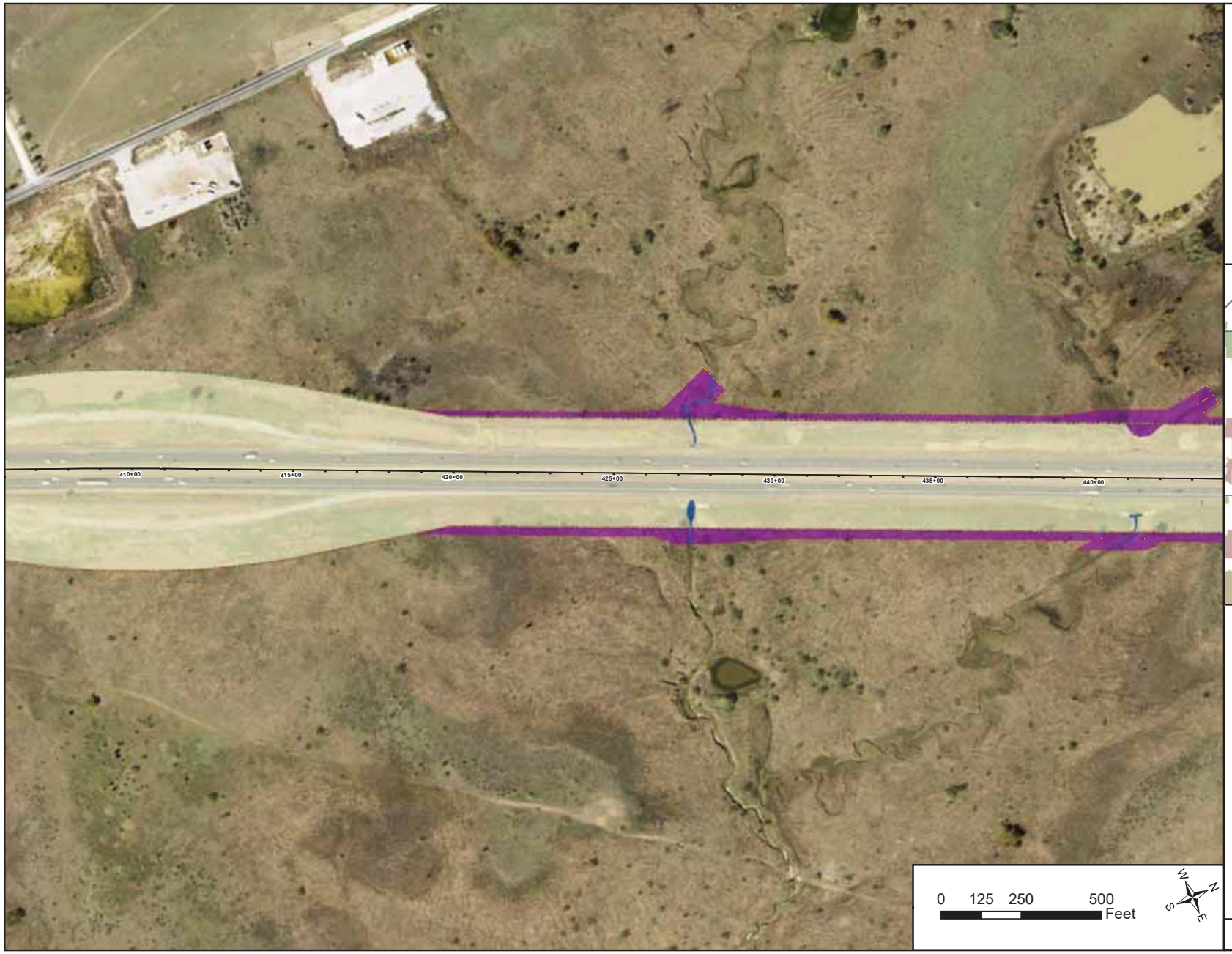
CSJ: 0081-13-065



Legend

- Proposed Right of Way
- Proposed Easement
- Existing Right of Way
- Agriculture
- Crosstimbers Woodland and Forest
- Disturbed Prairie
- Edwards Plateau Savannah, Woodland, and Shrubland
- Riparian
- Open Water
- Urban

Base Map Source: TNRIS (2018)



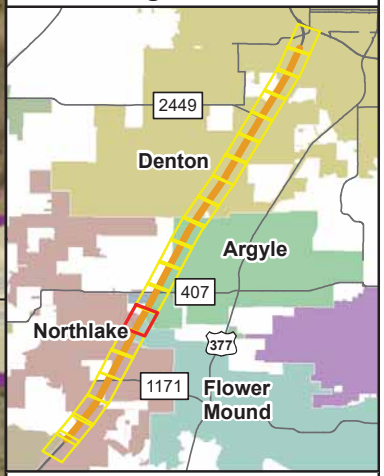
ACTUAL VEGETATION MAP

IH 35W FRONTAGE ROADS

From Dale Earnhardt Way
to south of the IH 35E/IH 35W
Interchange
Denton County, Texas

CSJ: 0081-13-065

Page 7 of 20



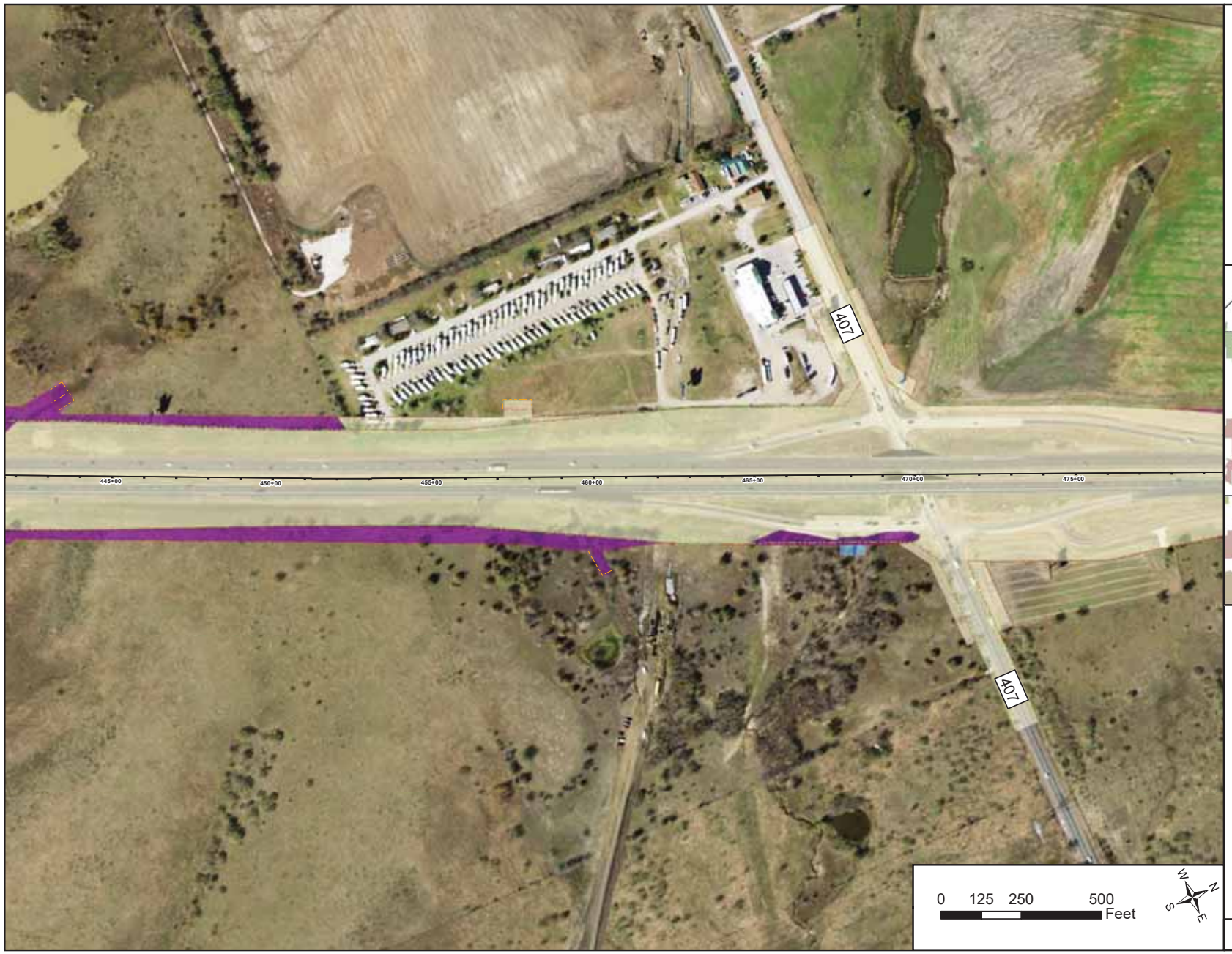
Legend

- Proposed Right of Way
- Proposed Easement
- Existing Right of Way
- Agriculture
- Crosstimbers Woodland and Forest
- Disturbed Prairie
- Edwards Plateau Savannah, Woodland, and Shrubland
- Riparian
- Open Water
- Urban

0 125 250 500 Feet

N E S

Base Map Source: TNRIS (2018)



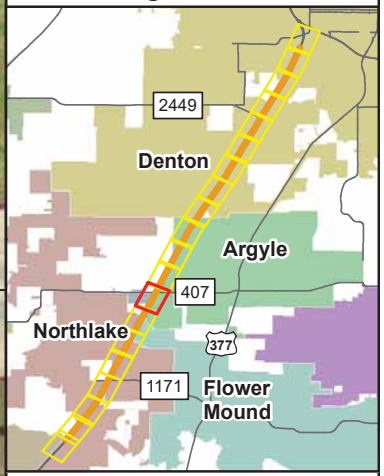
ACTUAL VEGETATION MAP

IH 35W FRONTAGE ROADS

From Dale Earnhardt Way
to south of the IH 35E/IH 35W
Interchange
Denton County, Texas

CSJ: 0081-13-065

Page 8 of 20



Legend

- Proposed Right of Way
- Proposed Easement
- Existing Right of Way
- Agriculture
- Crosstimbers Woodland and Forest
- Disturbed Prairie
- Edwards Plateau Savannah, Woodland, and Shrubland
- Riparian
- Open Water
- Urban

Base Map Source: TNRIS (2018)

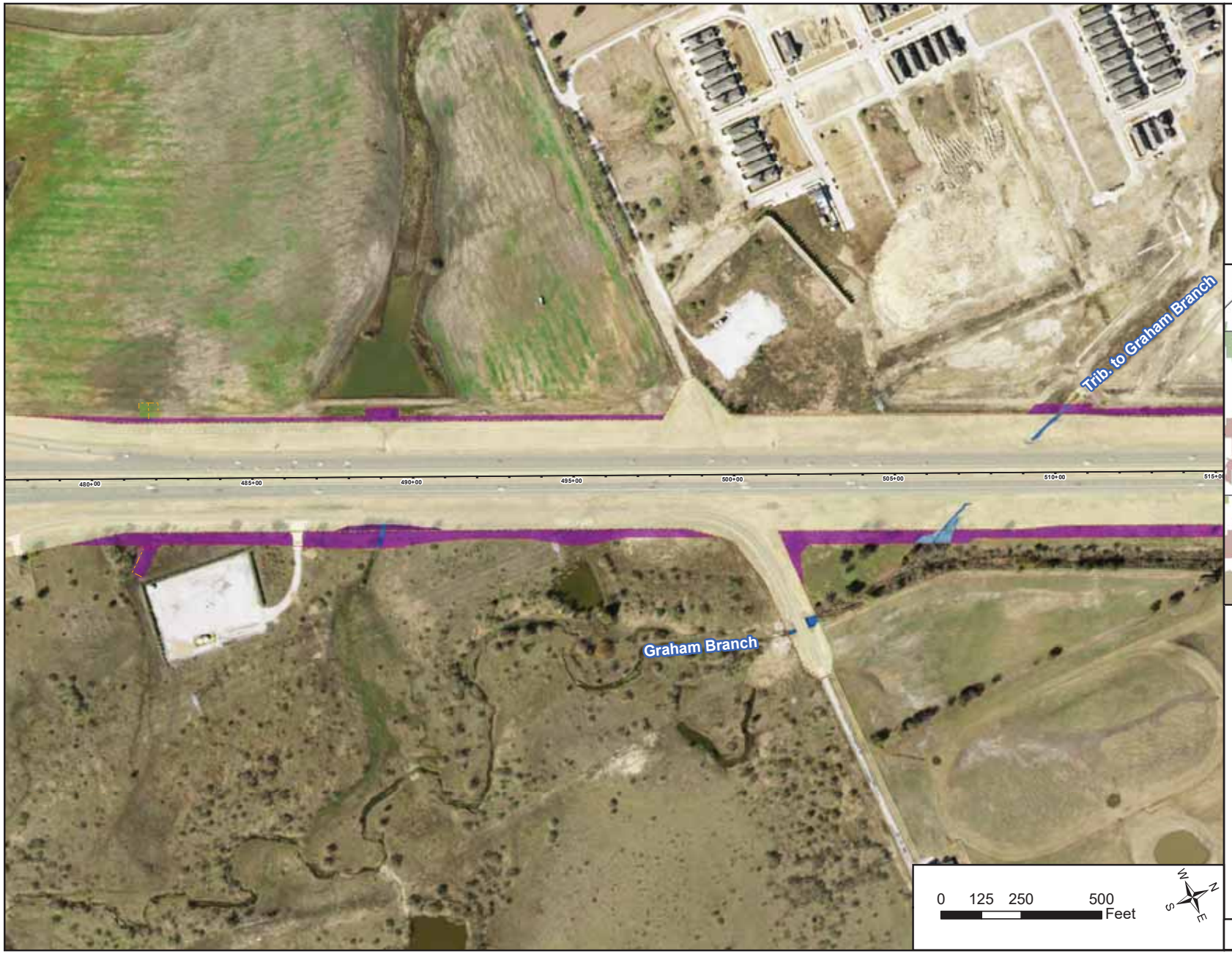
ACTUAL VEGETATION MAP

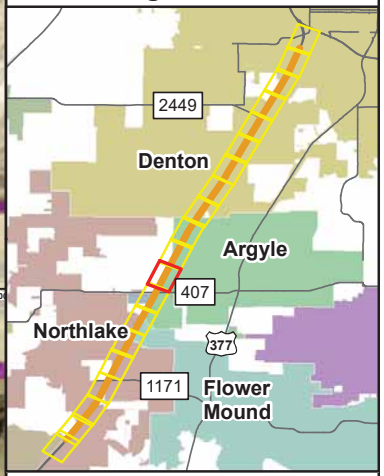
IH 35W FRONTAGE ROADS

From Dale Earnhardt Way
to south of the IH 35E/IH 35W
Interchange
Denton County, Texas

CSJ: 0081-13-065

Page 9 of 20





Legend

- Proposed Right of Way
- Proposed Easement
- Existing Right of Way
- Agriculture
- Crosstimbers Woodland and Forest
- Disturbed Prairie
- Edwards Plateau Savannah, Woodland, and Shrubland
- Riparian
- Open Water
- Urban

Base Map Source: TNRIS (2018)

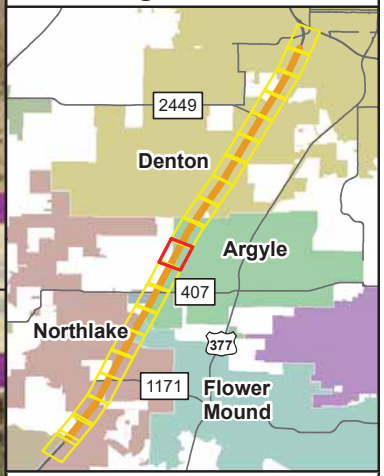
ACTUAL VEGETATION MAP

IH 35W FRONTAGE ROADS

From Dale Earnhardt Way
to south of the IH 35E/IH 35W
Interchange
Denton County, Texas

CSJ: 0081-13-065

Page 10 of 20



Legend

- Proposed Right of Way
- Proposed Easement
- Existing Right of Way
- Agriculture
- Crosstimbers Woodland and Forest
- Disturbed Prairie
- Edwards Plateau Savannah, Woodland, and Shrubland
- Riparian
- Open Water
- Urban

Base Map Source: TNRIS (2018)

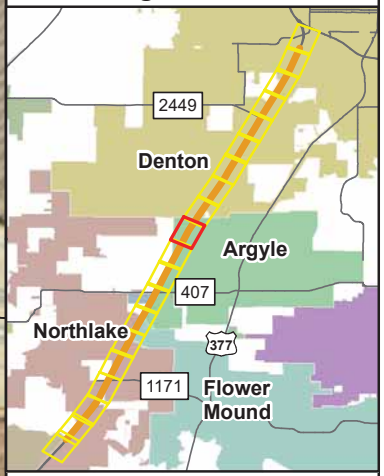
ACTUAL VEGETATION MAP

IH 35W FRONTAGE ROADS

From Dale Earnhardt Way
to south of the IH 35E/IH 35W
Interchange
Denton County, Texas

CSJ: 0081-13-065

Page 11 of 20



Legend

- Proposed Right of Way
- Proposed Easement
- Existing Right of Way
- Agriculture
- Crosstimbers Woodland and Forest
- Disturbed Prairie
- Edwards Plateau Savannah, Woodland, and Shrubland
- Riparian
- Open Water
- Urban

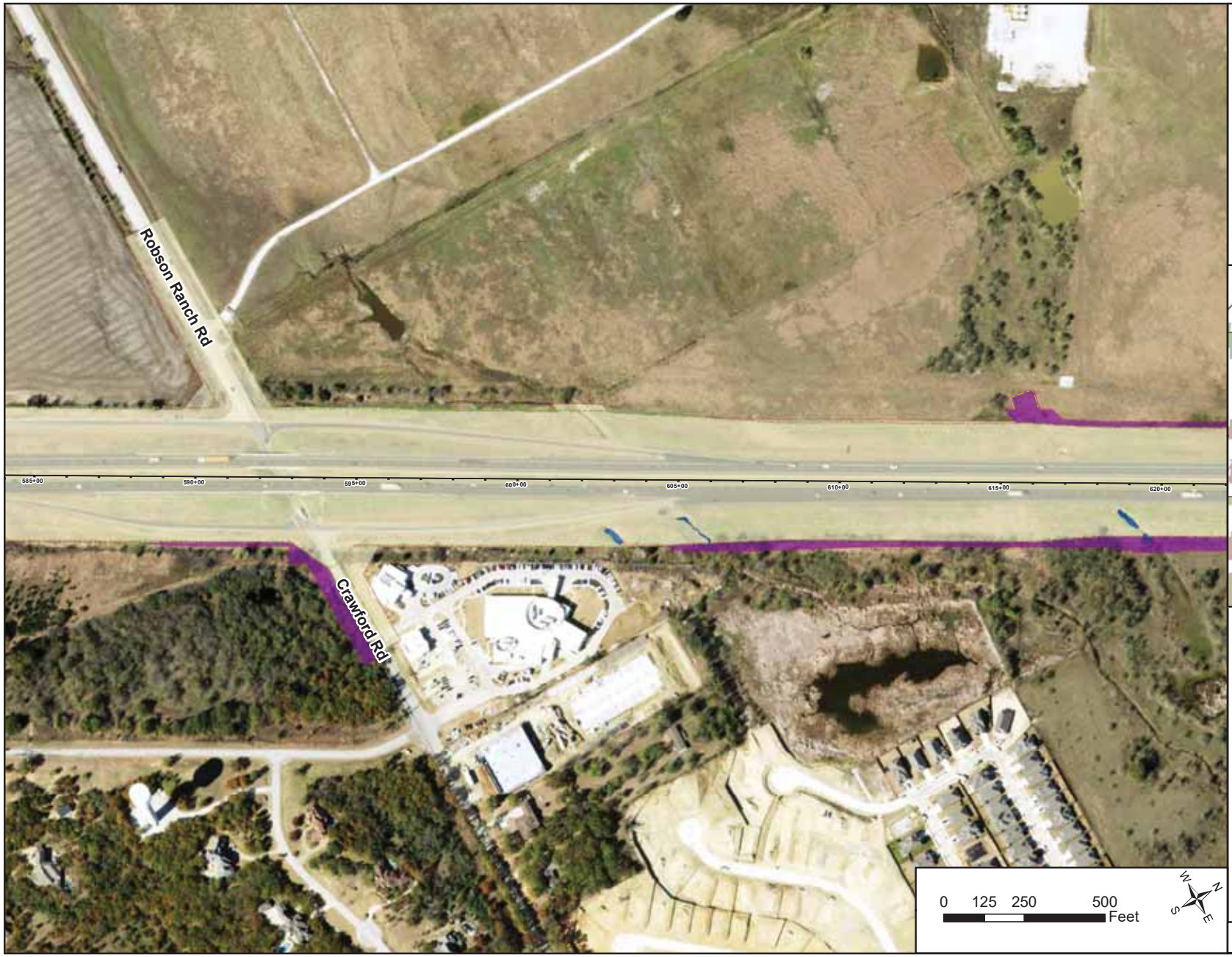
Base Map Source: TNRIS (2018)

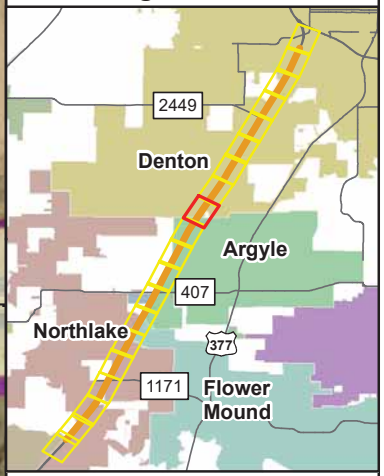
ACTUAL VEGETATION MAP

IH 35W FRONTAGE ROADS

From Dale Earnhardt Way
to south of the IH 35E/IH 35W
Interchange
Denton County, Texas

CSJ: 0081-13-065





Legend

- Proposed Right of Way
- Proposed Easement
- Existing Right of Way
- Agriculture
- Crosstimbers Woodland and Forest
- Disturbed Prairie
- Edwards Plateau Savannah, Woodland, and Shrubland
- Riparian
- Open Water
- Urban

Base Map Source: TNRIS (2018)

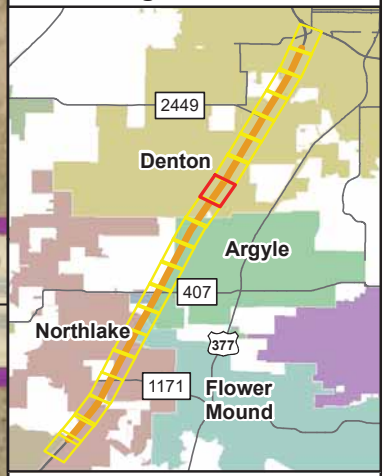
ACTUAL VEGETATION MAP

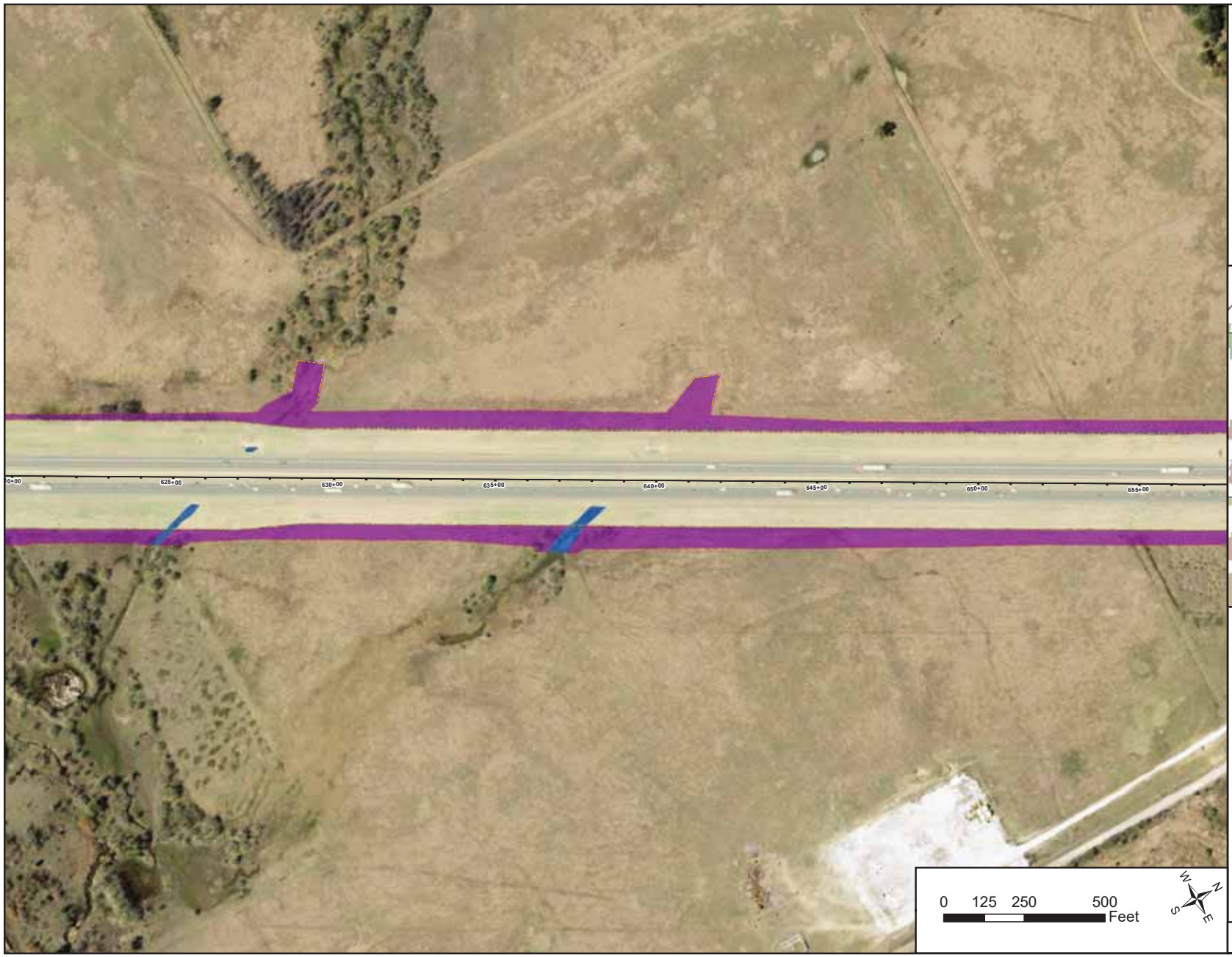
IH 35W FRONTAGE ROADS

From Dale Earnhardt Way
to south of the IH 35E/IH 35W
Interchange
Denton County, Texas

CSJ: 0081-13-065

Page 13 of 20

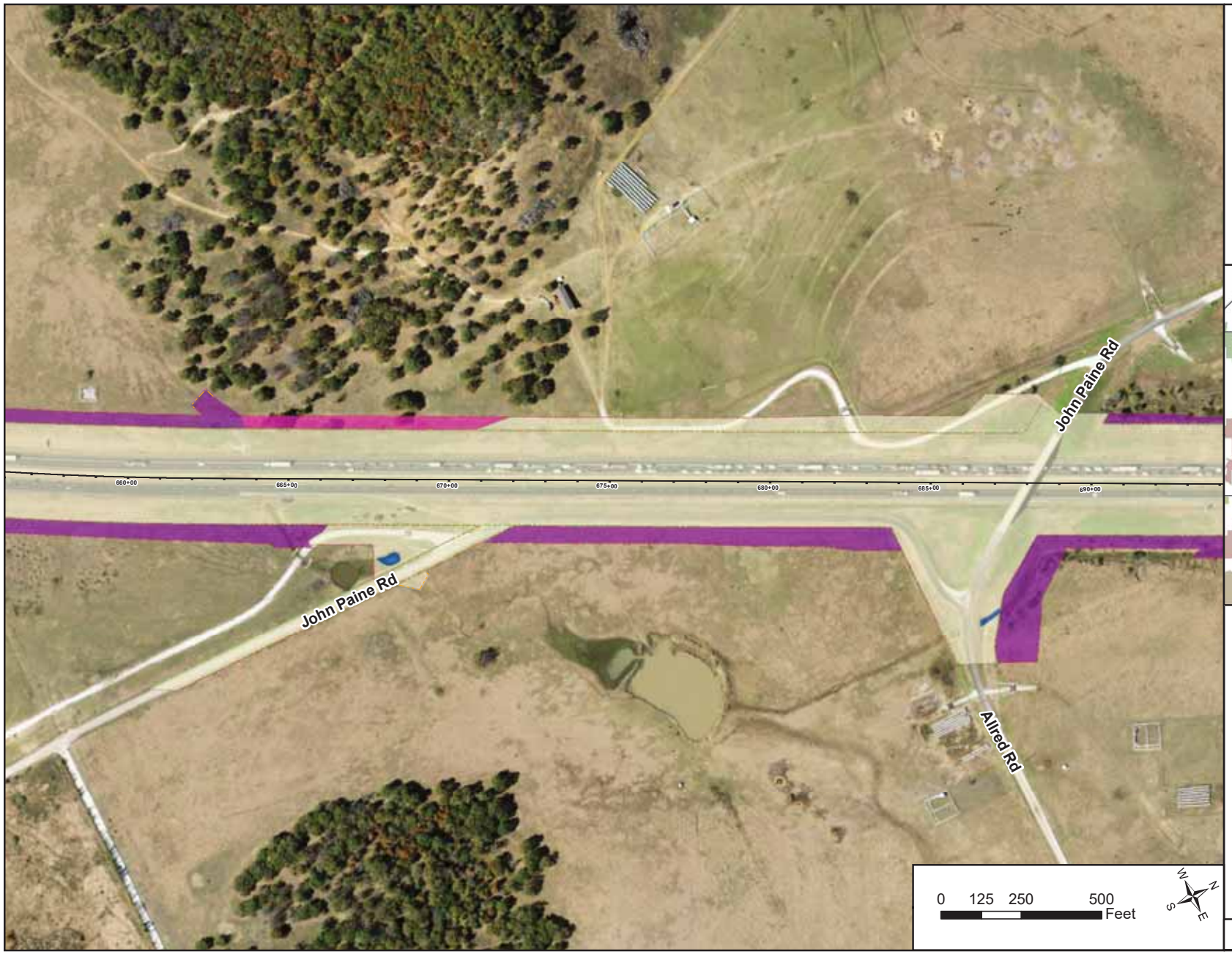




Legend

- Proposed Right of Way
- Proposed Easement
- Existing Right of Way
- Agriculture
- Crosstimbers Woodland and Forest
- Disturbed Prairie
- Edwards Plateau Savannah, Woodland, and Shrubland
- Riparian
- Open Water
- Urban

Base Map Source: TNRIS (2018)



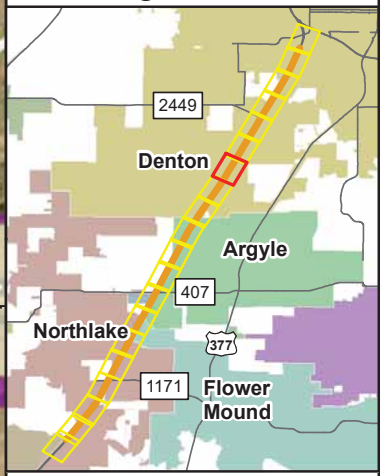
ACTUAL VEGETATION MAP

IH 35W FRONTAGE ROADS

From Dale Earnhardt Way
to south of the IH 35E/IH 35W
Interchange
Denton County, Texas

CSJ: 0081-13-065

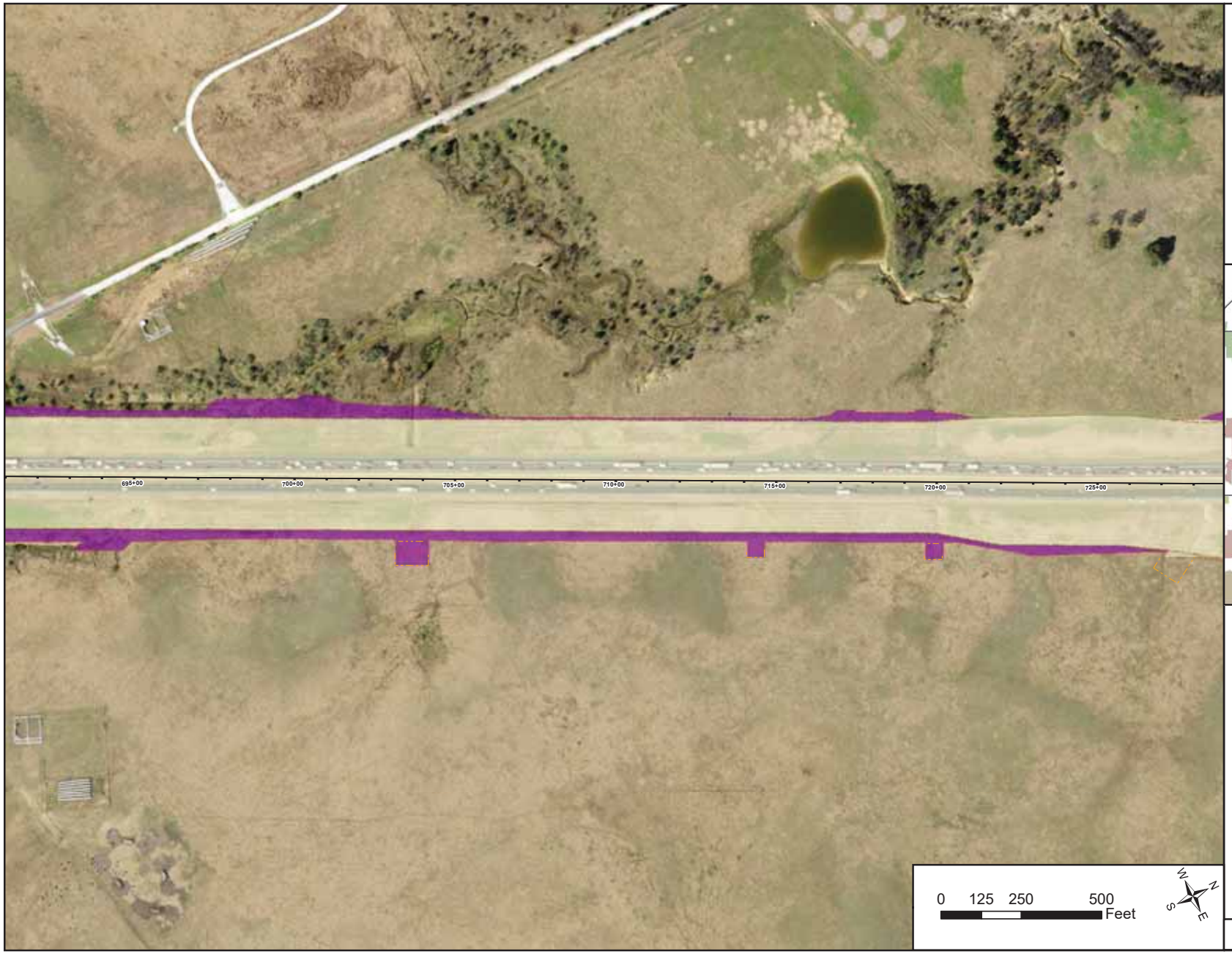
Page 14 of 20



Legend

- Proposed Right of Way
- Proposed Easement
- Existing Right of Way
- Agriculture
- Crosstimbers Woodland and Forest
- Disturbed Prairie
- Edwards Plateau Savannah, Woodland, and Shrubland
- Riparian
- Open Water
- Urban

Base Map Source: TNRIS (2018)



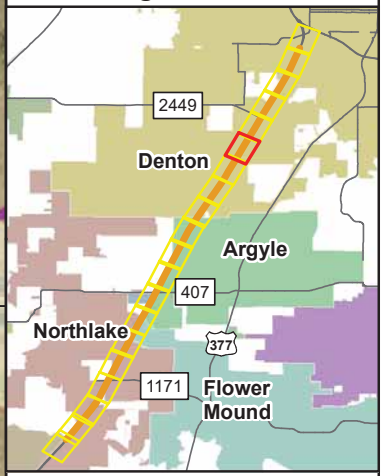
ACTUAL VEGETATION MAP

IH 35W FRONTAGE ROADS

From Dale Earnhardt Way
to south of the IH 35E/IH 35W
Interchange
Denton County, Texas

CSJ: 0081-13-065

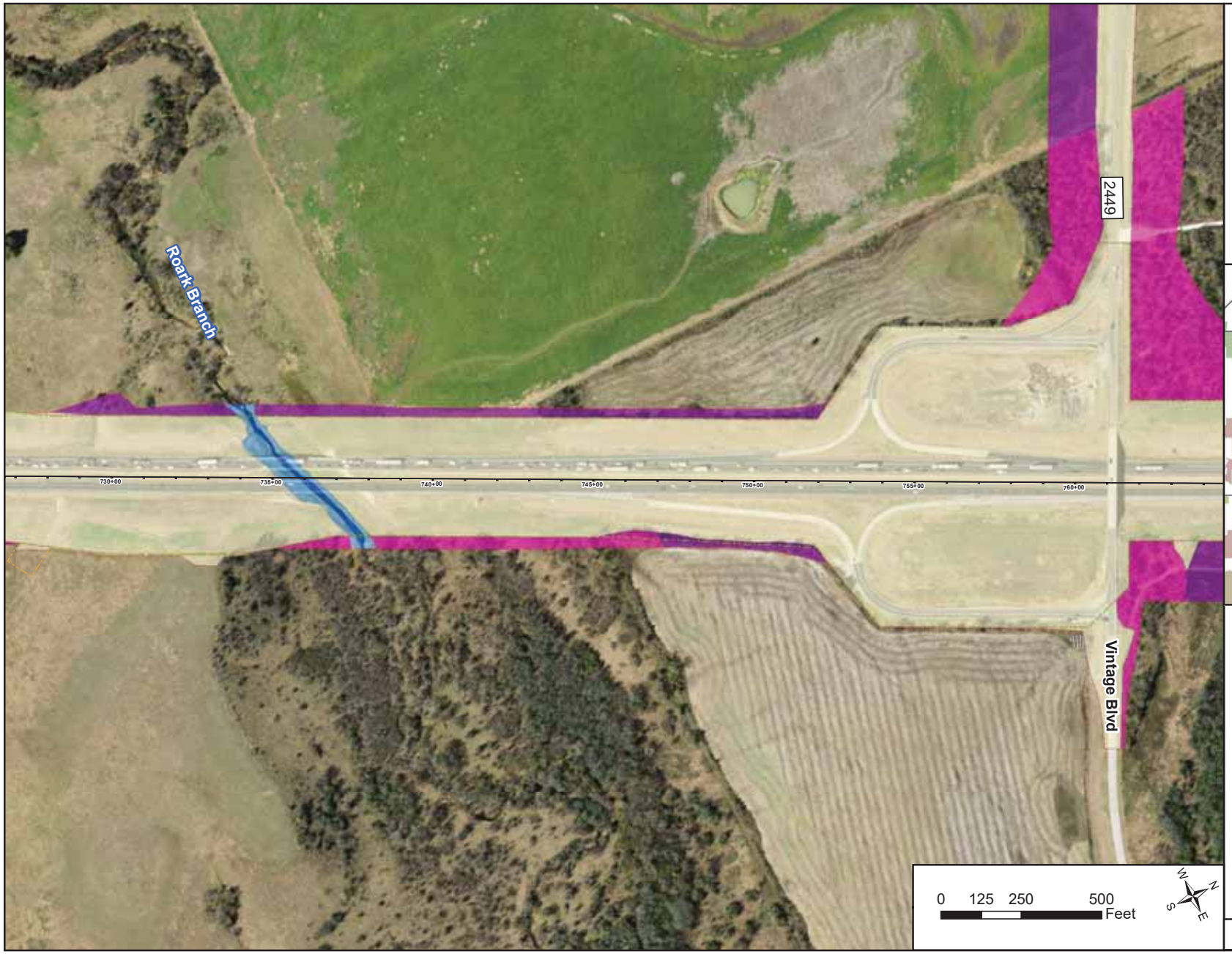
Page 15 of 20



Legend

- Proposed Right of Way
- Proposed Easement
- Existing Right of Way
- Agriculture
- Crosstimbers Woodland and Forest
- Disturbed Prairie
- Edwards Plateau Savannah, Woodland, and Shrubland
- Riparian
- Open Water
- Urban

Base Map Source: TNRIS (2018)



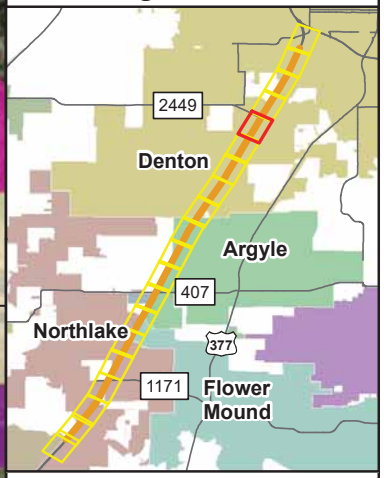
ACTUAL VEGETATION MAP

IH 35W FRONTAGE ROADS

From Dale Earnhardt Way
to south of the IH 35E/IH 35W
Interchange
Denton County, Texas

CSJ: 0081-13-065

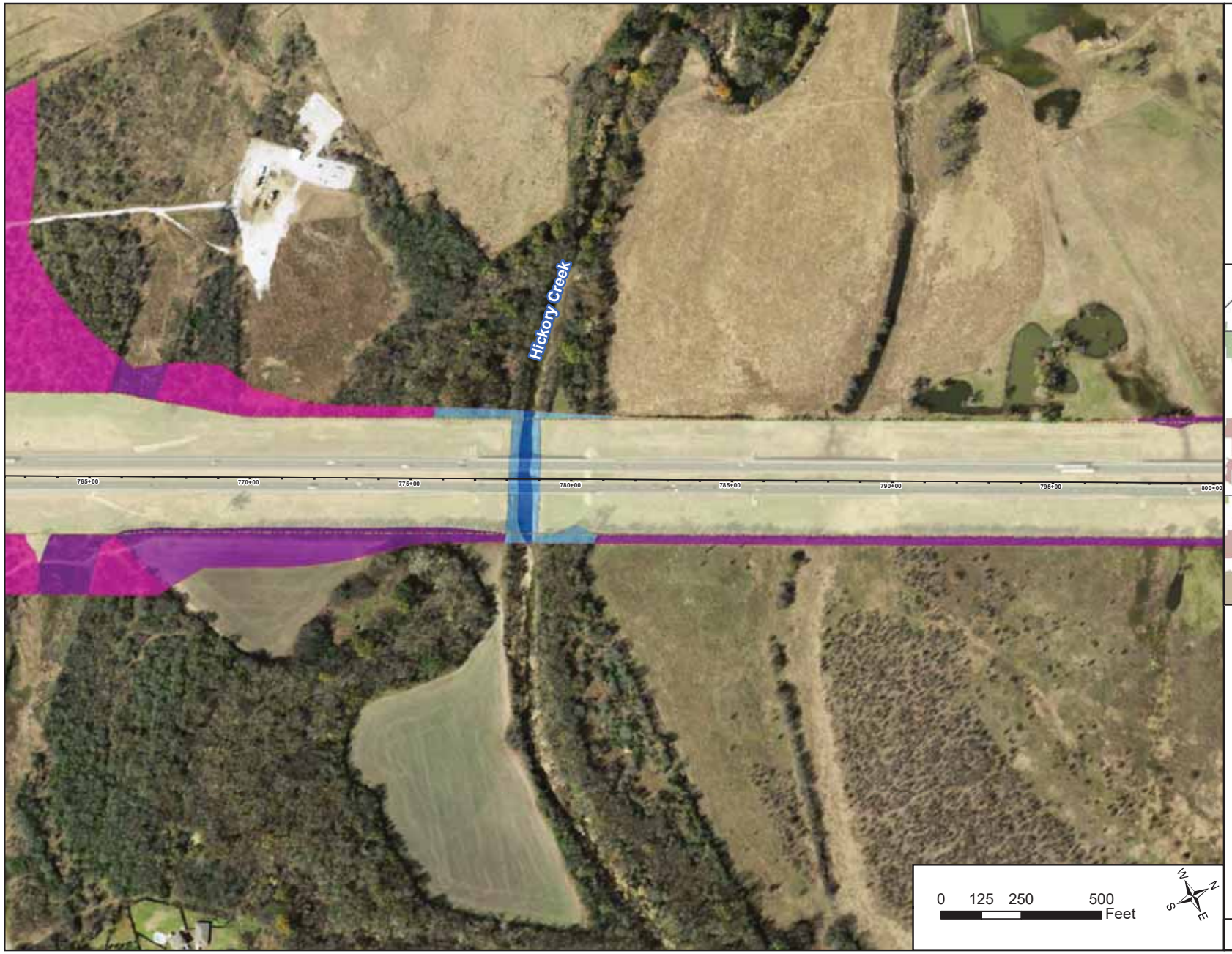
Page 16 of 20



Legend

- Proposed Right of Way
- Proposed Easement
- Existing Right of Way
- Agriculture
- Crosstimbers Woodland and Forest
- Disturbed Prairie
- Edwards Plateau Savannah, Woodland, and Shrubland
- Riparian
- Open Water
- Urban

Base Map Source: TNRIS (2018)

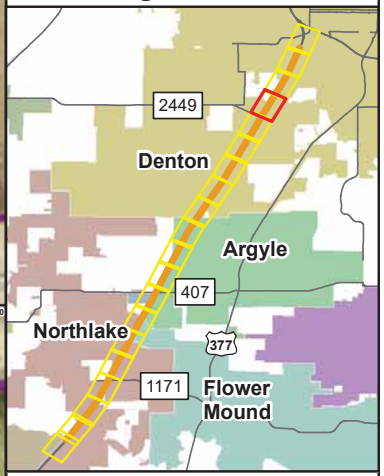


ACTUAL VEGETATION MAP

IH 35W FRONTAGE ROADS

From Dale Earnhardt Way
to south of the IH 35E/IH 35W
Interchange
Denton County, Texas

CSJ: 0081-13-065



Legend

- Proposed Right of Way
- Proposed Easement
- Existing Right of Way
- Agriculture
- Crosstimbers Woodland and Forest
- Disturbed Prairie
- Edwards Plateau Savannah, Woodland, and Shrubland
- Riparian
- Open Water
- Urban

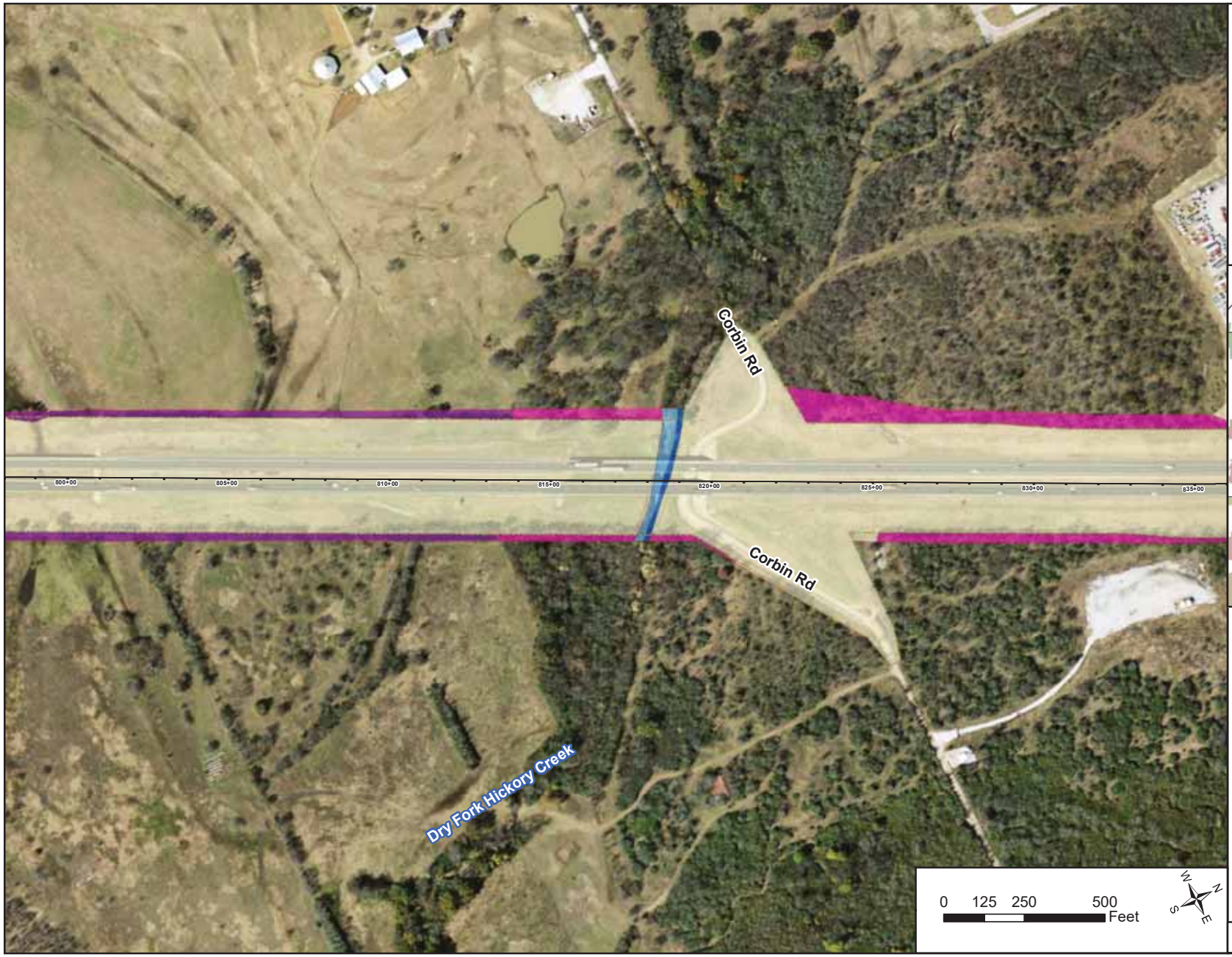
Base Map Source: TNRIS (2018)

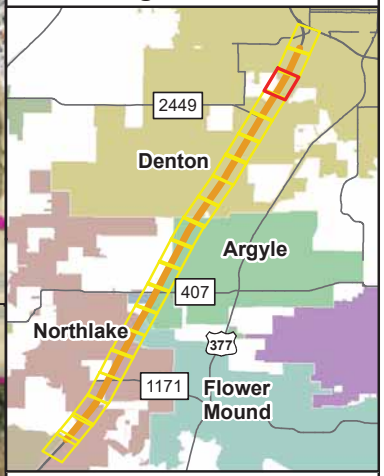
ACTUAL VEGETATION MAP

IH 35W FRONTAGE ROADS

From Dale Earnhardt Way
to south of the IH 35E/IH 35W
Interchange
Denton County, Texas

CSJ: 0081-13-065





Legend

- Proposed Right of Way
- Proposed Easement
- Existing Right of Way
- Agriculture
- Crosstimbers Woodland and Forest
- Disturbed Prairie
- Edwards Plateau Savannah, Woodland, and Shrubland
- Riparian
- Open Water
- Urban

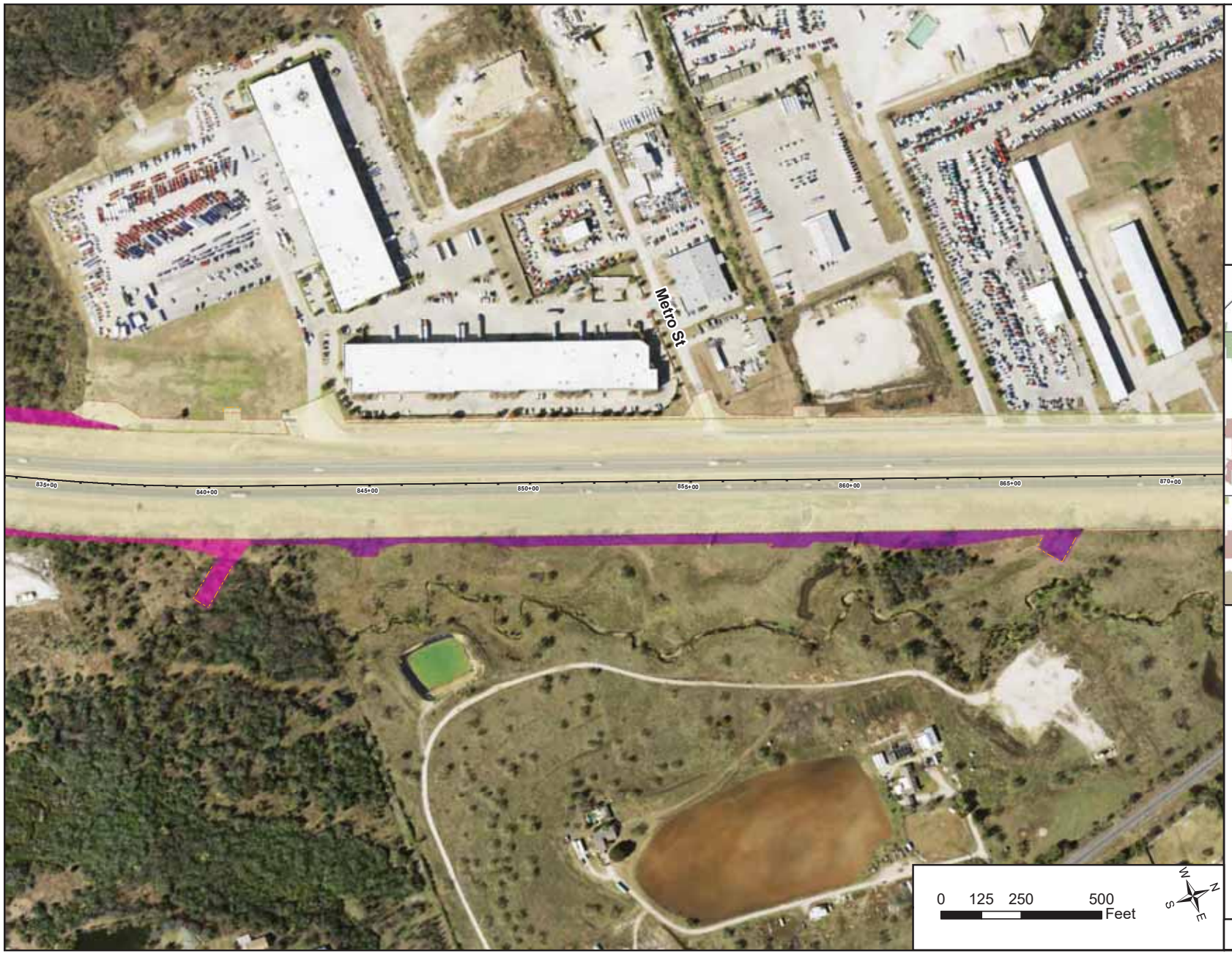
Base Map Source: TNRIS (2018)

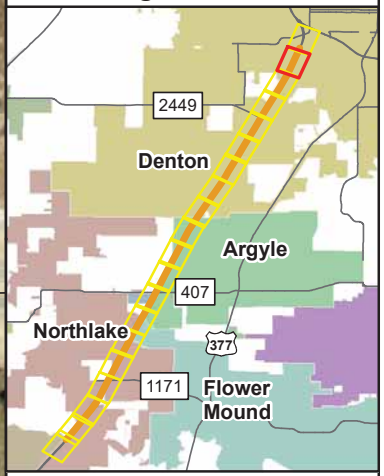
ACTUAL VEGETATION MAP

IH 35W FRONTAGE ROADS

From Dale Earnhardt Way
to south of the IH 35E/IH 35W
Interchange
Denton County, Texas

CSJ: 0081-13-065

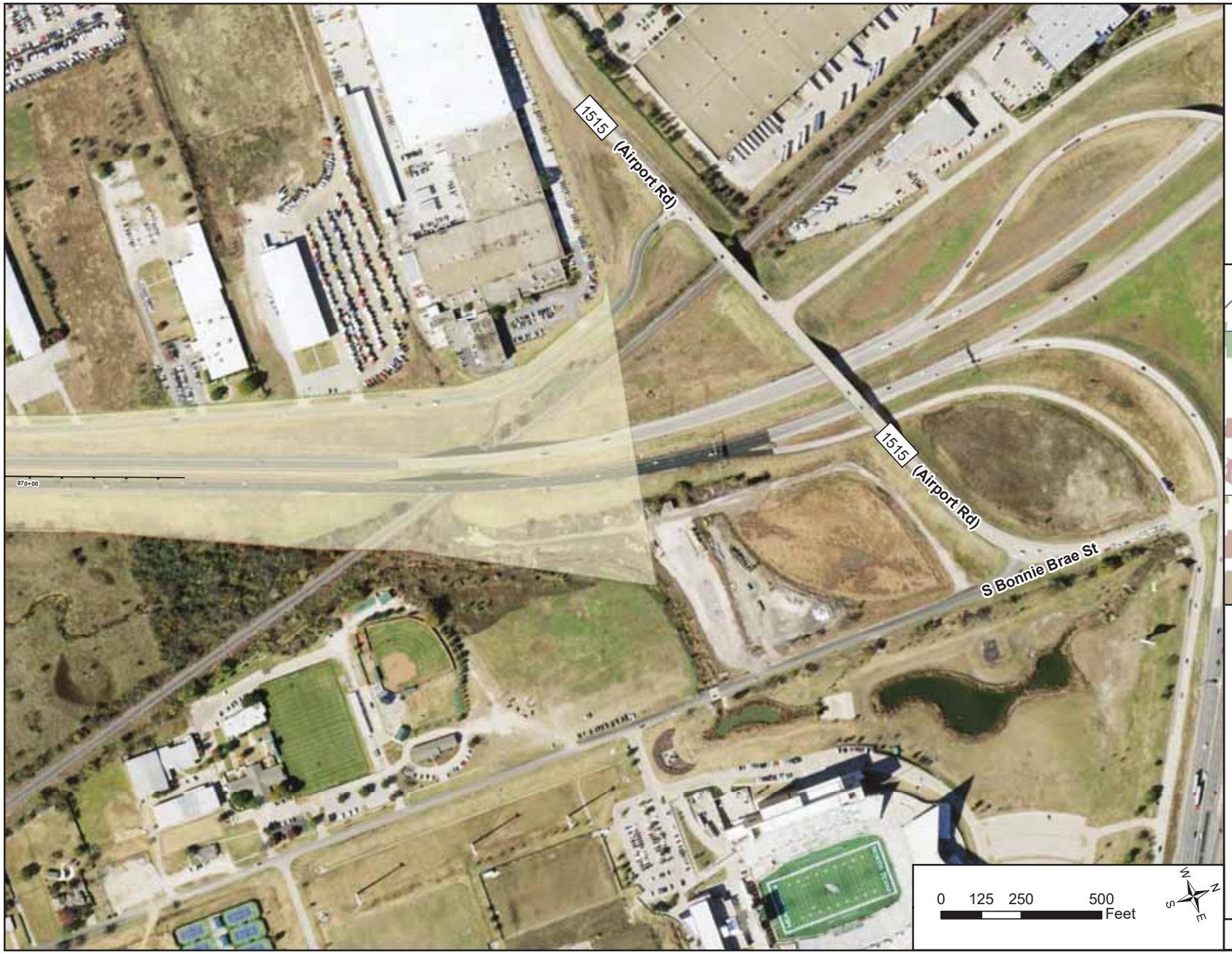




Legend

- Proposed Right of Way
- Proposed Easement
- Existing Right of Way
- Agriculture
- Crosstimbers Woodland and Forest
- Disturbed Prairie
- Edwards Plateau Savannah, Woodland, and Shrubland
- Riparian
- Open Water
- Urban

Base Map Source: TNRIS (2018)



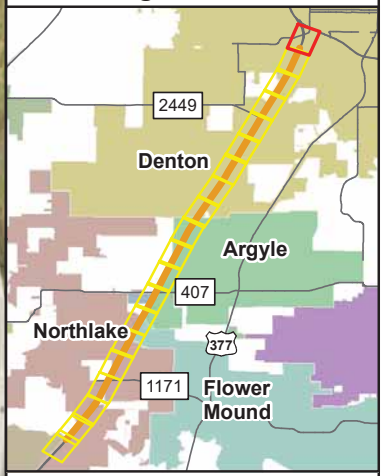
ACTUAL VEGETATION MAP

IH 35W FRONTAGE ROADS

From Dale Earnhardt Way
to south of the IH 35E/IH 35W
Interchange
Denton County, Texas

CSJ: 0081-13-065

Page 20 of 20



Legend

- Proposed Right of Way
- Proposed Easement
- Existing Right of Way
- Agriculture
- Crosstimbers Woodland and Forest
- Disturbed Prairie
- Edwards Plateau Savannah, Woodland, and Shrubland
- Riparian
- Open Water
- Urban

Base Map Source: TNRIS (2018)

Photograph 1: View looking southwest along the IH 35W east ROW from near STA. 228+00. The TESCP/EMST Mapper classifies the mowed-maintained vegetation and portions of the roadway as Disturbed Prairie; however, they better fit the Urban classification. Date of photograph: 12/7/19.

Photograph 2: View looking northeast across Dale Earnhardt Way and along the IH 35W east ROW from near STA. 228+00. The TESCP/EMST Mapper classifies the mowed-maintained vegetation and portions of the roadway as Disturbed Prairie and Tallgrass Prairie, Grassland; however, they better fit the Urban classification. Date of photograph: 12/7/19.

Photograph 3: View looking northeast from Dale Earnhardt Way along the IH 35W east ROW from near STA. 235+00. The TESCP/EMST Mapper classifies the mowed-maintained vegetation as Disturbed Prairie; however, it better fits the Urban classification. Date of photograph: 12/7/19.

Photograph 4: View looking west towards Dale Earnhardt Way and IH 35W west ROW from near STA. 233+00. The TESCP/EMST Mapper classifies the mowed-maintained vegetation and portions of the roadway as Tallgrass Prairie, Grassland; however, they better fit the Urban classification. Date of photograph: 12/7/19.

Photograph 5: View looking northeast across the Catherine Branch and floodplain from the bridge abutment of the southbound IH 35W mainlanes near STA. 240+00. The TESCP/EMST Mapper classifies the mowed-maintained vegetation and stream as Riparian; however, the vegetation better fits the Urban classification. The stream better fits the Open Water classification. Date of photograph: 12/8/19.

Photograph 6: View looking southeast along the Catherine Branch from the bridge abutment of the southbound IH 35W mainlanes near STA. 240+00. The TESCP/EMST Mapper classifies this stream as Riparian; however, it better fits the Open Water classification. Date of photograph: 12/8/19.

Photograph 7: View looking northeast along IH 35W east ROW from near STA. 249+00. The TESCP/EMST Mapper classifies portions of the mowed-maintained vegetation as Riparian, and the woody vegetation as Riparian and Crosstimbers Woodland and Forest. The mowed-maintained vegetation better fits the Urban classification and the woody vegetation fits the Riparian classification. Date of photograph: 12/7/19.

Photograph 8: View looking southwest along IH 35W east ROW from near STA. 249+00. The TESCP/EMST Mapper classifies portions of the mowed-maintained vegetation and woody vegetation as Riparian. The mowed-maintained vegetation better fits the Urban classification and the woody vegetation fits the Riparian classification. Date of photograph: 12/7/19.

Photograph 9: View looking southwest along IH 35W west ROW from near STA. 252+00. The TESCP/EMST Mapper classifies the mowed-maintained vegetation, woody, and other unmaintained vegetation as Riparian. The mowed-maintained vegetation better fits the Urban classification. The woody and other unmaintained vegetation fits the Riparian classification. A small portion of woody vegetation up slope fits the Edwards Savannah, Woodland, and Shrubland classification. Date of photograph: 12/7/19.

Photograph 10: View looking east from near the IH 35W west ROW line near STA. 253+00. The TESCP/EMST Mapper classifies the mowed-maintained vegetation as Riparian; however, it better fits the Urban classification. Date of photograph: 12/8/19.

Photograph 11: View looking northeast along IH 35W west ROW from near STA. 253+00. The TESCP/EMST Mapper classifies the mowed-maintained vegetation and woody vegetation as Riparian. The mowed-maintained vegetation better fits the Urban classification and the woody vegetation fits the Riparian classification. Date of photograph: 12/8/19.

Photograph 12: View looking southwest along IH 35W west ROW from near STA. 262+00. The TESCP/EMST Mapper classifies portions of the roadway, and the mowed-maintained vegetation and woody vegetation as Edwards Plateau Savannah, Woodland, and Shrubland, along with Riparian. The roadway and mowed-maintained vegetation better fit the Urban classification and the woody vegetation fits the Riparian classification. Date of photograph: 12/8/19.

Photograph 13: View looking northeast along IH 35W west ROW from near STA. 262+00. The TESCP/EMST Mapper classifies portions of the roadway, and the mowed-maintained vegetation and woody vegetation as Riparian. The roadway and mowed-maintained vegetation better fit the Urban classification and the woody vegetation fits the Riparian classification. Date of photograph: 12/8/19.

Photograph 14: View looking southwest across Denton Creek from the IH 35W east ROW from near STA. 276+80. The TESCP/EMST Mapper classifies portions of the roadway, the mowed-maintained vegetation, and woody and unmaintained vegetation as Edwards Plateau Savannah, Woodland, and Shrubland, along with Riparian. The woody and unmaintained vegetation fit the Riparian classification. Denton Creek fits the Open Water classification. The mowed-maintained vegetation fits the Urban classification. Date of photograph: 12/7/19.

Photograph 15: View looking southwest across Denton Creek along the IH 35W west ROW near STA. 277+00. The TESCP/EMST Mapper classifies portions of the roadway, and the mowed-maintained vegetation, and woody and unmaintained vegetation as Edwards Plateau Savannah, Woodland, and Shrubland, along with Riparian. The roadway and mowed-maintained vegetation better fit the Urban classification. The woody and unmaintained vegetation fit the Riparian classification. Denton Creek fits the Open Water classification. Date of photograph: 12/8/19.

Photograph 16: View looking northeast along IH 35W west ROW from near STA. 280+00. The TESCP/EMST Mapper classifies portions of the mowed-maintained vegetation, and woody and unmaintained vegetation as Crosstimbers Woodland and Forest, along with Disturbed Prairie. The mowed-maintained vegetation better fits the Urban classification. The woody and unmaintained vegetation fit the Crosstimbers Woodland and Forest classification. Date of photograph: 12/8/19.

Photograph 17: View looking northeast along IH 35W east ROW from near STA. 280+00. The TESCP/EMST Mapper classifies portions of the mowed-maintained vegetation, and woody and unmaintained vegetation as Tallgrass Prairie, Grassland. The mowed-maintained vegetation better fits the Urban classification. The woody and unmaintained vegetation fits the Crosstimbers Woodland and Forest, and Disturbed Prairie classifications. Date of photograph: 12/7/19.

Photograph 18: View looking northeast along IH 35W east ROW from near STA. 283+00. The TESCP/EMST Mapper classifies portions of the mowed-maintained vegetation as Agriculture and portions of the row crops at the right of the photo as Urban. The mowed-maintained vegetation better fits the Urban classification. Date of photograph: 12/7/19.

Photograph 19: View looking southwest along IH 35W west ROW from near STA. 290+00. The TESCP/EMST Mapper classifies portions of the mowed-maintained vegetation, and the woody vegetation as Crosstimbers Woodland and Forest. The mowed-maintained vegetation better fits the Urban classification and the woody vegetation fits the Crosstimbers Woodland and Forest classification. Date of photograph: 12/8/19.

Photograph 20: View looking north-northeast along IH 35W west ROW from near STA. 290+00. The TESCP/EMST Mapper classifies portions of the roadway and mowed-maintained vegetation as Tallgrass Prairie, Grassland. The roadway and mowed-maintained vegetation better fit the Urban classification. Date of photograph: 12/8/19.

Photograph 21: View looking south-southeast along IH 35W east ROW from near STA. 299+00. The TESCP/EMST Mapper classifies portions of the roadway and mowed-maintained vegetation as Tallgrass Prairie, Grassland. The mowed-maintained vegetation better fits the Urban classification. The vegetation east of the fence line fits the Disturbed Prairie classification. Date of photograph: 12/8/19.

Photograph 22: View looking southeast along a tributary to Cleveland Branch on IH 35W east ROW from near STA. 301+50. The TESCP/EMST Mapper classifies the mowed-maintained vegetation and stream as Tallgrass Prairie, Grassland. The mowed-maintained vegetation better fits the Urban classification. The stream fits the Open Water classification. Disturbed Prairie is in the background. Date of photograph: 12/7/19.

Photograph 23: View looking north-northeast along IH 35W east ROW from near STA. 301+50. The TESCP/EMST Mapper classifies portions of the mowed-maintained vegetation and stream as Tallgrass Prairie, Grassland. The mowed-maintained vegetation better fits the Urban classification. Disturbed Prairie is east of the fence line. Date of photograph: 12/7/19.

Photograph 24: View looking west along FM 1171/Cross Timbers Road at the intersection with the southbound IH 35W exit ramp near STA. 329+00. The TESCP/EMST Mapper classifies portions of roadway and mowed-maintained vegetation as Crosstimbers Woodland and Forest. The roadway and mowed-maintained vegetation better fit the Urban classification. Date of photograph: 12/8/19.

Photograph 25: View looking northeast from the intersection of FM 1171Cross Timbers Road at the northbound IH 35W entrance ramp near STA. 327+00. The TESCP/EMST Mapper classifies portions of the mowed-maintained vegetation as Tallgrass Prairie, Grassland. The mowed-maintained vegetation better fits the Urban classification. Date of photograph: 12/7/19.

Photograph 24: View looking south-southwest along IH 35W east ROW from near STA. 357+00. The TESCP/EMST Mapper classifies portions of the mowed-maintained vegetation as Tallgrass Prairie, Grassland, along with Riparian. The mowed-maintained vegetation better fits the Urban classification. Tallgrass Prairie, Grassland is east of the fence line. Date of photograph: 12/7/19.

Photograph 27: View looking southeast along Cleveland Branch on east ROW near STA. 358+00. The TESCP/EMST Mapper classifies stream and the mowed-maintained vegetation as Riparian. The mowed-maintained vegetation better fits the Urban classification. The stream better fits the Open Water classification. Date of photograph: 12/7/19.

Photograph 25: View looking north-northeast along IH 35W east ROW near STA. 358+00. The TESCP/EMST Mapper classifies portions of the mowed-maintained vegetation as Tallgrass Prairie, Grassland. The mowed-maintained vegetation better fits the Urban classification. Tallgrass Prairie, Grassland is east of the fence line. Date of photograph: 12/7/19.

Photograph 29: View looking south-southwest along IH 35W west ROW near STA. 358+00. The TESCP/EMST Mapper classifies portions of the mowed-maintained vegetation as Tallgrass Prairie, Grassland, along with Urban. The mowed-maintained vegetation better fits the Urban classification. Date of photograph: 12/7/19.

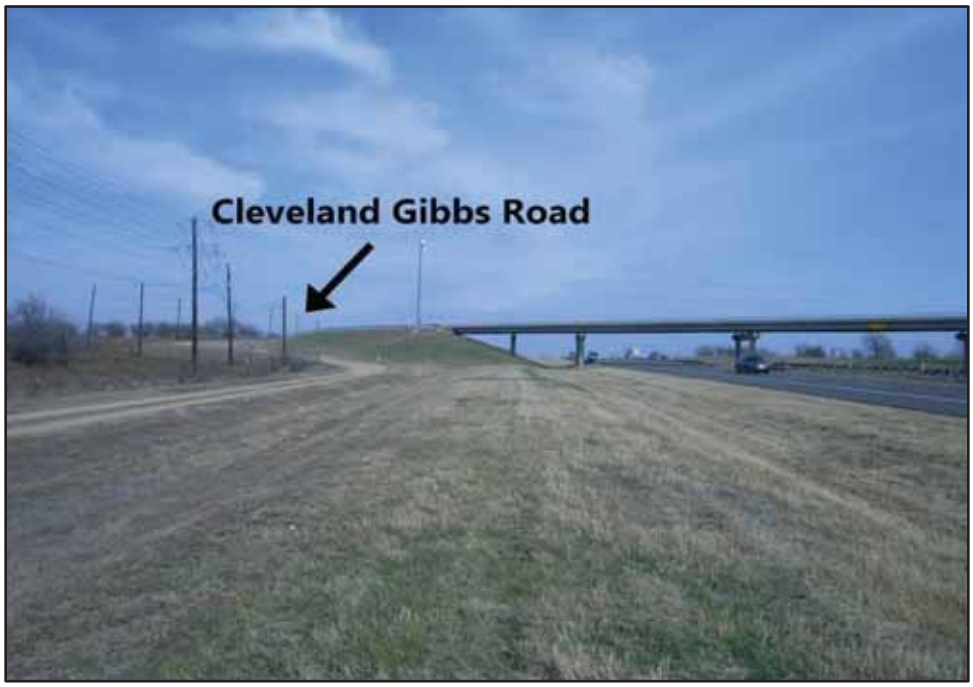
Photograph 30: View looking northwest along Cleveland Branch on the IH 35W west ROW near STA. 359+00. The TESCP/EMST Mapper classifies the mowed-maintained vegetation, stream, and woody vegetation as Riparian and Tallgrass Prairie, Grassland. The mowed-maintained vegetation better fits the Urban classification and the woody vegetation fits the Disturbed Prairie classification. The stream better fits the Open Water classification. Date of photograph: 12/8/19

Photograph 31: View looking north-northeast along IH 35W west ROW near STA. 359+00. The TESCP/EMST Mapper classifies portions of the roadway and mowed-maintained vegetation as Tallgrass Prairie, Grassland. The roadway and mowed-maintained vegetation better fit the Urban classification. Tallgrass Prairie, Grassland is west of the fence line. Date of photograph: 12/8/19

Photograph 32: View looking south-southwest along IH 35W east ROW from near STA. 380+00. The TESCP/EMST Mapper classifies portions of the mowed-maintained vegetation as Tallgrass Prairie, Grassland. The mowed-maintained vegetation better fits the Urban classification. Tallgrass Prairie, Grassland is east of the fence line. Date of photograph: 12/7/19.

Photograph 33: View looking east towards Cleveland Gibbs Road from IH 35W east ROW near STA. 381+00. The TESCP/EMST Mapper classifies portions of the mowed-maintained vegetation and Cleveland Gibbs Road as Edwards Plateau Savannah, Woodland, and Shrubland. The mowed-maintained vegetation and Cleveland Gibbs Road better fit the Urban classification. Date of photograph: 12/7/19.

Photograph 34: View looking south-southwest along IH 35W west ROW from near STA. 386+00. The TESCP/EMST Mapper classifies portions of the roadway and mowed-maintained vegetation as Tallgrass Prairie, Grassland. The roadway and mowed-maintained vegetation better fit the Urban classification. Disturbed Prairie is west of the fence line. Date of photograph: 12/8/19.



Photograph 35: View looking north-northeast along IH 35W west ROW from near STA. 386+00. The TESCP/EMST Mapper classifies portions of the mowed-maintained vegetation and Cleveland Gibbs Road as Edwards Plateau Savannah, Woodland, and Shrubland, along with Tallgrass Prairie, Grassland. The mowed-maintained vegetation and Cleveland Gibbs Road better fit the Urban classification. Date of photograph: 12/8/19.

Photograph 36: View looking south-southeast along IH 35W east ROW from near STA. 393+00. The TESCP/EMST Mapper classifies portions of the mowed-maintained vegetation as Edwards Plateau Savannah, Woodland, and Shrubland. The mowed-maintained vegetation better fits the Urban classification. Disturbed Prairie is east of the fence line. Date of photograph: 12/7/19.

Photograph 37: View looking north-northeast along IH 35W east ROW from near STA. 393+00. The TESCP/EMST Mapper classifies portions of the mowed-maintained vegetation as Edwards Plateau Savannah, Woodland, and Shrubland, along with Tallgrass Prairie, Grassland. The mowed-maintained vegetation better fits the Urban classification. Date of photograph: 12/7/19.

Photograph 38: View looking south-southwest along IH 35W west ROW from near STA. 405+00. The TESCP/EMST Mapper classifies portions of the mowed-maintained vegetation as Edwards Plateau Savannah, Woodland, and Shrubland, along with Tallgrass Prairie, Grassland. The mowed-maintained vegetation better fits the Urban classification. Date of photograph: 12/8/19.

Photograph 39: View looking south-southwest along IH 35W east ROW from near STA. 427+00. The TESCP/EMST Mapper classifies portions of the roadway and mowed-maintained vegetation as Tallgrass Prairie, Grassland. The mowed-maintained vegetation better fits the Urban classification. Tallgrass Prairie, Grassland is east of the fence line. Date of photograph: 12/7/19.

Photograph 40: View looking east-southeast towards a stream on IH 35W east ROW near STA. 427+00. The TESCP/EMST Mapper classifies the tributary and surrounding mowed-maintained vegetation as Riparian. The mowed-maintained vegetation better fits the Urban classification. The stream fits the Open Water classification. Date of photograph: 12/7/19.

Photograph 41: View looking north-northeast along IH 35W east ROW from near STA. 427+00. The TESCP/EMST Mapper classifies portions of the mowed-maintained vegetation as Edwards Plateau Savannah, Woodland, and Shrubland, along with Tallgrass Prairie, Grassland. The mowed-maintained vegetation better fits the Urban classification. Tallgrass Prairie, Grassland is east of the fence line. Date of photograph: 12/7/19.

Photograph 42: View looking south-southwest along IH 35W west ROW from near STA. 428+00. The TESCP/EMST Mapper classifies portions of the mowed-maintained vegetation as Edwards Plateau Savannah, Woodland, and Shrubland. The mowed-maintained vegetation better fits the Urban classification. Date of photograph: 12/8/19.

Photograph 43: View looking west-northwest towards a stream on IH 35W west ROW near STA. 428+00. The TESCP/EMST Mapper classifies the stream and surrounding mowed-maintained vegetation as Riparian. The mowed-maintained vegetation better fits the Urban classification. The stream fits the Open Water classification. The wooded area fits the Disturbed Prairie classification. Date of photograph: 12/8/19.

Photograph 44: View looking north-northeast along IH 35W west ROW near STA. 428+00. The TESCP/EMST Mapper classifies the mowed-maintained vegetation as Edwards Plateau Savannah, Woodland, and Shrubland, along with Tallgrass Prairie, Grassland. The mowed-maintained vegetation better fits the Urban classification. The stream fits the Riparian classification. Date of photograph: 12/8/19.

Photograph 45: View looking south-southwest along IH 35W east ROW from near STA. 441+00. The TESCP/EMST Mapper classifies portions of the mowed-maintained vegetation as Edwards Plateau Savannah, Woodland, and Shrubland, along with Tallgrass Prairie, Grassland. The mowed-maintained vegetation better fits the Urban classification. Tallgrass Prairie, Grassland is east of the fence line. Date of photograph: 12/7/19.

Photograph 46: View looking southeast towards a towards a stream on IH 35W east ROW near STA. 441+00. The TESCP/EMST Mapper classifies the stream and surrounding mowed-maintained vegetation as Riparian. The mowed-maintained vegetation better fit the Urban classification. The stream better fits the Open Water classification. Tallgrass Prairie, Grassland is in the background. Date of photograph: 12/7/19.

Photograph 47: View looking north-northeast along IH 35W east ROW near STA. 441+00. The TESCP/EMST Mapper classifies the mowed-maintained vegetation as Edwards Plateau Savannah, Woodland, and Shrubland, along with Crosstimbers Woodland and Forest. The mowed-maintained vegetation better fits the Urban classification. Tallgrass Prairie, Grassland is east of the fence line. Date of photograph: 12/7/19.

Photograph 48: View looking northwest towards a stream on IH 35W west ROW from near STA. 443+00. The TESCP/EMST Mapper classifies the mowed-maintained vegetation and ephemeral stream as Riparian. The mowed-maintained vegetation and ephemeral stream better fit the Urban classification. Date of photograph: 12/8/19.

Photograph 49: View looking south-southwest along IH 35W west ROW from near STA. 452+00. The TESCP/EMST Mapper classifies portions of the mowed-maintained vegetation as Crosstimbers Woodland and Forest. The mowed-maintained vegetation better fits the Urban classification. Tallgrass Prairie, Grassland is west of the fence line. Date of photograph: 12/8/19.

Photograph 50: View looking south-southwest along IH 35W east ROW from near STA. 459+00. The TESCP/EMST Mapper classifies portions of the mowed-maintained vegetation as Edwards Plateau Savannah, Woodland, and Shrubland, along with Crosstimbers Woodland and Forest. The mowed-maintained vegetation better fits the Urban classification. Disturbed Prairie is east of the fence line. Date of photograph: 12/7/19.

Photograph 51: View looking north-northeast along IH 35W east ROW from near STA. 459+00. The TESCP/EMST Mapper classifies portions of the mowed-maintained vegetation as Tallgrass Prairie, Grassland. The mowed-maintained vegetation better fits the Urban classification. Disturbed Prairie is east of the fence line. Date of photograph: 12/7/19.

Photograph 52: View looking east-southeast towards a stream on IH 35W east ROW from near STA. 468+00. The TESCP/EMST Mapper classifies this stream and adjacent vegetation as Urban; however, the vegetation better fits the Riparian classification and the stream better fits the Open Water classification. Date of photograph: 12/7/19.

Photograph 53: View looking east from the intersection of FM 407 at the IH 35W northbound entrance ramp. The TESCP/EMST Mapper classifies the mowed-maintained vegetation as Crosstimbers Woodland and Forest. The mowed-maintained vegetation better fits the Urban classification. Date of photograph: 12/7/19.

Photograph 54: View looking west-southwest from the intersection of FM 407 at the IH 35W southbound exit ramp. The TESCP/EMST Mapper classifies portions of the roadway, mowed-maintained vegetation and stream as Crosstimbers Woodland and Forest, along with Tallgrass Prairie, Grassland. The mowed-maintained vegetation better fits the Urban classification. The stream better fits the Open Water classification. Date of photograph: 12/8/19.

Photograph 55: View looking north-northeast along IH 35W east ROW near STA. 485+00. The TESCP/EMST Mapper classifies portions of the mowed-maintained vegetation as Crosstimbers Woodland and Forest; however, it better fits the Urban classification. Disturbed Prairie is east of the fence line. Date of photograph: 12/7/19.

Photograph 56: View looking south-southwest along IH 35W east ROW near STA. 485+00. The TESCP/EMST Mapper classifies portions of the mowed-maintained vegetation as Crosstimbers Woodland and Forest, along with Tallgrass Prairie, Grassland; however, it better fits the Urban classification. Disturbed Prairie is east of the fence line. Date of photograph: 12/7/19.

Photograph 57: View looking east towards Sam Davis Road from IH 35W east ROW near STA. 500+00. The TESCP/EMST Mapper classifies portions of Sam Davis Road as Crosstimbers Woodland and Forest, along with Riparian. The roadway better fits the Urban classification. Date of photograph: 12/7/19.

Photograph 58: View looking south-southwest along IH 35W east ROW from near STA. 506+00. The TESCP/EMST Mapper classifies portions of the mowed-maintained vegetation as Crosstimbers Woodland and Forest, along with Riparian. The mowed-maintained vegetation better fits the Urban classification. Disturbed Prairie is east of the fence line. Date of photograph: 12/7/19.

Photograph 59: View looking southeast towards a tributary to Graham Branch on IH 35W east ROW from near STA. 507+00. The TESCP/EMST Mapper classifies this stream and mowed-maintained vegetation as Riparian. The mowed-maintained vegetation better fits the Urban classification and the stream fits the Open Water classification. Date of photograph: 12/7/19.

Photograph 60: View looking north-northeast along IH 35W east ROW near STA. 506+00. The TESCP/EMST Mapper accurately classifies the mowed-maintained vegetation as Urban. Date of photograph: 12/7/19.

Photograph 61: View looking northwest towards a tributary to Graham Branch on IH 35W west ROW from near STA. 509+00. The TESCP/EMST Mapper classifies the roadway, stream and mowed-maintained vegetation as Riparian. The roadway and mowed-maintained vegetation better fit the Urban classification. The stream fits the Open Water classification. Disturbed Prairie is in the background. Date of photograph: 12/8/19.

Photograph 62: View looking north-northeast along IH 35W west ROW near STA. 509+00. The TESCP/EMST Mapper classifies portions of the roadway and mowed-maintained vegetation as Crosstimbers Woodland and Forest, along with Tallgrass Prairie, Grassland. The roadway and mowed-maintained vegetation better fit the Urban classification. Date of photograph: 12/7/19.

Photograph 63: View looking southeast towards Graham Branch on IH 35W east ROW from near STA. 518+50. The TESCP/EMST Mapper classifies the stream as Urban; however, it better fits the Open Water classification. Date of photograph: 12/7/19.

Photograph 64: View looking northwest towards Graham Branch on IH 35W west ROW from near STA. 520+00. The TESCP/EMST Mapper classifies the stream and mowed-maintained vegetation as Riparian. The mowed-maintained vegetation better fits the Urban classification and the stream fits the Open Water classification. Date of photograph: 12/8/19.

Photograph 65: View looking south-southwest along IH 35W west ROW from near STA. 530+00. The TESCP/EMST Mapper classifies portions of the mowed-maintained vegetation as Crosstimbers Woodland and Forest, along with Tallgrass Prairie, Grassland. The mowed-maintained vegetation better fits the Urban classification. Disturbed Prairie is west of the fence line. Date of photograph: 12/8/19.

Photograph 66: View looking north-northeast along IH 35W west ROW from near STA. 530+00. The TESCP/EMST Mapper classifies portions of the mowed-maintained vegetation as Crosstimbers Woodland and Forest, along with Tallgrass Prairie, Grassland. The mowed-maintained vegetation better fits the Urban classification. Disturbed Prairie is west of the fence line. Date of photograph: 12/8/19

Photograph 67: View looking northeast along IH 35W east ROW from near STA. 535+00. The TESCP/EMST Mapper classifies the mowed-maintained vegetation and woody vegetation as Urban. The woody vegetation better fits the Disturbed Prairie classification. Date of photograph: 12/7/19.

Photograph 68: View looking southwest along IH 35W east ROW from near STA. 535+00. The TESCP/EMST Mapper classifies the mowed-maintained vegetation and woody vegetation as Urban. The woody vegetation better fits the Disturbed Prairie classification. Date of photograph: 12/7/19.

Photograph 69: View looking northeast along IH 35W east ROW from near STA. 548+00. The TESCP/EMST Mapper classifies the mowed-maintained vegetation and woody vegetation as Riparian and Urban. The mowed-maintained vegetation better fits the Urban classification and the woody vegetation better fits the Disturbed Prairie classification. Date of photograph: 12/7/19.

Photograph 70: View looking southwest along IH 35W east ROW near STA. 548+00. The TESCP/EMST Mapper classifies the mowed-maintained vegetation and woody vegetation as Riparian and Urban. The mowed-maintained vegetation better fits the Urban classification and the woody vegetation better fits the Disturbed Prairie classification. Date of photograph: 12/7/19.

Photograph 71: View looking southwest along IH 35W west ROW near STA. 560+00. The TESCP/EMST Mapper classifies portions of the mowed-maintained vegetation and woody vegetation as Crosstimbers Woodland and Forest, along with Disturbed Prairie. The mowed-maintained vegetation better fits the Urban classification and the woody vegetation better fits the Disturbed Prairie classification. The fence line vegetation fits the Disturbed Prairie classification. Date of photograph: 12/8/19.

Photograph 72: View looking northeast along IH 35W west ROW near STA. 560+00. The TESCP/EMST Mapper classifies portions of the roadway, mowed-maintained vegetation, and woody vegetation as Agriculture, Crosstimbers Woodland and Forest, and Edwards Plateau Savannah, Woodland, and Shrubland. The roadway and mowed-maintained vegetation better fit the Urban classification. The woody vegetation fits the Disturbed Prairie classification. The land to the west-northwest of the fence line fits the Agriculture classification. Date of photograph: 12/8/19.

Photograph 73: View looking northeast along IH 35W east ROW near STA. 572+00. The TESCP/EMST Mapper classifies portions of the roadway and mowed-maintained vegetation as Crosstimbers Woodland and Forest. The roadway and mowed-maintained vegetation better fit the Urban classification. The unmaintained herbaceous vegetation to the east fits the Tallgrass Prairie, Grassland classification. Date of photograph: 12/7/19.

Photograph 74: View looking southwest along IH 35W west ROW from near STA. 585+00. The TESCP/EMST Mapper classifies portions of the roadway and mowed-maintained vegetation as Crosstimbers Woodland and Forest. The roadway and mowed-maintained vegetation better fit the Urban classification. Date of photograph: 12/8/19.

Photograph 75: View looking east along Crawford Road from the intersection of Crawford Road at the northbound IH 35W entrance ramp. The TESCP/EMST Mapper classifies portions of Crawford Road as Crosstimbers Woodland and Forest. The roadway better fits the Urban classification. Date of photograph: 12/7/19.

Photograph 76: View looking west along Robson Ranch Road from the intersection of Robson Ranch Road at the southbound IH 35W exit ramp. The TESCP/EMST Mapper classifies portions of Robson Ranch as Crosstimbers Woodland and Forest. The roadway better fits the Urban classification. Date of photograph: 12/8/19.

Photograph 77: View looking northeast along IH 35W west ROW from near STA. 603+00. The TESCP/EMST Mapper classifies portions of the mowed-maintained vegetation Crosstimbers Woodland and Forest; however, it better fits the Urban classification. Date of photograph: 12/8/19.

Photograph 78: View looking east-northeast towards a stream IH 35W east ROW from near STA. 602+00. The TESCP/EMST Mapper classifies the mowed-maintained vegetation and stream as Urban. The stream better fits the Open Water classification. Disturbed Prairie is in the background. Date of photograph: 12/7/19.

Photograph 79: View looking northeast along IH 35W east ROW from near STA. 605+00. The TESCP/EMST Mapper classifies portions of the mowed-maintained vegetation as Crosstimbers Woodland and Forest. The mowed-maintained vegetation better fits the Urban classification. Disturbed Prairie is east of the fence line. Date of photograph: 12/7/19.

Photograph 80: View looking east-northeast towards a stream IH 35W east ROW from near STA. 605+00. The TESCP/EMST Mapper classifies the mowed-maintained vegetation and stream as Cross Timbers Woodland and Forest, along with Urban. The mowed-maintained vegetation better fits the Urban classification and the stream fits the Open Water classification. Date of photograph: 12/7/19

Photograph 81: View looking northeast along IH 35W west ROW from near STA. 616+00. The TESCP/EMST Mapper classifies portions of the mowed-maintained vegetation as Crosstimbers Woodland and Forest, Urban, and Riparian. The mowed-maintained vegetation better fits the Urban classification. Vegetation west of the existing ROW fits the Tallgrass Prairie, Grassland classification. Date of photograph: 12/8/19.

Photograph 82: View looking east-southeast towards a stream on IH 35W east ROW near STA. 618+00. The TESCP/EMST Mapper classifies the mowed-maintained vegetation and stream as Urban. The mowed-maintained vegetation fits the Urban classification and the stream better fits the Open Water classification. Date of photograph: 12/7/19.

Photograph 83: View looking northwest along a stream on IH 35W west ROW near STA. 627+00. The TESCP/EMST Mapper classifies this area as Crosstimbers Woodland and Forest, along with Riparian. The mowed-maintained vegetation better fits the Urban classification. The small area of water better fits the Open Water classification. Date of photograph: 12/8/19.

Photograph 84: View looking northeast along IH 35W west ROW near STA. 627+00. The TESCP/EMST Mapper classifies the mowed-maintained vegetation as Crosstimbers Woodland and Forest, along with Riparian. The mowed-maintained vegetation better fits the Urban classification. Date of photograph: 12/8/19.

Photograph 85: View looking northeast along IH 35W east ROW near STA. 639+00. The TESCP/EMST Mapper classifies portions of the mowed-maintained vegetation as Crosstimbers Woodland and Forest. The mowed-maintained vegetation better fits the Urban classification. The vegetation east of the fence line fits the Tallgrass Prairie, Grassland classification. Date of photograph: 12/7/19.

Photograph 86: View looking south-southeast towards a stream on IH 35W east ROW from near STA. 639+00. The TESCP/EMST Mapper classifies the stream and mowed-maintained vegetation as Riparian. The mowed-maintained vegetation better fits the Urban classification and the stream fits the Open Water classification. Date of photograph: 12/7/19.

Photograph 87: View looking southwest along IH 35W east ROW from near STA. 660+00. The TESCP/EMST Mapper classifies portions of the mowed-maintained vegetation as Crosstimbers Woodland and Forest. The mowed-maintained vegetation better fits the Urban classification. Tallgrass Prairie, Grassland is east of the fence line. Date of photograph: 12/7/19.

Photograph 88: View looking northeast along IH 35W east ROW from near STA. 660+00. The TESCP/EMST Mapper classifies portions of the mowed-maintained vegetation as Crosstimbers Woodland and Forest, along with Tallgrass Prairie, Grassland. The mowed-maintained vegetation better fits the Urban classification. Tallgrass Prairie, Grassland is east of the fence line. Date of photograph: 12/7/19.

Photograph 89: View looking northeast along IH 35W west ROW from near STA. 667+00. The TESCP/EMST Mapper classifies portions of the mowed-maintained vegetation as, along with Tallgrass Prairie, Grassland. The mowed-maintained vegetation better fits the Urban classification. The woody vegetation to the west of the fence line fits the Crosstimbers Woodland and Forest classification. Date of photograph: 12/8/19.

Photograph 90: View looking northeast along IH 35W west ROW from near STA. 683+00. The TESCP/EMST Mapper classifies portions of the mowed-maintained vegetation as Tallgrass Prairie, Grassland; however, it better fits the Urban classification. Date of photograph: 12/8/19.

Photograph 91: View looking southeast toward a stream on IH 35W east ROW from near STA. 696+00. The TESCP/EMST Mapper classifies this area as Tallgrass Prairie, Grassland. The mowed-maintained vegetation better fits the Urban classification. Date of photograph: 12/7/19.

Photograph 92: View looking northwest toward a stream on IH 35W west ROW from near STA. 697+00. The TESCP/EMST Mapper classifies this area as Riparian and Tallgrass Prairie, Grassland. The mowed-maintained vegetation better fits the Urban classification and the stream fits the Open Water classification. Disturbed Prairie is in the background. Date of photograph: 12/8/19.

Photograph 93: View looking southwest along IH 35W west ROW from near STA. 733+00. The TESCP/EMST Mapper classifies portions of the roadway and mowed-maintained vegetation as Tallgrass Prairie, Grassland. The mowed-maintained vegetation better fits the Urban classification. Disturbed Prairie is west of the fence line. Date of photograph: 12/8/19.

Photograph 94: View looking northeast across the Roark Branch from IH 35W west ROW from near STA. 734+00. The TESCP/EMST Mapper classifies the stream, vegetation and mowed-maintained vegetation as Riparian. The mowed-maintained vegetation better fits the Urban classification. The other vegetation beyond the fence fits the Riparian classification. The steam better fits the Open Water classification. Date of photograph: 12/8/19.

Photograph 95: View looking northeast along IH 35W east ROW from near STA. 738+00. The TESCP/EMST Mapper classifies portions of the roadway and mowed-maintained vegetation as Tallgrass Prairie, Grassland and Disturbed Prairie. The mowed-maintained vegetation better fits the Urban classification. The woody vegetation to the east of the fence line fits the Disturbed Prairie classification. Date of photograph: 12/7/19.

Photograph 96: View looking northeast along IH 35W west ROW from near STA. 743+00. The TESCP/EMST Mapper classifies portions of the mowed-maintained vegetation as Tallgrass Prairie, Grassland. The mowed-maintained vegetation better fits the Urban classification. The woody vegetation along the fence line fits the Disturbed Prairie classification. Date of photograph: 12/8/19.

Photograph 97: View looking northeast across the FM 2499 interchange on the east side of IH 35W from near STA. 755+00. The TESCP/EMST Mapper classifies portions of the roadway and mowed-maintained vegetation Agriculture and Tallgrass Prairie, Grassland. The roadway and mowed-maintained vegetation better fit the Urban classification. Date of photograph: 12/7/19

Photograph 98: View looking east-southeast across the FM 2449 interchange from the west side of IH 35W near STA 755+00. The TESCP/EMST Mapper classifies portions of the roadway and mowed-maintained vegetation as Crosstimbers Woodland and Forest, along with Disturbed Prairie. The roadway and mowed-maintained vegetation better fit the Urban classification. Date of photograph: 12/8/19.

Photograph 99: View looking southwest along IH 35W west ROW from near STA. 767+00. The TESCP/EMST Mapper classifies portions of the mowed-maintained vegetation as Tallgrass Prairie, Grassland, Crosstimbers Woodland, and Forest, and Disturbed Prairie. The mowed-maintained vegetation better fits the Urban classification. Date of photograph: 12/8/19.

Photograph 100: View looking southwest along IH 35W east ROW from near STA. 767+00. The TESCP/EMST Mapper classifies portions of the mowed-maintained vegetation as Disturbed Prairie. The mowed-maintained vegetation better fits the Urban classification. Disturbed Prairie is east of the fence line. Date of photograph: 12/8/19.

Photograph 101: View looking east towards Hickory Creek on the IH 35W west ROW near STA. 779+00. The TESCP/EMST Mapper classifies the stream, unmaintained vegetation and mowed-maintained vegetation as Riparian. The mowed-maintained vegetation better fits the Urban classification and the stream better fits the Open Water classification. The unmaintained vegetation fits the Riparian classification. Date of photograph: 12/8/19.

Photograph 102: View looking southwest along IH 35W west ROW near STA. 777+00. The TESCP/EMST Mapper classifies portions of this area as Riparian. The mowed-maintained vegetation better fits the Urban classification. The woody vegetation fits the Riparian classification. Woody vegetation up slope fits the Crosstimbers Woodland, and Forest classification. Date of photograph: 12/7/19.

Photograph 103: View looking southeast towards Hickory Creek on IH 35W east ROW from near STA. 780+00. The TESCP/EMST Mapper classifies this area as Riparian. The mowed-maintained vegetation better fits the Urban classification and the stream better fits the Open Water classification. The unmaintained vegetation fits the Riparian classification. Date of photograph: 12/7/19.

Photograph 104: View looking south-southeast across a floodplain area associated with a tributary to Hickory Creek from IH 35W west ROW near STA. 805+50. The TESCP/EMST Mapper classifies this area as Riparian. The mowed-maintained vegetation better fits the Urban classification. Date of photograph: 12/8/19.

Photograph 105: View looking southwest along IH 35W east ROW from near STA. 815+00. The TESCP/EMST Mapper classifies this area as Riparian. The mowed-maintained vegetation better fits the Urban classification and the woody vegetation fits the Disturbed Prairie classification. Date of photograph: 12/7/19.

Photograph 106: View looking northeast along IH 35W east ROW from near STA. 815+00. The TESCP/EMST Mapper classifies this area as Riparian. The mowed-maintained vegetation better fits the Urban classification and the woody vegetation fits the Crosstimbers Woodland and Forest classification. Date of photograph: 12/7/19.

Photograph 107: View looking southeast across Corbin Road on IH 35W west ROW near STA. 821+00. The TESCP/EMST Mapper classifies portions of the mowed-maintained vegetation as Riparian; however, it better fits the Urban classification. The stream better fits the Open Water classification. The woody vegetation adjacent to the stream fits the Riparian classification. Date of photograph: 12/8/19.

Photograph 108: View looking northeast along IH 35W east ROW from near STA. 825+00. The TESCP/EMST Mapper classifies portions of the mowed-maintained vegetation as Crosstimbers Woodland and Forest. The mowed-maintained vegetation better fits the Urban classification and the woody vegetation fits the Crosstimbers Woodland and Forest classification. Date of photograph: 12/7/19.

Photograph 109: View looking northeast along IH 35W west ROW from near STA. 827+00. The TESCP/EMST Mapper classifies portions of the mowed-maintained vegetation as Crosstimbers Woodland and Forest, and Disturbed Prairie. The mowed-maintained vegetation better fits the Urban classification and the woody vegetation fits the Crosstimbers Woodland and Forest classification. Date of photograph: 12/8/19.

Photograph 110: View looking southwest along IH 35W west ROW from near STA. 847+00. The TESCP/EMST Mapper classifies portions of the mowed-maintained vegetation as Crosstimbers Woodland and Forest, and Tallgrass Prairie, Grassland. The mowed-maintained vegetation better fits the Urban classification. Date of photograph: 12/8/19.

Photograph 111: View looking southwest along IH 35W east ROW from near STA. 860+00. The TESCP/EMST Mapper classifies portions of the mowed-maintained vegetation as Tallgrass Prairie, Grassland. The mowed-maintained vegetation better fits the Urban classification. Disturbed Prairie is east of the fence line. Date of photograph: 12/7/19.

Photograph 112: View looking southwest along IH 35W west ROW from near STA. 874+00. The TESCP/EMST Mapper accurately classifies this area as Urban. Date of photograph: 12/8/19.

Photograph 113: View looking southwest along IH 35W west ROW from near STA. 874+00. The TESCP/EMST Mapper classifies portions of the mowed-maintained vegetation as Disturbed Prairie. The mowed-maintained vegetation better fits the Urban classification. Date of photograph: 12/7/19.

CROSS TIMBERS SPECIES OF GREATEST CONSERVATION NEED

Scientific Name	Common Name	Status		Abundance Ranking		General Habitat Type(s) in Texas These are VERY broad habitat types as a starting place
		Federal	State	Global	State	
MAMMALS						
Conepatus leuconotus	Hog-nosed skunk			G5	S4	Shrubland, Savanna/Open Woodland, Barren/Sparse Vegetation,
Dipodomys elator	Texas kangaroo rat		T	G1G2	S2	Shrubland, Agricultural
Lutra canadensis	River otter			G5	S4	Riparian
Mustela frenata	Long-tailed weasel			G5	S5	Forest, Woodland, Desert Scrub, Shrubland, Savanna/Open Woodland
Myotis velifer	Cave myotis			G5	S4	Caves/Karst,
Neovison vison	Mink			G5	S4	Riparian, Riverine, Lacustrine, Freshwater Wetland
Puma concolor	Mountain lion			G5	S2	Forest, Woodland, Desert Scrub, Shrubland, Savanna/Open Woodland, Riparian
Spilogale putorius	Eastern spotted skunk			G4T	S4	Savanna/Open Woodland, Grassland
Sylvilagus aquaticus	Swamp rabbit			G5	S5	Riparian, Freshwater Wetland
Tadarida brasiliensis	Brazilian free-tailed bat			G5	S5	Cave/Karst, Artificial Refugia
Taxidea taxus	American badger			G5	S5	Grassland, Desert scrub, Woodland, Savanna/Open Woodland, Forest
BIRDS						
Anas acuta	Northern Pintail			G5	S3B,S5N	Lacustrine, freshwater wetland, saltwater wetland, coastal, marine
Colinus virginianus	Northern Bobwhite			G5	S4B	Grassland, Shrubland, Savanna/Open Woodland
Tympanuchus cupido	Greater Prairie-Chicken (Interior)			G4	S1B	Grassland
Meleagris gallopavo	Wild Turkey			G5	S5B	Shrubland, Savanna/Open Woodland, Forest, Riparian, Agricultural
Egretta thula	Snowy Egret			G5	S5B	Riparian, Riverine, Lacustrine, Freshwater Wetland, Saltwater Wetland, Estuary, Coastal, Cultural Aquatic
Egretta caerulea	Little Blue Heron			G5	S5B	Riparian, Riverine, Lacustrine, Freshwater Wetland, Saltwater Wetland, Estuary, Coastal, Cultural Aquatic
Butorides virescens	Green Heron			G5	S5B	Riparian, Riverine, Lacustrine, Freshwater Wetland, Cultural Aquatic
Ictinia mississippiensis	Mississippi Kite			G5	S4B	Woodland, Forest, Riparian, Developed:Urban/Suburban/Rural
Haliaeetus leucocephalus	Bald Eagle			G5	S3B,S3N	Riparian, Lacustrine, Freshwater Wetland, Saltwater Wetland
Circus cyaneus	Northern Harrier			G5	S2B,S3N	Grassland, Shrubland
Buteo lineatus	Red-shouldered Hawk			G5	S4B	Woodland, Forest, Riparian, Freshwater Wetland
Buteo swainsoni	Swainson's Hawk			G5	S4B	Desert Scrub, Grassland, Shrubland
Pluvialis dominica	American Golden-Plover			G5	S3	Grassland, Freshwater Wetland, Agricultural
Sternula antillarum	Least Tern	LE*	E*	G4	S3B	Riverine, Lacustrine, Freshwater Wetland, Saltwater Wetland, Estuary, Coastal, Marine, Developed: Industrial
Athene cunicularia	Burrowing Owl			G4	S3B	Desert Scrub, Grassland, Shrubland, Agricultural, Developed
Asio flammeus	Short-eared Owl			G5	S4N	Grassland, Shrubland, Agricultural
Caprimulgus carolinensis	Chuck-will's-widow			G5	S3S4B	Woodland, Forest, Riparian
Melanerpes erythrocephalus	Red-headed Woodpecker			G5	S3B	Savanna/Open Woodland, Woodland, Forest, Riparian, Developed: Urban/Suburban/Rural
Tyrannus forficatus	Scissor-tailed Flycatcher			G5	S3B	Desert Scrub, Grassland, Shrubland, Agricultural, Developed
Lanius ludovicianus	Loggerhead Shrike			G4	S4B	Desert Scrub, Grassland, Shrubland, Savanna/Open Woodland, Agricultural, Developed
Vireo bellii	Bell's Vireo			G5	S3B	Desert scrub, Shrubland, Riparian
Vireo atricapilla	Black-capped Vireo	LE	E	G3	S2B	Shrubland
Poecile carolinensis	Carolina Chickadee			G5	S5B	Woodland, Forest, Riparian, Developed: Urban/Suburban/Rural
Anthus spragueii	Sprague's Pipit	C		G4	S3N	Barren/Sparse Vegetation, Grassland, Shrubland, Agricultural
*Dendroica chrysoparia**	Golden-cheeked Warbler	LE	E	G2	S2B	Woodland
Aimophila cassinii	Cassin's Sparrow			G5	S4B	Grassland, Shrubland
Aimophila ruficeps	Rufous-crowned Sparrow			G5	S4B	Grassland
Spizella pusilla	Field Sparrow			G5	S5B	Grassland, Shrubland, Savanna/Open Woodland

Scientific Name	Common Name	Status		Abundance Ranking		General Habitat Type(s) in Texas These are VERY broad habitat types as a starting place
		Federal	State	Global	State	
Ammodramus savannarum	Grasshopper Sparrow			G5	S3B	Grassland, Agricultural
Chondestes grammacus	Lark Sparrow			G5	S4B	Grassland, Shrubland, Savanna/Open Woodland
Ammodramus leconteii	Le Conte's Sparrow					Grassland
Zonotrichia querula	Harris's Sparrow			G5	S4	Shrubland, Agricultural
Calcarius mccownii	McCown's Longspur			G4	S4	Grassland, Agricultural
Piranga rubra	Summer Tanager			G5	S5B	Savanna/Open Woodland, Woodland, Forest, Riparian, Developed: Urban/Suburban/Rural
Passerina ciris	Painted Bunting			G5	S4B	Shrubland, Agricultural
Spiza americana	Dickcissel			G5	S4B	Grassland, Agricultural
Sturnella magna	Eastern Meadowlark			G5	S5B	Grassland, Shrubland, Savanna/Open Woodland
Icterus spurius	Orchard Oriole			G5	S4B	Shrubland, Savanna/Open Woodland, Woodland, Riparian
REPTILES AND AMPHIBIANS						
Anaxyrus (Bufo) woodhousii	Woodhouse's toad			G5	SU	woodland, forest, freshwater wetland
Apalone mutica	smooth softshell turtle					riparian, riverine, lacustrine, freshwater wetland
Cheylydra serpentina	Common snapping turtle					riparina, riverine
Crotalus atrox	Western diamondback rattlesnake				S4	barren/sparse vegetation, desert scrub, grassland, shrubland, savanna, woodland, caves/karst
Crotalus horridus	Timber (Canebrake) Rattlesnake		T	G4	S4	woodland, forest, riparian
Eurycea chisolmensis	Salado Springs salamander	C		G1	S1	freshwater wetland (springs)
Eurycea naufragia	Georgetown Salamander	C		G1	S1	caves and karst, freshwater wetland (springs)
Graptemys versa	Texas map turtle			G4	SU	riparian, riverine
Heterodon nasicus	Western hognosed snake					desert scrub, grassland, shrubland
Macrochelys temminckii	alligator snapping turtle		T	G3G4	S3	riparian, riverine, cultural aquatic
Nerodia harteri	Brazos Water Snake		T		S1	riparian, riverine, cultural aquatic
Phrynosoma cornutum	Texas horned lizard		T	G4G5	S4	desert scrub, grassland, savanna
Pseudacris streckeri	Strecker's Chorus Frog			G5	S3	grassland, savanna, woodland, riparian, cultural aquatic, freshwater wetland
Sistrurus catenatus	massasauga					grassland, barren/sparse vegetation, shrubland, coastal,
Terrapene ornata	Ornate box turtle			G5	S3	grassland, barren/sparse vegetation, deset scrub, savanna, woodland
Thamnophis sirtalis annectans	Texas Garter Snake (Eastern/Texas/ New Mexico)			G5	S2	riparian, around lacustrine and cultural aquatic sites
Trachemys scripta	Red-eared slider					riparian, riverine, lacustrine, freshwater wetland, cultural aquatic
FRESHWATER FISHES						
Anguilla rostrata	American eel			G4	S5	streams and reservoirs in drainages connected to marine environments
Cycleptus elongatus	Blue sucker		T	G3G4	S3	large, deep rivers, and deeper zones of lakes
Hiodon alosoides	Goldeye					large lakes; backwaters
Ictalurus lupus	Headwater catfish			G3	S2	clear streams and rivers with moderate gradients, deep spring runs
Macryhbopsis storeriana	Silver chub					over silt or mud, turbid water with very soft sand/silt substrate
Micropterus treculii	Guadalupe bass			G3	S3	small lentic environments; commonly taken in flowing water
Notropis bairdi	Red River shiner					streambeds with widely fluctuating flows subject to high summer temperatures, high rates of evaporation, and
Notropis oxyrhynchus	Sharpnose shiner	C		G3	S3	Moderate current velocities and depths, sand bottom
Notropis potteri	Chub shiner		T	G4	S3	turbid, flowing water with silt or sand substrate; tolerant of high salinities
Polyodon spathula	Paddlefish		T	G4	S3	rivers, sluggish pools, backwaters, bayous, and oxbows with abundant zooplankton; large reservoirs if
INVERTEBRATES						
Amblycorypha uhleri	A katydid			G2G3*	S2?*	Savanna/Open Woodland
Arethaea ambulator	A katydid			G2G3*	S2?*	Savanna/Open Woodland
Bombus pensylvanicus	American bumblebee			GU	SU*	Grassland, Savanna/Open Woodland
Pleurobema riddellii	Louisiana pigtoe		T	G1G2	S1	Riverine

Scientific Name	Common Name	Status		Abundance Ranking		General Habitat Type(s) in Texas These are VERY broad habitat types as a starting place
		Federal	State	Global	State	
Pogonomyrmex comanche	Comanche harvester ant			G2G3*	S2*	Barren/Sparse Vegetation
Potamilus amphichaenus	Texas heelsplitter		T	G1G2	S1	Riverine
Quadrula aurea	Golden orb		T	G1	S2*	Riverine
Quadrula houstonensis	Smooth pimpleback		T	G2	S1S2*	Riverine
Quadrula mitchelli	False Spike		T	GH	SH	Riverine
Taeniopteryx starki	Texas willowfly			G1	S1	Riparian, Riverine
Truncilla macrodon	Texas fawnsfoot		T	G2Q	S1*	Riverine
PLANTS						
Agalinis auriculata	earleaf false foxglove			G3	SH	Savanna/Open Woodland; Grrassland
Agalinis densiflora	Osage Plains false foxglove			G3	S2	Savanna/Open Woodland - Outcrops
Argythamnia aphoroides	Hill Country wild-mercury			G2G3	S2S3	Savanna/Open Woodland
Carex edwardsiana	canyon sedge			G3G4S3S4	S3S4	Woodland (slopes above Riparian)
Carex shinnersii	Shinner's sedge			G3?	S2	Grassland
Clematis texensis	scarlet leather-flower			G3G4	S3S4	Woodland
Croton alabamensis var. texensis	Texabama croton			G3T2	S2	Woodland
Cuscuta exaltata	tree dodder			G3	S3	Woodland
Dalea reverchonii	Comanche Peak prairie-clover			G2	S2	Savanna/Open Woodland; Grassland
Echinacea atrorubens	Topeka purple-coneflower			G3	S3	Savanna/Open Woodland
Festuca versuta	Texas fescue			G3	S3	Woodland
Gaura triangulata	prairie butterfly-weed			G3G4	S3	Grassland
Hexalectris nitida	Glass Mountains coral-root			G3	S3	Woodland
Ipomoea shumardiana	Shumard's morning glory			G2G3	S1	Savanna/Open Woodland
Liatris glandulosa	glandular gay-feather			G3	S3	Savanna/Open Woodland
Oenothera coryi	Cory's Evening-primrose			G3	S3	Savanna/Open Woodland
Pediomelum cyphocalyx	turnip-root scurfpea			G3G4	S3S4	Grassland
Pediomelum reverchonii	Reverchon's curfpea			G3	S3	Grassland
Physaria engelmannii	Engelmann's bladderpod			G3	S3	Savanna/Open Woodland
Prunus minutiflora	Texas almond			G3G4	S3S4	Savanna/Open Woodland
Schoenoplectus hallii	Hall's baby bulrush			G2G3	S1	Freshwater Wetland (ponds)
Senecio quaylei	Quayle's butterweed			G1Q	S1	Savanna/Open Woodland
Styrax platanifolius subsp. platanifolius	sycamore-leaf snowbell			G3T3	S3	Woodland
Valerianella stenocarpa	bigflower cornsalad			G3	S3	Savanna/Open Woodland
Yucca necopina	Glen Rose yucca			G1G2	S1S2	Savanna/Open Woodland

U.S. DEPARTMENT OF AGRICULTURE
Natural Resources Conservation Service

NRCS-CPA-106
(Rev. 1-91)

FARMLAND CONVERSION IMPACT RATING FOR CORRIDOR TYPE PROJECTS

PART I *(To be completed by Federal Agency)*	3. Date of Land Evaluation Request	4. Sheet 1 of 1
1. Name of Project **IH 35W Frontage Roads From Dale Earnhardt**	5. Federal Agency Involved **TxDOT**	
2. Type of Project **Add Frontage Roads**	6. County and State **Denton County, Texas**	

PART II *(To be completed by NRCS)*	1. Date Request Received by NRCS	2. Person Completing Form
3. Does the corridor contain prime, unique statewide or local important farmland? (If no, the FPPA does not apply - Do not complete additional parts of this form). YES ☐ NO ☐		4. Acres Irrigated | Average Farm Size
5. Major Crop(s)	6. Farmable Land in Government Jurisdiction Acres: %	7. Amount of Farmland As Defined in FPPA Acres: %
8. Name Of Land Evaluation System Used	9. Name of Local Site Assessment System	10. Date Land Evaluation Returned by NRCS

PART III *(To be completed by Federal Agency)*	Alternative Corridor For Segment			
	Corridor A	Corridor B	Corridor C	Corridor D
A. Total Acres To Be Converted Directly	112			
B. Total Acres To Be Converted Indirectly, Or To Receive Services				
C. Total Acres In Corridor	764			
PART IV *(To be completed by NRCS) Land Evaluation Information*				
A. Total Acres Prime And Unique Farmland				
B. Total Acres Statewide And Local Important Farmland				
C. Percentage Of Farmland in County Or Local Govt. Unit To Be Converted				
D. Percentage Of Farmland in Govt. Jurisdiction With Same Or Higher Relative Value				
PART V *(To be completed by NRCS) Land Evaluation Information Criterion Relative value of Farmland to Be Serviced or Converted (Scale of 0 - 100 Points)*				
PART VI *(To be completed by Federal Agency) Corridor Assessment Criteria (These criteria are explained in 7 CFR 658.5(c))* — Maximum Points				
1. Area in Nonurban Use — 15	13			
2. Perimeter in Nonurban Use — 10	9			
3. Percent Of Corridor Being Farmed — 20	0			
4. Protection Provided By State And Local Government — 20	0			
5. Size of Present Farm Unit Compared To Average — 10	1			
6. Creation Of Nonfarmable Farmland — 25	0			
7. Availablility Of Farm Support Services — 5	2			
8. On-Farm Investments — 20	10			
9. Effects Of Conversion On Farm Support Services — 25	0			
10. Compatibility With Existing Agricultural Use — 10	0			
TOTAL CORRIDOR ASSESSMENT POINTS — 160	35	0	0	0
PART VII *(To be completed by Federal Agency)*				
Relative Value Of Farmland (From Part V) — 100	0	0	0	0
Total Corridor Assessment (From Part VI above or a local site assessment) — 160	35	0	0	0
TOTAL POINTS *(Total of above 2 lines)* — 260	35	0	0	0

1. Corridor Selected:	2. Total Acres of Farmlands to be Converted by Project:	3. Date Of Selection:	4. Was A Local Site Assessment Used?
A	0	11/26/19	YES ☐ NO ☑

5. Reason For Selection:

Signature of Person Completing this Part: Chris Hagar

DATE 11/26/19

Chris Hagar

NOTE: Complete a form for each segment with more than one Alternate Corridor

CORRIDOR - TYPE SITE ASSESSMENT CRITERIA

The following criteria are to be used for projects that have a linear or corridor - type site configuration connecting two distant points, and crossing several different tracts of land. These include utility lines, highways, railroads, stream improvements, and flood control systems. Federal agencies are to assess the suitability of each corridor - type site or design alternative for protection as farmland along with the land evaluation information.

(1) How much land is in nonurban use within a radius of 1.0 mile from where the project is intended?
More than 90 percent - 15 points
90 to 20 percent - 14 to 1 point(s)
Less than 20 percent - 0 points

(2) How much of the perimeter of the site borders on land in nonurban use?
More than 90 percent - 10 points
90 to 20 percent - 9 to 1 point(s)
Less than 20 percent - 0 points

(3) How much of the site has been farmed (managed for a scheduled harvest or timber activity) more than five of the last 10 years?
More than 90 percent - 20 points
90 to 20 percent - 19 to 1 point(s)
Less than 20 percent - 0 points

(4) Is the site subject to state or unit of local government policies or programs to protect farmland or covered by private programs to protect farmland?
Site is protected - 20 points
Site is not protected - 0 points

(5) Is the farm unit(s) containing the site (before the project) as large as the average - size farming unit in the County ? (Average farm sizes in each county are available from the NRCS field offices in each state. Data are from the latest available Census of Agriculture, Acreage or Farm Units in Operation with $1,000 or more in sales.)
As large or larger - 10 points
Below average - deduct 1 point for each 5 percent below the average, down to 0 points if 50 percent or more below average - 9 to 0 points

(6) If the site is chosen for the project, how much of the remaining land on the farm will become non-farmable because of interference with land patterns?
Acreage equal to more than 25 percent of acres directly converted by the project - 25 points
Acreage equal to between 25 and 5 percent of the acres directly converted by the project - 1 to 24 point(s)
Acreage equal to less than 5 percent of the acres directly converted by the project - 0 points

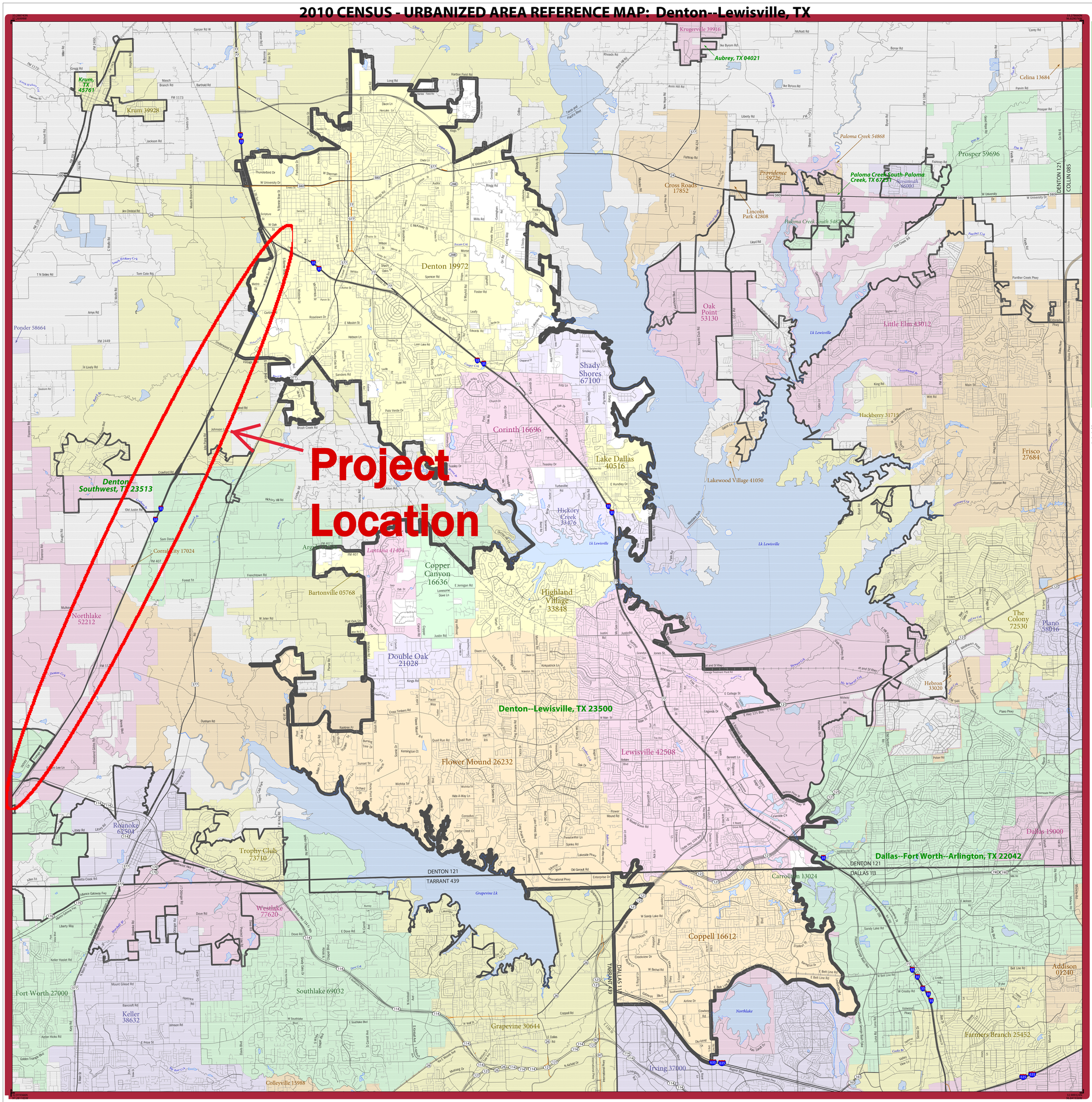
(7) Does the site have available adequate supply of farm support services and markets, i.e., farm suppliers, equipment dealers, processing and storage facilities and farmer's markets?
All required services are available - 5 points
Some required services are available - 4 to 1 point(s)
No required services are available - 0 points

(8) Does the site have substantial and well-maintained on-farm investments such as barns, other storage building, fruit trees and vines, field terraces, drainage, irrigation, waterways, or other soil and water conservation measures?
High amount of on-farm investment - 20 points
Moderate amount of on-farm investment - 19 to 1 point(s)
No on-farm investment - 0 points

(9) Would the project at this site, by converting farmland to nonagricultural use, reduce the demand for farm support services so as to jeopardize the continued existence of these support services and thus, the viability of the farms remaining in the area?
Substantial reduction in demand for support services if the site is converted - 25 points
Some reduction in demand for support services if the site is converted - 1 to 24 point(s)
No significant reduction in demand for support services if the site is converted - 0 points

(10) Is the kind and intensity of the proposed use of the site sufficiently incompatible with agriculture that it is likely to contribute to the eventual conversion of surrounding farmland to nonagricultural use?
Proposed project is incompatible to existing agricultural use of surrounding farmland - 10 points
Proposed project is tolerable to existing agricultural use of surrounding farmland - 9 to 1 point(s)
Proposed project is fully compatible with existing agricultural use of surrounding farmland - 0 points

2010 CENSUS - URBANIZED AREA REFERENCE MAP: Denton--Lewisville, TX



LEGEND

SYMBOL DESCRIPTION	SYMBOL	LABEL STYLE
International		CANADA
Federal American Indian Reservation		L'ANSE RES 1880
Off-Reservation Trust Land		T1880
Urbanized Area		Dover, DE 24580
Urban Cluster		Tooele, VT 88057
State (or statistically equivalent entity)		NEW YORK 36
County (or statistically equivalent entity)		ERIE 029
Minor Civil Division (MCD) [1,2]		Bristol town 07485
Consolidated City		MILFORD 47500
Incorporated Place [1,3]		Davis 18100
Census Designated Place (CDP) [3]		Incline Village 35100

DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL
Interstate	35	Water Body	Pleasant Lake
U.S. Highway	2	Military	Fort Belvoir
State Highway	4	Outside Subject Area	
Other Road	Marsh Ln		
Railroad	Southern RR		
Perennial Stream	Tumbling Cr		
Intermittent Stream	Piney Cr		

Where international, state, county, and/or MCD boundaries coincide, the map shows the boundary symbol for only the highest-ranking of these boundaries.

1 A '*' following an MCD name denotes a false MCD. A '°' following a place name indicates that a false MCD exists with the same name and FIPS code as the place; the false MCD label is not shown.

2 MCD boundaries are shown in the following states in which some or all MCDs function as general-purpose governmental units: Connecticut, Illinois, Indiana, Kansas, Maine, Massachusetts, Michigan, Minnesota, Missouri, Nebraska, New Hampshire, New Jersey, New York, North Dakota, Ohio, Pennsylvania, Rhode Island, South Dakota, Vermont, and Wisconsin. (Note that Illinois and Nebraska have some counties covered by nongovernmental precincts and Missouri has most counties covered by nongovernmental townships.)

3 Place label color corresponds to the place fill color.
Label colors: Davis Davis Davis Davis Davis

SUBJECT AREA COUNTIES ON MAP SHEET
48113 Dallas
48121 Denton
48439 Tarrant

All legal boundaries and names are as of January 1, 2010. Urban areas are based on results from the 2010 Decennial Census. The boundaries shown on this map are for Census Bureau statistical data collection and tabulation purposes only; their depiction and designation for statistical purposes does not constitute a determination of jurisdictional authority or rights of ownership or entitlement.

Geographic Vintage: 2010 Census (reference date: January 1, 2010)
Data Source: U.S. Census Bureau's MAF/TIGER database (TAB10)
Map Created by Geography Division: March 10, 2012

U.S. DEPARTMENT OF COMMERCE Economics and Statistics Administration U.S. Census Bureau

Projection: Albers Equal Area Conic
Datum: NAD 83
Spheroid: GRS 80
1st Standard Parallel: 27 36 51
2nd Standard Parallel: 34 43 24
Central Meridian: -100 04 35
Latitude of Projection's Origin: 25 50 13
False Easting: 0
False Northing: 0

0 1 2 3 4 5 Kilometers
0 1 2 3 4 5 Miles
The plotted map scale is 1:56194

N W E S

United States Census Bureau

PARENT SHEET 1

Total Sheets: 1
- Index Sheets: 0
- Parent Sheets: 1

UA NAME: Denton--Lewisville, TX
UA CODE: 23500
ENTITY TYPE: Urbanized Area (UA)
ST: Texas (48)

2010 CENSUS UA REF MAP (PARENT)
2310235000001

Form
Community Impacts Assessment Technical Report

Project Name: IH 35W Frontage Roads

Control Section Job Number (CSJ):

0081-13-065 **Report Date:** 12/19/2019

District: Dallas **County(ies):** Denton **Let Date:** 01/2025

Project Classification: Environmental Assessment

Report Version **Draft** ☒ **Revised** ☐ **Final** ☐

Please refer to the italicized instructions throughout this form, for guidance in determining which section should be completed. More detailed information on filling out this form is available in the Community Impacts Assessment Technical Report Instructions document in the CIA Toolkit. Additional guidance can be found in the Environmental Handbook - Community Impacts, Environmental Justice, Limited English Proficiency and Title VI and Frequently Asked Questions page in the Community Impacts Assessment Toolkit available on TxDOT.gov. For further assistance in developing this report or to discuss review comments on previous analyses, please contact the Environmental Affairs Division (ENV).

A. Applicable Projects

Would the proposed project involve ANY of the following conditions?

- Displacements of any kind
- Permanent increase in travel times to community facilities, businesses, or homes (except for projects that construct a new or extend an existing raised median or median barrier – see question below)
- Permanent elimination of driveway connections to/from community facilities, businesses, or homes
- Permanent impediment to use of non-automobile modes of travel
- Construction of a highway on new location
- Creation of a new bypass or reliever route
- Upgrading a non-freeway facility to a freeway facility
- Adding toll lanes

☐ Yes *Completion of this Community Impact Assessment Technical Report form is required. Proceed to **Section B**. Do not answer the remaining questions in this **Section A.***

☒ No *Proceed to the following question*

Would the proposed project involve ANY of the following conditions?

- Expansion of the roadway pavement by the width of one vehicle lane or more
- Creation of a new grade separation
- Construction of a new or extends an existing raised median or median barrier in front of a school OR with a section longer than 3 miles without a break or crossover

☒ Yes *Proceed to the following question*

☐ No *Completion of this Community Impact Assessment Technical Report form is not required (unless there is a reason to believe that the project would, nevertheless, have the potential to result in adverse temporary or permanent impacts to community resources, in which case proceed to **Section B**.) Do not answer the remaining questions in this **Section A.***

Are all of the following statements correct (to the extent they are applicable to the specific project)?

- For a project that involves expansion of a roadway by the width of one vehicle lane or more, the expansion is limited to an area that is rural or undeveloped.
- For a project that creates a new grade separation, the grade separation is limited to only one level (i.e. creating an overpass where one roadway will pass over another roadway), and is not a multi-level interchange.
- For a project that constructs a new or extends an existing raised median or median barrier in front of a school OR with a section longer than 3 miles without a break or crossover, the new or extended raised median or median barrier will not change access to any driveways or cross streets.

☐ Yes *Provide a brief summary of why there would not be any community impacts in the text box below. This will conclude the analysis and completion of the remainder of this Community Impact Assessment Technical Report form is not required (unless there is a reason to believe that the project would, nevertheless, have the potential to result in adverse temporary or permanent impacts to community resources, in which case proceed to **Section B**).*

☒ No *Completion of this Community Impact Assessment Technical Report form is required. Proceed to **Section B**.*

<Insert Text Here>

B. Community Study Area

Please answer all of the following questions in full sentences and proceed to *Section C.*

1. **Describe the overall objective of the improvements (e.g., to reduce congestion at an intersection, to improve operational efficiency, etc.).**

   The overall objective of the proposed project is to improve access, operational efficiency, and mobility in the project area.

2. **Describe the boundaries of the community study area and the reasoning behind why these boundaries were selected for this analysis. State the county, distance to major city, and nearby major roadways for the community that may be impacted. Attach a map showing the community study area as well as the locations of all community facilities within the study area (e.g., schools, places of worship, health care facilities, recreation centers, social services, libraries, emergency services, etc.).**

   The boundaries of the community study area are based upon adjacent Census Block Groups within Denton County, and encompass the the Towns of Argyle and Draper, as well as portions of the Towns of Bartonville, Flower Mound and Northlake, and City of Denton.

   Refer to Attachment 1 CIA Study Area Map and Attachment 3 Facilities Map.

3. **Describe the current land use patterns within the community study area (e.g., scattered rural development and agricultural use, planned suburban residential development, high-density urban development, mixed use, etc.).**

   Land use within the community study area is primarily agricultural and ranch land in its western portion; however, the area is quickly developing with a number of existing and planned residential developments underway. The eastern portion of the study area is primarily residential neighborhoods. Existing residential areas can be found along either side of US 377, in the northeast in Denton, and southeast in Flower Mound and Bartonville. There are also large areas of newly-built single-family residential developments within Northlake. The majority of residential areas throughout the study area are single family, though areas of higher-density urban development can be found in the northern limits in Denton. There are educational facilities interspersed across the central and northern portions of the study area. There is one area of industrial land use on the east side of IH 35W near Dale Earnhardt Way and another area at the northern limits of the study area adjacent to the IH 35W on the west side. There are a number of golf courses surrounded by older single-family developments in the eastern portion of the study area. There is a large area of undeveloped land within a riparian/floodplain in the southern portion of the study area, stemming from Denton Creek, which flows into Grapevine Lake just east of the study area.

   Refer to Attachment 1 CIA Study Area Map.

4. List and describe the community facilities within the community study area in the table below and show these facilities on an attached map.

#	Name of Facility	Type of Facility (ex.: school, park, place of worship, etc.)	Public or Private?	Serves a Specific Population?	Adjacent to the Project?	Additional Details/Comments
1	National Guard Office	Government	Public	No	No	
2	TxDOT Engineering And Maintenance Facility - Denton County	Government	Public	No	No	
3	University of North Texas	Educational	Public	No	No	
4	Ponder United Methodist Church	Place of Worship	Public	No	No	
5	Denton County Cowboy Church	Place of Worship	Public	No	No	
6	Argyle United Methodist Church	Place of Worshiop	Public	No	No	
7	Wise Health Emergency Center and iCare Urgent Care	Hospital	Public	No	No	
8	St. Mark Catholic Church	Place of Worship	Public	No	No	
9	Jehova's Witnesses Kingdom Hall	Place of Worship	Public	No	No	
10	Graham-Argyle Cemetery	Cemetery	Public	No	No	
11	Unity Park	Park	Public	No	No	

#	Name of Facility	Type of Facility (ex.: school, park, place of worship, etc.)	Public or Private?	Serves a Specific Population?	Adjacent to the Project?	Additional Details/Comments
12	Tribes Church	Place of Worship	Public	No	No	
13	Hilltop Elementary School	Educational	Public	Children	No	
14	Argyle Intermediate School	Educational	Public	Children	No	
15	Argyle Fine Arts Preschool	Educational	Private	Children	No	
16	Argyle Police Department	Government	Public	No	No	
17	Argyle Town Hall	Government	Public	No	No	
18	U.S. Postal Service	Government	Public	No	No	
19	First Baptist Church of Argyle	Place of Worship	Public	No	No	
20	Argyle Elementary School	Educational	Public	Children	No	
21	Harvest Meadows Northpark	Park	Public	No	No	
22	Living Savior Church	Place of Worship	Public	No	No	
23	Lance Thompson Elementary School	Educational	Public	Children	No	
24	Harvest Meadows Park on Meadows Drive	Park	Public	No	No	
25	Harvest Barn and Park	Park	Public	No	No	
26	Prairie Mound Cemetery	Cemetery	Public	No	No	
27	Harvest Sunflower Park	Park	Public	No	No	

#	Name of Facility	Type of Facility (ex.: school, park, place of worship, etc.)	Public or Private?	Serves a Specific Population?	Adjacent to the Project?	Additional Details/Comments
28	Harvest Meadows Park on Homestead Way	Park	Public	No	No	
29	Northlake Police Department	Government	Public	No	No	
30	North Texas Church of Christ	Place of Worship	Public	No	No	
31	Harvest Meadows Toddler Park	Park	Public	Children	No	
32	The Goddard School of Northlake	Educational	Private	Children	No	
33	Northlake Municipal Court	Government	Public	No	No	
34	Harvest Pond Walking Trail	Park	Public	No	No	
35	Draper Town Hall	Government	Public	No	No	
36	Argyle High School	Educational	Public	Children	No	
	Refer to Attachment 2: Facilities List for Full List and Attachment 3 Facilities Map.					

C. Demographics

Attach tables to this Community Impact Assessment Technical Report form detailing race/ethnicity (including Hispanic or Latino persons), language, income, employment, disability, and age data for the community study area. Include other demographic data as appropriate. A template demographics table is provided as Appendix A to this form. Following completion of this section, proceed to Section D.

1. **What data sources were used?**

   ☒ U.S. Census Bureau

   ☒ American Community Survey (ACS)

   ☐ Texas Demographics Center

   ☒ Texas Education Agency – "Texas Academic Performance Reports"

   ☒ Site Visit – The Date of Site Visit: 11/26/19

   ☒ Current and/or historic aerial photographs

   ☐ Other <Insert Text>

2. **How many of the census geographies within the community study area indicate half or more of the population as minorities (e.g., 2 out of 10 census blocks within the community study area indicate half or more of their populations to be minorities)? Also consider whether any of the census geographies indicate an appreciably greater percentage of minorities compared to the next largest census geography (e.g., one block indicates a 45-percent minority population, while its parent block group indicates a five-percent minority population). What is the racial makeup of the minority census geographies? Minority data should be evaluated at the block level in most circumstances.**

   Of the 980 census blocks within the community study area, with a total population of 22,850, there are 25 census blocks that indicate half or more of the population as minorities, with a total population of 2,276. The majority of these census blocks have very low populations (median population of blocks is 5 persons). There are 577 census blocks with zero recorded population. The EJ-predominant census block with the largest population of 1,389 (52% minority population) can be found just north of the project limits, at the edge of the study area within the City of Denton, and located less than a mile from the University of North Texas. The largest minority populations within this census block are Hispanic or Latino (23%) and Black or African American (20%). This

census block is not only the largest, but more than double the population of all other EJ census blocks combined (677). The next largest EJ-predominant census block within the study area, with a population of 320 (67% minority population) can be found at the very eastern edge of the study area, within the Town of Flower Mound. This census block is predominantly Hispanic or Latino (63%).

Only two EJ census blocks can be found adjacent to the project corridor, with large portions of the corridor being unpopulated ranchland. A total population of 961 is within the census blocks adjacent to the study area (4.7% of total study area population).

All census block groups are below the 50% minority population threshhold, though one census block group is close, with 48.9% minority population, located at the northeast end of the project within the City of Denton. The census block group is skewed because one census block has a population of 1,389 persons with 52% minority population, and makes up the majority (91%) of the census block group's total population.

It should be noted that demographics have likely changed significantly since the 2010 census was conducted nearly a decade ago. Notably, a number of recent housing developments have brought many people to areas near adjacent to the project location.

Refer to Attachments 5-7 for detailed Census Geography Maps on Minority Populations.

3. **What is the current U.S. Department of Health and Human Services (DHHS) poverty level for a family of four, and what year is this based on?**

The 2019 DHHS poverty level for a family of four is $25,750.

4. **How many of the census geographies show a median household income below the DHHS poverty level? What are the median incomes of each those census geographies? If there are more than four block groups in the study area, list the range of incomes (e.g., Median income in the study area ranges from $32,415 to $47,651). Median household income should be evaluated at the block group level if available.**

No census block group or census block geographies show a median household income below the DHHS poverty level; however, Census Tract 209 does have a median income level below the poverty level. Median income in the study area within census block groups ranges from $36,641 to $119,535 and within census tracts ranges from $21,285 to $119,015. There are an estimated 632 households within the study area below the poverty level. Block Group 1, Census Tract 208 has the lowest median income and the most households below poverty level at 189 households for block groups. This is the same block group with the largest population and a majority minority population, found in the City of Denton on the northern limits of the study area near the University of North Texas.

Refer to Attachment 8: Census Geography Map - Median Household Income.

5. **Do any of the census geographies show the presence of persons who speak English "less than very well?" Which languages are spoken by those with limited English proficiency? Language spoken should be evaluated at the block group level if available.**

   All census block groups show the presence of LEP populations with the highest being Block Group 1, Census Tract 208 with 8.2%. At the census tract level, Census Tract 208 has 14% LEP population, and Census Tract 209 has 11%, with Spanish being the most spoken. The primary language spoken by LEP populations is Spanish at 52% of all LEP populations across all census block groups. However, Block Group 2, Census Tract 203.07 has a slightly larger LEP population that speaks Other Indo-European Languages (3.1%) compared to Spanish-speaking LEP population (2.9%). Also, Block Group 2, Census Tract 203.10 has zero Spanish-speaking LEP peoples, but has an Asian and Pacific Island language speaking LEP population of 4.8% of the total population, though this amounts to only an estimated 22 persons.

   Refer to Attachment 9: Census Geography Map - LEP Populations.

D. Site Visit

*Following completion of this section, proceed to **Section E**.*

1. **Was a site visit conducted? If so, indicate when the site visit was conducted, attach documentation (including notes and photographs) from the field visit, and complete the rest of Section D. A site visit should be conducted for most projects. If not, explain why site visit was not conducted.**

   A site visit was conducted on 11/26/19. See Attachment 10 CIA Project Area Photographs for representaitve photos of the facilities in the CIA study area.

2. **Were there signs observed in languages other than English? Describe the language(s) observed as well as the frequency and general location of signs in other languages (e.g., throughout the community study area, concentrated in a particular vicinity, etc.).**

   No signs in other languages were observed during the site visit.

3. **Were there places of worship, businesses, services, or other community facilities that target or primarily serve specific minority groups?**

   No places of worship, businesses, services, or other community facilities that target or primarily serve specific minority groups were observed during the site visit.

4. **Were there observable signs of persons with disabilities, such as ramps on homes or public transportation vehicles, or stops specifically designed for persons with disabilities?**

   No observable signs of persons with disabilities were observed during the site visit.

5. **Were there signs of other vulnerable populations (including children and elderly persons), such as the presence of daycares, elementary schools, or assisted living facilities?**

   Signs of other vulnerable populations were observed in the CIA study area including day care facilities and schools. See Attachment 2 Facilities List.

6. **Were there signs of low-income populations or neighborhoods, such as government-subsidized housing, homes in disrepair, and low-cost health care facilities?**

   No signs of low-income populations were observed during the site visit.

7. **Were there signs of other modes of transportation, such as bus stops, train stations, or designated bicycle lanes or bicycle lane signage? Did you observe cyclists in the area? Are there sidewalks or trails? Did you observe "goat paths" or dirt pathways adjacent to the proposed facility? If any of these signs are present, please describe their location and extent and show on a map, if necessary.**

   No signs of other modes of transportation such as bus stops, train stations, designated bicycle lanes, signage, or bicyclists were observed in the CIA study area. No goat paths or dirt pathways were observed adjacent to IH 35W. The Harvest Pond Walking Trail was observed in the Harvest subdivision. The trail is bordered by Waterside Drive to the west, 1st Street to the south, Harvest Way to the east, and Homestead Way to the north. The trail is approximately 0.8 mile long. Sidewalks are present in all of the subdivisions in the CIA study area. Sidewalks are not present along IH 35W, cross streets, or rural large-lot neighborhoods.

8. **Based on the observations made during the site visit and the data provided in Sections B and C, summarize the general character of the community study area. Consider the present condition as well as the overall development trends within the community study area.**

   The general character of the CIA study area can be described as affluent. The development trend in the CIA study area consists of single-family subdivisions with some mixed use and commercial facilities.

E. Public Involvement

*Following completion of this section, proceed to **Section F.***

1. **Please describe the public involvement efforts planned or previously carried out for the proposed project.**

   A public meeting was held on May 16, 2019 at the Argyle Middle School. A public hearing is anticipated in spring 2020.

2. **If public involvement has already occurred or is ongoing, what type of feedback has been received from the public regarding the proposed project or other community-related issues (i.e., what is the general sentiment of the public regarding the proposed project**.

   There were five commenters from the public meeting. The comments were positive regarding the proposed project improvements.

3. **If public involvement has already occurred or is ongoing, and if feedback has been received from the public, how has this feedback been incorporated into the proposed project? Have attempts been made to address specific concerns of the public?**

   One comment regarding flooding associated with a culvert outfall was coordinated with the property owner by TxDOT.

F. Displacements

Would the proposed project result in any displacements?

☒ No Proceed to **Section G**, Access and Travel Patterns.

☐ Yes Answer the questions in all applicable sections.

- *If residential displacements would occur, answer all questions in **Section F.a.***
- *If commercial displacements would occur, answer all questions in **Section F.b.***
- *If commercial displacements would occur, (such as places of worship, community centers, or schools), answer all questions in **Section F.c.***

1. **Residential Displacements**

   If residential displacements would occur, answer all the questions in this section and proceed to **Section G.**

a. **How many residences would be displaced (including those that would be impacted in a manner that would prevent them from being occupied because of loss of parking or access, etc.)? What types of residences would be displaced (e.g., single-family homes, apartments, duplexes, etc.)?**

<Insert Text Here>

b. **Is there an adequate number of available replacement homes of comparable type, size, and cost? How was this determined?**

<Insert Text Here>

2. **Commercial Displacements**

If the number of employees at businesses that would be displaced represents less than five percent of the workforce in the community study area, then only questions i through vii should be answered below. If the number of employees at businesses that would be displaced represents more than five percent of the workforce in the community study area, then answer all of the questions in this section and refer to ***Appendix B*** *for guidance on how to further analyze economic impacts (unless there is reason to believe that the overall economic impact of the displacements on the community would nevertheless be minor, in which case discuss with an ENV SME before completing all of the questions in this section). Upon completion of this section, proceed to* ***Section G.***

a. **What types of businesses exist in the study area (e.g., commercial, retail, industrial, medical, etc.)?**

<Insert Text Here>

b. **Which businesses would be displaced (including those that are impacted in a manner that would prevent them from continuing to operate because of loss of parking, removal of access, etc.)?**

<Insert Text Here>

c. **Are these businesses unique to the area? How far would a person have to travel to find a business offering similar services?**

<Insert Text Here>

d. **Do these businesses serve a specific population such as persons with disabilities, children, the elderly, a specific ethnic group, low-income families, or a specific religious group?**

<Insert Text Here>

e. **Have any business owners indicated that they would or would not relocate if the proposed project is implemented? (base your answer on any information that is already available, there is no need to poll business owners for the sole purpose of answering this question)**

<Insert Text Here>

f. **Do customers generally access these businesses by car, mass transit, walking, or bicycling?**

<Insert Text Here>

g. **Are there replacement properties available for relocation of the businesses? Are there parcels available of comparable size, zoning, or special access needs (e.g., adjacent to a railroad)?**

<Insert Text Here>

3. **Other Displacements**

Other displacements could include but are not limited to places of worship, community centers, or schools. If other displacements would occur, answer all of the questions in this section and proceed to ***Section G.***

a. **What non-residential and non-commercial displacements would occur? Where are these facilities located?**

<Insert Text Here>

b. **Do the displaced facilities serve a specific population such as persons with disabilities, children, the elderly, a specific ethnic group, low-income families, or a specific religious group?**

<Insert Text Here>

c. Are there replacement properties available for relocation of comparable size or zoning?

<Insert Text Here>

d. How far would a person have to travel to find similar facilities or services?

<Insert Text Here>

e. Is there any opportunity to mitigate the impact to the facilities?

<Insert Text Here>

G. Access and Travel Patterns

Would the project potentially result in permanent changes to access (i.e., driveway closures), permanent removal of bike or pedestrian facilities, or permanent changes to travel patterns? Project elements that could result in changes in access and/or travel patterns include but are not limited to: introduction or modification of raised medians; dividing a previously undivided facility; reconfiguration of intersections; construction of a highway on new location; and construction of frontage roads along a highway.

☐ No Proceed to **Section H**, Community Cohesion

☒ Yes Answer questions in the applicable sections

- If the project would improve an existing facility (including construction of new frontage roads along an existing highway), complete Section G.a. only and proceed to **Section H**.
- If the project would be constructed on new location but would not create a new bypass or reliever route, complete Section G.b. only and proceed to **Section H**.
- If the project would create a new bypass or reliever route, complete Sections G.b. and G.c. and proceed to **Section H**.

1. **Changes in Access and Travel Patterns for Projects on Existing Facilities**

   a. **What modes do people currently use to access destinations in the community study area (car, walking, cycling, and/or mass transit)?**

   The most common form of transportation people use to access the adjacent parcels is by automobile followed by walking. Bicycling was not observed, and unlikely due to lack of development along the corridor. Mass transit is not available within the project area.

   b. **Describe the current travel patterns along the existing facility and within the community study area. Consider the travel patterns observed during the site visit as well as the potential origins and destinations of trips for people in the community study area. Consider all modes if multiple modes are used in the community study area**.

   Under existing conditions, motorists can enter both north and southbound IH 35W within the project limits from limited key cross streets spread out along the project. These cross-streets primarily overpass IH 35W with ramp access to and from the roadway. Driveway access to IH 35W is prohibited due to its status as an interstate highway. There are no adjacent sidewalks along the corridor.

   c. **Describe how the proposed project would permanently change access and travel patterns along the facility and within the community study area compared to the existing condition, including beneficial and adverse impacts. Please include estimated travel time changes, as appropriate.**

   The proposed project consists of the construction of continuous, one-way, two-lane urban, northbound and southbound frontage roads, along IH 35W. Other improvements would include changing the IH 35W ramp configuration from a conventional diamond to a reverse diamond (X ramp); flipping the Farm-to-Market (FM) 1171 (Cross Timber Road), Old Justin Road, and John Paine Road/Allred Road interchanges so that the IH 35W mainlanes cross over these streets; constructing an interchange for the future Denton Creek Road, and expanding the Cleveland Gibbs Road, FM 407, Robson Ranch Road/Crawford Road, and proposed Loop 288/Vintage Boulevard interchanges. The project would also connect Sam Davis Road to the northbound frontage road and provide new access to IH 35W at the reconstructed Old Justin Road and John Paine Road/Allred Road interchanges.

   Access to adjacent land from Dale Earnhardt Way north to FM 1515 would be improved by the continuous frontage roads, improved intersections, and new roadway connections. Currently, there is only access via cross streets.

   Travel pattern changes are discussed as follows:

Dale Earnhardt Way
The northbound IH 35W entrance ramp from Dale Earnhardt Way would be moved approximately 1.53 miles north of its present location. The southbound IH 35W exit ramp to Dale Earnhardt Way would be moved approximately 1.36 miles north of its present location.

Changes in travel time relative to the existing ramp locations are anticipated to be minimal.

FM 1171 (Cross Timber Road)
The northbound IH 35W entrance ramp from FM 1171 (Cross Timber Road) would be moved approximately 0.63 mile north of its present location.

The northbound IH 35W exit ramp to FM 1171 (Cross Timber Road) would be moved approximately 0.59 mile south of its present location.

The southbound IH 35W entrance ramp from FM 1171 (Cross Timber Road) would be moved approximately 0.45 mile south of its present location.

The southbound IH 35W exit ramp to FM 1171 (Cross Timber Road) would be moved approximately 0.89 mile north of its present location.

Changes in travel time relative to the existing ramp locations are anticipated to be minimal.

Cleveland Gibbs Road
There is no current access to IH 35W from Cleveland Gibbs Road. The proposed IH 35W at Cleveland Gibbs Road interchange would be located approximately 300 feet north of the existing location where Cleveland Gibbs Road crosses over IH 35W.

The northbound IH 35W entrance ramp from Cleveland Gibbs Road would be located approximately 1.04 miles north of Cleveland Gibbs Road. Motorists would cross through the Denton Creek Drive interchange before accessing northbound IH 35W.

The northbound IH 35W exit ramp to Cleveland Gibbs Road would be located approximately 1.06 miles south of Cleveland Gibbs Road.

The southbound IH 35W entrance ramp from Cleveland Gibbs Road would be located approximately 0.53 mile south of Cleveland Gibbs Road.

The southbound IH 35W exit ramp to Cleveland Gibbs Road would be located approximately 1.06 miles north of Cleveland Gibbs Road. Motorists would cross through the Denton Creek Drive interchange and continue to Cleveland Gibbs Road.

Travel time to Cleveland Gibbs Road from IH 35W would be substantially improved since there would be a connection from IH 35W.

Denton Creek Drive
The IH 35W at Denton Creek Road interchange would accommodate the proposed Denton Creek Road to be constructed by others.

The northbound IH 35W entrance ramp from Denton Creek Drive would be located approximately 0.68 mile north of the interchange.

The northbound IH 35W exit ramp to Denton Creek Drive would be located approximately 1.21 miles south of the interchange. Motorists would cross through the Cleveland Gibbs Road interchange before accessing Denton Creek Drive.

The southbound IH 35W entrance ramp from Denton Creek Drive would be located approximately 0.83 mile south of the interchange. Motorists would cross through the Cleveland Gibbs Road interchange before accessing southbound IH 35W.

The southbound IH 35W exit ramp to Denton Creek Drive would be located approximately 0.81 mile north of the interchange.

Changes in travel time to Denton Creek Drive are not applicable.

FM 407
The northbound IH 35W entrance ramp from FM 407 would be moved approximately 0.49 mile north of its present location.

The northbound IH 35W exit ramp to FM 407 would be moved approximately 0.76 mile south of its present location.

The southbound IH 35W entrance ramp from FM 407 would be moved approximately 0.68 mile south of its present location.

The southbound IH 35W exit ramp to FM 407 would be moved approximately 0.64 mile north of its present location.

Changes in travel time relative to the existing ramp locations are anticipated to be minimal.

Sam Davis Road
There is no current access to IH 35W from Sam Davis Road. The proposed Sam Davis Road would intersect the northbound IH 35W frontage road.

To access the northbound IH 35W entrance ramp from Sam Davis Road, motorists would travel on the northbound frontage road, cross the Old Justin Road interchange, and continue to the IH 35W entrance ramp. The total travel distance is approximately 1.42 miles.

To access Sam Davis Road from northbound IH 35W, motorists would exit south of FM 407, take the northbound frontage road across the FM 407 interchange, and continue to Sam Davis Road. The total travel distance is approximately 0.57 mile.

To access southbound IH 35W from Sam Davis Road, motorists would travel on the northbound frontage road, take the U-turn at the FM 407 interchange, and travel on the IH 35W southbound frontage road to the southbound IH 35W entrance ramp. The total travel distance is approximately 1.67 miles.

To access Sam Davis Road from southbound IH 35W, motorists would exit north of Old Justin Road, take the southbound frontage road across the interchange, continue along the southbound frontage road and take the U-turn at the FM 407, then go north on the northbound frontage road to Sam Davis Road. The total travel distance is approximately 2.90 miles.

Travel time from IH 35W to Sam Davis Road would be substantially improved since there would be a connection to IH 35W.

Old Justin Road
There is no current access to IH 35W from Old Justin Road. The proposed IH 35W at Old Justin Road would provide access to northbound and southbound IH 35W.

The northbound IH 35W entrance ramp from Old Justin Road would be located approximately 0.68 mile north of Old Justin Road.

The northbound IH 35W exit ramp to Old Justin Road would be located approximately 1.33 miles south of Old Justin Road.

The southbound IH 35W entrance ramp from Old Justin Road would be located approximately 0.95 mile south of Old Justin Road.

The southbound IH 35W exit ramp to Old Justin Road would be located approximately 0.97 mile north of Old Justin Road.

Changes in travel time from IH 35W to Old Justin Road would be substantially improved since there would be a connection to IH 35W.

Robson Ranch Road/Crawford Road
The northbound IH 35W entrance ramp from Robson Ranch Road/Crawford Road would be moved approximately 1.04 miles north of its present location.

The northbound IH 35W exit ramp to Robson Ranch Road/Crawford Road would be moved approximately 1.57 miles south of its present location.

The southbound IH 35W entrance ramp from Robson Ranch Road/Crawford Road would be moved approximately 0.45 mile south of its present location.

The southbound IH 35W exit ramp to Robson Ranch Road/Crawford Road would be moved approximately 0.80 mile north of its present location.

Changes in travel time relative to the existing ramp locations are anticipated to be minimal.

John Paine Road/Allred Road
There is no current access to IH 35W from John Paine Road/Allred Road. The proposed IH 35W at John Paine Road/Allred Road interchange would provide access to northbound and southbound IH 35W.

The northbound IH 35W entrance ramp from John Paine Road/Allred Road would be located approximately 1.04 miles north of John Paine Road/Allred Road.

The northbound IH 35W exit ramp to John Paine Road/Allred Road would be located approximately 1.57 miles south of John Paine Road/Allred Road.

The southbound IH 35W entrance ramp from John Paine Road/Allred Road would be located approximately 1.33 miles south of John Paine Road/Allred Road.

The southbound IH 35W exit ramp to John Paine Road/Allred Road would be located approximately 0.80 mile north of John Paine Road/Allred Road.

Changes in travel time from IH 35W to John Paine Road/Allred Road would be substantially improved since there would be a connection to IH 35W.

Loop 288/Vintage Boulevard
The northbound IH 35W entrance ramp from Loop 288/Vintage Boulevard would be moved approximately 1.63 miles north of its present location.

The northbound IH 35W exit ramp to Loop 288/Vintage Boulevard would be moved approximately 1.46 miles south of its present location.

The southbound IH 35W entrance ramp from Loop 288/Vintage Boulevard would be moved approximately 1.10 miles south of its present location.

The southbound IH 35W exit ramp to Loop 288/Vintage Boulevard would be moved approximately 2.08 miles north of its present location.

Changes in travel time relative to the existing ramp locations are anticipated to be minimal.

FM 1515
The proposed FM 1515 at IH 35 interchange would be constructed by others and it currently does not have access to IH 35W. The proposed IH 35W Frontage Roads project would construct one southbound IH 35W entrance ramp from the proposed FM 1515 interchange approximately 2.36 miles south of the existing FM 1515.

The proposed IH 35W Frontage Roads project would construct one northbound IH 35W exit ramp to the proposed FM 1515 interchange approximately 1.45 miles south of the existing FM 1515.

No adverse impacts are anticipated as a result of the ramp reversals and relocations. There might be some initial confusion to motorists until they learn where the new ramps are located; however, travel times in the CIA study area would not be negatively impacted and new access to IH 35W from roadways without existing access would be provided.

d. Describe the specific areas that would be affected by these changes, such as residences or businesses. Which community facilities listed in Section B.g. would be affected? Do any of the community facilities provide "essential services," such as clinics, schools, or emergency response?

There are very few adjacent businesses or residences due to the lack of frontage roads. Currently, all nearby facilities rely on access through various cross-streets. Proposed improvements to cross-streets, combined with frontage roads would provide better access to all nearby areas and people. Additionally, the proposed Old Justin Road and Clevland Gibbs Road interchanges would have access to the proposed frontage roads providing greater access to the areas surrounding those roadways. There is a recently completed hospital and urgent care clinic (MapID 7) that are adjacent to the project at the Robson Ranch Road/Crawford Road interchange. While this interchange currently provides ramps to and from IH 35W, the improvements would have the road widened to include left-turn lanes and U-turns, as well as provide access to and from the connecting frontage roads.

e. How would the proposed project affect emergency response times? Please calculate added distance and/or estimated travel times for any potential response time increases.

The addition of frontage roads, new access for two cross-streets to IH 35W via the frontage roads, and reconstruction and realignment of overpasses and cross-streets would provide greater access across the CIA study area. The ramp reversals and relocations are not anticipated to substantially increase travel time to IH 35W cross streets. In addititon, emergency services could use the frontage roads to avoid traffic backups on IH 35W resulting from vehicular incidents.

f. Are there active farms or ranches in the community study area? If so, would the project affect the movement of farm equipment or livestock trailers across the highway?

There are numerous agricultural and ranch areas adjacent to, and near the project, within the CIA study area. The existing IH 35W creates a barrier between agricultural areas to the

east and west, with access only at cross-streets. The proposed project would increase the number of cross-streets with access to IH 35W, as well as provide continuous frontage roads along the length of IH 35W, providing direct access to adjacent land uses. This would provide greater access for farm equipment or livestock trailers, which would be able to access adjacent property directly, rather than having to find less direct routes along cross-streets.

g. Are any design elements proposed to mitigate adverse impacts to access and/or travel patterns?

The addition of new access points to IH 35W at Old Justin Road and Cleveland Gibbs Road as well as U-turns at cross-streets, would help to mitigate any adverse impacts to access that might result from changes like reversed and/or relocated ramps.

2. Changes in Access and Travel Patterns for Construction of Highway on New Locations

a. What modes do people currently use to access destinations in the community study area (car, walking, cycling, and/or mass transit)?

<Insert Text Here>

b. Describe the current travel patterns within the community study area. Consider the travel patterns observed during the site visit as well as the potential origins and destinations of trips for people in the community study area. Consider all modes if multiple modes are used in the community study area.

<Insert Text Here>

c. Describe the changes in access and travel patterns that would result from the proposed project, including any beneficial and adverse impacts. For new location projects, consider whether access to previously inaccessible areas would be created, as well as how the introduction of the project to the area could change previously established travel patterns on other facilities in the community study area.

<Insert Text Here>

d. Describe the specific areas that would be affected by these changes. What residences or businesses are located near the proposed new-location facility? Which community facilities listed in Section B.d. would be affected? Do any of the

community facilities provide "essential services," such as clinics, schools, or emergency response?

<Insert Text Here>

e. How would the new highway affect emergency response times?

<Insert Text Here>

f. Is land adjacent to the new-location highway available for development?

<Insert Text Here>

g. Are there active farms or ranches in the community study area? If so, would the project affect the movement of farm equipment, livestock, or trailers across the highway?

<Insert Text Here>

h. Are any design elements proposed to mitigate adverse impacts to access and/or travel patterns?

<Insert Text Here>

3. Changes in Access and Travel Patterns for New Bypass or Reliever Route Projects

a. What businesses are located along the existing corridor for which the bypass or reliever route would be created? Which of these businesses are primarily dependent on passing traffic for business (e.g., gas stations, restaurants, hotels, etc.)?

<Insert Text Here>

b. Are frontage roads proposed as part of the project? If so, describe the type and location of the frontage roads.

<Insert Text Here>

c. **Describe any mitigation or design element, such as new signage, proposed to address adverse impacts to existing traffic-dependent businesses.**

<Insert Text>

H. Community Cohesion

Does the project involve one or more of the following elements?

- Construction of a highway on new location
- Construction of a new grade separation of more than one level
- Construction of a new interchange
- Expansion of an existing facility or interchange by a width equal to or greater than an existing travel lane.
- Upgrade of a non-freeway facility to a free-way facility
- Addition of tolled or managed lanes
- Construction of a new raised median or extension of an existing raised median that will prevent access to a least one driveway or cross street.
- Introduction of a new median along a previously undivided facility

☐ No Proceed to **Section I, Environmental Justice**.

☒ Yes Answer all questions in this section and proceed to **Section I.** .

1. **Briefly characterize the existing level of community cohesion. Ideally, this information should be based on feedback from members of the affected community or communities. If no such information is available, rely on geographic characteristics, development patterns, and observations made during the site visit.**

The study area includes the entire Towns of Argyle and Northlake as well as portions of the Cities of Denton and Fort Worth, and Towns of Flower Mound and Bartonville, Justin and Ponder. These different areas all have their own community cohesion, though some of them are periphery areas of greater communities, and some smaller subdivisions could be categorized as their own communities rather than part of the greater town or city they are a part of. For example, the existing Canyon Falls development, within the Town of Flower Mound, has its own unique character and cohesion, with its own school, parks and churches.

2. **Describe whether construction of the proposed project would change the existing level(s) of separation experienced near the project area. Changes in separation could include but are not limited to introduction of a new physical barrier; expansion of an existing physical barrier; or contribution to a perceived sense of separation by constructing a new grade separation. Consider all modes if multiple modes are used in the community study area.**

   The proposed project would not change the existing level of separation in the project area. The addition of continuous frontage roads would provide direct access to all adjacent properties reducing their physical separation, while reconstructed interchanges as well as new interchanges, would substantially reduce physical separation for other properties with current access to those cross-streets. The inclusion of continuous sidewalks and shared-use lanes along frontage roads would also reduce physical separation for pedestrian and bicycle movement, which would aid future development adjacent to the project. Furthermore, the inclusion of frontage roads with sidewalks would provide a framework for future public transport as adjacent commercial and residential developments advance. The proposed project would also improve safety for movements across and along the project area by providing greater capacity for vehicular movement and new capacity for pedestrians and bicycles.

3. **Describe whether the changes associated with the proposed project (including impacts to access and travel patterns) would directly or indirectly result in separation or isolation of any geographic areas or groups of people. Consider all modes if multiple modes are used in the community study area.**

   The proposed changes associated with the proposed project are not anticipated to separate or isolate any geographic areas or groups of people. The changes would not remove access to any cross-streets, and would add access to two. While the proposed ramp reconfigurations would involve flipping ramps to a reverse diamond design, this would only require drivers to go slightly farther along the project to enter onto the highway, and these improvements would specifically improve traffic flow and reduce congestion. So while drivers might have to travel farther to enter the highway, this would not likely negatively impact travel times.

4. **Describe whether the changes associated with the proposed project would affect use of local services and community facilities. Would the project make access to these services and facilities more or less convenient? Would the frequency with which people access other parts of the community change? Consider all modes if multiple modes are used in the community study area.**

   Local services and community facilities are sparse along the mostly rural project corridor, but with the inclusion of frontage roads in the proposed project, growth is expected to occur. These frontage roads along with reverse diamond ramps would allow future motorists to access many adjacent facities without driving through cross-street intersections, and would also allow more access to IH 35W from these adjacent facilities without needing to go through cross-street intersections.

The addition of two new cross-street intersections would also improve access to existing and future community facilities. Old Justin Road would provide north access to the Harvest subdivision, which includes a number of parks and schools, as well as Northlake and Draper government facilities and a cemetery. Cleveland Gibbs Road would provide more direct access to IH 35W for the Canyon Falls development and nearby park, school and courthouse.

5. **Are any design elements proposed to mitigate adverse impacts to community cohesion?**

No adverse impacts to community cohesion are anticipated.

I. Environmental Justice

Based on the data provided in Sections C.b. and C.d., does the community study area include any minority or low-income census geographies (i.e., "EJ census geographies")?

☐ No Proceed to **Section J, Limited English Proficiency.**

☒ Yes Answer all questions in this section and proceed to **Section J**.

1. **If the project would result in displacements, how many of these displacements would be located in EJ census geographies versus non-EJ census geographies?**

There would be no displacements.

2. **Would there be impacts related to access and/or travel patterns? If yes, what types of impacts would occur in EJ census geographies versus non-EJ census geographies?**

There would be net positive impacts to access and travel patterns, and all of these impacts would be felt equally across the CIA study area for EJ and non-EJ census geographies. The CIA study area is large, so it is unlikely that distant census geographies would be substantially impacted.

3. **Would there be impacts related to community cohesion? If yes, what types of impacts would occur in EJ census geographies versus non-EJ census geographies?**

No. Any impacts related to community cohesion would be equally shared between EJ census geographies and non-EJ census geographies.

4. **Do any of the displaced businesses, community facilities, or services specifically cater to minority or low-income populations? Would the services provided cease, be reduced, or be forced to temporarily stop if displaced? If so, where is the nearest comparable service provided? Consider the effects to EJ populations that reside within the community study area as well as EJ populations that may reside elsewhere but still rely on the services being provided by these establishments.**

   There would be no displacements.

5. **Based on the other technical documentation prepared for the proposed project, would there be any impacts to the human environment (e.g., noise, air quality, etc.) that could affect the community study area? If yes, would these impacts occur in EJ census geographies or non-EJ census geographies?**

   There is very little development directly adjacent to IH 35W. Impacts to the human environment that would adversely affect EJ or non-EJ cenbsus geographies are not anticipated.

6. **Has the community experienced substantial impacts from past transportation projects such as a new roadway causing a large number of displacements or introducing a barrier and separating parts of the community? Describe any recurring community impacts that may be perpetuated by the proposed project.**

   No. The existing IH 35W has been in place since the 1960s. No new roadways causing a large number of displacements or separating parts of the community have been constructed.

7. **Have there been any major infrastructure projects, industrial facilities, or other large-scale developments constructed in or adjacent to the community area?**

   Yes, a number of existing and planned residential and commercial developments are under construction or are pending along the IH 35W corridor. The proposed frontage roads would facilitate access to these developments, which include the following:

   Indian Springs – This 120-acre development in the Town of Northlake will consist of high-density residential and commercial uses.

   Canyon Falls – This is a 1,119-acre master-planned community in the towns of Flower Mound, Northlake, and Argyle.

   Avalon at Argyle – This 330-acre development in the Town of Argyle includes a mix of commercial and residential uses with a mix of lot sizes and densities.

Pecan Square – This 1,157-acre development in the Town of Northlake includes a mix of commercial and residential uses with a mix of lot sizes and densities.

The Highlands – This is a 363-acre residential development with one-acre homesites in the Town of Northlake.

The Heath Tract – This is an approximate 417-acre tract of land in Argyle, Texas that is proposed for development.

Harvest – This is an approximate 1,200-acre residential development in the Town of Argyle.

The Ridge at Northlake – This is an approximate 820-acre mixed use development in the Town of Northlake.

Hunter Ranch – This 3,179-acre master planned community in the City of Denton will include retail/commercial, industrial, single-family residential, medium density residential, schools, parks, and open space.

Robson Ranch – This is a 2,700-acre master planned retirement community with 7,200 homes in the City of Denton.

Cole Ranch – This 3,432-acre master planned community in the City of Denton will include retail/commercial, industrial, single-family residential, medium density residential, schools, parks, and open space.

8. **Are there any minimization or mitigation efforts proposed specifically to lessen impacts to EJ populations?**

No adverse impacts to EJ populations are anticipated.

9. **In consideration of all the impacts to EJ populations described above and any mitigation proposed, would impacts to EJ populations be disproportionately high and adverse when compared to impacts to and mitigation for impacts to non-EJ populations? Describe why or why not.**

The proposed project would not cause any displacements or separation or isolation of neighborhoods. No adverse impacts to EJ populations are anticipated. Any adverse impacts would be equally shared between EJ populations and non-EJ populations.

J. Limited English Proficiency

Based on the data provided in Sections C.e. and observations made during the site visit, are LEP persons likely to be present in the community study area?

☐ No Proceed to **Section K, Conclusions**.

☒ Yes Answer all questions in this section and proceed to **Section K.**

1. **What languages do the LEP persons likely to be present in the community study area speak?**

   Spanish, Other Indo-European Languages, Asian and Pacific Island.

2. **If public involvement events have occurred or are ongoing, then describe the accommodations that have been made for LEP persons during the public involvement process. Was assistance in a language other than English requested or is it anticipated to be requested? Were notices for public involvement opportunities provided in languages other than English? Were services such as translation or interpretation provided during public involvement events?**

   A public meeting was held on May 16, 2019 at the Argyle Middle School. Bilingual English/Spanish public meeting notices were mailed to adjacent property owners. Public meeting display ads were published in English and Spanish newspapers and Spanish-speaking staff were present at the public meeting. The public meeting notices stated that accommodations for other non-English languages would be provided if requested ahead of the meeting; however, no assistance in a language other than English was required.

3. **Are more public involvement efforts planned? If yes, has the plan to accommodate LEP persons changed based on past public involvement feedback?**

   A public hearing will be conducted in spring 2020. Bilingual English/Spanish public hearing notices will be mailed to adjacent property owners and other interested persons. Public hearing display ads will be published in English and Spanish newspapers, and Spanish-speaking staff will be present at the public hearing. The public hearing notices will state that accommodations for other non-English languages would be provided if requested ahead of the hearing.

K. Conclusions

Following approval of the Community Impact Assessment Technical Report form by TxDOT ENV, this summary must be included in the draft EA or draft EIS, if one is being prepared.

In the text box provided below, provide a summary of the analysis conducted above and include the following information:

- Whether EJ populations occur within the community study area
- Summary of impacts related to displacements
- Summary of impacts related to access and travel patterns
- Summary of impacts related to community cohesion
- Summary of impacts to EJ populations
- Summary of LEP issues and accommodations

If some of the above components of the analysis do not apply to a particular project, please indicate this in the conclusion statements (i.e., "The proposed project would not result in any displacements; therefore, a displacements analysis was not required.").

EJ populations occur within the CIA study area. There are 25 out of 980 census blocks within the CIA study area that contain 50% or more minorities; however, the majority of these census blocks have very low populations (median population of blocks is 5 persons). All census block groups are below the 50% minority population.

The proposed project would not cause any displacements; therefore, a displacements analysis was not required. Changes in travel time relative to the existing roadway are anticipated to be minimal. Access to IH 35W cross streets would be improved and new access to IH 35W would be provided at two interchanges. No adverse impacts to community cohesion would occur. The proposed project would not cause any displacements or separation or isolation of neighborhoods. No adverse impacts to EJ populations are anticipated. Any adverse impacts would be equally shared between EJ populations and non-EJ populations.

The languages that LEP persons likely speak in the CIA study area include Spanish, Other Indo-European Languages, Asian and Pacific Island. Accommodations for LEP persons during public involvement have included, and will continue to include, providing bilingual (English/Spanish) public notices, placing public notice display ads in English and Spanish newspapers, and having Spanish-speaking staff present at public involvement events. In addition, the public involvement notices state that accommodations for other non-English languages would be provided if requested ahead of the meeting.

Report Version 5

Hazardous Materials Initial Site Assessment (ISA)

November 4, 2019 District: Dallas

0081-13-065 Interstate Highway (IH) 35W Frontage Roads

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

Hazardous Materials Initial Site Assessment (ISA) Report

This ISA complies with the Federal Highway Administration's (FHWA's) policy dealing with hazardous materials discussed in FHWA's *Supplemental Hazardous Waste Guidance* (January 16, 1997) located at http://www.environment.fhwa.dot.gov/guidebook/vol1/doc7b.pdf.

FHWA's policy emphasizes three objectives: 1) identify and assess potentially contaminated sites early in project development, 2) coordinate early with federal/ state/ local agencies to assess the contamination and the cleanup needed; and 3) determine and implement measures early to avoid or minimize involvement with substantially contaminated properties.

In addition, completing the ISA will aid in identifying hazardous material issues early, avoiding construction delays, and reducing the department's liability associated with the purchase of contaminated right of way.

Maintain a copy of the completed ISA report with all applicable attachments in the project file.

For additional information, refer to TxDOT's online manual: *Hazardous Materials in Project Development:* http://onlinemanuals.txdot.gov/txdotmanuals/haz/index.htm and the Hazardous Materials Toolkit Site: http://www.txdot.gov/inside-txdot/division/environmental/compliance-toolkits/haz-mat.html

Abbreviations and Acronyms

CALF	Closed and Abandoned Landfill
CERCLIS	Comprehensive Environmental Response Compensation and Liability Information System
EA	Environmental Assessment
EIS	Environmental Impact Statement
ECOS	Environmental Compliance Oversight System
ERNS	Emergency Response Notification System
EPA	Environmental Protection Agency
ESA	Environmental Site Assessment
HAZMAT	Hazardous Materials
MS4	Municipal Separate Storm Sewer System
MSWLF	Municipal Solid Waste Landfill
NPL	National Priorities List
RCRA	Resource Conservation and Recovery Act
ROW	Right of Way
SEMS	Superfund Enterprise Management System
TCEQ	Texas Commission on Environmental Quality
TRRC	Texas Railroad Commission
US	United States
USGS	United States Geological Survey
VCP	Voluntary Cleanup Program

TxDOT Hazardous Materials Initial Site Assessment (ISA) Report

Project Information			
CSJ No: 0081-13-065	City: Fort Worth, Northlake, Flower Mound, Draper (Corral City), Argyle, Denton	Zip Code: 76177, 76205, 76207, 76226, 76247, 76259, 76262	County: Denton
HWY: IH 35W Frontage Roads	Limits: From Dale Earnhardt Way to South of the IH 35E/IH35W Interchange		

Section 1: Identify Previously Completed Environmental Site Assessments, Known Hazmat Conditions, Preliminary Project Design, and Right-of-Way Requirements	
Note: Obtain information/comments from design, right-of-way, and/or environmental staff. Attach maps and/or details as appropriate.	
☐ Yes ☐ No ☒ Unknown	Are there any previous environmental assessments, testing, or studies performed within the proposed project area related to contamination issues (to include Phase I ESAs)? If yes, explain here if there are any concerns to the proposed project:
☒Yes ☐ No	Have the project schematics and/or plan-profile sheets (if available) been reviewed?* Look for substantial excavations (including utilities and storm sewer designs), new ROW and easements, and bridge demolitions or renovations.

* For consultants: this information shall be supplied by TxDOT.

Section 2: Demolition and Renovation Information Related to Asbestos and Lead-Containing-Paint	
☒Yes ☐No	Are there proposed bridges or building demolitions or renovations for this project?
Note: If "Yes" is selected, buildings or structures being acquired through the acquisition process are assessed and mitigated for asbestos, as needed, within the ROW process according to the TxDOT ROW Manual ROW Vol. 6 Miscellaneous -Chapter 1 Section 5. Bridge structures being demolished or renovated are assessed and mitigated for asbestos and lead-containing-paint, as needed, within the construction process according to Standard Specification Item 6.10 (and applicable Provisions), and the TxDOT guidance document: Guidance for Handling Asbestos in Construction Projects, dated January 26, 2007.	

Section 3: Project Screening	
Note: Section 3.1 is only applicable for Categorically Excluded (CE) projects. If you are uncertain of the project type, select "No" and continue to Section 3.2. **Section 3.1** Determine if the proposed project has a low potential to encounter contamination. Refer to the preliminary schematics for project limits and internet-based maps for surrounding land use.	
☐ Yes ☒ No or an EA or EIS Project	Are the limits of the proposed project within a historically undeveloped area and outside the boundaries of a designated MS4 permitted area? Historically undeveloped areas are locations where no commercial buildings are located within one-half (0.5) miles of the proposed project limits and the surrounding land use is historically agricultural, forest, or ranch lands.
If "Yes" is selected, the ISA is complete. The proposed project has a low potential to encounter contamination. Complete Sections 9 and 10 of this ISA and maintain a copy and all applicable attachments in the project file. If "No" is selected, proceed to Section 3.2 of this ISA.	
Section 3.2 **Note:** Determine if the project includes any of the activities listed below:	

☒ Yes ☐ No	**Project Excavations:** Will the work consist of substantial excavation operations. Substantial excavation includes, but is not necessarily limited to: • Underpass construction, • Storm sewer installations, and • Trenching or tunneling that would require temporary or permanent shoring.
☐ Yes ☒ No	**Dewatering of Groundwater:** Are there proposed de-watering operations. If yes, what is the estimated depth to groundwater?
☒ Yes ☐ No	**Encroachments:** Are there known or potential encroachments into the project area? Encroachments include soil and groundwater contamination, dump sites, tanks, and other issues in the ROW.
☒ Yes ☐ No	**ROW and Easements:** Are there any acquisitions of new ROW, easements, temporary construction easements planned for the project?

3.3 Complete the appropriate box below:

☒ If Section 3.2 contains any "Yes" answers, please proceed to Section 4.

☐ If Section 3.2 contains all "No" answers, proceed to Section 6, Site Survey. Please perform a site survey documenting the results in Section 6 and then mark the appropriate box below. If a Phase I ESA has been prepared for this project, you may use the applicable site survey information from the Phase I ESA.

☐ The site survey did not identify evidence of any environmental concerns listed in Section 6. The ISA is complete. Complete Sections 9 and 10 and maintain a copy of the ISA and all applicable attachments in the project file.

☐ The site survey identified evidence of environmental concerns listed in Section 6. Continue with Section 4.

Section 4: Current and Past Land Use Information

Note: Review and assess current and past land use (up to 50 years) in the project area. Document and attach sources that were reviewed. If one or more Phase I ESAs were prepared for this project, please use applicable information from the Phase I ESAs to help complete this section of the ISA.

☒ Yes
☐ No
☐ Not Available
☐ Not Applicable

4.1 Review Current and Past USGS 7.5 Minute Topographic Maps of the project area: Look for oil & gas pipelines, tanks, landfills, or other industrial features.

Describe any concerns: No concerns.

List Topo Maps Reviewed:	Dates:	Comments:
Justin	1960, 1968, 1978, 2019	1960: IH 35W not constructed, 1968: IH 35W present on map.
Argyle	1960, 1968, 1973, 2019	1960: IH 35W not constructed, 1968: IH 35W south portion of IH 35W present on map with north portion labeled "under construction," 1973: IH 35W north portion shown on map as constructed.
Denton West	1960, 1968, 1973, 2019	1960: IH 35W not constructed, 1968: IH 35W labeled as "under construction," 1973: IH 35W shown as constructed.

☒ Yes
☐ No
☐ Not Available
☐ Not Applicable

4.2 Review Current and Past Aerial Photographs of the project area: Look for oil & gas pipelines, tanks, landfills, or other industrial features.

Describe any concerns: No concerns.

List All Aerial Photos Reviewed:	Photo Dates:	Comments:

	Google Earth https://www.historicaerials.com/viewer 5-10-19	1995, 1996, 2001, 2005, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018 1968, 1981	1995: Portion of aerial missing, Texas Motor Speedway and Dale Earnhardt Way constructed, 2012: poor quality. IH 35W under construction.

☐ Yes ☒ No ☐ Not Available ☐ Not Applicable	**4.3 Review Current and Past Right-of-Way Maps/Files*:** Look for oil & gas pipelines, tanks, landfills, or other industrial features. Describe any concerns:	
	List Maps/ Files & Dates Reviewed:	Comments:
☐ Yes ☐ No ☒ Not Available ☐ Not Applicable	**4.4 Review Sanborn Fire Insurance Maps/Files:** Look for tanks, oil & gas pipelines, landfills, or other industrial features. Describe any concerns:	
	List Maps/ Files & Dates Reviewed:	Comments:
☐ Yes ☒ No ☐ Not Available ☐ Not Applicable	**4.5 Review TxDOT As-Built Plans*:** Were any concerns identified during previous work within the project limits? If yes, explain: If known, what is the previous Project CSJ:	
☐ Yes ☒ No ☐ Not Available ☐ Not Applicable	**4.6 Review TxDOT Geotechnical Soil Boring Logs*:** Were any concerns noted on the boring logs such as unusual odors, visible contamination, trash, waste or debris? If yes, explain:	
☐ Yes ☐ No ☒ Not Available	**4.7 Review TxDOT Temporary Use ROW Agreements (permits issued by the district to entities to occupy a portion of the ROW)*:** Were any concerns such as monitor wells or treatment systems identified within the ROW? For consultants: this information shall be supplied by TxDOT. If yes, explain:	
☐ Yes ☐ No ☒ Not Available	**4.8 Review Notifications of Contamination to TxDOT*** (These are typically letters from TCEQ or third parties explaining the presence of contamination on TxDOT ROW): Were any concerns regarding contamination of ROW from off-site sources? If yes, explain:	

* For consultants: this information shall be supplied by TxDOT. If no information is supplied by TxDOT, then select Not Available.

Section 5: Complete a Regulatory Records Review (Database Search)

Note: Use the comment field in Section 5.1 to provide a synopsis of the total number of sites identified within the search distances of the regulatory record reviewed. No comments are required when no sites were identified or the regulatory record was not reviewed.

Select the appropriate box below:

☒ A Database search was conducted through a contracted service. Indicate in Section 5.1, and if applicable, Section 5.2, the regulatory records searched. Maintain a complete copy of the database search findings (contractor's report deliverable) in the project file with the ISA.

☐ A Database search was conducted in-house. For in-house database searches, not all databases need to be reviewed, but at a minimum the databases listed in Section 5.1 marked in **bold with a star(*)** must be reviewed. Include database records that list potential issues in the project file with the ISA. It is not necessary to include records of negative findings.

Section 5.1 Standard Database Sources of Environmental Information from Government Agency Records	
Findings	Regulatory Record
☐**Sites Identified** ☒**No Sites Identified**	**Federal Active NPL or Not NPL list (CERCLIS or SEMS sites)*** **https://cumulis.epa.gov/supercpad/CurSites/srchsites.cfm; and/or https://www.epa.gov/cleanups/cleanups-my-community** (1 mile minimum search distance from project limits)
Comments for Sites Identified:	
☒**Sites Identified** ☐**No Sites Identified**	**Federal Archived NPL or Not NPL list (CERCLIS or SEMS sites)*** **https://cumulis.epa.gov/supercpad/CurSites/srchsites.cfm** (0.5 mile minimum search distance from project limits)
Comments for Sites Identified: One site (Map ID 7) was identified within the search radius and is discussed in Section 8.1.	
☐Sites Identified ☒No Sites Identified ☐Not Reviewed	US EPA Brownfield Properties **https://www.epa.gov/cleanups/cleanups-my-community** (0.5 mile minimum search distance from project limits)
Comments for Sites Identified:	
☐Sites Identified ☒No Sites Identified ☐Not Reviewed	Federal RCRA Corrective Action (CORRACTS) list https://www.epa.gov/cleanups/cleanups-my-community, and/or http://www.epa.gov/enviro/ (1 mile minimum search distance from project limits)
Comments for Sites Identified:	
☐Sites Identified ☒No Sites Identified ☐Not Reviewed	Federal RCRA non-CORRACTS Treatment Storage Disposal (TSD) facilities list http://www.envcap.org/statetools/tsdf/ and/or http://www.epa.gov/enviro/ (0.5 mile minimum search distance from project limits)
Comments for Sites Identified:	
☒Sites Identified ☐No Sites Identified ☐Not Reviewed	Federal RCRA generators http://www.epa.gov/enviro/ (acquired property and adjoining properties)
Comments for Sites Identified: Two sites (Map IDs 6 and 7) are identified in the database; however, one site (Map ID 6) is outside of the search radius and is considered a low environmental risk to the project. The other site is discussed in Section 8.1.	
☒Sites Identified ☐No Sites Identified ☐Not Reviewed	Federal ERNS (or Responses) https://www.epa.gov/cleanups/cleanups-my-community (acquired property and adjoining properties)
Comments for Sites Identified: One unlocatable release incident was listed in the database and is discussed in Section 8.1.	
☒**Sites Identified** ☐**No Sites Identified**	**TCEQ Industrial Hazardous Waste Corrective Action (IHWCA) sites only*** **http://www15.tceq.texas.gov/crpub/** (1 mile minimum search distance from project limits)

Comments for Sites Identified: Two IHWCA sites (Map IDs 7 and 13) were identified within the search radius; however, one site (Map ID 13) is approximately 0.82 mile west-northwest of the project and is considered a low environmental risk to the project. The other site is discussed in Section 8.1.	
☐**Sites Identified** ☒**No Sites Identified**	**TCEQ Superfund sites*** **http://www15.tceq.texas.gov/crpub/ and/or** **https://www.tceq.texas.gov/remediation/superfund/sites/index.html** (1 mile minimum search distance from project limits)
Comments for Sites Identified:	
☐**Sites Identified** ☒**No Sites Identified**	**Closed and abandoned municipal solid waste landfill sites*** **http://www.tceq.texas.gov/permitting/waste_permits/msw_permits/msw-data** (0.5 mile minimum search distance from project limits)
Comments for Sites Identified:	
☒**Sites Identified** ☐**No Sites Identified**	**TCEQ leaking petroleum storage tank remediation lists (LPST)*** **http://www15.tceq.texas.gov/crpub/** (0.5 mile minimum search distance from project limits)
Comments for Sites Identified: Two LPST sites (Map IDs 4 [two releases] and 8) were identified within the search radius and are discussed in Section 8.1.	
☒**Sites Identified** ☐**No Sites Identified**	**TCEQ registered petroleum storage tank lists (PST)*** **http://www15.tceq.texas.gov/crpub/** (acquired property and adjoining properties)
Comments for Sites Identified: Eight PST sites were identified in the database; however, four of the sites (Map IDs 1, 3, 5, and 10) are outside of the search radius and are considered low environmental risks to the project. The remaining PSTs are discussed in Section 8.1.	
☒**Sites Identified** ☐**No Sites Identified**	**TCEQ voluntary cleanup program (VCP) sites*** **http://www15.tceq.texas.gov/crpub/** (0.5 mile minimum search distance from project limits)
Comments for Sites Identified: Three VCP sites (Map IDs 7 [two cleanups], 8, and 11) were identified within the search radius; however, one site (Map ID 11) is approximately 1,060 feet NNW of the project and is considered a low environmental risk to the project. The remaining VCP sites are discussed in Section 8.1.	
☐Sites Identified ☒No Sites Identified ☐Not Reviewed	TCEQ Innocent Owner/ Operator (IOP) sites http://www15.tceq.texas.gov/crpub/ (0.5 mile minimum search distance from project limits)
Comments for Sites Identified:	
☐**Sites Identified** ☒**No Sites Identified**	**TCEQ Dry Cleaners <u>remediation only</u> Database*** http://www15.tceq.texas.gov/crpub/ (0.5 mile minimum search distance from project limits)
Comments for Sites Identified:	
☐**Sites Identified** ☒**No Sites Identified**	**Texas Railroad Commission VCP sites*** **http://www.rrc.state.tx.us/oil-gas/environmental-cleanup-programs/site-remediation/voluntary-cleanup-program/** (0.5 mile minimum search distance from project limits)
Comments for Sites Identified:	
Section 5.2 List below other pertinent records reviewed such as local records and/or additional state records	
Record Source and Comments: One RCRA Subject to Corrective Action site (Map ID 12) was identified on the regulatory database report. The site is approx. 3,000 ft west-northwest of the end project terminus. There are no reported releases for the site. Based on the distance this site is not considered an environmental concern.	
Record Source and Comments: Texas Railroad Commission Well and Pipeline Viewer (accessed 7-30-19). According to the Viewer, 12 natural gas pipelines cross the project. They are discussed as follows:	

1. One Bluestone Natural Res. II, LLC 8.63-inch diameter Robbins to Speedway - GL natural gas gathering line at approximately STA 238+20. Status is “in service.” Approximately 650 linear feet of the pipeline cross the project at a 90o angle (see the Hazardous Materials Sites Map – Page 2).

2. One Cowtown Pipeline Partners LP 20-inch diameter Robbins to Speedway natural gas gathering line at approximately STA 238+50. Status is “in service.” Approximately 630 linear feet of pipeline cross the project at a 90o angle (see the Hazardous Material Site Map – Page 2).

3. One SWG Pipeline, LLC 12.75-inch diameter Rhome System Roanoke Lateral natural gas gathering line at approximately STA. 238+90. Status is “in service.” Approximately 610 linear feet of pipeline cross the project at a 90o angle (see the Hazardous Materials Sites Map – Page 2).

4. One Midcoast Gathering (N TX) LP 10.75-inch diameter Justin natural gas gathering line at approximately STA. 239+40. Status is “in service.” Approximately 600 linear feet of pipeline cross the project at a 90o angle. An additional 3,000 linear-foot portion of this pipeline is located parallel to IH 35W within proposed east ROW from approximately STA 253+00 to 283+00 (see the Hazardous Materials Sites Map – Pages 2 and 3).

5. One 1849 Midstream Partners, LLC 8.63-inch diameter DC Gathering natural gas gathering line. Approximately 570 linear feet of pipeline cross the project at a 45o angle. The pipeline crosses the proposed east ROW line at approximately STA. 248+00 and crosses the proposed west ROW line at approximately STA. 252+00. Status is “in service” (see the Hazardous Materials Sites Map – Page 2).

6. One 1849 Midstream Partners, LLC 6.63-inch diameter DC Gathering natural gas gathering line at approximately STA. 379+70. Status is “in service.” Approximately 490 linear feet of pipeline cross the project at a 90o angle (see the Hazardous Materials Sites Map – Page 6).

7. One Atmos Pipeline – Texas 24-inch diameter W natural gas transmission line at approximately STA. 462+00. Status is “in service.” Approximately 460 linear feet of pipeline cross the project at a near 90o angle (see the Hazardous Materials Sites Map – Page 8).

8. One SWG Pipeline, LLC 6.63-inch diameter James Heath 1H natural gas gathering line at approximately STA. 486+30. Status is “in service.” Approximately 420 linear feet of pipeline from a gas well east of the project cross the project at a near 90o angle. The pipeline stops just short of the proposed west ROW line, turns approximately 90o to the northeast, and remains within proposed west ROW from approximately STA 486+00 to 497+80, a distance of 1,180 linear feet, before veering west away from the project (see the Hazardous Materials Sites Map – Page 9).

9. One Hunter Gathering, LP 8.63-inch diameter Hunter Ranch Gathering System natural gas gathering line. This pipeline crosses the west side of the roadway at approximately STA 559+70 and generally follows the roadway centerline until it terminates west of the centerline at approximately STA 619+00. Approximately 1.15 mile of the pipeline is located within the project’s existing or proposed ROW. Status is “in service” (see the Hazardous Materials Sites Map – Pages 11 and 12).

10. One Hunter Gathering, LP 10.75-inch diameter Hunter Ranch Gathering System natural gas gathering line. A 300 linear-foot section of the pipeline crosses the west side of the roadway at approximately STA 617+20, then turns almost 90o at the project’s centerline and continues for approximately 1.2 miles within existing or proposed west ROW until it crosses the west ROW line at approximately STA 678+00. The pipeline splits at approximately STA 656+00 and an approximate 400 foot-long pipeline section crosses the proposed east ROW line at an approximate 30o angle. Status is “in service” (see the Hazardous Materials Sites Map – Pages 12 to 14).

11. One Energy Transfer Company 16-inch diameter Northeast Texas Region natural gas gathering line. This pipeline crosses the proposed west ROW line at approximately STA 625+70, continues approximately 0.65 mile within proposed west ROW, then turns 90o for approximately 350 feet to cross the proposed east ROW line at approximately STA 658+00. Status is “in service” (see the Hazardous Materials Sites Map – Pages 13 and 14).

12. One Enlink North Texas Gathering, LP 12.75-inch diameter D-100 natural gas gathering line. This pipeline crosses proposed west ROW at approximately STA 766+50, continues approximately 0.26 mile within existing west ROW, then turns 90o for approximately 380 feet to cross the proposed east ROW line at approximately STA 780+80. Status is “in service” (see the Hazardous Materials Sites Map – Page 17).

Based on the contents of the natural gas pipelines, these features are not considered an environmental concern. Formal utilities location and advance planning would be required to facilitate pipeline and utilities adjustments and to otherwise avoid associated impacts. TxDOT Dallas District SUE Coordinator and ROW will be responsible for the adjustments and displacements.

Eleven gas wells on six pad sites are situated within 200 ft of existing and/or proposed ROW. These gas wells and pad sites are considered a low environmental risk at this time. If the project design was to change and ROW would be acquired from any of these pad sites or any wells would be displaced, the risk level may be elevated.

One gas well/pad site (API 12131372) is adjacent to existing ROW along FM 338 (Cleveland Gibbs Rd). This well site is further discussed in Sec. 8.1 Oil and Gas Activity.

Section 6: Complete a Project Site Survey

Note: Do not document site survey concerns that were previously identified by the regulatory list search, by the Current and Past Land Use review, or both. In Section 6.1, describe the location and size of the concern. Attach site maps and photographs, as appropriate. If a Phase I ESA has been prepared for this project, you may use the applicable site survey information from the Phase I ESA and updated current site conditions, as needed.

Possible Site Survey Concerns: The following items are to be used as a guide to help identify potential hazardous material issues during a site survey.

- underground storage tanks
- aboveground storage tanks
- injection wells, cisterns, sumps, dry wells
- floor drains, walls stained by substances other than water or emitting foul odors
- stockpiling, storage of material
- surface dumping of trash, garbage, refuse, rubbish, debris half exposed/buried, etc.
- stained, discolored, barren, exposed or foreign (fill) soil
- oil sheen or film on surface water, seeps, lagoons, ponds, or drainage basins
- changes in drainage patterns from possible fill areas
- Dead animals (fish, birds, etc.)
- vent pipes, fill pipes, or access ways indicating a fill pipe protruding from the ground
- electrical and transformer equipment storage or evidence of release
- groundwater monitoring wells and groundwater treatment systems
- vats, 55-gallon drums (labeled/unlabeled), canisters, barrels, bottles, etc.
- evidence of liquid spills
- damaged or discarded automotive or industrial batteries
- dead, damaged, or stressed vegetation
- pits, ponds, or lagoons associated with waste treatment or waste disposal
- security fencing, protected areas, placards, warning signs

Site Survey Date(s): 8/1/19

6.1 Describe Concerns Observed During the Site Survey. **Do not** include concerns previously identified during the regulatory list search, the current and past land use review or both. Indicate if the concern is associated with existing ROW, proposed ROW, adjacent property, or easements. Provide address location (or relative location) and any additional information about the evidence identified; include photographs as an attachment to the ISA.

Comments or Concerns Identified:

Pole-mounted electrical transformers are located along various sections of IH 35W. No environmental concerns were observed. These transformers are considered a low environmental risk for the project.

A gas well drilling pad was observed near the existing west ROW line near STA 861+00. The drilling pad is considered a low environmental risk to the project. Gas well/pad sites are discussed in Sec. 5.2 and Sec. 8.1.

Section 7: Interviews		
Section 7.1 Were interviews conducted? ☐Yes ☒No Possible interviewees include local residents, TxDOT staff, fire department personnel, city or county department of health/environmental staff, city or county planning staff, TCEQ staff, TRRC staff, and current and former property owners or operators. If one or more Phase I ESAs were prepared for this project, please use applicable interview information from the Phase I ESAs to help complete this section of the ISA.		
Section 7.2 Interview Summary: Complete this section if interviews were conducted. Add additional rows as needed. Attach record of communications to the ISA.		
Name:	Title:	Date:
Describe any potential concerns:		
Name:	Title:	Date:
Describe any potential concerns:		
Name:	Title:	Date:
Describe any potential concerns:		

Section 8: Hazardous Material Concerns	
On the list below, indicate if a concern is resolved or unresolved. "Unresolved" indicates additional investigation or research is required. "Resolved" indicates the concern has been resolved during the preparation of this ISA. If a concern is "Unresolved" or "Resolved", include a statement explaining the planned next steps to resolve the issue. If no concerns were identified, select "No Issue". For additional information regarding scheduling considerations, internal/external coordination and recommended practices for resolving hazmat issues please refer to TxDOT's *Environmental Tool Kit* web site. Contact TxDOT ENV Hazardous Material Management (HMM) for additional assistance.	
8.1 Identify Type of Hazardous Material Concerns	
Resolution	**Type of Concern**
☐**Unresolved** ☐**Resolved** ☒**No Issue**	**Current or Past Land Use Concerns:** These concerns are associated with hazardous material issues identified in Section 4 that were not discovered during the database search in Section 5.1 or during the Site Survey in Section 6.1. Note: *For ECOS IIR development, the Available Contaminated Media would be "Other".*
Explain Unresolved or Resolved Issues:Features observed during the site reconnaissance are considered low environmental risks. See Sec. 5.2 and 6.1 for more information.	
☐**Unresolved** ☒**Resolved** ☐**No Issue**	**Site Visit Concerns:** These concerns are associated with hazardous material issues discovered following the completion of Section 6 that were not previously discovered during the database search in Section 5.1 or during the current and past land use review in Section 4. Note: *For ECOS IIR development, the Available Contaminated Media would be "Other".*
Explain Unresolved or Resolved Issues:Features observed during the site reconnaissance are considered low environmental risks. See Sec. 5.2 and 6.1 for more information..	
☐**Unresolved** ☐**Resolved** ☐**No Issue** ☒**N/A**	**Interview Concerns:** These concerns are associated with any hazardous material issues discovered during an interview listed in Section 7, that were not previously discovered during the database search in Section 5.1, during the current and past land use review in Section 4, or during

	the Site Survey in Section 6.1. Note: *For ECOS IIR development, the Available Contaminated Media would be "Other".*
Explain Unresolved or Resolved Issues:	

☐**Unresolved** ☒**Resolved** ☐**No Issue**	**Petroleum Storage Tanks (PSTs) Concerns discovered during the database search:** PSTs are underground or aboveground storage tanks used to store fuel or other petroleum substances. Typically, these are found at gasoline and diesel refueling facilities. Select below all that apply.	
	☒Yes ☐No	ROW acquisition or partial acquisition of a parcel with one or more PSTs.
	☐Yes ☒No	Other- Describe:

Explain Unresolved or Resolved Issues:

Resolved:

Interstate Texaco, 1201 FM 407, Corral City, TX. Currently vacant (Map ID 8). Adjacent SWC of FM 407 at IH 35W. The site is a PST, LPST, and VCP site and is discussed in Section 8.1 LPSTs.

Charleys Concrete Plant 3, 14960 IH 35W, Justin, TX (Map ID 2). Adjacent W. The site is an concrete batch plant utilizing one steel, 10,000-gallon diesel AST with concrete containment installed in 1997. No releases have been reported for the facility. ROW, including the displacement of a metal building and the AST, would be required from the site. Although ROW acquisition would displace the AST, based on the type of storage tank (AST) with concrete containment and no reported releases, this site is a low environmental risk to the project.

Kenosha Auto Transport, 1518 IH 35W, Denton, TX. Currently Active USA Kat (Map ID 4). Adjacent W. This is a PST and LPST site and is discussed in Section 8.1 LPSTs.

Paradise Market Wine & Beer, 1213 FM 407 W, Argyle, TX (Map ID 9). Adjacent southwest to project improvements along FM 407. The site is an active gas station utilizing one single-wall, composite, 12,000-gallon split diesel/gasoline underground PST and one single-wall, composite, 12,000-gallon gasoline underground PST, both installed in 1995. No releases have been reported for the facility. The tank hold is approximately 60 feet south of existing FM 407 ROW. According to the TCEQ Central Registry, the site received a complaint on 6-24-14 that a dispenser was leaking fuel at the nozzle/ hose and was missing its vapor escape guard. The status is reported as “closed” as of 7-9-14. No ROW would be required from this site. Based on the absence of ROW acquisition from the site and no reported releases, this site is a low environmental risk to the project.

☒**Unresolved** ☒**Resolved** ☐**No Issue**	**Leaking Petroleum Storage Tanks (LPSTs) Concerns discovered during the database search:** LPSTs are PSTs that have caused or are suspected to have caused a release of fuel or other petroleum substances to the environment.	
	☒Yes ☐No	Additional Research is needed or uncertain of impacts from one or more LPSTs. Request assistance from ENV.
	☒Yes ☐No	ROW acquisition or partial acquisition of a parcel with one or more LPSTs.
	☒Yes ☐No	One or more LPSTs are located within 0.25 miles of the project.
	☐Yes ☒No	Other- Describe:

Explain Unresolved or Resolved Issues:

Unresolved:

Interstate Texaco, 1201 FM 407, Corral City, TX. Currently vacant lot (Map ID 8). Adjacent SWC of FM 407 at IH 35W. The site is a PST, LPST, and VCP site. The location of the site is erroneously reported as FM 407, Argyle, TX. The site is a former gas station that utilized one 55-gallon hydraulic lift oil underground PST; one 4,000-gallon diesel underground PST, and two 8,000-gallon gasoline underground PSTs, all installed in 1977 and removed from the ground in 1997. The 55-gallon underground PST is reported as “in use”; however, based on aerials, the site was demolished by 2001. A release was reported on 12-21-07. The database reports “groundwater impacted, no apparent threats or impacts to receptors.” The TCEQ has not issued final concurrence and the case is “active.” A VCP application (VCP 2167) was submitted to the TCEQ in April 2008. The facility type for the source of contamination is reported as “gas station.” The contaminants are TPH and VOCs, and the media affected is soil/ groundwater. The TCEQ Central Registry indicates that three monitoring wells were installed on the property and quarterly monitoring had been performed. The Registry also shows the VCP was withdrawn in May 2017 with no indication the site had completed cleanup. The VCP site totals 3.8 acres. The site has no reported institutional control. No ROW would be

required from this site. Based on the location of the former gas station in relation to the project, three reported monitoring wells on-site, and the uncertain status of the VCP, this site is a moderate environmental risk to the project.

Resolved:

Kenosha Auto Transport, 1518 IH 35W, Denton, TX. Currently Active USA Kat (Map ID 4). Adjacent W. This is a PST and LPST site. The site formerly utilized two 10,000-gallon diesel underground PSTs installed in 1985 and removed from the ground in 1994; and one 12,000-gallon diesel underground PST installed in 1994 and removed from the ground in 2008. The site, doing business as Kenosha Auto Transport, reported a release on 11-21-94 upon tank closure. The database reports “no groundwater impact, no apparent threats or impacts to receptors.” The TCEQ issued final concurrence on 8-2-95 and the case is “closed.” The site, doing business as Active USA Kat, reported a release on 5-11-07. The database reports “impacted groundwater wihin 500 feet – 0.25 mile to southwest used by humans/ endangered species.” An Affected Property Assessment Report (APAR) was submitted to TCEQ in Sept 2008. The TCEQ issued final concurrence on 1-22-10 and the case is “closed.” According to the TCEQ Central Registry, the site was issued a Commissioner’s Enforcement Order in January 2008 for failing to have release detection, failing to prevent an unauthorized discharge of diesel fuel, and an administrative violation. The status is reported as “Closed.” ROW would be required from this site. Based on historic aerial photos, the former fueling area appears to be approximately 270 feet wes of proposed ROW. Based on the minor amount of ROW required from the site, the apparent distance of the former fueling area relative to proposed ROW, TCEQ final concurrence of the release incidents, and no PSTs currently on site, this site is a low environmental risk to the project.

☐**Unresolved** ☒**Resolved** ☐**No Issue**	**Oil and Gas Activity Concerns**: TxDOT is concerned with the acquisition of oil and gas wells (and ancillary equipment) such as process, piping, production equipment, pipelines, etc. Select below all that apply.	
	☐Yes ☒No	Additional Research needed or uncertain of impacts. Request assistance from ENV.
	☐Yes ☒No	Database search identified TRRC VCP Site within 0.5 miles of project.
	☐Yes ☒No	Oil/ Gas Wells within future ROW.
	☐Yes ☒No	Spills or other Contamination Issues associated with ancillary equipment or pipelines.
	☒Yes ☐No	Other- Describe: Pipeline crossings. Gas wells/pad sites

Explain Unresolved or Resolved Issues:

Twelve natural gas pipelines transect the project. These features are not considered an environmental concern. Additional information regarding the pipelines is discussed in Sec. 5.2. Formal utilities location and advance planning would be required to facilitate pipeline and utilities adjustments and to otherwise avoid associated impacts. TxDOT Dallas District SUE Coordinator and ROW will be responsible for the adjustments and displacements.

Eleven gas wells on six pad sites are situated within 200 ft of existing and/or proposed ROW. These gas wells and pad sites are considered a low environmental risk.

One gas well/pad site (API 12131372) is adjacent to existing ROW along FM 338 (Cleveland Gibbs Rd). The schematic shows FM 338 will be removed from its current location. No significant excavation adjacent to or ROW from this well site is proposed. Based on this information, the well site is a low environmental risk to the project at this time. If the project design was to change and ROW would be acquired from this pad site and/or the well would be displaced, the risk level may be elevated.

☐**Unresolved** ☒**Resolved** ☐**No Issue**	**Non-LPST Source Contamination Concerns discovered during the database search**: These are sites or locations that have a potential for soil and groundwater contamination and are not associated with LPST sites. Select below all that apply.	
	☐Yes ☒No	Additional Research is needed or uncertain of impacts from a Non-LPST site. Request assistance from ENV.

	☐Yes ☒No	Database search identified SEMS Active NPL or Not NPL site(s) within 1 mile of the project. This may be identified on a database search as a CERCLIS or NPL site.
	☒Yes ☐No	Database search identified SEMS Archived NPL or Not NPL site(s) within 0.5 miles of the project. This may be identified on a database search as a CERCLIS NFRAP.
	☐Yes ☒No	Database search identified RCRA Corrective Action(s) site within 1 mile of project.
	☐Yes ☒No	Database search identified RCRA TSD facilities within 0.5 miles of project.
	☒Yes ☐No	Database search identified TCEQ IHW Corrective Action sites within 1 mile of project.
	☐Yes ☒No	Database search identified TCEQ Superfund sites within 1 mile of project.
	☒Yes ☐No	Database search identified TCEQ VCP sites within 0.5 miles of project.
	☐Yes ☒No	Database search identified TCEQ IOP sites within 0.5 miles of project.
	☒Yes ☐No	Other- Describe: RCRASUBC

Explain Unresolved or Resolved Issues:

Resolved:

Healthtrack Rx, 1500 IH 35W Denton, TX (Map ID 7). Formerly Ohio Rubber Company, Trio-Denton, and Eagle Picher Automotive Group. Approx. 500 ft N of southbound frontage road project improvements and adjacent west of end project terminus. The facility currently operates as clinical solutions company for medical professionals.

Operating as Ohio Rubber Company, a contaminant discovery was reported to the EPA in Jan 1980 and a preliminary assessment was performed in Sept 1980. The site did not qualify for NPL based on existing information. The site was archived (SEMSArch) in Sept 1980. In addition, the TCEQ Central Registry identifies a Site Discovery Assessment being performed in 1986 and completed in 1993. Additional information regarding the SDA was not provided. The Registry shows the facility was also known as Hi Tech Metal Finishing.

Operating as Eagle Picher Automotive Group, a VCP application was submitted to TCEQ in May 1996. The site is listed as manufacturing and 10 acres in size. Contaminants are reported as TPH and VOCs in soil and groundwater. The VCP application was withdrawn in 1996.

Operating as Trio-Denton, the facility submitted a VCP application to TCEQ in March 2010. An APAR was submitted in Sept 2010. The site is listed as doing plating/coating/engraving and 24.4 acres in size. Contaminants are reported as metals, chlorinated solvents, and VOCs in soil and groundwater. The VCP received a certificate of completion in June 2011.

Operating as Healthtrack Rx, an IHWCA began in Oct 2004. Facility type listed in 2004 was plating/coating/engraving. Since Healthtrack is not a metal plating company, it is presumed the Healthtrack business was completing corrective action work from prior business(es) on-site. The Registry shows the facility completed workload in March 2017.

No ROW is proposed from this site and no significant excavations are proposed adjacent to this site. Based on the closures of the VCPs, IHWCA, and SEMSArch, the distance from the project improvement area, and the current nature of business on the property, this site is a low environmental risk to the project.

☐**Unresolved** ☐**Resolved** ☒**No Issue**	**Landfills/Waste Pits/Dump Site Concerns:** These concerns are associated with any known or suspected (based on visual observations) landfills, dump sites, or waste pits. These concerns may appear on a database search as CALF or MSWLF site. Additionally, the local Council of Governments (COG) maintains a list of closed and open landfills in your project area. Select below all that apply.	
	☐Yes ☒No	Additional research is needed or uncertain of impacts. Request assistance from ENV.
	☐Yes ☒No	Database search identified active/closed/abandoned CALF or MSWLF landfill sites within .5 miles of the project.
	☐Yes ☒No	Other- Describe:

Explain Unresolved or Resolved Issues:

8.3 Did the ISA identify any Unresolved Hazardous Material concerns?

☐ No, unresolved hazardous materials concerns were identified and/or all potential concerns were resolved within the ISA. No further hazardous materials action is required. The ISA is complete for this project. Any unanticipated hazardous materials impacts encountered during the project construction phase shall be addressed in accordance with regulatory requirements and TxDOT standard specifications. Complete Sections 9 and 10 and maintain a copy of the ISA and all applicable attachments in the project file.

☒ Yes, the ISA identified one or more unresolved hazardous materials concerns requiring additional investigations or assessments. An Issues, Identification, and Resolution (IIR) form shalll be completed in ECOS to track the additional investigations and assessments. Complete Sections 9 and 10 and maintain a copy of the ISA and all applicable attachments in the project file.

Section 9: Reference Materials Utilized (Identify any referenced materials and attach them to the ISA or in the project file.			
Referenced Materials Used	☒ Project Map	☒ USGS Topo Maps	☒ Aerial Photographs
	☐ ROW Maps/Files	☐ Sanborn Fire Insurance Maps	☐ Temporary Use Agreements
	☐ TxDOT As-Built Plans	☐ Notifications	☒ Photographs
	☒ Project Schematics/Profiles	☒ Regulatory Database	☐ Record of Interviews
	☒ Other: Hazardous Materials Site Map, Pipeline Information, Gas Wells/Pad Sites		

Section 10: Contact/Completed by		
Name:	Chris Hagar	**Tel: (214) 703-5151**
Title:	Sr. Project Manager	
Firm (District Section):	Civil Associates, Inc.	
Address:	9330 LBJ Freeway, Suite 1150, Dallas, TX 75243	
Signature:	Chris Hagar	**Date:November 4, 2019**

Historical Studies Project Coordination Request (PCR)

Reset Form

Main CSJ: 0081-13-065

District personnel should complete this form with all appropriate documentation attached. ENV-HIST staff review is contingent on provision of an active CSJ (or equivalent if the project is not a construction project) against which environmental work can be charged. District personnel shall ensure project description information in ECOS is complete and accurate prior to submitting the PCR to ENV-HIST. District-provided responses should reflect known data about the project and identify any limitations that hindered provision of the requested information. ENV-HIST staff will review the PCR form and attached information per established Documentation Standards. This review will result in:

- ENV-HIST environmental clearance of the project; OR
- ENV-HIST identification of additional technical studies required for clearance; OR
- ENV-HIST rejection of the PCR for failure to meet specific Documentation Standards and instructions on how to redress the rejection.

This form specifies minimally required information needed to properly facilitate ENV-HIST's review process. Please submit all relevant documentation with this PCR at one time.

NOTE: * If this project information changes over the course of design OR if the funding source changes, then HIST requires re-coordination and a revised PCR in ECOS.

No — If FHWA funded, does the project conform to the type listed in Appendix 4 and the Historic Resources Toolkit?
OR
Does this historic coordination apply to the Antiquities Code as referenced in the Historic Resources Toolkit?

Information Required to Process Projects with Potential to Affect Historic Properties

1. Targeted ENV clearance date: 03/01/2020
2. *Anticipated letting date: January 2025
3. "Historic-age" date (let date minus 45 years): 1980
4. Yes — *The proposed action is subject to federal permitting (i.e. Corps of Engineers, Coast Guard, IBWC, etc.).

   Describe:
   NWP
5. Yes — *The proposed action requires additional ROW (purchased or donated) or easements?

Parcel ID	Required New ROW (acres)	Required New Easements	
		Temporary	*Permanent*
See Appendix A of PCR attachments	95.42642799	0	2.47421138
Total:	**95.42642799**	**0**	**2.47421138**

Reset Form

6. The following maps, tables or equivalents are uploaded to ECOS.

Yes/No/NA	Map Type		
Yes	Existing and proposed ROW boundaries.	ECOS File Name:	HIST PCR Attachment 0081-13-065 IH35W 11.2019
Yes	Parcel boundaries for properties within the APE.	ECOS File Name:	HIST PCR Attachment 0081-13-065 IH35W 11.2019
Yes	Results of the Texas Historic Sites Atlas search, identifying NHL, NRHP, SAL, and RTHL resources located within one-quarter mile of the project area listed in a table format and identified on color aerial map(s) or equivalent.	ECOS File Name:	HIST PCR Attachment 0081-13-065 IH35W 11.2019

Comments: The Texas Historical Commission (THC) Historic Properties Atlas online was reviewed for all previously recorded historic properties within 0.25 miles of the project area. The atlas revealed three historical markers within the 0.25-mile study area, listed in the table below and identified on the map in Appendix B.

Yes	Results of TxDOT eligibility and historic bridge layers search. (See Historic Resources Toolkit for links).	ECOS File Name:	HIST PCR Attachment 0081-13-065 IH35W 11.2019

Comments: The TxDOT Listed and Eligible Bridges of Texas Map was reviewed for all previously recorded historic bridges within 0.25 miles of the project area. No such bridges were identified (see Appendix B).

7. Yes — Representative and dated photographs of the project area are uploaded to ECOS.

Note: Photographs should include the following elements:

1. Buildings/structures adjacent to project, especially if TxDOT will acquire ROW or easements from parcel.
2. Road Features (culverts, bridges, landscaping, etc.
3. Areas of proposed construction.

File Name in ECOS: HIST PCR Attachment 0081-13-065 IH35W 11.2019

8. Yes — Preliminary plans are uploaded to ECOS.

File Name in ECOS: HIST PCR Attachment 0081-13-065 IH35W 11.2019

9. No — Historic-age bridges are within the project area.

10. No — Rock masonry features (culverts, ditches, walls, etc.) are within the project area.

11. No — Historic-age rest area(s) are located within the project area.

12. No — The proposed action involves the relocation of historical markers.

Reset Form

13. Yes Additional consulting parties (other than the THC) may be involved in this project.

Consulting Party Name	Representing	Contact Information
Roslyn Shelton	Denton County Historical Comm	110 West Hickory, Denton, TX, 76201-4168 940-349-2860

Additional Project Comments:

The 3 historical markers identified in the study area only Historical Marker #2827: John's Well and Campgrounds; Intersection of Old Justin Road and C. Taylor Road (just east of I-35 west), 2 miles west of Argyle via Old Justin Road is within the project foot print.

District Personnel Certification

Yes I reviewed all submitted documents for quality assessment and control.

Mohammed Shaikh
District Personnel Name

11/22/2019
Date:

Reset Form

The following table shows the revision history for this document.

Revision History	
Effective Date Month, Year	Reason for and Description of Change
December 2013	Version 1 released.
June 2015	Version 2 released. The form was converted to a PDF format. Form level validations were installed to ensure that all certified forms contained the minimum required information. Various questions were modified to accommodate the improved functionality of the PDF format.
August 2015	Version 3 released. Revised the form to make it compatible with Adobe Acrobat Reader DC. No changes were made to the question sequence or form logic.
June 2019	Version 4 released. The form was updated to include a separate section for Appendix 4. Additional questions were added for form logic.

Appendix A

Required New ROW and Easements, in Acres

IH 35W Frontage Roads Project
From: Dale Earnhardt Way
To: South of the IH 35E/IH 35W Interchange
Denton County, Texas
CSJ: 0081-13-065

Appendix A

Required new ROW and Easements, in acres

Denton County Appraisal District Parcel ID	Required new ROW (acres)	Required easements (acres)
		0.0
68512	0.1239861	0.0
241779	0.119836839	0.0
668954	0.012952158	0.0
122849	0.861342973	0.0
150120	0.003797828	0.0
70820	0.697300356	0.0
70817	2.002977987	0.0
70832	0.686793577	0.087835085
0	1.989769392	0.0
68510	0.323609949	0.0
150125	0.041121359	0.0
68431	0.339425817	0.0
244899	0.204990941	0.0
97397	0.828173937	0.0
73881	0.720031579	0.263216338
97399	0.407579394	0.0
73876	0.071331412	0.0
716677	0.387521488	0.0
70822	0.019243577	0.0
199196	1.13758034	0.0
70803	0.715194796	0.020954858
70784	2.114979001	0.0
722040	1.421419582	0.067632381
73875	0.441434382	0.0
70799	2.827345565	0.067170094
724504	2.170239828	0.0
212742	1.77243831	0.246602638
208252	0.398808058	0.0
208251	1.224968473	0.083906049
69069	1.688046573	0.092819534
219487	0.030167146	0.00367121
208045	1.98650714	0.0
69062	1.704480939	0.0
193084	0.516096903	0.029188303
526599	0.139504038	0.033656049

69054	0.298412507	0.0
69045	0.025574298	0.0
302065	1.309305748	0.032645895
72969	0.11836582	0.0
693123	0.906538402	0.0
523538	0.01983396	0.0
69052	1.10178433	0.053564164
156952	0.265975565	0.0
73015	1.558391006	0.035707794
72973	2.474960978	0.0
72978	0.612263669	0.0
154876	1.433479141	0.0
124335	2.901714004	0.0
75360	0.943361687	0.0
114264	0.096769532	0.0
200768	2.215249927	0.0
339705	3.054821543	0.0
75361	2.413630271	0.0
209186	0.388503567	0.0
73860	0.118694456	0.0
73863	0.571122656	0.085582578
73880	3.692699323	0.41032081
67432	2.473982401	0.042640622
701134	0.413343232	0.0
701135	0.035852578	0.0
701141	0.27283753	0.0
67477	0.169585461	0.0
64562	0.232873698	0.0
64554	4.185117612	0.0
73868	0.554875562	0.0
73867	2.918461088	0.0
65052	1.444575771	0.0
164722	2.094390344	0.0
75755	1.532364858	0.050766366
67445	3.34776368	0.143016699
164724	0.344359979	0.139500126
202283	0.660512511	0.0
64801	2.881348753	0.0
37340	0.873263097	0.0
64803	0.723366979	0.0
524172	0.298594045	0.0
37184	4.525039226	0.0

162869	1.306609968	0.0
37093	0.896712404	0.0
37895	1.773601042	0.0
464870	0.092337202	0.000450728
464869	0.636074261	0.000567399
464739	0.064792984	0.017921267
464738	0.372432966	0.0
128465	0.124304279	0.0
223198	0.078380684	0.0
223199	0.009059458	0.0
37324	0.352936309	0.0
162864	0.218982833	0.0
162867	0.091244286	0.0
76187	0.127970966	0.0
113156	0.119864027	0.0
122986	0.299474532	0.0
122985	0.393151421	0.164158772
35325	0.198338843	0.0
35323	0.974507119	0.0
35319	0.552293531	0.09793508
39303	0.065689167	0.030558916
81997	0.023336148	0.0
662202	0.008603285	0.0
650767	0.010771747	0.0
Total	95.42642799	2.474211384

Appendix B

Texas Historic Sites Atlas Search Results

IH 35W Frontage Roads Project
From: Dale Earnhardt Way
To: South of the IH 35E/IH 35W Interchange
Denton County, Texas
CSJ: 0081-13-065

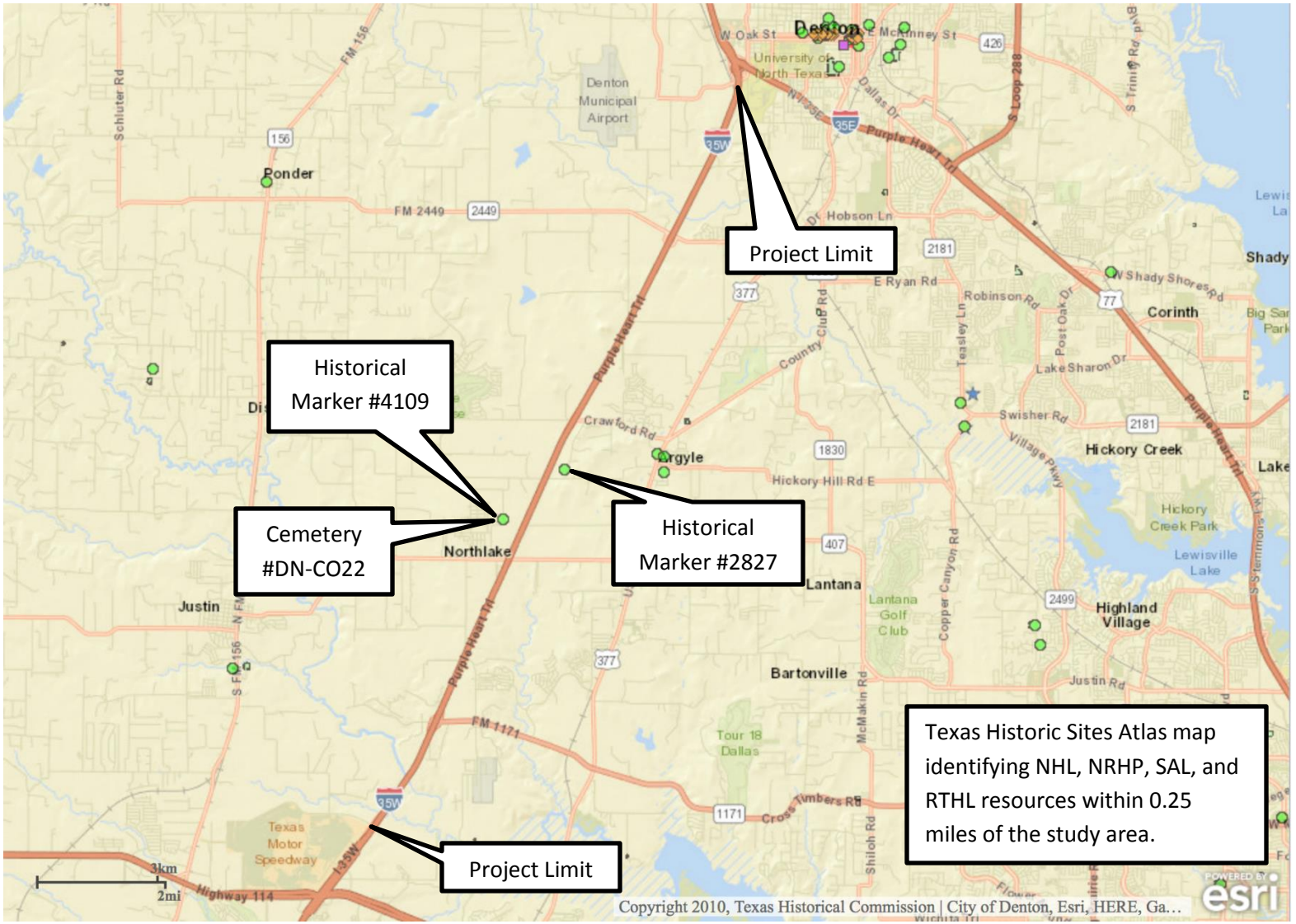
Appendix B

Results of Texas Historic Sites Atlas Search, identifying NHL, NRHP, SAL, and RTHL Resources located within one-quarter mile of project area

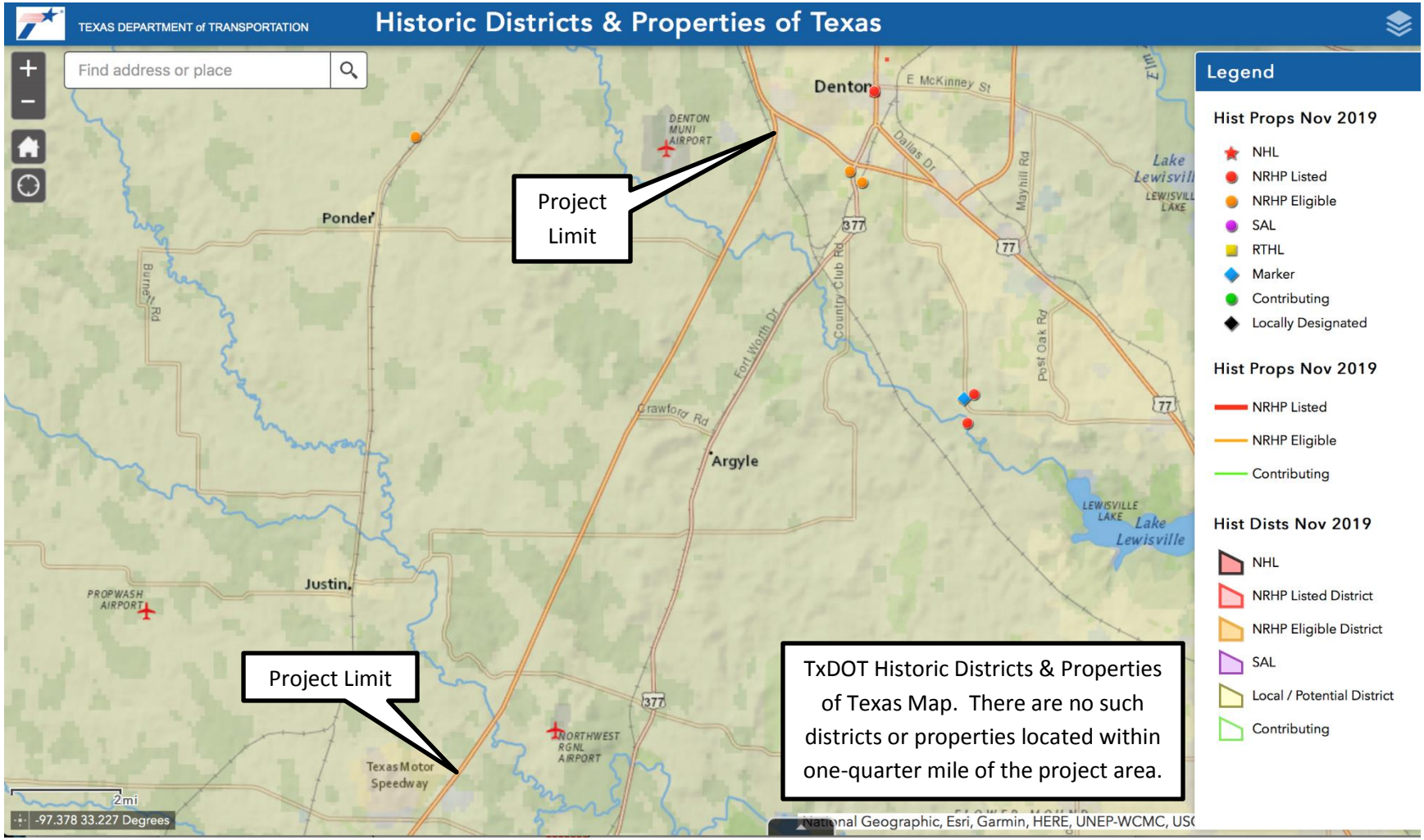
The Texas Historical Commission (THC) Historic Properties Atlas online was reviewed for all previously recorded historic properties within 0.25 miles of the project area. The atlas revealed two historical markers and one cemetery within the 0.25-mile study area, listed in the table below and identified on the maps in Appendices B and C. The TxDOT Listed and Eligible Bridges of Texas Map was also reviewed. No additional historic properties or bridges were identified within 0.25 miles of the project area.

Property Name and Location	**Description**
Historical Marker #2827: John's Well and Campgrounds; Intersection of Old Justin Road and C. Taylor Road (just east of I-35 west), 2 miles west of Argyle via Old Justin Road.	Marker text: In 1884 this site was designated as a religious campground by the members of the Prairie Mound Methodist Church. Johns' well, named for former owner Hardin Johns, provided the steady water supply needed by campers, area settlers and travelers. During annual ten-day camp meetings, families camped around the brush arbor where services were held. As nearby communities erected church buildings the campgrounds began to decline and the land was sold in 1913. John's well continued to serve the area residents until 1963. (1982)
Historical Marker #4109: Prairie Mound Cemetery; 1/2 mile north of FM 407, 4 miles southwest of Argyle on Prairie Mound Cemetery Road.	Marker text: This burial ground was in use by 1882 when adjoining property was deeded to the Prairie Mound Methodist Episcopal Church, South. The earliest marked grave here is that of Edgar Myers (1875-1878), the son of J. E. and M. J. Myers. Church services were discontinued before 1920, and a public school, organized nearby in 1878, was consolidated with neighboring districts in the 1940s. Shortly after the original sanctuary was removed from the site in 1961, the Lark Heath Memorial Chapel was dedicated. Many pioneer settlers of the Argyle-Justin area are buried here. (1981) Incise on back: Donated by J. Heath Family, Argyle Centennial Committee.
Cemetery ID #DN-CO22: Prairie Mound Cemetery; SW of Denton off I-35W on west side of Prairie Mound Cemetery Road.	Cemetery

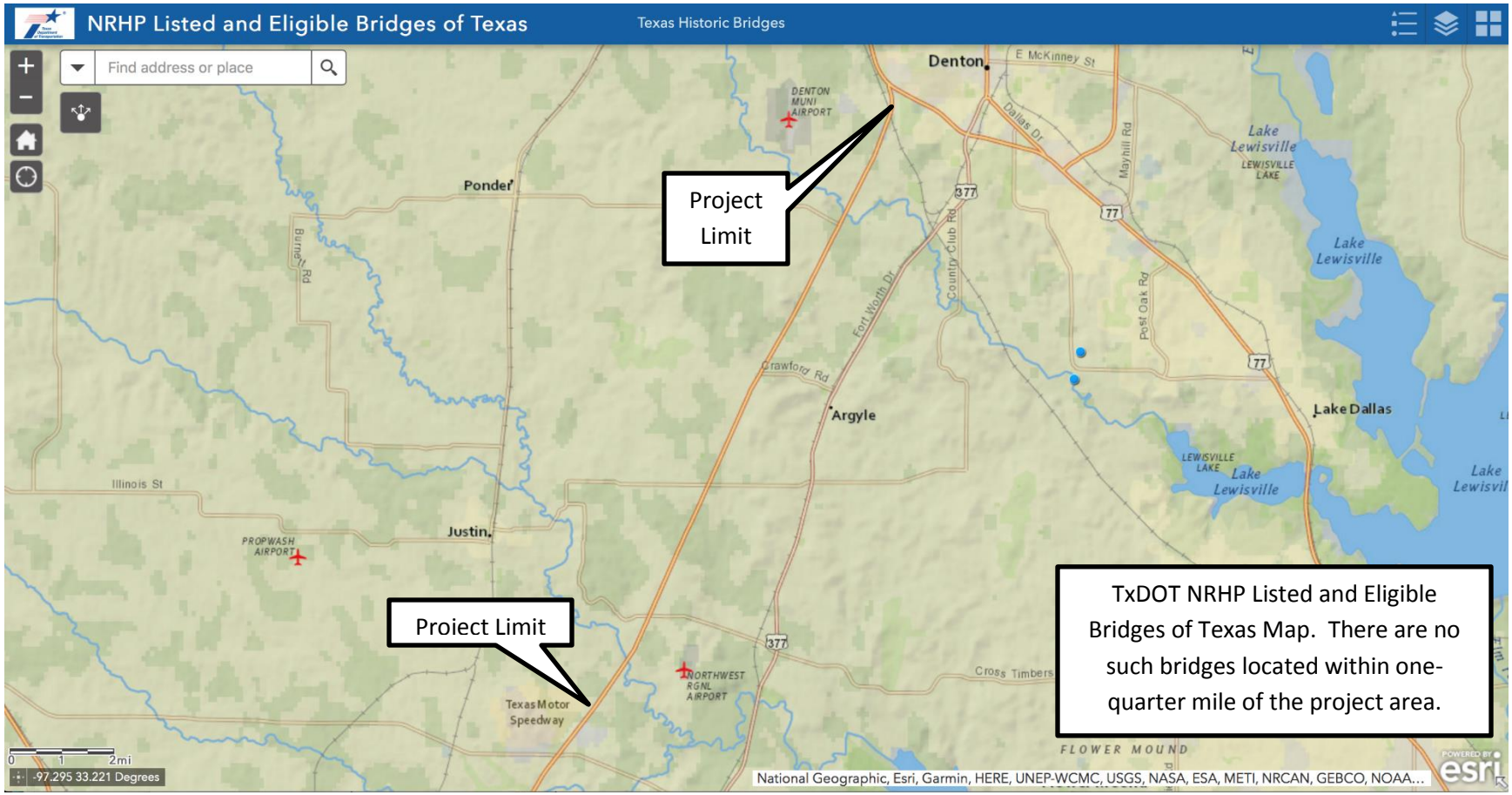
Near Prairie Mound Episcopal Church South. .5 miles north of FM 407, 4 miles SW of Argyle on Prairie Mound Cemetery Road by Prairie Mound Church.	



IH 35W Frontage Roads Project
From: Dale Earnhardt Way
To: South of the IH 35E/IH 35W Interchange
Denton County, Texas
CSJ: 0081-13-065



IH 35W Frontage Roads Project
From: Dale Earnhardt Way
To: South of the IH 35E/IH 35W Interchange
Denton County, Texas
CSJ: 0081-13-065

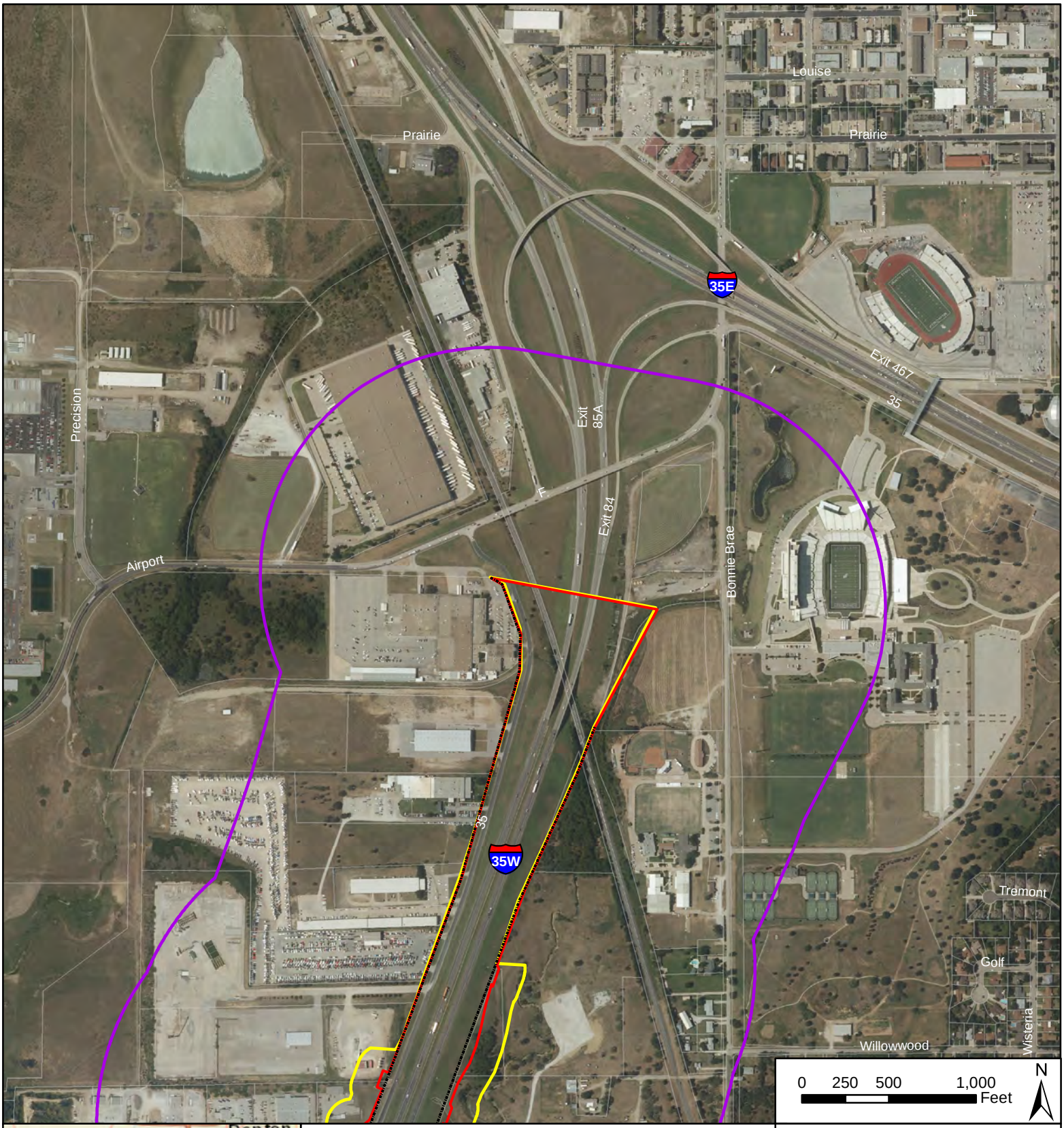


IH 35W Frontage Roads Project
From: Dale Earnhardt Way
To: South of the IH 35E/IH 35W Interchange
Denton County, Texas
CSJ: 0081-13-065

Appendix C

Historic-Age Resources Map

IH 35W Frontage Roads Project
From: Dale Earnhardt Way
To: South of the IH 35E/IH 35W
Interchange Denton County,
Texas CSJ: 0081-13-065



Legend

- Historical Markers
- Cemeteries
- Proposed APE
- 1300-ft Study Area
- Project Limits
- Existing ROW
- Parcels

IH35W Frontage Roads
Dale Earnhardt Way to south of the IH35E/IH35W Interchange
Denton County, Texas

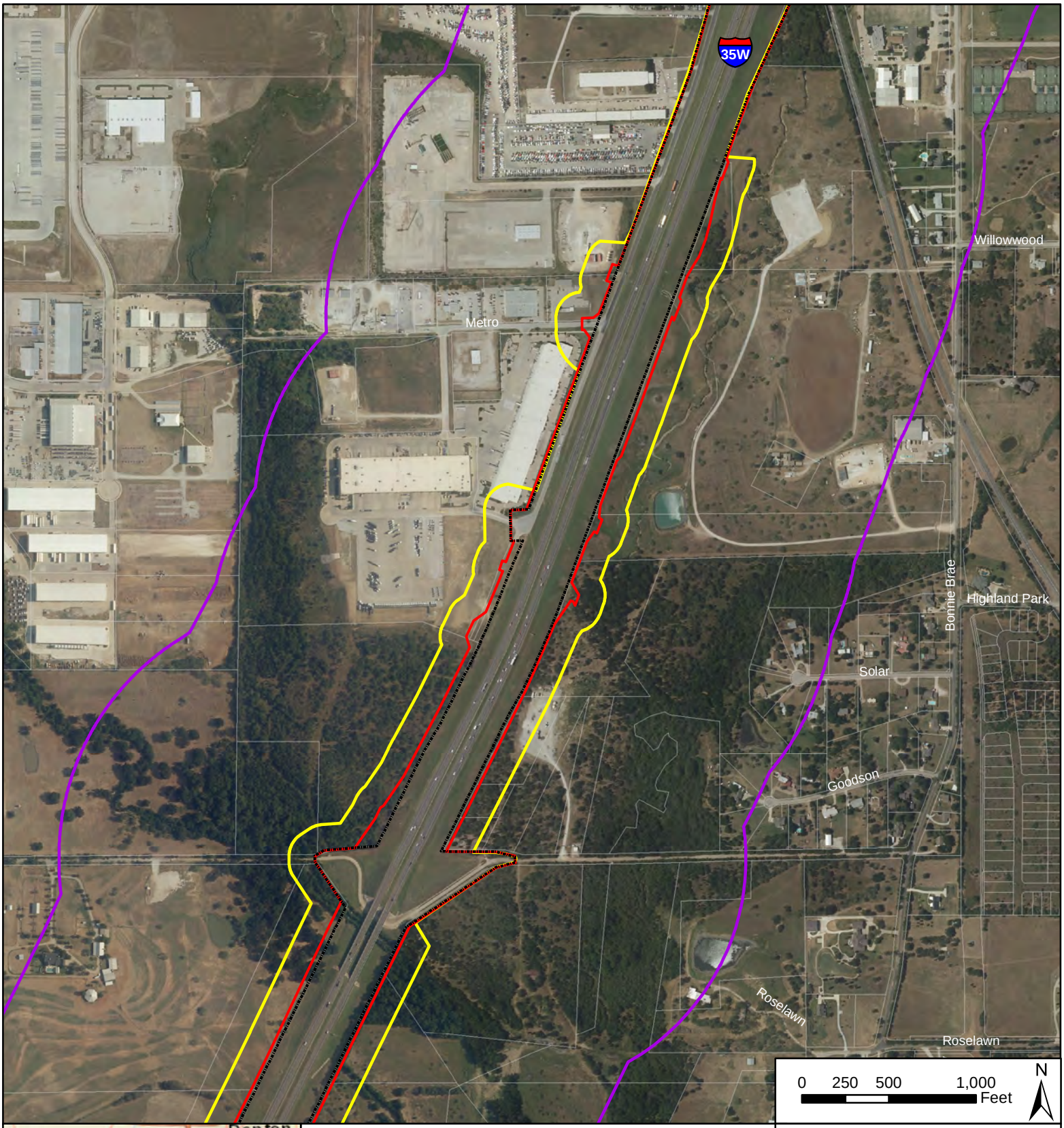
Exhibit 2:
Historic-Age Resources Map
Page 1 of 15

Texas Department of Transportation

TXDOT CSJ:
0081-13-065

Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, © OpenStreetMap contributors, and the GIS User

Source: Project Team (2019)



Legend

- Historical Markers
- Cemeteries
- Proposed APE
- 1300-ft Study Area
- Project Limits
- Existing ROW
- Parcels

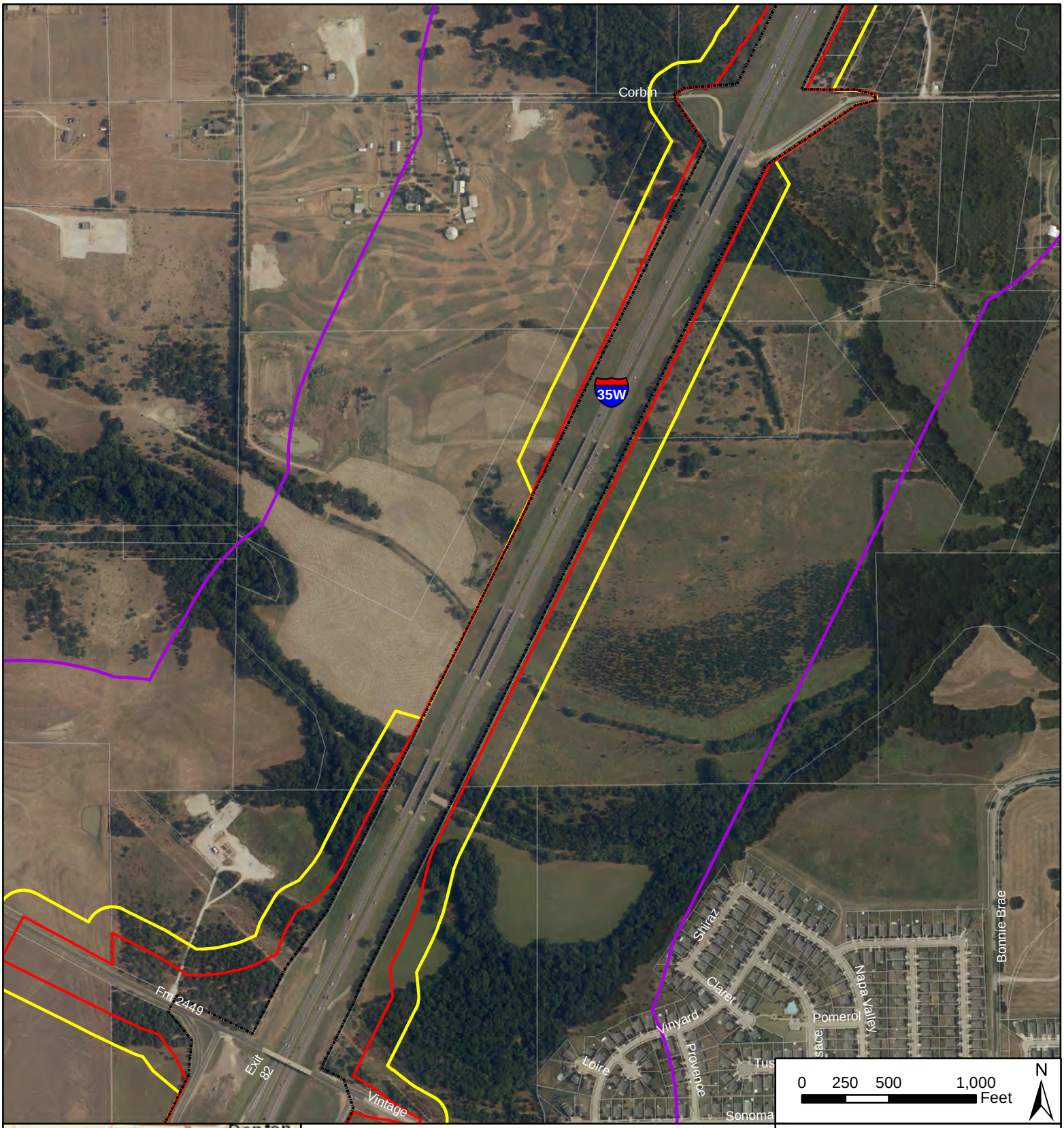
IH35W Frontage Roads
Dale Earnhardt Way to south of the IH35E/IH35W Interchange
Denton County, Texas

Exhibit 2:
Historic-Age Resources Map
Page 2 of 15

Texas Department of Transportation

TXDOT CSJ:
0081-13-065

Source: Project Team (2019)



Legend

- Historical Markers
- Cemeteries
- Proposed APE
- 1300-ft Study Area
- Project Limits
- Existing ROW
- Parcels

IH35W Frontage Roads
Dale Earnhardt Way to south of the IH35E/IH35W Interchange
Denton County, Texas

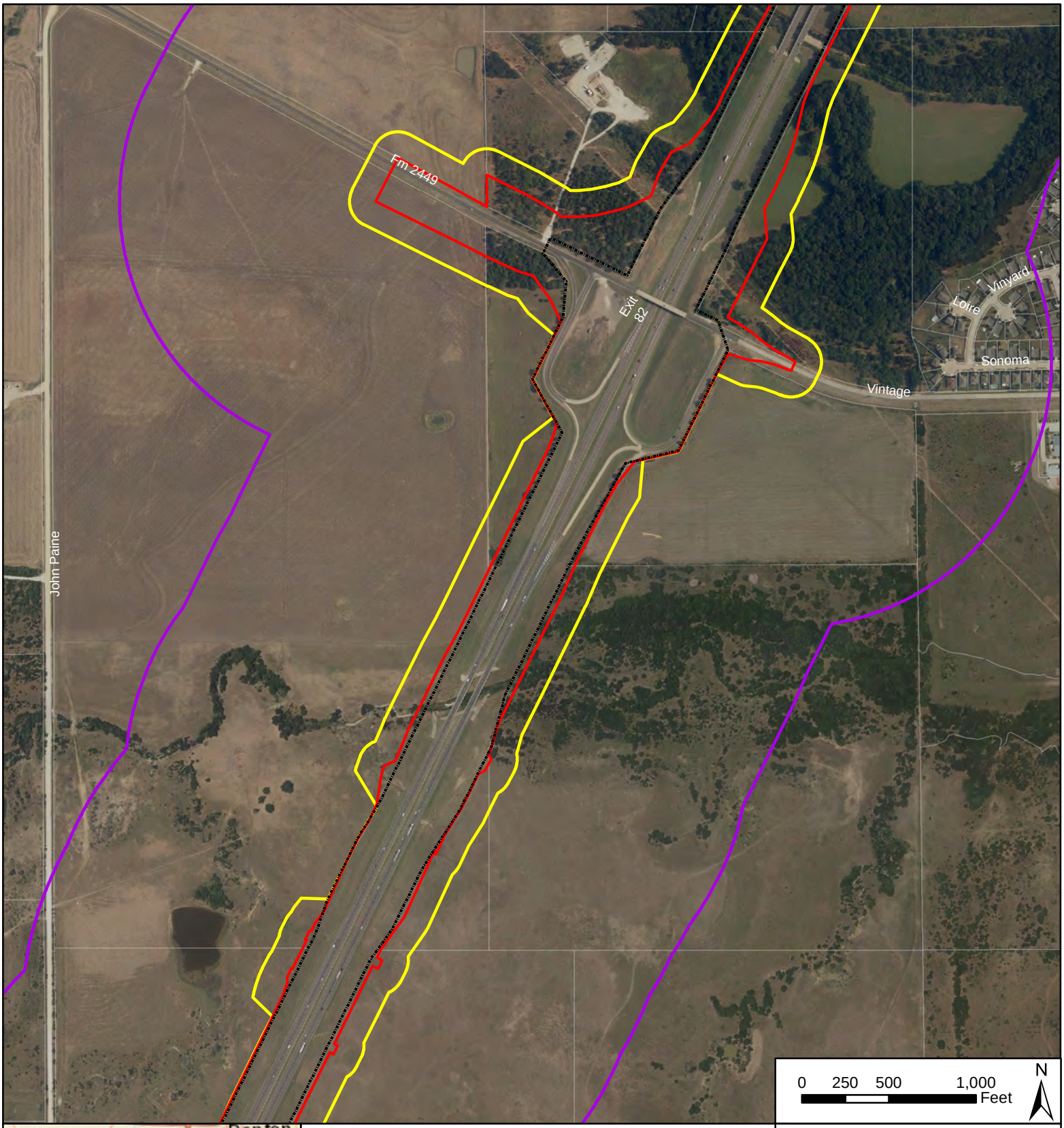
Exhibit 2:
Historic-Age Resources Map
Page 3 of 15

Texas Department of Transportation

TXDOT CSJ:
0081-13-065

Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, © OpenStreetMap contributors, and the GIS User

Source: Project Team (2019)



Legend

- Historical Markers
- Cemeteries
- Proposed APE
- 1300-ft Study Area
- Project Limits
- Existing ROW
- Parcels

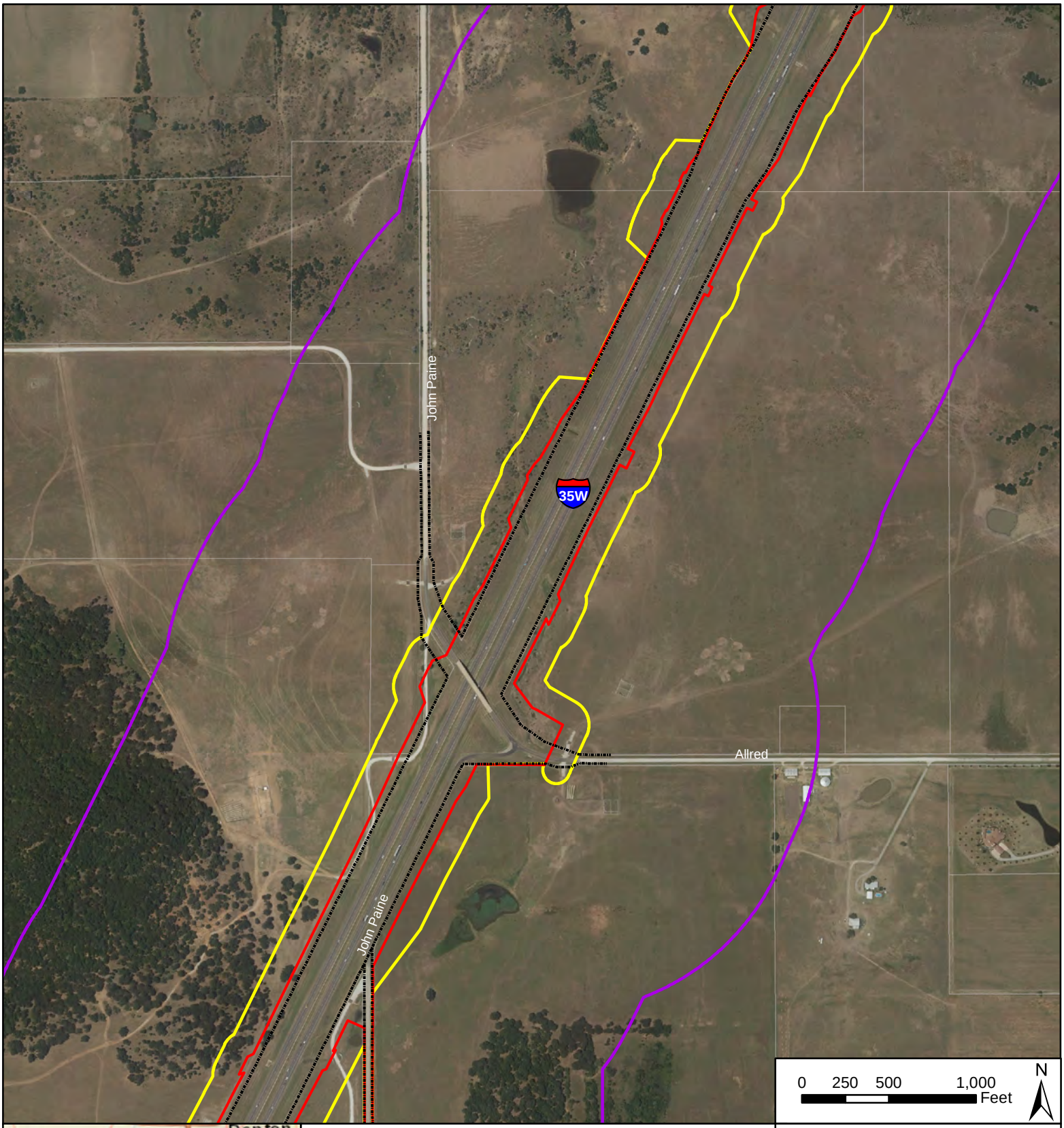
IH35W Frontage Roads
Dale Earnhardt Way to south of the IH35E/IH35W Interchange
Denton County, Texas

Exhibit 2:
Historic-Age Resources Map

Texas Department of Transportation

TXDOT CSJ:
0081-13-065

Source: Project Team (2019)



Legend

- Historical Markers
- Cemeteries
- Proposed APE
- 1300-ft Study Area
- Project Limits
- Existing ROW
- Parcels

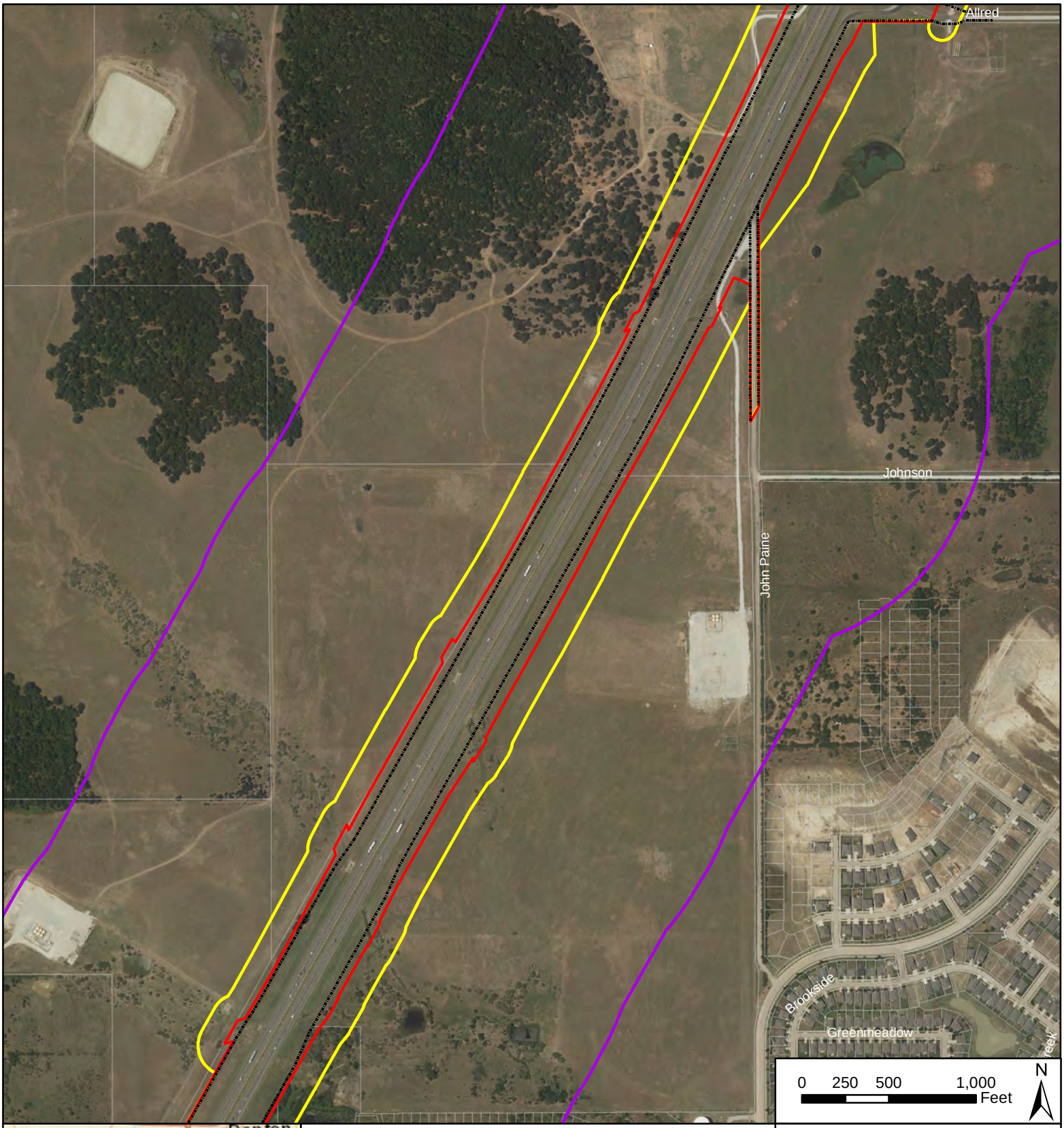
IH35W Frontage Roads
Dale Earnhardt Way to south of the IH35E/IH35W Interchange
Denton County, Texas

Exhibit 2:
Historic-Age Resources Map

Texas Department of Transportation

TXDOT CSJ:
0081-13-065

Source: Project Team (2019)



Legend

- Historical Markers
- Cemeteries
- Proposed APE
- 1300-ft Study Area
- Project Limits
- Existing ROW
- Parcels

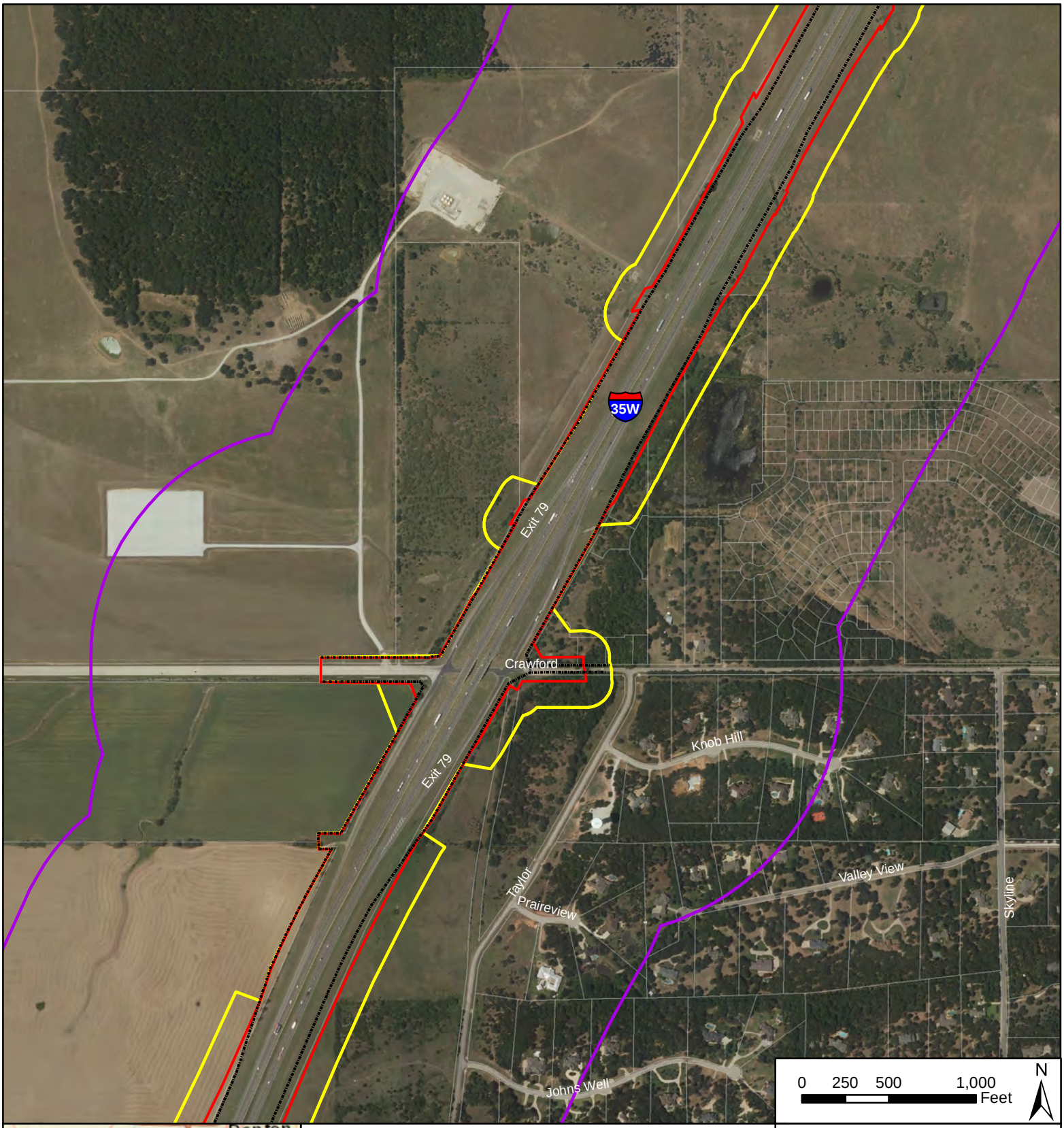
IH35W Frontage Roads
Dale Earnhardt Way to south of the IH35E/IH35W Interchange
Denton County, Texas

Exhibit 2:
Historic-Age Resources Map

Texas Department of Transportation

TXDOT CSJ:
0081-13-065

Source: Project Team (2019)



Legend

- Historical Markers
- Cemeteries
- Proposed APE
- 1300-ft Study Area
- Project Limits
- Existing ROW
- Parcels

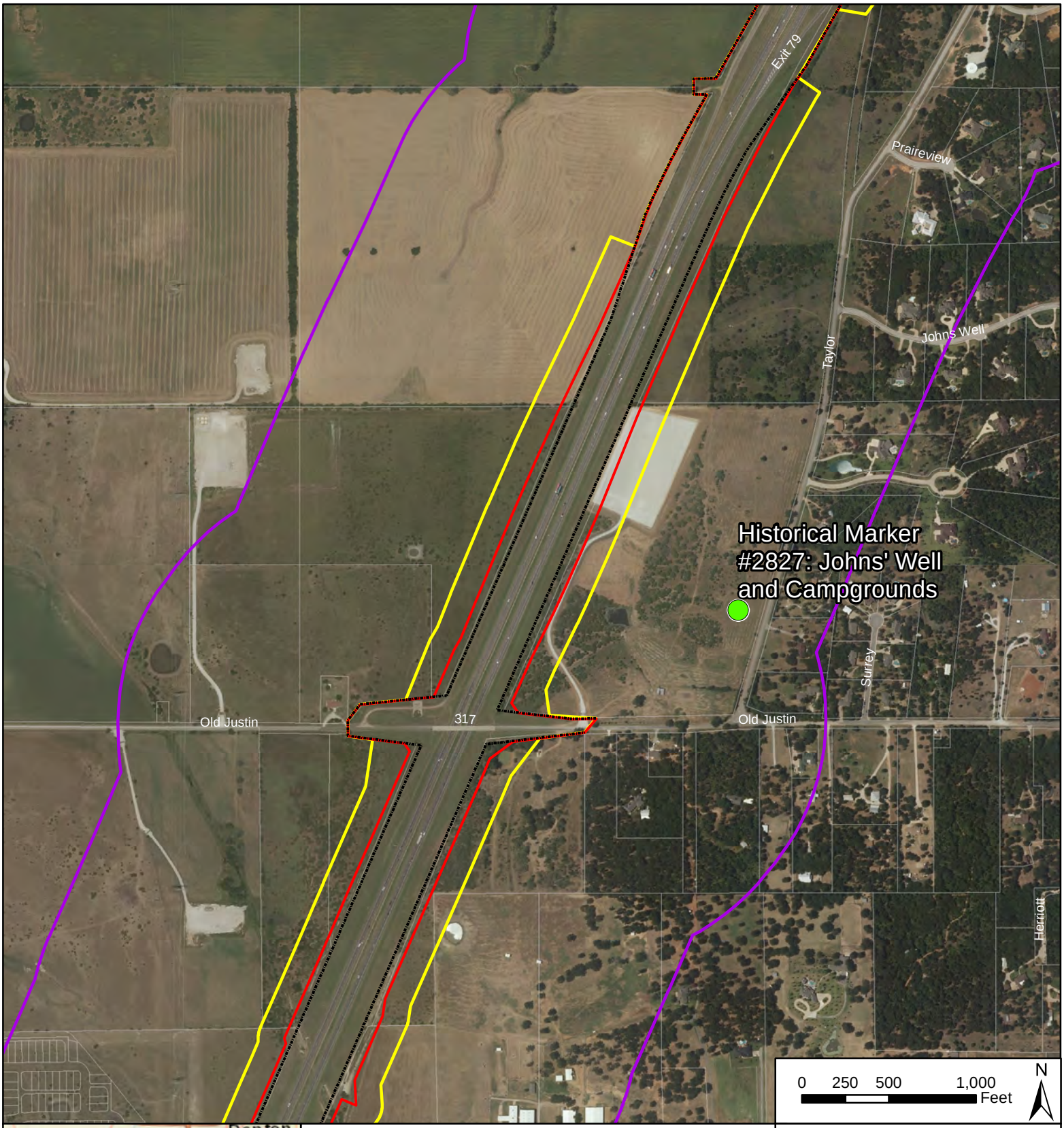
IH35W Frontage Roads
Dale Earnhardt Way to south of the IH35E/IH35W Interchange
Denton County, Texas

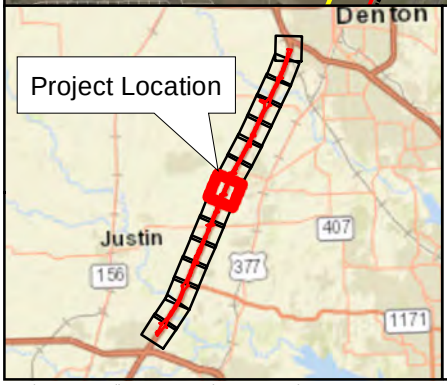
Exhibit 2:
Historic-Age Resources Map

Texas Department of Transportation

TXDOT CSJ:
0081-13-065

Source: Jacobs Project Team (2019)





Legend

- Historical Markers
- Project Limits
- Cemeteries
- Existing ROW
- Proposed APE
- Parcels
- 1300-ft Study Area

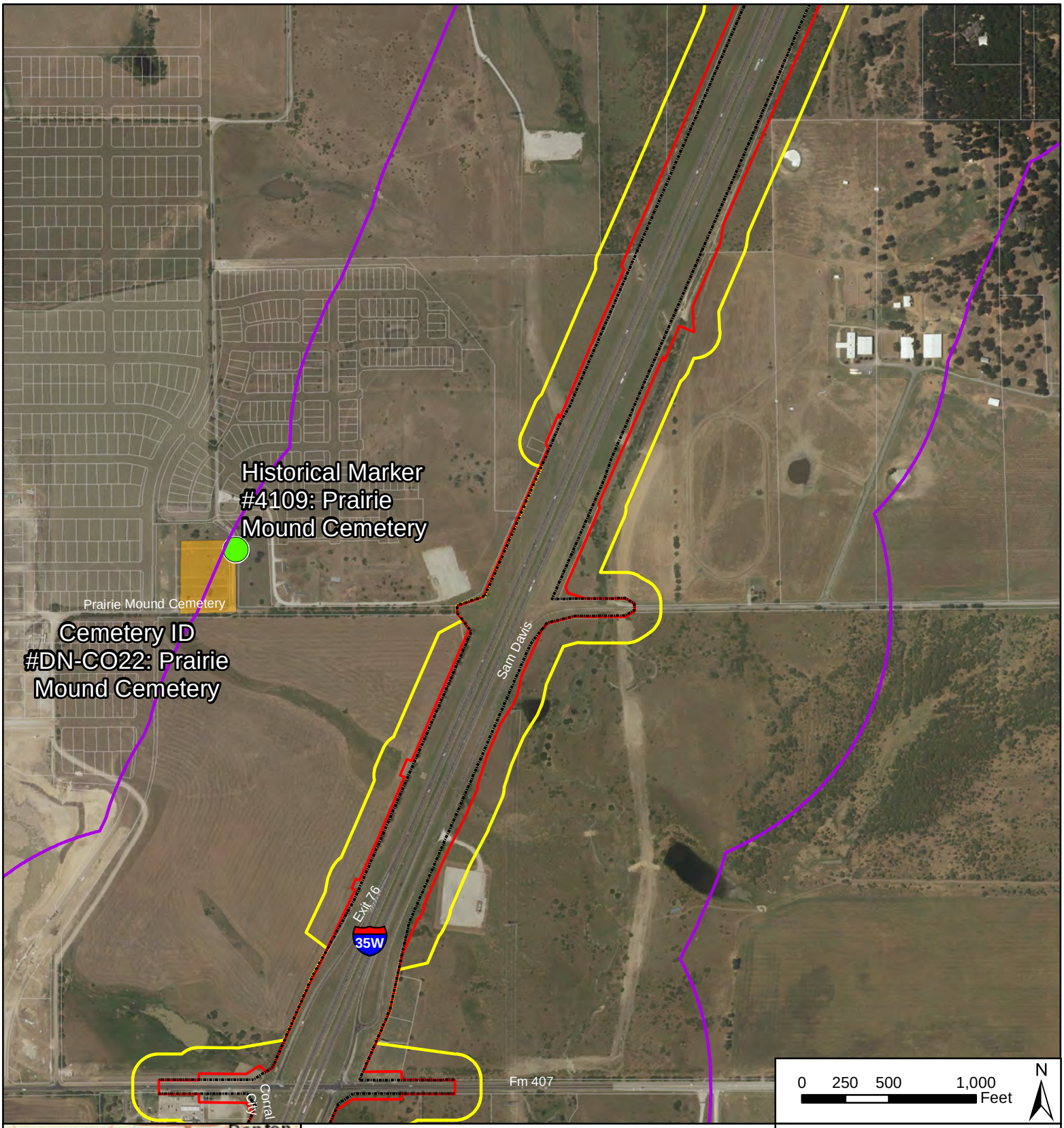
IH35W Frontage Roads
Dale Earnhardt Way to south of the IH35E/IH35W Interchange
Denton County, Texas

Exhibit 2:
Historic-Age Resources Map

Texas Department of Transportation

TXDOT CSJ:
0081-13-065

Source: Project Team (2019)



Legend

- Historical Markers
- Cemeteries
- Proposed APE
- 1300-ft Study Area
- Project Limits
- Existing ROW
- Parcels

IH35W Frontage Roads
Dale Earnhardt Way to south of the IH35E/IH35W Interchange
Denton County, Texas

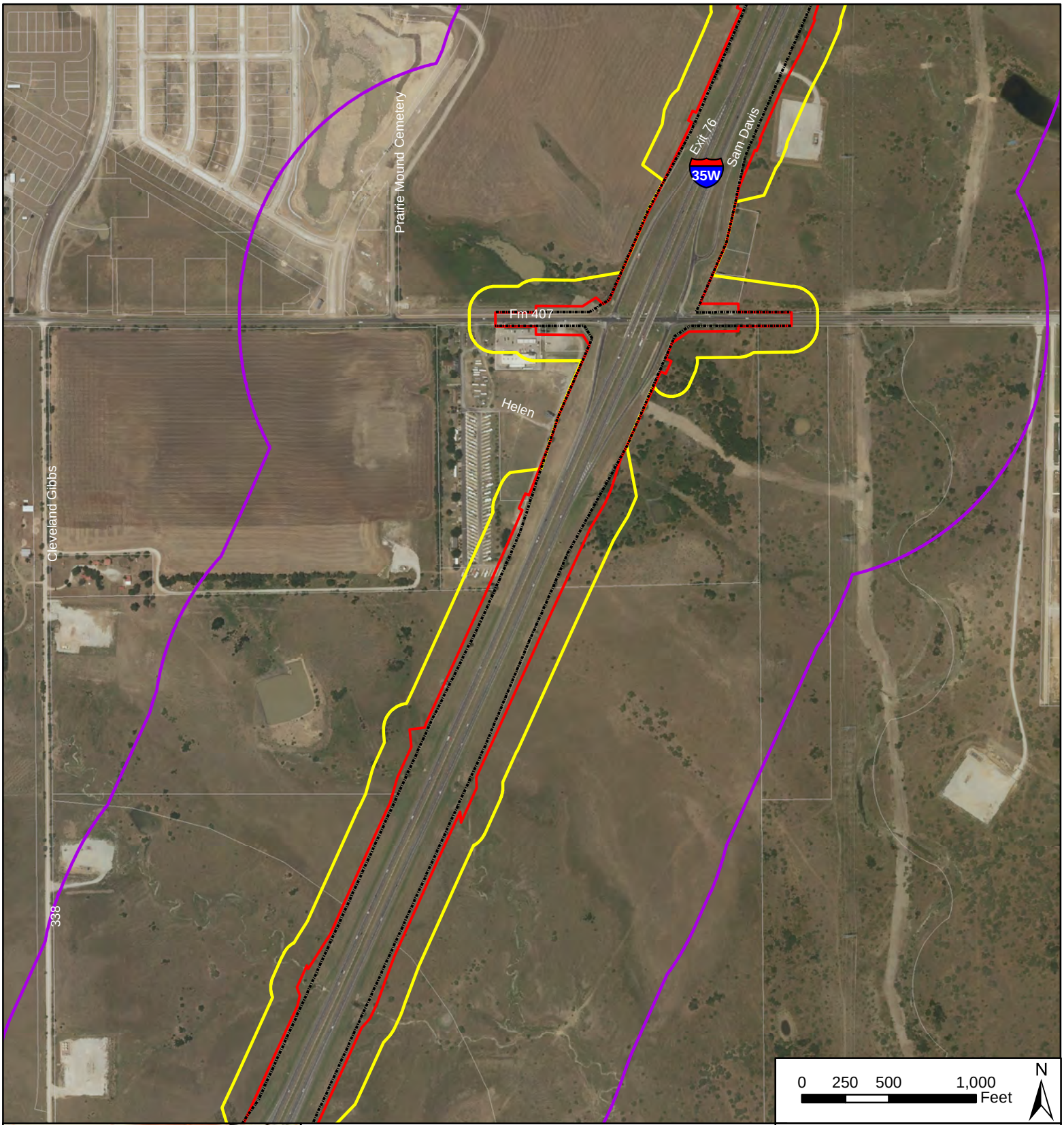
Exhibit 2:
Historic-Age Resources Map
Page 9 of 15

Texas Department of Transportation

TXDOT CSJ: 0081-13-065

Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, © OpenStreetMap contributors, and the GIS User

Source: Project Team (2019)



Legend

- Historical Markers
- Cemeteries
- Proposed APE
- 1300-ft Study Area
- Project Limits
- Existing ROW
- Parcels

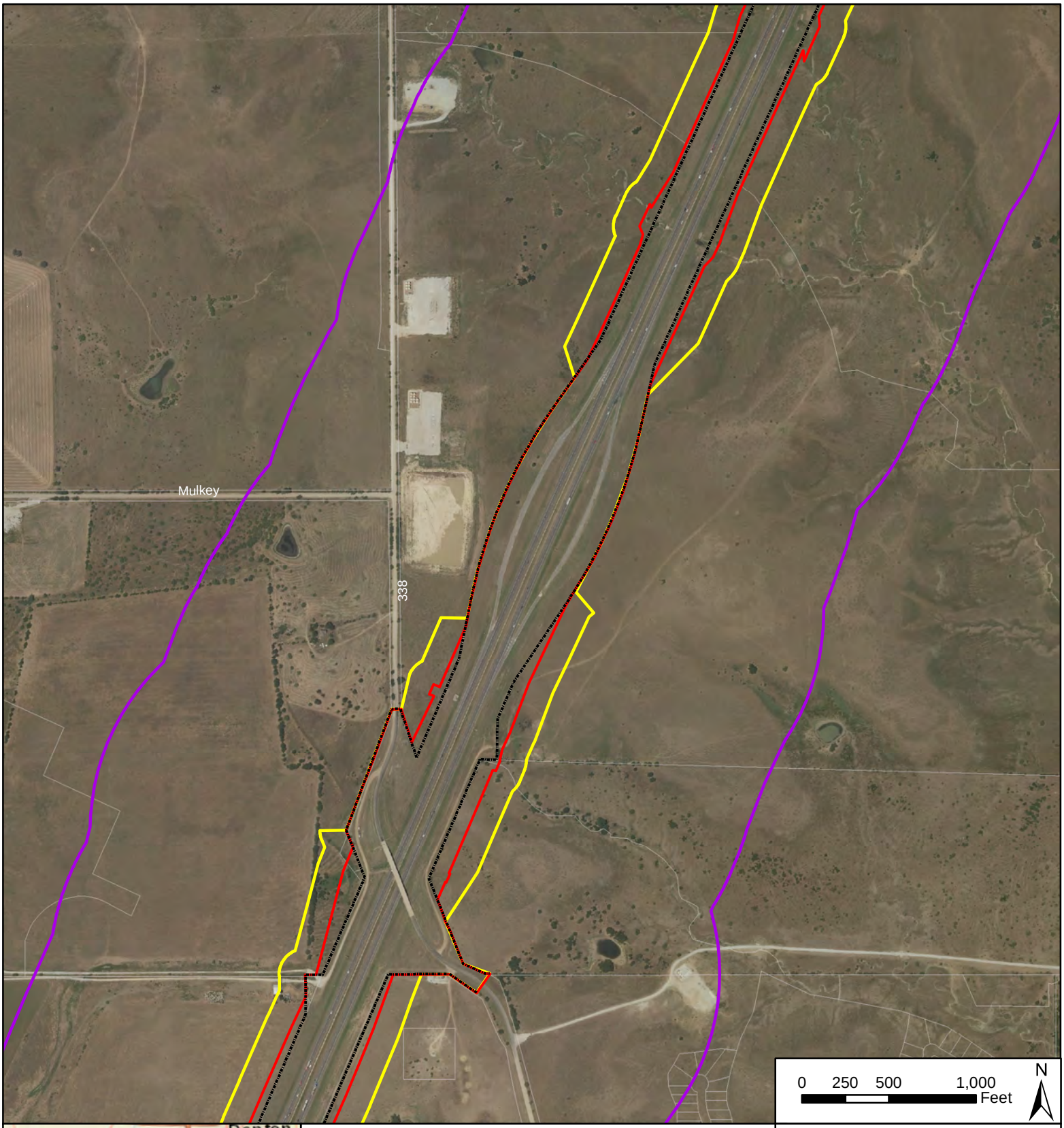
IH35W Frontage Roads
Dale Earnhardt Way to south of the IH35E/IH35W Interchange
Denton County, Texas

Exhibit 2:
Historic-Age Resources Map

Texas Department of Transportation

TXDOT CSJ:
0081-13-065

Source: Project Team (2019)



0 250 500 1,000 Feet

N

Legend

- Historical Markers
- Cemeteries
- Proposed APE
- 1300-ft Study Area
- Project Limits
- Existing ROW
- Parcels

IH35W Frontage Roads
Dale Earnhardt Way to south of the IH35E/IH35W Interchange
Denton County, Texas

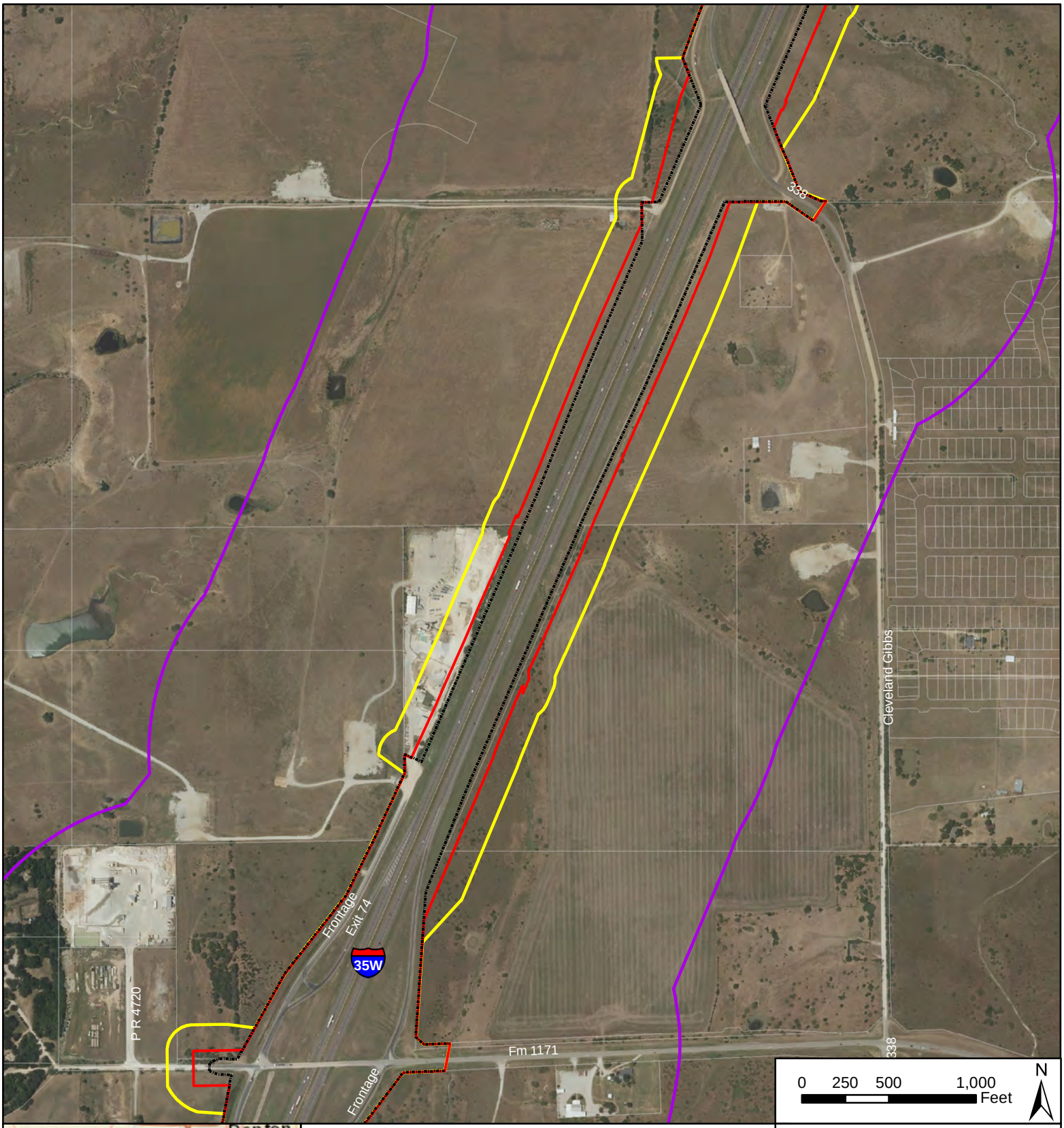
Exhibit 2:
Historic-Age Resources Map
Page 11 of 15

Texas Department of Transportation

TXDOT CSJ:
0081-13-065

Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, © OpenStreetMap contributors, and the GIS User

Source: Project Team (2019)



Legend

- Historical Markers
- Cemeteries
- Proposed APE
- 1300-ft Study Area
- Project Limits
- Existing ROW
- Parcels

IH35W Frontage Roads
Dale Earnhardt Way to south of the IH35E/IH35W Interchange
Denton County, Texas

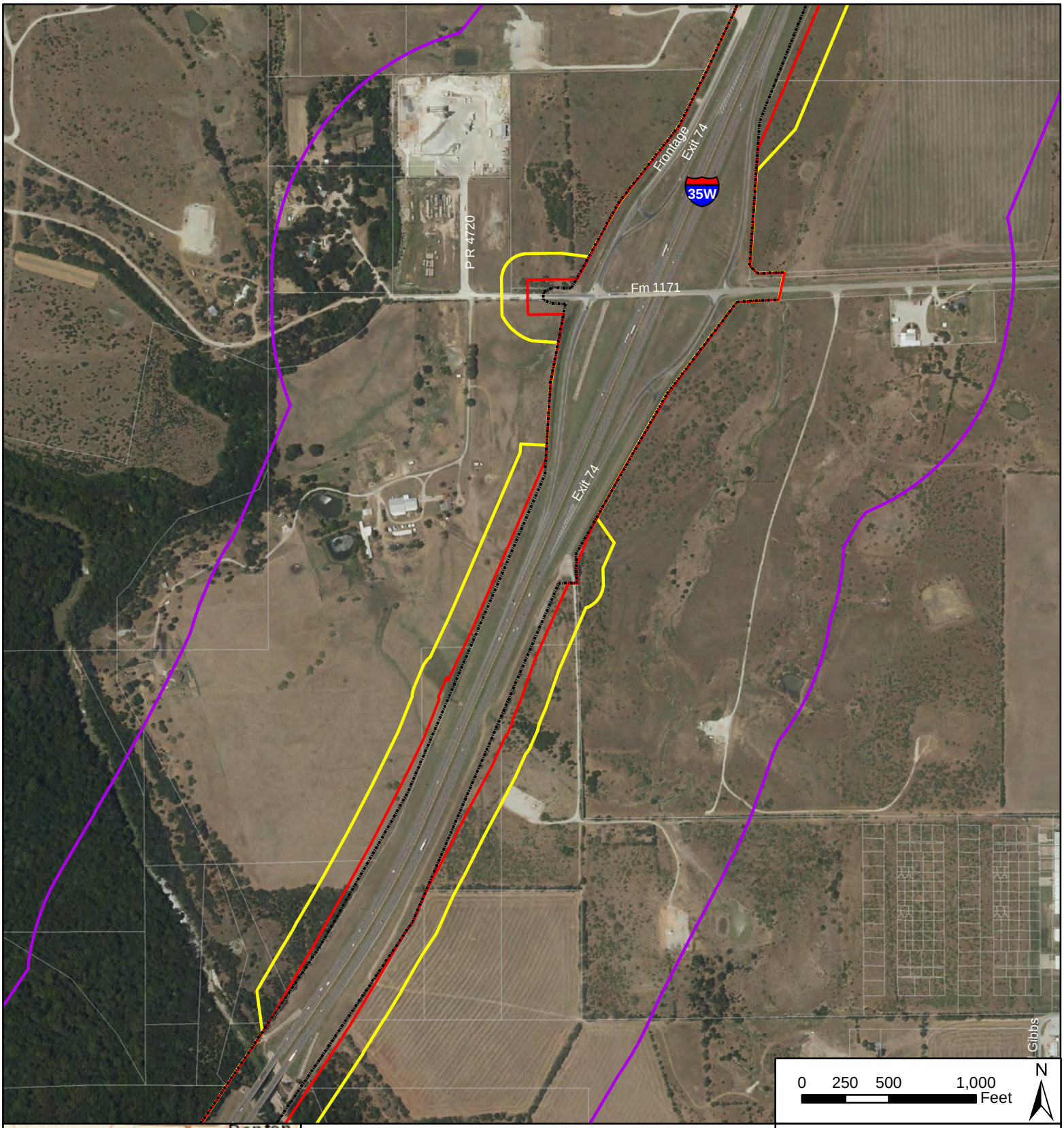
Exhibit 2:
Historic-Age Resources Map
Page 12 of 15

Texas Department of Transportation

TXDOT CSJ:
0081-13-065

Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, © OpenStreetMap contributors, and the GIS User

Source: Project Team (2019)



Legend

- Historical Markers
- Cemeteries
- Proposed APE
- 1300-ft Study Area
- Project Limits
- Existing ROW
- Parcels

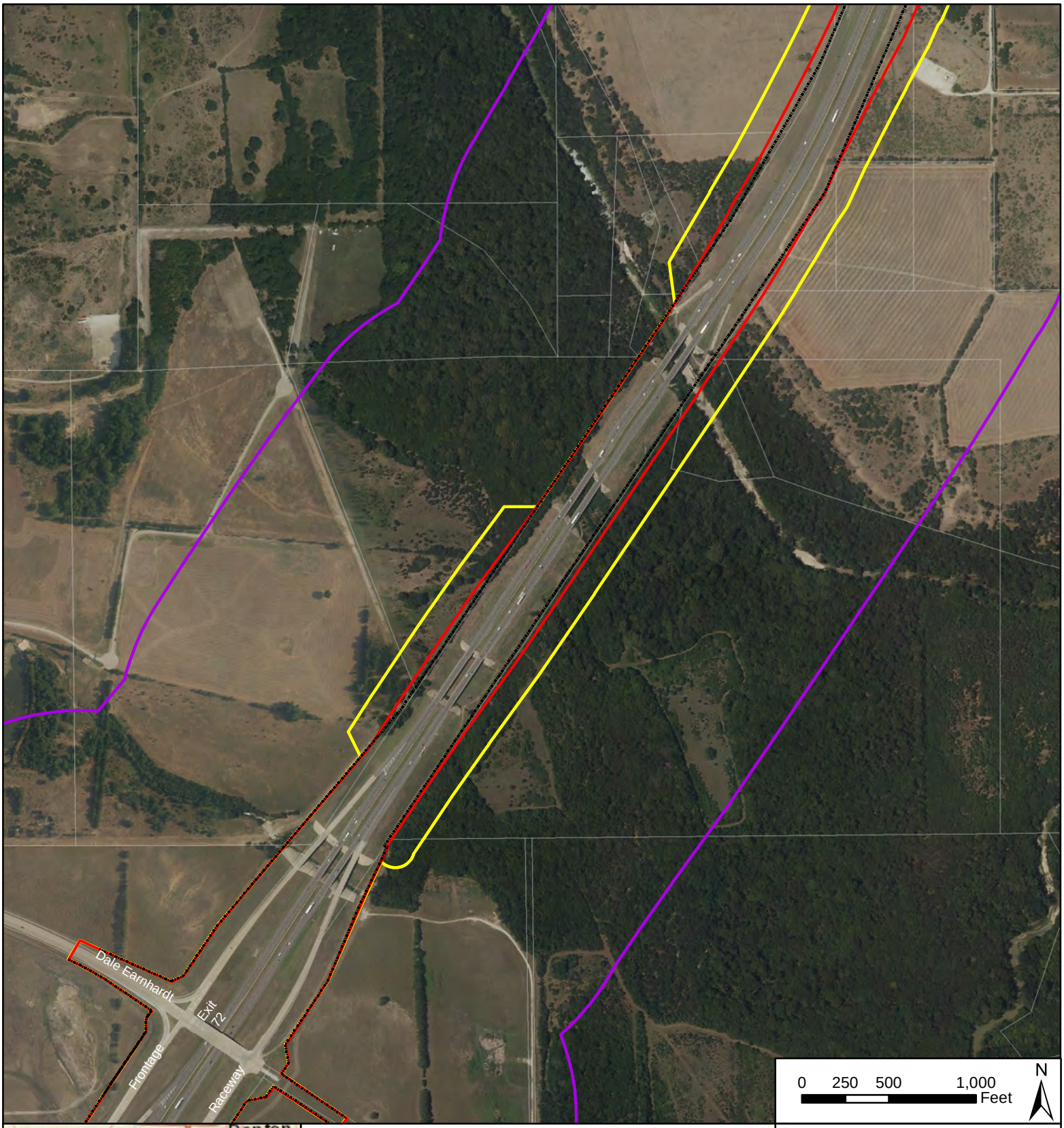
IH35W Frontage Roads
Dale Earnhardt Way to south of the IH35E/IH35W Interchange
Denton County, Texas

Exhibit 2:
Historic-Age Resources Map

Texas Department of Transportation

TXDOT CSJ:
0081-13-065

Source: Project Team (2019)



Legend

- Historical Markers
- Cemeteries
- Proposed APE
- 1300-ft Study Area
- Project Limits
- Existing ROW
- Parcels

IH35W Frontage Roads
Dale Earnhardt Way to south of the IH35E/IH35W Interchange
Denton County, Texas

Exhibit 2:
Historic-Age Resources Map

Texas Department of Transportation

TXDOT CSJ:
0081-13-065

Source: Project Team (2019)

Legend

- Historical Markers
- Cemeteries
- Proposed APE
- 1300-ft Study Area
- Project Limits
- Existing ROW
- Parcels

IH35W Frontage Roads
Dale Earnhardt Way to south of the IH35E/IH35W Interchange
Denton County, Texas

Exhibit 2:
Historic-Age Resources Map
Page 15 of 15

Texas Department of Transportation

TXDOT CSJ:
0081-13-065

Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, © OpenStreetMap contributors, and the GIS User

Source: Project Team (2019)

Indirect and Cumulative Impacts Analysis

Interstate Highway 35 West (IH 35W) Frontage Roads

From: Dale Earnhardt Way
To: South of the IH 35E/IH35W Interchange

Denton County, Texas

Control-Section-Job (CSJ): 0081-13-065

Date: December 2019

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

THIS PAGE INTENTIONALLY LEFT BLANK

Table of Contents

Tables

Appendix

I. INTRODUCTION

The Texas Department of Transportation (TxDOT) is proposing improvements to Interstate Highway 35 West (IH 35W) from Dale Earnhardt Way in the City of Fort Worth to south of the IH 35E/IH35W interchange in the City of Denton, Denton County, Texas; a distance of approximately 12.3 miles. The proposed project consists of the construction of continuous, one-way, two-lane urban, northbound and southbound frontage roads, along IH 35W. Other improvements would include changing the IH 35W ramp configuration from a conventional diamond to a reverse diamond (X ramp); flipping the Farm-to-Market (FM) 1171 (Cross Timbers Road), Old Justin Road, and John Paine Road/Allred Road interchanges so that the IH 35W mainlanes cross over these streets; constructing an interchange for the future Denton Creek Road, and expanding the Cleveland Gibbs Road, FM 407, Robson Ranch Road/Crawford Road, and proposed Loop 288/Vintage Road interchanges. The proposed project would require approximately 95.43 acres of additional right-of-way (ROW). See **Appendix: Project Location Map, USGS Topographic Map,** and **Aerial Map**.

A. Need and Purpose

The proposed project is needed to address transportation issues associated with travel safety, population and employment growth, and access to development in the project corridor. The purpose of the project is to improve safety and provide access to adjacent land uses.

B. Existing Facility

Mainlanes

The mainlanes consist of two 12-foot wide general-purpose lanes in each direction with 4-foot to 6-foot wide inside shoulders and 9-foot to 12-foot wide outside shoulders separated by a 35 to 40-foot wide median.

Frontage Roads

At the north end of the project, the existing IH 35W contains an approximate 0.5-mile long, discontinuous, two-way, southbound frontage road consisting of two 12-foot wide lanes with a 10-foot wide outside shoulder and a 4-foot wide inside shoulder. The frontage road provides no access to IH 35W.

Entrance/ Exit Ramps

The existing northbound and southbound entrance and exit ramps consist of one 14-foot wide lane with 2-foot wide inside shoulders and 10-foot wide outside shoulders. All of the existing ramp configurations at interchanges are of a conventional diamond design.

Interchanges

The existing Dale Earnhardt Way at IH 35W consists of two 12-foot wide eastbound and westbound travel lanes separated by 14-foot wide two-way left-turn lane, and 10-foot wide outside shoulders. Dale Earnhardt Way crosses over the IH 35W mainlanes.

The existing FM 1171 (Cross Timbers Road) at IH 35W consists of one 12-foot wide travel lane in each direction. FM 1171 (Cross Timbers Road) crosses over the IH 35W mainlanes.

The existing Cleveland Gibbs Road at IH 35W consists of one 12-foot wide travel lane in each direction. Cleveland Gibbs Road crosses over the IH 35W mainlanes.

The existing FM 407 at IH 35W consists of one 12-foot wide travel lane in each direction separated by 14-foot wide two-way left-turn lane. FM 407 crosses under the IH 35W mainlanes.

The existing Old Justin Road at IH 35W consists of one 12-foot wide travel lane in each direction. Old Justin Road crosses over the IH 35W mainlanes. There is no access to IH 35W from Old Justin Road.

The existing Robson Ranch Road west of IH 35W consists of one eastbound 12-foot wide travel lane, one eastbound 12-foot wide dedicated right-turn lane, and two westbound 12-foot wide travel lanes. The existing Crawford Road at IH 35W consists of one eastbound 12-foot wide travel lane and one westbound 12-foot wide travel lane. The IH 35W mainlanes cross over Robson Ranch Road/Crawford Road.

The existing John Paine/Allred Road at IH 35W consists of one eastbound 12-foot wide travel lane and one westbound 12-foot wide travel lane. John Paine/Allred Road crosses over the IH 35W mainlanes. There is no access to IH 35W from John Paine/Allred Road.

The existing FM 2449/Vintage Road at IH 35W consists of one eastbound 12-foot wide travel lane and one westbound 12-foot wide travel lane. The FM 2449/Vintage Road crosses over the IH 35W mainlanes.

C. Proposed Facility

Mainlanes

The proposed project includes replacement of the existing IH 35W cross-street overpasses with new overpasses at IH 35W/Cross Timbers Road, IH 35W/FM 407, IH 35W/Old Justin Road, IH 35W/Robson Ranch Road/Crawford Road, and IH 35W/John Paine Road/Allred Road. The width of the bridge structures is based on the ultimate IH 35W mainlanes. Constructing the ultimate bridge structures along with changing the IH 35W ramp configuration from a conventional diamond to a reverse diamond (X ramp), requires portions of the ultimate IH 35W mainlanes to be constructed with transition pavement sections to tie back to the existing. The proposed mainlanes at the interchanges would consist of three

12-foot wide lanes in each direction with 10-foot wide inside shoulders and 12-foot wide outside shoulders.

Frontage Roads

The proposed northbound and southbound frontage roads would consist of one 12-foot wide inside travel lane, one 14-foot wide outside shared use lane with 2-foot wide curb offsets, and a 6-foot wide sidewalk in each direction.

The proposed northbound and southbound frontage road bridges would consist of one 12-foot wide inside travel lane, one 14-foot wide outside shared use lane with two-foot wide inside and outside shoulders, and an 8-foot wide sidewalk in each direction.

Entrance/ Exit Ramps

The proposed northbound and southbound entrance and exit ramps would consist of one 14-foot wide lane with 4-foot wide inside shoulders and 8-foot wide outside shoulders. All of the proposed ramp configurations at interchanges would be of a reverse diamond (X ramp) design.

Interchanges

The proposed Dale Earnhardt Way at IH 35W would consist of one inside 12-foot wide travel lane, one 14-foot wide outside shared use lane with a 2-foot wide curb offset, a 10-foot wide outside median, and a 20-foot wide U-turn lane with 2-foot wide inside and outside curb offsets in each direction. The eastbound and westbound roadways would be separated by a 14-foot wide two-way left-turn lane.

The proposed FM 1171 (Cross Timbers Road) at IH 35W would consist of one inside 12-foot wide dedicated left-turn lane with a 2-foot wide inside curb offset, two 12-foot wide travel lanes, one 14-foot wide outside shared use lane with a 2-foot wide outside curb offset, an 18-foot wide outside median, and a 20-foot wide U-turn lane with 2-foot wide inside and outside curb offsets in each direction. FM 1171 (Cross Timbers Road) would be flipped so that the IH 35W mainlanes cross over FM 1171 (Cross Timbers Road).

The proposed eastbound Cleveland Gibbs Road at IH 35W would consist of one inside 12-foot wide dedicated left-turn lane with a 2-foot wide inside curb offset, one 12-foot wide travel lane, and one outside 14-foot wide shared use lane. The westbound roadway would consist of one inside 12-foot wide dedicated left-turn lane with a 2-foot wide inside curb offset, one 12-foot wide travel lane, one 14-foot wide outside shared use lane with a 2-foot wide outside curb offset, an 18-foot wide outside median, and a 20-foot wide U-turn lane with 2-foot wide inside and outside curb offsets. The interchange would be relocated approximately 400 feet north of its existing location and would tie into a future Cleveland Gibbs Road designed and constructed by others.

The proposed eastbound Denton Creek Road at IH 35W is a new interchange and would consist of one inside 12-foot wide dedicated left-turn lane with a 2-foot wide inside curb offset, one 12-foot wide travel lane, one 14-foot wide outside shared use lane with a 2-foot wide outside curb offset, an 18-foot wide outside median, and a 20-foot wide U-turn lane with 2-foot wide inside and outside curb offsets. The westbound roadway would consist of one inside 12-foot wide dedicated left-turn lane with a 2-foot wide inside curb offset, one 12-foot wide travel lane, and one outside 14-foot wide shared use lane. The new interchange would tie into a future Denton Creek Road designed and constructed by others.

The proposed FM 407 at IH 35W would consist of one inside 12-foot wide dedicated left-turn lane with a 2-foot wide inside curb offset, two 12-foot wide travel lanes, one 14-foot wide outside shared use lane with a 2-foot wide outside curb offset, an 18-foot wide outside median, and a 20-foot wide U-turn lane with 2-foot wide inside and outside curb offsets in each direction.

The proposed Old Justin Road at IH 35W interchange would consist of one inside 12-foot wide dedicated left-turn lane with a 2-foot wide inside curb offset, one 12-foot wide travel lane, one 14-foot wide outside shared use lane with a 2-foot wide outside curb offset, an 18-foot wide outside median, and a 20-foot wide U-turn lane with 2-foot wide inside and outside curb offsets in each direction. Old Justin Road would be flipped so that the IH 35W mainlanes cross over Old Justin Road and access from Justin Road to IH 35W would be provided via ramps.

The proposed Robson Ranch Road/Crawford Road at the IH 35W interchange would consist of one inside 12-foot wide dedicated left-turn lane with a 2-foot wide inside curb offset, one 12-foot wide travel lane, one 14-foot wide outside shared use lane with a 2-foot wide outside curb offset, an 18-foot wide outside median, and a 20-foot wide U-turn lane with 2-foot wide inside and outside curb offsets in each direction.

The proposed Loop 288/Vintage Road (FM 2499) at the IH 35W interchange would consist of one inside 12-foot wide dedicated left-turn lane with a 2-foot wide inside curb offset, one 12-foot wide travel lane, one 14-foot wide outside shared use lane with a 2-foot wide outside curb offset, an 18-foot wide outside median, and a 20-foot wide U-turn lane with 2-foot wide inside and outside curb offsets in each direction.

II. INDIRECT IMPACTS

The Council on Environmental Quality (CEQ) defines indirect effects as those caused by the action and occur later in time or farther removed in distance than direct effects but are still reasonably foreseeable. Indirect impacts may include growth inducing effects and other effects related to induced changes in the pattern of land use, population density or growth rate, and related effects on air and water and other natural systems, including ecosystems (40 Code of Federal Regulations [CFR] Section 1508.8). Indirect effects differ from the direct impacts associated with the construction and operation of the Build Alternative and are

caused by another action or actions that have an established relationship or connection to the Build Alternative. These induced actions are those that would not or could not occur without the implementation of the Build Alternative.

The encroachment-alteration component of indirect impacts is discussed in tandem with direct impacts that were addressed in the resource specific technical reports. These technical reports are available for review at the TxDOT Dallas District office.

The analysis of indirect impacts discussed in this document follows the six-step process outlined in TxDOT's Indirect Impacts Analysis Guidance (January 2019). The six steps in the TxDOT Indirect Impacts Analysis Guidance consist of the following:

1. Define the Methodology
2. Define the Area of Influence (AOI) and Study Timeframe
3. Identify Areas Subject to Induced Growth in the AOI
4. Determine if Growth is Likely to Occur in the Induced Growth Areas
5. Identify Resources Subject to Induced Growth Impacts
6. Identify Mitigation if Applicable

Step 1: Define the Methodology

The potential for induced growth impacts was determined using a planning judgment approach consisting of interviews with the planning departments of the City of Denton and Towns of Argyle, Flower Mound, and Northlake.

Cartographic techniques using map overlays of environmental constraints such as cemeteries, floodplains, and parks were used to identify areas where potential induced growth would not likely occur.

Step 2: Define the Area of Influence and Study Timeframe

The basic objective in creating an indirect impacts AOI is to delineate a study area in which project-related indirect induced growth may occur. According to TxDOT's Indirect Impacts Analysis Guidance, there are four preferred methods for determining the AOI:

1. Adopting political/geographic boundaries;
2. Using the project's commute-shed;
3. Using the location of next major parallel roadway; and/or
4. Incorporating data from stakeholder interviews or public involvement.

The AOI for the proposed project was established with a methodology of using the location of next major parallel roadways. The proposed project's AOI was established using US 377 and FM 156 as eastern and western borders, with SH 114 and US 380 as southern and northern borders to encompass the proposed project limits. Then, meetings and communication were

initiated with the City of Denton and Towns of Argyle, Draper, Flower Mound, and Northlake to discuss the AOI and locations of potential induced growth.

The Planning Departments of the City of Denton, and Towns of Argyle, Draper, Flower Mound and Northlake agreed that the AOI would encompass any induced growth effects associated with the proposed project. The AOI encompasses approximately 58,887.6 acres and can be viewed on the **Indirect Impacts Area of Influence Map**.

The area within the AOI encompasses the entire Build Alternative and adjacent areas where development or accelerated rates of development could potentially occur. Extending the AOI out farther would encompass areas unlikely to be affected by the proposed project.

A small portion of the City of Fort Worth is near the project location; however, it is occupied by the Texas Motor Speedway and a few vacant tracts of land adjacent to SH 114 and FM 156. Furthermore, this portion of IH 35W already has frontage roads so the area would not be impacted by changes within the project limits. Consequently, there would be no induced growth within the City of Fort Worth as a result of the proposed project. Based on the absence of potential induced growth, the City of Fort Worth is eliminated from further induced growth discussions.

Temporal boundaries for the indirect effect analysis extend from construction of the Build Alternative (2028) until 2045, the end of the proposed Metropolitan Transportation Plan (MTP) planning cycle.

Step 3: Identify Areas Subject to Induced Growth in the AOI

Cartographic techniques using overlays showing potential constraints such as cemeteries, existing development, floodplains, surface wells, parks, and water bodies were used to identify which areas within the AOI would be most likely to experience induced growth. Utilities are available to the entire AOI. A discussion of the land uses within the AOI and whether they would be subject to induced growth is as follows:

Areas Without Potential for Induced Growth

The following land uses within the AOI and outside of the proposed project footprint would generally not experience induced growth within the City of Denton and Towns of Argyle, Draper, Flower Mound, and Northlake, and unincorporated areas of Denton County. All areas without potential for induced growth (excluding existing development) are shown on the **Indirect Impacts Area of Influence Map.**

Floodplain

A portion of the AOI contains Denton Creek, Hickory Creek and their associated tributaries and floodplains. The floodplain areas total approximately 11,298.7 acres and depending on specific site conditions, would generally not experience induced growth. These floodplain areas (100-year flood zones) are shown on the **Indirect Impacts Area of Influence Map**. Federal Emergency Management Agency (FEMA) National Flood Hazard Layer (NFHL) geographic information system (GIS) data was utilized to identify 100-year flood zones within the AOI.[1] This constraint is unlikely to undergo induced growth due to regulatory protections.

Waters of U.S.

The National Wetlands Inventory (NWI) Wetlands Mapper was utilized to determine potential open water, riverine and wetland acreages in the AOI along with aerial imagery analysis.[2]

There are approximately 2,898.5 acres of Waters of U.S. in the AOI and consist of approximately 629.3 acres of open water (freshwater ponds and lakes), 646.3 acres of riverine features and 1,622.9 acres of potential wetlands. These constraints are unlikely to undergo induced growth due to regulatory protections. These water features are shown on the **Indirect Impacts Area of Influence Map**.

Cemeteries

These areas were identified using North Central Texas Council of Governments (NCTCOG) Land Use data for 2015.[3] There is are two cemeteries within the AOI called Prairie Mound Cemetery and Roselawn Memorial Park, which encompass approximately 93.5 acres of land within the AOI.

Parkland/Green Belts

These areas were identified using North Central Texas Council of Governments (NCTCOG) Land Use data for 2015. Approximately 775.9 acres of parkland and green belts are located within the AOI. Land identified as parkland/green space is shown on the **Indirect Impacts Area of Influence Map**. This constraint is unlikely to undergo induced growth due to regulatory protections.

[1] https://www.fema.gov/faq-details/GIS-Data/

[2] https://www.fws.gov/wetlands/data/Mapper.html

[3] http://data-nctcoggis.opendata.arcgis.com/datasets/2015-land-use

Gas Well Pad Sites

These areas were identified using aerial imagery from Google Maps and TNRIS as well as available City of Denton data.[4] Approximately 605.5 acres of gas well pad sites are located within the AOI and are unlikely to undergo induced growth due to regulatory constraints.

Existing Roadways and Railroads

There are approximately 1,770 acres of existing roadways and associated transportation ROW, and approximately 242.2 acres of existing railroads.[5] These roadways and railroads are not subject to induced growth. These constraints are unlikely to undergo induced growth because these roadways/railroads already exist and city planning representatives did not identify any roadways/railroads that would be modified as a result of the proposed project.

Proposed Project

The existing and proposed project footprint is approximately 761 acres and is not developable. The proposed project would not undergo induced growth because the footprint would be utilized for the IH 35W frontage roads.

Existing Development

There are approximately 51,534.8 acres of existing development within the AOI.[6] This development consists of agriculture, single-family residential, mobile-home parks, commercial/retail services, industrial, the Texas Motor Speedway, civic/institutional facilities, utilities and places of worship. The majority of existing land use in the AOI is agriculture. This agricultural land totals approximately 31,423.1 acres with 12,105.4 potentially being subject to redevelopment through either planned development, or through induced growth as a result of the project, as indicated by planners during interviews. Areas of planned redevelopment and induced growth were identified by City of Denton and towns of Argyle, Flower Mound, and Northlake planning representatives.

Planned Development Not Dependent on Proposed Project

Currently planned and foreseeable development and redevelopment were identified using information gathered at the planner interview and from planning documents. Planned development is identified in **Table 1** and is shown on the **Indirect Impacts Area of Influence Map.**

[4] http://gis.cityofdenton.com/CODPublic/gaswell.html

[5] http://data-nctcoggis.opendata.arcgis.com/datasets/roads-2017

[6] http://data-nctcoggis.opendata.arcgis.com/datasets/2015-land-use

Table 1: Planned Development within the AOI

Map ID No.	City	Development Type	Name	Area (acres)[1]
1	Northlake	Industrial	Northport Industrial	49.8
2	Northlake	Residential	Petrus	605.2
3	Northlake	Residential	Indian Springs	119.0
4	Northlake	Residential	Pecan Square	711.1
5	Northlake	Residential	The Highlands	195.8
6	Argyle	Mixed Residential and Commercial	Avalon at Argyle	327.9
7	Northlake	Residential	Harvest	410.6
8	Argyle	Residential	Heath Tract	300.3
9	Northlake	Residential	The Ridge	575.6
10	Denton	Mixed Residential and Commercial	Hunter Ranch	2,096.9
11	Denton	Residential	Robson Ranch	1,373.1
12	Denton	Mixed Residential and Commercial	Cole Ranch	2,989.3
			Total	**9,754.6**

Sources: Interviews with planners from the Town of Argyle (6/11/19); Town of Northlake (6/17/19); Town of Flower Mound (7/27/19); and City of Denton (7/3/19).
[1]The area of proposed roadways within planned developments are included in the area (acreage) of the planned development.

The 9,754.6 acres of planned and foreseeable development and redevelopment listed in **Table 1** are not dependent on the proposed project.

Vacant Land Not Influenced by the Proposed Project

Approximately 1,637.5 acres of vacant land is located within the AOI that does not fall under the other categories discussed in Step 3. The professional opinion of the preparers and of those interviewed was that any new development of these vacant lands would be associated with the other roadways, economic conditions, and population demand of the project area cities and counties.

Summary

Table 2 shows a summary of the areas without the potential for induced growth within the AOI.

Table 2: Summary of the Areas Without the Potential for Induced Growth Within the AOI

Land Use	Acres
Floodplain*	11,298.7
Open Water*	629.3
Riverine Features*	646.3
Wetlands*	1,622.9
Cemeteries	93.5
Parkland/Green Belts	775.9
Gas Well Pad Sites	605.5
Existing Roadways	1,770
Existing Railroads	242.2
Proposed IH 35W Project*	761.1
Existing Development Excluding Planned and Potential Redevelopment	39,429.4
Planned Development Not Dependent on Proposed Project	9,754.6
Vacant Land Not Influenced by the Proposed Project	1,637.5
Total	**69,266.9**

*Overlaps other areas of land use.
Sources: FEMA NFHL GIS data (2018); USFWS GIS data (2019); NCTCOG GIS Data (2015); TNRIS and Google Maps aerial imagery (2018, 2019).

As shown in **Table 2**, there are approximately 69,266.9 acres of land without the potential for induced growth within the AOI. Areas of agricultural land use with planned developments or potential induced growth are excluded (12,110.4 acres).

Areas with Potential for Induced Growth

Table 3: shows the acreage, and development type, of all areas of potential induced growth in the AOI and the **Indirect Impacts Area of Influence Map** shows the locations of the areas with the potential for induced growth. This is based on input from city planners during various interviews.

Table 3: Summary of Areas with Potential Induced Growth in the AOI

City	Map ID No.	Potential Development Type*	Acres
Northlake	A	Commercial/Mixed-Use	461.7
	B	Commercial/Mixed-Use	300.6
	C	Commercial	238.5
		City Subtotal	**1,000.8**
Flower Mound	D	Commercial	254.3
		City Subtotal	**254.3**
Draper	E	Commercial	5.0
		City Subtotal	**5.0**
Argyle	F	Commercial	65.6
	G	Commercial	76.1
	H	Community Facilities	53.1
	I	Commercial	148.1
	J	Office Retail	55.2
		City Subtotal	**398.1**
Denton	K	Hunter Ranch Commercial	563.3
	L	Commercial	74.3
	M	Commercial	40.7
	N	Commercial	19.3
		City Subtotal	**697.6**
		Total All Cities	**2,355.8**

* Generic types of potential development were provided by planners during interviews with the Town of Argyle (6/11/19); Town of Draper (12/16/2019); Town of Northlake (6/17/19); Town of Flower Mound (7/27/19); and City of Denton (7/3/19).

As shown in **Table 3**, the areas within the AOI with the potential for induced growth are located within the City of Denton, and Towns of Argyle, Flower Mound and Northlake, and total approximately 2,355.8 acres.

Note that some of the listed resources overlap (i.e., floodplains and waters overlap existing land use, the proposed project overlaps existing roadways). For this reason, the areas within the AOI not subject to induced growth (69,266.9 acres) exceed the area of the AOI (58,887.6 acres). Floodplains account for the majority of this overlap, which when excluded, bring the areas within the AOI not subject to induced growth down to 57,968.2 acres, much closer to the area of the AOI. See the **Indirect Impacts Area of Influence Map** for detailed map symbolizing the above land uses.

Step 4: Determine if Growth is Likely to occur in the Induced Growth Areas

The purpose of this step is to analyze the likelihood for induced growth to occur on the 2,355.8 acres of land identified in Step 3. Factors that were used to determine the likelihood of induced growth include information from planners, planning documents, land use and zoning maps, and population, employment, and housing trend data.

Planner Information

Argyle

A meeting was held with the Town of Argyle planning representatives on June 11, 2019. The planning representatives indicated a number of planned residential and commercial developments along and nearby IH 35W. They predicted induced growth in agricultural areas surrounding these developments near the project, and would primarily consist of commercial land use with other single-family growth expected.

Northlake

A meeting was held with the Town of Northlake planning representatives on June 17, 2019. The planning representatives anticipated general commercial and mixed-use growth along the project corridor, which would replace the existing agricultural land use. The planners believed that these new commercial and higher-density residential areas are dependent on the construction of frontage roads to provide access.

Flower Mound

A meeting was held with the Town of Flower Mound planning representatives on June 27, 2019. The planning representatives expected that the small portion of Flower Mound City Limits adjacent to the project would become commercial developments to accommodate the existing and planned residential developments nearby outside of the AOI. This area of commercial development would be dependent on the frontage roads to provide greater ease of access.

Denton

A meeting was held with the City of Denton planning representatives on July 3, 2019. The planning representatives noted plans for large residential and commercial developments near the project. While they expected the residential projects to continue regardless of the proposed project, the commercial aspects would be reliant on the construction of frontage roads to allow access for future customers to commercial areas adjacent to the project.

Draper

Draper does not have a planning department; however, a phone call was held with the Mayor on December 16, 2019. The Mayor indicated that induced growth was likely to occur on an

undeveloped area adjacent to the proposed southbound frontage road. Other areas within Draper are not expected to undergo induced growth.

Based on the recommendations of the planners of the City of Denton and Towns of Argyle, Draper, Flower Mound and Northlake, the resulting areas with potential for induced growth can be viewed on the **Indirect Impacts Area of Influence Map**.

Planning Documents

There are numerous planning documents that cover the AOI. Representative applicable planning documents are listed in **Table 4**.

Table 4: Planning Documents

Document	Entity
Mobility 2045: The Metropolitan Transportation Plan for North Central Texas	NCTCOG
Vision North Texas 2050 (2010)	NCTCOG
Denton County Thoroughfare Plan (2017)	Denton County
Denton Mobility Plan Thoroughfare Map (2015)	City of Denton
Denton Plan 2030 (2015)	City of Denton
Denton Bike Plan (2012)	City of Denton
Comprehensive Plan Update (2018)	Town of Argyle
Thoroughfare Plan Map (2010)	Town of Argyle
Land Use Map (2018)	Town of Flower Mound
Thoroughfare Plan (2018)	Town of Flower Mound
Urban Design Plan (2017)	Town of Flower Mound
Master Plan (2013)	Town of Flower Mound
Northlake Comprehensive Plan Update (2016)	Town of Northlake
Master Thoroughfare Plan Map (2017)	Town of Northlake
Future Park Plan (2014)	Town of Northlake
Zoning Map (2017)	Town of Northlake
Pecan Square Regional Development Corridor Map (2018)	Hillwood Communities

Details from various planning documents that support the induced growth discussion in the coming steps are summarized below:

- *Mobility 2045: The Metropolitan Transportation Plan for North Central Texas* was adopted in June 2018 by the Regional Transportation Council, which serves as the policy body for the Metropolitan Planning Organization for North Central Texas. The Plan is the defining vision for the multimodal transportation system in the Dallas-Fort Worth Metropolitan Planning Area and guides the implementation of multimodal transportation improvements, policies, and programs in the 12-county Metropolitan

Planning Area through the year 2045. Appendix E. Mobility Options recommends adding four to six-lane continuous frontage roads by 2028.

- *Vision North Texas 2050* (2010) was a collaborative planning effort conducted in the late 2000s to educate elected officials and regional leaders on growth trends in the North Texas region. The Plan acknowledges that North Texas is the fastest-growing region in the country and the increasing growth is putting pressure on the region's natural resources (especially water) and infrastructure (especially transportation).
- Town of Argyle *Comprehensive Plan Update* (2018) is a reflection of community sentiments, aspirations, goals, objectives, and vision for Argyle's incorporated land area and its associated Extra-Territorial Jurisdiction. The Plan discusses that residential development outside of Argyle town boundaries, yet near the IH 35W corridor, will be beneficial to the potential commercial growth along IH 35W within Argyle's municipal boundaries and will provide a much-needed tax base.
- Town of Flower Mound *Master Plan* (2013) has designated six major planning areas. The Denton Creek District Area contains land use categories suitable for uses oriented towards IH 35W. These land use categories include Regional Campus Commercial, Campus Industrial, Office, Mixed Residential, and Town Entrance Landscape.
- Town of Northlake *Comprehensive Plan Update* (2016) recognizes that Northlake's current economy depends on its close proximity to the downtowns of Denton and Fort Worth, DFW and Alliance Airports, Texas Motor Speedway, major employment centers in the Alliance Airport and SH 114 Corridors and over 11 miles of freeway frontage on IH 35W and SH 114.
- Hillwood Communities *Pecan Square Regional Development Corridor Map* (2018) shows a number of existing and planned communities along the IH 35W corridor including Northport Industrial Park and the Petrus, Indian Springs, Canyon Falls, Pecan Square, Avalon at Argyle, The Highlands, Harvest, The Ridge, Hunter Ranch, Robson Ranch, and the Cole Ranch residential subdivisions.

Population and Employment Trends and Forecasts

Population

According to *Mobility 2045*, the 12-county Dallas-Fort Worth (DFW) MPA had a 2010 population of approximately 6.4 million persons. By 2045, the population of the 12-county DFW MPA is projected to be 11.2 million persons; an increase in growth of approximately 75%.[7]

According to NCTCOG population projections, the 2017 population of Denton County was 804,396 persons and the 2045 population is projected to be 1,346,316 persons; an increase in growth of approximately 67.3%. Transportation Serial Zones (TSZ) created by the NCTCOG

[7] https://www.nctcog.org/trans/plan/mtp/2045

provide area-specific population and employment trends from 2005 to 2045 as based on *Mobility 2045*. These zones follow roadways, and consequently the AOI contains exactly 30 TSZs. The combined populations for these TSZs show 9,925 persons for 2005 and 70,283 persons for 2045.[8] Compared to the county or individual city levels, this is a 708% increase in population relative to the 2005 population. This is likely due to a number of planned and potential developments in heavily agricultural areas outside of city limits and shows how necessary this project is for the region.

The Texas Water Development Board (TWDB) conducts population projections to assist in regional water planning. **Table 5** shows the projected populations of five of the six cities or towns within the IH 35W project area for the years 2020 and 2040 as well as the projected population within the AOI for the years 2005 and 2045 based on TSZ data.

Table 5: Projected Populations for the Cities in the IH 35W Project Area

City	2020	2040	Percent Increase
Town of Argyle	6,000	13,000	116.7
City of Denton	160,145	211,733	32.2
Town of Flower Mound	75,555	93,000	23.1
City of Fort Worth	953,971	1,490,815	56.3
Town of Northlake	4,500	31,010	589.1

Sources: TWDB 2016 Regional Water Plan. http://www.twdb.texas.gov/waterplanning/rwp/plans/2016/ (Accessed 7-18-19)

As shown in **Table 5**, the 2020 projected populations for five of the six cities or towns in the IH 35W project area are projected to grow from 23.1 percent to 589.1 percent by 2040.

Employment

According to the NCTCOG, 4,584,235 persons were employed in the 12-county DFW MPA in 2017. By 2045, 7,024,227 persons are projected to be employed in the 12- county DFW MPA; an increase in growth of approximately 53.2 percent. In Denton County, 298,071 persons were forecast to be employed in 2017. By 2045, Denton County employment is projected to be 479,619 persons; an increase in growth of approximately 60.9 percent. TSZs within the AOI project a 301 percent increase in employment between 2005 and 2045, from 9,272 to 27,885 persons employed there.[9]

Access to Development in the Project Corridor

The IH 35W corridor is one of the last areas north of DFW with room for the development of large master planned communities with access to major employment centers such as Charles Schwab, Mercedes-Benz Financial, and Stanley Black and Decker. A number of

[8] http://data-nctcoggis.opendata.arcgis.com/datasets/c8ab64bc19eb4878b659bdf50710c036_11

[9] http://data-nctcoggis.opendata.arcgis.com/datasets/c8ab64bc19eb4878b659bdf50710c036_11

existing and planned residential and commercial developments are under construction or are pending along the IH 35W corridor. These developments would be constructed with or without the project and include the following:

- Indian Springs – This 120-acre development in the Town of Northlake will consist of high-density residential and commercial uses.
- Canyon Falls – This is a 1,119-acre master-planned community in the towns of Flower Mound, Northlake, and Argyle.
- Avalon at Argyle – This 330-acre development in the Town of Argyle includes a mix of commercial and residential uses with a mix of lot sizes and densities.
- Pecan Square – This 1,157-acre development in the Town of Northlake includes a mix of commercial and residential uses with a mix of lot sizes and densities.
- The Highlands – This is a 363-acre residential development with one-acre homesites in the Town of Northlake.
- The Heath Tract – This is an approximate 417-acre tract of land in Argyle, Texas that is proposed for development.
- Harvest – This is an approximate 1,200-acre residential development in the Town of Argyle.
- The Ridge at Northlake – This is an approximate 820-acre mixed use development in the Town of Northlake.
- Hunter Ranch – This 3,179-acre master planned community in the City of Denton will include retail/commercial, industrial, single-family residential, medium density residential, schools, parks, and open space.
- Robson Ranch – This is a 2,700-acre master planned retirement community with 7,200 homes in the City of Denton.
- Cole Ranch – This 3,432-acre master planned community in the City of Denton will include retail/commercial, industrial, single-family residential, medium density residential, schools, parks, and open space.

Although the existing and planned developments discussed above are not dependent on the proposed project, the proposed frontage roads are necessary to provide access to the approximately 2,355.8 acres of potentially induced commercial and other development anticipated to support these existing and planned developments.

Summary

Based on the information from the planning departments of the City of Denton and Towns of Argyle, Flower Mound and Northlake, planning documents, land use and zoning maps, thoroughfare plans, and population, employment and housing trend data, there is potential for induced growth on the approximately 2,355.8 acres of land identified in **Step 3.**

Step 5: Identify Resources Subject to Induced Growth Impacts

Vegetation and Wildlife Habitat

Areas of induced growth were overlaid on GIS habitat/vegetation polygons generated from the Phase 1 Texas Ecological Systems Classification Project (TESCP) data to determine the induced growth impacts to habitat/vegetation types in the AOI. **Table 6** shows a breakdown of the habitat/vegetation types potentially impacted by the 2,355.8 acres of land identified in Steps 3 and 4 that would be subjected to induced growth.

Table 6: Vegetation and Wildlife Habitat Potentially Impacted by Land Subjected to Induced Growth

Habitat/Vegetation Type	Impact Area (Acres)	Present within the AOI (Acres)	Potential Impact
Agriculture	225.6	7,232.4	3.1%
Crosstimbers Woodland and Forest	585.5	8,431.6	6.9%
Disturbed Prairie	75.2	1,946.7	3.9%
Edwards Plateau Savannah, Woodland, and Shrubland	315.0	4,789.2	6.6%
Riparian	49.3	8,909.0	0.6%
Tallgrass Prairie, Grassland	989.9	21,194.2	4.7%
Urban	115.3	6,384.5	1.8%
Total	**2,355.8**	**58,887.6**	**4.0%**
All Non-Urban Habitat/Vegetation	**2,240.5**	**52,503.1**	**4.3%**

Source: Texas Parks and Wildlife's (TPWD) Phase 1 Texas Ecological Systems Classification Project (TESCP) data (accessed November 2019).

It should be noted that while 49.3 acres of riparian areas are shown to be potentially impacted by induced growth in these areas, they were originally shaped to avoid waters and floodplains based on data from the USFWS National Wetlands Inventory (NWI) and FEMA 100-year Floodplain data. This is because these areas have certain regulatory protections that make induced growth unlikely. The different datasets are compiled through different methods of varying accuracy making these overlaps noted in **Table 6** unavoidable.

Numerous wildlife species may utilize the previously discussed vegetation for food and habitat; however, similar and higher quality habitat is present in the surrounding areas such as the 100-year floodplains and riparian areas associated with Catherine Branch, Denton

Creek, Cleveland Branch, Roark Branch, Hickory Creek, Dry Fork of Hickory Creek, and various tributaries.

Farmland (Soils)

According to GIS data for soils obtained from the U.S. Department of Agriculture (USDA) and the Web Soil Survey,[10] there are approximately 40,566.9 acres of prime farmland and farmland of statewide importance in the AOI. Approximately 1,742.9 acres of prime farmland and farmland of statewide importance would be impacted by potential induced development. This represents approximately 4.3% of the 40,566.9 acres of prime farmland soils and farmland soils of statewide importance in the AOI and is not considered substantial. Of the 1,742.9 acres of prime farmland potentially impacted by induced development, 1,489.8 acres (85.5 percent) are located outside of the U.S. Census Bureau (USCB) 2017 Denton Southwest, Denton-Lewisville and Justin, TX Urban Areas and are potentially subject to the Farmland Protection Policy Act (FPPA).

Waters of the U.S.

According to the USFWS National Wetlands Inventory (NWI) Wetland Mapper,[11] there are approximately 629.3 acres of open water (lakes and ponds), 646.3 acres of riverine features, and 1,622.9 acres of potential wetlands within the AOI. Areas of induced growth were overlaid on a water features polygon generated from the NWI Wetland Mapper. Because Waters of the US are unlikely to undergo induced impact due to regulatory protections, the open waters and wetlands were avoided in the measurement and drawing of induced growth areas indicated by planners. Riparian areas were included in the induced growth areas because developments often involve the realignment and/or channelization of the streams and as such, would be considered as having potential for induced growth. There are approximately 24.4 acres of open waters fully or partially surrounded by areas with potential for induced growth. There are approximately four acres of potential wetlands fully or partially surrounded by areas with potential for induced growth. Riparian areas designated by the NWI account for 7.2 acres of the areas with potential for induced growth. All Waters of the U.S. designated by the NWI Wetland Mapper are shown on the **Indirect Impacts Area of Influence Map.**

Floodplains

According to FEMA NFHL GIS data,[12], there are approximately 11,298.7 acres of 100-year flood zone within the AOI. Because floodplains are unlikely to undergo induced growth impacts due to regulatory protections, floodplains were avoided in the measurement and drawing of

---

[10] http://websoilsurvey.sc.egov.usda.gov/App/WebSoilSurvey.aspx

[11] https://www.fws.gov/wetlands/data/mapper.html

[12] https://www.fema.gov/national-flood-hazard-layer-nfhl

induced growth areas indicated by planners. Areas of induced growth were overlaid on polygons generated from FEMA NFHL GIS data. Floodplains were not included as a part of the areas of potential induced growth within the AOI. All 100-year floodplains within the AOI are shown on the **Indirect Impacts Area of Influence Map.**

Socio-Economic/Community Impacts

Socio-economic/community resources would be subjected to induced growth impacts. There are several socioeconomic facets related to the anticipated project-induced growth impacts on the 2,355.8 acres within the AOI. The potential development on the currently agricultural land would be expected to benefit the surrounding communities in a trend that has been ongoing for decades. While potential induced growth would impact local agriculture, existing and planned developments encompass what primarily was, or currently is, also agricultural land, and it is a common trend in the DFW region that would eventually happen regardless of the proposed project. The expected development in the AOI would improve the socioeconomic conditions of the communities through the construction of new homes and businesses. It is anticipated that environmental justice (EJ) and non-EJ populations would benefit from the induced growth impacts equally.

Step 6: Identify Mitigation

The induced growth associated with the proposed project does not conflict with study area goals, would not delay or interfere with the planned improvement of a resource, and is not inconsistent with any applicable laws; therefore, mitigation for the impacts to Waters of the U.S., floodplains, and socio-economic/community resources is not warranted. All developers, public and private, would be subject to the Clean Water Act, Endangered Species Act, and Migratory Bird Treaty Act; however, private developers would not be subject to Section 106 of the National Historic Preservation Act. There are no known mitigative responsibilities for private developers in Texas for impacts to Agriculture; Disturbed Prairie; Post Oak Savanna; Riparian; or Tallgrass Prairie, Grassland vegetation. Private developers would not be subject to the FPPA for impacts to prime farmland soils and farmland soils of statewide importance. Land development activities would be regulated by the local municipalities. The mitigation of potential development within the AOI considered for this assessment would be the responsibility of the agencies with the authority to implement such controls. This authority rests with the municipal governments of Northlake, Flower Mound, Argyle, Denton and, to a lesser extent, Denton County.

All of the municipalities experiencing induced growth from the IH 35W frontage roads have development ordinances that regulate the types of construction and landscape plantings mandated by development codes. For example, the Town of Argyle's Tree Ordinance places the consideration of trees and how they will be preserved or mitigated at the beginning of the development process. Article 9 of the Town of Northlake's Design Standards sets open space requirements for residential developments. The Town of Flower Mound has an Urban Forestry

Program that has established rules and regulations governing the protection and preservation of native or established trees within the town. The City of Denton's Site Design Standards has rules for landscape and tree canopies, parking lot landscaping, and street trees.

Overall, the expected project induced growth would be compatible with zoning requirements, city planning documents, and project area goals.

III. CUMULATIVE IMPACTS

The CEQ defines cumulative impacts as those which result from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time (40 CFR §1508.7). As such, it may be difficult to understand the role that a proposed action may have in contributing to the overall or cumulative impacts to an area or resource. In accordance with TxDOT's *Cumulative Impacts Analysis Guidelines* (January 2019), this analysis includes the five steps, listed below, to adequately consider the cumulative effects of the proposed project.

1. Resource Study Area, Conditions, and Trends
2. Direct and Indirect Effects on each Resource from the Proposed Project
3. Other Actions – Past, Present, and Reasonably Foreseeable – and their Effect on each Resource
4. The Overall Effects of the Proposed Project Combined with other Actions
5. Mitigation of Cumulative Impacts

Step 1: Resource Study Area, Conditions and Trends

The proposed project's cumulative impacts were identified by carrying forward the direct and indirect impacts that may contribute to a cumulative impact. The cumulative impacts analysis focused on resources substantially impacted by the proposed project and resources in poor or declining health or at risk that are directly or indirectly impacted by the proposed project. The resources which were evaluated for direct and indirect impacts are listed in **Table 7**. The table summarizes the direct and indirect impacts anticipated for each resource and identifies whether or not the resource is carried forward for cumulative impacts analysis.

Table 7: Resources to be Evaluated in the Cumulative Impacts Analysis

Resource or Topic Evaluated	Direct Impacts	Indirect Effects	Carried Forward for Cumulative Effects Analysis	Reason for Elimination
Community Cohesion, Acquisitions, Relocations and Displacements	No residential, commercial or public facility displacements will occur as a result of the proposed project. The proposed improvements would not affect, separate, or isolate any distinct neighborhoods, ethnic groups, or other specific groups. No residential neighborhoods would be separated or divided by the proposed project. Positive impacts to residential communities would include improved mobility and accessibility throughout the project study area and to surrounding communities. Negative impacts to access and travel patterns resulting from the implementation of the proposed project are not anticipated.	The potential development in the project area is anticipated to provide an overall benefit to the surrounding community. The construction of new homes and businesses would create new jobs and increase the local tax base. Development would be compatible with zoning requirements, city planning documents, and project area goals. It is anticipated that EJ and non-EJ populations would benefit from the induced growth impacts equally. Impacts to socio-economic/community resources by induced growth are not considered substantial.	No	Direct impacts to community cohesion are not anticipated. The indirect effects would provide a positive benefit to the community.
Environmental Justice	No disproportionately high or adverse direct impacts. No adverse encroachment-alteration effects on EJ and LEP populations are anticipated.	No adverse indirect effects are anticipated.	No	No adverse direct impacts or indirect effects are anticipated.
Economy	The proposed improvements would benefit the economy due to new access to adjacent property and from improved mobility in the project corridor. The access to adjacent property would provide the potential for new commercial developments. No adverse encroachment-alteration effects on the economy are anticipated.	Indirect effects that may result from direct impacts include changes in travel patterns and changes in the local economy. No substantial adverse indirect effects are anticipated. Potential induced growth would create new jobs in the AOI and increase the local tax base.	No	No adverse direct impacts or indirect effects are anticipated.
Section 4(f) and Section 6(f) Resources	No Section 4(f) or 6(f) resources would be impacted by the proposed project. Any potential impacts to historic properties would be confined to the existing and proposed ROW/easements; thus, encroachment-alteration effects are not anticipated.	No indirect effects are anticipated.	No	No direct impacts or indirect effects are anticipated, and the resource is not in poor and/or declining health.

Table 7: Resources to be Evaluated in the Cumulative Impacts Analysis

Resource or Topic Evaluated		Direct Impacts	Indirect Effects	Carried Forward for Cumulative Effects Analysis	Reason for Elimination
Cultural Resources	Historic Structures	No impacts to historic structures would result from the proposed project. Any potential impacts to historic properties would be confined to the existing and proposed ROW/easements; thus, encroachment-alteration effects are not anticipated.	No indirect effects are anticipated.	No	No direct impacts or indirect effects are anticipated, and the resource is not in poor and/or declining health.
	Archeological Resources	No direct impacts are anticipated to occur. Any potential impacts to archeological resources would be limited to the construction phase of the project and confined to the existing and proposed ROW/easements; thus, encroachment-alteration effects are not anticipated.	No indirect effects are anticipated.	No	No substantial adverse direct impacts or indirect effects are anticipated, and the resource is not in poor and/or declining health.
Vegetation and Wildlife Habitat		Approximately 5 acres of Agriculture; 53.1 acres of Crosstimbers Woodland and Forest; 12.4 acres of Disturbed Prairie; 14.5 acres of Edwards Plateau Savannah, Woodland, and Shrubland; 47.9 acres of Riparian; 78.8 acres of Tallgrass Prairie, Grassland; and 549.4 acres of Urban MOU Habitat-type vegetation would be directly impacted by the proposed project. Non-Urban vegetation impacts total approximately 211.7 acres. Potential impacts to vegetation would be confined to the existing and proposed ROW/easements; thus, encroachment-alteration effects are not anticipated.	Approximately 225.6 acres of Agriculture; 585.5 acres of Crosstimbers Woodland and Forest; 75.2 acres of Disturbed Prairie; 315 acres of Edwards Plateau Savannah, Woodland, and Shrubland; 49.3 acres of Riparian; 989.9 acres of Tallgrass Prairie, Grassland; and 115.3 acres of Urban vegetation would be potentially impacted by induced growth. The induced growth impacts on non-Urban vegetation and wildlife habitat in the AOI total approximately 2,240.5 acres. These impacts are not considered substantial as they encompass 4.3 percent of the AOI. The potential impacts to wildlife from induced growth could include loss of habitat, habitat fragmentation, wildlife disturbance from increased human activity levels, and changes in storm drainage patterns.	Yes. There are direct impacts, indirect effects, and the resource is in poor and/or declining health.	Not Applicable.

Table 7: Resources to be Evaluated in the Cumulative Impacts Analysis

Resource or Topic Evaluated	Direct Impacts	Indirect Effects	Carried Forward for Cumulative Effects Analysis	Reason for Elimination
Migratory Birds	No impacts to migration patterns or migratory bird habitat are anticipated. Expected impacts to migratory birds would be associated with construction activity within the project footprint, no encroachment-alteration indirect impacts to birds are likely.	No indirect effects are anticipated.	No	There are no direct impacts, the indirect effects are not substantial, and the resource is not in poor and/or declining health.
Waters of the U.S.	The proposed project crosses 27 streams, and 12 wetlands. All combined, the proposed project would permanently impact approximately 0.4 acres of Waters of the U.S. The potential for project-related encroachment-alteration effects on Waters of the U.S. would be mitigated through permanent (post-construction) Best Management Practices (BMPs).	Approximately 4 acres of potential wetlands, 24.4 acres of open water, and 7.2 acres of riverine features have the potential to be impacted by induced growth, though because these areas are subject to regulatory protections these areas were not included in the acreages of potential induced growth and are not expected to be directly impacted by the growth. The indirect effects are not considered substantial.	No	The direct impacts and indirect effects are not substantial, and the resource is not in poor and/or declining health.
Water Quality	Potential impacts would be minimized by BMPs associated with Tier I projects and are not anticipated to be substantial. The potential for project-related encroachment-alteration effects on water quality would be mitigated through permanent (post-construction) BMPs. To minimize the potential for adverse impacts, the BMPs would be regularly inspected and proactively maintained.	No adverse indirect impacts are anticipated.	No	The direct impacts and indirect effects are not substantial, and the resource is not in poor and/or declining health.

Table 7: Resources to be Evaluated in the Cumulative Impacts Analysis

Resource or Topic Evaluated	Direct Impacts	Indirect Effects	Carried Forward for Cumulative Effects Analysis	Reason for Elimination
Floodplains	The proposed project crosses 123.7 acres of FEMA designated 100-year floodplain. The project would permit the conveyance of the 100-year flood, inundation of the roadway being acceptable, without causing significant damage to the facility, stream, or other property. The proposed project would not increase the base flood elevation to a level that would violate applicable floodplain regulations and ordinances. Coordination with the local Floodplain Administrator would be required. Construction would be limited to the proposed project's existing/proposed ROW/easement areas and would have no effect on floodplains outside of the construction area.	No 100-year flood zones are located within the areas of potential induced development. Floodplain regulations monitor and prohibit select types of development within the floodplain and as such, were deemed unlikely for induced growth. No substantial indirect effects are anticipated.	No	The direct impacts and indirect effects are not substantial, and the resource is not in poor and/or declining health.
Farmland (Soils)	The proposed project would convert 86.4 acres of farmland subject to the FPPA to a non-agricultural, transportation use; however, the impacts are not substantial and the resulting score of the FPPA Form SCS-CPA 106 was below that required for coordination with the Natural Resources Conservation Service. Farmland impacts would be limited to areas directly adjacent to the existing project corridor and would not result in the division or separation of existing agricultural land. Farmlands would continue to function as they do under existing conditions; therefore, encroachment-alteration effects stemming from farmland impacts are not anticipated	Approximately 1,743 acres of prime farmland and farmland of statewide importance would be potentially impacted by induced development. This represents approximately 4.3 percent of the 40,567 acres of prime farmland soils and farmland soils of statewide importance in the AOI and is not considered substantial. While there are thousands of acres of farmland soils, the majority of agricultural land within the AOI is ranchland. Of the 1,743 acres of farmland soils potentially impacted by induced development, approximately 1,507 acres are located outside of the USCB 2017 Denton Southwest, Denton-Lewisville and Justin, TX Urban Areas and are potentially subject to the FPPA.	Yes. There are direct impacts, indirect effects, and the resource is in poor and/or declining health.	Not Applicable.
Air Quality	The project is consistent with the MTP, which conforms to the Transportation Improvement Plan; therefore, air quality impacts are not expected related to ozone.	No substantial indirect effects are anticipated.	No	The direct impacts and indirect effects are not substantial, and the resource is

Table 7: Resources to be Evaluated in the Cumulative Impacts Analysis

Resource or Topic Evaluated	Direct Impacts	Indirect Effects	Carried Forward for Cumulative Effects Analysis	Reason for Elimination
				not in poor and/or declining health.
Visual/Aesthetics	The proposed project improvements would be expected to blend with the general character of the area. The proposed project entails improvements/widening of an existing visual element (IH 35W) rather than introducing a new visual element into the environment; thus, visual encroachment-alteration effects are not anticipated.	No indirect effects are anticipated.	No	No direct impacts or indirect effects are anticipated.

Source: Study Team (November 2019).

As shown in **Table 7**, vegetation, wildlife habitat and farmland soils will be analyzed to identify effects from cumulative impacts.

Resource Study Area

A Resource Study Area (RSA) has both temporal and geographic components. The temporal component of the RSA is the timeframe in which effects to resources are expected to occur. For vegetation and wildlife habitat, the year 2001 was used as the beginning temporal boundary because it corresponds to the end of the longest period of economic expansion in recent U.S. history. The temporal boundary extends to 2045, the end of the current MTP planning cycle.

Due to laws and regulations concerning Waters of the U.S. and associated floodplains, agricultural practices and residential/commercial development usually avoid streams and their associated floodplains and can leave portions of pristine habitat in place. For this reason, quality wildlife habitat and vegetation are usually found within stream systems, adjacent to intermittent and perennial streams. The proposed project is located within the Elm Fork Trinity and Denton subbasins. The geographical RSA for vegetation and wildlife used in this analysis consist of these subbasins because they support the vegetation, wildlife habitat, and waters most likely to be affected by the proposed project. The Elm Fork Trinity and Denton subbasins RSA is also the geographical RSA for farmland (soils). The RSA boundary follows topographical highs. Topography affects soil formation and development, and the chemical and physical properties of soil. These factors play a part in determining soil quality. Therefore, using the subbasins RSA for farmland (soils) is admissible.

The RSA captures the Cities of Argyle, Bartonville, Draper, Denton, Dish, Flower Mound, Fort Worth, Justin, Northlake, Ponder and Roanoke, and unincorporated areas of Denton County. The RSA totals approximately 81,870 acres. A map of the RSA is shown on the **Cumulative Impacts Resource Study Area Map**.

Conditions and Trends

The RSA is located within the Cross Timbers and Prairies Ecological Region, which was historically dominated by a combination of prairies and woodlands along rivers and creeks. This region was a difficult narrow strip of woodland and prairie, difficult for early settlers to traverse. Over time, agriculture has come to dominate the region leading to fragmentation of once continuous habitat. With competition for food and cover with livestock, conversion of woodland habitat to improved pastures or other agricultural developments, and urban and rural developments, varying levels of decline in the density and diversity of wildlife can be seen today.[13]

[13] https://tpwd.texas.gov/landwater/land/habitats/cross_timbers/ecoregions/cross_timbers.phtml

The RSA is located within the Cities of Argyle, Bartonville, Draper, Denton, Dish, Flower Mound, Fort Worth, Justin, Northlake, Ponder and Roanoke, and unincorporated areas of Denton County. Historic aerial photographs and topographic maps were reviewed to determine the development trend in the RSA. In 2001, developed properties inside of the RSA included single and occasional multi-family residential, commercial/retail services and shopping centers, industrial facilities, and mobile homes. These areas of development are broken up by large tracts of agricultural and undeveloped land, especially west of the project location. By 2019, many of the large tracts of land have been developed into residential subdivisions, most notably in Northlake and Argyle where there are now large subdivisions. Other areas where rural development already existed have seen some redevelopment to greater density residential neighborhoods.

The expanding development and associated transportation network reduced the available wildlife habitat in the RSA. Much of the wildlife habitat is constrained to riparian corridors and floodplains. These areas have remained relatively unchanged over the years and continue to provide habitat for wildlife and ecological benefits from water features. Other areas consist of ranch land. As a result of a change in vegetation and habitat, wildlife species in more developed areas of the RSA are shifting to species better able to adapt to a suburban environment. The current condition of the vegetation and wildlife habitat within the RSA is considered "in decline."

Vegetation and Wildlife Habitat

Aerial photography of the RSA from 2018 indicates that the primary vegetation types within the RSA are floodplain forest, prairie, and maintained herbaceous. Healthy riparian areas are also found adjacent to Cade Branch, Catherine Branch, Cleveland Branch, Denton Creek, Dry Fork Hickory Creek, Elizabeth Creek, Graham Branch, Graveyard Branch, Harriet Creek, Henrietta Creek, Hickory Creek, Hog Branch, North Hickory Creek, Oliver Creek, Roark Branch, South Hickory Creek, Trail Creek, Whites Branch, Wolf Branch, and their associated tributaries.

According to TPWD's TESCP - Phase 1 vegetation data,[14] existing potential wildlife habitat includes approximately 12,184 acres of Crosstimbers Woodland and Forest; 2,806 acres of Disturbed Prairie; 6,827 acres of Edwards Plateau Savannah, Woodland, and Shrubland; 11,594 acres of Riparian; 27,060 acres of Tallgrass Prairie, Grassland; 10,216 acres of Agriculture; and 11,206 acres of Urban MOU Habitat-type vegetation within the RSA. Based on the above, non-Urban MOU Habitat-type vegetation within the RSA totals approximately 60,471 acres.

[14] Texas Parks and Wildlife's (TPWD) Phase 1 Texas Ecological Systems Classification Project (TESCP)

Based upon 2018 aerial photography and 2015 Land Use GIS data from the NCTCOG,[15] approximately 44 percent (36,017 acres) of the RSA is urban or developed with an additional 50 percent (40,559 acres) of the RSA being agricultural use, primarily ranchland.

Wooded areas can be found along portions of almost all major streams within the RSA as well as various tributaries and other separated areas. The largest wooded area can be found in the southern portion of the RSA along Denton Creek and its associated tributaries and riparian areas. These wooded areas serve as a buffer to development and as a sanctuary for vegetation and wildlife. Some undeveloped areas beyond the wooded corridors consist of pasture/prairie, agriculture, and scrub/shrub vegetation. Overall, the riparian and floodplain corridors provide a protected environment for native and sensitive wildlife and plant species to live and grow with minimal disturbance.

Farmland (Soils)

According to GIS data for soils obtained from the USDA and the Web Soil Survey,[16] there are approximately 57,280 acres of prime farmland soils and farmland soils of statewide importance in the RSA. Of this, 49,088 acres are located outside of the USCB 2017 Dallas-Fort Worth-Arlington, Denton Southwest, Denton-Lewisville and Justin, TX Urban Areas and are potentially subject to the FPPA.

Based upon 2001 aerial photography and 2000 land use GIS data from the NCTCOG, approximately 83 percent (68,236 acres) of the RSA was used for agricultural purposes in 2001. Of the 68,236 acres of agricultural land, approximately 70 percent (47,923 acres) was underlaid by prime farmland soils and farmland soils of statewide importance. Of the 47,923 acres, approximately 80 percent (38,338 acres) were located outside of the USCB 2000 Denton-Lewisville and Dallas-Fort Worth-Arlington, TX Urban Areas and potentially subject to the FPPA.

Currently, approximately 50 percent (40,559 acres) of the RSA is used for agricultural purposes. Of the 40,559 acres, approximately 87 percent (28,315 acres) is underlain by prime farmland soils and farmland soils of statewide importance. Of the 28,315 acres, 93 percent (26,405 acres) are located outside of the USCB 2017 Dallas-Fort Worth-Arlington, Denton Southwest, Denton-Lewisville and Justin, TX Urban Areas and are potentially subject to the FPPA.

As the DFW Metroplex continues expanding along the IH 35W corridor, existing ranchlands are being converted to residential, commercial and other developed land uses as the population grows.

---

[15] http://data-nctcoggis.opendata.arcgis.com/datasets/2015-land-use

[16] http://websoilsurvey.sc.egov.usda.gov/App/WebSoilSurvey.aspx

Step 2: Direct and Indirect Effects on each Resource from the Proposed Project

Vegetation and Wildlife Habitat

Approximately 78.8 acres of Tallgrass Prairie, Grassland; 53.1 acres of Crosstimbers Woodland and Forest; 47.9 acres of Riparian; 14.5 acres of Edwards Plateau Savannah, Woodland, and Shrubland; 12.4 acres of Disturbed Prairie; 5 acres of Agriculture; and 549.4 acres of Urban MOU Habitat-type vegetation would be directly impacted by the proposed project. Non-Urban vegetation impacts total approximately 206.7 acres.

Approximately 225.6 acres of Agriculture; 585.5 acres of Crosstimbers Woodland and Forest; 75.2 acres of Disturbed Prairie; 315 acres of Edwards Plateau Savannah, Woodland, and Shrubland; 49.3 acres of Riparian; 989.9 acres of Tallgrass Prairie, Grassland; and 115.3 acres of Urban vegetation would be potentially impacted by induced growth. The induced growth impacts on non-Urban vegetation and wildlife habitat in the AOI total approximately 2,014.7 acres.

Farmland (Soils)

Approximately 86 acres of prime farmland soils subject to FPPA would be directly impacted by the proposed project and approximately 1,507 acres of prime farmland soils subject of FPPA would be potentially impacted by induced growth.

Step 3: Other Actions – Past, Present and Reasonably Foreseeable – and their Effect on each Resource

The cumulative impacts analysis considers the combined effects of past, present, and reasonably foreseeable actions on the resources analyzed. To identify other past, present, and reasonably foreseeable actions within the RSA, NCTCOG 2000 and 2015 Land Use data and aerial imagery dating back to 2001 and 2018, and planned development information provided by the City of Denton, and Towns of Argyle, Draper, Flower Mound and Northlake. The past, present, and reasonably foreseeable actions identified are listed in **Table 8**.

Table 8: Other Past, Present, and Reasonably Foreseeable Actions (2001-2045)[1]

Development	Past, Present, or Reasonably Foreseeable Action	Area (acres)
Commercial	Past	1,651
Institutional/Semi-Public	Past	731
Residential	Past	4,241
Industrial	Past	1,620
Parkland/Green Belts	Past	1,266
Airport	Past	399
Commercial	Reasonably Foreseeable	2,317
Institutional/Semi-Public	Reasonably Foreseeable	78
Residential	Reasonably Foreseeable	29,602
Mixed Use	Reasonably Foreseeable	5,414
Industrial	Reasonably Foreseeable	93
Parkland/Green Belts	Reasonably Foreseeable	197
	Total	**47,609**

[1] The area of proposed roadways within planned developments is included in the area (acreage) of the planned development.
Some areas of foreseeable actions overlap areas of past action where redevelopment is expected.
Sources: Interviews with planners from the Town of Argyle (6/11/19); Town of Northlake (6/17/19); Town of Flower Mound (7/27/19); and City of Denton (7/3/19). NCTCOG Land Use Data for 2000 and 2015 http://data-nctcoggis.opendata.arcgis.com/datasets

As shown in **Table 8**, the other past, present and reasonably foreseeable actions total approximately 47,609 acres.

Vegetation and Wildlife Habitat

Potential cumulative impacts considered and discussed include direct impacts to vegetation and wildlife habitat as a result of implementation of the proposed project in combination with the effects of potential induced growth and other past, present, and reasonably foreseeable actions. The approximately 81,870-acre RSA was considered sufficient to capture the cumulative effects of the proposed project on vegetation and wildlife habitat because Elm Fork Trinity and Denton subbasins contain the streams and associated vegetative habitat that wildlife depends on for food, water, and shelter. Acreages of vegetation types in the RSA were determined from aerial photographs and TPWD's TESCP - Phase 1 vegetation data. For the purposes of this analysis, it was assumed that any of the past, present, and reasonably foreseeable actions would displace all of the native vegetation and wildlife habitat within the confines of the development.

Table 9 lists the vegetation that has been/will be impacted by past, present, and reasonably foreseeable actions in the RSA.

Table 9: Vegetation Impacts by Other Past, Present, and Reasonably Foreseeable Actions[1]

Vegetation Classification[2]	Acres
Agriculture	8,929.1
Crosstimbers Woodland and Forest	6,857.5
Disturbed Prairie	1,491.5
Edwards Plateau Savannah, Woodland, and Shrubland	4,531.2
Riparian	3,327
Tallgrass Prairie, Grassland	18,919.2
Urban	3,553.6
Total	**47,609.1[3]**

[1] The vegetation impacted by induced growth is not included in this table.
[2] Per TPWD's Texas Ecological Systems Classification Project - Phase 1 vegetation data.
[3] This acreage includes the proposed project.

As shown in **Table 9**, the vegetation impacts by other past, present and reasonably foreseeable actions total approximately 47,609 acres. Impacts to non-urban vegetation total approximately 44,055.5 acres.

The vegetation and streams surrounding the proposed project are connected to other nearby vegetated areas, creating open corridors that can be used by aerial and terrestrial animals. Development within the RSA could fragment existing vegetation into small, distinct segments surrounded by manmade structures instead of the existing continuous corridors, effectively removing travel corridors for any animals.

Farmland (Soils)

Potential cumulative impacts considered and discussed include direct impacts to farmland as a result of implementation of the proposed project in combination with the effects of potential induced growth and other past, present, and reasonably foreseeable actions. The approximately 81,870-acre RSA was considered sufficient to capture the cumulative effects of the proposed project on farmland because the RSA boundary follows topographical highs. Topography affects soil formation and development, and the chemical and physical properties of soil. These factors play a part in determining soil quality.

According to GIS data for soils obtained from the USDA and the Web Soil Survey,[17] there are approximately 40,567 acres of prime farmland and farmland of statewide importance in the RSA. Approximately 36,781 acres of prime farmland soils and farmland soils of statewide importance have/would be impacted by other past, present and reasonably foreseeable actions. This represents approximately 91 percent of the 40,567 acres of prime farmland soils and farmland soils of statewide importance in the RSA.

[17] http://websoilsurvey.sc.egov.usda.gov/App/WebSoilSurvey.aspx

Of the 36,781 acres of prime farmland potentially impacted by other past, present and reasonably foreseeable actions, 88 percent (32,431 acres) are located outside of the USCB 2017 Dallas-Fort Worth-Arlington, Denton Southwest, Denton-Lewisville and Justin, TX Urban Area and are potentially subject to the FPPA.

Step 4: The Overall Effects of the Proposed Project Combined with Other Actions

Vegetation and Wildlife Habitat

The cumulative impacts on non-urban vegetation and wildlife habitat resulting from the approximately 211.7 acres of direct impacts, 2,240.5 acres from induced growth impacts, and 44,055.5 acres of impacts from the previously described other past, present, and reasonably foreseeable actions would total approximately 46,507.7 acres. The cumulative impacts to vegetation and wildlife habitat would affect approximately 66 percent of the approximately 70,686.5 acres of non-Urban MOU Habitat-type vegetation within the RSA.

While cumulative impacts would affect approximately 46,507.7 acres of non-Urban MOU Habitat-type vegetation and potential wildlife habitat, it is likely that most of the wildlife that resides in the RSA would migrate to other areas of available non-human-altered habitat such as those protected within floodplain areas near rivers and streams. In addition, riparian areas are known to be migration corridors for wildlife. It is expected that these areas would not be adversely affected due to municipal protections to riparian resources within floodplains. That is, restrictions on construction within floodplains and tree preservation regulations make it probable that most of the riparian habitat within the RSA would not be subject to widespread removal. Based on the continued availability of protected habitat areas, the potential cumulative impact occurring over a 44-year period, allowing for resource recovery; and assuming appropriate implementation of regulated avoidance, minimization, and mitigation strategies for vegetation and habitat impacts, the proposed project would not contribute to substantial cumulative impacts to the area's vegetation and habitat.

Farmland (Soils)

The cumulative impact on prime farmland soils subject to the FPPA resulting from the approximately 86 acres of direct impacts, 1,507 acres from induced growth impacts, and 32,431 acres of impacts from the previously described other past, present, and reasonably foreseeable actions would total 34,024 acres. The cumulative impacts to prime farmland soils subject to the FPPA would affect approximately 69 percent of the approximately 49,088 acres of prime farmland soils subject to FPPA within the RSA.

Summary

Table 10 summarizes the information gathered in Steps 1 through 4 and presents the potential cumulative impacts to vegetation and wildlife habitat and farmland (soils) subject to the FPPA.

Table 10: Potential Cumulative Impacts to Vegetation and Wildlife Habitat and Farmland (Soils)

Vegetation Classification/Resource	Direct Impact (Acres)	Indirect Impact (Acres)	Past, Present, and Reasonably Foreseeable Projects (Acres)	Cumulative Impacts (Acres)
Agriculture	5	225.6	8,929.1	9,159.7
Crosstimbers Woodland and Forest	53.1	585.5	6,857.5	7,496.1
Disturbed Prairie	12.4	75.2	1,491.5	1,579.1
Edwards Plateau Savannah, Woodland, and Shrubland	14.5	315.0	4,531.2	4,860.7
Riparian	47.9	49.3	3,327	3,424.2
Tallgrass Prairie, Grassland	78.8	989.9	18,919.2	19,987.9
Urban	549.4	115.3	3,553.6	4,218.3
Non-Urban Vegetation and Wildlife Habitat	**211.7**	**2,240.5**	**44,055.5**	**46,507.7**
Farmland (Soils) subject to FPPA	**86**	**1,507**	**32,431**	**34,024**

Source: Study Team (November 2019).

Step 5: Mitigation of Cumulative Effects

Farmland (Soils)

Private developers would not be subject to the FPPA for impacts to prime farmland soils and farmland soils of statewide importance. The Texas Farm and Ranch Lands Conservation Program (TFRLCP), created in 2005, is a grant-making program that provides landowners with financial incentives to conserve their land and productivity through Agricultural Conservation Easements. These easements restrict all future development while allowing the landowner to continue farming or ranching (American Farmland Trust, 2009). The TFRLCP was transferred from the Texas General Land Office (GLO) to TPWD in 2016. Approved grant projects awarded by the Texas GLO range in size from 175 acres to 2,995 acres and by the TPWD range in size from 144 acres to 7,229 acres. This type of program could be effective mitigation within the Farmland (Soils) RSA. The average farm size in Denton County is 120 acres.[18]

Incorporated areas can manage growth issues through local ordinances, such as zoning and subdivision ordinances. Development activities outside of the incorporated areas are under the jurisdiction of Collin, Dallas, Hunt, and Rockwall Counties, which use subdivision ordinances primarily to regulate lot sizes and density.

Vegetation and Wildlife Habitat

Incorporating parks, open spaces, and riparian corridors around and within developed areas would provide wildlife habitat and shelter. Planting these areas with native fruit or nut-bearing

[18] https://www.nass.usda.gov/Publications/AgCensus/2012/Online_Resources/County_Profiles/Texas/cp48121.pdf

trees and shrubs, and native grain-bearing grasses would provide food for wildlife and would help to mitigate impacts to habitat used by wildlife. This mitigation could be conducted by whoever is responsible for the impact such as a city or a developer. Private development within the associated municipalities within the RSA (Northlake, Flower Mound, Argyle, Denton and, to a lesser extent, Denton County) would be subject to the laws and ordinances regulating residential, commercial and industrial development set by each municipal government. Examples of municipal government regulations include the Town of Argyle's Tree Ordinance, Article 9 of the Town of Northlake's Design Standards, the Town of Flower Mound's Urban Forestry Program, and the City of Denton's Site Design Standards. Mitigation could include mandatory park areas or a limit on lot sizes. State and federal entities protect the quality of water and wildlife habitat in the area and additional development would follow the requirements of state and federal regulations.

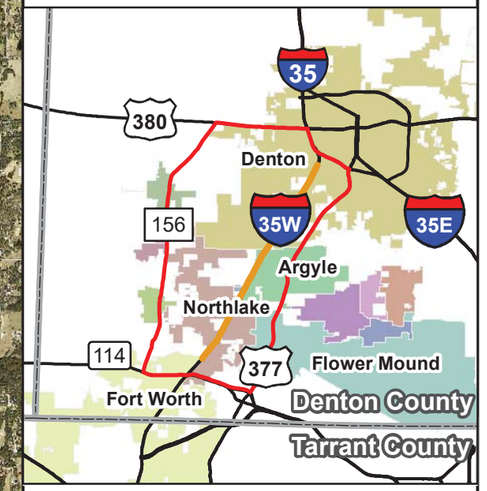
Appendix
Figures

Planned Developments		
Map ID	**Name**	**Development Type**
1	Northport Industrial	Industrial
2	Petrus	Residential
3	Indian Springs	Residential
4	Pecan Square	Residential
5	The Highlands	Residential
6	Avalon at Argyle	Mixed Residential and Commercial
7	Harvest	Residential
8	Heath Tract	Residential
9	The Ridge	Residential
10	Hunter Ranch	Mixed Residential and Commercial
11	Robson Ranch	Residential
12	Cole Ranch	Mixed Residential and Commercial

Potential Induced Growth	
Map ID	**Development Type**
A	Commercial/Mixed-Use
B	Commercial/Mixed-Use
C	Commercial
D	Commercial
E	Commercial
F	Commercial
G	Commercial
H	Community Facilities
I	Commercial
J	Office Retail
K	Hunter Ranch Commercial
L	Commercial
M	Commercial
N	Commercial

FIGURE 3
INDIRECT IMPACTS AREA OF INFLUENCE MAP
IH 35W FRONTAGE ROADS

FROM DALE EARNHARDT WAY
TO SOUTH OF THE IH 35E/IH 35W
INTERCHANGE
DENTON COUNTY
CSJ: 0081-13-065



0 2,500 5,000 Feet

N W E S

Legend

- Area of Influence
- Project Location
- Gas Well Pad Sites
- Cemetery
- Recreational
- Potential Induced Growth
- Planned Development
- Potential Wetlands
- Waters of the U.S.
- 100-Year Floodplains

Base Map Source: TNRIS (2018)

FIGURE 3
INDIRECT IMPACTS AREA OF INFLUENCE MAP
IH 35W FRONTAGE ROADS

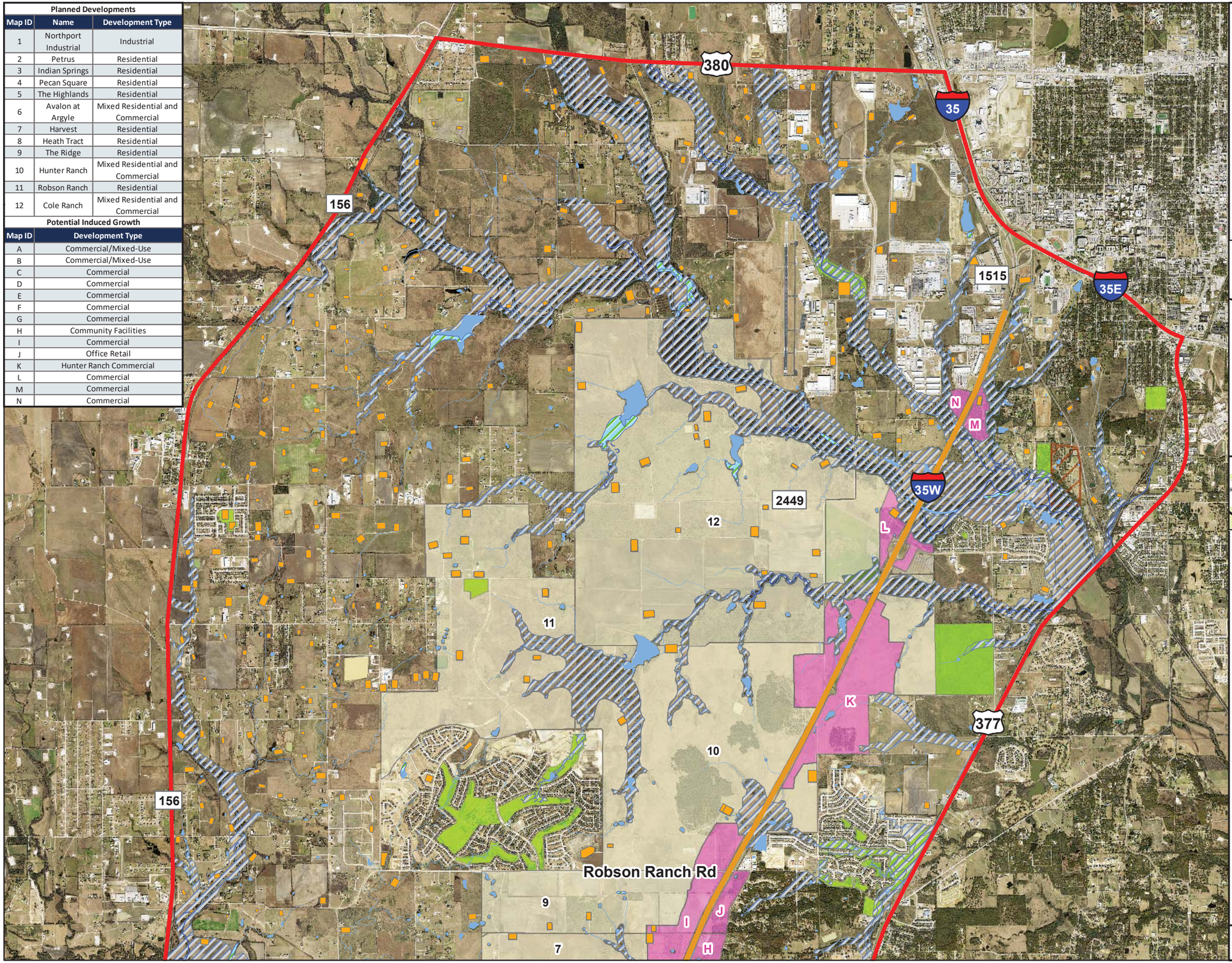
FROM DALE EARNHARDT WAY
TO SOUTH OF THE IH 35E/IH 35W
INTERCHANGE
DENTON COUNTY
CSJ: 0081-13-065

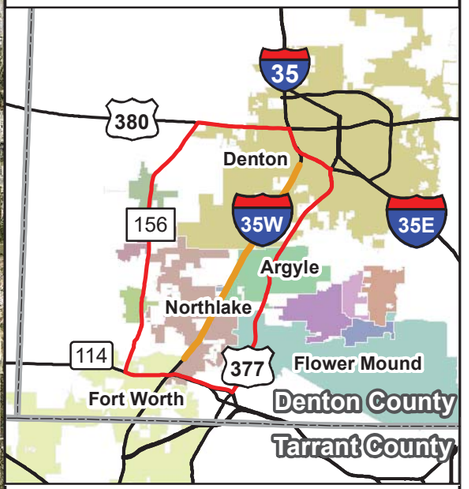
Planned Developments

Map ID	Name	Development Type
1	Northport Industrial	Industrial
2	Petrus	Residential
3	Indian Springs	Residential
4	Pecan Square	Residential
5	The Highlands	Residential
6	Avalon at Argyle	Mixed Residential and Commercial
7	Harvest	Residential
8	Heath Tract	Residential
9	The Ridge	Residential
10	Hunter Ranch	Mixed Residential and Commercial
11	Robson Ranch	Residential
12	Cole Ranch	Mixed Residential and Commercial

Potential Induced Growth

Map ID	Development Type
A	Commercial/Mixed-Use
B	Commercial/Mixed-Use
C	Commercial
D	Commercial
E	Commercial
F	Commercial
G	Commercial
H	Community Facilities
I	Commercial
J	Office Retail
K	Hunter Ranch Commercial
L	Commercial
M	Commercial
N	Commercial





0 2,500 5,000 Feet

N W E S

Legend

- Area of Influence
- Project Location
- Gas Well Pad Sites
- Cemetery
- Recreational
- Potential Induced Growth
- Planned Development
- Potential Wetlands
- Waters of the U.S.
- 100-Year Floodplains

Base Map Source: TNRIS (2018)

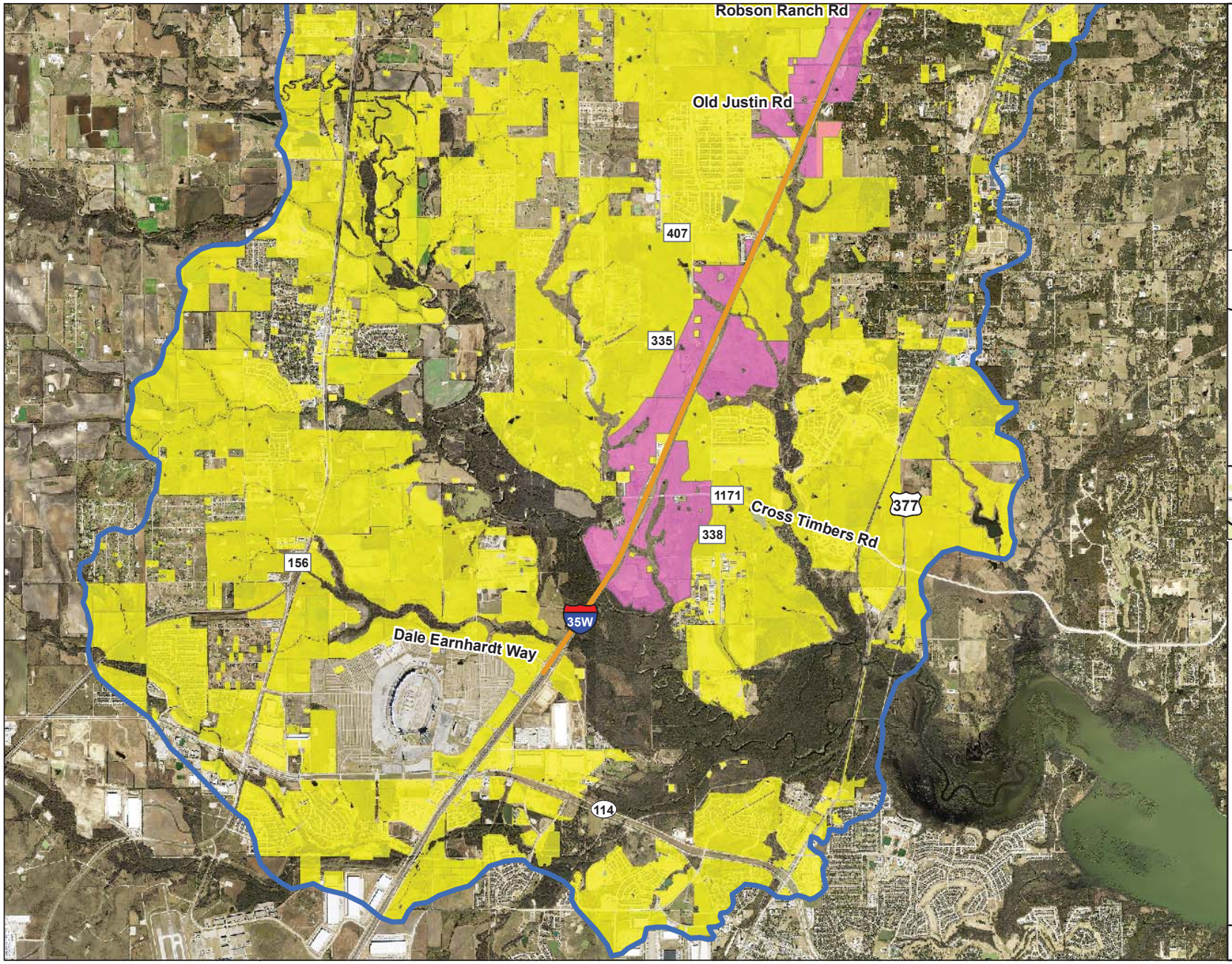
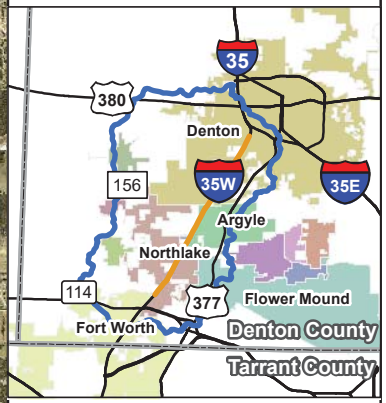


FIGURE 4
CUMULATIVE IMPACTS
RESOURCE STUDY AREA MAP

IH 35W FRONTAGE ROADS

FROM DALE EARNHARDT WAY
TO SOUTH OF THE IH 35E/IH 35W
INTERCHANGE
DENTON COUNTY
CSJ: 0081-13-065

Page 1 of 2



0 2,500 5,000 Feet

N
W E
S

Legend

- Project Location
- Resource Study Area
- Past, Present, and Reasonably Foreseeable Actions
- Potential Induced Growth

Base Map Source: TNRIS (2018)

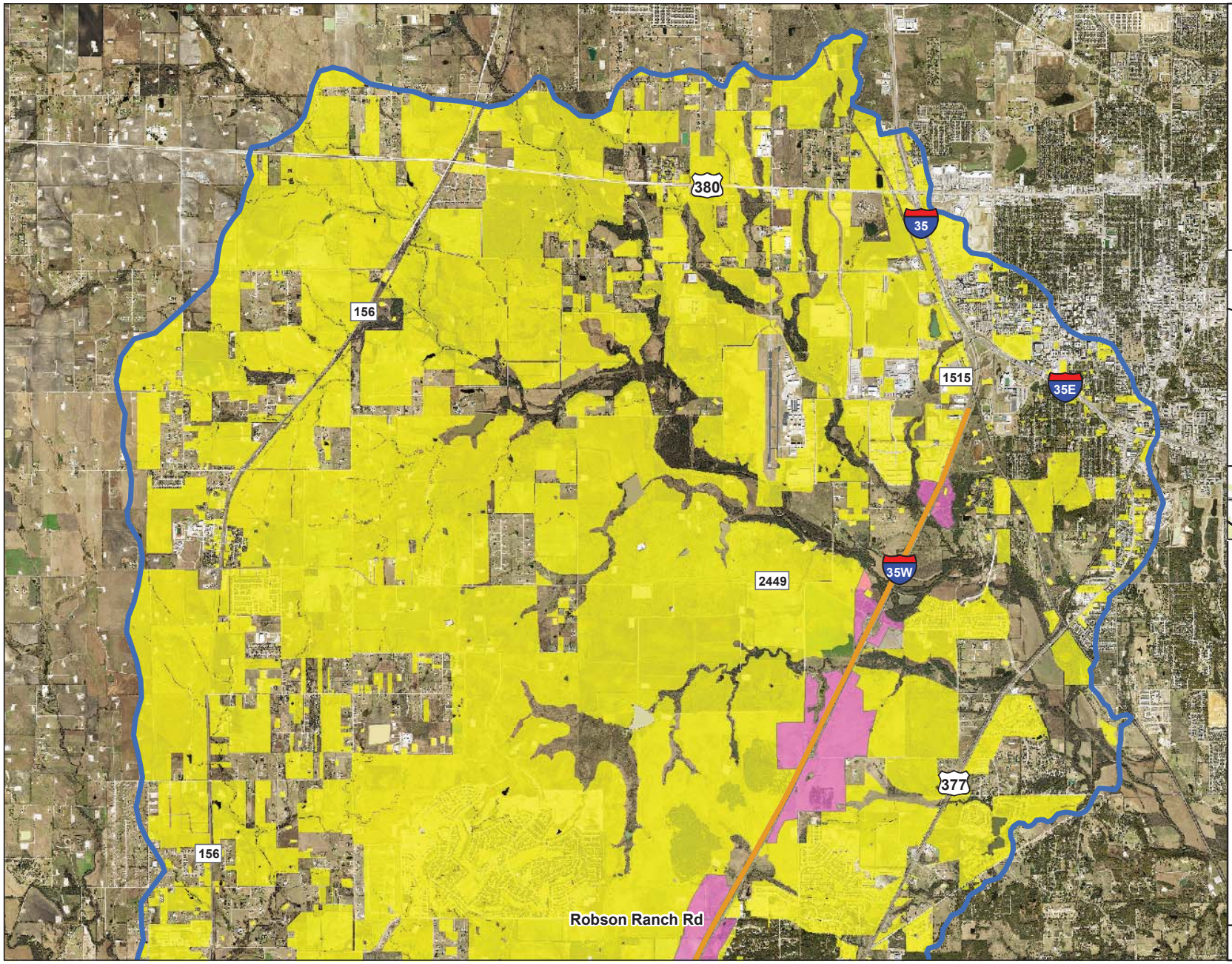
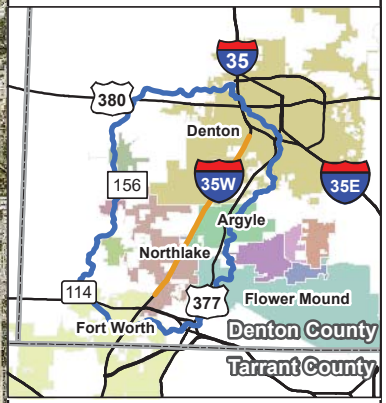


FIGURE 4
CUMULATIVE IMPACTS
RESOURCE STUDY AREA MAP

IH 35W FRONTAGE ROADS

FROM DALE EARNHARDT WAY
TO SOUTH OF THE IH 35E/IH 35W
INTERCHANGE
DENTON COUNTY
CSJ: 0081-13-065

Page 2 of 2



0 2,500 5,000 Feet

N
W E
S

Legend

- Project Location
- Resource Study Area
- Past, Present, and Reasonably Foreseeable Actions
- Potential Induced Growth

Base Map Source: TNRIS (2018)

Traffic Noise Analysis Technical Report

Interstate Highway 35 West (IH 35W) Frontage Roads

From: Dale Earnhardt Way

To: South of the IH 35E/IH35W Interchange

Denton County, Texas

Control-Section-Job (CSJ): 0081-13-065

Date: December 2019

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

THIS PAGE INTENTIONALLY LEFT BLANK

TABLE OF CONTENTS

LIST OF TABLES

APPENDIX A: FIGURES

- See the IH 35W Frontage Roads Environmental Assessment Appendix A – Maps
- See the IH 35W Frontage Roads Environmental Assessment Appendix F – Resource-specific Maps for the Noise Receiver Location Map

APPENDIX B: TRAFFIC DATA

- See the IH 35W Frontage Roads Air Quality Technical Report Appendix C – Traffic Data

I. INTRODUCTION

The Texas Department of Transportation (TxDOT) is proposing improvements to Interstate Highway 35 West (IH 35W) from Dale Earnhardt Way in the City of Fort Worth to south of the IH 35E/IH35W interchange in the City of Denton, Denton County, Texas; a distance of approximately 12.3 miles. The proposed project consists of the construction of continuous, one-way, two-lane urban, northbound and southbound frontage roads, along IH 35W. Other improvements would include changing the IH 35W ramp configuration from a conventional diamond to a reverse diamond (X ramp); flipping the Farm-to-Market (FM) 1171 (Cross Timbers Road), Old Justin Road, and John Paine Road/Allred Road interchanges so that the IH 35W mainlanes cross over these streets; constructing an interchange for the future Denton Creek Road, and expanding the Cleveland Gibbs Road, FM 407, Robson Ranch Road/Crawford Road, and proposed Loop 288/Vintage Road interchanges. The proposed project would require approximately 95.43 acres of additional right-of-way (ROW). See **Appendix A: Project Location Map, USGS Topographic Map,** and **Aerial Map**.

A. Need and Purpose

The proposed project is needed to address transportation issues associated with travel safety, population and employment growth, and access to development in the project corridor. The purpose of the project is to improve safety and provide access to adjacent land uses.

B. Existing Facility

Mainlanes

The existing IH 35W within the project limits does not contain frontage roads and consists of two 12-foot wide mainlanes in each direction with 4-foot to 6-foot wide inside shoulders and 9-foot to 12-foot wide outside shoulders separated by a 35 to 40-foot wide median.

Frontage Roads

At the north end of the project, the existing IH 35W contains an approximate 0.5-mile long, discontinuous, two-way, southbound frontage road consisting of two 12-foot wide lanes with a 10-foot wide outside shoulder and a 4-foot wide inside shoulder. The frontage road provides no access to IH 35W.

Entrance/ Exit Ramps

The existing northbound and southbound entrance and exit ramps consist of one 14-foot wide lane with 2-foot wide inside shoulders and 10-foot wide outside shoulders. All of the existing ramp configurations at interchanges are of a conventional diamond design.

Interchanges

The existing Dale Earnhardt Way at IH 35W consists of two 12-foot wide eastbound and westbound travel lanes separated by 14-foot wide two-way left-turn lane, and 10-foot wide outside shoulders. Dale Earnhardt Way crosses over the IH 35W mainlanes.

The existing FM 1171 (Cross Timbers Road) at IH 35W consists of one 12-foot wide travel lane in each direction. FM 1171 (Cross Timbers Road) crosses over the IH 35W mainlanes.

The existing Cleveland Gibbs Road at IH 35W consists of one 12-foot wide travel lane in each direction. Cleveland Gibbs Road crosses over the IH 35W mainlanes.

The existing FM 407 at IH 35W consists of one 12-foot wide travel lane in each direction separated by 14-foot wide two-way left-turn lane. FM 407 crosses under the IH 35W mainlanes.

The existing Old Justin Road at IH 35W consists of one 12-foot wide travel lane in each direction. Old Justin Road crosses over the IH 35W mainlanes. There is no access to IH 35W from Old Justin Road.

The existing Robson Ranch Road west of IH 35W consists of one eastbound 12-foot wide travel lane, one eastbound 12-foot wide dedicated right-turn lane, and two westbound 12-foot wide travel lanes. The existing Crawford Road at IH 35W consists of one eastbound 12-foot wide travel lane and one westbound 12-foot wide travel lane. The IH 35W mainlanes cross over Robson Ranch Road/Crawford Road.

The existing John Paine/Allred Road at IH 35W consists of one eastbound 12-foot wide travel lane and one westbound 12-foot wide travel lane. John Paine/Allred Road crosses over the IH 35W mainlanes. There is no access to IH 35W from John Paine/Allred Road.

The existing FM 2449/Vintage Road at IH 35W consists of one eastbound 12-foot wide travel lane and one westbound 12-foot wide travel lane. The FM 2449/Vintage Road crosses over the IH 35W mainlanes.

C. Proposed Facility

Mainlanes

The proposed project includes replacement of the existing IH 35W cross-street overpasses with new overpasses at IH 35W/Cross Timbers Road, IH 35W/FM 407, IH 35W/Old Justin Road, IH 35W/Robson Ranch Road/Crawford Road, and IH 35W/John Paine Road/Allred Road. The width of the bridge structures is based on the ultimate IH 35W mainlanes. Constructing the ultimate bridge structures along with changing the IH 35W ramp configuration from a conventional diamond to a reverse diamond (X ramp), requires portions of the ultimate IH 35W mainlanes to be constructed with transition pavement sections to tie back to the existing. The proposed mainlanes at the interchanges would consist of three

12-foot wide lanes in each direction with 10-foot wide inside shoulders and 12-foot wide outside shoulders.

Frontage Roads

The proposed northbound and southbound frontage roads would consist of one 12-foot wide inside travel lane, one 14-foot wide outside shared use lane with 2-foot wide curb offsets, and a 6-foot wide sidewalk in each direction.

The proposed northbound and southbound frontage road bridges would consist of one 12-foot wide inside travel lane, one 14-foot wide outside shared use lane with two-foot wide inside and outside shoulders, and an 8-foot wide sidewalk in each direction.

Entrance/ Exit Ramps

The proposed northbound and southbound entrance and exit ramps would consist of one 14-foot wide lane with 4-foot wide inside shoulders and 8-foot wide outside shoulders. All of the proposed ramp configurations at interchanges would be of a reverse diamond (X ramp) design.

Interchanges

The proposed Dale Earnhardt Way at IH 35W would consist of one inside 12-foot wide travel lane, one 14-foot wide outside shared use lane with a 2-foot wide curb offset, a 10-foot wide outside median, and a 20-foot wide U-turn lane with 2-foot wide inside and outside curb offsets in each direction. The eastbound and westbound roadways would be separated by a 14-foot wide two-way left-turn lane.

The proposed FM 1171 (Cross Timbers Road) at IH 35W would consist of one inside 12-foot wide dedicated left-turn lane with a 2-foot wide inside curb offset, two 12-foot wide travel lanes, one 14-foot wide outside shared use lane with a 2-foot wide outside curb offset, an 18-foot wide outside median, and a 20-foot wide U-turn lane with 2-foot wide inside and outside curb offsets in each direction. FM 1171 (Cross Timbers Road) would be flipped so that the IH 35W mainlanes cross over FM 1171 (Cross Timbers Road).

The proposed eastbound Cleveland Gibbs Road at IH 35W would consist of one inside 12-foot wide dedicated left-turn lane with a 2-foot wide inside curb offset, one 12-foot wide travel lane, and one outside 14-foot wide shared use lane. The westbound roadway would consist of one inside 12-foot wide dedicated left-turn lane with a 2-foot wide inside curb offset, one 12-foot wide travel lane, one 14-foot wide outside shared use lane with a 2-foot wide outside curb offset, an 18-foot wide outside median, and a 20-foot wide U-turn lane with 2-foot wide inside and outside curb offsets. The interchange would be relocated approximately 400 feet north of its existing location and would tie into a future Cleveland Gibbs Road designed and constructed by others.

The proposed eastbound Denton Creek Road at IH 35W is a new interchange and would consist of one inside 12-foot wide dedicated left-turn lane with a 2-foot wide inside curb offset, one 12-foot wide travel lane, one 14-foot wide outside shared use lane with a 2-foot wide outside curb offset, an 18-foot wide outside median, and a 20-foot wide U-turn lane with 2-foot wide inside and outside curb offsets. The westbound roadway would consist of one inside 12-foot wide dedicated left-turn lane with a 2-foot wide inside curb offset, one 12-foot wide travel lane, and one outside 14-foot wide shared use lane. The new interchange would tie into a future Denton Creek Road designed and constructed by others.

The proposed FM 407 at IH 35W would consist of one inside 12-foot wide dedicated left-turn lane with a 2-foot wide inside curb offset, two 12-foot wide travel lanes, one 14-foot wide outside shared use lane with a 2-foot wide outside curb offset, an 18-foot wide outside median, and a 20-foot wide U-turn lane with 2-foot wide inside and outside curb offsets in each direction.

The proposed Old Justin Road at IH 35W interchange would consist of one inside 12-foot wide dedicated left-turn lane with a 2-foot wide inside curb offset, one 12-foot wide travel lane, one 14-foot wide outside shared use lane with a 2-foot wide outside curb offset, an 18-foot wide outside median, and a 20-foot wide U-turn lane with 2-foot wide inside and outside curb offsets in each direction. Old Justin Road would be flipped so that the IH 35W mainlanes cross over Old Justin Road and access from Justin Road to IH 35W would be provided via ramps.

The proposed Robson Ranch Road/Crawford Road at the IH 35W interchange would consist of one inside 12-foot wide dedicated left-turn lane with a 2-foot wide inside curb offset, one 12-foot wide travel lane, one 14-foot wide outside shared use lane with a 2-foot wide outside curb offset, an 18-foot wide outside median, and a 20-foot wide U-turn lane with 2-foot wide inside and outside curb offsets in each direction.

The proposed Loop 288/Vintage Road (FM 2499) at the IH 35W interchange would consist of one inside 12-foot wide dedicated left-turn lane with a 2-foot wide inside curb offset, one 12-foot wide travel lane, one 14-foot wide outside shared use lane with a 2-foot wide outside curb offset, an 18-foot wide outside median, and a 20-foot wide U-turn lane with 2-foot wide inside and outside curb offsets in each direction.

II. NOISE ASSESSMENT

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

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

Sound occurs over a wide range of frequencies. However, not all frequencies are detectable by the human ear; therefore, an adjustment is made to the high and low frequencies to

approximate the way an average person hears traffic sounds. This adjustment is called A-weighting and is expressed as "dB(A)."

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

The traffic noise analysis typically includes the following elements:

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

The FHWA has established the following Noise Abatement Criteria (NAC) for various land use activity areas that are used as one of two means to determine when a traffic noise impact would occur (**Table 1**).

Table 1: FHWA Noise Abatement Criteria

Activity Category	dB(A) Leq	Description of Land Use Activity Areas
A	57 (exterior)	Lands on which serenity and quiet are of extra-ordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose.
B	67 (exterior)	Residential
C	67 (exterior)	Active sport areas, amphitheaters, auditoriums, campgrounds, cemeteries, day care centers, hospitals, libraries, medical facilities, parks, picnic areas, places of worship, playgrounds, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, recreation areas, Section 4(f) sites, schools, television studios, trails, and trail crossings.
D	52 (interior)	Auditoriums, day care centers, hospitals, libraries, medical facilities, places of worship, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, schools, and television studios.
E	72 (exterior)	Hotels, motels, offices, restaurants/bars, and other developed lands, properties, or activities not included in A-D or F.
F	--	Agricultural, airports, bus yards, emergency services, industrial, logging, maintenance facilities, manufacturing, mining, rail yards, retail facilities, shipyards, utilities (water resources, water treatment, electrical), and warehousing.
G	--	Undeveloped lands that are not permitted.

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

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

Relative criterion - The predicted noise level substantially exceeds the existing noise level at a receiver even though the predicted noise level does not approach, equal or exceed the NAC. “Substantially exceeds” is defined as more than 10 dB(A). For example, a noise impact would occur at a Category B residence if the existing level is 54 dB(A) and the predicted level is 65 dB(A).

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

The FHWA traffic noise modeling software was used to calculate existing and predicted traffic noise levels. The model primarily considers the number, type and speed of vehicles; highway alignment and grade; cuts, fills and natural berms; surrounding terrain features; and the locations of activity areas likely to be impacted by the associated traffic noise. Existing year traffic (2025) and proposed year (2045) volumes utilized in the model were approved by TxDOT – Transportation Planning and Programing Division (TPP) (**APPENDIX B: Traffic Data**).

Existing and predicted traffic noise levels were modeled at receiver locations (**Table 2** and **APPENDIX A: Noise Receiver Location Map**) that represent the land use activity areas adjacent to the proposed project that might be impacted by traffic noise and potentially benefit from feasible and reasonable noise abatement.

Table 2: Traffic Noise Levels dB(A) Leq

Representative Receiver	NAC Category	NAC Level	Existing	Predicted 2045	Change (+/-)	Noise Impact
R1 - Single-family Residential	B	67	61	62	+1	No
R2 - Single-family Residential	B	67	51	53	+2	No
R3 - RV Park	B	67	69	73	+4	Yes
R4 – Townhome Phase 2 - Single-family Residential	B	67	63	66	+3	Yes
R5 – Townside Phase 2 - Single-family Residential	B	67	63	66	+3	Yes
R6 - Single-family Residential	B	67	61	64	+3	No
R7 - Single-family Residential	B	67	52	55	+3	No
R8 - Women's Heath Surgical Hospital	D	52	40	46	+6	No
R9 - Single-family Residential	B	67	56	61	+5	No
R10 - Single-family Residential	B	67	54	57	+3	No
R11 - Single-family Residential	B	67	54	57	+3	No
R12 - Mean Green Village (UNT baseball field, bleacher seating)	B	67	57	62	+5	No
R13 - Apogee Stadium (football field, bleacher seating)	B	67	51	53	+2	No

As indicated in **Table 2**, the proposed project would result in traffic noise impact to the three receivers. The following noise abatement measures were considered: traffic management; alteration of horizontal and/or vertical alignments; acquisition of undeveloped property to act as a buffer zone; and the construction of noise barriers.

Before any abatement measure can be proposed for incorporation into the project, it must be both feasible and reasonable. In order to be "feasible," the abatement measure must be able to reduce the noise level at greater than 50% of impacted, first row receivers by at least five dB(A); in order to be "reasonable," it must not exceed the cost-effectiveness criterion of $25,000 for each receiver that would benefit by a reduction of at least five dB(A) and the abatement measure must be able to reduce the noise level at least one impacted, first row receiver by at least seven dB(A).

Traffic management - Control devices could be used to reduce the speed of the traffic; however, the minor benefit of one dB(A) per five miles per hour reduction in speed does not outweigh the associated increase in congestion and air pollution. Other measures such as time or use restrictions for certain vehicles are prohibited on state highways.

Alteration of horizontal and/or vertical alignments - Any alteration of the existing alignment would displace existing businesses and residences, require additional right of way (ROW) and not be cost effective/reasonable.

Buffer zone: the acquisition of undeveloped property to act as a buffer zone is designed to avoid rather than abate traffic noise impacts and, therefore, is not feasible.

Noise barriers - This is the most commonly used noise abatement measure. Noise barriers were evaluated for each of the impacted receiver locations.

Noise barriers would not be feasible and reasonable for the following impacted receivers and, therefore, are not proposed for incorporation into the project:

R3 – This receiver represents 42 residences of a RV park. Three 20-foot tall noise barriers (480 feet long, 770 feet long, and 80 feet long) along the proposed ROW would not achieve the minimum feasible reduction of 5 dBA for at least 50 percent of the first-row receivers or the 7dB(A) design goal for at least one receiver. Two 20-foot tall noise barriers (1,296 feet long and 654 feet long) between the main lanes and frontage road would achieve the minimum feasible reduction of 5 dBA for at least 50 percent of the first-row receivers, but would fail to meet the 7dB(A) design goal for at least one receiver.

R4 and R5 – These receivers represent 37 residences in two areas (Townhome Phase 2 and Townside Phase 2) of a new subdivision. Two 20-foot tall noise barriers (1,065 feet long and 2,136 feet long) along the proposed ROW would not achieve the minimum feasible reduction of 5 dBA for at least 50 percent of the first-row receivers or the 7dB(A) design goal for at least one receiver. Two 20-foot tall noise barriers (1,420 feet long and 2,511 feet long) between the main lanes and frontage road would not achieve the minimum feasible reduction of 5 dBA for at least 50 percent of the first-row receivers or the 7dB(A) design goal for at least one receiver.

None of the above noise abatement measures would be both feasible and reasonable; therefore, no abatement measures are proposed for this project.

Any subsequent project design changes may require a reevaluation of this preliminary noise barrier proposal. The final decision to construct the proposed noise barrier will not be made until completion of the project design, utility evaluation, and polling of adjacent property owners.

However, to avoid noise impacts that may result from future development of properties adjacent to the project, local officials responsible for land use control programs must ensure, to the maximum extent possible, no new activities are planned or constructed along or within the following predicted (2045) noise impact contours (**Table 3**).

Table 3: Noise Impact Contours in the Project Study Area

Limits	Land Use NAC Category	Impact Contour*	Distance from Proposed ROW Line
Dale Earnhardt Way to FM 1171	B & C	66 dB(A)	265 feet
	E	71 dB(A)	30 feet
FM 1171 to IH 35E/IH35W Interchange	B & C	66 dB(A)	200 feet
	E	71 dB(A)	5 feet

* Impact contours are one dB(A) lower than the NAC per category to reflect impacts that would occur as a result of approaching the NAC for the respective contours.

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

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

Waters of the U.S. Delineation Report

Interstate Highway 35 West (IH 35W): From Dale Earnhardt Way to South of the IH 35E/IH 35W Interchange

CSJ: 0081-13-065

Texas Department of Transportation, Fort Worth District

November 2019

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

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 IH 35W from Dale Earnhardt Way to south of the IH 35E/IH 35W interchange near Denton, Denton County, Texas (CSJ 0081-13-065). The delineation was conducted on August 14-15 and 22-23, 2019.

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 2010 Regional Supplement. The 2010 Regional Supplement presents wetland indicators, delineation guidance, and other information that is specific to the Great Plains, 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 three (3) attachments:

- Attachment 1 – See the IH 35W Frontage Roads Environmental Assessment for maps.
- Attachment 2 – Wetland Determination Data Forms: documents the three (3) criteria for wetlands at all sample points.

2.0 Project Overview

For a detailed project overview, refer to the Project Description in the Purpose and Need document.

3.0 Ecological Site Description

According to the NRCS *Land Resource Regions and Major Land Resource Areas of the United States, the Caribbean, and the Pacific Basin* (NRCS 2006) document, the project is within the 'J' Land Resource Region (LRR). This is defined as the Southwestern Prairies Cotton and Forage Region. This region runs north-south from SE Kansas, through central Oklahoma, down towards south central Texas. Moderate precipitation is paired with moderately high temperatures. Soils are dominantly Mollisols, Entisols, Alfisols, and Vertisols. The native vegetation consists mainly of grasses and scattered tress, with the trees mostly concentrated in the Cross Timbers area. Grazing is the dominant land use in most of the region, but hay, grain sorghum, and small grains are grown in areas where the soils, topography, and moisture supply are favorable.

Within the 'J' LRR, the project area is more specifically located within the MLRA subregions of Grand Prairie and East Cross Timbers. The southern section of the project area is within the Grand Prairie MLRA. The Grand Prairie MLRA is characterized by gently rolling to hilly, dissected limestone plateaus and adjacent gently sloping valleys. Native vegetation within the area consists of mid and tall grasses interspersed with scattered oaks. The northern section is within the East Cross Timbers MLRA. This region is characterized by gently sloping to rolling uplands that are moderately dissected. Hills and ridges rise prominently above the surrounding landscape. Native vegetation within the area consists of mid and tall grasses interspersed with blackjack oak and post oak. Area supports savannah vegetation with an understory of tall grasses.

According to the Ecological Mapping Systems of Texas General Phase Map, the project is within the Cross Timbers Ecoregion (TPWD 2014). The vegetation types confirmed within the project area during the site survey consist of Central Texas: Floodplain Deciduous Shrubland, Floodplain Hardwood / Evergreen Forest, Floodplain Herbaceous Vegetation, Riparian Deciduous Shrubland, Riparian Hardwood Forest, and Riparian Herbaceous Vegetation. The vegetation types also consist of Crosstimbers: Post Oak Woodland and Savannah Grassland, Edwards Plateau: Oak / Ashe Juniper Slope Forest, Oak / Hardwood Motte and Woodland, Savanna Grassland, Grand Prairie: Tallgrass Prairie, Native Invasive: Deciduous Woodland, Urban High Density, and Urban Low Density.

The current conditions of the project site are under normal circumstances. Project site had above average rainfall in the spring coupled with below average rainfall in the summer. Most of the project area is within existing TxDOT ROW. New ROW along the project is in mostly disturbed urban and agricultural land use areas.

4.0 Methods

4.1 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.

4.1.1 USGS Topographic Maps

USGS topographic maps illustrate elevation contours, drainage patterns, and hydrography. The Justin, Argyle, and Denton West, Texas, USGS Quad maps were reviewed to determine the likelihood of the project area containing jurisdictional waterbodies.

4.1.2 USFWS NWI Data

NWI data was reviewed as a contributing resource to help identify potential wetland features located within the project area. The mapped NWI can be seen in ***Exhibit 5***.

4.1.3 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.

4.1.4 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.

4.1.5 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.

4.1.6 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 obtained for the Justin, Argyle, and Denton West, Texas, USGS Quad to evaluate elevation changes throughout the project area.

4.2 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. There are no tidal waterbodies within the project limits.

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 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 R1 Global Positioning System (GPS), capable of sub-meter accuracy

4.2.1 **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.

4.2.2 **Vegetation**

In accordance with the procedure set forth in the 1987 Manual and the 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 updated 2018 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.

4.2.3 **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.

5.0 Results

5.1 Map and Database Review

5.1.1 USGS Topographic Maps

According to the Justin, Argyle, and Denton West U.S. Geologic Survey (USGS) topographic map, 7.5-minute series quadrangles, elevations within the proposed project ranged from a low of approximately 550 feet above mean sea level (msl) at the Denton Creek crossing, near the southern end of the proposed project to a high approximately 730 feet above msl in the central section of the proposed project at the southbound entrance ramp from Robson Ranch Road **(*Exhibit 3: USGS Topographic Map*).** The proposed project is located in the Trinity River Basin and intersects a total of 27 stream crossings. These crossings include Catherine Branch, Denton Creek, Cleveland Branch Graham Branch, Roark Branch, Hickory Creek, and several other streams that are associated with these mentioned crossings. Within the project area, surface topography consists of gently sloping hills with elevations ranging from approximately 550-ft. to 730-ft. above sea level. Topography and drainage patterns within most of the project area generally slope and flow ultimately towards either Lake Grapevine or Lake Lewisville, both several miles outside of the Right-of-Way, via roadside ditches, larger perennial streams, or small unnamed ephemeral to intermittent tributary creeks. Open Water 1 is the only open body of water observed inside of the proposed project area

5.1.2 USFWS NWI Data

According to NWI maps, the proposed project would cross two NWI classified wetland areas and six open water areas. The table below summarizes the NWI features within the project area. Refer to ***Figure 5*** 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
PFO1A (2)	Palustrine System, Forested, Broad-Leaved Deciduous, Temporary Flooded	Wetland
PUBHh (1)	Palustrine System, Unconsolidated Bottom, Permanently Flooded, Diked/Impounded	Open Water
PUSCx (1)	Palustrine System, Unconsolidated Shore, Seasonally Flooded, Excavated	Open Water
PUBFx (1)	Palustrine System, Unconsolidated Bottom, Semi Permanently Flooded, Excavated	Open Water
PUBF (3)	Palustrine System, Unconsolidated Bottom, Semi Permanently Flooded	Open Water

5.1.3 **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 ***Exhibit 6*** in ***Attachment 1*** for an illustration of the mapped soil units in and surrounding the project area. Only one mapped soil unit is listed as hydric; Frio silty clay.

Table 2 Denton County Soils Located with the Proposed Project

Soil Type	Map Symbol	Soil Description
Aledo association, undulating	1	This association is made up of shallow and very shallow soils on upland ridges and their side slopes. These soils are well drained and surface runoff and permeability are medium. Available water capacity is very low, although some water seeps to the surface above the rock outcrops during wet seasons. This Aledo association is used as rangeland. The potential for urban and recreational development is medium because of the slope and rock outcrops.
Altoga silty clay, 2 to 5 percent slopes	2	This deep, clayey, gently sloping soil is on high terraces of major streams. The soil is well drained, runoff is medium, and permeability is moderate. The available water capacity is high. This Altoga soil is used mainly as pastureland, but some areas are planted to small grain. Potential for pastureland and rangeland are high. Crop and recreation potential use is medium.
Altoga Silty Clay, 5 to 8 percent slopes	3	This deep clayey, sloping soil is on old high terraces of major streams with convex slopes. This soil is well drained, runoff is medium, and water capacity is high. Hazard for water erosion is high. Range production potential is high, crop production potential is low, and pasture production is medium.
Altoga silty clay, 5 to 12 percent slopes, eroded	4	This deep, clayey, sloping to strongly sloping, eroded soil is on old high terraces of major streams. Eroded areas make up about 40 percent of the map areas. This soil is well drained, permeability is moderate and the available water capacity is high. Runoff is medium, the hazard for erosion is severe and erosion is active in most areas. Included in mapping are small areas of less sloping Altoga and Lewisville soils. Range potential is high, pasture potential is low and recreational potential is medium.
Arents, gently undulating	6	These deep, loamy soils are within mined out sand and gravel pits in which the remaining soil material has been smoothed and re-vegetated to grass. They are on the lower parts of the landscape, mainly stream terraces. Included in mapping area small pits that usually contain water. The potential for range and pasture is medium and the potential for crops and recreation is low.
Branyon clay, 0 to 1 percent slopes	18	This deep, nearly level soil is on broad, smooth valley fills and ancient terraces. The soil is moderately, well drained. Runoff is slow, and permeability is very slow. The available water capacity is high. When the soil is dry it has cracks that extend 30 to 60 inches. Crop, pasture and rangeland potential is high.

Soil Type	Map Symbol	Soil Description
Branyon Clay, 1 to 3 percent slopes	19	This deep, gently sloping soil is located in valley fill areas and on side slopes around the outer edges of ancient terraces. This soil is moderately well drained. Runoff is medium. Permeability is very slow. Available water capacity is high. When the soil is dry, it has cracks that extend from depths of 30 to 60 inches. The potential for rangeland is high.
Burleson clay, 0 to 1 percent slopes	21	This deep, nearly level soil is on ancient upland terraces. The surface is smooth and areas are mainly rounded. This soil is moderately well drained, while runoff is slow, and permeability is very slow. Available water capacity is high. This Burleson soil is used as cropland, pasture, and rangeland. Potential for recreational development is low.
Burleson clay, 1 to 3 percent slopes	22	This deep, gently rolling soil is on valley fills and edges and upland terraces. It is moderately well drained and runoff is medium. Permeability is very slow and available water capacity is high. This Burleson soil is used mainly for improved pasture and with a few areas in rangeland. The potential for recreational development is low for this soil due to its clayey texture and very slow permeability.
Callisburg fine sandy loam, 3 to 5 percent slopes	24	This deep, gently sloping soil is on low sides of ridges. This soil is well drained and runoff is medium. Permeability is moderately slow and the available water capacity is high. This Callisburg soil is used as pasture and rangeland. The potential for most recreational development is high with the moderately slow permeability being the only limitation.
Frio silty clay, occasionally flooded	33	This deep soil is located on floodplains of major streams. The soil is well drained with slow runoff and moderately slow permeability. The available water capacity for this soil is high. Some areas are subject to flooding for less than 2 days duration about once each 5 to 10 years. Small areas of Ovan and Trinity soils are included within the mapping area. This Frio soil is mainly used for crops and pasture, although the soil is difficult to work when the moisture level is high.
Frio silty clay, frequently flooded	34	This is a deep nearly level soil located on floodplains of major streams. The soil is well drained with slow runoff and moderately slow permeability. The available water capacity for the soil is high. This soil is subject to flooding one to three times each year. Floodwaters are normally of low velocity and less than four feet deep. The hazard of flooding limits the use of this soil. Small areas of Gowen, Ovan and Trinity soils are included within the mapping area. This Frio soil is mainly used for pasture, rangeland and wildlife, although the soil is difficult to work when the moisture level is high.

Soil Type	Map Symbol	Soil Description
Gasil fine sandy loam, 1 to 3 percent slopes	35	This deep, gently sloping soil is on slight convex ridges and areas that have a smooth surface. This soil is well drained, runoff is slow and permeability is moderate. Available water capacity is high and the hazard of erosion is medium. This Gasil soil is used mainly for pasture and its potential for this use medium. The potential for crops is high on this soil, but only a few areas are cultivated because the mapped areas are so small. There is some urban development on this soil near cities.
Gasil fine sandy loam, 3 to 8 percent slopes	36	This deep, gently sloping soil is on convex ridges and side slopes. This soil is well drained, permeability is moderate and the available water capacity is high. Runoff is slow and the hazard for erosion is severe when the ground is bare. Included in mapping area small areas of Konsil and Silstid soils. This soil has a medium potential for pasture, crops and rangeland. Its use as wildlife and recreation is high.
Gowen clay loam, frequently flooded	40	This deep, nearly level soil is on flood plains of major streams. The soil is well drained, permeability is moderate and the available water capacity is high. Runoff is slow and flooding is a major hazard. Included in mapping are small areas of Bunyan soils. The potential for range and pasture is high, low for recreational development and medium for wildlife.
Justin fine sandy loam, 1 to 3 percent slopes	46	This deep, gently sloping soil is on plane to convex foot slopes. The soil is very well drained and runoff is medium. Permeability is moderately slow and available water capacity is high. The hazard for erosion is moderate. This Justin soil is used mainly for pasture, while the potential for recreational development and open land wildlife habitat are high.
Justin fine sandy loam, 3 to 5 percent slopes	47	This deep, gently sloping soil is on convex narrow bands on the lower part of foot slopes and ridges. This soil is well drained, permeability is moderately slow and the available water capacity is high. Runoff is medium and the hazard for erosion is moderate. Included in mapping are small areas of Navo soils. The potential for range, pasture and recreation is high while the potential for crops is medium.
Lindale clay loam, 1 to 3 percent slopes	54	This deep, gently sloping soil is located on convex ridges. Soil areas have a smooth surface and are subrounded. It is well drained, and runoff is medium. Permeability is slow and available water capacity is medium. The hazard of erosion is moderate. This soil is used for pasture, crops, and rangeland. Potential for recreational development is medium, with slow permeability and clay loam texture being the main limitations.

Soil Type	Map Symbol	Soil Description
Medlin-Sanger clays, 5 to 15 percent slopes	56	These sloping to moderately steep soils are on sides of ridges. About 60 percent of this complex is Medlin soils, about 30 percent is Sanger soils and about 10 percent other soils. The soils occur in patterns too intricate to be delineated at the scale mapped. The soils in this complex are well drained, permeability is very slow and available water capacity is high. Runoff is rapid and the hazard of erosion is severe. The complex is used as rangeland. Potential for recreational development is low due to the slope and clayey texture.
Medlin-Sanger stony clays, 5 to 15 percent slopes	57	These sloping to strongly sloping soils are on convex side slopes with limestone rock strata at each 10 to 20 feet of change in elevation. About 45 percent of this complex is made up of stony Medlin soils, about 25 percent is stony Sanger soils, and 30 percent is other soils and rock outcrop. These soils are so intricately mixed that separation is not practical at the scale mapped. The soils are well drained, permeability is very slow, and available water capacity is high. Runoff is rapid, and the hazard of erosion is severe. These soils are used as rangeland and potential for recreational development is low due to the clayey surface layer and large stones.
Mingo clay loam, 1 to 3 percent slopes	58	This moderately deep, gently sloping soil is on convex, slight ridges and side slopes between valley fills and high limestone ridges. It is well drained and runoff is medium. Permeability is very slow and available water capacity is low. This Mingo soil is used mainly for crops and rangeland. Potential for recreational development is medium because of very slow permeability and the clay loam surface layer.
Navo clay loam, 0 to 1 percent slopes	59	This deep, gently sloping, loamy soil is on side slopes and low ridges along drainageways. The soil is moderately well drained with very slow permeability and high available water capacity. Surface runoff and the hazard of erosion are moderate. The root zone is deep although plants have difficulty penetrating the clayey lower layers. Navo clay loam is well suited as pasture; and moderately suited to cropland, urban development and recreational uses. Small areas of Wilson soil are included in this map unit. Good vegetative cover provides habitat for small to medium wildlife and birds.
Navo clay loam, 1 to 3 percent slopes	60	This deep, gently sloping soil is on sides along the drains and low hills. Soil areas have a smooth surface and are subrounded. It is well drained, permeability is very slow, and available water capacity is high. Runoff is medium, and the hazard of erosion is high. This Navo soil is used mainly for pasture and crops. Potential for recreational development is low due to the very slow permeability and clay loam texture. Use of loamy fill material and maintaining a good grass cover can help to overcome these limitations.

Soil Type	Map Symbol	Soil Description
Ovan clay, occasionally flooded	63	This deep, nearly level soil is on floodplains along major streams. Soil areas are longer than they are wide and range from 50 to 600 acres. This soil is moderately well drained. Surface runoff is slow. Permeability is very slow. Used for pasture and crops, and the potential for these uses is high. Potential for rangeland is high. Potential for recreational use is low.
Ponder loam, 0 to 1 percent slopes	65	This deep, nearly level soil is in broad valley fill areas. Soil areas have a smooth surface and are subrounded. This soil is well drained and runoff is slow. Permeability is very slow and available water capacity is medium. This Ponder soil is used for pasture, crops, rangeland, and urban development.
Ponder loam, 1 to 3 percent slopes	66	This deep, gently sloping soil is on low convex ridges and in valley fill areas. Soil areas have a smooth surface and are subrounded. It is very well drained and surface runoff is medium. Permeability is very slow and available water capacity is medium. The hazard of erosion is moderate. This Ponder soil is used for pasture, crops, rangeland, and urban development.
Sanger clay, 1 to 3 percent slopes	67	This deep, gently sloping soil is in valley fill areas between limestone ridges. Soil areas are subrounded. It is well drained and runoff is medium. Permeability is very slow and available water capacity is high. The hazard of erosion is moderate. Potential for recreational use is low because the soil has very slow permeability and clayey texture.
Sanger clay, 3 to 5 percent slopes	68	This deep, gently sloping soils is in valley fill areas and on sides of ridges. This soil is well drained and runoff is medium. Permeability is very slow and available water capacity is high. The hazard of erosion is severe. This Sanger soil is used mainly as rangeland and pasture, but some fields are planted to small grain. Potential for recreational development is low due to the clayey texture and very slow permeability.
Slidell clay, 1 to 3 percent slopes	74	This deep, gently sloping soil is located in valley fill areas and in the low landscape positions. Soil areas have a smooth surface and are mainly elongated. The soil is well drained and surface runoff is slow. Permeability is very slow and 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. This Slidell soil is used as pasture, cropland, and rangeland. Potential for crops, pasture, and rangeland is high. Very slow permeability and clayey texture are its main limitations.

Soil Type	Map Symbol	Soil Description
Somervell gravelly loam, 1 to 5 percent slopes	75	This moderately deep, gently sloping soil is on high convex ridges and side slopes. This soil is well drained and runoff is rapid. Permeability is moderate and available water capacity is very low. The hazard of erosion is severe where the soil is left bare. This Somervell soil is used mainly as rangeland and some small areas within larger fields of deeper soils are planted to small grain. Potential for recreational development is medium. Small stones are the major limitations.
Speck clay loam, 1 to 3 percent slopes	76	This shallow, gently sloping soil is on convex ridges. It is well drained and surface runoff is medium. Permeability is slow and available water capacity is very low. The hazard of erosion is severe. This Speck soil is used mainly as rangeland and a few small areas within fields of deeper soils are planted to small grain. Potential for recreational use is medium due to the soil's clay loam texture and slow permeability.
Wilson clay loam, 1 to 3 percent slopes	84	This deep, gently sloping soils is on the low part of the landscape and side slopes. This soil is somewhat poorly drained and surface runoff is slow. Permeability is very slow and available water capacity is high. This soil receives runoff from the higher parts of the landscape and wetness is a hazard during rainy seasons. It is used for pasture and crops and potential for recreational use is very low. Very slow permeability and wetness are its main limitations. Drainage can be used to remove surface water.

Source: USDA NRCS Web Soil Survey, Denton County, Version 14, September 29, 2014.

5.1.4 Aerial Photography

Current aerial photography shows distinct vegetation correlation with areas adjacent to existing streams. The change of topography and land use surrounding Denton Creek and Hickory Creek is easily observed. Most tributaries are also easily distinguishable with use of the current aerials.

5.1.5 FEMA FIRM

Based on a review of the Federal Emergency Management Agency's (FEMA's) Flood Insurance Rate Map (FIRM) numbers 48121C0360G, 48121C0365G, 48121C0370G, 48121C0505G, 48121C0495G, and 48121C0515G for Denton County, Texas, the proposed project area lies within Zone A, Zone AE, and Zone X and intersects the 100-year floodplain at thirteen locations (FEMA 2012). There are 126.08 acres of the proposed project that are located within the 100-year floodplain. Refer to ***Exhibit 3: USGS Topographic Map, Exhibit 4: Waters of the U.S. Map, and Exhibit 5: Federal Emergency Management Agency Floodplain and NWI Map*** in ***Attachment 1*** for an illustration of the FEMA FIRM data within and surrounding the project area.

5.1.6 LiDAR

A review of LiDAR data helped confirm the elevation of aquatic resources in the project area and when compared to the elevation of the 100-year floodplain. This information helped support the jurisdictional determination. Refer to ***Exhibit 7: LiDAR Map*** in Attachment 1 for an illustration of LiDAR data within the project area.

5.2 Waters of the U.S. Delineation

The table below summarizes the waterbodies/wetlands identified within the project area. Refer to ***Exhibit 4*** 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 3***, Representative Site Photos, for one or more photographs of each waterbody/wetland feature observed within the project area.

Table 3 Summary of Waterbody/Wetland Features:

Crossing	Waterbody ID	Coordinates	Station	Resource Type	OHWM (ft)	Linear Feet in Project Area	Acres in Project Area	Perm. Acres of Impact	PCN
1	Unnamed Tributary of Elizabeth Creek	33.035317 -97.264377	203+00	Ephemeral Stream	5	14	0.002	-	N
2	Elizabeth Creek Trib 2	33.040001 -97.259798	223+00	Ephemeral Stream	4	850	0.078	-	N
3	Catherine Branch	33.044174 -97.257643	240+75	Perennial stream	11	539	0.136	-	N
4	Open Water 1	33.048419 -97.253491	260+20	Jurisdictional Impoundment	-	-	0.057	0.057	Y
5	Denton Creek Trib 6	33.050139 -97.252801	266+90	Intermittent Stream	2	589	0.027	0.001	N
6	Denton Creek	33.052194 -97.250958	276+50	Perennial Stream	50	450	0.516	-	N
7	Unnamed Tributary of Cleveland Branch	33.057998 -97.246667	301+00	Ephemeral Stream	2	415	0.018	-	N
8	Cleveland Branch	33.071909 -97.239199	368+50	Ephemeral Stream	1	995	0.023	0.014	N
	Wetland 1	33.072891		Non-Forested	-	-			

Crossing	Waterbody ID	Coordinates	Station	Resource Type	OHWM (ft)	Linear Feet in Project Area	Acres in Project Area	Perm. Acres of Impact	PCN
		-97.239868		Wetland			0.038	0.038	Y
9	Graham Branch Tributary 10	33.089700 -97.229753	427+50	Ephemeral Stream	3	518	0.036	-	N
	Wetland 2	33.089649 -97.229653		Non-Forested Wetland	-	-	0.017	0.017	Y
10	Graham Branch Trib 10.1	33.093075 -97.227671	441+30	Ephemeral Stream	2	598	0.022	-	N
	Wetland 3	33.093142 -97.227806		Non-Forested Wetland	-	-	0.018	0.018	Y
11	Unnamed Tributary of Graham Branch 1	33.097690 -97.225248	459+50	Ephemeral Stream	2	160	0.007	-	N
12	Graham Branch Trib 13	33.099751 -97.223898	468+50	Intermittent Stream	6	594	0.081	-	N
13	Unnamed Tributary of Graham Branch 2	33.105044 -97.221148	489+40	Intermittent Stream	10	79	0.018	-	N
	Wetland 4	33.105058 -97.221208		Non-forested Wetland	-	-	0.001	0.001	Y
14	Unnamed Tributary of Graham Branch 3	33.106518 -97.220316	495+00	Intermittent Stream	8	63	0.011	-	Y
	Wetland 5	33.106518 -97.220316		Non-forested Wetland	-	-	0.001	0.001	Y
15	Graham Branch at Sam Davis Rd.	33.108018 -97.218563	501+00	Intermittent Stream	35	106	0.090	-	N
	Wetland 6	33.108049 -97.218567		Non-forested Wetland	-	-	0.028	-	Y
	Wetland 7	33.107865 -97.218562		Non-forested Wetland	-	-	0.015	-	Y
16	Graham Branch Trib 15	33.109478 -97.218822	508+10	Intermittent Stream	4	604	0.055	-	N
	Wetland 8	33.110419 -97.219281		Non-forested Wetland	-	-	0.025	0.025	Y
17	Graham Branch at IH 35W	33.099751 -97.223898	519+70	Intermittent Stream	5	653	0.075	-	N

Crossing	Waterbody ID	Coordinates	Station	Resource Type	OHWM (ft)	Linear Feet in Project Area	Acres in Project Area	Perm. Acres of Impact	PCN
18	Unnamed Tributary of Graveyard Branch 1	33.133177 -97.205135	602+60	Ephemeral Stream	10	102	0.023	-	N
	Wetland 9	33.133225 -97.204983		Non-forested Wetland	-	-	0.027	0.027	Y
19	Unnamed Tributary of Graveyard Branch 2	33.133837 -97.204705	603+70	Ephemeral Stream	3	634	0.043	-	N
	Wetland 10	33.133798 -97.204831		Non-forested Wetland	-	-	0.006	0.006	Y
	Wetland 11	33.133365 -97.206478		Non-forested Wetland	-	-	0.002	0.002	Y
20	Graveyard Branch Trib 2.1	33.137129 -97.202279	619+00	Ephemeral Stream	4	188	0.017	0.014	N
21	Graveyard Branch Trib 2	33.138384 -97.201520	626+50	Ephemeral Stream	3	176	0.012	0.010	N
22	Graveyard Branch Trib Unnamed	33.141291 -97.199448	639+00	Ephemeral Stream	3	187	0.012	0.009	N
	Wetland 12	33.141537 -97.199512		Non-forested Wetland	-	-	0.061	0.061	Y
23	Roark Branch Trib 5.1	33.154979 -97.190615	696+00	Ephemeral Stream	3	739	0.050	0.022	Y
24	Roark Branch	33.165663 -97.184648	736+00	Intermittent Stream	20	601	0.275	0.069	N
25	Hickory Creek	33.175969 -97.178568	779+30	Intermittent Stream	57	415	0.543	-	N
26	Dry Fork Hickory Creek	33.185828 -97.172805	818+50	Intermittent Stream	15	438	0.151	-	N

Crossing	Waterbody ID	Coordinates	Station	Resource Type	OHWM (ft)	Linear Feet in Project Area	Acres in Project Area	Perm. Acres of Impact	PCN
27	Unnamed Tributary of Dry Fork Hickory Creek Trib	33.197732 -97.165970	867+00	Ephemeral Stream	2	112	0.005	0.004	N

5.2.1 Hydrology

Normal hydrological conditions are present within the existing and proposed right-of-way (ROW) and are typical to roadways and stream crossings. 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 4: Wetland Hydrological Indicators

Wetland Type	Sample Point Name(s)	Primary Wetland Hydrological Indicators	Secondary Wetland Hydrological Indicators
Non-forested wetland	Wet 1	Saturation, Sediment Deposits, Oxidized Rhizospheres	N/A
Non-forested wetland	Wet 2	Saturation, Oxidized Rhizospheres	N/A
Non-forested wetland	Wet3	Saturation, Oxidized Rhizospheres	N/A
Non-forested wetland	Wet 4	Surface Water, High Water Table, Saturation, Oxidized Rhizospheres	N/A
Non-forested wetland	Wet 5	Surface Water, High Water Table, Saturation	N/A
Non-forested wetland	Wet 6	Saturation	N/A
Non-forested wetland	Wet 7	Saturation	N/A
Non-forested wetland	Wet 8	Saturation	N/A

Wetland Type	Sample Point Name(s)	Primary Wetland Hydrological Indicators	Secondary Wetland Hydrological Indicators
Non-forested wetland	Wet 9	Saturation, Sediment Deposits, Oxidized Rhizospheres	Surface Soil Cracks
Non-forested wetland	Wet 10	Surface Water, Saturation, Oxidized Rhizospheres	Surface Soil Cracks
Non-forested wetland	Wet 11	Surface Water, Saturation, Oxidized Rhizospheres	N/A
Non-forested wetland	Wet 12	Saturation, Oxidized Rhizospheres	N/A

5.2.2 **Vegetation**

Normal circumstances were present during surveys for vegetation. The vegetative habitats are consistent with types that are typical for the region and within roadway ROW. Dominant taxa for habitat types encountered within the project area (below) are listed in the tables below. Indicator status for each species was obtained from the updated 2018 NWPL.

- Crosstimbers: Post Oak Woodland
- Crosstimbers: Savanna Grassland
- Native Invasive: Deciduous Woodland
- Mesquite Shrubland
- Riparian Hardwood Forest
- Riparian Herbaceous
- Disturbed Prairie
- Agriculture/Crops
- Maintained Urban

Table 5: Dominant Plant Species

Strata	Scientific Name	Common Name	NWPL Classification
Trees & Shrubs	*(Salix nigra)*	black willow	OBL
Trees & Shrubs	*(Carya illinoinensis)*	pecan	FAC
Trees & Shrubs	*(Callicarpa americana)*	American beautyberry	FACU

Trees & Shrubs	*(Juniperus virginiana)*	eastern redcedar	UPL
Trees & Shrubs	*(Celtis occidentalis)*	hackberry	FACU
Trees & Shrubs	*(Quercus stellata)*	post oak	FACU
Trees & Shrubs	*(Diospyros virginiana)*	common persimmon	FAC
Trees & Shrubs	*(Quercus nigra)*	water oak	FAC
Trees & Shrubs	*(Quercus rubra)*	red oak	FACU
Trees & Shrubs	*(Cercis canadensis)*	eastern redbud	UPL
Trees & Shrubs	*(Ulmus americana)*	American elm	FAC
Trees & Shrubs	*(Platanus occidentalis)*	sycamore	FAC
Trees & Shrubs	*(Ulmus crassifolia)*	cedar elm	FAC
Trees & Shrubs	*(Rhus spp.)*	Sumac	UPL
Trees & Shrubs	*(Fraxinus pennsylvanica)*	green ash	FAC
Forbs	*(Ambrosia trifida)*	giant ragweed (	FAC
Forbs	*(Toxicodendron radicans)*	poison ivy	FACU
Forbs	*(Mimosa quadrivalis)*	Fourvalve mimosa	FACW
Forbs	*(Xanthium strumarium)*	Rough cocklebur	FAC
Forbs	*(Sesbania drummondii)*	Rattlebush	FACW
Forbs	*(Solidago spp.)*	goldenrod	FACU
Forbs	*(Smilax rotundiflora.)*	greenbrier	FAC
Forbs	*(Ipomoe spp.)*	Morning Glory	FAC
Forbs	*(Desmanthus illinoensis)*	Illinois bundleflower	FACU
Forbs	*(Croton texensis)*	Texas croton	UPL
Forbs	*(Leucosyris spinosa)*	Wolfweed	FACW
Forbs	*(Rumex crispus)*	curly dock	FAC
Forbs	*(Smilax rotundiflora)*	common greenbrier	FAC
Forbs	*(Toxicodendron radicans)*	Poison ivy	FACU
Forbs	*(Trifolium repens)*	white clover	FACU
Forbs	*(Phyla nodiflora)*	fogfruit	FAC
Forbs	*(Alternathera philoxeroides)*	alligatorweed	OBL

Forbs	*(Opuntia engalmannii)*	Prickly-pear	UPL
Forbs	*(Cardiospermum halicacabum)*	Balloon vine	FAC
Forbs	*(Hymenoxys spp.)*	Bitterweed	FACW
Forbs	*(Helenium amarum)*	Sneezeweed	FACU
Forbs	*(Iva angustifolia)*	Marsh elder	UPL
Grasses, Rushes, and Sedges	*(Juncus torreyi)*	Torrey's rush	FACW
Grasses, Rushes, and Sedges	*(Sorghum halepense)*	Johnsongrass	FACU
Grasses, Rushes, and Sedges	*(Bothriochloa laguroides ssp. Torreyana)*	Silver bluestem	UPL
Grasses, Rushes, and Sedges	*(Panicum virgatum)*	switchgrass	FAC
Grasses, Rushes, and Sedges	*(Paspalum notatum)*	Bahia grass	FAC
Grasses, Rushes, and Sedges	*(Eleocharis spp.)*	spike rush	FACW
Grasses, Rushes, and Sedges	*(Paspalum dilatatum)*	Dallisgrass	FAC
Grasses, Rushes, and Sedges	*(Sorghastrum nutans)*	Indiangrass	FACU
Grasses, Rushes, and Sedges	*(Bouteloua curtipendula)*	Sideoats grama	FACU
Grasses, Rushes, and Sedges	*(Eleocharis montevidensis)*	sand spikerush	FACW
Grasses, Rushes, and Sedges	*(Cynodon dactylon)*	bermudagrass	FACU
Grasses, Rushes, and Sedges	*(Paspalum plicatulum)*	brownseed paspalum	FAC
Grasses, Rushes, and Sedges	*(Cyperus spp.)*	umbrella sedge	FAC
Grasses, Rushes,	*(Carex Spp.)*	sedge	FACW

and Sedges			
Grasses, Rushes, and Sedges	*(Andropogon glomeratus)*	bushy bluestem	FACW
Grasses, Rushes, and Sedges	*(Typha latifolia)*	Bulrush	OBL
Grasses, Rushes, and Sedges	*Eragrostis intermedia)*	Plains lovegrass	FACU
Grasses, Rushes, and Sedges	*(Setaria pumila)*	yellow foxtail	FACU

5.2.3 **Soils**

There are 32 soil types mapped within the proposed project by the U.S. Department of Agriculture (USDA) (**Exhibit 6: Natural Resources Conservation Service Soil Survey Map**). The descriptions provided in **Table 2** are derived from the USDA Soil Conservation Service (SCS) Soil Survey of Denton County, Texas (September 2018) and the online *USDA Web Soil Survey* (http://websoilsurvey.nrcs.usda.gov). Based on the USDA soil survey there is one hydric soil located within the proposed project; Frio silty clay, 0 to 1 percent slopes, occasionally flooded. This soil makes up approximately 0.006 acres. The table below summarizes hydric soil data identified within the project area based on the wetland delineation conducted in the field. 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)
Non-forested wetland	Wet 1	Depleted Matrix
Non-forested wetland	Wet 2	Depleted Dark Surfaces
Non-forested wetland	Wet 3	Depleted Matrix, Redox Dark Surface
Non-forested wetland	Wet 4	Thick Dark Surface, Depleted Matrix
Non-forested wetland	Wet 5	Thick Dark Surface, Sandy Gleyed Matrix, Depleted Matrix
Non-forested wetland	Wet 6	Loamy Gleyed Matrix
Non-forested wetland	Wet 7	Loamy Gleyed Matrix
Non-forested wetland	Wet 8	Depleted Matrix
Non-forested wetland	Wet 9	Sandy Redox, Depleted Matrix

Wetland Type	Sample Point Name(s)	Hydric Soil Indicator(s)
Non-forested wetland	Wet 10	Sandy Redox, Depleted Matrix
Non-forested wetland	Wet 11	Depleted Matrix
Non-forested wetland	Wet 12	Depleted Matrix

6.0 Conclusion

A WOTUS delineation was conducted for the IH 35W Frontage Road Project from Dale Earnhardt Way to South of the IH 35E/IH 35W Interchanged near Denton, Denton County, Texas (CSJ 0081-13-065). The field delineation was completed on August 14-15 and 22-23, 2019. Refer to Section 5.2, above, for a table summarizing the aquatic resources (i.e., waterbodies/wetlands) identified within the project area.

Crossing 1 – Unnamed Tributary of Elizabeth Creek is a potential jurisdictional ephemeral stream segment that enters the ROW via a culvert on the northbound IH 35W frontage road on the southeast corner of project limits. This branch segment continues to the east towards Elizabeth Creek Tributary 2. This crossing is not within the 100-year floodplain.

Crossing 2 – **Elizabeth Creek Tributary 2** is a potential jurisdictional ephemeral stream that enters the existing ROW from the west and passes under IH 35W via a concrete culvert 0.1 mile south of Dale Earnhardt Way. The stream originates from the west and flows east to Elizabeth Creek to Denton Creek to Lake Grapevine. This crossing is not within the 100-year floodplain.

Crossing 3 – Catherine Branch is a potential jurisdictional perennial stream that enters the existing ROW from the west and passes under IH 35W 0.2 mile north of Dale Earnhardt Way. The stream originates from the west and flows east to Denton Creek to Lake Grapevine. This crossing is within the 100-year floodplain.

Crossing 4 – Open Water 1 is a potential jurisdictional impoundment along the eastern project boundary 0.1 mile south of the Denton Creek Tributary 6 crossing. This open water straddles the ROW boundary and is adjacent to a larger open water feature further east of the project boundary. This open water is within the 100-year floodplain.

Crossing 5 – Denton Creek Tributary 6 is a potential jurisdictional intermittent stream that enters the existing ROW from the west and passes under IH 35W 0.7 mile north of Dale Earnhardt Way. The stream originates from the west and flows east to Denton Creek to Lake Grapevine. This crossing is within the 100-year floodplain.

Crossing 6 – Denton Creek is a potential jurisdictional perennial stream that enters the existing ROW from the west and passes under IH 35W 0.9 mile north of Dale Earnhardt Way. The stream originates from the west and flows east to Lake Grapevine. This crossing is within the 100-year floodplain.

Crossing 7 – Unnamed Tributary of Cleveland Branch is a potential jurisdictional ephemeral tributary that enters the existing ROW from the west and passes under IH 35W via concrete culvert 0.5 mile south of FM 1171. The stream originates from the west and flows east to Cleveland Branch to Denton Creek. This crossing is not within the 100-year floodplain.

Crossing 8 – Cleveland Branch is a potential jurisdictional ephemeral stream that enters the existing ROW from the west and passes under IH 35W via concrete culvert 0.6 mile north of FM 1171. The stream originates from the west and flows east to Denton Creek and ultimately Lake Grapevine. This crossing is not within the 100-year floodplain. ***Wetland 1*** is a potential jurisdictional herbaceous wetland with fringe located along the western project boundary at *Cleveland Branch. (*Source is *Cleveland Branch* north of *Wetland 1*).

Crossing 9 – Graham Branch Tributary 10 is a potential jurisdictional ephemeral stream that enters the existing ROW from the west and passes under IH 35W via concrete culvert 0.8 mile south of FM 407. The stream originates from the west and flows east to Graham Branch to Denton Creek. This crossing is not within the 100-year floodplain. ***Wetland 2*** is a potential jurisdictional herbaceous wetland with fringe located along the eastern project boundary along *Graham Branch Tributary 10.*.

Crossing 10 – Graham Branch Tributary 10.1 is a potential jurisdictional ephemeral stream that enters the existing ROW from the west and passes under IH 35W via concrete culvert 0.5 mile south of FM 407. The stream originates from the west and flows east to Graham Branch to Denton Creek. This crossing is not within the 100-year floodplain. ***Wetland 3*** is a potential jurisdictional herbaceous wetland located along the eastern project boundary along *Graham Branch Tributary 10.1.*

Crossing 11 – Unnamed Tributary of Graham Branch 1 is a potential jurisdictional ephemeral tributary that enters the existing ROW from a culvert of IH 35W 0.2 mile south of FM 407. The stream originates from a drainage culvert and flows east to a pond east of the ROW. This crossing is not within the 100-year floodplain.

Crossing 12 – Graham Branch Tributary 13 is a potential jurisdictional intermittent stream that enters the existing ROW from the west and passes under IH 35W via concrete culvert at FM 1171. The stream originates from the west and flows east to Graham Branch to Denton Creek. This crossing is within the 100-year floodplain.

Crossing 13 – Unnamed Tributary of Graham Branch 2 is a potential jurisdictional intermittent stream that originates in the ROW east of Sam Davis Road at a concrete culvert 0.3 mile north of FM 407. The stream flows east to Graham Branch to Denton Creek. This crossing is not within the 100-year floodplain. ***Wetland 4*** is a potential jurisdictional wetland located along the eastern project boundary along *Unnamed 4.*

Crossing 14 – Unnamed Tributary of Graham Branch 3 is a potential jurisdictional intermittent stream that originates in the ROW east of Sam Davis Road at a concrete culvert 0.4 mile north of FM 407. The stream flows east to a pond to Graham Branch to Denton Creek. This crossing is within the 100-year floodplain. ***Wetland 5*** is a potential jurisdictional wetland located along the eastern project boundary along *UTGB3.*

Crossing 15 – Graham Branch (Sam Davis) is a potential jurisdictional intermittent stream that enters the existing ROW from the north and passes under Sam David Road via concrete culvert 0.6 mile north of FM 407. The stream originates from the northwest and flows east to Denton Creek. This crossing is within the 100-year floodplain. ***Wetland 6*** is a potential jurisdictional herbaceous wetland located along the eastern project boundary inside *Graham Branch (Sam Davis)* north of the culvert. ***Wetland 7*** is a potential jurisdictional herbaceous wetland located along the eastern project boundary inside *Graham Branch (Sam Davis)* south of the culvert.

Crossing 16 – Graham Branch Tributary 15 is a potential jurisdictional intermittent stream that enters the existing ROW from the west and passes under IH 35W via concrete culvert 0.6 miles south of Old Justin Road. The stream originates from the west and flows east to Graham Branch to Denton Creek. This crossing is within the 100-year floodplain. ***Wetland 8*** is a potential jurisdictional herbaceous wetland located along the western project boundary inside *Graham Branch Tributary 15.*

Crossing 17 – Graham Branch (IH 35W) is a potential jurisdictional intermittent stream that enters the existing ROW from the west and passes under IH 35W via concrete culvert 0.4 miles south of Old Justin Road. The stream originates from the west and flows east to Denton Creek. This crossing is within the 100-year floodplain.

Crossing 18 – Unnamed Tributary of Graveyard Branch 1 is a potential jurisdictional ephemeral stream that enters the existing ROW from the west and passes under IH 35W via concrete culvert 0.1 miles north of Crawford Road. The stream originates from the west and flows east to a pond to Graveyard Branch to Hickory

Creek. This crossing is not within the 100-year floodplain. ***Wetland 9*** is a potential jurisdictional herbaceous wetland located near the eastern project boundary inside *Unnamed 6.*

Crossing 19 – Unnamed Tributary of Graveyard Branch 2 is a potential jurisdictional ephemeral stream that enters the existing ROW from the west and passes under IH 35W via concrete culvert 0.2 miles north of Crawford Road. The stream originates from the west and flows east to Graveyard Branch to Hickory Creek. This crossing is within the 100-year floodplain east of IH 35W. ***Wetland 10*** is a potential jurisdictional herbaceous wetland located along the eastern project boundary inside *UTGB2.* ***Wetland 11*** is a potential jurisdictional herbaceous wetland located along the western project boundary inside *UTGB2.*

Crossing 20 – **Graveyard Branch Tributary 2.1** is a potential jurisdictional intermittent stream that enters the existing ROW from the west and passes under IH 35W via a concrete culvert 0.5 mile north of Crawford Road. The stream originates from the west and flows east to Graveyard Branch to Hickory Creek to Lake Lewisville. This crossing is within the 100-year floodplain.

Crossing 21– **Graveyard Branch Tributary 2** is a potential jurisdictional intermittent stream that enters the existing ROW from the west and passes under IH 35W via a concrete culvert 0.6 mile north of Crawford Road. The stream originates from the west and flows east to Graveyard Branch to Hickory Creek to Lake Lewisville. This crossing is within the 100-year floodplain.

Crossing 22 – Graveyard Branch Trib Unnamed is a potential jurisdictional intermittent stream that enters the existing ROW from the west and passes under IH 35W via concrete culvert 0.8 miles north of Crawford Road. The stream originates from the west and flows east to Graveyard Branch to Hickory Creek. This crossing is not within the 100-year floodplain east of IH 35W. ***Wetland 12*** is a potential jurisdictional herbaceous wetland located along the eastern project boundary inside *Graveyard Branch Trib Unnamed.*

Crossing 23 – Roark Branch Tributary 5.1 is a potential jurisdictional ephemeral stream that enters the existing ROW from the east and passes under IH 35W via a concrete culvert 1.2 miles south of FM 2449. The stream originates from the east and flows west and north to Roark Branch to Hickory Creek to Lake Lewisville. This crossing is not within the 100-year floodplain.

Crossing 24 – Roark Branch is a potential jurisdictional intermittent stream that enters the existing ROW from the west and passes under IH 35W 0.5 miles south of FM 2449. The stream originates from the west and flows east to Hickory Creek to Lake Lewisville. This crossing is within the 100-year floodplain.

Crossing 25 –Hickory Creek is a potential jurisdictional intermittent stream that enters the existing ROW from the west and passes under IH 35W 0.3 miles north of FM 2449. The stream originates from the west and flows east to Lake Lewisville. This crossing is within the 100-year floodplain.

Crossing 26 –Dry Fork Hickory Creek is a potential jurisdictional intermittent stream that enters the existing ROW from the west and passes under IH 35W 1.1 miles north of FM 2449. The stream originates from the west and flows east to Hickory Creek to Lake Lewisville. This crossing is within the 100-year floodplain.

Crossing 27 –Unnamed Tributary of Dry Fork Hickory Creek is a potential jurisdictional ephemeral stream that enters the existing ROW from the west and passes under IH 35W via concrete culvert 0.5 miles south of Exit 84. The stream originates from the west and flows southeast to Hickory Creek to Lake Lewisville. This crossing is not within the 100-year floodplain.

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.

7.0 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 August 2019.

Google Inc. (2009). Google Earth (Version 5.1.3533.1731) [Software]. Accessed July 2019.

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 July 2019.

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 August 2019.

Soil Survey Staff, Natural Resources Conservation Service, United States Department of Agriculture. Web Soil Survey. Available online at http://websoilsurvey.nrcs.usda.gov/. Accessed July 2019.

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 July 2019.

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). March 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.

8.0 Attachments

1. Exhibits
2. Wetland Determination Data Forms
3. Stream Forms
4. Site Photographs

Attachment 1 - Exhibits

Attachment 2 - Wetland Determination Data Forms

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: IH-35W Denton County City/County: Denton Sampling Date: 8/26/19

Applicant/Owner: State: TX Sampling Point: Wet 1

Investigator(s): Cliff Riley, Lance Olenius Section, Township, Range:

Landform (hillslope, terrace, etc.): Local relief (concave, convex, none): Convex Slope (%): 3-5

Subregion (LRR): J-84C Lat: 33.072891 Long: -97.239868 Datum: NAD83

Soil Map Unit Name: Slidell clay, 1 to 3 percent slopes NWI classification: --

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

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation _____, Soil _____, or Hydrology _____ 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 within a Wetland?** **Yes** X **No** _____
Hydric Soil Present?	Yes X	No _____	
Wetland Hydrology Present?	Yes X	No _____	

Remarks:

Normal conditions present. Upstream of Cleveland Branch.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 30 ft)			
1. Typha sp.	60	Y	OBL
2. Solidago altissima	10		FACU
3.			
4.			
5.			
	70 = Total Cover		
Herb Stratum (Plot size: 10 ft)			
1. Eleocharis sp.	20	Y	FACW
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	= Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): 2 (A)

Total Number of Dominant Species Across All Strata: 2 (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

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a 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:

Hydrophytic vegetation present based on observed indicators.

SOIL

Sampling Point: Wet 1

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-6	7.5 YR 3/1		5YR 3/4	10	C	M	Sandy Clay	
6-18	7.5 YR 2.5/2	80	7.5YR 7/8	20	D	M	Sandy Clay	

[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.)

- ___ Histosol (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)
- X 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 I, 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 Shallow Dark Surface (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:

Hydric soil is present based on observations of indicators

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)
- X Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal 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)
- X Oxidized Rhizospheres on Living Roots (C3) (**where not tilled**)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (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 X No _____ Depth (inches): _____

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

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

Remarks:

Hydrology is present due to found indicators

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: IH-35W Denton County City/County: Denton Sampling Date: 8/26/19

Applicant/Owner: State: TX Sampling Point: Upl 1

Investigator(s): Cliff Riley, Lance Olenius Section, Township, Range:

Landform (hillslope, terrace, etc.): Local relief (concave, convex, none): Concave Slope (%): 1-3

Subregion (LRR): Lat: 33.072825 Long: -97.239833 Datum: NAD83

Soil Map Unit Name: Slidell clay, 1 to 3 percent slopes NWI classification: --

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

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation _____, Soil _____, or Hydrology _____ 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 within a Wetland?** **Yes** _____ **No** X
Hydric Soil Present?	Yes _____	No X	
Wetland Hydrology Present?	Yes _____	No X	

Remarks:

Upland point taken outside of wetland. Normal circumstances were present at time of investigation.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: 30 ft)			
1. Solidago altissima	5		FACU
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: 10 ft)			
1. Cynodon dactylon	100	Y	FACU
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	_____ = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum _____

Dominance Test worksheet:

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

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

Percent of Dominant Species That Are OBL, FACW, or FAC: - (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

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a 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:

Hydrophytic vegetation not present based on observations.

SOIL

Sampling Point: Upl 1

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-16	10YR 5/4		5YR 4/6	7			Sandy Clay	

[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.)

- ___ Histosol (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 I, 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 Shallow Dark Surface (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:

Hydric soil is not present based on observations. Likely fill material.

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)
- ___ Algal 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 Indicators (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 _____ Depth (inches): _____

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

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

Wetland Hydrology Present? Yes _____ No X

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

Remarks:

No indicators found

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: IH-35W Denton County City/County: Denton Sampling Date: 8/15/19

Applicant/Owner: State: TX Sampling Point: Wet 2

Investigator(s): Cliff Riley, Lance Olenius Section, Township, Range:

Landform (hillslope, terrace, etc.): Local relief (concave, convex, none): Concave Slope (%): 1-3

Subregion (LRR): Lat: 33.08965 Long: -97.22967 Datum: NAD83

Soil Map Unit Name: Sanger clay, 3 to 5 % slopes NWI classification: --

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

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation _____, Soil _____, or Hydrology _____ 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 within a Wetland?** **Yes** X **No** _____
Hydric Soil Present?	Yes X	No _____	
Wetland Hydrology Present?	Yes X	No _____	

Remarks:

PEM wetland at Graham Branch Trib 10.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: 30 ft)			
1. Typha sp.	20	Y	OBL
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: 10 ft)			
1. Eleocharis sp.	20	Y	FACW
2. Paspalum notatum	5	N	FAC
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	_____ = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): 2 (A)

Total Number of Dominant Species Across All Strata: 2 (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

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a 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:

Hydrophytic vegetation present based on observed indicators.

SOIL

Sampling Point: Wet 2

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-6	10 YR 2/1							
6-18	7.5 YR 2.5/2	80	7.5YR 7/8	20	D	M	Sandy Clay	

[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.)

- ___ Histosol (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)
- 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 I, 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 Shallow Dark Surface (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:

Hydric soil is present based on observations of indicators

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)
- ___ Algal 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)
- X Oxidized Rhizospheres on Living Roots (C3) (**where not tilled**)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (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 X No _____ Depth (inches): _____

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

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

Remarks:

Hydrology is present due to found indicators

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: IH-35W Denton County City/County: Denton Sampling Date: 8/15/19

Applicant/Owner: State: TX Sampling Point: Upl 2

Investigator(s): Cliff Riley, Lance Olenius Section, Township, Range:

Landform (hillslope, terrace, etc.): Local relief (concave, convex, none): Concave Slope (%): 1-3

Subregion (LRR): J-84C Lat: 33.08733 Long: -97.229624 Datum: NAD83

Soil Map Unit Name: Sanger clay, 3 to 5 % slopes NWI classification: --

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

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation _____, Soil _____, or Hydrology _____ 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 within a Wetland?** **Yes** _____ **No** X
Hydric Soil Present?	Yes _____	No X	
Wetland Hydrology Present?	Yes _____	No X	

Remarks:

Upland point taken outside of wetland.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: 30 ft)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: 10 ft)			
1. Cynodon dactylon	100	Y	FACU
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	_____ = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum _____

Dominance Test worksheet:

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

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

Percent of Dominant Species That Are OBL, FACW, or FAC: _____ (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

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a 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:

Hydrophytic vegetation not present based on observations.

SOIL

Sampling Point: Upl 2

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-18	2.5 YR 2.5/1							

[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.)

- ___ Histosol (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 I, 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 Shallow Dark Surface (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:

Hydric soil is not present based on observations. Likely fill material.

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)
- ___ Algal 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 Indicators (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 _____ Depth (inches): _____

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

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

Wetland Hydrology Present? Yes _____ No X

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

Remarks:

No indicators found

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: IH-35W Denton County City/County: Denton Sampling Date: 8/15/19

Applicant/Owner: State: TX Sampling Point: Wet 3

Investigator(s): Cliff Riley, Lance Olenius Section, Township, Range:

Landform (hillslope, terrace, etc.): Local relief (concave, convex, none): Concave Slope (%): 1-3

Subregion (LRR): Lat: 33.093142 Long: -97.227808 Datum: NAD83

Soil Map Unit Name: Sanger clay, 3 to 5 % slopes NWI classification: --

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

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation _____, Soil _____, or Hydrology _____ 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 within a Wetland?** **Yes** X **No** _____
Hydric Soil Present?	Yes X No _____	
Wetland Hydrology Present?	Yes X No _____	

Remarks:

Wetland at Graham Branch Trib 10.1.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: 30 ft)			
1. Solidago altissima	10	N	FACU
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: 10 ft)			
1. Eleocharis sp.	40	Y	FACW
2. Phyla nodiflora	15	N	FAC
3. Paspalum dilatatum	5	N	FAC
4. Juncus torreyi	10	N	FACW
5.			
6.			
7.			
8.			
9.			
10.			
	_____ = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum _____

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 a 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:

Hydrophytic vegetation present based on observed indicators.

SOIL

Sampling Point: Wet 3

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-6	7.5 YR 3/1							
6-18	7.5 YR 7/1	80	7.5YR 7/4	15	D	M	Sandy Clay	

[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.)

- ___ Histosol (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)
- X 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 I, 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 Shallow Dark Surface (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:

Hydric soil is present based on observations of indicators

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)
- ___ Algal 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)
- X Oxidized Rhizospheres on Living Roots (C3) (**where not tilled**)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (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 X No _____ Depth (inches): 8

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

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

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

Remarks:

Hydrology is present due to found indicators

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: IH-35W Denton County City/County: Denton Sampling Date: 8/15/19

Applicant/Owner: State: TX Sampling Point: Upl 3

Investigator(s): Cliff Riley, Lance Olenius Section, Township, Range:

Landform (hillslope, terrace, etc.): Local relief (concave, convex, none): Concave Slope (%): 3-5

Subregion (LRR): J-84C Lat: 33.093050 Long: -97.227811 Datum: NAD83

Soil Map Unit Name: Sanger clay, 3 to 5 % slopes NWI classification: --

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

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation _____, Soil _____, or Hydrology _____ 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 within a Wetland?** **Yes** _____ **No** X
Hydric Soil Present?	Yes _____	No X	
Wetland Hydrology Present?	Yes _____	No X	

Remarks:

Upland point taken outside of wetland.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: 30 ft)			
1. Solidago altissima	20	Y	FACU
2. Ambrosia trifida	10	N	FAC
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: 10 ft)			
1. Cynodon dactylon	100	Y	FACU
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	_____ = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum _____

Dominance Test worksheet:

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

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

Percent of Dominant Species That Are OBL, FACW, or FAC: _____ (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

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a 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:

Hydrophytic vegetation not present based on observations.

SOIL

Sampling Point: Upl 3

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-18	2.5 YR 4/1							

[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.)

- ___ Histosol (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 I, 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 Shallow Dark Surface (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:

Hydric soil is not present based on observations. Likely fill material.

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)
- ___ Algal 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 Indicators (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:

No indicators found

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: IH-35W Denton County City/County: Denton Sampling Date: 8/26/19

Applicant/Owner: State: TX Sampling Point: Wet 4

Investigator(s): Cliff Riley, Lance Olenius Section, Township, Range:

Landform (hillslope, terrace, etc.): Local relief (concave, convex, none): Convcave Slope (%): 1-3

Subregion (LRR): J-84C Lat: 33.105061 Long: -97.221208 Datum: NAD83

Soil Map Unit Name: Lindale clay loam, 1 to 3 percent slopes NWI classification: --

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

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation _____, Soil _____, or Hydrology _____ 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 within a Wetland?** **Yes** X **No** _____
Hydric Soil Present?	Yes X	No _____	
Wetland Hydrology Present?	Yes X	No _____	

Remarks:

Normal conditions present. Located N of FM 407, E of Sam Davis Rd. Unnamed Trib 4

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. Salix nigra	20	Y	FACW
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 30 ft)			
1. Typha sp.	20	Y	OBL
2.			
3.			
4.			
5.			
	70 = Total Cover		
Herb Stratum (Plot size: 10 ft)			
1. Eleocharis sp.	20	Y	FACW
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	= Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum _____

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

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a 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:

Hydrophytic vegetation present based on observed indicators.

SOIL

Sampling Point: Wet 4

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-3	10YR 2/1							
3-10	5 YR 2.5/1	90	7.5YR 4/2	5	D	M	Sandy Clay	

[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.)

- ___ Histosol (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)
- X 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)
- X 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 I, 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 Shallow Dark Surface (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:

Hydric soil is present based on observations of indicators

HYDROLOGY

Wetland Hydrology Indicators:

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

- X Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal 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)
- X Oxidized Rhizospheres on Living Roots (C3) (**where not tilled**)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (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 _____ Depth (inches): _____

Water Table Present? Yes X No _____ Depth (inches): 8in

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

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

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

Remarks:

Hydrology is present due to found indicators

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: IH-35W Denton County City/County: Denton Sampling Date: 8/15/19

Applicant/Owner: State: TX Sampling Point: Upl 4

Investigator(s): Cliff Riley, Lance Olenius Section, Township, Range:

Landform (hillslope, terrace, etc.): Local relief (concave, convex, none): Concave Slope (%): 1-3

Subregion (LRR): J-84C Lat: 33.105040 Long: -97.221262 Datum: NAD83

Soil Map Unit Name: Lindale clay loam, 1 to 3 percent slopes NWI classification: --

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

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation _____, Soil _____, or Hydrology _____ 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 within a Wetland?** **Yes** _____ **No** X
Hydric Soil Present?	Yes _____	No X	
Wetland Hydrology Present?	Yes _____	No X	

Remarks:

Upland point taken outside of wetland.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1. Ulmus americana	5		FAC
2. Salix nigra	5		
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 30 ft)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 10 ft)			
1. Cynodon dactylon	90	y	FACU
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	= Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum _____

Dominance Test worksheet:

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

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

Percent of Dominant Species That Are OBL, FACW, or FAC: _____ (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

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a 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:

Hydrophytic vegetation not present based on observations.

SOIL

Sampling Point: Upl 4

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-12	2.5 YR 2.5/1							

[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.)

- ___ Histosol (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 I, 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 Shallow Dark Surface (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:

Hydric soil is not present based on observations.

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)
- ___ Algal 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 Indicators (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 _____ Depth (inches): _____

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

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

Wetland Hydrology Present? Yes _____ No X

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

Remarks:

No indicators found

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: IH-35W Denton County City/County: Denton Sampling Date: 8/15/19

Applicant/Owner: State: TX Sampling Point: Wet 5

Investigator(s): Cliff Riley, Lance Olenius Section, Township, Range:

Landform (hillslope, terrace, etc.): Local relief (concave, convex, none): Concave Slope (%): 1-3

Subregion (LRR): J-84C Lat: 33.106596 Long: -97.220385 Datum: NAD83

Soil Map Unit Name: Lindale clay loam, 1 to 3 percent slopes NWI classification: --

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

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation _____, Soil _____, or Hydrology _____ 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 within a Wetland?** **Yes** X **No** _____
Hydric Soil Present?	Yes X	No _____	
Wetland Hydrology Present?	Yes X	No _____	

Remarks:

Normal conditions present. Located N of FM 407, E of Sam Davis Rd. Unnamed Trib 5. Larger wetland beyond fenceline.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 30 ft)			
1.			
2.			
3.			
4.			
5.			
	70 = Total Cover		
Herb Stratum (Plot size: 10 ft)			
1. Eleocharis sp.	25	Y	FACW
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	= Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum _____

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

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a 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:

Hydrophytic vegetation present based on observed indicators.

SOIL

Sampling Point: Wet 5

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-3	10YR 2.5/1							
3-20	7.5 YR 5/1	90	10YR 5/4	5	D	M	Sandy Clay	

[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.)

- ___ Histosol (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)
- X 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**)
- X Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- X 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 I, 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 Shallow Dark Surface (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:

Hydric soil is present based on observations of indicators

HYDROLOGY

Wetland Hydrology Indicators:

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

- X Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal 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 Indicators (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 _____ Depth (inches): _____

Water Table Present? Yes X No _____ Depth (inches): 10 in

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

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

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

Remarks:

Hydrology is present due to found indicators

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: IH-35W Denton County City/County: Denton Sampling Date: 8/15/19

Applicant/Owner: State: TX Sampling Point: Upl 5

Investigator(s): Cliff Riley, Lance Olenius Section, Township, Range:

Landform (hillslope, terrace, etc.): Local relief (concave, convex, none): Concave Slope (%): 1-3

Subregion (LRR): J-84C Lat: 33.106625 Long: -97.220416 Datum: NAD83

Soil Map Unit Name: Lindale clay loam, 1 to 3 percent slopes NWI classification: --

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

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation _____, Soil _____, or Hydrology _____ 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 within a Wetland?** **Yes** _____ **No** X
Hydric Soil Present?	Yes _____	No X	
Wetland Hydrology Present?	Yes _____	No X	

Remarks:

Upland point taken outside of wetland.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: 30 ft)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: 10 ft)			
1. Cynodon dactylon	90	y	FACU
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	_____ = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum _____

Dominance Test worksheet:

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

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

Percent of Dominant Species That Are OBL, FACW, or FAC: _____ (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

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a 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:

Hydrophytic vegetation not present based on observations.

SOIL

Sampling Point: Upl 5

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-12	10 YR 3/1						Sandy clay	

[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.)

- ___ Histosol (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 I, 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 Shallow Dark Surface (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:

Hydric soil is not present based on observations.

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)
- ___ Algal 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 Indicators (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 _____ Depth (inches): _____

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

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

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

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

Remarks:

No indicators found

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: IH-35W Denton County City/County: Denton Sampling Date: 8/15/19

Applicant/Owner: State: TX Sampling Point: Wet 6

Investigator(s): Cliff Riley, Lance Olenius Section, Township, Range:

Landform (hillslope, terrace, etc.): Local relief (concave, convex, none): Concave Slope (%): 1-3

Subregion (LRR): J-84C Lat: 33.108050 Long: -97.218566 Datum: NAD83

Soil Map Unit Name: Lindale clay loam, 1 to 3 % slopes NWI classification: --

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

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation _____, Soil _____, or Hydrology _____ 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 within a Wetland?** **Yes** X **No** _____
Hydric Soil Present?	Yes X No _____	
Wetland Hydrology Present?	Yes X No _____	

Remarks:

Wetland at Graham Branch/Sam Davis Rd intersection. (North of Sam Davis Rd)

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: 30 ft)			
1. Sesbania drummondii	5	N	FACW
2. Alternathera philoxeroides	10	N	OBL
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: 10 ft)			
1. Eleocharis sp.	20	Y	FACW
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	_____ = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum _____

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 1	x 1 = 1
FACW species 2	x 2 = 4
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: 3 (A)	5 (B)

Prevalence Index = B/A = 1.66

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

x 2 - Dominance Test is >50%

x 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a 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:

Hydrophytic vegetation present based on dominance and prevalence tests.

SOIL

Sampling Point: Wet 6

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-12	Gley 1/10Y	100					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.)

- ___ Histosol (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)
- X 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 I, 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 Shallow Dark Surface (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:

Hydric soil is present based on observations of indicators

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)
- ___ Algal 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 Indicators (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 x No _____ Depth (inches): _____

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

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

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

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

Remarks:

Hydrology is present due to found indicators

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: IH-35W Denton County City/County: Denton Sampling Date: 8/15/19

Applicant/Owner: State: TX Sampling Point: Upl 6

Investigator(s): Cliff Riley, Lance Olenius Section, Township, Range:

Landform (hillslope, terrace, etc.): Local relief (concave, convex, none): Concave Slope (%): 1-3

Subregion (LRR): J-84C Lat: 33.108075 Long: -97.218657 Datum: NAD83

Soil Map Unit Name: Lindale clay loam, 1 to 3 percent slopes NWI classification: --

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

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation _____, Soil _____, or Hydrology _____ 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 within a Wetland?** **Yes** _____ **No** X
Hydric Soil Present?	Yes _____	No X	
Wetland Hydrology Present?	Yes _____	No X	

Remarks:

Upland point taken outside of wetland.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: 30 ft)			
1. Opuntia engalmannii	5		FACU
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: 10 ft)			
1. Cynodon dactylon	90	y	FACU
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	_____ = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum _____

Dominance Test worksheet:

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

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

Percent of Dominant Species That Are OBL, FACW, or FAC: _____ (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

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a 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:

Hydrophytic vegetation not present based on observations.

SOIL

Sampling Point: Upl 6

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-12	5 YR 5/8							

[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.)

- ___ Histosol (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 I, 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 Shallow Dark Surface (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:

Hydric soil is not present based on observations.

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)
- ___ Algal 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 Indicators (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 _____ Depth (inches): _____

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

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

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

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

Remarks:

No indicators found

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: IH-35W Denton County City/County: Denton Sampling Date: 8/15/19

Applicant/Owner: State: TX Sampling Point: Wet 7

Investigator(s): Cliff Riley, Lance Olenius Section, Township, Range:

Landform (hillslope, terrace, etc.): Local relief (concave, convex, none): Concave Slope (%): 1-3

Subregion (LRR): J-84C Lat: 33.107868 Long: -97.218564 Datum: NAD83

Soil Map Unit Name: Lindale clay loam, 1 to 3 % slopes NWI classification: --

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

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation _____, Soil _____, or Hydrology _____ 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 within a Wetland?** **Yes** X **No** _____
Hydric Soil Present?	Yes X	No _____	
Wetland Hydrology Present?	Yes X	No _____	

Remarks:

Wetland at Graham Branch/Sam Davis Rd intersection. (South of Sam Davis Rd)

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: 30 ft)			
1. Sesbania drummondii	5	N	FACW
2. Alternathera philoxeroides	20	Y	OBL
3. Typha sp.	15	Y	OBL
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: 10 ft)			
1. Eleocharis sp.	20	Y	FACW
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	_____ = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum _____

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 a 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:

Hydrophytic vegetation present based on dominance test.

SOIL

Sampling Point: Wet 7

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-12	Gley 1/10Y	100					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.)

- ___ Histosol (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)
- X 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 I, 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 Shallow Dark Surface (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:

Hydric soil is present based on observations of indicators

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)
- ___ Algal 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 Indicators (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 x No _____ Depth (inches): _____

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

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

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

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

Remarks:

Hydrology is present due to found indicators

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: IH-35W Denton County City/County: Denton Sampling Date: 8/15/19

Applicant/Owner: State: TX Sampling Point: Upl 7

Investigator(s): Cliff Riley, Lance Olenius Section, Township, Range:

Landform (hillslope, terrace, etc.): Local relief (concave, convex, none): Concave Slope (%): 1-3

Subregion (LRR): J-84C Lat: 33.107893 Long: -97.218462 Datum: NAD83

Soil Map Unit Name: Lindale clay loam, 1 to 3 percent slopes NWI classification: --

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

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation _____, Soil _____, or Hydrology _____ 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 within a Wetland?** **Yes** _____ **No** X
Hydric Soil Present?	Yes _____	No X	
Wetland Hydrology Present?	Yes _____	No X	

Remarks:

Upland point taken outside of wetland.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: 30 ft)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: 10 ft)			
1. Cynodon dactylon	60	Y	FACU
2. Panicum virgatum	10		FAC
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	_____ = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum _____

Dominance Test worksheet:

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

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

Percent of Dominant Species That Are OBL, FACW, or FAC: _____ (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

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a 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:

Hydrophytic vegetation not present based on observations.

SOIL

Sampling Point: Upl 7

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-18	2.5 YR 2.5/1							

[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.)

- ___ Histosol (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 I, 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 Shallow Dark Surface (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:

Hydric soil is not present based on observations.

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)
- ___ Algal 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 Indicators (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 _____ Depth (inches): _____

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

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

Wetland Hydrology Present? Yes _____ No X

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

Remarks:

No indicators found

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: IH-35W Denton County City/County: Denton Sampling Date: 8/26/19

Applicant/Owner: State: TX Sampling Point: Wet 8

Investigator(s): Cliff Riley, Lance Olenius Section, Township, Range:

Landform (hillslope, terrace, etc.): Local relief (concave, convex, none): Concave Slope (%): 1-3

Subregion (LRR): J-84C Lat: 33.110409 Long: -97.219299 Datum: NAD83

Soil Map Unit Name: Speck clay loam, 1 to 3 percent slopes NWI classification: --

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

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation _____, Soil _____, or Hydrology _____ 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 within a Wetland?** **Yes** X **No** _____
Hydric Soil Present?	Yes X	No _____	
Wetland Hydrology Present?	Yes X	No _____	

Remarks:

Normal conditions present. Western extent of project area on SB side of IH 35W.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: 30 ft)			
1. Sesbania drummondii	10	N	FACW
2. Ambrosia trifida	5	N	FAC
3. Typha sp.	20	Y	OBL
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: 10 ft)			
1. Eleocharis sp.	20	Y	FACW
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	_____ = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): 2 (A)

Total Number of Dominant Species Across All Strata: 2 (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 a 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:

Hydrophytic vegetation present based on dominance test.

SOIL

Sampling Point: Wet 8

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-3	10YR 2/1						Loam	
3-9	10 YR 3/2							
9-16	10 YR 7/3		10 YR 7/8	5	D	M	Sandy 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.)

- ___ Histosol (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)
- X 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 I, 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 Shallow Dark Surface (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:

Hydric soil is present based on observations of indicators

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)
- ___ Algal 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 Indicators (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 X No ____ Depth (inches): _____

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

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

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

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

Remarks:

Hydrology is present due to found indicators

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: IH-35W Denton County City/County: Denton Sampling Date: 8/15/19

Applicant/Owner: State: TX Sampling Point: Upl 8

Investigator(s): Cliff Riley, Lance Olenius Section, Township, Range:

Landform (hillslope, terrace, etc.): Local relief (concave, convex, none): Concave Slope (%): 1-3

Subregion (LRR): J-84C Lat: 33.110515 Long: -97.219366 Datum: NAD83

Soil Map Unit Name: Speck clay loam, 1 to 3 percent slopes NWI classification: --

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

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation _____, Soil _____, or Hydrology _____ 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 within a Wetland?** **Yes** _____ **No** X
Hydric Soil Present?	Yes _____	No X	
Wetland Hydrology Present?	Yes _____	No X	

Remarks:

Upland point taken outside of wetland.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: 30 ft)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: 10 ft)			
1. Cynodon dactylon	40	Y	FACU
2. Panicum virgatum	10		FAC
3. Eragrostis intermedia	10		-
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	_____ = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum _____

Dominance Test worksheet:

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

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

Percent of Dominant Species That Are OBL, FACW, or FAC: _____ (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

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a 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:

Hydrophytic vegetation not present based on observations.

SOIL

Sampling Point: Upl 8

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-16	10 YR 5/1							

[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.)

- ___ Histosol (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 I, 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 Shallow Dark Surface (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:

Hydric soil is not present based on observations.

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)
- ___ Algal 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 Indicators (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 _____ Depth (inches): _____

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

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

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

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

Remarks:

No indicators found

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: IH-35W Denton County City/County: Denton Sampling Date: 8/26/19

Applicant/Owner: State: TX Sampling Point: Wet 9

Investigator(s): Cliff Riley, Lance Olenius Section, Township, Range:

Landform (hillslope, terrace, etc.): Local relief (concave, convex, none): Concave Slope (%): 1-3

Subregion (LRR): J-84C Lat: 33.133220 Long: -97.205046 Datum: NAD83

Soil Map Unit Name: Ponder loam, 1 to 3 percent slopes NWI classification: --

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

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation _____, Soil _____, or Hydrology _____ 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 within a Wetland?** **Yes** X **No** _____
Hydric Soil Present?	Yes X	No _____	
Wetland Hydrology Present?	Yes X	No _____	

Remarks:

Normal conditions present. East of NB on-ramp from Crawford Road.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: 30 ft)			
1. Typha sp.	25	Y	OBL
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: 10 ft)			
1. Eleocharis sp.	20	Y	FACW
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	_____ = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): 2 (A)

Total Number of Dominant Species Across All Strata: 2 (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 a 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:

Hydrophytic vegetation present based on dominance test.

SOIL

Sampling Point: Wet 9

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-3	7.5 YR 3/3	90	7.5 4/4	5			Sandy Loam	
3-9	10 YR 3/2	85	10 YR 5/8	15	D	M	Sandy 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.)

- ___ Histosol (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)
- X Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- Loamy Gleyed Matrix (F2)
- X 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 I, 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 Shallow Dark Surface (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:

Hydric soil is present based on observations of indicators

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)
- X Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal 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)
- x Oxidized Rhizospheres on Living Roots (C3) (**where not tilled**)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- X 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 X No _____ Depth (inches): _____

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

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

Remarks:

Hydrology is present due to found indicators

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: IH-35W Denton County City/County: Denton Sampling Date: 8/15/19

Applicant/Owner: State: TX Sampling Point: Upl 9

Investigator(s): Cliff Riley, Lance Olenius Section, Township, Range:

Landform (hillslope, terrace, etc.): Local relief (concave, convex, none): Concave Slope (%): 1-3

Subregion (LRR): J-84C Lat: 33.133257 Long: -97.205086 Datum: NAD83

Soil Map Unit Name: Ponder loam, 1 to 3 percent slopes NWI classification: --

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

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation _____, Soil _____, or Hydrology _____ 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 within a Wetland?** **Yes** _____ **No** X
Hydric Soil Present?	Yes _____	No X	
Wetland Hydrology Present?	Yes _____	No X	

Remarks:

Upland point taken outside of wetland.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: 30 ft)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: 10 ft)			
1. Cynodon dactylon	80	Y	FACU
2. Setaria pumila	10		FACU
3. Paspalum dilataum			FAC
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	_____ = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum _____

Dominance Test worksheet:

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

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

Percent of Dominant Species That Are OBL, FACW, or FAC: _____ (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

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a 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:

Hydrophytic vegetation not present based on observations.

SOIL

Sampling Point: Upl 9

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-12	5 YR 2.5/1	100						

[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.)

- ___ Histosol (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 I, 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 Shallow Dark Surface (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:

Hydric soil is not present based on observations.

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)
- ___ Algal 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 Indicators (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 _____ Depth (inches): _____

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

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

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

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

Remarks:

No indicators found

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: IH-35W Denton County City/County: Denton Sampling Date: 8/15/19

Applicant/Owner: State: TX Sampling Point: Wet 10

Investigator(s): Cliff Riley, Lance Olenius Section, Township, Range:

Landform (hillslope, terrace, etc.): Local relief (concave, convex, none): Concave Slope (%): 1-3

Subregion (LRR): J-84C Lat: 33.133789 Long: -97.204840 Datum: NAD83

Soil Map Unit Name: Ponder loam, 1 to 3 percent slopes NWI classification: --

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

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation _____, Soil _____, or Hydrology _____ 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 within a Wetland?** **Yes** X **No** _____
Hydric Soil Present?	Yes X	No _____	
Wetland Hydrology Present?	Yes X	No _____	

Remarks:

Normal conditions present. East of NB on-ramp from Crawford Road. N of Wetland 9.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: 30 ft)			
1. Typha sp.	20	Y	OBL
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: 10 ft)			
1. Eleocharis sp.	20	Y	FACW
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	_____ = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): 2 (A)

Total Number of Dominant Species Across All Strata: 2 (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 a 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:

Hydrophytic vegetation present based on dominance test.

SOIL

Sampling Point: Wet 10

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-3	7.5 YR 5/3	75	7.5 4/6	2			Sand	
3-18	2.5 YR 2/1		5 YR 4/4	15	D	M	Sandy 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.)

- ___ Histosol (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)
- x Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- Loamy Gleyed Matrix (F2)
- x 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 I, 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 Shallow Dark Surface (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:

Hydric soil is present based on observations of indicators

HYDROLOGY

Wetland Hydrology Indicators:

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

- x Surface Water (A1)
- ___ High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal 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)
- x Oxidized Rhizospheres on Living Roots (C3) (**where not tilled**)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- x 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 x No ____ Depth (inches): _____

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

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

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

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

Remarks:

Hydrology is present due to found indicators

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: IH-35W Denton County City/County: Denton Sampling Date: 8/15/19

Applicant/Owner: State: TX Sampling Point: Upl 10

Investigator(s): Cliff Riley, Lance Olenius Section, Township, Range:

Landform (hillslope, terrace, etc.): Local relief (concave, convex, none): Concave Slope (%): 1-3

Subregion (LRR): J-84C Lat: 33.133746 Long: -97.204866 Datum: NAD83

Soil Map Unit Name: Ponder loam, 1 to 3 percent slopes NWI classification: --

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

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation _____, Soil _____, or Hydrology _____ 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 within a Wetland?** **Yes** _____ **No** X
Hydric Soil Present?	Yes _____	No X	
Wetland Hydrology Present?	Yes _____	No X	

Remarks:

Upland point taken outside of wetland.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: 30 ft)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: 10 ft)			
1. Cynodon dactylon	60	Y	FACU
2. Paspalum dilataum	10		FAC
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	_____ = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum _____

Dominance Test worksheet:

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

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

Percent of Dominant Species That Are OBL, FACW, or FAC: _____ (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

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a 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:

Hydrophytic vegetation not present based on observations.

SOIL

Sampling Point: Upl 10

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-20	5 YR 2.5/1	100					Clay	

[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.)

- ___ Histosol (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 I, 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 Shallow Dark Surface (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:

Hydric soil indicators were not observed

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)
- ___ Algal 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 Indicators (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 _____ Depth (inches): _____

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

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

Wetland Hydrology Present? Yes _____ No X

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

Remarks:

No indicators observed. No hydrology present at location

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: IH-35W Denton County City/County: Denton Sampling Date: 8/26/19

Applicant/Owner: State: TX Sampling Point: Wet 11

Investigator(s): Cliff Riley Section, Township, Range:

Landform (hillslope, terrace, etc.): Local relief (concave, convex, none): Concave Slope (%): 1-3

Subregion (LRR): J-84C Lat: 33.133368 Long: -97.206479 Datum: NAD83

Soil Map Unit Name: Ponder loam, 1 to 3 percent slopes NWI classification: --

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

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation _____, Soil _____, or Hydrology _____ 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 within a Wetland?** **Yes** X **No** _____
Hydric Soil Present?	Yes X	No _____	
Wetland Hydrology Present?	Yes X	No _____	

Remarks:

Normal conditions present. West of SB IH-35W. Unnamed stream #7

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1. Salix nigra	20	Y	FACW
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: 30 ft)			
1. Typha sp.	20	Y	OBL
2. Ambrosia trifida	15		FAC
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: 10 ft)			
1. Eleocharis sp.	20	Y	FACW
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	_____ = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum _____

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 a 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:

Hydrophytic vegetation present based on dominance test.

SOIL

Sampling Point: Wet 11

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-6	10 YR 3/1							
6-20	10 YR 5/2		10 YR 5/8	5	D	M	Sandy 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.)

- ___ Histosol (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)
- X 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 I, 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 Shallow Dark Surface (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:

Hydric soil is present based on observations of indicators

HYDROLOGY

Wetland Hydrology Indicators:

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

- X Surface Water (A1)
- ___ High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal 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)
- x Oxidized Rhizospheres on Living Roots (C3) (**where not tilled**)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (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 x No ____ Depth (inches): _____

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

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

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

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

Remarks:

Hydrology is present due to found indicators

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: IH-35W Denton County City/County: Denton Sampling Date: 8/26/19

Applicant/Owner: State: TX Sampling Point: Upl 11

Investigator(s): Cliff Riley Section, Township, Range:

Landform (hillslope, terrace, etc.): Local relief (concave, convex, none): Concave Slope (%): 1-3

Subregion (LRR): J-84C Lat: 33.133339 Long: -97.206393 Datum: NAD83

Soil Map Unit Name: Ponder loam, 1 to 3 percent slopes NWI classification: --

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

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation _____, Soil _____, or Hydrology _____ 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 within a Wetland?** **Yes** _____ **No** X
Hydric Soil Present?	Yes _____	No X	
Wetland Hydrology Present?	Yes _____	No X	

Remarks:

Upland point taken outside of wetland.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: 30 ft)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: 10 ft)			
1. Cynodon dactylon	60	Y	FACU
2. Paspalum dilataum	10		FAC
3. Sorghum halepense	10		FACU
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	_____ = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum _____

Dominance Test worksheet:

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

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

Percent of Dominant Species That Are OBL, FACW, or FAC: _____ (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

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a 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:

Hydrophytic vegetation not present based on observations.

SOIL

Sampling Point: Upl 11

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-16	7.5 YR 4/2	100					Sandy 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.)

- ___ Histosol (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 I, 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 Shallow Dark Surface (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:

Hydric soil indicators were not observed

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)
- ___ Algal 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 Indicators (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 _____ Depth (inches): _____

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

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

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

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

Remarks:

No indicators observed. No hydrology present at location

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: IH-35W Denton County City/County: Denton Sampling Date: 8/16/19

Applicant/Owner: State: TX Sampling Point: Wet 12

Investigator(s): Cliff Riley, Lance Olenius Section, Township, Range:

Landform (hillslope, terrace, etc.): Local relief (concave, convex, none): Concave Slope (%): 1-3

Subregion (LRR): J-84C Lat: 33.141488 Long: -97.199536 Datum: NAD83

Soil Map Unit Name: Wilson clay loam, 1 to 3 percent slopes NWI classification: --

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

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation _____, Soil _____, or Hydrology _____ 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 within a Wetland?** **Yes** X **No** _____
Hydric Soil Present?	Yes X	No _____	
Wetland Hydrology Present?	Yes X	No _____	

Remarks:

Normal conditions present. East of NB IH-35W at Graveyard Branch Unnamed Tributary.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: 30 ft)			
1. Typha sp.	20	Y	OBL
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: 10 ft)			
1. Eleocharis sp.	20	Y	FACW
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	_____ = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): 2 (A)

Total Number of Dominant Species Across All Strata: 2 (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 a 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:

Hydrophytic vegetation present based on dominance test.

SOIL

Sampling Point: Wet 12

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-3	7.5 YR 3/1							
3-20	7.5 YR 5/2		7.5 YR 5/8	5	D	M	Sandy 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.)

- ___ Histosol (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)
- X 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 I, 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 Shallow Dark Surface (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:

Hydric soil is present based on observations of indicators

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)
- ___ Algal 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)
- x Oxidized Rhizospheres on Living Roots (C3) (**where not tilled**)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (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 X No _____ Depth (inches): _____

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

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

Remarks:

Hydrology is present due to found indicators

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: IH-35W Denton County City/County: Denton Sampling Date: 8/26/19

Applicant/Owner: State: TX Sampling Point: Upl 11

Investigator(s): Cliff Riley Section, Township, Range:

Landform (hillslope, terrace, etc.): Local relief (concave, convex, none): Concave Slope (%): 1-3

Subregion (LRR): J-84C Lat: 33.141479 Long: -97.199593 Datum: NAD83

Soil Map Unit Name: Wilson clay loam, 1 to 3 percent slopes NWI classification: --

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

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation _____, Soil _____, or Hydrology _____ 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 within a Wetland?** **Yes** _____ **No** X
Hydric Soil Present?	Yes _____	No X	
Wetland Hydrology Present?	Yes _____	No X	

Remarks:

Upland point taken outside of wetland.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: 30 ft)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: 10 ft)			
1. Cynodon dactylon	40	Y	FACU
2. Paspalum dilataum	10		FAC
3. Eragrostis intermedia	10		-
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	_____ = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum _____

Dominance Test worksheet:

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

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

Percent of Dominant Species That Are OBL, FACW, or FAC: _____ (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

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a 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:

Hydrophytic vegetation not present based on observations.

SOIL

Sampling Point: Upl 12

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-16	10 YR 5/1	100					Sandy 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.)

- ___ Histosol (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 I, 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 Shallow Dark Surface (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:

Hydric soil indicators were not observed

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)
- ___ Algal 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 Indicators (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 _____ Depth (inches): _____

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

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

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

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

Remarks:

No indicators observed. No hydrology present at location

Attachment 3 – Stream Forms

Stream Data Form #: 1
Project Name: IH 35W Frontage Roads
CSJ: 0081-13-065

Stream Data Form

Surveyor(s): Cliff Riley
Date of Field Work: 8/14/19
USGS Stream Name: Unnamed Tributary of Elizabeth Creek
County/State: Denton, TX
USGS Topo Quad Name: Justin
Stream Number [303(d) List]:
Associated Wetland(s):
GPS Data: 33.035317N -97.264377W

Stream Type: Ephemeral Characteristics Natural
Bank Stability (e.g. highly eroding, sloughing banks, etc.):

Stream Flow Direction: East
OHWM Width (ft): 5 OHWM Height (in): 1-3
Stream Bottom composition:

☒ Silts ☒ Cobbles ☒ Concrete ☐ Other:
☒ Sands ☐ Bedrock ☐ Muck
☐ Gravel ☒ Vegetation Type: Herbaceous Percent Cover 50

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.

Riparian Vegetation: List species observed.
Herbaceous Vegetation: switchgrass, morning glory, Illinois bundleflower, indiangrass, and rattle bush

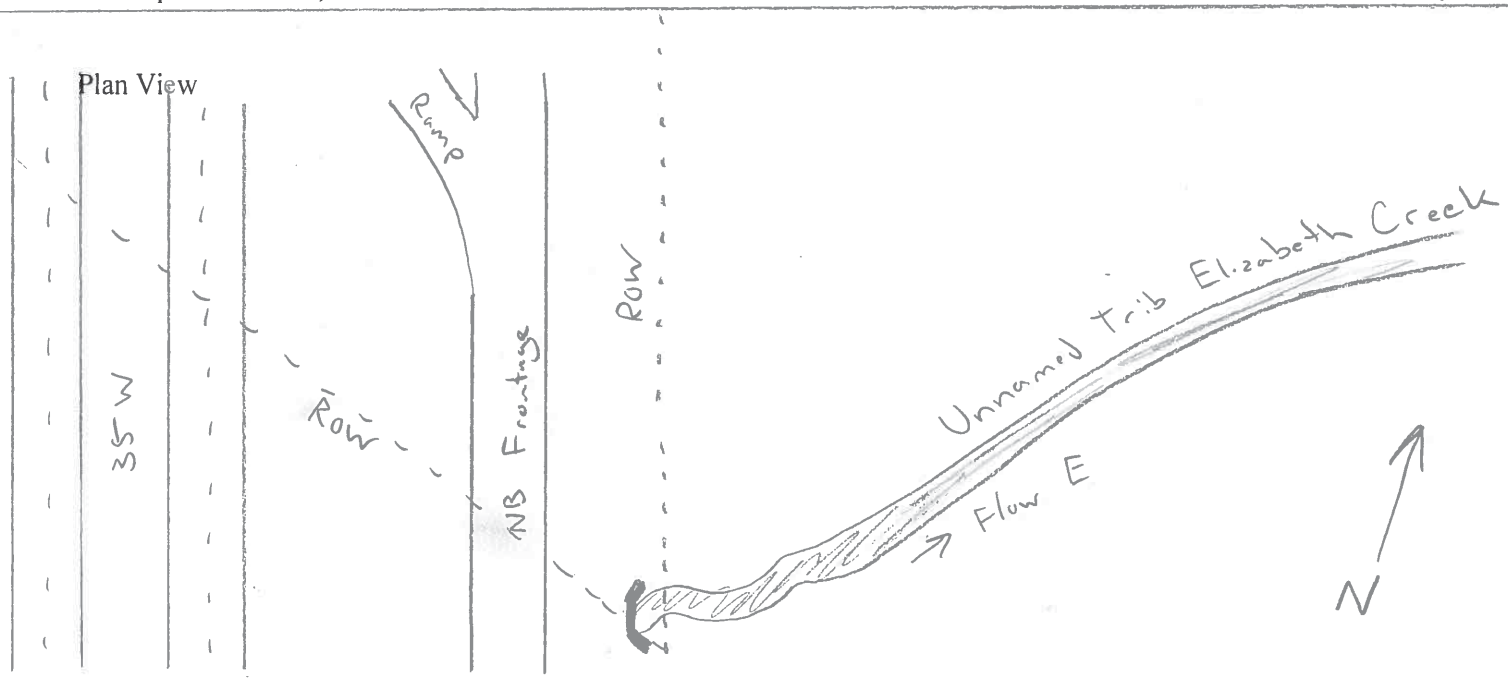
T&E Species/Suitable Habitat: List T&E species observed or which species the habitat is suitable for.

Stream Data Form #: 1
Project Name: IH 35W Frontage Roads
CSJ: 0081-13-065

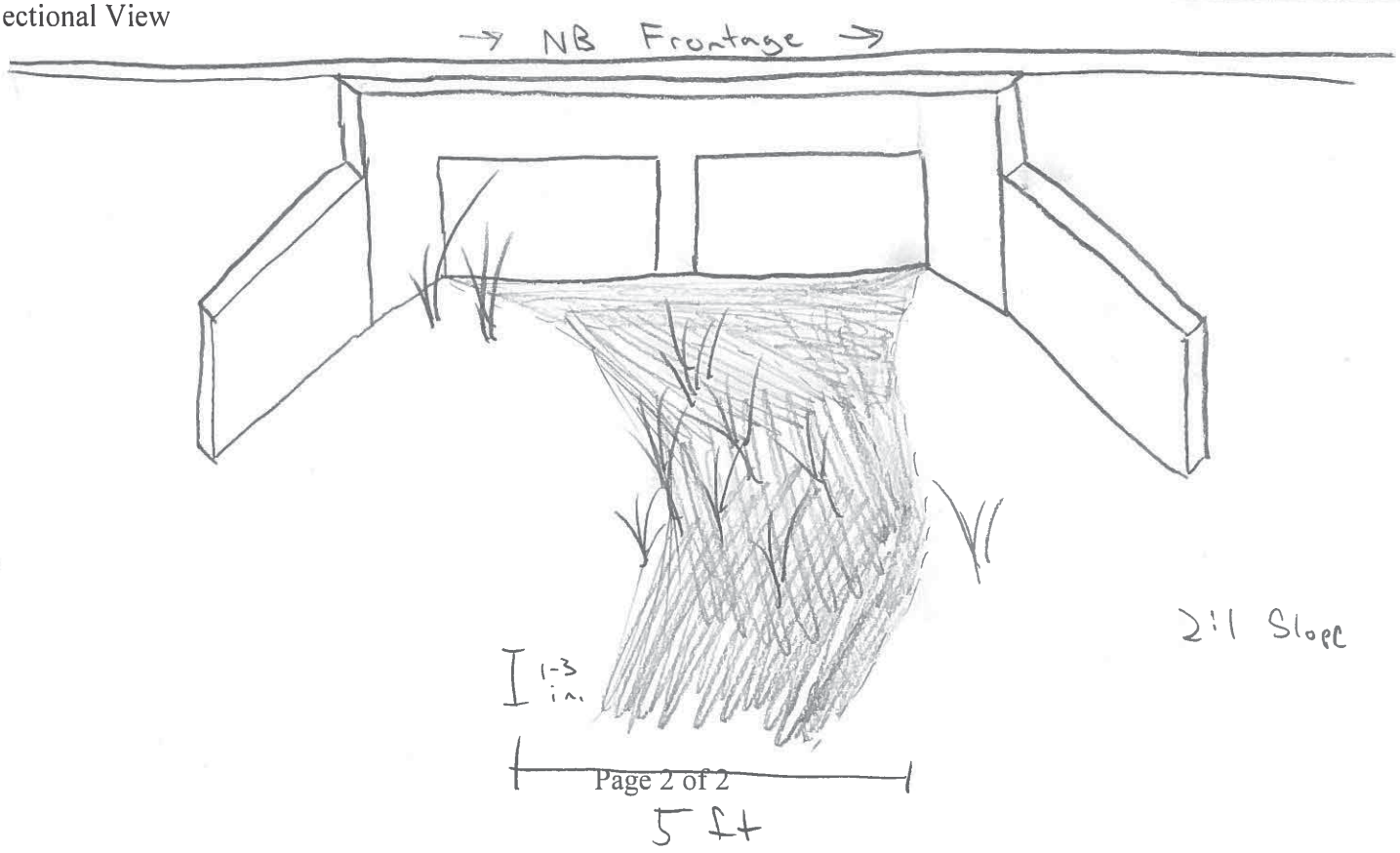
Stream Data Form (continued)
Please provide a plan and section view sketch of the stream channel.
Sketch should include:

- 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



Sectional View



Stream Data Form #: 2
Project Name: IH 35W Frontage Roads
CSJ: 0081-13-065

Stream Data Form

Surveyor(s): Cliff Riley
USGS Stream Name: Elizabeth Creek Tributary 2
USGS Topo Quad Name: Justin
Associated Wetland(s):

Date of Field Work: 8/14/19
County/State: Denton, TX
Stream Number [303(d) List]:
GPS Data: 33.040001 N 97.259798W

Stream Type: Ephemeral Characteristics Natural
Bank Stability (e.g. highly eroding, sloughing banks, etc.):

Stream Flow Direction: East
OHWM Width (ft): 4 OHWM Height (in): 6
Stream Bottom composition:

☒ Silts ☒ Cobbles ☒ Concrete ☐ Other:
☒ Sands ☐ Bedrock ☐ Muck
☐ Gravel ☒ Vegetation Type: Herbaceous Percent Cover 60

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.

Riparian Vegetation: List species observed.

Herbaceous Vegetation: side-oats grama. Switchgrass, Johnsongrass, bitterweed, bermudagrass, yellow foxtail, indiangrass, rattlebush, and dallisgrass

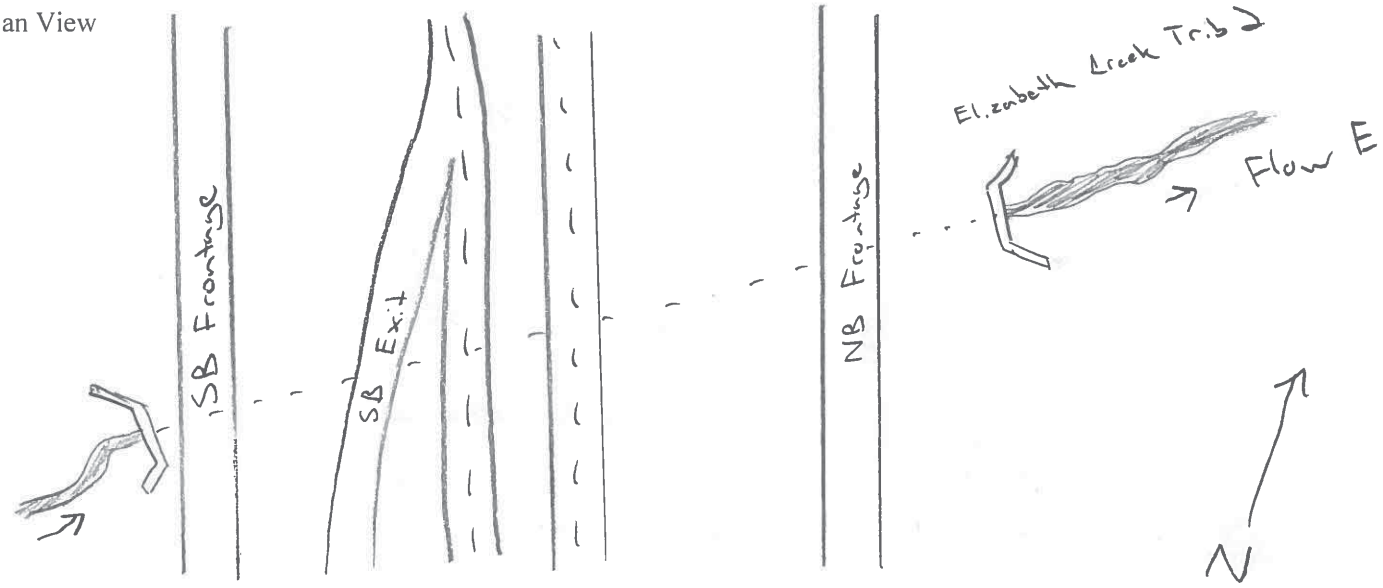
T&E Species/Suitable Habitat: List T&E species observed or which species the habitat is suitable for.

Stream Data Form #:	2
Project Name:	IH 35W Frontage Roads
CSJ:	0081-13-065

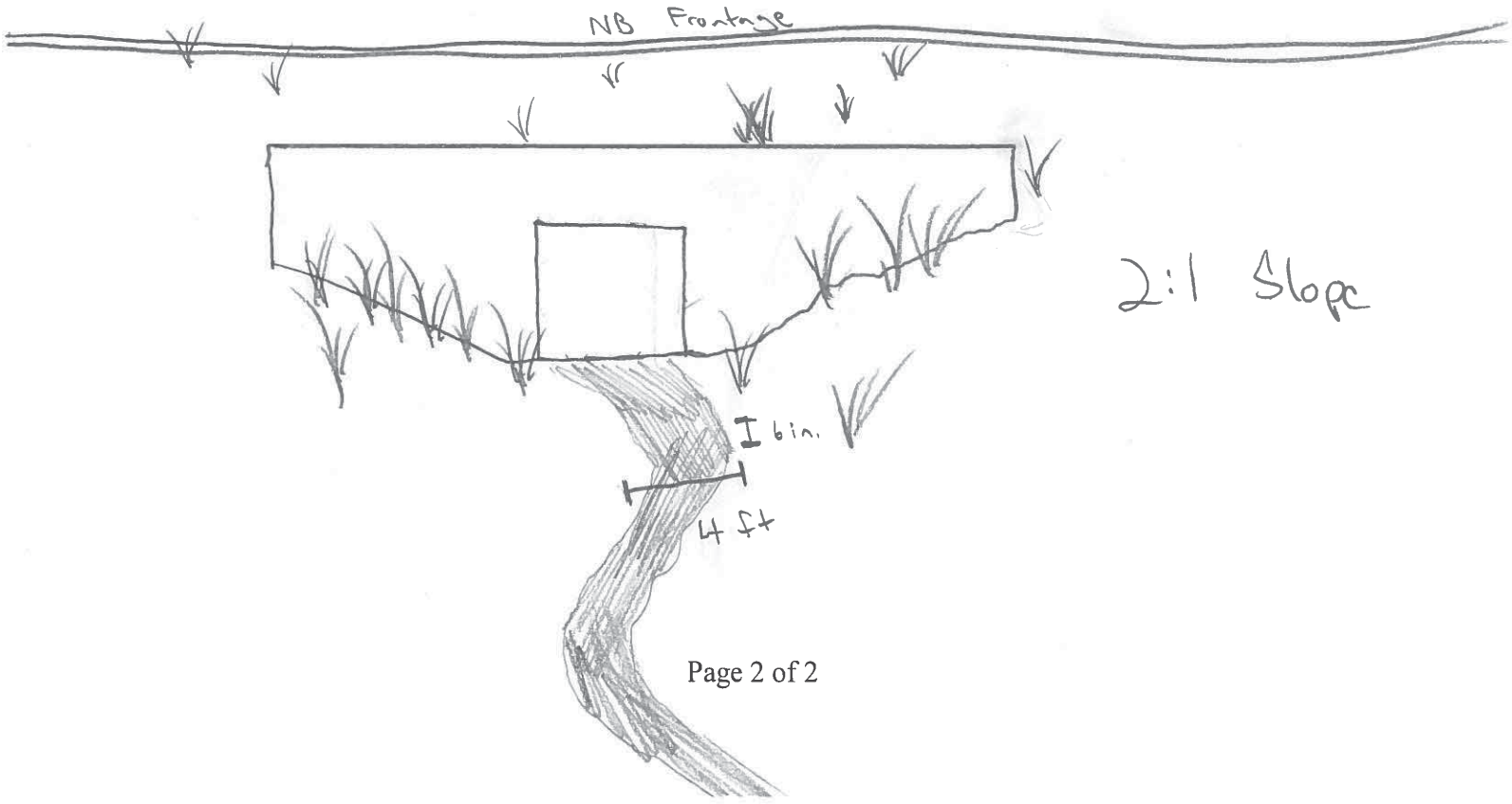
Stream Data Form (continued)
Please provide a plan and section view sketch of the stream channel.
Sketch should include:

- 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



Sectional View



Stream Data Form #: 3
Project Name: IH 35W Frontage Roads
CSJ: 0081-13-065

Stream Data Form

Surveyor(s): Cliff Riley
Date of Field Work: 8/14/19
USGS Stream Name: Catherine Branch
County/State: Denton, TX
USGS Topo Quad Name: Justin
Stream Number [303(d) List]:
Associated Wetland(s):
GPS Data: 33.050139N -97.252801W

Stream Type: Perennial Characteristics Natural
Bank Stability (e.g. highly eroding, sloughing banks, etc.):

Stream Flow Direction: East
OHWM Width (ft): 11 OHWM Height (in): 1-2
Stream Bottom composition:

- ☐ Silts ☐ Cobbles ☐ Concrete ☐ Other:
- ☒ Sands ☐ Bedrock ☐ Muck
- ☐ Gravel ☒ Vegetation Type: Herbaceous Percent Cover 15

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.

Riparian Vegetation: List species observed.
Herbaceous Vegetation: rattlebush, switchgrass, bitterweed, spikerush, and yellow foxtail

T&E Species/Suitable Habitat: List T&E species observed or which species the habitat is suitable for.

Stream Data Form #:	3
Project Name:	IH 35W Frontage Roads
CSJ:	0081-13-065

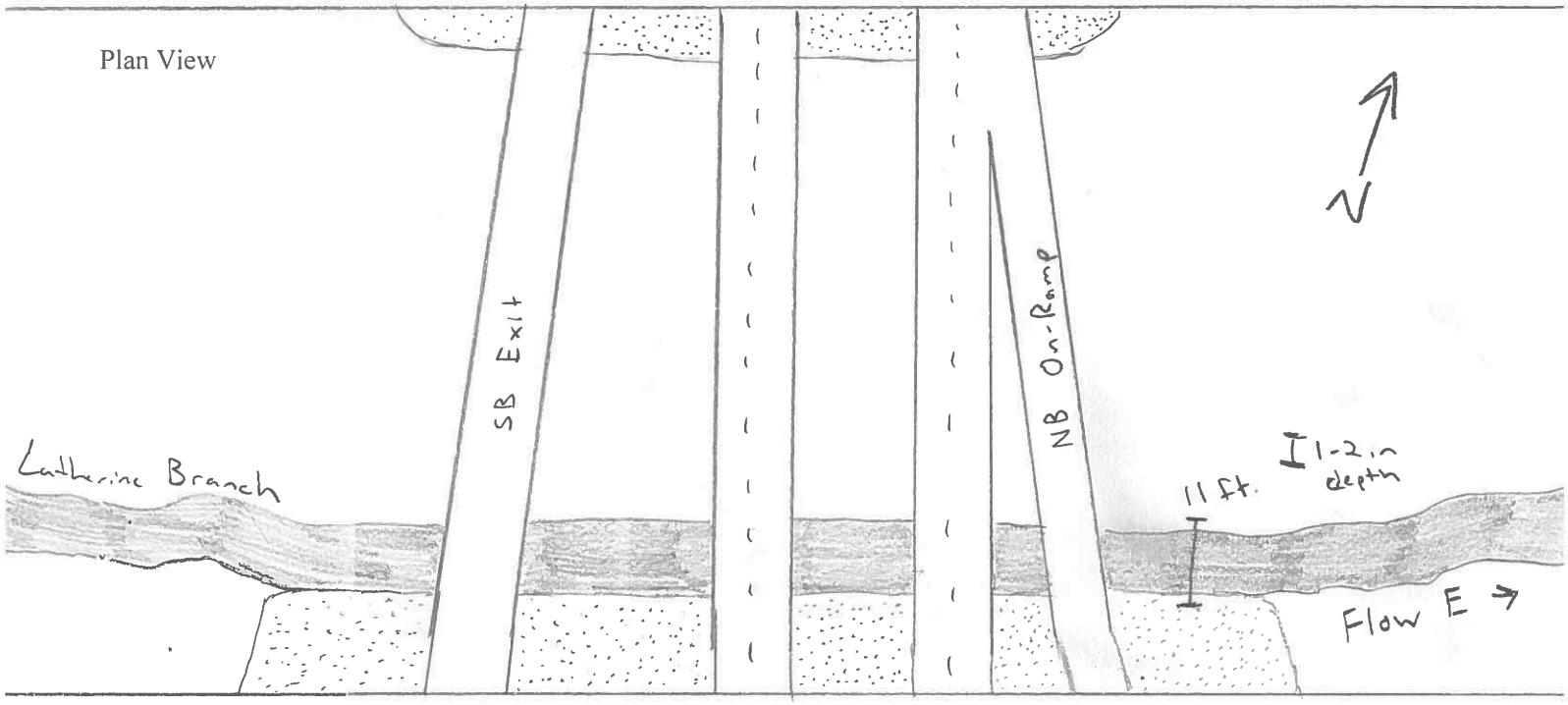
Stream Data Form (continued)

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

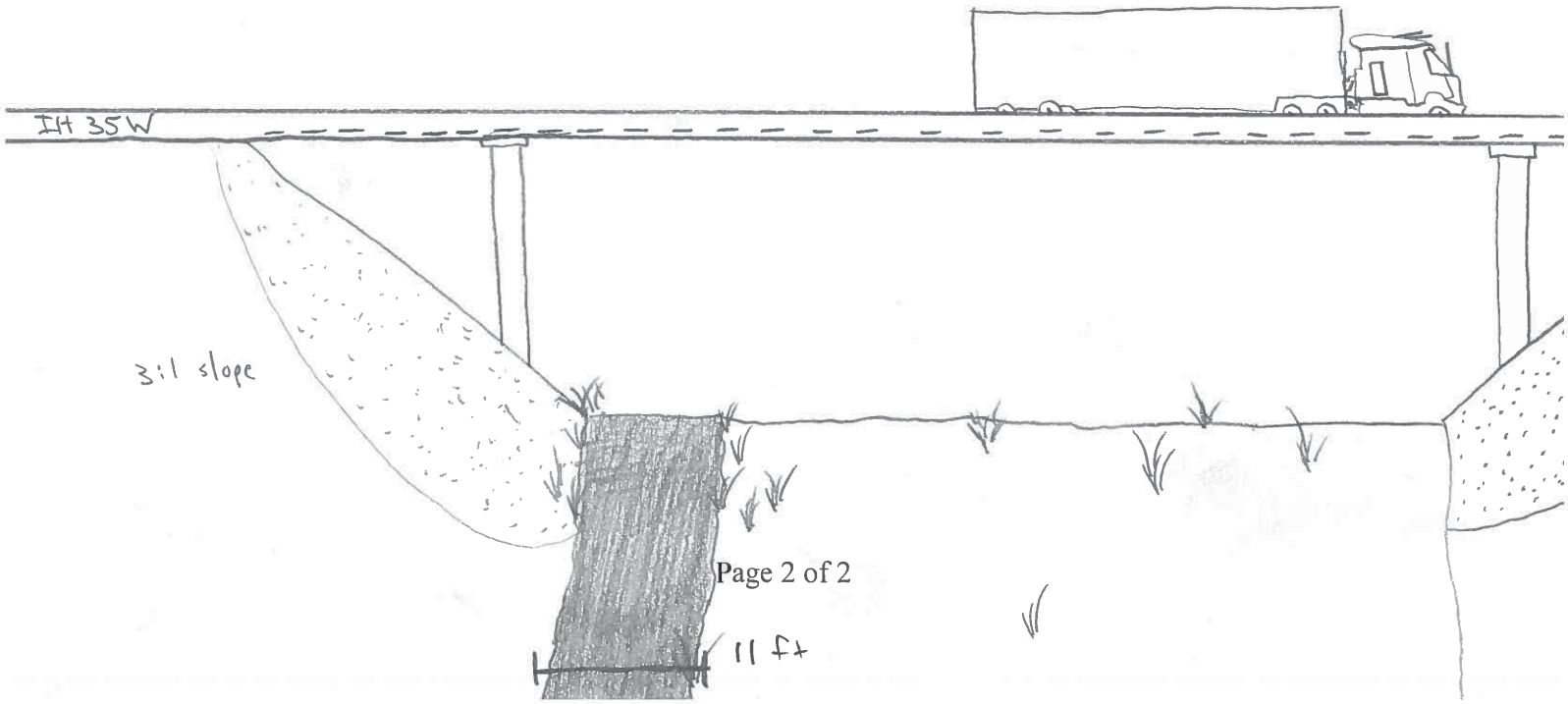
Sketch should include:

- 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



Sectional View



Stream Data Form #: 4
Project Name: IH 35W Frontage Roads
CSJ: 0081-13-065

Stream Data Form

Surveyor(s): Cliff Riley
Date of Field Work: 8/14/19
USGS Stream Name: Open Water 1
County/State: Denton, TX
USGS Topo Quad Name: Justin
Stream Number [303(d) List]:
Associated Wetland(s): Open Water 1 - Near Denton Creek
GPS Data: 33.048419N -97.253491W

Stream Type: <Select Type> Characteristics: Natural
Bank Stability (e.g. highly eroding, sloughing banks, etc.):
Stream Flow Direction: <Select Dir>
OHWM Width (ft): - OHWM Height (in): -
Stream Bottom composition:

☐ Silts ☐ Cobbles ☐ Concrete ☐ Other:
☐ Sands ☐ Bedrock ☐ Muck
☐ Gravel ☐ Vegetation Type: Herbaceous 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.

Riparian Vegetation: List species observed.
Herbaceous Vegetation: bitterweed, goldenrod, spikerush, and switchgrass

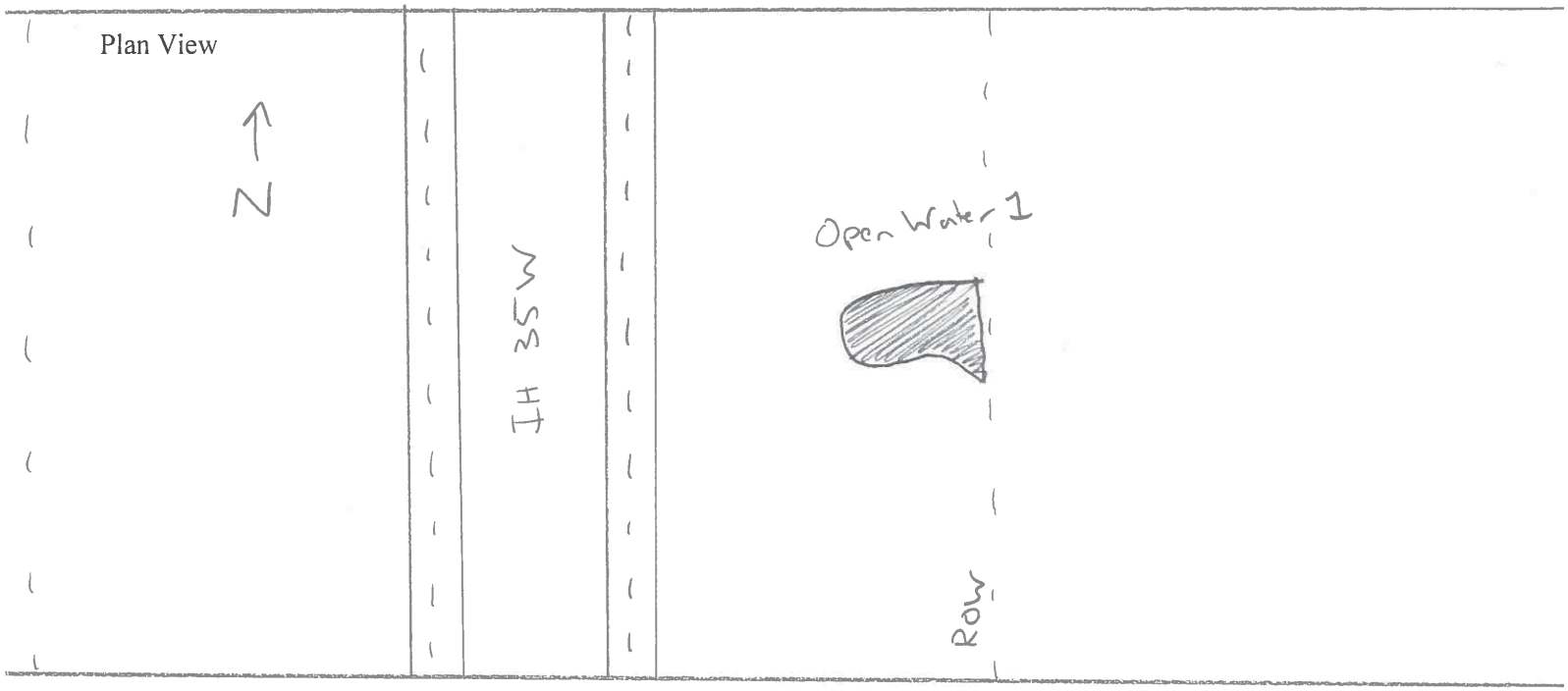
T&E Species/Suitable Habitat: List T&E species observed or which species the habitat is suitable for.

Stream Data Form #:	4
Project Name:	IH 35W Frontage Roads
CSJ:	0081-13-065

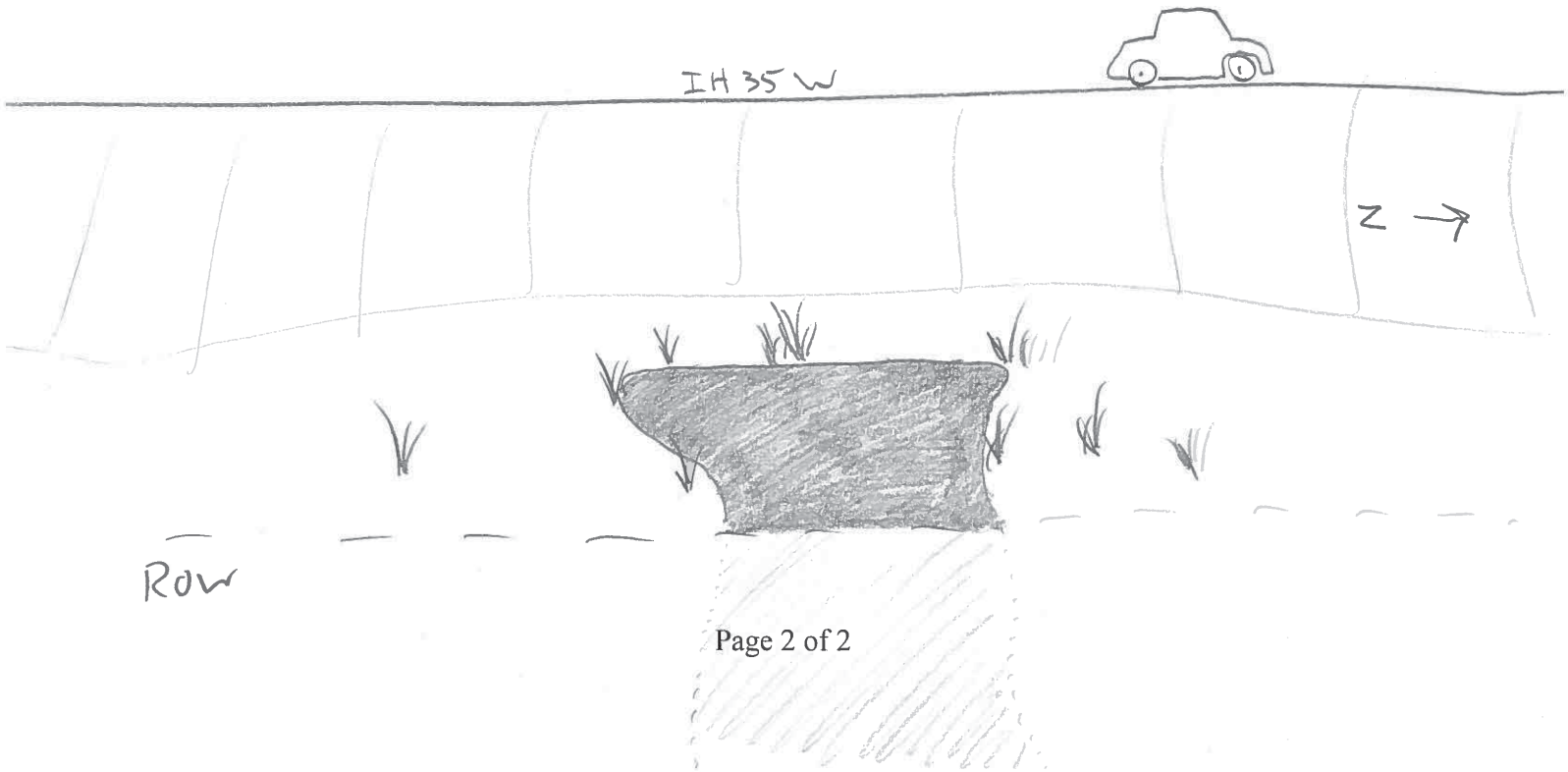
Stream Data Form (continued)
Please provide a plan and section view sketch of the stream channel.
Sketch should include:

- 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



Sectional View



Stream Data Form #: 5
Project Name: IH 35W Frontage Roads
CSJ: 0081-13-065

Stream Data Form

Surveyor(s): Cliff Riley
Date of Field Work: 8/14/19
USGS Stream Name: Denton Creek Tributary 6
County/State: Denton, TX
USGS Topo Quad Name: Justin
Stream Number [303(d) List]:
Associated Wetland(s):
GPS Data: 33.050139N -97.252801W

Stream Type: Intermittent Characteristics Natural
Bank Stability (e.g. highly eroding, sloughing banks, etc.):

Stream Flow Direction: East
OHWM Width (ft): 5 OHWM Height (in): 1-2
Stream Bottom composition:

- ☐ Silts ☐ Cobbles ☐ Concrete ☐ Other:
- ☒ Sands ☐ Bedrock ☐ Muck
- ☐ Gravel ☒ Vegetation Type: Herbaceous Percent Cover 60

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.

Riparian Vegetation: List species observed.
Herbaceous Vegetation: hackberry, green ash, spikerush, curly dock, giant ragweed, balloon vine, rattlebush, fourvalve mimosa, bahiagrass, American elm, sycamore, and dallisgrass

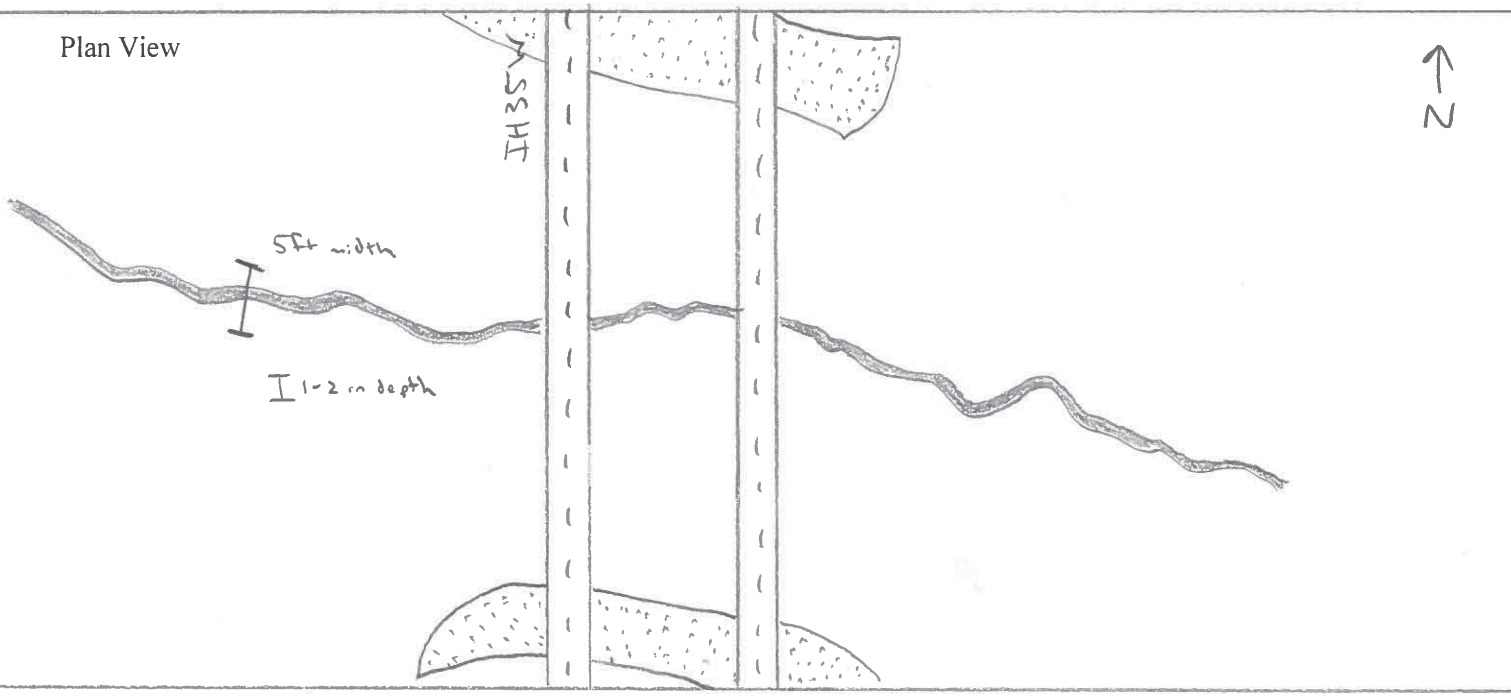
T&E Species/Suitable Habitat: List T&E species observed or which species the habitat is suitable for.

Stream Data Form #:	5
Project Name:	IH 35W Frontage Roads
CSJ:	0081-13-065

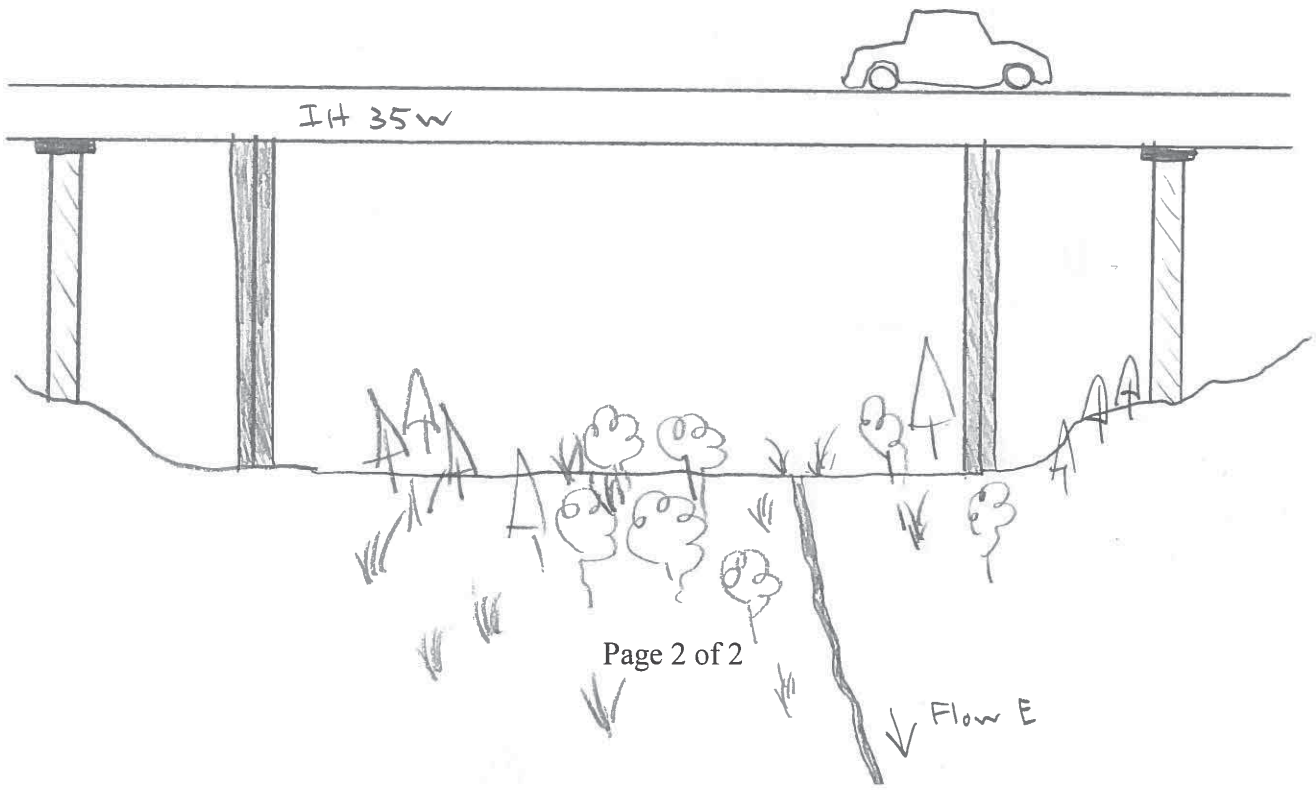
Stream Data Form (continued)
Please provide a plan and section view sketch of the stream channel.
Sketch should include:

- 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



Sectional View



Stream Data Form #: 6
Project Name: IH 35W Frontage Roads
CSJ: 0081-13-065

Stream Data Form

Surveyor(s): Cliff Riley
Date of Field Work: 8/14/19
USGS Stream Name: Denton Creek
County/State: Denton, TX
USGS Topo Quad Name: Justin
Stream Number [303(d) List]:
Associated Wetland(s):
GPS Data: 33.052194N -97.250958W

Stream Type: Perennial Characteristics Natural
Bank Stability (e.g. highly eroding, sloughing banks, etc.):

Stream Flow Direction: East
OHWM Width (ft): 50 OHWM Height (in): 1-2
Stream Bottom composition:

☐ Silts ☐ Cobbles ☐ Concrete ☐ Other:
☒ Sands ☐ Bedrock ☐ Muck
☒ Gravel ☒ Vegetation Type: Herbaceous Percent Cover 15

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.

Riparian Vegetation: List species observed.
Herbaceous Vegetation: rattlebush, bitterweed, switchgrass, red oak, sycamore, common dayflower, and American elm

T&E Species/Suitable Habitat: List T&E species observed or which species the habitat is suitable for.

Stream Data Form #:	6
Project Name:	IH 35W Frontage Roads
CSJ:	0081-13-065

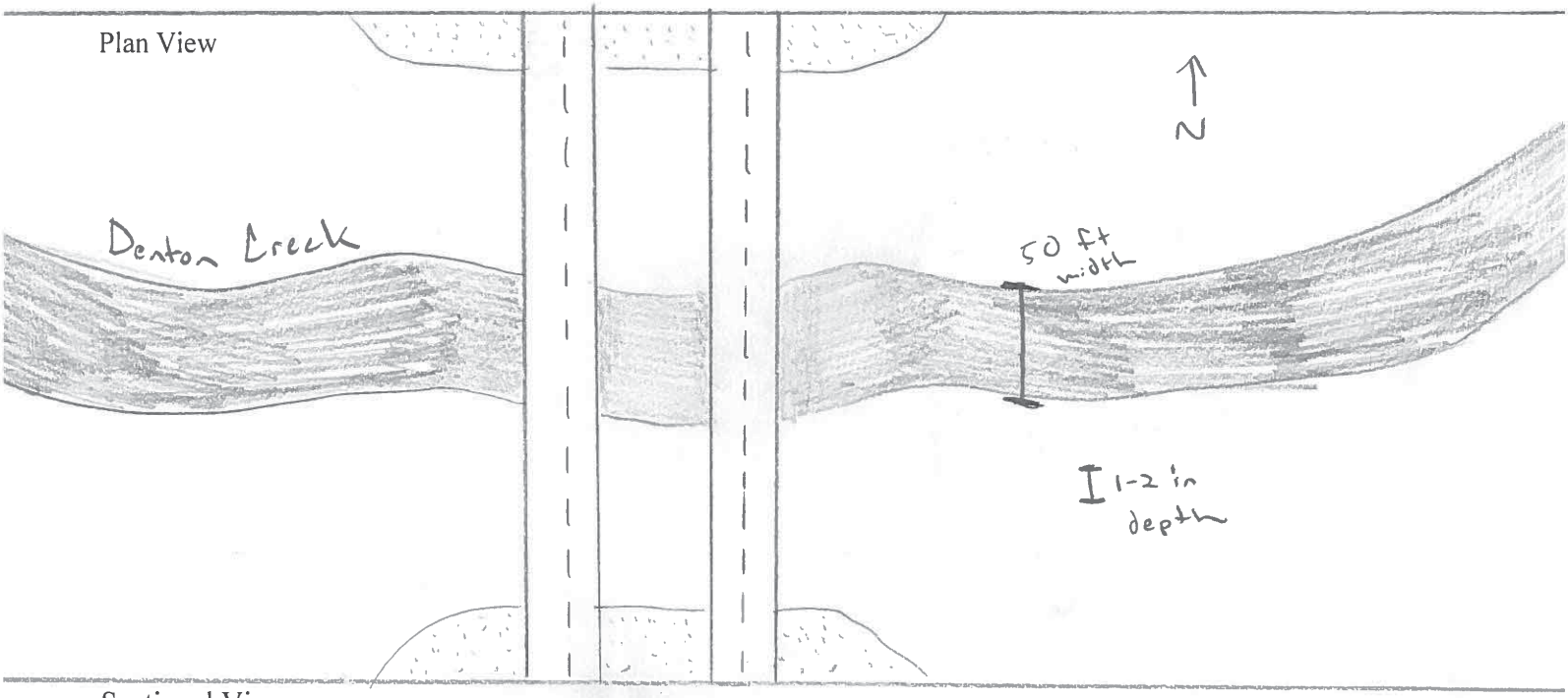
Stream Data Form (continued)

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

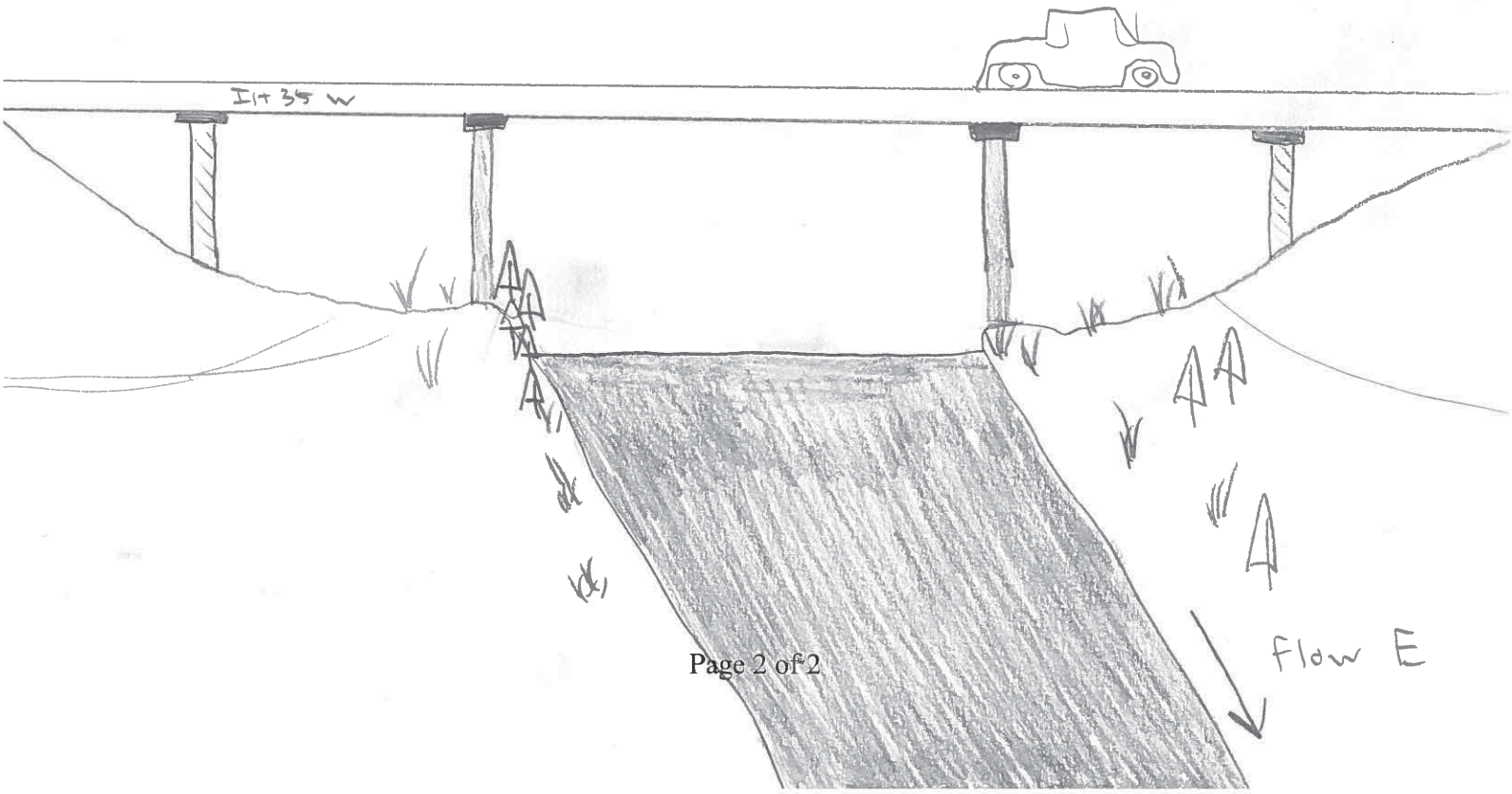
Sketch should include:

- 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



Sectional View



Stream Data Form #: 7
Project Name: IH 35W Frontage Roads
CSJ: 0081-13-065

Stream Data Form

Surveyor(s): Cliff Riley
Date of Field Work: 8/14/19
USGS Stream Name: Unnamed Tributary of Cleveland Branch
County/State: Denton, TX
USGS Topo Quad Name: Justin
Stream Number [303(d) List]:
Associated Wetland(s):
GPS Data: 33.057998N -97.246667W

Stream Type: Ephemeral Characteristics: Natural
Bank Stability (e.g. highly eroding, sloughing banks, etc.):
Stream Flow Direction: East
OHWM Width (ft): 2 OHWM Height (in): 2-3
Stream Bottom composition:

- ☐ Silts ☐ Cobbles ☐ Concrete ☐ Other:
- ☒ Sands ☐ Bedrock ☐ Muck
- ☒ Gravel ☒ Vegetation Type: Herbaceous Percent Cover 15

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.

Riparian Vegetation: List species observed.
Herbaceous Vegetation: dallisgrass, switchgrass, bermudagrass, and indiangrass

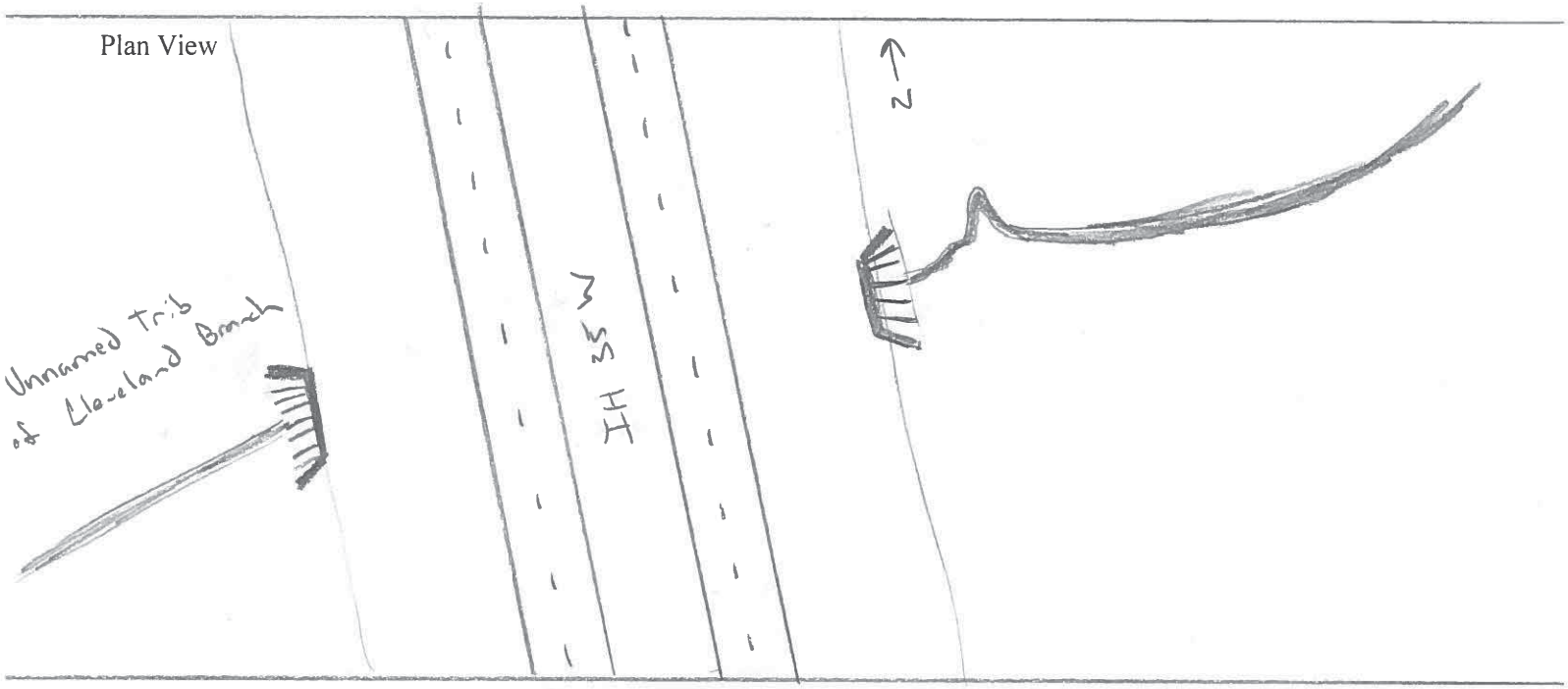
T&E Species/Suitable Habitat: List T&E species observed or which species the habitat is suitable for.

Stream Data Form #: 7
Project Name: IH 35W Frontage Roads
CSJ: 0081-13-065

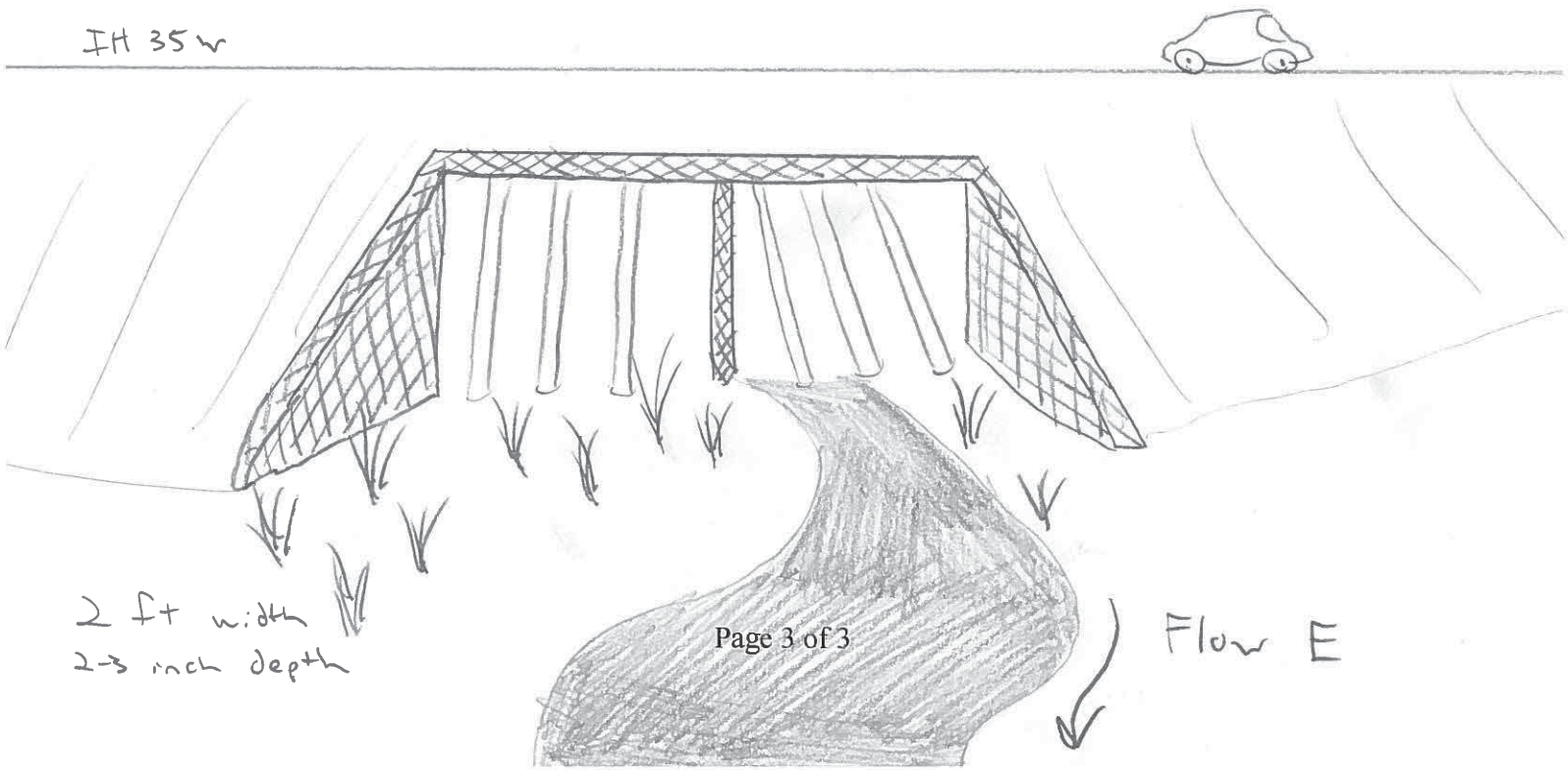
Stream Data Form (continued)
Please provide a plan and section view sketch of the stream channel.
Sketch should include:

- 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



Sectional View



Stream Data Form #: 8
Project Name: IH 35W Frontage Roads
CSJ: 0081-13-065

Stream Data Form

Surveyor(s): Cliff Riley
Date of Field Work: 8/14/19
USGS Stream Name: Cleveland Branch
County/State: Denton, TX
USGS Topo Quad Name: Justin
Stream Number [303(d) List]:
Associated Wetland(s): Wetland 1
GPS Data: 33.057998N -97.246667W

Stream Type: Ephemeral Characteristics Natural
Bank Stability (e.g. highly eroding, sloughing banks, etc.):

Stream Flow Direction: East
OHWM Width (ft): 1 OHWM Height (in): 2-3
Stream Bottom composition:

☐ Silts ☐ Cobbles ☐ Concrete ☐ Other:
☐ Sands ☐ Bedrock ☒ Muck
☐ Gravel ☒ Vegetation Type: Herbaceous Percent Cover 40

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.

Riparian Vegetation: List species observed.
Herbaceous Vegetation: cattail, spikerush, and goldenrod

T&E Species/Suitable Habitat: List T&E species observed or which species the habitat is suitable for.

Stream Data Form #:	8
Project Name:	IH 35W Frontage Roads
CSJ:	0081-13-065

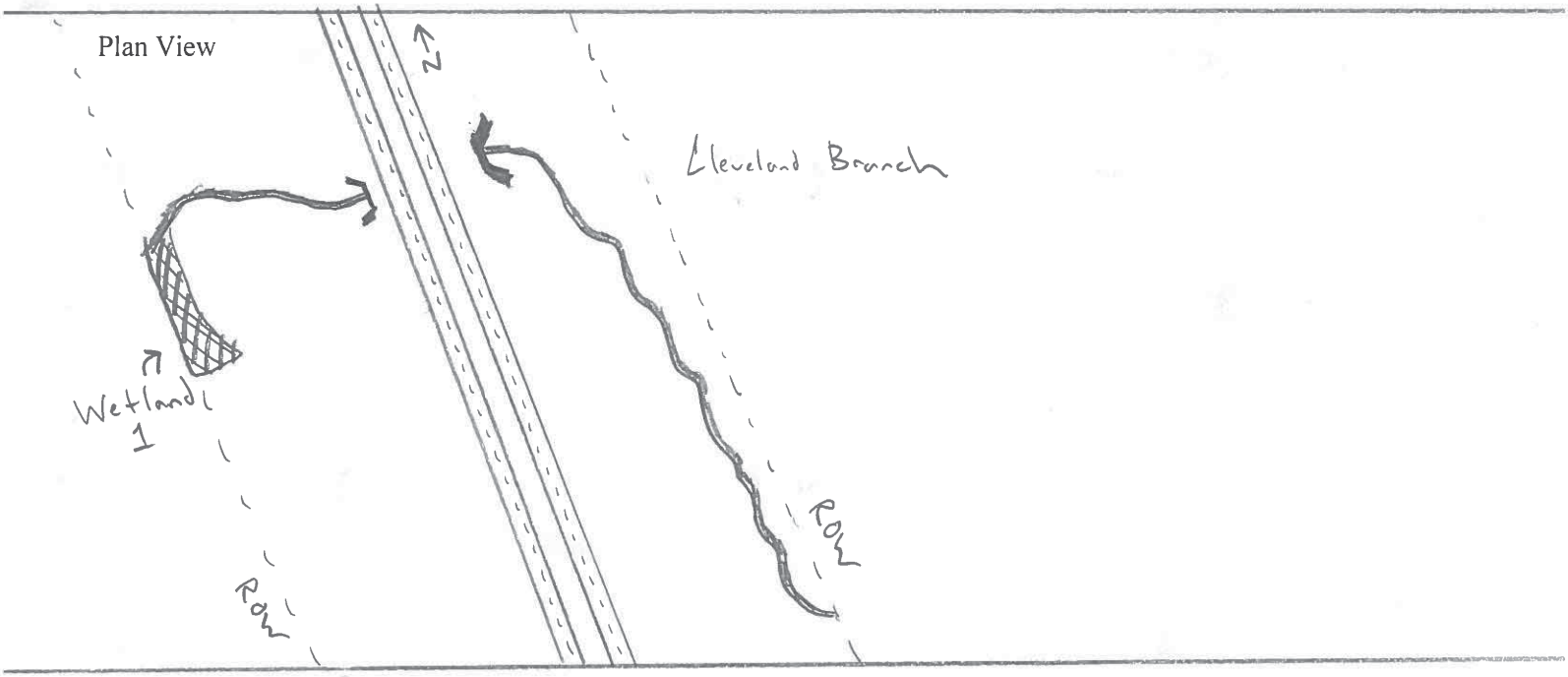
Stream Data Form (continued)

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

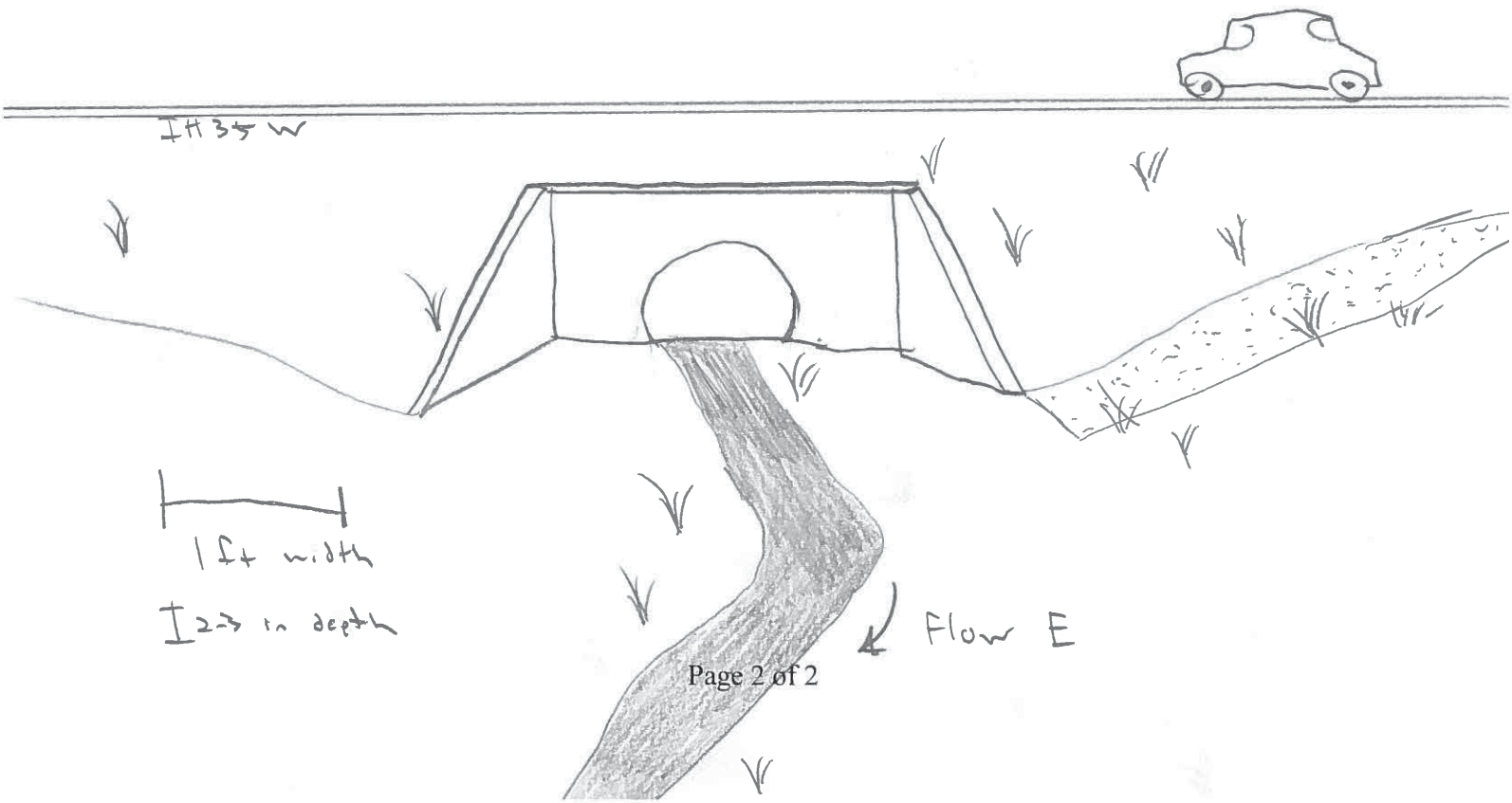
Sketch should include:

- 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



Sectional View



Stream Data Form #: 9
Project Name: IH 35W Frontage Roads
CSJ: 0081-13-065

Stream Data Form

Surveyor(s): Cliff Riley
Date of Field Work: 8/14/19
USGS Stream Name: Graham Branch Tributary 10
County/State: Denton, TX
USGS Topo Quad Name: Justin
Stream Number [303(d) List]:
Associated Wetland(s): Wetland 2
GPS Data: 33.089700N -97.229753W

Stream Type: Ephemeral Characteristics: Natural
Bank Stability (e.g. highly eroding, sloughing banks, etc.):
Stream Flow Direction: East
OHWM Width (ft): 3
OHWM Height (in): 2-3
Stream Bottom composition:

- ☐ Silts ☐ Cobbles ☐ Concrete ☐ Other:
- ☐ Sands ☐ Bedrock ☒ Muck
- ☐ Gravel ☒ Vegetation Type: Herbaceous Percent Cover 20

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.

Riparian Vegetation: List species observed.
Herbaceous Vegetation: yellow foxtail, Johnsongrass, goldenrod, and spikerush

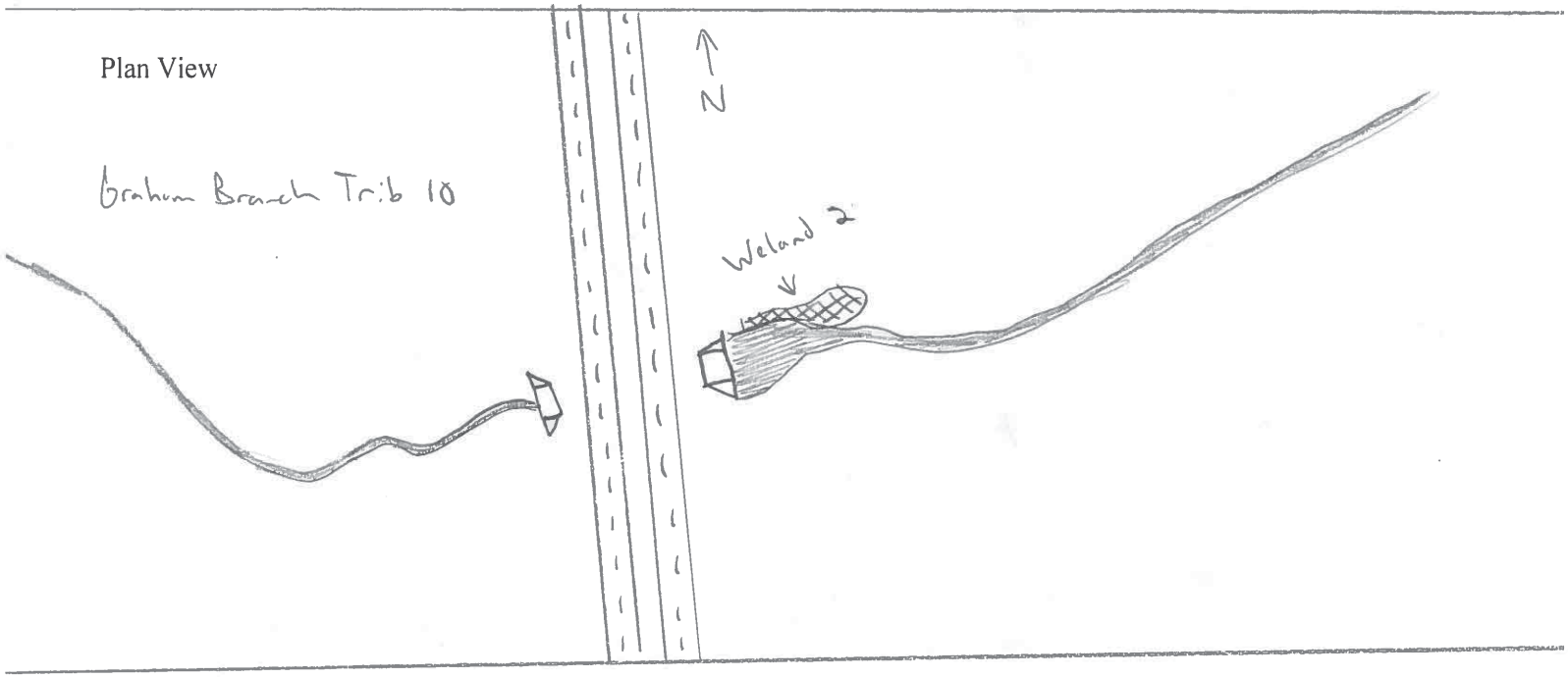
T&E Species/Suitable Habitat: List T&E species observed or which species the habitat is suitable for.

Stream Data Form #:	9
Project Name:	IH 35W Frontage Roads
CSJ:	0081-13-065

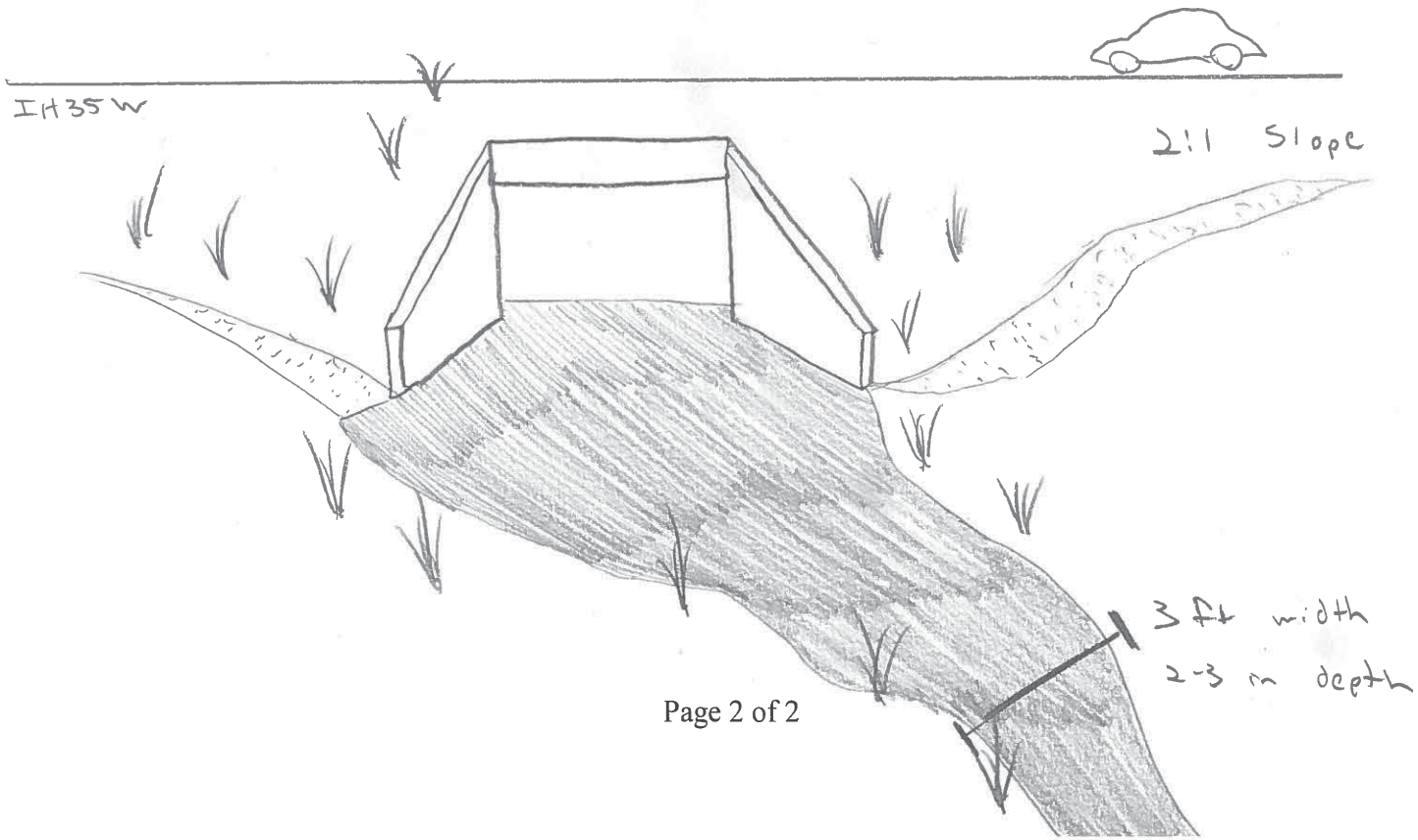
Stream Data Form (continued)
Please provide a plan and section view sketch of the stream channel.
Sketch should include:

- 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



Sectional View



Stream Data Form #: 10
Project Name: IH 35W Frontage Roads
CSJ: 0081-13-065

Stream Data Form

Surveyor(s): Cliff Riley
Date of Field Work: 8/14/19
USGS Stream Name: Graham Branch Tributary 10.1
County/State: Denton, TX
USGS Topo Quad Name: Justin
Stream Number [303(d) List]:
Associated Wetland(s): Wetland 3
GPS Data: 33.093075N -97.227671W

Stream Type: Ephemeral Characteristics Natural
Bank Stability (e.g. highly eroding, sloughing banks, etc.):

Stream Flow Direction: East
OHWM Width (ft): 2
OHWM Height (in): 3-8
Stream Bottom composition:

- ☒ Silts ☐ Cobbles ☐ Concrete ☐ Other:
- ☒ Sands ☐ Bedrock ☒ Muck
- ☐ Gravel ☒ Vegetation Type: Herbaceous Percent Cover 20

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.

Riparian Vegetation: List species observed.
Herbaceous Vegetation: spikerush, goldenrod, dallisgrass, Torrey's rush, and bahiagrass

T&E Species/Suitable Habitat: List T&E species observed or which species the habitat is suitable for.

Stream Data Form #:	10
Project Name:	IH 35W Frontage Roads
CSJ:	0081-13-065

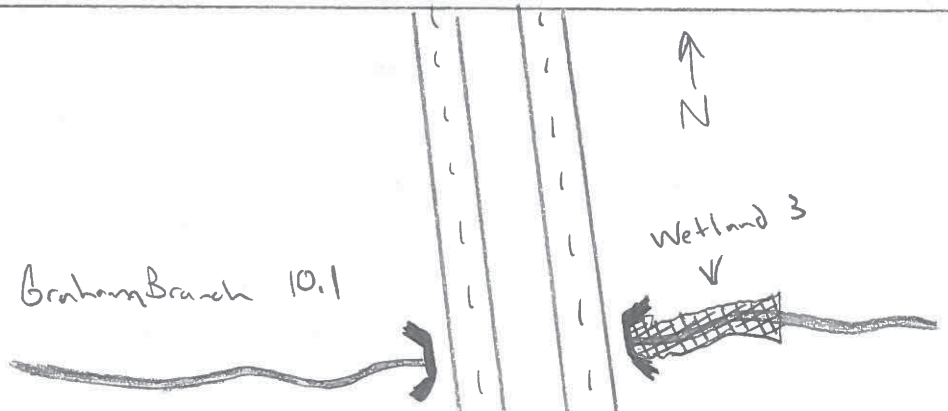
Stream Data Form (continued)

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

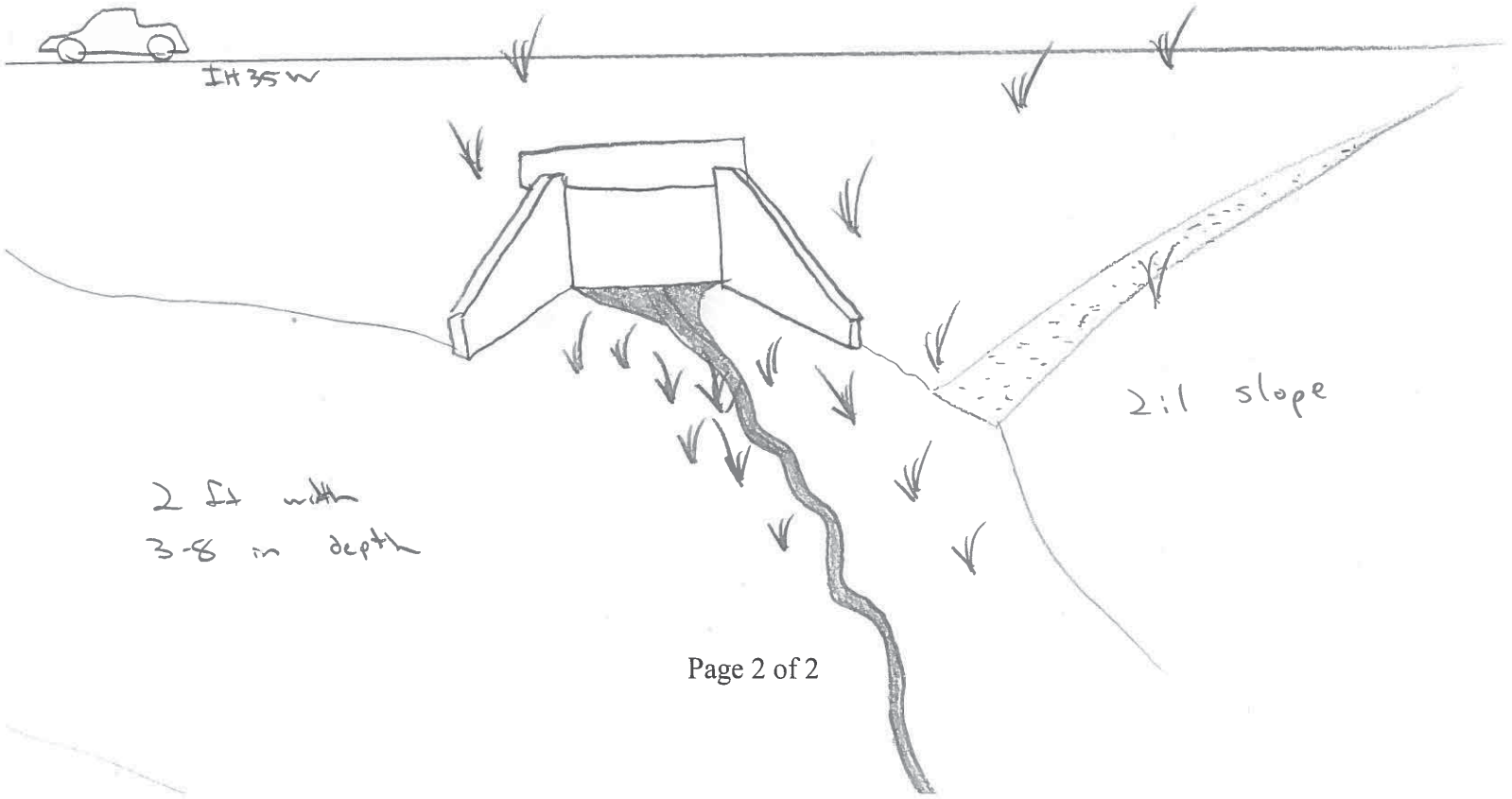
Sketch should include:

- 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



Sectional View



Stream Data Form #: 11
Project Name: IH 35W Frontage Roads
CSJ: 0081-13-065

Stream Data Form

Surveyor(s): Cliff Riley
Date of Field Work: 8/15/19
USGS Stream Name: Unnamed Trib. of Graham Branch 1
County/State: Denton, TX
USGS Topo Quad Name: Argyle
Stream Number [303(d) List]:
Associated Wetland(s):
GPS Data: 33.097690N -97.225248W

Stream Type: Ephemeral Characteristics Natural
Bank Stability (e.g. highly eroding, sloughing banks, etc.):

Stream Flow Direction: East
OHWM Width (ft): 2
OHWM Height (in): 2-3
Stream Bottom composition:

- ☒ Silts ☐ Cobbles ☐ Concrete ☐ Other:
- ☒ Sands ☐ Bedrock ☐ Muck
- ☐ Gravel ☒ Vegetation Type: Herbaceous Percent Cover 40

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.

Riparian Vegetation: List species observed.
Herbaceous Vegetation: plains lovegrass, spikerush, indiangrass, and bahiagrass

T&E Species/Suitable Habitat: List T&E species observed or which species the habitat is suitable for.

Stream Data Form #:	11
Project Name:	IH 35W Frontage Roads
CSJ:	0081-13-065

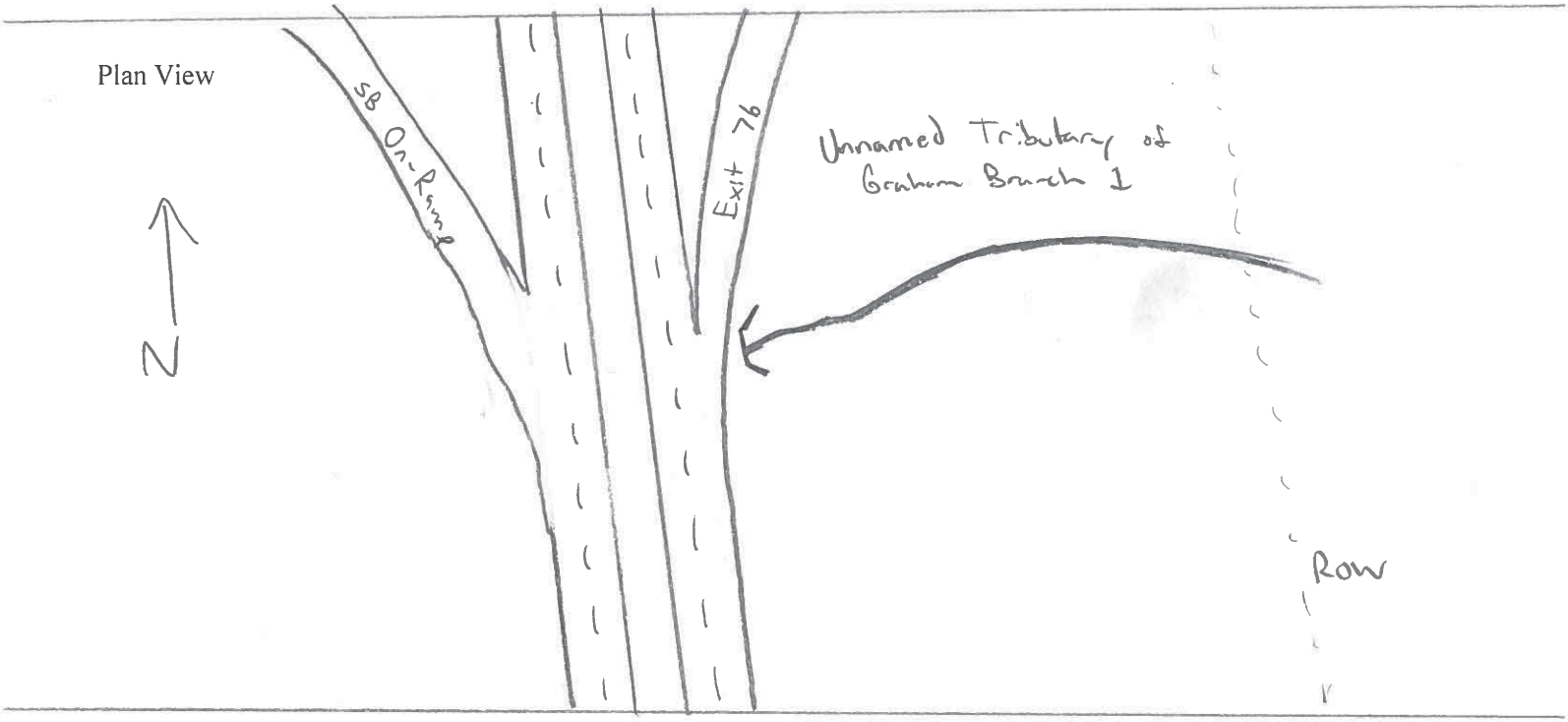
Stream Data Form (continued)

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

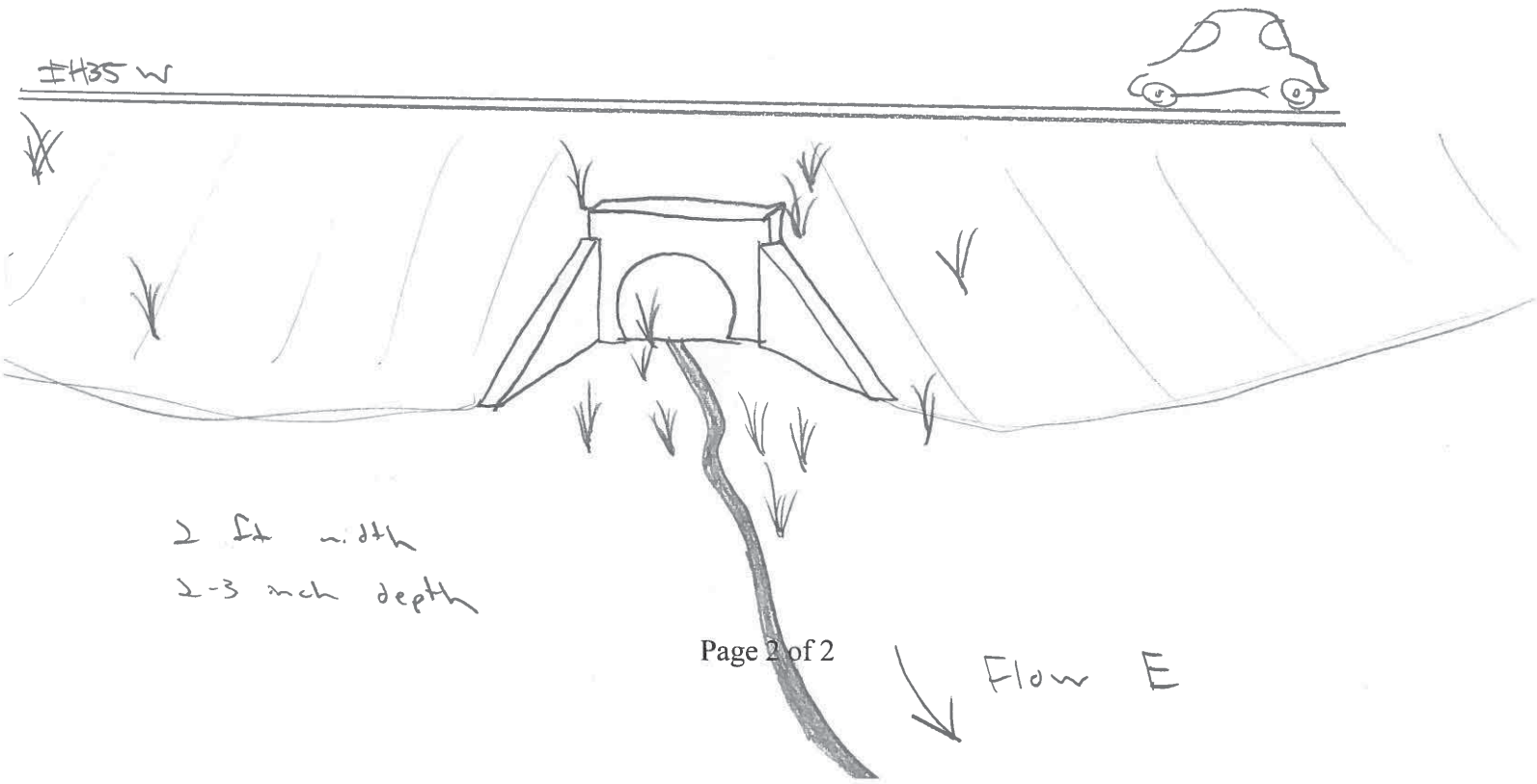
Sketch should include:

- 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



Sectional View



Stream Data Form #: 12
Project Name: IH 35W Frontage Roads
CSJ: 0081-13-065

Stream Data Form

Surveyor(s): Cliff Riley
Date of Field Work: 8/15/19
USGS Stream Name: Graham Branch Tributary 13
County/State: Denton, TX
USGS Topo Quad Name: Argyle
Stream Number [303(d) List]:
Associated Wetland(s):
GPS Data: 33.099751N -97.223898W

Stream Type: Intermittent Characteristics Natural
Bank Stability (e.g. highly eroding, sloughing banks, etc.):

Stream Flow Direction: East
OHWM Width (ft): 6 OHWM Height (in): 6
Stream Bottom composition:

- ☒ Silts ☐ Cobbles ☐ Concrete ☐ Other:
- ☒ Sands ☐ Bedrock ☐ Muck
- ☐ Gravel ☐ Vegetation Type: Herbaceous Percent Cover 40

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.

Riparian Vegetation: List species observed.
Herbaceous Vegetation: black willow, spikerush, and bermudagrass

T&E Species/Suitable Habitat: List T&E species observed or which species the habitat is suitable for.

Stream Data Form #:	12
Project Name:	IH 35W Frontage Roads
CSJ:	0081-13-065

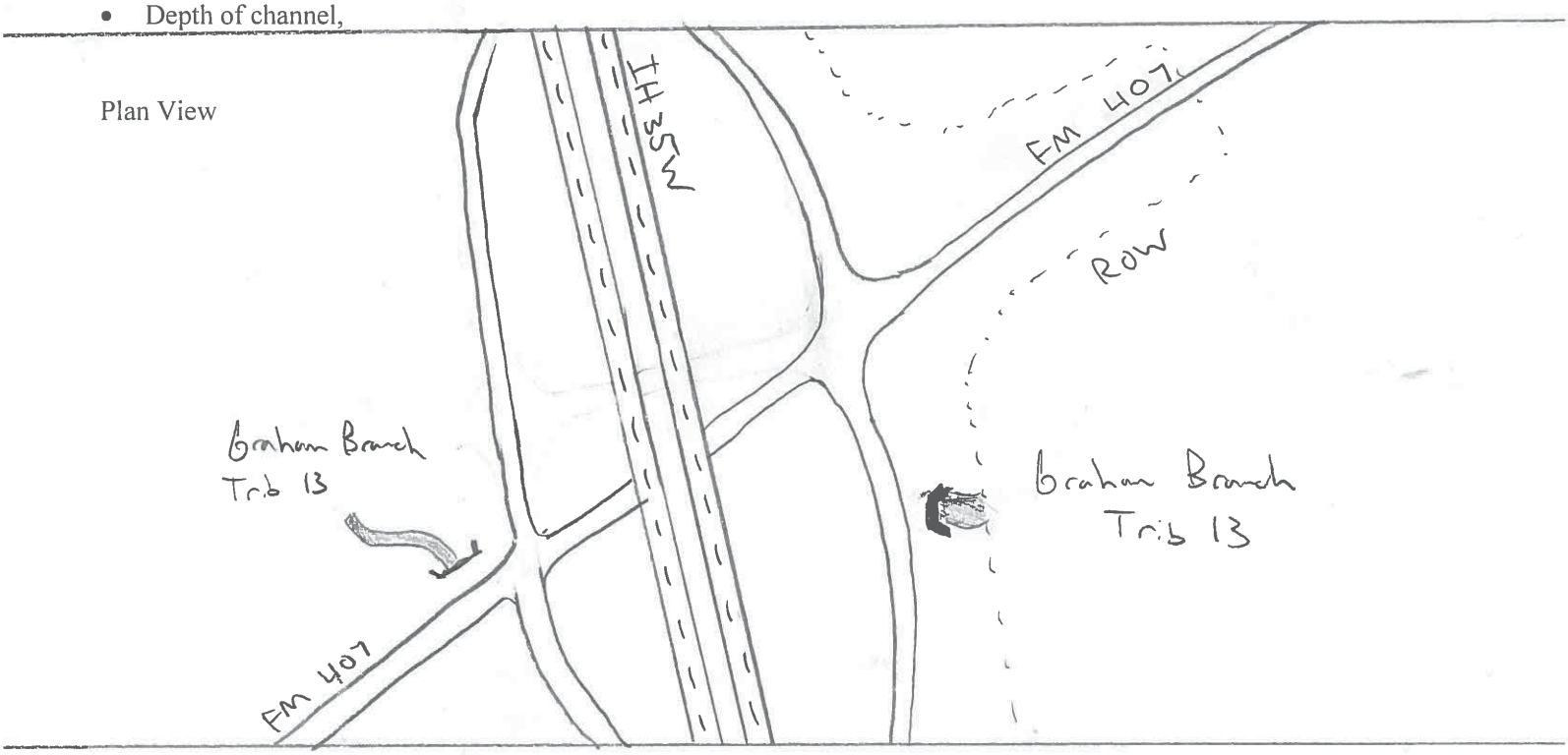
Stream Data Form (continued)

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

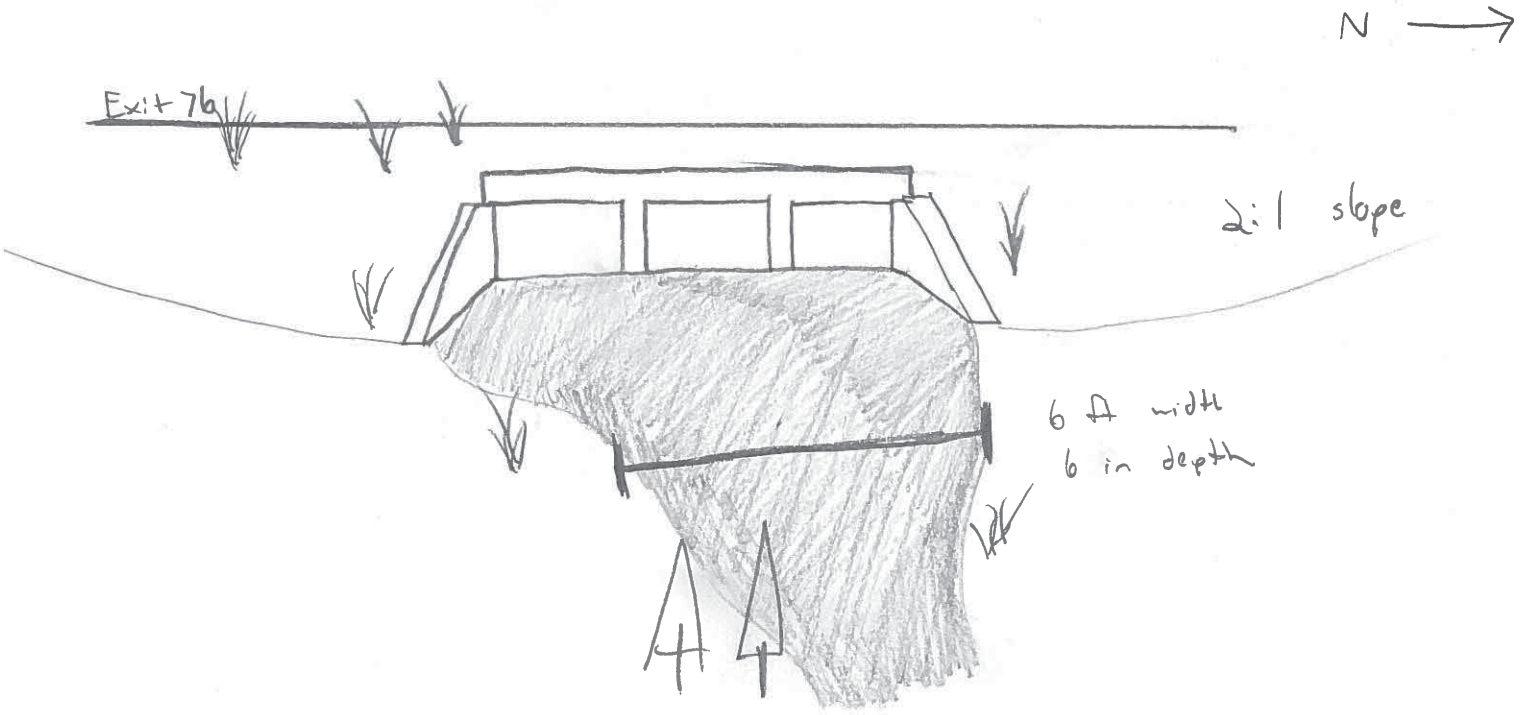
Sketch should include:

- 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



Sectional View



Stream Data Form #: 13
Project Name: IH 35W Frontage Roads
CSJ: 0081-13-065

Stream Data Form

Surveyor(s): Cliff Riley
Date of Field Work: 8/15/19
USGS Stream Name: Unnamed Trib. of Graham Branch 2
County/State: Denton, TX
USGS Topo Quad Name: Argyle
Stream Number [303(d) List]:
Associated Wetland(s): Wetland 4
GPS Data: 33.105044N -97.221148W

Stream Type: Intermittent Characteristics Natural
Bank Stability (e.g. highly eroding, sloughing banks, etc.):

Stream Flow Direction: East
OHWM Width (ft): 10 OHWM Height (in): 6-10
Stream Bottom composition:

☒ Silts ☐ Cobbles ☐ Concrete ☐ Other:
☒ Sands ☐ Bedrock ☐ Muck
☐ Gravel ☐ Vegetation Type: Herbaceous Percent Cover 40

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.

Riparian Vegetation: List species observed.
Herbaceous Vegetation: black willow, cattail, and spikerush

T&E Species/Suitable Habitat: List T&E species observed or which species the habitat is suitable for.

Stream Data Form #:	13
Project Name:	IH 35W Frontage Roads
CSJ:	0081-13-065

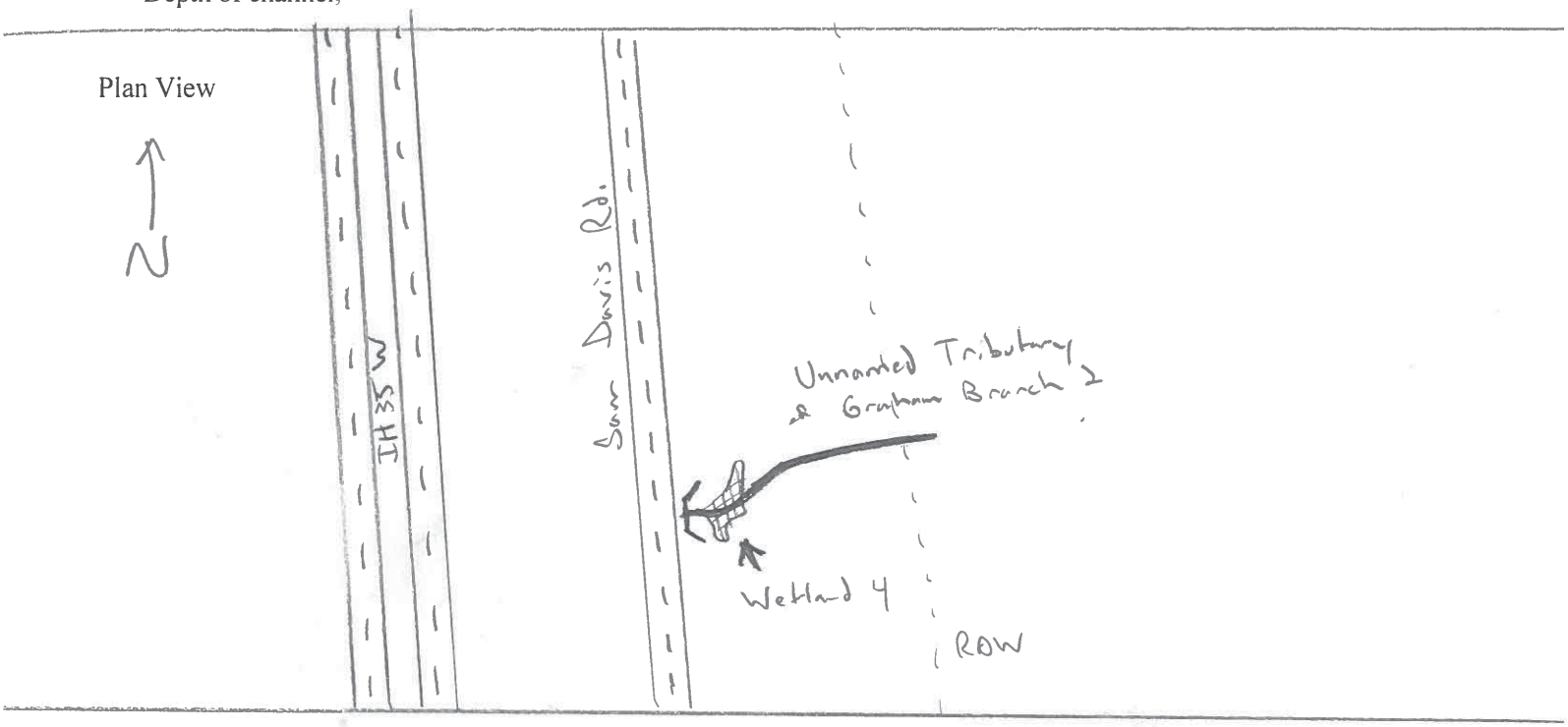
Stream Data Form (continued)

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



Sectional View

Stream Data Form #: 14
Project Name: IH 35W Frontage Roads
CSJ: 0081-13-065

Stream Data Form

Surveyor(s): Cliff Riley
Date of Field Work: 8/15/19
USGS Stream Name: Unnamed Trib. of Graham Branch 3
County/State: Denton, TX
USGS Topo Quad Name: Argyle
Stream Number [303(d) List]:
Associated Wetland(s): Wetland 5
GPS Data: 33.106518N -97.220316W

Stream Type: Intermittent Characteristics Natural
Bank Stability (e.g. highly eroding, sloughing banks, etc.):

Stream Flow Direction: East
OHWM Width (ft): 8 OHWM Height (in): 6-10
Stream Bottom composition:

☒ Silts ☐ Cobbles ☐ Concrete ☐ Other:
☒ Sands ☐ Bedrock ☐ Muck
☐ Gravel ☐ Vegetation Type: Herbaceous Percent Cover 15

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.

Riparian Vegetation: List species observed.
Herbaceous Vegetation: bahiagrass and spikerush

T&E Species/Suitable Habitat: List T&E species observed or which species the habitat is suitable for.

Stream Data Form #:	14
Project Name:	IH 35W Frontage Roads
CSJ:	0081-13-065

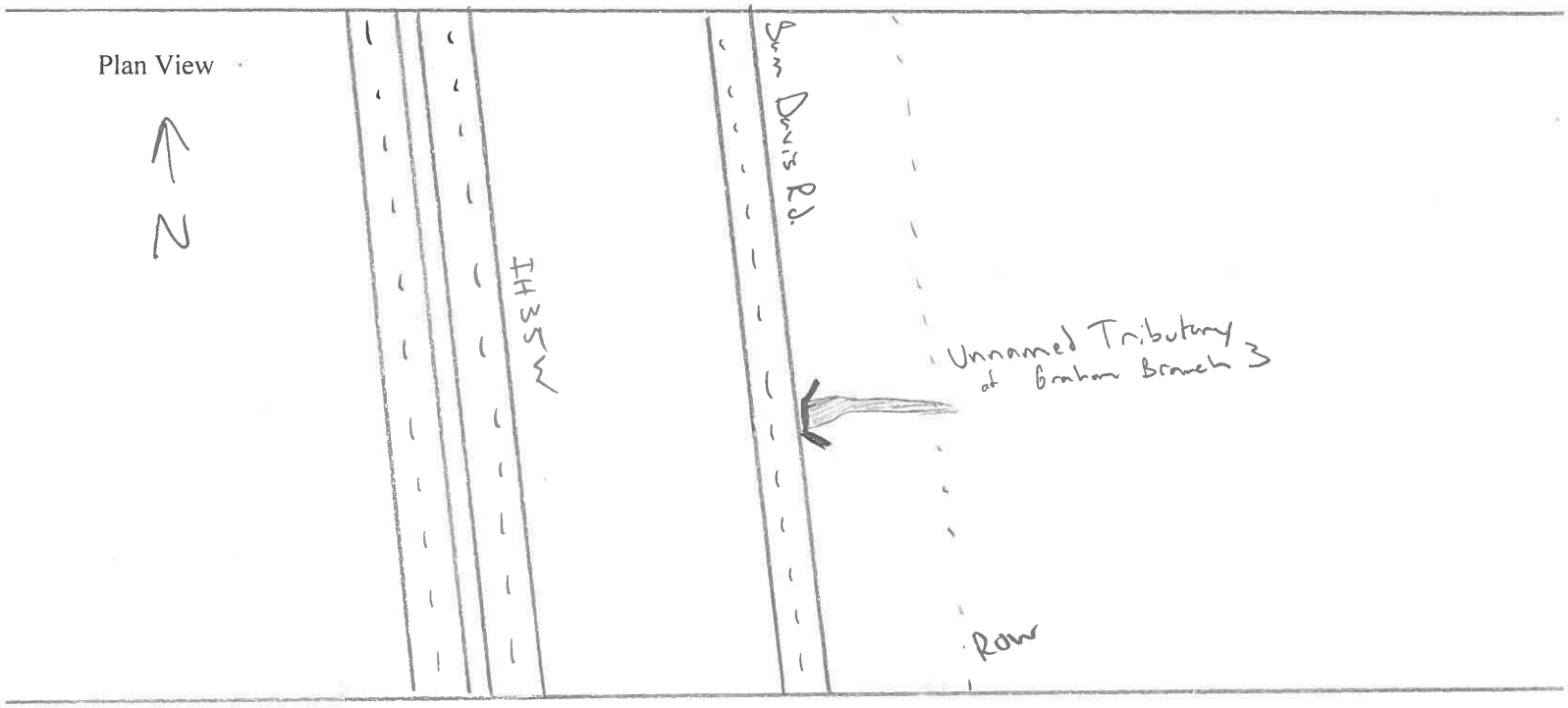
Stream Data Form (continued)

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

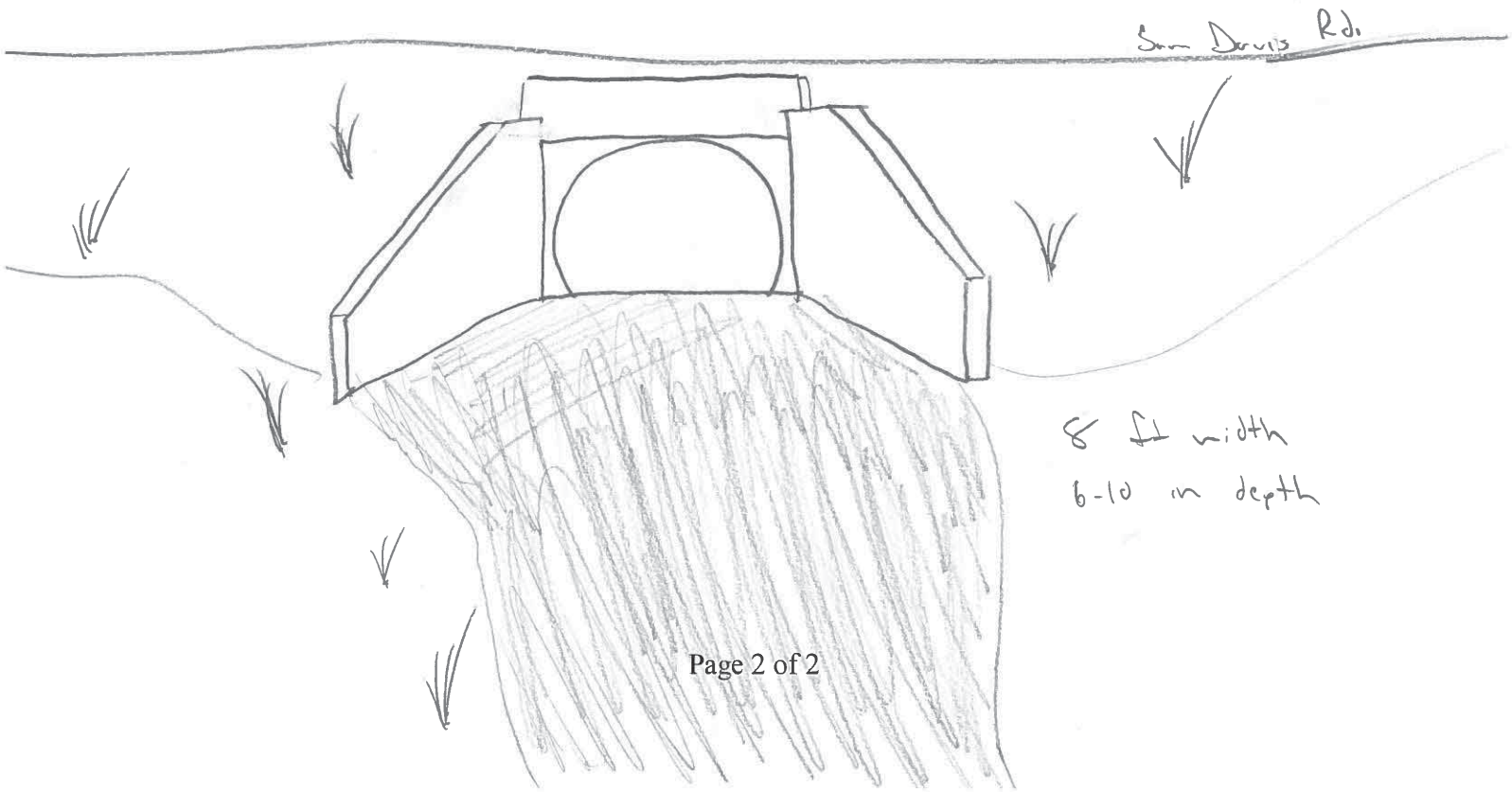
Sketch should include:

- 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



Sectional View



Stream Data Form #: 15
Project Name: IH 35W Frontage Roads
CSJ: 0081-13-065

Stream Data Form

Surveyor(s): Cliff Riley
Date of Field Work: 8/15/19
USGS Stream Name: Graham Branch at Sam Davis Rd.
County/State: Denton, TX
USGS Topo Quad Name: Argyle
Stream Number [303(d) List]:
Associated Wetland(s): Wetland 6 & Wetland 7
GPS Data: 33.108018N -97.218563W

Stream Type: Intermittent Characteristics Natural
Bank Stability (e.g. highly eroding, sloughing banks, etc.):

Stream Flow Direction: South
OHWM Width (ft): 35
OHWM Height (in): 8-16
Stream Bottom composition:

- ☒ Silts ☐ Cobbles ☐ Concrete ☐ Other:
- ☒ Sands ☐ Bedrock ☐ Muck
- ☐ Gravel ☐ Vegetation Type: Herbaceous Percent Cover 15

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.

Riparian Vegetation: List species observed.
Herbaceous Vegetation: spikerush, rattlebush, alligatorweed, cattail, bahiagrass, sand spikerush, nutsedge, and switchgrass

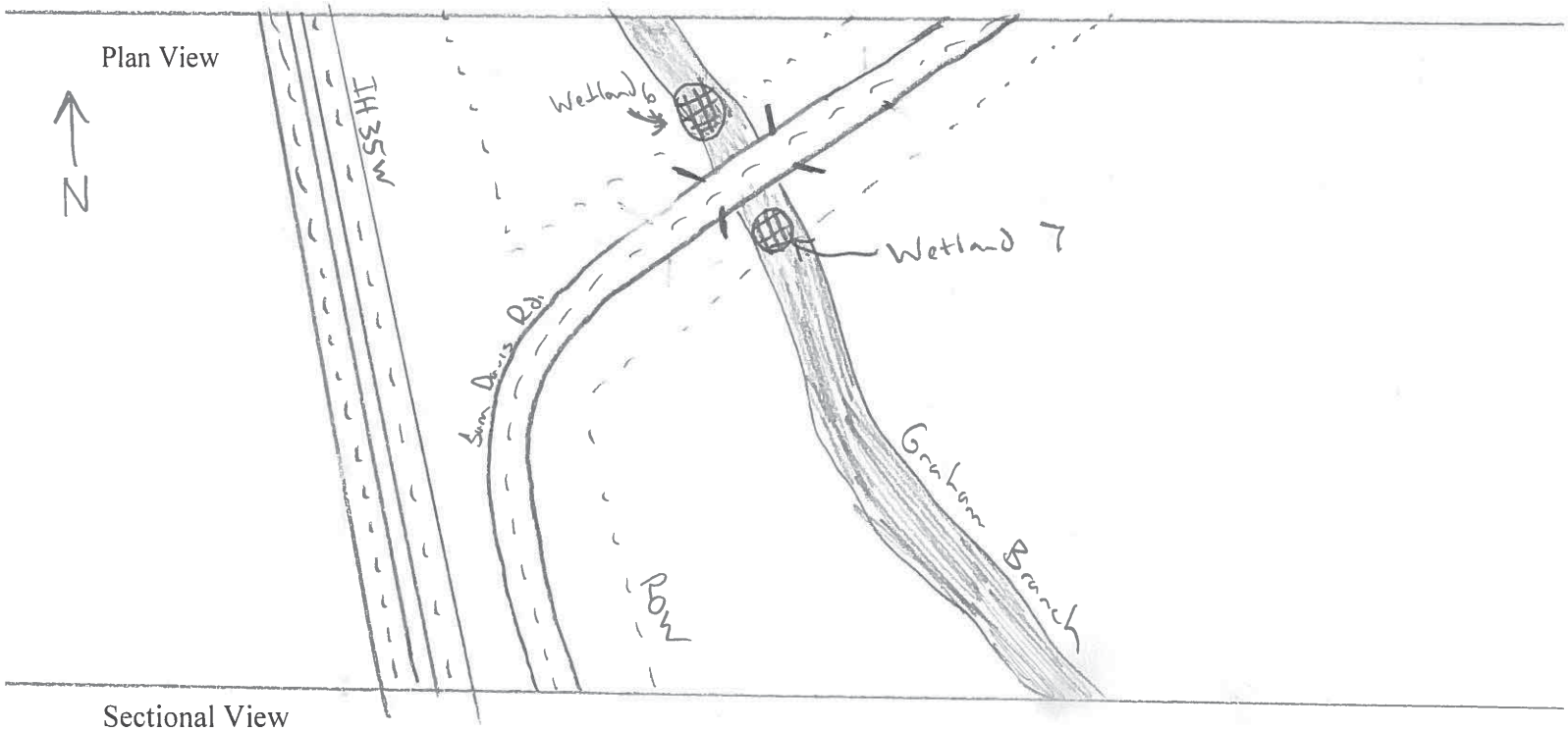
T&E Species/Suitable Habitat: List T&E species observed or which species the habitat is suitable for.

Stream Data Form #: 15
Project Name: IH 35W Frontage Roads
CSJ: 0081-13-065

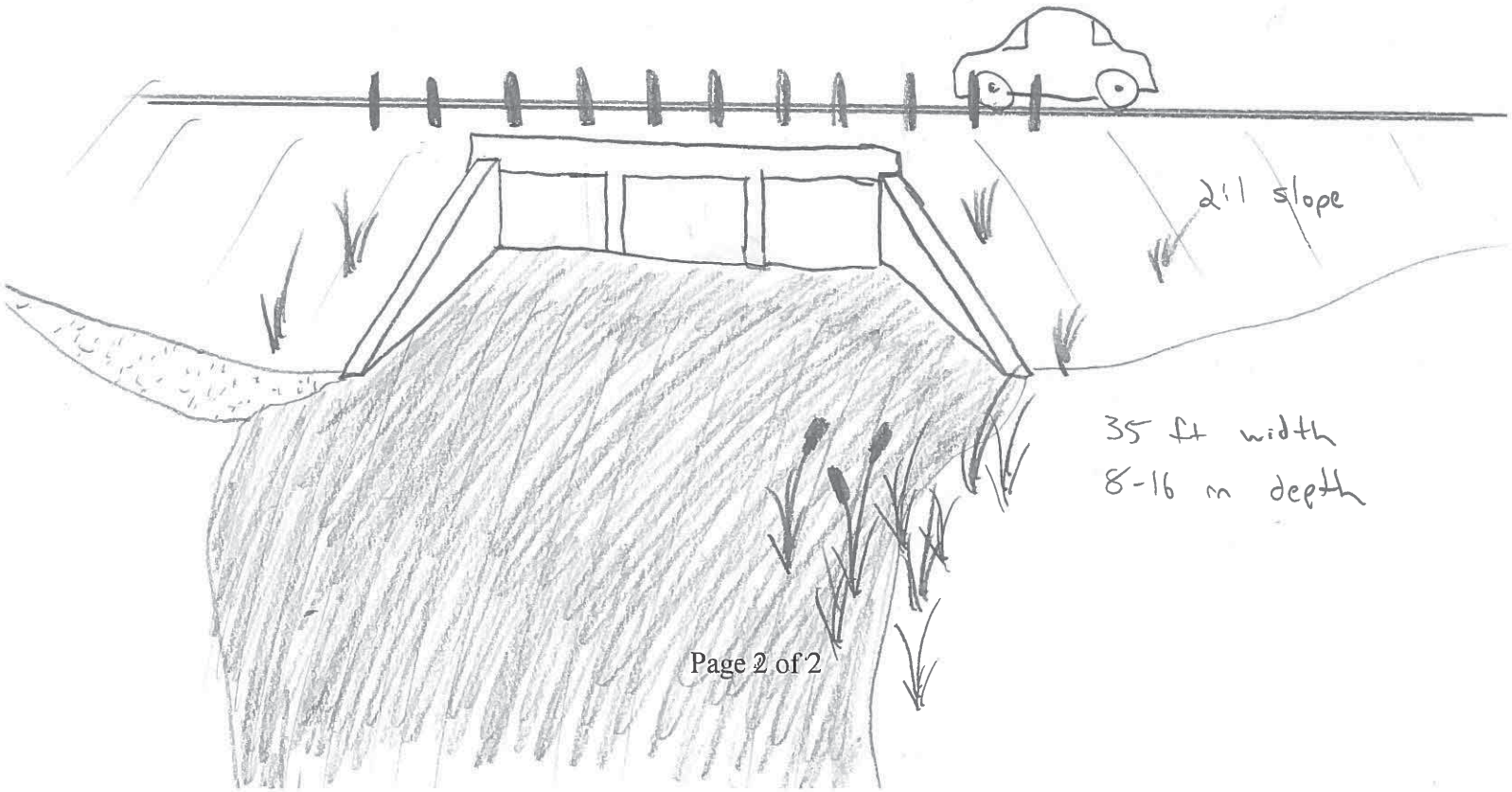
Stream Data Form (continued)
Please provide a plan and section view sketch of the stream channel.
Sketch should include:

- 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



Sectional View



Stream Data Form #: 16
Project Name: IH 35W Frontage Roads
CSJ: 0081-13-065

Stream Data Form

Surveyor(s): Cliff Riley
Date of Field Work: 8/15/19
USGS Stream Name: Graham Branch Tributary 15
County/State: Denton, TX
USGS Topo Quad Name: Argyle
Stream Number [303(d) List]:
Associated Wetland(s): Wetland 8
GPS Data: 33.109478N -97.219281W

Stream Type: Intermittent Characteristics Natural
Bank Stability (e.g. highly eroding, sloughing banks, etc.):

Stream Flow Direction: East
OHWM Width (ft): 4 OHWM Height (in): 4-8
Stream Bottom composition:

- ☒ Silts ☐ Cobbles ☐ Concrete ☐ Other:
- ☒ Sands ☐ Bedrock ☐ Muck
- ☐ Gravel ☒ Vegetation Type: Herbaceous Percent Cover 15

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.

Riparian Vegetation: List species observed.
Herbaceous Vegetation: yellow foxtail, Johnsongrass, switchgrass, plains lovegrass, black willow, spikerush, cattail, and goldenrod.

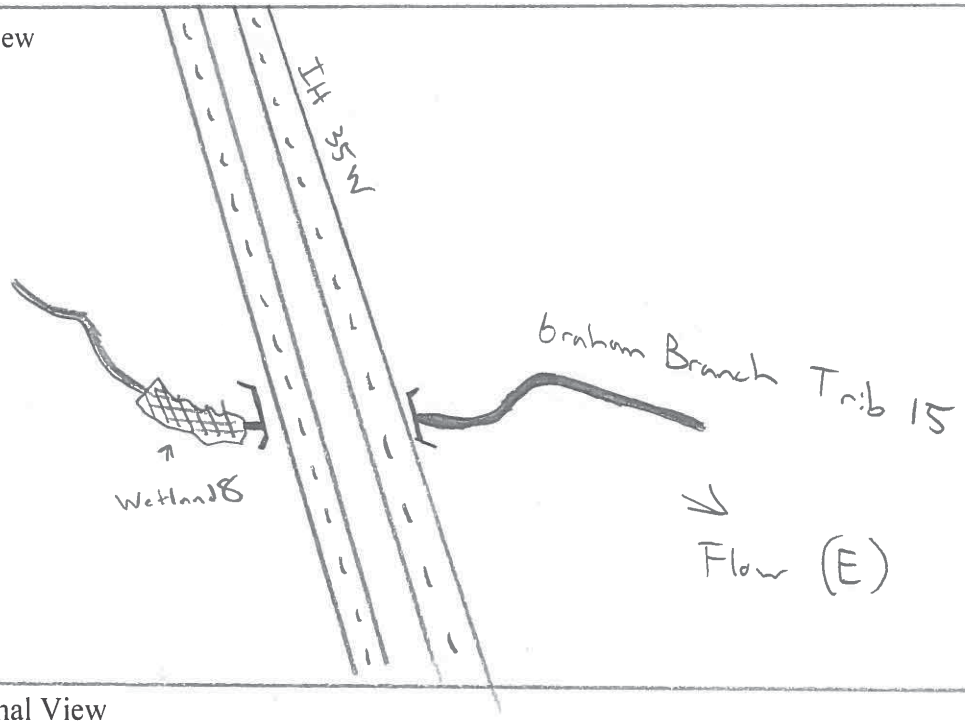
T&E Species/Suitable Habitat: List T&E species observed or which species the habitat is suitable for.

Stream Data Form #:	16
Project Name:	IH 35W Frontage Roads
CSJ:	0081-13-065

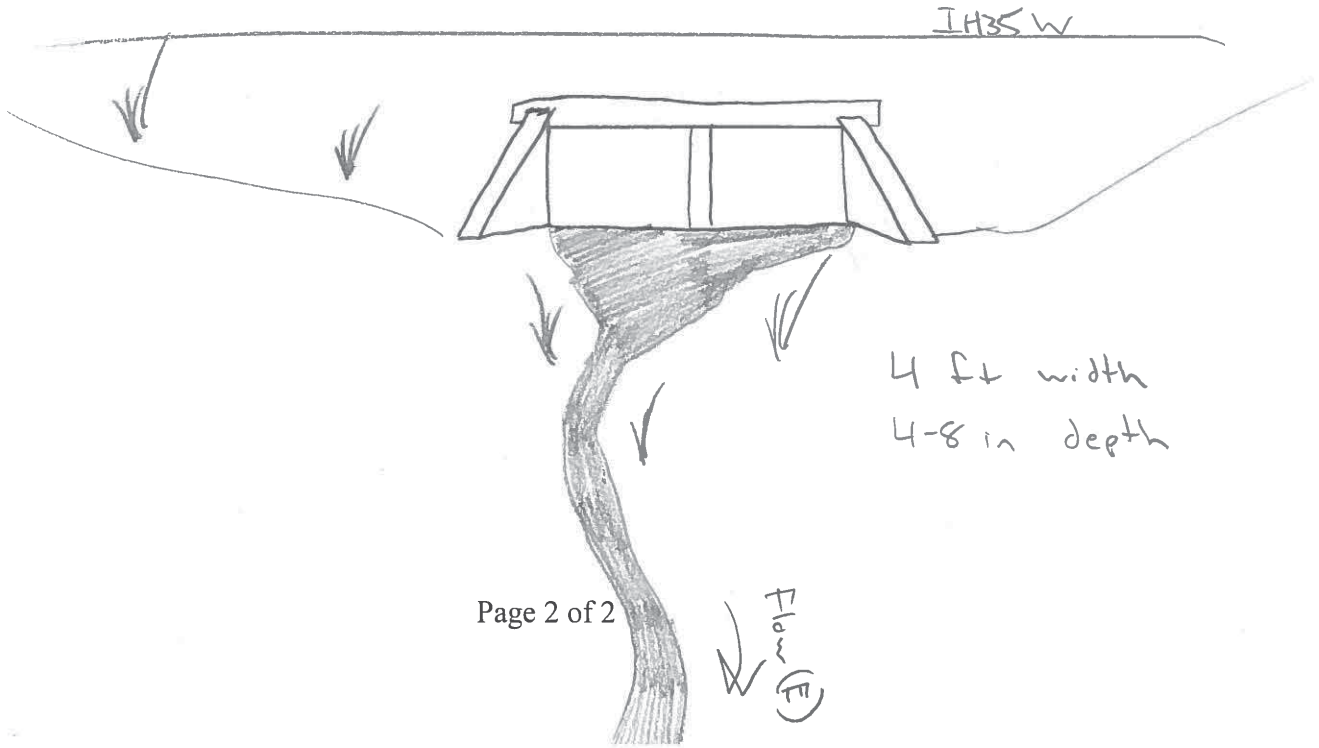
Stream Data Form (continued)
Please provide a plan and section view sketch of the stream channel.
Sketch should include:

- 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



Sectional View



Stream Data Form #: 17
Project Name: IH 35W Frontage Roads
CSJ: 0081-13-065

Stream Data Form

Surveyor(s): Cliff Riley
Date of Field Work: 8/15/19
USGS Stream Name: Graham Branch at IH 35W
County/State: Denton, TX
USGS Topo Quad Name: Argyle
Stream Number [303(d) List]:
Associated Wetland(s):
GPS Data: 33.099751N -97.223898W

Stream Type: Intermittent Characteristics Natural
Bank Stability (e.g. highly eroding, sloughing banks, etc.):

Stream Flow Direction: East
OHWM Width (ft): 5 OHWM Height (in): 6-12
Stream Bottom composition:

- ☒ Silts ☐ Cobbles ☐ Concrete ☐ Other:
- ☒ Sands ☐ Bedrock ☐ Muck
- ☐ Gravel ☒ Vegetation Type: Herbaceous Percent Cover 25

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.

Riparian Vegetation: List species observed.
Herbaceous Vegetation: switchgrass, indiangrass, yellow foxtail, rattlebush, giant ragweed, and bermudagrass

T&E Species/Suitable Habitat: List T&E species observed or which species the habitat is suitable for.

Stream Data Form #:	17
Project Name:	IH 35W Frontage Roads
CSJ:	0081-13-065

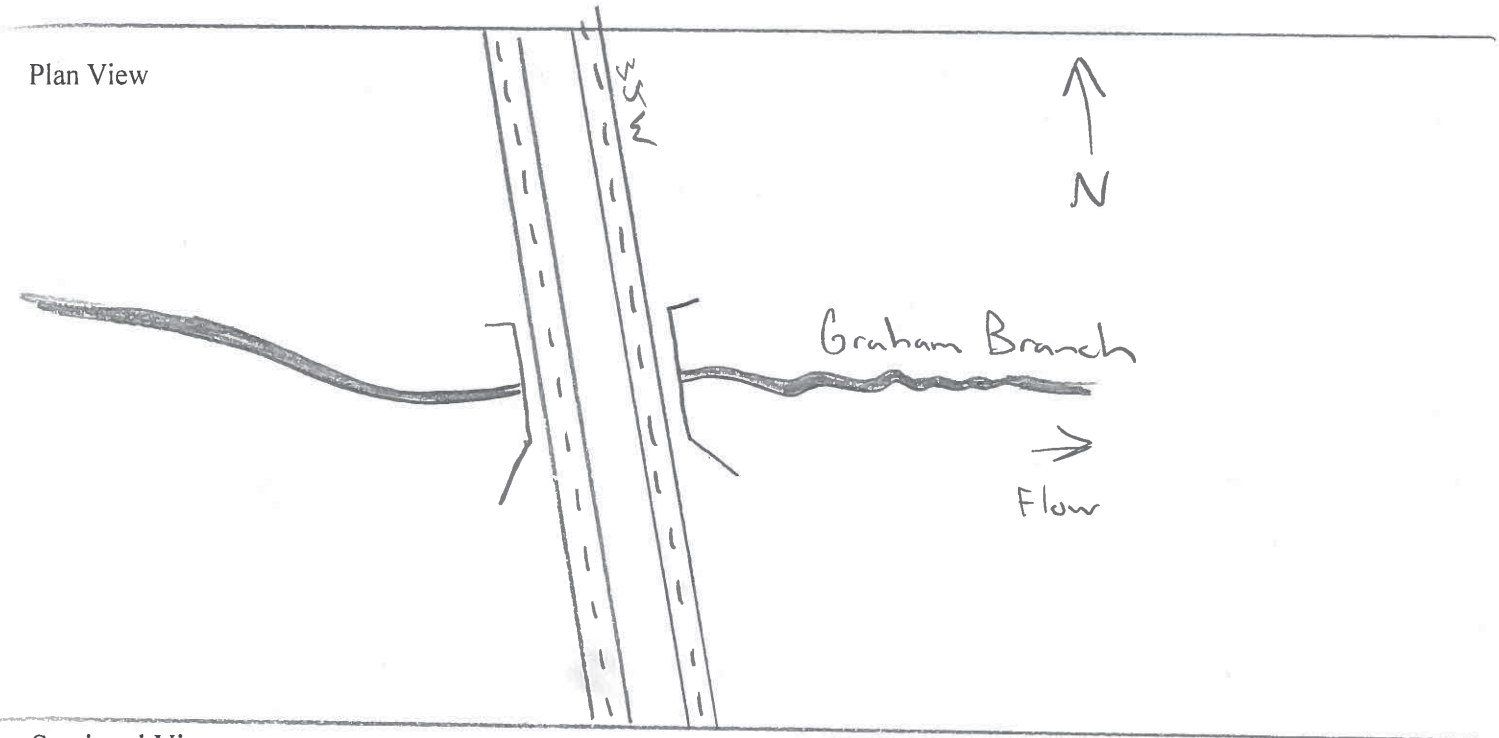
Stream Data Form (continued)

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.

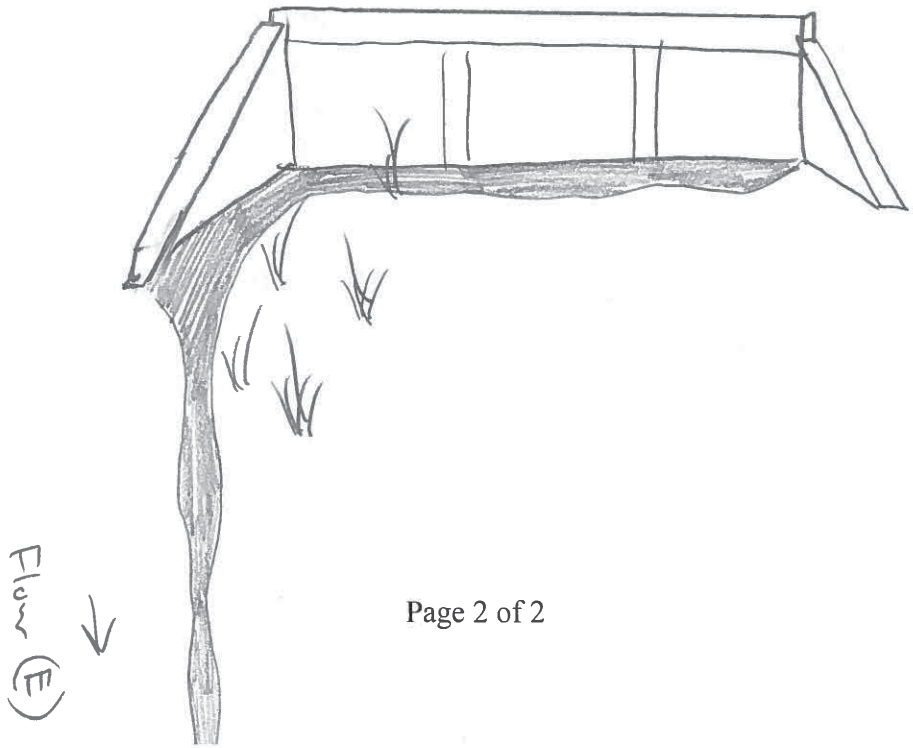
Plan View



Sectional View

5 ft width

6-12 in depth



Stream Data Form #: 18
Project Name: IH 35W Frontage Roads
CSJ: 0081-13-065

Stream Data Form

Surveyor(s): Cliff Riley
Date of Field Work: 8/15/19
USGS Stream Name: Unnamed Tributary of Graveyard Branch 1
County/State: Denton, TX
USGS Topo Quad Name: Denton West
Stream Number [303(d) List]:
Associated Wetland(s): Wetland 9
GPS Data: 33.133177N -97.205135W

Stream Type: Ephemeral Characteristics: Natural
Bank Stability (e.g. highly eroding, sloughing banks, etc.):
Stream Flow Direction: East
OHWM Width (ft): 10
OHWM Height (in): 2-6
Stream Bottom composition:

- ☒ Silts ☐ Cobbles ☐ Concrete ☐ Other:
- ☒ Sands ☐ Bedrock ☐ Muck
- ☐ Gravel ☒ Vegetation Type: Herbaceous Percent Cover 25

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.

Riparian Vegetation: List species observed.
Herbaceous Vegetation: yellow foxtail, Johnsongrass, cattail, and spikerush

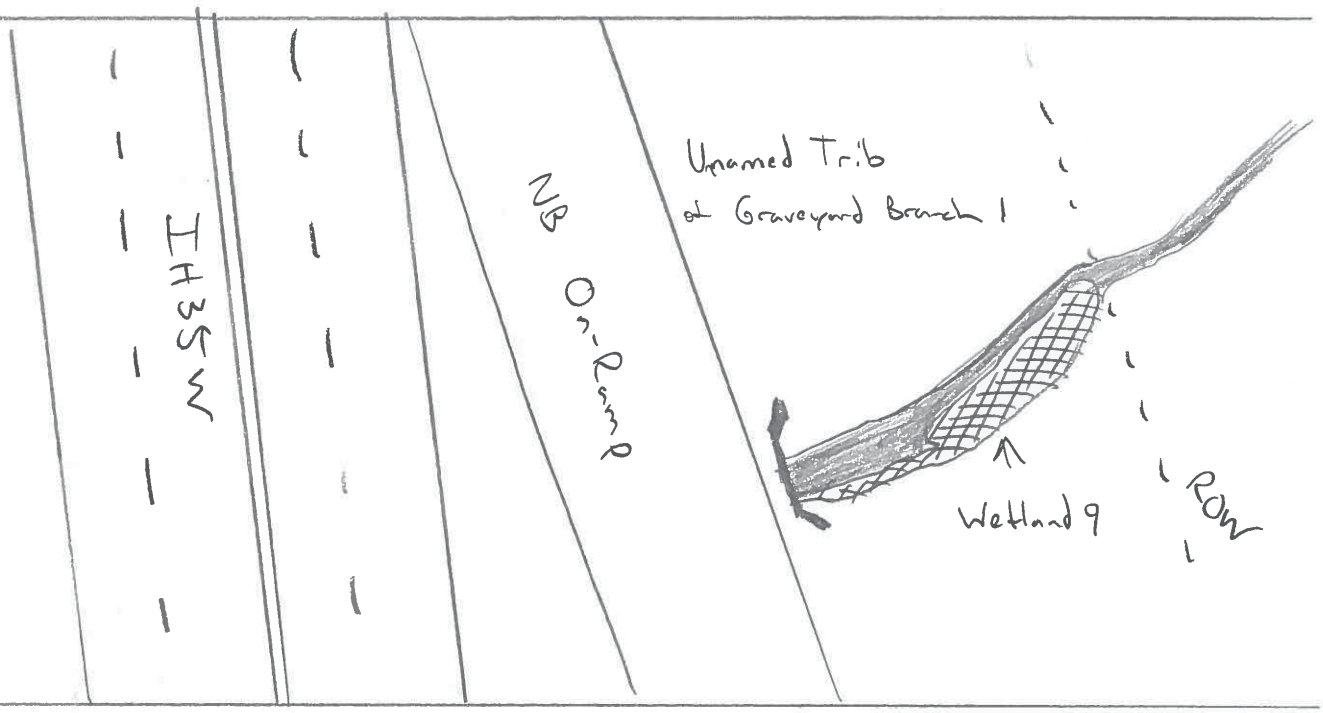
T&E Species/Suitable Habitat: List T&E species observed or which species the habitat is suitable for.

Stream Data Form #:	18
Project Name:	IH 35W Frontage Roads
CSJ:	0081-13-065

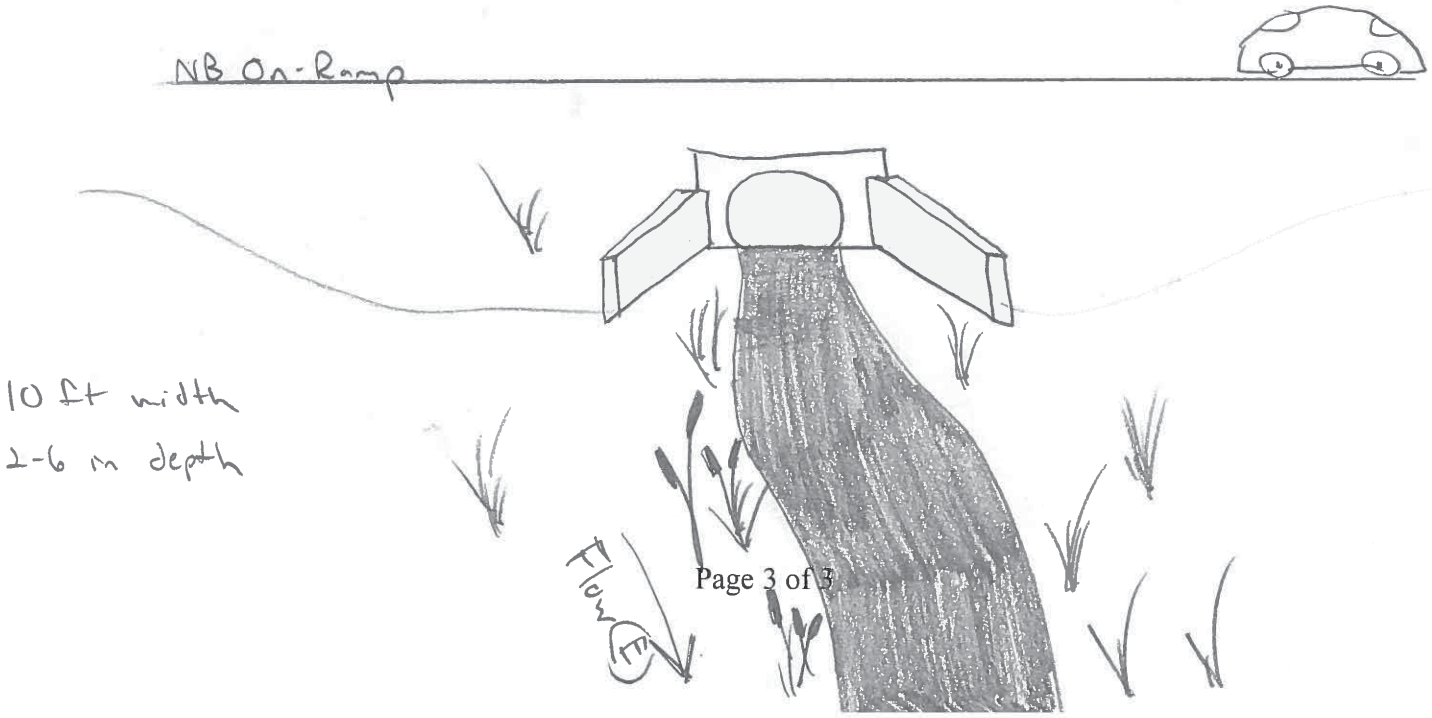
Stream Data Form (continued)
Please provide a plan and section view sketch of the stream channel.
Sketch should include:

- 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



Sectional View



Stream Data Form #: 19
Project Name: IH 35W Frontage Roads
CSJ: 0081-13-065

Stream Data Form

Surveyor(s): Cliff Riley
Date of Field Work: 8/22/19
USGS Stream Name: Unnamed Tributary of Graveyard Branch 2
County/State: Denton, TX
USGS Topo Quad Name: Denton West
Stream Number [303(d) List]:
Associated Wetland(s): Wetland 10 & Wetland 11
GPS Data: 33.133837N -97.204705W

Stream Type: Ephemeral Characteristics: Natural
Bank Stability (e.g. highly eroding, sloughing banks, etc.):
Stream Flow Direction: East
OHWM Width (ft): 3
OHWM Height (in): 2-6
Stream Bottom composition:

- ☒ Silts ☐ Cobbles ☐ Concrete ☐ Other:
- ☒ Sands ☐ Bedrock ☐ Muck
- ☐ Gravel ☒ Vegetation Type: Herbaceous Percent Cover 40

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.

Riparian Vegetation: List species observed.
Herbaceous Vegetation: spikerush, big ragweed, yellow foxtail, switchgrass, black willow, and cattail

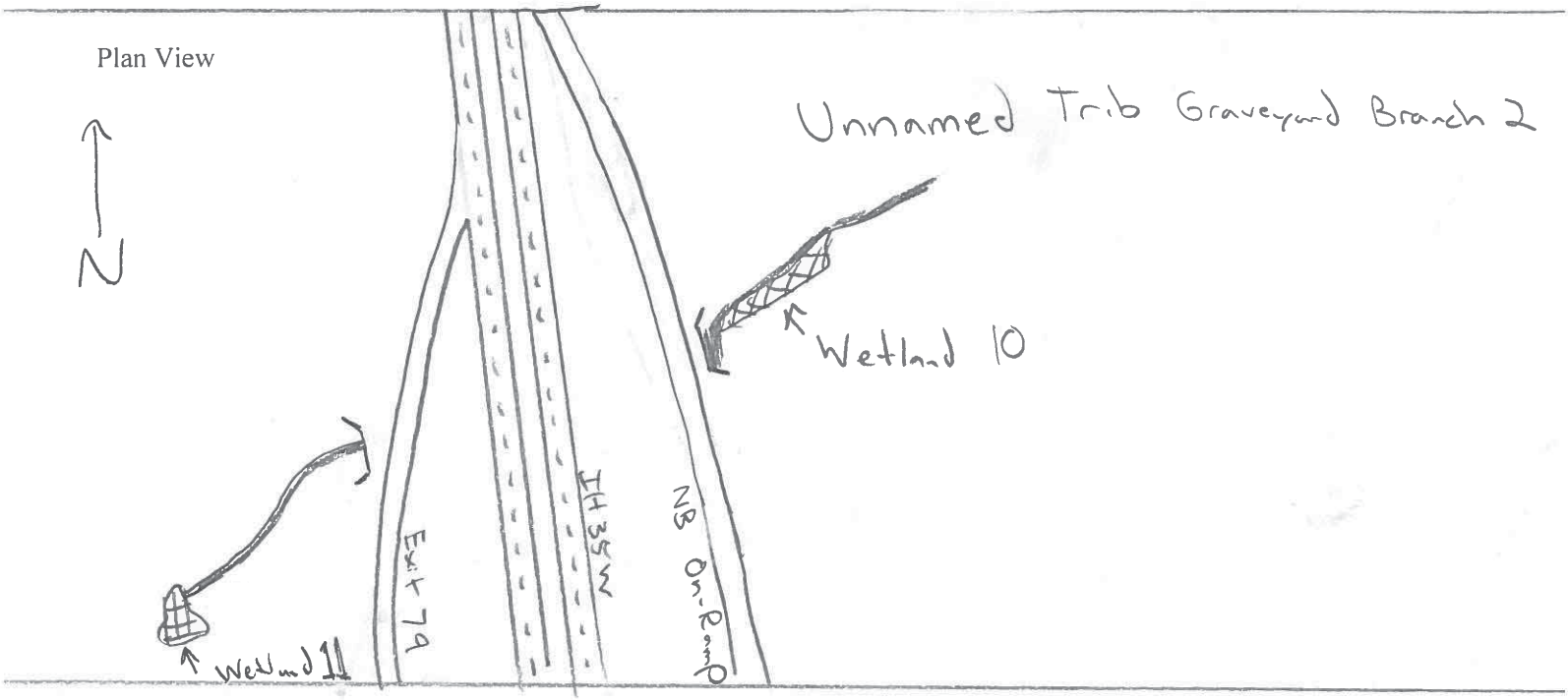
T&E Species/Suitable Habitat: List T&E species observed or which species the habitat is suitable for.

Stream Data Form #:	19
Project Name:	IH 35W Frontage Roads
CSJ:	0081-13-065

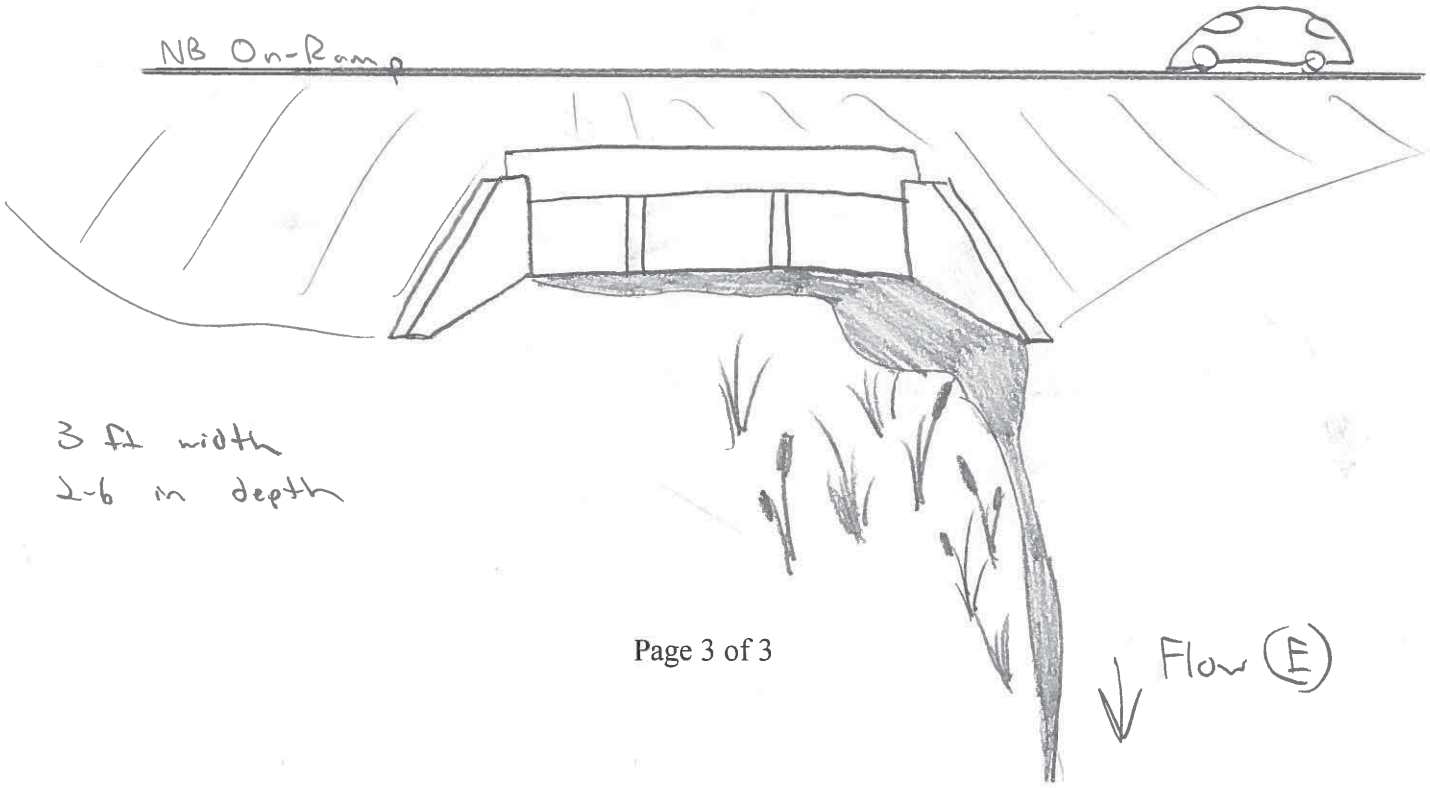
Stream Data Form (continued)
Please provide a plan and section view sketch of the stream channel.
Sketch should include:

- 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



Sectional View



Stream Data Form #: 20
Project Name: IH 35W Frontage Roads
CSJ: 0081-13-065

Stream Data Form

Surveyor(s): Cliff Riley
Date of Field Work: 8/22/19
USGS Stream Name: Graveyard Branch Tributary 2.1
County/State: Denton, TX
USGS Topo Quad Name: Denton West
Stream Number [303(d) List]:
Associated Wetland(s):
GPS Data: 33.137129N -97.202279W

Stream Type: Intermittent Characteristics Natural
Bank Stability (e.g. highly eroding, sloughing banks, etc.):

Stream Flow Direction: East
OHWM Width (ft): 4 OHWM Height (in): 2-6
Stream Bottom composition:

- ☒ Silts ☐ Cobbles ☐ Concrete ☐ Other:
- ☒ Sands ☐ Bedrock ☐ Muck
- ☐ Gravel ☒ Vegetation Type: Herbaceous Percent Cover 25

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.

Riparian Vegetation: List species observed.
Herbaceous Vegetation: switchgrass, bermudagrass, spikerush, and dallisgrass

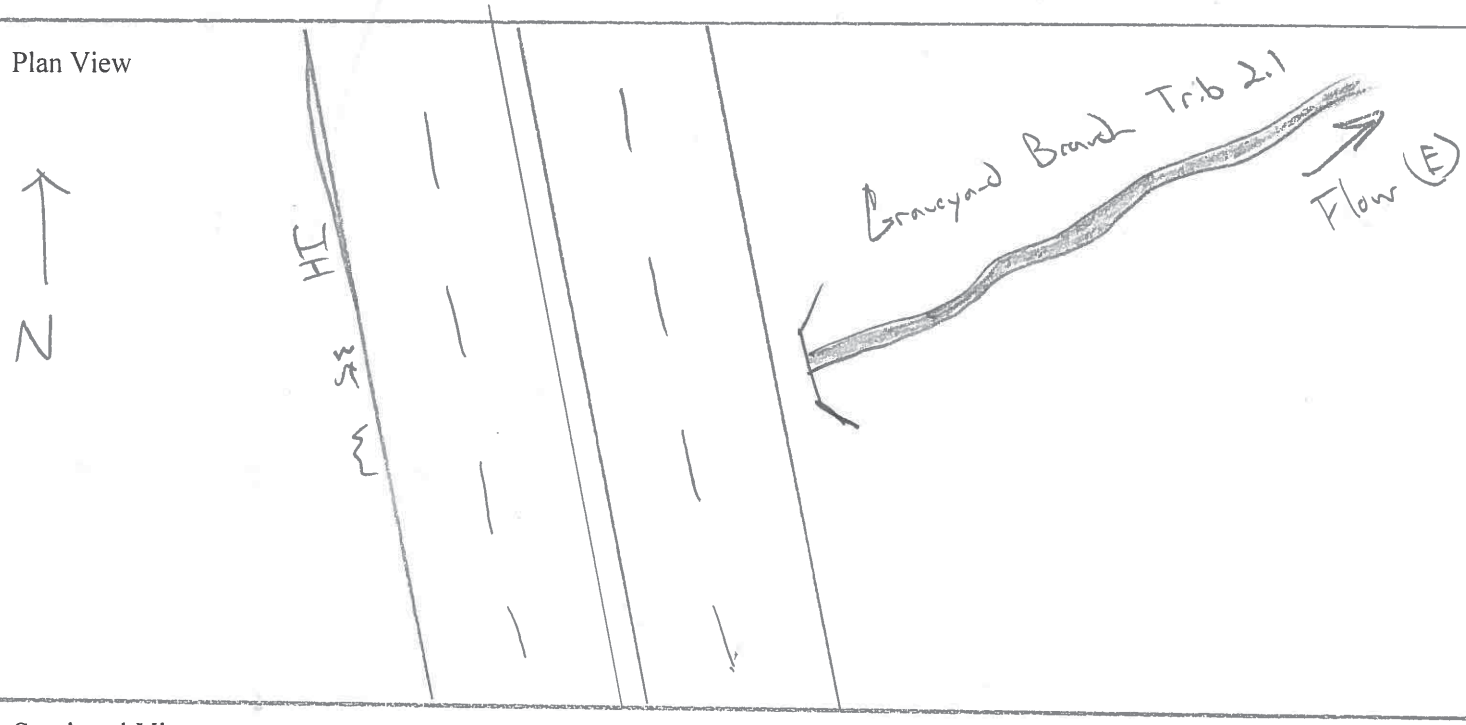
T&E Species/Suitable Habitat: List T&E species observed or which species the habitat is suitable for.

Stream Data Form #:	20
Project Name:	IH 35W Frontage Roads
CSJ:	0081-13-065

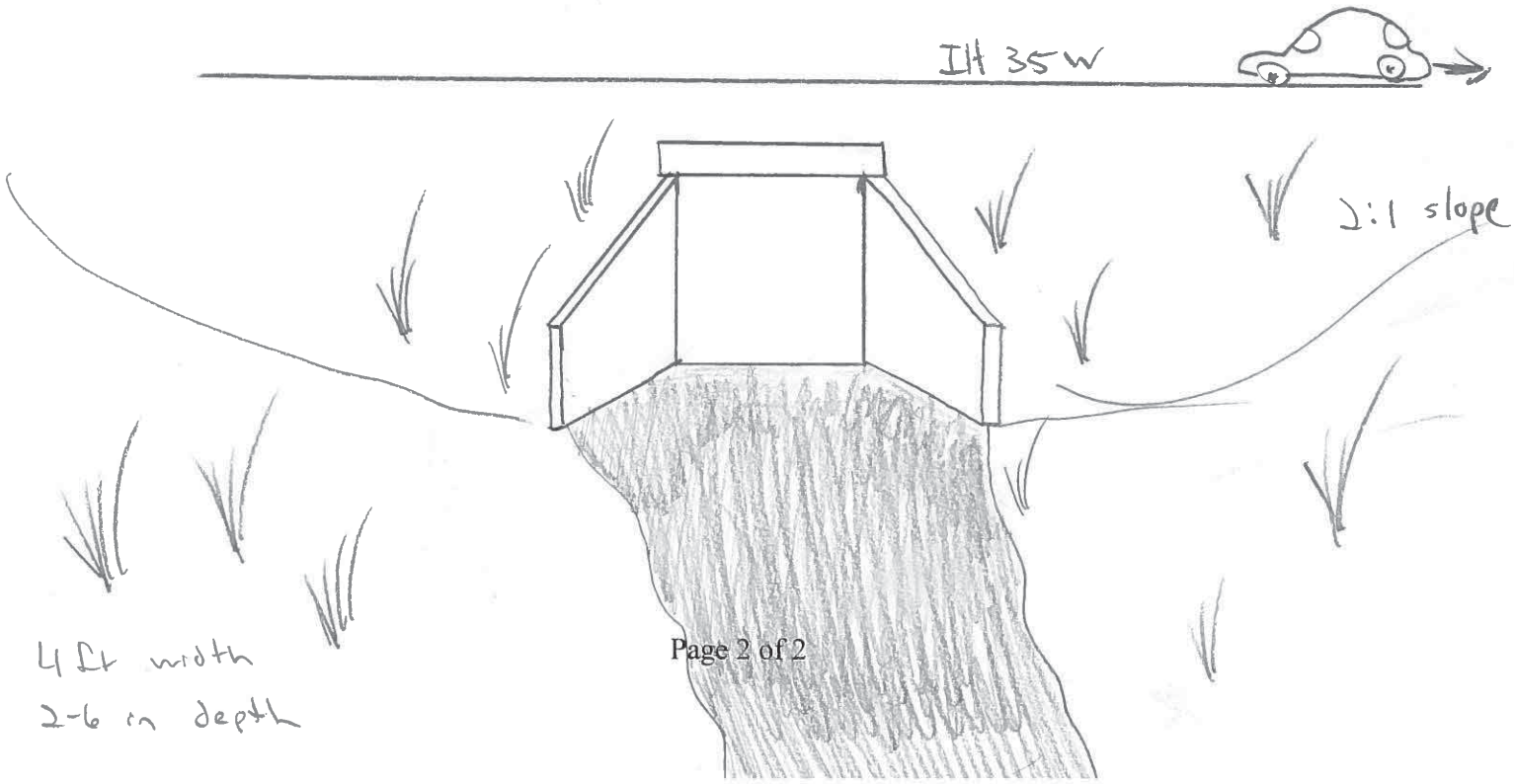
Stream Data Form (continued)
Please provide a plan and section view sketch of the stream channel.
Sketch should include:

- 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



Sectional View



Stream Data Form #: 21
Project Name: IH 35W Frontage Roads
CSJ: 0081-13-065

Stream Data Form

Surveyor(s): Cliff Riley
Date of Field Work: 8/22/19
USGS Stream Name: Graveyard Branch Tributary 2
County/State: Denton, TX
USGS Topo Quad Name: Denton West
Stream Number [303(d) List]:
Associated Wetland(s):
GPS Data: 33.138384N -97.201520W

Stream Type: Ephemeral Characteristics Natural
Bank Stability (e.g. highly eroding, sloughing banks, etc.):

Stream Flow Direction: East
OHWM Width (ft): 3
OHWM Height (in): 2-4

Stream Bottom composition:

- ☒ Silts ☐ Cobbles ☐ Concrete ☐ Other:
- ☒ Sands ☐ Bedrock ☐ Muck
- ☐ Gravel ☒ Vegetation Type: Herbaceous Percent Cover 80

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.

Riparian Vegetation: List species observed.
Herbaceous Vegetation: switchgrass, bermudagrass, spikerush, and cattail

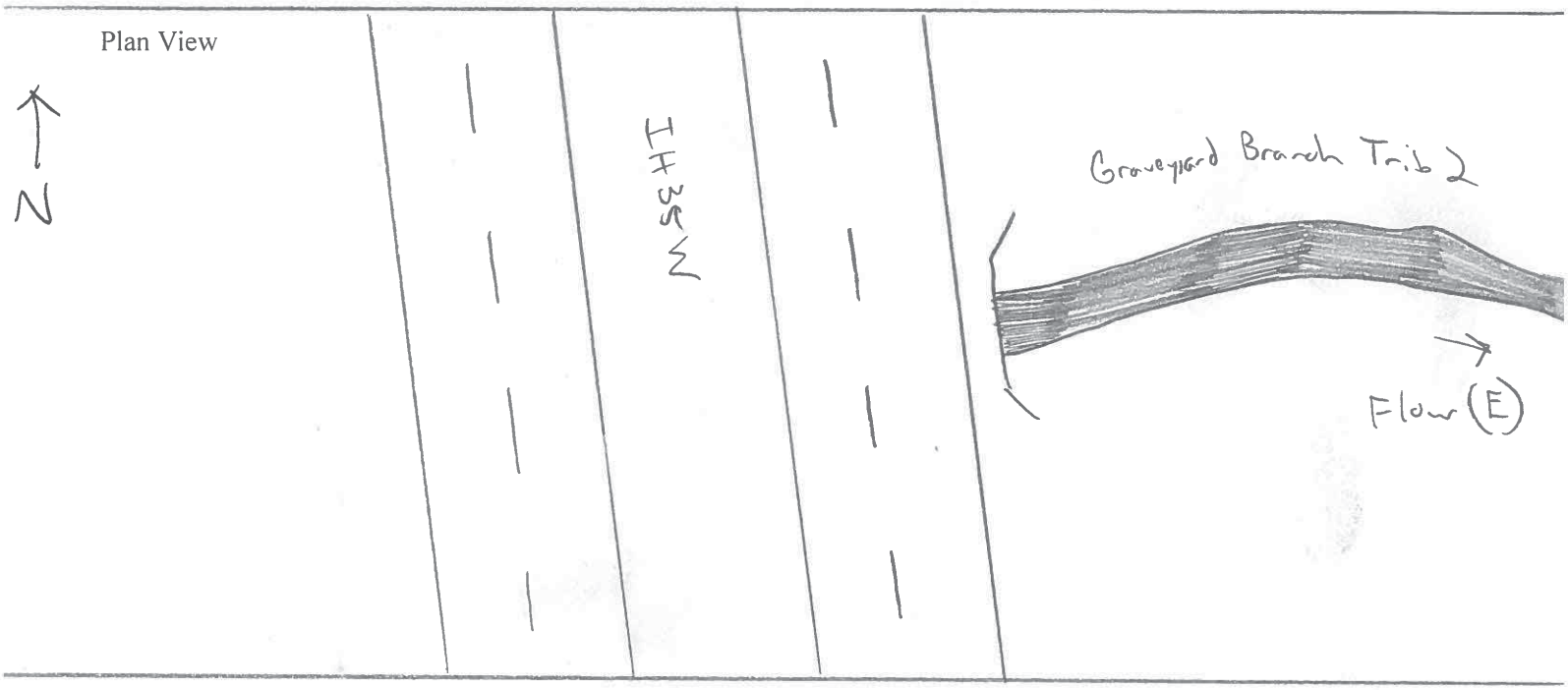
T&E Species/Suitable Habitat: List T&E species observed or which species the habitat is suitable for.

Stream Data Form #:	21
Project Name:	IH 35W Frontage Roads
CSJ:	0081-13-065

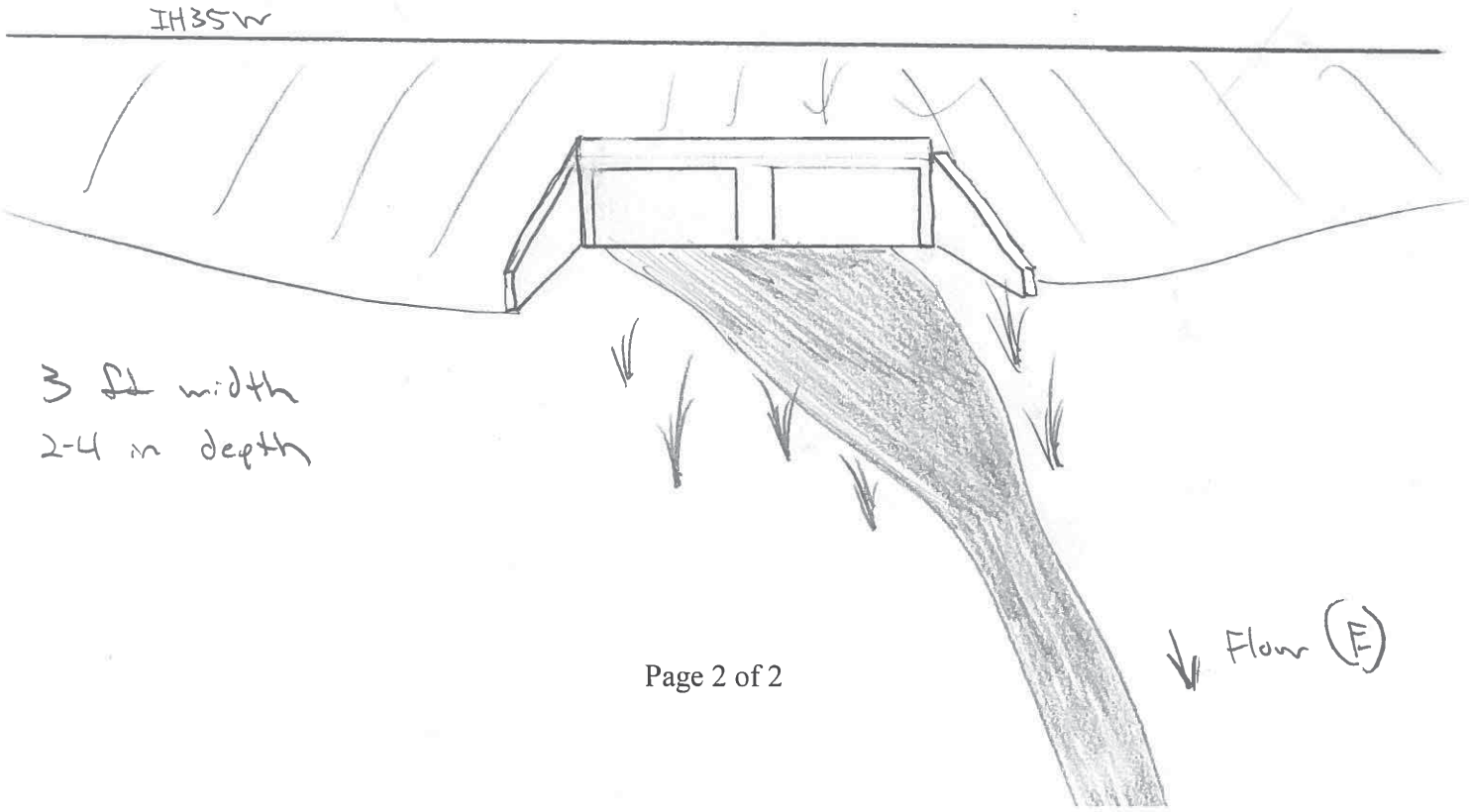
Stream Data Form (continued)
Please provide a plan and section view sketch of the stream channel.
Sketch should include:

- 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



Sectional View



Stream Data Form #: 22
Project Name: IH 35W Frontage Roads
CSJ: 0081-13-065

Stream Data Form

Surveyor(s): Cliff Riley
Date of Field Work: 8/22/19
USGS Stream Name: Graveyard Branch Trib Unnamed
County/State: Denton, TX
USGS Topo Quad Name: Denton West
Stream Number [303(d) List]:
Associated Wetland(s): Wetland 12
GPS Data: 33.141291N -97.199448W

Stream Type: Ephemeral Characteristics Natural
Bank Stability (e.g. highly eroding, sloughing banks, etc.):
Stream Flow Direction: East
OHWM Width (ft): 3 OHWM Height (in): 2-4
Stream Bottom composition:

- ☒ Silts ☐ Cobbles ☐ Concrete ☐ Other:
- ☒ Sands ☐ Bedrock ☐ Muck
- ☐ Gravel ☒ Vegetation Type: Herbaceous Percent Cover 25

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.

Riparian Vegetation: List species observed.
Herbaceous Vegetation: yellow foxtail, switchgrass,spikerush and cattail

T&E Species/Suitable Habitat: List T&E species observed or which species the habitat is suitable for.

Stream Data Form #:	22
Project Name:	IH 35W Frontage Roads
CSJ:	0081-13-065

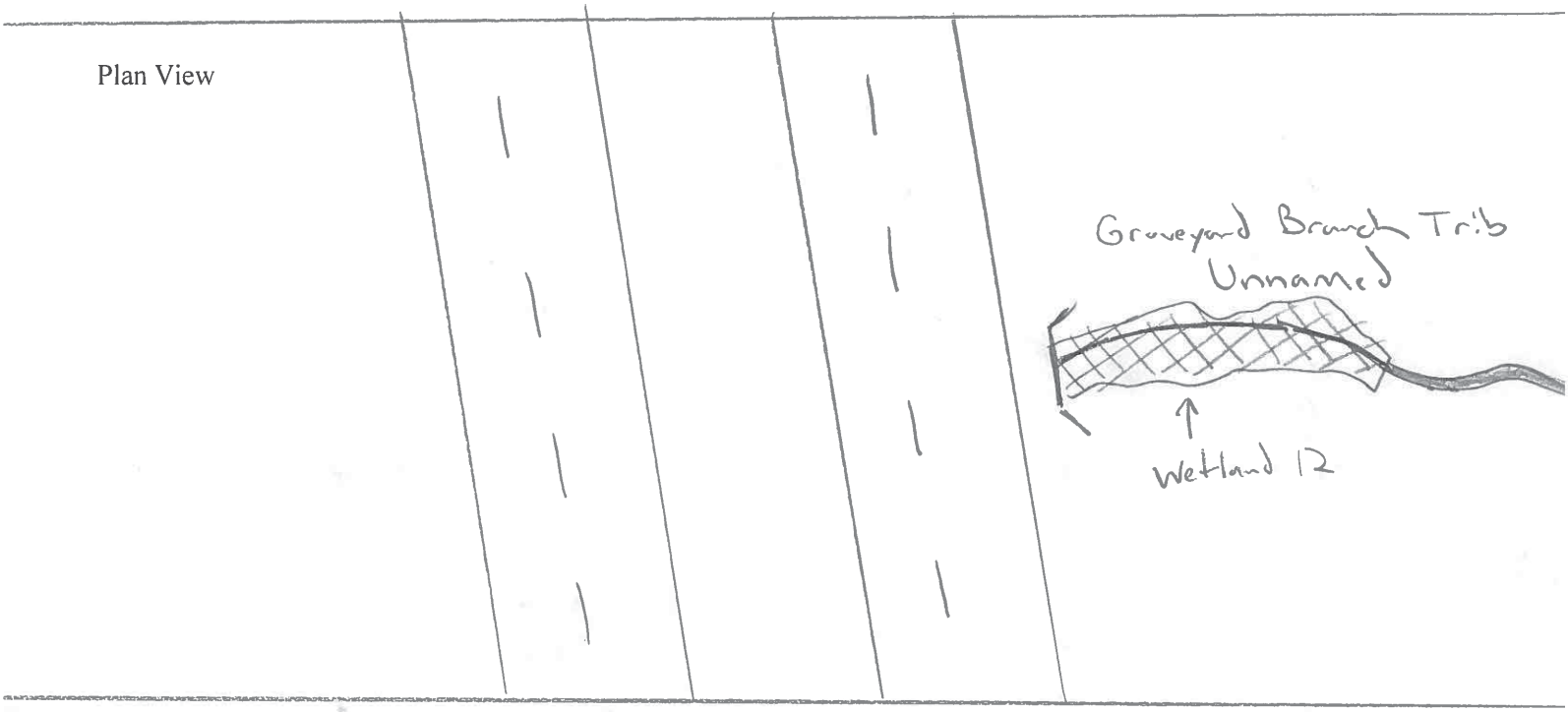
Stream Data Form (continued)

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

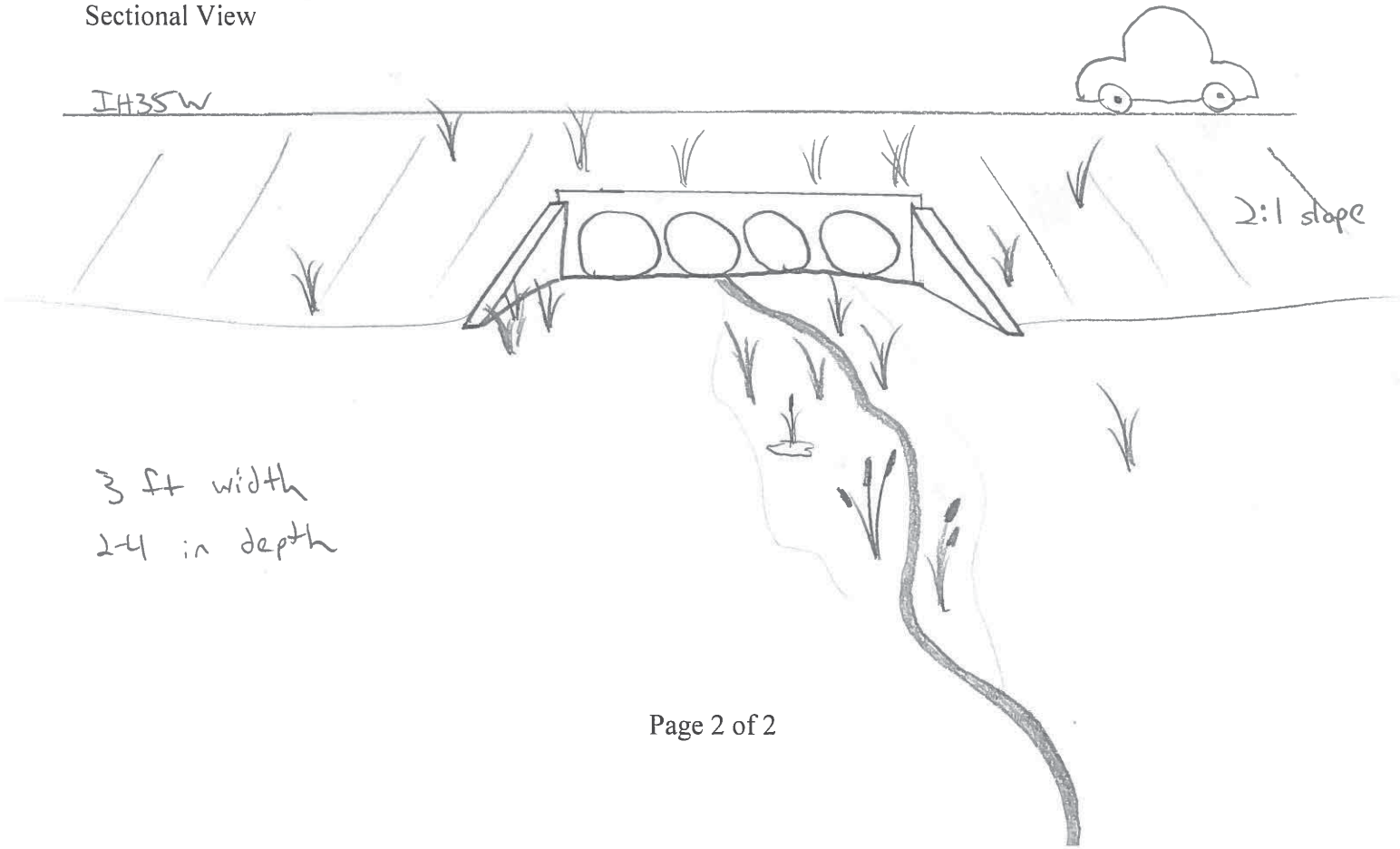
Sketch should include:

- 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



Sectional View



Stream Data Form #: 23
Project Name: IH 35W Frontage Roads
CSJ: 0081-13-065

Stream Data Form

Surveyor(s): Cliff Riley
Date of Field Work: 8/22/19
USGS Stream Name: Roark Branch Tributary 5.1
County/State: Denton, TX
USGS Topo Quad Name: Denton West
Stream Number [303(d) List]:
Associated Wetland(s):
GPS Data: 33.154979N -97.190615W

Stream Type: Ephemeral Characteristics Natural
Bank Stability (e.g. highly eroding, sloughing banks, etc.):

Stream Flow Direction: West
OHWM Width (ft): 3 OHWM Height (in): 3-6
Stream Bottom composition:

☒ Silts ☐ Cobbles ☐ Concrete ☐ Other:
☒ Sands ☐ Bedrock ☐ Muck
☐ Gravel ☒ Vegetation Type: Herbaceous Percent Cover 40

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.

Riparian Vegetation: List species observed.
Herbaceous Vegetation: switchgrass, bermudagrass, spikerush, big ragweed, and Texas croton

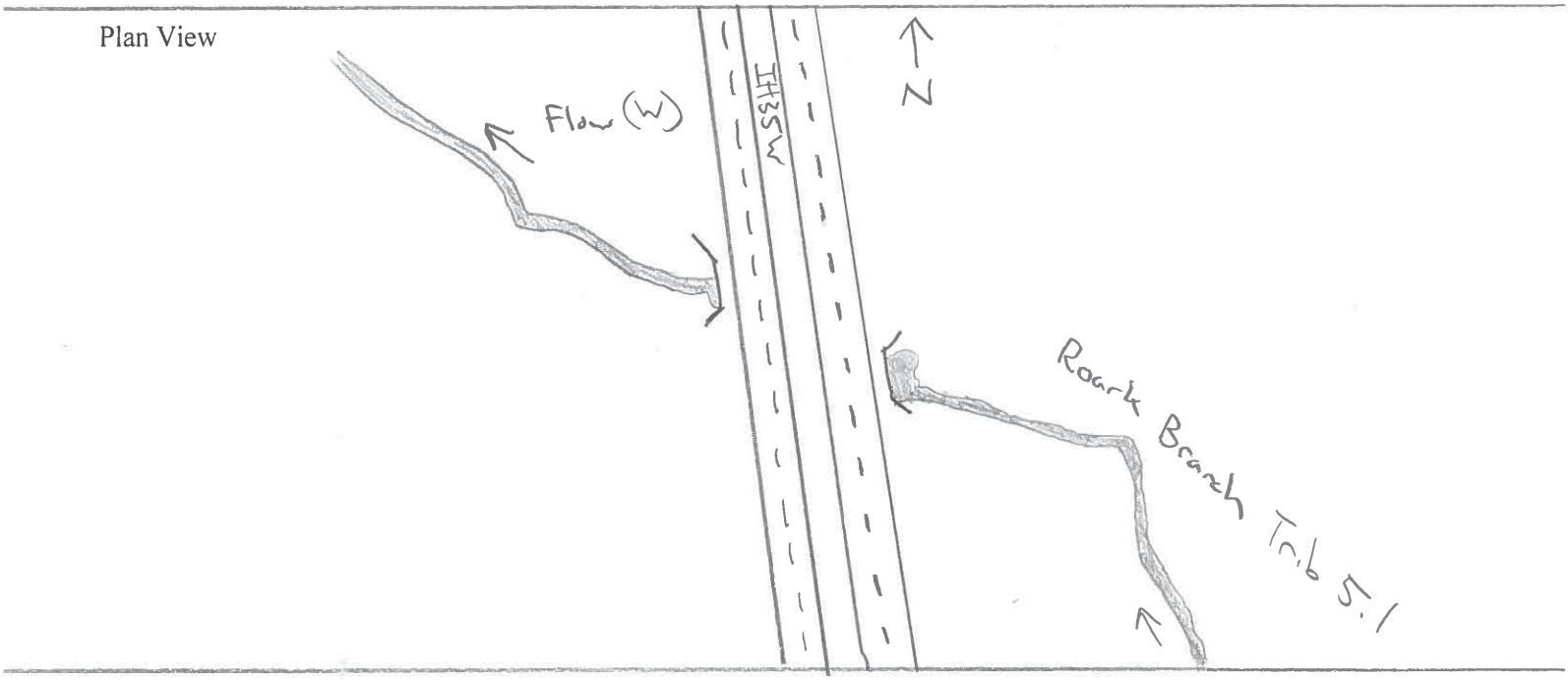
T&E Species/Suitable Habitat: List T&E species observed or which species the habitat is suitable for.

Stream Data Form #:	23
Project Name:	IH 35W Frontage Roads
CSJ:	0081-13-065

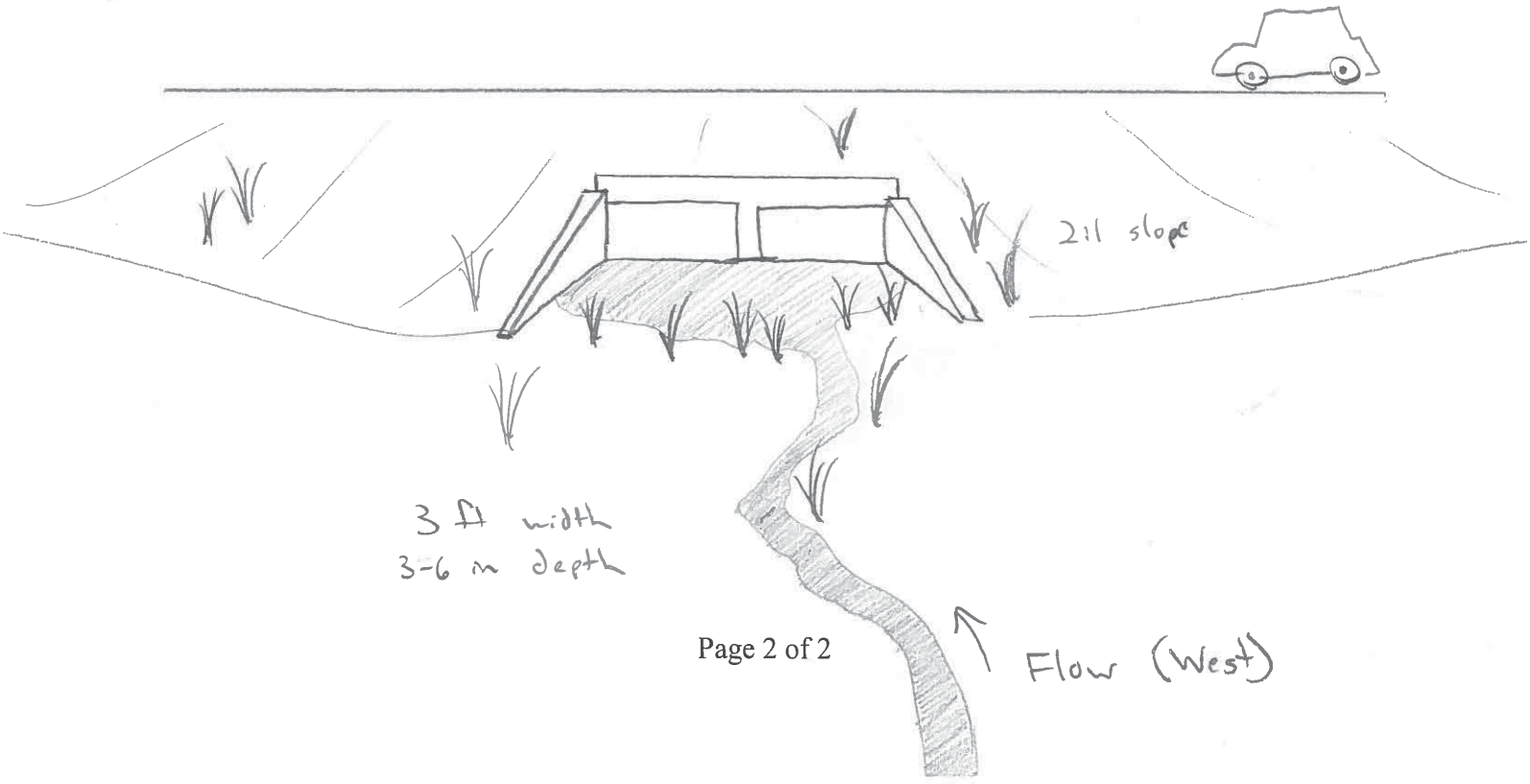
Stream Data Form (continued)
Please provide a plan and section view sketch of the stream channel.
Sketch should include:

- 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



Sectional View



Stream Data Form #: 24
Project Name: IH 35W Frontage Roads
CSJ: 0081-13-065

Stream Data Form

Surveyor(s): Cliff Riley
Date of Field Work: 8/22/19
USGS Stream Name: Roark Branch
County/State: Denton, TX
USGS Topo Quad Name: Denton West
Stream Number [303(d) List]:
Associated Wetland(s):
GPS Data: 33.165663N -97.184648W

Stream Type: Intermittent Characteristics Natural
Bank Stability (e.g. highly eroding, sloughing banks, etc.):

Stream Flow Direction: East
OHWM Width (ft): 20 OHWM Height (in): 12
Stream Bottom composition:

☒ Silts ☐ Cobbles ☐ Concrete ☐ Other:
☒ Sands ☐ Bedrock ☐ Muck
☐ Gravel ☐ Vegetation Type: Herbaceous Percent Cover 10

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.

Riparian Vegetation: List species observed.
Herbaceous Vegetation: Johnsongrass, indiangrass, plains lovegrass, and bermudagrass

T&E Species/Suitable Habitat: List T&E species observed or which species the habitat is suitable for.

Stream Data Form #:	24
Project Name:	IH 35W Frontage Roads
CSJ:	0081-13-065

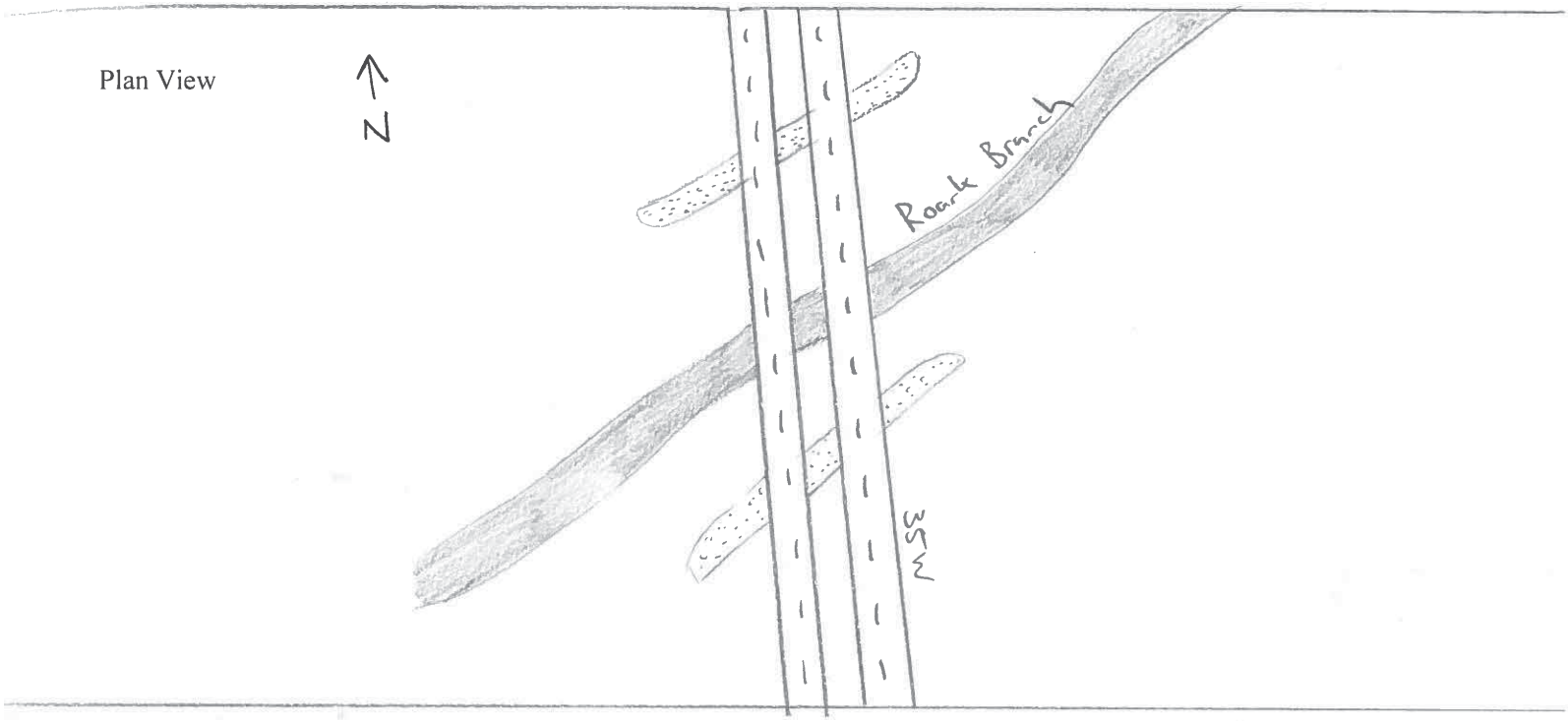
Stream Data Form (continued)

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

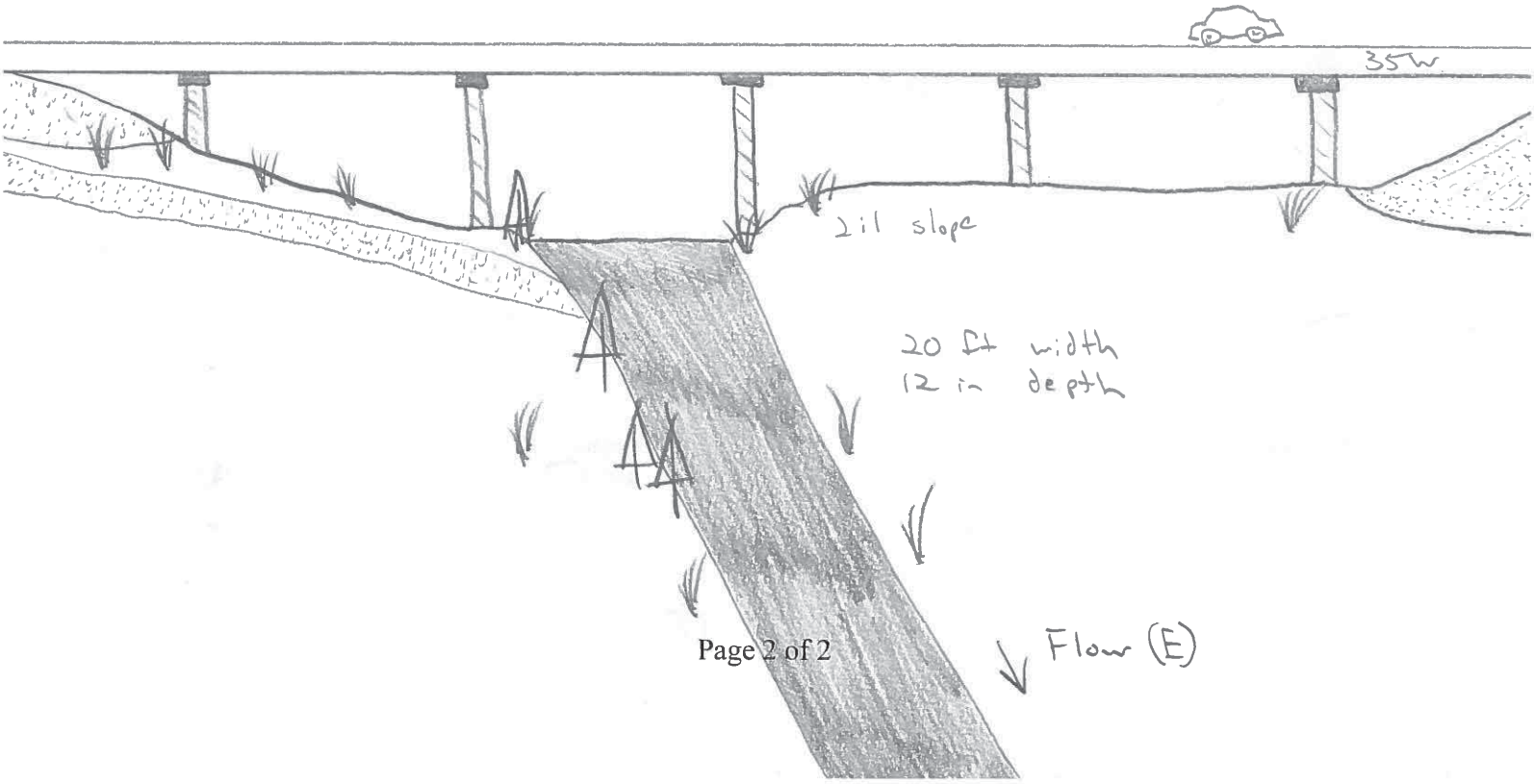
Sketch should include:

- 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



Sectional View



Stream Data Form #: 25
Project Name: IH 35W Frontage Roads
CSJ: 0081-13-065

Stream Data Form

Surveyor(s): Cliff Riley
Date of Field Work: 8/22/19
USGS Stream Name: Hickory Branch
County/State: Denton, TX
USGS Topo Quad Name: Denton West
Stream Number [303(d) List]:
Associated Wetland(s):
GPS Data: 33.175969N -97.178568W

Stream Type: Intermittent Characteristics Natural
Bank Stability (e.g. highly eroding, sloughing banks, etc.):

Stream Flow Direction: East
OHWM Width (ft): 57 OHWM Height (in): 12-18
Stream Bottom composition:

☒ Silts ☐ Cobbles ☐ Concrete ☐ Other:
☒ Sands ☐ Bedrock ☐ Muck
☐ Gravel ☐ Vegetation Type: Herbaceous Percent Cover 10

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.

Riparian Vegetation: List species observed.

Herbaceous Vegetation: Johnsongrass, indiangrass, plains lovegrass, big ragweed, goldenrod, rough cockle bur, American elm, hackberry, and bermudagrass

T&E Species/Suitable Habitat: List T&E species observed or which species the habitat is suitable for.

Stream Data Form #:	25
Project Name:	IH 35W Frontage Roads
CSJ:	0081-13-065

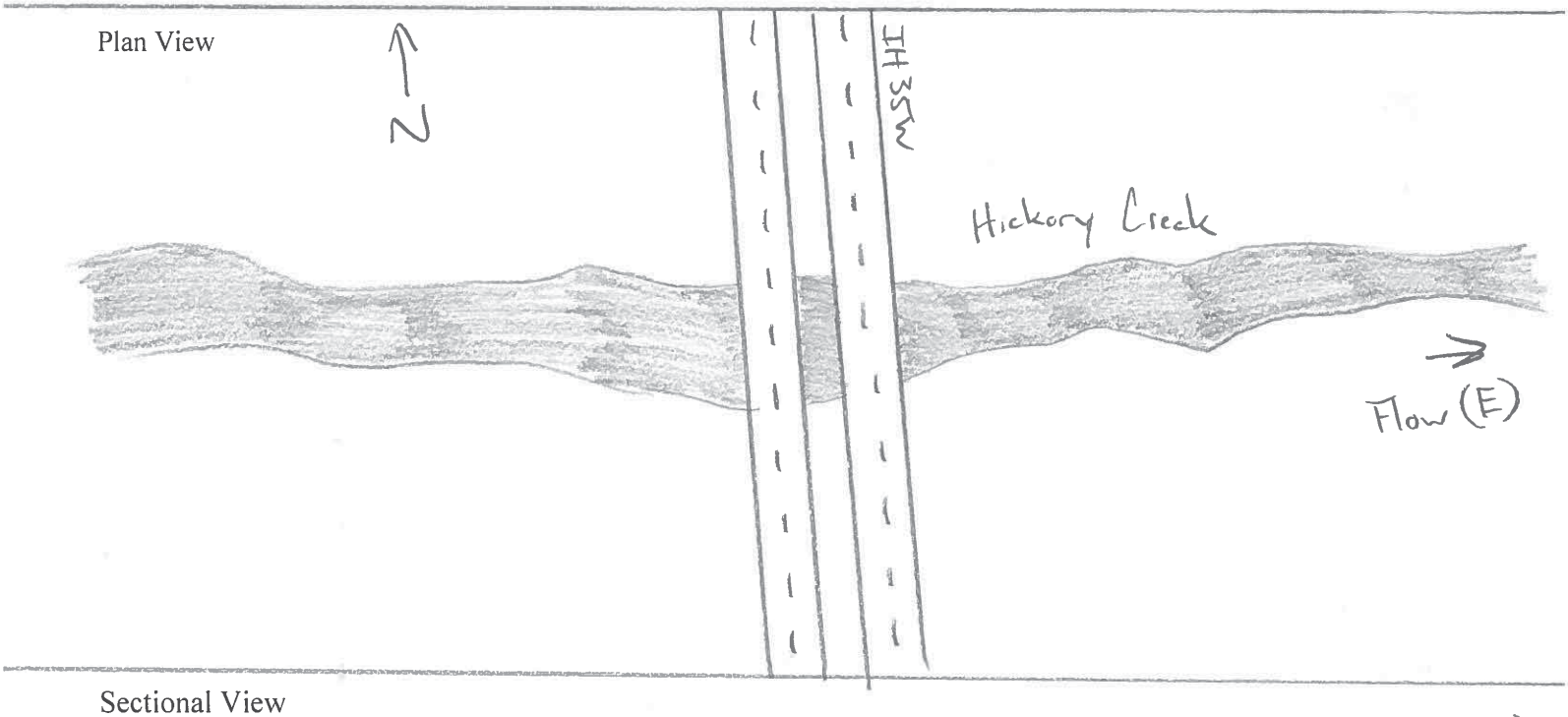
Stream Data Form (continued)

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

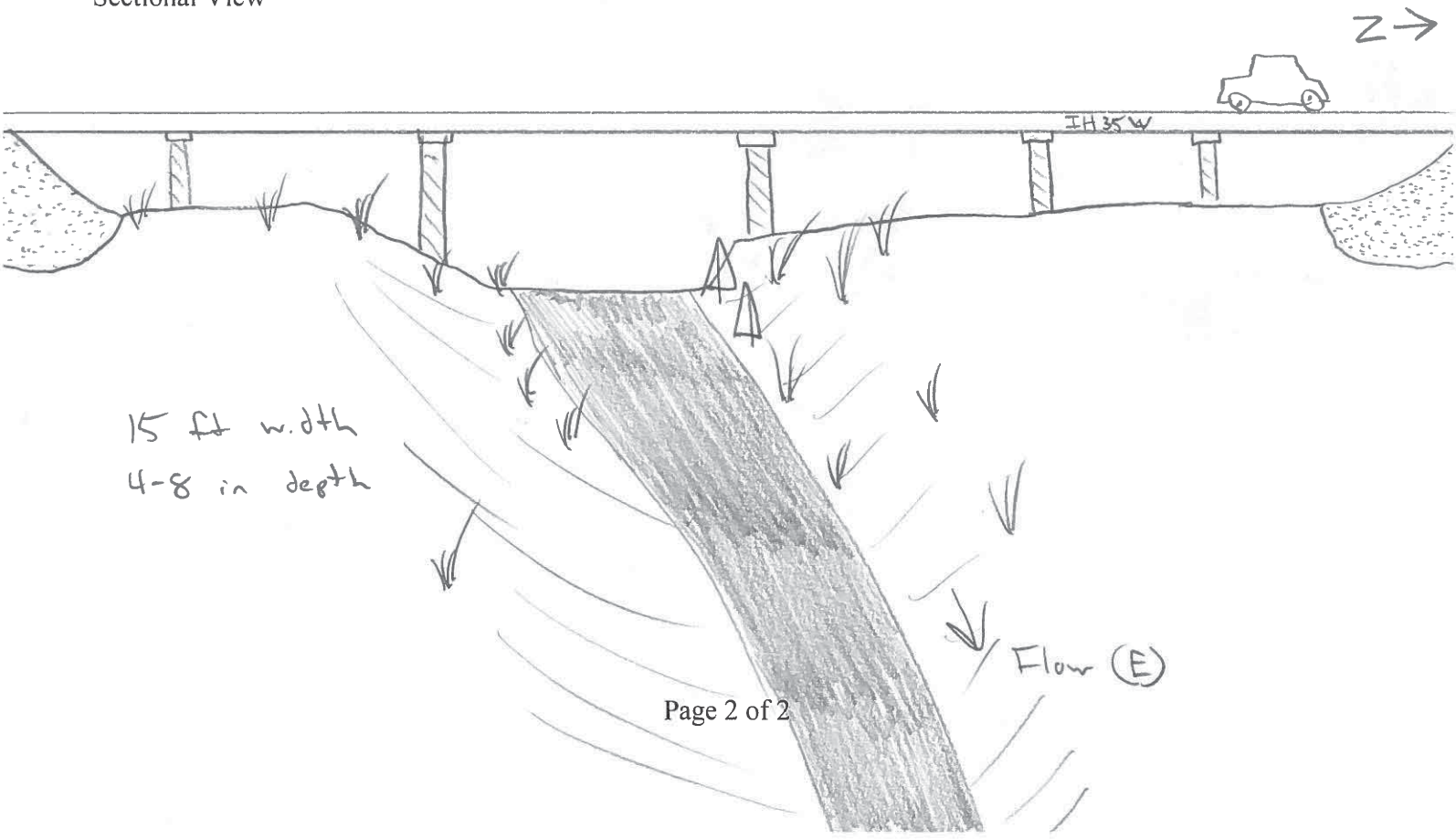
Sketch should include:

- 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



Sectional View



Stream Data Form #: 26
Project Name: IH 35W Frontage Roads
CSJ: 0081-13-065

Stream Data Form

Surveyor(s): Cliff Riley
Date of Field Work: 8/22/19
USGS Stream Name: Dry Fork Hickory Creek
County/State: Denton, TX
USGS Topo Quad Name: Denton West
Stream Number [303(d) List]:
Associated Wetland(s):
GPS Data: 33.185828N -97.172805W

Stream Type: Intermittent Characteristics Natural
Bank Stability (e.g. highly eroding, sloughing banks, etc.):

Stream Flow Direction: East
OHWM Width (ft): 15 OHWM Height (in): 4-8
Stream Bottom composition:

- ☒ Silts ☐ Cobbles ☐ Concrete ☐ Other:
- ☒ Sands ☐ Bedrock ☐ Muck
- ☐ Gravel ☐ Vegetation Type: Herbaceous Percent Cover 40

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.

Riparian Vegetation: List species observed.
Herbaceous Vegetation: alligatorweed, giant ragweed, spikerush, rattlebush, goldenrod, switchgrass, indiangrass, bitterweed, hackberry, red oak, plains lovegrass, bahiagrass, and American elm

T&E Species/Suitable Habitat: List T&E species observed or which species the habitat is suitable for.

Stream Data Form #:	26
Project Name:	IH 35W Frontage Roads
CSJ:	0081-13-065

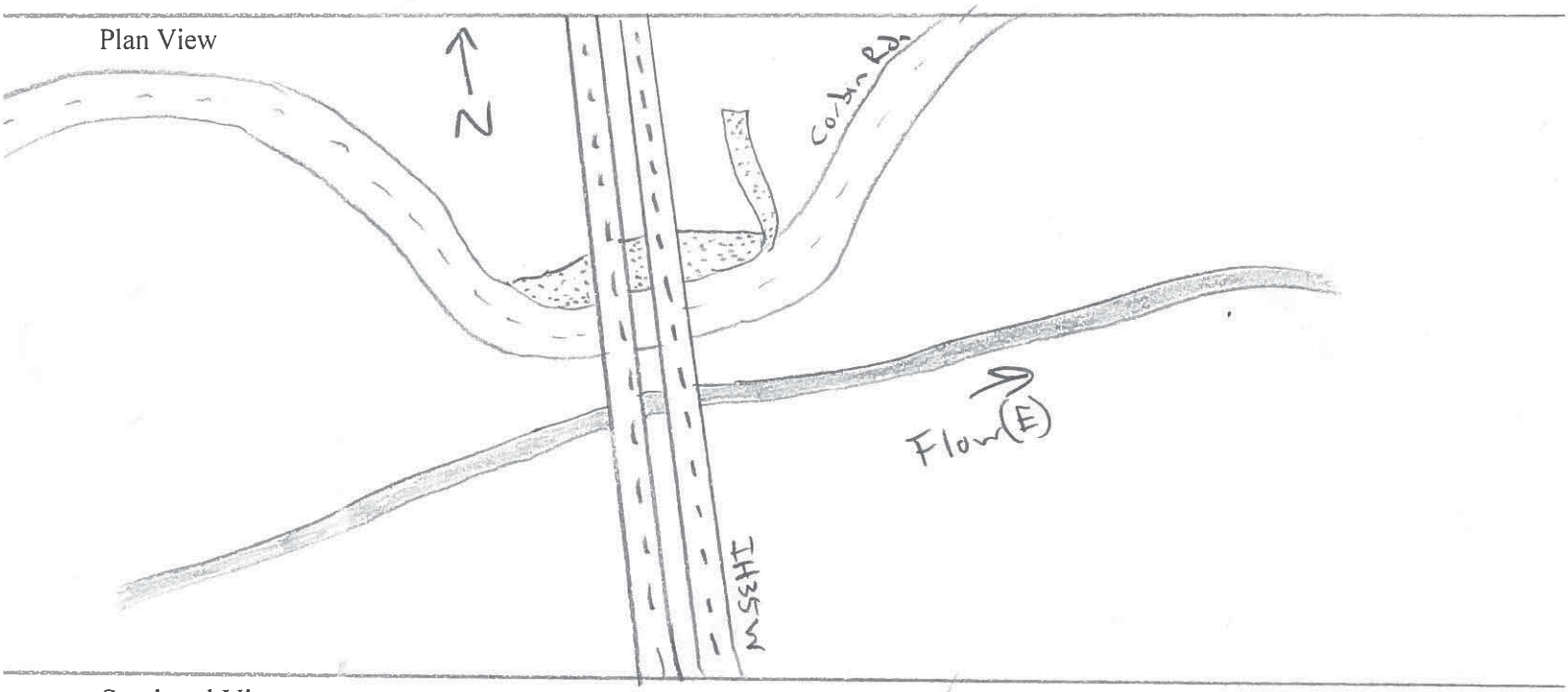
Stream Data Form (continued)

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

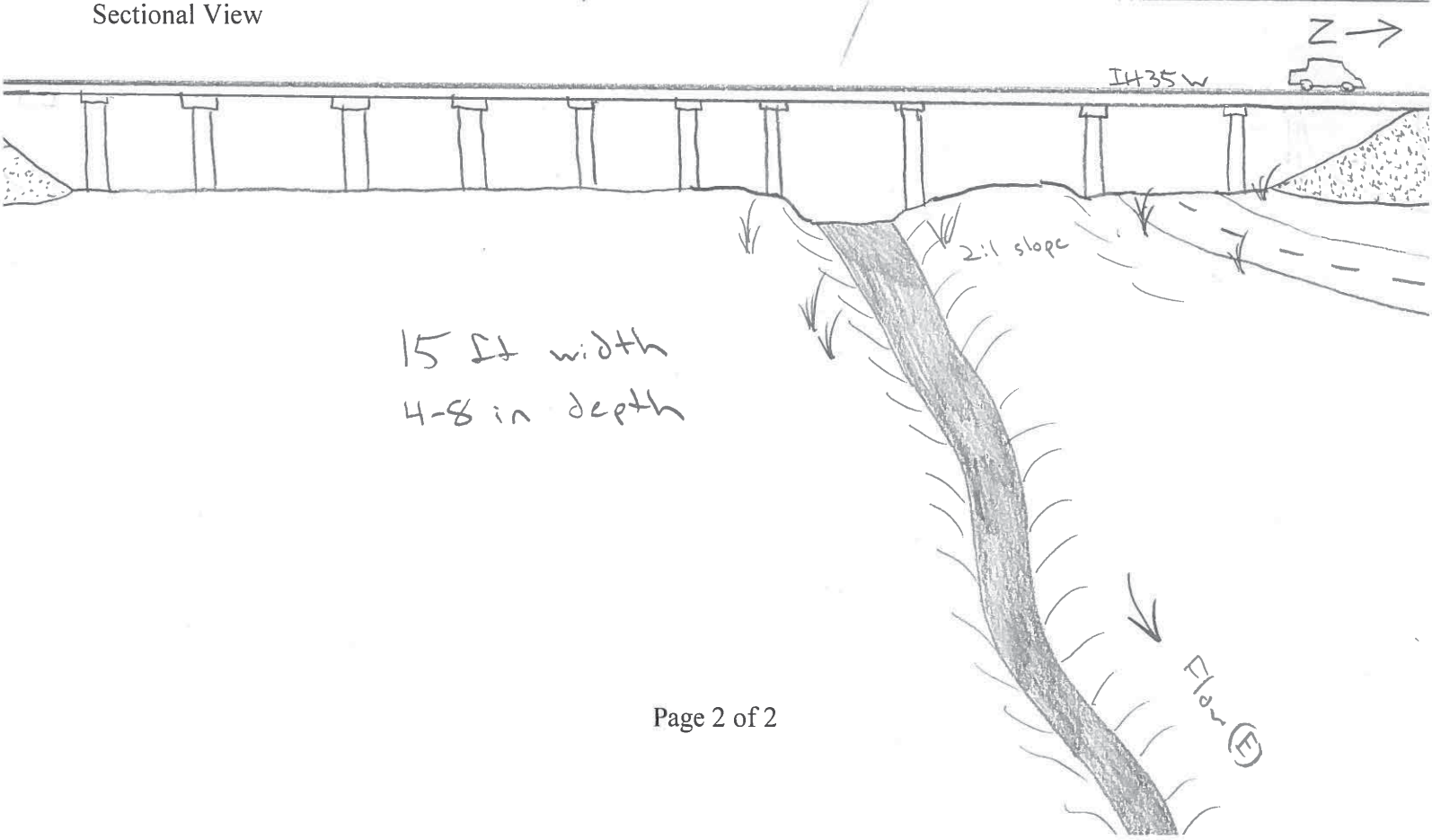
Sketch should include:

- 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



Sectional View



Stream Data Form #: 27
Project Name: IH 35W Frontage Roads
CSJ: 0081-13-065

Stream Data Form

Surveyor(s): Cliff Riley
Date of Field Work: 8/22/19
USGS Stream Name: Unnamed Trib of Dry Fork Hickory Creek
County/State: Denton, TX
USGS Topo Quad Name: Denton West
Stream Number [303(d) List]:
Associated Wetland(s):
GPS Data: 33.197732N -97.165970W

Stream Type: Ephemeral Characteristics: Natural
Bank Stability (e.g. highly eroding, sloughing banks, etc.):
Stream Flow Direction: East
OHWM Width (ft): 2
OHWM Height (in): 2-6
Stream Bottom composition:

- ☒ Silts ☐ Cobbles ☐ Concrete ☐ Other:
- ☒ Sands ☐ Bedrock ☐ Muck
- ☐ Gravel ☒ Vegetation Type: Herbaceous Percent Cover 60

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.

Riparian Vegetation: List species observed.
Herbaceous Vegetation: giant ragweed, goldenrod, spikerush, switchgrass, and Johnsongrass

T&E Species/Suitable Habitat: List T&E species observed or which species the habitat is suitable for.

Stream Data Form #:	27
Project Name:	IH 35W Frontage Roads
CSJ:	0081-13-065

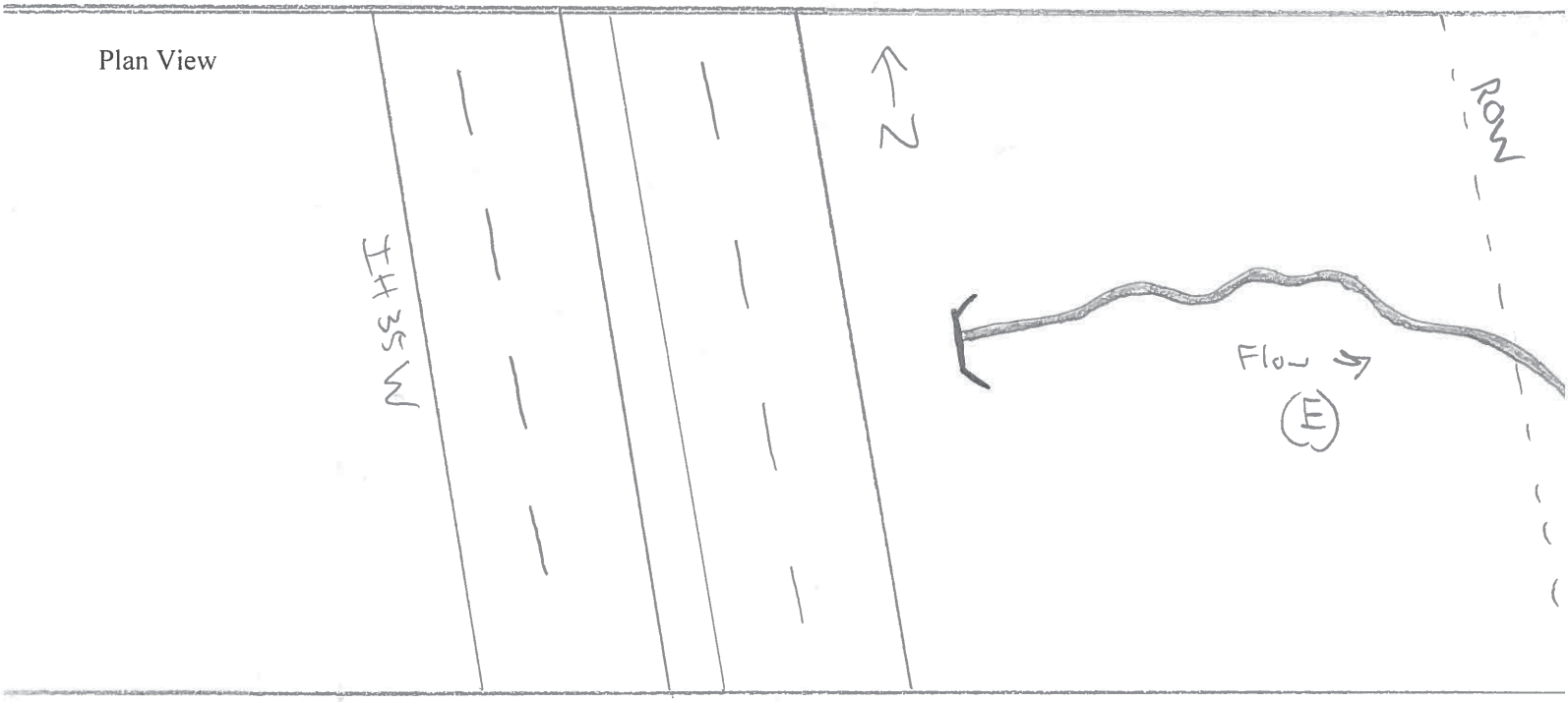
Stream Data Form (continued)

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

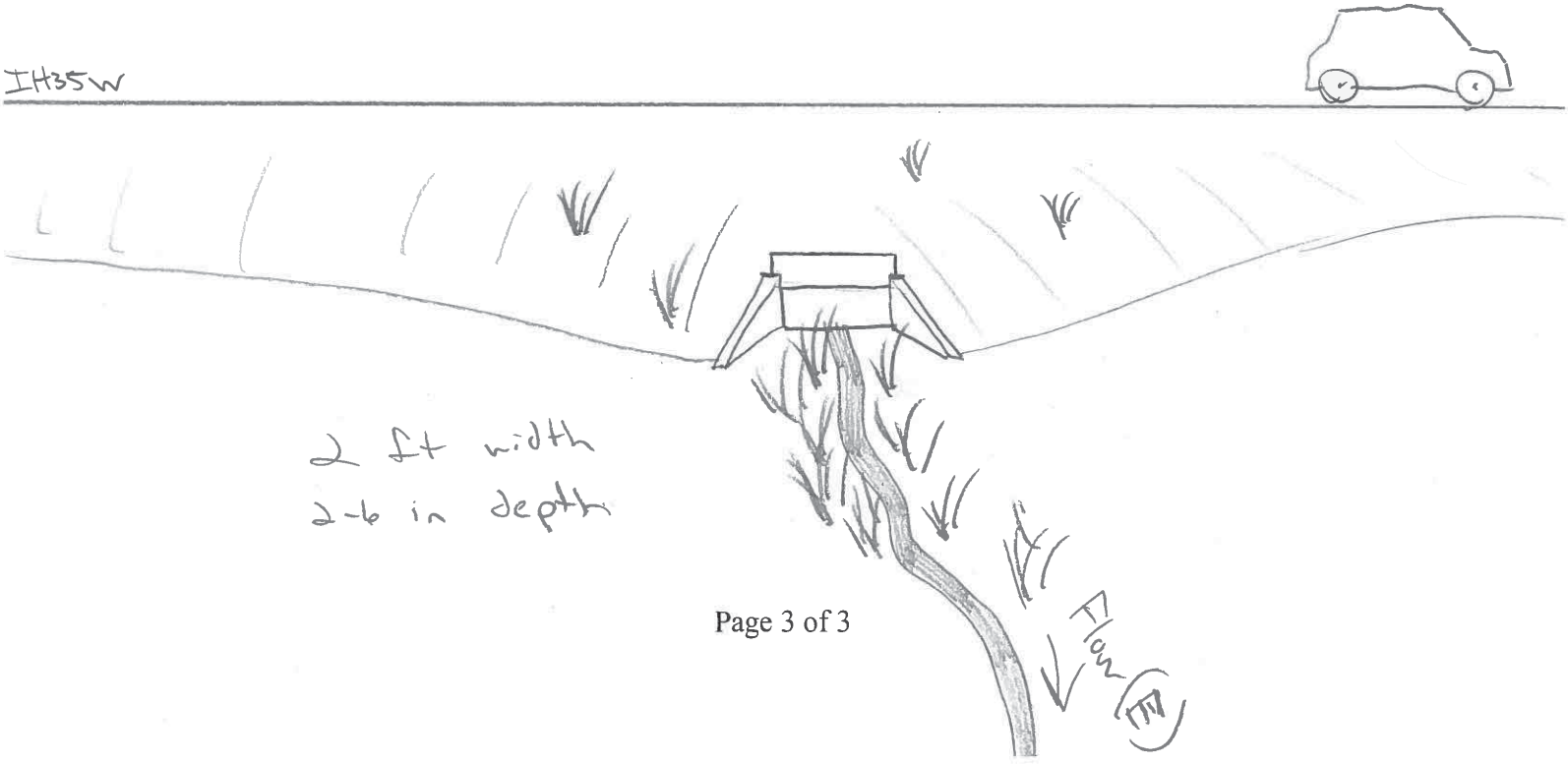
Sketch should include:

- 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



Sectional View



Attachment 4 – Site Photographs

Photograph 1. Unnamed Tributary of Elizabeth Creek. Facing east from IH 35W

Photograph 2. Elizabeth Creek Tributary 2. Facing west toward IH 35W

Photograph 3. Catherine Branch – Facing southwest toward IH 35W

Photograph 4. Open Water 1 – Facing east from IH 35W

Photograph 5. Denton Creek Tributary 6 – Facing east from under IH 35W

Photograph 6. Denton Creek – Facing southwest from just east of IH 35W

Photograph 7. Unnamed Tributary of Cleveland Branch - Facing west toward IH 35W

Photograph 8. Cleveland Branch – Facing north from NB IH 35W

Photograph 9. Wetland 1 - Facing north from west of IH 35

Photograph 10. Graham Branch Tributary 10 – Looking west toward IH 35W

Photograph 11. Wetland 2 – Facing east from Graham Branch Tributary 10

Photograph 12. Graham Branch Tributary 10.1 – Looking east away from IH 35W

Photograph 13. Wetland 3 – Looking north across Graham Branch Trib 10.1, east of IH 35W

Photograph 14. Unnamed Tributary of Graham Branch 1 – Facing east from IH 35W

Photograph 15. Graham Branch Tributary 13 – Facing east from NB frontage of IH 35W

Photograph 16. Unnamed Tributary of Graham Branch 2 – Looking west from eastern fence line along Sam Davis Road

Photograph 17. Wetland 4 – Looking east from just west of Sam Davis Road

Photograph 18. Unnamed Tributary of Graham Branch 3 – Facing southwest toward Sam Davis Road

Photograph 19. Wetland 5 – Looking east from just west of Sam Davis Road

Photograph 20. Graham Branch at Sam Davis Road – Looking west from eastern bank of stream

Photograph 21. Wetland 6 – Looking southwest from just north of Sam Davis Road

Photograph 22. Wetland 7 – Looking northwest from just south of Sam Davis Road

Photograph 23. Graham Branch Tributary 15 – Looking east from the culvert at IH 35W

Photograph 24. Wetland 8 – Looking southeast toward IH 35

Photograph 25. Graham Branch at IH 35W – Looking east from the culvert at IH 35W

Photograph 26. Unnamed Tributary of Graveyard Branch 1 – Looking west toward IH 35W

Photograph 27. Wetland 9 – Looking west toward IH 35W

Photograph 28. Unnamed Tributary of Graveyard Branch 2 – Looking east from IH 35W

Photograph 29. Wetland 10 – Looking east toward IH 35W

Photograph 30. Wetland 11 – Looking east from IH 35W

Photograph 31. Graveyard Branch Tributary 2.1 – Looking west toward IH 35W

Photograph 32. Graveyard Branch Tributary 2 – Looking west toward IH 35W

Photograph 33. Graveyard Branch Trib Unnamed – Looking northwest toward IH 35W

Photograph 34. Wetland 12 – Looking east from IH 35W

Photograph 35. Roark Branch Tributary 5. 1 – Looking southwest from the just east of NB IH 35W

Photograph 36. Roark Branch – Looking northwest toward IH 35W

Photograph 37. Hickory Creek – Looking southwest toward IH 35W

Photograph 38. Dry Fork Hickory Creek – Looking west toward IH 35W

Photograph 39. Unnamed Tributary of Dry Fork Hickory Creek – Looking east from IH 35W