# DRAFT Water Resources Technical Report

## US Highway 79 from Interstate Highway 35 to Farm-to-Market Road 1460

## Round Rock, Williamson County, Texas

CSJ: 0204-01-063

Prepared by: Cox|McLain Environmental Consulting, Inc.
September 2018

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

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## 1.0 Introduction and Purpose

The Texas Department of Transportation (TxDOT) Austin District is proposing improvements to United States Highway 79 (US 79) between Interstate Highway 35 (I-35) to Farm-to-Market Road 1460 (FM 1460) within the city of Round Rock in Williamson County, Texas. **Figure 1** and **Figure 2** provide an aerial and topographic view of the project area.

Within the project limits, US 79 consists of four 12-foot main lanes (two in each direction) with 10-foot outside shoulders. Some locations along the corridor have a central turn lane measuring 14 feet. The existing US 79 right-of-way (ROW) varies from 150 to 300 feet wide.

Proposed improvements include widening the existing US 79 roadway to add a third travel lane in each direction and installing a raised median for safety. Improvements to intersections would include potential overpasses at US 79/Mays Street and US 79/FM 1460, and altering the US 79/I-35 Intersection. Driveways and access points would be modified to improve safety and traffic flow. The proposed improvements also include installing shared-use paths on both sides of US 79 to improve pedestrian and bicycle accommodations. The proposed project would require approximately 8.97 acres of new right-of-way.

The proposed project would include a major reconfiguration of the intersection at US 79 and Mays Street. The addition of a partial cloverleaf interchange would replace the existing four-way traffic light to improve safety and enhance the flow of traffic from one corridor to the other. Two traffic lights would be added facilitating the left and right hand turns on and off Mays Street. The addition of an overpass would direct Mays Street traffic over US 79, thus avoiding the potential danger and congestion associated with the intersection.

A raised median is proposed along the center of US 79 throughout the majority of the project area. The addition of this median would limit access points on and off US 79 to five cross-street intersections, the interchange at Mays Street, and three designated turn lanes at breaks in the median. The five cross-street intersections are listed below:

- FM 1480
- Sunrise Road
- Georgetown Street
- Egger Avenue
- Heritage Center

The proposed project would include the addition of an overpass at the intersection of US 79 and FM 1480. The overpass would allow vehicles traveling in the left lanes along US 79 to go over FM 1480 without stopping, thus bypassing the intersection. The right lanes would direct traffic to the 4-way traffic light at the intersection of US 79 and FM 1480, below the overpass bridge. This intersection would include turnaround lanes, protected left turn lanes, and pedestrian crosswalks and would facilitate the transfer of vehicles on and off US 79 and FM 1460.

The purpose of this Water Resources Technical Report is to evaluate potential water resources regulatory issues associated with the proposed improvements to US 79, including the potential for impacts to waters of the United States (U.S)., including wetlands, water quality, floodplains, and groundwater. This report also describes potentially jurisdictional wetlands and waters of the U.S. located within the proposed project area to assist in avoidance of impacts and determine whether U.S. Army Corps of Engineers (USACE) project authorization would be required. Conclusions contained in this report are the opinions of the professionals conducting the study and are subject to confirmation by the USACE Fort Worth District.

Project Information

| | |
|---|---|
| **Project Area:** | US 79 from I-35 to FM 1460, within Williamson County, Texas (**Attachment A**, **Figure 1**) |
| **Size:** | The length of the proposed project is approximately 2.6 miles |
| **County:** | Williamson County, Texas |
| **USGS 7.5' Quads:** | *Round Rock, Texas* (**Attachment A**, **Figure 2**) |
| **Client:** | TxDOT Austin District |
| **Client Address:** | 7901 N Interstate Hwy 35, Austin, Texas 78753 |
| **Client Contact:** | Hilda Ortiz |

## 2.0 Methods

This Water Resources Technical Report includes a summary of waters of the U.S., including wetlands, delineated within the existing right-of-way (ROW) and proposed detention pond site and affiliated structures in March 2018 by Cox|McLain Environmental Consulting, Inc. (CMEC), as well as a compilation of published data related to water quality, floodplains, and groundwater. For more detailed information regarding the individual waters of the U.S. crossings within the project area, please refer to the "Wetlands/Waters of the U.S. Delineation Report, 2018" submitted under separate cover.

### 2.1 Data Review

Qualified wetland ecologists reviewed several published data resources prior to the field visit to identify potentially jurisdictional crossings, floodplains, impaired stream segments, coastal zone boundaries, and other sensitive surface and groundwater resources. Sources consulted included National Wetland Inventory (NWI) maps, the National Hydrography Dataset, the Natural Resources Conservation Service (NRCS) Soil Survey for Williamson County, U.S. Geological Survey (USGS) 7.5-minute quadrangle sheets (*Round Rock, Texas*), Geologic Atlas of Texas maps (Austin sheet), Federal Emergency Management Agency (FEMA) floodplain maps, and recent and historic aerial photography.

## 2.2 Field Delineation

Qualified wetland ecologists conducted field investigations in March 2018 within the existing and proposed roadway ROW, where right-of-entry was granted. The routine method of wetland delineation outlined in the *Field Guide for Wetland Delineation: 1987 Corps of Engineers Manual* (WTI 1991) and updated in the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Great Plains Region, Version 2.0* (USACE 2010) was utilized for wetland determinations within the project area. Field activities focused on wetlands and waters of the U.S. delineation and description.

The *Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory 1987) defines wetlands based on three criteria: hydrophytic vegetation, hydric soils, and wetland hydrology. In general, all three criteria must be present for an area to qualify as a wetland. Some exceptions can occur in disturbed areas or in newly formed wetlands where one indicator (such as hydric soils) might be lacking. These areas would be dealt with on an individual basis as outlined in the *Field Guide for Wetland Delineation* (WTI 1991) and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Atlantic and Gulf Coastal Plain Region, Version 2.0* (USACE 2010).

In addition to the jurisdictional wetlands defined above, the Clean Water Act regulates impacts to other waters of the United States. The term "waters of the United States" has broad meaning and incorporates both deepwater aquatic habitats and special aquatic sites, including wetlands, as listed below:

- The territorial seas with respect to the discharge of fill material
- Coastal and inland waters, lakes, rivers, and streams that are navigable waters of the United States, including their adjacent wetlands
- Tributaries to navigable waters of the United States, including adjacent wetlands
- Interstate waters and their tributaries, including adjacent wetlands

On August 28, 2015, the EPA finalized the Clean Water Rule: Definition of "Waters of the United States" (EPA 2015a). However, on October 9, 2015, the U.S. Court of Appeals for the Sixth Circuit issued a stay of the rule (EPA 2015b).

For linear waters of the United States, the Ordinary High Water Mark (OHWM) was determined by assessing a combination of factors at each site. In accordance with Sec. 328.3(e) of the Clean Water Act (CWA) and Regulatory Guidance Letter 05-05 (USACE December 5, 2005), the following factors were considered in determining the jurisdictional boundary:

- Natural line impressed on the bank
- Shelving
- Changes in the character of soil
- Destruction of terrestrial vegetation
- Presence of litter and debris
- Wracking
- Vegetation matted down, bent, or absent

- Sediment sorting
- Leaf litter disturbed or washed away
- Scour
- Deposition
- Multiple observed flow events
- Bed and banks
- Water staining
- Change in plant community
- Other appropriate means that consider the characteristics of the surrounding areas

Following the completion of preliminary data gathering and synthesis, the routine method of wetland determination was used to identify potentially jurisdictional areas within the project area. Four crossings, including one spring, were identified during field investigation and potential impacts to these waters are described in **Table 2**. Photographs of the evaluated crossings are included in **Attachment B** of this report.

# 3.0 Results

## 3.1 General Description of the Project Area

### *Vicinity and Project Area*

The proposed project area is located within Williamson County, Texas. The existing ROW is dedicated to transportation use. Land surrounding the existing roadway ROW, consists of commercial uses, residential development, and a small amount of undeveloped land.

### *Geology*

The project area is underlain by several geologic formations: Alluvium and Fluviatile terrace deposits; Del Rio Clay; Georgetown; Edwards Limestone, Buda Limestone, and Eagle Ford Group (TNRIS 2015) (**Figure 3**). Edwards Limestone, with a thickness of 60 to 350 feet, is composed of limestone, dolomite, and chert, which often displays a "honeycombed" pattern and cavernous voids forming an aquifer. More than 95 percent of the caves in Williamson County occur within the Edwards Formation (Reddell and Finch 1967). The Del Rio Clay and Georgetown formations both run north-south through the central part of Williamson County and have an average thickness of 40-70 feet and 30-80 feet, respectively. Although not as consistent in its cave-forming characteristics as the Edwards Limestone, several caves and systems are known from the Georgetown formation (Reddell and Finch 1967). Buda Limestone is a fine-grained mixture of bioclastic (mollusc-fragment-bearing) marl with a formation of 45 to 100 feet thick. The Eagle Ford Group is a mixture of shale and limestone, with an average thickness of 25 to 65 feet. Both the Alluvium and Fluviatile deposits are associated with terraces and floodplains surrounding streams and rivers and often contain gravel (TNRIS 2015). A known fault (Chandler Fault) intersects the project area to the west of Egger Avenue.

The geologic framework of this region creates the foundation for an underground layer of water-bearing permeable rock known as an aquifer. Williamson County lies within the

Northern Segment of the Edwards Aquifer, which also includes portions of Travis and Bell Counties. The proposed project area is located almost within the boundary of the Edwards Aquifer; the western terminus (US 79 intersection with I-35) occurs within the Edwards Aquifer Recharge Zone and the eastern portion of the project is located within the Transition Zone (TCEQ 2005). **Section 3.12** discusses impacts to the Edwards Aquifer Zones in greater detail.

A geologic assessment (GA) was prepared for this project and is available for review at the TxDOT Austin District Office.

### *Soils*

Information regarding soils within the project corridor was obtained from the U.S. Department of Agriculture NRCS Soil Surveys for Williamson County (NRCS 2017). Thirteen soil map units are found within the proposed project area. Information on soils is included in **Table 1** and the soils are shown in **Figure 4**. None of the soil map units are listed in the *National Hydric Soils List* as a hydric soil, though one may contain hydric inclusions (NRCS 2015).

*Table 1: Project Area Soils*

| | Soil Map Unit Code | Soil Map Unit | Hydric (Yes/No) |
|---|---|---|---|
| | BrA | Branyon clay, 0 to 1 percent slopes | No |
| | BrB | Branyon clay, 1 to 3 percent slopes | No |
| | CfA | Crawford clay, 0 to 1 percent slopes | No |
| | CfB | Crawford clay, 1 to 3 percent slopes | No |
| | DoC | Doss silty clay, moist, 1 to 5 percent slopes | No |
| | FaA | Fairlie clay, 0 to 1 percent slopes | No |
| | GsB | Georgetown stony clay loam, 1 to 3 percent slopes | No |
| | HuC2 | Houston black clay, 3 to 5 percent slopes, moderately eroded | No |
| | KsA | Krum silty clay, 0 to 1 percent slopes | No |
| | KsB | Krum silty clay, 1 to 3 percent slopes | No |
| | Of | Oakalla silty clay loam, 0 to 2 percent slopes, frequently flooded | No* |
| | QuC | Queeny clay loam, 1 to 5 percent slopes | No |
| | SuB | Sunev silty clay loam, 1 to 3 percent slopes | No |

*May contain hydric inclusions.
Source: NRCS 2017

### *Hydrology*

The project area is located within the Brazos River Basin. It lies within the Flood Insurance Rate Map (FIRM) Panel 48491C0495E and intersects the 100-year FEMA floodplain associated with Onion Branch (**Figure 5**) (FEMA 2018).

### *Project Area Vegetation*

Vegetation types within the US 79 project area, as determined during field visits by qualified biologists, include Edwards Plateau: Live Oak Motte and Woodland, Native Invasive: Deciduous Woodland, Blackland Prairie: Disturbance or Tame Grassland, Edwards Plateau: Floodplain Hardwood Forest, and Urban Low Intensity. The vegetation noted within the urban areas of existing and proposed ROW primarily consisted of maintained grasses and forbs, dominated by common bermudagrass (*Cynodon dactylon*), St. Augustine grass (*Stenotaphrum secundatum*), and Johnsongrass (*Sorghum halepense*). Vegetation communities observed during the wetland delineation and are described for each crossing in the Wetlands/Waters of the U.S. Delineation Report (provided under separate cover).

## 3.2 Section 404 of the Clean Water Act

### *Descriptions of Water Features Evaluated*

A Wetlands/Waters of the U.S. Delineation Report was prepared for the proposed project by CMEC in September 2018, which identified two potentially jurisdictional waters of the U.S. at four crossings within the project area. The potential waters of the U.S. consisted of two linear waters of the U.S. (Onion Branch and Brushy Creek Spring and run). Historic upland ponds identified through desktop reviews were found to have been obliterated by recent development. One manmade ditch in an upland was investigated and was determined to be a non-jurisdictional feature. **Table 2** summarizes the findings of the Wetlands/Waters of the U.S. Delineation Report and describes the four crossings located within the project area. All proposed roadway and drainage improvements should be designed in a manner to avoid or minimize impacts to jurisdictional crossings.

It is anticipated that impacts would be permitted under Nationwide Permit 14, Linear Transportation Projects. At the time of this report, the project's design information is not detailed enough to allow for impact quantification; however, based on the total aquatic resources in the project area, no Pre-construction notification or compensatory mitigation are anticipated.

*Table 2: Summary of Potential Waters of the U.S. within the US 79 Project Area*

| Single and Complete Crossing # | Name of Water Body | Latitude (decimal degrees) | Longitude (decimal degrees) | Linear Feet/Acres of Potential Waters of the U.S. Within the Existing Right-of-Way | Type of Aquatic Resource | Existing Structure | Geographic Authority to Which the Aquatic Resource "May be" Subject |
|---|---|---|---|---|---|---|---|
| 1 | Onion Branch | 30.518923 | -97.673973 | 205 ln ft/ 0.080 acres | Intermittent Stream | Bridge | Section 404 |
| 2 | Brushy Creek Spring | 30.51726 | -97.661179 | Unknown | Perennial Spring Run | Culvert | Section 404 |
| 3 | NWI Feature | N/A | N/A | 0.0 ln ft/ 0.0 acres | None | N/A | None |
| 4 | Manmade Ditch | 30.518497 | -97.650332 | 17 ln ft/ 0.001 acres | Manmade Ditch | Culvert | None |
| Total Manmade Ditch Linear Feet/Acreage: | | | | 17 ln ft/ 0.001 acre | | | |
| Total Water of the U.S. Linear Feet/Acreage: | | | | 205 ln ft/ 0.08 acres | | | |
| Total Wetland Acreage: | | | | 0.0 acres | | | |

## 3.3 Section 401 of the Clean Water Act

Erosion control, sediment control, and post-construction total suspended solids (TSS) controls would be incorporated into the construction plan to provide for the protection of surface water quality.

## 3.4 Navigable Waters

Section 9 of the Rivers and Harbors Act (RHA) prohibits the construction of any bridge or causeway over or in navigable waterways of the U.S. without Congressional consent and approval through the Secretary of Transportation. The typical permitting process for bridges and causeways, however, was modified by the General Bridge Act of 1946, which granted the consent of Congress for any construction, maintenance, and operation of bridges and approaches over navigable waters of the U.S. that are approved by the U.S. Coast Guard (USCG). The General Bridge Act, therefore, is the relevant regulation for construction of bridges over navigable waters. Under 33 Code of Federal Regulations (CFR) § 2.36, the definition of navigable waters to be used for USCG permitting purposes is as follows:

1. Territorial seas of the United States;
2. Internal waters of the United States that are subject to tidal influence; and
3. Internal waters of the United States not subject to tidal influence that:

    i. are or have been used, or are or have been susceptible for use, by themselves or in connection with other waters, as highways for substantial interstate or foreign commerce, notwithstanding natural or man-made obstructions that require portage; or

    ii. a governmental or non-governmental body, having expertise in waterway improvement, determines to be capable of improvement at a reasonable cost (a favorable balance between cost and need) to provide, by themselves or in connection with other waters, as highways for substantial interstate or foreign commerce.

No navigable waterways pursuant to Section 9 or Section 10 of the RHA or the General Bridge Act are located within the proposed project area.

## 3.5 Floodplains

The project area is located within the Brazos River Basin. It lies within the Flood Insurance Rate Map (FIRM) Panel 48491C0495E and intersects the 100-year FEMA floodplain associated with Onion Branch (**Figure 5**) (FEMA 2018). Coordination with the local floodplain administrator would be required.

### *Executive Order – Floodplain Management*

Executive Order 11988 directs each federal agency to take action to reduce the risk of losses associated with floods, to minimize the impact of floods on human health and safety, and to preserve the beneficial values of floodplains. Compliance with Executive Order 11988 is required for projects that are federally undertaken, financed, or assisted and that involve a floodplain encroachment, which is an action within the limits of the base floodplain. Although the proposed project intersects the 100-year floodplain, a significant encroachment of the floodplain is not expected and coordination with the local floodplain administrator would satisfy the requirements of this Executive Order.

## 3.6 Water Quality

### *Section 303(d) of the Clean Water Act*

The project area is located within the Turkey Creek-Brushy Creek watershed (HUC# 12040101). Storm water runoff from the project area flows into Brushy Creek, which is identified as assessment Segment 1244 by the TCEQ. This stream segment is listed as impaired due to elevated bacteria levels. The proposed project is not anticipated to contribute to the constituents of concern for this impaired water. Stormwater best management practices would be designed to treat roadway runoff prior to discharging into nearby streams. The TCEQ 2014 303(d) list, approved on November 19, 2015, was utilized in this assessment.

### *Section 402 of the Clean Water Act: Texas Pollutant Discharge Elimination System*

The proposed project would include five or more acres of earth disturbance. TxDOT would comply with the TCEQ's Texas Pollutant Discharge Elimination System (TPDES) Construction General Permit. Efforts would be made to avoid and minimize impacts to the aquatic ecosystem during roadway design. Minimization would be achieved by preparing and implementing a Stormwater Pollution Prevention Plan (SW3P), and by implementing Best Management Practices (BMPs), including temporary erosion, sedimentation, and TSS water pollution controls. All temporary erosion controls would be in compliance with TxDOT Standard Specifications and would be in place, according to the construction plans, prior to commencement of construction-related activities. The contractor would take appropriate measures to prevent, minimize, and control the spill of fuels, lubricants, and hazardous materials in the construction staging area. A construction site notice would be posted. A Notice of Intent (NOI) and Notice of Termination (NOT) would be required.

### *Section 402 of the Clean Water Act: Municipal Separate Storm Sewer System*

Since TPDES CGP authorization and compliance (and the associated documentation) occur outside of the environmental clearance process, compliance is ensured by the policies and procedures that govern the design and construction phases of the projects. The Project Development Process Manual and the Plans, Specifications, and Estimates (PS&E) Preparation Manual require an SW3P be included in the plans of all projects that disturb one or more acres. The Construction Contract Administration Manual requires that the appropriate

CGP authorization documents (NOI or site notice) be completed, posted, and submitted, when required by the CGP, to TCEQ and the MS4 operator. It also requires that projects be inspected to ensure compliance with the CGP.

The PS&E Preparation Manual requires that all projects include Standard Specification Item 506 (Temporary Erosion, Sedimentation, and Environmental Controls), and the "Required Specification Checklists" require Special Provision 506-003 on all projects that need authorization under the CGP. These documents require the project contractor to comply with the CGP and SW3P and complete the appropriate authorization documents.

## 3.7 Executive Order 11990, Wetlands

Executive Order 11990, Protection of Wetlands (issued in 1977), requires Federal agencies to minimize the destruction or modification of wetlands. No impacts to wetlands are anticipated; therefore, Executive Order 11990 does not apply to the proposed project.

## 3.8 Texas Coastal Management Program

The project is located within Williamson County; therefore, the proposed project does not lie within a coastal county. No coordination would be required.

## 3.9 Coastal Barrier Resources Act

The Coastal Barrier Resources Act (CBRA) was enacted in 1982 to discourage development in certain coastal areas along the Atlantic and Gulf coasts. The act designated certain undeveloped coastal areas as coastal barrier/system units under the Coastal Barrier Resources System (CBRS), and made those units ineligible for most new federal expenditures and financial assistance.

The proposed project is located within Williamson County and is not located within a CBRS system unit or otherwise protected area; therefore, CBRA is not applicable.

## 3.10 Trinity River Corridor Development Certificate

The project is located outside the Trinity River Corridor Development Regulatory zone. A Corridor Development Certificate would not be required.

## 3.11 Wild and Scenic Rivers

This project would not involve work within a segment of any river designated as a Wild and Scenic River, and it would not harm the free-flowing condition, water quality, or outstanding resource values of any designated Wild and Scenic Rivers.

## 3.12 Edwards Aquifer

The Edwards Aquifer is a major aquifer located in the south-central part of the state and crosses eight Texas counties: Williamson, Travis, Hays, Comal, Bexar, Medina, Uvalde, and Kinney. The Edwards Aquifer is primarily composed of partially dissolved limestone in

thicknesses ranging from 200 to 600 feet and is highly permeable, having sinkholes, caves, surface faults, and fractures. As a result, water levels and spring flows within the Edwards Aquifer respond quickly to rainfall, drought, and pumping. This aquifer provides water for municipal, industrial, and agricultural uses, and sustains a number of rare and endangered species. The Edwards Aquifer is comprised of three segments: Northern Segment, Barton Springs Segment, and San Antonio Segment; the proposed US 79 project is situated within the Northern Segment of the aquifer.

The Edwards Aquifer includes three primary zones: the Contributing Zone, the Recharge Zone, and the Transition Zone. These zones are depicted on **Illustration 1**; summary descriptions provided below are paraphrased from Eckhardt (2016).

- The Contributing Zone. Water from the Contributing Zone flows over relatively impermeable limestones until it reaches the Recharge Zone. The Contributing Zone is located on the Edwards Plateau and "catches" water from rainfall events in streams that flow into the Recharge Zone. The Contributing Zone within the Edwards Plateau generally occurs in the Texas Hill Country. This zone is about 5,400 square miles, with elevations ranging between 1,000 and 2,300 feet above sea level. Rainfall averages about 30 inches per year in this zone, and water runs off into streams or infiltrates into the water table.
- The Recharge Zone. The Recharge Zone is an area where highly fractured and faulted Edwards limestones outcrop at the land surface allowing large quantities of water to flow into the aquifer. The aquifer in the Recharge Zone is unconfined and has a water table that rises and falls in response to rainfall. Water works its way down through gravity into the transition/artesian zone. The Recharge Zone is about 1,250 square miles and is located along the Balcones Fault. About 75-80 percent of the recharge occurs when streams and rivers cross the porous formation and go underground. The remaining recharge amount is the result of precipitation.
- The Transition Zone. The Transition Zone includes a thin strip of land south and southeast of the Recharge Zone from San Antonio to Austin. Limestones that overlie the Edwards Aquifer in this area is faulted and fractured and has caves and sinkholes that allow surface water entry into the aquifer.

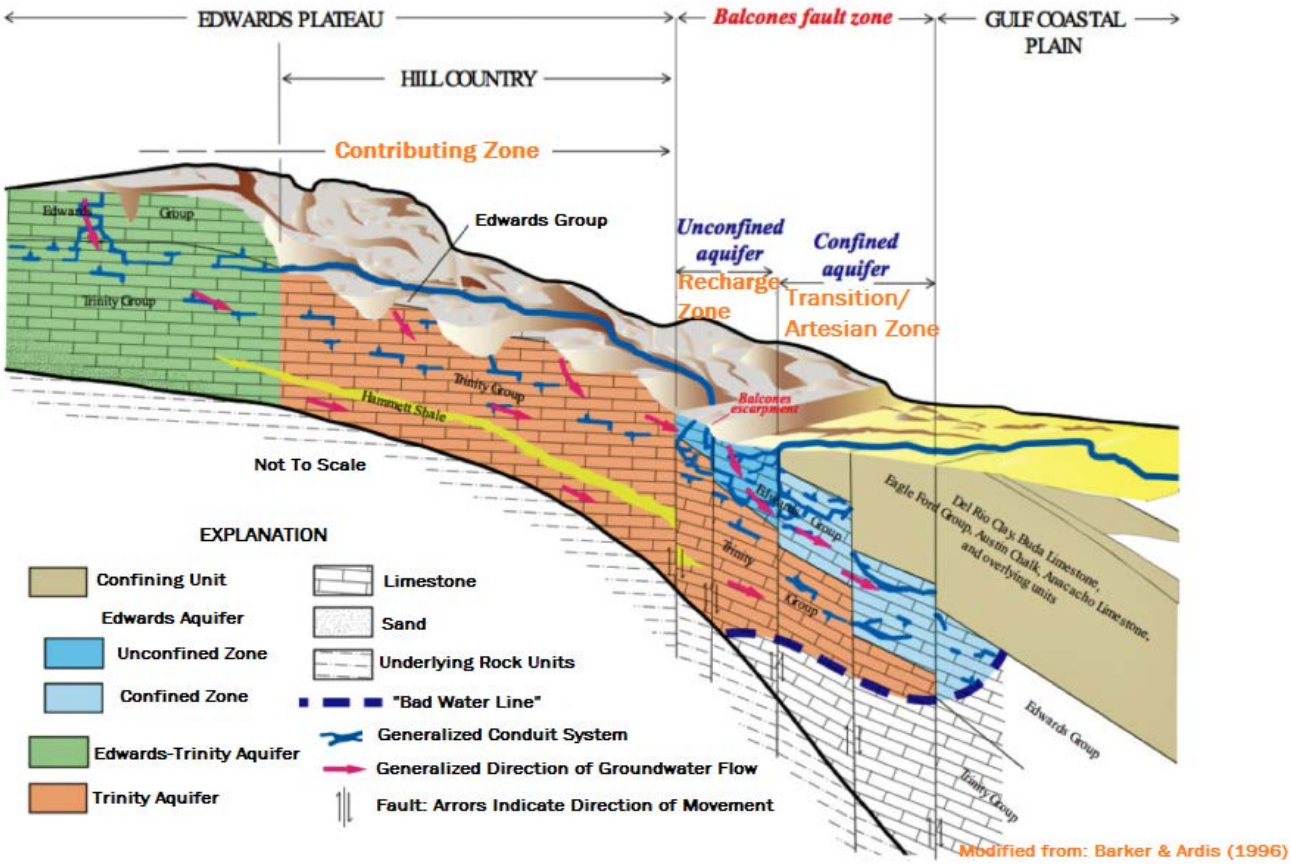


Illustration 1. Edwards and Trinity Aquifer Positions

Aquifers are generally recharged by direct precipitation on the land surface, but a number of factors including topography, streamflow characteristics, soils, geology, faulting, land-use, and distribution of precipitation will impact the amount of water that is recharged into or discharged from the aquifer (Ryder 1996). Karst landscapes have unique hydrogeology that results in aquifers that are highly productive but extremely vulnerable to contamination (Mahler and Massei 2007). Most of the recharge in karst regions occurs as point recharge into solution cavities or karst features. These features often form a network of subterranean flowpaths that allow for rapid transportation through the aquifer. Rapid transportation typically results in short residence times and little to no filtration, which minimizes the opportunity for sediment, pathogens, and chemicals to settle out, degrade, or become inert (Mahler et al. 2011). A GA was conducted for all publicly accessible land within the project area and is available for review at the TxDOT Austin District. According to the GA, two features (Brushy Creek Spring and Chandler Fault) were identified by geologists during field investigation. Only Brushy Creek Spring was ranked as sensitive with the potential for rapid infiltration into the aquifer when the spring is not flowing.

The proposed projects occur within the Recharge and Transition Zones of the Edwards Aquifer; therefore, an Edwards Aquifer Protection Plan would be required and coordinated through the TCEQ. Potential impacts on water quality related to roadway construction and operation can quickly translate to the aquifer and springflow environments. If contaminants such as heavy metals, oil, nutrients, or pesticides are mobilized by stormwater they could flow into Brushy Creek and enter the aquifer through faults, fractures, or other unidentified recharge features. Without appropriate BMP implementation, sediment-laden water may enter recharge features via overland flow or the stream bed and could bring contaminants into aquifer and downstream spring outflow environments.

The greatest possibility for groundwater impacts during the construction phase of the proposed project could occur if voids connected to the aquifer or containing groundwater are intersected during the down cutting of bedrock below the current grade or other excavation activities, such as bridge piers. Additionally, previously unknown caves and recharge features may be impacted by construction activities in this area. Trenching and boring may create, uncover, or enlarge openings, changing the hydrology and atmospheric conditions of newly discovered features. New or enlarged openings may allow for runoff to enter aquifer conduits with little to no opportunity for pollution attenuation from natural methods such as soil percolation. The accidental discovery of recharge features or other underground voids may require them to be partially or completely plugged, which could lead to their removal from the recharge matrix. If voids are encountered during construction, 30 TAC 213.5(f)(2) rule requires that activities near the void cease until a geologist evaluates the void and develops a void mitigation plan. The void mitigation plan must be certified by the geologist, submitted to the TCEQ, and approved prior to the implementation of mitigation, and before continuing construction in the vicinity of the void. In addition, a section 10(A)(1)(a) permitted scientist should inspect the site as soon as possible to evaluate potential species habitat due to the projects location in sensitive karst zones.

The proposed improvements would incorporate a variety of approved practices for managing stormwater runoff during all phases of the project in order to attenuate the potential impacts to groundwater. During construction, TCEQ-approved measures to reduce erosion and maintain sediment on site would be implemented and documented in the SW3P.

According to the TxDOT-TCEQ 2013 MOU, the project would require coordination with the TCEQ because the project is classified as an Environmental Assessment and is located within the boundary of the Edwards Aquifer Zones. BMPs for limiting impacts to water quality in the project area will be developed once an alternative has been selected. BMPs can include both permanent controls such as stormwater detention ponds, vegetative filter strips, and hazardous material traps and temporary controls such as silt fencing and dust abatement. BMPs are used to limit the amount of sediment entering the surface water and groundwater from the project area during the construction and operational phases. The project activities would be implemented, operated, and maintained in a manner that complies with the

Edwards Aquifer rules and any applicable TCEQ guidance documents in effect to implement the rules.

## 3.13 Groundwater

A review of the Texas Water Development Board's (TWDB) Water Data Interactive Viewer (TWDB 2018) indicated that six water supply wells occur within one-quarter mile of the project area (**Table 3** and **Figure 5**).

*Table 3: Summary of Wells within ¼-mile of the US 79 Project Area*

| | Well Number | Primary Use | Well Depth (feet) | Distance from ROW (miles) |
|---|---|---|---|---|
| | 5827839 | Public Supply/Withdrawal of water | 190 | 1,000 |
| | 5827810 | Public Supply/Withdrawal of water | 302 | 1,237 |
| | 5827809 | Public Supply/Withdrawal of water | 341 | 1,232 |
| | 5827808 | Public Supply/Withdrawal of water | 345 | 1,560 |
| | 5827918 | Public Supply/Withdrawal of water | Unk. | 135 |
| | 5827916 | Public Supply/Withdrawal of water | 380 | 485 |

Source: TWDB 2018

The proposed project is not anticipated to affect any public or private water supply wells.

## 3.14 International Boundary and Water Commission

The project would not be located within the floodplain of any international waters; therefore, coordination with the International Boundary and Water Commission (IBWC) would not be required.

## 4.0 Conclusions

Two potentially jurisdictional waters of the U.S. were identified within the proposed project area. The potential waters of the U.S. consisted of one creek (Onion Creek), and one spring (Brushy Creek Spring). All proposed roadway and drainage improvements should be designed in a manner to avoid or minimize impacts to jurisdictional crossings. It is anticipated that impacts would be permitted under an NWP without a pre-construction notification.

The project would be required to submit an application to TCEQ for authorization under the CGP. As such, completion and implementation of a SW3P, filing of an NOI with TCEQ, and posting of a construction site notice would be required. The project would require coordination with the TCEQ per the requirements of the TxDOT-TCEQ 2014 Memorandum of Understanding due to its location over the Edwards Aquifer and its classification as an EA.

An NOI would be submitted to the local MS4 operators.

## 5.0 References


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This report was prepared on behalf of the Texas Department of Transportation by:

Attachment A

Figures

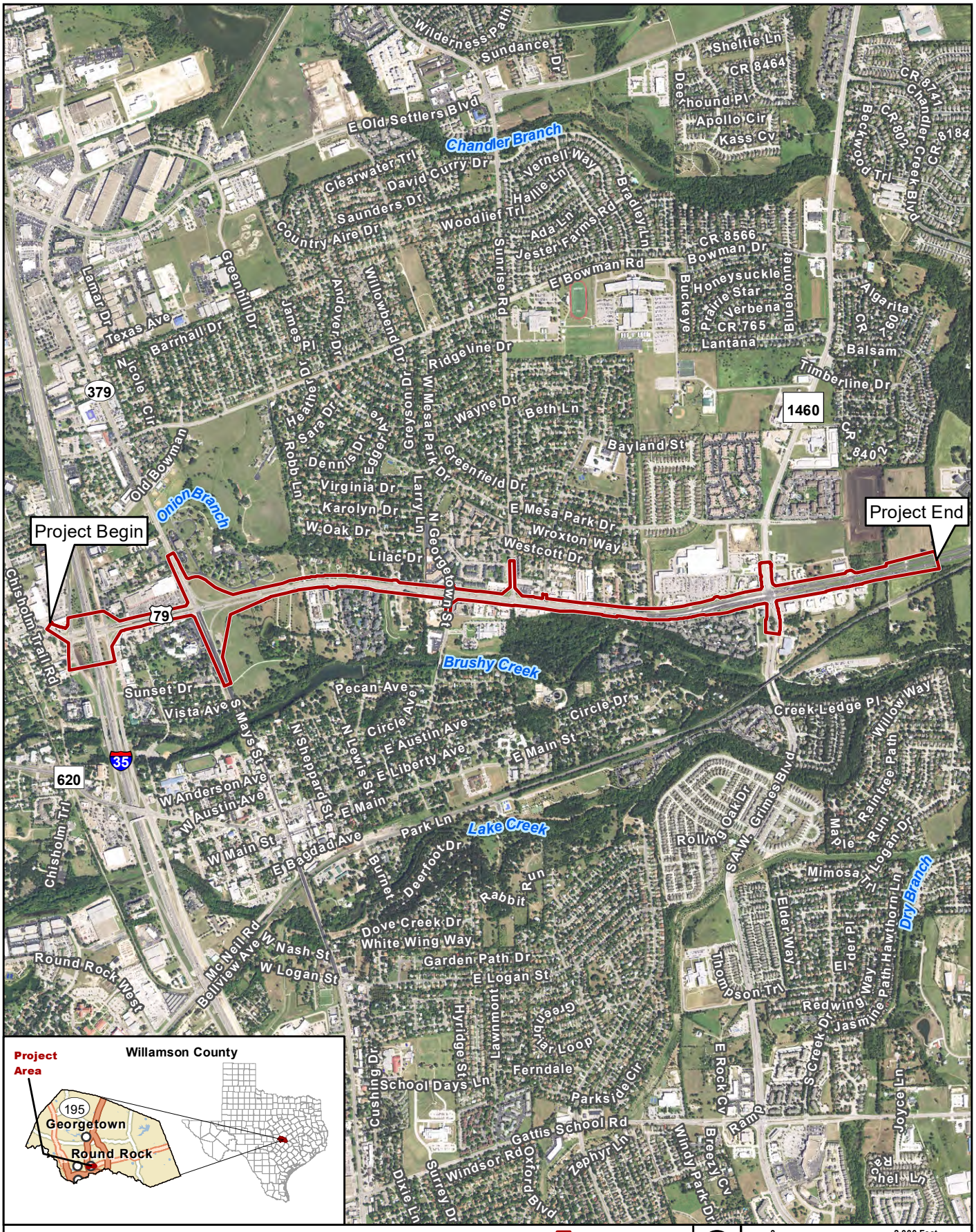


**Figure 1**

**Project Location (Aerial Base)**

**US 79 from I-35 to FM 1460**

Project Location

Aerial Source: NAIP (2016)

0 2,000 Feet

0 500 Meters

| | |
|---|---|
| Prepared for: TxDOT | 1 in = 2,000 feet |
| | Scale: 1:24,000 |
| CSJ: 0204-01-063 | Date: 8/16/2018 |

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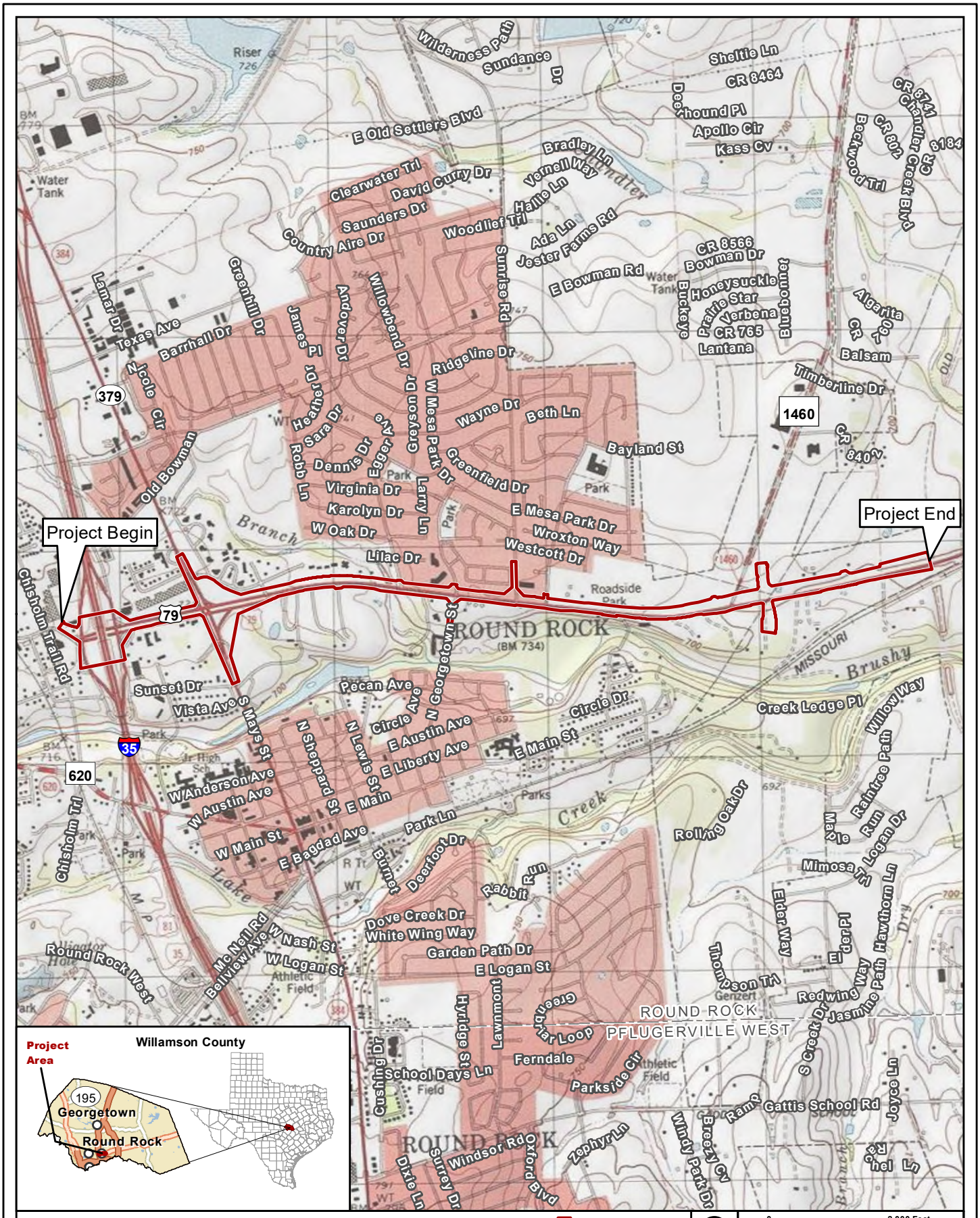


**Figure 2**

**Project Location (Topographic Base)**

**US 79 from I-35 to FM 1460**

| | |
|---|---|
| Prepared for: TxDOT | 1 in = 2,000 feet |
| | Scale: 1:24,000 |
| CSJ: 0204-01-063 | Date: 8/16/2018 |

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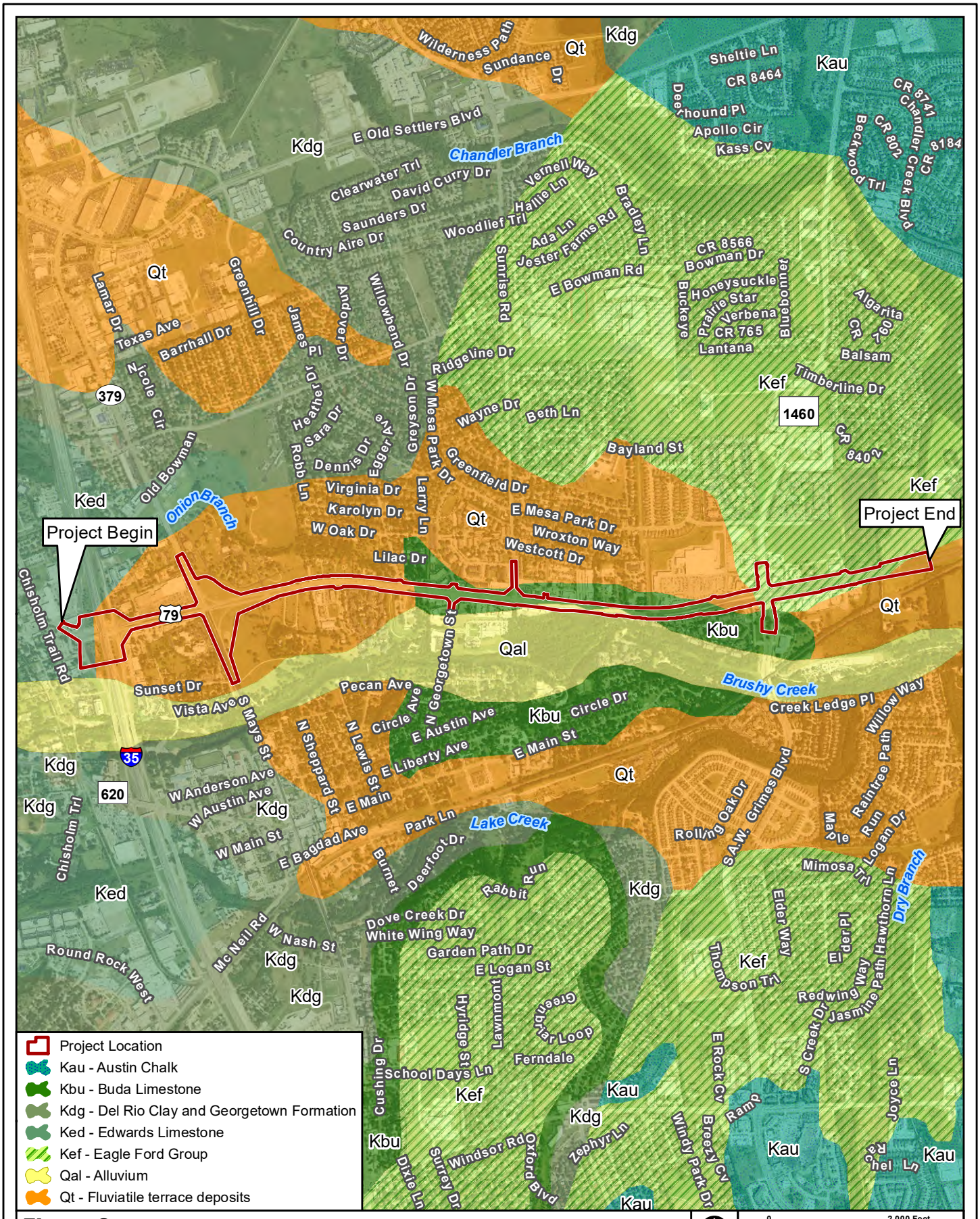


**Figure 3**

**Project Area Geology**

**US 79 from I-35 to FM 1460**

Data Source: Geologic Database of Texas (2007)/
Geologic Atlas of Texas Austin Sheet (1981)
Aerial Source: NAIP (2016)

| | |
|---|---|
| Prepared for: TxDOT | 1 in = 2,000 feet |
| | Scale: 1:24,000 |
| CSJ: 0204-01-063 | Date: 8/16/2018 |

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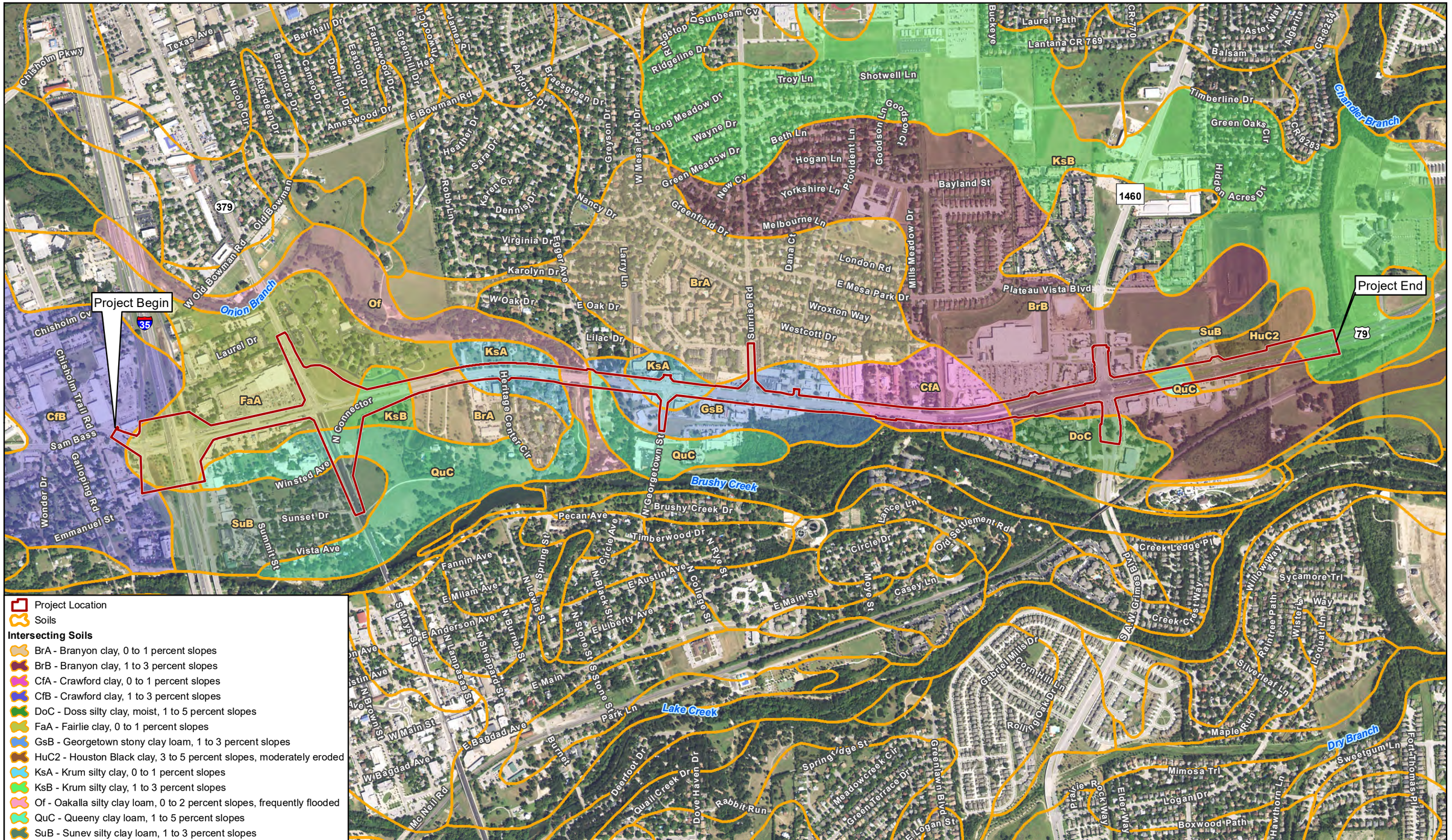


**Figure 4**

**Project Area Soils**

**US 79 from I-35 to FM 1460**

Data Source: NRCS (2017)
Aerial Source: NAIP (2016)

| | |
|---|---|
| Prepared for: TxDOT | 1 in = 1,000 feet |
| | Scale: 1:12,000 |
| CSJ: 0204-01-063 | Date: 8/16/2018 |

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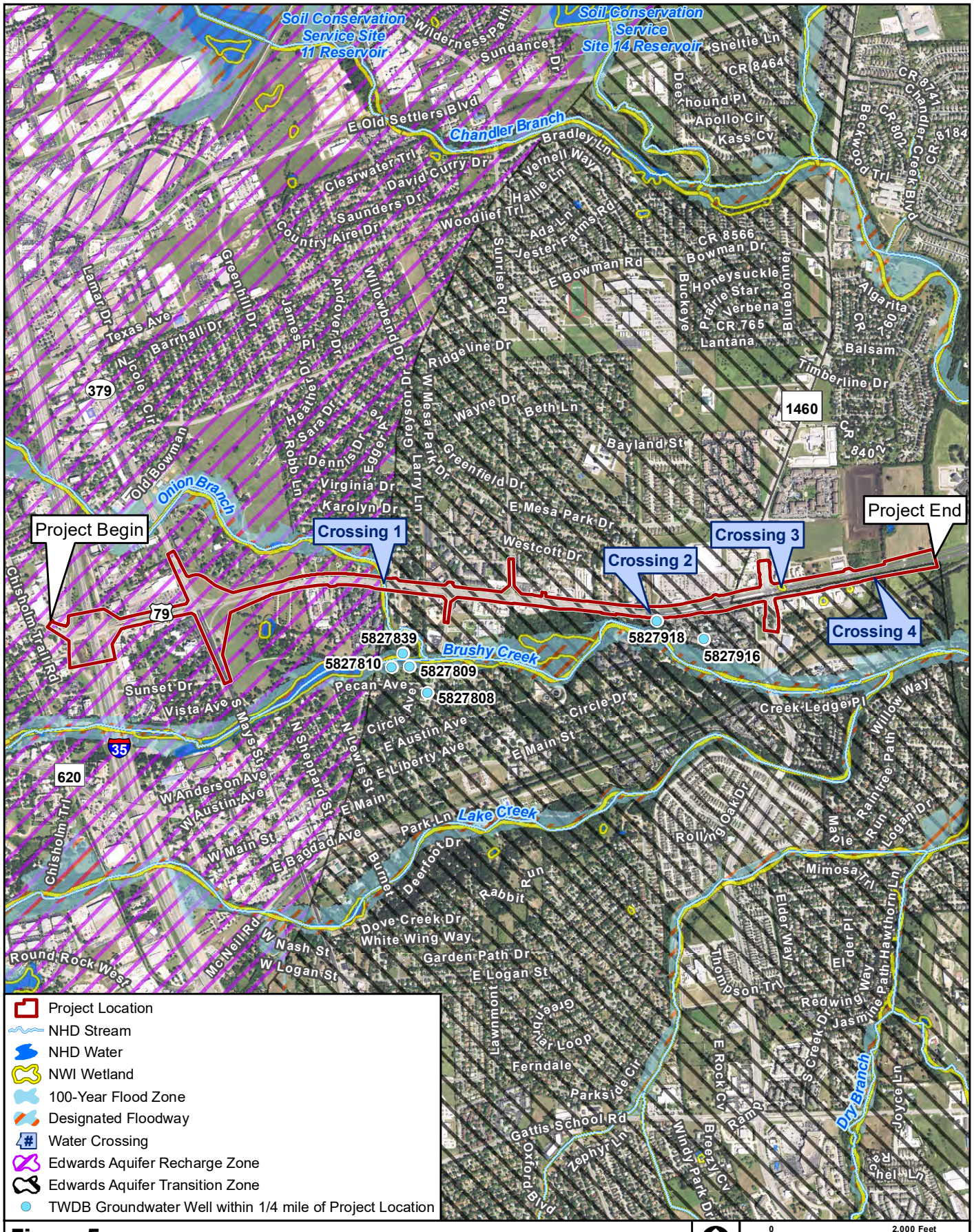


**Figure 5**

**Water Resources**

**US 79 from I-35 to FM 1460**

Data Sources: NHD (2018), NWI (2018), FEMA NFHL (2018), CMEC (2018), TWDB (2018), TCEQ (2005), Aerial Source: NAIP (2016)

0 2,000 Feet
0 500 Meters

| | |
|---|---|
| Prepared for: TxDOT | 1 in = 2,000 feet |
| | Scale: 1:24,000 |
| CSJ: 0204-01-063 | Date: 9/6/2018 |

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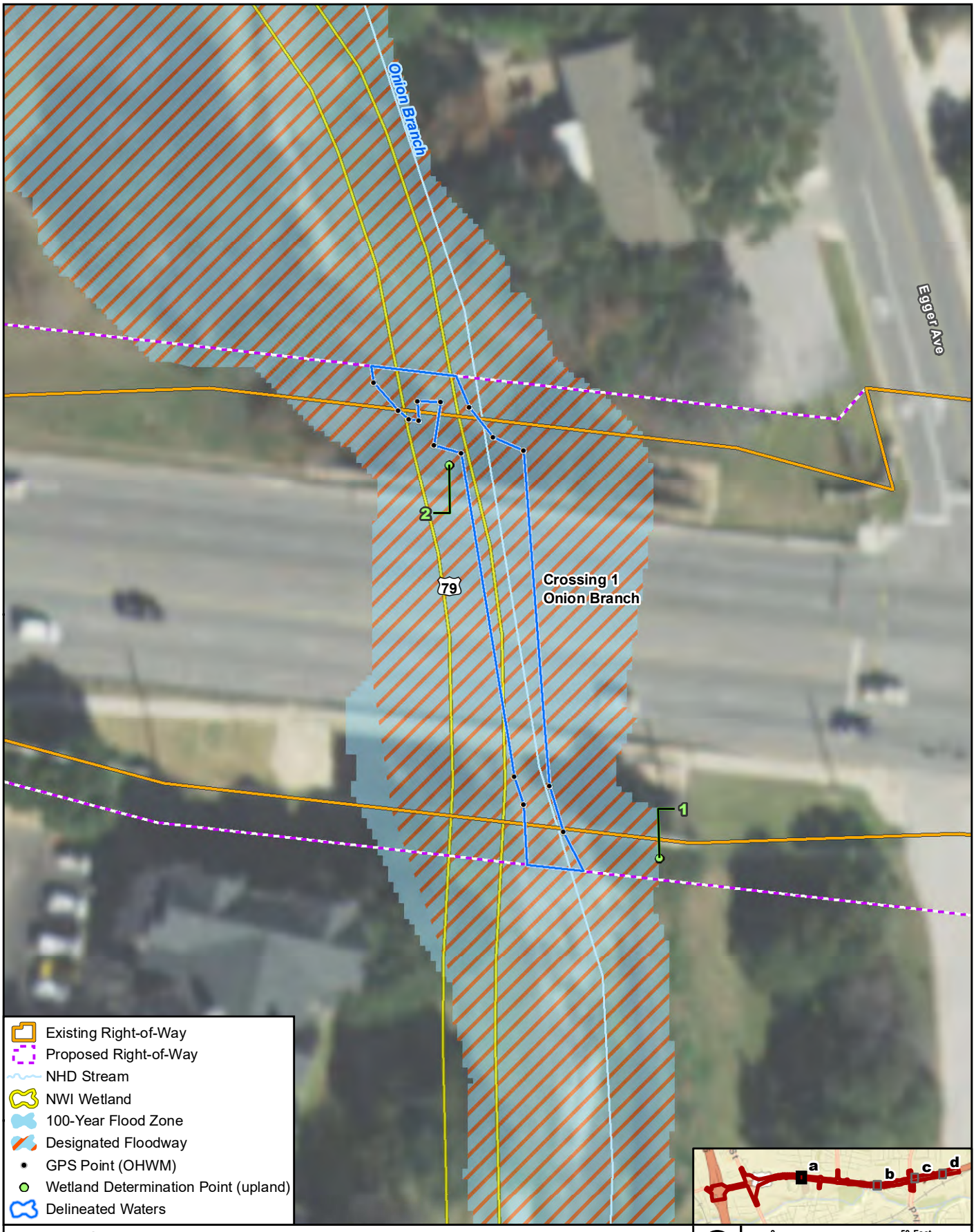


# Figure 6a

## Potential Waters of the U.S.

**US 79 from I-35 to FM 1460**

Data Sources: NHD (2018), NWI (2018), FEMA NFHL (2018), CMEC (2018)
Aerial Source: ESRI (2017)

| | |
|---|---|
| Prepared for: TxDOT | 1 in = 50 feet |
| | Scale: 1:600 |
| CSJ: 0204-01-063 | Date: 9/5/2018 |

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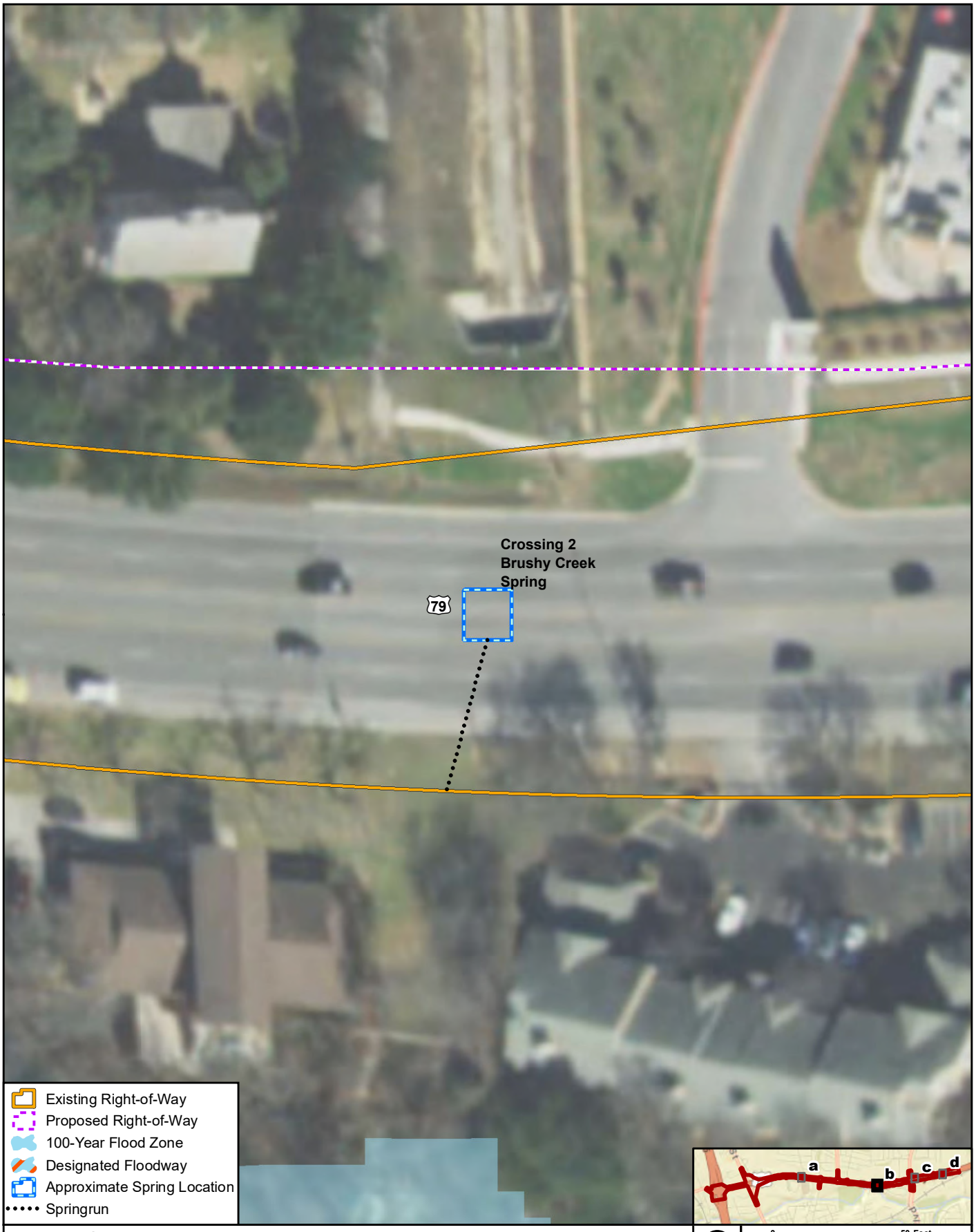


**Figure 6b**

**Potential Waters of the U.S.**

**US 79 from I-35 to FM 1460**

Data Sources: NHD (2018), NWI (2018), FEMA NFHL (2018), CMEC (2018)
Aerial Source: ESRI (2017)

| | |
|---|---|
| Prepared for: TxDOT | 1 in = 50 feet |
| | Scale: 1:600 |
| CSJ: 0204-01-063 | Date: 9/5/2018 |

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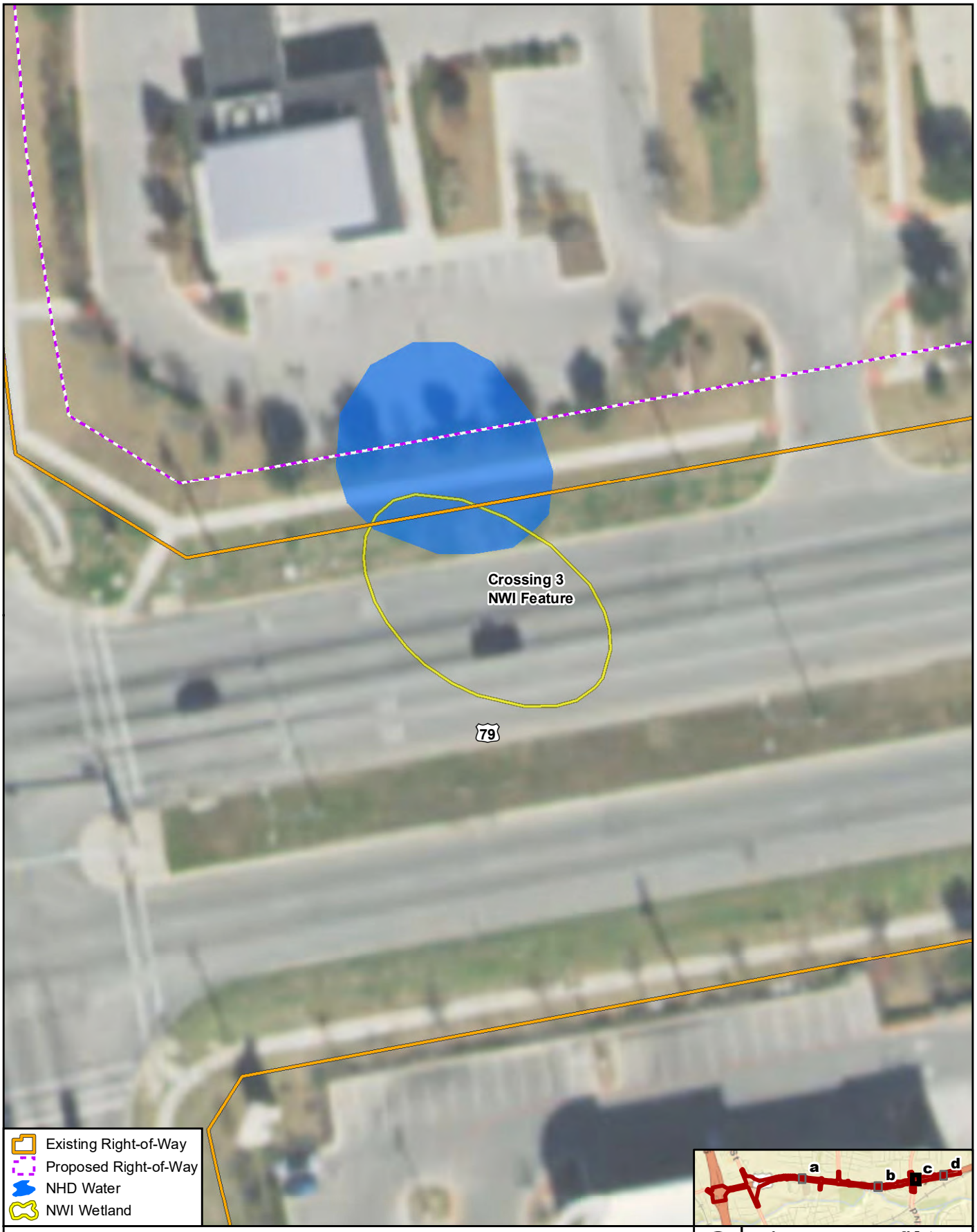


**Figure 6c**

**Potential Waters of the U.S.**

**US 79 from I-35 to FM 1460**

Data Sources: NHD (2018), NWI (2018), FEMA NFHL (2018), CMEC (2018)
Aerial Source: ESRI (2017)

| | |
|---|---|
| Prepared for: TxDOT | 1 in = 50 feet |
| | Scale: 1:600 |
| CSJ: 0204-01-063 | Date: 9/5/2018 |

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**Figure 6d**

**Potential Waters of the U.S.**

**US 79 from I-35 to FM 1460**

Data Sources: NHD (2018), NWI (2018), FEMA NFHL (2018), CMEC (2018)
Aerial Source: ESRI (2017)

| | |
|---|---|
| Prepared for: TxDOT | 1 in = 50 feet |
| | Scale: 1:600 |
| CSJ: 0204-01-063 | Date: 9/5/2018 |

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Attachment B

Project Area Photographs

Photo 1: Crossing 1 - Onion Branch, viewing northwest.

Photo 2: Crossing 1 - Bridge at Onion Branch, viewing west.

Photo 3: Crossing 1 - Upstream at Onion Branch, viewing north. Note exposed bedrock streambed and minimal surface flow.

Photo 4: Crossing 1 - Concrete slab and rubble downstream of US 79 in Onion Branch, viewing south.

Photo 5: Crossing 1 - Scour pool under the existing US 79 Bridge, viewing north (upstream).

Photo 6: Crossing 1 - Scoured areas and flood debris associated with existing bridge piers.

Photo 7: Crossing 1 - Onion Branch, north of US 79, viewing north. Note concrete slab and underground utilities.

Photo 8: Crossing 1 - Onion Branch. Flow is left to right. The concrete slab encased the (broken) pipe that intersects the stream.

Photo 9: Crossing 1 - Concrete-lined water quality pond adjacent to the right bank of Onion Branch south (downstream) of the US 79 bridge, viewing southwest.

Photo 10: Crossing 2 - Pilot channel for stormwater infrastructure connected to the culvert where the Brushy Creek Spring emanates. Flow is toward the photo point. US 79 is behind the photo point. Note the small (~4-inch) pipe above the headwall of the culvert's inlet.


Photo 11: Crossing 2 - Alternate view of the culvert's headwall, viewing west. Note the pipe and US 79 (right of frame). The small pipe connects to an inlet in the ditch adjacent to US 79 that drains stormwater from the roadway and surrounding area.

Photo 12: Crossing 2 - Culvert's inlet. Note the wet area of the headwall is under the small pipe's outlet and that the pilot channel is dry. Spring flow inside the culvert resulted in considerably larger volumes of flow, viewing south (downstream).

Photo 13: Crossing 2 - View south along the alignment of the culvert. US 79 is behind the photo point. The culvert's outfall and Brushy Creek are over the bluff that begins just beyond the maintained lawn (outside of right of way).

Photo 14: Crossing 3 - View northwest across recently developed area in the vicinity of the westernmost manmade pond that was identified through desktop analysis. US 79 is in the foreground and FM 1460 is in the distance.


Photo 15: Crossing 3 - Alternate view of the area shown in Photo 16. US 79 is in the foreground and FM 1460 is in the distance, viewing north-northwest.


Photo 16: Crossing 3 - View west across recently developed area in the vicinity of the manmade ponds south of US 79 that were identified through desktop analysis. An unnamed access drive is in the foreground and US 79 is in the distance.

Photo 17: Crossing 4 - View south (downstream) along the manmade ditch. Note the concrete headwall in the foreground. US 79 is behind the photo point.

Photo 18: Crossing 4 - View north (upstream) toward the culvert that discharges to the manmade ditch.

Photo 19: Crossing 4 - View south (downstream) along the manmade ditch. Note the steep banks and straight alignment of the trapezoidal channel.

Photo 20: Crossing 4 - View east along the roadside ditch adjacent to US 79 (right of frame). Note the inlet in the foreground. This is one of several inlets that flow to the culvert that discharges into the manmade ditch, viewing east.

Photo 21: Crossing 4 - View west along a roadside ditch and US 79 (left of frame). Note the pictured inlet, which is one of several that flow to the culvert that discharges to the manmade ditch.