DRAFT ENVIRONMENTAL ASSESSMENT

MODIFICATION TO THE FEDERAL FORT WORTH FLOODWAY PROJECT FOR TARRANT COUNTY COLLEGE DISTRICT'S DOWNTOWN CAMPUS BRIDGE

TARRANT COUNTY, TEXAS

PREPARED FOR

UNITED STATES ARMY CORPS OF ENGINEERS

FORT WORTH DISTRICT

BY

TARRANT COUNTY COLLEGE DISTRICT

FEBRUARY 2008

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1.0. Introduction

1.1. Background

In order to meet the growing needs within the central city area, the Board of Trustees of the Tarrant County College District (TCCD) decided in 2003 that a fifth TCCD college campus would be opened in downtown Fort Worth to serve the downtown and near north side populations. By the summer of 2004, the TCCD Board determined that no single available property was large enough to accommodate the total needs of the Downtown Campus for projected student enrollment capacity, thus the decision was made to acquire multiple contiguous properties on both sides of the Trinity River with the bulk of property located on the north side of the river. A bridge across the river would be needed to connect the south and north portions of the campus. The southernmost portion of the subject property has been designated as an entrance to the campus and a connection for the Downtown population with both sides of the river, thus integrating the campus into existing City of Fort Worth plans for the area. The south and north portions are adjacent to the Main Street Bridge on both sides of the Trinity River.

A team was assembled to explore alternatives for the campus development and recommend a master plan to meet the public's current and future higher education needs. The team included members from the TCCD Board of Trustees, City of Fort Worth, local chambers of commerce, businesses, and adjacent landowners. The team produced a number of functional alternatives for the layout and provided a campus Master Plan recommendation.

The campus master plan identifies an ultimate need for approximately one million square feet of classroom, laboratory, administrative, and assembly space that will be needed to accommodate approximately 20,000 students by the year 2023. The campus master plan has been designed in such a way that it can be integrated with the proposed Trinity River Vision, which includes the construction of a new Trinity River bypass channel. The first phase of the campus development would be constructed prior to elimination of the levees, which would occur after completion of the Central City project. As a result, the new campus buildings and pedestrian bridge constructed in the first phase of the project must continue to accommodate the existing levees.

The implementation of the proposed layout of the campus is such that a portion of the TCCD project lies within the limits of the Fort Worth Floodway, which significantly impacts the federal project, and therefore requires approval by the Chief of Engineers under 33 USC 408. Under this title, temporary or permanent alteration, occupation, or use of any public works, including levees, for any purpose is only allowable with the permission of the Secretary of the Army. Under the terms of 33 USC 408, any proposed levee modification requires a determination by the Secretary that the proposed alteration, permanent occupation, or use of a federal project is not injurious to the public interest and will not impair the usefulness of the levee. The authority to make this determination and approve modifications to federal works under 33 USC 408 has been delegated to the Chief of Engineers, U.S. Army Corps of Engineers (USACE).

Project Description

Figure 1 provides a general location of the project area, **Figure 2** provides an aerial view depicting the project area and photographs of the project area are presented in **Figure 3**. A summary of the portions of the Downtown Campus Project that interact with the levee, as related to flood control projects and waterways are as follows:

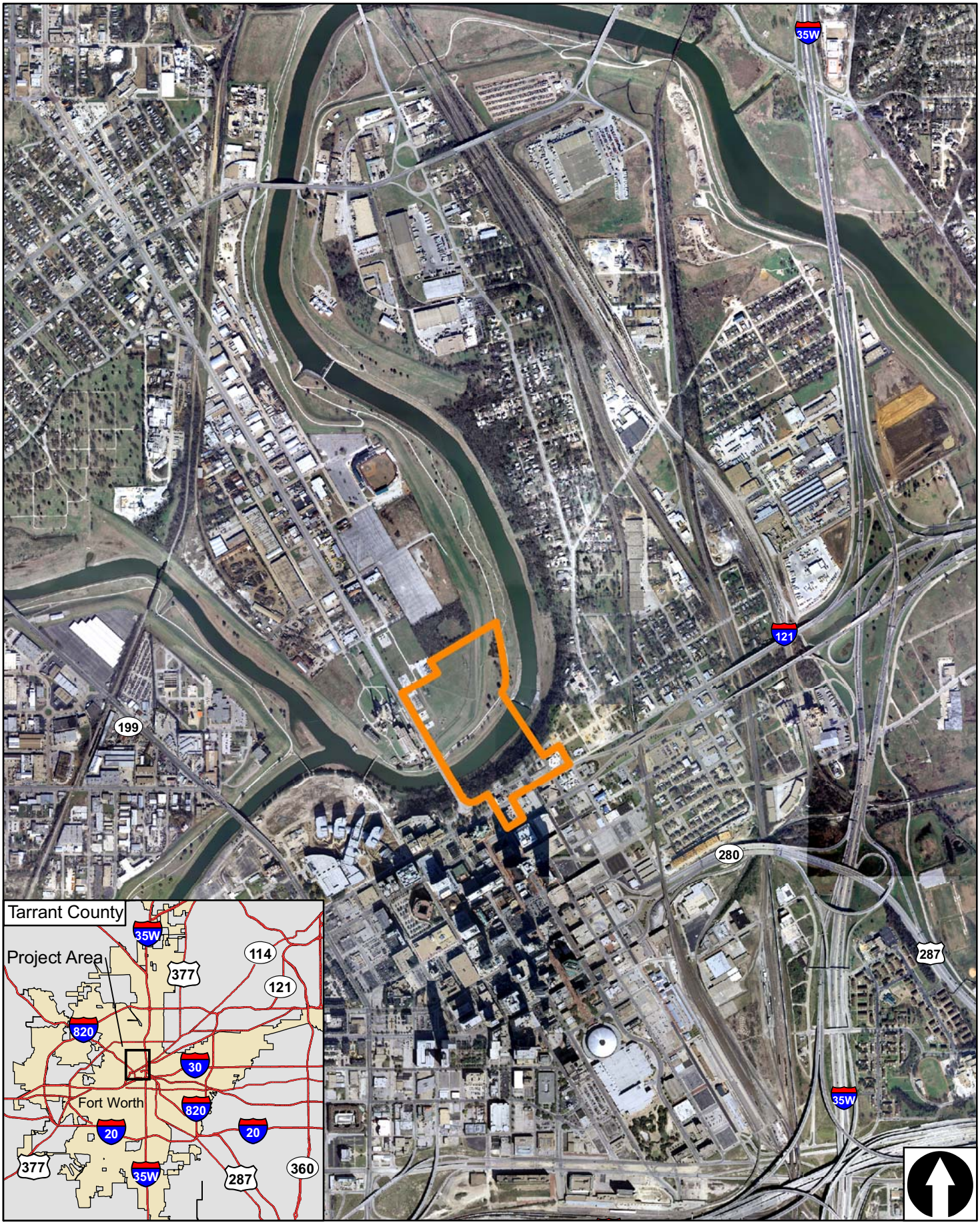

Figure 1 - Project Location Map

TCCD Environmental Assessment

Feet

0 1,000 2,000

Legend

Project Area

Sources: U.S. Geological Survey, NCTCOG

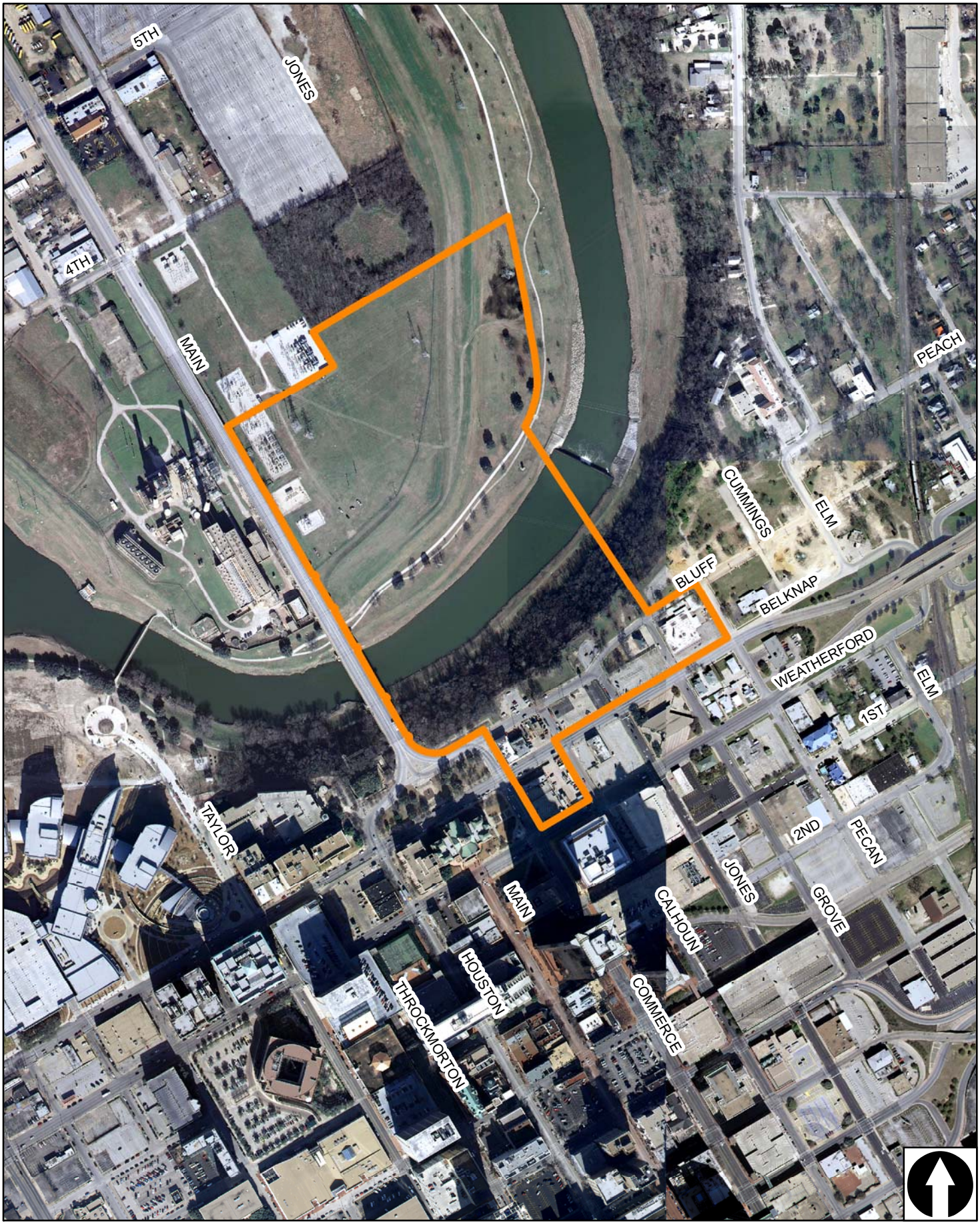

Figure 2 - Project Area Map

TCCD Environmental Assessment

Feet
0 250 500

Legend

Project Area

Sources: U.S. Geological Survey, NCTCOG

Figure 3 – Site Photographs

Photograph 1: Looking southeast at the proposed downtown campus and pedestrian bridge location

Photograph 2: Looking southwest at the existing Main Street bridge

Photograph 3: Looking southeast at the approximate location of the temporary work bridge

Photograph 4: Looking southeast from the Main Street bridge at the southern bank of the Trinity River

Photograph 4: Looking southeast at the southern bank of the Trinity River

Photograph 5: Looking southwest at a portion of the Trinity River Trail

Photograph 7: Looking northeast from the Main Street bridge at the proposed Downtown Campus Site

Photograph 8: Looking southwest from the Main Street bridge at the proposed Downtown Campus Site

Photograph 9: Looking southeast at the portion of the riverbank downstream from the proposed pedestrian bridge

Photograph 10: Looking northwest at the approximate location of the northern storm water outfall

- Piers in and near the above grade portion of the levee on the north side of the Trinity River that support the pedestrian bridge and campus buildings;
- Piers in the levee template below grade that are foundations for campus buildings;
- Temporary piers in the river that support the falsework and work bridges needed to construct the pedestrian bridge;
- Excavation on the dry side of the levee;
- Construction of storm drains and associated outfalls; and
- Realignment of the hike and bike trail and maintenance access roadway.

A more detailed description of the structures within the floodway is provided in Section 2.2.2. and 2.2.3.

1.2. System Overview and History of Flood Protection System

Flood damage reduction systems were constructed by Fort Worth local interests in 1910 in the form of levees. In 1922, these levees were overtopped by a flood. As a result, the height of levees was increased during the repairs. Further work on the levees was completed in 1936 using Works Progress Administration (WPA) funds. Additional modifications were made by local interests in 1942. The Fort Worth Floodway, as a federal project, was authorized by Section 2 of Public Law No.14, 79th Congress, 2nd Session approved March 2, 1945.

The federal project was initiated in 1950 and the central downtown segment was completed in September 1957. As part of these improvements, earthen levees were constructed along the Clear Fork channel from Lancaster Street to its confluence with the West Fork and along the West Fork channel from White Settlement Road to Riverside Drive. Levees were also constructed along the upper reaches of the West Fork in the Crestwood and Brookside neighborhoods.

Generally, levees were constructed by adding semi-compacted and compacted fills to existing grade, or in combination with removals or additions to the existing levee system. Levee side slopes were set at 3:1 with variable crest widths of five to 80 feet. Current crest widths vary form 20 to 80 feet.

The Flood Control Act of 1960 allowed for the extension of the completed Fort Worth Floodway upstream. This project, which was located on the Trinity River from White Settlement Road to just downstream of Meandering Road, included improvements to 4.1 miles of river channel as well as the construction of 6.2 miles of earthen levee, appurtenant drainage facilities, and 1.6 miles of diversion channels. Construction was initiated in March 1965 and completed in June 1971.

The Flood Control Act of 1962 allowed for the Clear Fork Extension Project, which was located along the Clear Fork of the Trinity River between the existing Fort Worth Floodway and State Highway (SH) 183. This project included an extension comprised of channel modifications to a 6.5 mile stretch of the Clear Fork; the construction of 2.3 miles of earthen levee; provision of interior drainage facilities; alteration of highway and railroad bridges; relocation and alteration of three channel dams; and control of about 566 acres of right-of-way (ROW). Construction was initiated in January 1966 and completed in September 1971.

The Fort Worth Floodway was designed and constructed to provide a level of protection equivalent to the Standard Project Flood (SPF) with four feet of freeboard on the levees. SPF is

defined by USACE to be an estimate representing flood discharges that may be expected from the most severe combination of metrological and hydrologic conditions that are considered reasonably characteristic of the geographical region involved, excluding extremely rare combinations.

The height of the levees is variable, but average approximately 13 feet above existing grade. The Fort Worth Floodway design discharges calculated at the time of initial construction for the SPF were 95,000 cubic feet per second (cfs) on the West Fork (Trinity River) downstream of the Clear Fork (Trinity River) confluence, 75,000 cfs on the Clear Fork and 50,000 cfs on the West Fork upstream of the Clear Fork confluence.

The levee system just east of Main Street was modified during the 1950's to provide a top width of 32 feet with compacted fill set on grade with a 3:1 slope. Over the years, graded fill material was applied to the dry side of the levee in the project area which increased the effective top width to between 60 and 70 feet.

The interior drainage requirements of the Fort Worth Floodway are served by 30 sumps and discharge gates. The sumps serve as collection points for local runoff and include naturally low areas, or excavations. Runoff from the exterior area of the levee system is stored in the sumps for gravity discharge to the river through a floodgate. The gates were designed to discharge the drainage from a 50-year storm quickly enough to keep the water within the sump as determined by backwater conditions.

Since the construction of the original levee system, the statistical database and urbanization over a 50-year period have led to increases in the calculated SPF flows. The increases in flow have resulted in a reduction in the level of protection offered by the floodway and levees. Much of the system along the West Fork and the Clear Fork of the Trinity River in proximity to downtown Fort Worth are below the authorized level of protection. This includes the floodway and levee system immediately west of Main Street.

In late 1984 and early 1985, it became apparent that numerous unrelated projects were being proposed along the Trinity River. This lead to a regional Environmental Impact Statement (EIS) which defined baseline conditions and analyzed a number of scenarios and impacts associated with different permitting strategies. The Record of Decision (ROD) was signed on April 29, 1988 and established a level of protection for the tops of levees as the SPF plus 4 feet. Criteria for hydraulic impacts were also established. To affirm local government authority of local floodplain management while establishing a common set of permitting criteria and procedures, the USACE - Fort Worth District, in a joint effort with the North Central Texas Council of Governments (NCTCOG), established the Corridor Development Certificate (CDC) process. Criteria used in the program closely mimic those developed by the USACE in the Regional EIS. Member cities administer the program with technical review and coordination by the USACE.

A Programmatic Environmental Impact Statement (PEIS) for the Upper Trinity River Basin Feasibility study addressing the potential cumulative effects of reasonable foreseeable projects, including the Clear Fork West Fork studies was completed in June 2000. The Central City Final Environmental Impact Statement (FEIS) that is tiered from the PEIS was published in January 2006. The study evaluated the potential modifications to the existing system of levees and channels in order to enhance existing levels of flood protection, restore components of the natural river system that were sacrificed in the construction of the existing flood control system, facilitate urban revitalization, and provide major quality-of-life enhancements (ecosystem improvements and recreation) for citizens of the region.

1.3. Purpose and Need

TCCD is the sixth largest college or university in the State of Texas, serving nearly 42,000 students. Enrollment increased 28 percent from 1998 to 2003 and is expected to continue this trend. TCCD has worked with city and county officials and administrators of other educational entities to ensure that the citizens of Fort Worth and Tarrant County have access to comprehensive educational opportunities. In the early 1990's, Downtown Fort Worth, Inc. requested the expansion of TCCD into the downtown area. The request was renewed as part of their 2002 Downtown Plan. Surveys of employers conducted by Downtown Fort Worth, Inc. indicated strong support for a downtown campus with 80 percent stating they would provide educational assistance for employees. More than 77 percent of all employees in the downtown area expressed interest in higher education in or near the downtown area. On August 29, 2002, the TCCD Board of Trustees approved a three percent increase in the tax rate specifically for the construction of the Downtown Campus Project.

In 2003, the TCCD Board of Trustees authorized the Chancellor to negotiate the purchase of property for the Downtown Campus Project. One of the key criteria was to identify a general location that would "bridge" both the downtown businesses and the underserved Hispanic community located north of the Trinity River. Other key selection criteria included adequate land for expansion, accessibility from both sides of the river, visibility, environmental conditions and price/availability of land.

In November 2004, the Board of Trustees approved a Facilities Master Plan that included a Downtown Campus Plan of approximately a million square feet to accommodate approximately 20,000 students by the year 2023. The initial phase of the campus is scheduled to open in January 2010 and will be approximately 400,000 square feet with a projected student population of 3,800 for the spring 2010 semester. The first phase would include the entire basic infrastructure for the full campus, in particular the bridge across the Trinity to connect the two sides. Later phases would include the full campus library, student services facility and administration buildings. Because of their importance to the campus and the need for these components to be equally accessible to all, the best alternative would locate these in the center of the campus adjacent to the river.

The centrally located campus is needed to provide educational opportunity to the population within and around the downtown Fort Worth area. In order to provide the students with a quality environment, TCCD has secured property located on either side of the Trinity River, just north of the Tarrant County Courthouse. Because of the nature of the property, long-range planning for the campus dictates that the property on both sides of the river be developed.

The proposed modifications to the Fort Worth Floodway including the levee are necessary to provide a cost effective way of linking the two sides of the campus and supporting the utilities (placed under the bridge deck) supplying services to the downtown campus buildings.

2.0. Description of Alternatives

2.1. Site and Structural Alternatives

A number of site and structural design alternatives were considered for the proposed Downtown Campus Project. The site alternatives were evaluated on TCCD selection criteria which included accessibility from both sides of the river, visibility, adequate land for expansion, availability of land, and cost of land. Each design alternative was evaluated on the consistency with the purpose and need of the proposed project. Once a preferred site location was selected, structural design alternatives were developed to minimize the interaction with the levee and related flood control projects. A discussion of the proposed alternatives and the action selected is presented below.

2.1.1. Site Alternatives Considered

The location of the Downtown Campus Project was not only influenced by the criteria mentioned above, but also by demographics and public input. A need to provide educational opportunities for employees working downtown and residents in proximity to downtown was identified. A determination of the expected minimum size of the proposed campus was completed, and as a result, two potential sites were identified.

Bluff Site Alternative

This site is located northeast of the Tarrant County Courthouse and consists of a number of properties along the south bank of the Trinity River. This proposed alternative site is bounded to the west by the Trinity River and to the south by East Belknap Street. The northern boundary extends 175 feet to the north of Gounah Street. This site situated along the bluff facing the Trinity River. The location of the alternative is presented in **Figure 4**.

The site slopes from south to north with the highest point of elevation occurring at the southern end with an elevation of approximately 615 feet above sea level and the lowest point occurring at the north end of the site with an elevation of approximately 535 feet above sea level.

The proposed alternative site was evaluated in terms of the consistency of the site with the previously stated selection criteria. The results of this evaluation are presented below.

- Location of the Preferred Alternative needs to be accessible to both the downtown businesses and the underserved residential population to the north of downtown Fort Worth. While the proposed Bluff Site Alternative would serve downtown business, the site is not the most accessible for the population that resides to the north due to the natural barrier of the Trinity River limiting the number of access points for a potential campus.
- Location of the Preferred Alternative must be visible to the surrounding community. Although the proposed Bluff Site Alternative is located on the south bank of the Trinity River, the site is surrounded by industrial and residential uses. The site is located approximately 1,000 feet to the east-northeast of a prominent downtown landmark, the Tarrant County Courthouse. The topography descends east and north of this landmark. Therefore, the location and the surrounding land uses would result in a less than desirable location for a visible proposed campus.
- Location of the Preferred Alternative must allow for the expansion of the proposed campus when demand warrants. Due to the proposed layout of the Bluff Site Alternative, additional space for potential expansion is limited.

Figure 4 - Bluff Alternative

TCCD Environmental Assessment

Feet

0 250 500

Sources: U.S. Geological Survey, NCTCOG

- Availability of properties is crucial for land assembly to create the proposed site for the campus. The proposed Bluff Site Alternative is fragmented and subdivided with numerous landowners, which presents a challenge to assembling land and the overall cost of acquiring land.

The proposed Bluff Site Alternative, therefore, does not meet all of the selection criteria in order to meet the need of TCCD.

TXU Site Alternative

This proposed alternative site is located directly to the north of the Tarrant County Courthouse. The site is located on the south and north banks of the Trinity River with the majority of land area north of the Trinity River. The proposed TXU Site Alternative is irregularly shaped, traversing both the north and south banks of the Trinity River. The southern portion of this proposed alternative site is an irregular shape and bounded by three roads, East First Street, West Weatherford Street and West Belknap Street. The western boundary of this proposed alternative site is Main Street. The northern boundary extends from Main Street in an east-northeast direction, along the TXU property, until terminating at the northern bank of the Trinity River. The eastern boundary is formed by the north bank of the Trinity River for approximately 1,000 feet; however, the boundary extends south across the river for approximately 680 feet to the South Grove Street and East Bluff Street intersection, and terminates at the intersection of Pecan Street and East Belknap Street. The location of the TXU Site Alternative is presented in **Figure 5**.

The site slopes from south to north with the highest point of evaluation occurring at the southern end of the site with an elevation of approximately 620 feet above sea level and the lowest point occurring at the north end of the site with an elevation of approximately 530 feet above sea level.

The TXU Site Alternative was evaluated in terms of the consistency of the site with the previously stated selection criteria. The results of this evaluation are presented below.

- Location of the Preferred Alternative needs to be accessible to both the downtown businesses and the underserved residential population to the north of downtown Fort Worth. The proposed TXU Site Alternative would serve both the downtown businesses and residential population to the north. The proposed campus would be accessible via Main Street, which connects both downtown and portions of the city immediately to the north of downtown.
- Location of the Preferred Alternative must be visible to the surrounding community. The proposed TXU Site Alternative is located on a very prominent location due to the proximity to the Tarrant County Courthouse and being adjacent to the Main Street Viaduct Bridge, which is a visual focal point for this portion of downtown. This proposed alternative site serves an important component to the overall Trinity River Uptown Master Plan, thus further increasing the visibility of the site.
- Location of the Preferred Alternative must allow for expansion of the proposed campus when demand warrants. The proposed site contains enough developable space for the proposed campus, thus meeting the current programmatic needs of the college as well as those in the future when expansion is warranted. The current site would accommodate an initial phase of construction and allow for expansions that would double the size of the initial phase of construction.

Figure 5 - TXU Alternative

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- Preliminary research conducted on TXU Site Alternative found no perceived environmental conditions that would present challenges or obstacles to developing this proposed alternative site.
- Availability of properties is crucial for land assembly to create the proposed site for the campus. The subject site contains parcels of land owned by different entities and individuals; however, the primary property owner for the TXU Site Alternative is TXU. With a primary property owner, the challenges of land assembly are greatly reduced along with the overall cost of acquiring the land.

This proposed alternative, therefore, most successfully meets all of the selection criteria in order to meet the need of TCCD. Furthermore, the TXU site provides unique design opportunities for the proposed campus as it traverses both the north and south banks of the Trinity River. The proposed design fully utilizes these opportunities by placing campus buildings on both the south and north portions of the site. These two areas would be connected by a proposed pedestrian bridge spanning the Trinity River. The bridge design would create a dramatic visual effect as it would descend from the south to the north bank of the river. The location would also allow TCCD to create a connection between the social and economic groups located north of the river with the commercial and governmental vitality within the downtown area. Additionally, the available parcels on the downtown side provided TCCD with the opportunity to draw the general public into and through the campus by becoming the downtown access point to the Trinity River. A schematic of the Preferred Site Alternative is presented in **Figure 6**.

In order for the preferred site alternative to be implemented, there are certain design aspects regarding the interaction with the Trinity River levee that must be approved by the USACE. The main design aspects that need to be considered are the bridge and building supports which are currently proposed to be bored into the existing levee. A number of structural design alternatives were considered to allow for the dramatic visual effect of the buildings and bridge descending from the southern bank to the northern bank of the Trinity River.

2.2.2. Structural Design Alternatives

No Action Alternative

Under the No Action Alternative, the construction of the Downtown Campus would not affect the Fort Worth Floodway, including the levee, or waters of the United States (U.S.) and there would be no federal action.

As part of the No Action Alternative two design options were considered. The first option was a pedestrian bridge spanning the existing Fort Worth Floodway and levee. This option would require placing foundation support outside the limits of the floodway and levee and the use of larger bridge beams extending over the Fort Worth Floodway and levee. Furthermore, it would not be cost-effective because it would require a significant rise in the overall campus elevation to accommodate the larger bridge beams.

The second option of eliminating the pedestrian bridge would severely impact access between the two sides of the campus. The Main Street Viaduct Bridge would be the only means of access to the north and south sides of campus; however, in its current condition the bridge is not conducive for pedestrian travel between the two sides. Furthermore, the secondary use of the pedestrian bridge is for providing a conduit for utilities to the downtown campus buildings. Without this proposed pedestrian bridge there would be no cost effective means of providing utilities to the two sides of the campus.

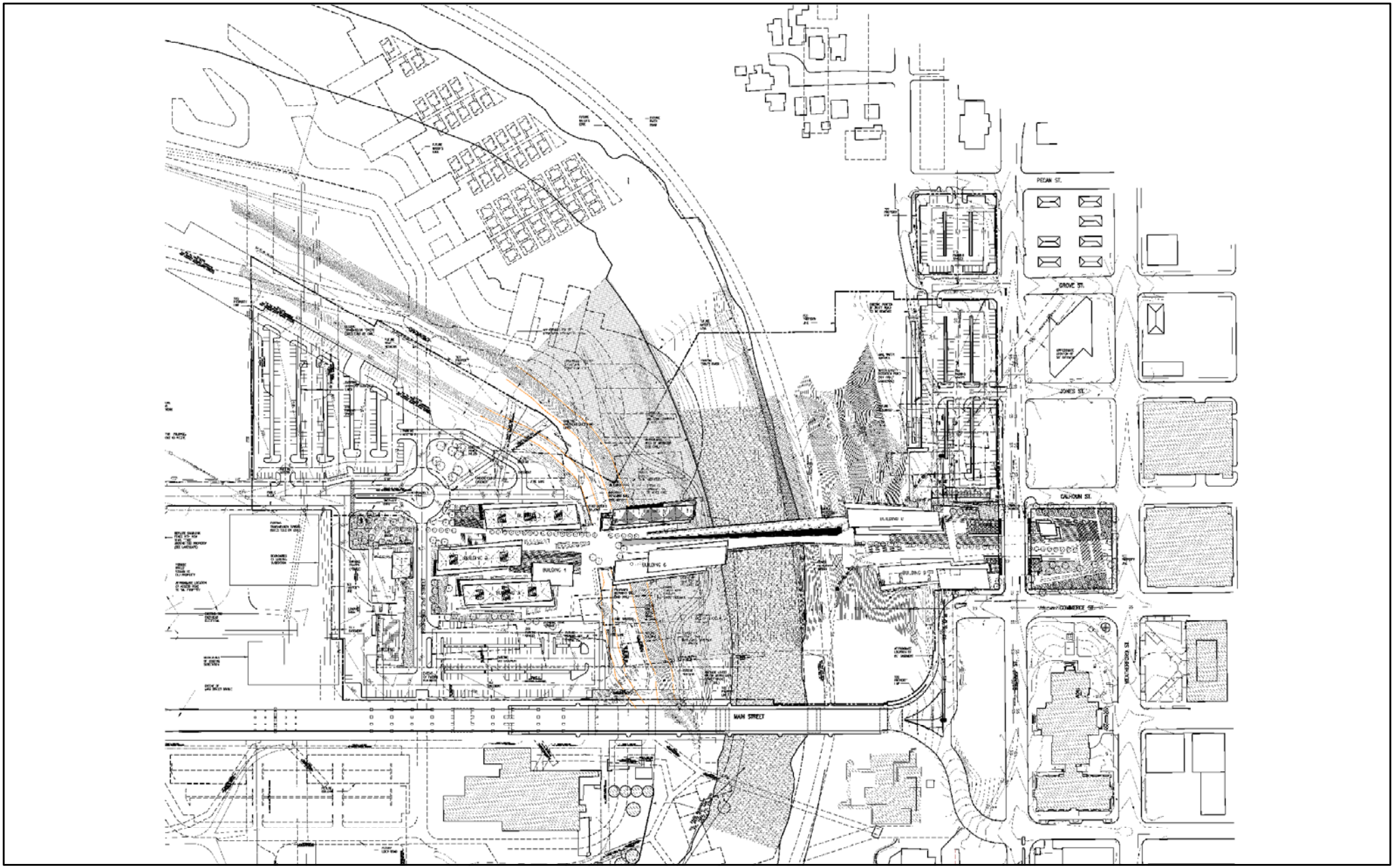

Figure 6 - Preferred Alternative

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Action Alternatives

The design of the proposed Downtown Campus would require modifications to the levee system and floodway. As a result, the USACE must approve these modifications under Section 408. In order to minimize the extent of the impact to the levee system, several structural design alternatives were considered. The design approaches considered and an evaluation of the feasibility of each of the approaches are summarized in **Table 1.**

Table 1 – Options to Avoid and/or Minimize Levee Impacts

Option	Option Details	Comments	Feasibility	Implemented?
1	Increasing the drilled shaft foundation diameter to reduce the number of levee penetrations	Drilled shafts would be sized to the point that column locations and beam capacity would govern design	Low	No
2	Shifting the buildings to the south so that drilled shafts do not penetrate the levee crust	Not possible to completely remove shaft locations without requiring excessive beam depths. Negative impact on the river hydraulics and waterway appearance	Low	No
3	Shift Buildings to the north so that drilled shafts do not penetrate the levee crust	This would not be feasible due to impacting the overall proposed site plan	Low	No
4	Construct concrete floodwall to supplant levee	Considered not cost-effective	Low	No
5	Reconfigure buildings and orientation to minimize the number of drilled shafts through the above ground levee and basement penetrations of the projected levee template	This would result in a reduction of the number of drilled shaft levee penetrations and the reconfiguration of the basements would not penetrate the project levee template	Moderate	Yes
6	Raising the campus to improve access to the levee below the building	The plaza elevation would be raised two feet	Moderate	Yes
7	Provide a detailed work plan to minimize construction related impacts to the levee	Detailed work plan along with on-site USACE oversight would significantly reduce potential levee damage	High	Proposed
8	Install diaphragm wall	By providing a barrier against preferential seepage paths associated with piers and other excavations made in and adjacent to the levee, the diaphragm wall would help mitigate damage resulting from the construction of the project	High	Proposed

Preferred Alternative

Based on considerations presented in **Table 1** and discussions with the USCAE, it is proposed that a detailed work plan (Option 7) be developed and diaphragm wall (Option 8) be constructed. The combination of the site location, structural options and associated project activities are referred to as the “Preferred Alternative” for the remainder of the EA discussion and are described as follows:

- Piers in and near the above grade portion of the levee on the north side of the Trinity River that support the pedestrian bridge;
- Piers in and near the above grade portion of the levee on the north side of the Trinity River that support the Student Services and Library Buildings (Buildings 5 and 6);
- Piers in the levee template below grade that are foundations for the Allied Health and Nursing Building;
- Temporary piers in the river that support the falsework and work bridges needed to construct the pedestrian bridge;
- Construction of two storm drains and associated outfalls;
- Realignment of the hike and bike trail and maintenance access roadway; and
- Mitigation needed to accommodate the changes, both temporary and permanent, in the flood control project and related waterways.

Pedestrian Bridge

A pedestrian bridge would span the river to provide pedestrian access and access for light vehicles from one part of the campus to the other. The bridge deck structure would also serve as the primary distribution route for hot and cold water pipes, electricity, communications, and information technology cabling from the central plant building on the north side of the river to the downtown campus buildings located on the south side of the river. The bridge would have two walkways: the first would be a horizontal pathway, set at an elevation of approximately 555 feet; the second would slope from this level up to 577 feet. Both walkways would be supported from a central spine, which would span from columns within the floodplain to the north side and to the edge of the buildings on the downtown side. The span of the spine would be approximately 450 feet. The bridge design would establish a minimum clearance of four feet above the SPF elevation which is 544 feet at the project location.

Towards the southern river bank, the central spine structure would rise above the 555 elevation deck and, therefore, not extend into the SPF plus 4-foot level. Towards the north, however, the spine structure would extend beneath the deck to approximately 525 feet. The structure within the floodplain would be kept as open as possible, allowing water to flow between structural members, albeit at reduced velocity. North of the bridge would be a length of pedestrian walkway which would span across the levee to the buildings beyond the floodplain. This walkway (containing piped utility services beneath the bridge walkway) would be supported on pier foundations formed through the levee. The proposed plan view and elevation view of the pedestrian bridge are included as **Figure 7**.

Student Services and Library Buildings

Both buildings would be approximately 300 feet in length and approximately 75 feet in width and accessed from the pedestrian bridge. The structure of both buildings would include long-span steel beams, two to three stories high, so that supporting columns would have approximately 60-foot spacing along the length of the building. The supporting columns would be mostly located within the floodplain to the north of the river.

Hike and Bike Trail

The proposed alternative would involve the relocation of approximately 1,750 feet of existing hike and bike trail and the maintenance access road within the Fort Worth Floodway. The relocations are necessary in order to accommodate the placement of piers for the proposed pedestrian bridge and student service and library buildings. The use and function of the trail would be restored following the completion of construction. Segments of the trail and

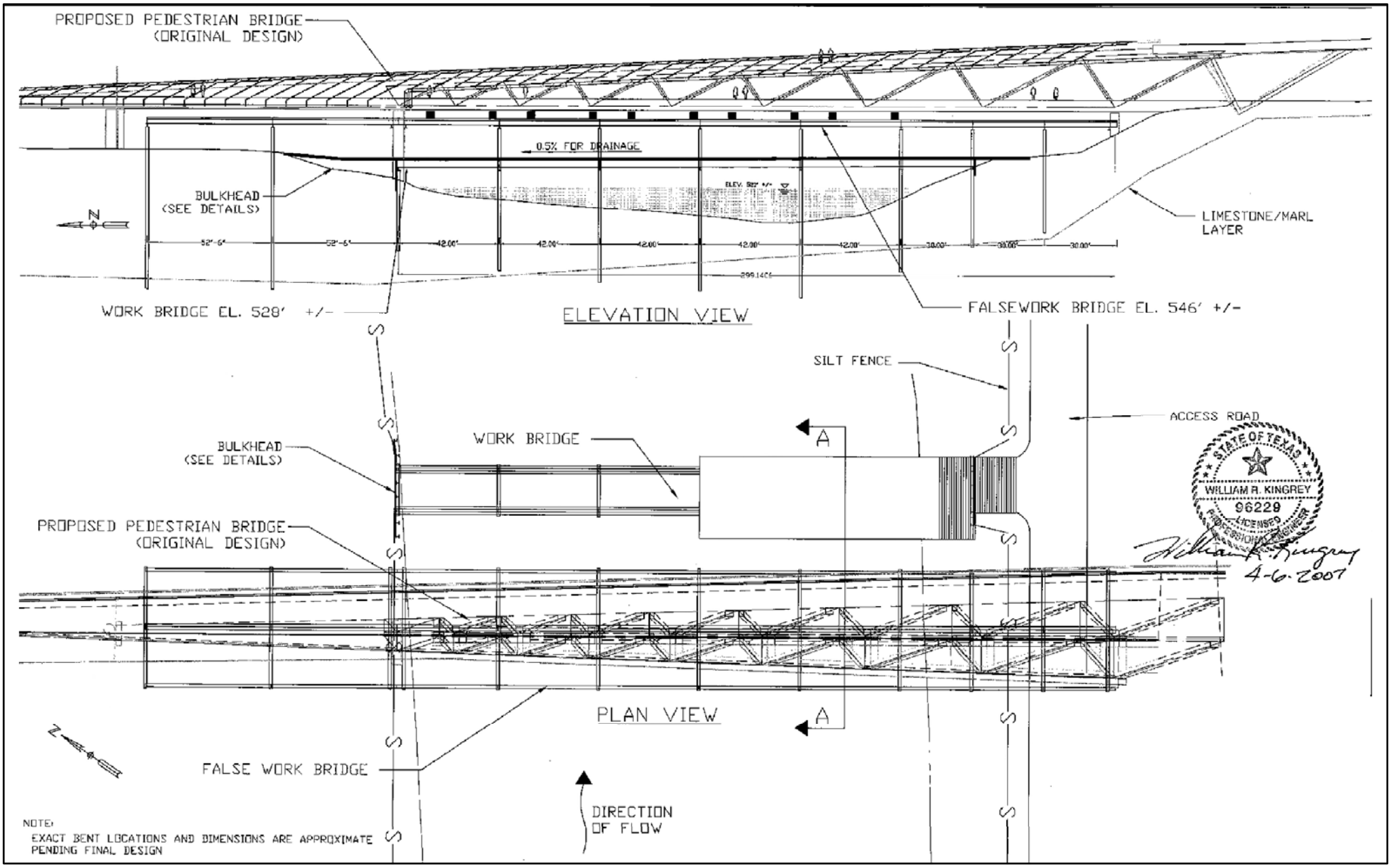

Figure 7 - Pedestrian Bridge Plan and Profile

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maintenance access road no longer in use due to the relocation, but not directly impacted by the placement of the piers, would be reseeded.

2.2.3. Construction Techniques

To minimize impacts to the Fort Worth Floodway, including the levee, construction techniques have been developed for the placement of the proposed diaphragm wall and piers. These techniques are in compliance with federal and local regulations and would be subject to USACE observation for all excavation performed within the footprint of the levees. In the event the USACE deems any construction activity to present an unacceptable risk to the integrity of the levee, construction would cease immediately.

The diaphragm wall is a cast in-place reinforced concrete structure that provides an impervious barrier when used as an embedded wall, as currently proposed in the Preferred Alternative. The proposed plan and profile view of the diaphragm wall are included as **Figures 8a and 8b**.

In order to begin construction of the diaphragm wall panels earthen fill would be placed on the levee and compacted two to three feet above the existing levee elevation and would serve as a work platform to prevent damage to the existing levee during construction. Following the completion of the work platform shallow concrete walls would be installed to allow for excavation to begin for the diaphragm wall panel. Excavation equipment would be located on the dry side of the levee. As the excavation begins slurry would be pumped into the trench to provide support and prevent movement of adjacent soil. Slurry is a liquid substance consisting of water and finely divided/suspended particles of powdered Bentonite (a clay substance formed by the decomposition of volcanic ash and has the ability to expand several times its normal volume when placed within water), which would conform with the standards set forth in American Petroleum Institute (API) Specification 13A. Excavation of the trench would proceed through the slurry, and thus slurry would be added to maintain its top level and support of the trench. Excavation for the diaphragm wall would cease at depth that is no less than six feet into the underlying shale or rock strata. The diaphragm wall would have an approximate depth of 75 feet. Once excavation ceases an assembled cage of reinforced steel would be placed into the trench with the slurry before adding the concrete. The cage consists of longitudinal and lateral steel bar reinforcement. Concrete would then be pumped from the dry side of the levee through a tube or hose into the base of the trench. The concrete would fill the trench from the bottom to the top. The concrete would displace the slurry in such a manner that the mixing of concrete with slurry would not occur. In addition, as the slurry is displaced it would be removed from the trench and pumped into a self contained slurry pit on the dry side of the levee. The slurry would be filtered and processed to be reused again during the excavation effort. Testing of the slurry would be ongoing through the entire excavation process to ensure desired composition is maintained. This construction technique would create an impervious seal along the trench walls which would prevent the migration of subsurface water into the excavated trench and surrounding areas including the Trinity River. This impervious layer or seal would remain after the concrete is poured and cured.

Currently there are approximately 40 proposed piers south of the diaphragm wall in the levee and floodway. There are additional piers proposed to the north of the diaphragm wall and levee, which would support the central plant of the proposed TCCD campus. Two processes of pier installation would be utilized depending on the location of the proposed pier. The first process would be utilized for the proposed piers located out of the levee and to the north of the levee (dry side of the levee). Pier placement would occur by drilling to the sand/gravel strata. Once this occurs casing would be driven at the lowest practical amplitude to advance at a rate of no greater than one foot per minute. The sand/gravel strata would absorb the vibrations from the

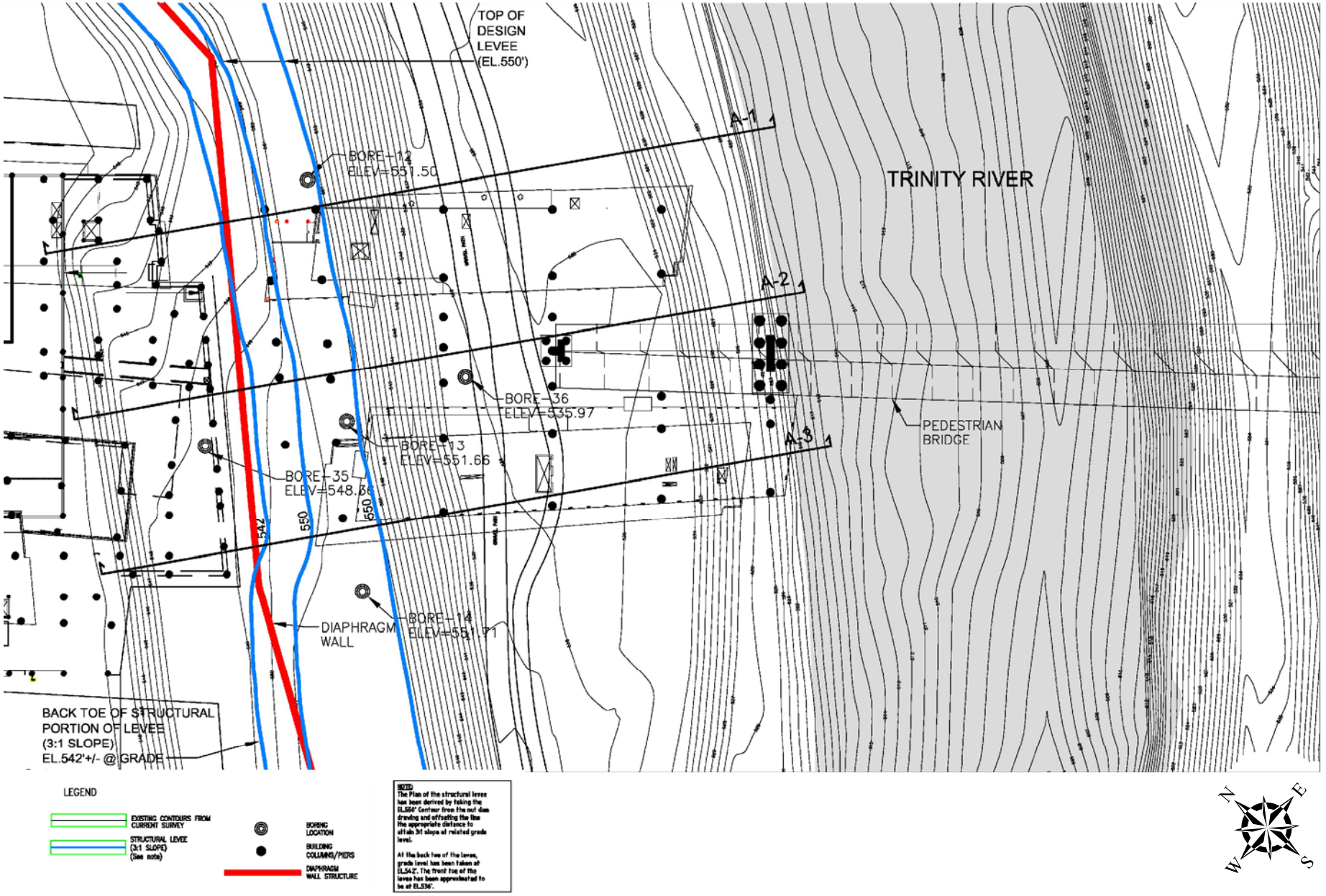

Figure 8a Pier and Diaphragm Wall Plan

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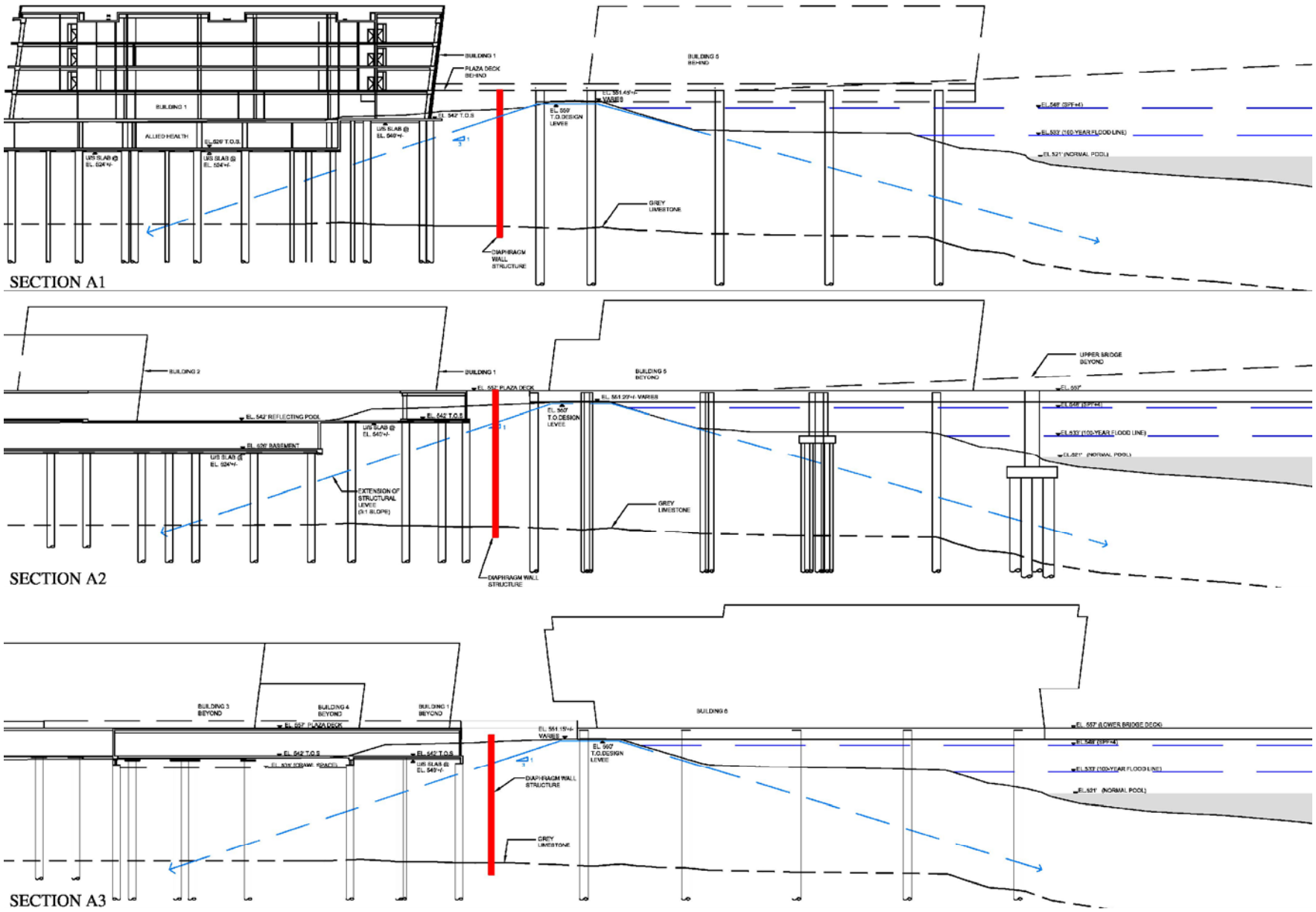

Figure 8b Pier and Diaphragm Wall Profile

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casing insertion. Once designated depth is reached in the underlying shale the soil materials within the casing would be cleaned out and the penetration into the shale would be completed. Rebar cages would then be lowered and concrete placed in the excavated pier shaft. Finally, the casing would be removed prior to the concrete curing. The second process, known as processing the soil, would be utilized for the proposed piers located in the levee and floodway, these piers are associated with Buildings 5 and 6 and the pedestrian bridge. The drill rig would drill the pier down to baring strata and then reverses the auger, also known as a drill bit, without removing soil. A construction crane would then hoist the casing into place and the weight of the casing would result in the casing descending through the processed soil to the baring strata. The auger is then re-inserted and the soils within the casing are removed. Drilling continues until the underlying shale is penetrated to the design depth. Once this occurs the rebar cage and concrete are placed within the excavated drill shaft. This second process minimizes the vibration impact caused by other drilling processes and protects the integrity of the surrounding soils in the levee. No circulating fluids or air will be utilized while drilling into the levee, embankment or foundation for either process. In addition, for the piers located near the Trinity River, mainly bridge piers, a filtration barrier would be installed to avoid unnecessary muddying of the river. A cofferdam would be installed in order to enable the construction of Bent 2 of the pedestrian bridge. The cofferdam would provide a dry area to construct the drilled shafts and form and pour the footing and column. Once the footing is complete, the cofferdam would remain in place with the exception of the portion above existing grade which would be cut-off and removed. The proposed cofferdam plan and profile view are included as **Figure 9**.

Prior to the construction of the diaphragm wall and pier placement, an Articulated Concrete Block (ACB) mat system would be installed along the length of the system as a mitigation measure to account for the hydraulic impacts of the proposed piers in the Trinity River floodway. The proposed ACB mat system plan and profile view are included as **Figures 10a and 10b**. Prior to commencing with placement of the ACB system silt fences would be placed along the length of the proposed system to minimize soil movement into the Trinity River. Upon completion of the ACB mat system installation, the joints would be filled with earthen material and the area would be reseeded. Once vegetation has been established the silt fence would be removed.

A storm drain is proposed on the northeast portion of the campus in the lower portion of the parking area adjacent to the Trinity River Levee. The plan view of this proposed storm drain is included as **Figure 11**. The outfall for this storm drain is located below the pool level in the Trinity River approximately 350 feet north of Nutt Dam. The run off from the uptown campus side would be conveyed through a storm drain line to the outfall. In order for this storm line to be constructed the line must penetrate the existing levee on the northeastern side of the uptown campus. The proposed levee penetration would be made using 72-inch diameter reinforced concrete pipe that is bored, cased, and grouted during installation.

Construction of this storm drain outfall and the south outfall (drainage for the downtown portion of the campus) would require the construction of a temporary coffer dam. The proposed south outfall plan is included in **Figure 12**. Sheet pile would be driven in place to form the coffer dam which would be dewatered to allow for construction of the outfall headwall.

All construction activities and associated temporary and permanent impacts will be documented and permitted through a Nationwide permit, described later in this report.

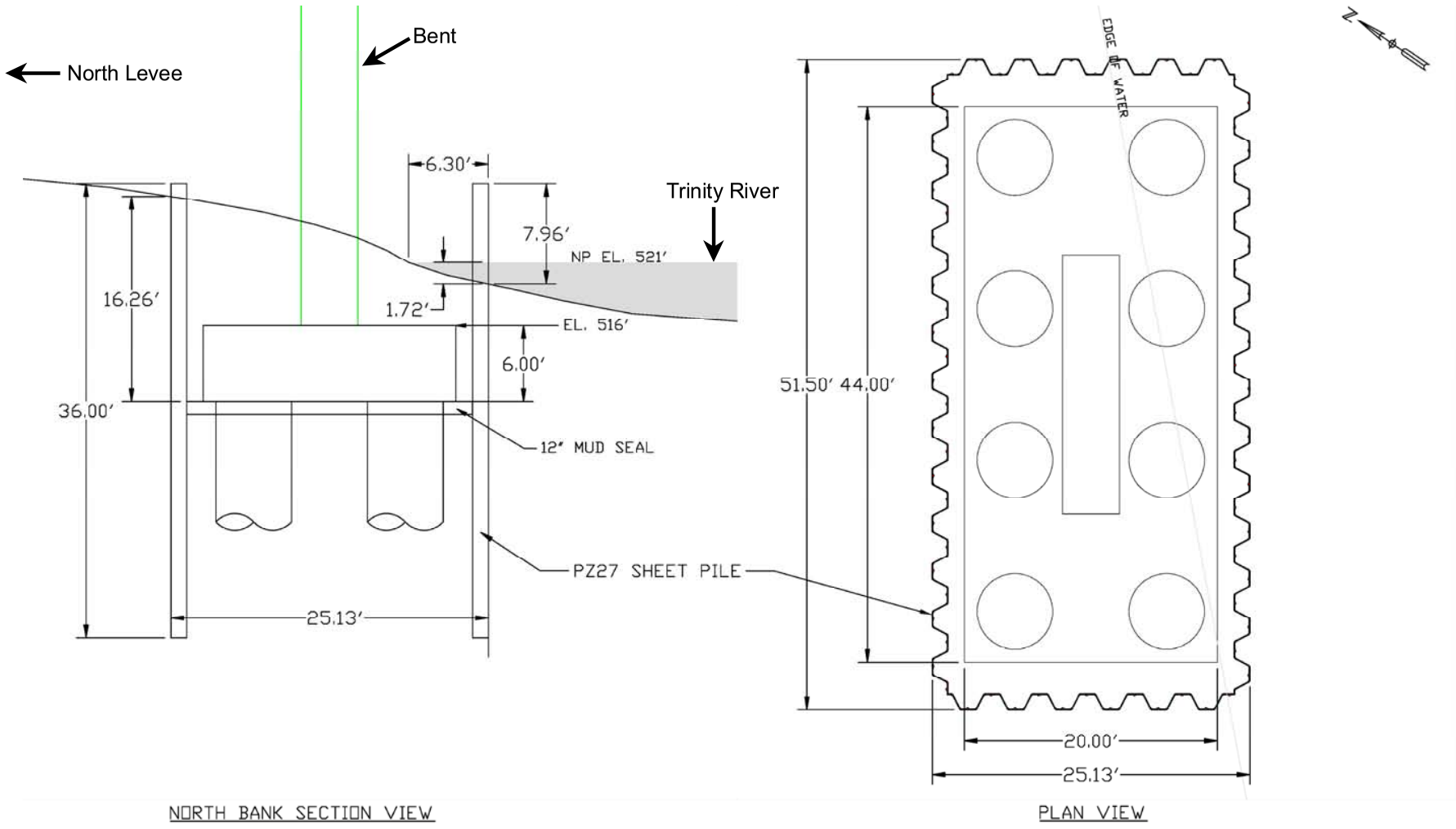


Figure 9 - Cofferdam

TCCD Environmental Assessment

Source: Austin Bridge & Road

Figure 10a - Articulated Concrete Block (ACB)

TCCD Environmental Assessment

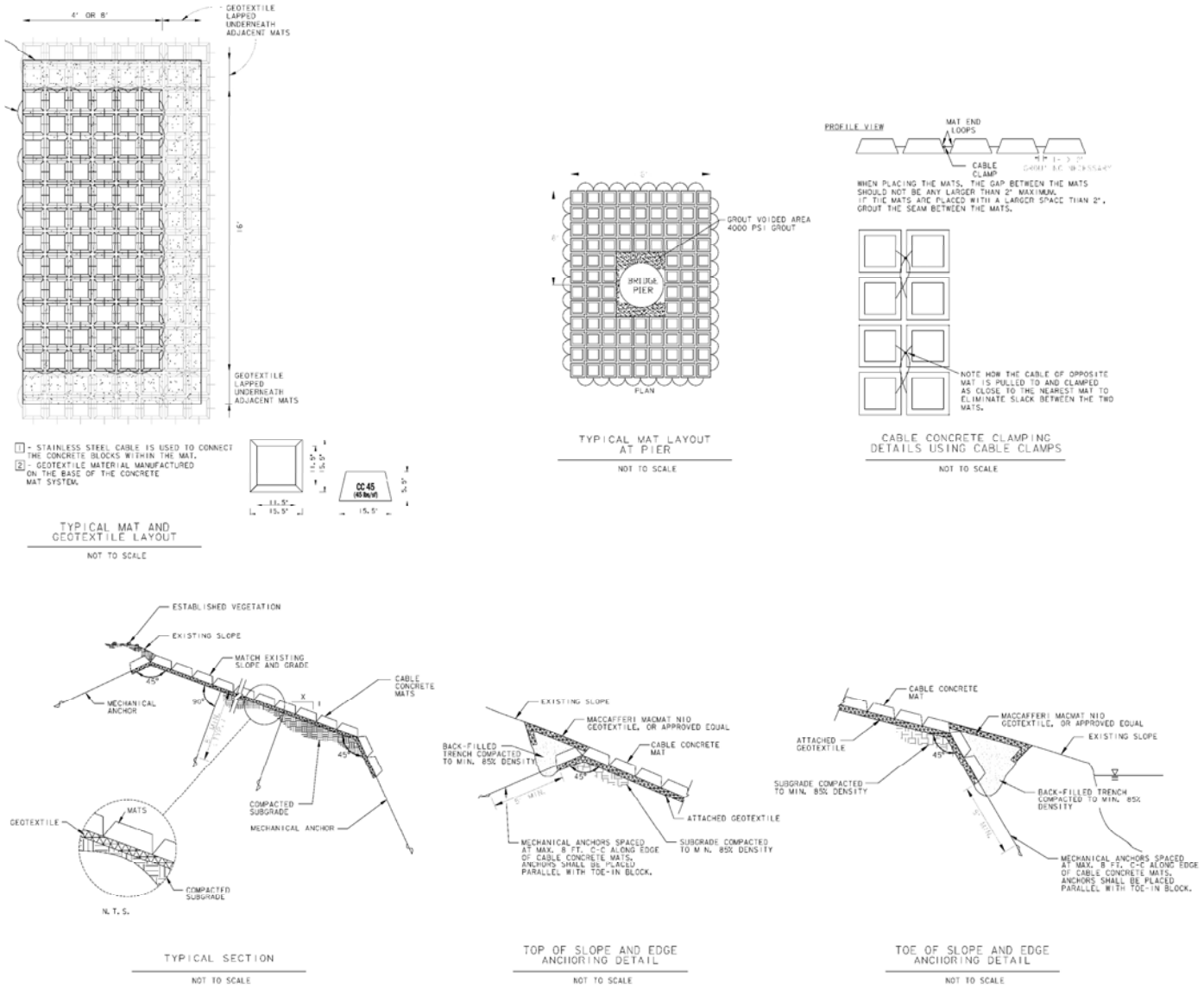


Figure 10b - Articulated Concrete Block (ACB)

TCCD Environmental Assessment

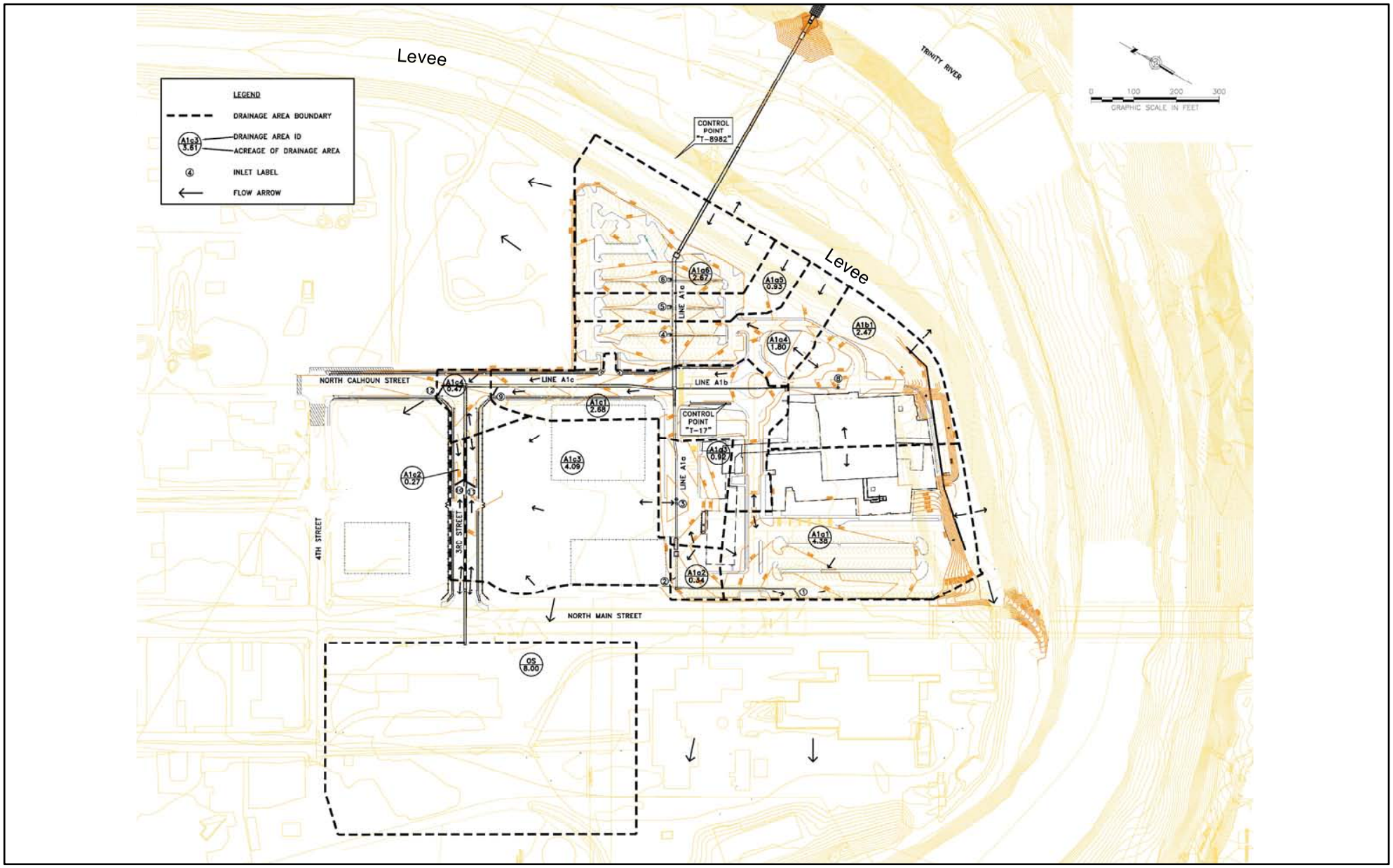


Figure 11 - North Outfall

TCCD Environmental Assessment

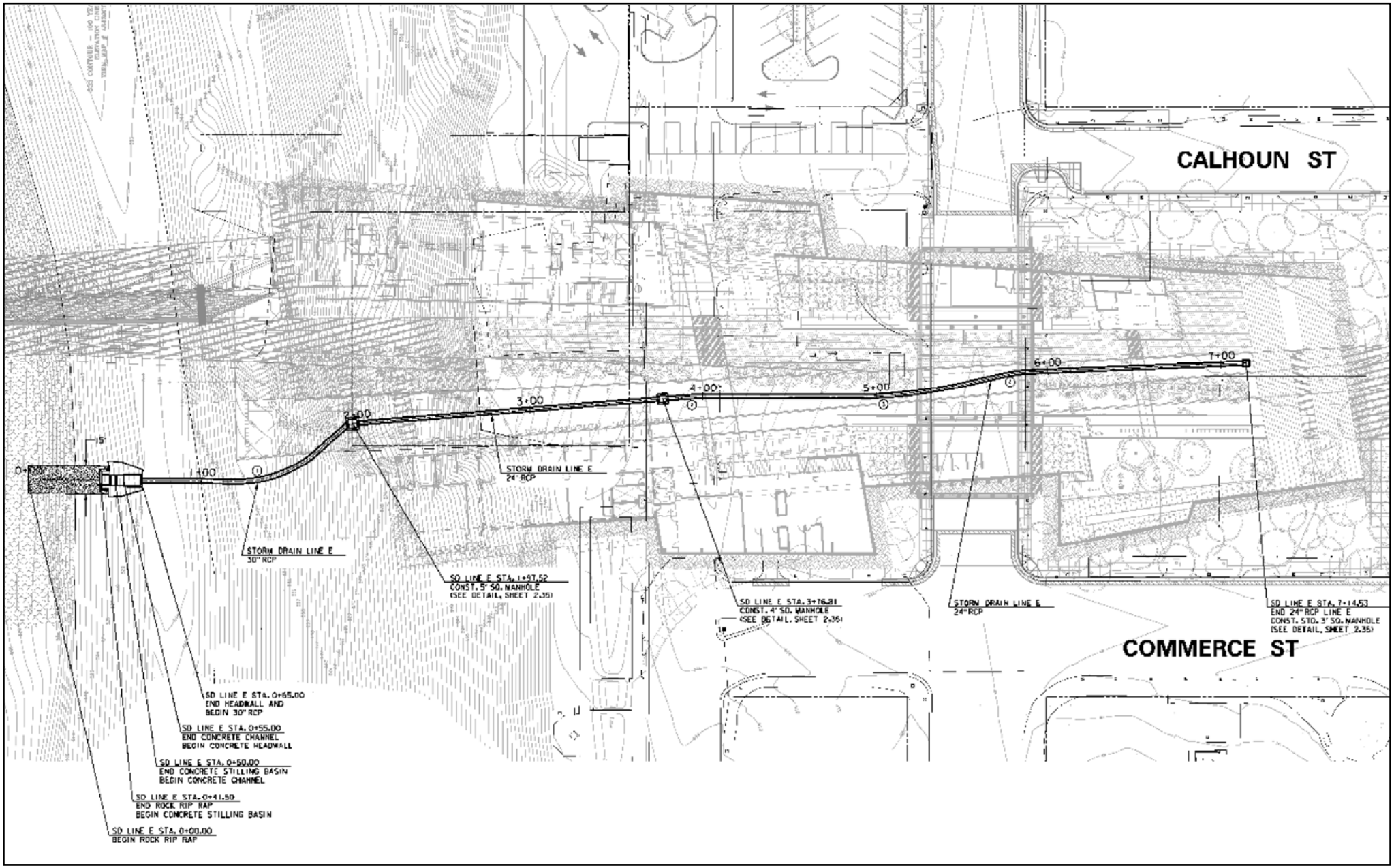


Figure 12 - South Outfall

TCCD Environmental Assessment

2.2.4. Dredged or Excavated Material

The construction of the Preferred Alternative would require the excavation, transportation, and disposal of dredged or excavated material along the north slope of the Trinity River levee. The excavation would involve the removal of between two feet and eight feet of material that has been previously placed on top of and behind the levee. It is estimated that this would result in the removal of between 11,000 to 12,000 cubic yards of soil (approximately 900 truckloads).

The material would be removed using excavators and front end loaders and loaded directly into end-dump trailers for transport to a disposal site. All trailers that leave the site would be covered in order to prevent the deposition of dust or loose soil onto the adjoining construction site and adjacent roadways. If it becomes necessary to stage material before removal, the material would be stockpiled on-site and covered with plastic sheeting until removed. Once the design sub-grade has been reached soil samples would be taken at a frequency of one sample per 5,000 square feet to document the concentrations of lead that would remain in place.

Once removed from the construction site, the dredged or excavated material would be disposed of at a Texas Commission on Environmental Quality (TCEQ) permitted solid waste landfill or other acceptable location as allowed under the Texas Administrative Codes. Soil samples have been collected from the potential areas of excavation for waste profiling in accordance with the requirements of the landfill permit. Turkey Creek Landfill, located in Alvarado, Texas and operated by BFI Industries, is currently being considered as the project disposal site. If an alternate disposal location is identified or found to be necessary, appropriate notification and regulatory documentation would be obtained prior to utilizing the facility.

2.2.5. Dredged or Excavated Material for Suspect Soil

The preferred alternative is surrounded by existing commercial and industrial development, and thus precautionary protocols would be established to ensure the safety of all project personnel. In the event suspect soils are encountered, these precautionary protocols would facilitate the safe removal of these soils by the appropriate environmental official.

Prior to the beginning of excavation for the preferred alternative a meeting would be held with field personnel and the Health and Safety Officer in order to review the construction plans. As site conditions that affect safety change, additional meetings would be held to inform field personnel of safety issues and corresponding response measures. Furthermore, general guidelines presented in the Occupations Safety and Health Administration (OSHA) standard for Hazardous Waste Operations and Emergency Reponses, 29 CFR 1910.120, would be adhered to due to the potential of exposure to low levels of contamination resulting from Lead, Volatile Organic Compounds, Total Petroleum Hydrocarbons, and Polynuclear Aromatic Hydrocarbons. If during excavation suspect soils are discovered the project manager is required to notify the Health and Safety Supervisor immediately. Construction or other work in the affected area would be stopped, and the area would be cordoned off until an evaluation can be made by the appropriate authorities. If the suspect soil is to be stockpiled, it would be placed on an impervious surface, covered with plastic tarp, and an embankment constructed around the stockpile to prevent runoff. The suspect soil stockpile would be removed and properly disposed of by the environmental official within a week of being discovered. If there is a perception of immanent threat to health, safety, or the environment, the Fire Department would be notified immediately.

According to TCEQ, soil at the preferred alternative location has been found to be protective of human health and the environment, and recent studies, have not provided any evidence for the

need of the excavated soil to be treated or handled in any special manner. The Phase II Environmental Site Assessment (ESA) conducted on the subject site indicated lead was present in the soil samples with a reading of 96.2 milligrams per kilogram; however, the lead impacted soil was below the established site specific clean up level for residential uses established by the TCEQ, thus no imminent threats to human health or the environment have been identified with this investigation.

2.2.6. Emergency Action Plan

With the exception of soil materials that would be stockpiled to backfill ongoing excavations in the event of high water, only those construction materials immediately necessary for ongoing construction activities would be temporarily stored within the floodplain. All other materials would be stored outside the floodway, north of the levee. Those construction materials that are temporarily stockpiled in the floodway would be kept stacked and bundled for quick removal with all terrain forklifts. Cranes and other equipment working within the limits of the floodway would be staged with direct access to existing ramps for prompt evacuation upon notification. All access roads would be kept free and clear of obstructions or hindrances. The superstructure of the work bridge is designed to enable the removal of the beams and decking of the bridge in the event high water is predicted. Removal of the beams and decking during large flood flows would be incorporated into the project Work Plan which would be approved by the USACE and the Tarrant Regional Water District (TRWD). The contractor must coordinate with the TRWD regarding the forecasting of river flows during storm events.

3.0. Existing Environment and Effects

3.1. Project Setting and Land Use

The Preferred Alternative is located adjacent to the Main Street Bridge on the north and south sides of the Trinity River. The project area is currently zoned as part of the Trinity Uptown Special Purpose District. Land use within the study area includes parkland (Heritage Park) and light commercial development. The majority of the property required by the TCCD for the proposed campus consists of the former TXU property on the north side of the river. The Preferred Alternative would not have a negative impact on existing land use as there are no relocations or displacements associated with the alternative. Positive influences on land use are anticipated as a result of the construction of the Preferred Alternative.

Temporary and permanent impacts to the undeveloped portion of Heritage Park would occur as a result of the construction of the Downtown campus. This segment of the park is not currently accessible by the public. Coordination between the TCCD, the City of Fort Worth, TRWD and Streams and Valleys has occurred to address the impacts of vegetation removal. Future mitigation would include the development of a new pedestrian trail along the south bank of the Trinity River.

3.1.1. Topography

The proposed project area is shown on the U.S. Geological Survey (USGS) Haltom City 7.5-minute quadrangle topographic map, see **Figure 13**. The project area lies at an elevation ranging from approximately 530 to 620 feet above mean sea level. The terrain slopes towards the Trinity River.

3.1.2 Geology and Soils

Geological maps published by the Bureau of Economic Geology at University of Texas at Austin reflect the subject site is located in an area with variable geological conditions. The uptown portion of the proposed campus is located in area that consists of alluvial (sediment) deposits, such as clay, silt, sand, and gravel. This alluvial overlies the Duck Creek geological formation that is present in this area of Tarrant County. The Duck Creek formation includes a variety of material and fossils, but generally consists of clay marl and limestone. Marl is geologic term used to describe hard, chalky clay. In this area, marl is similar to shale in appearance and is commonly referred to as shale.

A number of investigations have been undertaken in order to accurately document the subsurface conditions at the project site. These investigations include:

- Geotechnical Study – Flood Control Levee TCCD Downtown Campus – Fort Worth, Texas. Kleinfelder July 19, 2006.
- Geotechnical Study – Diaphragm Wall for Secondary Flood Control - Downtown Campus – Tarrant County College District - Fort Worth, Texas. Kleinfelder - Project 68273.5 Revised July 17, 2007.
- Site Investigation Report - TXU Electric Delivery Property Fort Worth, Texas. White and Mueller Inc. June 2004.
- Site Investigation Report - TXU Electric “East Bar” Water Access Parcel Fort Worth, Texas. White and Mueller Inc. June 2004.

Based on the geotechnical reports, which included boring logs and laboratory testing, four geological strata have been identified and could potentially be encountered during construction.

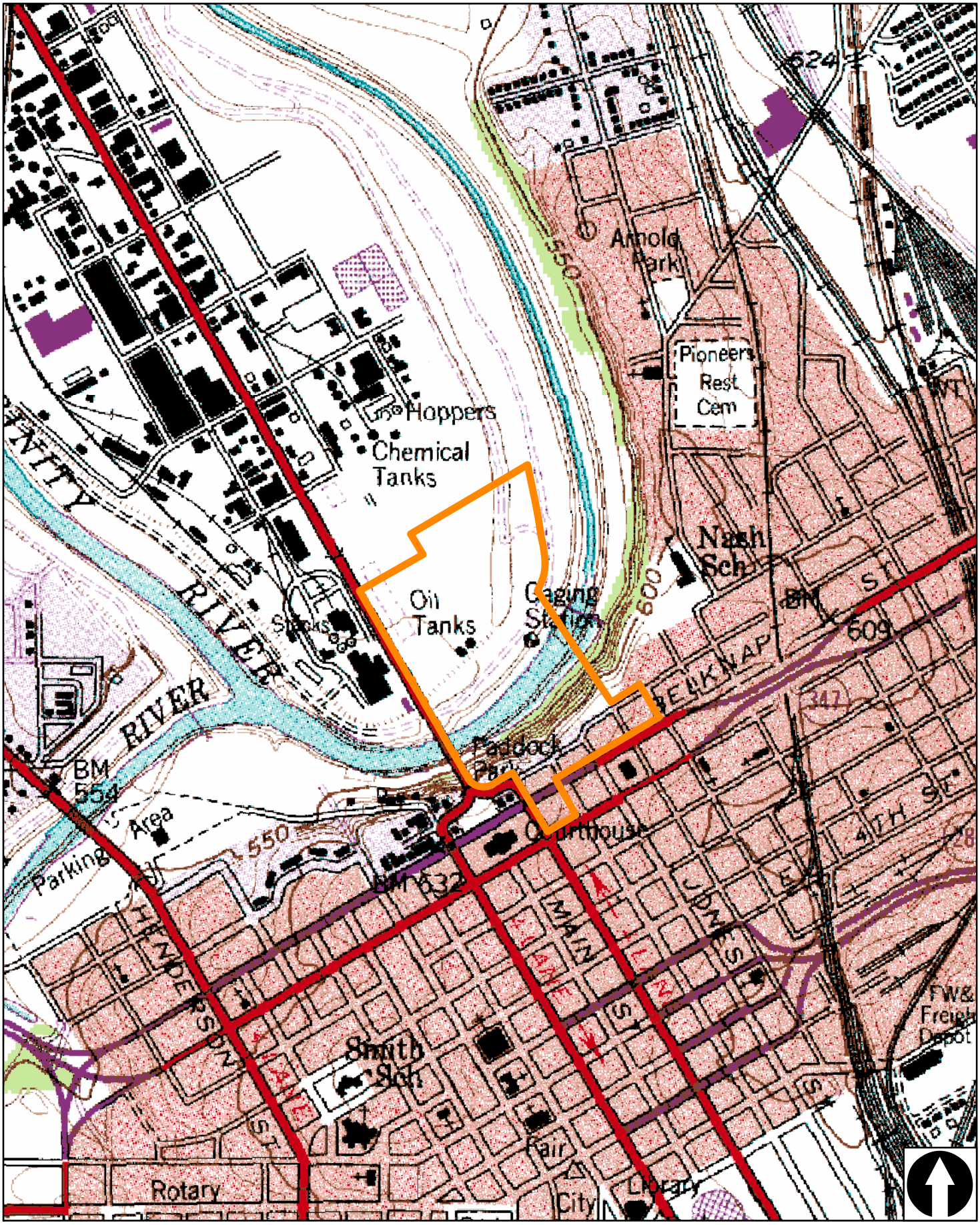


Figure 13 - Topographic Map

TCCD Environmental Assessment

Feet
0 250 500 1,000

Legend

Project Area

Sources: U.S. Geological Survey

The first stratum consists of lean clay to sandy lean clay with brown to dark brown appearance that extends four to 22 feet below the surface. The second stratum consists of lean clay, sandy lean clay, and clayey sandy with a dark brown to dark yellow appearance and a layer depth vary from 28 to 47 feet. The third stratum consists of sand with gravel to sandy gravel with a yellowish brown appearance and sub-rounded gravel with a layer depth of five to 21 feet. The fourth stratum consists of limestone and marl with a light gray to dark gray appearance and a layer depth of 23 to 35 plus feet.

Based on the site investigation reports, which included soil and groundwater sampling, soil samples contained concentrations of lead ranging up to 96.2 mg/kg and 9.65 mg/kg respectively. These concentrations are below established cleanup levels. Soil samples also indicated levels of arsenic above assessment levels; however these concentrations were not above background levels that would be expected for soils in the area.

3.2. Socioeconomic and Environmental Justice Analysis

According to the United States Census Bureau (USCB) the population of Tarrant County in 1999 was 1,446,219, of which 71.2 percent were white, 12.8 percent were black, and 19.7 percent were of Hispanic origin. The median household income for Tarrant County was $46,179 in 1999, and the percentage of individuals below the poverty level was 10.6 percent. USCB data for 1999 indicates that the City of Fort Worth had a population of 534,694, of which 59.7 percent were white, 20.3 percent were black, and 29.8 percent were of Hispanic origin. The median household income in Fort Worth was $37,074 and the percentage of individuals below the poverty level was 15.9 percent. The project area is located in Census Tract 1010.00. In 1999, this tract had a population of 4,246, of which 57.2 percent were white, 31.4 percent were black, and 35.5 percent were of Hispanic origin. Approximately 44.3 percent of individuals in this census tract fell below the poverty level.

Executive Order 12898, “Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations” requires agencies to ensure that disproportionately high and adverse human health or environmental effects on minority and low income communities are identified and addressed. Due to the high concentration of low-income individuals in Census Tract 1010.00 (almost three times greater than the city’s percentage), the Census Tract is sensitive to environmental justice concerns. The project area is directly adjacent to Census Tract 1018.00 to the south, which had a 1999 population of 857. Of this population 71.8 percent were white, 20.1 percent were black, and 10.2 percent were of Hispanic origin. Approximately 24.4 percent of the individuals in this census tract fell below the poverty level **(Table 2)**. This percentage is considerably greater than the city’s percentage of individuals below the poverty level; therefore, this census tract is also sensitive to environmental justice concerns.

Table 2 - Study Area Demographics

	Population	White	Black	Other	Hispanic*	Below Poverty
Census Tract 1010.00	4,246	57.2%	31.4%	11.4%	35.5%	44.3%
Census Tract 1018.00	857	71.8%	20.1%	8.1%	10.2%	24.4%
City of Fort Worth	534,694	59.7%	20.3%	20.0%	29.8%	15.9%
Tarrant County	1,446,219	71.2%	12.8%	16.0%	19.7%	10.6%

Source: USCB, 2000. *Hispanic percentage of all races

The Preferred Alternative would not disproportionately or adversely affect minority or low-income populations. The majority of the land purchased for the project is light commercial property and parkland; therefore, no residences would be displaced and no adverse impacts to neighborhoods would result from the proposed project. The Preferred Alternative would provide both a visual and physical connection between the north side of the Trinity River and the south, or downtown, side. Due to the nature of the project, the proposed Downtown Campus Project and associated pedestrian bridge would increase community cohesion within and between the downtown district and neighborhoods north of the Trinity River and serve as a focal point for both formal community events and informal community interactions. The Preferred Alternative would enhance educational opportunities for all populations in the county, particularly for the significant minority/low-income population on the north side of the Trinity River and the increasing downtown population on the south side of the river, by providing a nearby facility to meet the ever-growing demand for higher education in the area.

3.3. System Integrity

3.3.1. Localized Levee System Integrity

Hydraulic modeling has been conducted to validate the effect of the Preferred Alternative on the river flow. Numerical modeling was utilized to confirm the effect of the structures in the floodway and verify that mitigation would meet the required CDC criteria.

USACE's *Engineering Manual 1110-2-1913* provides guidance for the design of levees. While the manual provides a wide variety of recommendations for a range of conditions and material types, the major items that must be considered for a new levee and levee enlargement design are seepage control, slope stability and settlement. A geotechnical study was performed in July 2006 in order to assess these factors within the project site. A summary of the analyses and findings for each factor are presented below.

Seepage analyses were conducted using steady-state analysis procedures with the finite element program Seep/W version 6.17. The analysis performed considered the levee under the existing conditions, the proposed building excavation but without a diaphragm wall, the excavation with the diaphragm wall and long-term conditions with the diaphragm wall. Sequencing the evaluation in this order provided a basis to verify the need for the wall and design details of the wall, such as depth of penetration into bedrock.

ETL-1110-2-569 provides the most recent USACE guidance on allowable seepage exit gradients for levee systems. This document indicates that exit gradients should be less than 0.50 to reduce the risk of soil piping. This gradient assumes upward (vertical) flow. Because seepage flows entering the excavation may have a significant horizontal component based on discussions with the USACE Fort Worth District, a target exit gradient of approximately 0.25 has been identified for this project and the evaluation of the seepage model results.

The results of the seepage model, as presented in the July 17, 2007 Kleinfelder Geotechnical Study are summarized below in the **Table 3**.

Table 3 - Seepage Analyses Results Summary

Case	Case No.	Pool Elevation	Comments	Flow into Excavation per Foot of Excavation (cubic feet/ Sec)	Maximum Estimated Exit XY Gradient
Levee Existing Conditions	1	SPF	Base-Case Parameters	N/A	0.15
Open Excavation, No Wall	2	SPF	Base-Case Parameters	8.0E-06	0.83
	3	100-yearflood	Base-Case Parameters	3.0E-06	0.32
Open Excavation and Diaphragm Wall	4	SPF	Base-Case Parameters	1.8E-06	0.20
	5		Increased Bedrock Permeability	4.8E-06	0.53
	6	100-yearflood	Base-Case Parameters	7.0E-07	0.08
	7		Increased Bedrock Permeability	1.8E-06	0.20
Evaluation of Length of Diaphragm Wall	8	SPF	Diaphragm Wall Length of 400 feet (same as Case No. 2)	8.0E-06	0.83
	9		Diaphragm Wall Length of 560 feet	7.6E-06	0.82
	10		Diaphragm Wall Length of 720 feet	7.6E-06	0.80

Source Geotechnical Study – Diaphragm Wall for Secondary Flood Control, Revised July 17, 2007

The analysis indicates that the existing levee system has a negligible risk of soil piping due to elevated exit gradients during flood events, with a calculated exit gradient of 0.15 during an SPF event. The inclusion of the basement excavation would introduce higher exit gradients due to under seepage during flood events, as noted by a calculated exit gradient of 0.83. Therefore, the diaphragm wall is proposed as a method for reducing these exit gradients along the shortest flow path. The analysis does indicate that the installation of the diaphragm wall mitigates under-seepage exit gradients to 0.20 for the shortest flow path (perpendicular to the levee). However, the gradient is increased to 0.53 if increased bedrock permeability is assumed. Based on observations of the rock core and the general lack of weathering, the increased rock permeability is considered a conservative case and not likely to be present below the base of a wall with a six-foot bedrock penetration, with at least one-foot of penetration into unweathered bedrock is judged to be acceptable for wall design.

Elevated exit gradients would only occur during flood events, and the duration of the flood loads is transient and relatively short (two weeks). This is important to note since the seepage model assumes that all soil and rock units are saturated. In reality, significant portions of the soil units

are unsaturated or partially saturated. The flood duration is not likely to be great enough to completely saturate the system, which implies conservatism in the analysis.

Slope stability analyses of the levee and construction excavations were performed using the computer program Slope/W version 6.17, developed by Geo-Slope International, Ltd. This program was used to perform automatic searches of different potential failure surfaces and to compute the lowest safety factor corresponding to a critical failure surface for a particular analysis condition.

Failure surfaces were analyzed using Spencer's method. Spencer's method is a two dimensional limit-equilibrium method that satisfies force equilibrium of slices and overall moment equilibrium of the potential sliding mass. This method utilizes the embankment slope configuration, unit weight and shear strength properties of embankment and foundation materials, and boundary and internal distribution of forces due to water pressures.

The minimum calculated factor of safety and the minimum recommended for each condition are presented in **Table 4**. The USACE recommended values shown in the table were selected based on the guidelines provided in USACE Engineering Manuals EM 1110-2-1913 and EM 1110-2-1902.

Table 4 – Slope Stability Analysis Results Summary

Case	Slope	Loading Condition	USACE Factor of Safety	Calculated Factor of Safety
Levee Existing Conditions	Upstream/Riverside	SPF	1.4	3.2
		Rapid Drawdown	1.0 to 1.1	1.6
	Downstream/Landside	SPF	1.4	4.3
Diaphragm Wall Construction	Upstream/Riverside	100-year Flood	1.2	3.2
		Rapid Drawdown	1.0	1.8
		Normal Pool	1.3	2.4
	Downstream/Landside	100-year Flood	1.2	5.3
		Normal Pool	1.3	6.3
With Basement Excavation	Downstream/Landside	SPF	1.3	1.7
Project Completion (Long-term)	Upstream/Riverside	SPF	1.4	3.2
		Rapid Drawdown	1.0 to 1.1	1.6
	Downstream/Landside	SPF	1.4	4.3

Source: Geotechnical Study – Diaphragm Wall for Secondary Flood Control, Revised July 17, 2007

Based on the results presented, the computed factors of safety meet or exceed the minimum values recommended by the USACE. These factors of safety for the existing riverside vary from 3.2 for the SPF event to 1.6 for rapid drawdown from the SPF event. These values place the factors of safety over 200 percent above the minimum USAC requirements for the maximum rapid drawdown (total stress), and 50 percent above the minimum USACE requirements for the SPF event (effective stress). These results indicate that the levee is stable under the studied

loading conditions, including the existing conditions, during construction of the diaphragm wall, with the proposed excavation at the toe and long term with the diaphragm wall in place.

3.3.2. Levee Maintenance and Flood Fighting

The construction of the campus buildings and plaza would restrict access to the portions of the levee within the building and plaza area. As a result access to these portions of the levee for inspection, operations, maintenance and flood fighting activities by TRWD and the USACE may be affected.

The diaphragm wall has been developed, in part, to lessen the impact of these access limitations. Although the primary purpose of the wall is not to serve as a floodwall, the structural design is such that should a failure of the riverside of the levee occur, the diaphragm wall would be capable of retaining the remaining portions of the levee. While this does not remove the increased risk associated with the limited access, the wall would mitigate the inherent risk as it provides a redundancy that is not currently present within the system.

Additionally, a number of strategies have been proposed in order to further reduce the risk associated with reduced access. These strategies include the use of interlocking paver blocks for the portion of the plaza above the levee. These blocks would be able to be removed quickly in order to make the excavations necessary to observe the top of the diaphragm wall. While equipment access would be limited along this portion of the levee, access under the plaza and building would be maintained in order to visually observe the condition of the levee. Vehicular access would also be maintained to the general area by utilizing the existing access ramp to the north and east. TCCD would also ensure that all TRWD and USACE staff would have on-demand access to all buildings and basement drainage systems to satisfy any inspection needs.

The combination of these measures would allow for the continued maintenance and operation of the local flood protection structures and facilities as required under 33 CFR 208.10.

3.3.3. Executive Order 11988

Executive Order 11988 pertains to floodplain management and directs all Federal agencies to avoid, if possible, development and other activities in the 100-year floodplain. Where the base floodplain cannot be avoided special considerations and studies for new facilities and structures are needed. Design and siting are based on scientific, engineering, and architectural studies; considerations of human life, natural processes, cultural resources, and the planned life span of the preferred alternative.

Federal agencies are required to:

- Reduce the risk of flood loss
- Minimize the impact of floods on human safety, health , and welfare
- Restore and preserve the natural and beneficial values served by floodplains in carry out agency responsibilities.

Tarrant County is a participant in the National Flood Insurance Program. According to the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM), the project area crosses Zone AE within the FEMA FIRM of Tarrant County, Texas and Incorporated Areas, Panel # 48439CO290 J, map revised August 23, 2000. This indicates that the portions of the Preferred Alternative fall within the 100-year floodplain of the Trinity River.

3.3.4. CDC Criteria

The Trinity River is also regulated by the Trinity River Corridor Development Certificate (CDC) Process. This process aims to stabilize flood risk along the corridor by ensuring that any development that occurs in the floodplain would not raise flood water levels or reduce flood storage capacity. Local governments retain ultimate control over floodplain permitting decisions under the CDC process, but other communities along the Trinity River Corridor are given the opportunity to review and comment upon them. The proposed project would be required to meet permitting criteria in order to obtain a CDC from the floodplain/CDC administrators of Fort Worth.

These common permitting criteria include:

- no rise in the 100-year flood elevation;
- a maximum allowable loss of valley storage in the 100-year and Standard Project Flood discharges of 0% and 5%, respectively;
- no increases in erosive water velocity on–site or off-site; and
- equal conveyance reductions on both sides of the channel incorporated into hydraulic modeling.

The material included in the CDC Application should demonstrate, through submission of appropriate hydraulic data, that the above criteria have been met. (NCTCOG website Accessed (14 January).

In order to ensure that CDC requirements were met the impacts associated with the preferred alternative were evaluated using a HEC-RAS (Hydrologic Engineering Center- River Analysis System) model of the West Fork of the Trinity River (Trinity River). The evaluation included the development of a modified baseline model and a proposed conditions model.

The following HEC-RAS geometries were developed for the study.

- Modified Baseline
- Proposed Construction with Mitigation
- Temporary Construction with Work Bridge Deck in Place
- Temporary Construction with Work Bridge Deck Removed

Results obtained indicated a need for mitigation measures to be implemented. A number of scenarios were modeled resulting in the selection of placement of an ACB system called Cable Concrete. The layout of the channel modifications are shown in **Figures 10a and 10b**.

The proposed channel modification area is approximately 350 feet long, and generally maintains the existing side slopes of the banks. The proposed channel modifications would start at an approximate elevation of 522 to avoid earthwork below the Ordinary High Water Mark (OHWM) of 521. On the north bank, the channel modifications would extend horizontally approximately 12 feet, and then up along the existing slope to the top of the channel bank at an approximate elevation of 534. The horizontal cut into the north bank exists only through the downstream portion of the project area. As the project extends upstream, this cut into the bank would transition to match the existing ground surface of the north bank. On the south bank, the channel modifications would begin at elevation 522 and extend up the existing slope to the top of the channel bank at an approximate elevation of 534.

Modeling results were obtained for the 100-year and SPF flow conditions under mitigation conditions. The maximum water level increase in the SPF is 0.02 feet between the Library and Main Street. The proposed mitigation would therefore maintain the water level outside of the project area and slightly lower the water level through the project and upstream. Based on verbal communication between the USACE, TRWD and CDM, there was general agreement that a difference of 0.02 feet is within an acceptable range of model accuracy and can be considered as matching existing conditions.

Valley storage impacts were based on the total volume calculation from HEC-RAS. The results indicate a net gain in the 100-year volume of 0.25 acre-foot at the upstream limits of the project due to the increased cross-sectional area provided by the mitigation plan. Although there is some drawdown of 0.07 foot in the 100-year water surface elevation at the upstream limits of the project, it is reasonable to conclude that this difference is well within the computational accuracy of the HEC-RAS program, and no real loss of valley storage would result from the proposed project. There is a no loss of valley storage for the SPF.

The analysis of the existing and proposed conditions via modeling therefore demonstrate, within reasonable judgment, based on the degree of accuracy of the models, that the USACE and CDC criteria of having no rise in 100-year or SPF water surface elevation and no loss of valley storage are satisfied.

3.4. Water Resources

3.4.1. Aquatic Habitat and Community

Fish species common within the Trinity River watershed and associated tributaries include species such as carp (*Cyprinus carpio*), gizzard shad (*Dorosoma cepedianum*), and long-nose gar (*Lepisosteus osseus*), and smaller pollution-tolerant species such as the mosquito fish (*Gambusia affinis*), sunfish (*Lepomis spp.*), red shiner (*Notropis lutrensis*), and bullhead minnow (*Pimephales viglax*).

Aquatic organisms presently utilizing shoreline or near shore habitats along the Trinity River and adjacent to the project area would be temporarily displaced during the construction activity. Until re-vegetation occurs, fish and other aquatic biota would be temporarily impacted from the turbidity generated from suspended silt and other material in runoff from construction activities. Impacts to this community as a result of the hydraulic mitigation are not anticipated as mitigation measures will be installed outside of the OHWM of the river. Temporary impacts would be limited to the duration of construction. These impacts would be minimized through the use of a range of sedimentation and erosion control Best Management Practices (BMPs) as listed in **Table 5**. Over time, vegetation on affected areas would stabilize soils and minimize surface run-off.

3.4.2. Water Quality

TCEQ is charged with the responsibility of maintaining and enhancing the waters in the state, divided surface waters in the State of Texas into numbered segments for the purpose of organizing water quality data and designated water uses and classifications. This information is used to describe the status and trends of the State's waters. Water quality impairments are noted on the Texas 2004 and Draft 2006 Clean Water Act Section 303(d) List. The list is comprised of segments that do not meet, or are not expected to meet, applicable water quality standards, and includes the reasons for the impairment or threat. The Texas Department of Health (TDH) is responsible for issuance of fish consumption advisories, aquatic life closures, and commercial bans.

The segment within the study area is Segment 0806 (from a point immediately upstream of the confluence of Village Creek in Tarrant County to Lake Worth Dam in Tarrant County), the West Fork of the Trinity River Below Lake Worth, as documented in the Texas 2004 and Draft 2006 Clean Water Act Section 303(d) List. Segment 0806 is listed on the 303(d) list as an impaired water under Category 5a, which signifies a water body that does not meet applicable water quality standards or is threatened for one or more designated uses by one or more pollutants and for which a Total Maximum Daily Load (TMDL) study is underway or scheduled. TMDL is a calculation of the maximum amount of pollutant that a water body can receive and meet water quality standards and in allocation of that amount to the pollutant's sources. Segment 0806 has been given a high urgency ranking to initiate a TMDL for non-point sources of PCBs in fish tissue and an underway ranking (meaning a TMDL project has been initiated) for point sources and non-point sources of bacteria in the segment's lower 22 miles, which includes the project area.

According to TCEQ's 2006 Texas Water Quality Inventory Status and Category of All Waters, the designated water uses for this Segment 0806 are aquatic life, recreation, general, fish consumption, public water supply, and overall use. Recreation, fish consumption, and overall use were not supported due to the presence of PCBs and chlordane in fish tissue and bacteria.

Although run-off from the project area may discharge into an impaired segment, the water quality of wetlands and waters in the state shall be maintained in accordance with all applicable provisions of the Texas Surface Water Quality Standards including the general, narrative and numerical criteria.

Texas Pollutant Discharge Elimination System

The United States Environmental Protection Agency (EPA) promulgated storm water regulations pursuant to the National Pollutant Discharge Elimination System (NPDES) Program. Texas is an NPDES delegated state and the TCEQ continues to administer the general construction permits for storm water activities at this time. A Storm Water Pollution Prevention Plan (SWPPP) has been developed in accordance with the conditions of the General Permit for Storm Water Discharges from Construction Activity authorized pursuant to the TCEQ Texas Pollution Discharge Elimination System (TPDES) Program.

A SWPPP has been developed for the construction activities planned for the Downtown Campus Project. The SWPPP allows flexibility in complying with the provisions of the TCEQ TPDES General Permit for Storm Water Discharges Associated with Construction Activity. The owner's representative (Authorized Signatory) is responsible for ensuring that the contractor and all other participating subcontractors are in compliance with the provisions of the SWPPP. It is the policy of TCCD that all construction activities performed by the contractor and/or a subcontractor are in compliance with all federal, state, and local environmental laws and regulations.

In keeping in compliance with Part IV.D.2.a of the EPA's General Construction Permit, short and long term goals and criteria need to be applied. It is EPA's intent that erosion and sediment controls should be designed to retain sediment on-site to the extent practicable. The TCEQ will at a minimum retain the same erosion and control standards required by the EPA. The TCEQ has determined that incorporating certain BMPs into Tier I projects would sufficiently address the likelihood that water quality will remain at the desired level. At least one BMP for erosion control, one BMP for post-construction total suspended solids control, and one BMP for sedimentation control from the TCEQ Tier I checklist would be utilized for the project **(Table 5)**.

Table 5 - Storm Water Pollution Prevention – Best Management Practices

Erosion Control	Sedimentation Control	Post Construction TSS
Temporary Vegetation	Sand Bag Berm	Retention/Irrigation
Blankets/Mulch/Matting	Silt Fence	Vegetative Filter Strip
Mulch	Triangular Filter Dike	Constructed Wetlands
Sod	Rock Berm	Wet Basins
Interceptor Swale	Hay Bale Dike	Vegetation Lined Drainage Ditches
Diversion Dikes	Brush Berm	Grassy Swales
Erosion Control Compost	Stone Outlet Sediment Trap	Sand Filter Systems
Mulch Filter Berms/Socks	Sediment Basin	Extended Detention Basins
Compost Filter Berms/Socks	Erosion Control Compost	Erosion Control Compost
-	Mulch Filter Berms/Socks	Mulch Filter Berms/Socks
-	Compost Filter Berms/Socks	Compost Filter Berms/Socks

All control measures must be properly selected, installed, and maintained in accordance with the manufacturer's specifications and good engineering practices. If periodic inspections or other information indicates a control has been used inappropriately, or incorrectly, the permittee must replace or modify the control for site situations.

If sediment escapes the construction site, off-site accumulations of sediment must be removed at a frequency sufficient to minimize off-site impacts (e.g., fugitive sediment in street could be washed into storm sewers by the next rain and/or pose a safety hazard to users of public streets).

3.4.3. Section 404 of the Clean Water Act

The Trinity River begins in north Texas, a few miles south of the Red River. The Trinity River's headwaters are separated from the Red River basin by the high bluffs on the south side of the Red River. The Trinity has four forks, the Clear Fork, the Elm Fork, the West Fork, and the East Fork. The Clear Fork begins two miles south of Gibtown in extreme southeastern Jack County and flows east for five miles, then turns southeast and flows down a straight valley for fifty-six miles to its confluence with the West Fork of the Trinity River, just south of Lake Benbrook in southwestern Tarrant County. The West Fork begins in southern Archer County and flows southeast 180 miles through Jack, Wise, Tarrant, and Dallas counties and along the county line between Ellis and Kaufman counties, to its junction with the East Fork of the Trinity. The Clear Fork and the West Fork meet near downtown Fort Worth. The Preferred Alternative is on the West Fork of the Trinity River within the Lower West Fork of the Trinity drainage basin.

Congress directed the USACE under Section 404 of the Clean Water Act (33 USC 1344) to regulate the discharge of dredged and fill material into waters of the U.S. including wetlands. The West Fork of the Trinity River (Trinity River) is classified as a water of the U.S. as it is a navigable waterway. Activities that result in the discharge of dredged or fill material into waters of the U.S. require a permit under Section 404 of the Clean Water Act. Activities requiring a permit under Section 404 of the Clean Water Act may be authorized by a General Permit (such as Nationwide General Permits, Regional General Permits, or Programmatic General Permits) or an Individual Permit (such as Standard Individual Permits or Letters of Permission).

Regulated activities include actions that would result in a discharge of dredged or fill material below the Ordinary High Water Mark (OHWM). The OHWM is defined as a line on the shore established by the fluctuations of water and indicated by physical characteristics, or by other appropriate means that consider the characteristics of the surrounding areas (33 CFR328.3(e)). The construction of the preferred alternative would result in both the temporary and permanent discharge of dredged or fill material below the OHWM which was determined to be 521 feet above sea level at the Trinity River.

Temporary discharges would result from the construction of the work and pedestrian bridge structures. Both of these would be supported by 14 inch diameter falsework piers. A total of 6 falsework piers would be placed within the OHWM of the Trinity River as a result of the construction of the work bridge and a total of 9 falsework piers would be placed within the OHWM of the Trinity River as a result of the construction of the pedestrian bridge. The piers would be positioned in such as way as to minimize impacts to the flow of the river. Once the construction has been completed, the piers would be removed and river bed returned to pre-construction conditions. The plan and profile of the proposed work bridge and pedestrian bridge is presented in **Figure 14**.

Further temporary discharges would result from the construction of Bent 2 of the pedestrian bridge. Bent 2 is the main bridge support on the northern side of the Trinity River. The location of the bent with respect to the Trinity River is presented in **Figure 9**.

In order to complete the construction of Bent 2, a cofferdam would be required. The cofferdam, which would be constructed using sheet piling, would enclose approximately 0.006 acres of waters of the U.S. This area would be pumped in order to provide a dry area to construct the drilled shafts and form and pour the footing and column of the bent. Once the footing is complete, the cofferdam would remain in place with the exception of the portion above existing grade which would be cut-off and removed. Approximately 10.33 cubic yards of fill material would be temporarily placed within the OWHM of the Trinity River in order to reestablish existing grade and return the river bed to pre-construction conditions. There are no permanent discharges of dredged or fill material associated with this action. Details of the cofferdam are presented in **Figure 9**.

Permanent discharges would result from the construction of the northern and southern storm drains and associated outfalls. The proposed plan view of the northern and southern storm water drains and outfalls are included as **Figures 11 and 12**. Approximately 115 linear feet of the stream bank would be permanently impacted as a result of the construction. Coffer dams would also be used to enable construction and would result in further temporary fill.

Potential impacts to waters of the U.S. are summarized in **Table 6**.

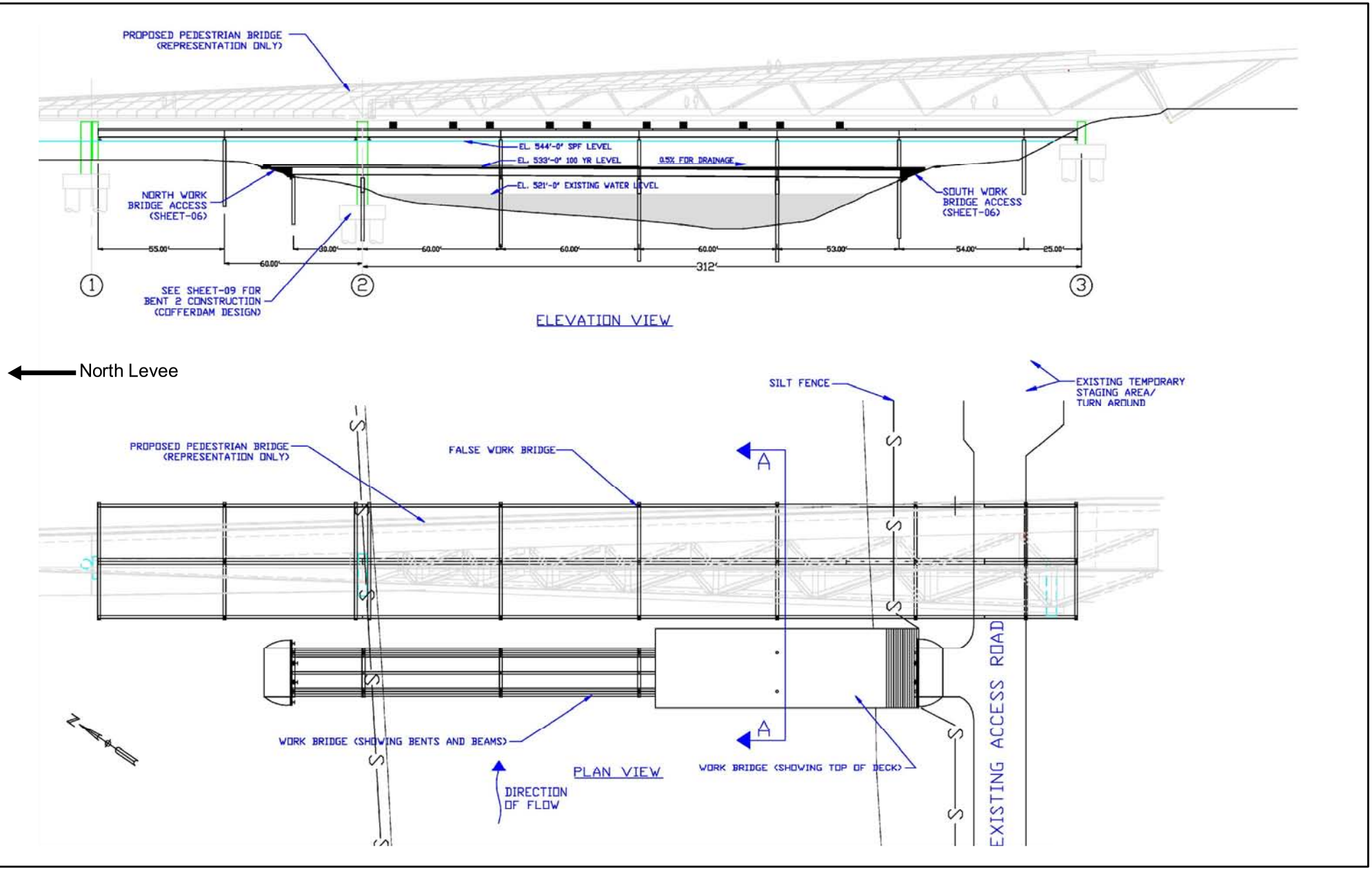


Figure 14 - Temporary Work Bridge Plan and Profile

TCCD Environmental Assessment

Source: Austin Bridge & Road

Table 6 - Potential Project Impacts to Waters of the U.S.

	Associated Permanent Impact		Associated Temporary Impact	
	Cubic yards	*Linear feet*	*Acres*	*Cubic yards*
Temporary Work Bridge	-	-	0.0001	3.30
Pedestrian Bridge	-	-	0.0002	4.95
Bent Two Coffer Dam	0.006	-	-	10.33
Northern Storm Water Drain and Coffer Dam	-	95	0.0510	-
Southern Storm Water Drain and Coffer Dam	-	20	0.0550	-
Total Impact	**-**	**115**	**0.1613**	**18.58**

Based on site reconnaissance and National Wetland Inventory (NWI) maps, no wetlands have been identified within the study area. Therefore, the Trinity River is the only aquatic feature located within the project area that is considered a water of the U.S.

According to Section 404(b)(1) Guidelines ("Guidelines for Specification of Disposal Sites for Dredged or Fill Material", 40 CFR Part 230) authorization of a discharge into waters of the United States is prohibited unless appropriate and practicable steps have been taken to avoid, minimize, or mitigate the adverse impact of the proposed action on the aquatic ecosystem.

Throughout project development efforts have been taken to avoid and minimize impacts to waters of the U.S. These efforts have taken place primarily during project design. Efforts to avoid include the design of the pedestrian bridge, work bridge, campus buildings and ACB in such a way as to not result in any permanent discharges of dredged or fill material into the Trinity River. Efforts to minimize include the construction of the storm drain outfalls in such as way as to reduce the associated impacts to the banks of the Trinity River. As a result of these efforts, adverse project impacts to the aquatic ecosystem have been reasonably avoided or minimized. It is therefore not anticipated that compensatory mitigation would be required for this project.

Based on the nature and scope of this project, it appears that the project may meet the terms and conditions associated with Nationwide Permit #39: *Commercial and Institutional Developments* with Pre-construction Notification.

3.4.4. Executive Order 11990

As this project qualifies as a federal action, Executive Order 11990, Protection of Wetlands must be met. Executive Order 11990 requires all executive agencies to "avoid to the extent possible the long and short term adverse impacts associated with the destruction or modification of wetlands and to avoid direct or indirect support of new construction in wetlands wherever there is a practicable alternative (May 24, 1977; 42 FR 26961)". As there are no wetlands present within the project area, the terms of Executive Order 11990 appear to be met.

3.5. Riparian and Terrestrial Resources

According to the Texas Parks and Wildlife (TPWD) Vegetation Types of Texas (1984), vegetation in the area is classified as Urban, which consists of previously disturbed and developed areas and is consistent with the vegetation within the project area. A swath of riparian forest is located on the southern bank of the Trinity River. This swath has been

previously impacted by construction activities within project area. The remainder of the vegetation in the project area consists primarily of upland terrestrial grass species. It is anticipated that the construction of the Preferred Alternative would result in the loss of approximately 0.6 acres of terrestrial vegetation. Dominant vegetative species observed are provided in **Table 7**.

Table 7 - Vegetation Observed within the Project Area

Common Name	Scientific Name
Red oak	*Quercus rubra*
Hackberry	*Celtis occidentalis*
Great ragweed	*Ambrosia trifida*
Johnson grass	*Sorghum halepense*
Bermuda grass	Cynodon dactylon
Indian woodoats	*Chasmanthium latifolium*

Slow moving wildlife species such as many species of reptiles and amphibians living in the portion of the Trinity River within the project area would be temporarily disturbed during construction activities. Other mobile animals associated with the project area such as squirrels, rabbits, skunks, rats, field mice, possum, raccoon, beaver, and nutria would be temporarily displaced to adjoining open space during construction. Noise associated with construction activities would also temporarily disturb terrestrial wildlife species in adjacent areas.

Common wildlife species in these areas are those which are tolerant of human activities such as squirrels, rabbits, migratory songbirds, and various rodents. Amphibians, reptiles and mammals which are common to the area include frogs and toads, snakes, turtles, cottontail rabbit, cotton rat, field mice, opossum, raccoon, bobcat, beaver, nutria, and coyotes.

3.6. Species of Special Concern

During the site reconnaissance in May 2007, habitat elements (streams, creeks, floodplains and poorly drained depressions) for some state and federally listed threatened and endangered species as listed for Tarrant County by TPWD and the U.S. Fish and Wildlife Service (USFWS) were identified within the project area. Species include the American Peregrine Falcon (*Falco peregrinus anatum*), Arctic peregrine falcon (*Falco peregrinus tundrius*), bald eagle (*Haliaeetus leucocephalus*), interior least tern (*Sterna antillarum athalassos*), peregrine Falcon (*Falco peregrinus),* whooping Crane (*Grus americana*), and the timber/canebrake rattlesnake (*Crotalus horridus*). A list of threatened or endangered species occurring in Tarrant County and their habitat preferences can be found in **Figure 15**. Coordination with TPWD was undertaken in order to determine if there have been any known occurrences of threatened or endangered species within the project or surrounding area. No threatened or endangered species were detected during the site reconnaissance. Due to the urban context of the project area and the presence of similar habitat adjacent to the project area, no impacts to threatened or endangered species are anticipated as a result of the Preferred Alternative.

During this coordination a response was received from TPWD on November 28, 2007 indicating the presence of a colonial waterbird rookery within proximity to the study area. As mentioned above, this area was permanently impacted during previous construction activities.

Figure 15
Federal and State Listed Threatened/Endangered Species of Concern in Tarrant County

Species	Federal Status	State Status	Description of Suitable Habitat	Habitat Present	Species Effect	Pertinent Project Information
Birds						
American Peregrine Falcon *Falco peregrinus anatum*	DL	E	Year-round resident and local breeder in west Texas, nests in tall cliff eyries; also, migrant across state from more northern breeding areas in US and Canada, winters along coast and farther south; occupies wide range of habitats during migration, including urban, concentrations along coast and barrier islands; low-altitude migrant, stopovers at leading landscape edges such as lake shores, coastlines, and barrier islands.	Yes	No	Potential habitat present on the southern bank of the Trinity River.
Arctic Peregrine Falcon *Falco peregrinus tundrius*	DL	T	Nests in tundra regions; migrates through Texas; winter inhabitant of coastlines and mountains from Florida to South America. Open areas, usually near water.	Yes	No	Potential habitat present on the southern bank of the Trinity River
Bald Eagle *Haliaeetus leucocephalus*	LT-PDL	T	Nests and winters near rivers, lakes and along coasts; nests in tall trees or on cliffs near large bodies of water.	Yes	No	Potential habitat present on the southern bank of the Trinity River
Henslow's Sparrow *Ammodramus henslowii*	—	R	Wintering individuals (not flocks) found in weedy fields or cut-over areas where lots of bunch grasses occur along with vines and brambles; a key component is bare ground for running/walking.	No	No	No habitat elements such as bunch grasses, vines and brambles observed in within the project area.
Interior Least Tern *Sterna anitllarum athalassos*	LE	E	Nests along sand and gravel bars within braided streams and rivers; also known to nest on man-made structures.	Yes	No	Potential habitat present on the southern bank of the Trinity River
Peregrine Falcon *Falco peregrinus*	DL	ET	Both subspecies migrate across the state from more northern breeding areas in US and Canada to winter along coast and farther south; subspecies (*F. p. anatum*) is also a resident breeder in west	Yes	No	Potential habitat present on the southern bank of the Trinity River

Species	Federal Status	State Status	Description of Suitable Habitat	Habitat Present	Species Effect	Pertinent Project Information
			Texas; the two subspecies' listing statuses differ, thus the species level shows this dual listing status; because the subspecies are not easily distinguishable at a distance, reference is generally made only to the species level; see subspecies for habitat.			
Western Burrowing Owl *Athene cunicularia hypugaea*	—	R	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	Yes	No	Vacant lands near human habitation and Alliance Airport are found within the project area. However, this species was not observed during the time of the site visit and no known occurrences of this species have been noted near the project area. In addition, this species prefers sandy soils for digging burrows. The dominant soils in the project area consist of clays and clay loams.
Whooping Crane *Grus americana*	LE	E	Estuaries, prairie marshes savannah, grasslands, croplands pastures- winter resident at Aransas NWR, Aransas and Matagorda.	Yes	No	Potential habitat present on the southern bank of the Trinity River
Mammals						
Gray Wolf *Canis lupus*	LE	E	Extirpated; formerly known throughout the western two-thirds of the state in forests, brushlands, or grasslands	No	No	This species requires significant areas of forest and brushland. Forested areas within the project area are fragmented and not conducive to this species' preferred habitat needs. In addition, no known occurrences of this species have been documented in the project area.
Plains Spotted Skunk *Spilogale putorius interrupta*	—	R	Catholic; open fields, prairies, croplands, fence rows, farmyards, forest edges, and woodlands;	Yes	No	Various elements of the preferred habitat for this species (such as fence rows,

Species	Federal Status	State Status	Description of Suitable Habitat	Habitat Present	Species Effect	Pertinent Project Information
			prefers wooded, brushy areas and tallgrass prairie			forest edges, open fields, pastures, etc.) occur within the project area. However, no known occurrences for this species have been recorded within or near the project area and no individuals were observed during the field reconnaissance.
Red Wolf *Canis rufus*	LE	E	Extirpated; formerly known throughout eastern half of Texas in brushy and forested areas, as well as coastal prairies	No	No	This species requires significant areas of forest and brushland. Forested areas within the project area are fragmented and not conducive to this species' preferred habitat needs. In addition, this species is extirpated throughout most of its historical Texas range. No known occurrences of this species have been documented in the project area.
Reptiles						
Texas Garter Snake *Thamnophis sirtalis annectens*	—	R	Wet or moist microhabitats are conducive to the species occurrence, but is not necessarily restricted to them; hibernates underground or in or under surface cover; breeds March-August	Yes	No	Wet habitats (near creeks and tributaries) are found within the project area. However, no known occurrences of this species were found near the project area. Impacts to Elizabeth and Henrietta creeks, and thus potential habitat for this species, within the project area would be minimal due to the implementation of a bridge at each crossing.
Texas Horned Lizard *Phrynosoma cornutum*	—	T	Open, arid and semi-arid regions with sparse vegetation, including grass, cactus, scattered brush or scrubby trees; sandy to rocky soil.	No	No	The project area is not located within a semi-arid region and does not contain sparse vegetation suitable for this

Species	Federal Status	State Status	Description of Suitable Habitat	Habitat Present	Species Effect	Pertinent Project Information
						species.
Timber/Canebrake Rattlesnake *Crotalus horridus*	—	T	Swamps, floodplains, upland woodlands, riparian zones, abandoned farmland; prefers dense ground cover, i.e. grapevines or palmetto.	Yes	No	Potential habitat near riparian areas within the project area. Impacts to Elizabeth and Henrietta creeks, and thus potential habitat for this species, within the project area would be minimal due to the implementation of a bridge at each crossing.
Plants						
Glen Rose Yucca *Yucca necopina*	—	R	Grasslands on sandy soils; flowering April-June, also found in limestone bedrock, clayey soil on top of limestone, and gravelly limestone alluvium	No	No	Grasslands on sandy soils not found in the project area

LE, LT - Federally Listed Endangered/Threatened PT, C1 - Federally Proposed Threatened, or Candidate Species DL, PDL - Federally Delisted/Proposed Delisted R – State Listed Rare	E, T - State Endangered/Threatened Data Source: Texas Parks and Wildlife Department, 6/28/2007. USFWS, 9/2007.

3.7. Air Quality

Air quality is defined by ambient air concentration of specific pollutants determined to be of concern with respect to the health and welfare of the general public. The federal air quality program in Texas is administered by the TCEQ. The State Implementation Plan (SIP) includes Tarrant County as a non-attainment area for ozone (i.e., air quality in Tarrant County has failed to meet national ambient standards for ozone). The Environmental Protection Agency (EPA) uses six "criteria pollutants" as indicators of air quality, and has established for each of them a maximum concentration above which adverse effects on human health may occur. These threshold concentrations are called National Ambient Air Quality Standards (NAAQS). Areas of the country where air pollution levels persistently exceed the NAAQS may be designated as non-attainment areas. Conversely, areas of the country that do not persistently exceed the NAAQS are designated as attainment areas. The recommended project area would be located entirely within the Consolidated Metropolitan Statistical Area (CMSA). CMSA is currently designated as in non-attainment for 8-hour ozone.

The Preferred Alternative would result in a temporary increase in air pollution from construction equipment. BMPs would be implemented to the extent practical to reduce dust particles from entering the air. All exhaust discharges would be localized and considered insignificant. No long-term negative air quality impacts are anticipated as a result of the construction of the Preferred Alternative.

3.8. Noise

Noise is typically defined as unwanted or undesirable sound, where sound is characterized by small air pressure fluctuations above and below the atmospheric pressure. The basic parameters of environmental noise that affect human subjective response are (1) intensity or level, (2) frequency content and (3) variation with time. The first parameter is determined by how greatly the sound pressure fluctuates above and below the atmospheric pressure, and is expressed on a compressed scale in units of decibels. By using this scale, the range of normally encountered sound can be expressed by values between zero and 120 decibels. On a relative basis, a three-decibel change in sound level generally represents a barely noticeable change outside the laboratory, whereas a 10-decibel change in sound level would typically be perceived as a doubling (or halving) in the loudness of a sound.

The frequency content of noise is related to the tone or pitch of the sound, and is expressed based on the rate of the air pressure fluctuation in terms of cycles per second (called Hertz and abbreviated as Hz). The human ear can detect a wide range of frequencies from about 20 Hz to 17,000 Hz. However, because the sensitivity of human hearing varies with frequency, the A-weighting system is commonly used when measuring environmental noise to provide a single number descriptor that correlates with human subjective response. Sound levels measured using this weighting system are called “A-weighted” sound levels, and are expressed in decibel notation as “dBA.” The A-weighted sound level is widely accepted by acousticians as a proper unit for describing environmental noise. Because environmental noise fluctuates from moment to moment, it is common practice to condense all of this information into a single number, called the “equivalent” sound level (Leq). Leq can be thought of as the steady sound level that represents the same sound energy as the varying sound levels over a specified time period (typically one hour or 24 hours). Often the Leq values over a 24-hour period are used to calculate cumulative noise exposure in terms of the Day-Night Sound Level (Ldn). Ldn is the Aweighed Leq for a 24-hour period with an added 10-decibel penalty imposed on noise that occurs during the nighttime hours (between 10 P.M. and 7 A.M.). Many surveys have shown

that Ldn is well correlated with human annoyance, and therefore this descriptor is widely used for environmental noise impact assessment.

While the extremes of Ldn are shown to range from 35 dBA in a wilderness environment to 85 dBA in noisy urban environments, Ldn is generally found to range between 55 dBA and 75 dBA in most communities. This spans the range between an ideal residential environment and the threshold for an unacceptable residential environment according to U.S. Federal agency criteria.

Noise-sensitive receptors are those locations where activities that could be affected by increased noise levels and include locations such as residences, motels, churches, schools, parks, and libraries. Once operational no long-term negative noise related impacts are anticipated as a result of the construction of the Preferred Alternative. The Preferred Alternative does however have the potential to affect noise levels during construction. Noise associated with the construction of the project is difficult to predict. Construction machinery and equipment, the major source of noise in construction, is constantly moving in unpredictable patterns. Equipment may include bulldozers, motor graders, dump trucks, water trucks, concrete trucks, loaders, back hoes, track hoes, trenchers, rollers, compactors, air compressors, power generators, arc-welders, chainsaws, air guns, power tools, and similar equipment. However, construction normally occurs during daylight hours when occasional loud noises are more tolerable. No extended disruption of normal activities is expected. Provisions would be included in the plans and specifications that require the contractor to make every reasonable effort to minimize construction noise through abatement measures such as work-hour controls and proper maintenance of muffler systems.

3.9. Hazardous Materials

A search of available environmental regulatory agency databases was conducted for the subject property, adjoining properties and surrounding properties within selected search radii. A total of 23 listings were noted for 19 facilities found within the respective search radii for the Preferred Alternative, see **Figure 16**. Some facilities were listed in multiple databases. The sites were classified as “High”, “Moderate”, and “Low” environmental risks based on the proximity to the site (adjacent, up gradient, down gradient), the nature of the database listing (active vs. inactive or violations vs. no violations), and the potential to contaminate the subject property (case under investigation vs. case closed). The regulatory agencies searched, search radius, and number of facilities within the radius is presented below in **Table 8**.

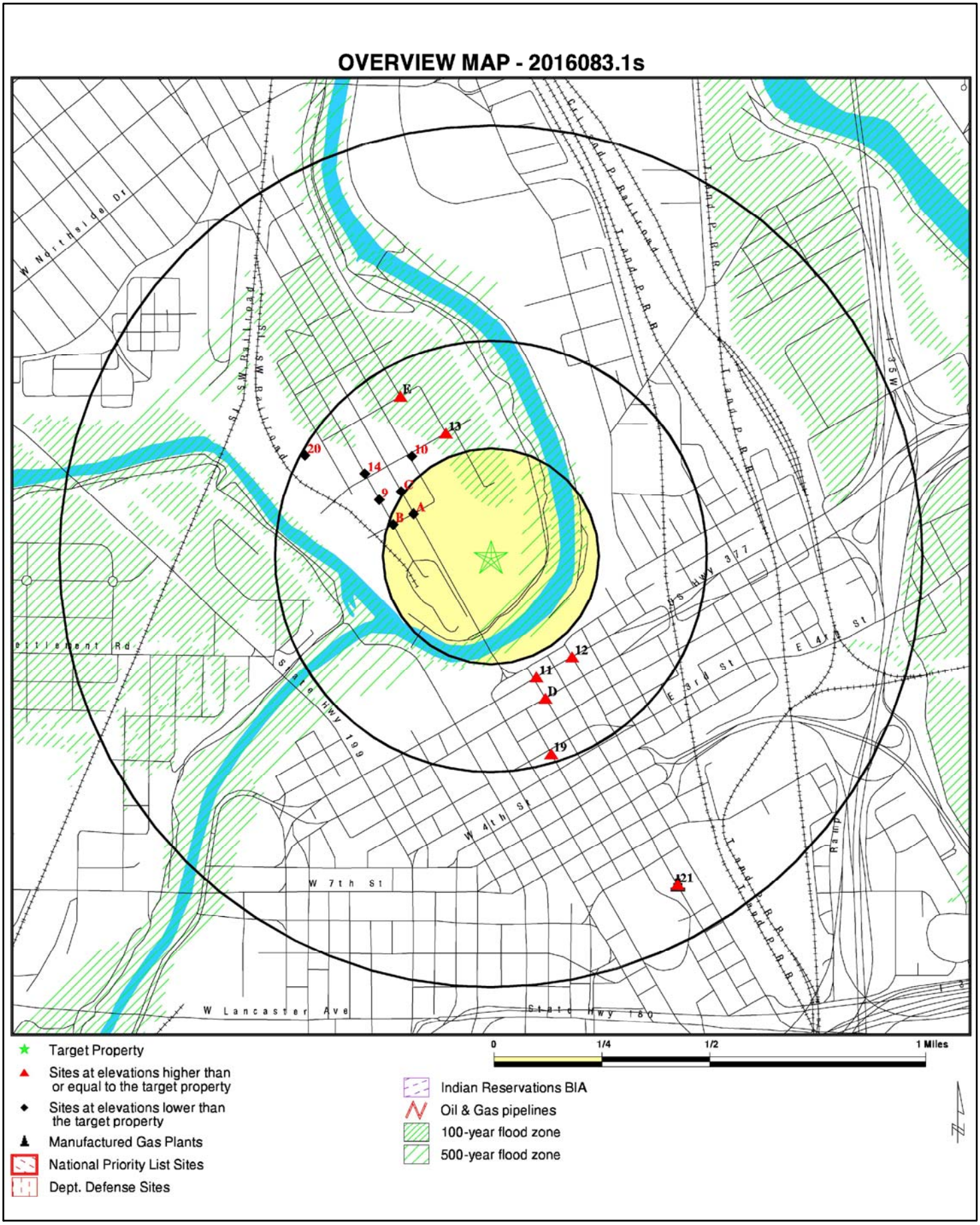


Figure 16 - EDR Overview Map

TCCD Environmental Assessment

Table 8 - List of Databases and Radii Search Distances

Database	Acronym	Search Radius (Miles)	Number of facilities within search radius
FEDERAL ASTM STANDARDS			
National Priority List	NPL	1.00	X
Proposed National Priority List	Proposed NPL	1.00	X
Delisted National Priority List	Delisted NPL	1.00	X
NPL Federal Superfund Lien	NPL Liens	Subject Property	X
Comprehensive Environmental Response, Compensation and Liability Information System	CERCLIS	0.50	X
CERCLIS-No Further Remedial Action Planned	CERCLIS-NFRAP	0.50	3
Resource Conservation and Recovery Corrective Action sites	CORRACTS	1.00	1
Resource Conservation and Recovery Information System- treatment, storage or dispose (TSD)	RCRA-TSD	0.50	1
Resource Conservation and Recovery Information System – Large Quantity Generator (LQG)	RCRA-LQG	0.25	X
Resource Conservation and Recovery Information System Small Quantity Generator (SQG)	RCRA-SQG	0.25	3
Emergency Response Notification System	ERNS	Subject Property	X
Hazardous Material Information Reporting System	HMRIS	Subject Property	X
Engineering Controls Sites Lists	US Eng Controls	0.50	X
Sites with Institutional Controls	US Inst Controls	0.50	X
Department of Defense Sites	DOD	1.00	X
Formerly Used Defense Site	FUDS	1.00	X
A listings of Brownfields Sites	US Brownfields	0.50	X
Superfund (CERCLA) Consent Decree	CONSENT	1.00	X
Record of Decision	ROD	1.00	X
Uranium Mill Tailings Sites	UMTRA	0.50	X
Open Dump Inventory	ODI	0.50	X
Toxic Chemical Release Inventory System	TRIS	Subject Property	X
Toxic Substances Control Act	TSCA	Subject Property	X
FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)	FTTS	Subject Property	X
Section 7 Tracking Systems	SSTS	Subject Property	X
PCB Activity Database System	PADS	Subject Property	X
Material Licensing Tracking System	MLTS	Subject Property	X

Database	Acronym	Search Radius (Miles)	Number of facilities within search radius
Mines Master Index File	MINES	0.25	X
Facility Index System/Facility Registry System	FINDS	Subject Property	X
RCRA Administrative Action Tracking System	RAATS	Subject Property	X
STATE AND LOCAL RECORDS			
State Superfund Registry	SHWS	1.00	X
Innocent Owner/Operator Program	IOP	Subject Property	X
Permitted Solid Waste Facilities	SWF/LF	0.50	X
Closed Landfill Inventory	CLI	0.50	X
Commercial Hazardous & Solid Waste Management Facilities	WASTEMGT	Subject Property	X
Leaking Petroleum Storage Tank Database	LTANKS	0.50	5
Underground Petroleum Storage Tank Database	UST	0.25	2
Above Ground Petroleum Storage Tank Database	AST	0.25	X
Environmental Liens Listing	LIENS	Subject Property	X
Deleted Superfund Registry Sites	DEL SHWS	1.00	X
Spills Database	TX Spills	Subject Property	X
Sites with Institutional and Engineering Controls	AUL	0.50	1
Voluntary Cleanup Program Database	TX VCP	0.50	6
Drycleaner Registration Database Listing	DRYCLEANERS	0.25	X
Brownfields Site Assessments	Brownfields	0.50	X
ENFORCEMENT	ENF	Subject Property	X
Industrial & Hazardous Waste Database	TX IHW	Subject Property	X
Edwards Aquifer Permits	ED AQUIF	Subject Property	X
Current Emission Inventory Data	AIRS	Subject Property	X
TRIBAL RECORDS			
Indian Reservations	INDIAN RESERV	1.00	X
USTs on Indian Land	INDIAN UST	0.25	X
EDR PROPRIETARY RECORDS			
Manufactured Gas Plant	---	0.25	1

Source: EDR Inquiry Number 2016083.1s. August 28, 2007

A summary of the database search findings including location, status and associated risk of each site is presented in **Table 9**.

Table 9 – Database Summary

Map ID	Distance Direction	Name	Address	Databases	Status	Risk
*	Subject	*B&D Muffler Shop*	101 NW 4th Street	LTANK	Final concurrence issued, case closed	Moderate
*	Subject	*Anderson Henderson Inc.*	401 E Belknap	LTANK	Final concurrence issued, case closed	Moderate
13	0-1/8 NNW	American Cyanamid Co. Chemicals	600 North Jones Street	CERCLIS-NFRAP VCP	Soils and groundwater being contaminated	Moderate
D16	0-1/8 SSE	Tarrant County Administration	116 Commerce	CERCLIS-NFRAP	No further remedial action required	Low
20	1/4-1/2 WNW	Texas Biulithic Co.	505 NW 5th Street	CERCLIS-NFRAP	No further remedial action required	Low
E18	1/8 – 1/4 NNW	Techni Coat Inc.	301 NE 6TH	CORRACTS RCRA -TSDF	Contamination and migration of groundwater was under control	Low
A1	0-1/8 WNW	Texas Utilities Fuel Company	101 NW 4th Street	RCRA-SQG Sites	No violations exist	Low
A2	0-1/8 WNW	O & S Garage	501 N Main Street	RCRA-SQG Sites	No violations exist	Low
B5	0-1/8 WNW	TXU Generation Company	210 NW 4th AVE	RCRA-SQG Sites	Enforcement action was taken against this violation	Low
B4	0-1/8 WNW	North Main Station	Intersection of 4th Street	UST	Permanently filled in place or removed	Low
C6	0-1/8 NW	AGAP	541 N Main	UST	Permanently filled in place or removed	Low
19	1/8-1/4 SSE	Old Western Union Building	318 Main Street	LTANK	Final concurrence issued, case closed	Low
C8	0-1/8 NW	Former Texas Rail Joint	500 N Main	LTANK VCP	Final concurrence pending documentation of well plugging	Low
9	0-1/8 WNW	LA Tex Salvage	505 N Houston Street	LTANK	Final concurrence issued, case closed	Low
21	1/2-1 SSE	Fort Worth Gas Light Co	Calhoun Street	Manufactured Gas Sites	Low risk due to distance from subject property	Low
A3	0-1/8 WNW	North Main West Tract	102 NW 4th Street	AUL VCP	Soils and groundwater contamination	Moderate
E17	1/8-1/4 NNW	LAGRAVE FIELD	301 NW 6th Street	VCP	Soils and groundwater contamination	Low
14	0-1/8 WNW	NATION WIDE ENGINES	609 NORTH HOUSTON STREET	VCP	Soils and groundwater contamination	Low
D15	0-1/8 SSE	BLOCK 10 CITY OF FORTH WORTH	100 NORTH COMMERCE STREET	VCP	Soils and groundwater contamination	Moderate

Source: EDR Inquiry Number 2016083.1s. August 28, 2007

Moderate Risk Sites

The moderate risk site locations identified in the database search along with other sites with recognized environmental conditions that had been identified by other environmental consultants are shown in **Figure 17**. See **Table 10** for additional information (not provided in the database search) about each of the sites identified in **Figure 17**.

Table 10 – Recognized Environmental Conditions

Map ID	Parcel Address	Owner	Occupant	Environmental Record Data- Preliminary REC Listings	Possible Previous
1	North Main Street (west Tract)	Tarrant County College	Site Construction Trailers	VCP ID 1705. Deed notice filed with Tarrant County restricting the exposure and use of groundwater from the site for residential, agricultural, recreational, or commercial purposes. Status: VCP Certificate of completion issues. Soil and groundwater contamination have been delineated and do not extend onto the eastern TCCD property.	North Main Generation Station
2	600 North Jones	City of Fort Worth	Vacant and Fort Worth Cats Baseball Parking Lot	VCP ID No. 1359, SWR/Facility ID No.: 30023, TXD008017261. The property has received a Municipal Setting Designation (MSD 026) from the TCEQ. Chlorinated solvents identified in the groundwater have been addressed with the MSD. The property owner intends to excavate and dispose of soil impacted with metals. The groundwater contamination has been delineated and does impact TCCD property. The TCCD East Tract and East Tract Bar properties have received Innocent Owner Certificates due to the impact.	American Cyanamid Cytec Industries
3	210 NW 4th Street	TX Electric Delivery	Vacant	SWR 39927, TXT982813628. The metals and PCBs identified on the property have been covered and placed in a “capped area” off Site. This “capped area” is regulated by an Agreed Order with the TCEQ and TXU Energy. The soil contamination has been delineated and will not impact the eastern TCCD properties.	National Metal and Smelting Company
4	500 North Main Street	Drake Reality, LLP	Vacant	VCP ID 1963, LPST ID No.: 113594. Source of groundwater contamination has been established as a former leaking UST. Chlorinated solvents have also migrated on-Site from the adjacent Cytec property. The property is currently in the application process for an MSD. The groundwater impact will be addressed with the MSD. The groundwater plume has been delineated and does not extend onto TCCD property.	Texas Rail Joint and gasoline stations
5	301 NW 6th Street	La Grave Reconstruction Company, LCC	Fort Worth Cats Parking Lot	VCP 1402, Pending Agreed Order. VOCs, metals, and chlorinated solvents were identified in the soil and groundwater and the property is subject to a TCEQ Agreed Order. The groundwater plume may be comingled with the former Cytec plume. The TCCD properties have received IOCs in association with the Technicoat and Cytec groundwater impact.	Technicoat Coatings Manufacture
6	301 NW 6th Street	La Grave Reconstruction Company, LCC	Fort Worth Cats Baseball Stadium	IOP ID No. 523. Groundwater impacted with chlorinated solvents and metals has migrated onto the property from the adjacent Cytec and Technicoat properties. The Site has received an Innocent Owner Certificate and is included in the La Grave Area MSD (MSD 026). The property is not anticipated to adversely impact the TCCD properties.	La Grave Baseball Field
7	505 North Houston Street	Various	Vacant	LPST ID 107518; 505 North Houston Street Municipal Setting Designation. The MSD has received certification from the City of Fort Worth and is currently pending TCEQ approval. The institutional control was sought to address petroleum impacted soil and groundwater in vicinity of the former salvage yard. The soil and groundwater impact has been delineated and does not extend onto the eastern TCCD property.	Salvage Yard
8	210 NW 4th Street	St. Louis Southwest RR Co.	Vacant	Jay’s salvage is currently an active metals salvage operation. The primary contaminants at the site are TPH, metals and chlorinated solvents. The soil and ground water impact has been delineated and does not extend onto the eastern TCCD property.	Metals recycling

Map ID	Parcel Address	Owner	Occupant	Environmental Record Data- Preliminary REC Listings	Possible Previous
9	205 NW 7th Street	AST Research	AST Research	SWR 33274, EPA ID: TXDO94260411. Both permits are inactive. The property is not anticipated to adversely impact the TCCD properties.	Unknown
10	820 North Main Street	Another Printing and Lithology	Anchor Printing and Lithology	EPA ID: TXD008015687, Small Quantity Handler of hazardous waster. Commercial Lithographic Printing from 1952-1998. The property is not anticipated to adversely impact the TCCD properties.	Machine Company
11	840 North Main Street	Texas Refinery Corp.	Texas Refinery Corp.	SWR 30384. Small quantity generator of hazardous waste. Produces greases, motor oils, hydraulic oils & fluids, fuel treatment systems, transmissions fluids & gear lubricants. The property is not anticipated to adversely impact the TCCD properties.	Panther Chemical Co.
12	La Grave Area	La Grave Reconstruction Company, LCC	Various	La Grave Area Municipal Setting Designation. The MESD was sought to address environmental impact to soil and groundwater in the vicinity of the former Cytec and Technicoat facilities, as well as La Grave Field. Multiple properties owners were included in the application.	Various
13	215 East Belknap	Tarrant County College	Tarrant County College Downtown Campus	LPST ID 116936. Five UST, two waste oil tanks, sumps and lifts were removed from the property. During the excavation contaminated soil and water were encountered and the Site was issued an LPST number. A screening well was advanced and the underlying groundwater was a not impacted. The TCEQ has issued final concurrence and the LPST case is closed. The property will not adversely impact the uptown TCCD properties.	B&D Muffler Shop and filing station
14	100 North Commerce Street (Block 10)	Tarrant County College	Tarrant County College Downtown Campus	VCP ID 1988. Elevated concentrations of gasoline constituents were identified in the soil and groundwater; however, the groundwater COCs was below applicable clean-up levels. The soil was excavated down to bedrock and disposed off-Site. The property has received closure through the TCEQ and is in the process of recording the COC on the property deed. The property will not adversely impact the TCCD uptown properties.	Gasoline Station
15	401 East Belknap Street	Tarrant County College	Tarrant County College Downtown Campus	LPST ID 108885. No ground water impact. The LPST case received closure in 1994. The property will not adversely impact the TCCD uptown properties.	Filling Station

Source: W & M Environmental Group, July 17, 2007

B & D Muffler Shop (LPST ID 116936) and Anderson Henderson Inc. (LPST ID108885) are located on the south bank of the Trinity River and are within the Preferred Alternative site. Site investigations were conducted on both sites. Contaminated soil was encountered at both B&D Muffler Shop and Anderson Henderson Inc. and was cleaned up to the applicable to TCEQ standards. Groundwater contamination was not detected at either facility. Final concurrence was issued by the TCEQ and the cases were closed. It was determined by the investigators that neither facility adversely impacted TCCD property. Since both sites are located within the project area, and the probability for contamination exists, both sites were determined to pose a moderate risk.

American Cyanamid is a petroleum refinery which applied for the Voluntary Cleanup Program (VCP) in 2001 due to the soil and groundwater contamination. The chemicals of concern are Volatile Organic Compounds (VOC), metals, and chlorinated solvents. The site (VCP ID 1359) is currently in the remediation phase. Groundwater contamination from the site has been delineated and the groundwater near the north boundary of the TCCD site has been impacted. The TCCD applied for and has received Innocent Owner Certificates (IOC ID 434 and 453) releasing the TCCD from liability for the remediation of the groundwater plume that migrated from the Cytec Landfill. The site lies adjacent to the Preferred Alternative site, and was determined to pose a moderate environmental risk.

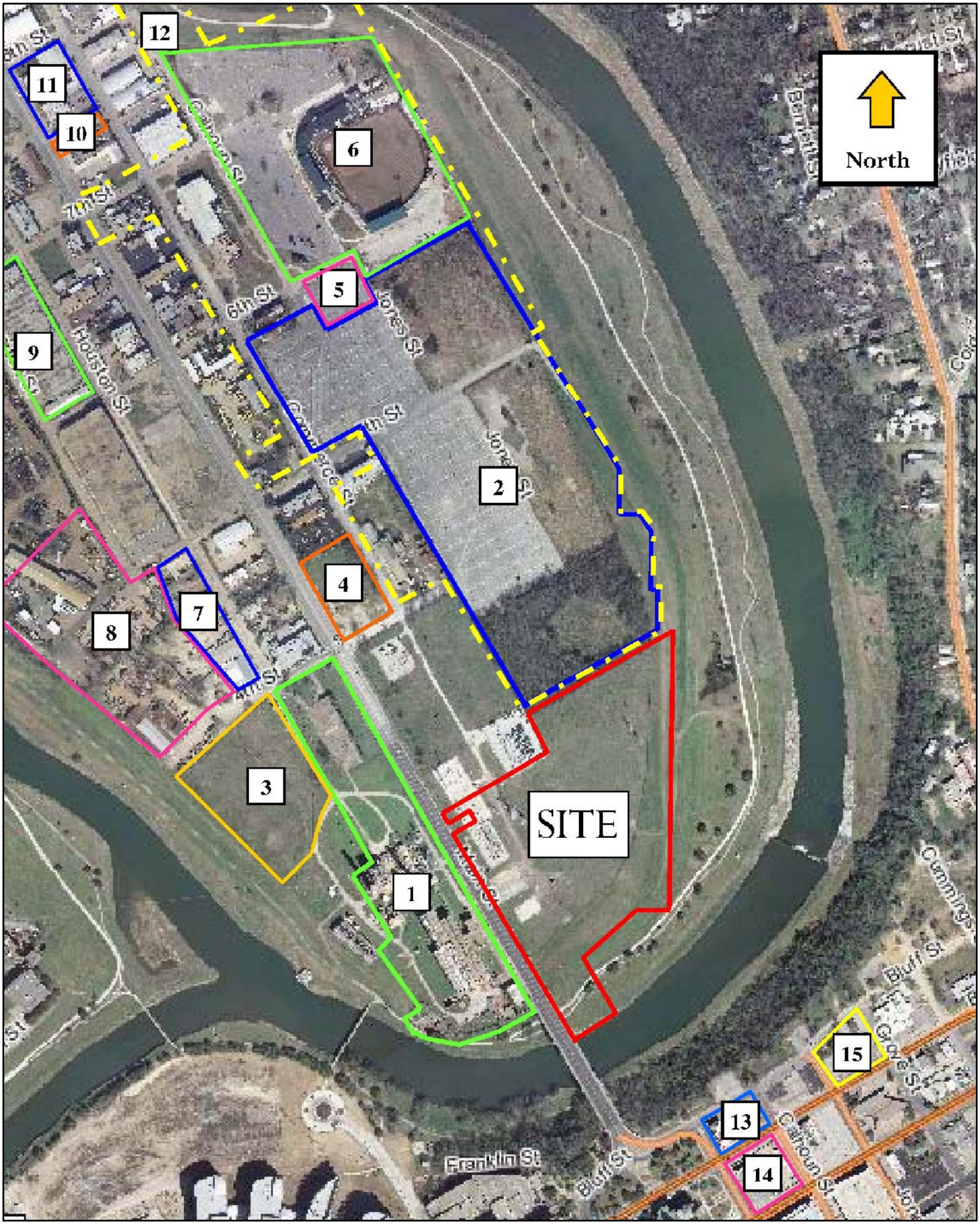


Figure 17 - Moderate Risk Sites

TCCD Environmental Assessment

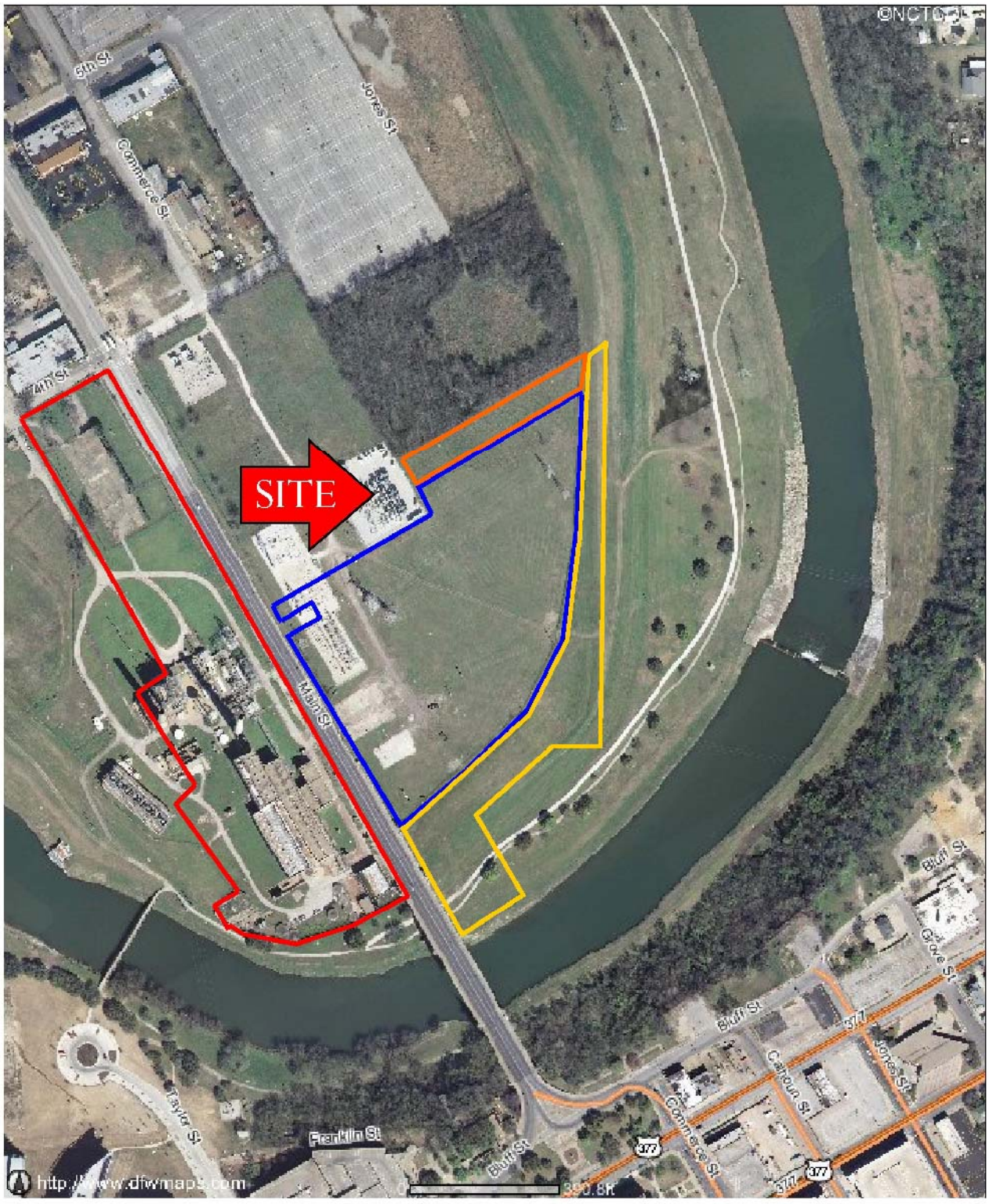
Source: W&M Inc.

The North Main West Tract is located directly adjacent to the Preferred Alternative site. The facility was an electrical generation plant which applied for VCP in 2004. Elevated concentrations of VOCs, metals, chlorinated solvents, and Total Petroleum Hydrocarbon (TPH) were detected in the soils and groundwater at the site. Use of groundwater in the area for residential, agricultural, recreational, or commercial purposes was restricted. The Certificate of Completion (VCP ID1705) was issued for the site. Soil and groundwater contamination was delineated and did not extend onto the subject property. Due to the proximity and known contamination at the facility, it was determined to pose a moderate environmental risk.

Block 10 of the City of Forth Worth applied for VCP in 2004 due to the soil and groundwater contamination. The chemicals of concern were VOCs, chlorinated solvents, and TPH. The site was issued VCP ID 1988. Contaminated soil was removed and the groundwater concentrations of chemicals of concern were determined to be below applicable cleanup levels. The property was closed through the TCEQ and is in the process of recording the Certificate of Completion on the deed. The investigators noted that this site was not likely to adversely impact the TCCD properties. This site is within 300 feet of the Preferred Alternative site and at a higher elevation, it was therefore determined to pose a moderate risk.

It was noted that the subject property was not listed in the environmental database search. Two areas within the campus site have been designated as VCP sites (VCP ID 1748, East Track and VCP ID 1757-East Bar Track). **Figure 18** reflects the locations of the VCP and IOC sites adjacent and on subject property. There have been numerous environmental studies conducted on both sites, including a Phase II ESA conducted in 2004. Sample locations assessed during this study are presented in **Figure 19**. The East Track site was found to contain elevated lead and arsenic concentrations (not above Tier 2 Protective Concentration Levels (PCLs) for residential use) in the soil and elevated concentrations of chlorinated volatile organic compounds (CVOC) in the groundwater near the northern boundary of the property. The source of the groundwater contamination was identified as the Cytec Landfill to the north. TCCD was provided with an Innocent Owner/Operator Program Certificate (#434) releasing the TCCD from liability for the remediation of the groundwater plume that migrated from the Cytec Landfill. The East Bar Track was found to contain chemicals of concern in the soil and groundwater. The soil contained elevated concentrations of lead and arsenic; however, the concentrations were less than the calculated Tier 2 PCLs for residential use. The groundwater near the Cytec Landfill to the north had elevated concentrations of CVOCs. The source of the groundwater contamination was identified as the Cytec Landfill to the north. TCCD was provided with an Innocent Owner/Operator Program Certificate (#453) releasing TCCD from liability for the remediation of the groundwater plume that migrated from the Cytec Landfill.

In addition, the subject property is included in the City of Fort Worth Trinity Uptown Municipal Setting Designation (MSD). A MSD is an official state designation given to property within a municipality or its extraterritorial jurisdiction. It certifies the designated groundwater at the property is not used as potable water (water used for drinking or irrigation), and is prohibited from future use as potable water due to the groundwater contamination exceeding the applicable potable-water protective concentration level. The prohibition must be in the form of a city ordinance or restrictive covenant that is enforceable by the city and filed in the property records. The MSD is utilized by properties as a response to soil and groundwater contamination. By eliminating the groundwater ingestion pathway (i.e., restricting the use of groundwater as potable water) the cleanup levels are less restrictive to achieve regulatory closure. The subject property received regulatory closure prior to the City of Fort Worth receiving the MSD certification with the VCP and IOP certificates. The VCP certificates indicate the soil on the subject property was remediated to the satisfaction of the TCEQ. The IOP



VCP #1705

VCP #1748

VCP #1757 and IOC #453

IOC #434

Figure 18 - Location of VCP and IOC Sites

TCCD Environmental Assessment

Source: W&M Inc.

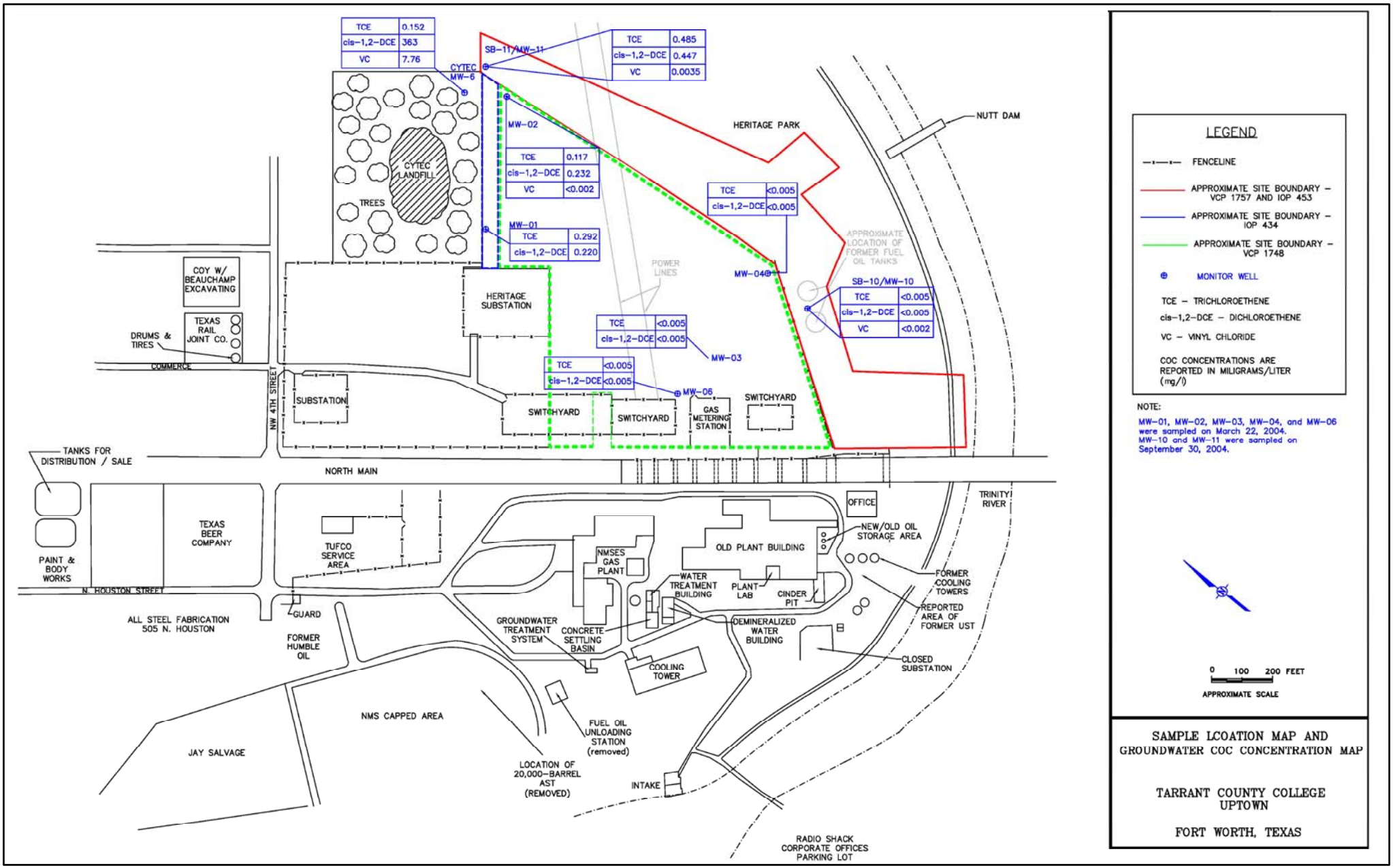


Figure 19 - Sample Site Map

TCCD Environmental Assessment

Source: W&M Inc.

certificates certify TCCD is not responsible for the contamination and is not liable for addressing the impacted groundwater, which has been determined to be emanating from the Cytec Landfill. Thus, the MSD provides an additional level of protection by restricting the use of current and future groundwater for potable purposes.

As part of the project, a diaphragm wall would be constructed. The wall would be constructed in such a manner that the migration of CVOC-contaminated groundwater found near the north boundary of the site would not be increased but would most likely have the effect of retarding any southern migration of contaminated groundwater towards the Trinity River. Lead-contaminated dredge material on the dry side of the levee disturbed during excavation would be sampled and disposed of per TCEQ regulations. Any unanticipated hazardous materials encountered during construction would be handled according to applicable federal and state regulations.

3.10. Cultural Resources

A cultural resource is an inclusive term that consists of the sub-set of historic resources, historic properties, archaeological resources, and traditional cultural properties. Historic resources consist of all properties that are primarily non-archaeological in nature and can include such diverse properties as residential buildings, farmhouses, sheds, barns, industrial structures, mills, commercial buildings, objects, markers, and bridges. Archaeological resources can be either prehistoric or historic in nature. Historic properties specifically refer to those properties that are listed in, or eligible for listing in, the National Register of Historic Places (NRHP). Archaeological resources are those properties that require excavation to obtain data. Traditional cultural property is a term that refers to any prehistoric or historic neighborhood, community, location, or object generally defined as associated with cultural practices or beliefs.

3.10.1. Legal and Regulatory Requirements

For projects receiving federal funding, partial funding, permitting, or licensing, the project is subject to regulations defined in Section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended. Section 106 of the NHPA requires that the Federal agency, or the agency acting on its behalf, take into account the undertaking's effects on historic properties. The responsibilities are outlined in Protection of Historic Properties, 36 CFR 800. Historic properties are defined as those buildings, structures, objects, sites, and districts that are listed in, or eligible for listing in, the NRHP. The NRHP is an inventory of listed historic resources that is maintained by the Secretary of the Interior.

Historic resources located on land owned or controlled by the State of Texas, or one of its cities, counties, or other political subdivisions, are protected by the Antiquities Code of Texas. Under the Antiquities Code, any historic property located on publicly owned land may be determined eligible as a State Archaeological Landmark (SAL). Conditions for formal landmark designation are defined in Chapter 26 of the Texas Historical Commission's (THC) Rules of Practice and Procedure for the Antiquities Code of Texas.

3.10.2. Archaeology

Background research at the Texas Archeological Sites Atlas indicates that no archeological sites have been recorded in the Preferred Alternative site and due to its location in the floodplain and ground disturbance, a low probability for sites exist. The THC concurred with the Corps that no archeological sites are present and no further archeological investigations were required on November 19, 2007.

One cultural resources survey was completed under Texas Antiquities Permit 3653 for the proposed TCCD project, which includes the Preferred Alternative site. This permit was issued under the Texas Antiquities Code and is not connected with the federal undertaking addressed in this EA. Thirteen backhoe trenches and seventeen shovel tests were excavated in floodplain and bluff settings indicating that cultural resources were not present in the archeological Area of Potential Effect (APE). A final recommendation was made that the project be would allowed to proceed as planned (Skinner et al. 2006:88).

3.10.3. Historic Resources

The Preferred Alternative project area is historically referred to as downtown/North Fort Worth and was mainly used for industrial and commercial purposes associated with the cattle industry. The Union Stockyards were established in 1889 just north of the project area (Prior 2005:20). The city of Fort Worth as a whole was the largest livestock market in Texas and the largest south of Kansas City (TSHA 2007).

The APE for the preferred alternative resembles the one used in the USACE Central City undertaking that resulted in a 2006 Programmatic Agreement mitigating adverse effects resulting from the construction of a bypass channel. However, the boundaries of this APE are smaller to the north and extend only as far as the viewshed from the bluff . A map showing the Area of Potential Effect is presented in **Figure 20**.

Efforts to identify historic properties relied heavily on the 2005 Central City report *Below the Bluff: Urban Development at the Confluence of the West Fork and Clear Fork of the Trinity River, 1849-1965.*

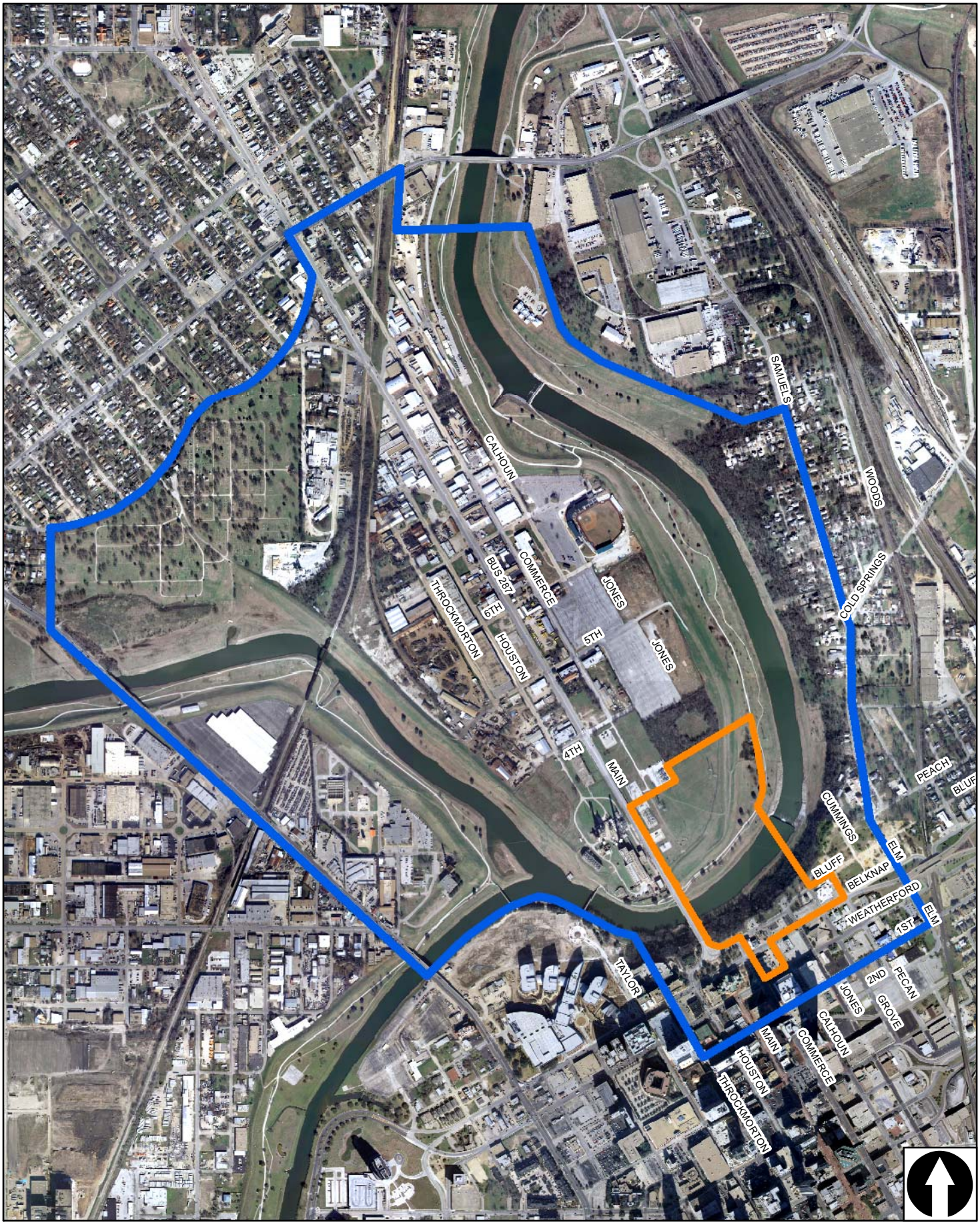
A review of the Texas Historic Sites Atlas and previous reports prepared for other studies of the project area was conducted to determine if any National Register of Historic Places (NRHP)listed or previously documented buildings, structures, objects, or state historic markers lie within or near the proposed APE. Properties or documented resources of historic age are located within the proposed APE and are listed in **Table 11**.

Table 11 - Previously Documented Historic Properties with in the APE

Address	Name and Date of Construction	NRHP	Significance Comments
1005 Samuels Avenue	Residence at 1005 Samuels Avenue, 1900	*N/A*	THC Neighborhood survey. Serial #NRS79-21748.**
1011 Samuels Avenue	Residence at 1011 Samuels Avenue, ca. 1900	*N/A*	THC Neighborhood survey. Serial #NRS79-21749.**
915 Samuels Avenue	Residence at 915 Samuels Avenue, 1903	*N/A*	THC Neighborhood survey. Serial #NRS79-21747.**
901 Bennett Street	Residence at 915 Bennett Street, 1904	*N/A*	THC Neighborhood survey. Serial #NRS79-22078.**
823 Samuels Avenue	Residence at 823 Samuels Avenue, ca. 1890	*N/A*	THC Neighborhood survey. Serial #NRS79-21746.**
815 Bennett Street	Residence at 815 Bennett Street, 1910	*N/A*	THC Neighborhood survey. Serial #NRS79-22077.**
761 Samuels Avenue	Residence at 761 Samuels Avenue, ca. 1880	*N/A*	THC Neighborhood survey. Serial #NRS79-21744.**

769 Samuels Avenue	Residence at 769 Samuels Avenue, ca. 1895	*N/A*	THC Neighborhood survey. Serial #NRS79-21745.**
731 Samuels Avenue	Bennet House, ca. 1875	*N/A*	THC Neighborhood survey. Serial #NRS79-21743.**
625 North Commerce	Hobbs Trailers, 1928	*Eligible A, C**	Property Number 15[1]
648 North Commerce	Carruthers Stone, 1930	*Eligible A, C**	Property Number 18[1]
601 North Throckmorton	Hutchinson Pipe and Waste Material Company, 1940	*Eligible A, C**	Property Number 13-A[1]
601 North Throckmorton	Hutchinson Pipe and Waste Material Company, 1940	*Eligible A, C**	Property Number 13-B[1]
609 North Houston	Hobbs Trailers, 1950	*Eligible A, C**	Property Number 14[1]
529-541 North Throckmorton	Unknown, 1940	*Eligible A, C**	Property Number 3-A[1]
Flood Control System	Flood Control System, 19101957	*Eligible A, C**	Property Number 104[1]
500 block, North Commerce Street	Texas Rail and Joint Company, ca. 1920	*N/A*	THC Neighborhood survey. Serial #NRS82-3807.**
619 (?) Samuels Avenue	Residence at 619 (?) Samuels Avenue, 1910	*N/A*	THC Neighborhood survey. Serial #NRS79-21741.**
811 East Bluff Street	Residence at 811 East Bluff Street, 1900	*N/A*	THC Neighborhood survey. Serial #NRS79-22081.**
315 East Belknap	First Masonic Hall in Fort Worth, Site of	*N/A*	Historic Marker #13486.**
410 East Weatherford Street	Texas State Teachers Association Building/Southwestern Cattle Raisers Association Building, 1930	*N/A*	THC Neighborhood survey. Serial #NRS79-21795.**
400 block East Weatherford	Walter A. Huffman School, ca. 1920	*N/A*	THC Neighborhood survey. Serial #NRS79-21936.**
205 East Belknap	Commercial Building at 205 East Belknap, 1915	*N/A*	THC Neighborhood survey. Serial #NRS4-22055.**
Belknap at Commerce, Southeast Corner	Commerce Building at Belknap and Commerce, ca. 1900	*N/A*	THC Neighborhood survey. Serial #NRS4-22054.**
2801-2 East Weatherford	State Apartments, ca. 1925	*N/A*	THC Neighborhood survey. Serial #NRS79-21935.**
Southeast corner of Weatherford and Main	Ellison Building, 1906	*N/A*	THC Neighborhood survey. Serial #NRS79-21793.**
109-111 Main Street	Carter Building, ca. 1900	*N/A*	THC Neighborhood survey. Serial #NRS79-21800.**

Source: Prior, et al, 2005: Table 1-1 **Source: Texas Historic Sites Atlas (THSA), 2006



Legend

Area of Potential Effects

Project Area

Figure 20 - Historic Structures APE

TCCD Environmental Assessment

Feet

0 500 1,000

Sources: U.S. Geological Survey, NCTCOG

Table 12 - Previously Documented Historic Properties with in the APE

Address	Name and Date of Construction	NRHP	Significance Comments
100 East Weatherford Street	Tarrant County Courthouse, 1894	*Listed, 1970*	Property Number 107[1]
100 Houston Street	Civil Courts Building, 1958	*N/A*	THC Neighborhood survey. Serial #NRS79-21658.**
101-107 Houston Street	"Joe Daiches Jewelers," 1910	*N/A*	THC Neighborhood survey. Serial #NRS79-21659.**
111 Houston Street	Commercial Building at 111 Houston Street, 1910	*N/A*	THC Neighborhood survey. Serial #NRS79-21660.**
111-113 Houston Street	Victorian Commercial Buildings, ca. 1895	*N/A*	THC Neighborhood survey. Serial #NRS79-21783.**
113 Houston Street	Unknown, 1904	*N/A*	THC Neighborhood survey. Serial #NRS79-21661.**
300 West Belknap, Northwest corner of North Houston	County Criminal Courts Building, ca. 1925	*N/A*	THC Neighborhood survey. Serial #NRS79-22056.**
300 West Belknap Street	Tarrant County Criminal Courts Building, 1962	*N/A*	THC Neighborhood survey. Serial #NRS79-22075.**
Southeast corner of Criminal Court Building	Granite Boulder Historical Monument,1921	*N/A*	THC Neighborhood survey. Serial #NRS79-22074.**
Paddock Viaduct	Paddock Viaduct, 1902	*Listed, 1976*	Property Number 103[1]
Fort Worth Power and Light/TXU	Fort Worth Power and Light Buildings, 1910	*Eligible A, C**	THC Neighborhood survey. Serial #NRS82-23171. ** Property Number 1-A[1]
Fort Worth Power and Light/TXU	Fort Worth Power and Light Buildings, 1940	*Eligible A, C**	THC Neighborhood survey. Serial #NRS82-23171. ** Property Number 1-B[1]
Fort Worth Power and Light/TXU	Fort Worth Power and Light Buildings, 1940	*Eligible A, C**	THC Neighborhood survey. Serial #NRS82-23171. ** Property Number 1-C[1]
Fort Worth Power and Light/TXU	Fort Worth Power and Light Buildings, 1940	*Eligible A, C**	THC Neighborhood survey. Serial #NRS82-23171.** Property Number 1-F[1]
Fort Worth Power and Light/TXU	Fort Worth Power and Light Buildings, ca. 1940	*Eligible A, C**	THC Neighborhood survey. Serial #NRS82-23171. ** Property Number 1-G[1]
501 North Main	Texas Beer Company, 1931	*Eligible A, C**	Property Number 5[1]
Henderson Street Bridge	Henderson Street Bridge, 1930	*Eligible A, C**	Property Number 101[1]
701 North Henderson	Triple A Package Store, 1946	*Eligible A, C**	Property Number 87[1]
900 Woodward Street	City of Fort Worth, 1940	*Eligible A, C**	Property Number 96-A[1]
Saint Louis, San Francisco and Texas Railway Bridge	Saint Louis, San Francisco and Texas Railway Bridge, 1902	*Eligible A, C**	Property Number 102[1]

Source: Prior, et al, 2005: Table 1-1 **Source: Texas Historic Sites Atlas (THSA), 2006

The historic properties primarily affected by the Preferred Alternative are those immediately adjacent to the project: the Levee, the Viaduct, Courthouse, TXU Building and the Bluff. Effects to these resources were found to be adverse. The remaining resources within the APE are not adversely effected due to their visual distance to the project does not diminish their location and setting.

The full report of the Corps findings is found in **Appendix A**. Coordination with the THC was initiated on October 24, 2007 through a coordination letter and a determination of effects report. The USACE found that the undertaking will have an adverse effect on the Levee, the Tarrant County Courthouse, the Main Street Viaduct, the TXU Power Plant, the Main Street Viaduct, and the Bluff. The THC commented on the proposed undertaking on November 28, 2007 by concurring with the Corps of Engineer's determination that the project undertaking will have an adverse effect on some of the historic resources within the area of potential effect.

A Public Meeting, combined with a NEPA scoping meeting, was held on October 9, 2007 to seek public input on the effects of the Preferred Alternative and ways to avoid, reduce or mitigate adverse effects. A public information website has been established at http://www.swf.usace.army.mil/pubdata/notices/trinityriverlevee/index.asp to keep the public informed on the Section 106 process.

A Section 106 consultation meeting was held on January 8, 2008 with all interested consulting parties to seek ways to avoid, reduce or mitigate adverse effects as the result of the undertaking. Mitigation measures that may be used as the stipulations for the Memorandum of Agreement (MOA) were discussed for consideration by the consulting parties.

The adverse effects resulting from the Preferred Alternative will be considered a significant impact to the human environment unless reduced below the threshold of significance by a MOA that reduces or mitigates adverse effects as a result of implementation of the Preferred Alternative.

3.11. Cumulative Impacts

In accordance with the Council on Environmental Quality (CEQ) regulations, indirect and cumulative effects must be considered for any projects that are subject to the National Environmental Policy Act (NEPA). The assessment of cumulative impacts is addressed in NEPA by its reference to interrelations of all components of the natural environment.

Federal law defines cumulative impacts as impacts "on the environment which result from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions, regardless of what agency (federal or non-federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time" (40 CFR § 1508.7). Cumulative impacts tend to be less defined than indirect impacts and are therefore more difficult to quantify.

A reasonably foreseeable action is an action that is sufficiently likely to occur such that a person of ordinary prudence would take it into account in making a decision. Factors that would indicate that a project or action is reasonably foreseeable include federal funding approvals for an anticipated project, pending funding before an agency to begin a project, and whether there is evidence of active preparation to make a decision on alternatives to a project.

Due to the number of projects located within the Upper Trinity River Basin, the potential for cumulative impacts is high. However, establishing the significance of cumulative impacts is difficult to assess. This analysis is based on the cumulative impacts analysis developed for the Upper Trinity River Central City FEIS (January 2006). Cumulative impacts discussed in that document are hereby incorporated by reference. Therefore, the permit actions considered include all actions within a 200 meter buffer surrounding and including the 100 year floodplain along the West Fork and Clear Fork of the Trinity River. The base study area for social resources was determined to coincide primarily with the general project study area, however, any projects identified as "reasonably foreseeable" for environmental resource impacts were also considered in the cumulative impact assessment. Hydrology and hydraulics cumulative impact assessment study area includes the contributing watersheds above the Central City study area and extended downstream to the confluence of West and Elm Forks.

This cumulative impacts analysis uses the level of information available at the time of this EA. If sufficient data or information on specific proposed projects was not available to complete an analysis comparable to the evaluation of other projects, and reasonable efforts to obtain that information were unsuccessful, professional judgment was used to estimate the potential impacts. Numerous flood damage reduction, channelization, transportation, and recreation projects, along with general urbanization of the area has resulted in significant alterations to the historical condition of the Upper Trinity River Basin and within the downtown Fort Worth vicinity. Historical information related to the impacts of these past projects is unavailable and unattainable. Therefore, this cumulative impacts analysis considered the existing conditions to be a result of the past and present projects that have occurred in the study area and serves as a baseline to address impacts of the reasonably foreseeable projects.

This analysis focuses on resources that are affected by the Preferred Alternative, even if the direct impacts to the resources may be relatively minor. As previously mentioned, the following resources were identified for analysis:

- Land Use
- Socioeconomic and Environmental Justice Analysis
- Water Resources
  - Water Quality
  - Waters of the U.S.
- Wildlife Habitat and Vegetation
- Cultural Resources

3.11.1. Reasonably Foreseeable Actions of the USACE

- Riverside Oxbow - East of Downtown Fort Worth on West Fork of Trinity. The project involves creating and restoring 56.5 acres of wetland, restoring and improving 250 acres of bottomland hardwoods and deciduous forest and restoring 253 acres of prairie grassland.

- Little Fossil Creek - Northeast of downtown Fort Worth from confluence of Big Fossil Creek to Beach Street. The project consists of the construction of 7,350 feet of grass and concrete lined trapezoidal channel with some erosion control measures. Mitigation would include 11 acres of forested habitat, 20 acres of open water, 33 acres of old field, and 10 acres of wetlands.

3.11.2. Reasonably Foreseeable Actions of Others

- Uptown Fort Worth - A $300 million redevelopment of the northeast end of Downtown Fort Worth is planned to bring residents and neighborhood retail to the riverfront. Lincoln

Properties has built the first residential structure, a 300 unit apartment building. Lincoln plans to build more units in the community. Palisades, a 40-unit townhome development is also under construction. Development of a new upscale condominium tower has also begun.

- The Trinity River Vision - The Trinity River Vision plan was completed in March 2003. Flood control and development issues are addressed by the plan, laying the groundwork to significantly increase the Downtown population over the next 40 years. Funds have been secured for public improvements required within the project's 800 acre downtown segment. $1.3 million in federal funding has been secured by Representative Kay Granger to continue the study and to cover the cost of pre-engineering and design work. The US Congress approved $110 Million in fall 2004 for USACE construction funding for this project. The USACE approved the project in 2006. The City of Fort Worth has developed a relocation assistance package for businesses in the path of proposed waterways, bridges, streets and other rights of way. The Trinity River Vision Authority is leading this award winning center city improvement project.

- Hyde Park & 9th Street - The Fort Worth Transportation Authority and the City executed a design contract for the Hyde Park Transit Plaza and Ninth Street improvements to create a civic square and pedestrian-friendly corridor. $3.5 million in federal grants and local matching funds have been secured for acquisition, design and construction of the transit plaza, and the United States General Services Administration (GSA) has allocated $1.1 million for improvements to the Federal Plaza, which is adjacent to the Fritz G. Lanham Building housing the GSA. The projected construction start date of the Hyde Park project is expected to begin in 2007.

- Family Law Center Tarrant County - *200 E. Weatherford Fort Worth, 76102*. 258,000 sq. ft. court building.

- Trinity Bluffs - *Samuels Avenue* - Private Individual 650 apartments and 175 town homes.

- City Place – There are plans to transform the former RadioShack corporate headquarters into a $200 million mixed use development in the heart of downtown. The north tower will be dedicated to office space, anchored by Range Resources. The south tower will be condominiums. Retail will be found on the ground floor and parking will be provided on-site.

- Transport Life Building - *714 Main Street Fort Worth, 76102*. 24-story building. Private Individual 65 rental units.

- The Fort Worth Transportation Authority (also known as The T) is developing plans for a rail line in the Southwest-to-Northeast Rail Corridor from southwest Tarrant County through downtown Fort Worth and northeast to DFW Airport. The proposed commuter route follows existing rail lines from Fort Worth’s Granbury Road/South Hulen area, through downtown Fort Worth, northeast to downtown Grapevine and then into the north entrance of Dallas-Fort Worth.

- 7th Street Bridge - *7th Street above Forest Park Blvd. and the Clear Fork of Trinity River*. The project involves the replacement of a Bridge.

3.11.3. Land Use

Potential cumulative impacts considered land use and development impacts associated with regional and local growth as related to the Preferred Alternative in combination with the effects of other reasonably foreseeable public and private actions. In general, cumulative impacts to environmental resources associated with urbanization would continue to follow existing trends, even without the construction of the Preferred Alternative. Implementation of the Preferred Alternative, while not causing substantial cumulative effects itself, could increase the industrial and commercial development on available parcels along and near the proposed action.

3.11.4. Socioeconomic and Environmental Justice

As noted above, there are numerous public, residential, and commercial/mixed-use development projects evolving in proximity to the project area. The project area is virtually surrounded by these types of initiatives. Previous community studies currently on file at TCCD suggest that the development of the TCCD Downtown Campus would potentially create significant new economic activity and changes in land use patterns. The cumulative effect of this growth and economic activity is predicted to be major increases in employment, households, property values, and tax revenues. The net effect of the cumulative changes to land use and patterns of economic activity on minority populations within the study area is strongly dependant on the actions of local governments, primarily the City of Fort Worth to require or provide incentives affordable housing. The City has achieved affordable housing goals in association with other downtown development projects through the use of affordable housing set-asides. Similar institutional tools are envisioned to be incorporated into the Trinity Bluffs project and other development projects near the proposed campus in order to maintain diversity in the area's population and avoid adverse impacts to minority populations.

There are no environmental justice concerns assumed with the Preferred Alternative. There is a potential that the development of the Preferred Alternative would have a beneficial impact on low income or minority populations as access to educational facilities would be enhanced.

3.11.5. Water Resources

Water Quality

Increases in impervious surface area associated with the development of the proposed campus and the land use intensification anticipated within the Central City area would be expected to contribute cumulatively to nonpoint source water quality issues, along with similar increases in impervious cover associated with other downtown/uptown development projects. It is important to note that under the No-Build Alternative, the reasonably foreseeable land development projects would still have the potential to increase impervious surfaces within the resource area and thus create further adverse impacts to water quality regardless of the implementation of the proposed project.

However, these impacts can be extensively mitigated through the consistent application of innovative Best Management Practices. The City of Fort Worth is currently performing a comprehensive evaluation of the existing storm water management practices with the intent of improving the quality of urban storm water runoff on a city-wide basis. These improvements have the potential to reduce or eliminate cumulative water quality impacts.

Waters of the U.S.

Potential cumulative impacts considered and discussed include impacts to the Trinity River. The cumulative impacts on waters of the U.S. resulting from the direct effects of the construction of the Preferred Alternative, in combination with the previously described reasonably foreseeable land development projects, would have the potential to cause additional fill and

degradation of waters of the U.S. These activities would, however, be subject to permitting requirements in accordance with all applicable laws, statutes, and regulations. It is therefore assumed that no adverse cumulative impacts as related to Waters of the U.S. would result from the construction of the Preferred Alternative.

Flood Control

The proposed downtown campus would impact the existing flood protection project maintained and operated by the TRWD. The levee is critical to protecting the areas north of the bluff area. The construction techniques for this effort would require the addition of a diaphragm wall necessary to mitigate for the impacts to the levee due to excavation on the dry side of the levee. The future implementation of the bypass channel associated with the Central City project could lessen the need for the existing levees; thus, the cumulative impacts to the flood reduction project could possibly be nullified.

3.11.6. Wildlife Habitat and Vegetation

The cumulative impacts on wildlife habitat resulting from the direct and indirect effects of the construction of the Preferred Alternative, in combination with the previously described reasonably foreseeable land development projects would have the potential to cause additional displacement or fragmentation of wildlife habitat. However, a number of regulatory measures have been introduced in an effort to curb historic vegetation loss including the Riverside Oxbow Project located just downstream of the study area, east of downtown Fort Worth and Riverside Drive. The proposed project would provide ecosystem restoration to a currently disconnected river oxbow and the surrounding lands. These proposed ecosystem improvements along with mitigation required for the preferred alternative may provide an opportunity for some of the ecosystem communities to interact positively.

3.11.7. Cultural Resources

Section 106 of the National Historic Preservation Act of 1966 requires that impacts on historic and archaeological resources are comprehensively considered for all proposed actions. Impacts to historic and archaeological resources within the project area would therefore be evaluated and appropriately mitigated as per Section 106.

While the direct impact is the modification of the historic levee, the indirect impact is the construction of the entire campus and its effects on historic resources. The cumulative impacts are therefore considered as part of the undertaking and discussed in Section 3.10.3. Historic Resources.

The TXU building, while not part of the original construction project, is part of the overall undertaking and as a consideration of cumulative effect, when TCCD makes plans for the use or disposal of the property, it will become a separate Section 106 undertaking unless it is addressed in the current MOA to mitigate adverse effects as a result of the implementation of the Preferred Alternative.

4.0. Public and Agency Interest Review

Coordination letters have been prepared and coordination is ongoing with the following agencies for this EA:

- United States Fish and Wildlife Service (USFWS)
- United States Coast Guard (USCG)
- Texas Parks and Wildlife Department (TPWD)
- Texas Council on Environmental Quality (TCEQ)
- Texas Historical Commission (THC)

A scoping meeting occurred on Tuesday, October 9, 2007, at the Rose Marine Theater located at 1440 Main Street, Fort Worth, Texas, 76106. This meeting was attended by 18 residents and 5 public officials for a total of 23 attendees.

An open house began at 6:00 p.m. followed by a formal presentation on the proposed project. Mark Harberg, USACE, presented the EA process and timeline for this project. In addition, Jerry Smiley, environmental consultant, and Joseph Murphey, USACE, presented the EA findings and Section 106 process. A question and answer period occurred following the formal presentation in which eight comments and questions were received and answered on subjects ranging from the construction of the diaphragm wall to the section 106 process. Section 106 questionnaire and fact sheets were distributed to all attendees and five were returned into the comment box at the meeting. Four of these comments stated the resident believes that the project would have no adverse effect to Section 106 properties and one stated that the project would have an adverse effect. No other written comments were received at the meeting. Attendees were informed that they could mail additional comments at a later date. One written comment was received from L.H. Meeker. Mr. Meeker's comment expressed concern with the proposed excavation for the diaphragm wall. A copy of the comment is provided in **Appendix B**. A summary of Mr. Meeker's comment has been provided below:

- Excavation with a depth of 60 feet or more and a length of 400 feet and greater would likely expose several strata of sand, gravel, and other porous alluvia (existing river sediment) to toxic contaminants that are contained in these porous deposits.
- The engineer consultant informed Mr. Meeker of the soil and geotechnical boring samples that had been conducted on the uptown campus side. He indicated that the consultant stated there was no sand, gravel, or contamination found in these samples.
- Mr. Meeker believes the consultant's assessment to be inaccurate and has provided a report from Dr. Billy Caldwell. The report suggests sand and gravel strata are present north of the Trinity River, including the uptown campus side. Furthermore, the report suggests the possibility of contamination from the sites north of the uptown campus side migrating south via the subsurface water.
- Finally, excavating at a depth of greater than 60 feet may result in the area losing its Municipal Setting Designation and put the Trinity River Vision project in jeopardy.

These items raised in Mr. Meeker's comment have been carefully considered and evaluated. These comments have been addressed in the following sections:

- Section 2.2.3, Construction Techniques
- Section 3.1.2, Geology and Soils
- Section 3.9, Hazardous Materials

The Draft EA will be released for a 30-day public comment period in early 2008. A Notice of Availability will be sent out releasing this draft for public review.

If requested, a public hearing would be held at the end of the EA process. In order to comply with federal NEPA public hearing requirements, notices would be published in the Federal Register and the Fort Worth Star-Telegram as appropriate. The public hearing would be held in proximity to the project study area with preference given to locations on public bus routes where applicable. Notices for the public hearing would be mailed to all persons on the project mailing list including adjacent property owners. Newspaper advertisements to announce the hearing would be developed and placed in the *Fort Worth Star Telegram* and *La Estrella*. Elected officials would be informed of a requested public hearing.

5.0. Recommendation

This EA has evaluated the potential environmental, structural and cultural impacts associated with the construction of the Downtown Campus Project.

The adverse effects resulting from the Preferred Alternative will be considered a significant impact to the human environment unless reduced below the threshold of significance by a MOA that reduces or mitigates adverse effects as a result of implementation of the Preferred Alternative.

Based on the findings and conclusions in this EA, it is anticipated that the proposed project would not be a major federal action that would require an Environmental Impact Statement. A Finding of No Significant Impact (FONSI) is therefore anticipated.

6.0. References

- Environmental Data Resources Inc. - Inquiry Number 2016083.1s. August 28, 2007

- Geotechnical Study – Flood Control Levee TCCD Downtown Campus – Fort Worth, Texas. Kleinfelder - Project 68273.1, July 19, 2006.

- Geotechnical Study – Diaphragm Wall for Secondary Flood Control - Downtown Campus – Tarrant County College District - Fort Worth, Texas. Kleinfelder - Project 68273.5 Revised July 17, 2007.

- Site Investigation Report - TXU Electric Delivery Property Fort Worth. White and Mueller Inc. Texas, June 2004.

- Site Investigation Report - TXU Electric "East Bar" Water Access Parcel Fort Worth, Texas. White and Mueller Inc. June 2004.

- Soil Management Plan – Tarrant County College Downtown Campus – W&M Environmental Group, Inc.

- Soil Survey of Tarrant County, Texas - United States Department of Agriculture, Soil Conservation Service, In Cooperation with the Texas Agricultural Experiment Station – June 1981.

- Tarrant County College – Proposed New Downtown Campus – Fort Worth, Texas – Project Binder – Application for Department of the Army Permit – Octobers, 2006.

- The History and Archaeology of the Tarrant County College Downtown Campus Site – The River and Bluff Floodplain – Texas Antiquities Permit 3653 – AR Consultants Inc. July 13, 2006.