DRAFT
Environmental Assessment

Neches River Bridge Study

Revised August 2016

Jefferson and Orange Counties
CSJ: 7220-01-001

Texas Department of Transportation – Rail Division

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1.0 Introduction

1.1 Purpose of this Document

This Environmental Assessment (EA) has been developed in order to study the potential environmental consequences of constructing the project. This document has been prepared in accordance with the procedural provisions of the National Environmental Policy Act (NEPA); the Council on Environmental Quality (CEQ) regulations in Implementing the Procedural Provisions of NEPA (40 Code of Federal Regulations [CFR] 1500-1508) and Environmental Impact and Related Procedures (23 CFR 771); and, Environmental Review of Transportation Projects (43 Texas Administrative Code [TAC] 2).

1.2 Public Review of the Environmental Assessment

The Notice of Availability (NOA) of the EA will be published on www.txdot.gov. Interested parties and stakeholders will be notified via email about the availability of the document and how to access it.

The EA will be available for review at:

Texas Department of Transportation (TxDOT) Beaumont District
8350 Eastex Freeway, Beaumont, TX 77708

A digital version of EA will be posted to the TxDOT Beaumont District webpage at:

http://www.txdot.gov/inside-txdot/projects/studies/beaumont/neches-bridge.html

Written comments on this document may be submitted through TxDOT's Rail Division:

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TxDOT is funding the current study and leading the development of this EA on behalf of the federal lead agency. Since TxDOT or other project stakeholders may apply for a grant or a loan from the Federal Railroad Administration (FRA) or the U.S. Department of Transportation (USDOT) for design or construction of the project, FRA is currently serving as the federal lead agency. The FRA will consider issuing an environmental decision if and when TxDOT or other project stakeholders are awarded a grant or approved for a loan to construct the project.

TxDOT and FRA will thoroughly consider all comments submitted during the comment period. Based on the analysis conducted in this EA and comments received during the comment period, TxDOT and FRA will determine whether the potential environmental effects warrant the preparation of an Environmental Impact Statement. If TxDOT and FRA determine that there are no significant adverse

effects, they would prepare and issue a Finding of No Significant Impact (FONSI), which would be made publically available.

1.3 Project Description

TxDOT and FRA are studying a project to add track capacity to the rail corridor crossing of the Neches River in the City of Beaumont, Texas. The project consists of an additional track over the Neches River, which requires construction and operation of an additional lift bridge north of the existing bridge.

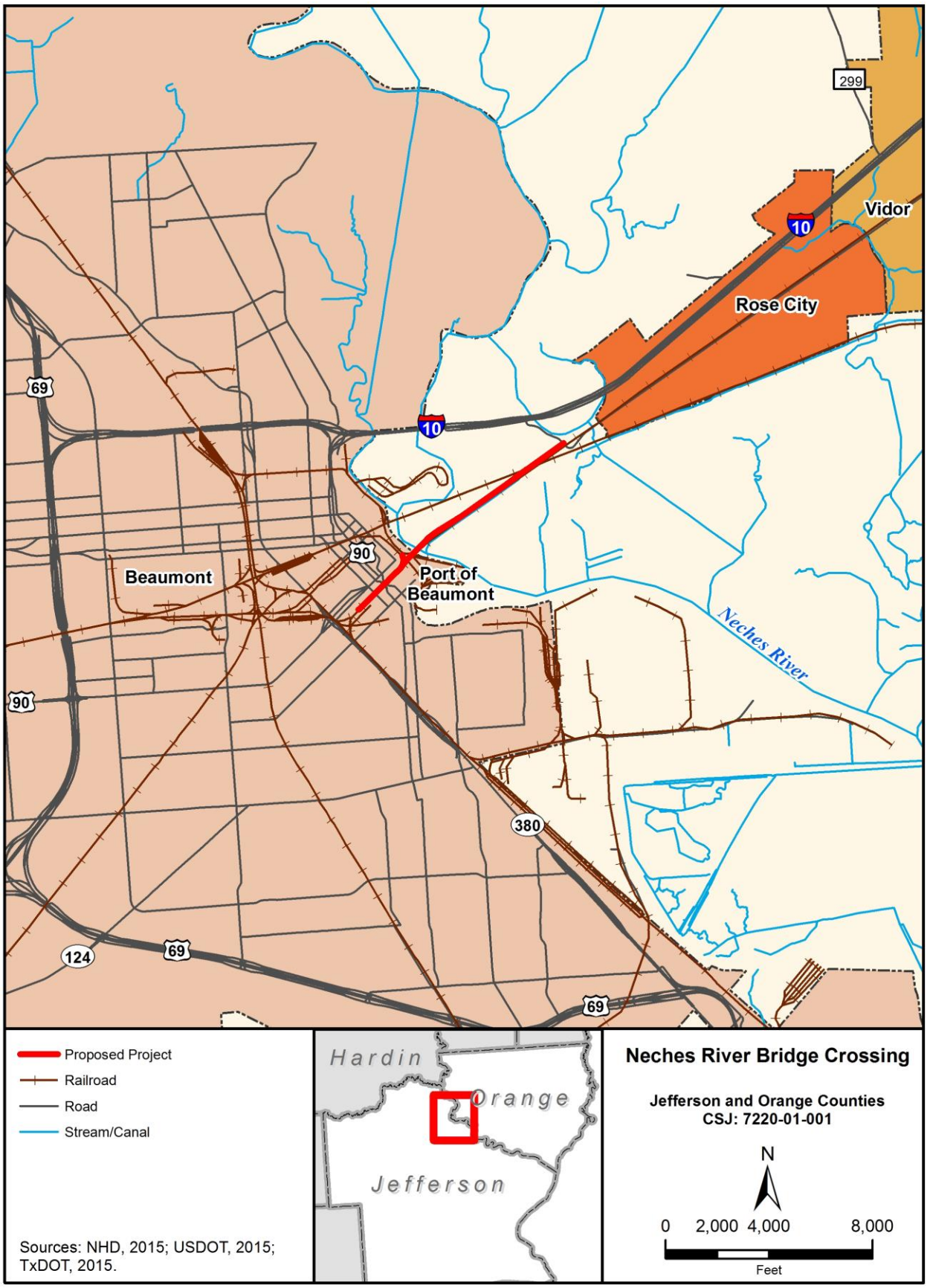
The limits of the project that provide logical termini and independent utility are shown in (**Figure 1**). The western terminus begins about 170 feet east of the intersection of Archie Street and the Kansas City Southern (KCS) Railway line in the City of Beaumont, Jefferson County, Texas. The eastern terminus is located near the Old United States Highway 90 (US-90) alignment just west of Rose City in Orange County, Texas. The project length is 1.68 miles.

The project purpose and need, environmental impacts, and cost were the primary focus of the planning, design, and environmental analysis processes. The purpose and need is outlined in **Section 2.0** and the proposed action is described in **Section 3.0.** Environmental impacts are identified in **Section 4.0** and commitments and mitigation for these impacts are listed in **Section 5.0**. Agency coordination and public involvement activities conducted to date are included in **Section 6.0**. The plan and profile of the No Build and Build Alternatives are included in **Appendix A** and **Appendix C**, respectively. **Appendix B** presents a summary matrix of the alternative evaluation. **Appendix D** shows environmental resources in relation to the existing and proposed right-of-way, and site photographs are included in **Appendix E**. Coordination to date is documented in **Appendix F**.

1.4 Project Background

The project was initiated as part of the Neches River Bridge *Feasibility Study* (TxDOT 2013). The *Feasibility Study* provides the basis for the purpose and need and initial alternatives considered. Construction of the project is not currently funded or programmed. A breakdown of the cost to complete the project is provided in **Section 1.4.2.**

Figure 1. Project Location Map



1.4.1 Neches River Bridge Feasibility Study

TxDOT conducted the Neches River Bridge *Feasibility Study* (TxDOT 2013) to evaluate the feasibility of rail corridor system improvements at or near the existing Neches River rail bridge crossing in the City of Beaumont, Texas. A feasibility study is a precursor to the evaluation conducted for the NEPA process in order to inform decision makers regarding the basic elements of the physical and financial attributes of the project. The study area used in the *Feasibility Study* is bordered on the north by Interstate 10 (I-10), on the east by the eastern city limits (extended to intersect with I-10 in Orange County), on the south by Washington Boulevard, and on the west primarily by 4th Street. The purpose of the *Feasibility Study* was to evaluate rail movements and operations within the study area; identify opportunities to increase rail efficiency; analyze potential alternatives and improvements to the existing bridge and rail alignment; and, determine the physical and financial viability of such potential improvements.

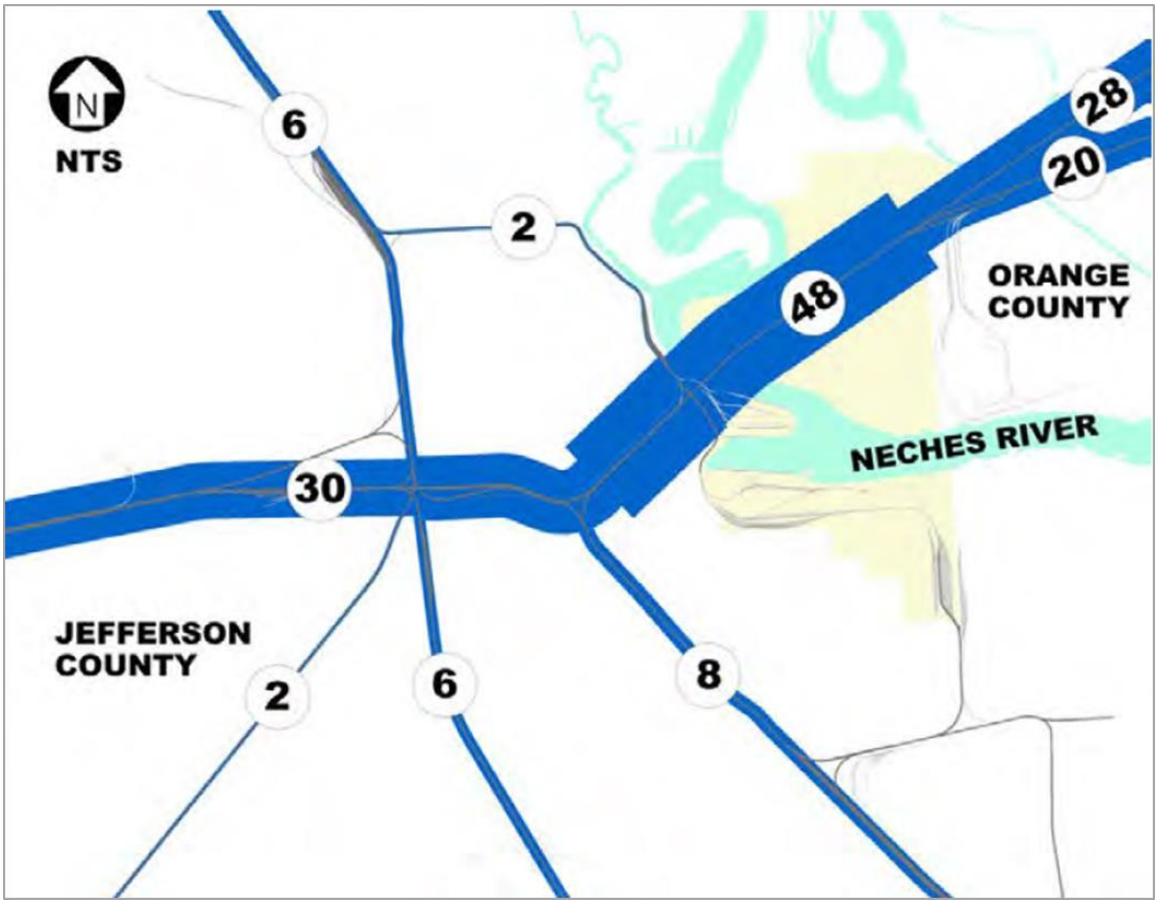
The *Feasibility Study* recognizes that this is an important project for railroad fluidity. The Neches River railroad crossing enables commodities to be moved from New Orleans, Louisiana to Long Beach, California; within the Beaumont Region; and other locations to the west (e.g., Houston and Laredo). The Neches River is the second most congested railroad choke point in Texas after Tower 55 in Fort Worth. This illustrates the importance this project has on the local, state, and national economy. KCS, Burlington Northern and Santa Fe Railway Company (BNSF), and Union Pacific Railroad (UPRR) all use the bridge.

The following subsections summarize key elements of the study. For further details, please refer to the *Feasibility Study* (TxDOT 2013).

1.4.1.1 Existing Rail Movements and Future Operations in the Study Area

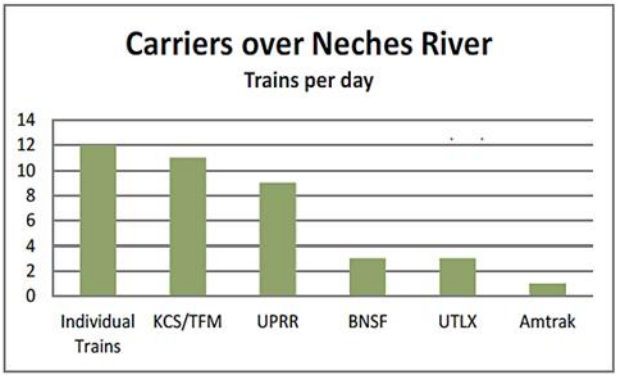
The *Feasibility Study* evaluated the existing and projected rail movements and operations in the study area. **Figure 2** shows the existing daily train volumes in the Beaumont area, and **Figure 3** shows the trains per day by carrier and number of trains per hour crossing the Neches River. The Rail Traffic Controller (RTC) modeled current operations (base modified) and projected rail operations to the year 2035. The model shows that train delays would rise from 9.0 delay hours per day currently to 69.7 delay hours in 2035 if nothing were done (**Table 1**). That number can be dropped to 23.4 hours by adding a track to the existing route (**Table 2**).

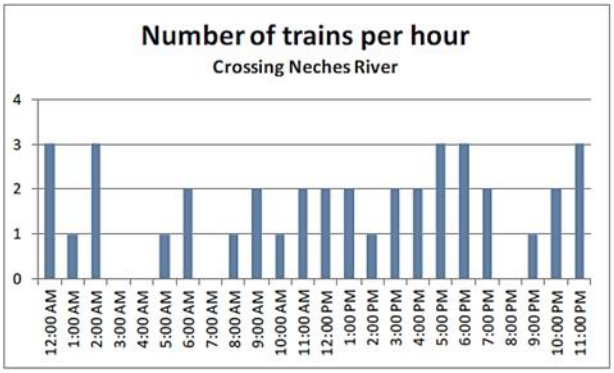
Figure 2. Daily Train Volumes in the Beaumont Area (Federal Railroad Administration Database)



Source: TxDOT 2013

Figure 3. Sample of Neches River Rail Crossings by Carrier and Trains per Hour





Source: TxDOT 2013

Table 1. RTC Freight Train Performance – 2035 Projected No Build

Case	Train Count	Delay Hours Per Day	Delay Minutes Per 100 Train Miles	Bridge Lifts Per Week
Base (modified)[1]	287	9	61.1	8
Projected No Build	582	69.7	306.4	16

Source: TxDOT 2013

Note:

1. The Base RTC model as modified reflects approximately eight lifts per week.

Table 2. RTC Freight Train Performance –Alternatives with 2035 Projected Volumes

Projected 2035 Case	Train Count	Delay Hours Per Day	Delay Minutes Per 100 Train Miles	Bridge Lifts Per Week	# tracks crossing Neches River
No Build[1]	582	69.7	306.4	16	1
Double Track Existing Route[2]	573	23.4	158.1	16	2
I-10 New Alignment[2]	573	17.3	113.9	16	2

Source: TxDOT 2013

Notes:

1. Represents the condition for the existing bridge with no improvements.
2. Represents the condition for the existing bridge and new bridge combined.

1.4.1.2 Feasibility Alternative Evaluation

The initial evaluation of alternatives was conducted as part of the *Feasibility Study* (TxDOT 2013). The study identified and evaluated different route options using performance measures that focused on transportation impacts (e.g., congestion relief and system capacity) of the proposed infrastructure changes. The evaluation was conducted using TxDOT's *Identification of Priority Rail Projects for Texas, Initial Methodology/User Manual and Guidebook* (May 2012). The evaluation of the "build" alternatives involved improving capacity by providing additional track, as well as exploring operational issues associated with the lift bridge over the Neches River. The options were also assessed for performance in the areas of sustainability (e.g., environmental/social), and implementation (e.g., project development) as data and known conditions permitted. In addition to the No Build, three Build Alternatives were assessed under forecasted 2035 conditions. The Build Alternatives included expanding the existing route to a double track river crossing by adding a lift bridge, a new Pine Street alignment with a lift bridge, and a new I-10 alignment with a fixed bridge. Within the scope of the *Feasibility Study*, the elimination of the existing structure was not considered feasible because of disruption to existing rail service during construction.

1.4.2 Project Planning and Programming Status

This section summarizes the status of planning and programming of the project for construction. As shown in **Table 3**, program costs are estimated in 2016 dollars at approximately $120 million. Funding has not yet been authorized for construction. Funding participation by federal, state, county, or city agencies, as well as the Class I railroads, has not been negotiated. TxDOT intends to apply for Transportation Investment Generating Economic Recovery (TIGER) and/or Fixing America's Surface Transportation Act (FAST ACT) grants from the USDOT and fund the remainder of the project through a partnership between the railroads and other local stakeholders to accelerate the project implementation from a 10 to 20 year timeframe to a 5 year or less timeframe.

Table 3. Program Cost Summary

Standard Cost Category	Program Cost ($ 2016 Millions)
10 – Track Structures and Track	$78.9
40 – Sitework, ROW, Land Improvements	$3.8
50 – Communications and Signaling	$8.4
80 – Professional Services	$12.3
90 – Miscellaneous and Unallocated Contingencies	$13.2
Total (10-100) Rounded	$120.0

Source: Study Team 2016

1.4.3 Early Coordination and Planning

Agency coordination and public involvement activities are detailed in **Section 6.0**. Early coordination for this project was sought in order to incorporate stakeholder and public concerns into the design, to the extent possible. Coordination with project stakeholders included combined and one-on-one meetings. These meetings helped inform stakeholders about the project and obtain their input and concerns regarding the purpose and need statement, financing, design criteria, railroad operations, navigational considerations, railway and roadway integration and access, alignment options, availability of existing data, review of public meeting materials and findings of the EA. Additionally, a project open house was held to inform the public and to obtain their input and concerns about the purpose and need for the project, project alternatives, and environmental constraints.

As described in **Sections 4.6**, **4.7, and 4.8**, permits and project approvals are necessary from the Texas Commission on Environmental Quality (TCEQ), U.S. Army Corps of Engineers (USACE), and U.S. Coast Guard (USCG). Project coordination is also required with the U.S. Fish and Wildlife Service (USFWS), Texas Parks and Wildlife Department (TPWD), National Marine Fisheries Service (NMFS), Texas General Land Office (TGLO), State Historic Preservation Office/Texas Historical Commission (THC), local floodplain coordinators for Jefferson and Orange counties, the City of Beaumont, and the Port of Beaumont.

2.0 Purpose and Need

The project purpose and need guides the development of alternatives and is fundamental to how the evaluation criteria are developed for selecting the range of alternatives. The purpose defines the transportation problem to be solved by the project. The need describes the problem and provides data to support the identified solution to the problem (purpose). The study team drafted the purpose and need using information available from the *Feasibility Study* (TxDOT 2013) and input received at the February 19, 2015 Stakeholder Meeting. The draft purpose and need was reviewed with project stakeholders at the May 20, 2015 Stakeholder Meeting and further modified based on their input about regional benefits. Purpose and need exhibits were also presented at the public open house held October 21, 2015. No further changes were necessary based on comments received from the public open house.

2.1 Purpose of the Project

The purpose of the proposed Neches River Bridge project is to:

- Improve rail operations through the Beaumont area by providing a second rail crossing of the Neches River.
  - Improved rail operations would focus on maintaining existing rail mobility and continuity while providing new rail capacity to accommodate growth.
  - Improved rail operations would increase overall freight and passenger rail capacity and efficiency and reduce rail and vehicular congestion by addressing vehicular mobility at railroad-highway grade crossings.
- Support and enhance industrial facilities utilizing rail, marine, and highway services in the Beaumont region.
  - Improved movement and interface amongst rail, marine, and vehicular modes would benefit the Beaumont region in terms of development and economic growth, which are top priorities for stakeholders and the public in the region.

2.2 Need for the Project

Currently, there are a number of operational challenges in and around the Beaumont area, which include the existing single track Neches River crossing, the Port of Beaumont operations and infrastructure, and the balance of local versus through trains. Improvements to the Beaumont regional freight and passenger rail environment are needed because:

- Existing rail operations through the Beaumont area are affected by track capacity, track switching, industrial service access, and bridge openings for marine vessel traffic.
  - The existing rail operations in the Beaumont area are estimated to operate at a delay ratio of 23 percent at an average speed of 15.0 miles per hour (mph) (TxDOT 2013).
  - The existing bridge is in the rail locked (closed) position until a navigation request is made to raise the lift bridge, generally to a requested vertical clearance. Information supplied by the USCG indicates approximately 400 lifts of the bridge per year in 2011. Data from KCS in 2012 indicates 7 lifts in a 6-day period, which is consistent with the USCG's annual lift figures. According to KCS, an average of 39 trains per day cross the Neches River Bridge. While requests for bridge openings can occur at any time, most occur during daylight hours. The bridge openings result in some train delays. The delays are more pronounced when trains are traveling in the same direction across the bridge, as adjacent trains must be separated by two signals in order to prevent a train from stopping on the bridge. The bridge typically stays open to river traffic for 15 to 30 minutes. (TxDOT 2013)
- Future rail traffic across the Neches River is expected to increase with both through traffic along this national corridor, as well as local rail traffic serving the region's existing and expanding industrial facilities.
  - Rail traffic throughout the region's network is forecasted to increase from 287 trains per week to 582 trains per week by the year 2035 (TxDOT 2013).
  - The Port of Beaumont's Master Plan (Port of Beaumont 2015) calls for expanded industrial facilities in both Jefferson and Orange Counties where efficient rail and vehicular access is necessary to serve projected demand.
  - Increased activities at private industrial facilities, including terminals along the Neches River, are also forecasted with or without this project.

- Without improvements to the existing rail crossing of the Neches River at Beaumont, operations would deteriorate in the future with increased rail traffic.
  - With train volumes nearly doubling by the year 2035, the delay ratio would increase to 94 percent. Operating speeds are forecasted to decrease systemically from 15.0 mph to 10.6 mph and delays would increase from 9.0 delay hours per day to 69.7 delay hours per day (TxDOT 2013).
  - When river traffic requires the lift bridge to be open, all rail traffic is delayed. The return to normal operations can take several hours. With the projected increase in rail traffic, the effects of a delay are magnified both in time of delay and physical impacts in storing the stopped train traffic.
  - With the projected increased train traffic, railroad-highway grade crossings within the City of Beaumont would be blocked more frequently and for longer durations, resulting in increased vehicular delay with associated operating costs, adverse impacts to air quality, and potential safety issues.

Project objectives considered in the alternatives development and screening process (discussed further in **Section 3.2**) include the ability of an alternative to achieve the following:

- Meet the purpose and need by improving rail operations across the Neches River; improving the interface between rail, marine, and vehicular traffic; and maintaining compatibility with planned industrial development.
- Minimize impacts to the community, cultural, and natural environments.
- Minimize constructability issues and disruption of service to existing rail, marine and vehicular traffic during construction.
- Provide a cost effective solution that meets the purpose and need for the project and other project objectives stated above.

3.0 Alternatives

3.1 No Build Alternative

The existing facility is the primary east-west rail corridor through the City of Beaumont and includes the only river crossing in the region, the Neches River rail bridge, a single-track vertical lift-span bridge owned and operated by KCS. The existing navigational channel is shown in **Appendix D, Exhibit 1**. The existing track speed is 20 mph west of the existing Neches River Bridge and 40 mph east of the bridge. The existing KCS railroad right-of-way width in the City of Beaumont is 60 feet. Proceeding easterly, the right-of-way narrows to 20 feet along the bridge structure crossing the Neches River. On land in Orange County, the right-of-way width expands to 225 feet and continues at that width until a notch on the north side reduces the width to approximately 150 feet. The notch is associated with the former Southern Pacific railroad alignment. This junction is also referred to as Tower 31. KCS's railroad corridor is part of the Beaumont Subdivision. UPRR's railroad corridor is part of the Lafayette Subdivision.

The No Build Alternative would include continued operational and maintenance activities of the existing rail network (see **Section 3.3.2, Figure 4**) and lift bridge. It serves as the baseline against which the Build Alternative is compared in the identification of environmental impacts in this EA. The plan and profile of the existing facility (the No Build Alternative) are included in **Appendix A**.

Table 4 outlines several on-going construction projects and other planned projects within the study area that may occur with or without the project. These independent projects are considered part of the baseline condition in the No Build Alternative.

Table 4. Ongoing Construction and Planned Projects within the Study Area

Plan	Relevance to the Project
Interstate 10 over Neches River (CSJ: 0028-09-111)	Project to reconstruct the interstate adjacent to the existing alignment is currently under construction. Construction is anticipated to be completed by summer 2016.
Island Park Road (Federal Aid Project No. BR 2011 (844))	This bridge replacement project over Brakes Bayou will re-establish a connection from Pine Street to Pine Island. The current bridge is closed. Vehicular traffic utilizes an access road from the north passing beneath I-10. The bridge is a TxDOT project while the roadway connection to Pine Street is a Jefferson County project. The project is under construction.
Rail Access to the Port of Beaumont	Jefferson Gulf Coast Energy Partners, LLC proposes to construct an approximately 215-acre North Terminal development to include a rail storage yard, four loop tracks and a truck unloading terminal. The North Terminal is proposed to connect to the KCS mainline east of the Neches River. The development would be located between I-10 and the KCS mainline west of Old US 90 in Orange County.
Port of Beaumont Access Road (CSJ: 0920-30-081)	A new roadway and bridge over the KCS that connects the Port's northern Orange County parcel with the Jefferson Energy Terminal operations south of the KCS tracks. Current access to the petroleum industry facility requires numerous transport trucks to cross two sets of railroad tracks along Old US 90 and a private access road. The Port of Beaumont's Access Road proposes a controlled and gated entrance north of the KCS tracks at Old US 90. The roadway would then become an elevated structure to cross over the KCS tracks near Tower 31 before descending in the Jefferson Energy Terminal. The Access Road's structural alignment splits in two directions, providing a loop road circulation through the terminal. Rough grading for the Access Road (north of the KCS tracks) is complete. Design plans are complete but construction has not yet started.
Jefferson Energy Terminal Tank Farm (Private Development)	This development is located on the Port of Beaumont's Orange County property north of the KCS railroad tracks. It includes an access road along the south side of the eastbound I-10 Frontage Road and a proposed tank storage farm for truck loading. The plans are preliminary with the purpose to acquire access permits for up to four driveways. The development includes a pipe rack attached to the underside of the proposed Access Road structure that crosses the KCS railroad. The project has yet to start construction.
Pearl Street Closure, City of Beaumont	During project scoping with stakeholders, City of Beaumont representatives confirmed that the city is closing Pearl Street in the near future.
Sabine-Neches Waterway Channel Improvement Project, USACE	The project includes deepening the Sabine-Neches Waterway from the Port of Beaumont's Turning Basin just south of the Neches River Bridge through the Sabine Pass Jetty Channel from ~40 feet to ~48 feet. A Record of Decision was issued February 14, 2012 (USACE 2012). The project is currently awaiting approval of funding (Henderson, February 24, 2016).

Source: Study Team 2016

3.2 Development of Reasonable Build Alternatives

Alternatives considered for the project and the evaluation of these alternatives are discussed in the Neches River Bridge *Alternative Development and Screening Technical Report* (TxDOT 2016a). Two basic parameters were included in the range of alternatives considered:

- The development of bridge type (stationary or lift)
- The development of bridge crossing locations (along existing or on new alignment)

Phase 1 evaluation of alternatives occurred during the *Feasibility Study* (TxDOT 2013). Four initial build alternatives were developed to a 10 percent design for the Phase 2 screening (the first screening step conducted during the NEPA process) with key stakeholder input (Alternatives E-1, E-2, N-1, and N-2). Phase 3 screening included an additional build alternative (Alternative E-3) that was added at the request of the USCG and also developed to a 10 percent design, and then compared to Alternative E-1 (the recommended Build Alternative resulting from Phase 2 screening). Beyond the description of the following 5 Build Alternatives that were developed to a 10 percent design, no other alternatives were developed:

- Existing Alignment Alternatives:
  - Alternative E-1 would build an additional track over the Neches River using a new lift-span or fixed rail bridge that would be parallel to and north of the existing KCS Railway lift-span bridge. The low chord elevation at the navigational channel would provide the same vertical clearance as the existing Neches River Bridge. This alternative was advanced to 30 percent design and evaluated further in this EA.
  - Alternative E-2 would build an additional track over the Neches River using a new lift-span or fixed rail bridge parallel to and north of the existing KCS Railway lift-span bridge. The low chord elevation at the navigation channel would provide the same vertical clearance as the I-10 Bridge. The west approach would use a viaduct, the east approach a trestle structure. Horizontal curves east of Tower 31 and the Port of Beaumont access bridge would allow the UPRR to tie into the KCS mainline. Two additional UPRR bridges and two grade crossings would be constructed at the east end of the project. This alternative had greater impacts to cultural and natural resources and required more than double the amount right-of-way compared to Alternative E-1. The cost of this alternative would be more than three times the cost of Alternative E-1. Therefore, this alternative was dismissed from further evaluation.
  - Alternative E-3 would build two tracks over the Neches River using a new lift-span rail bridge parallel to and north of the existing Neches River Bridge. The low chord elevation at the navigational channel would provide the same vertical clearance as the existing bridge. The horizontal clearance would result in a wider navigational channel. This alternative would also demolish the historic Neches River Bridge, an adverse impact to a National Register of Historic Places (NRHP) eligible property protected under both Section 106 of the National Historic

Preservation Act (NHPA) and Section 4(f) of the USDOT Act. As such, this alternative was dismissed from further evaluation.

- Northern Alignment Alternatives
  - Alternative N-1 would build a new alignment across the Neches River with a single-track, fixed-span bridge just south of the I-10 Bridge over the Neches River. This alignment would also include a rail grade separation to alleviate the need for a diamond connection between the KCS and UPRR rail traffic east of the Neches River. On the west side of the Neches River, the alignment would upgrade the existing BNSF single track along Long Avenue and add a track along the First Avenue/Gulf Street corridor. This alternative did not perform as well as other alternatives along the existing alignment (i.e., lower design speed, additional dispatcher, longer route, conflicts with vehicular movements) and had substantially greater impacts to natural resources and the community, including the potential for disproportionately high and adverse effects to low income and minority populations. The cost of this alternative would be more than three times the lowest cost alternative. Therefore, this alternative was dismissed from further evaluation.
  - Alternative N-2 would build a new alignment that crosses the Neches River with a single-track, fixed-span bridge just south of the I-10 Bridge over the Neches River similar to Alternative N-1. On the west side of the Neches River, the alignment would upgrade the existing BNSF track along and through the former Port of Beaumont Interchange Yard, roughly following Pine Street. Similar to Alternative N-1, this alternative did not perform as well as other alternatives and had substantially greater impacts to natural resources and the community. Therefore, this alternative was dismissed from further evaluation.

Screening criteria measures for Phase 2 and 3 were evaluated using both quantitative and qualitative data. A summary matrix (see **Appendix B**) helped key stakeholders and the public compare alternatives. Quantitative and qualitative statements were based on preliminary information available at the time of this screening. Screening measures focused on the ability of an alternative to meet the purpose and need and other project objectives, while considering its impacts to the community, cultural and natural environments, as well as its cost.

Three regulations played a key role in the decision-making process:

- Section 106 of the NHPA
- Section 4(f) of the USDOT Act
- Section 404 of the Clean Water Act (CWA)

Section 106 (16 United States Code [USC] 470) requires "federal agencies to take into account the effects of their undertakings on historic properties and afford a reasonable opportunity to comment on such undertakings" (36 CFR 800.1). Under 36 CFR 800, federal agencies must identify and

evaluate historic resources and determine if they are eligible for the NRHP; assess potential effects of the project; consider ways to avoid, minimize, or mitigate adverse effects; and consult with the public.

The intent of Section 4(f) and TxDOT policy is to avoid the use of a Section 4(f)-protected property or reduce project impacts to a de minimis level. If a de minimis impact determination is inappropriate and there is a feasible and prudent alternative that addresses the project purpose and need without a use of Section 4(f)-protected property, it must be chosen. "A feasible and prudent avoidance alternative avoids using Section 4(f) property and does not cause other severe problems of a magnitude that substantially outweighs the importance of protecting the Section 4(f) property" (23 CFR 774.17).

Section 404 of the CWA (33 USC 1344) regulates the discharge of dredged or fill material into waters of the U.S., including wetlands. The basic premise of the program is that no discharge of dredged or fill material may be permitted if: (1) a practicable alternative exists that is less damaging to the aquatic environment; or (2) the nation's waters would be significantly degraded. A project must show that steps have been taken to avoid impacts to wetlands, streams and other aquatic resources; that potential impacts have been minimized; and that compensation would be provided for unavoidable impacts.

Based on the screening process and consideration of stakeholder comments, Alternative E-1 was identified as the least impactful yet fiscally feasible option that addresses the purpose and need for the project. As such, Alternative E-1 (based on a 30 percent design) is presented as the Build Alternative in this EA, along with the No Build Alternative. Specifically:

- Alternative E-1 would satisfy the requirements of Section 106 in that it would avoid adverse effects to NRHP properties, including the Neches River Bridge.
- Alternative E-1 would meet the intent of Section 4(f) in that it would satisfy the purpose and need for the project and would reduce impacts to Section 4(f) resources to a de minimis level.
- Alternative E-1 would be the least damaging environmentally practicable alternative.

3.3 Build Alternative

3.3.1 Proposed Right-of-Way

A map showing the existing and proposed right-of-way and other areas of construction are depicted in **Appendix D, Exhibits 2a and 2b**. Most of the Build Alternative would be located within the existing KCS railroad right-of-way (described in **Section 3.1**). As described in **Section 4.1.2**, approximately 2.0 acres[1] of additional right-of-way would be acquired from the City of Beaumont and the Port of Beaumont. The TGLO has jurisdiction over the Neches River bottom and a land use agreement would be acquired for the river crossing. Additionally, a temporary easement may be needed for construction. While the location of the construction laydown area may change depending on the contractor selected, a temporary 21.5-acre area near I-10, that also provides access to the river, has been evaluated to account for potential impacts during construction. This area is owned by the Port of Beaumont and BOMAC Contractors, LTD and slated for future development.

3.3.2 Description of Build Alternative

Under the Build Alternative, an additional track would be constructed over the Neches River using a new lift-span railroad bridge that would be parallel to and approximately 35 feet north (centerline to centerline) of the existing KCS Railway lift-span bridge. Rail operations would use both the existing and new bridge. The existing and proposed railroad system line diagram is depicted in **Figure 4**. The 30 percent drawings of the Build Alternative are included in **Appendix C**. The existing navigational channel is shown in **Appendix D, Exhibit 1**. The low chord elevation at the navigational channel would provide vertical clearance similar to the existing Neches River Bridge. The proposed Navigation Design Criteria adjacent to and north of the KCS railroad bridge would be 200-foot minimum horizontal clearance and 140-foot minimum vertical clearance. At the time of this report's submittal, the USCG has not formally responded to the values proposed.

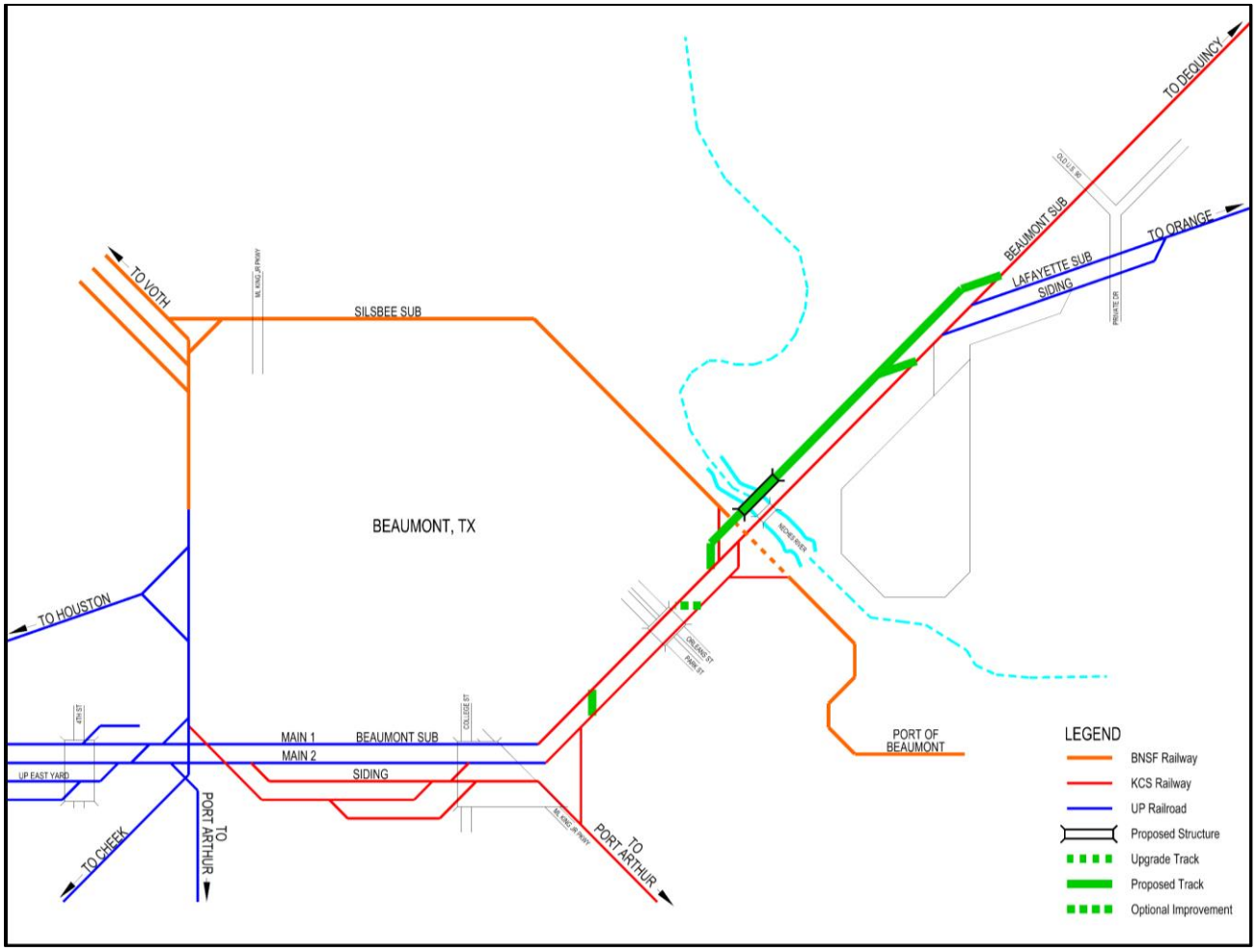
The Build Alternative alignment would begin west of Trinity Street with a crossover that would allow westbound trains on the north track to access the south track and then proceed on to the KCS mainline to Port Arthur. Eastbound trains from Port Arthur on the KCS track and from Beaumont on the UPRR south track would access the north track through this crossover. Construction would occur within the existing right-of-way between Archie Street and Neches Street.

An optional crossover would be located near Pearl Street. This would allow westbound trains on the north track to access the Port of Beaumont wye track to the south or westbound trains coming from

[1] Areas were not measured where the proposed railroad right-of-way line may cross another railroad, public agency right-of-way such as a street right-of-way, or where acquisition costs cannot be ascribed based upon the assessed value methodology.

the Port of Beaumont track to access the north track. This access or movement of trains is not currently available; therefore, it would be included as an option.

Figure 4. Railroad System Line Diagram – Existing and Proposed



Source: Study Team 2016

Construction of the second main track would begin at Pearl Street and would continue through a curve designed for 40 mph freight speed to the east. A turnout would be located in a tangent portion of the track to connect to the existing BNSF wye track. The second main track would cross with a diamond over the BNSF (highline) track and would continue on approach structure to the proposed lift bridge over the Neches River.

The second main track would continue to the east through a curve designed for 40 mph freight speed parallel to the existing mainline track. A crossover would allow westbound trains coming from the UPRR or industry track to access the proposed north track or eastbound trains on the north proposed track to access the industry or UPRR track. The Build Alternative would accommodate the proposed design for the Port of Beaumont access road, an independent project to be built by others.

The east end would conclude with a turnout. The alignment would tie into the existing mainline east of the existing UPRR and industry connections, which would allow parallel movements coming from the UPRR to the existing south track and on the existing mainline through the turnout on to the north track.

The proposed alignment would cross over the existing lowline. Due to low vertical clearance, a thru plate girder would be used on the west approach. Steel plate girders would be used on east approach to the river crossing. At the main channel, a lift truss would be used. Two tower spans would lay on either side of the truss span. The truss length would be determined based on the navigational clearances. The existing fender system would be removed and a new extended fender system would provide vessel impact protection to the piers on the river span for both structures.

The distinguishing factors of the Build Alternative would include:

- Track capacity would be increased over the existing condition across the Neches River by adding a single-track bridge. The additional bridge capacity would reduce train traffic delays and stacking of trains over the no build condition.
- Train operating design speed would be improved from 20 mph to 40 mph west of the river. The operating speed east of the river (40 mph) would be the same as currently exists.
- Vertical grade would be the same as the existing bridge. Both the vertical and horizontal clearances of the bridge would comply with the minimum navigational requirements listed in the National Oceanic and Atmospheric Administration (NOAA) navigation charts (**Appendix D, Exhibit 1**).
- Train operations would be able to continue throughout construction with short-term construction windows.
- Dispatching and industrial access would likely be the same as existing. Future connections to planned industrial facilities east of the river could be made from the new track.
- There would be no additional at-grade roadway/railroad crossings to delay vehicular traffic.
- Minimal right-of-way would be needed and no businesses or residences would be displaced.
- The alignment would be located within the KCS right-of-way through the historic Beaumont Commercial District area.
- Impacts to wetlands, waters of the U.S., floodplains, Section 4(f) resources, hazardous material sites, and low income/minority populations would be minimized.

4.0 Affected Environment and Environmental Consequences

This section discusses the affected environment and environmental consequences for the No Build and Build Alternatives. Farmlands is not discussed below because the study area does not contain areas mapped as prime, unique, statewide important or locally important farmland by the Natural Resources Conservation Service (NRCS) Web Soil Survey (NRCS 2015). Since no farmlands are located within the study area, the Farmland Protection Policy Act (7 USC 73) does not apply. Use of natural resources is not discussed because no extraction of water, minerals, or timber are anticipated.

4.1 Land Use

4.1.1 Existing Land Use

The Community Impacts Assessment (CIA) study area and land use types by category are depicted in **Appendix D, Exhibit 3**. Existing land use within the CIA study area is primarily industrial and commercial. The major uses for the area include the Port of Beaumont, municipal buildings, and industrial warehouses. **Table 5** identifies acreage of specific land use types by category within the CIA study area.

Table 5. Existing Land Use Types in the CIA Study Area

Land Use Type	Acreage
Church	1.74
Civic	23.81
Commercial	12.78
Industrial	174.88
Industrial-Marsh Land	191.33
Park	8.65
Port of Beaumont	13.73
Railroad	20.97
Residential-Multi-Family	0.08
Vacant	19.58

Source: Jefferson County Appraisal District 2015; Orange County Appraisal District 2015

4.1.2 Planned Land Use

Planned land use within the CIA study area would be expected to follow the current trend as primarily industrial and commercial, with or without the proposed project. The City of Beaumont has an adopted zoning map to guide future land use development within the City (**Appendix D, Exhibit 4**). According to the City of Beaumont's zoning map, the entire Riverfront Park area is zoned as Planned Development. In September 2014, the City of Beaumont approved a resolution adopting the Beaumont Riverfront Reinvestment Zone Project Plan (**Appendix D, Exhibit 5**), which would develop the park into mixed uses with improved park amenities. The Port of Beaumont property is also zoned as Planned Development. The Port of Beaumont's Master Plan (Port of Beaumont 2015) calls for expanded industrial facilities with or without the proposed project in both Jefferson and Orange Counties where efficient rail and vehicular access is necessary to serve the projected demand (**Appendix D, Exhibit 6**). Increased activities at private industrial facilities, including terminals along the Neches River, are also forecasted.

There would be no changes to planned land use under the No Build Alternative. Planned industrial development would continue to occur but would not benefit from improved rail efficiency.

The Build Alternative would follow an existing rail corridor and would be primarily located within the existing KCS right-of-way. The Build Alternative would conform to plans and policies and would be compatible with existing and planned land uses. No residential or business displacements would be anticipated. Existing municipal services would remain, and adjacent land would continue to develop in accordance with plans and policies.

As shown in **Appendix D, Exhibit 3**, approximately 2.0 acres of civic, park, and industrial-marsh land uses would be acquired from the City of Beaumont and the Port of Beaumont. Approximately 0.1 acres (civic) is owned by the City of Beaumont and is used for parking. The Port of Beaumont owns the remainder, including approximately 0.4 acres associated with Riverfront Park and another 1.5 acres in Orange County that is vacant land zoned industrial-marsh land. The TGLO has jurisdiction over the Neches River bottom and a land use agreement would be acquired for the river crossing as discussed in **Section 4.6.5.8**. Additionally, a temporary easement may be needed for construction. While the location of the construction laydown area may change depending on the contractor selected, a temporary 21.5-acre area near I-10, that also provides access to the river, has been evaluated to account for potential impacts related to construction. This area is owned by the Port of Beaumont (industrial marsh) and BOMAC Contractors, LTD (industrial) and is slated for future development.

4.1.3 Mitigation for Land Use Impacts

Land use impacts include acquisition of property. These impacts would be mitigated through compensation in accordance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 as amended (Uniform Act) (42 USC 61).

4.2 Social and Community Resources and Community Impact Assessment

Social and community impacts were assessed through conducting a CIA in accordance with the USDOT, CEQ, and U.S. Environmental Protection Agency (USEPA) laws, regulations and orders listed below:

- Title VI of the Civil Rights Act as codified at 42 USC 2000 d (1-7)
- EO 12898 Federal Actions to Address Environmental Justice (EJ) in Minority Populations and Low-Income Populations
- US Department of Transportation Order 5610.2(a): Actions to Address EJ in Minority Populations and Low-Income Populations
- Uniform Relocation Assistance and Real Property Acquisition Policies Act (Uniform Act) as codified at 42 USC 61 and 49 CFR 24
- EO 13166: Improving Access to Services for Persons with Limited English Proficiency (LEP)
- Americans with Disabilities Act (ADA) of 1990 and Section 504 of the Rehabilitation Act of 1973 as codified at 42 USC 126

A community is defined as a distinctive, homogeneous, stable, self-contained unit of a larger spatial area defined by geographical boundaries; ethnic, or cultural characteristics of the inhabitants; a psychological unity among the residents; and the concentrated use of the area's facilities. Community cohesion is defined as those behavior or perceptual relationships that are shared among residents of a community that cause the community to be identifiable as a discrete, distinctive geographic entity within the urban pattern.

This assessment relied on U.S. Census data (U.S. Census Bureau 2010 and 2013) supplemented with local land use data (Jefferson County Appraisal District 2015; Orange County Appraisal District 2015; TNRIS 2015; and THC 2015) and information gathered from site visits conducted September 15-16, 2015, and September 24, 2015.

U.S. Census and CIA study area boundaries are shown in **Appendix D, Exhibit 7**. The CIA study area includes 83 Census Blocks within 700 feet of either side of the proposed alignment. This area was chosen based on the physical limits of the Build Alternative and the distance from the physical limits that is evaluated for potential noise impacts. Since the area is comprised of commercial and industrial properties, there is not a traditional neighborhood or community to evaluate. Because of the limited scope of the project along an existing railroad line, the project impacts are not anticipated to affect areas outside the physical project limits other than the potential for noise impacts.

The 2010 U.S. Census and the 2009-2013 American Community Survey (ACS) (U.S. Census Bureau 2013) were used to compile demographic information. The ACS five-year estimate is calculated from

a sampled data range from January 1, 2009, to December 31, 2013. The yielded estimate over the five-year period is reported with a margin of error.[2]

It is important to note that the CIA study area population totals for the following characteristics may vary. This is due to different data sources and geographic level of information available for a specific characteristic. Census Block level is used in the CIA analysis where data is available because it represents the smallest geographic area and better encompasses the actual CIA study area. As the geographic levels increase, the data becomes less confined and may encompass areas outside of the CIA study area. Therefore, data that is only available in Census Tracts or Block Groups have higher population totals. Generally, this data can be used as a representative for the CIA study area. Since only 7 Census Blocks in the CIA study area have a population greater than zero, these 7 Census Blocks and their 3 associated Block Groups were the focus of this assessment. Two Block Groups were excluded from the demographic analysis because their population does not represent the CIA study area population (i.e., the population of the Census Blocks within the CIA study area associated with these Block Groups is equal to zero).

4.2.1 Population by Age and Disability

The CIA study area is located in the City of Beaumont, and Jefferson and Orange counties, Texas. Population totals for these local areas are shown in **Table 6** along with totals for the CIA study area. Only 7 of the 83 Census Blocks within the CIA study area include a population greater than zero. The CIA population is less than 0.1 percent of the City of Beaumont population.

Table 6. 2010 Population Estimates

Description	CIA Study Area (Census Block)	City of Beaumont	Jefferson County	Orange County
Total Population	93	117,478[1]	252,273	81,837

Source: U.S. Census Bureau 2010 (Extracted from Summary File 1 Table P1)

Note:

1. Revised count, February 22, 2013.

Table 7 shows the distribution of the population by age group as represented by Block Groups. Census Tract 217, Block Group 2 had the highest percentage of young population within the CIA study area and Census Tract 117 Block Group 1 had the highest percentage of elderly population. It should be noted that the majority of the population in these Block Groups do not live within the CIA study

[2] A margin of error is the difference between an estimate and its upper or lower confidence bounds. Confidence bounds can be created by adding the margin of error to the estimate (for an upper bound) and subtracting the margin of error from the estimate (for a lower bound). All published margins of error for the American Community Survey are based on a 90 percent confidence level. (U.S. Census Bureau n.d.)

area. No signs of vulnerable populations were observed in the site visit (e.g., daycare centers, elementary schools, or assisted living facilities).

Table 7. Age Composition of the CIA Study Area

Location		Age Group							
		Under 5	%	5 to 19	%	20 to 64	%	65 & Over	%
Tract 17 Jefferson County	Block Group 1	13	2.9	100	22.1	315	69.5	25	5.5
Tract 117 Jefferson County	Block Group 2	104	8.8	324	27.3	594	50.0	166	14.0
Tract 217 Orange County	Block Group 2	224	13.8	376	23.2	887	54.8	133	8.2
CIA Study Area (Block Group)		341	10.5	800	24.5	1,796	55.1	324	9.9

Source: U.S. Census Bureau 2009 – 2013 ACS 5-Year Estimates (Table B01001)

According to the data shown in **Table 8**, 20.6 percent of the CIA study area population is considered disabled as represented by Census Tracts. However, it should be recognized that most of the population in these Census Tracts do not live within the CIA study area. The greatest concentration is in Census Tract 17. The Beaumont Transit System offers door-to-door transit service for disabled individuals. No signs of vulnerable populations were observed during the site visit.

Table 8. Disabled Population of the CIA Study Area

Location	Population with Disability[1]	Percent of Population with Disability[1]
Tract 17 - Jefferson County	516	27.8
Tract 117 - Jefferson County	287	16.2
Tract 217 - Jefferson County	456	18.4
CIA Study Area (Tract)	1,259	20.6

Source: U.S. Census Bureau 2009 – 2013 ACS 5-Year Estimates, Table DP02

Note:

1 Disability includes hearing, vision, cognitive, ambulatory, self-care, and independent living difficulties.

4.2.2 Income and Poverty Status

Table 9 shows the median household income, total households, and households below the poverty level as represented by Block Groups. **Appendix D, Exhibit 8** shows the median household income and households below poverty level. The U.S. Census Bureau defines a household as all people who occupy a housing unit regardless of relationship. A household may consist of a person living alone or a group of unrelated individuals or families living together.

All Block Groups in the CIA study area have a median household income above the 2015 U.S. Department of Health and Human Services poverty guideline of $24,250 for a family/household of four persons (80 Federal Register [FR] 3236). According to the Block Group data, 22.9 percent of households in the CIA study area are below the poverty threshold, which is greater than the local area. However, the majority of the population in these Block Groups do not live within the CIA study area. The site visit identified a 5-unit housing complex at 875 Neches Street that may offer subsidized or affordable housing to low income individuals. No other signs of vulnerable populations were observed during the site visit.

Table 9. Median Income and Poverty Status

Location		Median Household Income	Total Households	Households Below Poverty Level
City of Beaumont		$39,526	45,190	9,327 (20.6%)
Jefferson County		$42,568	92,634	17,889 (19.3%)
Orange County		$49,507	31,162	4,604 (14.8%)
CIA Study Area (Block Group)		$34,254	1,144	262 (22.9%)
Tract 17 Jefferson County	Block Group 1	$33,438	163	34 (20.9%)
Tract 117 Jefferson County	Block Group 2	$33,343	409	45 (11.0%)
Tract 217 Jefferson County	Block Group 2	$35,982	572	183 (32%)

Source: U.S. Census Bureau 2009 – 2013 ACS 5-Year Estimates (B17017 and B19013)

4.2.3 Racial and Ethnic Composition

Table 10 shows a summary of the racial and ethnic compositions. The CIA study area is comprised of 51.6 percent racial minorities and 5.4 percent ethnic minorities (individuals of Hispanic or Latino origin). As shown on **Appendix D, Exhibit 9,** 5 Census Blocks in the CIA study area have a minority population greater than 50 percent. The greatest concentration of minorities is located in Census Block 2148 of Jefferson County Tract 117, Block Group 2. Black Alone (Not Hispanic or Latino) represents 87.5 percent of the minority population within the CIA study area, and 94.1 percent within Census Block 2148. The remainder of the minority population is of Two or More Races (Not Hispanic or Latino) or Hispanic or Latino of Any Race.

No places that target or serve specific minority groups were observed during the site visit. However, because the percentage of minority population is greater than 50 percent, it is reasonable to assume that the churches and businesses in the CIA study area serve minority groups.

Table 10. Racial and Ethnic Composition

Location	Total Population	Non-White Population	Hispanic or Latino of Any Race
Tract 17 Jefferson County Block Group 1	682	589 (86.4%)	57 (8.4%)
Block 1021	*7*	*4 (57.1%)*	*0 (0.0%)*
Tract 117 Jefferson County Block Group 2	1,235	948 (76.8%)	621 (50.3%)
Block 2147	*42*	*5 (11.9%)*	*3 (7.1%)*
Block 2148	*36*	*34 (94.4%)*	*2 (5.6%)*
Block 2165	*2*	*2 (100%)*	*0 (0.0%)*
Block 2172	*2*	*2 (100%)*	*0 (0.0%)*
Block 2185	*3*	*0 (0.0%)*	*0 (0.0%)*
Tract 217 Orange County, Block Group 2	1,428	130 (9.1%)	103 (7.2%)
Block 2088	*1*	*1 (100%)*	*0 (0.0%)*
CIA Study Area (Block)	93	48 (51.6%)	5 (5.4%)

Source: U.S. Census Bureau 2010, Summary File 1 (P5)

4.2.4 Limited English Proficiency

EO 13166 "Improving Access to Services for Persons with Limited English Proficiency" mandates that federal agencies examine the services they provide and develop and implement a system by which LEP persons can meaningfully access those services consistent with, and without unduly burdening, the fundamental mission of the agency. LEP persons are considered those who speak English less than "very well." Approximately 16.8 percent of the population within the CIA study area speaks English "less than very well." As detailed in **Table 11,** LEP persons are located in Tract 117, Block Group 2 and Tract 217, Block Group 2 in Jefferson County. The predominant language, other than English, for the CIA study area was Spanish (99.8 percent of the LEP population). No signs in languages other than English were observed during the site visit. Accommodations for engaging LEP populations include the translation of public notices and meeting materials in Spanish, and a Spanish-speaking team member in attendance at these events. Other reasonable accommodations are available upon request.

Table 11. Population with Limited English Proficiency

Location		Total Individuals that Speak English Less Than "Very Well"	Population by Age Group that Speak English Less Than "Very Well"			Number of Households of Linguistic Isolation	
			Ages 5-17	Ages 18-64	Ages 65+	Number of Households	Percentage of Total Households
Tract 17 Jefferson County	Block Group 1	0	0	0	0	0	0.0
Tract 117 Jefferson County	Block Group 2	437	87	323	27	75	18.3
Tract 217 Orange County	Block Group 2	55	0	50	5	25	4.4
CIA Study Area (Block Group)		492	87	373	32	100	8.7

Source: U.S. Census Bureau 2009 – 2013 ACS 5-Year Estimates (B16004 and B16002)

4.2.5 Community Resources

Community resources identified within the CIA study area are listed in **Table 12** and shown in **Appendix D, Exhibit 10.** There are no hospitals or public schools in the CIA study area. The nearest hospital is Baptist Hospitals of Southeast Texas, located at 3080 College Street, Beaumont, TX. School districts include Beaumont Independent School District (ISD) in Jefferson County, and Vidor ISD in Orange County.

Table 12. Community Resources

Destination Type	Name	Address
Municipal	Beaumont Police Department	255 College Street
	Beaumont Chamber of Commerce	1110 Park Street
	Beaumont Civic Center Complex	701 Main Street
	Beaumont Municipal Transit System	550 Milam Street
	Beaumont Police Department	255 College Street
	Beaumont Public Library	801 Pearl Street
	City of Beaumont	801 Main Street
	County Annex/Texas Agrilife Extension Service	1225 Pearl Street
	County Courthouse Complex/Jail	1001 Pearl Street
	Fire Station No. 1	747 College Street
	Jefferson County Courthouse	1001 Pearl Street #202
	Jefferson County Probation Services	820 Neches Street
	Port of Beaumont	1225 Main Street
Parks	Martin Luther King, Jr. Park	1050 College Street
	Riverfront Park	805 Main Street
	Waldman Park	College Street and Pearl Street
Places of Worship	Catholic Diocese Of Beaumont	710 Archie Street
	Ebenezer Baptist Church and Christian Education Advancement Center	675 College Street
	St. Anthony Cathedral Basilica	700 Jefferson Street
	St. Mark's Episcopal Church	680 Calder Avenue
	Future Home of Ebenezer Missionary Baptist Church	College Street and Neches Street

Source: Study Team 2016

4.2.6 Economic Industries

Table 13 provides the 2009-2013 Census estimates for 13 economic industries in the City of Beaumont, Jefferson and Orange Counties, and the Census Tracts associated with the CIA Study Area. The largest industry in the region is educational and health care services. The major employers for this industry and for the area are Christus St. Elizabeth Hospital, Baptists Hospitals of Southeast Texas, Beaumont ISD, and Lamar University. These are located outside the CIA study area.

Table 13. Economic Industries

Industry	CIA Study Area (Tracts)	City of Beaumont	Jefferson County	Orange County
Civilian Employed Population 16 years old and over	3,824	49,602	101,918	34,797
Agriculture, forestry, fishing, hunting and mining	109 (2.9%)	576 (1.2%)	1,600 (1.6%)	537 (1.5%)
Construction	534 (14.0%)	4,004 (8.1%)	10,138 (9.9%)	3,804 (10.9%
Manufacturing	389 (10.2%)	4,991 (10.1%)	12,214 (12.0%)	5,947 (17.1%)
Wholesale trade	63 (1.6%)	1,446 (2.9%)	2,757 (2.7%)	650 (1.9%)
Retail trade	516 (13.5%)	6,461 (13.0%)	12,145 (11.9%)	4,408 (12.7%)
Transportation, warehousing, and utilities	192 (5.0%)	2,529 (5.1%)	4,809 (4.7%)	1,921 (5.5%)
Information	19 (0.5%)	668 (1.3%)	1,437 (1.4%)	276 (0.8%)
Finance, insurance, and real estate	129 (3.4%)	2,371 (4.8%)	4,164 (4.1%)	1,636 (4.7%)
Professional, scientific, and management, and administrative and waste management services	239 (6.3%)	4,444 (9.0%)	9,472 (9.3%)	2,962 (8.5%)
Educational services and health care	854 (22.3%)	12,255 (24.7%)	23,590 (23.1%)	7,099 (20.4%)
Arts, entertainment, and recreation, and accommodation and food services	476 (12.4%)	4,929 (9.9%)	8,789 (8.6%)	2,391 (6.9%)
Other services except public administration	172 (4.5%)	2,298 (4.6%)	5,618 (5.5%)	2,004 (5.8%)
Public administration	132 (3.5%)	2,630 (5.3%)	5,185 (5.1%)	1,162 (3.3%)

Source: U.S. Census Bureau 2009 – 2013 Extracted from ACS 5-Year Estimates (Table S2405)

4.2.7 Community and Economic Impacts

The No Build Alternative would not alter the social or community environment. Potential economic benefits from improved rail operations and reduced rail and vehicular congestion would not be recognized.

The Build Alternative would not alter community cohesion. The CIA study area does not represent a traditional cohesive community since it is primarily industrial and commercial. The Build Alternative would follow an existing rail corridor and would not change access or include relocations.

No changes to access or travel patterns are anticipated because the Build Alternative would follow an existing rail corridor. There would be no road closures, changes in access, or rerouting of pedestrian, bicycle, transit or vehicular traffic. As a separate action, the City of Beaumont has committed to closing Pearl Street in the near-term (with or without the proposed project) to reduce the use of train horns at this location. No construction is proposed at Neches Street -- the one remaining roadway/railroad grade crossing (i.e., an intersection where a roadway crosses a railroad at-grade). As explained in **Section 4.2.10**, existing features at this signaled and gated crossing are appropriate for access by pedestrian, bicycle or vehicular traffic.

There would be no loss of tax base under the Build Alternative to either Jefferson County or Orange County, as the parcels that would be acquired for right-of-way are exempt from taxes (owned by the City of Beaumont and the Port of Beaumont).

The Build Alternative would have the potential to positively impact economic conditions within the CIA study area, the City of Beaumont, and the greater Beaumont region. Improved rail operations would increase overall freight and passenger rail capacity and efficiency and reduce rail and vehicular congestion. The Build Alternative would support and enhance industrial facilities using rail, marine and highway services in the Beaumont region. Improving the movement and interface amongst rail, marine and vehicular modes benefits the Beaumont region in terms of development and economic growth, which are top priorities for stakeholders and the public in the region. For example, efficiencies may lead to reduced transportation cost of goods and services that may allow businesses to be more competitive or that may increase revenues to grow their business.

4.2.8 Chapter 26 Properties

Chapter 26 of the Texas Parks and Wildlife Code requires TxDOT to make specific findings before approving the use of certain kinds of public lands for a transportation project. The specific required findings are that there is no feasible and prudent alternative to the use or taking of such land and that all reasonable planning to minimize harm to the public land has been undertaken.

Under the Build Alternative, Chapter 26 applies to the Riverfront Park. **Section 4.14** provides further detail about this property and impacts under the Build Alternative. Prior to taking of land, public involvement requirements of Chapter 26 will be satisfied, including notification and a public hearing.

4.2.9 Environmental Justice Considerations

The Build Alternative was assessed to determine the potential for disproportionately high and adverse effect(s) on low-income or minority populations in compliance with EO 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*. EO 12989

requires each federal agency to "make achieving Travel Patterns and Accessibility environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies and activities on minority populations and low-income populations." Although the U.S. Census data (summarized in **Sections 4.2.2 and 4.2.3**) indicate the presence of low-income households in the CIA study area and a minority population greater than 50 percent, the Build Alternative would not have any disproportionate impacts to these populations. The Build Alternative would not alter community cohesion, does not change access or travel patterns, or require relocations. Additionally, rail noise and vibration impacts (see **Section 4.5**) are not anticipated to disproportionately impact any community of concern as the existing noise environment along the rail corridor is already dominated by rail noise, including horn blowing, with existing noise levels exceeding 70 dBA. No long-term public health risks are anticipated and positive barriers (e.g., fencing) would protect populations from potentially unsafe conditions (e.g., objects or persons entering the railroad corridor).

4.2.10 Public Health and Safety

The FRA is the federal agency responsible for development and enforcement of safety rules for railroads and railroad employees (49 CFR 2). The state addresses rail safety in 43 TAC 7, Subchapter D. Counties, cities and individual railroad companies also adopt emergency plans that provide operating procedures for safety and security.

Vehicular, pedestrian and cyclist safety issues under the No Build and Build Alternative would primarily concern the potential for conflict between motor vehicles, pedestrians and cyclists and trains at roadway/railroad grade crossings. As a separate action, the City of Beaumont has plans to close Pearl Street in the near term (with or without this project) to eliminate the use of train horns at this location. While there is no construction proposed at Neches Street (the one remaining roadway/railroad grade crossing), this intersection was reviewed for safety. Existing safety features at this crossing are appropriate for access by pedestrian, bicycle or vehicular traffic. The USDOT Crossing Inventory dated February 11, 2016 indicates that highway or pathway traffic control devices at this location include advanced warning signs, pavement markings, channelization devices (medians), and emergency notification signs. Train activated warning devices include gate arms across the roadway, cantilevered flashing light structures over the traffic lane, mast mounted flashing lights, flashing light pairs, and bells. As rail traffic increases, small safety projects may be programmed under the No Build Alternative to implement positive barriers such as fencing where needed as a safety measure to minimize potential for conflicts. The Build Alternative would include positive barriers such as fencing in locations where it is needed as a safety measure to minimize potential for conflicts.

Air quality, water quality, and proximity to hazardous materials sites and solid waste disposal areas are also factors related to public health and safety. As noted in **Section 4.4**, the City of Beaumont, as well as Jefferson and Orange counties, are classified as in attainment for all National Ambient Air Quality Standards (NAAQS). Since the area is in attainment for all pollutants, and with locomotives

becoming cleaner, no long-term air quality impacts would be expected to occur under the No Build Alternative or Build Alternative. Therefore, public health and welfare would continue to be protected relative to air quality.

No adverse water quality impacts to public health would be anticipated under the No Build or Build Alternative. Section 4.6.4 states that Build Alternative would not contribute to the listed impairments of the Neches River. No long-term water quality impacts would be expected as a result of the Build Alternative.

The potential for public health risks would be unchanged under the No Build Alternative. Section 4.9 shows the identified 37 hazardous materials sites within the study area. All 37 sites have a low potential for impacts under the Build Alternative. No long-term risks would be expected to occur under the Build Alternative. Therefore, public health would have minimal exposure risk from hazardous materials sites or solid waste disposal.

4.2.11 Mitigation for Community Impacts

Community impacts relate to public safety. These impacts would be mitigated through the use of positive barriers such as fencing that would be incorporated into the design, where needed, for public safety to reduce risk associated with objects or persons entering the railroad corridor.

While not required mitigation, community outreach has included several stakeholder meetings and a public open house to identify community issues and address stakeholder concerns (see Section 6.0 for further detail).

4.3 Transportation Impacts

Existing rail operations are affected by track capacity, track switching, industrial service access, and bridge openings for marine vessel traffic. Future rail traffic across the Neches River is expected to increase with both through and local rail traffic serving existing and expanding industrial facilities. The *Feasibility Study* evaluated performance in the year 2035 focusing on transportation impacts (e.g., congestion relief and system capacity) of proposed infrastructure changes.

The No Build Alternative would not provide any of the transportation benefits of the Build Alternative. As rail traffic increases, congestion to both vehicular and rail traffic would continue to increase under the No Build Alternative. National, regional, and local freight and passenger rail would not benefit from reducing congestion across the Neches River. Train delays would rise from the current 9.0 delay hours per day to 69.7 delay hours per day by the year 2035 (see Section 1.4.1.1, Table 1). Delayed trains would backup the rail network and block at-grade rail crossings of roadways in Beaumont. Under the No Build Alternative, both train and vehicular traffic would have a longer wait for congestion to clear than would occur with the Build Alternative.

Under the Build Alternative, train delay would be 23.4 delay hours per day (46.3 delay hours per day less than the No Build Alternative) in the year 2035 by adding a track to the existing route (see **Section 1.4.1.1, Table 2**). The added capacity across the Neches River would benefit vehicle, transit services, and bicycle/pedestrian access at at-grade crossings by reducing train-related delays. National, regional, and local freight and passenger rail would benefit from adding rail capacity and eliminating the existing bottleneck created by the single rail crossing of the Neches River. Congestion from train back-ups and blocked at-grade crossings of roadways would be minimized.

Table 14 summarizes the regional, statewide planning, and transportation plans and their relevance to this project. The Build Alternative functions independently of other projects in these plans and was designed to be compatible with the projects listed in these plans.

Table 14. Relationship to Regional Statewide Planning and Transportation Plans

Plan	Relevance to the Project
Texas Rail Plan (TxDOT 2010)	▪ Shows TxDOT's proactive approach to addressing rail transportation issues within the state. ▪ Provides a statewide forecast of freight. ▪ Identifies rail congestion in the Beaumont area. ▪ Projects a methodology for assessing and rating rail projects across the state.
Gulf Coast Service Plan Report (Amtrak 2009)	▪ If the original Sunset Limited service between Los Angeles and Orlando is restored, ridership on this route would increase and potentially causing the need for additional service and putting additional pressure on the Neches River bridge crossing. The Sunset Limited has a station stop in Beaumont, Texas.
Rail Access to the Port of Beaumont (Center for Transportation Research [CTR] 2005)	▪ The Port of Beaumont is a critical rail user in the Beaumont area. ▪ Access to the Port of Beaumont has a strong influence on rail operations in the region. ▪ Anticipated growth at the Port necessitates the identification of immediate and long-range transportation improvements.
Gulf Coast High-Speed Rail Corridor Evaluation (Carter & Burgess 2004)	▪ Passenger rail plays an important part in the nation and in this region, and it utilizes the Neches River Bridge. ▪ Rail improvements are needed to accommodate the Gulf Coast High Speed Rail throughout Texas. ▪ Within Beaumont, rail improvements are desired at the existing Amtrak station.
Jefferson-Orange-Hardin Regional Transportation Study Metropolitan Transportation Plan (MTP) 2040, as Amended (South East Texas Regional Planning Commission [SETRPC] 2015a)	▪ The Plan addresses all modes of transport including freight (by truck, rail, water and air). ▪ Roadway improvement projects in the region may affect where potential rail alignments might be located. ▪ Railroad Grade Separation project at Old US-90 south of the I-10 access road east of the Neches River is included in this plan.
Jefferson-Orange-Hardin Regional Transportation Study (JOHRTS) Transportation Improvement Program, 2015-2018, as Revised (SETRPC 2015b)	▪ The Plan addresses short-term transportation improvements for all modes of transport including freight. ▪ Railroad Grade Separation project at Old US-90 south of the I-10 access road east of the Neches River is included in this plan.
Texas Ports 2015-2016 Capital Program (Port Authority Advisory Committee 2015)	▪ Port of Beaumont's New Access Roadway and Overpass project is included in this program.

Source: Included in the table.

4.3.1 Mitigation for Transportation Impacts

Transportation impacts would be beneficial. No mitigation for transportation impacts is warranted.

4.4 Air Quality

The study area is located in Jefferson and Orange Counties in Texas, areas listed as in attainment for all NAAQS; therefore, conformity rules do not apply. Since conformity does not apply and because the project is not located within a CO or PM nonattainment or maintenance area, a project level hot spot analysis as required under the conformity rule is not required. However, analysis of the operational emissions of both ozone (O_3) precursors and GHG was completed.

Locomotive sources generate varying amounts of O_3 and its precursors; nitrogen oxides (NO_X); hydrocarbons (HC) (specifically volatile organic compounds (VOCs)); particulate matter (PM); and/or carbon monoxide (CO) emissions, all of which are concerns for human and environmental health.

O_3 is a highly reactive pollutant that damages lung tissue, causes congestion, reduces vital lung capacity, and can also damage vegetation. NO_X are an important precursor to both O_3 and acid rain, and may affect both terrestrial and aquatic ecosystems. The major mechanism for the formation of NO_2 in the atmosphere is the oxidation of the primary air pollutant nitric oxide (NO). NO_X plays a major role with VOCs to produce O_3. The two major emissions sources are transportation and stationary fuel combustion sources, such as electric utilities and industrial boilers.

PM is the term for particles found in the air, including dust, dirt, soot, smoke, and liquid droplets. Particles less than 10 micrometers in diameter (PM_{10}) pose a health concern because they can be inhaled into and accumulate in the respiratory system. Particles less than 2.5 micrometers in diameter ($PM_{2.5}$) are referred to as "fine" particles and are believed to pose the largest health risks. Hot-spot analyses are not required for projects in $PM_{2.5}$ or PM_{10} attainment area or if they are exempt from regional transportation conformity according to 40 CFR 93.126 or 93.128.

CO is a colorless, odorless and poisonous gas produced by incomplete burning of carbon in fuels. Exposure to elevated CO levels can cause impairment of visual perception, manual dexterity, learning ability and performance of complex tasks (USEPA, undated).

4.4.1 National Ambient Air Quality Standards

The Clean Air Act, which was last amended in 1990, requires EPA to set NAAQS (40 CFR 50) for pollutants considered harmful to public health and the environment. **Table 15** lists the NAAQS primary and secondary standards. Primary standards set limits to protect public health, including the health of “sensitive” populations such as asthmatics, children, and the elderly. Secondary standards set limits to protect public welfare, including protection against decreased visibility, damage to animals, crops, vegetation, and buildings.

Table 15. National Ambient Air Quality Standards

Pollutant [final rule cite]		Primary/ Secondary	Averaging Time	Level	Form
Carbon Monoxide (76 FR 54294, Aug 31, 2011)		Primary	8-hour	9 ppm	Not to be exceeded more than once per year
			1-hour	35 ppm	
Lead (73 FR 66964, Nov 12, 2008)		Primary and Secondary	Rolling 3 month average	0.15 µg/m^3 (1)	Not to be exceeded
Nitrogen Dioxide (75 FR 6474, Feb 9, 2010) (61 FR 52852, Oct 8, 1996)		Primary	1-hour	100 µg/m^3	98th percentile of 1-hr daily maximum concentrations, averaged over 3 years
		Primary and Secondary	Annual	53 ppb (2)	Annual mean
Ozone (80 FR 65292, Oct 26, 2015)		Primary and Secondary	8-hour	0.070-ppm (3)	Annual 4th-highest daily maximum 8-hr concentration, averaged over 3 years
Particle Pollution (78 FR 3086, Jan 15, 2013)	$PM_{2.5}$	Primary	Annual	12 µg/m^3	Annual mean, averaged over 3 years
		Secondary	Annual	15 µg/m^3	Annual mean, averaged over 3 years
		Primary and Secondary	24-hour	35 µg/m^3	98th percentile, averaged over 3 years
	PM_{10}	Primary and Secondary	24-hour	150 µg/m^3	Not to be exceeded more than once per year on average over 3 years
Sulfur Dioxide (75 FR 35520, Jun 22, 2010; 38 FR 25678, Sept 14, 1973)		Primary	1-hour	75 ppb (4)	99th percentile of 1-hour daily maximum concentrations, averaged over 3 years
		Secondary	3-hour	0.5 ppm	Not to be exceeded more than once per year

Source: USEPA 2016

Notes:

1. In areas designated nonattainment for the Pb standards prior to the promulgation of the current (2008) standards, and for which implementation plans to attain or maintain the current (2008) standards have not been submitted and approved, the previous standards (1.5 µg/m3 as a calendar quarter average) also remain in effect.
2. The level of the annual NO2 standard is 0.053 ppm. It is shown here in terms of ppb for the purposes of clearer comparison to the 1-hour standard level.
3. Final rule signed October 1, 2015, and effective December 28, 2015. The previous (2008) O_3 standards additionally remain in effect in some areas. Revocation of the previous (2008) O_3 standards and transitioning to the current (2015) standards will be addressed in the implementation rule for the current standards.
4. The previous SO2 standards (0.14 ppm 24-hour and 0.03 ppm annual) will additionally remain in effect in certain areas: (1) any area for which it is not yet 1 year since the effective date of designation under the current (2010) standards, and (2)any area for which implementation plans providing for attainment of the current (2010) standard have not been submitted and approved and which is designated nonattainment under the previous SO2 standards or is not meeting the requirements of a SIP call under the previous SO2 standards (40 CFR 50.4(3)), A SIP call is an EPA action requiring a state to resubmit all or part of its State Implementation Plan to demonstrate attainment of the require NAAQS.

4.4.2 Climate Change and Greenhouse Gas Emissions

The science of climate change is evolving and briefly summarized here to illustrate the sources of scientific information that are presently available for consideration. CEQ's first Annual Report in 1970 discussed climate change, concluding that "[m]an may be changing his weather" (CEQ 1970). At that time, the mean level of atmospheric carbon dioxide had been elevated to 325 parts per million (ppm). Since 1970, the concentration of atmospheric carbon dioxide has increased at a rate of about 1.6 ppm per year (1970–2012) to approximately 404 ppm in April 2016 (current globally averaged value) (NOAA 2016b).

It is now well established that rising global atmospheric greenhouse gas (GHG) emission concentrations are significantly affecting the Earth's climate. These conclusions are built upon a scientific record that has been created with substantial contributions from the United States Global Change Research Program (USGCRP), formerly the Climate Change Science Program, which informs our response to climate and global change through coordinated federal programs of research, education, communication, and decision support.[3] Studies have projected the effects of increasing GHGs on water availability, ocean acidity, sea-level rise, ecosystems, energy production, agriculture and food security, and human health (USGCRP 2014; IPCC 2014).

Based primarily on the scientific assessments of the USGCRP and the National Research Council, the USEPA issued findings in the federal register that the changes in our climate caused by increased concentrations of atmospheric GHG emissions endanger public health and welfare. These USEPA findings include: *Endangerment and Cause or Contribute Findings for Greenhouse Gases Under Section 202(a) of the Clean Air Act; Final Rule* (74 FR 66496-98, December 15, 2009), and *Standards of Performance for Greenhouse Gas Emissions from New Stationary Sources: Electric Utility Generating Units* (79 FR 1429–1519, January 8, 2014). Adverse health effects and other impacts caused by elevated atmospheric concentrations of GHGs occur via climate change.[4] Broadly stated, the effects of climate change observed to date and projected to occur in the future include more frequent and intense heat waves, more severe wildfires, degraded air quality, more heavy downpours and flooding, increased drought, greater sea-level rise, more intense storms, harm to water resources, harm to agriculture, and harm to wildlife and ecosystems (USGCRP n.d.).

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3 USGCRP coordinates and integrates the activities of 13 federal agencies that conduct research on changes in the global environment and their implications for society. USGCRP began as a Presidential initiative in 1989 and was codified in the Global Change Research Act of 1990 (Public Law 101–606). USGCRP-participating agencies are the Departments of Agriculture, Commerce, Defense, Energy, Interior, Health and Human Services, State, and Transportation; the U.S. Agency for International Development, the Environmental Protection Agency, the National Aeronautics and Space Administration, the National Science Foundation, and the Smithsonian Institution. For additional information on the Global Change Research Program, go to www.globalchange.gov.

4 For example, "[t]he evidence concerning how human-induced climate change may alter extreme weather events also clearly supports a finding of endangerment, given the serious adverse impacts that can result from such events and the increase in risk, even if small, of the occurrence and intensity of events such as hurricanes and floods. Additionally, public health is expected to be adversely affected by an increase in the severity of coastal storm events due to rising sea levels." (74 FR 66496–98)

4.4.3 Operational Emissions and Greenhouse Gas Analysis

Although not required, an air quality emission inventory was conducted for the Build Alternative operations using emission factors from USEPA's *Emission Factors for Locomotives* (USEPA 2009) to demonstrate that operations are well below de minimis levels and would not adversely affect air quality. Specific locomotive information is not available, so the 2006 emission rates in grams per gallon were used. These factors were then converted to grams per ton-mile by using a conservative conversion factor provided in the aforementioned memo. In order to determine the emission quantity for one operation, these rates were then multiplied by the length of Build Alternative. The Build Alternative operating condition in the year 2035 is estimated at 573 trains per week (**Section 1.4.1.1, Table 2**), which equates to approximately 82 trains per day. **Table 16** shows the 2035 emission quantities. The total emissions per year generated by the Build Alternative would be well below the de minimis levels. Hot-spot analyses are not required because Jefferson and Orange counties are in attainment or unclassifiable for CO, $PM_{2.5}$ or PM_{10} pollutants.

Table 16. Annual Tons per Year of Pollutant

Pollutant	Emission Factors (g/ton-mile)	Annual Tons Per Year	De Minimis
PM_{10}	0.016	0.0017	100
HC	0.025	0.0026	--
NO_X	0.47	0.0493	100
CO	0.067	0.0070	100

Source: Study Team 2016

The emissions calculations for the GHG analysis focuses on carbon dioxide (CO_2). Emission factors for CO_2 were determined based on the methodology found in USEPA's *Emission Factors for Locomotives* (USEPA 2009). The gram per gallon emissions of CO_2 is largely independent of engine parameters and are primarily dependent on fuel properties. CO_2 emission rates are calculated based on the properties of the specific fuel being used by the locomotives. These emission rates can also be assumed to be the same as for other diesel engines operating on similar fuel.

In order to determine tons per year of CO_2, the emission factors generated (in grams per gallon) were converted into grams per mile and subsequently multiplied by the length of the Build Alternative alignment and the annual operations. In order to determine the emissions associated with the hours of idling anticipated, the emission factors were converted into grams per horsepower hour. This emission factor was multiplied by the hours of idling for the existing, No Build Alternative, and the Build Alternative. The results are shown in **Table 17**.

Table 17. Annual Tons per Year of CO_2

Scenario	Running Emissions	Idle Emissions
Existing	1,916.9	1.8
No Build Alternative	3,887.2	13.7
Build Alternative	3,827.1	4.6
Benefit (No Build – Build)	60.1	9.1

Source: Study Team 2016

Under the No Build Alternative, idle emissions would increase to 13.7 annual tons per year by the year 2035. The Build Alternative would benefit air quality by reducing idle emissions over the No Build Alternative by 9.1 annual tons per year. Impacts during the construction period are addressed in **Section 4.12**.

4.4.4 Mitigation for Air Quality Impacts

Other than short-term impacts during construction, air quality impacts are not anticipated. Construction phase mitigation is discussed in **Section 4.12.1.** No other mitigation for air quality is warranted.

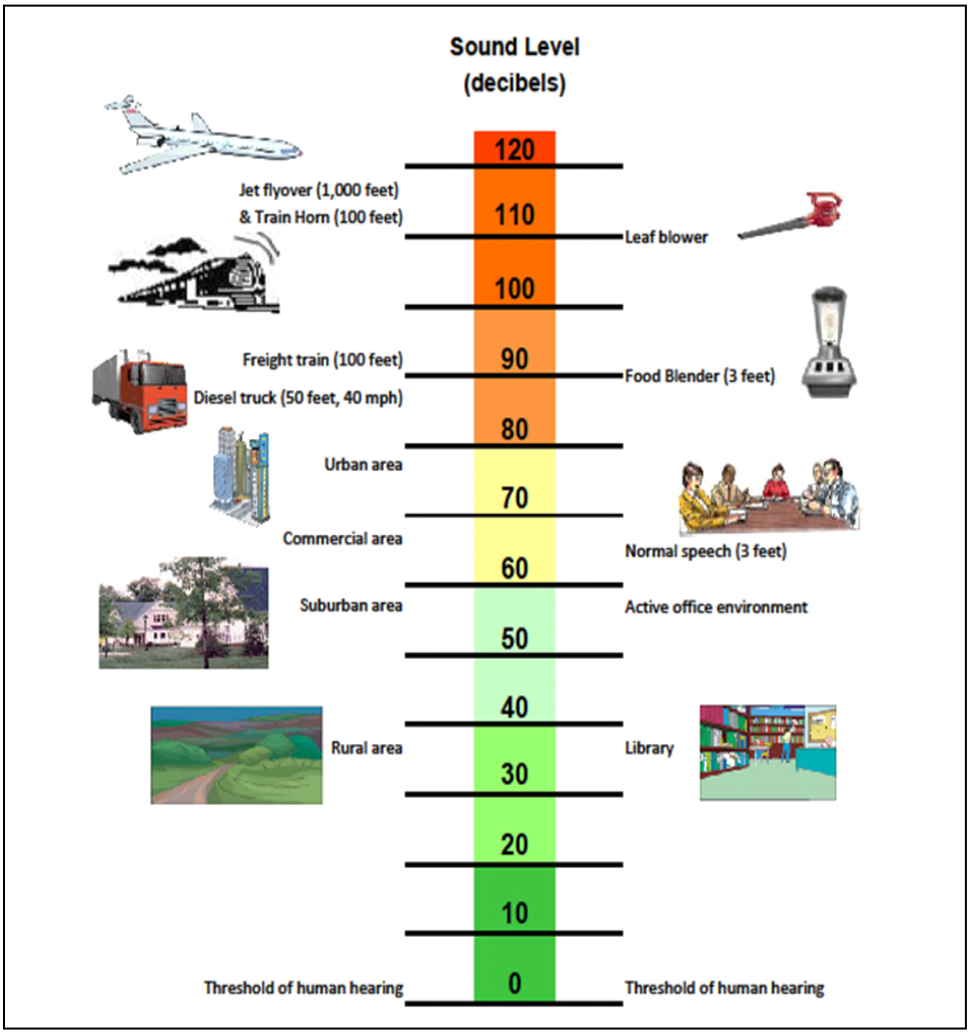
4.5 Noise and Vibration

The following summarizes the *Noise and Vibration Analyses Technical Report* (TxDOT 2016e).

Noise is usually defined as sound that is undesirable because it interferes with speech communication and hearing, or is otherwise annoying. Under certain conditions, noise may cause hearing loss, interfere with human activities, and in various ways may affect people's health and well-being.

The decibel (dB) is the accepted standard unit for measuring the amplitude of sound because it accounts for the large variations in sound pressure amplitude. When describing sound and its effect on a human population, A-weighted (dBA) sound pressure levels are typically used to account for the response of the human ear. The term "A-weighted" refers to a filtering of the noise signal in a manner corresponding to the way the human ear perceives sound. The A-weighted noise level has been found to correlate well with people's judgments of the noisiness of different sounds and has been used for many years as a measure of community noise. **Figure 5** illustrates typical A-weighted sound pressure levels for various noise sources.

Figure 5. Typical A-Weighted Sound Levels



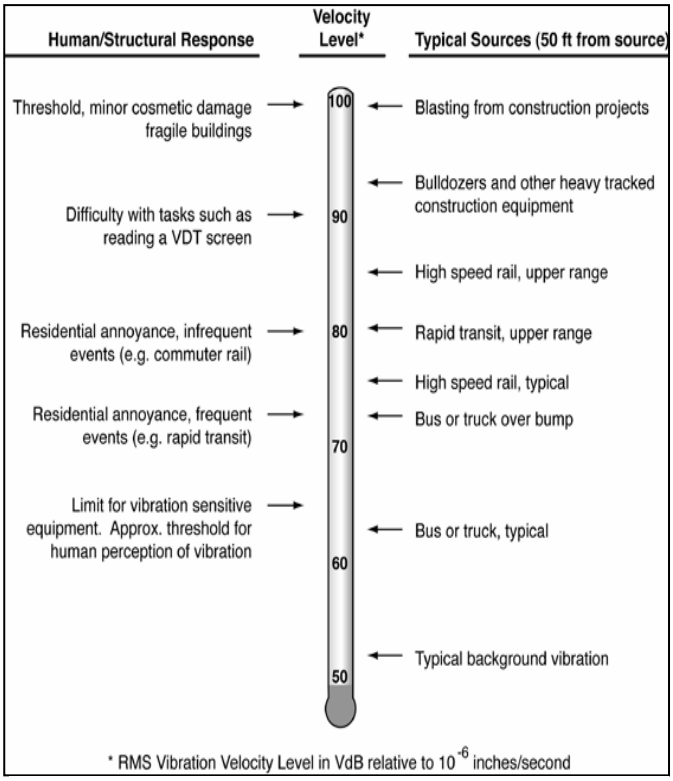
Source: Study Team 2016

Vibration is an oscillatory motion, which can be described in terms of displacement, velocity, or acceleration. Displacement, in the case of a vibrating floor, is simply the distance that a point on the floor moves away from its static position. The velocity represents the instantaneous speed of the floor movement, and acceleration is the rate of change of the speed. The response of humans, buildings, and equipment to vibration is normally described using velocity or acceleration. In this report, velocity will be used in describing ground-borne vibration.

Vibration amplitudes are usually expressed as either peak particle velocity (PPV) or the root mean square (RMS) velocity. PPV is used to evaluate the potential for building damage. RMS is used to evaluate human response, since it takes some time for the human body to respond to vibration signals. The Federal Transit Administration (FTA) uses the abbreviation "VdB" for vibration decibels to reduce the potential for confusion with sound decibel (USDOT 2006).

Figure 6 illustrates common vibration sources and the human and structural responses to ground-borne vibration. As shown in Figure 6, the threshold for damage to buildings is approximately 95 to 100 dB and the threshold of perception for human response is approximately 65 dB. However, human response to vibration is not usually significant unless the level exceeds 70 dB.

Figure 6. Typical Vibration Levels



Source: USDOT 2006

4.5.1 Impact Criteria

The speeds of the trains would be below 90 mph. Therefore, they are not considered high-speed trains and criteria and methodology described in FTA's *Transit Noise and Vibration Impact Assessment* (herein after referred to as FTA's manual) (USDOT 2006) are applicable for this evaluation. The noise impact criteria are based on comparison of the existing outdoor noise levels and the future outdoor noise levels. They incorporate both absolute criteria, which consider activity interference caused by the transportation project alone, and relative criteria, which consider annoyance due to the change in the noise environment caused by the transportation project. The FTA noise impact criteria are applicable to three categories of land use and are summarized in Table 18.

Table 18. Land Use Categories and Metrics for Transit Noise Impact Criteria

Land Use Category	Noise Metric (dBA)	Description of Land Use Category
1	Outdoor $L_{eq(h)}$[1] (Equivalent Sound Level)	Tracts of land where quiet is an essential element in their intended purpose. This category includes lands set aside for serenity and quiet, and such land uses as outdoor amphitheaters and concert pavilions, as well as National Historic Landmarks with significant outdoor use. Also included are recording studios and concert halls.
2	Outdoor L_{dn} (Day-night equivalent level)	Residences and buildings where people normally sleep. This category includes homes, hospitals, and hotels where a nighttime sensitivity to noise is assumed to be of utmost importance.
3	Outdoor $L_{eq(h)}$[1]	Institutional land uses with primarily daytime and evening use. This category includes schools, libraries, and churches where it is important to avoid interference with such activities as speech, meditation, and concentration on reading material. Places for meditation or study associated with cemeteries, monuments and museums can also be considered to be in this category. Certain historical sites, parks, campgrounds and recreational facilities are also included.

Source: USDOT 2006

Note:

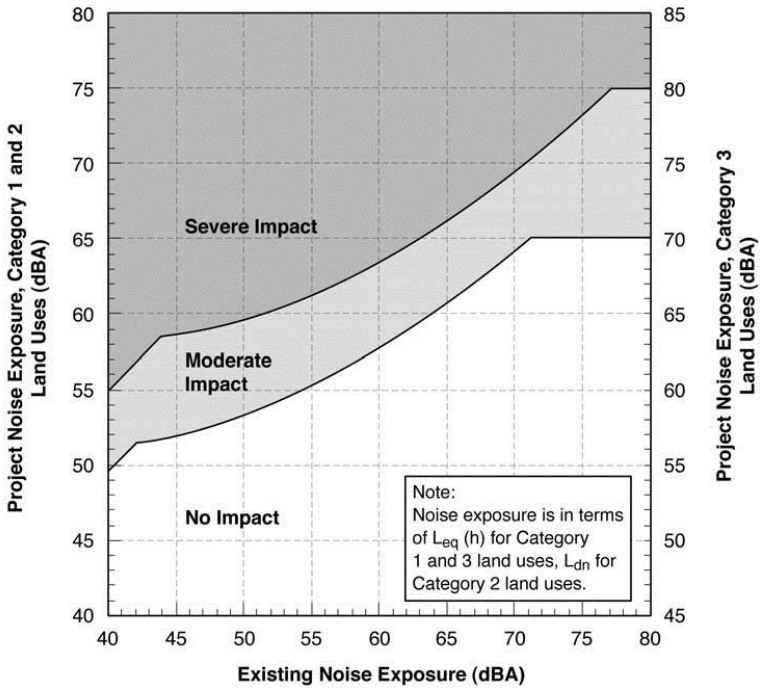
1. L_{eq} for the noisiest hour of rail-related activity during hours of noise sensitivity.

L_{dn} is used to characterize noise exposure for areas where people normally sleep, such as residential areas and hotels (Category 2). The maximum 1-hour L_{eq} during the period that the facility is in use is used for other noise sensitive land uses such as National Historic Landmarks with significant outdoor use (Category 1) or schools (Category 3). There are two levels of impact included in the FTA criteria, as shown in **Figure 7**. The interpretation of these two levels of impact is summarized below:

- **Severe Impact**: Noise mitigation is normally specified for severe impact areas unless there is no practical method of mitigating the noise.
- **Moderate Impact**: In this range, other project-specific factors must be considered to determine the magnitude of the impact and the need for mitigation. These other factors can include the predicted increase over existing noise levels, the types and number of noise-sensitive land uses affected, existing outdoor-indoor sound insulation, and the cost-effectiveness of mitigating noise to more acceptable levels.

As can be seen in **Figure 7**, an impact determination is based on the exceedance of the moderate or severe impact criteria that accounts for both existing and project noise exposure.

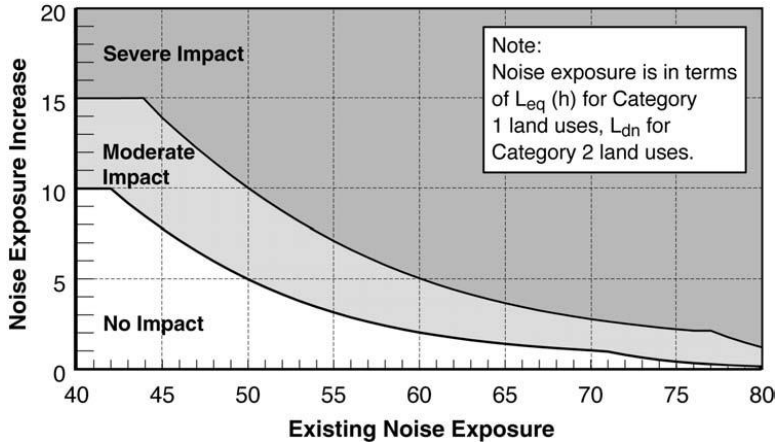
Figure 7. Noise Impact Criteria for Transit Projects



Source: USDOT 2006

Figure 8 shows the noise impact criteria for Category 1 and 2 land uses in terms of cumulative noise exposure increase.

Figure 8. Increase in Cumulative Noise Levels Allowed by Criteria



Source: USDOT 2006

As mentioned previously, FTA's manual (USDOT 2006) is applicable for FRA projects with conventional train speeds less than 90 mph. The evaluation of vibration impacts can be divided into two categories: (1) human annoyance, and (2) building damage.

4.5.1.1 Human Annoyance Criteria

Table 19 presents the criteria for various land use categories, as well as the frequency of events. The criteria are related to ground-borne vibration/ground-borne noise causing human annoyance or interfering with the use of vibration sensitive equipment. The criteria for acceptable ground-borne vibration are expressed in terms of RMS velocity levels in VdB and are based on the maximum levels for a single event (L_{max}).

Table 19. Ground-Borne Vibration (GVB) and Ground-Borne Noise (GBN) Impact Criteria for General Assessment

Land Use Category	Ground-Borne Vibration Impact Levels (dB re 1 micro-inch/sec)					
	GBV Impact Levels (VdB re 1 µin/s)			GBN Impact Levels (dB re 20 µPa)		
	Frequent[1] Events	Occasional[2] Events	Infrequent[3] Events	Frequent[1] Events	Occasional[2] Events	Infrequent[3] Events
Category 1: Buildings where vibration would interfere with interior operations.	65 VdB[4]	65 VdB[4]	65 VdB[4]	N/A[5]	N/A[5]	N/A[5]
Category 2: Residences and buildings where people normally sleep.	72 VdB	75 VdB	80 VdB	35 VdB	38 VdB	43 VdB
Category 3: Institutional land uses with primarily daytime use.	75 VdB	78 VdB	83 VdB	40 VdB	43 VdB	48 VdB

Source: USDOT 2006

Notes:

1. *Frequent* Events is defined as more than 70 vibration events of the same kind per day.
2. *Occasional* Events is defined as between 30 and 70 vibration events of the same kind per day.
3. *Infrequent* Events is defined as fewer than 30 vibration events of the same kind per day.
4. This criterion limit is based on levels that are acceptable for most moderately sensitive equipment such as optical microscopes. Vibration-sensitive manufacturing or research will require detailed evaluation to define the acceptable vibration levels. Ensuring lower vibration levels in a building often requires special design of the HVAC systems and stiffened floors.
5. Vibration-sensitive equipment is not sensitive to ground-borne noise.

All of the sensitive receptors within the study area fall under Land Use Category 2 or 3.

4.5.1.2 Building Damage Criteria

Normally, vibration resulting from a train passby would not cause building damage. It is extremely rare for vibration from train operations to cause any sort of building damage, even minor cosmetic damage. However, there is sometimes concern about damage to fragile historic buildings located near the right-of-way.

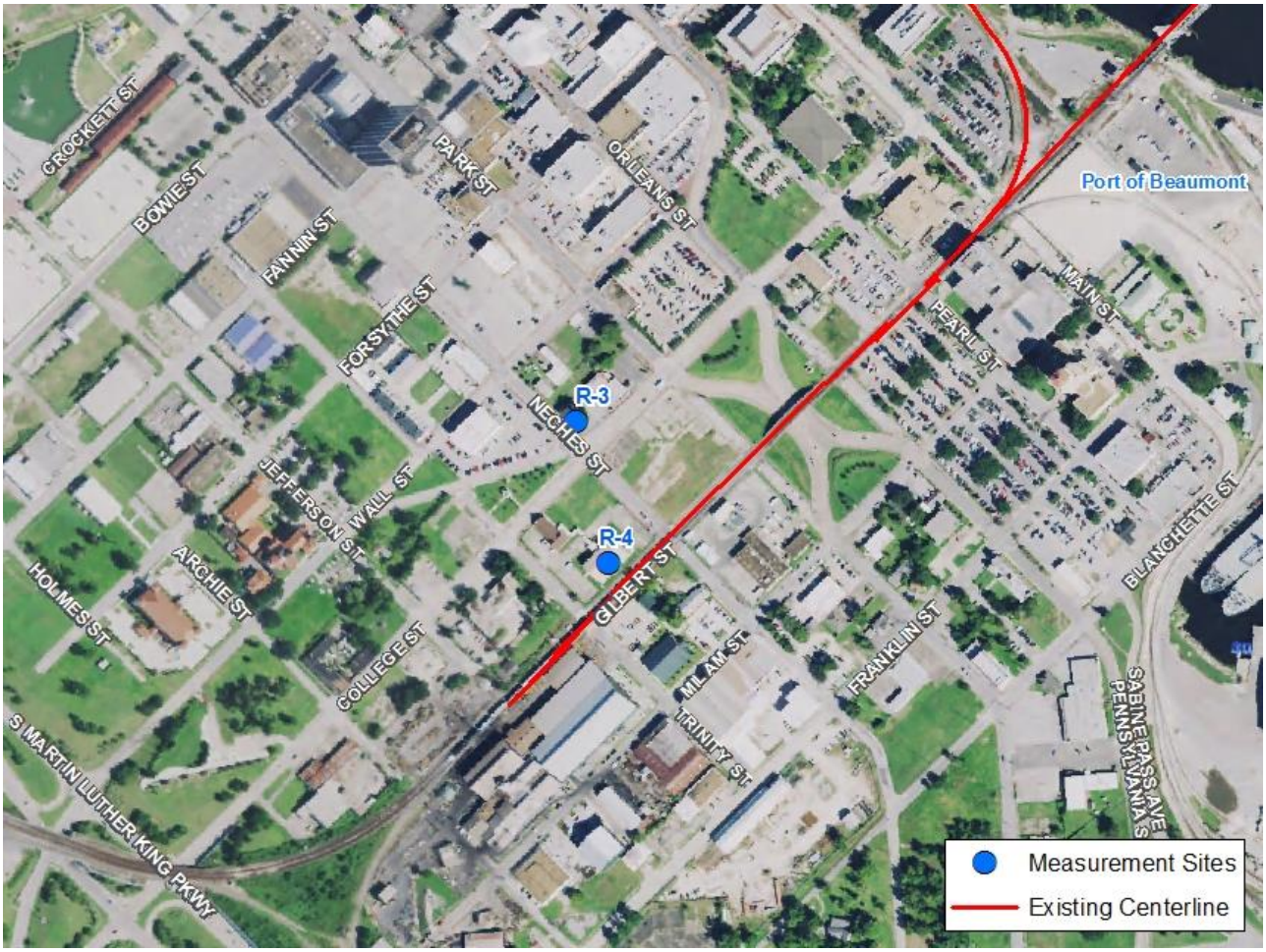
Vibrations generated by surface transportation are mainly in the form of surface or Raleigh waves. Studies have shown that the vertical component of transportation-generated vibrations is the strongest, and that PPV correlates best with building damage. Even in these cases, damage is unlikely except when the track would be very close to the structure.

4.5.2 Existing Conditions and Measurements

Sensitive receptors within the study area consist of two places of worship (existing and planned sites associated with the Ebenezer Baptist Church), three parks (Riverfront, Waldman, and Martin Luther King Jr.), a multi-family/halfway house, and the Beaumont Public Library. While historically significant sites are treated as noise-sensitive depending on the land use activities, there are no NRHP-eligible historic sites within the APE that are considered noise sensitive. See **Section 4.8.2** for further information on historic sites.

Noise and vibration field measurements were conducted during the week of November 9, 2015, at the locations shown in **Figure 9**.

Figure 9. Noise and Vibration Measurement Locations



Source: Study Team 2016

The purpose of measuring existing noise levels is to determine the appropriate impact criteria based on the FTA noise impact guidelines, as shown previously in **Figure 7**. The noise measurement sites with results are listed in **Table 20** and the locations of the measurement sites are shown on **Figure 9**. The measured values were used to estimate existing noise levels at all other sensitive receptors along the alignment. The existing noise environment is dominated by the existing rail noise, including horn blowing, with existing noise levels exceeding 70 dBA.

Table 20. Long Term Noise Measurement Sites (dBA)

Site	Location/Site Description	Date	Start Time	Duration	Peak L_{eq}	L_{dn}
R3	Halfway House 875 Neches Street	11/9/15	3:00 PM	49 hours	70	75
R4	Ebenezer Baptist Church 675 College Street	11/9/15	1:20 PM	51 hours	84	90

Source: Study Team 2015

A total of two vibration measurements were taken. The locations of the measurement sites with the background vibration measurements are listed in **Table 21** and shown previously in **Figure 9**.

Please note that it is preferable that ambient vibration be characterized in terms of the root mean square (RMS) velocity level, in VdB, not the peak particle velocity (PPV). PPV is commonly used to monitor construction vibration. RMS velocity is considered more appropriate than PPV for describing human response to building vibration.

Table 21. Vibration Measurements

Site	Location/Site Description	Date	Land Use	Max RMS Velocity Level (VdB)	Background
R3	Halfway House 875 Neches Street	11/9/15	RES	84	61
R4	Ebenezer Baptist Church 675 College Street	11/9/15	COM	103	75

Source: Study Team 2015

4.5.3 No Build Alternative

Under the No Build Alternative, the existing rail line and Neches River Bridge would continue to be used for rail service. Since it is already part of the existing noise and vibration environment, the No Build Alternative does not create any new impacts. Under the No Build Alternative, the noise environment would continue to be dominated by rail noise, including horn blowing. Existing noise levels exceeding 70 dBA would continue. According to FTA's manual, "the criteria specify a comparison of future project noise with existing noise and *not* with projections of future 'no build' noise exposure (i.e. without the project)" (USDOT 2006).

4.5.4 Build Alternative

Train noise impacts predicted as part of the Build Alternative were evaluated using the detailed noise assessment methodology in Chapter 6 of FTA's manual (USDOT 2006).

Projected noise was calculated using a combination of formulas in the FTA manual (USDOT 2006) and the *CREATE Railroad Noise Model User Guide* (Harris Miller Miller & Hanson 2006). Hourly train operations were available for the existing condition. The day/night split of operations was used to determine the hourly train volume for the Build Alternative. **Table 22** identifies the assumptions used for the projected train operations.

Table 22. Projected Train Operations

Total Number Trains (Daily)	82
Trains Per Hour (Day)	3.4
Trains Per Hour (Night)	3.5
# Locomotives	2
# Rail Cars/Length	60 cars /4,380 feet

Source: Study Team 2016

In addition to calculating operational noise levels, horn blowing was incorporated into the projected noise levels for the one remaining existing at-grade rail crossing that is present under the Build Alternative at Neches Road. As a separate action, the City of Beaumont has committed to closing Pearl Street in the near term (with or without this project) to eliminate the use of train horns at this location. No construction is proposed at Neches Street -- the one remaining roadway-railroad grade crossing. The analysis also assumed that the track would consist of continuously welded rail and would be in generally good condition.

Projected noise levels under the Build Alternative for each site are shown in **Table 23**. A map showing the location of each site is provided in **Appendix D, Exhibit 11a and 11b**.

Table 23. Projected Noise Levels (dBA)

Receptor	Land Use (Category)[1]	Background Level (L_{eq} or L_{dn})	Distance to Track (Feet)	Moderate Impact Level	Severe Impact Level	Project Noise	Build Alternative Impact
R1	Beaumont Public Library (3)	70	468	70	75	66	None
R2	Planned Church Site (3)	84	131	71	81	**74**	**Moderate**
R3	Multi-Family (2)	75	459	66	74	**77**	**Severe**
R4	Church (3)	84	81	71	81	**75**	**Moderate**
R5	Park (3)	84	63	71	81	**72**	**Moderate**
R6	Park (3)	70	298	70	75	68	None
R7	Park (3)	70	435	70	75	67	None

Source: Study Team 2016

Note:

1. Category 2 receptors use L_{dn} and Category 3 receptors use L_{eq}. Both are in dBA.

The values measured for freight train vibration were compared to the generalized ground surface vibration curves presented in the FTA manual (USDOT 2006) and shown in **Table 24**. The vibration levels listed in the FTA manual are higher than the measured data. After reviewing the data, it was determined that the FTA generalized ground surface vibration curve for a typical freight train should be used for operation impact assessment to provide a conservative estimate of impacts. Since operations in the year 2035 exceed 70 events per day (total daily operations are expected to be 82 freight passbys), the criteria for frequent events is used (as previously presented in **Table 19**).

Table 24. Comparison of Ground Vibration Impact Curves

Ground Vibration Estimation Techniques	Distance to Human Annoyance Vibration Impacts (in feet)	
	Residential	Commercial
Measured Freight Train Passby	45	30
FTA Generalized Curve for Freight Trains	195	140

Source: Study Team 2016

Based on the FTA generalized curve, annoyance vibration impacts (i.e., where vibration levels would be 72 VdB or higher) would occur at residences located 195 feet or closer to the track. For commercial and institutional uses, annoyance vibration impacts (i.e., where vibration levels would be 75 VdB or higher) would occur at structures located 140 feet or closer to the track. The annoyance

impact criteria for residences and commercial/institutional property established by the FTA apply to vibrations inside building structures.

There are no residences or buildings where people normally sleep within 195 feet of either the No Build Alternative or Build Alternative. Two institutional land use sites with primarily daytime use (Sites R2 and R4) are within 140 feet of the No Build Alternative and Build Alternative.

In extreme cases, vibration can cause damage to buildings; however, it is not a factor for normal transportation projects, with the occasional exception of blasting and pile driving during construction. Damage to structure starts to occur around 95 to 100 VdB, as shown in **Figure 6**. In addition, based on measurements (**Table 25**), the background vibration levels (75 VdB at R4 – 30 feet from the track) do not come close to the criteria for building damage as shown in **Table 25**, even for the most sensitive buildings.

Table 25. Construction Vibration Damage Criteria

Building Category	PPV (in. sec)	Approximate Lv[1]
I. Reinforced-concrete steel or timber (no plaster)	0.5	102
II. Engineered concrete and masonry (no plaster)	0.3	98
III. Non-engineered timber and masonry buildings	0.2	94
IV. Buildings extremely susceptible to vibration damage	0.12	90

Source: Study Team 2016

Note:

1. RMS velocity in decibels (VdB) are 1 micro-inch/second.

Impacts during construction are discussed in **Section 4.12.2**.

4.5.5 Mitigation for Noise and Vibration Impacts

Noise impacts are anticipated at Sites R2, R3, R4, and R5. Noise mitigation is recommended for Sites R2, R3, and R4. Noise mitigation is not proposed for Site R5 because mitigation measures are not practicable or feasible. Vibration impacts are anticipated at Sites R2 and R4. Mitigation of vibration impacts is recommended for both of these sites. Construction phase mitigation is discussed in **Section 4.12.2**.

Recommended mitigation for noise impacts to Site R2, R3, and R4 would consist of providing sound insulation for the buildings. Effective treatments include caulking and sealing gaps in the building façade, and installation of new doors and windows that are specially designed to meet acoustical transmission-loss requirements. Reasonableness of these noise mitigation measures would be addressed during final design.

Mitigation for noise impacts to Site R5 is not practicable or feasible. It is not practicable to recommend treatments at the source (i.e., the trains). In addition, since this site is the Riverfront Park, sound insulation is not possible. A barrier is not feasible because the optimal location for the barrier would be along the tracks and a barrier in this location would create utility conflicts and safety concerns. In addition, to fully protect the park from the rail noise, part of the barrier would need to be built along an existing culvert (adjacent to the City Hall) and on the new approach structure for the Neches River Bridge. Therefore, no mitigation is proposed for Site R5.

Recommended mitigation for vibration impacts at Sites R2 and R4 would be regular rail grinding through maintenance. Wheel and rail surfaces that are degraded over time due to wear generate vibration levels that are significantly higher than those produced by a well-maintained system. Up to 20 VdB of vibration reduction can be gained when comparing new or well-maintained rail systems to older systems showing wear.

4.6 Water Resources

The following summarizes the *Water Resources Technical Report* (TxDOT 2015c) and the *Wetlands Technical Report* (TxDOT 2015d). Relevant exhibits in **Appendix D** include U.S. Geological Survey (USGS) Map (**Exhibit 12**), Soils (**Exhibits 13a and 13b**), Wetlands (**Exhibits 14a and 14b**), Floodplains (**Exhibit 15**), and Texas Coastal Management Program Boundary Map (**Exhibit 16**). Site photographs are located in **Appendix E**. Refer to **Section 4.12** for construction impacts and **Section 4.13** for indirect and cumulative impacts.

4.6.1 Wetlands

Wetland determinations were made using observable vegetation, hydrology, and soils in accordance with the routine approach described in the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Atlantic and Gulf Coastal Plain Region (Version 2.0) dated November 2010, and the USACE Wetlands Delineation Manual, Technical Report Y-87-1, January 1987, Final Report (1987 Manual). Details of the observed wetlands and upland habitats were recorded on regional supplement data forms.

Due to limited access to the existing ROW, existing data were used to focus field efforts in areas where jurisdictional wetlands were probable. Existing data included review of aerial photography, U.S. Geological Survey (USGS) topography maps (**Appendix D, Exhibit 12**), soil surveys (**Appendix D Exhibits 13a and 13b**), National Wetland Inventory (NWI) maps (**Appendix D, Exhibits 14a and 14b**), and vegetation types (**Appendix D, Exhibit 17** and **Section 4.7.1**). Site conditions further limited access to some of the wetland areas. Field staff made reasonable efforts to access areas as close as possible to wetlands delineated in the NWI, but in some instances were limited by high water and/or dense vegetation. In areas determined to be contiguous wetland habitat, field staff documented observations of vegetation, soils, and hydrology to determine the presence of potentially jurisdictional wetlands within the study area.

Wetland types observed during the field investigation include freshwater ponds, freshwater emergent wetlands, freshwater scrub/shrub wetlands, and freshwater forested wetlands (**Appendix D, Exhibits 14a and 14b**). Field observations are included in each wetland type description below and acreages follow in **Table 26.**

- **Freshwater Pond:** This wetland type is semipermanently flooded and consists mostly of open water. The wetland type is usually bordered by emergent vegetation along the shoreline. The bottom is unconsolidated by the lack of large stable surfaces for plant and animal attachment. During the field investigation, surface water was observed in all freshwater ponds identified (**Appendix E, Photo 10**).

- **Freshwater Emergent Wetland:** This wetland type occurs in areas with relatively stable climatic conditions and maintains the same appearance over time. Emergent wetlands include marshes, wet meadows, fens, prairie potholes, and sloughs. Palustrine Persistent Emergent wetlands contain a vast array of grass-like plants such as cattail (*Typha* spp.), bulrush (*Scirpus* spp.), saw grass (*Cladium jamaicense*), sedges (*Carex* spp.); and true grasses such as manna grasses (*Glyceria* spp.), slough grass (*Beckmannia syzigachne*), and common river grass (*Scolochloa festucacea*). There is also a variety of broad-leaved persistent emergents such as purple loosestrife (*Lythrum salicaria*), Mexican dock (*Rumex mexicanus*), swamp loosestrife (*Decodon verticillatus*), and some species of smartweeds (*Polygonum*). During the field investigation cattail, sedges, duckweed (*Spirodela polyrhiza*), and smartweed were observed within the mapped type. In addition, surface water was observed in most areas consisting of this wetland type (**Appendix E, Photo 11**).

- **Freshwater Scrub / Shrub Wetland**: This wetland type contains woody plants less than 20 feet tall with at least 30 percent cover. Shrubs includes tree shrubs, young specimens of tree species, and woody plants that are stunted due to adverse environmental conditions. In the Palustrine System, typical vegetation includes alder (*Alnus* spp.), black willow, buttonbush (*Cephalanthus occidentalis*), red osier dogwood (*Cornus stolonifera*), honeycup (*Zenobia pulverulenta*), Douglas' meadowsweet (*Spiraea douglasii*), bog birch (*Betula pumila*), and young red maple (*Acer rubrum*). During the field investigation black willow, buttonbush, dogwood, Chinese tallow, and red maple were observed within this mapped typed. In addition, surface water was observed in most areas consisting of this wetland type. A soil pit was collected containing a depleted matrix (**Appendix E, Photo 12**).

- **Freshwater Forested Wetland:** This wetland type is common in areas along rivers. This type consist of an overstory of trees, an understory of young trees or shrubs, and an herbaceous layer. In the broad-leaved subclass, dominant species include red maple, American elm (*Ulmus americana*), ashes (*Fraxinus pennsylvanica* and F. *nigra*), black gum, tupelo gum (*Nyssa aquatica*), swamp white oak (*Q. bicolor*), overcup oak (*Q. lyrata*), and swamp chestnut oak (*Q. michauxii*). During the field investigation red maple, American elm, coastal live oak, loblolly pine, and Chinese tallow were observed within this mapped typed. In addition, surface water was observed in most areas consisting of this wetland type. A soil pit was collected containing a depleted matrix (**Appendix E, Photo 13**).

No wetland impacts would occur under the No Build Alternative since no rail improvements would be constructed.

Table 26 summarizes the potential impacts to wetlands under the Build Alternative. An estimated total of 14.48 acres of wetlands occur within the study area. Based on 30 percent design, an estimated total of 7.23 acres of wetland impacts would occur in the construction limits within the existing and proposed right-of-way. Up to another 5.06 acres of wetland impacts would occur within the construction laydown area. Total wetland impacts are conservatively estimated at 12.29 acres.

Table 26. Field Verified Wetlands in the Study Area

ID	Wetland Types	Existing Wetlands (acres)				Wetland Impacts[1] (acres)		
		Existing ROW	Proposed ROW	Laydown Area	Total Existing	ROW	Laydown Area	Total Impacts
1	Freshwater Forested Wetland	0.74	0.00	0.00	0.74	0.23	0.00	0.23
2	Freshwater Pond	0.90	0.00	0.00	0.90	0.64	0.00	0.64
3	Freshwater Forested Wetland	0.03	0.00	0.00	0.03	0.00	0.00	0.00
4	Freshwater Forested Wetland	0.04	0.00	0.00	0.04	0.00	0.00	0.00
5	Freshwater Forested Wetland	1.47	0.00	0.00	1.47	0.72	0.00	0.72
6	Freshwater Pond	1.18	0.49	0.00	1.67	1.63	0.00	1.63
7	Freshwater Emergent Wetland	2.30	0.23	0.00	2.53	2.53	0.00	2.53
8	Freshwater Scrub / Shrub Wetland	1.48	0.00	0.00	1.48	1.47	0.00	1.47
9	Freshwater Emergent Wetland	0.56	0.00	0.00	0.56	0.01	0.00	0.01
10	Freshwater Forested Wetland	0.00	0.00	2.28	2.28	0.00	2.28	2.28
11	Freshwater Forested Wetland	0.00	0.00	1.97	1.97	0.00	1.97	1.97
12	Freshwater Forested Wetland	0.00	0.00	0.22	0.22	0.00	0.22	0.22
13	Freshwater Emergent Wetland	0.00	0.00	0.59	0.59	0.00	0.59	0.59
	Total	8.70	0.72	5.06	14.48	7.23	5.06	12.29

Source: Study Team 2016

ROW = Right-of-Way

Note:

1. Estimated Based on 30 Percent Design.

4.6.2 Other Waters of the U.S.

Other Waters of the U.S. within the study area are confined to the Neches River. In the study area, the Neches River is designated as an Ecologically Significant Stream Segment from the confluence with Sabine Lake in Orange County upstream to Town Bluff Dam in Jasper/Tyler County. The Neches River through the study area is listed as Essential Fish Habitat for fish species that live in the Gulf of Mexico and is part of the Great Texas Coastal Birding Trail. Ecological systems and biological resources are further discussed in **Section 4.7** and water quality is discussed in **Section 4.6.4**.

The Neches River is a regulated navigable waterway (**Appendix D, Exhibit 1**). The 33 CFR 165.806 states, "The following is a regulated navigation area—The Sabine Neches Waterway which includes the following waters: Sabine Pass Channel, Port Arthur Canal, Sabine Neches Canal, Neches River, Sabine River and all navigable waterways tributary thereto." The USCG uses the Bridge Program Manual (COMDTINST M16590.5) and the Bridge Permit Application Guide (COMDTPUB P16591.3C) to determine the reasonable needs of navigation. The USCG indicates that a navigational evaluation should be conducted early in the project planning and updated during project development so that the most accurate picture of navigation is available. The existing Neches River rail bridge is a vertical lift-span bridge that allows river traffic to pass under the bridge. The bridge is in the rail-locked position until a navigation request is made to raise the lift bridge, generally to a requested vertical clearance. Information supplied by the USCG indicates approximately 400 lifts per year in 2011 (TXDOT 2013).

The No Build Alternative would not result in impacts to other waters of the U.S. other than as necessary for periodic routine maintenance of the existing bridge (e.g., scour maintenance). No changes to existing navigational conditions would occur.

In regards to navigational needs, the vertical and horizontal profiles of the proposed lift bridge under the Build Alternative have been designed for planning purposes to comply with the minimum navigational requirements listed in the NOAA navigation charts (NOAA 2016a). Design criteria were provided to the USCG on July 13, 2015.

It is anticipated that the Build Alternative would not substantially add to environmental effects to the Neches River. While the proposed bridge design is subject to change based on additional engineering, impacts to the river have been approximated using the 30 percent design for the Build Alternative. Approximately 5,990 square feet (0.14 acres) of permanent stream impacts are anticipated to place the bents required to support the bridge and the associated fender system. An additional 0.23 acres of temporary stream impacts would occur during construction, as discussed in **Section 4.12.3**.

4.6.3 Floodplains

EO 11988, Floodplain Management, ensures consideration of how development impacts floodplains. Specifically, it states that a project should "avoid to the extent possible the long- and short-term

adverse impacts associated with the occupancy and modification of floodplains and to avoid direct or indirect support of floodplain development wherever there is a practicable alternative." This EO is to be implemented alongside the National Flood Insurance Act of 1968 and the Flood Protection Act of 1973.

The Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRMs) were reviewed for the study area. This area encompasses FIRM panels 4803850155B and 4803850160B for Jefferson County (effective June 1, 1983); 4805100125B for Orange County (effective January 6, 1983); and 4854570005D and 4854570020C for the City of Beaumont (effective August 6, 2002). According to the FIRMs, the Neches River and the land adjacent to the river within the study area in Orange County are within the Special Flood Hazard Area with established base (100-year) flood elevations (see **Appendix D, Exhibit 15**).

No impacts to floodplains would occur under the No Build Alternative because no rail improvements would be constructed.

Construction of the Build Alternative would occur within regulated floodplains. It is anticipated that construction of the Build Alternative would not increase water surface elevations during a Base Flood Event.

The Intergovernmental Panel on Climate Change predicts climate change will cause a continued rise in global mean sea level. The Texas coast is impacted by climate change through increasing sea level rise and more intense storms. According to NOAA (2013), the Sabine Pass, Texas tide gauge is experiencing a sea level rise of 5.42 millimeters/year. At this rate, sea level at the tide gauge would raise approximately 5.3 inches in 25 years and 10.7 inches in 50 years. Potential impacts from sea level rise within the study area could cause an increase in surface elevations during flood events over time with or without the project. However, the design of the Build Alternative would account for this rise in sea level.

4.6.4 Water Quality

The Neches River Tidal segment (Segment 0601) was listed on the 303(d) list for the first time in 2012 under category 5c, for bacteria and PCBs in edible tissue, and is listed as the same on the approved 2014 list (TCEQ 2013; 2015). However, the Lower Neches River is listed as an ecologically significant stream under four categories, including "high water quality/exceptional aquatic life/high aesthetic value", and "biological function", indicating the overall health of the stream is generally high. According to the East Texas Regional Water Planning Area 2016 Initially Prepared Plan (2015), pollution from industrial discharges was historically a major concern in the industrial areas of the lower Neches and Sabine Rivers, but due to strengthened environmental regulation and increased environmental awareness, industries in the region have made significant improvements to the quality of their effluent discharges.

In addition to these stream segments, the study area contains canals, ditches, and intermittent tributaries. The Neches River Salt Water Barrier is an additional feature located near the study area, which was constructed in 2003 north of Beaumont to prevent saltwater from reaching the freshwater intakes of Lower Neches River cities, industries, and farms during periods of low flow.

No changes in water quality would be anticipated under the No Build Alternative as no rail improvements would be constructed and impacts would be limited those relating to periodic routine maintenance of the existing bridge.

The Build Alternative is not expected increase concentrations of PCBs or bacteria in the Neches River. Therefore, the Build Alternative would not contribute to the 303(d)-listed impairments of the waterbody. Activities during the construction of the lift bridge could suspend existing sediment with PCBs, as discussed in **Section 4.12.3.**

4.6.5 Permits and Approvals

The No Build Alternative would not require permits and approvals other than for periodic routine maintenance of the existing bridge (e.g., scour maintenance).

The following describe permits and approvals for the Build Alternative.

4.6.5.1 Section 401 of the Clean Water Act: Water Quality Certification

A Tier II Section 401 Water Quality Certification from TCEQ would be obtained as part of the Section 404 permitting process. Based on the anticipated impacts, compliance with Section 404 of the CWA would require an individual permit.

4.6.5.2 Section 402 of the Clean Water Act: Texas Pollutant Discharge Elimination System, Construction General Permit

The Build Alternative would include more than 5 acres of earth disturbance. TxDOT would comply with TCEQ's Texas Pollutant Discharge Elimination System (TPDES) Construction General Permit. A Storm Water Pollution Prevention Plan (SWPPP) would be implemented, and a construction site notice would be posted at the construction site. A Notice of Intent would be required.

4.6.5.3 Section 402 of the Clean Water Act: Texas Pollutant Discharge Elimination System, Municipal Storm Sewer System

The Build Alternative would be partially located within the boundaries of the Jefferson County Texas Storm Water Management Program (TPDES, ID TXR040000) and would comply with the applicable Municipal Separate Storm Sewer System (MS4) requirements.

4.6.5.4 Section 403 of the Clean Water Act: Ocean Discharges

Section 403 applies because the Build Alternative may affect Essential Fish Habitat; therefore, coordination with NMFS would be required.

4.6.5.5 Section 404 of the Clean Water Act: Waters of the U.S.

Based on the anticipated impacts to waters of the U.S. compliance with Section 404 of the CWA would require an Individual Permit. Coordination under the Fish and Wildlife Coordination Act (FWCA) would be executed through the USACE permitting process when acquiring the Individual Permit.

4.6.5.6 Rivers and Harbors Act of 1899, Sections 9 and 10

The Neches River is considered navigable. Sections 9 and 10 of the Rivers and Harbors Act of 1899 applies, and plans would be submitted to USACE for their approval and a USCG Bridge permit would be obtained.

4.6.5.7 Coastal Zone and Coastal Barrier Management

The Texas Coastal Management Program (CMP), funded by NOAA, is administered by the TGLO in conjunction with the Coastal Coordination Advisory Committee. The CMP helps ensure the long-term environmental and economic health of the Texas coast. The study area is within the CMP Boundary for Jefferson and Orange counties (**Appendix D, Exhibit 16**). The Build Alternative would meet the goals and policies of the CMP. Specifically, wetlands along the Neches River are considered protected areas under the Texas Coastal Zone Management Plan (CZMP) (Texas CMP 2014). Coordination with the TGLO would take place prior to obtaining the bridge permit from the USCG, and the office would supply a letter of concurrence for the permit (Personal Communication, Ray Newby, TGLO, October 2015).

The Coastal Barrier Resources Act (CBRA) established the Coastal Barrier Resources System to protect a defined set of geographic units along the coast of the U.S. The Build Alternative is not located within a designated CBRA map unit. Coordination with the USFWS is not required.

4.6.5.8 Texas General Land Office Easement

The TGLO has jurisdiction over submerged lands of the Neches River. Construction of the new bridge would require additional footings along the bottom of the Neches River; therefore, an easement is required from the TGLO. The existing rail bridge contains an easement (ME20130033) to K Railway Company. A Miscellaneous Easement application would be submitted, including a survey plat with coordinates of centerline from bank to bank, and width needed. (Personal Communication, Glenn Rosenbaum TGLO, March 30, 2016.)

4.6.6 Mitigation for Impacts to Water Resources

Mitigation of direct wetland impacts would comply with the conditions of the USACE Section 10/404 Individual Permit. Mitigation for unavoidable wetlands is likely to include purchasing credits from a designated mitigation bank. The Galveston District has implemented the Hydrogeomorphic Approach for Assessing Wetland Functions (HGM) to determine the amount of required compensatory mitigation associated with unavoidable wetland impacts. The HGM model is used to determine a functional index for each impacted wetland. The product of the functional index and area of impact determines the appropriate amount of functional capacity units needed for compensatory mitigation. The appropriate amount of functional capacity units, or credits, would be purchased from an appropriate mitigation bank, such as the Pineywoods Mitigation Bank.

Coordination with the local floodplain administrator is required. Any necessary modeling for potential floodplain impacts would be conducted prior to construction.

Pre-construction and post-construction Best Management Practices (BMPs) for erosion control, sedimentation control, and post-construction total suspended solids control would be implemented in compliance with Section 401 of the CWA.

TxDOT would comply with TCEQ's TPDES Construction General Permit. A SWPPP would be implemented, and a construction site notice would be posted at the construction site. A Notice of Intent would be required.

4.7 Ecological Systems and Biological Resources

The following summarizes the *Biological Resources Technical Report* (TxDOT 2015a) and the *Essential Fish Habitat Assessment* (TxDOT 2016c).

The study area is located in the Western Gulf Coastal Plain and South Central Plains Ecoregions of Texas. The Western Gulf Coastal Plain is a relatively flat strip of land, generally 50 to 90 miles wide, adjacent to the Gulf of Mexico. The principal distinguishing characteristics of this ecoregion are its relatively flat topography and natural grassland. Inland from this region the plains are older, more irregular, and have mostly forest or savanna-type vegetation potentials. Largely because of these characteristics, a higher percentage of the land is in cropland than in bordering ecological regions. Rice, grain sorghum, cotton, and soybeans are the principal crops. Urban and industrial land uses have expanded greatly in recent decades, and oil and gas production is common (Griffith et al., 2007).

The South Central Plains, consisting of mostly irregular plains, represent the western edge of the southern coniferous forest belt. Once blanketed by a mix of pine and hardwood forests, much of the region is now in loblolly and shortleaf pine plantations. Soils are mostly acidic sands and sandy loams. Covering parts of Louisiana, Arkansas, east Texas, and Oklahoma, only about one sixth of the region is in cropland, primarily within the Red River floodplain, while about two thirds of the region is

in forests and woodland. Lumber, pulpwood, oil, and gas production are major economic activities (Griffith et al., 2007).

Ecological systems include the interaction of organism communities and the surrounding environment. The ecological systems within the study area include upland systems, wetland systems, open water, and the species utilizing these systems. The study area also includes several mapped vegetation types. These systems, habitats, and organisms are described in the following sections.

4.7.1 Vegetation, Wildlife Habitat, and Invasive Species

Table 27 includes field verified Ecological Mapping Systems of Texas (EMST) vegetation types within the existing right-of-way, the proposed right-of-way, and the proposed construction laydown area, as shown in **Appendix D, Exhibit 17**. Based on the field investigation, it was determined that vegetation types contained within the existing right-of-way, proposed right-of-way, and proposed laydown area include Urban High Intensity; Chenier Plain: Mixed Live Oak – Deciduous Hardwood Fringe Forest; Non-Native Invasive: Chinese Tallow Forest, Woodland, or Shrubland; and Open Water.

Table 27. Potential Impacts to Field Verified EMST Vegetation

EMST Vegetation Type	MOU Vegetation Type	Area Within the Existing ROW (acres)	Area Within Proposed ROW (acres)	Area Within Laydown Area (acres)	Area Within Proposed Construction Limits* (acres)	Total (acres)
Urban High Intensity	Urban	6.25	0.48	4.95	5.69	11.68
Non-Native Invasive: Chinese Tallow Forest, Woodland, or Shrubland	Disturbed Prairie	23.18	0.81	3.51	13.64	27.50
Chenier Plain: Mixed Live Oak – Deciduous Hardwood Fringe Forest	Coastal Mixed Woodland and Forest	9.81	0.71	13.06	6.68	23.58
Open Water	Riparian	0.24	0.58	0.00	0.58	0.82
Total		39.48	2.58	21.52	26.59	63.58

Source: TPWD 2014b; Field verified by Study Team 2015

* Estimated Based on 30 Percent Design

ROW = Right-of-Way

The Urban High Intensity type occurs mostly in the study area west of the Neches River. The majority of this vegetation type occurs within downtown Beaumont and near the Port of Beaumont. This

vegetation type consists of built-up areas and wide transportation corridors that are dominated by impervious cover (**Appendix E, Photo 2**).

The Chenier Plain: Mixed Live Oak – Deciduous Hardwood Fringe Forest type occurs mostly east of the Neches River in the proposed construction laydown area and adjacent to the existing rail. This mapped type includes coastal live oak (*Quercus virginiana*) or loblolly pine *(Pinus taeda*) mixed with deciduous species, or in some places southern magnolia (*Magnolia grandiflora*) (**Appendix E, Photo 8**). According to TPWD (2014a), deciduous trees may include laurel oak (*Q. laurifolia*), water oak (*Q. nigra*), willow oak (*Q. phellos*), cherrybark oak (*Q. pagoda*), sweetgum (*Liquidambar styraciflua*), Hercules-club pricklyash (*Zanthoxylum clava-herculis*), Chinese tallow (*Triadica sebifera*), and post oak (*Q. stellata*). The understory is patchy and includes yaupon (*Ilex vomitoria*), American beautyberry (*Callicarpa americana*), dwarf palmetto (*Sabal minor*), and wax-myrtle (*Morella cerifera*). Woody vines include Mustang grape (*Vitis mustangensis*), trumpet creeper (*Campsis radicans*), and poison ivy (*Toxicodendron radicans*). The herbaceous layer is sparse and includes little bluestem (*Schizachyrium scoparium*). Trees observed within this vegetation type ranged from 5 feet to 50 feet in height and 12 inches to 24 inches diameter at breast height (dbh). Percent canopy observed during the field investigation ranged from 20 percent cover to 80 percent cover.

The Non-Native Invasive: Chinese Tallow Forest, Woodland, or Shrubland type occurs east of the Neches River in the proposed construction laydown area and adjacent to the existing rail. Stands of Chinese tallow characterize this type. In addition, black willow (*Salix nigra*) was also observed during the field investigation. Other species that occur within this vegetation type include baccharis (*Baccharis halimifolia*), sweetgum, water oak, blackgum (*Nyssa sylvatica*), loblolly pine, and willow oak (**Appendix E, Photo 9**). Tree species within this type included Chinese tallow and black willow ranging from 5 feet to 20 feet in height. Percent canopy ranged from 20 percent to 80 percent and dbh ranged from 6 inches to 12 inches.

Open Water type consists of reservoirs, bays, large ponds, canals, rivers, and the Gulf of Mexico. The Open Water type exists where the proposed/existing right-of-way crosses the Neches River and is approximately 0.82 acres (**Appendix E, Photo 1**). The Neches River is channelized and maintained within the study area.

No impacts to vegetation and wildlife habitat would occur under the No Build Alternative because no rail improvements would be constructed.

In accordance with the TxDOT-TPWD Memorandum of Understanding (MOU) effective September 1, 2013, a Tier I Site Assessment was conducted in order to determine impacts and the need for coordination with the TPWD. Based on the results of the assessment, coordination with TPWD would be required due to the need for a Section 404 Individual Permit, potential impacts to wetlands, riparian habitat, and coastal mixed woodland and forest. The Build Alternative would impact approximately 23.58 acres of Coastal Mixed Woodland and Forest and 0.82 acres of Riparian habitat, which both exceed the trigger threshold value for those MOU types. The trigger for coordination was not met for the Disturbed Prairie MOU type.

In accordance with EO 13112 on invasive species, native plant species would be used in landscaping and in the seed mixes where applicable.

4.7.2 Threatened and Endangered Species

According to TPWD (2015a; 2015b), 28 species are listed as state threatened or endangered and 18 species are listed as Species of Greatest Conservation Need (SGCN). Seven state listed threatened and 3 SGCN species have potential habitat within the study area.

No impacts to state threatened and endangered species would occur under the No Build Alternative because no rail improvements would be constructed.

Table 28 describes potential impacts of the Build Alternative to the white-faced ibis, wood stork, swallow-tailed kite, bald eagle, Rafinesque's big-eared bat, northern scarlet snake, and timber rattlesnake. These species, listed as state-threatened, have the potential to occur within the study area. In addition, the American eel, southeastern myotis bat, and plains spotted skunk are listed as SGCNs that may be impacted. Potential habitat for these species is limited to east of the Neches River within the existing right-of-way, the proposed right-of-way, and the proposed construction laydown area.

Table 28. Potential Impacts to State Threatened and Endangered Species/Species of Greatest Conservation Need

Species	State Status	Federal Status	Potential Habitat Present	Species Effect/ Impact	Justification
White-Faced Ibis *Plegadis chihi*	T	—	Yes	May Impact	Prefers freshwater marshes, sloughs, and irrigated rice fields. Potential habitat adjacent to the study area east of the Neches River.
Wood Stork *Mycteria americana*	T	—	Yes	May Impact	Prefers prairie ponds, flooded pastures or fields, ditches, and other shallow standing water. Irregular to uncommon in study area and wanders widely. Potential habitat adjacent to the study area east of the Neches River. Present seasonally from April through November.
Swallow- Tailed Kite *Elanoides forficatus*	T	—	Yes	May Impact	Prefers lowland forested regions, especially swampy areas, ranging into open woodland. Potential habitat adjacent to the study area east of the Neches River. Seasonally present from February through October.
Bald Eagle *Haliaeetus leucocephalus*	T	DL	Yes	May Impact	Primarily found near rivers and large lakes; nests in tall trees or on cliffs near water. Potential habitat in the study area adjacent to the Neches River.
American Eel *Anguilla rostrata*	SGCN	—	Yes	May Impact	Found in rivers and bays. Potential habitat in the study area in the Neches River.
Rafinesque's Big- Eared Bat *Corynorhinus rafinesquii*	T	—	Yes	May Impact	Roosts in cavity trees of bottomland hardwoods, concrete culverts, and abandoned man-made structures. Potential habitat in study area.
Southeastern Myotis Bat *Myotis austroriparius*	SGCN	—	Yes	May Impact	Roosts in cavity trees of bottomland hardwoods, concrete culverts, and abandoned man-made structures. Potential habitat in study area.
Plains Spotted Skunk *Spilogale putorius interrupta*	SGCN	—	Yes	May Impact	Prefers open fields, prairies, croplands, fence rows, farmyards, forest edges, and woodlands. Potential habitat in the study area east of the Neches River.
Northern Scarlet Snake *Cemophora coccinea copei*	T	—	Yes	May Impact	Prefers mixed hardwood scrub on sandy soils. Potential habitat in the study area east of the Neches River.
Timber Rattlesnake *Crotalus horridus*	T	—	Yes	May Impact	Occurs in swamps, floodplains, upland pine and deciduous woodland, riparian zones. Potential habitat in the study area east of the Neches River.

Sources: TPWD 2015a and 2015b; USFWS 2015a, 2015b and 2015c

T – Threatened; DL – Delisted; NL – Not Federally Listed; SGCN – Species of Greatest Conservation Need

Table 29 provides elements of occurrence of state- and federally-listed species within 10 miles of the study area. No species occur within 1.5 miles of the study area.

Table 29. Elements of Occurrence State and Federal Listed within 10 miles of the Study Area

Scientific Name/Habitat	Common Name	Federal / State Status
Cemophora coccinea copei	Northern Scarlet Snake	ST
Corynorhinus rafinesquii	Rafinesque's Big - Eared Bat	ST
Fusconaia askewi	Texas Pigtoe	ST
Fusconaia lananensis	Triangle Pigtoe	ST
Phlox nivalis ssp. texensis	Texas Trailing Phlox	SE, FLE

Source: TXNDD 2015

ST = State-listed Threatened, SE = State-listed Endangered, FLE = Federal-listed Endangered

According to the USFWS, the federally-listed West Indian Manatee may occur in Jefferson and Orange counties. Based on the field investigation, there is potential habitat for the West Indian Manatee in the Neches River. However, the species is extremely rare in Texas and its occurrence in the study area is unlikely. Therefore, the Build Alternative would have no effect on the West Indian Manatee. No critical habitat was identified within the study area. Consultation with the USFWS would not be required.

4.7.3 Essential Fish Habitat

The study area is located within counties with tidally influenced waters. According to the NOAA (n.d.), Essential Fish Habitat for fish species that live in the Gulf of Mexico may be present in the study area within the Neches River for red drum (*Sciaenops ocellatus*), gray triggerfish (*Balistes capriscus*), greater amberjack (*Seriola dumerili*), lesser amberjack (*S. fasciata*), almaco jack (*S. rivoliana*), banded rudderfish (*S. zonata*), hogfish (*Lachnolaimus maximus*), queen snapper (*Etelis oculatus*), mutton snapper (*Lutjanus analis*), schoolmaster (*L. apodus*), blackfin snapper (*L. buccanella*), red snapper (*L. campechanus*), cubera snapper (*L. cyanopterus*), gray snapper (*L. griseus*), dog snapper (*L. jocu*), mahogany snapper (*L. mahogoni*), lane snapper (*L. synagris*), silk snapper (*L. vivanus*), yellowtail snapper (*Ocyurus chrysurus*), wenchman (*Pristipomoides aquilonaris*), vermilion snapper (*Rhomboplites aurorubens*), goldface tile fish (*Caulolatilus chrysops*), blackline tilefish (*C. cyanops*), anchor tilefish (*C. intermedius*), blueline tilefish (*C. microps*), tilefish (*Lopholatilus chamaeleonticeps*), dwarf sand perch (*Diplectrum bivittatum*), sand perch (*D. formosum*), rock hind (*Epinephelus adscensionis*), speckled hind (*E. drummondhayi*), yellowedge grouper (*E. flavolimbatus*), red hind (*E. guttatus*), goliath grouper (*E. itajara*), red grouper (*E. morio*), misty grouper (*E. mystacinus*), warsaw grouper (*E. nigritus*), snow grouper (*E. niveatus*), nassau grouper (*E. striatus*), marbled grouper (*E. inermis*), black grouper (*Mycteroperca bonaci*), yellowmouth

grouper (*M. interstitialis*), gag (*M. microlepis*), scamp (*M. phenax*), yellowfin grouper (*M. venenosa*), brown shrimp (*Penaeus aztecus*), white shrimp (*P. setiferus*), pink shrimp (*P. duorarum*), and royal red shrimp (*Pleoticus robustus*).

No impacts to Essential Fish Habitat would occur under the No Build Alternative because no rail improvements would be constructed and impacts would be limited to those relating to periodic routine maintenance of the existing bridge.

Under the Build Alternative, the placement of bridge pilings would permanently modify the structural habitat of managed fish species and their Essential Fish Habitat. The Build Alternative would directly impact approximately 0.14 acres of unvegetated substrate through filling and placement of bridge columns. The impact to unvegetated substrate would consist of impacts to sand/shell and soft bottom. Soft bottom and sand/shell habitats are inhabited by various organisms living within the sediment (infauna) and on the riverbed (epifauna) that burrow into the substrate. The conversion of unvegetated substrate to a hard-structured habitat may result in the localized loss of demersal fish and benthic species who feed on infauna and epifauna. The loss of soft benthic habitat may be partially offset by the creation of hard structure habitat, which could potentially serve as an attractant to epifauna and to many fish species.

No direct impacts to the water column habitat would occur because the Build Alternative would not result in the removal or loss of water and there would be minimal displacement of water column due to bridge column placement and replacement of the existing fender system. Fourteen columns would be placed in the river to support the proposed rail bridge and pile caps. The columns would range from 2.75 feet to 5.5 feet in diameter. The columns would be placed in a water column at a depth ranging from approximately 2 feet to 40 feet. The new fender system would replace the existing system and would be constructed on each side of the river, providing protection for both the existing and new bridge. Impacts of construction activities are discussed in **Section 4.12.3**. Coordination with NMFS is included in **Appendix F**.

4.7.4 Marine Mammal Protection Act

Marine mammals are protected under the Marine Mammal Protection Act (MMPA). There is potential habitat for the West Indian Manatee in the Neches River; however, the species is extremely rare in Texas and its occurrence in the study area is unlikely. Since previous bridge maintenance activities have not caused any significant impacts to marine mammals, the No Build Alternative would be unlikely to adversely affect marine mammals. Likewise, based on the nature of the proposed work, the Build Alternative would be unlikely to adversely affect marine mammals.

4.7.5 Bald and Golden Eagle Protection Act

The Bald and Golden Eagle Protection Act was enacted in 1940 to provide for the protection of the bald Eagle and the golden eagle by prohibiting, except under certain specified conditions, the taking, possession, and sale of such birds. The USFWS has regulatory authority over this act. In addition,

TPWD collects data concerning the location of bald eagle nests. The Bald and Golden Eagle Protection Act applies to projects with the potential to take bald or golden eagles. Suitable habitat for the bald eagle exists within the study area; therefore, coordination with USFWS and TPWD would be required. While there were no nests observed during the field investigation, there is potential for nesting birds to be present in the study area during maintenance activities under the No Build Alternative or during construction and maintenance activities under the Build Alternative. Construction and maintenance activities would comply with the National Bald Eagle Management Guidelines.

4.7.6 Migratory Bird Treaty Act

The Migratory Bird Treaty Act (MBTA) states that it is unlawful to kill, capture, collect, possess, buy, sell, trade, or transport any migratory bird, nest, young, feather, or egg in part or in whole, without a federal permit issued in accordance within the Act's policies and regulations. While there were no active nests observed during the site survey, there is potential for nesting birds to be present in the study area during maintenance activities under the No Build Alternative and during construction and maintenance of the Build Alternative. Construction period mitigation and use of BMPs is discussed in Section 4.12.7.

4.7.7 Fish and Wildlife Coordination Act

The FWCA of 1934 and subsequent amendments requires federal agencies to consider the effect that water-related projects have on fish and wildlife resources; act to prevent loss or damage to these resources, and provide for the development and improvement of these resources. Federal agencies must consult with resources agencies including TPWD, USFWS, and NMFS. The No Build Alternative would not impact waters of the United States, including wetlands. The Build Alternative would impact these waters and coordination under the FWCA would be executed through the USACE permitting process when acquiring the Section 404 Individual Permit.

4.7.8 Invasive Species

As identified in Table 27, Non-Native Invasive species occur in the study area. Non-Native Invasive species may spread within the study area from maintenance activities under the No Build Alternative and from construction and maintenance activities under the Build Alternative.

4.7.9 Mitigation for Impacts to Ecological Systems and Biological Resources

Construction period BMPs for protection of federal and state threatened species are described in Section 4.12.7. Coordination with TPWD is required since the Build Alternative would be within the range of a SGCN or state-listed fish, and work is in the water.

Mitigation of Essential Fish Habitat typically consists of avoidance, minimization, and compensatory mitigation:

- The Build Alternative would comply with federal regulations protecting Essential Fish Habitat and would avoid and/or minimize impacts to fishery species and their associated Essential Fish Habitat. In order to avoid and/or minimize impacts to fishery resources, minimize cost, and maintain traffic within the navigation channel, the design would minimize the number of bridge pilings by maximizing the bridge span lengths. The Build Alternative would follow guidelines outlined in federal and state required plans including the preparation of a Spill Prevention Control and Countermeasures (SPCC) Plan and a SWPPP.

- Mitigation measures include the use of a design intended to avoid and minimize Essential Fish Habitat impacts by maximizing span lengths to reduce the number of pilings constructed in the Neches River.

4.8 Cultural Resources

4.8.1 Archeological

The following summarizes the *Archeological Survey Report* (TxDOT 2016b).

Three terrestrial archeological sites and 14 shipwreck sites have been recorded within 0.62 miles of the Area of Potential Effects (APE). The APE is defined as the entirety of existing right of way, proposed right of way, and temporary easements (**Appendix D, Exhibit 18**). Depth of impacts would vary from entirely surficial to approximately 12 feet for bridge approaches. Bridge support piers at the river would include deeper impacts into geologic deposits. None of the previously recorded sites are within the APE.

In consultation with TxDOT, it was determined that 18.04 acres of the APE would require archeological survey. The survey was conducted for TxDOT under Section 106 of the NHPA and under the Antiquities Code of Texas (ACT) in compliance with 36 CFR 800, 36 CFR 60, and 13 TAC 26. Coordination with the THC and TxDOT occurred under Antiquities Permit #7494.

A pedestrian survey of the accessible portions of the APE (totaling 4.92 acres) resulted in recordation of no prehistoric or historic archeological sites or features. Due to heavy inundation and limited access, 13.12 acres of the APE were not accessible for survey during the field investigations conducted in December 2015. Observations made of inaccessible portions of the APE from the areas that were accessible suggest that these areas are within a heavily inundated marsh environment possessing limited potential to contain cultural deposits, either prehistoric or historic, that retain integrity of location, design, setting, materials, workmanship, feeling, or association (36 CFR 60.4).

Based on the results of the December 2015 survey, no archeological historic properties (36 CFR 800.16[1]) or State Antiquities Landmarks (13 TAC 26.12) would be affected by the Build Alternative for the area surveyed and for the approximately 4 acres of unsurveyed areas mapped as wetlands by the USFWS, and no further archeological investigations are required for these locations.

The No Build Alternative would not affect archeological historic because no rail improvements would be constructed. Review by qualified TxDOT archeologists on March 3, 2016, found the Build Alternative to have no effect on archeological historic properties within the areas where the resource survey was able to be completed or within areas mapped as wetlands. On April 28, 2016, THC concurred with the findings and recommendations of the *Archeological Survey Report* (see **Appendix F**). For unsurveyed segments of the APE that are not mapped as wetlands (totaling approximately 9 acres), an archeological survey would need to be conducted once right-of-entry and/or ground conditions permit. At that time, additional coordination with the THC would occur to finalize the determination of the Build Alternative's potential effects and mitigation requirements.

4.8.2 Historic

The following summarizes the *Report for Historical Studies Survey* (TxDOT 2016f).

The study area in downtown Beaumont extends through some of the oldest and most densely developed areas of the city. On the west side of the river (Jefferson County), the study area abuts the Beaumont Commercial District, an NRHP district listed in 1978 with a boundary expansion in 2008.

A reconnaissance survey, in compliance with TxDOT survey standards, was completed on November 23, 2015. In coordination with TxDOT, the APE was defined as areas within 150 feet from the proposed right-of-way and easements (**Appendix D, Exhibit 19**). During the survey, all structures wholly or partially within the APE that appeared to be of historic age were photographed. All historic-age properties were evaluated according to National Register criteria for significance and integrity.

Table 30 lists each of the historic-age resources identified within the APE and identifies the NRHP eligibility of these properties. The locations of these properties are depicted in **Appendix D, Exhibit 20a, 20b, and 20c**. Two properties (Resource 1 and 10) are individually NRHP eligible, and two properties (Resource 2 and 3) were previously determined to contribute to the NRHP-listed Beaumont Commercial District. These four properties are discussed further in the sections that follow and photos are included in **Appendix E (Photos 14 through 17)**. THC concurrence with the determination of eligibility and finding of effect recommendations made in the *Report for Historical Studies Survey* (TxDOT 2016f) is included in **Appendix F**.

Table 30. Surveyed Historic-Age Properties

No.	Address	Date	Type/Subtype	Style/Form	NRHP Eligible	Effect Under Build Alternative
1	255 College St.	ca. 1973	Civic – Beaumont Police Department	Brutalist	Yes	No Adverse Effect
2	905 Orleans St.	1919	Commercial	Two-part commercial block	Contributing to NRHP-listed district	No Effect
3	967 Orleans St.	ca. 1961	Commercial	Mid-century modern, one-part com. block	Contributing to NRHP-listed district	No Effect
4	653 College St.	1952	Church – Ebenezer Baptist Church	No style	No	n/a
5	1030 Trinity St., 1055 Archie St.	ca. 1950s	Industrial – Eastham Forge, Inc.	Industrial	No	n/a
6	1048 Neches St.	ca. 1963	Commercial	No style	No	n/a
7	1090 Park St.	ca. 1971	Civic/Transportation – Beaumont Municipal Transit System facility	Brutalist influence on main structure	No	n/a
8a	Port of Beaumont / 1255 Main St.	1916, 1949	Industrial – Port of Beaumont	Industrial	No	n/a
8b	Port of Beaumont	ca. 1970	Warehouse associated with Port of Beaumont complex	Industrial	No	n/a
8c	Port of Beaumont / 1255 Main St.	Ca. 1959, altered ca. 1996	Commercial building associated with Port of Beaumont complex	No style	No	n/a
9a	Railroad corridor	ca. 1899	Transportation – KCS Railway Line	Railroad line	No	n/a
9b	Rail-related structure at west bridge approach	ca. 1965	Transportation-related structure	No style	No	n/a
10	Railroad bridge over Neches River	1941	Transportation – Neches River Bridge	Single-track, vertical lift-span railroad bridge	Yes	No Adverse Effect

Source: Study Team 2016

4.8.2.1 Beaumont Police Department (Resource 1)

Under the Build Alternative, a small portion of right-of-way would be acquired at the east rear corner of the property for construction of a second mainline track to allow for rail crossovers and to realign industry connections in downtown Beaumont. Proposed right-of-way acquisition is approximately 0.05 acre of the 2.07-acre parcel. The acquisition is at the rear of the Beaumont Police Department property where it would abut the railroad track, along the outer edge of a paved parking lot that is designated as parking for staff only. The 30 percent design plans for the Build Alternative indicate incorporation of a retaining wall along the northern edge of the railroad right-of-way at this location. The proposed retaining wall would be approximately two feet in height and of concrete construction.

The existing railroad line has been in its current location and part of the context of the surrounding area since at least 1899, long before construction of the Beaumont Police Department building. The incorporation of an additional mainline track would not significantly alter the existing setting and would not directly impact the eligible historic building. The Beaumont Police Department building is eligible for NRHP listing under Criterion C for its exemplification of the Brutalist style of civic architecture of the early 1970s. The rear parking lot is not a contributing element of the property and does not contribute to the architectural significance of the building. The proposed right-of-way acquisition would not impact the building itself or affect the integrity of its design, materials, workmanship, or feeling. Therefore, the Build Alternative would have no adverse effect to the Beaumont Police Department building.

4.8.2.2 905 Orleans Street (Resource 2) and 967 Orleans Street (Resource 3)

Under the Build Alternative, no new right-of-way would be acquired near the commercial structures at 905 Orleans Street or 967 Orleans Street, contributing resources to the NRHP-listed Beaumont Commercial District. In this area, the Build Alternative would involve construction of a second mainline track to allow for rail crossovers and realign industry connections in downtown Beaumont.

The ca. 1899 rail corridor was an element of the context and setting of the Beaumont Commercial District before the construction of the District in 1919. The addition of a second mainline track parallel to the existing rail line and within the railroad right-of-way would not affect the architectural integrity of the contributing buildings, and it would not undermine the significance or integrity of the Beaumont Commercial District. Therefore, the Build Alternative would have no effect to the contributing resources or to the listed historic district.

4.8.2.3 Neches River Bridge (Resource 10)

The Build Alternative would not acquire new right-of-way from the Neches River Bridge, and the historic-age bridge would remain in place and continue to operate. An additional rail bridge over the Neches River parallel to and north of the existing bridge would be constructed. The proposed rail bridge would be constructed approximately 35 feet north of the centerline of the existing bridge and would be a through-truss lift-span bridge. The Build Alternative would replace the existing bridge fenders and would extend a new fender system underneath both the existing and proposed bridge structures. The existing bridge piers would remain in place.

The Neches River Bridge is eligible for NRHP listing under Criterion A in the areas of Transportation, Commerce, Community Development, and Industry in Beaumont and the lower Neches River area. The bridge is also eligible under Criterion C for its engineering technology as a mid-twentieth-century vertical lift-span bridge. The structure has functioned as an operational railroad bridge and lift-span bridge over the Neches River since its construction in 1941. Under the Build Alternative, operations and maintenance of the bridge would continue.

The bridge is not eligible aesthetically for its architectural style, but for its engineering technology as a functional vertical lift-span bridge that allows for both rail transport over the bridge and ship transport in the Neches River below the bridge. Although the construction of the new bridge would introduce a visual change to the setting of the historic bridge, the functionality of the vertical lift of the bridge would not be adversely affected, and the historic bridge would continue to operate in its current manner. The construction of the additional rail bridge north of the existing bridge would not directly impact the historic structure, would not alter its current or historic use, and would not diminish its engineering or historical significance. The removal and replacement of the existing fender system below the bridge would not alter the operational capacity of the bridge. The fender system is not a character-defining feature of the bridge's engineering technology, and the materials have likely been replaced over time. The bridge would retain integrity of design, materials, workmanship, feeling, location, and association. Therefore, the Build Alternative would have no adverse effect on the bridge.

4.8.3 Section 106 Consultation

Notices and materials for the October 21, 2015 Public Open House recognized that TxDOT is using public involvement procedures under NEPA to fulfill the Section 106 public involvement requirements and explained how individuals or organizations may make a request to become a consulting party. Section 106 consulting parties include:

- Jefferson County Historical Commission
- Jefferson County Certified Local Government
- City of Beaumont, Beaumont Certified Local Government
- Beaumont Main Street

- Historic Bridge Foundation
- KCS Railway

On November 19, 2015, prior to the historic resources survey, an email was provided to these consulting parties. The email included a project description and map of previously identified historic resources. An email response was received from the Jefferson County Historical Commission on November 20, 2015 (see **Appendix F**). THC concurrence with the determination of eligibility and finding of effect recommendations outlined in the *Report for Historical Studies Survey* (TxDOT 2016f) is included in **Appendix F**.

4.8.4 Mitigation for Impacts to Cultural Resources

There would be no known adverse impacts to cultural resources; therefore, mitigation is not currently warranted. Findings of future archeological surveys would determine the need for mitigation. Appropriate mitigation measures would be identified as part of the formal Section 106 consultation.

For unsurveyed segments of the APE that are not mapped as wetlands (totaling approximately 9 acres), an archeological survey would be conducted once right-of-entry and/or ground conditions permit prior to the start of construction.

Stipulations regarding discovery properties during the construction period are identified in **Section 4.12.7**.

4.9 Hazardous Materials and Solid Waste Disposal

The following summarizes the *Hazardous Materials Technical Report* (TxDOT 2016d).

The state and federal database searches identified 82 records at a total of 37 sites within the designated American Society for Testing and Materials (ASTM) search radii from the study area.

The potential for interactions or impacts would be unchanged under the No Build Alternative because no rail improvements would be constructed.

The potential for interactions or impacts associated with the Build Alternative was assessed for each of the database search records based on the type of site-specific hazardous materials issue, site location with respect to the right-of-way, and planned improvements. Each site-specific issue was classified as having low, medium, or high potential for impacts associated with construction or operation of the Build Alternative.

The assessment found that all of the 37 sites have low potential for impacts. Sites with low potential are not within the right-of-way, and were not previously contaminated or previous contamination has been cleaned up based on the TCEQ records. The sites are detailed in **Table 31**; and the locations of these sites are depicted in **Appendix D, Exhibit 21**.

Table 31. Potential Hazardous Materials Sites in the Study Area

No.	Site Name	Site Address / Description	Type	Status of Site	Potential for Impact
1	CITY OF BEAUMONT-MUNICPAL TRANSIT SYSTEM	550 MILAM STREET The site is located adjacent to the KCS Railway on the southeast side. The site appears to contain a fueling station and auto repair shops for the Beaumont Municipal Transit System.	PST TIERII FRSTX RCRANGR06 IHW	There are three active underground storage tanks (USTs) containing diesel and used oil. The site used to be a small-quantity generator of ignitable waste and non-industrial municipal waste; however, the site does not currently generate waste.	Low
2	N/A	965 AND 985 ORLEANS STREET	ERNSTX	Equipment failure reported in 1990 when four transformers/ poles fell over after a train snagged power lines.	Low
3	GOODWILL INDUSTRIES	970 PARK STREET The site is located adjacent to the KCS Railway on the northwest side. The parcel was cleared in 2009. The site is currently vacant with some concrete slabs. The Ebenezer Missionary Baptist Church currently owns the property and is planning to develop the land.	PST FRSTX	Two USTs were removed from the ground. A warehouse was located on the southeast side of the parcel, bordering the railroad.	Low
4	NORTH STAR STEEL TEXAS GERDAU AMERISTEEL BEAUMONT	100 OLD HWY 90 The site is located adjacent to the KCS Railway on the southeast side. The parcel is on the eastern side of the Neches River at the far northeastern portion of the project limits, by George R. Brown Road.	LPST PST IHW IHWCA NLRRCRAT RCRAGR06	The PST and LPST tanks are 0.5 miles down gradient from the Build Alternative. LPSTs impacted groundwater and minor soil contamination. Final concurrence was issued on the site, and the case was closed. Two above-ground storage tanks containing diesel are on the property. Five USTs were removed from the ground. The site is classified as a conditionally exempt small-quality generator of industrial waste, ignitable waste, corrosive waste, and reactive waste, among others. The facility is also a large-quantity industrial generator. The details of the corrective action conducted were not reported.	Low
5	POLICE STATION	255 COLLEGE STREET The site is located adjacent to the KCS Railway on the northwest side at the intersection of Pearl Street.	PST	One UST containing diesel is in use on the site, one UST was permanently filled in place, and one UST was removed from the ground. One above-ground storage tank is in use on the property.	Low

No.	Site Name	Site Address / Description	Type	Status of Site	Potential for Impact
6	FIRE STATION	747 COLLEGE STREET The site is located on the northwest side of the KCS Railway, separated from the rail by a vacant parcel.	PST	Two USTs containing diesel are in use; one UST was removed from the ground.	Low
7	BEAUMONT WAREHOUSE-TRANSIT	1030 TRINITY STREET The site is located on the southeast side of the railroad, at the crossing of the KCS Railway and Trinity Street.	PST	Three USTs have been removed from the ground.	Low
8	EASTHAM FORGE C-E BEAUMONT	1055 ARCHIE STREET The site is located on the southeast side of the KCS Railway, at the crossing of the railroad and Trinity Street. The site is on the same parcel as Map ID 7.	RCRAGR06 PST	The site is classified as a large-quantity generator and a conditionally exempt small-quantity generator for ignitable waste. Two USTs were removed from the ground.	Low
9	NECHES STREET PROPERTIES	1090 NECHES STREET The site at which the contamination occurred has since been redeveloped. The original site was located on the corner of Neches and Milam Streets.	LPST	LPST impacted groundwater with no apparent threats or impacts to receptors; final concurrence was issued, and the case is closed.	Low
10	EXELL, INC.	690 FRANKLIN STREET The site is located on the corner of Franklin and Neches Streets. The current tenant of the building is Richard Construction, Inc. 1110 NECHES STREET The site is located on the corner of Neches and Milam Streets, in the same block as 690 Franklin Street.	IHW RCRANGR06 VCP APAR	The site is classified as an inactive small-quantity industrial generator. The report details chlorinated solvents affected soil and groundwater. The site has been cleaned up under the Voluntary Cleanup Program (VCP).	Low
11	CITY SPRING & BREAK SERVICE	798 COLLEGE STREET The site is located on the corner of College and Jefferson Streets, across the street from the fire station.	IHW	The site is classified as a conditionally exempt small-quantity generator for non-industrial and/or municipal waste.	Low
12	PORT OF BEAUMONT	1255 MAIN STREET The site is located on the southeast side of the KCS Railway along the Neches River.	LPST PST RCRANG06	Three LPSTs were reported to have minor soil contamination and groundwater contamination (other than drinking water) and did not require a remedial action plan (RAP). Final concurrence was issued, and the case is closed. Two PSTs containing diesel and gasoline are in use. The site is not a generator of waste.	Low

No.	Site Name	Site Address / Description	Type	Status of Site	Potential for Impact
13	FIRE DEPARTMENT MAINTENANCE SHOP	1125 ARCHIE STREET The site is located on the corner of Archie Street and Milam Street.	PST	Two underground tanks were permanently filled in place.	Low
14	JEFFERSON COUNTY MAINTENANCE DEPARTMENT	1149 PEARL STREET The site is located on the corner of Pearl Street and Franklin Street.	PST	One tank was removed from the ground.	Low
15	PREMIUM CONSTRUCTION	585 WALL STREET The site is located at the corner of Wall Street and Neches Street.	IHW	The site is inactive.	Low
16	AT&T-IS	995 MILAM STREET The site is located on the corner of Milam Street and Johns Street. The site appears to be a junk yard for car parts.	PST	One underground tank was permanently filled in place.	Low
17	ENTEX GAS COMPANY BEUAMONT GAS LIGHT COMPANY	865 FRANKLIN STREET The site is located at the corner of Franklin and Archie Streets.	BF CERCLIS NFRAP PST	The site is currently undergoing a Phase II Environmental Site Assessment. The property is clear of all structures. No further remedial action is planned (NFRAP). One PST was removed from the ground.	Low
18	JEFFERSON COUNTY SERVICE CENTER	1295 ORLEANS STREET The site is located at the corner of Orleans and Franklin Streets.	PST	Two tanks were removed from the ground.	Low
19	FRANKLIN STEEL	695 FRANKLIN STREET The site is located at the corner of Franklin and Trinity Streets.	PST	One tank was removed from the ground.	Low
20	SABINE INDUSTRIES ESOP	NOT REPORTED The point listed by the Database Report would be at the corner of Fannin Street and South MLK Jr. Parkway. The property is vacant.	PST	Two tanks were removed from the ground.	Low
21	GET-N-GO 2	1280 S M L KING JR PARKWAY The site is at the corner of Fannin Street and South MLK Jr. Parkway. The property is vacant.	PST	Three tanks were removed from the ground.	Low
22	TEXAS STATE OPTICAL LABORATORY	715 ORLEANS STREET The site is on the corner of Forsythe Street and Orleans Street. Community Pharmacy and Southeast Texas Community Clinic occupy the building.	IHW	The site is classified as an inactive waste generator and transporter.	Low

No.	Site Name	Site Address / Description	Type	Status of Site	Potential for Impact
23	BECKER GUS PRINTING	1080 FORSYTHE STREET The site is at the corner of Wall Street and Holmes Avenue along South MLK Jr. Parkway. The property is vacant.	IHW	The site was classified as a non-industrial and/or municipal waste generator and a conditionally exempt small-quantity generator; the site has been inactive since 1996.	Low
24	COLLECTING BANK NA	1000 BLANCHETTE STREET The site is at the corner of Blanchette Street and Johns Street. The property is vacant.	PST LSPT	Two tanks were permanently filled in place. The tanks leaked and contaminated soil only; final concurrence was issued, and case is closed.	Low
25	NSS HENSEY	610 TRINITY STREET The site is at the corner of Trinity Street and Fannin Street. The property is currently used for a Habitat for Humanity ReStore.	LPST PST IHW	Three LPSTs were removed from the ground and contaminated soil only. Final concurrence was issued, and the case is closed. The site is a small-quantity generator for non-industrial and/or municipal waste. The site is currently generating grease sludge.	Low
26	BURRIS TRANSFER & STORAGE	760 FANNIN STREET The site is at the corner of Trinity and Fannin Streets, across the street from Map ID 25.	LPST	The site reports minor soil contamination due to an LPST; final concurrence was issued, and case is closed.	Low
27	VACANT LOT SPUR 380 ROW	1215 FRANKLIN STREET The site is at the corner of Franklin and Orange Streets.	LPST	The site reports minor soil contamination due to an LPST; final concurrence was issued, and case is closed.	Low
28	INTERNATIONAL CREOSOTING	710 PINE STREET The site is bordered by the Neches River/Brakes Bayou, Pine Street, and I-10. The TCEQ lists the address of this site as 1110 Pine Street.	SF CERCLIS NFRAP	The site is listed as a superfund by the TCEQ. Groundwater, sediments, soil, and surface water have been affected. The site is not listed on the national priority or federal list; however, the site is considered a potential hazard by the USEPA. The site was used for wood treating from 1898 through 1973; it was then used as a ready-mix concrete production facility until 1987.	Low
29	ABANDONED GAS STATION	1425 COLLEGE STREET The site is at the corner of College Street and Avenue A.	LPST	Four tanks were removed from the ground. Minor soil contamination was reported; final concurrence was issued, and case is closed.	Low
30	FORMER GAS STATION	CROCKET STREET AND MAIN STREET	LPST	One tank was removed from the ground. Minor soil contamination was reported; final concurrence was issued, and case is closed.	Low
31	OLD SAMPSON STEEL	999 CROCKET ROAD The site is at the corner of Crocket Street and Holmes Avenue.	NFRAP CERCLIS	The site is not listed on the national priority or federal list; however, the site is listed as a potential hazard by the USEPA.	Low

No.	Site Name	Site Address / Description	Type	Status of Site	Potential for Impact
32	OCB METALS	600 CROCKETT STREET The site is at the corner of Crocket and Neches Streets.	LPST	Two tanks are in use on the site. The assessment was reported as incomplete with no apparent receptors impacted. The contamination was reported in 1993.	Low
33	BEAUMONT AUTO COLOR	1498 COLLEGE STREET The site is at the corner of College Street and Avenue B.	LPST	Two tanks were removed from the ground. Soil contamination occurred; final concurrence was issued, and case is closed.	Low
34	BEAUMONT ENTERPRISE INC	308 WALNUT STREET The site is at the corner of Walnut and Elizabeth Streets.	LPST	Three tanks were removed from the ground. Soil contamination occurred; final concurrence was issued, and case is closed.	Low
35	SHEPARDS INC	WILLOW STREET AND LAUREL STREET	LPST	One tank was removed from the ground. Soil contamination occurred; final concurrence was issued, and case is closed.	Low
36	TEXAS METAL WORKS BEAUMONT	937 PINE STREET The site is at the corner of Pine Street and Long Avenue.	IHW	The site is reported as inactive.	Low
37	EXXONMOBIL OIL BEAUMONT CHEMICAL PLANT	1795 BURT STREET The property occupied the majority of the industrial land near Smith Island, south of downtown Beaumont along the Neches River.	IHWCA RCRAC RCRASUBC	The site is an active large-quantity generator of a number of hazardous wastes associated with oil industries.	Low

Source: TxDOT (2016f)

An Initial Site Assessment (ISA) was completed to assess potential hazardous materials concerns associated with the proposed improvements. A desktop-level assessment combined with field investigations was performed. Multiple stockpiles of trash and rail-related debris within the existing and proposed right-of-way were observed. Stockpile materials at the time of the field visit included steel rods, concrete, ballast rock, and railroad crossties. These materials are not considered hazardous waste. If the stockpiles would require removal prior to construction, the materials should be disposed of properly in accordance with local and state regulations. No additional excavation for contaminated material is anticipated.

Solid waste would be disposed of properly in accordance with local and state regulations. Solid waste generated under the Build Alternative was estimated to include:

- Approximately 50,000 cubic yards of unsuitable subgrade material, which is material that is not sufficient to handle the weight of the embankment.

- Approximately 1,200 railroad ties and 4,000 feet of rail. Rail could be repurposed or sold as scrap.
- Metal and timber from the existing Fender system.
- Demolition materials in the form of railroad signals/communication infrastructure, buildings and the mechanical room. Demolished materials could include asbestos containing materials (ACM) and lead paint.

4.9.1 Mitigation for Hazardous Materials and Solid Waste Impacts

The low potential for impacts from hazardous materials and solid waste would be mitigated through proper handling of materials/waste during construction, as identified in **Section 4.12.7**.

4.10 Visual and Aesthetic Quality

Under the No Build Alternative, there would be no changes to the existing visual and aesthetic qualities in the study area because no rail improvements would be constructed.

The location with the greatest potential for visual impact under the Build Alternative would be on and along the waterway of the Neches River. This viewshed includes views of the historic Neches River Bridge. Views of the rail corridor and Neches River Bridge from viewpoints within Riverfront Park are included in **Appendix E, Photos 1, 15, and 18**. The alignment of the Build Alternative would parallel the existing rail alignment and would be at a similar grade as the existing rail line. The new bridge could alter the view of the existing bridge from viewpoints, such as the Riverfront Park; however, since both bridge designs would be a through-truss lift bridge, the character of the transportation facility and the surrounding environment under the Build Alternative would not be substantially different visually or aesthetically from the existing condition. The new bridge would be of similar height and construction materials as the existing bridge. Renderings of the proposed bridge from this viewpoint are provided in **Appendix E, Photos 19 and 20**.

4.10.1 Mitigation for Impacts to Visual and Aesthetic Quality

Impacts to visual and aesthetic quality have been minimized through the bridge design, which includes a through-truss lift bridge of similar height and construction materials as the existing bridge. Visual and aesthetic impacts that would remain include an altered viewshed, which would not be substantially different from the existing condition.

4.11 Use of Energy

With respect to energy use, existing rail operations are affected by track capacity, track switching, industrial service access, and bridge openings for marine vessel traffic. Future rail traffic across the Neches River is expected to increase with both through traffic along this national corridor, as well as local rail traffic serving the region's existing and expanding industrial facilities.

The No Build Alternative would result in extended delays to cross the river that would increase idling times and energy use for both rail and vehicular traffic, or necessitate the need to find alternate routes and/or transport modes that would also consume additional energy. Generally speaking, rail is more energy efficient than surface and air transportation.

Overall, there would be a positive impact on energy use under the Build Alternative. This positive impact would result from decreased idling times, decreased trip lengths from alternate routes and/or decreased energy consumption from utilizing rail over surface and air transport modes. Impacts during construction are addressed in **Section 4.12.6**.

4.11.1 Mitigation for Use of Energy

Other than short-term impacts during construction, there would be a positive impact on energy use under the Build Alternative and no mitigation is warranted. BMPs to be followed during construction are discussed in **Section 4.12.7**.

4.12 Construction Impacts

4.12.1 Air Quality

Construction activities can generate temporary air pollutants including fugitive dust and emissions from construction vehicles. Mitigation measures including site watering to minimize the generation of dust and minimizing idling vehicles would prevent significant impacts on air quality.

During the construction phase, temporary increases in PM and Mobile Source Air Toxics emissions may occur. The primary emissions of PM during construction are fugitive dust from site preparation, and the primary emissions of Mobile Source Air Toxics during construction are diesel PM from diesel-powered construction equipment and vehicles.

The potential impacts of PM emissions would be minimized by using fugitive dust control measures contained in standard specifications. The Texas Emissions Reduction Plan (TERP) provides financial incentives to reduce emissions from vehicles and equipment. TxDOT encourages construction contractors to use this and other local and federal incentive programs to the fullest extent possible to minimize diesel emissions. Information about the TERP program can be found at: http://www.tceq.state.tx.us/implementation/air/terp/.

The use of fugitive dust control measures, the encouragement of the use of TERP, and compliance with applicable regulatory requirements would ensure that emissions from construction of the Build Alternative would not have a significant impact on air quality.

4.12.2 Noise and Vibration

The predominant construction activities would be earth removal, hauling, grading, and paving. Temporary and localized construction noise impacts may occur because of these activities. Table 32 illustrates the noise levels associated with various construction activities.

During daytime hours, the effects of these impacts may be temporary speech interference for passers-by and those individuals living, working, or attending school near the construction site. During evening and nighttime hours, if applicable, steady-state construction noise emissions such as paving operations may be audible, and may cause impacts to activities such as sleep. Sporadic evening and nighttime construction equipment noise emissions, such as from backup alarms, lift gate closures (slamming of dump truck gates), etc., may be perceived as distinctly louder than the steady-state acoustic environment, and may cause impacts to the general peace and usage of noise-sensitive areas. Extremely loud construction noise activities, such pile-drivers and impact-hammers (jack hammer, hoe-ram), would result in sporadic and temporary construction noise impacts in the near vicinity of those activities.

Table 32. Construction Equipment Typical Noise Level Emissions

Equipment	Typical Noise Level (dBA) 50 Feet from Source
Air Compressor	81
Backhoe	80
Ballast Equalizer	82
Ballast Tamper	83
Compactor	82
Concrete Mixer	85
Concrete Pump	82
Concrete Vibrator	76
Crane, Derrick	88
Crane, Mobile	83
Dozer	85
Generator	81
Grader	85
Impact Wrench	85
Jack Hammer	88
Loader	85
Paver	89
Pile-driver (Impact)	101
Pile-driver (Sonic)	96
Pneumatic Tool	85
Pump	76
Rail Saw	90
Rock Drill	98
Roller	74

Source: USDOT 2006

Construction noise impact level predictions (**Table 33**) can be assessed in a general capacity with respect to distance from known or likely construction activities.

Table 33. Construction Noise Impact Levels

Land Use	One-Hour L_{eq} (dBA)	
	Day	Night
Residential	13	2.9
Commercial	104	8.8
Industrial	224	13.8

Source: USDOT 2006

Using the general methodology outlined in FTA's manual (USDOT 2006), and assuming the two loudest pieces of equipment are operating at the point of the track nearest to the sensitive receptor, and the distance to the nearest commercial site (R4), no construction noise impacts are projected for any commercial sites. Based on the distance to the nearest residential receptor (R3) and the two loudest pieces of equipment, a construction noise impact are projected for nighttime construction activity only. However, these would be short-term impacts and could be avoided by restricting construction activities to daytime hours only.

Two types of construction vibration impact were analyzed: (1) human annoyance and (2) building damage. Human annoyance occurs when construction vibration rises significantly above the threshold of human perception for extended periods of time. Building damage can be cosmetic or structural. Fragile buildings such as historical structures are generally more susceptible to damage from ground vibration. Normal buildings that are not particularly fragile would not experience any cosmetic damage (e.g., plaster cracks) at distances beyond 30 feet based on typical construction equipment vibration levels. This distance can vary substantially depending on the soil composition and underground geological layer between vibration source and receiver. In addition, not all buildings respond similarly to vibration generated by construction equipment.

Vibration levels produced by construction equipment were obtained from FTA's manual (USDOT 2006). Based on the typical vibration levels listed in **Table 34**, calculations were performed to determine the distances at which vibration impacts would occur according to the criteria discussed in **Section 4.5.1**.

Table 34. Vibration Source Levels for Construction Equipment

Equipment (projected use)	PPV[1] at 25 feet (in/sec)	Approximate Velocity Level[2] at 25 ft (VdB)
Large bulldozer	0.089	87
Loaded trucks	0.076	86
Vibratory compactor/roller	0.210	94

Source: USDOT 2006

Notes:
1. Peak particle ground velocity measured at 25 feet unless noted otherwise.
2. RMS ground velocity in decibels (VdB) referenced to 1 micro-inch/second.

The distances shown in **Table 35** are the maximum distances at which short-term construction vibration impacts may occur. It is assumed that the equipment listed would be used on the point of the track nearest any sensitive receptors. The nearest vibration sensitive receptor is approximately 80 feet from the track; therefore, no building damage or vibration annoyance impacts would be anticipated during construction of the Build Alternative.

Table 35. Construction Equipment Vibration Impact Distances

Equipment	Distance to Vibration Annoyance Impact[1] (feet)	Distance to Vibration Building Damage[2] (feet)
Large bulldozer	43	15
Loaded trucks	40	13
Vibratory compactor/roller	73	26

Source: Study Team 2016

Notes:

1. This is the distance at which the RMS velocity level is 80 VdB or less at the inside of the building structure. When propagating from the ground surface to the building structure foundation, there is a vibratory coupling loss of approximately 5 dB; however, this loss is offset by the building amplification in light-frame construction. Thus, no additional adjustments are applied.
2. This is the distance at which the peak particle velocity is 0.20 inch/sec or less.

4.12.3 Water and Biological Resources

As discussed in **Section 4.6.1**, a total of up to 5.06 acres of wetland impacts are associated the proposed construction laydown area.

Construction of the bridge would result in both permanent and temporary impacts to the Neches River. While the proposed bridge design is subject to change based on additional engineering, impacts to the river have been approximated using the 30 percent design. Approximately 5,990 square feet (0.14 acres) of permanent stream impacts are anticipated to place the piers required to support the proposed bridge and fender system. An additional 9,835 square feet (0.23 acres) of temporary impacts are anticipated to remove the existing fender system and temporary installation of cofferdams at Bent 4 through Bent 7 during construction of the bridge. The following summarizes the likely bridge construction that would occur within the Neches River:

- On the east side of the river, Bent 4 and Bent 5 would be located in the river. Bent 4 is a 2-column concrete drilled shaft structure with an 11-foot by 41-foot concrete pile cap that supports the single-track approach and tower spans. The total plan surface area of the pile cap at Bent 4 is approximately 450 square feet. Bent 5 is a 4-column concrete drilled shaft with a 41-foot by 41-foot concrete pile cap that supports the single track tower span and lift span. The total plan surface area of the pile cap at Bent 5 is approximately 1,680 square feet.

- Continuing to the west side of the Neches River, Bent 6 is a 4-column concrete drilled shaft structure with a 41-foot by 41-foot pile cap that supports the single track lift span and tower span.

The total plan surface area of the pile cap at Bent 6 is approximately 1,680 square feet. Bent 7 is a two-column concrete drilled shaft structure with an 11-foot by 41-foot concrete pile cap that supports the single track tower and approach spans. The total plan surface area of the pile cap at Bent 7 is approximately 450 square feet. Bent 3 is a 2-column concrete drilled shaft structure with a pier cap that supports single track approach spans. Each column has a 5.5-foot diameter for a total plan surface area of approximately 50 square feet at Bent 3.

- The new fender system would be located at the river channel between Bent 5 and Bent 6. The total surface area of the new fender system on the west side would be approximately 815 square feet, and the one on the east side would be about 865 square feet. Placement of the new fender system would require removal of the existing fender system.

- Approximately 8,075 square feet (0.19 acres) of temporary stream impacts would occur during removal of the existing fender system (i.e., the fender and a series of battered piles located behind each fender). The plan surface area on the east side is estimated to be approximately 4,180 square feet, and the west side is estimated at 3,895 square feet. In some cases, the area disturbed for removal of the existing fender system overlaps where permanent impacts would occur. In these cases, the impact is accounted for under permanent impacts.

- During construction of the railroad bridge, an additional 1,760 square feet (0.04 acres) of temporary stream impacts would occur for cofferdams at Bent 4 through Bent 7. Bent 4 and Bent 7 each have a 17-foot by 47-foot cofferdam. Excluding the area permanently impacted by the Bents, the increased surface area for each of these cofferdams would be approximately 350 square feet. Bent 5 and Bent 6 each would have a 47-foot by 47-foot cofferdam, and the increased surface area for each of these cofferdams would be approximately 530 square feet.

Several different species of fish exist near the proposed rail bridge. Turbidity levels near the construction area would increase temporarily while bridge pilings are being installed into the river bottom. These temporary increases in turbidity would cause short-term, adverse effects on fishes near the construction area. Fish species would avoid areas of increased turbidity caused by construction and would likely return after construction is completed and turbidity levels have returned to pre-construction levels. Fish species in earlier life stages do not have the same avoidance abilities as later life stages and may be more susceptible to increased turbidity levels.

Short-term, minor adverse impacts to the finfish could occur from an accidental petroleum spill from construction equipment or vessels used during construction. Most petroleum products stored onboard construction vessels during construction would be light and, if spilled, would remain on the surface of the water and evaporate quickly. A SPCC Plan and a SWPPP would reduce the potential for water quality impacts.

Short-term, adverse impacts on finfish may occur from lighting during construction. Although lights would not intentionally illuminate surrounding waters, fishes could be attracted to the construction area, making them more vulnerable to predation.

Construction of pilings would physically displace sediments along the bridge alignment. As a result, this action may cause localized mortality, displacement, or burial of benthic organisms, which provide the prey base for managed species and of eggs and larvae for managed species. The effects of disturbance of the benthic environment following construction would most likely be short-term and localized. While the placement of the columns would result in the loss of potential foraging habitat, the loss of the prey base in these areas would not result in a substantial adverse effect on Essential Fish Habitat or managed species.

There is the potential that sediment disturbances within the Neches River during construction of the proposed project could suspend existing sediments with PCBs; however, these activities have a limited time duration and no PCB inputs would take place as a result of this project. It is also unlikely that the Build Alternative would increase bacteria levels in the Neches River. Therefore, the Build Alternative would not contribute to the listed impairments of the waterbody. The state of Texas has authority to administer the National Pollutant Discharge Elimination System program in Texas through the TPDES. The TPDES program has federal regulatory authority over discharges of pollutants to Texas surface water. Coordination with TCEQ is required to acquire permits needed to complete construction in and/or near the Neches River including a construction general permit and SWPPP. The construction general permit requires a wide range of erosion and sediment controls to meet certain effluent limits to minimize impacts to surface water in the study area. In addition, a Section 401 Water Quality Certification from TCEQ would be obtained as part of the Section 404 permitting process.

Construction activities have the potential to disturb nesting bald eagles or nesting migratory birds if present within the study area during construction activities.

Construction activities would remove or disturb the vegetative communities in the study area, which could result in temporary habitat loss for resident and migratory species and could result in the removal of erosion-inhibiting ground cover.

4.12.4 Cultural Resources

There is the potential to encounter undiscovered archeological deposits during construction.

4.12.5 Hazardous Materials and Solid Waste

As discussed in **Section 4.9**, there is a low potential to encounter unanticipated hazardous materials and/or petroleum contamination during construction of the Build Alternative. Buildings to be demolished may contain asbestos and bridges or structures may have lead based paint.

4.12.6 Energy Use

Non-recoverable energy would be consumed during construction of the Build Alternative on a short-term basis. Since there is a likely reduction of energy consumption under the Build Alternative over

the No Build Alternative, it is reasonable to assume that the energy consumption needed to construct the Build Alternative would be recouped at some time in the future.

4.12.7 Mitigation for Construction Period

Air Quality

Temporary air pollutants such as fugitive dust and emissions from construction vehicles would be mitigated by using fugitive dust control measures contained in standard specifications, as appropriate. The Texas Emissions Reduction Plan (TERP) provides financial incentives to reduce emissions from vehicles and equipment. TxDOT encourages construction contractors to use this and other local and federal incentive programs to the fullest extent possible to minimize diesel emissions. Information about the TERP program can be found at: http://www.tceq.state.tx.us/implementation/air/terp/. In addition, construction contractors are required to comply with applicable federal, state, and local regulations (including applicable permitting requirements) which are based on the construction methodology and equipment that are used.

Noise

Generally, low-cost and easily implemented construction noise and vibration control measures should be incorporated into the project plans and specifications. These measures include, but are not limited to, noise and vibration monitoring, work-hour limits, exhaust muffler requirements, haul-road locations, limit the use of construction equipment that creates high vibration (e.g., vibratory rollers, hammers), elimination of tail gate banging, ambient-sensitive backup alarms, construction noise complaint mechanisms, and consistent and transparent community communication.

The construction contractor shall be required by contract specification to comply with all local noise and vibration ordinances and obtain all necessary permits and variances.

Water Resources

Pre-construction and post-construction BMPs for erosion control, sedimentation control, and post-construction total suspended solids control would be implemented in compliance with Section 401 of the CWA. Therefore, it is anticipated that the Build Alternative would not contribute to the listed impairments of the waterbody. Coordination with the TCEQ would be required to acquire permits needed to complete construction in and/or near the Neches River. Permits needed prior to construction would include:

- Section 401 Water Quality Certification
- Section 402 Construction General Permit
- Section 403 Ocean Discharge Permit

- Section 404 Individual Permit
- Sections 9 and 10 of The Rivers and Harbors Act Permit

Disturbance of wetland areas by the contractor would be limited to the area necessary for construction.

During construction, a SPCC Plan and SWPPP for avoidance and minimization of water quality impacts would be completed.

Threatened and Endangered Species

The following BMPs would be in place for protection of federal and state threatened species:

- Northern Scarlet Snake - Contractors would be advised of potential occurrence in the study area, and to avoid harming the species if encountered.
- Timber Rattlesnake - Contractors would be advised of potential occurrence in the study area, and to avoid harming the species if encountered.
- Plains Spotted Skunk - Contractors would be advised of potential occurrence in the study area, and to avoid harming the species if encountered.
- State threatened bird species – Active nests would not be disturbed, destroyed, or removed, including ground nesting birds, during the nesting season. Removal of unoccupied inactive nests would be avoided as practicable. The establishment of active nests would be prevented during the nesting season on TxDOT owned and operated facilities and structures proposed for replacement or repair. Birds, eggs, young, or active nests would not be collected, captured, relocated, or transported without a permit.

BMPs would be incorporated to protect migratory bird nests. A MBTA appropriate Environmental Permits, Issues, & Commitments (EPIC) sheet would be included in the project file. Appropriate measures would be taken to avoid impacts to migratory birds, including:

- No active migratory bird nests (nests containing eggs and/or young) would be removed or destroyed at any time of the year.
- No colonial nests (swallows, for example) on or in structures would be removed until all nests in the colony become inactive.
- Measures, to the extent practicable, would be used to prevent or discourage migratory birds from building nests within portions of the study area planned for construction.
- Inactive nests would be removed from the portions of the study area planned for construction to minimize the potential for reuse by migratory birds.

- Construction or demolition activities would be scheduled outside the typical nesting season (February 15 to October 1), and would comply with the previously listed prohibitive provisions of the MBTA, which apply year-round.

The following BMPs would be in place to protect bat species:

- Bridge Bats – A survey by a qualified biologist would be conducted to determine if bats are present. If bats are present, appropriate measures would be taken as practical to ensure that bats are not harmed such as exclusion or timing activities. For maternity colonies, exclusion activities should be timed to avoid separating lactating females from nursing pups. If structures used by bats are removed as a result of construction, replacement structures should incorporate bat-friendly design, or artificial roosts should be constructed to replace these features as practical.

- Tree Bats – Large hollow trees should be surveyed for maternity colonies and, if found, should not be disturbed until after the pups fledge.

If nesting bald eagles are present in the study area during construction, the National Bald Eagle Management Guidelines would be implemented.

While conducting pile driving within the Neches River, mitigation for noise impacts include the use of a "soft start" method. This method allows motile species to move to another area by starting the pile-driver with a small number of lighter hammer impacts. In addition, bubble curtains may be implemented during pile driving. Bubble curtains are created by forcing compressed air through small holes in PVC piping. Bubble curtains disrupt sound waves and are effective at reducing impacts to species within the construction area. In addition, turbidity curtains may be used to reduce sedimentation impacts.

Vegetation

Disturbed areas would be restored, re-graded and reseeded according to TxDOT specifications, and BMPs would be implemented to provide temporary erosion control during construction and permanent erosion control after the project is complete.

Disturbed areas would be re-vegetated according to TxDOT's standard practices for rural areas, which to the extent practicable, complies with Executive Memorandum on Beneficial Landscaping. Re-vegetation of disturbed areas would comply with EO 13112 on invasive species. Regionally native and non-invasive plants would be used to the extent practicable in landscaping and re-vegetation.

Cultural Resources

In the event that unanticipated archeological deposits are encountered during construction, work in the immediate area would cease, and TxDOT and/or THC archeological staff would be contacted to initiate post-review discovery procedures.

Hazardous Materials and Solid Waste

Any unanticipated hazardous materials and/or petroleum contamination encountered during construction would be handled and disposed of according to applicable federal and state regulations per TxDOT Standard Specifications. Section 6.10 of the "General Provisions of the Standard Specifications for Construction and Maintenance of Highways, Streets and Bridges" includes guidelines addressing the contractor's responsibilities regarding the discovery and disposal of hazardous materials.

As required by the Texas Asbestos Health Protection Rules (25 TAC 295.61), a survey for ACM and a 10 working day, pre-demolition notification would be required prior to demolition of the 2 rail-related buildings and 2 utility sheds in the proposed right-of-way. If asbestos is confirmed, then asbestos-abatement activities would be performed in accordance with the Texas Asbestos Health Protection Act and the National Emissions Standards for Hazardous Air Pollutants.

Solid waste generated would be disposed of properly in accordance with local and state regulations.

Prior to project letting, the coatings on any bridges to be modified would be analyzed for the presence or absence of lead-based paint (LBP). If LBP is discovered, contingencies would be developed to address worker safety, material recycling, and proper management of any paint-related wastes, as necessary.

Energy Use

BMPs followed during construction may include measures to minimize energy use, such as the use of energy-efficient equipment, restrictions on unnecessary idling of construction equipment, proper maintenance of equipment and machinery to meet original standards, and consolidation of material delivery and use of local materials where possible.

4.13 Indirect and Cumulative Impacts

The FRA and other federal agencies' responsibility to address and consider direct, indirect, and cumulative impacts in the NEPA process was established in the CEQ Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act (40 CFR 1500-1508).

The CEQ regulations define the impacts that must be addressed and considered by federal agencies in satisfying the requirements of the NEPA process. Direct, indirect/secondary and cumulative impacts can be defined as follows:

- Direct impacts are caused by the action and occur at the same time and place. (40 CFR 1508.8). These impacts have been addressed in the previous sections of this EA.
- Indirect/secondary impacts are caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable. Indirect impacts may include growth-inducing

impacts and other impacts related to induced changes in the pattern of land use, population density or growth rate, and related effects on air and water and other natural systems, including ecosystems. (40 CFR 1508.8) The terms "indirect impacts" and "secondary impacts" are used interchangeably by many federal and state agencies. These impacts are addressed in **Section 4.13.1**.

- Cumulative impact is the impact on the environment, which results 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) These impacts are addressed in **Section 4.13.2**.

4.13.1 Indirect Impacts

This analysis of indirect impacts was conducted in accordance with *Indirect Impacts Analysis* (TxDOT 2015e), and *Indirect and Cumulative Impacts* (TxDOT, 2014). The analysis contains two parts. **Section 4.13.1.1** discusses induced growth impacts and **Section 4.13.1.2** summarizes the encroachment alteration impacts.

The No Build Alternative would not result in any of the potential indirect effects because no rail improvements would be constructed.

4.13.1.1Induced Growth Impacts Analysis

Due to the nature of the Build Alternative, the current land uses, and the existing development plans in place, no induced growth impacts analysis is required. This section explains the factors considered to reach this conclusion.

The primary purpose of the project is to improve rail operations, including maintaining existing rail mobility and reducing rail congestion. The Build Alternative consists of only freight rail improvements and does not alter access to any non-rail facilities or open up any new areas to development. The study area is non-residential in nature, consisting of the Beaumont central business district and industrial areas in and adjacent to the Port of Beaumont. Therefore, it is anticipated that any potential for induced growth would be limited to industrial facilities supported by rail.

Much of the undeveloped land on the east side of the Neches River is marsh/wetlands, and therefore unsuitable for development. Although there is some undeveloped land in the area suitable for industrial development, these areas are planned for future development independent of the outcome of the project. The Port of Beaumont's Master Plan (Port of Beaumont 2015) includes plans for development that are independent on the outcome of the project. The plan shows future development on the currently undeveloped portions of their property with the existing single track Neches River bridge crossing (**Appendix D, Exhibit 6**). In addition, recent developments include $67 million in capital improvements that are complete, including a new interchange and holding rail space

and additional infrastructure improvements. This is an indication that rail and intermodal support facilities will be implemented to meet current and future demand whether or not a second rail crossing is implemented. The City of Beaumont Zoning map shows planned development along the riverfront. During a stakeholder meeting, the City of Beaumont indicated that the Build Alternative would not interfere with the city's waterfront redevelopment plans. Part of the riverfront is already dedicated parkland, and north of the study area is a large Superfund site still in the remediation process. The Build Alternative is not currently listed on the MTP, the Statewide Transportation Improvement Program (STIP), or the Transportation Improvement Programs (TIP).

Due to the lack of available developable land, the existing plans for future development, and because the Build Alternative pertains to freight rail and would not alter access for non-rail facilities, it is anticipated that there would be no induced growth.

4.13.1.2 Encroachment Alteration Impacts Analysis

Encroachment-alteration effects are effects that alter the behavior and functioning of the physical environment and are related to project design features but are indirect in nature because they can be separated from the project in time or distance. As directed in *Indirect Impacts Analysis* (TxDOT, September 2015), encroachment alteration impacts are discussed in each of the subject specific resource reports. A summary of these impacts is shown in Table 36.

Table 36. Summary of Encroachment-Alteration Effects

Resource and/or Issue	Potential Encroachment-Alteration Effects
Community/ Socioeconomic/ Environmental Justice Populations	The proposed project would not result in changes to travel patterns, access, or relocations. The character of the transportation facility and the surrounding environment under the Build Alternative would not be substantially different visually or aesthetically from the existing condition. Noise would be similar to future conditions without the project. **Therefore, no encroachment impacts on community or EJ populations are anticipated.**
Surface Water/ Wetlands and Other Waters of the U.S.	Surface water within the study area includes the Neches River, ponds, wetlands, and riparian areas including approximately 500 feet of Neches River crossing, approximately 14.48 acres of wetlands, and 0.82 acres of Riparian area. Construction of the project within the study area would occur adjacent to existing infrastructure and would not affect the surrounding hydrology. Impacts to the Neches River would be limited to infrastructure needed to support the rail bridge span across the Neches River. In relation to the total area of the river crossing, the construction footprint would be minimal. Encroachment impacts to wetlands are expected to be limited to changes to edge effect of wetland vegetation adjacent to wetland areas directly impacted by construction or clearing. **Therefore, encroachment-related indirect impacts to surface water would be minimal.**
Essential Fish Habitat	Direct impacts would include 0.14 acres of stream impacts in essential fish habitat. Shading impacts would be negligible. **Encroachment impacts are limited to potential water quality deterioration from accidental spills and are expected to be minimal.**
Floodplains	The proposed project would increase impermeable surfaces and have the potential to indirectly affect sediment and pollutant loading in the 100-yr floodplain. However, floodplain management regulations and design standards would require that the proposed Build Alternative be designed so as not to alter base flood elevations and not cause adverse flood impacts to upstream or downstream properties. **Therefore, no encroachment impacts related to floodplains are anticipated.**
Vegetation	The total study area consists of 63.58 acres and includes 4 vegetation types. Encroachment effects would be limited to changes to edge effect of vegetation adjacent to vegetated areas directly impacted by construction or clearing. **Therefore, encroachment-related indirect impacts to vegetation would be minimal.**
Threatened and Endangered Species/Habitat	Habitat for state-threatened species including the white-faced ibis, wood stork, swallow-tailed kite, bald eagle, Rafinesque's big-eared bat, northern scarlet snake, timber rattlesnake, and alligator snapping turtle, and SGCNs including the American eel, southeastern myotis bat, and plains spotted skunk may occur in the study area. Potential habitat for these species is limited to east of the Neches River within the existing right-of-way, proposed right-of-way, and proposed laydown area. **Due to the relatively small amount of habitat impacted in relation to the surrounding area, the encroachment-related indirect effects would not be substantial.**
Historic Resources	No adverse effects, including noise and vibration, to any historic properties from the proposed project are anticipated. **Therefore, no encroachment impacts relating to historic resources are anticipated.**
Archeological Resources	While a portion of the project has not been surveyed, given the lack of previously identified sites in the vicinity of this location and the failure to document archeological deposits in the nearby portions of the APE that were evaluated, **no encroachment impacts relating to archeology are anticipated at this time.**
Air Quality	This project is not expected to result in increased vehicle idling at railway crossings. Any increase in daily rail volumes would contribute to the amount of pollution emitted; however, based on the annual emissions presented the increase in volume would need to be substantial in order to exceed the de minimis level. **Therefore, no encroachment impacts relating to air quality are anticipated**.

4.13.2 Cumulative Impacts

Reasonably foreseeable actions evaluated for cumulative impacts include those relating to development and transportation projects in the region (Table 37). Sources for these actions included the *Jefferson-Orange-Hardin Regional Transportation Study: MTP 2040*, the Port of Beaumont, and coordination with local jurisdictions. The city manager for the City of Vidor confirmed in September 28, 2015 that there are no planned developments within their jurisdictional boundary.

Reasonably foreseeable actions include 3 transportation projects, 2 Port of Beaumont projects, and 1 new church. Although not located in the study area, the Panama Canal Expansion (currently set to open in June 2016) would provide the U.S. Army with strategic flexibility in the deployment of cargo from the Port of Beaumont. Cargo can be shipped through the canal to destinations in the Pacific, as well as to Europe, South America, Africa, and other destinations. The Port of Beaumont is the number one port in the country for the shipment of military cargo (TTI 2013). The increased barge traffic has the potential to impact water quality; however, these potential impacts are not reasonably quantifiable at this time.

Table 37. Reasonably Foreseeable Actions in the Study Area

Project	Description	Potential Water Impacts[1]
Ebenezer Church Relocation	Relocation of existing church	Potential for approximately 2.1 acres of new impervious cover.
Port of Beaumont Tank Farm	New tank farm, admin building, truck unloading facility, service entrance/exit, storage tanks	Potential for approximately 21.4 acres of new impervious cover, direct wetland impacts.
Port of Beaumont Access Road	Access Road within POB property	Potential for approximately 4 acres of new impervious cover, direct wetland impacts.
Pine Island Bridge (Island Park Road at Brakes Bayou)	Replacement of bridge and approaches	Replacing existing- no substantial impacts likely.
FM 299 (South of Walden Rd and FM 105 to Conner Rd and FM 105)	Construct a new 2 lane highway	Increased impervious cover/runoff potential for induced development, direct wetland impacts. Potential for approximately 42 acres[2] of new impervious cover.
CR (Old Highway 90, south of IH-10 access road to East bank of Neches River)	Construct railroad grade separation	Negligible impacts to water quality.
Panama Canal Expansion	Expand capacity and allow larger ships through the canal	Increased barge traffic in the Neches River to and from Port of Beaumont could impact water quality. Not quantifiable.

Sources: Jefferson-Orange-Hardin Regional Transportation Study: MTP 2040; Port of Beaumont 2015; Study Team 2015
Notes:

1. Based on project description and aerial interpretation.
2. Based on assumption of 12-foot lanes and 10-foot shoulders throughout the length of project.

One additional project, the Sabine-Neches Waterway Channel Improvement Project, was considered for inclusion in this analysis. The proposed project includes deepening the Sabine-Neches Waterway from the Port of Beaumont's Turning Basin (just south of the Neches River Bridge) through the Sabine Pass Jetty Channel from approximately 40 feet to approximately 48 feet. A Record of Decision (ROD) was issued February 1, 2012. The project was authorized by Congress in 2014 and is currently awaiting approval of funding (Henderson, February 24, 2016). Since funding has not been secured, the project was not considered to be reasonably foreseeable and not included in this analysis.

In addition to the above reasonably foreseeable future actions, the other actions considered in the cumulative impact analysis are:

- Previous floodplain filling, altering of riparian areas, filling of wetlands, pollutant loading (past, ongoing and future actions)
- Development of industrial land, rail lines, and other transportation facilities (past, ongoing and future actions)
- Continued operation of the port and associated industrial activity (ongoing and future action)

As discussed in **Section 2.2**, existing rail operations through the Beaumont area are affected by track capacity, track switching, industrial service access, and bridge openings for marine vessel traffic on the Neches River. With or without the project, future rail traffic across the Neches River is expected to increase from through traffic along this national corridor, as well as local rail traffic serving the region's existing and expanding industrial facilities. In addition, the Port of Beaumont's Master Plan (Port of Beaumont 2015) calls for expanded industrial facilities in both Jefferson and Orange counties where efficient rail and vehicular access is necessary to serve projected demand.

The Build Alternative would result in cumulative impacts for most of the environmental resources but most impacts are minimal or, when considered with reasonably foreseeable future actions and mitigation, the impacts are negligible. The cumulative impacts for each environmental resource are discussed below.

- **Land Use and Zoning** – The Build Alternative would result in minimal impacts to land use and zoning. Reasonably foreseeable future projects are anticipated to impact land use and zoning. Therefore, the Build Alternative, when considered with the reasonably foreseeable future actions, would result in a negligible cumulative effect on this resource.
- **Social and Community Resources** – The Build Alternative and the reasonably foreseeable future actions would have the potential to positively impact economic conditions within the City of Beaumont and the greater Beaumont region. The improved economic conditions created by the Build Alternative and reasonably foreseeable future actions are anticipated to have a beneficial cumulative effect on socioeconomic resources in the study area.
- **Environmental Justice** – The Build Alternative would not have high and adverse disproportionate impacts to environmental justice communities or other sensitive populations, and would not contribute to a cumulative high and adverse disproportionate impact on these resources.

- **Transportation** – The Build Alternative would add capacity across the Neches River and would benefit transportation by reducing train-related delays. National, regional, and local freight and passenger rail would benefit from adding rail capacity and eliminating the existing bottleneck created by the single rail crossing of the Neches River. Congestion from train back-ups and blocked crossings of roadways would be minimized. Therefore, the Build Alternative, when considered with the reasonably foreseeable future actions, would result in a beneficial cumulative effect to rail traffic and a negligible cumulative effect on vehicular, bicycle, and pedestrian traffic.
- **Air Quality** – Air quality impacts from the Build Alternative would be minimal and air quality impacts are expected from the reasonably foreseeable future projects; therefore, the Build Alternative, when considered with the reasonably foreseeable future actions, would have a negligible cumulative effect on air quality.
- **Noise and Vibration** – Noise impacts from the Build Alternative are expected at four sites. Vibration impacts are expected at two sites. Noise and vibration impacts would be anticipated from the reasonably foreseeable future projects. Therefore, the Build Alternative, when considered with the reasonably foreseeable future actions, would result in a negligible cumulative effect on noise and vibration.
- **Water Resources and Floodplains** – The Build Alternative would result in impacts to water resources and floodplains that would be offset by minimization and mitigation measures in accordance with permit requirements. Water resource and floodplain impacts are anticipated to occur from the reasonably foreseeable future projects. Therefore, the Build Alternative, when considered with the reasonably foreseeable future actions, would result in a negligible cumulative effect on this resource.
- **Water Quality** – The Build Alternative would result in minimal impacts to water quality that would be offset by implementing BMPs and other minimization measures in accordance with permit requirements. Water quality impacts are anticipated to occur from the reasonably foreseeable future projects. Therefore, the Build Alternative, when considered with the reasonably foreseeable future actions, would result in a negligible cumulative effect on this resource.
- **Wetlands** – The Build Alternative would result in impacts to wetlands that would be offset by minimization and mitigation measures in accordance with permit requirements. Wetland impacts are anticipated to occur from the reasonably foreseeable future projects. Therefore, the Build Alternative, when considered with the reasonably foreseeable future actions, would result in a negligible cumulative effect on this resource.
- **Ecological Resources** – The Build Alternative would result in minimal impacts to ecological resources that would be offset by minimization and mitigation measures. Ecological resource impacts are anticipated to occur from the reasonably foreseeable future projects. Therefore, the Build Alternative, when considered with the reasonably foreseeable future actions, would result in a negligible cumulative effect on this resource.
- **Threatened and Endangered Species** – The Build Alternative would result in impacts to threatened and endangered species that would be offset by minimization and mitigation

measures. Threatened and endangered species impacts are not anticipated to occur from the reasonably foreseeable future projects. Therefore, the Build Alternative, when considered with the reasonably foreseeable future actions, would result in a negligible cumulative effect on this resource.

- **Cultural and Historic Resources** – While a portion of the project has not been surveyed, given the lack of previously identified sites in the vicinity of this location and the failure to document archeological deposits in the nearby portions of the APE that were evaluated, the Build Alternative would not result in adverse impacts to cultural and historic resources. Reasonably foreseeable future projects would not result in additional effects to cultural and historic resources identified (Beaumont Police Department and Neches River Bridge). Therefore, the Build Alternative, when considered with the reasonably foreseeable future actions, would not contribute to a cumulative effect on this resource.
- **Hazardous Materials** – The Build Alternative has low potential for impacts from hazardous materials that would be offset by minimization and mitigation measures. The reasonably foreseeable future projects are anticipated to have hazardous materials effects similar to those associated with the Build Alternative. Therefore, the Build Alternative, when considered with the reasonably foreseeable future actions, would result in a negligible cumulative effect on this resource.
- **Aesthetics** – The Build Alternative would result in minimal impacts to aesthetics that would be offset by minimization and mitigation measures. Aesthetic impacts are anticipated to occur from the reasonably foreseeable future projects. Therefore, the Build Alternative, when considered with the reasonably foreseeable future actions, would result in a negligible cumulative effect on this resource.
- **Section 4(f) Resources** – The Build Alternative would result in de minimis impacts to Section 4(f) resources. Reasonably foreseeable future projects would not result in additional effects to these Section 4(f) resources. Therefore, the Build Alternative, when considered with the reasonably foreseeable future actions, would not contribute to a cumulative effect on these resources.
- **Energy** – The Build Alternative would increase efficiency and capacity of rail operations and would result in reduced delay times and decreased fuel usage. The reasonably foreseeable future projects are anticipated to consume energy and fuel. Therefore, the Build Alternative, when considered with the reasonably foreseeable future actions, would result in a negligible cumulative effect on this resource.
- **Public Health and Safety** – The Build Alternative would result in minimal impacts to public health and safety that would be offset by minimization and mitigation measures. The reasonably foreseeable future projects are anticipated to have public health and safety effects similar to those associated with the Build Alternative. Therefore, the Build Alternative, when considered with the reasonably foreseeable future actions, would result in a negligible cumulative effect on this resource.

- **GHG** – The projects included in the cumulative effects analysis would each contribute to GHG emissions. Although the proposed construction and operation of the Build Alternative would produce GHG emissions, the project would result in fewer emissions compared with shipping the same amount of freight by truck. The capacity improvements would reduce delays that contribute to GHG emissions. Reasonably foreseeable future actions would also benefit from these improvements. Thus, the Build Alternative, when considered with reasonably foreseeable future actions, is anticipated to have an overall beneficial cumulative effect on GHG emissions.

4.14 Section 4(f) and Section 6(f)

4.14.1 Section 4(f) Properties

Section 4(f) applies to transportation projects that receive federal funding from or require approval by a federal agency of the USDOT and prohibits the use of a publicly owned park, recreation area, or wildlife and waterfowl refuge of national, state, or local significance, or land of a historic site of national, state, or local significance (49 USC 303[c]).

There are two scenarios under which a federal agency may approve a transportation project requiring the use of a Section 4(f) property: (1) there is no prudent and feasible alternative to using that land, and the program or project includes all possible planning to minimize harm to the park, recreation area, wildlife and waterfowl refuge, or historic site resulting from the use; or (2) the use of the Section 4(f)-protected property is determined to be *de minimis*.

The Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) amended Section 4(f) to allow federal agencies to determine that certain uses would have a *de minimis*, or no adverse effect, on a protected resource provided that the responsible party with jurisdiction over the affected property agrees in writing. The Moving Ahead for Progress in the 21st Century Act (MAP-21) maintained the determination of *de minimis* impacts. *De minimis* impacts to Section 4(f) properties are also defined and addressed in 23 CFR 774.17. For parks, recreation areas, and wildlife and waterfowl refuges, a *de minimis* impact is one that does not adversely affect the features, attributes, or activities qualifying the property for protection under Section 4(f). For historic resources, a *de minimis* impact is defined as a determination of either "no adverse effect" or "no historic properties affected" (no effect) in compliance with Section 106 of the NHPA.

Five Section 4(f)-protected properties were identified: Riverfront Park, a publically owned park located on the bank of the Neches River; the Beaumont Police Department, a historic-age building eligible for listing in the NRHP; the Neches River Bridge, a historic-age rail bridge eligible for listing in the NRHP; and two contributing resources to the NRHP-listed Beaumont Commercial District. These properties are described below.

4.14.1.1 Riverfront Park

Riverfront Park (**Appendix D, Exhibit 22**) is situated on the west bank of the Neches River east of the Beaumont Civic Center Complex at 805 Main Street. This 7.4-acre publically owned park includes a boat dock, miniature amphitheater, benches and picnic tables, a covered pavilion, and an overlook that provides views of the Neches River and rail bridge. The southern portion of the park abuts the KCS Railway right-of-way and includes a triangular-shaped parking lot used by Riverfront Park patrons, as well as for overflow parking for the Beaumont Civic Center and City Hall.

Appendix D, Exhibit 23 shows the relationship of the Build Alternative to the Riverfront Park. The Build Alternative would convert approximately 0.41 acres of Riverfront Park to transportation use, equating to approximately 5.5 percent of the total acreage of the park property. About 0.4 acres is needed from a 1.3-acre overflow parking area to accommodate the fillslope on the second track, and 0.01 acres is needed from an undeveloped portion of the park, located outside the fenced area of the park immediately adjacent to the KCS Railway just west of the Neches River. Project improvements in this area include an approach structure for the additional rail bridge. Current design plans indicate that all piers would be installed outside of the park boundary, and improvements would span this unimproved portion of the park once construction is complete. Other rail improvements within the boundaries of Riverfront Park include minor track work associated with a short stretch of the BNSF line within the existing railroad right-of-way. This area is privately owned by railroad entities and it does not function as part of the park. Once construction is completed, the BNSF rail would function as it currently does. Therefore, the improvements would not constitute a use under Section 4(f).

Constructive use under Section 4(f) may include impacts such as noise, access restrictions, vibration, ecological intrusions and visual impacts. Note that constructive use does not occur when noise resulting from the project does not approach or exceed the noise abatement criteria or when it is considered a barely perceptible increase over existing levels. As discussed in **Section 4.5**, the Build Alternative noise and vibration impact at the park would be moderate. (72 dBA). However, since rail noise is part of the existing park environment with existing noise levels exceeding 70 dBA, this impact would not result in a constructive use of the park. Likewise, there would be no constructive use from visual impacts. The Build Alternative would parallel the existing rail alignment and would be at a similar grade as the existing rail line. The new bridge could alter the view of the existing bridge from viewpoints such as the Riverfront Park; however, since both bridge designs would be a through-truss lift bridge, the character of the transportation facility and the surrounding environment under the Build Alternative would not be substantially different visually or aesthetically from the existing condition. The new bridge would be of similar height and construction materials as the existing bridge. Renderings of the proposed bridge from this viewpoint are provided in **Appendix E, Photos 19 and 20**.

The City of Beaumont and the Port of Beaumont have been identified as the officials with jurisdiction for Riverfront Park. As discussed in **Section 6.0**, these parties have participated in stakeholder meetings, and one on one meetings were held on February 19, 2016 and February 24, 2016 specific

to Section 4(f) considerations. Coordination with the City of Beaumont and Port of Beaumont regarding the park's significance and de minimis use is included in **Appendix F**. It is anticipated that a *de minimis* Section 4(f) determination would be pursued should Section 4(f) apply to the project (e.g., if federal transportation funding is used). Photos and renderings of the park in relation to the project are included in **Appendix E (Photos 15, 18, 19, and 20)**.

4.14.1.2 Beaumont Police Department

The Beaumont Police Department building, located at 255 College Street, is situated at the south corner of Main and College Streets adjacent to the proposed right-of-way. As discussed in the *Report for Historical Studies Survey*, this historic-age (ca. 1973) building is eligible for listing on the NRHP under Criterion C for its exemplification of the Brutalist style of civic architecture of the early 1970s. THC concurrence regarding eligibility is included in **Appendix F**.

The Build Alternative would acquire approximately 0.04 acres from the parking lot behind the police station building, representing a total of approximately 2 percent of the 2.07-acre parcel on which the building is located. The rear parking lot is not a contributing element of the property and does not contribute to the architectural significance of the building. Additionally, the proposed right-of-way acquisition would not impact the building itself, nor would it affect the integrity of its design, materials, workmanship, or feeling. Therefore, the project would have no adverse effect to the Beaumont Police Station under Section 106 of the NHPA. The Build Alternative would have a *de minimis* impact to this historic resource, because the proposed right-of-way acquisition would be minimal and would not affect or diminish the architectural qualities and characteristics for which the building is NRHP eligible. THC had no comment on the *de minimis* impact for the Beaumont Police Station (see **Appendix F**). A photo showing the police department parking area is included in **Appendix E (Photo 14)**.

4.14.1.3 Neches River Bridge

The Neches River Bridge (see **Appendix E, Photo 15**) was constructed in 1941 and is a single-track, vertical lift-span railroad bridge that serves as the only rail crossing of the Neches River in Beaumont. As discussed in the *Report for Historical Studies Survey,* this historic-age bridge is eligible for listing on the NRHP under Criterion A for the areas of Transportation, Commerce, Community Development, and Industry in Beaumont and the lower Neches River area. The bridge is also eligible for listing under Criterion C in the area of Engineering for its vertical lift span technology. THC concurrence regarding eligibility is included in **Appendix F**.

No new right-of-way would be acquired from the Neches River Bridge, and the historic-age bridge would remain in place and continue to operate if the Build Alternative were constructed. The construction of an additional rail bridge north of the existing bridge would not directly impact the historic structure, would not alter its current or historic use, and would not diminish its engineering or historical significance. The bridge would retain integrity of design, materials, workmanship, feeling, location, and association. Therefore, the *Report for Historical Studies Survey* determines that the

Build Alternative would have no adverse effect to the bridge under Section 106 of the NHPA. The Build Alternative would not require a use of this property as defined in 23 CFR 774.17. THC concurrence is included in **Appendix F**.

4.14.1.4 Beaumont Commercial District Contributing Resources

Two historic-age commercial structures (see **Appendix E, Photos 16 and 17**) currently designated as contributing resources to the NRHP-listed Beaumont Commercial District are located within the APE. These include an early-twentieth century, 2-part block commercial structure at 905 Orleans Street, as well as a small, mid-twentieth-century modern commercial structure at 967 Orleans Street. No new right-of-way would be acquired near either of these commercial structures, and the Build Alternative would have no direct, indirect, or cumulative effect to these contributing resources. The Build Alternative would not require a use of either of these properties as defined in 23 CFR 774.17.

4.14.2 Section 6(f) Properties

Section 6(f) of the Land and Water Conservation Fund (LWCF) Act of 1965 requires that recreational facilities receiving funding from the U.S. Department of the Interior under the LWCF Act as allocated by TPWD may not be converted to non-recreational uses (referred to as the anti-conversion requirement) unless approval is received from TPWD and the National Park Service. Conversion to use other than recreation use can occur only if the NPS approves substitution of property of reasonably equivalent usefulness and location and of at least equal fair market value (36 CFR 59.3).

In September 1980, the City of Beaumont received a grant through the LWCF program in the sum of $32,400 for development of Riverfront Park, including installation of picnic units, benches, and water and electrical systems. The grant outlines the areas covered by Section 6(f)(3) anti-conversion protections to include Tracts 2 and 3 of the Noah Tevis Survey Tracts, measuring 4.154 acres and 1.125 acres, respectively (5.279 acres total). According to Part II of the General Provisions of the LWCF Project Agreement and 36 CFR 59.1, the anti-conversion requirement applies in perpetuity or for the term of the lease in the case of leased property. Compliance with the requirements of the grant ceases following the lease expiration unless the grant calls for some other arrangement.

The tracts of land included in the grant were leased to the City of Beaumont from the Port of Beaumont as detailed in a lease agreement dated January 2, 1979. This lease agreement expired in 2001. Currently, these tracts continue to function as part of Riverfront Park and are generally maintained by the City of Beaumont.

According to the City of Beaumont's online zoning map, the entire Riverfront Park area is zoned as Planned Development. In September 2014, the City of Beaumont approved a resolution adopting the Beaumont Riverfront Reinvestment Zone Project Plan, which would develop the park into mixed uses with improved park amenities.

The Build Alternative would acquire approximately 0.4 acres of new right-of-way within the triangular parking lot used by Riverfront Park patrons and as overflow parking for the Beaumont Civic Center and City Hall. This area is within Tract 3 of the Noah Tevis Tract. The Build Alternative would also acquire 0.01 acres from a tract of land located immediately adjacent to the KCS Railway just west of the Neches River. This 0.01-acre area is within Tract 2 of the Noah Tevis Tract. Improvements in this area would consist of construction of an additional rail bridge adjacent to the existing rail bridge. Current design plans indicate that all piers associated with the proposed bridge would be installed outside of the park boundary and that any improvements within this area would span this 0.01-acre unimproved portion of the park. Photos and renderings of the park in relation to the Build Alternative are included in **Appendix E (Photos 15, 18, 19, and 20)**.

Coordination regarding the LWCF grant and applicability of Section 6(f) is currently underway.

4.14.3 Mitigation for Section 4(f) and Section 6(f)

Mitigation for Section 4(f) would include fencing for safety. Mitigation for Section 6(f) would be in-kind replacement of land as determined in consultation with the owner with jurisdiction.

5.0 List of Commitments and Mitigation

The following is a list of commitments and mitigation measures associated with the Build Alternative:

Land Use

1) TxDOT shall comply with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 as amended (Uniform Act).

Community

2) TxDOT shall ensure that positive barriers such as fencing are incorporated into the design, where needed, for public safety to reduce risk of objects or persons entering the railroad corridor.

Transportation Impacts - No mitigation for transportation impacts is warranted.

Air Quality

3) The contractor shall mitigate temporary air pollutants (e.g., fugitive dust and emissions from construction vehicles) by using fugitive dust control measures contained in standard specifications, as appropriate. The Texas Emissions Reduction Plan (TERP) provides financial incentives to reduce emissions from vehicles and equipment. TxDOT encourages construction contractors to use this and other local and federal incentive programs to the fullest extent possible to minimize diesel emissions. Information about the TERP program can be found at: http://www.tceq.state.tx.us/implementation/air/terp/.

Noise and Vibration

4) TxDOT shall assess the reasonableness of the following noise mitigation measures during final design for Sites R2, R3, and R4. Recommended mitigation for noise impacts at these would consist of providing sound insulation for the buildings. Effective treatments would include caulking and sealing gaps in the building façade, and installation of new doors and windows that are specially designed to meet acoustical transmission-loss requirements.

5) Mitigation of noise impacts for Site R5 is not practicable or feasible. Therefore, no mitigation is proposed for Site R5.

6) Mitigation for vibration impacts shall be in accordance with agreements negotiated with the Class I railroads. Regular rail grinding is the recommended mitigation for vibration impacts for Sites R2 and R4.

7) TxDOT shall incorporate low-cost and easily implemented construction noise control measures into the project plans and specifications for use in the vicinity of sensitive receptors. These measures may include, but are not limited to, work-hour limits, exhaust muffler requirements,

haul-road locations, elimination of tail gate banging, ambient-sensitive backup alarms, construction noise complaint mechanisms, and consistent and transparent community communication.

Water Resources

8) TxDOT shall comply with the conditions of the Section 10/404 Individual Permit for construction activities within the Neches River and wetlands. Mitigation for direct wetland impacts shall be determined through coordination with USACE. The appropriate amount of functional capacity units, or credits, shall be purchased from an appropriate mitigation bank, such as the Pineywoods Mitigation Bank.

9) The contractor shall limit disturbance of wetland areas to the area necessary for construction.

10) TxDOT shall coordinate with the local floodplain administrator and conduct necessary modeling for potential floodplain impacts prior to construction.

11) TxDOT shall implement pre-construction and post-construction BMPs for erosion control, sedimentation control, and post-construction total suspended solids control in compliance with Section 401 of the CWA.

12) TxDOT shall comply with TCEQ's TPDES Construction General Permit.

13) TxDOT shall implement a SWPPP, post notice at the construction site, and issue a Notice of Intent.

Ecological Systems and Biological Resources

14) TxDOT shall implement the following BMPs for protection of federal and state threatened species:

    a) Northern Scarlet Snake - Contractors shall be advised of potential occurrence in the study area and shall avoid harming the species if encountered.

    b) Timber Rattlesnake - Contractors shall be advised of potential occurrence in the study area and shall avoid harming the species if encountered.

    c) Plains Spotted Skunk - Contractors shall be advised of potential occurrence in the study area and shall avoid harming the species if encountered.

    d) State threatened bird species – Active nests shall not be disturbed, destroyed, or removed, including ground nesting birds, during the nesting season. Removal of unoccupied inactive nests shall be avoided as practicable. The establishment of active nests shall be prevented during the nesting season on TxDOT owned and operated facilities and structures proposed for replacement or repair. Birds, eggs, young, or

active nests shall not be collected, captured, relocated, or transported without a permit.

15) TxDOT shall incorporate BMPs to protect migratory bird nests. A MBTA appropriate EPIC sheet shall be included in the project file. Appropriate measures shall be taken by TxDOT and the contractor to avoid impacts to migratory birds, including:

a) No active migratory bird nests (nests containing eggs and/or young) shall be removed or destroyed at any time of the year.

b) No colonial nests (swallows, for example) on or in structures shall be removed until all nests in the colony become inactive.

c) Measures, to the extent practicable, shall be used to prevent or discourage migratory birds from building nests within portions of the study area planned for construction.

d) Inactive nests shall be removed from the portions of the study area planned for construction to minimize the potential for reuse by migratory birds.

e) Construction or demolition activities shall be scheduled outside the typical nesting season (February 15 to October 1), and shall comply with the previously listed prohibitive provisions of the MBTA, which apply year-round.

16) TxDOT shall include the following BMPs to protect bat species:

a) Bridge Bats – A survey by a qualified biologist shall be conducted prior to construction to determine if bats are present. If bats are present, appropriate measures shall be taken as practical to ensure that bats are not harmed such as exclusion or timing activities. For maternity colonies, exclusion activities shall be timed to avoid separating lactating females from nursing pups. If structures used by bats are removed as a result of construction, replacement structures shall incorporate bat-friendly design, or artificial roosts shall be constructed to replace these features as practical.

b) Tree Bats – Prior to construction, large hollow trees shall be surveyed for maternity colonies and, if found, shall not be disturbed until after the pups fledge.

17) TxDOT shall coordinate with TPWD since the project is within the range of a SGCN or state-listed fish, and work is in the water.

18) Mitigation of Essential Fish Habitat shall consist of avoidance, minimization, and compensatory mitigation:

a) TxDOT shall comply with federal regulations protecting Essential Fish Habitat and avoid and/or minimize impacts to fishery species and their associated Essential Fish Habitat.

In order to avoid and/or minimize impacts to fishery resources, minimize cost, and maintain traffic within the navigation channel, the design of the Build Alternative has minimized the number of bridge pilings by maximizing the bridge span lengths.

b) TxDOT shall follow guidelines outlined in federal and state required plans including the preparation of a SPCC Plan and a SWPPP for avoidance and minimization of water quality impacts during construction.

c) While conducting pile driving, the contractor shall include the use of a "soft start" method and bubble curtains, where needed, to mitigate for noise impacts to species within the construction area of the Neches River. The contractor shall use turbidity curtains, where needed, to reduce sedimentation impacts to these species.

19) The contractor shall re-vegetate disturbed areas according to TxDOT's standard practices for rural areas, which to the extent practicable, complies with the Executive Memorandum on Beneficial Landscaping. Re-vegetation of disturbed areas by the contractor shall comply with EO 13112 on invasive species. Regionally native and non-invasive plants shall be used to the extent practicable in landscaping and re-vegetation.

Cultural Resources

20) TxDOT shall conduct an archeological survey once right of entry and/or ground conditions permit for unsurveyed segments of the APE that are not mapped as wetlands (totaling approximately nine acres) prior to constructing in these areas.

21) In the event that unanticipated archeological deposits are encountered during construction, the contractor shall cease work in the immediate area, and contact TxDOT and/or THC archeological staff to initiate post-review discovery procedures.

22) For archeological resources, appropriate mitigation measures pertaining to unsurveyed segments of the APE shall be identified as necessary prior to completion of the Section 106 coordination process.

Hazardous Materials and Solid Waste Disposal

23) Any unanticipated hazardous materials and/or petroleum contamination encountered during construction shall be handled and disposed of by the contractor according to applicable federal and state regulations per TxDOT Standard Specifications outlined in Section 6.10 of the "General Provisions of the Standard Specifications for Construction and Maintenance of Highways, Streets and Bridges."

24) As required by the Texas Asbestos Health Protection Rules (25 TAC 295.61), the contractor shall be required to conduct a survey for ACM and provide a 10-working-day, pre-demolition notification prior demolition of the 2 rail-related buildings and 2 utility sheds in the proposed

right-of-way. If asbestos is confirmed, then asbestos-abatement activities shall be performed in accordance with the Texas Asbestos Health Protection Act and the National Emissions Standards for Hazardous Air Pollutants.

25) Prior to project letting, TxDOT shall analyze the coatings on any bridges to be modified for the presence or absence of LBP. If LBP is discovered, contingencies shall be developed to address worker safety, material recycling, and proper management of any paint-related wastes by the contractor, as necessary.

Visual and Aesthetic Quality

26) TxDOT shall mitigate visual impacts through the bridge design of the Build Alternative. The bridge design shall include a through-truss lift bridge of similar height and construction materials as the existing bridge.

Use of Energy

27) The contractor shall follow BMPs during construction that include measures to minimize energy use, such as the use of energy-efficient equipment, restrictions on unnecessary idling of construction equipment, proper maintenance of equipment and machinery to meet original standards, and consolidation of material delivery and use of local materials where possible.

Section 4(f) / 6(f)

28) TxDOT shall mitigate Section 4(f) impacts through acquisition of property in accordance with the Uniform Act and by incorporating fencing into the design of the Build Alternative where needed as a safety measure to minimize potential for conflicts.

29) TxDOT shall mitigate Section 6(f) impacts with in-kind replacement of land in accordance with the Uniform Act and in consultation with the owner with jurisdiction.

6.0 Agency Consultation and Public Involvement

6.1 Stakeholder Coordination Meetings

Table 38 summarizes stakeholder coordination meetings held to date.

Table 38. Stakeholder Coordination Meetings

Date	Participants	Key Discussion
2/18/2015	USCG, BNSF, KCS, City of Beaumont, Port of Beaumont, Jefferson County	Project Stakeholder Meeting - #1: Kickoff meeting. Introduction to the project, request input from stakeholders to develop purpose and need statement.
4/2/2015	BNSF, KCS, UPRR	Stakeholder Meeting with Railroads (conference call): Recap of kickoff meeting, identify additional railroad concerns, revision of draft purpose and need, preliminary financing, next steps.
5/20/2015	FRA, KCS, UPRR, BNSF, Port of Beaumont, Sabine-Neches Navigation District, City of Beaumont	Project Stakeholder Meeting - #2: Recap of kickoff meeting. Summary of input on purpose and need. Review of draft purpose and need statement. Update on project tasks. Review of alignment options. Scheduling of individual meetings. Project schedule.
6/29/2015	UPRR	Individual Stakeholder Meeting with UPRR: Project overview, request input from UPRR regarding alignments and funding sources.
7/1/2015	KCS	Individual Stakeholder Meeting KCS: Project overview, request input from KCS regarding available existing data, alignments and funding sources.
7/22/2015	Port of Beaumont, SETRPC, City of Beaumont, and Jefferson County	Stakeholder Meeting with Local Agencies: Gather input and identify stakeholder concerns regarding design criteria, navigational considerations, railway and roadway integration and access, and alignment options.
8/11/2015	BNSF	Individual Stakeholder Meeting with BNSF: Gather input and identify stakeholder concerns regarding railway access and alignment options.

Date	Participants	Key Discussion
8/20/2015	FRA, USCG, Sabine-Neches Navigational District	Individual Stakeholder Meeting with USCG and Navigation District: Gather input and identify stakeholder concerns regarding alignment options, vertical and horizontal navigational clearance, design criteria, and vessel survey.
9/23/2015	APAC-TX, City of Beaumont, Jefferson County, SETRPC, KCS, UPRR, BNSF, Lamar University, Port of Beaumont, USCG	Project Stakeholder Meeting #3: Gather input on Public Meeting Materials and identify stakeholder concerns regarding alternatives. Presentation of the project, including a review of its local, regional and national importance, purpose and need, alternatives, stakeholder engagement, Sabine-Neches Navigation District perspective, and schedule. The USCG requested a new alternative at this meeting.
12/8/2015	Jefferson Energy Companies, Lanier & Associates, Port of Beaumont	Review of Neches River Bridge project in relation to development plans east of the Neches River.
2/24/2016	FRA, USCG, KCS, UPRR, BNSF, Port of Beaumont, City of Beaumont, Lanier & Associates	Project Stakeholder Meeting #4: Presentation of the project, including the project overview, a review of the environmental analysis to date, and an update on the alternative analysis, public and stakeholder engagement, next steps, schedule, and funding. Alternative E-1 identified as the proposed Build Alternative to advance to 30 percent design and then evaluated in the Draft EA along with the No Build Alternative.
7/20/2016	Port of Beaumont, BNSF, KCS	Project Stakeholder Meeting #5: Presentation of the project, including a recap of the project overview, a review of the alternative and environmental analysis, public and stakeholder engagement, next steps, schedule, and funding status.

Source: Study Team 2016

6.2 Public Open House

TxDOT held a public open house on October 21, 2015, to introduce the study to the public, outline proposed alternatives, and detail the alternatives screening process. The notice of the open house was published in the Beaumont Enterprise and El Perico newspapers, a letter was sent to elected officials, a postcard notified adjacent property owners, and an email with the project newsletter provided additional notice to stakeholders. TxDOT also posted the notice of the open house and

meeting materials at www.txdot.org. Meeting notices and materials recognized that TxDOT is utilizing public involvement procedures under NEPA to fulfill the Section 106 public involvement requirements and explained how individuals or organizations may request to become a consulting party.

Some 20 citizens and 8 public officials attended the meeting. The open house offered the opportunity to review exhibits and maps that outlined the environmental process and timeline; summarized the project purpose and need; described the No Build and Build Alternatives, environmental constraints, and alternative comparison matrix; and explained how to provide comments and participate in the Section 106 process. Schematics of the alternatives were spread out on tables for the public to view and discuss with team members. A written comment area was furnished with tables, chairs, comment forms, pens and comment boxes for depositing the comments. A court reporter was available at another table for recording of verbal comments. As participants entered the public open house, they were asked to sign in and offered a newsletter and comment form. Meeting materials were available in Spanish and a translator was present; however, no requests for language assistance were received. The *Public Meeting Summary Report* (TxDOT, 2015b) provides further details regarding this meeting and comments received.

6.3 Agency Coordination

Table 39 identifies agency coordination conducted to date. Coordination with agencies is ongoing.

Table 39. Agency Coordination

Date(s)	Agency	Purpose
7/13/2015	USCG	Email to the USCG requesting review of proposed design criteria.
8/20/2015	USCG Sabine Neches Navigational District	Meeting with the Study Team to gather input and identify concerns regarding alignment options, vertical and horizontal navigational clearance, design criteria, and vessel survey.
9/30/2015	USACE THC	Email to USACE and THC (and other stakeholders) providing the project introduction newsletter and invitation to Public Open House.
9/30/2015	USACE	Email response from USACE identifying project representative.
9/30/2015	THC	Email response from THC regarding question related to Section 106 coordination.
9/30/2015	THC	Email reply to THC regarding 9/30/2015 inquiry.
10/2015	TGLO	Personal communication with Study Team and TGLO to discuss the Coastal Zone Management Program and TxDOT Consistency Determination Authority.
11/16/2015	TPWD	Email submittal of Biological Resources Technical Report and Biological Evaluation Form (Endangered Species).

Date(s)	Agency	Purpose
11/20/2015	Jefferson County Historical Commission	Email response to opportunity to comment on historic resources in the study area.
12/4/2015	TPWD	Email request from TPWD for additional information regarding the proposed laydown area and EMST impacts.
1/6/2016	TPWD	Email response to TPWD's 12/4/2015 inquiry.
1/21/2016	TPWD	Followup email regarding laydown area and permitting. TPWD requests that non-regulatory mitigation be considered for potential impacts to the Chenier Plain - Mixed Live Oak forest and riparian habitat.
1/29/2016	TPWD	Email response to TPWD's 1/21/2016 inquiry.
2/19/2016 2/24/2016	Port of Beaumont City of Beaumont	Phone conferences with the Port of Beaumont and City of Beaumont to discuss Section 4(f) considerations related to the Riverfront Park and Beaumont Police Department building. Discussion included a review of ownership, significance of the park, potential impacts, and option to reduce impacts through the use of a retaining wall. A formal letter to these entities is underway.
3/1/2016	TPWD	Email reply from TPWD stating there are no TPWD properties with projects in the area and inquiring if consultation is to remain open.
3/1/2016	TPWD	Email to TPWD's 3/1/2016 inquiry regarding closing of consultation.
3/8/2016	TPWD	Email reply from TPWD stating coordination is complete.
4/28/2016	THC	Letter requesting concurrence with findings and recommendations in the Draft Archeological Survey Report.
4/28/2016	THC	Response from THC providing their concurrence with the Draft Archeological Survey Report.
4/5/2016	NMFS	Email to NMFS requesting Essential Fish Habitat consultation.
4/18/2016	NMFS	Question from NMFS regarding construction laydown area.
4/19/2016	NMFS	Response to NMFS 4/18/2016 inquiry.
4/25/2016	Port of Beaumont	Letter requesting concurrence with regarding significance and de minimis impact for Riverfront Park.

Date(s)	Agency	Purpose
4/25/2016	City of Beaumont	Letter requesting concurrence with regarding significance and de minimis impact for Riverfront Park.
6/22/2016	Port of Beaumont	Response providing concurrence with de minimis impact for Riverfront Park. Defers determination of significance to the City of Beaumont.
6/23/2016	City of Beaumont	Response providing concurrence with significance and de minimis impact for Riverfront Park.
6/27/2016	NMFS	Response from NMFS concurring that adverse effects that might occur to Essential Fish Habitat would be minimal.
7/14/2016	THC	Concurrence with non-archeological Section 106 findings. Also, no comments regarding the Section 4(f) de minimis impact for Beaumont Police Station.

Source: Study Team 2016

7.0 Conclusion

The Build Alternative (Alternative E-1) is the recommended Preferred Alternative. As presented in this document, the Build Alternative would incorporate measures to avoid and minimize impacts to parks, historic properties, wetlands, and water resources. Specifically, during the development of the 30 percent design, the centerline of Alternative E-1 was shifted closer to the existing bridge to minimize impacts on these resources. The Build Alternative would comply with all environmental laws and applicable EOs, or these requirements would be met at the appropriate times. Permits would be applied for once funding is secure.

The Build Alternative is the recommended as the Preferred Alternative because:

- Track capacity would be increased over existing condition across the Neches River by adding a single-track bridge.
- Dispatching and industrial access would likely be the same as existing. Future connections to planned industrial facilities east of the river could be made from the new track.
- Train operating design speed would be improved from 20 mph to 30 mph west of the river. The operating speed east of the river (40 mph) would be the same as currently exists.
- The vertical grade would be the same as the existing bridge.
- Train operations would be able to continue throughout construction with short-term construction windows.
- The additional bridge capacity would reduce train traffic delays and stacking of trains over the no build condition.
- There would be no at-grade road/rail crossings to delay vehicular traffic.
- The vertical and horizontal clearances of the bridge comply with the minimum navigational requirements listed in the NOAA navigation charts (NOAA 2016a).
- The new track would accommodate future connections to planned industrial facilities east of the river.
- Impacts to wetlands, waters of the U.S., floodplains, parklands, historic properties, hazardous material sites, and low income/minority populations would be minimized.
- Minimal right-of-way would be needed, and no businesses or residences would be displaced.
- The alignment would be located within the existing KCS right-of-way adjacent to the historic Beaumont Commercial District.
- It is the lowest cost alternative.

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9.0 List of Abbreviations

ACM asbestos containing materials

ACS American Community Survey

ADA Americans with Disabilities Act

APE area of potential effect

ASTM American Society for Testing and Materials

BMPs Best Management Practices

BNSF Burlington Northern and Santa Fe Railway Company

CBRA Coastal Barrier Resources Act

CEQ Council on Environmental Quality

CFR Code of Federal Regulations

CIA Community Impacts Assessment

CMP Coastal Management Program

CO carbon monoxide

CO_2 carbon dioxide

CSJ control-section-job

CTR Center for Transportation Research

CZMP Coastal Zone Management Plan

CWA Clean Water Act

dB decibel

dBA a-weighted decibels

dbh diameter at breast height

EA Environmental Assessment

EJ Environmental Justice

EO Executive Order

EMST Ecological Mapping Systems of Texas

EPIC Environmental Permits, Issues, & Commitments

FAST ACT Fixing America's Surface Transportation Act

FEMA Federal Emergency Management Agency

FIRM Flood Insurance Rate Map

FONSI Finding of No Significant Impact

FR Federal Register

FRA Federal Railroad Administration

FTA Federal Transit Administration

FWCA Fish and Wildlife Coordination Act

GBN ground-borne noise

GHG greenhouse gas

GVB ground-borne vibration

KCS Kansas City Southern

HC hydrocarbons

HUC hydrologic unit code

ISA Initial Site Assessment

ISD Independent School District

JOHRTS Jefferson-Orange-Hardin Regional Transportation Study

LBP lead-based paint

L_{dn} Day-night equivalent level

L_{eq} Equivalent Sound Level

L_{max} maximum levels for a single event

LEP limited English proficiency

LWCF Land and Water Conservation Fund

MBTA Migratory Bird Treaty Act

MMPA Marine Mammal Protection Act

MOU Memorandum of Understanding

MS4 Municipal Separate Storm Sewer System

MTP Metropolitan Transportation Plan

NAAQS National Ambient Air Quality Standards

NAIP National Agriculture Imagery Program

NEPA National Environmental Policy Act

NHD National Hydrography Dataset

NHPA National Historic Preservation Act

NLCD National Land Cover Data

NMFS National Marine Fisheries Service

NOA Notice of Availability

NOAA National Oceanic and Atmospheric Administration

NO_x nitrogen oxides

NRCS Natural Resources Conservation Service

NRHP National Register of Historic Places

NWI National Wetland Inventory

O_3 ozone

PCB polychlorinated biphenyls

PM particulate matter

PPV peak particle velocity

RMS root mean square

ROW right-of-way

RSA Resource Study Area

RTC Rail Traffic Controller

SAFETEA-LU Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users

SETRPC South East Texas Regional Planning Commission

SGCN species of greatest conservation need

SPCC Spill Prevention Control and Countermeasures

STIP Statewide Transportation Improvement Program

SWPPP Storm Water Pollution Prevention Plan

TAC Texas Administrative Code

TCEQ Texas Commission on Environmental Quality

TERP Texas Emissions Reduction Plan

TGLO Texas General Land Office

THC Texas Historical Commission

TIGER Transportation Investment Generating Economic Recovery

TIP Transportation Improvement Programs

TNRIS Texas Natural Resources Information Systems

TPDES Texas Pollutant Discharge Elimination System

TPWD Texas Parks and Wildlife Department

TxDOT Texas Department of Transportation

UPRR Union Pacific Railroad

USACE U.S. Army Corps of Engineers

USC United States Code

USCG U.S. Coast Guard

USGS U.S. Geological Survey

USDOT U.S. Department of Transportation

USEPA U.S. Environmental Protection Agency

USFWS U.S. Fish and Wildlife Service

USGCRP United States Global Change Research Program

VdB vibration decibels

VOC volatile organic compound

Appendices

Appendix A – No Build (Existing Conditions)

Appendix B – Alternative Development Matrix

Appendix C – Build Alternative (30% Design)

Appendix D – Environmental Resource Exhibits

Appendix E – Site Photographs

Appendix F – Coordination