



Form Species Analysis

Project Name: **FM 1641 and FM 548 Widening**

CSJ(s): **1217-01-019 & 2588-01-020**

County(ies): **Kaufman**

Date Analysis Completed: **April 29, 2020**

Prepared by: **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 9, 2019, 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. Do not fill out a separate Tier I Site Assessment Form.
- ☒ 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 active 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: _____



Tier I Site Assessment

Main CSJ: 1217-01-019 and 2588-01-020

Form Prepared By: Jonathan Stewart, Civil Associates, Inc.

Date of Evaluation: April 29, 2020

Proposed Letting Date: August 2020

☐ Project not assigned to TxDOT under the NEPA Assignment MOU

District(s): Dallas

County(ies): Kaufman

Roadway Name: FM 1641

Limits From: FM 548

Limits To: FM 148

Project Description: Please see the project description available in ECOS in the Work Plan Development Section I.

The environmental review, consultation, and other actions required by applicable Federal environmental laws for this project are being, or have been, carried-out by TxDOT pursuant to 23 U.S.C. 327 and a Memorandum of Understanding dated December 9, 2019, and executed by FHWA and TxDOT.

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:**

No state-listed species would be impacted by the project. SGCN were analyzed and only those included on the Tier 1 form 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: Woodhouse's toad (*Anaxyrus woodhousii*), southern crawfish frog (*Lithobates areolatus areolatus*), Western Burrowing Owl (*Athene cunicularia hypugaea*), eastern spotted skunk (*Spilogale putorius*), and Shinner's sedge (*Carex shinnerii*).

Suitable habitats for these species were present; however, no species were observed within the proposed project area.

Date [TPWD County](#) List Accessed: April 28, 2020

Date that the NDD was accessed: January 16, 2020

What agency performed the NDD search? TPWD

EOID Number	Common Name	Scientific Name	Listing Status	Buffer Zone
10146, 9977	Topeka purple-coneflower	<i>Echinacea atrorubens</i>	SGCN	10 Mile

NDD Search Results for EOIDs and Tracked Managed Areas

EOID Number	Common Name	Scientific Name	Listing Status	Buffer Zone
11478, 11476	Southern crayfish frog	<i>Lithobates areolatus areolatus</i>	SGCN	10 Mile
5782	Rookery			10 Mile
4149, 440, 4573, 2037	Little bluestem - indiagrass series	<i>Schizachyrium scoparium</i> - <i>Sorghastrum nutans</i> series		10 Mile
11961, 11955, 11918, 11917, 11564	Verisol Blackland Prairie	<i>Schizachyrium scoparium</i> - <i>Andropogon gerardii</i> - <i>Sorghastrum nutans</i> - <i>Bifora americana</i> Vertisol Grassland		10 Mile

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

Comments:

Species-specific BMPs are present in the BMP PA for the following species: Southern crawfish frog, Western Burrowing Owl, and eastern spotted skunk (using plains spotted skunk BMPs by TPWD approval). There are listed in full at the end of this form.

Although southern crawfish frog has species-specific BMPs in the BMP PA that would be implemented, coordination is still triggered because the project includes proposed ROW in Kaufman County.

There are no species-specific BMPs for Woodhouse's toad or Shinner's sedge.

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

*Explain:

According to the MOU, important remnant vegetation includes 1) rare vegetation communities and 2) those that are suitable habitat for SGCN.

To address the first component, TxNDD data obtained from TPWD on January 16, 2020, was reviewed along with the TPWD RTEST list for Kaufman County, dated April 28, 2020. The TxNDD radii was 1.5 miles and 10 miles from the project area (see table above). These specific species and plant community detections are located outside of the project area and would not be impacted by the proposed project.

To address important remnant vegetation's second component, general habitat types of those SGCNs that may be impacted by the proposed project include agriculture, grassland, woodland, riparian, and urban. These habitat types are located immediately adjacent to the existing FM 1641 corridor, and each includes an edge component. Developed habitat is located throughout the project area. Impacts to these habitats were quantified based on the MOU type that best fits vegetation present in the given habitat, by using EMST correcting for discrepancies using actual observed vegetation types as discussed below. None of these areas that include habitat for SGCNs are considered rare or remnant vegetation communities.

5. No Does the project require a NWP with PCN or IP by USACE?



Tier I Site Assessment

6. No 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:
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 2.3 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 7.5 acres of Disturbed Prairie MOU Type habitat disturbance exceeds the 3-acre area of threshold indicated in the Texas Blackland Prairies Threshold Table PA for Disturbed Prairie.

The approximately 2.3 acres of Riparian MOU Type habitat disturbance exceeds the 0.1-acre area of threshold indicated in the Texas Blackland Prairies 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 11 1217-01-019, etc. FM 1641 EMSTandObservedVegTable 4-29-20.xls

- 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	3.2	11.1
Disturbed Prairie	7.5	2.0
Open Water	0.3	0
Riparian	2.3	2.6
Tallgrass Prairie, Grassland	0	29.6
Urban	77.2	45.2
Total	90.4	90.4

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

File Name:

APPROVED 09 1217-01-019, etc. FM 1641 EMSTfigures 4-29-20.pdf
APPROVED 10 1217-01-019, etc. FM 1641 ObservedVegFigures 4-29-20.pdf
APPROVED 11 1217-01-019, etc. FM 1641 EMSTandObservedVegTable 4-29-20.xls
APPROVED 12 1217-01-019, etc. FM 1641 Photos 4-29-20.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:

Southern crawfish frog - 1) Minimize impacts to wetland habitats including isolated ephemeral pools. 2) Water Quality BMPs 3) Amphibian BMPs

Water Quality BMPs: In addition to BMPs required for a TCEQ Storm Water Pollution Prevention Plan and/or 401 water quality permit:

- 1) Minimize the use of equipment in streams and riparian areas during construction. When possible, equipment access should be from banks, bridge decks, or barges.
- 2) When temporary stream crossings are unavoidable, remove stream crossings once they are no longer needed and stabilize banks and soils around the crossing.

Amphibian & 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 wing walls 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.

Western Burrowing Owl - Bird BMPs:

In addition to complying with the Migratory Bird Treaty Act perform the following BMPs:

- a) 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.
- b) Do not disturb, destroy, or remove active nests, including ground nesting birds, during the nesting season.
- c) Avoid the removal of unoccupied, inactive nests, as practicable.
- d) Prevent the establishment of active nests during the nesting season on TxDOT owned and operated facilities and structures proposed for replacement or repair.
- e) Do not collect, capture, relocate, or transport birds, eggs, young, or active nests without a permit.

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

TxDOT proposes implementing the following for species with no species-specific BMPs included in the BMP PA:

Woodhouse's toad - Amphibian BMPs

Shinner's sedge - Contractors will be advised of potential occurrence in the project area, and to avoid harming the species if encountered.

TxDOT Contact Information

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Suggested Attachments

Aerial Map (with delineated project boundaries)

USFWS T&E List

TPWD T&E List

Species Analysis Summary

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)

SPECIES ANALYSIS SUMMARY
Project Name: FM 1641
CSJ(s): 1217-01-019 and 2588-01-020

County	Taxon	Common Name	Scientific Name	Habitat	Suitable Habitat Present?	Explanation for determination regarding suitable habitat	Federal Status	Effect/Take Determination for Federally Listed Species	State Status	Impact Determination for State-Listed Species	Explanation for Effect/Take and/or Impact Determination	Presence/Absence survey conducted?
Kaufman	Birds	Bald Eagle	<i>Haliaeetus leucocephalus</i>	The species occurs throughout Texas and is divided into two populations: breeding and non-breeding or wintering birds. Breeding populations occur primarily in the eastern half of the state and in coastal counties from Rockport to Houston. Nonbreeding or wintering populations are located primarily in the panhandle, central, and east Texas, and in other areas of suitable habitat throughout the state. Habitat consists of dense mature coniferous or hardwood trees adjacent to large open bodies of water. Breeding habitat can include any type of wetland habitat such as rivers, marshes, or large lakes with high concentration of prey fish. Trees utilized for nesting are typically over 60 feet tall, have an open structure, and close proximity to habitat edge.	N	There is no suitable habitat such as dense mature coniferous or hardwood trees adjacent to large open bodies of water within the project area.	—	N/A	T	No impact	There is no suitable habitat within the project area. In addition, the species no longer has state-threatened status but is considered an SGCN.	N
Kaufman	Birds	Black Rail	<i>Laterallus jamaicensis</i>	Black rails are year-round residents of the central and upper coast and migrants in the eastern part of the state. The species nests in salt, brackish, and freshwater marshes, pond borders, wet meadows, and wetlands with hydrophytic grass species. Water depth is an important and key habitat component, as the species typically is found where water is less than two to four centimeters deep. Other significant habitat factors may include vegetation density, distance to open water, and water regime stability. Nesting typically occurs in the highest sections of the marsh, which have mesic to hydric soils and are flooded by only the highest tides. Nests are built in areas with saturated or shallowly flooded soils and dense vegetation on damp ground, on mat of previous year's dead grasses, or over shallow water. In salt or brackish marshes, typical habitat includes dense stands of cordgrasses (<i>Spartina</i> sp.), spikegrasses (<i>Distichlis</i> sp.), and needlerush (<i>Juncus</i> sp.), or, in more upland saltbush communities along marsh edges. Typical freshwater habitat includes species such as cattail (<i>Typha</i>) and bulrush (<i>Scirpus</i> sp.). Non-breeding habitat is thought to be similar to breeding habitat.	N	Salt, brackish or freshwater marshes, pond borders, wet meadows, or wetlands with hydrophytic grass species were not identified within the action area. The action area lines up with the project areas for this species evaluation.	PT	No effect	—	N/A	There is no suitable habitat within the action area.	N
Kaufman	Birds	Least Tern	<i>Sternula</i> (=Sterna) <i>antillarum</i>	The interior population (subspecies <i>athalassos</i>) of the Least Tern nests on bare or sparsely vegetated sand, shell, and gravel beaches, sandbars, islands, and salt flats associated with inland rivers and reservoirs. It occasionally nests on man-made structures such as sand and gravel pits or gravel rooftops. Preferred habitat includes sand and gravel bars within a wide unobstructed river channel, or open flats along shorelines of lakes and reservoirs. Colony sites can move annually, depending on landscape disturbance and vegetation growth at established colonies. It is known to nest at three reservoirs along the Rio Grande River, on the Canadian River in the northern Panhandle, and along the Red River.	N	Bare or sparsely vegetated sand, shell, or gravel beaches, sandbars, islands, and salt flats associated with inland rivers and reservoirs were not identified in the action area. The action area lines up with the proposed project area for this species evaluation.	E	No effect	E	No impact	There is no suitable habitat within the action area.	N

SPECIES ANALYSIS SUMMARY
Project Name: FM 1641
CSJ(s): 1217-01-019 and 2588-01-020

County	Taxon	Common Name	Scientific Name	Habitat	Suitable Habitat Present?	Explanation for determination regarding suitable habitat	Federal Status	Effect/Take Determination for Federally Listed Species	State Status	Impact Determination for State-Listed Species	Explanation for Effect/Take and/or Impact Determination	Presence/Absence survey conducted?
Kaufman	Birds	Piping Plover	<i>Charadrius melodus</i>	This migratory species overwinters in Texas, where it occurs on beaches, ephemeral sand flats, barrier islands, sand, mud, algal flats, washover passes, salt marshes, lagoons, and dunes along the Gulf Coast and adjacent offshore islands, including spoil islands in the Intracoastal Waterway. Algal flats appear to be the highest quality habitat because of 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 or 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.	N	The proposed action area is not located on the Gulf Coast, offshore islands, or beaches. The action area lines up with the proposed project area for this species evaluation.	T	No effect	T	No impact	There is no suitable habitat within the action area, and this species only requires consideration for wind energy projects.	N
Kaufman	Birds	Red Knot	<i>Calidris canutus rufa</i>	The species is a winter resident and migrant in Texas. It is primarily found in marine habitats such as sandy beaches, salt marshes, lagoons, mudflats of estuaries and bays, and mangrove swamps during winter months. It primarily occurs along the Gulf coast on tidal flats and beaches and less frequently in marshes and flooded fields. It has occasionally been observed along shorelines of large lakes and freshwater marshes.	N	Sandy beaches, salt marshes, lagoons, mudflats of estuaries and bays, mangrove swamps, marshes, or flooded fields were not identified in the action area. The action area lines up with the proposed project area for this species evaluation.	T	No effect	—	N/A	There is no suitable habitat within the action area and this species only requires consideration for wind energy projects.	N
Kaufman	Birds	White-faced Ibis	<i>Plegadis chihi</i>	The species is found in the Western Gulf Coastal Plains ecoregion of Texas. Preferred habitat includes freshwater wetlands, marshes, ponds, rivers, irrigated land, and sloughs, but it occasionally forages in brackish or saltwater marshes. It nests in marshes in low trees, on the ground in bulrushes (<i>Scirpus</i> sp.) or reeds, or on floating mats.	N	No suitable habitat such as wetlands, rivers, marshes, irrigated land and sloughs were identified within the project area.	—	N/A	T	No impact	There is no suitable habitat within the project area.	N
Kaufman	Birds	Whooping Crane	<i>Grus americana</i>	The species breeds in Canada and winters on the Texas coast at Aransas National Wildlife Refuge. During migration it typically stops to rest and feed in open bottomlands of large rivers and marshes but, like other waterbirds, it may also utilize flooded croplands, playas, large wetlands associated with lakes, small ponds, and various other aquatic features. Typical migration habitat includes sites with good horizontal visibility, water depth of 30 centimeters or less, and minimum wetland size of 0.04 hectare for roosting.	N	No suitable habitat such as large rivers, marshes, flooded croplands, playas, or large wetlands were identified within the action area. The action area lines up with the proposed project area for this species evaluation.	E	No effect	E	No impact	There is no suitable habitat within the action area.	N

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Kaufman	Birds	Wood Stork	<i>Mycteria americana</i>	The species breeds in Mexico, and nesting sites have not been recorded in Texas since 1960. However, post-breeding migrants disperse into Texas in the summer. Foraging habitat includes freshwater prairie ponds, flooded pastures or fields, ditches, and other shallow standing water with an open canopy, occasionally including brackish wetlands. The species typically roosts communally in tall snags, sometimes in association with other wading birds (i.e. active heronries).	N	There are no freshwater prairie ponds, or areas of shallow standing water found within the project area.	—	N/A	T	No impact	There is no suitable habitat within the project area.	N
Kaufman	Mammals	Black Bear	<i>Ursus americanus</i>	Once widespread throughout the state, both subspecies of American black bear (<i>Ursus americanus eremicus</i> and <i>U. a. amblyceps</i>) have been restricted to west Texas, primarily in or near the larger mountain ranges such as the Chisos and Guadalupe Mountains, but occasionally in the Edwards Plateau region. Preferred habitat consists of desert scrub, chaparral, and juniper-oak or pinyon-oak woodlands. Optimal brushy and forest habitats consist of moderate to high density and canopy cover, high species diversity, rugged topography, and low human population.	N	There are no large mountain ranges near the project. Preferred vegetation is sparse within the project area, topography is relatively flat, and human populations are moderately high.	—	N/A	T	No impact	There is no suitable habitat within the project area.	N
Kaufman	Mollusks	Louisiana Pigtoe	<i>Pleurobema riddellii</i>	Freshwater mussel currently found in the Sabine, Neches, and Trinity River basins in Texas. The species occurs in streams to medium-sized rivers with moderate flow. In Texas, the species has only been documented occurring in relatively shallow lotic waters with preferable substrate being sand and sand with gravel and silt. It is not generally known to tolerate impoundments.	N	No suitable perennial streams are present in the project area.	—	N/A	T	No impact	There is no suitable habitat within the project area.	N
Kaufman	Mollusks	Sandbank Pocketbook	<i>Lampsilis satura</i>	A freshwater mussel that is currently limited to the Upper Trinity, Neches, Sabine, and San Jacinto River basins in Texas. The species occurs in flowing small to large rivers with gravel, gravel-sand, and sand substrates. It has been observed in littoral areas with snags, gravel, or sand substrate with slow to moderate currents, as well as lotic waters in substrates of sand, silty sand, and sand and clay mixture.	N	No suitable perennial streams are present in the project area.	—	N/A	T	No impact	There is no suitable habitat within the project area.	N
Kaufman	Mollusks	Texas Heelsplitter	<i>Potamilus amphichaenus</i>	A freshwater mussel currently known from the Trinity, Neches, and Sabine River basins. The species occurs in small streams to medium rivers with sand or mud substrate. It is found in flowing water but not in riffles or shoals. It prefers quiet waters and can be found in reservoirs.	N	No suitable perennial streams are present in the project area.	—	N/A	T	No impact	There is no suitable habitat within the project area.	N
Kaufman	Reptiles	Alligator Snapping Turtle	<i>Macrochelys temminckii</i>	Occurs in East Texas where it inhabits perennial water bodies such as the deep water of rivers, canals, lakes, and oxbows, along with swamps, bayous, and ponds near deep running water. Preferred habitat is usually in water with a mud bottom and abundant aquatic vegetation, but the species may use sand-bottomed creeks.	N	No suitable perennial streams are present in the proposed project area.	—	N/A	T	No impact	There is no suitable habitat within the project area.	N

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Kaufman	Reptiles	Texas Horned Lizard	<i>Phrynosoma cornutum</i>	The species is found in semi-arid open areas with scattered vegetation comprised of bunchgrass, cacti, yucca, mesquite, acacia, juniper, or other woody shrubs and small trees commonly found in loose sandy or loamy soils.	N	No suitable semi-arid open areas with loose sandy or loamy soils are present in the proposed project area.	—	N/A	T	No impact	There is no suitable habitat within the project area.	N

SPECIES ANALYSIS SUMMARY (SGCN)

Project Name: FM 1641

CSJ(s): 1217-01-019 and 2588-01-020

County	Taxon	Common Name	Scientific Name	Habitat	Suitable Habitat Present?	Explanation for determination regarding suitable habitat	Impact Determination for SGCNs	Explanation for Impact Determination	Presence/ Absence survey conducted?
Kaufman	Amphibians	Woodhouse's toad	<i>Anaxyrus woodhousii</i>	Extremely catholic up to 5000 feet, does very well (except for traffic) in association with man.	Y	Floodplains and maintained areas adjacent to human activities are present in the proposed project area.	May impact	Suitable habitat is present in the project area. The species was not observed in the project area during the site assessment.	N
Kaufman	Amphibians	Strecker's chorus frog	<i>Pseudacris streckeri</i>	Wooded floodplains and flats, prairies, cultivated fields and marshes. Likes sandy substrates.	N	There a narrow, fragmented, wooded floodplains within the proposed project area. However, no sandy soils are present. Presence is unlikely.	No impact	No suitable habitat is present in the project area. The species was not observed in the project area during the site assessment.	N
Kaufman	Amphibians	southern crawfish frog	<i>Lithobates areolatus areolatus</i>	The Southern Crawfish Frog can be found in abandoned crawfish holes and small mammal burrows. This species inhabits moist meadows, pasturelands, pine scrub, and river flood plains. This species spends nearly all of its time in burrows and only leaves the burrow area to breed. Although this species can be difficult to detect due to its reclusive nature, the call of breeding males can be heard over great distances. Eggs are laid and larvae develop in temporary water such as flooded fields, ditches, farm ponds and small lakes. Habitat: Shallow water, Herbaceous Wetland, Riparian, Temporary Pool, Cropland/hedgerow, Grassland/herbaceous, Suburban/orchard, Woodland Conifer.	Y	Moist areas, temporary pools, herbaceous riparian areas are present in the proposed project area.	No impact	Suitable habitat is present within the project area. No frogs were observed during the site assessment. Species-specific BMPs would be implemented.	N
Kaufman	Birds	Franklin's Gull	<i>Leucophaeus pipixcan</i>	Nests in freshwater prairie and open-country marshes with patches of emergent and floating vegetation. Migrates mostly through the continent's center, utilizing agricultural fields, marshes, reservoirs, and many other habitats. Winters mostly along Pacific coastline of Peru and Chile.	N	There is no suitable habitat such as marshes or inland lakes within the project area.	No impact	No suitable habitat is present within the project area, and no gulls were observed during the site assessment.	N
Kaufman	Birds	Western Burrowing Owl	<i>Athene cunicularia hypugaea</i>	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.	Y	There is suitable habitat present such as fields with open grassland within the project area.	No impact	Suitable habitat is present; however, no owls were observed during the site assessment. The Bird BMPs would be implemented.	N
Kaufman	Mammals	southern short-tailed shrew	<i>Blarina carolinensis</i>	Found primarily in pine forests, dry to wet and even swampy habitats, as well as disturbed forests and abandoned agricultural land.	N	There are no pine forests, swampy habitats in the proposed project area.	No impact	No suitable habitat present within the project area, and no shrews were observed during the site	N

Prepared Date: 4/28/2020

SPECIES ANALYSIS SUMMARY (SGCN)

Project Name: FM 1641

CSJ(s): 1217-01-019 and 2588-01-020

County	Taxon	Common Name	Scientific Name	Habitat	Suitable Habitat Present?	Explanation for determination regarding suitable habitat	Impact Determination for SGCNs	Explanation for Impact Determination	Presence/ Absence survey conducted?
Kaufman	Mammals	southeastern myotis bat	<i>Myotis austroriparius</i>	Caves are rare in Texas portion of range; buildings, hollow trees are probably important. Historically, lowland pine and hardwood forests with large hollow trees; associated with ecological communities near water. Roosts in cavity trees of bottomland hardwoods, concrete culverts, and abandoned man-made structures.	N	There are woodlands and a riparian area within the proposed project area. However, no large trees known to develop hollows, pine trees with sloughing bark, or limestone caves were observed.	No impact	No suitable habitat present within the project area, and no bats were observed during the site assessment.	N
Kaufman	Mammals	tricolored bat	<i>Perimyotis subflavus</i>	Forest, woodland and riparian areas are important. Caves are very important to this species. They are not often found in buildings or in deep woods, seeming to prefer edge habitats near areas of mixed agricultural use.	N	Wooded areas dominated by sugarberry (<i>Celtis laevigata</i>), cedar elm (<i>Ulmus crassifolia</i>), and American elm (<i>Ulmus americana</i>) were observed within the project area. These trees do not provide suitable habitat for the species as they prefer trees known to develop hollows. Tight bark trees like elms are unlikely to provide roost sites.	No impact	No suitable habitat is present within the project area, and no bats were observed during the site assessment.	N
Kaufman	Mammals	big brown bat	<i>Eptesicus fuscus</i>	Any wooded areas or woodlands except south Texas. Riparian areas in west Texas.	N	Wooded areas dominated by sugarberry, cedar elm, and American elm were observed within the project area. These trees do not provide suitable habitat for the species as they prefer trees known to develop hollows. Tight bark trees like elms are unlikely to provide roost sites.	No impact	No suitable habitat present within the project area and no bats were observed during the site assessment.	N

Prepared Date: 4/28/2020

SPECIES ANALYSIS SUMMARY (SGCN)

Project Name: FM 1641

CSJ(s): 1217-01-019 and 2588-01-020

County	Taxon	Common Name	Scientific Name	Habitat	Suitable Habitat Present?	Explanation for determination regarding suitable habitat	Impact Determination for SGCNs	Explanation for Impact Determination	Presence/ Absence survey conducted?
Kaufman	Mammals	eastern red bat	<i>Lasiurus borealis</i>	Found in a variety of habitats in Texas. Usually associated with wooded areas. Found in towns especially during migration.	N	Wooded areas dominated by sugarberry, cedar elm, and American elm were observed within the project area. These trees do not provide suitable habitat for the species as they prefer trees known to develop hollows. Tight bark trees like elms are unlikely to provide roost sites.	No impact	No suitable habitat is present within the project area, and no bats were observed during the site assessment.	N
Kaufman	Mammals	hoary bat	<i>Lasiurus cinereus</i>	Known from montane and riparian woodland in Trans-Pecos, forests and woods in east and central Texas.	N	Wooded areas dominated by sugarberry, cedar elm, and American elm were observed within the project area. These trees do not provide suitable habitat for the species as they prefer trees known to develop hollows. Tight bark trees like elms are unlikely to provide roost sites.	No impact	No suitable habitat is present within the project area, and no bats were observed during the site assessment.	N
Kaufman	Mammals	Mexican free-tailed bat	<i>Tadarida brasiliensis</i>	Roosts in buildings in east Texas. Largest maternity roosts are in limestone caves on the Edwards Plateau. Found in all habitats, forest to desert.	N	The proposed project is located in North Texas. Limestone caves or wooded riparian zones consisting of cypress trees, which are known to develop hollows, were not identified within the project area.	No impact	No suitable habitat is present within the project area, and no bats were observed during the site assessment.	N
Kaufman	Mammals	swamp rabbit	<i>Sylvilagus aquaticus</i>	Mainly lives close to lowland water, often in cypress swamps, marshland, floodplain, and river tributaries	N	There is no suitable habitat such as lowland water, cypress swamps, or marshland within the proposed project area.	No impact	No suitable habitat is present within the project area, and no rabbits were observed during the site assessment.	N

Prepared Date: 4/28/2020

SPECIES ANALYSIS SUMMARY (SGCN)

Project Name: FM 1641

CSJ(s): 1217-01-019 and 2588-01-020

County	Taxon	Common Name	Scientific Name	Habitat	Suitable Habitat Present?	Explanation for determination regarding suitable habitat	Impact Determination for SGCNs	Explanation for Impact Determination	Presence/ Absence survey conducted?
Kaufman	Mammals	thirteen-lined ground squirrel	<i>Ictidomys tridecemlineatus</i>	Prefers open areas with short grass and well-drained sandy or loamy soils for burrows. It avoids wooded areas.	N	There is no suitable habitat such as short grass and well-drained sandy soil within the proposed project area.	No impact	No suitable habitat is present within the project area, and no squirrels were observed during the site assessment.	N
Kaufman	Mammals	woodland vole	<i>Microtus pinetorum</i>	Include grassy marshes, swamp edges, old-field/pine woodland ecotones, tallgrass fields; generally sandy soils.	N	There is no suitable habitat such as grassy marshes, swamp edges, old-field/pine woodland ecotones, or tallgrass fields within the proposed project area.	No impact	No suitable habitat is present within the project area, and no voles were observed during the site assessment.	N
Kaufman	Mammals	long-tailed weasel	<i>Mustela frenata</i>	Includes brushlands, fence rows, upland woods and bottomland hardwoods, forest edges & rocky desert scrub. Usually live close to water.	N	Fencerows are present within the proposed project area. However, habitat is not suitable as the area is developing with residential, rural residential, and fragments of agricultural properties present. No perennial streams are present.	No impact	No suitable habitat present within the project area, and no minks were observed during the site assessment.	N
Kaufman	Mammals	mink	<i>Neovison vison</i>	Intimately associated with water; coastal swamps & marshes, wooded riparian zones, edges of lakes. Prefer floodplains.	N	Coastal swamps or marshes, wooded riparian zones associated with water, or lakes were not identified within the action area. There are no perennial streams in the project area.	No impact	No suitable habitat present within the project area, and no minks were observed during the site assessment.	N
Kaufman	Mammals	American badger	<i>Taxidea taxus</i>	Prefers grasslands and open areas with grasslands, which can include parklands, farms, and treeless areas with friable soil and a supply of rodent prey. They may also be found in forest glades and meadows, marshes, brushy areas, hot deserts, and mountain meadows.	N	Grasslands and open areas with grasslands with friable soil and a supply of rodent prey, forest glades and meadows, marshes, brushy areas, hot deserts, or mountain meadows were not identified within the project area.	No impact	No suitable habitat is present within the project area, and no badgers were observed during the site assessment.	N

Prepared Date: 4/28/2020

SPECIES ANALYSIS SUMMARY (SGCN)

Project Name: FM 1641

CSJ(s): 1217-01-019 and 2588-01-020

County	Taxon	Common Name	Scientific Name	Habitat	Suitable Habitat Present?	Explanation for determination regarding suitable habitat	Impact Determination for SGCNs	Explanation for Impact Determination	Presence/ Absence survey conducted?
Kaufman	Mammals	eastern spotted skunk	<i>Spilogale putorius</i>	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.	Y	Open fields, woodlands, fencerows, and croplands are present.	No impact	Suitable habitat is present. Species-specific BMPs would be implemented.	N
Kaufman	Mammals	mountain lion	<i>Puma concolor</i>	Rugged mountains & riparian zones.	N	There are no large riparian corridors in the proposed project area.	No impact	No suitable habitat is present in the project area, and no mountain lions were observed	N
Kaufman	Reptiles	eastern box turtle	<i>Terrapene carolina</i>	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).	N	The proposed project area includes an existing roadway with increased development in surrounding areas. No sandy soils are documented in the project area, which is largely dominated by clay.	No impact	No suitable habitat is present in the project area, and no box turtles were observed during the site assessment.	N
Kaufman	Reptiles	western box turtle	<i>Terrapene ornata</i>	Ornate or western box turtles 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.	N	The proposed project area includes an existing roadway with increased development in surrounding areas. No sandy soils are documented in the project area, which is largely dominated by clay.	No impact	No suitable habitat is present in the project area, and no box turtles were observed during the site assessment.	N

Prepared Date: 4/28/2020

SPECIES ANALYSIS SUMMARY (SGCN)

Project Name: FM 1641

CSJ(s): 1217-01-019 and 2588-01-020

County	Taxon	Common Name	Scientific Name	Habitat	Suitable Habitat Present?	Explanation for determination regarding suitable habitat	Impact Determination for SGCNs	Explanation for Impact Determination	Presence/ Absence survey conducted?
Kaufman	Reptiles	slender glass lizard	<i>Ophisaurus attenuatus</i>	<p>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).</p> <p>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).</p>	N	Open grassland, fields, woodland edges, and areas near a stream are present within the proposed project area. However, the species prefers sandy soils, and none are present in the project area.	No impact	No suitable habitat is present in the project area, and no lizards were observed during the site assessment.	N
Kaufman	Reptiles	western hognose snake	<i>Heterodon nasicus</i>	<p>Quite common in gently rolling prairie occasionally broken by creek valley or rocky hillside.</p>	N	There is no suitable habitat such as prairies, sandhills, wide valleys, and river floodplains with sandy or gravelly soils within the proposed project area.	No impact	No suitable habitat present in the project area and no snakes were observed during the site assessment.	N
Kaufman	Reptiles	massasauga	<i>Sistrurus tergeminus</i>	<p>Quite common in gently rolling prairie occasionally broken by creek valley or rocky hillside.</p>	N	There is no suitable habitat such as prairies, creek valleys, or rocky hillsides within the proposed project area.	No impact	No suitable habitat present in the project area, and no snakes were observed during the site assessment.	N
Kaufman	Plants	Topeka purple-coneflower	<i>Echinacea atrorubens</i>	<p>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</p>	N	There is no suitable habitat such as tallgrass prairie within the proposed project area.	No impact	No suitable habitat is present in the project area. The species was not observed during the site assessment; however, it was conducted in the winter.	N
Kaufman	Plants	Shinner's sedge	<i>Carex shinnerii</i>	<p>Occurs in ditches and swales in prairie landscapes (Carr 2015).</p>	Y	There is suitable habitat such as ditches and swales with clayey soils in the proposed project area.	May impact	Suitable habitat is present in the project area. The species was not observed during site assessment; however, it was conducted in the winter.	N

SPECIES ANALYSIS SUMMARY (ADDENDUM)

Project Name: FM 1641

CSJ(s): 1217-01-019 and 2588-01-020

County	Taxon	Common Name	Scientific Name	Habitat	Suitable Habitat Present?	Explanation for determination regarding suitable habitat	Federal Status	Effect/Take Determination for Federally Listed Species	State Status	Impact Determination for State-Listed Species	Explanation for Effect/Take and/or Impact Determination	Presence/Absence survey conducted?
Kaufman	Mollusks	Trinity pigtoe	<i>Fusconaia chunii</i>	Found in a variety of habitats but most common in rifles. Inhabitats various substrates though most often sand, gravel, and cobble (species was recently split from Texas Pigtoe and occurs in similar habitats; Howells 2010a; Randklev et al. 2013b; Randklev et al. 2014a; Troia et al. 2015). [Mussels of Texas 2019]	N	No suitable perennial streams are present in the project area.	—	No take	T	No impact	There is no suitable habitat in the project area.	N



United States Department of the Interior



FISH AND WILDLIFE SERVICE
Arlington Ecological Services Field Office

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<http://www.fws.gov/southwest/es/arlingtontexas/>

<http://www.fws.gov/southwest/es/EndangeredSpecies/lists/>

In Reply Refer To:

January 10, 2020

Consultation Code: 02ETAR00-2020-SLI-0683

Event Code: 02ETAR00-2020-E-01418

Project Name: FM 1641- 2660

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-0683

Event Code: 02ETAR00-2020-E-01418

Project Name: FM 1641- 2660

Project Type: TRANSPORTATION

Project Description: January 10, 2020

Project Location:

Approximate location of the project can be viewed in Google Maps: <https://www.google.com/maps/place/32.71270050311287N96.41865547218435W>



Counties: Kaufman, 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 Fisheries¹, 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
<p>Least Tern <i>Sterna antillarum</i></p> <p>Population: interior pop.</p> <p>No critical habitat has been designated for this species.</p> <p>Species profile: https://ecos.fws.gov/ecp/species/8505</p>	Endangered
<p>Piping Plover <i>Charadrius melodus</i></p> <p>Population: [Atlantic Coast and Northern Great Plains populations] - Wherever found, except those areas where listed as endangered.</p> <p>There is final critical habitat for this species. Your location is outside the critical habitat.</p> <p>This species only needs to be considered under the following conditions:</p> <ul style="list-style-type: none"> ▪ Wind Energy Projects <p>Species profile: https://ecos.fws.gov/ecp/species/6039</p>	Threatened
<p>Red Knot <i>Calidris canutus rufa</i></p> <p>No critical habitat has been designated for this species.</p> <p>This species only needs to be considered under the following conditions:</p> <ul style="list-style-type: none"> ▪ Wind Energy Projects <p>Species profile: https://ecos.fws.gov/ecp/species/1864</p>	Threatened
<p>Whooping Crane <i>Grus americana</i></p> <p>Population: Wherever found, except where listed as an experimental population</p> <p>There is final critical habitat for this species. Your location is outside the critical habitat.</p> <p>Species profile: https://ecos.fws.gov/ecp/species/758</p>	Endangered

Critical habitats

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

Last Update: 4/13/2020

KAUFMAN COUNTY

AMPHIBIANS

southern crawfish frog *Lithobates areolatus areolatus*

Terrestrial and aquatic: The terrestrial habitat is primarily grassland and can vary from pasture to intact prairie; it can also include small prairies in the middle of large forested areas. Aquatic habitat is any body of water but preferred habitat is ephemeral wetlands.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G4T4	State Rank: S3

Strecker's chorus frog *Pseudacris streckeri*

Terrestrial and aquatic: 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*

Terrestrial and aquatic: A wide variety of terrestrial habitats are used by this species, including forests, grasslands, and barrier island sand dunes. Aquatic habitats are equally varied.

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:	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: T	SGCN: Y
Endemic: N	Global Rank: G3G4	State Rank: S2

Franklin's gull *Leucophaeus pipixcan*

This species is only a spring and fall migrant throughout Texas. It does not breed in or near Texas. Winter records are unusual consisting of one or a few individuals at a given site (especially along the Gulf coastline). During migration, these gulls fly during daylight hours but often come down to wetlands, lake shore, or islands to roost for the night.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G5	State Rank: S2N

DISCLAIMER

The information on this web application is provided "as is" without warranty as to the currentness, completeness, or accuracy of any specific data. The data provided are for planning, assessment, and informational purposes. Refer to the Frequently Asked Questions (FAQs) on the application website for further information.

KAUFMAN COUNTY

BIRDS

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: G4T3Q

State Rank: S1B

pipin 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

Rufa 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: T

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

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KAUFMAN COUNTY

BIRDS

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

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

wood stork

Mycteria americana

Prefers to nest in large tracts of baldcypress (*Taxodium distichum*) or red mangrove (*Rhizophora mangle*); forages in prairie ponds, flooded pastures or fields, ditches, and other shallow standing water, including salt-water; usually roosts communally in tall snags, sometimes in association with other wading birds (i.e. active heronries); breeds in Mexico and birds move into Gulf States in search of mud flats and other wetlands, even those associated with forested areas; formerly nested in Texas, but no breeding records since 1960

Federal Status:

State Status: T

SGCN: Y

Endemic: N

Global Rank: G4

State Rank: SHB,S2N

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

MAMMALS

American badger

Taxidea taxus

Generalist. Prefers areas with soft soils that sustain ground squirrels for food. When inactive, occupies underground burrow. Young are born in underground burrows.

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

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KAUFMAN COUNTY

MAMMALS

black bear

Ursus americanus

Generalist. Historically found throughout Texas. In Chisos, prefers higher elevations where pinyon-oaks predominate; also occasionally sighted in desert scrub of Trans-Pecos (Black Gap Wildlife Management Area) and Edwards Plateau in juniper-oak habitat. For ssp. *luteolus*, bottomland hardwoods, floodplain forests, upland hardwoods with mixed pine; marsh. Bottomland hardwoods and large tracts of inaccessible forested areas.

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

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

Generalist; 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

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KAUFMAN COUNTY

MAMMALS

mountain lion *Puma concolor*

Generalist; found in a wide range of habitats statewide. Found most frequently in rugged mountains & riparian zones.

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

plains spotted skunk *Spilogale putorius interrupta*

Generalist; 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

southeastern myotis bat *Myotis austroriparius*

Caves are rare in Texas portion of range; buildings, hollow trees are probably important. Historically, lowland pine and hardwood forests with large hollow trees; associated with ecological communities near water. Roosts in cavity trees of bottomland hardwoods, concrete culverts, and abandoned man-made structures.

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

southern short-tailed shrew *Blarina carolinensis*

Found in East Texas pine forests and agricultural land. May favor areas with abundant leaf litter and fallen logs (Baumgardner et al. 1992). Nest sites are probably under logs, stumps and other debris.

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

swamp rabbit *Sylvilagus aquaticus*

Primarily found in lowland areas near water including: cypress bogs and marshes, floodplains, creeks and rivers.

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

thirteen-lined ground squirrel *Ictidomys tridecemlineatus*

Prefers short grass prairies with deep soils for burrowing. Frequently found in grazed ranchland, mowed pastures, and golf courses.

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

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KAUFMAN COUNTY

MAMMALS

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

MOLLUSKS

Louisiana pigtoe *Pleurobema riddellii*

Occurs in small streams to large rivers in slow to moderate currents in substrates of clay, mud, sand, and gravel. Not known from impoundments (Howells 2010f; Randklev et al. 2013b; Troia et al. 2015). [Mussels of Texas 2019]

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

sandbank pocketbook *Lampsilis satura*

Occurs in small streams to large rivers in slow to moderate current in sandy mud to sand and gravel substrate. Can occur in a variety of habitats but most common in littoral habitats such as banks or backwaters or in protected areas along point bars (Randklev et al. 2013b; Randklev et al. 2014a; Troia et al. 2015). [Mussels of Texas 2019]

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

Texas heelsplitter *Potamilus amphichaenus*

Occurs in small streams to large rivers in standing to slow-flowing water; most common in banks, backwaters and quiet pools; adapts to some reservoirs. Often found in soft substrates such as mud, silt or sand (Howells et al. 1996; Randklev et al. 2017a). [Mussels of Texas 2019]

Federal Status:	State Status: T	SGCN: Y
Endemic: N	Global Rank: G1G3	State Rank: S1

Trinity pigtoe *Fusconaia chunii*

Found in a variety of habitats but most common in riffles. Inhabits various substrates though most often sand, gravel, and cobble (species was recently split from Texas Pigtoe and occurs in similar habitats; Howells 2010a; Randklev et al. 2013b; Randklev et al. 2014a; Troia et al 2015). [Mussels of Texas 2019]

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

REPTILES

alligator snapping turtle *Macrochelys temminckii*

Aquatic: Perennial water bodies; rivers, canals, lakes, and oxbows; also swamps, bayous, and ponds near running water; sometimes enters brackish coastal waters. Females emerge to lay eggs close to the waters edge.

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

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KAUFMAN COUNTY

REPTILES

eastern box turtle *Terrapene carolina*

Terrestrial: 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.

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

massasauga *Sistrurus tergeminus*

Terrestrial: Shortgrass or mixed grass prairie, with gravel or sandy soils. Often found associated with draws, floodplains, and more mesic habitats within the arid landscape. Frequently occurs in shrub encroached grasslands.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G3G4	State Rank: S3S4

slender glass lizard *Ophisaurus attenuatus*

Terrestrial: 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.

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

Texas horned lizard *Phrynosoma cornutum*

Terrestrial: Open habitats with sparse vegetation, including grass, prairie, 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. Occurs to 6000 feet, but largely limited below the pinyon-juniper zone on mountains in the Big Bend area.

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

western box turtle *Terrapene ornata*

Terrestrial: Ornate or western box turtles 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.

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

western hognose snake *Heterodon nasicus*

Terrestrial: Shortgrass or mixed grass prairie, with gravel or sandy soils. Often found associated with draws, floodplains, and more mesic habitats within the arid landscape. Frequently occurs in shrub encroached grasslands.

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

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KAUFMAN COUNTY

PLANTS

Shinner's sedge

Carex shimmersii

Occurs in ditches and swales in prairie landscapes (Carr 2015).

Federal Status:

State Status:

SGCN: Y

Endemic: N

Global Rank: G3

State Rank: S2

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

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FM 664					
Present per the Texas Ecological Systems Classification Project (TESCP) conversion of Common Name=>NatureServe Ecological System Name=>MOU TYPE					
CommonName	NatureServe_Number	NatureServe_EcoSys	MOU_Type	Area (ac)	Area (ac)
Barren	TPW101.008	Barren	Agriculture	1.4	11.1
Row Crops	TPW101.005	Agriculture	Agriculture	9.6	
Native Invasive: Deciduous Woodland	TPW101.001	Native Invasive Shrub and Woodland	Distubed Prairie	2.0	2.0
Native Invasive: Mesquite Shrubland	TPW101.001	Native Invasive Shrub and Woodland	Distubed Prairie	0.0	
Pineywoods: Small Stream and Riparian Herbaceous Wetland	CES203.487	West Gulf Coastal Plain Small Stream and River Forest	Riparian	0.6	2.6
Central Texas: Riparian Deciduous Shrubland	CES205.709	Southeastern Great Plains Riparian Forest	Riparian	0.1	
Central Texas: Riparian Hardwood Forest	CES205.709	Southeastern Great Plains Riparian Forest	Riparian	0.8	
Central Texas: Riparian Herbaceous Vegetation	CES205.709	Southeastern Great Plains Riparian Forest	Riparian	1.2	
Blackland Prairie: Disturbance or Tame Grassland	CES205.684	Texas Blackland Tallgrass Prairie	Tallgrass Prairie, Grassland	29.6	29.6
Urban High Intensity	TPW101.003	Urban	Urban	7.5	45.2
Urban Low Intensity	TPW101.003	Urban	Urban	37.7	
Total				90.4	90.4

Actual MOU Type vegetation present per site visits and aerial photography			
MOU Type	Area (ac)	TBPR Threshold (ac)	Equal to or Greater than PA Threshold?
Agriculture	3.2	10	No
Disturbed Prairie	7.5	3	Yes
Open Water	0.3	No Threshold	N/A
Riparian	2.3	0.1	Yes
Urban	77.2	No Threshold	N/A
Total	90.4		

Updated: 1-30-20

EMST VEGETATION MAP

FARM-TO-MARKET
ROAD (FM) 1641
and FM 548

From FM 548 to FM 148
and from FM 1641 to
United States (US) 80

CSJs: 1217-01-019 & 2588-01-020

Page 1 of 12



Legend

- Existing Right-of-way
- Proposed Right-of-Way
- Agriculture
- Disturbed Prairie
- Riparian
- Tallgrass Prairie, Grassland
- Urban

Base Map Source: TNRIS (2018)



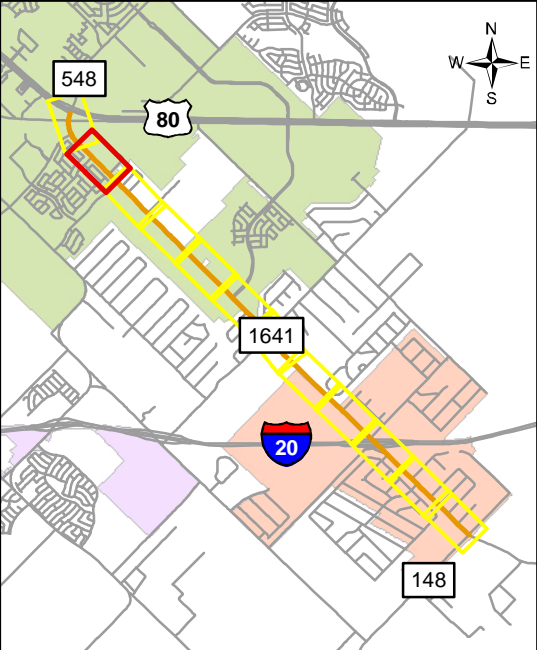
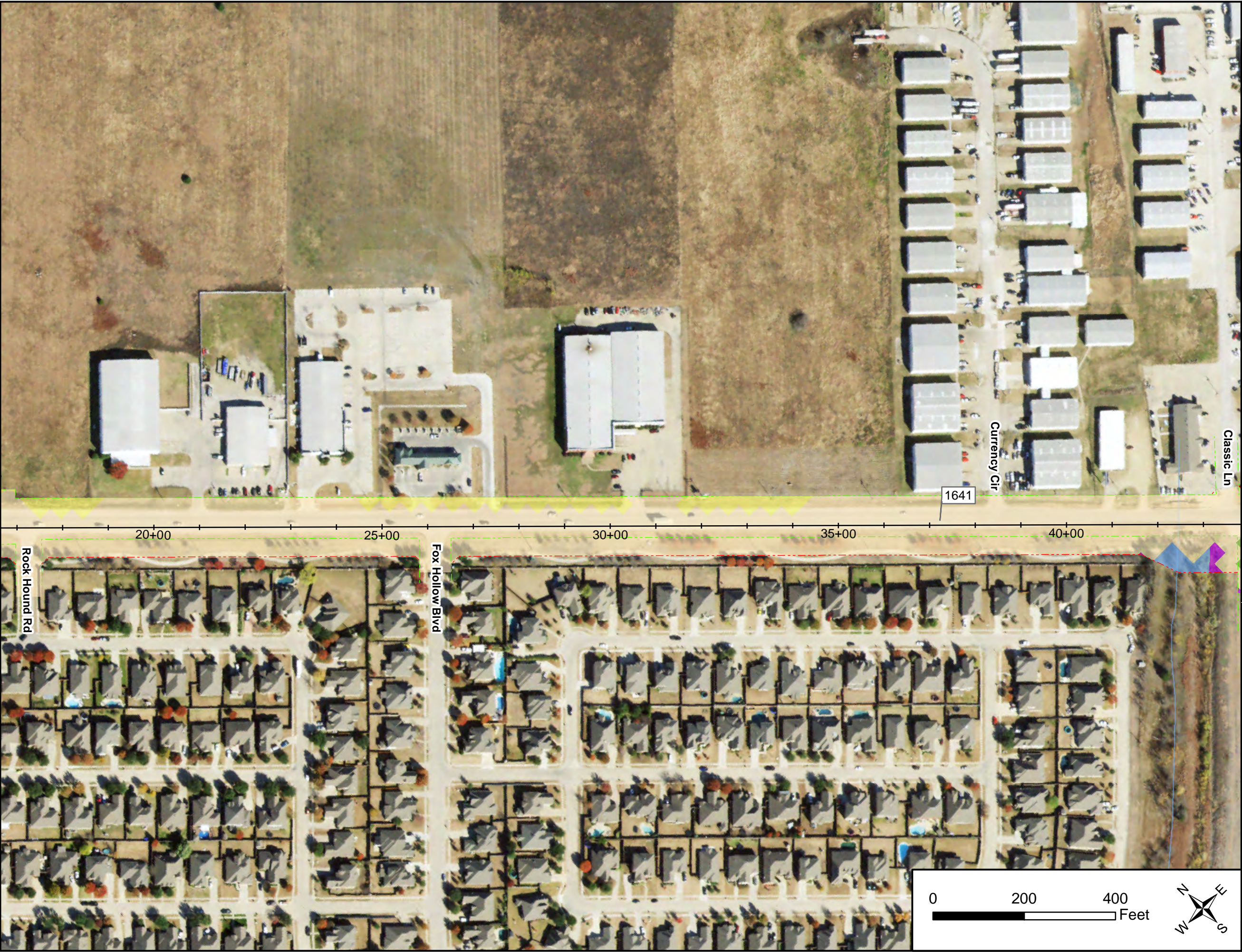
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Page 2 of 12



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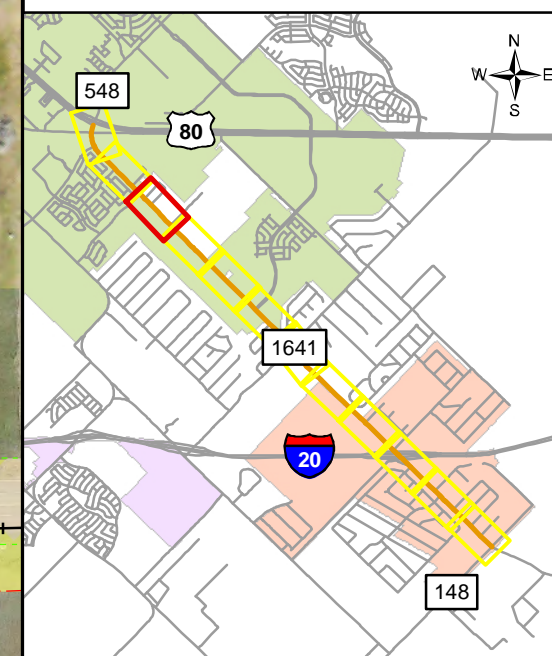
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Page 3 of 12



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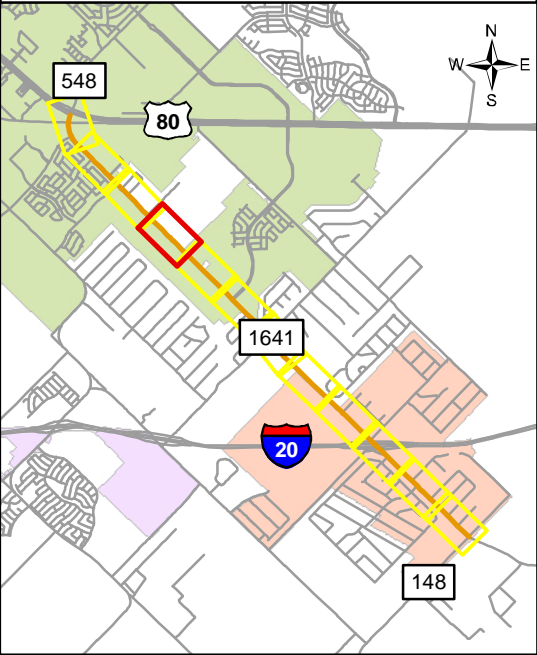
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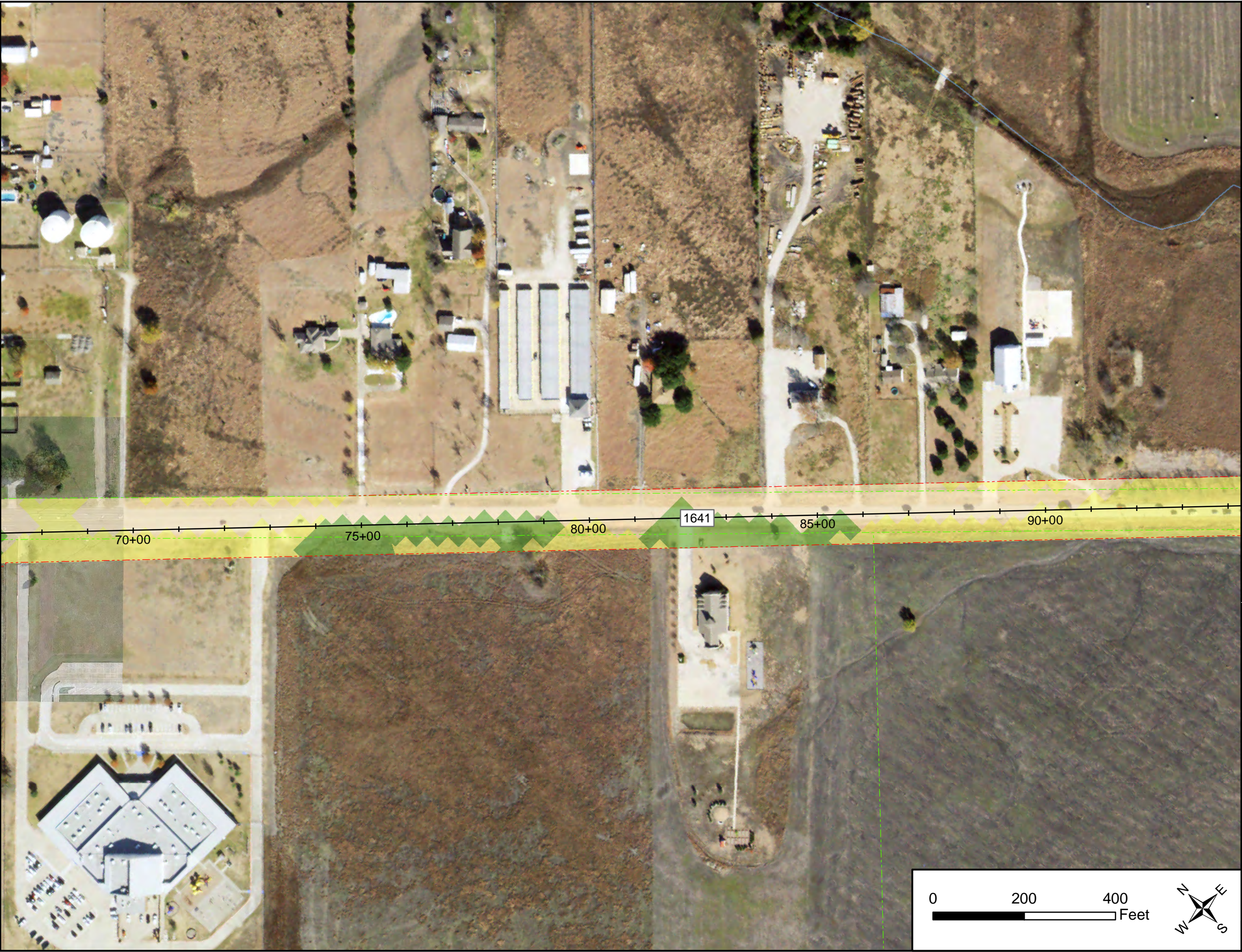
Page 4 of 12



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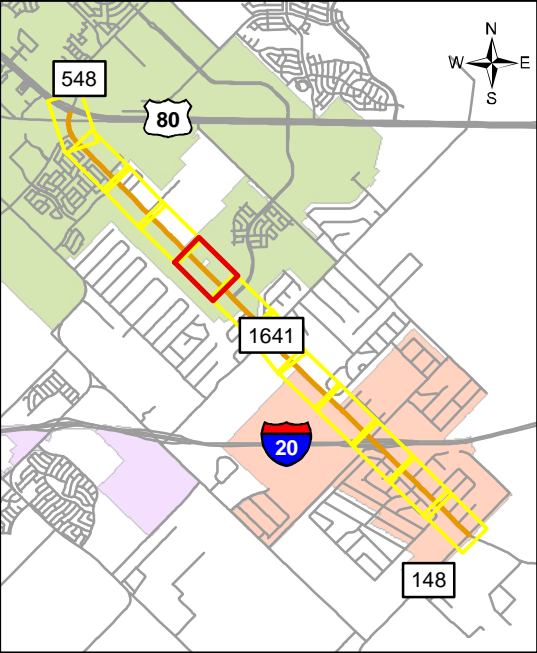
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Page 5 of 12



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0 200 400 Feet



Base Map Source: TNRIS (2018)

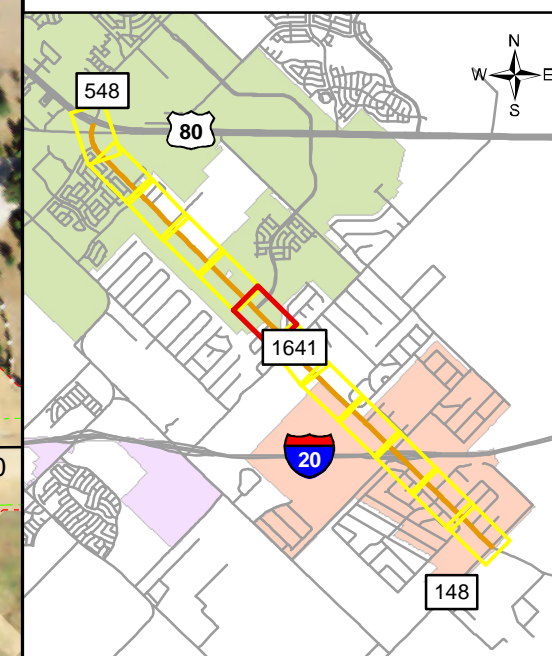
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United States (US) 80

CSJs: 1217-01-019 & 2588-01-020

Page 6 of 12



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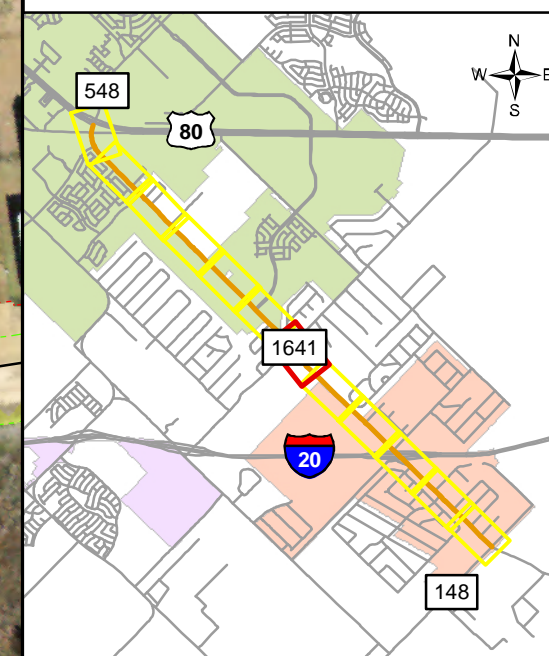
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Page 7 of 12



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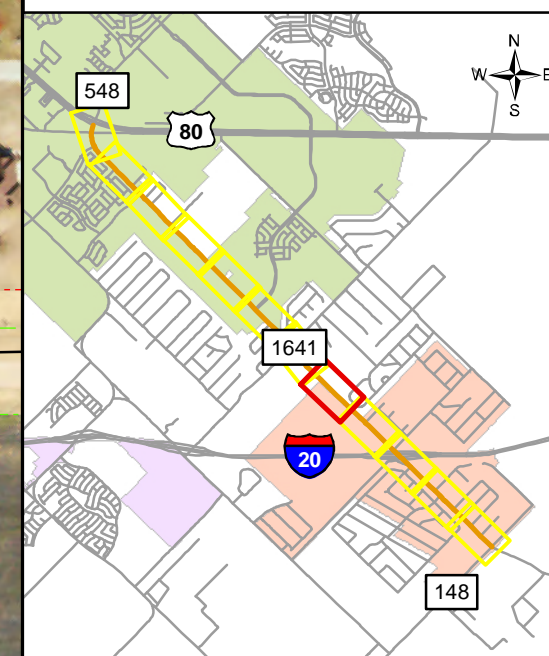
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Page 8 of 12



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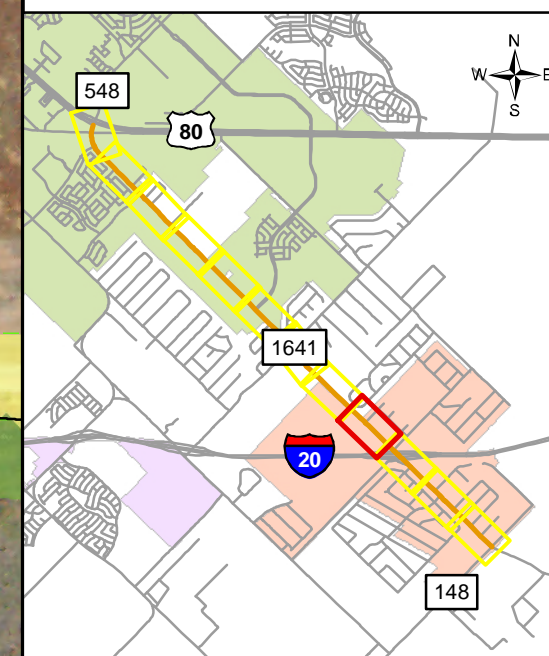
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Page 9 of 12



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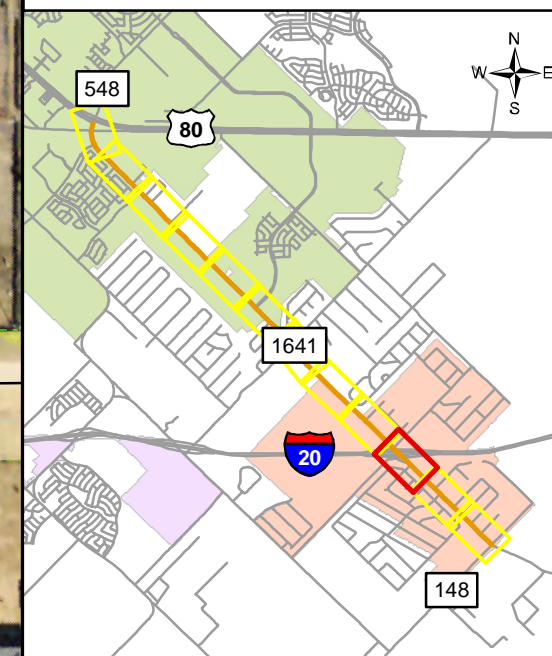
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Page 10 of 12



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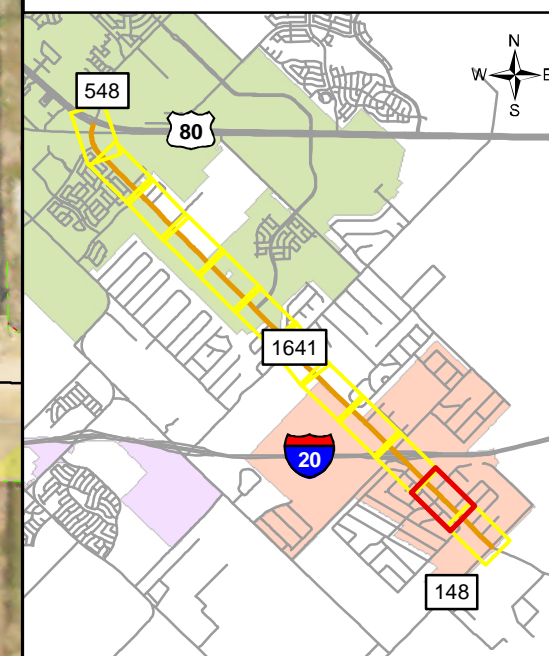
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Page 11 of 12



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Base Map Source: TNRIS (2018)



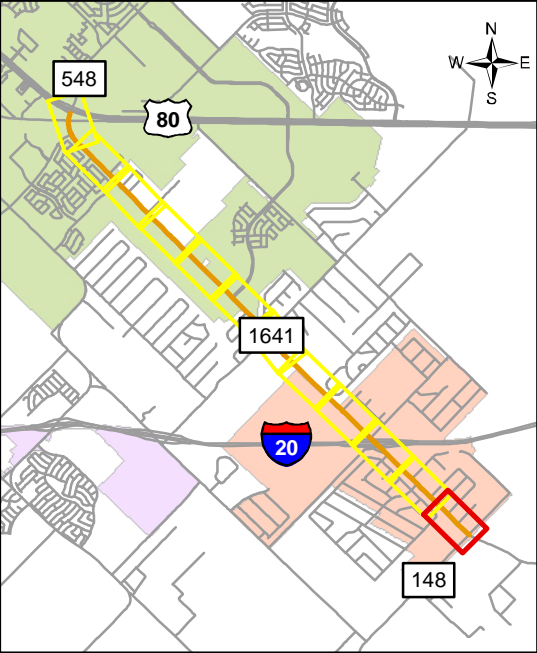
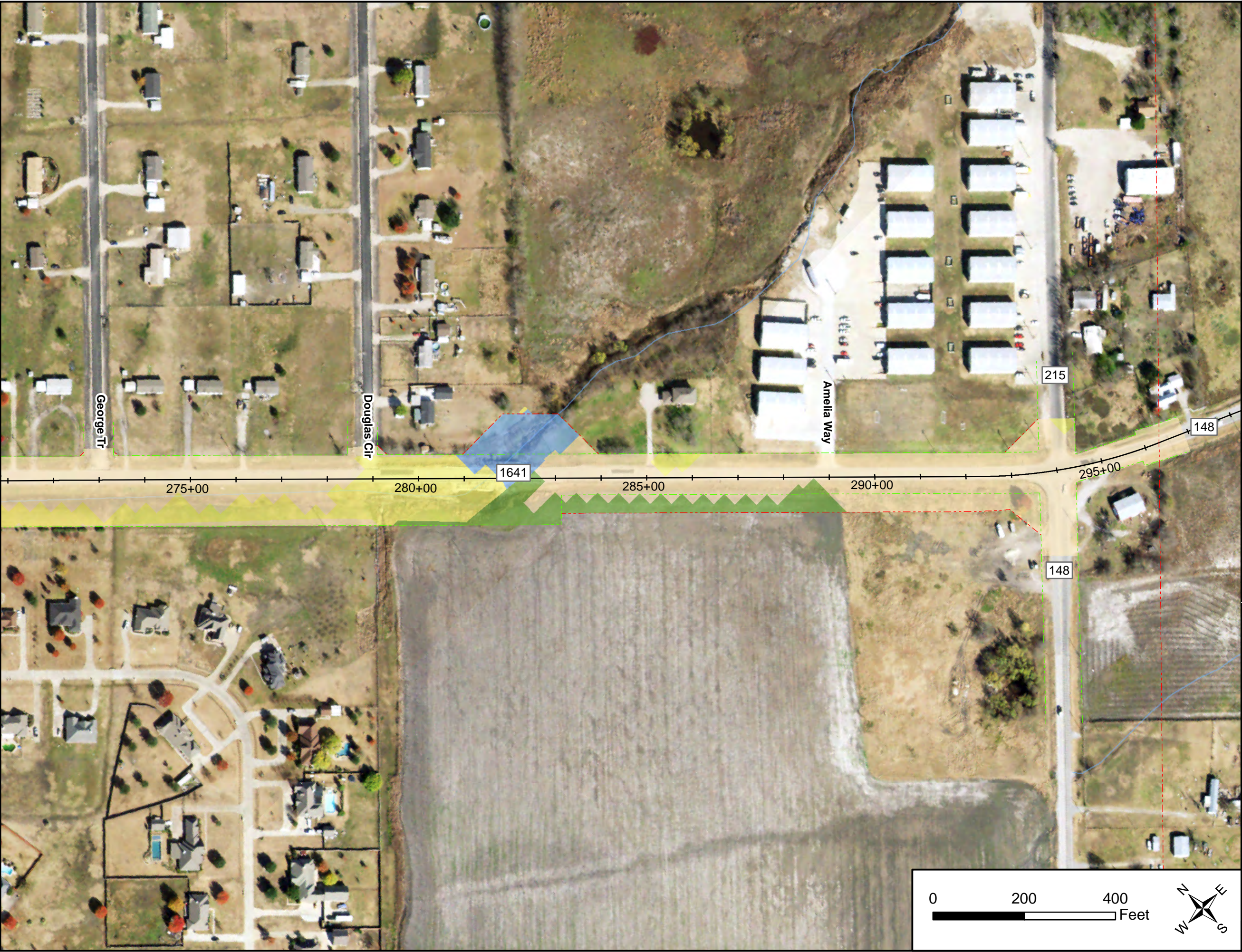
EMST VEGETATION MAP

FARM-TO-MARKET
ROAD (FM) 1641
and FM 548

From FM 548 to FM 148
and from FM 1641 to
United States (US) 80

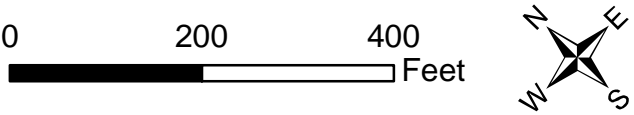
CSJs: 1217-01-019 & 2588-01-020

Page 12 of 12



Legend

- Existing Right-of-way
- Proposed Right-of-Way
- Agriculture
- Disturbed Prairie
- Riparian
- Tallgrass Prairie, Grassland
- Urban



Base Map Source: TNRIS (2018)

ACTUAL VEGETATION MAP

FARM-TO-MARKET
ROAD (FM) 1641
and FM 548

From FM 548 to FM 148
and from FM 1641 to
United States (US) 80

CSJs: 1217-01-019 & 2588-01-020

Page 1 of 12



Legend

- Existing Right-of-way
- Proposed Right-of-Way
- Agriculture
- Disturbed Prairie
- Open Water
- Riparian
- Urban

Base Map Source: TNRIS (2018)



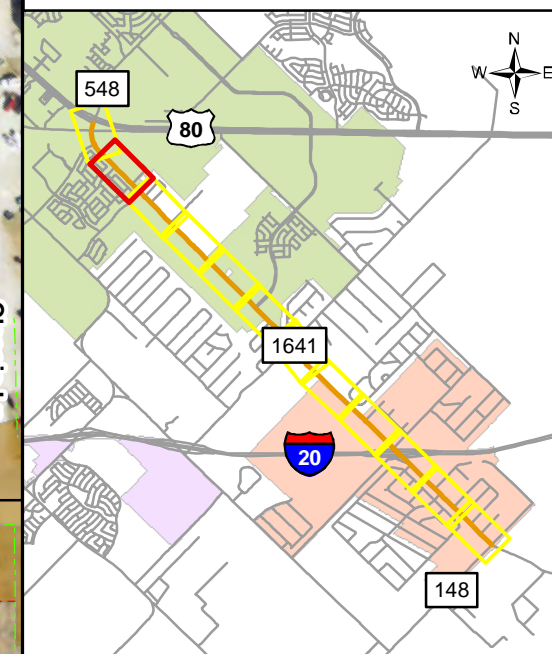
ACTUAL VEGETATION MAP

FARM-TO-MARKET
ROAD (FM) 1641
and FM 548

From FM 548 to FM 148
and from FM 1641 to
United States (US) 80

CSJs: 1217-01-019 & 2588-01-020

Page 2 of 12



Legend

- Existing Right-of-way
- Proposed Right-of-Way
- Agriculture
- Disturbed Prairie
- Open Water
- Riparian
- Urban

Base Map Source: TNRIS (2018)

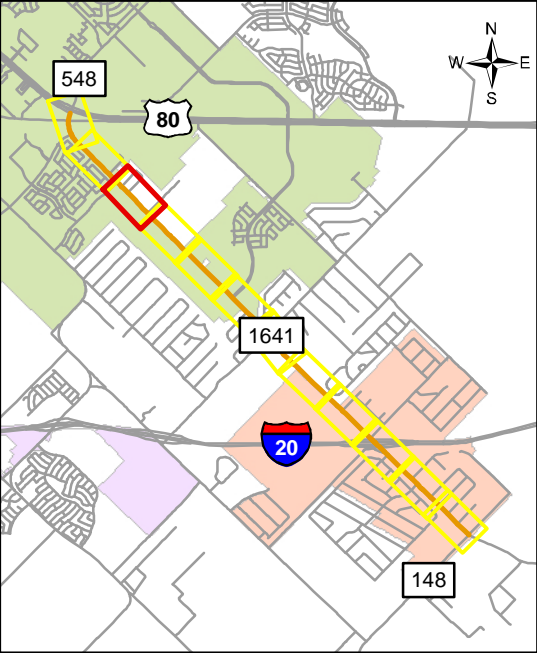


ACTUAL VEGETATION MAP

FARM-TO-MARKET
ROAD (FM) 1641
and FM 548

From FM 548 to FM 148
and from FM 1641 to
United States (US) 80

CSJs: 1217-01-019 & 2588-01-020



Legend

- Existing Right-of-way
- Proposed Right-of-Way
- Agriculture
- Disturbed Prairie
- Open Water
- Riparian
- Urban

Base Map Source: TNRIS (2018)



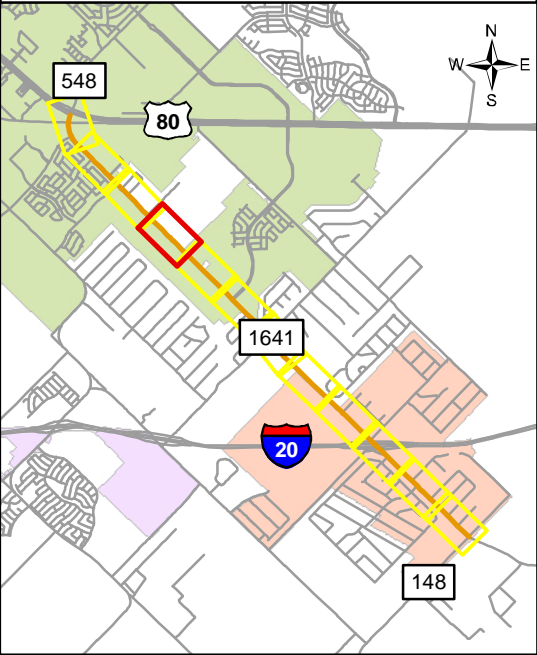
ACTUAL VEGETATION MAP

FARM-TO-MARKET
ROAD (FM) 1641
and FM 548

From FM 548 to FM 148
and from FM 1641 to
United States (US) 80

CSJs: 1217-01-019 & 2588-01-020

Page 4 of 12



Legend

- Existing Right-of-way
- Proposed Right-of-Way
- Agriculture
- Disturbed Prairie
- Open Water
- Riparian
- Urban

0 200 400 Feet



Base Map Source: TNRIS (2018)

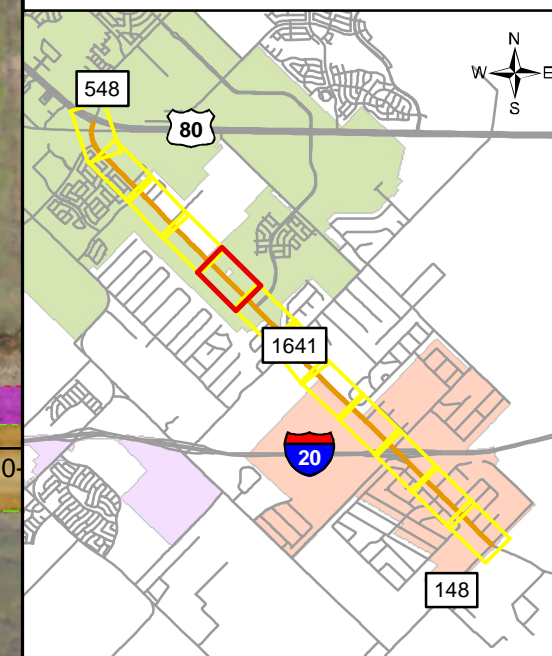
ACTUAL VEGETATION MAP

FARM-TO-MARKET
ROAD (FM) 1641
and FM 548

From FM 548 to FM 148
and from FM 1641 to
United States (US) 80

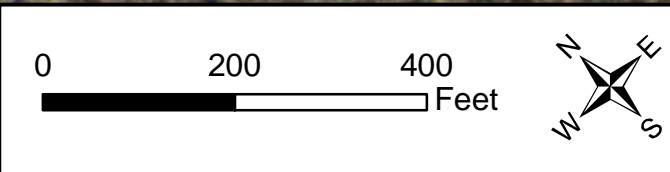
CSJs: 1217-01-019 & 2588-01-020

Page 5 of 12



Legend

- Existing Right-of-way
- Proposed Right-of-Way
- Agriculture
- Disturbed Prairie
- Open Water
- Riparian
- Urban



Base Map Source: TNRIS (2018)

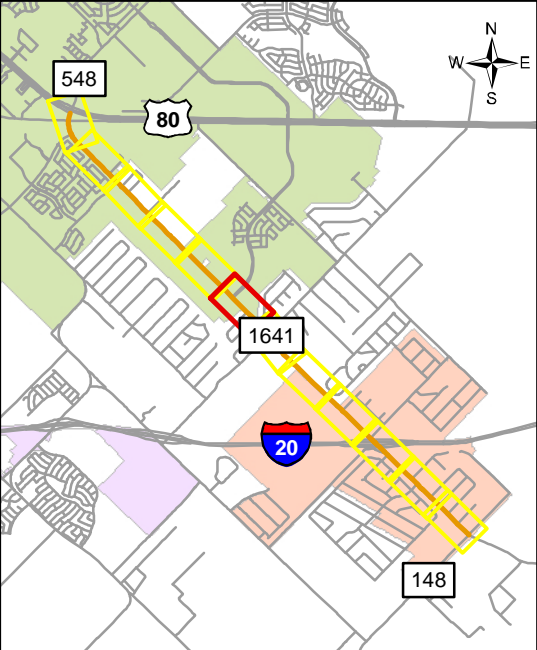
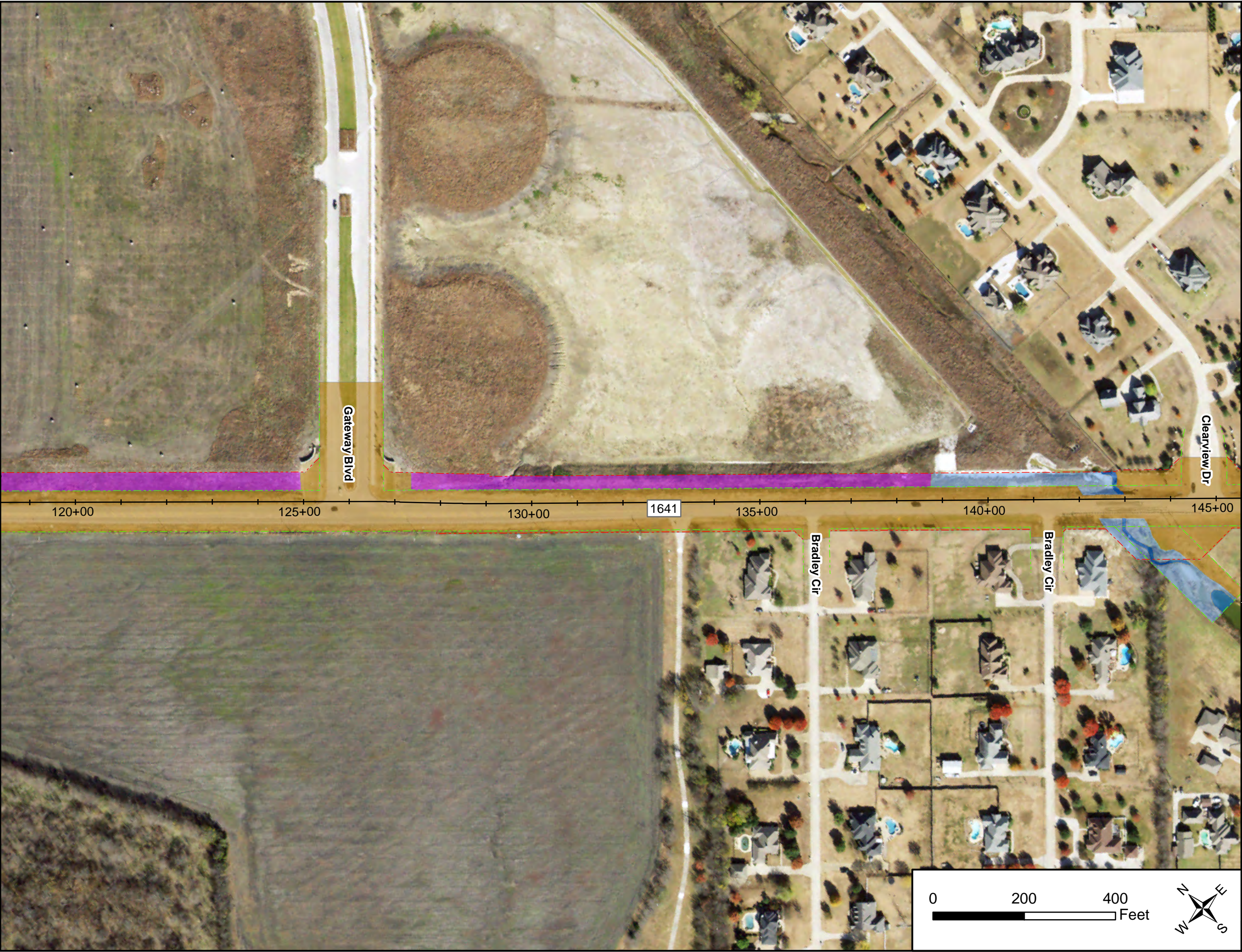
ACTUAL VEGETATION MAP

FARM-TO-MARKET
ROAD (FM) 1641
and FM 548

From FM 548 to FM 148
and from FM 1641 to
United States (US) 80

CSJs: 1217-01-019 & 2588-01-020

Page 6 of 12



Legend

- Existing Right-of-way
- Proposed Right-of-Way
- Agriculture
- Disturbed Prairie
- Open Water
- Riparian
- Urban

Base Map Source: TNRIS (2018)

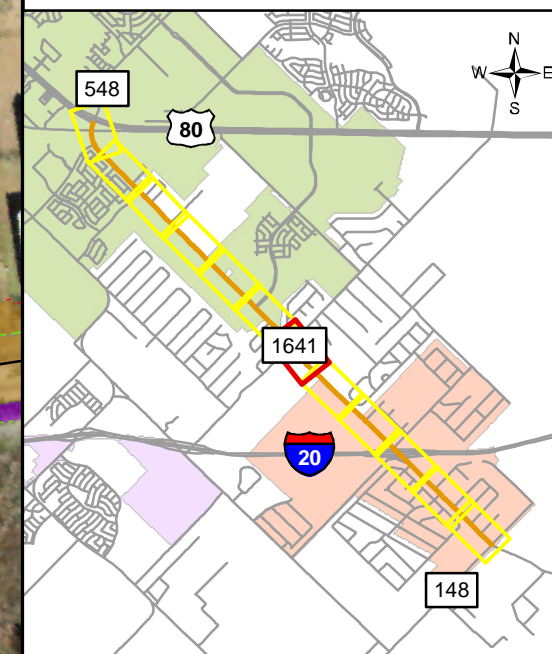
ACTUAL VEGETATION MAP

FARM-TO-MARKET
ROAD (FM) 1641
and FM 548

From FM 548 to FM 148
and from FM 1641 to
United States (US) 80

CSJs: 1217-01-019 & 2588-01-020

Page 7 of 12



Legend

- Existing Right-of-way
- Proposed Right-of-Way
- Agriculture
- Disturbed Prairie
- Open Water
- Riparian
- Urban

0 200 400 Feet



Base Map Source: TNRIS (2018)

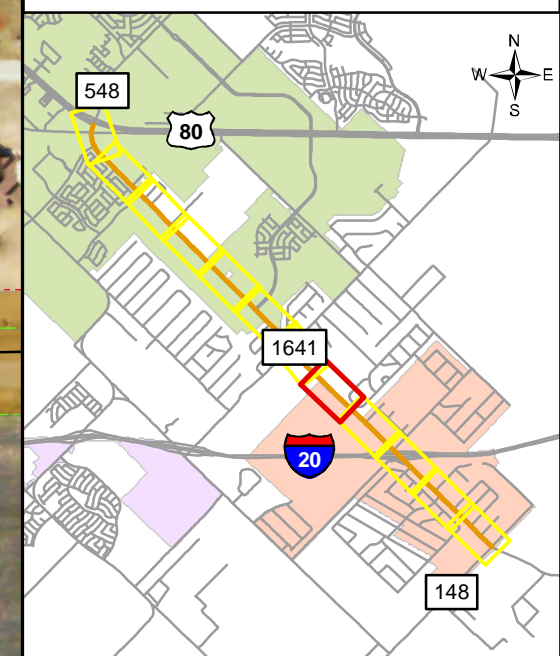
ACTUAL VEGETATION MAP

FARM-TO-MARKET
ROAD (FM) 1641
and FM 548

From FM 548 to FM 148
and from FM 1641 to
United States (US) 80

CSJs: 1217-01-019 & 2588-01-020

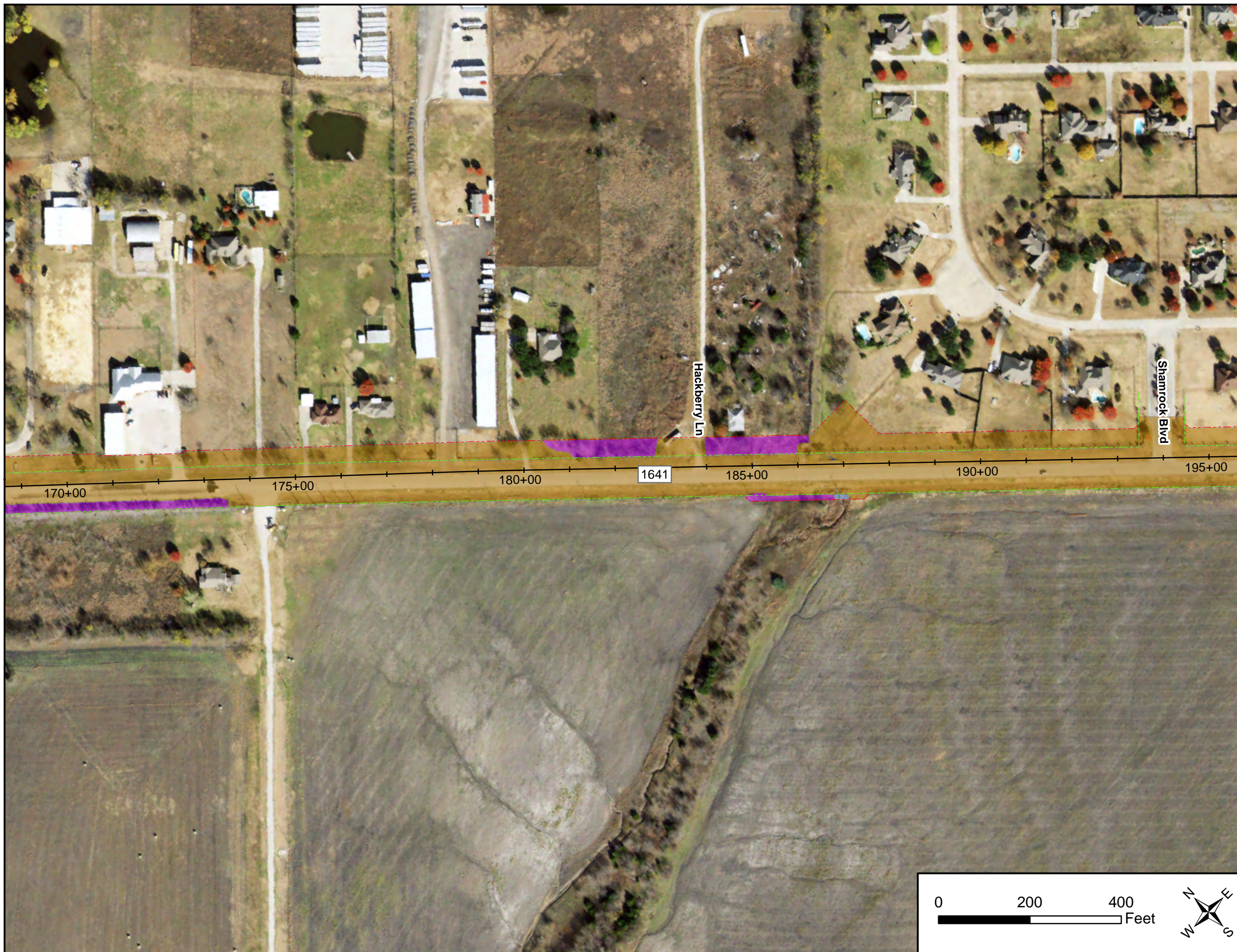
Page 8 of 12



Legend

- Existing Right-of-way
- Proposed Right-of-Way
- Agriculture
- Disturbed Prairie
- Open Water
- Riparian
- Urban

Base Map Source: TNRIS (2018)

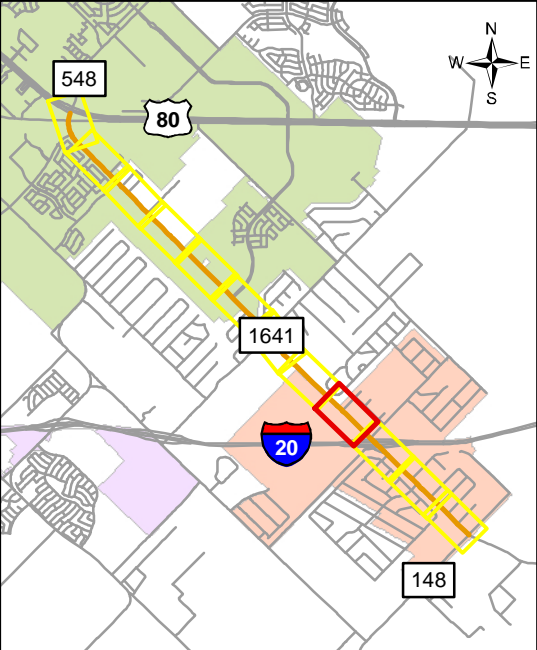
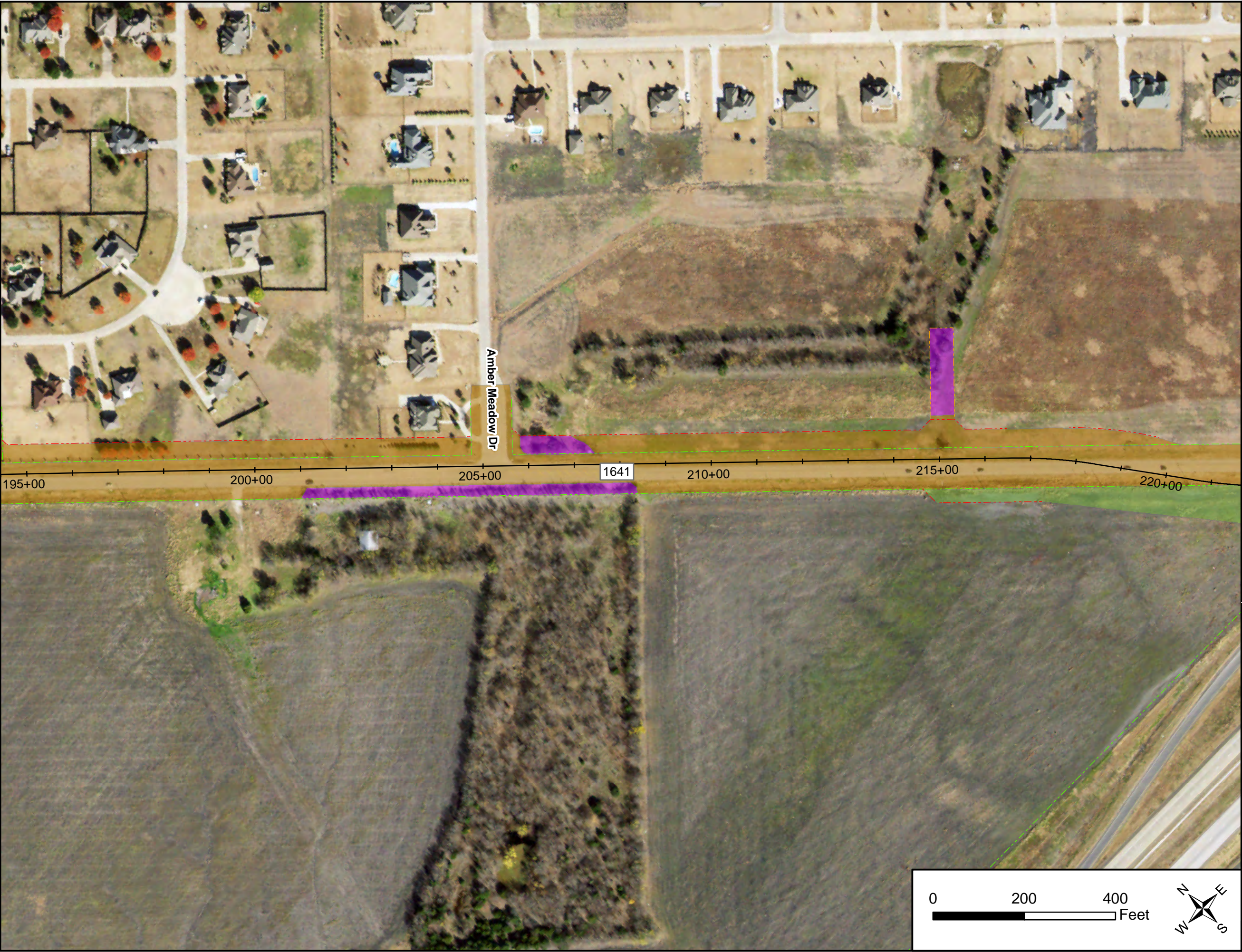


ACTUAL VEGETATION MAP

FARM-TO-MARKET
ROAD (FM) 1641
and FM 548

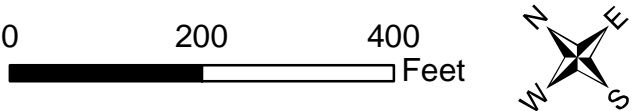
From FM 548 to FM 148
and from FM 1641 to
United States (US) 80

CSJs: 1217-01-019 & 2588-01-020



Legend

- Existing Right-of-way
- Proposed Right-of-Way
- Agriculture
- Disturbed Prairie
- Open Water
- Riparian
- Urban



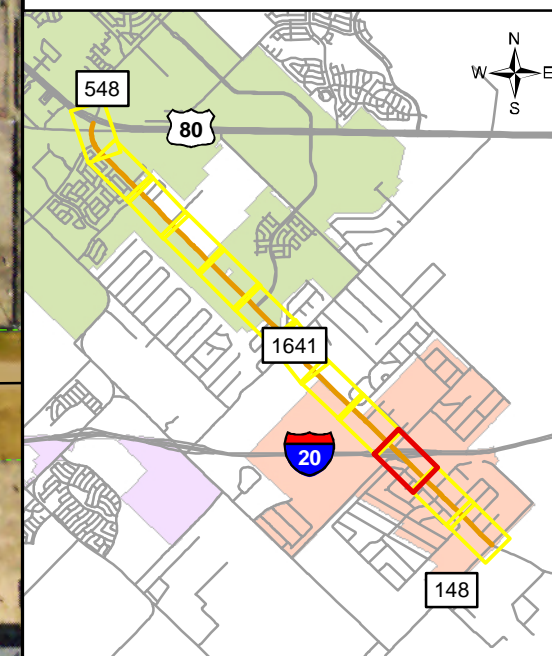
ACTUAL VEGETATION MAP

FARM-TO-MARKET
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From FM 548 to FM 148
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CSJs: 1217-01-019 & 2588-01-020

Page 10 of 12



Legend

- Existing Right-of-way
- Proposed Right-of-Way
- Agriculture
- Disturbed Prairie
- Open Water
- Riparian
- Urban

0 200 400 Feet



Base Map Source: TNRIS (2018)

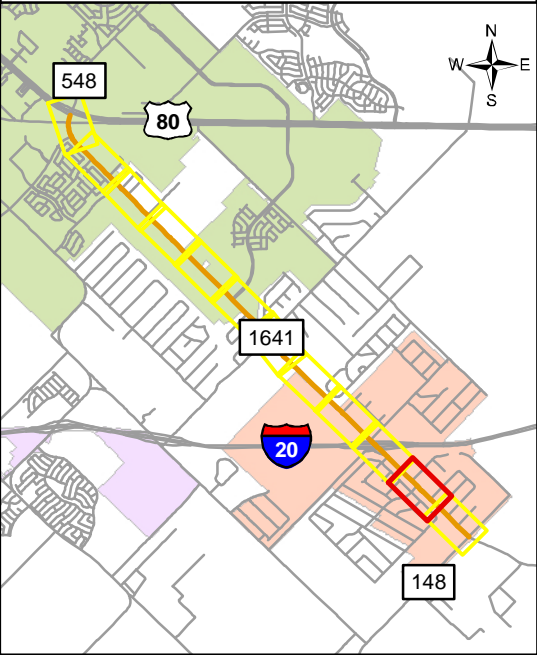
ACTUAL VEGETATION MAP

FARM-TO-MARKET
ROAD (FM) 1641
and FM 548

From FM 548 to FM 148
and from FM 1641 to
United States (US) 80

CSJs: 1217-01-019 & 2588-01-020

Page 11 of 12



Legend

- Existing Right-of-way
- Proposed Right-of-Way
- Agriculture
- Disturbed Prairie
- Open Water
- Riparian
- Urban

Base Map Source: TNRIS (2018)



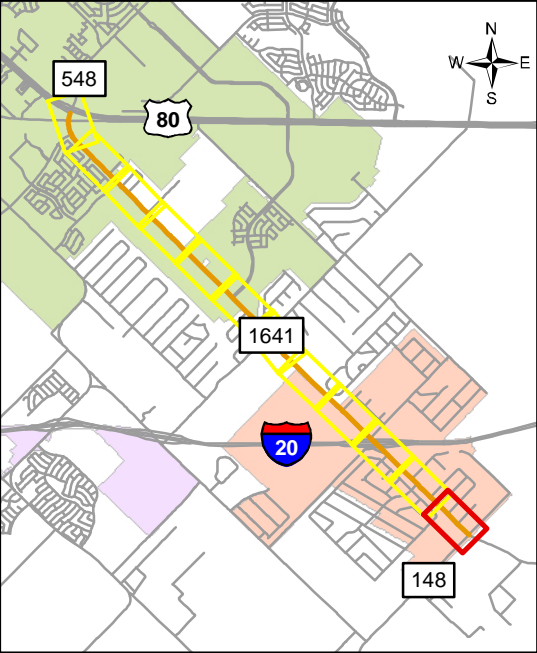
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ROAD (FM) 1641
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From FM 548 to FM 148
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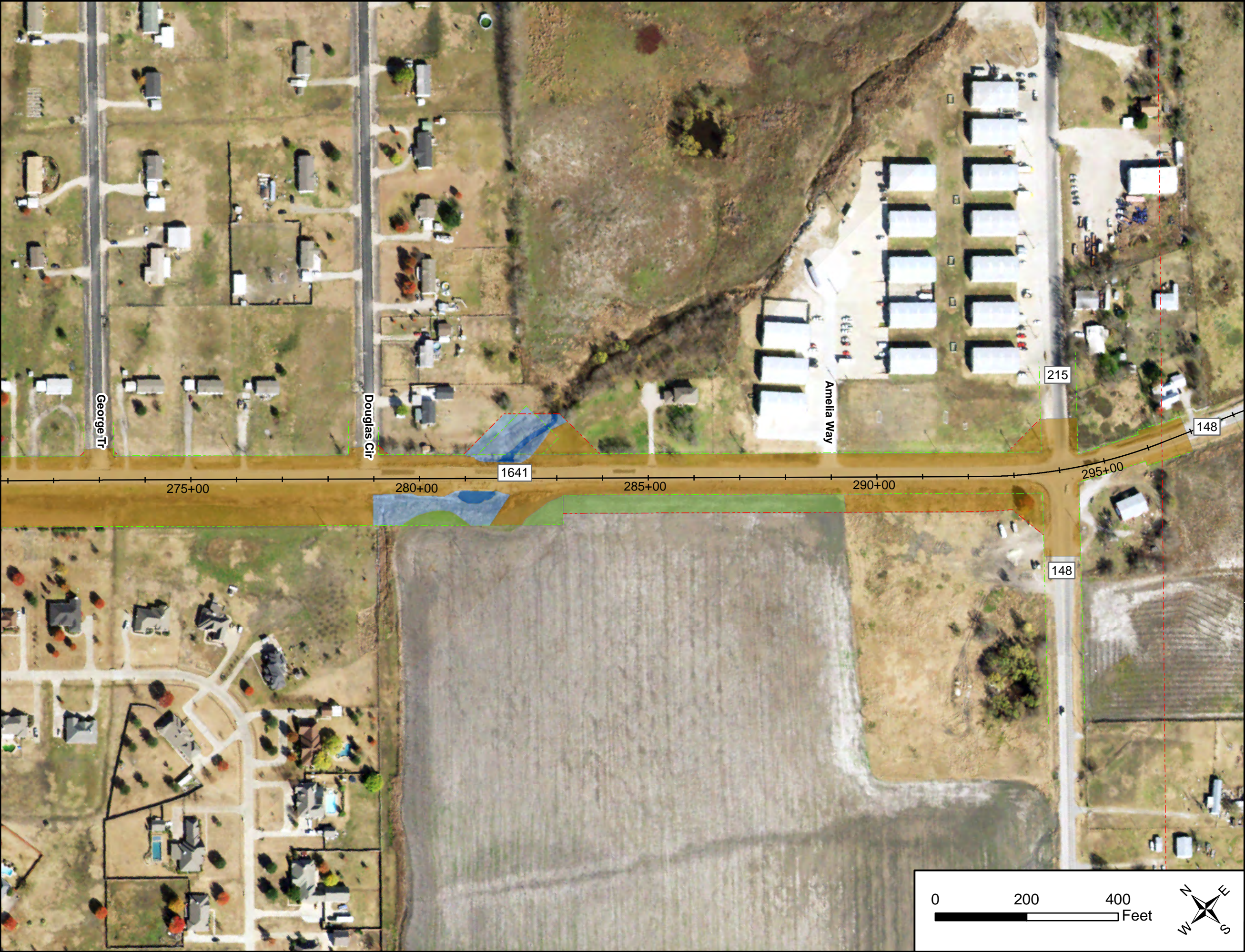
Page 12 of 12



Legend

- Existing Right-of-way
- Proposed Right-of-Way
- Agriculture
- Disturbed Prairie
- Open Water
- Riparian
- Urban

Base Map Source: TNRIS (2018)





Photograph 1: View looking northeast along the FM 1641 west ROW near STA. 00+50. This image shows the beginning of the project limits. Date of photograph: 01/08/20



Photograph 2: View looking northwest along the FM 1641 west ROW near STA. 26+00. This image shows a residential/commercial area of the project limits. Date of photograph: 01/08/20



Photograph 3: View looking southeast along the FM 1641 east ROW near STA. 60+00. This image shows a commercial area of the project limits. Date of photograph: 01/08/20



Photograph 4: View looking northwest along the FM 1641 west ROW near STA. 125+00. This image shows a typical rural area of the project limits. Date of photograph: 01/08/20



Photograph 5: View looking north along the FM 1641 west ROW near STA. 295+00. This image shows the end of the project limits at the intersection with FM 148. Date of photograph: 01/08/20



Photograph 6: View looking south from FM 1641 west ROW near STA. 02+50. The TESCP/EMST Mapper classifies portions of the mowed-maintained vegetation as Agriculture; however, it better fits the Urban classification. Date of photograph: 01/08/20



Photograph 7: View looking north from FM 1641 east ROW near STA. 10+00. The TESCP/EMST Mapper classifies the roadway and mowed-maintained vegetation as Tallgrass Prairie, Grassland; however, it better fits the Urban classification. Date of photograph: 01/08/20



Photograph 8: View looking north from FM 1641 east ROW near STA. 15+50. The TESCP/EMST Mapper classifies the roadway and mowed-maintained vegetation as Tallgrass Prairie, Grassland; however, it better fits the Urban classification. Date of photograph: 01/08/20



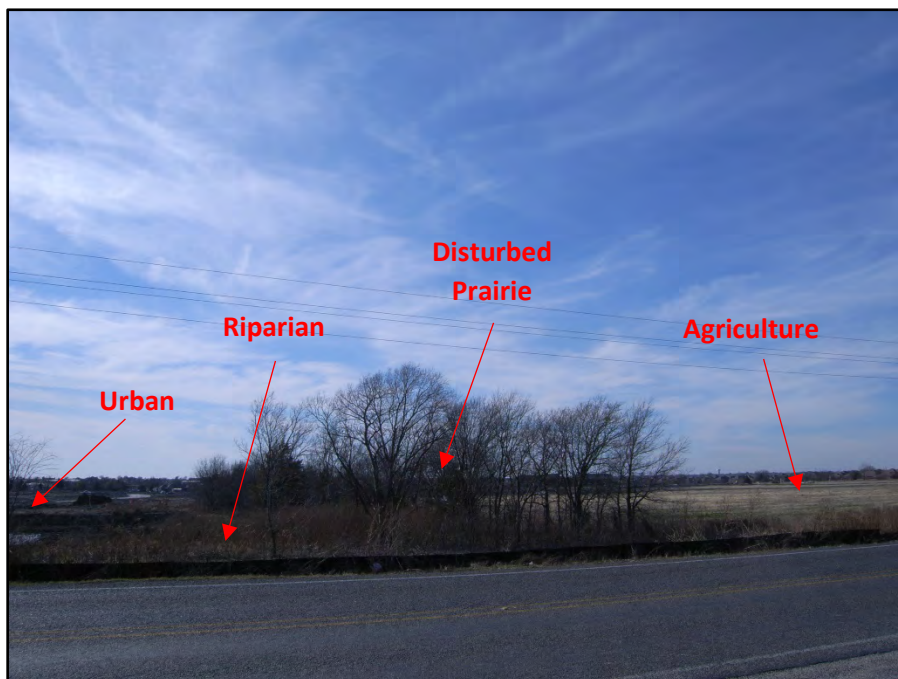
Photograph 9: View looking northwest from FM 1641 east ROW near STA. 36+00. The TЕСP/EMST Mapper classifies the roadway and mowed-maintained vegetation as Tallgrass Prairie, Grassland; however, it better fits the Urban classification. Date of photograph: 01/08/20



Photograph 10: View looking southwest along FM 1641 west ROW near STA. 42+50. The TЕСP/EMST Mapper classifies the unmaintained and woody vegetation as Urban, Disturbed Prairie, and Riparian. The unmaintained vegetation within the clearly defined channel better fits the Riparian classification. The woody vegetation outside of the channel better fits the Disturbed Prairie classification. Date of photograph: 01/08/20



Photograph 11: View looking southeast along FM 1641 west ROW near STA. 45+00. The TЕСP/EMST Mapper classifies the roadway and mowed-maintained vegetation as Agriculture classification. The mowed-maintained vegetation and roadway better fits the Urban classification. The vegetation beyond the mowed vegetation fits the Agriculture classification. Date of photograph: 01/08/20



Photograph 12: View looking southwest along FM 1641 east ROW near STA. 60+00. The TЕСP/EMST Mapper classifies the roadway, mowed-maintained vegetation, construction area, and unmaintained and woody vegetation as Disturbed Prairie, Agriculture and Tallgrass Prairie, Grassland. The mowed-maintained vegetation, roadway and construction area better fits the Urban classification. The unmaintained vegetation beyond the silt fence better fits the Riparian classification. The woody vegetation fits the Disturbed Prairie classification. The unmaintained vegetation right of the woody vegetation better fits the Agriculture classification. Date of photograph: 01/08/20



Photograph 13: View looking southwest along FM 1641 west ROW near STA. 60+00. The TЕСP/EMST Mapper classifies portions of the roadway, mowed-maintained vegetation, unmaintained vegetation, and construction site, as Agriculture and Disturbed Prairie. The roadway, mowed-maintained vegetation and construction area better fit the Urban classification. The unmaintained vegetation better fits the Riparian classification. Date of photograph: 01/08/20



Photograph 14: View looking northwest along FM 1641 east ROW near STA. 66+00. The TЕСP/EMST Mapper classifies portions of the roadway, and the mowed-maintained vegetation as Agriculture and Tallgrass Prairie, Grassland. The roadway and mowed-maintained vegetation better fit the Urban classification. Date of photograph: 01/08/20



Photograph 15: View looking southeast along FM 1641 west ROW near STA. 68+00. The TЕСP/EMST Mapper classifies portions of the roadway and mowed-maintained vegetation as Tallgrass Prairie, Grassland and mowed-maintained vegetation better fit the Urban classification. Date of photograph: 01/08/20



Photograph 16: View looking northwest along FM 1641 west ROW near STA. 82+00. The TЕСP/EMST Mapper classifies portions of the roadway, mowed-maintained and unmaintained vegetation as Tallgrass Prairie, Grassland and Agriculture. The roadway and mowed-maintained vegetation better fit the Urban classification. The unmaintained vegetation better fits the Disturbed Prairie classification. Date of photograph: 01/08/20



Photograph 17: View looking southeast along FM 1641 west ROW near STA. 82+00. The TESCP/EMST Mapper classifies portions of the roadway and mowed-maintained vegetation as Agriculture and Tallgrass Prairie, Grassland. The roadway and mowed-maintained vegetation better fit the Urban classification. Date of photograph: 01/08/20



Photograph 18: View looking northwest along FM 1641 east ROW near STA. 99+00. The TESCP/EMST Mapper classifies portions of the roadway, mowed-maintained and woody vegetation as Disturbed Prairie and Tallgrass Prairie, Grassland. The roadway and mowed-maintained vegetation better fit the Urban classification. The woody vegetation fits the Disturbed Prairie classification. Date of photograph: 01/08/20



Photograph 19: View looking northwest along FM 1641 east ROW near STA. 105+00. The TЕСP/EMST Mapper classifies portions of the roadway, mowed-maintained and unmaintained vegetation and open water as Tallgrass Prairie, Grassland and Riparian. The roadway and mowed-maintained vegetation better fit the Urban classification. The unmaintained vegetation within the channel fits the Riparian classification. The small stream of open water within the channel better fits the Open Water classification. The unmaintained vegetation in the background better fits the Disturbed Prairie classification. Date of photograph: 01/08/20



Photograph 20: View looking southwest along FM 1641 west ROW near STA. 105+00. The TЕСP/EMST Mapper classifies portions of the open water, woody and unmaintained vegetation as Riparian. The woody vegetation better fits the Disturbed Prairie classification. The stream better fits the Open Water classification. The unmaintained vegetation in the foreground fits the Riparian classification. Date of photograph: 01/08/20



Photograph 21: View looking southeast along the west ROW of FM 1641 near STA. 107+00. The TЕСP/EMST Mapper classifies portions of the roadway, mowed-maintained, and woody vegetation as Agriculture, Disturbed Prairie and Tallgrass Prairie, Grassland. The roadway and mowed-maintained vegetation better fit the Urban classification. The woody vegetation fits the Disturbed Prairie classification. Date of photograph: 01/08/20



Photograph 22: View looking northwest along the east ROW of FM 1641 near STA. 118+00. The TЕСP/EMST Mapper classifies portions of the roadway and mowed-maintained and unmaintained vegetation as Agriculture and Tallgrass Prairie, Grassland. The roadway and mowed-maintained vegetation better fit the Urban classification. The unmaintained vegetation better fits the Disturbed Prairie classification. Date of photograph: 01/08/20



Photograph 23: View looking southeast along the east ROW of FM 1641 near STA. 127+00. The TЕСP/EMST Mapper classifies portions of the roadway, mowed-maintained as Tallgrass Prairie, Grassland. The roadway and mowed-maintained vegetation better fit the Urban classification. The unmaintained vegetation better fits the Disturbed Prairie classification. Date of photograph: 01/08/20



Photograph 24: View looking south along the west ROW of FM 1641 near STA. 143+00. The TЕСP/EMST Mapper classifies portions of the stream, woody and unmaintained vegetation as Urban. The unmaintained and woody vegetation better fits the Riparian classification. The stream better fits the Open Water classification. Date of photograph: 01/08/20



Photograph 25: View looking east along the east ROW of FM 1641 near STA. 142+00. The TЕСP/EMST Mapper classifies portions of the stream, and unmaintained vegetation as Urban. The unmaintained and woody vegetation better fits the Riparian classification. The stream better fits the Open Water classification. Date of photograph: 01/08/20



Photograph 26: View looking northwest along the east ROW of FM 1641 near STA. 142+00. The TЕСP/EMST Mapper classifies portions of the roadway, mowed-maintained and unmaintained vegetation as Tallgrass Prairie, Grassland. The roadway and mowed-maintained vegetation better fit the Urban classification. The unmaintained vegetation better fits the Riparian classification. Date of photograph: 01/08/20



Photograph 27: View looking west along the west ROW of FM 1641 near STA. 153+00. The TЕСP/EMST Mapper classifies portions of the woody and unmaintained vegetation as Urban. The unmaintained and woody vegetation better fits the Disturbed Prairie classification. Date of photograph: 01/08/20



Photograph 28: View looking west along the southwest ROW of FM 1641 near STA. 157+50. The TЕСP/EMST Mapper classifies portions of the woody vegetation and stream as Riparian and Tallgrass Prairie, Grassland. The woody vegetation outside of the defined channel better fits the Disturbed Prairie classification. The stream better fits the Open Water classification. Date of photograph: 01/08/20



Photograph 29: View looking south along west ROW of FM 1641 near STA. 158+50. The TЕСP/EMST Mapper classifies portions of the roadway, mowed-maintained and woody vegetation as Tallgrass Prairie, Grassland. The roadway, and mowed-maintained vegetation better fits the Urban classification. The woody vegetation better fits the Disturbed Prairie classification. Date of photograph: 01/08/20



Photograph 30: View looking east along east ROW of FM 1641 near STA. 157+00. The TЕСP/EMST Mapper classifies portions of the woody vegetation and stream as Tallgrass Prairie, Grassland and Riparian. The woody vegetation near the stream better fits the Riparian classification. The woody vegetation outside of the channel better fits the Disturbed Prairie classification. The stream better fits the Open Water classification. Date of photograph: 01/08/20



Photograph 31: View looking north along east ROW of FM 1641 near STA. 159+00. The TЕСP/EMST Mapper classifies portions of the roadway, mowed-maintained and woody vegetation as Tallgrass Prairie, Grassland. The roadway, and mowed-maintained vegetation better fits the Urban classification. The woody vegetation better fits the Disturbed Prairie classification except near the culvert where it better fits the Riparian classification. Date of photograph: 01/08/20



Photograph 32: View looking southeast along west ROW of FM 1641 near STA. 168+00. The TЕСP/EMST Mapper classifies portions of the roadway, mowed-maintained and woody vegetation as Tallgrass Prairie, Grassland. The roadway, and mowed-maintained vegetation better fits the Urban classification. The woody vegetation better fits the Disturbed Prairie classification. Date of photograph: 01/08/20



Photograph 33: View looking southwest along west ROW of FM 1641 near STA. 187+00. The TЕСP/EMST Mapper classifies the mowed-maintained and unmaintained vegetation and stream as Agriculture. The mowed-maintained vegetation better fits the Urban classification. The stream better fits the Open Water classification. The woody and unmaintained vegetation within the depression better fits the Riparian classification. The other woody vegetation better fits the Disturbed Prairie classification. Date of photograph: 01/08/20



Photograph 34: View looking northwest along east ROW of FM 1641 near STA. 187+00. The TЕСP/EMST Mapper classifies the mowed-maintained vegetation and stream as Agriculture and unmaintained vegetation in the background as Urban. The mowed-maintained vegetation better fits the Urban classification. The stream better fits the Open Water classification. The unmaintained vegetation in the background better fits the Disturbed Prairie classification. Date of photograph: 01/08/20



Photograph 35: View looking southeast along west ROW of FM 1641 near STA. 200+50. The TЕСP/EMST Mapper classifies portions of the roadway, mowed-maintained and woody vegetation as Tallgrass Prairie, Grassland. The roadway, and mowed-maintained vegetation better fits the Urban classification. The woody vegetation better fits the Disturbed Prairie classification. Date of photograph: 01/08/20



Photograph 36: View looking west along east ROW of FM 1641 near STA. 221+00. The TЕСP/EMST Mapper classifies portions of the roadway, maintained and unmaintained vegetation as Tallgrass Prairie, Grassland. The roadway, and mowed-maintained vegetation better fits the Urban classification. The unmaintained vegetation better fits the Agriculture classification. Date of photograph: 01/08/20



Photograph 37: View looking southeast along west ROW of FM 1641 near STA. 233+00. The TЕСP/EMST Mapper classifies portions of the roadway and maintained vegetation as Tallgrass Prairie, Grassland. The roadway, and mowed-maintained vegetation better fits the Urban classification. Date of photograph: 01/08/20



Photograph 38: View looking northwest along east ROW of FM 1641 near STA. 273+00. The TЕСP/EMST Mapper classifies portions of the roadway and maintained vegetation as Tallgrass Prairie, Grassland. The roadway, and mowed-maintained vegetation better fits the Urban classification. Date of photograph: 01/08/20



Photograph 39: View looking northwest along west ROW of FM 1641 near STA. 279+00. The TЕСP/EMST Mapper classifies portions of the roadway, maintained vegetation as Tallgrass Prairie, Grassland. The roadway, and mowed-maintained vegetation better fits the Urban classification. Date of photograph: 01/08/20



Photograph 40: View looking west along west ROW of FM 1641 near STA. 280+00. The TЕСP/EMST Mapper classifies portions of the roadway, rock, maintained and unmaintained vegetation, and open water as Agriculture and Tallgrass Prairie, Grassland. The roadway, rock and mowed-maintained vegetation in the foreground better fit the Urban classification. The unmaintained vegetation in the ditch better fits the Riparian classification. The unmaintained vegetation in the background better fits the Agriculture classification. The water better fits the Open Water classification. Date of photograph: 01/08/20



Photograph 41: View looking east along east ROW of FM 1641 near STA. 281+00. The TЕСP/EMST Mapper classifies portions of the roadway, maintained and unmaintained vegetation, and stream as Riparian. The roadway, rock and mowed-maintained vegetation in the foreground better fit the Urban classification. The unmaintained vegetation fits the Riparian classification. The stream better fits the Open Water classification. Date of photograph: 01/08/20



Photograph 42: View looking east along west ROW of FM 1641 near STA. 293+00. The TЕСP/EMST Mapper classifies portions of the roadway and maintained vegetation as Tallgrass Prairie, Grassland. The roadway, and mowed-maintained vegetation better fits the Urban classification. Date of photograph: 01/08/20



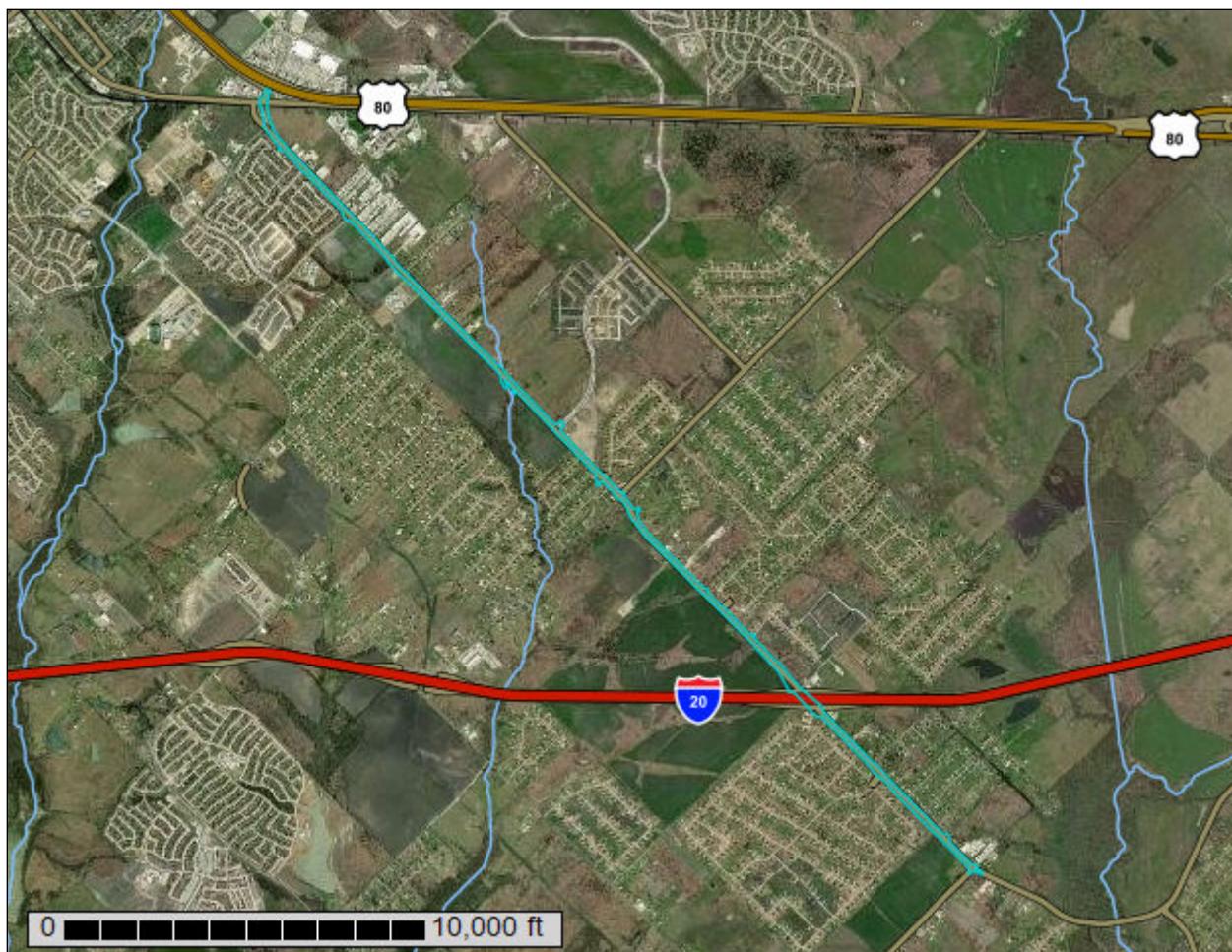
United States
Department of
Agriculture

NRCS

Natural
Resources
Conservation
Service

A product of the National
Cooperative Soil Survey,
a joint effort of the United
States Department of
Agriculture and other
Federal agencies, State
agencies including the
Agricultural Experiment
Stations, and local
participants

Custom Soil Resource Report for **Kaufman and Rockwall Counties, Texas**



January 7, 2020

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (<http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/>) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (<https://offices.sc.egov.usda.gov/locator/app?agency=nrcs>) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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Contents

Preface	2
How Soil Surveys Are Made	5
Soil Map	8
Soil Map.....	9
Legend.....	10
Map Unit Legend.....	11
Map Unit Descriptions.....	11
Kaufman and Rockwall Counties, Texas.....	13
HeC—Heiden clay, 3 to 5 percent slopes.....	13
HoA—Houston Black clay, 0 to 1 percent slopes.....	14
HoB—Houston Black clay, 1 to 3 percent slopes.....	16
WsA—Wilson silt loam, 0 to 1 percent slopes.....	17
WsC2—Wilson clay loam, 2 to 5 percent slopes, eroded.....	18
Soil Information for All Uses	20
Suitabilities and Limitations for Use.....	20
Land Classifications.....	20
Farmland Classification.....	20
References	26

How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

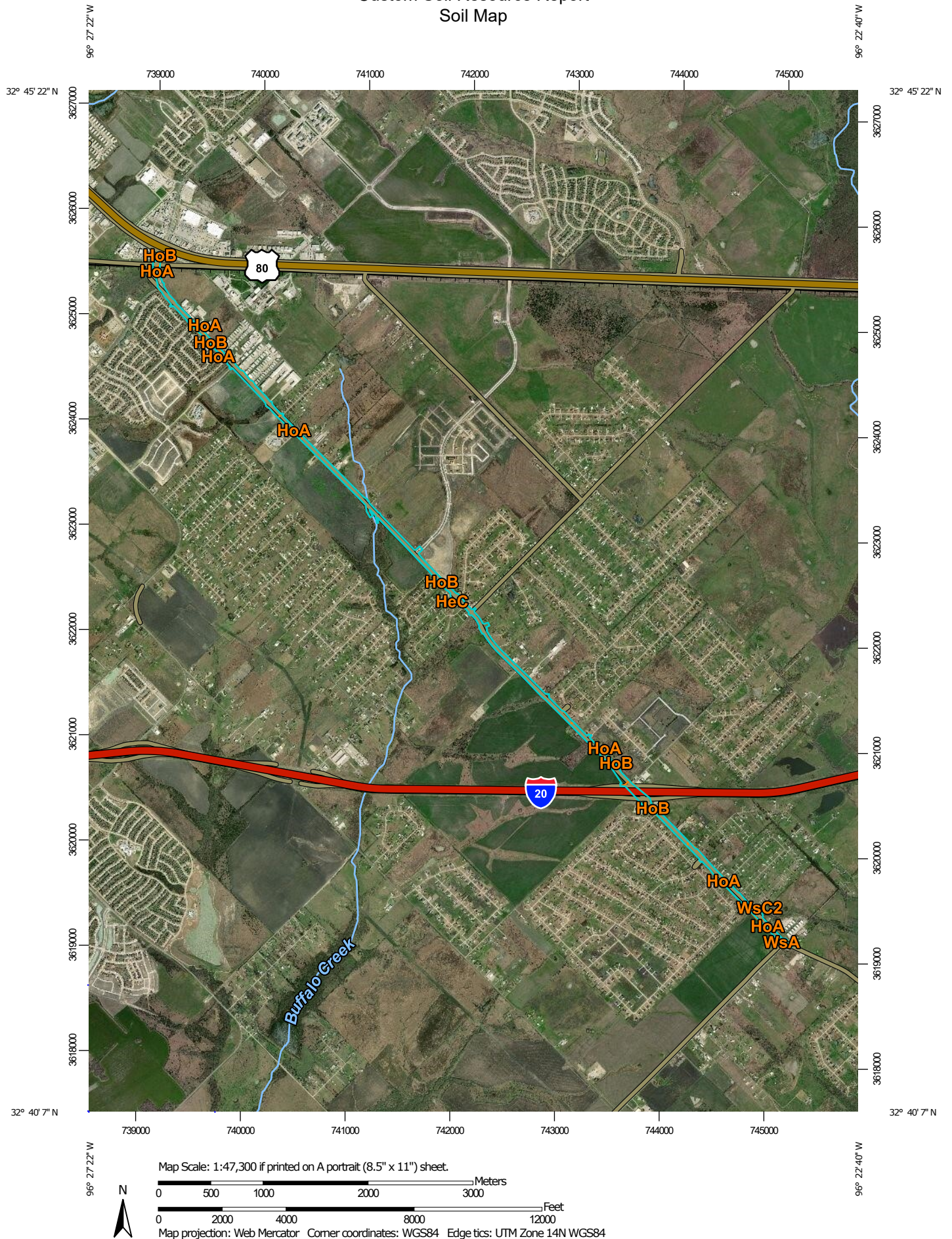
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identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report Soil Map



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MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)

Soils

 Soil Map Unit Polygons


 Soil Map Unit Lines

 Soil Map Unit Points

Special Point Features

 Blowout

 Borrow Pit

 Clay Spot


 Closed Depression

 Gravel Pit


 Gravelly Spot


 Landfill

 Lava Flow

 Marsh or swamp

 Mine or Quarry

 Miscellaneous Water


 Perennial Water

 Rock Outcrop


 Saline Spot

 Sandy Spot

 Severely Eroded Spot


 Sinkhole


 Slide or Slip


 Sodic Spot

 Spoil Area

 Stony Spot


 Very Stony Spot

 Wet Spot

 Other

 Special Line Features

Water Features

 Streams and Canals

Transportation

 Rails


 Interstate Highways

 US Routes

 Major Roads

 Local Roads

Background

 Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service

Web Soil Survey URL:

Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Kaufman and Rockwall Counties, Texas

Survey Area Data: Version 16, Sep 12, 2019

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Aug 20, 2016—Dec 13, 2017

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
HeC	Heiden clay, 3 to 5 percent slopes	0.3	0.3%
HoA	Houston Black clay, 0 to 1 percent slopes	26.6	26.0%
HoB	Houston Black clay, 1 to 3 percent slopes	72.1	70.4%
WsA	Wilson silt loam, 0 to 1 percent slopes	2.3	2.2%
WsC2	Wilson clay loam, 2 to 5 percent slopes, eroded	1.1	1.1%
Totals for Area of Interest		102.4	100.0%

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

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The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Kaufman and Rockwall Counties, Texas

HeC—Heiden clay, 3 to 5 percent slopes

Map Unit Setting

National map unit symbol: 2v1vc
Elevation: 260 to 890 feet
Mean annual precipitation: 33 to 42 inches
Mean annual air temperature: 63 to 68 degrees F
Frost-free period: 233 to 260 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Heiden and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Heiden

Setting

Landform: Ridges
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Side slope, interfluvium
Microfeatures of landform position: Linear gilgai
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Clayey residuum weathered from mudstone

Typical profile

Ap - 0 to 6 inches: clay
Bkss1 - 6 to 18 inches: clay
Bkss2 - 18 to 58 inches: clay
CBdk - 58 to 80 inches: clay

Properties and qualities

Slope: 3 to 5 percent
Depth to restrictive feature: 40 to 65 inches to densic material
Natural drainage class: Well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 40 percent
Gypsum, maximum in profile: 5 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 12.0
Available water storage in profile: High (about 9.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: D

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Ecological site: Southern Blackland (R086AY011TX)

Hydric soil rating: No

Minor Components

Houston black

Percent of map unit: 10 percent

Landform: Ridges

Landform position (two-dimensional): Backslope

Landform position (three-dimensional): Side slope

Microfeatures of landform position: Circular gilgai

Down-slope shape: Convex

Across-slope shape: Linear

Ecological site: Southern Blackland (R086AY011TX)

Hydric soil rating: No

Ferris, moderately eroded

Percent of map unit: 5 percent

Landform: Ridges

Landform position (two-dimensional): Backslope

Landform position (three-dimensional): Side slope

Microfeatures of landform position: Linear gilgai

Down-slope shape: Linear

Across-slope shape: Convex

Ecological site: Southern Eroded Blackland (R086AY009TX)

Hydric soil rating: No

HoA—Houston Black clay, 0 to 1 percent slopes

Map Unit Setting

National map unit symbol: 2shgy

Elevation: 300 to 870 feet

Mean annual precipitation: 31 to 39 inches

Mean annual air temperature: 65 to 70 degrees F

Frost-free period: 238 to 288 days

Farmland classification: All areas are prime farmland

Map Unit Composition

Houston black and similar soils: 85 percent

Minor components: 15 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Houston Black

Setting

Landform: Plains

Landform position (two-dimensional): Summit

Landform position (three-dimensional): Interfluvial

Microfeatures of landform position: Linear gilgai

Down-slope shape: Convex, linear

Custom Soil Resource Report

Across-slope shape: Convex, linear

Parent material: Clayey residuum weathered from calcareous mudstone of upper cretaceous age

Typical profile

Ap - 0 to 6 inches: clay

Bkss - 6 to 70 inches: clay

BCkss - 70 to 80 inches: clay

Properties and qualities

Slope: 0 to 1 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Moderately well drained

Runoff class: High

Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Calcium carbonate, maximum in profile: 35 percent

Gypsum, maximum in profile: 5 percent

Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)

Sodium adsorption ratio, maximum in profile: 2.0

Available water storage in profile: High (about 9.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 2w

Hydrologic Soil Group: D

Ecological site: Southern Blackland (R086AY011TX)

Hydric soil rating: No

Minor Components

Wilson

Percent of map unit: 8 percent

Landform: Stream terraces

Landform position (three-dimensional): Tread

Down-slope shape: Linear

Across-slope shape: Concave

Ecological site: Southern Claypan Prairie (R086AY004TX)

Hydric soil rating: No

Heiden

Percent of map unit: 7 percent

Landform: Plains

Landform position (two-dimensional): Shoulder

Landform position (three-dimensional): Interfluve

Microfeatures of landform position: Linear gilgai

Down-slope shape: Linear

Across-slope shape: Convex

Ecological site: Southern Blackland (R086AY011TX)

Hydric soil rating: No

HoB—Houston Black clay, 1 to 3 percent slopes

Map Unit Setting

National map unit symbol: 2ssh0
Elevation: 270 to 1,040 feet
Mean annual precipitation: 33 to 43 inches
Mean annual air temperature: 62 to 63 degrees F
Frost-free period: 217 to 244 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Houston black and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Houston Black

Setting

Landform: Ridges
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Interfluve
Microfeatures of landform position: Linear gilgai
Down-slope shape: Convex, linear
Across-slope shape: Convex, linear
Parent material: Clayey residuum weathered from calcareous mudstone of upper cretaceous age

Typical profile

Ap - 0 to 6 inches: clay
Bkss - 6 to 70 inches: clay
BCKss - 70 to 80 inches: clay

Properties and qualities

Slope: 1 to 3 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Moderately well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 35 percent
Gypsum, maximum in profile: 5 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 2.0
Available water storage in profile: High (about 9.6 inches)

Custom Soil Resource Report

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 2e

Hydrologic Soil Group: D

Ecological site: Southern Blackland (R086AY011TX)

Hydric soil rating: No

Minor Components

Heiden

Percent of map unit: 15 percent

Landform: Plains

Landform position (two-dimensional): Shoulder

Landform position (three-dimensional): Interfluve

Microfeatures of landform position: Linear gilgai

Down-slope shape: Linear

Across-slope shape: Convex

Ecological site: Southern Blackland (R086AY011TX)

Hydric soil rating: No

Fairlie

Percent of map unit: 5 percent

Landform: Ridges

Landform position (two-dimensional): Toeslope, footslope

Landform position (three-dimensional): Base slope

Down-slope shape: Linear

Across-slope shape: Convex

Ecological site: Southern Blackland (R086AY011TX)

Hydric soil rating: No

WsA—Wilson silt loam, 0 to 1 percent slopes

Map Unit Setting

National map unit symbol: dkpj

Elevation: 250 to 700 feet

Mean annual precipitation: 32 to 45 inches

Mean annual air temperature: 64 to 70 degrees F

Frost-free period: 220 to 270 days

Farmland classification: Farmland of statewide importance

Map Unit Composition

Wilson and similar soils: 100 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Wilson

Setting

Landform: Stream terraces, stream terraces

Landform position (three-dimensional): Tread

Down-slope shape: Linear

Custom Soil Resource Report

Across-slope shape: Concave

Parent material: Clayey alluvium of quaternary age derived from mixed sources

Typical profile

H1 - 0 to 5 inches: silt loam

H2 - 5 to 32 inches: silty clay

H3 - 32 to 77 inches: silty clay

Properties and qualities

Slope: 0 to 1 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Moderately well drained

Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Calcium carbonate, maximum in profile: 20 percent

Gypsum, maximum in profile: 15 percent

Salinity, maximum in profile: Very slightly saline to moderately saline (2.0 to 8.0 mmhos/cm)

Sodium adsorption ratio, maximum in profile: 10.0

Available water storage in profile: Moderate (about 7.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 3w

Hydrologic Soil Group: D

Ecological site: Northern Claypan Prairie (R086AY003TX)

Hydric soil rating: No

WsC2—Wilson clay loam, 2 to 5 percent slopes, eroded

Map Unit Setting

National map unit symbol: dkpl

Elevation: 250 to 700 feet

Mean annual precipitation: 32 to 45 inches

Mean annual air temperature: 64 to 70 degrees F

Frost-free period: 220 to 270 days

Farmland classification: Not prime farmland

Map Unit Composition

Wilson, eroded, and similar soils: 100 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Wilson, Eroded

Setting

Landform: Stream terraces, stream terraces

Landform position (three-dimensional): Riser, tread

Down-slope shape: Convex

Across-slope shape: Convex

Custom Soil Resource Report

Parent material: Clayey alluvium of quaternary age derived from mixed sources

Typical profile

H1 - 0 to 5 inches: clay loam

H2 - 5 to 47 inches: clay

H3 - 47 to 80 inches: clay

Properties and qualities

Slope: 2 to 5 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Moderately well drained

Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Calcium carbonate, maximum in profile: 20 percent

Gypsum, maximum in profile: 15 percent

Salinity, maximum in profile: Very slightly saline to moderately saline (2.0 to 8.0 mmhos/cm)

Sodium adsorption ratio, maximum in profile: 10.0

Available water storage in profile: Moderate (about 7.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 4e

Hydrologic Soil Group: D

Ecological site: Northern Claypan Prairie (R086AY003TX)

Hydric soil rating: No

Soil Information for All Uses

Suitabilities and Limitations for Use

The Suitabilities and Limitations for Use section includes various soil interpretations displayed as thematic maps with a summary table for the soil map units in the selected area of interest. A single value or rating for each map unit is generated by aggregating the interpretive ratings of individual map unit components. This aggregation process is defined for each interpretation.

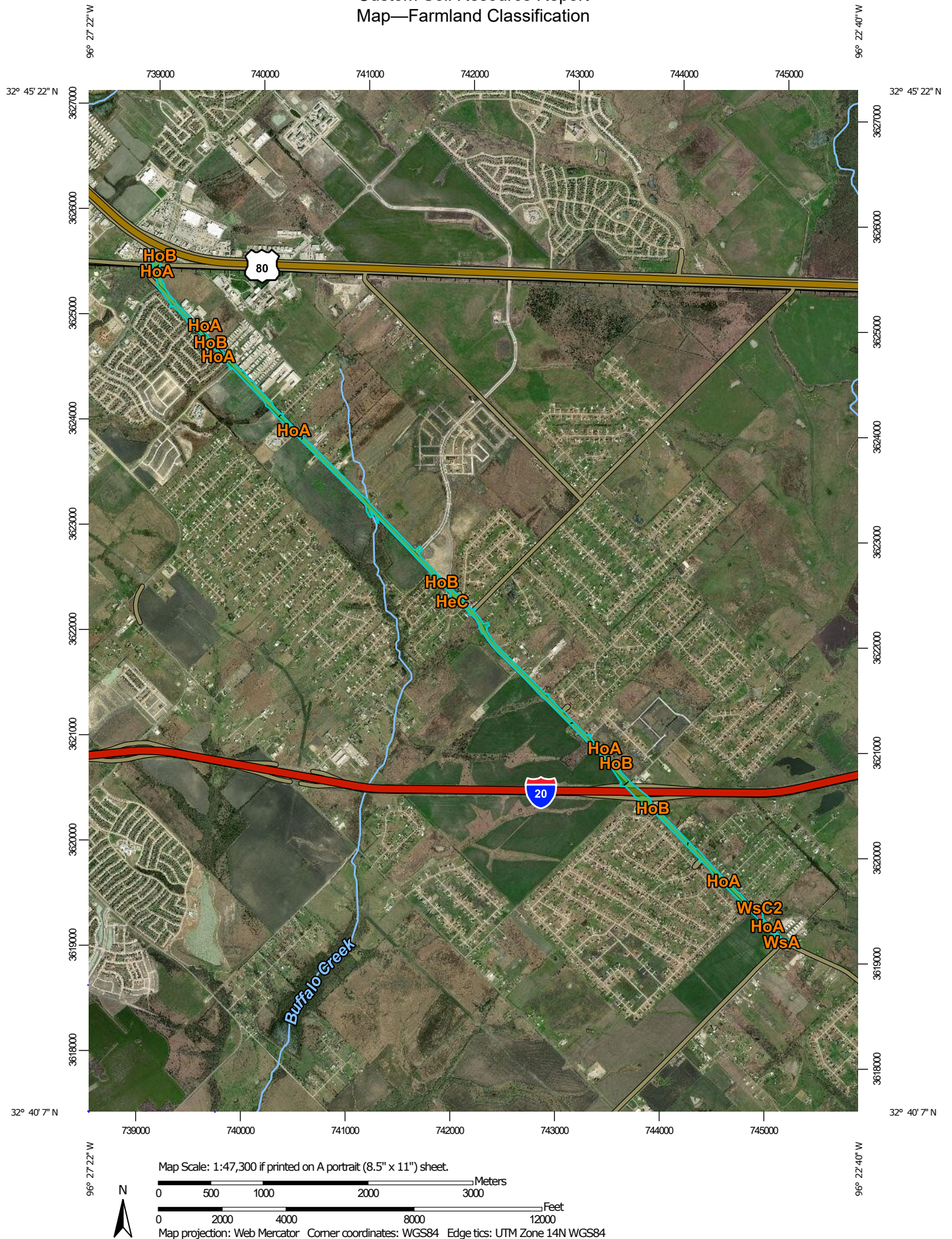
Land Classifications

Land Classifications are specified land use and management groupings that are assigned to soil areas because combinations of soil have similar behavior for specified practices. Most are based on soil properties and other factors that directly influence the specific use of the soil. Example classifications include ecological site classification, farmland classification, irrigated and nonirrigated land capability classification, and hydric rating.

Farmland Classification

Farmland classification identifies map units as prime farmland, farmland of statewide importance, farmland of local importance, or unique farmland. It identifies the location and extent of the soils that are best suited to food, feed, fiber, forage, and oilseed crops. NRCS policy and procedures on prime and unique farmlands are published in the "Federal Register," Vol. 43, No. 21, January 31, 1978.


Custom Soil Resource Report Map—Farmland Classification



Custom Soil Resource Report









MAP LEGEND








Area of Interest (AOI)






 Area of Interest (AOI)








Soils



Soil Rating Polygons

-  Not prime farmland
-  All areas are prime farmland
-  Prime farmland if drained
-  Prime farmland if protected from flooding or not frequently flooded during the growing season
-  Prime farmland if irrigated
-  Prime farmland if drained and either protected from flooding or not frequently flooded during the growing season
-  Prime farmland if irrigated and drained
-  Prime farmland if irrigated and either protected from flooding or not frequently flooded during the growing season









-  Prime farmland if subsoiled, completely removing the root inhibiting soil layer
-  Prime farmland if irrigated and the product of I (soil erodibility) x C (climate factor) does not exceed 60
-  Prime farmland if irrigated and reclaimed of excess salts and sodium
-  Farmland of statewide importance
-  Farmland of statewide importance, if drained
-  Farmland of statewide importance, if protected from flooding or not frequently flooded during the growing season
-  Farmland of statewide importance, if irrigated

-  Farmland of statewide importance, if drained and either protected from flooding or not frequently flooded during the growing season
-  Farmland of statewide importance, if irrigated and drained
-  Farmland of statewide importance, if irrigated and either protected from flooding or not frequently flooded during the growing season
-  Farmland of statewide importance, if subsoiled, completely removing the root inhibiting soil layer
-  Farmland of statewide importance, if irrigated and the product of I (soil erodibility) x C (climate factor) does not exceed 60

-  Farmland of statewide importance, if irrigated and reclaimed of excess salts and sodium
-  Farmland of statewide importance, if drained or either protected from flooding or not frequently flooded during the growing season
-  Farmland of statewide importance, if warm enough, and either drained or either protected from flooding or not frequently flooded during the growing season
-  Farmland of statewide importance, if warm enough
-  Farmland of statewide importance, if thawed
-  Farmland of local importance
-  Farmland of local importance, if irrigated

-  Farmland of unique importance
-  Not rated or not available






















Soil Rating Lines

-  Not prime farmland
-  All areas are prime farmland
-  Prime farmland if drained
-  Prime farmland if protected from flooding or not frequently flooded during the growing season
-  Prime farmland if irrigated
-  Prime farmland if drained and either protected from flooding or not frequently flooded during the growing season
-  Prime farmland if irrigated and drained
-  Prime farmland if irrigated and either protected from flooding or not frequently flooded during the growing season

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	Prime farmland if subsoiled, completely removing the root inhibiting soil layer		Farmland of statewide importance, if drained and either protected from flooding or not frequently flooded during the growing season		Farmland of statewide importance, if irrigated and reclaimed of excess salts and sodium		Farmland of unique importance		Prime farmland if subsoiled, completely removing the root inhibiting soil layer
	Prime farmland if irrigated and the product of I (soil erodibility) x C (climate factor) does not exceed 60		Farmland of statewide importance, if irrigated and drained		Farmland of statewide importance, if drained or either protected from flooding or not frequently flooded during the growing season	Soil Rating Points			Prime farmland if irrigated and the product of I (soil erodibility) x C (climate factor) does not exceed 60
	Prime farmland if irrigated and reclaimed of excess salts and sodium		Farmland of statewide importance, if irrigated and either protected from flooding or not frequently flooded during the growing season		Farmland of statewide importance, if warm enough, and either drained or either protected from flooding or not frequently flooded during the growing season		Not prime farmland		Prime farmland if irrigated and reclaimed of excess salts and sodium
	Farmland of statewide importance		Farmland of statewide importance, if subsoiled, completely removing the root inhibiting soil layer		Farmland of statewide importance, if thawed		Prime farmland if drained		Farmland of statewide importance
	Farmland of statewide importance, if drained		Farmland of statewide importance, if irrigated and the product of I (soil erodibility) x C (climate factor) does not exceed 60		Farmland of local importance		Prime farmland if protected from flooding or not frequently flooded during the growing season		Farmland of statewide importance, if drained
	Farmland of statewide importance, if protected from flooding or not frequently flooded during the growing season				Farmland of local importance, if irrigated		Prime farmland if irrigated		Farmland of statewide importance, if protected from flooding or not frequently flooded during the growing season
	Farmland of statewide importance, if irrigated						Prime farmland if drained and either protected from flooding or not frequently flooded during the growing season		Farmland of statewide importance, if irrigated

Custom Soil Resource Report

	Farmland of statewide importance, if drained and either protected from flooding or not frequently flooded during the growing season		Farmland of statewide importance, if irrigated and reclaimed of excess salts and sodium		Farmland of unique importance
	Farmland of statewide importance, if irrigated and drained		Farmland of statewide importance, if drained or either protected from flooding or not frequently flooded during the growing season		Not rated or not available
	Farmland of statewide importance, if irrigated and either protected from flooding or not frequently flooded during the growing season		Farmland of statewide importance, if warm enough, and either drained or either protected from flooding or not frequently flooded during the growing season	Water Features	
	Farmland of statewide importance, if subsoiled, completely removing the root inhibiting soil layer		Farmland of statewide importance, if warm enough		Streams and Canals
	Farmland of statewide importance, if irrigated and the product of I (soil erodibility) x C (climate factor) does not exceed 60		Farmland of statewide importance, if thawed		Rails
			Farmland of local importance		Interstate Highways
			Farmland of local importance, if irrigated		US Routes
					Major Roads
					Local Roads
				Background	
					Aerial Photography

The soil surveys that comprise your AOI were mapped at 1:20,000.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Kaufman and Rockwall Counties, Texas
Survey Area Data: Version 16, Sep 12, 2019

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Aug 20, 2016—Dec 13, 2017

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Table—Farmland Classification

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
HeC	Heiden clay, 3 to 5 percent slopes	All areas are prime farmland	0.3	0.3%
HoA	Houston Black clay, 0 to 1 percent slopes	All areas are prime farmland	26.6	26.0%
HoB	Houston Black clay, 1 to 3 percent slopes	All areas are prime farmland	72.1	70.4%
WsA	Wilson silt loam, 0 to 1 percent slopes	Farmland of statewide importance	2.3	2.2%
WsC2	Wilson clay loam, 2 to 5 percent slopes, eroded	Not prime farmland	1.1	1.1%
Totals for Area of Interest			102.4	100.0%

Rating Options—Farmland Classification

Aggregation Method: No Aggregation Necessary

Tie-break Rule: Lower

References

- American Association of State Highway and Transportation Officials (AASHTO). 2004. Standard specifications for transportation materials and methods of sampling and testing. 24th edition.
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- Federal Register. September 18, 2002. Hydric soils of the United States.
- Hurt, G.W., and L.M. Vasilas, editors. Version 6.0, 2006. Field indicators of hydric soils in the United States.
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- United States Army Corps of Engineers, Environmental Laboratory. 1987. Corps of Engineers wetlands delineation manual. Waterways Experiment Station Technical Report Y-87-1.
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- United States Department of Agriculture, Natural Resources Conservation Service. National range and pasture handbook. <http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/landuse/rangepasture/?cid=stelprdb1043084>

Custom Soil Resource Report

United States Department of Agriculture, Natural Resources Conservation Service. National soil survey handbook, title 430-VI. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/scientists/?cid=nrcs142p2_054242

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United States Department of Agriculture, Soil Conservation Service. 1961. Land capability classification. U.S. Department of Agriculture Handbook 210. http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_052290.pdf

**FARMLAND CONVERSION IMPACT RATING
FOR CORRIDOR TYPE PROJECTS**

PART I (To be completed by Federal Agency)		3. Date of Land Evaluation Request 1/14/20	4. Sheet 1 of 1
1. Name of Project FM 1641 and FM 548		5. Federal Agency Involved TxDOT	
2. Type of Project Roadway Widening		6. County and State Kaufman 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 <input type="checkbox"/> NO <input type="checkbox"/>		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	23.9			
B. Total Acres To Be Converted Indirectly, Or To Receive Services	0			
C. Total Acres In Corridor	102.3			

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)				
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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	7			
2. Perimeter in Nonurban Use	10	6			
3. Percent Of Corridor Being Farmed	20	6			
4. Protection Provided By State And Local Government	20	0			
5. Size of Present Farm Unit Compared To Average	10	8			
6. Creation Of Nonfarmable Farmland	25	1			
7. Availability Of Farm Support Services	5	5			
8. On-Farm Investments	20	2			
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? YES <input type="checkbox"/> NO <input type="checkbox"/>
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5. Reason For Selection:

Signature of Person Completing this Part: Jonathan Stewart	DATE 1/29/20
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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

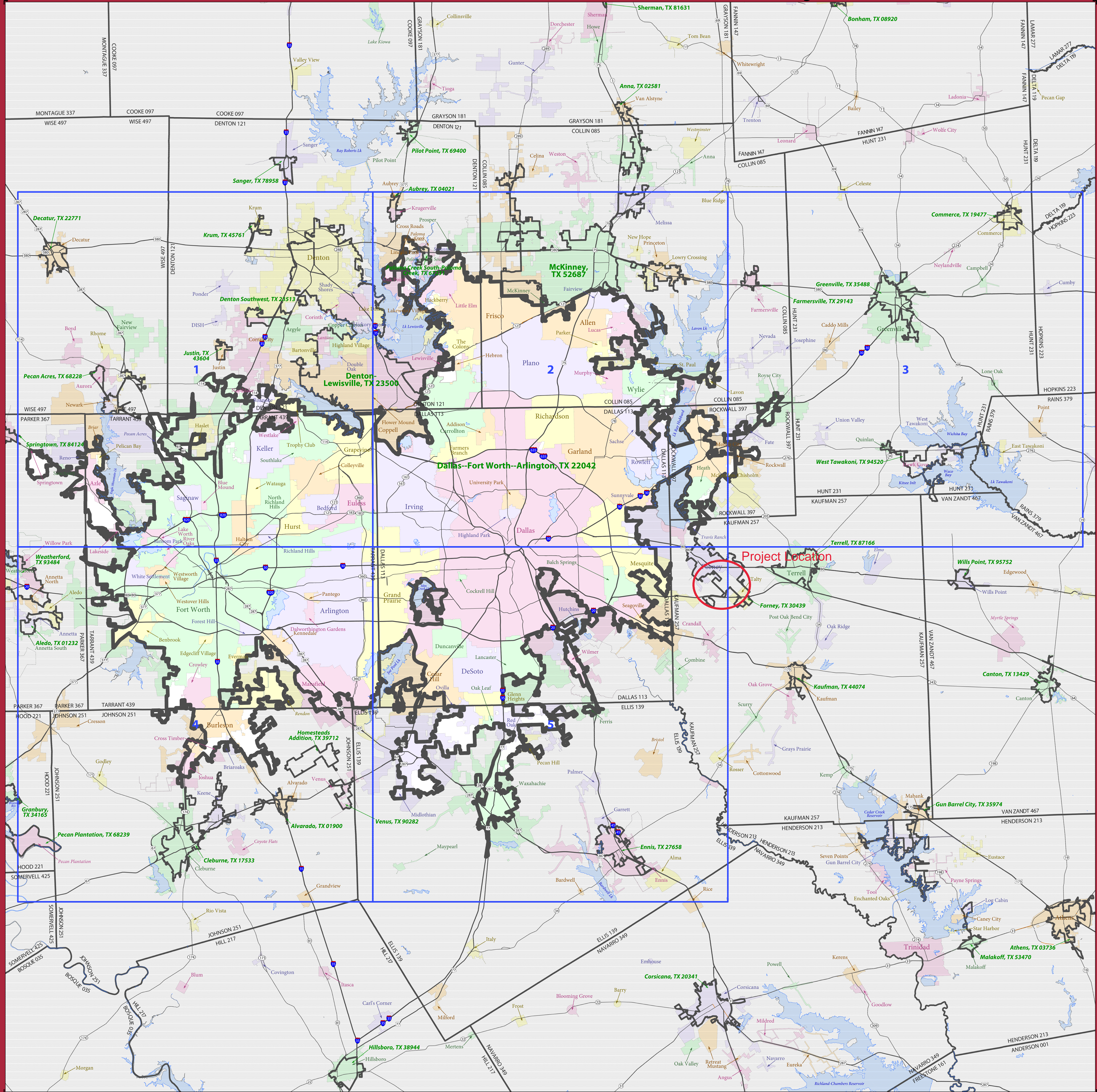
(9) Would the project at this site, by converting farmland to nonagricultural use, reduce the demand for farm support services so as to jeopardize the continued existence of these support services and thus, the viability of the farms remaining in the area?

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: Dallas--Fort Worth--Arlington, 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) ²	■ ■ ■ ■ ■	Incline Village 35100

DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL
Interstate	■ ■ ■ ■ ■	Water Body	■ ■ ■ ■ ■
U.S. Highway	■ ■ ■ ■ ■	Military	■ ■ ■ ■ ■
State Highway	■ ■ ■ ■ ■	Outside Subject Area	■ ■ ■ ■ ■
Other Road	■ ■ ■ ■ ■		
Railroad	■ ■ ■ ■ ■		
Perennial Stream	■ ■ ■ ■ ■		
Intermittent Stream	■ ■ ■ ■ ■		

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

COUNTIES IN SUBJECT URBANIZED AREA

- 48085 Collin
- 48113 Dallas
- 48121 Denton
- 48139 Ellis
- 48251 Johnson
- 48257 Kaufman
- 48367 Parker
- 48397 Rockwall
- 48439 Tarrant

Leslie Mirise

From: Suzanne Walsh <Suzanne.Walsh@tpwd.texas.gov>
Sent: Thursday, June 4, 2020 5:30 PM
To: Leslie Mirise
Cc: Christine Polito; Dan Perge
Subject: RE: CSJ 1217-01-019, etc. FM 1641 Widening Project (Kaufman County) - request for Early Coordination

This email originated from outside of the organization. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Leslie,

TPWD accepts the Best Management Practices proposed by the district for species in Kaufman County that have suitable habitat present but do not yet have BMPs identified under the 2017 BMP PA.

Thank you for submitting the following project for early coordination: FM 1641 from FM 548 to FM 148 (CSJ: 1217-01-019). TPWD appreciates TxDOT's commitment to implement the practices listed in the Tier I Site Assessment form submitted on April 29, 2020. Based on a review of the documentation, the avoidance and mitigation efforts described, and provided that project plans do not change, TPWD considers coordination to be complete. However, please note it is the responsibility of the project proponent to comply with all federal, state, and local laws that protect plants, fish, and wildlife.

According to §2.204(g) of the 2013 TxDOT-TPWD MOU, TxDOT agreed to provide TXNDD reporting forms for observations of tracked SGCN (which includes federal- and state-listed species) occurrences within TxDOT project areas. Please keep this mind when completing project due diligence tasks. For TXNDD submission guidelines, please visit the following link: http://tpwd.texas.gov/huntwild/wild/wildlife_diversity/txnodd/submit.phtml

Sincerely,

Suzanne Walsh
Transportation Conservation Coordinator
(512) 389-4579

From: Suzanne Walsh
Sent: Thursday, May 28, 2020 8:53 AM
To: Leslie Mirise <Leslie.Mirise@txdot.gov>
Cc: Christine Polito <Christine.Polito@txdot.gov>; Dan Perge <Dan.Perge@txdot.gov>
Subject: RE: CSJ 1217-01-019, etc. FM 1641 Widening Project (Kaufman County) - request for Early Coordination

Thanks, Leslie. I will let you know if I have any questions or need additional information.

Suzanne

From: Leslie Mirise <Leslie.Mirise@txdot.gov>
Sent: Thursday, May 28, 2020 8:49 AM
To: Suzanne Walsh <Suzanne.Walsh@tpwd.texas.gov>

Cc: Christine Polito <Christine.Polito@txdot.gov>; Dan Perge <Dan.Perge@txdot.gov>

Subject: RE: CSJ 1217-01-019, etc. FM 1641 Widening Project (Kaufman County) - request for Early Coordination

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Hi Suzanne,

My apologies for the delay. It will be so nice when ECOS is back up and running. The Project Description is attached. Please let me know if you need anything else.

Thanks,

Leslie Mirise

Environmental Specialist
Dallas District – DAL-ENV
Texas Department of Transportation
4777 East Highway 80
Mesquite, Texas 75150
(214) 320-6162 office
(214) 320-4470 FAX

From: Suzanne Walsh [<mailto:Suzanne.Walsh@tpwd.texas.gov>]

Sent: Wednesday, May 20, 2020 5:46 PM

To: Leslie Mirise <Leslie.Mirise@txdot.gov>

Cc: Christine Polito <Christine.Polito@txdot.gov>; Dan Perge <Dan.Perge@txdot.gov>; Mohammed Shaikh <Mohammed.Shaikh@txdot.gov>

Subject: RE: CSJ 1217-01-019, etc. FM 1641 Widening Project (Kaufman County) - request for Early Coordination

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Hi Leslie,

Could you provide a project description of the proposed work for this project? With ECOS being down, I am not able to look at the Work Plan Development Section I.

Thanks,
Suzanne

Suzanne Walsh
Transportation Conservation Coordinator
(512) 389-4579

From: WHAB_TxDOT <WHAB_TxDOT@tpwd.texas.gov>

Sent: Wednesday, April 29, 2020 1:01 PM

To: Leslie Mirise <Leslie.Mirise@txdot.gov>; WHAB_TxDOT <WHAB_TxDOT@tpwd.texas.gov>; Christine Polito <Christine.Polito@txdot.gov>; Dan Perge <Dan.Perge@txdot.gov>; Mohammed Shaikh <Mohammed.Shaikh@txdot.gov>
Cc: Suzanne Walsh <Suzanne.Walsh@tpwd.texas.gov>
Subject: RE: CSJ 1217-01-019, etc. FM 1641 Widening Project (Kaufman County) - request for Early Coordination

The TPWD Wildlife Habitat Assessment Program has received your request and has assigned it project ID # 43805. The Habitat Assessment Biologist who will complete your project review is copied on this email.

Thank you,

John Ney

Administrative Assistant

Texas Parks & Wildlife Department

Wildlife Diversity Program – Habitat Assessment Program

4200 Smith School Road

Austin, TX 78744

Office: (512) 389-4571

From: Leslie Mirise <Leslie.Mirise@txdot.gov>
Sent: Wednesday, April 29, 2020 12:29 PM
To: WHAB_TxDOT <WHAB_TxDOT@tpwd.texas.gov>
Cc: Christine Polito <Christine.Polito@txdot.gov>; Dan Perge <Dan.Perge@txdot.gov>; Mohammed Shaikh <Mohammed.Shaikh@txdot.gov>
Subject: CSJ 1217-01-019, etc. FM 1641 Widening Project (Kaufman County) - request for Early Coordination

ALERT: This email came from an external source. Do not open attachments or click on links in unknown or unexpected emails.

Hello,

TxDOT requests early coordination for the FM 1641 (and FM 548) Widening Project in Kaufman County, Texas. Please see ECOS for the project description. The project is classified as an CE (open-ended D). Project documents include the following, and those of appropriate file size are attached:

1. Species Analysis Spreadsheet
2. Species Analysis Spreadsheet – SGCN
3. Species Analysis Spreadsheet - Addendum
4. Species Analysis Form
5. Tier 1 Site Assessment Form
6. USFWS IPaC Resource List

7. TPWD RTEST List for Denton County
8. NDD figure
9. EMST Figures
10. Observed Veg Figures
11. EMST and Observed Veg Spreadsheet
12. Photos

These documents, along with other project-related information, are available in ECOS under the CSJ: 1217-01-019.

The letting date in ECOS is currently April 2028. However, the planned NEPA clearance date for this project is August 15, 2020. The public hearing is scheduled to occur in June 2020. Please provide comments or complete coordination on or before June 1, 2020, if possible.

Please feel free to contact me with any questions or if you need any additional information.

Leslie Mirise

Environmental Specialist
Dallas District – DAL-ENV
Texas Department of Transportation
4777 East Highway 80
Mesquite, Texas 75150
(214) 320-6162 office
(214) 320-4470 FAX

A Texas Department of Transportation (TxDOT) message



#EndTheStreakTX

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A Texas Department of Transportation (TxDOT) message

#EndTheStreakTX