AECOM

TECHNICAL MEMORANDUM
WILDLIFE CROSSINGS

To: Jerry Smiley, AICP, AECOM

From: Jennifer Oakley, AECOM

Date: November 1, 2017

RE: DALLAS TO HOUSTON HSR – WILDLIFE CROSSINGS

Linear transportation projects can create movement barriers for many wildlife species, including amphibians, reptiles and small and large mammals, resulting in impacts to individual species and ecosystems. Indirect effects to wildlife species from habitat fragmentation could include interrupting migration corridors resulting in potentially lowered reproductive success rates (restricted gene flow). Fragmentation could also divide existing populations into subpopulations, potentially increasing predation on small animals due to lack of cover and general disturbance of wildlife communities immediately adjacent to the Dallas to Houston High-Speed Rail Project corridor. To mitigate such impacts, wildlife crossings provide permanent structures that are integrated into the landscape to reduce fragmentation and limit the impacts of wildlife movement barriers. The Build Alternatives would include design features to avoid impacts to wildlife corridors to the maximum extent practicable. Minimization of potential impacts would include the use of viaducts and incorporating wildlife crossings at a frequency to minimize direct and indirect impacts to wildlife. Other mitigation design elements include elevated tracks, underpasses, and specific structures for wildlife crossings which could allow for unimpeded wildlife movement.

This technical memorandum details proposed wildlife crossing design considerations and recommendations for the Build Alternatives based on currently available scientific literature. Due to the average lifespan of wildlife crossing structures (approximately 70 to 80 years), the location and design of the crossings would consider the changing dynamics of habitat and climatic conditions and the target species populations over time. Target species include native species with the potential to occur along the Build Alternatives, such as white-tailed deer (*Odocoileus virginianus*), bobcat (*Lynx rufus*) as well as threatened and endangered species, and exclude non-native species such as feral pigs (*Sus scrofa*). Once a preferred alternative has been selected, design plans would be further refined based upon field studies and close coordination with landowners, wildlife agencies and species-specific experts. The design plans would identify optimal wildlife-friendly crossing locations to maintain or enhance crossings, dispersal, and migration opportunities for wildlife across the Build Alternatives. TCRR would be responsible for initiating coordination with landowners, wildlife agencies and species-specific experts, ensuring correct construction and placement of all wildlife crossings and post construction monitoring and maintenance of all wildlife crossings.

General Design Considerations

The potential impacts to wildlife movement would be dependent on the permeability of the Build Alternatives (i.e., the presence of elevated or viaduct structures, road crossings or wildlife crossings), the amount of non-urban land within and adjacent to the Build Alternatives, and identified habitat linkages and corridors within and adjacent to the corridor. A detailed understanding of the wildlife and associated habitats with the potential to occur within the corridor is important to determine specific characteristics of individual wildlife crossing locations and specifications in order to minimize and mitigate impacts to wildlife movements. Corridor-wide considerations focus on the permeability and connectivity of the landscape along the Build Alternatives including topography, locations of threatened and/or endangered species, migration corridors, unfragmented areas of wildlife habitat, watersheds and other similar concerns. Frequency and placement of wildlife crossings should support habitat connectivity and be tailored to any target species. Research suggests that the design of a wildlife crossing can be just as important as the crossing location.[1, 2, 3]

A general summary of wildlife crossing design considerations and recommendations based on a review of available literature is provided below. These recommendations would be incorporated into more detailed designs, as appropriate, and as required to mitigate potential impacts identified by the FRA analyses.[4, 5, 6]

- Include key project stakeholders along with researchers and professionals familiar with wildlife and ecology in the Study Area in design development to address local concerns.
- Publically available data, including National Wetlands Inventory (NWI), National Hydrography Data (NHD), Ecological Mapping Systems of Texas (EMST) and Natural Resources Conservation Service (NRCS) soils data will be utilized in the determination of optimum placement of wildlife crossings.
- Integrate wildlife crossings into the natural landscape and take advantage of existing wildlife corridors when deciding on the placement of wildlife crossings.
- Ensure that wildlife crossings connect to and from larger regional corridor networks to address habitat fragmentation (division of a particular habitat) and avoid ecological dead-ends (a connection that fails to connect to similar habitat).
- Incorporate a variety of styles of crossings to ensure opportunities for all species present in the corridor (for example, amphibians need tunnels that are wet and cool, while small mammals need cover in the form of logs, rocks and bushes) .
- Place crossings in areas with limited noise and human activity, such as away from cities and towns, to the greatest extent applicable.

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[1] TCRR, "*Texas Central Partners Texas High Speed Rail Final Draft Conceptual Engineering Report-FDCERv7*," September 15, 2017.
[2] Clevenger, Anthony P. and Huijser, Marcel P. *Wildlife Crossing Structure Handbook Design and Evaluation in North America.* Federal Highway Administration, 2011.
[3] Iuell, B.; Bekker, C.J.; Cuperus, R.; Dufek, J.; Fry, G.; Hicks, C.; Hlavac, V.; Keller, V.; Rosell, C.; Sangwine, T.; Torslov, N.; and Wandall, B. *Wildlife and Traffic: A European Handbook for Identifying Conflicts and Designing Solutions*. NKKV Publishers, Brussels, Belguim, 2003.
[4] TCRR, "*Texas Central Partners Texas High Speed Rail Final Draft Conceptual Engineering Report-FDCERv7*," September 15, 2017.
[5] Clevenger, Anthony P. and Huijser, Marcel P. *Wildlife Crossing Structure Handbook Design and Evaluation in North America.* Federal Highway Administration, 2011.
[6] Iuell, B.; Bekker, C.J.; Cuperus, R.; Dufek, J.; Fry, G.; Hicks, C.; Hlavac, V.; Keller, V.; Rosell, C.; Sangwine, T.; Torslov, N.; and Wandall, B. *Wildlife and Traffic: A European Handbook for Identifying Conflicts and Designing Solutions*. NKKV Publishers, Brussels, Belguim, 2003.

- Locate crossings away from highways and other hazard areas to prevent wildlife mortality due to exposure to traffic or other threats, unless studies or expertise from researchers and professionals indicate a high mortality along certain areas necessitating placement of wildlife crossings in such locations.
- Ensure adequate provision and effective design of wildlife crossings to prevent wildlife from crossing adjacent roadways and threatening driver safety after project implementation including areas that the Build Alternatives parallel adjacent roadway corridors.
- In areas where the Build Alternatives parallel roadway corridors, wildlife crossings would be placed to avoid funneling wildlife towards roadways but would be placed in locations with high road mortality, as these areas are considered population sinks and known wildlife corridors.
- Protect both sides of wildlife crossings with long-term conservation easements, particularly at larger crossings.
- Place crossings creating a straight line of sight for wildlife to encourage use of the crossings.
- Consider long-term maintenance requirements of passages and fencing to ensure effectiveness of crossings, especially the bottom of passages in riparian areas and holes in fencing.
- Wildlife crossings in highly urbanized areas, namely in the City of Dallas and Houston, would be limited due to anticipated low wildlife populations.

General Wildlife

To provide a basis for detailed design of wildlife crossings for the Draft EIS stage of the Project, the project team used information gathered during the review of drainage and infrastructure elements to target preliminary locations for the placement of crossings. In addition, areas were identified for further investigation based on proposed embankment length, proximity to water resources, surrounding fragmentation, proximity to viaduct crossings and vegetation type and cover (shown on **Wildlife Crossings Mapbook**). These preliminary locations were identified and mapped in GIS considering the following basic assumptions: [7]

- Viaduct sections would allow “free movement” and would not require wildlife crossings.
- Embankment sections, stations, and large maintenance facilities would “constrict movement” and require wildlife crossings.
- Wildlife crossings would be moved, as appropriate; to take advantage of proposed drainage design features (i.e. culverts).
- Wildlife crossings would be placed regardless of frequency to accommodate special situations (i.e. fenced stations or maintenance facilities and large road crossings).
- Wildlife crossings in highly urbanized areas, namely in the City of Dallas and Houston, would be limited due to anticipated low wildlife populations.

[7] TCRR, “*Texas Central Partners Texas High Speed Rail Final Draft Conceptual Engineering Report-FDCERv7*,” September 15, 2017.

In order for a crossing to be effective for a target species, it would be critical to determine the minimum structure size necessary through environmental analysis. Recommendations for sizing and specifications of wildlife crossings based on current available literature includes:[8, 9, 10]

- Wildlife crossings designed to accommodate small to large wildlife should utilize microhabitat complexity and escape cover (e.g. logs, rock piles) to encourage use by the smaller wildlife. In addition, to encourage use by smaller wildlife, incorporating tunnel sub compartments within the larger wildlife crossings should be considered.
- To encourage use of all wildlife crossings by amphibians and reptiles, natural ponds and riparian habitats should be incorporated into the crossing design. In addition, crossings should maintain existing riparian vegetation, soil moisture and natural light at crossings, where applicable.
- If a closed bottom (i.e. concrete floor) is incorporated into a wildlife crossing, it is recommended that a soil substrate of at least 6 inches be applied to the interior of the crossing.
- For wildlife crossings designed for small to medium-sized wildlife, ensure that sufficient cover and protection is incorporated into the crossing design. These crossings should be placed in known routes of seasonal migration, dispersal or other movement events for target amphibians and reptiles to encourage use by these species.
- The recommended dimension of a wildlife crossing underpass for small to large mammals is 32 feet wide and greater than 13 feet high with a minimum recommendation of 23 feet wide and 13 feet high.
- The minimum recommended dimension of a wildlife crossing underpass incorporated into large creek culvert crossings is greater than 10 feet wide and greater than 13 feet high with a minimum of six and a half feet wide and 10 feet high. This size could be used for small to large mammals as well as amphibians and reptiles. For smaller modified culverts, the recommended dimension for small to medium-sized mammals and amphibians and reptiles is greater than three feet wide and greater than four feet high with a minimum of one and a half feet wide and greater than three feet high.
- For wildlife crossings designed for small to medium-sized mammals, the recommended size is one to four feet wide and one to four feet high or a diameter of one to four feet.
- Amphibian and reptile tunnel dimensions would vary depending on target species. The recommended size range for tunnels is one to three feet in diameter.
- Tunnels installed for the passage of amphibians and reptiles should be placed between upland habitat and wetland breeding grounds or between isolated wetlands. The tunnels should be placed to allow for migration of adults to travel from breeding grounds, migration of adults returning to upland habitat, and the emigration of metamorphs from breeding ponds.

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[8] Clevenger, Anthony P. and Huijser, Marcel P. *Wildlife Crossing Structure Handbook Design and Evaluation in North America.* Federal Highway Administration, 2011.

[9] Iuell, B.; Bekker, C.J.; Cuperus, R.; Dufek, J.; Fry, G.; Hicks, C.; Hlavac, V.; Keller, V.; Rosell, C.; Sangwine, T.; Torslov, N.; and Wandall, B. *Wildlife and Traffic: A European Handbook for Identifying Conflicts and Designing Solutions*. NKKV Publishers, Brussels, Belguim, 2003.

[10] Roads & Ecological Infrastructure: Concepts and Applications for Small Animals, Edited by Kimberly M. Andrews, Priya Nanjappa, and Seth P. D. Riley, The Wildlife Society, 2015, Chapter 6: The Current Planning and Design Process

Riparian and Flooding Areas

Wildlife corridors are generally associated with riparian habitats; therefore, wildlife crossings placed in riparian areas can be desirable for the free movement of wildlife. If the riparian habitat would be retained or cover would be provided along the walls of underpasses, small and medium-sized wildlife are more likely to utilize wildlife crossings placed in these areas. In addition, these types of crossings can be easily adapted for amphibians and reptiles.[11] A large number of the wildlife crossings would be placed in association or in conjunction with creek crossings within the Study Area. These creek corridors are often the only sufficiently vegetated areas in otherwise predominantly agricultural or developed areas. They frequently serve as wildlife travel corridors and as foraging and resting habitat for wildlife.

Where the track configuration would be on an embankment, creeks would be carried through culverts. These culverts would be designed to accommodate the 100-year flood with three feet of freeboard. Culverts would be used by some species during dry periods to cross the alignment, but during heavy rain events these crossings may be flooded. However, additional culvert design features should be considered to allow safe passage for wildlife at these crossings during flood events. In areas where culvert placement or structure does not allow for these additional design features, the design team would review the need for additional crossings at higher elevations.

Once a preferred alternative has been selected, the considerations and recommendations below would be incorporated into more detailed design as appropriate.[12, 13, 14]

- Culverts for wildlife crossings can be placed near those used to convey stormwater, but should be placed at an elevation above the design flood elevation. Travel routes to these wildlife crossing culverts would also need to be above the 100-year flood elevations and should have appropriate cover.
- Wildlife crossings incorporated into culvert design should include minimal clearing widths to reduce impacts on existing vegetation. Where practicable, open designs should be considered to provide ample natural lighting to allow for natural vegetative growth.
- Wildlife crossings incorporated into culvert design should consider specifications to accommodate amphibians and reptiles as well as small to large mammals.
- Even in riparian zones, culverts should be built with dry ledges for use by water-shy wildlife, and ledges should be located above the design flood elevation.
- Where wildlife crossings are incorporated into creek culverts, specific size specifications for each crossing would be based on the results of the environmental analyses, as well as coordination with local land owners, trained biologists, and wildlife agencies (A minimum size recommendation is provided above in **General Wildlife**).
- Avoid importation of soils from outside the Study Area.

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[11] Clevenger, Anthony P. and Huijser, Marcel P. *Wildlife Crossing Structure Handbook Design and Evaluation in North America.* Federal Highway Administration, 2011.

[12] TCRR, "*Texas Central Partners Texas High Speed Rail Final Draft Conceptual Engineering Report-FDCERv7*," September 15, 2017.

[13] Clevenger, Anthony P. and Huijser, Marcel P. *Wildlife Crossing Structure Handbook Design and Evaluation in North America.* Federal Highway Administration, 2011.

[14] Iuell, B.; Bekker, C.J.; Cuperus, R.; Dufek, J.; Fry, G.; Hicks, C.; Hlavac, V.; Keller, V.; Rosell, C.; Sangwine, T.; Torslov, N.; and Wandall, B. *Wildlife and Traffic: A European Handbook for Identifying Conflicts and Designing Solutions*. NKKV Publishers, Brussels, Belguim, 2003.

- Escape cover should be provided for small to medium wildlife to avoid predation and encourage use.
- Box culverts have been found effective in both riparian and upland situations, especially when used in conjunction with fencing to guide (or "funnel") animals into the culvert.
- Selection of the substrate in the floor of the culvert has been demonstrated to be important and should be the same or similar to the substrate in the surrounding habitat.
- Long-term monitoring and maintenance of the culverts should be considered to maintain effectiveness, especially following precipitation events.
- Boulders, riprap, or other coarse materials should not be used to maintain the aprons on culverts used for passage by small-bodied animals since rough materials may be difficult to navigate for small and hoofed wildlife unless a smooth pathway is provided.

Frequency of Wildlife Crossings

Factors that influence landscape connectivity (the degree to which the landscape facilitates or impedes wildlife movement and ecological flows) include terrain, habitat type, levels of human activity and climate. Therefore, in order to determine optimum frequency, spacing and placement of wildlife crossings along the Build Alternatives, considerations include the variability of landscape, population densities, species movement data, biology for target species and the juxtaposition of wildlife habitat, including critical habitat that intersects the LOD and the connectivity requirements for the target species. In general, landscapes that are highly fragmented with little natural habitat would require fewer wildlife crossings as compared to relatively intact, less fragmented landscapes.[15] To facilitate spacing of wildlife crossings, the home ranges for target species would be determined through environmental analysis once a final build alternative is selected. The size of a particular species' home range is directly related to the size of the animal and its ability to move.[16] In addition, habitat suitability models should be created for target species including previously mentioned factors as well as land cover, elevation, topographic position, slope, aspect, proximity to water resources and soil characteristics. Habitat utilization is influenced by but not limited to food resource availability, mating and nesting sites, avoidance of predators, and hazards and competition with other species.[17] The design team would work with the environmental analysis team to develop impact mitigation standards, which would prescribe a minimum crossing density (crossings/mile) based on the biology of the target species (large vs. small vs. amphibian/reptilian), habitat fragmentation (highly fragmented vs. largely intact), habitat types, and construction type (i.e. viaduct vs. embankment). Individual wildlife crossing needs would also be identified for any target species found within the corridor that are federally listed as threatened or endangered and would consider the species' home range and habitat suitability models. A minimum crossing frequency of one-half mile (+/- 0.1 mile) would be applied along the Build Alternative where wildlife migration would be constricted.[18, 19]

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[15] Clevenger, Anthony P. and Huijser, Marcel P. *Wildlife Crossing Structure Handbook Design and Evaluation in North America.* Federal Highway Administration, 2011.
[16] Bissonett, John A. and Cramer, Patricia C. *Evaluation of the Use and Effectiveness of Wildlife Crossings, NCHRP Report 615*. Transportation Research Board, Washington D.C., 2008.
[17] Corridor Design. "Conceptual steps for designing wildlife corridors." http://corridordesign.org/designing_corridors. 2013. Accessed July 28, 2016
[18] TCRR, "*Texas Central Partners Texas High Speed Rail Final Draft Conceptual Engineering Report-FDCERv7*," September 15, 2017.
[19] Clevenger, Anthony P. and Huijser, Marcel P. *Wildlife Crossing Structure Handbook Design and Evaluation in North America.* Federal Highway Administration, 2011.

Additional recommendations and considerations for frequency and spacing of wildlife crossings based on current available literature includes:[20, 21, 22]

- Determine land use within and adjacent to the LOD based on aerial photography and EMST data to identify areas considered urban vs. non-urban.
- Preliminary wildlife crossings in areas with soils types preferred by the Houston toad would be placed every 500 feet; however, to allow for safe passage of amphibians and reptiles, including the Houston Toad, and increase the acceptance of the tunnels, it is recommended that tunnels be placed no more than 100 feet apart and in close proximity to breeding ponds.

The final number, types and spacing of wildlife crossings would be based upon the results of the environmental analyses, coordination with wildlife agencies and local subject matter experts once a preferred alternative is selected.

Land Use and Ownership

Land use and property ownership would be considered when determining the placement and design of wildlife crossings. Communication and coordination with land owners will aid in identifying potential issues related to unwanted wildlife movement onto or off of their property. As appropriate to mitigate impacts, existing rural fences that would allow wildlife species to pass through would be improved.[23]

During design, crossings would generally be placed on larger tracts of land with suitable habitat where ingress and egress are confined to the same property; if ingress and egress to the crossing are located on separate properties, special arrangements such as conservation easements would likely be necessary with individual landowners.[24]

Project-Specific Considerations

Embankment Sections

Wildlife crossings would be integrated along embankment sections at sufficient intervals along the Build Alternatives in order to facilitate wildlife movement and prevent wildlife movement barriers. At this level of design development, it is assumed that these crossings would most often be integrated with culvert crossings for drainage because wildlife corridors are generally associated with riparian habitats, culverts, employing wildlife-friendly designs such as catwalk sections [25], could be used by some species during dry periods to cross the Build Alternatives. Additional information regarding these types of crossings is provided above in **Riparian and Flooding Areas**. Based on the number and frequency of culvert crossings and proximity to

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[20] Clevenger, Anthony P. and Huijser, Marcel P. *Wildlife Crossing Structure Handbook Design and Evaluation in North America.* Federal Highway Administration, 2011.

[21] Iuell, B.; Bekker, C.J.; Cuperus, R.; Dufek, J.; Fry, G.; Hicks, C.; Hlavac, V.; Keller, V.; Rosell, C.; Sangwine, T.; Torslov, N.; and Wandall, B. *Wildlife and Traffic: A European Handbook for Identifying Conflicts and Designing Solutions*. NKKV Publishers, Brussels, Belguim, 2003.

[22] Jochimsen, Denim M.; Peterson, Charles R.; Andrews, Kimberly M.; and Gibbons, J. Whitfield. A Literature Review of the Effects of Roads on Amphibians and Reptiles and the Measures Used to Minimize those Effects. Idaho Fish and Game Department, 2004.

[23] Ibid.

[24] Ibid.

[25] Andrews, K.M., P. Nanjappa, and S.P.D. Riley. Roads and Ecological Infrastructure. Johns Hopkins Press. Baltimore, Maryland. 2015.

viaduct sections, it is recommended that a minimum of 74 wildlife crossings are constructed along the approximately 120.6 miles of embankment sections (shown on **Wildlife Crossings Mapbook)**. Approximately 69 miles of embankment were identified for further investigation based on embankment length, proximity to water resources, amount or lack of habitat fragmentation, distance to viaduct crossings and vegetation cover (woodland, grassland and agricultural) (shown on **Wildlife Crossings Mapbook)**. For the total number of proposed wildlife crossings and the miles identified for further investigation by segment, refer to **Table 1**. Additional typical details for culverts and wildlife crossings have been included in the Draft Conceptual Engineering Report.[26]

Table 1: Comparison by Segment

Segments	Miles on Embankment	# of Potential Minimum Wildlife Crossings	Miles of Further Investigation
Segment 1	2.9	0	3.1
Segment 2A	5.7	2	2.1
Segment 2B	6.4	2	3.2
Segment 3A	8.8	5	4.8
Segment 3B	10.7	9	5.5
Segment 3C	30.2	16	20.6
Segment 4	28.6	21	14.9
Segment 5	27.5	19	15.0

Source: AECOM, 2017

Identifying optimal locations for wildlife crossings as well as the final size and frequency of proposed wildlife crossings would be determined through field investigations by trained biologists, more detailed Project designs and coordination with local land owners and wildlife agencies.

Crossings would be located in areas with appropriate vegetation which provide sufficient wildlife cover to encourage the use of these crossings. This would be especially important for smaller and less mobile species. Wooded bottomlands, mesic and upland forests and woodlands or other areas with cover vegetation, such as vegetated fence lines, would be more attractive to wildlife and would have a greater frequency of crossings.

Viaduct Sections

Corridor segments with viaducts would not require many special considerations other than the placement of security fences or other barriers to prevent access by wildlife to the rail and access roads constructed on viaduct.

Viaducts are generally used where the track configuration would be located more than 20 feet (6.1 meters) above the surrounding grade. In addition, viaducts would also be used to cross floodplains and large water resources to minimize fill in those areas. Viaducts would be placed

[26] TCRR, "*Texas Central Partners Texas High Speed Rail Final Draft Conceptual Engineering Report-FDCERv7*," September 15, 2017.

to minimize disturbance to habitats, vegetation and riparian areas and would be designed wide enough to conserve riparian habitats and maintain local landform. Based on the current conceptual design, approximately 60 percent of the Build Alternatives would be constructed on viaduct. The viaducts would be constructed between approximately 5 and 80 feet from natural ground to the lowest elevation of the viaduct beam. The placement of viaducts along the Build Alternatives would provide unimpeded wildlife movement in floodplains and riparian areas where there would be significant wildlife habitat as well as other wildlife movement corridors. To mitigate impacts, expanded use of viaducts would be investigated as an infrastructure approach in critical wildlife habitat areas and areas with significant wildlife populations.

Fencing

In order to further reduce the risk of wildlife collisions and ensure the safe operation of the HSR system, fencing would be used to divert or funnel wildlife into the wildlife crossings. Fencing for the entire Build Alternative and for all crossings would be securely designed and tamper-proof so that animals cannot burrow, chew, climb or otherwise access the HSR line.[27] Standard fencing would consist of various sizes of page wire or similar material fencing at minimum of 12 feet high for large mammals and six feet high for small mammals. Fencing would be reinforced with dense, high-resistant wire mesh as applicable. Given propensity of the feral pig for cursorial (digging/rooting) behavior, protection of the HSR line from these animals would be a key consideration. High-strength buried fencing, or electrified fencing, would be required in areas with established pig populations and where the grade separation of the tracks and the natural ground is minimal. Typical details in the conceptual design for potential fencing types that could be employed at different locations along the Build Alternatives are included in the Draft Conceptual Engineering drawings.[28] In addition, long-term monitoring and maintenance of fencing should be considered to maintain integrity and effectiveness following installation.

Wildlife Overpasses

Wildlife overpasses are typically employed along roadways to reduce traffic mortality for wildlife, provide safe passage for large-bodied mammals and improve roadway safety. However, given that the majority of the HSR line would be constructed on an embankment or on an elevated viaduct with overhead catenary, the use of overpasses would likely be cost prohibitive except in select locations. In locations where topography or soils would not support culverts below track level, the use of overpasses would be considered.[29]

The following are considerations and recommendations related to overpasses for wildlife crossings:[30, 31]

- Typically the highest cost option, overpasses are typically used over multi-lane roadways, roadways with high-density and fast-driving traffic, high-speed railway line in areas where wildlife/vehicle collisions are relatively frequent and result in severe injuries or fatalities, or when special status species or ungulates (e.g. white-tailed deer

[27] TCRR, "*Texas Central Partners Texas High Speed Rail Final Draft Conceptual Engineering Report-FDCERv7*," September 15, 2017.
[28] Ibid.
[29] Ibid.
[30] Clevenger, Anthony P. and Huijser, Marcel P. *Wildlife Crossing Structure Handbook Design and Evaluation in North America.* Federal Highway Administration, 2011.
[31] Iuell, B.; Bekker, C.J.; Cuperus, R.; Dufek, J.; Fry, G.; Hicks, C.; Hlavac, V.; Keller, V.; Rosell, C.; Sangwine, T.; Torslov, N.; and Wandall, B. *Wildlife and Traffic: A European Handbook for Identifying Conflicts and Designing Solutions*. NKKV Publishers, Brussels, Belguim, 2003.

[*Odocoileus virginianus*]) and small to large mammals (e.g. bobcat [*Lynx rufus*] and rabbits) are involved.

- The placement of overpasses should be oriented and sized to the occurrence and behavior of the target species. The overpass should be wide enough at its narrowest point to function as a habitat corridor. In general, the minimum width recommendation for overpasses is 130 to 165 feet.
- In general, larger wildlife requires wider overpasses than smaller wildlife. In addition, smaller wildlife tends to rely on special habitat features, such as vegetation for cover.
- To ensure performance and function, wildlife overpasses should be situated in areas with high landscape permeability, are known wildlife travel corridors, and have minimal human disturbance.
- Fencing and vegetation can be used to direct animals to the overpass.
- Substrate and vegetation on the overpass should match that of surrounding landscapes and provide cover and refuge for small to medium wildlife.
- Soil depth should be sufficient for water retention for plant growth and support trees, if applicable, while providing adequate drainage.
- Overpasses can be effectively used to maintain habitat connectivity, especially when used in conjunction with vegetation and fencing to guide animals to over-crossing. Overpasses themselves may serve as intermediate habitat for smaller-sized organisms.
- Vegetation is often used to provide a sight and sound barrier at edges of overpass to encourage use by disturbance-shy animals.
- Long-term monitoring and maintenance of the structure and drainage system should be considered to maintain effectiveness and safety of the overpass.

Species-Specific Crossings

The effectiveness of the type of wildlife crossings utilized along the Build Alternatives would differ based on the target species. A list of wildlife species with the potential to occur in the Study Area is provided in **Section 3.6, Natural Ecological Systems and Protected Species** in the Draft EIS. For the purposes of identifying minimum recommended wildlife crossing width and heights, the target species are combined in to general groups consisting of large mammals (e.g. white-tailed deer), medium-sized mammals (e.g. bobcat, coyote [*Canis latrans*] and raccoon [*Procyon lotor*]), small mammals (e.g. ground squirrels and mice), and amphibians and reptiles (e.g. frogs, toads, snakes and lizards). As a general rule, wildlife crossings should be designed to allow for the movement of the greatest diversity of species.

As no standard design document is available for Texas-specific species, the project team would consult guidelines, successful designs, and Best Management Practices (BMPs) for wildlife crossings in other geographic areas, such as those by the California Department of Transportation (Caltrans) and the Arizona Game and Fish Department (AZGFD) as identified in the Draft Conceptual Engineering Report, and the Federal Highway Administration (FHWA) and European Commission. Guidance from these and similar sources would be adapted to create successful design approaches for species specific to the Study Area.

Houston Toad

The Houston toad is a federal and state-listed endangered species. Therefore, this species and its habitat are afforded federal protection under the Endangered Species Act, as discussed in **Section 3.6, Natural Ecological Systems and Protected Species**. Once a preferred alternative has

been selected, canopy cover and soil type should be taken into consideration for optimizing locations of wildlife crossings within Houston toad habitat. All other considerations would correspond with general amphibian and reptile target species.

Future Design Development Approach for Wildlife Crossings

The level of detail developed for the design and placement of wildlife crossings would increase through the planning and design process. Examples of typical details and proposed approaches to mitigation of impacts have been provided with the Draft Conceptual Engineering design to support the Draft EIS. Location-specific treatments and more advanced typical details would be provided in support of the Final EIS following input from the FRA, USFWS and TPWD.

In addition to the literature review, engineers and biologists from the project team have initiated planning-level design development to identify opportunities for wildlife crossings along the Build Alternatives. The planning level efforts completed to date in preparation of the Draft Conceptual Engineering include:[32]

- Drainage Design – Identified existing creek corridors along the Build Alternatives and bridge underpasses or culvert crossings required to meet drainage needs.
- Infrastructure Type Selection – Selected the proposed infrastructure type, namely embankment versus viaduct section; selection driven largely by track configuration and by constructability considerations, but identifies opportunities for wildlife crossing locations.
- Species List for Wildlife Crossings along the Preferred Alternative – Developed a list of species within the Study Area that would require some type of crossing to prevent interruptions to normal migrations patterns or require special considerations due to their protected status (i.e., threatened or endangered).
- Maps of Wildlife Crossing Areas – Performed a desktop analysis to identify the following:
    - Viaduct areas = free wildlife crossing, no special considerations
    - Highly urbanized areas where wildlife crossings would be low priority
    - Crossing locations along embankment sections at a specified interval (for purposes of this exercise, spacing would follow recommendations for white tailed deer)
    - Areas with special crossing considerations for the Houston toad
- Typical Sections for Wildlife Crossings and Fencing – Identified typical wildlife crossing and fencing details that could be modified for the Build Alternatives to meet the requirements of target species (i.e. white-tailed deer and Houston toad) and HSR safety needs.

Considerations and recommendations that should be incorporated into future design along with the planning level efforts mentioned above include the following:[33, 34]

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[32] TCRR, "*Texas Central Partners Texas High Speed Rail Final Draft Conceptual Engineering Report-FDCERv7*," September 15, 2017.
[33] Jochimsen, Denim M.; Peterson, Charles R.; Andrews, Kimberly M.; and Gibbons, J. Whitfield. A Literature Review of the Effects of Roads on Amphibians and Reptiles and the Measures Used to Minimize those Effects. Idaho Fish and Game Department, 2004.
[34] Roads & Ecological Infrastructure: Concepts and Applications for Small Animals, Edited by Kimberly M. Andrews, Priya Nanjappa, and Seth P. D. Riley, The Wildlife Society, 2015, Chapter 6: The Current Planning and Design Process

- While highly urbanized areas were considered low priority during the initial planning level efforts, it is recommended that areas along roadway corridors, including IH-45, consider placing wildlife crossings in locations with high road mortality and known wildlife corridors while avoiding funneling wildlife toward the roadways.
- Preliminary wildlife crossings were based on a frequency of every one-half mile. While this spacing is adequate for general wildlife crossings to allow for safe passage of small to large wildlife, tunnels should be placed every 100 feet to allow for the safe passage of amphibians and reptiles, including the Houston Toad, and increase acceptance of the tunnels.
- It is recommended that canopy cover be considered in determining optimum placement of wildlife crossings in Houston toad habitat.
- All bridges and culverts along existing roadways should be mapped and cataloged to assist in optimal placement of wildlife crossings.

The project team used GIS, design plans and aerial photography to analyze existing creek corridors along the Build Alternatives and bridge underpasses, or culvert crossings required to meet drainage needs. This information was compared to the proposed infrastructure type to identify and compare those locations where wildlife migration across the Build Alternatives would be impacted by design. In general, the project team considered viaduct sections with bridge overpasses to be areas of "free movement" for wildlife, where all species within the corridor would be able to easily navigate the corridor without special crossing considerations. As stated previously, approximately 60 percent of the Build Alternatives would be constructed on viaduct to increase permeability of the corridor for wildlife crossings. Conversely, embankment sections with culverted drainage crossings were considered "constricted" by the project team in terms of wildlife movement, thus potentially requiring special design treatments in the form of specialized culvert design and separate wildlife crossings in upland areas, to facilitate passage across the Build Alternatives.[35] The potential locations for specialized culvert design to incorporate wildlife crossings are provided on **Wildlife Crossings Mapbook**. Based on these locations, a minimum of 74 wildlife crossings is recommended along the 120.6 miles of embankment within the Build Alternatives. In addition, areas were identified for further investigation based on proximity to water resources, existing fragmentation, distance to viaduct crossings and vegetation cover (woodland, grassland and agricultural) are shown on **Wildlife Crossings Mapbook**. For the total number of proposed wildlife crossings and the miles identified for further investigation by segment refer to **Table 1**.

For the Final EIS, mitigation measures to address identified impacts would be provided, including site-specific crossing treatments. The level of detail required would be refined through coordination with regulatory bodies during the Final EIS stage, but it is expected that the following actions would be required:[36]

- Field Survey – The Study Area would be surveyed by qualified biologists to determine habitat suitability of crossings proposed in the planning-level design
    - Additional studies in areas identified for further investigation on **Wildlife Crossings Mapbook** would be conducted to determine the need and placement

[35] TCRR, "*Texas Central Partners Texas High Speed Rail Final Draft Conceptual Engineering Report-FDCERv7*," September 15, 2017.
[36] Ibid.

of additional crossings. Approximately 69 miles of the embankment sections were identified for further investigation. For the total number of proposed wildlife crossings and the miles identified for further investigation by segment refer to **Table 1**.
        - In addition, areas identified as listed species habitat would require further investigation to determine the need for additional crossings in those areas
- Develop Site-Specific Requirements for Fencing – Further refine typical details for fencing based on species-specific requirements. Identify locations along the preferred alternative for each fencing type. Where field survey and consultation with local resource agencies and subject matter experts indicate the presence of established feral pig populations, detailed design of specialized fencing would be advanced given the animal's ability to dig, the damage that the animal can do to sensitive systems, and the harm that can be caused by impact with an HSR trainset.
- Develop Site-Specific Crossing Treatments – Document requirements for wildlife treatments (fencing and crossings) based on site-specific habitats and target species. Identify treatments proposed at each location along the preferred alternative.
- Property Impacts – Identify any additional ROW requirements associated with provision of wildlife crossings, such as the purchase of conservation easements in the vicinity of wildlife crossings. Wildlife crossing designs would consider property ownership on either side of the crossing to minimize the need for special arrangements and conservation easements.
- Engage Local Subject Matter Experts – The location and design of wildlife crossings would be informed by local subject matters experts and resource agencies during design as appropriate.

Conclusion and Limitations

This technical memorandum identifies proposed wildlife crossing areas requiring further investigation, considerations, and recommendations for frequency and dimensions for wildlife crossings. The following includes limitations of this technical memorandum:

- The information presented is broad and meant to provide considerations and recommendations for the largest diversity of species possible.
- The considerations and recommendations are based on current literature and not based on agency or landowner coordination or field analysis which is essential when determining optimum placement, type, and frequency of wildlife crossings.
- Specific locations of potential existing wildlife crossings incorporated into existing roadways was not known when determining potential placement of wildlife crossings and areas for further investigation along the Study Area. Therefore, coordination with transportation agencies to determine exact locations of existing wildlife crossings, if any, should be conducted.
- Home ranges and habitat suitability models for target species is not included in publicly available data and was not mapped by the project team at the time that this technical memorandum was prepared.
- Crossings associated with NHD and NWI data relies upon accuracy of those publicly available databases and should be field verified.
- The minimum potential wildlife crossings presented in the technical memorandum is subject to change based on further environmental analysis and coordination.

AECOM

TECHNICAL MEMORANDUM
WATERS OF THE U.S.

To: Megan Inman, AECOM

From: Jennifer Oakley, AECOM

Date: November 1, 2017

RE: Dallas to Houston HSR – Waters of the U.S.

This technical memorandum identifies the streams, wetlands and waterbodies that occur within the Dallas to Houston HSR Study Area. The tables provided in this memorandum include streams, wetlands and waterbodies based on NHD, NWI and field collected data (as of April 25, 2017) construction type (access road, rail, stormwater drainage, facility, station and temporary fill), crossing type (fill, excavation, viaduct and culvert) and acres of estimated impacts at each crossing. For additional information on waters of the U.S. and descriptions of the crossing types refer to Section 3.7, Waters of the U.S. of the DEI

Dallas County

Table 1: Estimated Stream Impacts – Dallas County						
Natural Resources Mapbook Page #	Stream ID/Name*	Classification	Construction Type	Crossing Type	Segment 1	
					Temp	Perm
					linear feet	
1	Unnamed	Perennial	Access Road	Viaduct	0.00	0.00
1	Unnamed	Perennial	Station	Viaduct	0.00	0.01
2	Trinity River	Artificial	Access Road	Viaduct	0.00	0.00
2	Trinity River	Artificial	Stormwater Drainage	Excavation	0.00	451.0
2	Trinity River	Artificial	Rail	Viaduct	0.00	0.00
2	Trinity River	Artificial	Temporary Fill	Fill	43.5	0.00
3	Unnamed	Perennial	Access Road	Viaduct	0.00	0.00
3	Unnamed	Perennial	Stormwater Drainage	Excavation	0.00	165.1
3	Unnamed	Perennial	Rail	Viaduct	0.00	0.00
3	Unnamed	Artificial	Access Road	Viaduct	0.00	0.00
3	Unnamed	Artificial	Rail	Viaduct	0.00	0.00
3	NCB2S8	Intermittent	Temporary Fill	Fill	17.0	0.00
3	NCB2S8	Intermittent	Rail	Viaduct	0.00	0.00
3	NCB2S8	Intermittent	Access Road	Viaduct	0.00	0.00
4	Honey Springs Branch	Intermittent	Rail	Viaduct	0.00	0.00
4	NCC2S1	Intermittent	Access Road	Viaduct	0.00	0.00
4	NCC2S1	Intermittent	Rail	Viaduct	0.00	0.00
5	NCC3S1	Perennial	Rail	Viaduct	0.00	0.00
5	NCC3S1	Perennial	Access Road	Viaduct	0.00	0.00
5	NCC3S5	Ephemeral	Access Road	Viaduct	0.00	0.00
5	NCC3S5	Ephemeral	Rail	Viaduct	0.00	0.00
5	NCC3S7	Perennial	Access Road	Viaduct	0.00	0.00
5	NCC3S7	Perennial	Rail	Viaduct	0.00	0.00

Table 1: Estimated Stream Impacts – Dallas County						
Natural Resources Mapbook Page #	Stream ID/Name*	Classification	Construction Type	Crossing Type	Segment 1	
					Temp	Perm
					linear feet	
6	NCC3S3	Perennial	Access Road	Viaduct	0.00	0.00
6	NCC3S3	Perennial	Rail	Viaduct	0.00	0.00
6	Newton Creek	Perennial	Rail	Viaduct	0.00	0.00
6	Whites Branch	Perennial	Rail	Viaduct	0.00	0.00
9	Unnamed	Artificial	Access Road	Fill	0.00	321.7
9	Unnamed	Artificial	Stormwater Drainage	Excavation	0.00	247.1
9	Unnamed	Artificial	Rail	Fill	0.00	82.9
9	Unnamed	Intermittent	Access Road	Fill	0.00	54.6
10	Tenmile Creek	Perennial	Access Road	Viaduct	0.00	0.00
10	Tenmile Creek	Perennial	Rail	Viaduct	0.00	0.00
11	Unnamed	Intermittent	Rail	Viaduct	0.00	0.00
11	Unnamed	Intermittent	Access Road	Viaduct	0.00	0.00
11	Unnamed	Intermittent	Rail	Viaduct	0.00	0.00
				Total	60.5	1,322.4

Source: USGS, 2016; FNI, 2017

*Stream ID # (N) indicates a specific feature recorded in the field whereas stream names (or those "unnamed") indicate features mapped via data not yet field-verified. Jurisdictional determinations to be confirmed by the USACE. Each stream is separated by construction type.

Table 2: Estimated Wetland Impacts – Dallas County						
Natural Resources Mapbook Page #	Wetland ID/ Classification*	Wetland Type	Construction Type	Crossing Type	Segment 1	
					Temp	Perm
					acres	
2	NCB2FW6	Forested	Access Road	Viaduct/Conversion	0.00	0.01
2	NCB2FW6	Forested	Stormwater Drainage	Excavation	0.00	0.05
2	NCB2FW6	Forested	Rail	Viaduct/Conversion	0.00	0.11

Table 2: Estimated Wetland Impacts – Dallas County						
Natural Resources Mapbook Page #	Wetland ID/ Classification*	Wetland Type	Construction Type	Crossing Type	Segment 1	
					Temp	Perm
					acres	
2	NCB2FW6	Forested	Facility	Fill	0.00	0.03
2	NCB2FW6	Forested	Access Road	Viaduct/Conversion	0.00	0.08
2	NCB2FW6	Forested	Rail	Viaduct/Conversion	0.00	0.01
2	NCB2FW6	Forested	Facility	Fill	0.00	0.02
2	NCB2FW6	Forested	Access Road	Viaduct/Conversion	0.00	0.01
2	NCB2FW6	Forested	Stormwater Drainage	Excavation	0.00	0.06
2	NCB2FW6	Forested	Rail	Viaduct/Conversion	0.00	0.03
2	NCB2FW1	Forested	Access Road	Viaduct/Conversion	0.00	0.09
2	NCB2FW1	Forested	Stormwater Drainage	Excavation	0.00	1.5
2	NCB2FW1	Forested	Rail	Viaduct/Conversion	0.00	0.08
2	PFO1A	Forested	Access Road	Viaduct/Conversion	0.00	0.01
2	PFO1A	Forested	Stormwater Drainage	Excavation	0.00	0.15
2	PFO1A	Forested	Rail	Viaduct/Conversion	0.00	0.13
2	PFO1A	Forested	Temporary Fill	Fill	0.05	0.00
2	NCB2EW2	Emergent	Access Road	Viaduct	0.00	0.00
2	NCB2EW2	Emergent	Stormwater Drainage	Excavation	0.00	<0.01
2	NCB2EW2	Emergent	Rail	Viaduct	0.00	0.00
2	PFO1A	Forested	Stormwater Drainage	Excavation	0.00	0.10
2	PEM1A	Emergent	Access Road	Viaduct	0.00	0.00
2	PEM1A	Emergent	Stormwater Drainage	Excavation	0.00	2.12
2	PEM1A	Emergent	Rail	Viaduct	0.00	0.00
2	PEM1A	Emergent	Temporary Fill	Fill	0.27	0.00
3	PEM1A	Emergent	Access Road	Viaduct	0.00	0.00
3	PEM1A	Emergent	Rail	Viaduct	0.00	0.00
4	PFO1A	Forested	Utilities	Viaduct/Conversion	0.01	0.00
5	NCC2EW2	Emergent	Access Road	Viaduct	0.00	0.00

Table 2: Estimated Wetland Impacts – Dallas County						
Natural Resources Mapbook Page #	Wetland ID/ Classification*	Wetland Type	Construction Type	Crossing Type	Segment 1	
					Temp	Perm
					acres	
5	NCC3SW4	Scrub/Shrub	Access Road	Viaduct	0.00	0.00
5	NCC3SW4	Scrub/Shrub	Rail	Viaduct	0.00	0.00
5	NCC3FW8	Forested	Rail	Viaduct	0.00	0.04
5	NCC3FW1	Forested	Access Road	Viaduct/Conversion	0.00	0.04
5	NCC3FW1	Forested	Rail	Viaduct/Conversion	0.00	0.14
5	NCC3FW1	Forested	Access Road	Viaduct/Conversion	0.00	0.02
5	NCC3FW99	Forested	Utilities	Fill	0.10	0.00
5	NCC3FW99	Forested	Access Road	Viaduct/Conversion	0.00	0.13
5	NCC3FW99	Forested	Rail	Viaduct/Conversion	0.00	1.3
6	NCC3FW98	Forested	Rail	Viaduct/Conversion	0.00	0.07
6	PFO1A	Forested	Rail	Viaduct/Conversion	0.00	0.60
7	PFO1C	Forested	Access Road	Fill	0.00	<0.01
10	PFO1A	Forested	Access Road	Viaduct/Conversion	0.00	0.35
10	PFO1A	Forested	Rail	Viaduct/Conversion	0.00	0.75
10	PFO1C	Forested	Rail	Viaduct/Conversion	0.00	0.04
2	NCB2FW6	Forested	Access Road	Viaduct/Conversion	0.00	0.01
				Total	0.43	8.1

Source: USFWS, 2016; FNI, 2017

*Wetland ID # (N) indicates a specific feature recorded in the field. Wetland classifications (P) indicate wetlands not yet field-verified. Jurisdictional determinations to be confirmed by the USACE. Each wetland is separated by construction type.

P - Palustrine
EM – Emergent
FO – Forested
FO1 – Broad-leaved Deciduous Forested
EM1 - Persistent Emergent
A - Temporarily Flooded
C - Seasonally Flooded

Table 3: Estimated Waterbody Impacts – Dallas County						
Natural Resources Mapbook Page #	Waterbody ID/Name *	Waterbody Type	Construction Type	Crossing Type	Segment 1	
					Temp	Perm
					acres	
2	NCB2PD5	Pond	Access Road	Viaduct	0.00	0.00
2	NCB2PD5	Pond	Facility	Fill	0.00	0.08
2	NCB2PD5	Pond	Temporary Fill	Fill	<0.01	0.00
2	NCB2PD5	Pond	Facility	Fill	0.00	0.01
2	NCB2PD5	Pond	Access Road	Viaduct	0.00	0.00
2	NCB2PD5	Pond	Stormwater Drainage	Excavation	0.00	0.13
2	NCB2PD5	Pond	Rail	Viaduct	0.00	0.00
2	Unnamed	Pond	Stormwater Drainage	Excavation	0.00	0.26
2	Unnamed	Pond	Rail	Viaduct	0.00	0.00
2	Unnamed	Pond	Access Road	Viaduct	0.00	0.00
2	Unnamed	Pond	Stormwater Drainage	Excavation	0.00	0.62
3	Unnamed	Pond	Access Road	Viaduct	0.00	0.00
3	Unnamed	Pond	Rail	Viaduct	0.00	0.00
7	Unnamed	Pond	Rail	Viaduct	0.00	0.00
7	Unnamed	Pond	Access Road	Viaduct	0.00	0.00
8	Mooreland Lake	Lake	Rail	Viaduct	0.00	0.00
9	Unnamed	Pond	Access Road	Fill	0.00	0.05
9	Unnamed	Pond	Stormwater Drainage	Excavation	0.00	0.43
9	Unnamed	Pond	Rail	Fill	0.00	0.55
				Total	<0.01	2.1

Source: USGS, 2016; USFWS, 2016; FNI, 2017

*Waterbody ID # (N) indicates a specific feature recorded in the field. Waterbody classifications (P) indicate wetlands not yet field-verified. Jurisdictional determinations to be confirmed by the USACE. Each waterbody is separated by construction type.

Ellis County

Table 4: Estimated Stream Impacts for – Ellis County																	
Natural Resources Mapbook Page #	Stream ID/ Name*	Classification	Construction Type	Crossing Type	Segment 1		Segment 2A		Segment 2B		Segment 3A		Segment 3B		Segment 3C	
					Temp	Perm	Temp	Perm	Temp	Perm	Temp	Perm	Temp	Perm	Temp	Perm
					linear feet		linear feet		linear feet		linear feet		linear feet		linear feet	
12	Long Branch	Perennial	Access Road	Viaduct	0.00	0.00	--	--	--	--	--	--	--	--	--	--
12	Long Branch	Perennial	Rail	Viaduct	0.00	0.00	--	--	--	--	--	--	--	--	--	--
13	Bear Creek	Perennial	Access Road	Viaduct	--	--	--	--	0.00	0.00	--	--	--	--	--	--
13	Bear Creek	Perennial	Rail	Viaduct	--	--	0.00	0.00	0.00	0.00	--	--	--	--	--	--
13	Unnamed	Intermittent	Access Road	Viaduct	--	--	0.00	0.00	--	--	--	--	--	--	--	--
13	Unnamed	Intermittent	Rail	Viaduct	--	--	0.00	0.00	--	--	--	--	--	--	--	--
13	Unnamed	Intermittent	Access Road	Viaduct	--	--	--	--	0.00	0.00	--	--	--	--	--	--
13	Unnamed	Intermittent	Rail	Viaduct	--	--	--	--	0.00	0.00	--	--	--	--	--	--
13	Unnamed	Intermittent	Access Road	Viaduct	--	--	--	--	0.00	0.00	--	--	--	--	--	--
13	Unnamed	Intermittent	Rail	Viaduct	--	--	--	--	0.00	0.00	--	--	--	--	--	--
13	Unnamed	Intermittent	Access Road	Viaduct	--	--	0.00	0.00	--	--	--	--	--	--	--	--
13	Unnamed	Intermittent	Rail	Viaduct	--	--	0.00	0.00	--	--	--	--	--	--	--	--
13	Unnamed	Intermittent	Access Road	Excavation	--	--	--	--	0.00	152.8	--	--	--	--	--	--
13	Unnamed	Intermittent	Access Road	Fill	--	--	--	--	0.00	276.5	--	--	--	--	--	--
13	Unnamed	Intermittent	Rail	Fill	--	--	--	--	0.00	276.5	--	--	--	--	--	--
13	Unnamed	Artificial	Access Road	Fill	--	--	0.00	5.6	--	--	--	--	--	--	--	--
13	Unnamed	Artificial	Rail	Fill	--	--	0.00	152.8	--	--	--	--	--	--	--	--
13	Unnamed	Artificial	Rail	Excavation	--	--	--	--	0.00	5.6	--	--	--	--	--	--
13	Unnamed	Intermittent	Access Road	Viaduct	--	--	--	--	0.00	0.00	--	--	--	--	--	--
13	Unnamed	Intermittent	Rail	Viaduct	--	--	--	--	0.00	0.00	--	--	--	--	--	--
14	Unnamed	Intermittent	Access Road	Viaduct	--	--	0.00	0.00	--	--	--	--	--	--	--	--

Table 4: Estimated Stream Impacts for – Ellis County																	
Natural Resources Mapbook Page #	Stream ID/ Name*	Classification	Construction Type	Crossing Type	Segment 1		Segment 2A		Segment 2B		Segment 3A		Segment 3B		Segment 3C	
					Temp	Perm	Temp	Perm	Temp	Perm	Temp	Perm	Temp	Perm	Temp	Perm
					linear feet		linear feet		linear feet		linear feet		linear feet		linear feet	
14	Unnamed	Intermittent	Rail	Viaduct	--	--	0.00	0.00	--	--	--	--	--	--	--	--
15	NCF3S10	Perennial	Rail	Viaduct	--	--	0.00	0.00	--	--	--	--	--	--	--	--
15	Brushy Creek	Intermittent	Access Road	Viaduct	--	--	--	--	0.00	0.00	--	--	--	--	--	--
15	Brushy Creek	Intermittent	Rail	Viaduct	--	--	--	--	0.00	0.00	--	--	--	--	--	--
15	Unnamed	Intermittent	Access Road	Viaduct	--	--	--	--	0.00	0.00	--	--	--	--	--	--
15	Unnamed	Intermittent	Rail	Viaduct	--	--	--	--	0.00	0.00	--	--	--	--	--	--
15	NCG3S7	Ephemeral	Access Road	Viaduct	--	--	0.00	0.00	--	--	--	--	--	--	--	--
15	NCG3S7	Ephemeral	Rail	Viaduct	--	--	0.00	0.00	--	--	--	--	--	--	--	--
15	NCG3S8	Ephemeral	Access Road	Viaduct	--	--	0.00	0.00	--	--	--	--	--	--	--	--
15	NCG3S8	Ephemeral	Rail	Viaduct	--	--	0.00	0.00	--	--	--	--	--	--	--	--
15	NCG3S2	Ephemeral	Access Road	Viaduct	--	--	0.00	0.00	--	--	--	--	--	--	--	--
15	NCG3S2	Ephemeral	Rail	Viaduct	--	--	0.00	0.00	--	--	--	--	--	--	--	--
15	Unnamed	Intermittent	Access Road	Viaduct	--	--	--	--	0.00	0.00	--	--	--	--	--	--
15	Unnamed	Intermittent	Rail	Viaduct	--	--	--	--	0.00	0.00	--	--	--	--	--	--
15	Unnamed	Intermittent	Rail	Viaduct	--	--	0.00	0.00	--	--	--	--	--	--	--	--
15	NCG3S3	Intermittent	Access Road	Viaduct	--	--	0.00	0.00	--	--	--	--	--	--	--	--
15	NCG3S3	Intermittent	Rail	Viaduct	--	--	0.00	0.00	--	--	--	--	--	--	--	--
16	Unnamed	Intermittent	Access Road	Viaduct	--	--	--	--	0.00	0.00	--	--	--	--	--	--
16	Unnamed	Intermittent	Rail	Viaduct	--	--	--	--	0.00	0.00	--	--	--	--	--	--
16	Unnamed	Artificial	Access Road	Viaduct	--	--	--	--	0.00	0.00	--	--	--	--	--	--
16	Unnamed	Artificial	Rail	Viaduct	--	--	--	--	0.00	0.00	--	--	--	--	--	--
16	Red Oak Creek	Perennial	Access Road	Viaduct	--	--	--	--	0.00	0.00	--	--	--	--	--	--
16	Red Oak Creek	Perennial	Rail	Viaduct	--	--	--	--	0.00	0.00	--	--	--	--	--	--

Table 4: Estimated Stream Impacts for – Ellis County																	
Natural Resources Mapbook Page #	Stream ID/ Name*	Classification	Construction Type	Crossing Type	Segment 1		Segment 2A		Segment 2B		Segment 3A		Segment 3B		Segment 3C	
					Temp	Perm	Temp	Perm	Temp	Perm	Temp	Perm	Temp	Perm	Temp	Perm
					linear feet		linear feet		linear feet		linear feet		linear feet		linear feet	
16	NCG3S4	Perennial	Access Road	Viaduct	--	--	0.00	0.00	--	--	--	--	--	--	--	--
16	NCG3S4	Perennial	Rail	Viaduct	--	--	0.00	0.00	--	--	--	--	--	--	--	--
17	Unnamed	Artificial	Access Road	Fill	--	--	0.00	11.6	--	--	--	--	--	--	--	--
17	Unnamed	Artificial	Rail	Fill	--	--	0.00	11.6	--	--	--	--	--	--	--	--
17	Unnamed	Artificial	Rail	Viaduct	--	--	--	--	0.00	0.00	--	--	--	--	--	--
17	Unnamed	Artificial	Access Road	Viaduct	--	--	--	--	0.00	0.00	--	--	--	--	--	--
17	Unnamed	Intermittent	Access Road	Fill	--	--	0.00	246.0	--	--	--	--	--	--	--	--
17	Unnamed	Intermittent	Access Road	Viaduct	--	--	--	--	0.00	0.00	--	--	--	--	--	--
17	Unnamed	Intermittent	Rail	Viaduct	--	--	--	--	0.00	0.00	--	--	--	--	--	--
17	Unnamed	Intermittent	Access Road	Viaduct	--	--	0.00	0.00	--	--	--	--	--	--	--	--
17	Unnamed	Intermittent	Rail	Viaduct	--	--	0.00	0.00	--	--	--	--	--	--	--	--
17	Unnamed	Intermittent	Access Road	Viaduct	--	--	0.00	0.00	--	--	--	--	--	--	--	--
17	Unnamed	Intermittent	Rail	Viaduct	--	--	0.00	0.00	--	--	--	--	--	--	--	--
17	Unnamed	Intermittent	Access Road	Viaduct	--	--	--	--	0.00	0.00	--	--	--	--	--	--
17	Unnamed	Intermittent	Rail	Viaduct	--	--	--	--	0.00	0.00	--	--	--	--	--	--
17	Bone Branch	Intermittent	Access Road	Viaduct	--	--	0.00	0.00	--	--	--	--	--	--	--	--
17	Bone Branch	Intermittent	Rail	Viaduct	--	--	0.00	0.00	--	--	--	--	--	--	--	--
18	Unnamed	Intermittent	Rail	Viaduct	--	--	--	--	0.00	0.00	--	--	--	--	--	--
18	Bone Branch	Intermittent	Access Road	Viaduct	--	--	--	--	0.00	0.00	--	--	--	--	--	--
18	Bone Branch	Intermittent	Rail	Viaduct	--	--	--	--	0.00	0.00	--	--	--	--	--	--
18	Unnamed	Intermittent	Access Road	Viaduct	--	--	--	--	0.00	0.00	--	--	--	--	--	--
18	Unnamed	Intermittent	Rail	Viaduct	--	--	--	--	0.00	0.00	--	--	--	--	--	--
18	Unnamed	Intermittent	Access Road	Viaduct	--	--	0.00	0.00	--	--	--	--	--	--	--	--

Table 4: Estimated Stream Impacts for – Ellis County																	
Natural Resources Mapbook Page #	Stream ID/ Name*	Classification	Construction Type	Crossing Type	Segment 1		Segment 2A		Segment 2B		Segment 3A		Segment 3B		Segment 3C	
					Temp	Perm	Temp	Perm	Temp	Perm	Temp	Perm	Temp	Perm	Temp	Perm
					linear feet		linear feet		linear feet		linear feet		linear feet		linear feet	
18	Unnamed	Intermittent	Rail	Viaduct	--	--	0.00	0.00	--	--	--	--	--	--	--	--
18	Grove Creek	Intermittent	Access Road	Viaduct	--	--	--	--	0.00	0.00	--	--	--	--	--	--
18	Grove Creek	Intermittent	Rail	Viaduct	--	--	--	--	0.00	0.00	--	--	--	--	--	--
18	NCH3S13	Perennial	Access Road	Viaduct	--	--	0.00	0.00	--	--	--	--	--	--	--	--
18	NCH3S13	Perennial	Rail	Viaduct	--	--	0.00	0.00	--	--	--	--	--	--	--	--
18	Unnamed	Intermittent	Rail	Viaduct	--	--	0.00	0.00	--	--	--	--	--	--	--	--
18	Grove Creek	Intermittent	Access Road	Viaduct	--	--	0.00	0.00	--	--	--	--	--	--	--	--
18	Grove Creek	Intermittent	Rail	Viaduct	--	--	0.00	0.00	--	--	--	--	--	--	--	--
19	NCH3S6	Intermittent	Access Road	Viaduct	--	--	0.00	0.00	--	--	--	--	--	--	--	--
19	NCH3S6	Intermittent	Rail	Viaduct	--	--	0.00	0.00	--	--	--	--	--	--	--	--
19	Cottonwood Creek	Intermittent	Access Road	Viaduct	--	--	--	--	0.00	0.00	--	--	--	--	--	--
19	Cottonwood Creek	Intermittent	Rail	Viaduct	--	--	--	--	0.00	0.00	--	--	--	--	--	--
19	Unnamed	Intermittent	Stormwater Drainage	Excavation	--	--	--	--	0.00	82.1	--	--	--	--	--	--
19	Unnamed	Intermittent	Access Road	Viaduct	--	--	--	--	0.00	0.00	--	--	--	--	--	--
19	Unnamed	Intermittent	Rail	Viaduct	--	--	--	--	0.00	0.00	--	--	--	--	--	--
19	Unnamed	Artificial	Access Road	Fill	--	--	--	--	0.00	280.8	--	--	--	--	--	--
19	Unnamed	Intermittent	Stormwater Drainage	Excavation	--	--	--	--	0.00	172.3	--	--	--	--	--	--
19	Unnamed	Intermittent	Rail	Fill	--	--	--	--	0.00	125.6	--	--	--	--	--	--
19	Unnamed	Intermittent	Temporary Fill	Fill	--	--	2.5	0.00	--	--	--	--	--	--	--	--
19	Unnamed	Intermittent	Temporary Fill	Fill	--	--	--	--	2.5	0.00	--	--	--	--	--	--
19	Unnamed	Intermittent	Access Road	Viaduct	--	--	--	--	2.5	0.00	--	--	--	--	--	--

Table 4: Estimated Stream Impacts for – Ellis County																	
Natural Resources Mapbook Page #	Stream ID/ Name*	Classification	Construction Type	Crossing Type	Segment 1		Segment 2A		Segment 2B		Segment 3A		Segment 3B		Segment 3C	
					Temp	Perm	Temp	Perm	Temp	Perm	Temp	Perm	Temp	Perm	Temp	Perm
					linear feet		linear feet		linear feet		linear feet		linear feet		linear feet	
19	Unnamed	Intermittent	Access Road	Viaduct	--	--	0.00	0.00	--	--	--	--	--	--	--	--
19	Unnamed	Intermittent	Rail	Viaduct	--	--	0.00	0.00	--	--	--	--	--	--	--	--
20	Unnamed	Intermittent	Access Road	Viaduct	--	--	0.00	0.00	--	--	--	--	--	--	--	--
20	Unnamed	Intermittent	Rail	Viaduct	--	--	0.00	0.00	--	--	--	--	--	--	--	--
20	Mustang Creek	Intermittent	Access Road	Viaduct	--	--	0.00	0.00	--	--	--	--	--	--	--	--
20	Mustang Creek	Intermittent	Rail	Viaduct	--	--	0.00	0.00	--	--	--	--	--	--	--	--
20	Unnamed	Intermittent	Rail	Viaduct	--	--	--	--	0.00	0.00	--	--	--	--	--	--
20	Mustang Creek	Intermittent	Access Road	Viaduct	--	--	--	--	0.00	0.00	--	--	--	--	--	--
20	Mustang Creek	Intermittent	Rail	Viaduct	--	--	--	--	0.00	0.00	--	--	--	--	--	--
20	Unnamed	Intermittent	Access Road	Viaduct	--	--	--	--	0.00	0.00	--	--	--	--	--	--
20	Unnamed	Intermittent	Rail	Viaduct	--	--	--	--	0.00	0.00	--	--	--	--	--	--
20	NCI3S1	Ephemeral	Access Road	Viaduct	--	--	0.00	0.00	--	--	--	--	--	--	--	--
20	NCI3S1	Ephemeral	Rail	Viaduct	--	--	0.00	0.00	--	--	--	--	--	--	--	--
20	NCI3S2	Ephemeral	Access Road	Viaduct	--	--	0.00	0.00	--	--	--	--	--	--	--	--
20	NCI3S2	Ephemeral	Rail	Viaduct	--	--	0.00	0.00	--	--	--	--	--	--	--	--
22	Unnamed	Intermittent	Access Road	Viaduct	--	--	--	--	0.00	0.00	--	--	--	--	--	--
22	Unnamed	Intermittent	Rail	Viaduct	--	--	--	--	0.00	0.00	--	--	--	--	--	--
22	NCI3S5	Intermittent	Access Road	Viaduct	--	--	0.00	0.00	--	--	--	--	--	--	--	--
22	NCI3S5	Intermittent	Rail	Viaduct	--	--	0.00	0.00	--	--	--	--	--	--	--	--
22, 23	Waxahachie Creek	Perennial	Rail	Viaduct	--	--	0.00	0.00	0.00	0.00	--	--	--	--	--	--
22	NCI3S7	Perennial	Rail	Viaduct	--	--	0.00	0.00	--	--	--	--	--	--	--	--
23	Waxahachie Creek	Perennial	Access Road	Viaduct	--	--	--	--	0.00	0.00	--	--	--	--	--	--

Table 4: Estimated Stream Impacts for – Ellis County																	
Natural Resources Mapbook Page #	Stream ID/ Name*	Classification	Construction Type	Crossing Type	Segment 1		Segment 2A		Segment 2B		Segment 3A		Segment 3B		Segment 3C	
					Temp	Perm	Temp	Perm	Temp	Perm	Temp	Perm	Temp	Perm	Temp	Perm
					linear feet		linear feet		linear feet		linear feet		linear feet		linear feet	
23	Unnamed	Perennial	Access Road	Viaduct	--	--	--	--	0.00	0.00	--	--	--	--	--	--
40	Unnamed	Perennial	Rail	Viaduct	--	--	--	--	0.00	0.00	--	--	--	--	--	--
40	Unnamed	Intermittent	Access Road	Viaduct	--	--	--	--	0.00	0.00	--	--	--	--	--	--
40	Unnamed	Intermittent	Rail	Viaduct	--	--	--	--	0.00	0.00	--	--	--	--	--	--
23	Unnamed	Intermittent	Utilities	Viaduct	--	--	52.3	0.00	--	--	--	--	--	--	--	--
23	Unnamed	Intermittent	Access Road	Viaduct	--	--	0.00	0.00	--	--	--	--	--	--	--	--
23	Unnamed	Intermittent	Rail	Viaduct	--	--	0.00	0.00	--	--	--	--	--	--	--	--
40	Unnamed	Intermittent	Access Road	Viaduct	--	--	--	--	0.00	0.00	--	--	--	--	--	--
40	Unnamed	Intermittent	Rail	Viaduct	--	--	--	--	0.00	0.00	--	--	--	--	--	--
40	Unnamed	Intermittent	Access Road	Viaduct	--	--	--	--	0.00	0.00	--	--	--	--	--	--
40	Unnamed	Intermittent	Rail	Viaduct	--	--	--	--	0.00	0.00	--	--	--	--	--	--
24	Unnamed	Intermittent	Access Road	Viaduct	--	--	--	--	0.00	0.00	--	--	--	--	--	--
24	Unnamed	Intermittent	Rail	Viaduct	--	--	--	--	0.00	0.00	--	--	--	--	--	--
24	Unnamed	Intermittent	Utilities	Viaduct	--	--	--	--	40.2	0.00	--	--	--	--	--	--
24	NCJ3S9	Ephemeral	Stormwater Drainage	Excavation	--	--	0.00	301.3	--	--	--	--	--	--	--	--
24	NCJ3S9	Ephemeral	Access Road	Fill	--	--	0.00	22.2	--	--	--	--	--	--	--	--
24	NCJ3S9	Ephemeral	Rail	Fill	--	--	0.00	265.6	--	--	--	--	--	--	--	--
24	Unnamed	Intermittent	Access Road	Fill	--	--	--	--	0.00	121.5	--	--	--	--	--	--
41	Unnamed	Intermittent	Rail	Fill	--	--	--	--	0.00	305.6	--	--	--	--	--	--
25	Elm Branch	Intermittent	Access Road	Viaduct	--	--	--	--	0.00	0.00	--	--	--	--	--	--
25	Elm Branch	Intermittent	Rail	Viaduct	--	--	--	--	0.00	0.00	--	--	--	--	--	--
25	NCJ3S3	Ephemeral	Stormwater Drainage	Excavation	--	--	0.00	86.2	--	--	--	--	--	--	--	--
25	NCJ3S3	Ephemeral	Access Road	Fill	--	--	0.00	68.2	--	--	--	--	--	--	--	--

Table 4: Estimated Stream Impacts for – Ellis County																	
Natural Resources Mapbook Page #	Stream ID/ Name*	Classification	Construction Type	Crossing Type	Segment 1		Segment 2A		Segment 2B		Segment 3A		Segment 3B		Segment 3C	
					Temp	Perm	Temp	Perm	Temp	Perm	Temp	Perm	Temp	Perm	Temp	Perm
					linear feet		linear feet		linear feet		linear feet		linear feet		linear feet	
25	NCJ3S3	Ephemeral	Rail	Fill	--	--	0.00	190.6	--	--	--	--	--	--	--	--
25	Unnamed	Intermittent	Access Road	Viaduct	--	--	--	--	0.00	0.00	--	--	--	--	--	--
25	Unnamed	Intermittent	Rail	Viaduct	--	--	--	--	0.00	0.00	--	--	--	--	--	--
26	Unnamed	Intermittent	Stormwater Drainage	Excavation	--	--	--	--	0.00	81.0	--	--	--	--	--	--
26	Unnamed	Intermittent	Access Road	Fill	--	--	--	--	0.00	30.6	--	--	--	--	--	--
26	Unnamed	Intermittent	Rail	Viaduct	--	--	--	--	0.00	0.00	--	--	--	--	--	--
26	Unnamed	Intermittent	Access Road	Viaduct	--	--	0.00	0.00	--	--	--	--	--	--	--	--
26	Unnamed	Intermittent	Access Road	Viaduct	--	--	--	--	0.00	0.00	--	--	--	--	--	--
26	Unnamed	Intermittent	Rail	Viaduct	--	--	0.00	0.00	--	--	--	--	--	--	--	--
26	Unnamed	Intermittent	Access Road	Viaduct	--	--	--	--	0.00	0.00	--	--	--	--	--	--
26	NCK4S2	Intermittent	Rail	Viaduct	--	--	0.00	0.00	--	--	--	--	--	--	--	--
26	Unnamed	Intermittent	Access Road	Viaduct	--	--	0.00	0.00	--	--	--	--	--	--	--	--
26	Unnamed	Intermittent	Rail	Viaduct	--	--	0.00	0.00	--	--	--	--	--	--	--	--
26	Unnamed	Intermittent	Rail	Viaduct	--	--	--	--	0.00	0.00	--	--	--	--	--	--
26	Unnamed	Intermittent	Access Road	Viaduct	--	--	0.00	0.00	--	--	--	--	--	--	--	--
26	Unnamed	Intermittent	Rail	Viaduct	--	--	0.00	0.00	--	--	--	--	--	--	--	--
26	Unnamed	Intermittent	Access Road	Viaduct	--	--	--	--	0.00	0.00	--	--	--	--	--	--
26	Unnamed	Intermittent	Rail	Viaduct	--	--	--	--	0.00	0.00	--	--	--	--	--	--
26	Unnamed	Intermittent	Rail	Viaduct	--	--	0.00	0.00	--	--	--	--	--	--	--	--
26	Unnamed	Intermittent	Access Road	Viaduct	--	--	--	--	0.00	0.00	--	--	--	--	--	--
26	Unnamed	Intermittent	Rail	Viaduct	--	--	--	--	0.00	0.00	--	--	--	--	--	--
26	Unnamed	Intermittent	Access Road	Viaduct	--	--	0.00	0.00	--	--	--	--	--	--	--	--
26	NCK4S2	Intermittent	Access Road	Viaduct	--	--	0.00	0.00	--	--	--	--	--	--	--	--
26	NCK4S3	Ephemeral	Access Road	Viaduct	--	--	0.00	0.00	--	--	--	--	--	--	--	--
26	Unnamed	Intermittent	Access Road	Viaduct	--	--	--	--	0.00	0.00	--	--	--	--	--	--

Table 4: Estimated Stream Impacts for – Ellis County																	
Natural Resources Mapbook Page #	Stream ID/ Name*	Classification	Construction Type	Crossing Type	Segment 1		Segment 2A		Segment 2B		Segment 3A		Segment 3B		Segment 3C	
					Temp	Perm	Temp	Perm	Temp	Perm	Temp	Perm	Temp	Perm	Temp	Perm
					linear feet		linear feet		linear feet		linear feet		linear feet		linear feet	
26	NCK4S3	Ephemeral	Rail	Viaduct	--	--	0.00	0.00	--	--	--	--	--	--	--	--
27	NCK4S4	Intermittent	Access Road	Viaduct	--	--	0.00	0.00	--	--	--	--	--	--	--	--
27	NCK4S4	Intermittent	Rail	Viaduct	--	--	0.00	0.00	--	--	--	--	--	--	--	--
27	Big Onion Creek	Perennial	Access Road	Viaduct	--	--	--	--	0.00	0.00	--	--	--	--	--	--
27	Unnamed	Intermittent	Rail	Viaduct	--	--	--	--	--	--	0.00	0.00	--	--	--	--
27	Unnamed	Intermittent	Access Road	Viaduct	--	--	--	--	--	--	--	--	0.00	0.00	--	--
27	Unnamed	Intermittent	Rail	Viaduct	--	--	--	--	--	--	--	--	0.00	0.00	--	--
27	Unnamed	Intermittent	Rail	Viaduct	--	--	--	--	--	--	--	--	--	--	0.00	0.00
27	Unnamed	Intermittent	Access Road	Viaduct	--	--	--	--	--	--	0.00	0.00	--	--	--	--
27	Unnamed	Intermittent	Access Road	Viaduct	--	--	--	--	--	--	--	--	--	--	0.00	0.00
27	Clear Creek	Intermittent	Stormwater Drainage	Excavation	--	--	--	--	--	--	0.00	21.9	0.00	118.1	0.00	21.9
27	Clear Creek	Intermittent	Rail	Fill	--	--	--	--	--	--	--	--	0.00	117.4	--	--
27	Clear Creek	Intermittent	Access Road	Viaduct	--	--	--	--	--	--	0.00	0.00	--	--	0.00	0.00
27	Clear Creek	Intermittent	Rail	Viaduct	--	--	--	--	--	--	0.00	0.00	--	--	0.00	0.00
27	Clear Creek	Intermittent	Access Road	Fill	--	--	--	--	--	--	--	--	0.00	62.4	--	--
				Total	0.00	0.00	54.8	1,361.6	45.2	1,910.8	0.00	21.9	0.00	297.9	0.00	21.9

Source: USGS, 2016; FNI, 2017

*Stream ID # (N) indicates a specific feature recorded in the field whereas stream names (or those "unnamed") indicate features mapped via data not yet field-verified. Jurisdictional determinations to be confirmed by the USACE. Each stream is separated by construction type.

'--' - not present

Table 5: Estimated Wetland Impacts – Ellis County														
Natural Resources Mapbook Page #	Wetland ID/ Classification*	Wetland Type	Construction Type	Crossing Type	Segment 2A		Segment 2B		Segment 3A		Segment 3B		Segment 3C	
					Temp	Perm	Temp	Perm	Temp	Perm	Temp	Perm	Temp	Perm
					linear feet		linear feet		linear feet		linear feet		linear feet	
13	PFO1C	Forested	Access Road	Viaduct/ Conversion	--	--	0.00	0.03	--	--	--	--	--	--
13	PFO1C	Forested	Rail	Viaduct/ Conversion	--	--	0.00	0.05	--	--	--	--	--	--
13	PFO1C	Forested	Rail	Viaduct/ Conversion	0.00	0.05	--	--	--	--	--	--	--	--
16	PFO1A	Forested	Access Road	Viaduct/ Conversion	--	--	0.00	0.12	--	--	--	--	--	--
16	PFO1A	Forested	Rail	Viaduct/ Conversion	--	--	0.00	0.69	--	--	--	--	--	--
16	NCG3EW2	Emergent	Access Road	Viaduct	0.00	0.00	--	--	--	--	--	--	--	--
16	NCG3EW2	Emergent	Rail	Viaduct	0.00	0.00	--	--	--	--	--	--	--	--
17	NCG3EW14	Emergent	Access Road	Fill	0.00	0.07	--	--	--	--	--	--	--	--
17	NCG3EW16	Emergent	Access Road	Fill	0.00	0.04	--	--	--	--	--	--	--	--
17	NCG3EW15	Emergent	Access Road	Fill	0.00	0.06	--	--	--	--	--	--	--	--
17	NCG3EW17	Emergent	Access Road	Fill	0.00	0.37	--	--	--	--	--	--	--	--
17	NCG3EW17	Emergent	Rail	Fill	0.00	0.42	--	--	--	--	--	--	--	--
17	NCG3EW18	Emergent	Stormwater Drainage	Excavation	0.00	<0.01	--	--	--	--	--	--	--	--
17	NCG3EW18	Emergent	Access Road	Fill	0.00	0.08	--	--	--	--	--	--	--	--
17	NCG3EW19	Emergent	Access Road	Fill	0.00	0.01	--	--	--	--	--	--	--	--
17	NCG3EW20	Emergent	Access Road	Fill	0.00	0.03	--	--	--	--	--	--	--	--
17	PEM1Fh	Emergent	Rail	Viaduct	0.00	0.00	--	--	--	--	--	--	--	--
18	PFO1C	Forested	Access Road	Viaduct/ Conversion	--	--	0.00	0.01	--	--	--	--	--	--
18	PFO1C	Forested	Rail	Viaduct/ Conversion	--	--	0.00	0.05	--	--	--	--	--	--
18	PFO1C	Forested	Access Road	Viaduct/ Conversion	0.00	0.05	--	--	--	--	--	--	--	--
18	PFO1C	Forested	Rail	Viaduct/ Conversion	0.00	0.12	--	--	--	--	--	--	--	--
18	PFO1C	Forested	Access Road	Viaduct/ Conversion	0.00	0.02	--	--	--	--	--	--	--	--

Table 5: Estimated Wetland Impacts – Ellis County															
Natural Resources Mapbook Page #	Wetland ID/ Classification*	Wetland Type	Construction Type	Crossing Type	Segment 2A		Segment 2B		Segment 3A		Segment 3B		Segment 3C	
					Temp	Perm	Temp	Perm	Temp	Perm	Temp	Perm	Temp	Perm
					linear feet		linear feet		linear feet		linear feet		linear feet	
18	PFO1C	Forested	Rail	Viaduct/ Conversion	0.00	0.25	--	--	--	--	--	--	--	--
19	NCH3EW2	Emergent	Rail	Viaduct	0.00	0.00	--	--	--	--	--	--	--	--
19	NCH3EW3	Emergent	Rail	Fill	0.00	0.02	--	--	--	--	--	--	--	--
22	PFO1A	Forested	Access Road	Viaduct/ Conversion	0.00	<0.01	--	--	--	--	--	--	--	--
22	PFO1A	Forested	Rail	Viaduct/ Conversion	0.00	0.09	--	--	--	--	--	--	--	--
22	PFO1A	Forested	Rail	Viaduct/ Conversion	0.00	0.19	--	--	--	--	--	--	--	--
23	PFO1C	Forested	Access Road	Viaduct/ Conversion	--	--	0.00	0.01	--	--	--	--	--	--
23	PFO1C	Forested	Rail	Viaduct/ Conversion	--	--	0.00	0.09	--	--	--	--	--	--
23	NCI3EW100	Emergent	Access Road	Viaduct	0.00	0.00	--	--	--	--	--	--	--	--
23	NCI3EW100	Emergent	Rail	Viaduct	0.00	0.00	--	--	--	--	--	--	--	--
23	NCI3EW99	Emergent	Rail	Viaduct	0.00	0.00	--	--	--	--	--	--	--	--
25	NCJ3EW1	Emergent	Maintenance Facility	Fill	0.00	0.21	--	--	--	--	--	--	--	--
26	PFO1C	Forested	Access Road	Viaduct/ Conversion	0.00	<0.01	--	--	--	--	--	--	--	--
26	PFO1C	Forested	Rail	Viaduct/ Conversion	0.00	0.01	--	--	--	--	--	--	--	--
26	PFO1C	Forested	Access Road	Viaduct/ Conversion	--	--	0.00	<0.01	--	--	--	--	--	--
26	PFO1C	Forested	Rail	Viaduct/ Conversion	--	--	0.00	0.01	--	--	--	--	--	--
26	PFO1C	Forested	Access Road	Viaduct/ Conversion	0.00	<0.01	--	--	--	--	--	--	--	--
26	PFO1C	Forested	Access Road	Viaduct/ Conversion	--	--	0.00	0.05	--	--	--	--	--	--
26	PFO1C	Forested	Rail	Viaduct/ Conversion	--	--	0.00	<0.01	--	--	--	--	--	--
27	NCK4EW5	Emergent	Access Road	Viaduct	0.00	0.00	--	--	--	--	--	--	--	--
27	PFO1C	Forested	Access Road	Viaduct/ Conversion	--	--	--	--	0.00	0.01	--	--	--	--

Table 5: Estimated Wetland Impacts – Ellis County															
Natural Resources Mapbook Page #	Wetland ID/ Classification*	Wetland Type	Construction Type	Crossing Type	Segment 2A		Segment 2B		Segment 3A		Segment 3B		Segment 3C	
					Temp	Perm	Temp	Perm	Temp	Perm	Temp	Perm	Temp	Perm
					linear feet		linear feet		linear feet		linear feet		linear feet	
27	PFO1C	Forested	Access Road	Viaduct/ Conversion	--	--	--	--	--	--	--	--	0.00	0.01
27	PFO1C	Forested	Stormwater Drainage	Excavation	--	--	--	--	0.00	0.01	--	--	--	--
27	PFO1C	Forested	Access Road	Viaduct/ Conversion	--	--	--	--	0.00	0.12	--	--	--	--
27	PFO1C	Forested	Rail	Viaduct/ Conversion	--	--	--	--	0.00	0.15	--	--	--	--
27	PFO1C	Forested	Stormwater Drainage	Excavation	--	--	--	--	--	--	0.00	0.05	--	--
27	PFO1C	Forested	Rail	Fill	--	--	--	--	--	--	0.00	0.02	--	--
				Total	0.00	2.1	0.00	1.1	0.00	0.29	0.00	0.35	0.00	0.29

Source: USFWS, 2016; FNI, 2017

*Wetland ID # (N) indicates a specific feature recorded in the field. Wetland classifications (P) indicate wetlands not yet field-verified. Jurisdictional determinations to be confirmed by the USACE. Each wetland is separated by construction type.

P - Palustrine

FO1 - Broad-leaved Deciduous Forested

A - Temporarily Flooded C - Seasonally Flooded

'--' - not present

Table 6: Estimated Waterbody Impacts – Ellis County										
Natural Resources Mapbook Page #	Waterbody ID/Name *	Waterbody Type	Construction Type	Crossing Type	Segment 1		Segment 2A		Segment 2B	
					Temp	Perm	Temp	Perm	Temp	Perm
					linear feet		linear feet		linear feet	
12	Unnamed	Pond	Rail	Viaduct	0.00	0.00	--	--	--	--
12	Unnamed	Pond	Access Road	Viaduct	0.00	0.00	--	--	--	--
13	Unnamed	Pond	Rail	Fill	--	--	0.00	<0.01	--	--
13	Unnamed	Pond	Access Road	Fill	--	--	0.00	0.31	--	--
13	Unnamed	Pond	Rail	Excavation	--	--	--	--	0.00	<0.01
13	Unnamed	Pond	Access Road	Excavation	--	--	--	--	0.00	0.31
15	Unnamed	Pond	Rail	Viaduct	--	--	--	--	0.00	0.00

Table 6: Estimated Waterbody Impacts – Ellis County										
Natural Resources Mapbook Page #	Waterbody ID/Name *	Waterbody Type	Construction Type	Crossing Type	Segment 1		Segment 2A		Segment 2B	
					Temp	Perm	Temp	Perm	Temp	Perm
					linear feet		linear feet		linear feet	
15	Unnamed	Pond	Access Road	Viaduct	--	--	--	--	0.00	0.00
15	NCG3PD3	Pond	Access Road	Viaduct	--	--	0.00	0.00	--	--
15	NCG3PD3	Pond	Rail	Viaduct	--	--	0.00	0.00	--	--
15	NCG3PD4	Pond	Rail	Viaduct	--	--	0.00	0.00	--	--
16	Unnamed	Pond	Access Road	Fill	--	--	--	--	0.00	0.03
16	NCG3PD10	Pond	Access Road	Viaduct	--	--	0.00	0.00	--	--
16	NCG3PD10	Pond	Rail	Viaduct	--	--	0.00	0.00	--	--
16	Unnamed	Pond	Access Road	Viaduct	--	--	--	--	0.00	0.00
16	Unnamed	Pond	Rail	Viaduct	--	--	--	--	0.00	0.00
16	NCG3PD24	Pond	Access Road	Viaduct	--	--	0.00	0.00	--	--
16	NCG3PD24	Pond	Rail	Viaduct	--	--	0.00	0.00	--	--
17	Unnamed	Pond	Rail	Viaduct	--	--	--	--	0.00	0.00
17	Unnamed	Pond	Access Road	Viaduct	--	--	--	--	0.00	0.00
17	NCG3PD16	Pond	Access Road	Fill	--	--	0.00	0.17	--	--
17	Unnamed	Pond	Access Road	Fill	--	--	0.00	0.10	--	--
17	Unnamed	Pond	Access Road	Fill	--	--	0.00	0.25	--	--
17	Unnamed	Pond	Rail	Fill	--	--	0.00	0.25	--	--
17	Unnamed	Pond	Access Road	Viaduct	--	--	--	--	0.00	0.00
17	Unnamed	Pond	Rail	Viaduct	--	--	--	--	0.00	0.00
17	Unnamed	Pond	Access Road	Viaduct	--	--	--	--	0.00	0.00
17	Unnamed	Pond	Rail	Viaduct	--	--	--	--	0.00	0.00
17	Unnamed	Pond	Access Road	Viaduct	--	--	0.00	0.00	--	--
17	Unnamed	Pond	Rail	Viaduct	--	--	0.00	0.00	--	--
17	Unnamed	Pond	Rail	Viaduct	--	--	0.00	0.00	--	--
18	NCH3PD5	Pond	Rail	Viaduct	--	--	0.00	0.00	--	--
19	NCH3PD7	Pond	Access Road	Viaduct	--	--	0.00	0.00	--	--
19	NCH3PD7	Pond	Rail	Viaduct	--	--	0.00	0.00	--	--

Table 6: Estimated Waterbody Impacts – Ellis County										
Natural Resources Mapbook Page #	Waterbody ID/Name *	Waterbody Type	Construction Type	Crossing Type	Segment 1		Segment 2A		Segment 2B	
					Temp	Perm	Temp	Perm	Temp	Perm
					linear feet		linear feet		linear feet	
19	Unnamed	Pond	Stormwater Drainage	Excavation	--	--	--	--	0.00	0.21
19	Unnamed	Pond	Rail	Fill	--	--	--	--	0.00	1.0
19	Unnamed	Pond	Access Road	Viaduct	--	--	--	--	0.00	0.00
20	NCI3PD2	Pond	Rail	Viaduct	--	--	0.00	0.00	--	--
20	NCI3PD1	Pond	Access Road	Viaduct	--	--	0.00	0.00	--	--
20	NCI3PD1	Pond	Rail	Viaduct	--	--	0.00	0.00	--	--
20	NCI3PD3	Pond	Rail	Viaduct	--	--	0.00	0.00	--	--
22	NCI3PD9	Pond	Facility	Fill	--	--	0.00	0.23	--	--
22	NCI3PD10	Pond	Facility	Fill	--	--	0.00	0.14	--	--
22	NCI3PD100	Pond	Access Road	Viaduct	--	--	0.00	0.00	--	--
22	NCI3PD100	Pond	Rail	Viaduct	--	--	0.00	0.00	--	--
22	NCI3PD101	Pond	Access Road	Viaduct	--	--	0.00	0.00	--	--
22	NCI3PD101	Pond	Rail	Viaduct	--	--	0.00	0.00	--	--
22	NCI3PD99	Pond	Access Road	Viaduct	--	--	0.00	0.00	--	--
22	NCI3PD99	Pond	Rail	Viaduct	--	--	0.00	0.00	--	--
23	NCI3PD5	Pond	Rail	Viaduct	--	--	0.00	0.00	--	--
24	Unnamed	Pond	Access Road	Viaduct	--	--	--	--	0.00	0.00
24	Unnamed	Pond	Rail	Viaduct	--	--	--	--	0.00	0.00
24	Unnamed	Pond	Access Road	Viaduct	--	--	--	--	0.00	0.00
24	Unnamed	Pond	Rail	Viaduct	--	--	--	--	0.00	0.00
24	Unnamed	Pond	Rail	Viaduct	--	--	--	--	0.00	0.00
25	Unnamed	Pond	Access Road	Viaduct	--	--	--	--	0.00	0.00
25	Unnamed	Pond	Rail	Viaduct	--	--	--	--	0.00	0.00
25	Unnamed	Pond	Access Road	Viaduct	--	--	--	--	0.00	0.00
25	Unnamed	Pond	Rail	Viaduct	--	--	--	--	0.00	0.00
25	NCJ3PD29	Pond	Access Road	Fill	--	--	0.00	0.03	--	--
25	NCJ3PD19	Pond	Maintenance Facility	Fill	--	--	0.00	1.1	--	--

Table 6: Estimated Waterbody Impacts – Ellis County											
Natural Resources Mapbook Page #	Waterbody ID/Name *	Waterbody Type	Construction Type	Crossing Type	Segment 1		Segment 2A		Segment 2B	
					Temp	Perm	Temp	Perm	Temp	Perm
					linear feet		linear feet		linear feet	
25	NCJ3PD19	Pond	Rail	Viaduct	--	--	0.00	0.00	--	--
25	NCJ3PD20	Pond	Rail	Viaduct	--	--	0.00	0.00	--	--
25	Unnamed	Pond	Maintenance Facility	Fill	--	--	0.00	0.24	--	--
26	Unnamed	Pond	Access Road	Fill	--	--	--	--	0.00	0.21
26	NCK3PD2	Pond	Access Road	Viaduct	--	--	0.00	0.00	--	--
26	NCK3PD2	Pond	Rail	Viaduct	--	--	0.00	0.00	--	--
26	Unnamed	Pond	Access Road	Fill	--	--	--	--	0.00	0.09
26	Unnamed	Pond	Rail	Viaduct	--	--	--	--	0.00	0.00
26	NCK3PD4	Pond	Stormwater Drainage	Excavation	--	--	0.00	0.28	--	--
26	NCK3PD4	Pond	Maintenance Facility	Fill	--	--	0.00	0.05	--	--
26	NCK3PD4	Pond	Rail	Viaduct	--	--	0.00	0.00	--	--
				Total	0.00	0.00	0.00	3.1	0.00	1.9

Source: USGS, 2016; USFWS, 2016; FNI, 2017

*Waterbody ID # (N) indicates a specific feature recorded in the field. Waterbody classifications (P) indicate waterbodies not yet field-verified. Jurisdictional determination to be confirmed by the USACE. Each waterbody is separated by construction type.

'--' – Not Present

Navarro County

Table 7: Estimated Stream Impacts – Navarro County										
Natural Resources Mapbook Page #	Stream ID/Name*	Classification	Construction Type	Crossing Type	Segment 3A		Segment 3B		Segment 3C	
					Temp	Perm	Temp	Perm	Temp	Perm
					linear feet		linear feet		linear feet	
45	Unnamed	Intermittent	Access Road	Viaduct	--	--	0.00	0.00	--	--
45	Unnamed	Intermittent	Rail	Viaduct	--	--	0.00	0.00	--	--

Table 7: Estimated Stream Impacts – Navarro County										
Natural Resources Mapbook Page #	Stream ID/Name*	Classification	Construction Type	Crossing Type	Segment 3A		Segment 3B		Segment 3C	
					Temp	Perm	Temp	Perm	Temp	Perm
					linear feet		linear feet		linear feet	
45	Unnamed	Intermittent	Access Road	Viaduct	0.00	0.00	--	--	0.00	0.00
45	Unnamed	Intermittent	Rail	Viaduct	0.00	0.00	--	--	0.00	0.00
45	Unnamed	Intermittent	Access Road	Viaduct	--	--	--	--	0.00	0.00
45	Unnamed	Intermittent	Rail	Viaduct	--	--	--	--	0.00	0.00
45	Chambers Creek	Artificial	Access Road	Viaduct	--	--	0.00	0.00	--	--
45, 46	Chambers Creek	Artificial	Rail	Viaduct	0.00	0.00	0.00	0.00	0.00	0.00
46	NCL4S2	Ephemeral	Rail	Viaduct	0.00	0.00	--	--	--	--
46	Unnamed	Intermittent	Access Road	Viaduct	--	--	0.00	0.00	--	--
46	Unnamed	Intermittent	Rail	Viaduct	--	--	0.00	0.00	--	--
46	Unnamed	Intermittent	Access Road	Viaduct	--	--	0.00	0.00	--	--
46	Unnamed	Intermittent	Rail	Viaduct	--	--	0.00	0.00	--	--
47	Unnamed	Intermittent	Stormwater Drainage	Excavation	0.00	410.0	--	--	--	--
47	Unnamed	Intermittent	Access Road	Fill	0.00	376.1	--	--	--	--
47	Unnamed	Intermittent	Rail	Fill	0.00	25.7	--	--	--	--
47	Unnamed	Intermittent	Stormwater Drainage	Excavation	--	--	--	--	0.00	410.0
47	Unnamed	Intermittent	Access Road	Fill	--	--	--	--	0.00	376.1
47	Unnamed	Intermittent	Rail	Fill	--	--	--	--	0.00	25.7
47	NCL4S4	Ephemeral	Access Road	Fill	0.00	35.0	--	--	--	--
47	NCL4S4	Ephemeral	Rail	Fill	0.00	200.2	--	--	--	--
47	Briar Creek	Intermittent	Access Road	Viaduct	--	--	0.00	0.00	--	--
47	Briar Creek	Intermittent	Rail	Viaduct	--	--	0.00	0.00	--	--
67	Unnamed	Intermittent	Access Road	Viaduct	--	--	0.00	0.00	--	--
67	Unnamed	Intermittent	Rail	Viaduct	--	--	0.00	0.00	--	--
67	Unnamed	Intermittent	Stormwater Drainage	Excavation	--	--	0.00	637.1	--	--
67	Unnamed	Intermittent	Access Road	Fill	--	--	0.00	506.3	--	--
67	Unnamed	Intermittent	Rail	Fill	--	--	0.00	263.5	--	--
48	Unnamed	Intermittent	Access Road	Viaduct	0.00	0.00	--	--	--	--

Table 7: Estimated Stream Impacts – Navarro County										
Natural Resources Mapbook Page #	Stream ID/Name*	Classification	Construction Type	Crossing Type	Segment 3A		Segment 3B		Segment 3C	
					Temp	Perm	Temp	Perm	Temp	Perm
					linear feet		linear feet		linear feet	
48	Unnamed	Intermittent	Rail	Viaduct	0.00	0.00	--	--	--	--
48	Unnamed	Intermittent	Access Road	Viaduct	--	--	--	--	0.00	0.00
48	Unnamed	Intermittent	Rail	Viaduct	--	--	--	--	0.00	0.00
67	Unnamed	Intermittent	Access Road	Viaduct	--	--	0.00	0.00	--	--
49	Unnamed	Intermittent	Temporary Fill	Fill	24.2	0.00	--	--	--	--
49	Unnamed	Intermittent	Temporary Fill	Fill	--	--	--	--	24.2	0.00
68	Unnamed	Intermittent	Stormwater Drainage	Excavation	--	--	0.00	111.7	--	--
68	Unnamed	Intermittent	Access Road	Fill	--	--	0.00	55.1	--	--
68	Unnamed	Intermittent	Rail	Fill	--	--	0.00	295.9	--	--
49	Unnamed	Intermittent	Stormwater Drainage	Excavation	0.00	476.6	--	--	--	--
49	Unnamed	Intermittent	Access Road	Fill	0.00	481.8	--	--	--	--
48	Unnamed	Intermittent	Rail	Fill	0.00	325.4	--	--	--	--
49	Unnamed	Intermittent	Stormwater Drainage	Excavation	--	--	--	--	0.00	476.6
49	Unnamed	Intermittent	Access Road	Fill	--	--	--	--	0.00	481.8
48	Unnamed	Intermittent	Rail	Fill	--	--	--	--	0.00	325.4
68	Unnamed	Intermittent	Stormwater Drainage	Excavation	--	--	0.00	17.4	--	--
68	Unnamed	Intermittent	Access Road	Fill	--	--	0.00	31.3	--	--
68	Unnamed	Intermittent	Rail	Fill	--	--	0.00	265.7	--	--
49	Unnamed	Intermittent	Temporary Fill	Fill	315.0	0.00	--	--	--	--
49	Unnamed	Intermittent	Temporary Fill	Fill	--	--	--	--	315.0	0.00
49	Unnamed	Intermittent	Stormwater Drainage	Excavation	0.00	158.3	--	--	--	--
49	Unnamed	Intermittent	Access Road	Viaduct	0.00	0.00	--	--	--	--
49	Unnamed	Intermittent	Rail	Viaduct	0.00	0.00	--	--	--	--
49	Unnamed	Intermittent	Access Road	Viaduct	--	--	--	--	0.00	0.00
49	Unnamed	Intermittent	Rail	Viaduct	--	--	--	--	0.00	0.00
49	Unnamed	Intermittent	Stormwater Drainage	Excavation	--	--	--	--	0.00	158.3
68	Unnamed	Intermittent	Stormwater Drainage	Excavation	--	--		112.9	--	--

Table 7: Estimated Stream Impacts – Navarro County										
Natural Resources Mapbook Page #	Stream ID/Name*	Classification	Construction Type	Crossing Type	Segment 3A		Segment 3B		Segment 3C	
					Temp	Perm	Temp	Perm	Temp	Perm
					linear feet		linear feet		linear feet	
68	Unnamed	Intermittent	Rail	Fill	--	--		186.6	--	--
68	Unnamed	Intermittent	Temporary Fill	Fill	--	--	11.7	0.00	--	--
68	Unnamed	Intermittent	Temporary Fill	Fill	--	--	367.1	0.00	--	--
68	Unnamed	Intermittent	Access Road	Viaduct	--	--	0.00	0.00	--	--
68	Unnamed	Intermittent	Rail	Viaduct	--	--	0.00	0.00	--	--
68	Unnamed	Intermittent	Temporary Fill	Fill	--	--	616.7	0.00	--	--
49	Unnamed	Intermittent	Access Road	Viaduct	0.00	0.00	--	--	--	--
49	Unnamed	Intermittent	Rail	Viaduct	0.00	0.00	--	--	--	--
49	Unnamed	Intermittent	Access Road	Viaduct	--	--	--	--	0.00	0.00
49	Unnamed	Intermittent	Rail	Viaduct	--	--	--	--	0.00	0.00
49	Unnamed	Intermittent	Access Road	Viaduct	0.00	0.00	--	--	--	--
49	Unnamed	Intermittent	Rail	Viaduct	0.00	0.00	--	--	--	--
49	Unnamed	Intermittent	Access Road	Viaduct	--	--	--	--	0.00	0.00
49	Unnamed	Intermittent	Rail	Viaduct	--	--	--	--	0.00	0.00
50	Unnamed	Intermittent	Rail	Viaduct	0.00	0.00	--	--	--	--
50	Unnamed	Intermittent	Rail	Viaduct	--	--	--	--	0.00	0.00
50	Unnamed	Intermittent	Rail	Viaduct	0.00	0.00	--	--	--	--
50	Unnamed	Intermittent	Rail	Viaduct	--	--	--	--	0.00	0.00
50	Unnamed	Intermittent	Access Road	Viaduct	0.00	0.00	--	--	--	--
50	Unnamed	Intermittent	Rail	Viaduct	0.00	0.00	--	--	--	--
50	Unnamed	Intermittent	Access Road	Viaduct	--	--	--	--	0.00	0.00
50	Unnamed	Intermittent	Rail	Viaduct	--	--	--	--	0.00	0.00
69	Unnamed	Intermittent	Access Road	Viaduct	--	--	0.00	0.00	--	--
69	Unnamed	Intermittent	Rail	Viaduct	--	--	0.00	0.00	--	--
50	Unnamed	Intermittent	Access Road	Viaduct	0.00	0.00	--	--	--	--
50	Unnamed	Intermittent	Rail	Viaduct	0.00	0.00	--	--	--	--
50	Unnamed	Intermittent	Access Road	Viaduct	--	--	--	--	0.00	0.00

Table 7: Estimated Stream Impacts – Navarro County										
Natural Resources Mapbook Page #	Stream ID/Name*	Classification	Construction Type	Crossing Type	Segment 3A		Segment 3B		Segment 3C	
					Temp	Perm	Temp	Perm	Temp	Perm
					linear feet		linear feet		linear feet	
50	Unnamed	Intermittent	Rail	Viaduct	--	--	--	--	0.00	0.00
69	Unnamed	Artificial	Rail	Viaduct	--	--	0.00	0.00	--	--
69	Unnamed	Intermittent	Access Road	Viaduct	--	--	0.00	0.00	--	--
69	Unnamed	Intermittent	Access Road	Fill	--	--	0.00	78.9	--	--
69	Unnamed	Intermittent	Access Road	Fill	--	--	0.00	636.9	--	--
69	Unnamed	Intermittent	Access Road	Fill	--	--	0.00	167.6	--	--
69	Unnamed	Artificial	Rail	Viaduct	--	--	0.00	0.00	--	--
70	Unnamed	Artificial	Rail	Viaduct	--	--	0.00	0.00	--	--
70	Unnamed	Intermittent	Access Road	Viaduct	--	--	0.00	0.00	--	--
70	Unnamed	Intermittent	Rail	Viaduct	--	--	0.00	0.00	--	--
70	Cedar Creek	Intermittent	Access Road	Fill	--	--	0.00	336.1	--	--
70	Unnamed	Intermittent	Access Road	Viaduct	--	--	0.00	0.00	--	--
70	Unnamed	Intermittent	Rail	Viaduct	--	--	0.00	0.00	--	--
70	Unnamed	Intermittent	Rail	Fill	--	--	0.00	220.2	--	--
70	Unnamed	Artificial	Stormwater Drainage	Excavation	--	--	0.00	252.3	--	--
70	Unnamed	Artificial	Access Road	Fill	--	--	0.00	132.4	--	--
51	Unnamed	Intermittent	Stormwater Drainage	Excavation	0.00	99.8	--	--	--	--
51	Unnamed	Intermittent	Access Road	Fill	0.00	56.2	--	--	--	--
51	Unnamed	Intermittent	Rail	Fill	0.00	215.8	--	--	--	--
51	Unnamed	Intermittent	Stormwater Drainage	Excavation	--	--	--	--	0.00	99.8
51	Unnamed	Intermittent	Access Road	Fill	--	--	--	--	0.00	56.2
51	Unnamed	Intermittent	Rail	Fill	--	--	--	--	0.00	215.8
70	Cedar Creek	Intermittent	Access Road	Viaduct	--	--	0.00	0.00	--	--
70	Cedar Creek	Intermittent	Rail	Viaduct	--	--	0.00	0.00	--	--
70	Unnamed	Intermittent	Access Road	Viaduct	--	--	0.00	0.00	--	--
70	Unnamed	Intermittent	Rail	Viaduct	--	--	0.00	0.00	--	--
51	Unnamed	Intermittent	Stormwater Drainage	Excavation	0.00	253.3	--	--	--	--

Table 7: Estimated Stream Impacts – Navarro County										
Natural Resources Mapbook Page #	Stream ID/Name*	Classification	Construction Type	Crossing Type	Segment 3A		Segment 3B		Segment 3C	
					Temp	Perm	Temp	Perm	Temp	Perm
					linear feet		linear feet		linear feet	
52	Unnamed	Intermittent	Access Road	Fill	0.00	744.0	--	--	--	--
51	Unnamed	Intermittent	Rail	Fill	0.00	299.5	--	--	--	--
51	Unnamed	Intermittent	Stormwater Drainage	Excavation	--	--	--	--	0.00	253.3
52	Unnamed	Intermittent	Access Road	Fill	--	--	--	--	0.00	744.0
51	Unnamed	Intermittent	Rail	Fill	--	--	--	--	0.00	299.5
71	Unnamed	Intermittent	Access Road	Viaduct	--	--	0.00	0.00	--	--
71	Unnamed	Intermittent	Rail	Viaduct	--	--	0.00	0.00	--	--
71	Unnamed	Intermittent	Access Road	Viaduct	--	--	0.00	0.00	--	--
71	Unnamed	Intermittent	Rail	Viaduct	--	--	0.00	0.00	--	--
72	Unnamed	Intermittent	Stormwater Drainage	Excavation	--	--	0.00	305.5	--	--
72	Unnamed	Intermittent	Access Road	Fill	--	--	0.00	94.5	--	--
72	Unnamed	Intermittent	Rail	Fill	--	--	0.00	526.3	--	--
53	Unnamed	Intermittent	Rail	Viaduct	--	--	--	--	0.00	0.00
72	Unnamed	Intermittent	Access Road	Viaduct	--	--	0.00	0.00	--	--
72	Unnamed	Intermittent	Rail	Viaduct	--	--	0.00	0.00	--	--
53	Unnamed	Intermittent	Systems	Fill	0.00	92.6	--	--	--	--
72	Unnamed	Intermittent	Stormwater Drainage	Excavation	--	--	0.00	124.2	--	--
72	Unnamed	Intermittent	Access Road	Fill	--	--	0.00	34.2	--	--
72	Unnamed	Intermittent	Rail	Fill	--	--	0.00	217.1	--	--
53	Unnamed	Intermittent	Access Road	Viaduct	--	--	--	--	0.00	0.00
53	Unnamed	Intermittent	Rail	Viaduct	--	--	--	--	0.00	0.00
53	Unnamed	Intermittent	Access Road	Viaduct	0.00	0.00	--	--	--	--
53	Unnamed	Intermittent	Rail	Viaduct	0.00	0.00	--	--	--	--
54	Unnamed	Intermittent	Access Road	Viaduct	0.00	0.00	--	--	--	--
54	Unnamed	Intermittent	Rail	Viaduct	0.00	0.00	--	--	--	--
73	Unnamed	Intermittent	Stormwater Drainage	Excavation	--	--	0.00	299.4	--	--
73	Unnamed	Intermittent	Access Road	Fill	--	--	0.00	78.0	--	--

Table 7: Estimated Stream Impacts – Navarro County										
Natural Resources Mapbook Page #	Stream ID/Name*	Classification	Construction Type	Crossing Type	Segment 3A		Segment 3B		Segment 3C	
					Temp	Perm	Temp	Perm	Temp	Perm
					linear feet		linear feet		linear feet	
54	Unnamed	Intermittent	Access Road	Viaduct	--	--	--	--	0.00	0.00
54	Unnamed	Intermittent	Rail	Viaduct	--	--	--	--	0.00	0.00
73	Unnamed	Intermittent	Stormwater Drainage	Excavation	--	--	0.00	384.7	--	--
73	Unnamed	Intermittent	Access Road	Fill	--	--	0.00	517.6	--	--
73	Unnamed	Intermittent	Rail	Fill	--	--	0.00	298.9	--	--
54	Unnamed	Intermittent	Access Road	Viaduct	0.00	0.00	--	--	--	--
54	Unnamed	Intermittent	Rail	Viaduct	0.00	0.00	--	--	--	--
54	NCO6S3	Ephemeral	Access Road	Viaduct	0.00	0.00	--	--	--	--
54	NCO6S3	Ephemeral	Rail	Viaduct	0.00	0.00	--	--	--	--
54	Unnamed	Intermittent	Access Road	Viaduct	--	--	--	--	0.00	0.00
54	Unnamed	Intermittent	Rail	Viaduct	--	--	--	--	0.00	0.00
92	Briar Creek	Intermittent	Access Road	Viaduct	--	--	--	--	0.00	0.00
92	Briar Creek	Intermittent	Rail	Viaduct	--	--	--	--	0.00	0.00
93	Richland Creek	Intermittent	Access Road	Viaduct	--	--	--	--	0.00	0.00
93	Richland Creek	Intermittent	Rail	Viaduct	--	--	--	--	0.00	0.00
74	Unnamed	Intermittent	Access Road	Viaduct	--	--	0.00	0.00	--	--
74	Unnamed	Intermittent	Rail	Viaduct	--	--	0.00	0.00	--	--
55	NCO6S7	Perennial	Rail	Viaduct	0.00	0.00	--	--	--	--
55	NCO6S7	Perennial	Access Road	Viaduct	0.00	0.00	--	--	--	--
93	Unnamed	Intermittent	Access Road	Viaduct	--	--	--	--	0.00	0.00
93	Unnamed	Intermittent	Rail	Viaduct	--	--	--	--	0.00	0.00
74	Richland Creek	Artificial	Access Road	Viaduct	--	--	0.00	0.00	--	--
74	Richland Creek	Artificial	Rail	Viaduct	--	--	0.00	0.00	--	--
55	NCO6S9	Intermittent	Access Road	Viaduct	0.00	0.00	--	--	--	--
55	NCO6S9	Intermittent	Rail	Viaduct	0.00	0.00	--	--	--	--
56	Unnamed	Intermittent	Systems	Fill	--	--	--	--		2.7
56	Unnamed	Intermittent	Access Road	Viaduct	--	--	--	--	0.00	0.00

Table 7: Estimated Stream Impacts – Navarro County										
Natural Resources Mapbook Page #	Stream ID/Name*	Classification	Construction Type	Crossing Type	Segment 3A		Segment 3B		Segment 3C	
					Temp	Perm	Temp	Perm	Temp	Perm
					linear feet		linear feet		linear feet	
56	Unnamed	Intermittent	Rail	Viaduct	--	--	--	--	0.00	0.00
56	Unnamed	Intermittent	Access Road	Viaduct	--	--	--	--	0.00	0.00
56	Unnamed	Intermittent	Rail	Viaduct	--	--	--	--	0.00	0.00
56	Unnamed	Intermittent	Stormwater Drainage	Excavation	0.00	11.1	--	--	--	--
56	NCO6S99	Intermittent	Stormwater Drainage	Excavation	0.00	163.8	--	--	--	--
56	NCO6S99	Intermittent	Rail	Fill	0.00	283.6	--	--	--	--
94	Unnamed	Intermittent	Access Road	Viaduct	--	--	--	--	0.00	0.00
94	Unnamed	Intermittent	Rail	Viaduct	--	--	--	--	0.00	0.00
57, 94	Pin Oak Creek	Intermittent	Access Road	Viaduct	0.00	0.00	--	--	0.00	0.00
57, 94	Pin Oak Creek	Intermittent	Rail	Viaduct	0.00	0.00	--	--	0.00	0.00
56	Unnamed	Intermittent	Access Road	Viaduct	0.00	0.00	--	--	--	--
56	Unnamed	Intermittent	Rail	Viaduct	0.00	0.00	--	--	--	--
75	Unnamed	Intermittent	Access Road	Viaduct	--	--	--	--	0.00	0.00
75	Unnamed	Intermittent	Rail	Viaduct	--	--	--	--	0.00	0.00
75	Unnamed	Intermittent	Stormwater Drainage	Excavation	--	--	0.00	252.8	--	--
75	Unnamed	Intermittent	Access Road	Fill	--	--	0.00	37.9	--	--
75	Unnamed	Intermittent	Rail	Fill	--	--	0.00	263.4	--	--
76	Unnamed	Intermittent	Access Road	Viaduct	--	--	0.00	0.00	--	--
76	Unnamed	Intermittent	Rail	Viaduct	--	--	0.00	0.00	--	--
76	Unnamed	Intermittent	Stormwater Drainage	Excavation	--	--	--	--	0.00	82.6
76	Unnamed	Intermittent	Access Road	Fill	--	--	--	--	0.00	44.4
76	Unnamed	Intermittent	Rail	Fill	--	--	--	--	0.00	66.3
57	NCP7S5	Ephemeral	Access Road	Viaduct	0.00	0.00	--	--	--	--
57	NCP7S5	Ephemeral	Rail	Viaduct	0.00	0.00	--	--	--	--
76	Unnamed	Intermittent	Stormwater Drainage	Excavation	--	--	--	--	0.00	305.9
76	Unnamed	Intermittent	Access Road	Fill	--	--	--	--	0.00	161.6
76	Unnamed	Intermittent	Rail	Fill	--	--	--	--	0.00	205.8

Table 7: Estimated Stream Impacts – Navarro County										
Natural Resources Mapbook Page #	Stream ID/Name*	Classification	Construction Type	Crossing Type	Segment 3A		Segment 3B		Segment 3C	
					Temp	Perm	Temp	Perm	Temp	Perm
					linear feet		linear feet		linear feet	
76	Unnamed	Intermittent	Temporary Fill	Fill					30.8	0.00
76	Unnamed	Intermittent	Access Road	Viaduct	--	--	--	--	0.00	0.00
76	Unnamed	Intermittent	Rail	Viaduct	--	--	--	--	0.00	0.00
58	NCP7S8	Ephemeral	Access Road	Viaduct	0.00	0.00	--	--	--	--
58	NCP7S8	Ephemeral	Rail	Viaduct	0.00	0.00	--	--	--	--
96	Unnamed	Intermittent	Access Road	Viaduct	--	--	--	--	0.00	0.00
96	Unnamed	Intermittent	Rail	Viaduct	--	--	--	--	0.00	0.00
58	Unnamed	Intermittent	Access Road	Viaduct	--	--	0.00	0.00	--	--
58	Unnamed	Intermittent	Rail	Viaduct	--	--	0.00	0.00	--	--
58	NCP7S99	Ephemeral	Access Road	Viaduct	0.00	0.00	--	--	--	--
58	NCP7S99	Ephemeral	Rail	Viaduct	0.00	0.00	--	--	--	--
58	NCP7S10	Intermittent	Access Road	Viaduct	0.00	0.00	--	--	--	--
58	NCP7S10	Intermittent	Rail	Viaduct	0.00	0.00	--	--	--	--
96	Unnamed	Intermittent	Rail	Viaduct	--	--	--	--	0.00	0.00
96	Little Pin Oak Creek	Intermittent	Access Road	Viaduct	--	--	--	--	0.00	0.00
60, 96	Little Pin Oak Creek	Intermittent	Rail	Viaduct	--	--	0.00	0.00	0.00	0.00
58	Unnamed	Intermittent	Access Road	Viaduct	0.00	0.00	--	--	--	--
58	Unnamed	Intermittent	Rail	Viaduct	0.00	0.00	--	--	--	--
97	Unnamed	Intermittent	Stormwater Drainage	Excavation	--	--	--	--	0.00	204.3
97	Unnamed	Intermittent	Access Road	Viaduct	--	--	--	--	0.00	0.00
97	Unnamed	Intermittent	Rail	Viaduct	--	--	--	--	0.00	0.00
97	Unnamed	Intermittent	Access Road	Viaduct	--	--	--	--	9.4	0.00
59	Unnamed	Intermittent	Access Road	Viaduct	--	--	0.00	0.00	--	--
59	Unnamed	Intermittent	Rail	Viaduct	--	--	0.00	0.00	--	--
59	NCP7S12	Ephemeral	Stormwater Drainage	Excavation	0.00	42.7				
59	NCP7S12	Ephemeral	Access Road	Viaduct	0.00	0.00	--	--	--	--
59	NCP7S12	Ephemeral	Rail	Viaduct	0.00	0.00	--	--	--	--

Table 7: Estimated Stream Impacts – Navarro County										
Natural Resources Mapbook Page #	Stream ID/Name*	Classification	Construction Type	Crossing Type	Segment 3A		Segment 3B		Segment 3C	
					Temp	Perm	Temp	Perm	Temp	Perm
					linear feet		linear feet		linear feet	
97	Unnamed	Intermittent	Access Road	Viaduct	--	--	--	--	0.00	0.00
97	Unnamed	Intermittent	Rail	Viaduct	--	--	--	--	0.00	0.00
97	Mesquite Creek	Intermittent	Access Road	Viaduct	--	--	--	--	0.00	0.00
97	Mesquite Creek	Intermittent	Rail	Viaduct	--	--	--	--	0.00	0.00
59	Unnamed	Intermittent	Rail	Viaduct	--	--	0.00	0.00	--	--
97	Unnamed	Intermittent	Stormwater Drainage	Excavation	--	--	--	--	0.00	159.5
97	Unnamed	Intermittent	Access Road	Viaduct	--	--	--	--	0.00	0.00
97	Unnamed	Intermittent	Rail	Viaduct	--	--	--	--	0.00	0.00
59	NCQ7S2	Intermittent	Access Road	Viaduct	0.00	0.00	--	--	--	--
59	NCQ7S2	Intermittent	Rail	Viaduct	0.00	0.00	--	--	--	--
59	Unnamed	Intermittent	Rail	Viaduct	--	--	0.00	0.00	--	--
98	Unnamed	Intermittent	Access Road	Viaduct	--	--	--	--	0.00	0.00
98	Unnamed	Intermittent	Rail	Viaduct	--	--	--	--	0.00	0.00
60	Unnamed	Intermittent	Rail	Viaduct	--	--	0.00	0.00	--	--
60	NCQ7S7	Intermittent	Access Road	Viaduct	0.00	0.00	--	--	--	--
60	NCQ7S7	Intermittent	Rail	Viaduct	0.00	0.00	--	--	--	--
98	Unnamed	Intermittent	Stormwater Drainage	Excavation	--	--	--	--	0.00	325.9
98	Unnamed	Intermittent	Access Road	Fill	--	--	--	--	0.00	45.5
98	Unnamed	Intermittent	Rail	Fill	--	--	--	--	0.00	278.5
60	NCQ7S4	Intermittent	Rail	Viaduct	0.00	0.00	--	--	--	--
60	NCQ7S4	Intermittent	Access Road	Viaduct	0.00	0.00	--	--	--	--
61	NCQ7S6	Ephemeral	Access Road	Viaduct	0.00	0.00	--	--	--	--
61	NCQ7S6	Ephemeral	Rail	Viaduct	0.00	0.00	--	--	--	--
62	Unnamed	Intermittent	Access Road	Viaduct	0.00	0.00	--	--	--	--
62	Unnamed	Intermittent	Rail	Viaduct	0.00	0.00	--	--	--	--
62	Unnamed	Intermittent	Stormwater Drainage	Excavation	--	--	0.00	0.7	--	--
62	Unnamed	Intermittent	Access Road	Viaduct	--	--	0.00	0.00	--	--

Table 7: Estimated Stream Impacts – Navarro County											
Natural Resources Mapbook Page #	Stream ID/Name*	Classification	Construction Type	Crossing Type	Segment 3A		Segment 3B		Segment 3C	
					Temp	Perm	Temp	Perm	Temp	Perm
					linear feet		linear feet		linear feet	
62	Unnamed	Intermittent	Rail	Viaduct	--	--	0.00	0.00	--	--
62	Unnamed	Intermittent	Stormwater Drainage	Excavation	0.00	66.8	--	--	--	--
				Total	339.2	4,818.2	995.5	7,742.8	379.4	5,805.5

Source: USGS, 2016; FNI, 2017

*Stream ID # (N) indicates a specific feature recorded in the field whereas stream names (or those "unnamed") indicate features mapped via data not yet field-verified. Jurisdictional determinations to be confirmed by the USACE. Each stream is separated by construction type.

'--' - not present

Table 8: Estimated Wetland Impacts – Navarro County										
Natural Resources Mapbook Page #	Wetland ID/Classification*	Wetland Type	Construction Type	Crossing Type	Segment 3A		Segment 3B		Segment 3C	
					Temp	Perm	Temp	Perm	Temp	Perm
					acres		acres		acres	
46	NCL4EW1	Emergent	Access Road	Viaduct	0.00	0.00	--	--	--	--
46	NCL4EW1	Emergent	Rail	Viaduct	0.00	0.00	--	--	--	--
46	NCL4EW1	Emergent	Access Road	Viaduct	0.00	0.00	--	--	--	--
46	NCL4EW1	Emergent	Rail	Viaduct	0.00	0.00	--	--	--	--
46	NCL4EW99	Emergent	Access Road	Viaduct	0.00	0.00	--	--	--	--
46	NCL4EW99	Emergent	Rail	Viaduct	0.00	0.00	--	--	--	--
47	NCL4EW10	Emergent	Access Road	Viaduct	0.00	0.00	--	--	--	--
47	NCL4EW10	Emergent	Rail	Viaduct	0.00	0.00	--	--	--	--
48	NCL4EW9	Emergent	Access Road	Excavation	0.00	0.24	--	--	--	--
48	NCL4EW11	Emergent	Access Road	Excavation	0.00	<0.01	--	--	--	--
67	PFO1C	Forested	Access Road	Viaduct/Conversion	--	--	0.00	0.01	--	--
67	PFO1C	Forested	Rail	Viaduct/Conversion	--	--	0.00	0.05	--	--
50	NCM5EW21	Emergent	Access Road	Viaduct	0.00	0.00	--	--	--	--
50	NCM5EW21	Emergent	Rail	Viaduct	0.00	0.00	--	--	--	--
50	NCM5EW22	Emergent	Access Road	Viaduct	0.00	0.00	--	--	--	--

Table 8: Estimated Wetland Impacts – Navarro County										
Natural Resources Mapbook Page #	Wetland ID/Classification*	Wetland Type	Construction Type	Crossing Type	Segment 3A		Segment 3B		Segment 3C	
					Temp	Perm	Temp	Perm	Temp	Perm
					acres		acres		acres	
50	NCM5EW22	Emergent	Rail	Viaduct	0.00	0.00	--	--	--	--
69	PEM1Fh	Emergent	Rail	Viaduct	--	--	0.00	0.00	--	--
51	NCM5EW23	Emergent	Stormwater Drainage	Excavation	0.00	0.24	--	--	--	--
50	NCM5EW23	Emergent	Rail	Fill	0.00	0.04	--	--	--	--
51	NCM5EW24	Emergent	Rail	Fill	0.00	0.03	--	--	--	--
70	PEM1Ch	Emergent	Rail	Viaduct	--	--	0.00	0.00	--	--
70	PFO1A	Forested	Access Road	Fill	--	--	0.00	0.15	--	--
70	PEM1C	Emergent	Access Road	Fill	--	--	0.00	0.12	--	--
70	PFO1C	Forested	Stormwater Drainage	Excavation	--	--	0.00	0.07	--	--
70	PFO1C	Forested	Access Road	Fill	--	--	0.00	0.01	--	--
70	PFO1A	Forested	Access Road	Viaduct/Conversion	--	--	0.00	0.07	--	--
70	PFO1A	Forested	Rail	Viaduct/Conversion	--	--	0.00	0.89	--	--
52	NCN5EW4	Emergent	Rail	Excavation	0.00	0.13	--	--	--	--
71	PFO1C	Forested	Access Road	Viaduct/Conversion	--	--	0.00	0.01	--	--
71	PFO1C	Forested	Rail	Viaduct/Conversion	--	--	0.00	0.07	--	--
71	PFO1A	Forested	Access Road	Viaduct/Conversion	--	--	0.00	0.05	--	--
71	PFO1A	Forested	Rail	Viaduct/Conversion	--	--	0.00	0.06	--	--
53	NCN5EW14	Emergent	Tempoary Fill	Fill	0.46	0.00	--	--	--	--
53	NCN5EW12	Emergent	Tempoary Fill	Fill	0.19	0.00	--	--	--	--
53	NCN5EW7	Emergent	Tempoary Fill	Fill	0.93	0.00	--	--	--	--
53	NCN5EW12	Emergent	Tempoary Fill	Fill	0.02	0.00	--	--	--	--
53	NCN5EW12	Emergent	Rail	Viaduct	0.01	0.00	--	--	--	--
53	NCN5EW12	Emergent	Access Road	Viaduct	0.02	0.00	--	--	--	--
53	NCN5EW12	Emergent	Access Road	Viaduct	0.00	0.00	--	--	--	--
53	NCN5EW12	Emergent	Rail	Viaduct	0.00	0.00	--	--	--	--
53	NCN5EW6	Emergent	Tempoary Fill	Fill	0.04	0.00	--	--	--	--
53	NCN5EW3	Emergent	Tempoary Fill	Fill	0.17	0.00	--	--	--	--
53	NCN5EW13	Emergent	Tempoary Fill	Fill	1.38	0.00	--	--	--	--

Table 8: Estimated Wetland Impacts – Navarro County										
Natural Resources Mapbook Page #	Wetland ID/Classification*	Wetland Type	Construction Type	Crossing Type	Segment 3A		Segment 3B		Segment 3C	
					Temp	Perm	Temp	Perm	Temp	Perm
					acres		acres		acres	
53	NCN5EW5	Emergent	Tempoary Fill	Fill	0.10	0.00	--	--	--	--
53	NCN5EW9	Emergent	Tempoary Fill	Fill	0.11	0.00	--	--	--	--
53	NCN5EW15	Emergent	Tempoary Fill	Fill	0.08	0.00	--	--	--	--
53	NCN5EW16	Emergent	Tempoary Fill	Fill	0.24	0.00	--	--	--	--
53	NCN5EW16	Emergent	Rail	Viaduct	0.00	0.00	--	--	--	--
53	NCN5EW16	Emergent	Access Road	Viaduct	0.00	0.00	--	--	--	--
53	NCN5EW16	Emergent	Rail	Viaduct	0.00	0.00	--	--	--	--
53	NCN5EW16	Emergent	Tempoary Fill	Fill	0.58	0.00	--	--	--	--
53	NCN5EW16	Emergent	Tempoary Fill	Fill	0.04	0.00	--	--	--	--
53	NCN5EW16	Emergent	Rail	Viaduct	0.04	0.00	--	--	--	--
72	PFO1C	Forested	Stormwater Drainage	Excavation	--	--	0.00	0.20	--	--
72	PFO1C	Forested	Access Road	Fill	--	--	0.00	0.04	--	--
72	PFO1C	Forested	Rail	Fill	--	--	0.00	0.21	--	--
53	NCN5EW10	Emergent	Tempoary Fill	Fill	0.54	0.00	--	--	--	--
53	NCN5EW10	Emergent	Access Road	Viaduct	0.00	0.00	--	--	--	--
53	NCN5EW10	Emergent	Rail	Viaduct	0.00	0.00	--	--	--	--
53	NCN5EW10	Emergent	Access Road	Viaduct	0.00	0.00	--	--	--	--
53	NCN5EW10	Emergent	Rail	Viaduct	0.00	0.00	--	--	--	--
53	NCN5EW10	Emergent	Tempoary Fill	Fill	1.39	0.00	--	--	--	--
53	NCN5EW10	Emergent	Access Road	Viaduct	<0.01	0.00	--	--	--	--
53	NCN5EW10	Emergent	Tempoary Fill	Fill	0.92	0.00	--	--	--	--
53	NCN5EW10	Emergent	Access Road	Viaduct	0.09	0.00	--	--	--	--
53	NCN5EW10	Emergent	Rail	Viaduct	0.83	0.00	--	--	--	--
53	NCN5EW11	Emergent	Tempoary Fill	Fill	0.10	0.00	--	--	--	--
53	NCN5EW11	Emergent	Rail	Viaduct	0.00	0.00	--	--	--	--
53	NCN5EW11	Emergent	Tempoary Fill	Fill	0.12	0.00	--	--	--	--
72	PFO1A	Forested	Access Road	Viaduct/Conversion	--	--	0.00	0.16	--	--
72	PFO1A	Forested	Rail	Viaduct/Conversion	--	--	0.00	1.32	--	--

Table 8: Estimated Wetland Impacts – Navarro County										
Natural Resources Mapbook Page #	Wetland ID/Classification*	Wetland Type	Construction Type	Crossing Type	Segment 3A		Segment 3B		Segment 3C	
					Temp	Perm	Temp	Perm	Temp	Perm
					acres		acres		acres	
54	PEM1A	Emergent	Access Road	Viaduct	0.00	0.00	--	--	--	--
54	PEM1A	Emergent	Rail	Viaduct	0.00	0.00	--	--	--	--
54	PFO1C	Forested	Access Road	Viaduct/Conversion	0.00	0.01	--	--	--	--
54	PFO1C	Forested	Rail	Viaduct/Conversion	0.00	0.07	--	--	--	--
59	PFO1C	Forested	Access Road	Viaduct/Conversion	--	--	0.00	0.04	--	--
59	PFO1C	Forested	Rail	Viaduct/Conversion	--	--	0.00	0.19	--	--
59	NCQ7EW3	Emergent	Stormwater Drainage	Excavation	0.00	0.35	--	--	--	--
59	NCQ7EW3	Emergent	Access Road	Viaduct	0.00	0.00	--	--	--	--
59	NCQ7EW3	Emergent	Rail	Viaduct	0.00	0.00	--	--	--	--
59	NCQ7EW3	Emergent	Rail	Viaduct	0.00	0.00	--	--	--	--
59	NCQ7EW3	Emergent	Access Road	Viaduct	0.00	0.00	--	--	--	--
59	NCQ7EW6	Emergent	Access Road	Viaduct	0.00	0.00	--	--	--	--
59	NCQ7EW6	Emergent	Rail	Viaduct	0.00	0.00	--	--	--	--
59	NCQ7EW6	Emergent	Rail	Viaduct	0.00	0.00	--	--	--	--
59	PEM1C	Emergent	Rail	Viaduct	--	--	0.00	0.00	--	--
60	NCQ7EW99	Emergent	Access Road	Viaduct	0.00	0.00	--	--	--	--
60	NCQ7EW99	Emergent	Rail	Viaduct	0.00	0.00	--	--	--	--
60	NCQ7FW1	Forested	Rail	Viaduct/Conversion	0.00	0.04	--	--	--	--
61	NCQ8EW2	Emergent	Rail	Viaduct	0.00	0.00	--	--	--	--
62	NCQ8FW3	Forested	Rail	Viaduct/Conversion	0.00	0.06	--	--	--	--
				Total	8.5	2.9	0.00	4.8	0.00	8.0

Source: USFWS, 2016; FNI, 2017

*Wetland ID # (N) indicates a specific feature recorded in the field. Wetland classifications (P) indicate wetlands not yet field-verified. Jurisdictional determinations to be confirmed by the USACE. Each wetland is separated by construction type.

P - Palustrine
EM - Emergent
EM1 - Persistent Emergent
FO - Forested
FO1 - Broad-leaved Deciduous Forested
A - Temporarily Flooded
C - Seasonally Flooded
h - Diked/Impounded
'--' - not present

Table 9: Estimated Waterbody Impacts – Navarro County										
Natural Resources Mapbook Page #	Waterbody ID/Name *	Waterbody Type	Construction Type	Crossing Type	Segment 3A		Segment 3B		Segment 3C	
					Temp	Perm	Temp	Perm	Temp	Perm
					acres		acres		acres	
45	Unnamed	Pond	Rail	Viaduct	--	--	0.00	0.00	--	--
45	Unnamed	Pond	Access Road	Viaduct	0.00	0.00	--	--	--	--
45	Unnamed	Pond	Access Road	Viaduct	--	--	--	--	0.00	0.00
46	Unnamed	Pond	Access Road	Viaduct	--	--	0.00	0.00	--	--
46	Unnamed	Pond	Rail	Viaduct	--	--	0.00	0.00	--	--
46	NCL4PD43	Pond	Access Road	Viaduct	0.00	0.00	--	--	--	--
46	NCL4PD5	Pond	Access Road	Viaduct	0.00	0.00	--	--	--	--
46	NCL4PD7	Pond	Access Road	Viaduct	0.00	0.00	--	--	--	--
46	NCL4PD11	Pond	Stormwater Drainage	Excavation	0.00	0.03	--	--	--	--
46	NCL4PD11	Pond	Rail	Fill	0.00	0.78	--	--	--	--
46	Unnamed	Pond	Rail	Fill	--	--	0.00	0.26	--	--
47	Unnamed	Pond	Stormwater Drainage	Excavation	0.00	0.23	--	--	--	--
47	Unnamed	Pond	Stormwater Drainage	Excavation	--	--	--	--	0.00	0.23
47	NCL4PD36	Pond	Access Road	Fill	0.00	0.09	--	--	--	--
47	NCL4PD19	Pond	Access Road	Fill	0.00	<0.01	--	--	--	--
47	NCL4PD19	Pond	Stormwater Drainage	Excavation	0.00	0.02	--	--	--	--
47	NCL4PD19	Pond	Rail	Fill	0.00	0.19	--	--	--	--
47	NCL4PD20	Pond	Rail	Fill	0.00	0.57	--	--	--	--
48	Unnamed	Pond	Access Road	Excavation	0.00	0.07	--	--	--	--
48	Unnamed	Pond	Access Road	Excavation	--	--	--	--	0.00	0.07
48	Unnamed	Pond	Stormwater Drainage	Excavation	0.00	<0.01	--	--	--	--
48	Unnamed	Pond	Rail	Fill	0.00	<0.01	--	--	--	--
48	Unnamed	Pond	Stormwater Drainage	Excavation	0.00	0.09	--	--	--	--
48	Unnamed	Pond	Access Road	Fill	0.00	0.21	--	--	--	--
48	Unnamed	Pond	Rail	Fill	--	--	--	--	0.00	<0.01
48	Unnamed	Pond	Stormwater Drainage	Excavation	--	--	--	--	0.00	0.09
48	Unnamed	Pond	Access Road	Fill	--	--	--	--	0.00	0.21
48	Unnamed	Pond	Rail	Viaduct	0.00	0.00	--	--	--	--

Table 9: Estimated Waterbody Impacts – Navarro County										
Natural Resources Mapbook Page #	Waterbody ID/Name *	Waterbody Type	Construction Type	Crossing Type	Segment 3A		Segment 3B		Segment 3C	
					Temp	Perm	Temp	Perm	Temp	Perm
					acres		acres		acres	
48	Unnamed	Pond	Rail	Viaduct	--	--	--	--	0.00	0.00
49	NCM5PD6	Pond	Access Road	Viaduct	0.00	0.00	--	--	--	--
49	Unnamed	Pond	Temporary Fill	Fill	0.03	0.00	--	--	--	--
49	Unnamed	Pond	Temporary Fill	Fill	--	--	--	--	0.03	0.00
69	Unnamed	Pond	Rail	Viaduct	--	--	0.00	0.00	--	--
50	NCM5PD31	Pond	Access Road	Viaduct	0.00	0.00	--	--	--	--
50	NCM5PD31	Pond	Rail	Viaduct	0.00	0.00	--	--	--	--
69	Soil Conservation Service Site 138 Reservoir	Lake/Pond	Rail	Viaduct	--	--	0.00	0.00	--	--
50	NCM5PD35	Pond	Access Road	Fill	0.00	0.01	--	--	--	--
50	NCM5PD35	Pond	Rail	Fill	0.00	0.53	--	--	--	--
50	NCM5PD35	Pond	Stormwater Drainage	Excavation	0.00	0.76	--	--	--	--
51	NCM5PD36	Pond	Access Road	Fill	0.00	0.11	--	--	--	--
51	NCM5PD36	Pond	Rail	Fill	0.00	0.29	--	--	--	--
70	Unnamed	Pond	Access Road	Fill	--	--	0.00	0.05	--	--
70	Unnamed	Pond	Access Road	Fill	--	--	0.00	<0.01	--	--
70	Unnamed	Pond	Rail	Fill	--	--	0.00	0.29	--	--
70	Unnamed	Pond	Access Road	Fill	--	--	0.00	0.39	--	--
70	Unnamed	Pond	Access Road	Fill	--	--	0.00	0.04	--	--
70	Unnamed	Pond	Stormwater Drainage	Excavation	--	--	0.00	0.11	--	--
70	Unnamed	Pond	Access Road	Fill	--	--	0.00	0.06	--	--
70	Unnamed	Pond	Rail	Excavation	--	--	0.00	0.22	--	--
52	Unnamed	Pond	Access Road	Fill	0.00	0.01	--	--	--	--
52	Unnamed	Pond	Rail	Fill	0.00	0.44	--	--	--	--
52	Unnamed	Pond	Access Road	Fill	--	--	--	--	0.00	0.01
52	Unnamed	Pond	Rail	Fill	--	--	--	--	0.00	0.44
71	Unnamed	Pond	Temporary Fill	Fill	--	--	0.18	0.00	--	--
71	Unnamed	Pond	Temporary Fill	Fill	--	--	0.33	0.00	--	--

Table 9: Estimated Waterbody Impacts – Navarro County										
Natural Resources Mapbook Page #	Waterbody ID/Name *	Waterbody Type	Construction Type	Crossing Type	Segment 3A		Segment 3B		Segment 3C	
					Temp	Perm	Temp	Perm	Temp	Perm
					acres		acres		acres	
71	Unnamed	Pond	Temporary Fill	Fill	--	--	0.18	0.00	--	--
71	Unnamed	Pond	Rail	Viaduct	--	--	0.00	0.00	--	--
52	NCN5PD5	Pond	Rail	Fill	0.00	0.24	--	--	--	--
71	Unnamed	Pond	Access Road	Fill	--	--	0.00	<0.01	--	--
71	Unnamed	Pond	Rail	Fill	--	--	0.00	0.76	--	--
71	Unnamed	Pond	Rail	Fill	--	--	0.00	0.01	--	--
52	NCN5PD7	Pond	Access Road	Fill	0.00	0.06	--	--	--	--
71	Unnamed	Pond	Access Road	Fill	--	--	0.00	0.08	--	--
71	Unnamed	Pond	Rail	Excavation	--	--	0.00	0.17	--	--
72	Unnamed	Pond	Access Road	Excavation	--	--	0.00	0.10	--	--
72	Unnamed	Pond	Access Road	Excavation	--	--	0.00	0.32	--	--
53	NCN5PD12	Pond	Temporary Fill	Fill	0.23	0.00	--	--	--	--
72	Unnamed	Pond	Rail	Fill	--	--	0.00	<0.01	--	--
72	Unnamed	Pond	Stormwater Drainage	Excavation	--	--	0.00	0.50	--	--
73	Unnamed	Pond	Rail	Fill	--	--	0.00	0.28	--	--
54	NCO6PD10	Pond	Rail	Fill	0.00	0.04	--	--	--	--
74	Unnamed	Pond	Rail	Viaduct	--	--	0.00	0.00	--	--
93	Unnamed	Pond	Access Road	Viaduct	--	--	--	--	0.00	0.00
93	Unnamed	Pond	Rail	Viaduct	--	--	--	--	0.00	0.00
74	Unnamed	Pond	Access Road	Viaduct	--	--	0.00	0.00	--	--
74	Unnamed	Pond	Rail	Viaduct	--	--	0.00	0.00	--	--
74	Unnamed	Pond	Rail	Viaduct	--	--	0.00	0.00	--	--
74	Unnamed	Pond	Access Road	Viaduct	--	--	0.00	0.00	--	--
74	Unnamed	Pond	Rail	Viaduct	--	--	0.00	0.00	--	--
56	NCO6PD18	Pond	Access Road	Viaduct	0.00	0.00	--	--	--	--
56	NCO6PD18	Pond	Rail	Viaduct	0.00	0.00	--	--	--	--
75	Unnamed	Pond	Rail	Excavation	--	--	0.00	0.14	--	--
75	Unnamed	Pond	Rail	Excavation	--	--	0.00	0.09	--	--

Table 9: Estimated Waterbody Impacts – Navarro County										
Natural Resources Mapbook Page #	Waterbody ID/Name *	Waterbody Type	Construction Type	Crossing Type	Segment 3A		Segment 3B		Segment 3C	
					Temp	Perm	Temp	Perm	Temp	Perm
					acres		acres		acres	
56	Unnamed	Pond	Rail	Excavation	0.00	0.35	--	--	--	--
75	Unnamed	Pond	Rail	Fill	--	--	0.00	0.08	--	--
75	Unnamed	Pond	Access Road	Fill	--	--	0.00	0.10	--	--
56	Unnamed	Pond	Rail	Excavation	0.00	0.06	--	--	--	--
56	NCO6PD99	Pond	Rail	Excavation	0.00	0.07	--	--	--	--
56	Unnamed	Pond	Stormwater Drainage	Excavation	0.00	1.0	--	--	--	--
56	Unnamed	Pond	Rail	Excavation	0.00	1.2	--	--	--	--
56	Unnamed	Pond	Access Road	Excavation	0.00	0.14	--	--	--	--
57	Unnamed	Pond	Access Road	Viaduct	--	--	--	--	0.00	0.00
57	NCP7PD15	Pond	Access Road	Viaduct	0.00	0.00	--	--	--	--
57	NCP7PD15	Pond	Rail	Viaduct	0.00	0.00	--	--	--	--
57	NCP7PD15	Pond	Temporary Fill	Fill	0.01	0.00	--	--	--	--
57	NCP7PD39	Pond	Temporary Fill	Fill	0.09	0.00	--	--	--	--
57	NCP7PD16	Pond	Rail	Viaduct	0.00	0.00	--	--	--	--
57	NCP7PD16	Pond	Temporary Fill	Fill	0.41	0.00	--	--	--	--
76	Unnamed	Pond	Access Road	Viaduct	--	--	--	--	0.00	0.00
76	Unnamed	Pond	Rail	Viaduct	--	--	--	--	0.00	0.00
58	Unnamed	Pond	Rail	Viaduct	--	--	0.00	0.00	--	--
96	Unnamed	Pond	Rail	Viaduct	--	--	--	--	0.00	0.00
96	Unnamed	Pond	Access Road	Viaduct	--	--	--	--	0.00	0.00
96	Unnamed	Pond	Rail	Viaduct	--	--	--	--	0.00	0.00
58	Unnamed	Pond	Access Road	Viaduct	0.00	0.00	--	--	--	--
58	Unnamed	Pond	Rail	Viaduct	0.00	0.00	--	--	--	--
58	Unnamed	Pond	Rail	Fill	--	--	0.00	0.08	--	--
96	Unnamed	Pond	Access Road	Viaduct	--	--	--	--	0.00	0.00
58	Unnamed	Pond	Access Road	Viaduct	0.00	0.00	--	--	--	--
58	Unnamed	Pond	Rail	Viaduct	0.00	0.00	--	--	--	--
97	Unnamed	Pond	Rail	Viaduct	--	--	--	--	0.00	0.00

Table 9: Estimated Waterbody Impacts – Navarro County										
Natural Resources Mapbook Page #	Waterbody ID/Name *	Waterbody Type	Construction Type	Crossing Type	Segment 3A		Segment 3B		Segment 3C	
					Temp	Perm	Temp	Perm	Temp	Perm
					acres		acres		acres	
59	NCP7PD42	Pond	Rail	Viaduct	0.00	0.00	--	--	--	--
59	Unnamed	Pond	Rail	Fill	--	--	0.00	0.12	--	--
59	NCQ7PD1	Pond	Rail	Fill	0.00	0.04	--	--	--	--
59	NCQ7PD5	Pond	Rail	Viaduct	0.00	0.00	--	--	--	--
59	NCQ7PD5	Pond	Access Road	Viaduct	0.00	0.00	--	--	--	--
59	NCQ7PD5	Pond	Rail	Viaduct	0.00	0.00	--	--	--	--
59	Unnamed	Pond	Rail	Viaduct	--	--	0.00	0.00	--	--
60	NCQ7PD8	Pond	Rail	Viaduct	0.00	0.00	--	--	--	--
60	Unnamed	Pond	Rail	Fill	--	--	0.00	0.03	--	--
60	Unnamed	Pond	Rail	Fill	--	--	0.00	0.20	--	--
60	Unnamed	Pond	Access Road	Viaduct	--	--	0.00	0.00	--	--
60	Unnamed	Pond	Rail	Fill	--	--	0.00	0.14	--	--
60	NCQ7PD9	Pond	Access Road	Viaduct	0.00	0.00	--	--	--	--
60	NCQ7PD9	Pond	Rail	Viaduct	0.00	0.00	--	--	--	--
60	NCQ7PD12	Pond	Access Road	Viaduct	0.00	0.00	--	--	--	--
60	NCQ7PD12	Pond	Rail	Viaduct	0.00	0.00	--	--	--	--
60	NCQ7PD21	Pond	Access Road	Viaduct	0.00	0.00	--	--	--	--
60	NCQ7PD21	Pond	Access Road	Viaduct	0.00	0.00	--	--	--	--
60	NCQ7PD13	Pond	Rail	Viaduct	0.00	0.00	--	--	--	--
61	Unnamed	Pond	Rail	Viaduct	--	--	0.00	0.00	--	--
61	Unnamed	Pond	Rail	Viaduct	0.00	0.00	--	--	--	--
61	Unnamed	Pond	Rail	Viaduct	--	--	0.00	0.00	--	--
61	NCQ7PD15	Pond	Rail	Viaduct	0.00	0.00	--	--	--	--
62	Unnamed	Pond	Access Road	Viaduct	0.00	0.00	--	--	--	--
62	Unnamed	Pond	Stormwater Drainage	Excavation	0.00	0.00	--	--	--	--
62	Unnamed	Pond	Rail	Viaduct	0.00	0.00	--	--	--	--
62	Unnamed	Pond	Access Road	Viaduct	--	--	0.00	0.00	--	--
62	Unnamed	Pond	Stormwater Drainage	Excavation	--	--	0.00	0.00	--	--

Table 9: Estimated Waterbody Impacts – Navarro County											
Natural Resources Mapbook Page #	Waterbody ID/Name *	Waterbody Type	Construction Type	Crossing Type	Segment 3A		Segment 3B		Segment 3C	
					Temp	Perm	Temp	Perm	Temp	Perm
					acres		acres		acres	
62	Unnamed	Pond	Rail	Viaduct	--	--	0.00	0.00	--	--
62	Unnamed	Pond	Stormwater Drainage	Excavation	0.00	0.00	--	--	--	--
				Total	0.77	7.6	0.69	4.6	0.03	1.1

Source: USGS, 2016; USFWS, 2016; FNI, 2017

*Waterbody ID # (N) indicates a specific feature recorded in the field. Waterbody classifications (P) indicate waterbodies not yet field-verified. Jurisdictional determinations to be confirmed by the USACE. Each waterbody is separated by construction type.

'--' - not present

Freestone County

Table 10: Estimated Stream Impacts – Freestone County								
Natural Resources Mapbook Page #	Stream ID/Name*	Classification	Construction Type	Crossing Type	Segment 3C		Segment 4	
					Temp	Perm	Temp	Perm
					linear feet		linear feet	
98	Unnamed	Intermittent	Access Road	Viaduct	0.00	0.00	--	--
98	Unnamed	Intermittent	Rail	Viaduct	0.00	0.00	--	--
99	Unnamed	Intermittent	Stormwater Drainage	Excavation	0.00	279.5	--	--
99	Unnamed	Intermittent	Access Road	Fill	0.00	895.4	--	--
99	Unnamed	Intermittent	Rail	Viaduct	0.00	0.00	--	--
99	Unnamed	Intermittent	Access Road	Viaduct	0.00	0.00	--	--
99	Unnamed	Intermittent	Rail	Viaduct	0.00	0.00	--	--
99	Unnamed	Intermittent	Access Road	Viaduct	0.00	0.00	--	--
99	Unnamed	Intermittent	Rail	Viaduct	0.00	0.00	--	--
99	Unnamed	Intermittent	Utilities	Viaduct	126.1	0.00	--	--
99	Tehuacana Creek	Perennial	Access Road	Viaduct	0.00	0.00	--	--
99	Tehuacana Creek	Perennial	Rail	Viaduct	0.00	0.00	--	--
100, 158	Little Tehuacana Creek	Intermittent	Access Road	Viaduct	0.00	0.00	0.00	0.00
100	Unnamed	Intermittent	Rail	Viaduct	0.00	0.00	--	--

Table 10: Estimated Stream Impacts – Freestone County								
Natural Resources Mapbook Page #	Stream ID/Name*	Classification	Construction Type	Crossing Type	Segment 3C		Segment 4	
					Temp	Perm	Temp	Perm
					linear feet		linear feet	
100, 158	Little Tehuacana Creek	Intermittent	Rail	Viaduct	0.00	0.00	0.00	0.00
100	Unnamed	Intermittent	Access Road	Viaduct	0.00	0.00	--	--
100	Unnamed	Intermittent	Rail	Viaduct	0.00	0.00	--	--
100	Unnamed	Intermittent	Temporary Fill	Fill	1,184.2	0.00	--	--
100	Unnamed	Intermittent	Access Road	Viaduct	0.00	0.00	--	--
100	Unnamed	Intermittent	Rail	Viaduct	0.00	0.00	--	--
100	Unnamed	Intermittent	Temporary Fill	Fill	2,593.0	0.00	--	--
100	Unnamed	Intermittent	Access Road	Viaduct	0.03	0.00	--	--
62	CER8S1	Intermittent	Access Road	Viaduct	--	--	0.00	0.00
62	CER8S1	Intermittent	Rail	Viaduct	--	--	0.00	0.00
62	CER8S2	Intermittent	Access Road	Viaduct	--	--	0.00	0.00
62	CER8S2	Intermittent	Rail	Viaduct	--	--	0.00	0.00
62	CER8S3	Intermittent	Access Road	Viaduct	--	--	0.00	0.00
62	CER8S3	Intermittent	Rail	Viaduct	--	--	0.00	0.00
100	Unnamed	Intermittent	Access Road	Viaduct	0.00	0.00	--	--
100	Unnamed	Intermittent	Rail	Viaduct	0.00	0.00	--	--
101	Unnamed	Intermittent	Access Road	Fill	0.00	47.1	--	--
101	Unnamed	Artificial	Stormwater Drainage	Excavation	0.00	147.4	--	--
101	Unnamed	Artificial	Rail	Fill	0.00	224.2	--	--
101	Unnamed	Intermittent	Stormwater Drainage	Excavation	0.00	302.7	--	--
101	Unnamed	Intermittent	Rail	Fill	0.00	212.2	--	--
101	Unnamed	Intermittent	Access Road	Viaduct	0.00	0.00	--	--
101	Unnamed	Intermittent	Rail	Viaduct	0.00	0.00	--	--
101	Dry Creek	Intermittent	Access Road	Viaduct	0.00	0.00	--	--
101	Dry Creek	Intermittent	Rail	Viaduct	0.00	0.00	--	--
101	Dry Creek	Intermittent	Rail	Viaduct	0.00	0.00	--	--
101	Unnamed	Intermittent	Rail	Viaduct	0.00	0.00	--	--

Table 10: Estimated Stream Impacts – Freestone County								
Natural Resources Mapbook Page #	Stream ID/Name*	Classification	Construction Type	Crossing Type	Segment 3C		Segment 4	
					Temp	Perm	Temp	Perm
					linear feet		linear feet	
155	CER8S6	Ephemeral	Rail	Viaduct	--	--	0.00	0.00
155	CER8S5	Ephemeral	Rail	Viaduct	--	--	0.00	0.00
155	CER8S100	Ephemeral	Rail	Viaduct	--	--	0.00	0.00
101	Unnamed	Intermittent	Access Road	Viaduct	0.00	0.00	--	--
101	Unnamed	Intermittent	Rail	Viaduct	0.00	0.00	--	--
101	Unnamed	Intermittent	Stormwater Drainage	Excavation	0.00	136.6	--	--
101	Unnamed	Intermittent	Access Road	Fill	0.00	108.7	--	--
101	Unnamed	Intermittent	Rail	Fill	0.00	354.2	--	--
155	CER8S99	Intermittent	Rail	Viaduct	--	--	0.00	0.00
155	CER8S98	Ephemeral	Access Road	Viaduct	--	--	0.00	0.00
155	CER8S98	Ephemeral	Rail	Viaduct	--	--	0.00	0.00
102	Cedar Creek	Intermittent	Access Road	Viaduct	0.00	0.00	--	--
102	Cedar Creek	Intermittent	Rail	Viaduct	0.00	0.00	--	--
155	Unnamed	Artificial	Access Road	Viaduct	--	--	0.00	0.00
155	Unnamed	Artificial	Rail	Viaduct	--	--	0.00	0.00
102	Unnamed	Intermittent	Access Road	Viaduct	0.00	0.00	--	--
102	Unnamed	Intermittent	Rail	Viaduct	0.00	0.00	--	--
102	Caney Creek	Intermittent	Access Road	Viaduct	0.00	0.00	--	--
102	Caney Creek	Intermittent	Rail	Viaduct	0.00	0.00	--	--
156	CER8S10	Ephemeral	Maintenance Facility	Fill	--	--	0.00	186.1
156	CER8S10	Ephemeral	Rail	Viaduct	--	--	0.00	0.00
156	CER8S14	Ephemeral	Rail	Viaduct	--	--	0.00	0.00
156	CER8S14	Ephemeral	Maintenance Facility	Fill	--	--	0.00	28.1
156	CER8S13	Ephemeral	Maintenance Facility	Fill	--	--	0.00	18.6
156	Jackson Branch	Intermittent	Maintenance Facility	Fill	--	--	0.00	305.6
156	Jackson Branch	Intermittent	Access Road	Viaduct	--	--	0.00	0.00

Table 10: Estimated Stream Impacts – Freestone County								
Natural Resources Mapbook Page #	Stream ID/Name*	Classification	Construction Type	Crossing Type	Segment 3C		Segment 4	
					Temp	Perm	Temp	Perm
					linear feet		linear feet	
156	CER8S9	Ephemeral	Access Road	Viaduct	--	--	0.00	0.00
103	Unnamed	Intermittent	Access Road	Viaduct	0.00	0.00	--	--
103	Unnamed	Intermittent	Rail	Viaduct	0.00	0.00	--	--
156	CER8S11	Perennial	Access Road	Viaduct	--	--	0.00	0.00
156	CER8S11	Perennial	Rail	Viaduct	--	--	0.00	0.00
103	Unnamed	Intermittent	Rail	Viaduct	0.00	0.00	--	--
103	Unnamed	Intermittent	Access Road	Viaduct	0.00	0.00	--	--
157	CES8S1	Ephemeral	Access Road	Viaduct	--	--	0.00	0.00
157	CES8S2	Ephemeral	Access Road	Fill	--	--	0.00	68.4
157	CES8S2	Ephemeral	Rail	Fill	--	--	0.00	31.6
104	Unnamed	Intermittent	Access Road	Viaduct	0.00	0.00	--	--
104	Unnamed	Intermittent	Rail	Viaduct	0.00	0.00	--	--
157	CES9S1	Ephemeral	Rail	Viaduct	--	--	0.00	0.00
157	CES9S2	Ephemeral	Access Road	Viaduct	--	--	0.00	0.00
157	Unnamed	Intermittent	Access Road	Viaduct	--	--	0.00	0.00
157	CES9S1	Ephemeral	Access Road	Viaduct	--	--	0.00	0.00
105	Cottonwood Creek	Perennial	Access Road	Viaduct	0.00	0.00	--	--
104	Cottonwood Creek	Perennial	Rail	Viaduct	0.00	0.00	--	--
105	Unnamed	Intermittent	Access Road	Viaduct	0.00	0.00	--	--
105	Unnamed	Intermittent	Rail	Viaduct	0.00	0.00	--	--
158	Unnamed	Intermittent	Access Road	Viaduct	--	--	0.00	0.00
158	Unnamed	Intermittent	Rail	Viaduct	--	--	0.00	0.00
158	Unnamed	Intermittent	Stormwater Drainage	Excavation	--	--	0.00	135.8
158	Unnamed	Intermittent	Access Road	Fill	--	--	0.00	76.7
158	Unnamed	Intermittent	Rail	Fill	--	--	0.00	208.6
159	Unnamed	Intermittent	Stormwater Drainage	Excavation	--	--	0.00	159.2
159	Unnamed	Intermittent	Access Road	Fill	--	--	0.00	79.5

Table 10: Estimated Stream Impacts – Freestone County								
Natural Resources Mapbook Page #	Stream ID/Name*	Classification	Construction Type	Crossing Type	Segment 3C		Segment 4	
					Temp	Perm	Temp	Perm
					linear feet		linear feet	
159	Unnamed	Intermittent	Rail	Fill	--	--	0.00	300.5
159	Unnamed	Intermittent	Access Road	Viaduct	--	--	0.00	0.00
159	Unnamed	Intermittent	Rail	Viaduct	--	--	0.00	0.00
159	Unnamed	Intermittent	Access Road	Viaduct	--	--	0.00	0.00
159	Unnamed	Intermittent	Rail	Viaduct	--	--	0.00	0.00
159	CES9S9	Intermittent	Access Road	Viaduct	--	--	0.00	0.00
159	CES9S9	Intermittent	Rail	Viaduct	--	--	0.00	0.00
106	Unnamed	Intermittent	Access Road	Viaduct	0.00	0.00	--	--
106	Unnamed	Intermittent	Rail	Viaduct	0.00	0.00	--	--
160	CET9S3	Ephemeral	Stormwater Drainage	Excavation	--	--	0.00	37.5
160	CET9S3	Ephemeral	Access Road	Fill	--	--	0.00	87.5
160	CET9S3	Ephemeral	Rail	Fill	--	--	0.00	220.2
160	CET9S4	Ephemeral	Rail	Fill	--	--	0.00	334.5
160	CET9S4	Ephemeral	Stormwater Drainage	Excavation	--	--	0.00	317.8
160	CET9S4	Ephemeral	Access Road	Fill	--	--	0.00	160.8
160	Unnamed	Intermittent	Access Road	Fill	--	--	0.00	2.0
107	Unnamed	Intermittent	Access Road	Viaduct	0.00	0.00	--	--
160	Unnamed	Intermittent	Stormwater Drainage	Excavation	--	--	0.00	48.9
160	Unnamed	Intermittent	Rail	Fill	--	--	0.00	197.4
161	Unnamed	Artificial	Stormwater Drainage	Excavation	--	--	0.00	696.7
161	Unnamed	Artificial	Rail	Fill	--	--	0.00	39.8
108	Unnamed	Intermittent	Maintenance Facility	Fill	0.00	782.8	--	--
108	Unnamed	Intermittent	Access Road	Viaduct	0.00	0.00	--	--
108	Unnamed	Intermittent	Rail	Viaduct	0.00	0.00	--	--
161	Unnamed	Intermittent	Access Road	Fill	--	--	0.00	443.5
108	Unnamed	Intermittent	Maintenance	Fill	0.00	127.4	--	--

Table 10: Estimated Stream Impacts – Freestone County								
Natural Resources Mapbook Page #	Stream ID/Name*	Classification	Construction Type	Crossing Type	Segment 3C		Segment 4	
					Temp	Perm	Temp	Perm
					linear feet		linear feet	
			Facility					
108	Unnamed	Intermittent	Access Road	Viaduct	0.00	0.00	--	--
108	Unnamed	Intermittent	Rail	Viaduct	0.00	0.00	--	--
161	CET9S7	Ephemeral	Access Road	Viaduct	--	--	0.00	0.00
161	CET9S7	Ephemeral	Rail	Viaduct	--	--	0.00	0.00
161	CET9S7	Ephemeral	Temporary Fill	Fill	--	--	766.2	0.00
162	Unnamed	Intermittent	Access Road	Fill	--	--	0.00	98.8
109	Unnamed	Intermittent	Access Road	Viaduct	0.00	0.00	--	--
109	Unnamed	Intermittent	Rail	Viaduct	0.00	0.00	--	--
162	CET9S7	Ephemeral	Access Road	Fill	--	--	0.00	544.3
162	CET9S9	Ephemeral	Access Road	Viaduct	--	--	0.00	0.00
162	CET9S9	Ephemeral	Rail	Viaduct	--	--	0.00	0.00
162	CET9S10	Ephemeral	Access Road	Fill	--	--	0.00	62.7
162	CET9S10	Ephemeral	Rail	Fill	--	--	0.00	32.0
109	Unnamed	Intermittent	Access Road	Viaduct	0.00	0.00	--	--
109	Unnamed	Intermittent	Rail	Viaduct	0.00	0.00	--	--
109	Upper Keechi Creek	Intermittent	Access Road	Viaduct	0.00	0.00	--	--
109	Upper Keechi Creek	Intermittent	Rail	Viaduct	0.00	0.00	--	--
162	Unnamed	Intermittent	Stormwater Drainage	Excavation	--	--	0.00	617.1
163	Unnamed	Intermittent	Access Road	Viaduct	--	--	0.00	0.00
163	CEU9S2	Ephemeral	Access Road	Viaduct	--	--	0.00	0.00
163	CEU9S2	Ephemeral	Rail	Viaduct	--	--	0.00	0.00
163	Unnamed	Intermittent	Access Road	Viaduct	--	--	0.00	0.00
163	Unnamed	Intermittent	Access Road	Viaduct	--	--	0.00	0.00
110	Hog Creek	Intermittent	Access Road	Viaduct	0.00	0.00	--	--
110	Hog Creek	Intermittent	Rail	Viaduct	0.00	0.00	--	--
164	Patton Creek	Intermittent	Access Road	Viaduct	--	--	0.00	0.00

Table 10: Estimated Stream Impacts – Freestone County								
Natural Resources Mapbook Page #	Stream ID/Name*	Classification	Construction Type	Crossing Type	Segment 3C		Segment 4	
					Temp	Perm	Temp	Perm
					linear feet		linear feet	
164	Patton Creek	Intermittent	Rail	Viaduct	--	--	0.00	0.00
164	CEU9S5	Ephemeral	Access Road	Viaduct	--	--	0.00	0.00
164	CEU9S5	Ephemeral	Rail	Viaduct	--	--	0.00	0.00
111	Unnamed	Intermittent	Access Road	Viaduct	0.00	0.00	--	--
111	Unnamed	Intermittent	Rail	Viaduct	0.00	0.00	--	--
164	Unnamed	Intermittent	Access Road	Viaduct	--	--	0.00	0.00
165	Perry Creek	Intermittent	Access Road	Viaduct	--	--	0.00	0.00
165	Perry Creek	Intermittent	Rail	Viaduct	--	--	0.00	0.00
113	Caroline Creek	Intermittent	Access Road	Viaduct	0.00	0.00	--	--
113	Caroline Creek	Intermittent	Rail	Viaduct	0.00	0.00	--	--
113	Unnamed	Intermittent	Access Road	Viaduct	0.00	0.00	--	--
113	Unnamed	Intermittent	Rail	Viaduct	0.00	0.00	--	--
113	Unnamed	Intermittent	Stormwater Drainage	Excavation	0.00	22.8	--	--
113	Unnamed	Intermittent	Access Road	Viaduct	0.00	0.00	--	--
113	Unnamed	Intermittent	Rail	Viaduct	0.00	0.00	--	--
167	Chambers Creek	Intermittent	Rail	Viaduct	--	--	0.00	0.00
114	Unnamed	Intermittent	Rail	Fill	0.00	446.9	--	--
114	Unnamed	Intermittent	Access Road	Viaduct	0.00	0.00	--	--
114	Unnamed	Intermittent	Stormwater Drainage	Excavation	0.00	81.4	--	--
114	Unnamed	Intermittent	Access Road	Fill	0.00	153.2	--	--
114	Unnamed	Intermittent	Rail	Fill	0.00	86.2	--	--
114	Wilkerson Spring Branch	Intermittent	Access Road	Viaduct	0.00	0.00	--	--
114	Wilkerson Spring Branch	Intermittent	Rail	Viaduct	0.00	0.00	--	--
115	Fulks Dugout	Intermittent	Access Road	Viaduct	0.00	0.00	--	--
115	Fulks Dugout	Intermittent	Rail	Viaduct	0.00	0.00	--	--
116	Whitney Branch	Intermittent	Access Road	Viaduct	0.00	0.00	--	--

Table 10: Estimated Stream Impacts – Freestone County								
Natural Resources Mapbook Page #	Stream ID/Name*	Classification	Construction Type	Crossing Type	Segment 3C		Segment 4	
					Temp	Perm	Temp	Perm
					linear feet		linear feet	
116	Whitney Branch	Intermittent	Rail	Viaduct	0.00	0.00	--	--
116	Unnamed	Intermittent	Access Road	Viaduct	0.00	0.00	--	--
116	Unnamed	Intermittent	Rail	Viaduct	0.00	0.00	--	--
117	Buffalo Creek	Perennial	Rail	Viaduct	0.00	0.00	--	--
				Total	3,903.4	4,408.8	766.2	5,539.9

Source: USGS, 2016; FNI, 2017

*Stream ID # (C) indicates a specific feature recorded in the field whereas stream names (or those "unnamed") indicate features mapped via data not yet field-verified. Jurisdictional determinations to be confirmed by the USACE. Each stream is separated by construction type.

'--' - not present

Table 11: Estimated Wetland Impacts – Freestone County								
Natural Resources Mapbook Page #	Wetland ID/ Classification*	Wetland Type	Construction Type	Crossing Type	Segment 3C		Segment 4	
					Temp	Perm	Temp	Perm
					acres		acres	
100	PFO1A	Forested	Access Road	Viaduct/Conversion	0.00	0.1	--	--
100	PFO1A	Forested	Rail	Viaduct/Conversion	0.00	0.6	--	--
100	PFO1C	Forested	Access Road	Viaduct/Conversion	0.00	0.01	--	--
100	PFO1C	Forested	Rail	Viaduct/Conversion	0.00	0.05	--	--
100	PFO1A	Forested	Temporary Fill	Fill	1.8	0.00	--	--
100	PFO1A	Forested	Access Road	Viaduct/Conversion	<0.01	0.00	--	--
100	PFO1A	Forested	Access Road	Viaduct/Conversion	0.00	0.12	--	--
100	PFO1A	Forested	Rail	Viaduct/Conversion	0.00	0.44	--	--
100	PFO1C	Forested	Rail	Viaduct/Conversion	0.00	0.05	--	--
62	CER8EW17	Emergent	Rail	Viaduct	--	--	0.00	0.00
100	PFO1C	Forested	Temporary Fill	Fill	0.9	0.00	--	--
62	CER8EW10	Emergent	Temporary Fill	Fill	--	--	0.03	0.00
62	CER8EW9	Emergent	Temporary Fill	Fill	--	--	0.03	0.00
62	CER8EW11	Emergent	Access Road	Fill	--	--	0.00	0.02

Table 11: Estimated Wetland Impacts – Freestone County								
Natural Resources Mapbook Page #	Wetland ID/ Classification*	Wetland Type	Construction Type	Crossing Type	Segment 3C		Segment 4	
					Temp	Perm	Temp	Perm
					acres		acres	
155	CER8EW8	Emergent	Temporary Fill	Fill	--	--	0.02	0.00
101	PEM1F	Emergent	Rail	Fill	0.00	0.11	--	--
155	CER8EW7	Emergent	Temporary Fill	Fill	--	--	0.04	0.00
155	CER8EW5	Emergent	Temporary Fill	Fill	--	--	0.07	0.00
155	CER8EW18	Emergent	Temporary Fill	Fill	--	--	<0.01	0.00
101	PFO1C	Forested	Access Road	Viaduct/Conversion	0.00	0.04	--	--
101	PFO1C	Forested	Rail	Viaduct/Conversion	0.00	0.18	--	--
155	CER8SW1	Scrub/Shrub	Rail	Viaduct	--	--	0.00	0.00
102	PFO1C	Forested	Access Road	Viaduct/Conversion	0.00	0.09	--	--
102	PFO1C	Forested	Rail	Viaduct/Conversion	0.00	0.09	--	--
156	PFO1C	Forested	Maintenance Facility	Fill	--	--	0.00	0.13
155	PFO1C	Forested	Rail	Viaduct/Conversion	--	--	0.00	0.06
155	PFO1C	Forested	Access Road	Viaduct/Conversion	--	--	0.00	0.07
102	PSS1/EM1A	Forested	Access Road	Viaduct/Conversion	0.00	1.9	--	--
102	PSS1/EM1A	Forested	Rail	Viaduct/Conversion	0.00	2.6	--	--
102	PEM1Ch	Emergent	Access Road	Viaduct	0.00	0.00	--	--
156	PFO1A	Forested	Access Road	Viaduct/Conversion	--	--	0.00	0.01
156	PFO1A	Forested	Rail	Viaduct/Conversion	--	--	0.00	0.94
156	PFO1A	Forested	Access Road	Viaduct/Conversion	--	--	0.00	<0.01
156	PFO1A	Forested	Rail	Viaduct/Conversion	--	--	0.00	0.07
156	CER8EW16	Emergent	Access Road	Viaduct	--	--	0.00	0.00
156	CER8EW16	Emergent	Rail	Viaduct	--	--	0.00	0.00
156	CER8EW15	Emergent	Rail	Viaduct	--	--	0.00	0.00
156	CER8EW15	Emergent	Access Road	Viaduct	--	--	0.00	0.00
156	CER8EW14	Emergent	Utilities	Fill	--	--	0.02	0.00
156	CER8EW14	Emergent	Rail	Viaduct	--	--	0.00	0.00
156	CER8FW5	Forested	Utilities	Fill	--	--	<0.01	0.00

Table 11: Estimated Wetland Impacts – Freestone County								
Natural Resources Mapbook Page #	Wetland ID/ Classification*	Wetland Type	Construction Type	Crossing Type	Segment 3C		Segment 4	
					Temp	Perm	Temp	Perm
					acres		acres	
156	CER8FW5	Forested	Rail	Viaduct	--	--	0.00	0.00
156	CER8EW13	Emergent	Rail	Viaduct	--	--	0.00	0.00
156	CER8EW12	Emergent	Access Road	Viaduct	--	--	0.00	0.00
156	CER8EW12	Emergent	Rail	Viaduct	--	--	0.00	0.00
157	CES8EW1	Emergent	Rail	Fill	--	--	0.00	0.06
105	PEM1C	Emergent	Access Road	Viaduct	0.00	0.00	--	--
105	PEM1C	Emergent	Rail	Viaduct	0.00	0.00	--	--
105	PFO1A	Forested	Access Road	Viaduct/Conversion	0.00	0.05	--	--
105	PFO1A	Forested	Rail	Viaduct/Conversion	0.00	0.09	--	--
158	PFO1C	Forested	Access Road	Viaduct/Conversion	--	--	0.00	0.05
158	PFO1C	Forested	Rail	Viaduct/Conversion	--	--	0.00	0.06
162	PFO1C	Forested	Access Road	Fill	--	--	0.00	0.04
162	CEU9EW4	Emergent	Access Road	Fill	--	--	0.00	0.09
162	CEU9EW4	Emergent	Rail	Fill	--	--	0.00	0.09
163	CEU9EW3	Emergent	Access Road	Viaduct	--	--	0.00	0.00
163	CEU9EW3	Emergent	Rail	Viaduct	--	--	0.00	0.00
164	PFO1C	Forested	Access Road	Viaduct/Conversion	--	--	0.00	0.01
164	PFO1C	Forested	Rail	Viaduct/Conversion	--	--	0.00	0.18
165	PEM1C	Emergent	Access Road	Viaduct	--	--	0.00	0.00
165	PEM1C	Emergent	Rail	Viaduct	--	--	0.00	0.00
165	PEM1C	Emergent	Access Road	Viaduct	--	--	0.00	0.00
165	PEM1C	Emergent	Rail	Viaduct	--	--	0.00	0.00
165	PEM1A	Emergent	Access Road	Viaduct	--	--	0.00	0.00
165	PEM1A	Emergent	Rail	Viaduct	--	--	0.00	0.00
165	PFO1A	Forested	Access Road	Viaduct/Conversion	--	--	0.00	0.12
165	PFO1A	Forested	Rail	Viaduct/Conversion	--	--	0.00	0.86
112	PEM1A	Emergent	Rail	Viaduct	0.00	0.00	--	--
114	PFO1A	Forested	Stormwater	Excavation	0.00	0.12	--	--

Table 11: Estimated Wetland Impacts – Freestone County								
Natural Resources Mapbook Page #	Wetland ID/ Classification*	Wetland Type	Construction Type	Crossing Type	Segment 3C		Segment 4	
					Temp	Perm	Temp	Perm
					acres		acres	
			Drainage					
114	PFO1A	Forested	Access Road	Fill	0.00	0.07	--	--
116	PEM1C	Emergent	Access Road	Viaduct	0.00	0.00	--	--
116	PEM1C	Emergent	Rail	Viaduct	0.00	0.00	--	--
117	PFO1A	Forested	Access Road	Viaduct/Conversion	0.00	0.08	--	--
117	PFO1A	Forested	Rail	Viaduct/Conversion	0.00	2.6	--	--
				Total	2.7	9.4	0.21	2.9

Source: USFWS, 2016; FNI, 2017

*Wetland ID # (C) indicates a specific feature recorded in the field. Wetland classifications (P) indicate wetlands not yet field-verified. Jurisdictional determinations to be confirmed by the USACE. Each wetland is separated by construction type.

P - Palustrine
EM - Emergent
EM1 - Persistent Emergent
FO - Forested
FO1 - Broad-leaved Deciduous Forested
SS - Scrub-Shrub
SS1 - Broad-leaved Deciduous Scrub-Shrub
A - Temporarily Flooded
C - Seasonally Flooded
'--' - not present

Table 12: Estimated Waterbody Impacts – Freestone County								
Natural Resources Mapbook Page #	Waterbody ID/Name	Waterbody Type	Construction Type	Crossing Type	Segment 3C		Segment 4	
					Temp	Perm	Temp	Perm
					acres		acres	
99	Unnamed	Pond	Access Road	Fill	0.00	0.12	--	--
99	Unnamed	Pond	Rail	Fill	0.00	0.15	--	--
100	Unnamed	Pond	Rail	Viaduct	0.00	0.00	--	--
62	CER8PD1	Pond	Rail	Viaduct	--	--	0.00	0.00
100	Unnamed	Pond	Temporary Fill	Fill	0.44	0.00	--	--
100	Unnamed	Pond	Temporary Fill	Fill	0.11	0.00	--	--
100	Unnamed	Pond	Temporary Fill	Fill	0.09	0.00	--	--
100	Unnamed	Pond	Temporary Fill	Fill	0.48	0.00	--	--
62	CER8PD4	Pond	Access Road	Fill	--	--	0.00	0.01

Table 12: Estimated Waterbody Impacts – Freestone County								
Natural Resources Mapbook Page #	Waterbody ID/Name	Waterbody Type	Construction Type	Crossing Type	Segment 3C		Segment 4	
					Temp	Perm	Temp	Perm
					acres		acres	
101	Unnamed	Pond	Stormwater Drainage	Excavation	0.00	0.08	--	--
101	Unnamed	Pond	Rail	Fill	0.00	0.21	--	--
101	Unnamed	Pond	Rail	Fill	0.00	0.04	--	--
155	CER8PD7	Pond	Temporary Fill	Fill	--	--	0.16	0.00
155	CER8PD8	Pond	Temporary Fill	Fill	--	--	0.12	0.00
155	CER8PD9	Pond	Temporary Fill	Fill	--	--	0.02	0.00
155	CER8PD9	Pond	Access Road	Viaduct	--	--	0.00	0.00
155	CER8PD9	Pond	Rail	Viaduct	--	--	0.00	0.00
101	Unnamed	Pond	Access Road	Fill	0.00	0.07	--	--
155	CER8PD11	Pond	Rail	Viaduct	--	--	0.00	0.00
155	Unnamed	Pond	Access Road	Viaduct	--	--	0.00	0.00
155	Unnamed	Pond	Rail	Viaduct	--	--	0.00	0.00
103	Unnamed	Pond	Access Road	Viaduct	0.00	0.00	--	--
103	Unnamed	Pond	Rail	Viaduct	0.00	0.00	--	--
156	Unnamed	Pond	Maintenance Facility	Fill	--	--	0.00	0.16
156	Unnamed	Pond	Maintenance Facility	Fill	--	--	0.00	<0.01
156	Unnamed	Pond	Rail	Fill	--	--	0.00	0.17
156	CER8PD23	Pond	Access Road	Viaduct	--	--	0.00	0.00
156	CER8PD23	Pond	Rail	Viaduct	--	--	0.00	0.00
156	CER8PD23	Pond	Access Road	Viaduct	--	--	0.00	0.00
156	CER8PD23	Pond	Rail	Viaduct	--	--	0.00	0.00
156	CER8PD22	Pond	Access Road	Viaduct	--	--	0.00	0.00
156	CER8PD22	Pond	Rail	Viaduct	--	--	0.00	0.00
103	Unnamed	Pond	Rail	Viaduct	0.00	0.00	--	--
157	CES8PD2	Pond	Access Road	Fill	--	--	0.00	0.30
157	CES8PD2	Pond	Rail	Fill	--	--	0.00	0.33
157	CES8PD3	Pond	Access Road	Fill	--	--	0.00	0.02

Table 12: Estimated Waterbody Impacts – Freestone County								
Natural Resources Mapbook Page #	Waterbody ID/Name	Waterbody Type	Construction Type	Crossing Type	Segment 3C		Segment 4	
					Temp	Perm	Temp	Perm
					acres		acres	
157	CES8PD3	Pond	Utilities	Fill	--	--	0.01	0.00
157	CES9PD1	Pond	Rail	Fill	--	--	0.00	<0.01
157	CES9PD2	Pond	Access Road	Viaduct	--	--	0.00	0.00
157	CES9PD2	Pond	Stormwater Drainage	Excavation	--	--	0.00	0.34
158	CES9PD4	Pond	Access Road	Viaduct	--	--	0.00	0.00
158	CES9PD4	Pond	Rail	Viaduct	--	--	0.00	0.00
158	CES9PD5	Pond	Access Road	Fill	--	--	0.00	0.03
158	CES9PD5	Pond	Stormwater Drainage	Excavation	--	--	0.00	0.07
158	CES9PD5	Pond	Rail	Fill	--	--	0.00	0.53
105	Unnamed	Pond	Rail	Fill	0.00	0.01	--	--
105	Unnamed	Pond	Utilities	Fill	0.00	0.07	--	--
158	Unnamed	Pond	Access Road	Viaduct	--	--	0.00	0.00
158	Unnamed	Pond	Rail	Fill	--	--	0.00	0.15
159	Unnamed	Pond	Access Road	Viaduct	--	--	0.00	0.00
160	CET9PD4	Pond	Rail	Fill	--	--	0.00	0.01
160	CET9PD4	Pond	Stormwater Drainage	Excavation	--	--	0.00	0.03
160	CET9PD6	Pond	Stormwater Drainage	Excavation	--	--	0.00	0.09
160	CET9PD6	Pond	Rail	Fill	--	--	0.00	0.15
160	CET9PD6	Pond	Stormwater Drainage	Excavation	--	--	0.00	0.17
160	CET9PD6	Pond	Access Road	Fill	--	--	0.00	0.42
160	CET9PD7	Pond	Access Road	Fill	--	--	0.00	0.04
160	CET9PD7	Pond	Rail	Fill	--	--	0.00	0.09
107	Unnamed	Pond	Maintenance Facility	Fill	0.00	0.09	--	--
108	Unnamed	Pond	Access Road	Viaduct	0.00	0.00	--	--
108	Unnamed	Pond	Maintenance Facility	Fill	0.00	0.67	--	--

Table 12: Estimated Waterbody Impacts – Freestone County								
Natural Resources Mapbook Page #	Waterbody ID/Name	Waterbody Type	Construction Type	Crossing Type	Segment 3C		Segment 4	
					Temp	Perm	Temp	Perm
					acres		acres	
108	Unnamed	Pond	Maintenance Facility	Fill	0.00	0.12	--	--
161	Unnamed	Pond	Rail	Fill	--	--	0.00	0.17
161	Unnamed	Pond	Stormwater Drainage	Excavation	--	--	0.00	0.37
108	Unnamed	Pond	Access Road	Viaduct	0.00	0.00	--	--
161	Unnamed	Pond	Rail	Fill	--	--	0.00	0.08
161	Unnamed	Pond	Stormwater Drainage	Excavation	--	--	0.00	0.11
161	CET9PD27	Pond	Temporary Fill	Fill	--	--	0.30	0.00
161	CET9PD18	Pond	Temporary Fill	Fill	--	--	0.08	0.00
161	CET9PD18	Pond	Access Road	Fill	--	--	0.00	0.04
161	CET9PD18	Pond	Rail	Fill	--	--	0.00	0.10
162	Unnamed	Pond	Access Road	Fill	--	--	0.00	0.10
162	CET9PD20	Pond	Rail	Fill	--	--	0.00	0.06
162	CET9PD20	Pond	Access Road	Fill	--	--	0.00	0.16
162	Unnamed	Pond	Stormwater Drainage	Excavation	--	--	0.00	<0.01
162	Unnamed	Pond	Access Road	Fill	--	--	0.00	0.15
110	Unnamed	Pond	Access Road	Fill	0.00	0.02	--	--
163	CEU9PD3	Pond	Access Road	Viaduct	--	--	0.00	0.00
163	CEU9PD5	Pond	Access Road	Viaduct	--	--	0.00	0.00
163	CEU9PD5	Pond	Rail	Viaduct	--	--	0.00	0.00
163	CEU9PD7	Pond	Access Road	Viaduct	--	--	0.00	0.00
163	CEU9PD7	Pond	Rail	Viaduct	--	--	0.00	0.00
164	CEU9PD17	Pond	Stormwater Drainage	Excavation	--	--	0.00	0.13
164	CEU9PD11	Pond	Access Road	Fill	--	--	0.00	<0.01
164	CEU9PD11	Pond	Rail	Fill	--	--	0.00	0.04
111	Unnamed	Pond	Access Road	Viaduct	0.00	0.00	--	--
111	Unnamed	Pond	Rail	Viaduct	0.00	0.00	--	--

Table 12: Estimated Waterbody Impacts – Freestone County								
Natural Resources Mapbook Page #	Waterbody ID/Name	Waterbody Type	Construction Type	Crossing Type	Segment 3C		Segment 4	
					Temp	Perm	Temp	Perm
					acres		acres	
166	Unnamed	Pond	Rail	Viaduct	--	--	0.00	0.00
166	Unnamed	Pond	Access Road	Viaduct	--	--	0.00	0.00
166	Unnamed	Pond	Rail	Viaduct	--	--	0.00	0.00
				Total	1.1	1.7	0.69	4.6

Source: USGS, 2016; USFWS, 2016; FNI, 2017

*Waterbody ID # (C) indicates a specific feature recorded in the field. Waterbody classifications (P) indicate waterbodies not yet field-verified. Jurisdictional determinations to be confirmed by the USACE. Each waterbody is separated by construction type.

'--' - not present

Limestone County

Table 13: Estimated Stream Impacts – Limestone County						
Natural Resources Mapbook Page #	Stream ID/Stream Name*	Classification	Construction Type	Crossing Type	Segment 4	
					Temp	Perm
					linear feet	
167	Chambers Creek	Intermittent	Access Road	Viaduct	0.00	0.00
167	Unnamed	Intermittent	Stormwater Drainage	Excavation	0.00	120.6
167	Unnamed	Intermittent	Rail	Fill	0.00	162.9
167	CEV9S12	Ephemeral	Access Road	Viaduct	0.00	0.00
167	CEV9S12	Ephemeral	Rail	Viaduct	0.00	0.00
167	CEV9S11	Ephemeral	Access Road	Viaduct	0.00	0.00
167	Unnamed	Intermittent	Rail	Viaduct	0.00	0.00
167	CEV9S7	Ephemeral	Access Road	Viaduct	0.00	0.00
167	CEV9S7	Ephemeral	Rail	Viaduct	0.00	0.00
167	Unnamed	Intermittent	Access Road	Viaduct	0.00	0.00
167	Unnamed	Intermittent	Rail	Viaduct	0.00	0.00
168	CEV9S10	Ephemeral	Facility	Fill	0.00	72.7
168	CEV9S10	Ephemeral	Rail	Viaduct	0.00	0.00

Table 13: Estimated Stream Impacts – Limestone County						
Natural Resources Mapbook Page #	Stream ID/Stream Name*	Classification	Construction Type	Crossing Type	Segment 4	
					Temp	Perm
					linear feet	
168	CEW9S1	Intermittent	Access Road	Viaduct	0.00	0.00
168	CEW9S1	Intermittent	Rail	Viaduct	0.00	0.00
168	CEW9S13	Ephemeral	Access Road	Viaduct	0.00	0.00
168	CEW9S13	Ephemeral	Rail	Viaduct	0.00	0.00
168	Unnamed	Intermittent	Access Road	Viaduct	0.00	0.00
168	Unnamed	Intermittent	Rail	Viaduct	0.00	0.00
168	Unnamed	Intermittent	Access Road	Viaduct	0.00	0.00
168	Unnamed	Intermittent	Rail	Viaduct	0.00	0.00
169	Unnamed	Intermittent	Access Road	Viaduct	0.00	0.00
169	Unnamed	Intermittent	Rail	Viaduct	0.00	0.00
169	Unnamed	Intermittent	Access Road	Viaduct	0.00	0.00
169	Unnamed	Intermittent	Access Road	Viaduct	0.00	0.00
169	Unnamed	Intermittent	Rail	Viaduct	0.00	0.00
169	CEW9S9	Perennial	Access Road	Viaduct	0.00	0.00
169	CEW9S9	Perennial	Rail	Viaduct	0.00	0.00
170	CEW9S100	Ephemeral	Access Road	Fill	0.00	589.1
170	CEW9S100	Ephemeral	Rail	Fill	0.00	795.9
170	CEW9S12	Intermittent	Access Road	Viaduct	0.00	0.00
170	CEW9S12	Intermittent	Rail	Viaduct	0.00	0.00
170	CEW9S99	Ephemeral	Access Road	Viaduct	0.00	0.00
170	CEW9S99	Ephemeral	Rail	Viaduct	0.00	0.00
171	Unnamed	Intermittent	Access Road	Viaduct	0.00	0.00
171	Unnamed	Intermittent	Rail	Viaduct	0.00	0.00
172	Sanders Creek	Intermittent	Access Road	Viaduct	0.00	0.00
172	Sanders Creek	Intermittent	Rail	Viaduct	0.00	0.00
172	Unnamed	Intermittent	Access Road	Viaduct	0.00	0.00
172	Unnamed	Intermittent	Rail	Viaduct	0.00	0.00
172	Coots Branch	Intermittent	Access Road	Viaduct	0.00	0.00

Table 13: Estimated Stream Impacts – Limestone County						
Natural Resources Mapbook Page #	Stream ID/Stream Name*	Classification	Construction Type	Crossing Type	Segment 4	
					Temp	Perm
					linear feet	
172	Coots Branch	Intermittent	Rail	Viaduct	0.00	0.00
172	CEX10S10	Ephemeral	Access Road	Viaduct	0.00	0.00
172	CEX10S10	Ephemeral	Rail	Viaduct	0.00	0.00
173	CEX10S16	Ephemeral	Stormwater Drainage	Excavation	0.00	50.3
173	CEX10S16	Ephemeral	Access Road	Fill	0.00	315.8
173	Unnamed	Artificial	Access Road	Fill	0.00	784.4
173	Unnamed	Intermittent	Stormwater Drainage	Excavation	0.00	280.9
173	Lies Branch	Intermittent	Access Road	Viaduct	0.00	0.00
173	Lies Branch	Intermittent	Rail	Viaduct	0.00	0.00
173	Unnamed	Intermittent	Access Road	Viaduct	0.00	0.00
173	Unnamed	Intermittent	Rail	Viaduct	0.00	0.00
174	Unnamed	Intermittent	Access Road	Viaduct	0.00	0.00
174	Unnamed	Intermittent	Rail	Viaduct	0.00	0.00
174	Unnamed	Intermittent	Access Road	Viaduct	0.00	0.00
174	Unnamed	Intermittent	Rail	Viaduct	0.00	0.00
174	Lambs Creek	Intermittent	Access Road	Viaduct	0.00	0.00
174	Lambs Creek	Intermittent	Rail	Viaduct	0.00	0.00
				Total	0.00	3,172.6

Source: USGS, 2016; FNI, 2017

*Stream ID # (N) indicates a specific feature recorded in the field whereas stream names (or those "unnamed") indicate features mapped via data not yet field-verified. Jurisdictional determinations to be confirmed by the USACE. Each stream is separated by construction type.

Table 14: Estimated Wetland Impacts – Limestone County						
Natural Resources Mapbook Page #	Wetland ID/Classification*	Wetland Type	Construction Type	Crossing Type	Segment 4	
					Temp	Perm
					acres	
168	PFO1C	Forested	Access Road	Viaduct/Conversion	0.00	0.01
168	PFO1C	Forested	Rail	Viaduct	0.00	0.08

Table 14: Estimated Wetland Impacts – Limestone County						
Natural Resources Mapbook Page #	Wetland ID/Classification*	Wetland Type	Construction Type	Crossing Type	Segment 4	
					Temp	Perm
					acres	
169	PFO1A	Forested	Rail	Viaduct	0.00	0.90
169	CEW9EW13	Emergent	Access Road	Viaduct	0.00	0.00
169	CEW9EW13	Emergent	Rail	Viaduct	0.00	0.00
169	CEW9EW12	Emergent	Access Road	Viaduct	0.00	0.00
169	CEW9EW12	Emergent	Rail	Viaduct	0.00	0.00
169	CEW9EW14	Emergent	Access Road	Viaduct	0.00	0.00
169	CEW9EW14	Emergent	Rail	Viaduct	0.00	0.00
169	CEW9EW8	Emergent	Rail	Viaduct	0.00	0.00
170	CEW9FW99	Forested	Access Road	Viaduct/Conversion	0.00	0.03
170	CEW9FW99	Forested	Rail	Viaduct	0.00	0.08
170	PFO1C	Forested	Access Road	Viaduct/Conversion	0.00	0.01
171	PFO1C	Forested	Access Road	Viaduct/Conversion	0.00	0.02
171	PFO1C	Forested	Rail	Viaduct	0.00	0.27
171	PEM1C	Emergent	Access Road	Viaduct	0.00	0.00
171	PEM1C	Emergent	Rail	Viaduct	0.00	0.00
172	PFO1C	Forested	Access Road	Viaduct/Conversion	0.00	0.03
172	PFO1C	Forested	Rail	Viaduct	0.00	0.07
172	PFO1C	Forested	Access Road	Viaduct/Conversion	0.00	0.03
172	PFO1C	Forested	Rail	Viaduct	0.00	0.06
173	CEX10EW2	Emergent	Rail	Fill	0.00	0.08
173	CEX10EW3	Emergent	Access Road	Fill	0.00	0.05
173	CEX10EW3	Emergent	Rail	Fill	0.00	<0.01
173	PFO1C	Forested	Stormwater Drainage	Excavation	0.00	0.05
173	PFO1C	Forested	Access Road	Viaduct/Conversion	0.00	0.38
173	PFO1C	Forested	Rail	Viaduct	0.00	0.12
173	CEY10EW1	Emergent	Access Road	Viaduct	0.00	0.00
173	CEY10EW1	Emergent	Rail	Viaduct	0.00	0.00
174	PFO1C	Forested	Access Road	Viaduct/Conversion	0.00	0.04

Table 14: Estimated Wetland Impacts – Limestone County						
Natural Resources Mapbook Page #	Wetland ID/Classification*	Wetland Type	Construction Type	Crossing Type	Segment 4	
					Temp	Perm
					acres	
174	PFO1C	Forested	Rail	Viaduct	0.00	0.05
				Total	0.00	2.4

Source: USFWS, 2016; FNI, 2017

*Wetland ID # (C) indicates a specific feature recorded in the field. Wetland classifications (P) indicate wetlands not yet field-verified. Jurisdictional determinations to be confirmed by the USACE. Each wetland is separated by construction type

P - Palustrine
FO – Forested
FO1 - Broad-leaved Deciduous Forested
C – Seasonally Flooded
EM - Emergent
EM1 – Persistent Emergent
A - Temporarily Flooded

Table 15: Estimated Waterbody Impacts – Limestone County						
Natural Resources Mapbook Page #	Waterbody ID/Name *	Waterbody Type	Construction Type	Crossing Type	Segment 4	
					Temp	Perm
					acres	
168	CEW9PD26	Pond	Access Road	Viaduct	0.00	0.00
168	CEW9PD26	Pond	Rail	Viaduct	0.00	0.00
169	Unnamed	Pond	Rail	Viaduct	0.00	0.00
169	CEW9PD10	Pond	Access Road	Viaduct	0.00	0.00
169	CEW9PD10	Pond	Rail	Viaduct	0.00	0.00
171	Unnamed	Pond	Access Road	Fill	0.00	<0.01
171	Unnamed	Pond	Access Road	Fill	0.00	0.10
171	Unnamed	Pond	Rail	Fill	0.00	0.04
172	Unnamed	Pond	Access Road	Fill	0.00	0.11
172	CEX10PD25	Pond	Access Road	Fill	0.00	0.05
173	CEX10PD26	Pond	Rail	Fill	0.00	0.16
173	CEX10PD37	Pond	Access Road	Fill	0.00	0.22
173	CEX10PD37	Pond	Rail	Fill	0.00	0.02
173	CEX10PD27	Pond	Access Road	Fill	0.00	0.23
173	CEX10PD27	Pond	Rail	Fill	0.00	0.08
173	Unnamed	Pond	Access Road	Fill	0.00	0.36

Table 15: Estimated Waterbody Impacts – Limestone County						
Natural Resources Mapbook Page #	Waterbody ID/Name *	Waterbody Type	Construction Type	Crossing Type	Segment 4	
					Temp	Perm
					acres	
173	Unnamed	Pond	Stormwater Drainage	Excavation	0.00	0.08
173	CEY10PD3	Pond	Rail	Viaduct	0.00	0.00
173	CEY10PD4	Pond	Rail	Viaduct	0.00	0.00
173	CEY10PD6	Pond	Rail	Viaduct	0.00	0.00
174	CEY10PD14	Pond	Rail	Viaduct	0.00	0.00
174	CEY10PD14	Pond	Utilities	Fill	0.00	<0.01
				Total	0.00	1.5

Source: USGS, 2016; USFWS, 2016; FNI, 2017

*Waterbody ID # (C) indicates a specific feature recorded in the field. Waterbody classifications (P) indicate waterbodies not yet field-verified. Jurisdictional determinations to be confirmed by the USACE. Each waterbody is separated by construction type.

Leon County

Table 16: Estimated Stream Impacts – Leon County								
Natural Resources Mapbook Page #	Stream ID/Name*	Classification	Construction Type	Crossing Type	Segment 3C		Segment 4	
					Temp	Perm	Temp	Perm
					linear feet		linear feet	
117	Unnamed	Intermittent	Access Road	Viaduct	0.00	0.00	--	--
117	Unnamed	Intermittent	Rail	Viaduct	0.00	0.00	--	--
118	Unnamed	Intermittent	Stormwater Drainage	Fill	0.00	204.7	--	--
118	Unnamed	Intermittent	Rail	Fill	0.00	179.1	--	--
118	Unnamed	Intermittent	Access Road	Viaduct	0.00	0.00	--	--
118	Unnamed	Intermittent	Rail	Viaduct	0.00	0.00	--	--
118	Cane Branch	Intermittent	Temporary Fill	Fill	50.4	0.00	--	--
118	Cane Branch	Intermittent	Rail	Viaduct	0.00	0.00	--	--
118	Cane Branch	Intermittent	Access Road	Viaduct	0.00	0.00	--	--
118	Unnamed	Intermittent	Access Road	Viaduct	0.00	0.00	--	--
118	Unnamed	Intermittent	Rail	Viaduct	0.00	0.00	--	--
119	Copper Creek	Intermittent	Access Road	Viaduct	0.00	0.00	--	--
119	Copper Creek	Intermittent	Rail	Viaduct	0.00	0.00	--	--
120	Unnamed	Intermittent	Access Road	Viaduct	0.00	0.00	--	--

Table 16: Estimated Stream Impacts – Leon County								
Natural Resources Mapbook Page #	Stream ID/Name*	Classification	Construction Type	Crossing Type	Segment 3C		Segment 4	
					Temp	Perm	Temp	Perm
					linear feet		linear feet	
120	Unnamed	Intermittent	Rail	Viaduct	0.00	0.00	--	--
120	Unnamed	Perennial	Access Road	Viaduct	0.00	0.00	--	--
120	Bliss Creek	Perennial	Access Road	Viaduct	0.00	0.00	--	--
120	Bliss Creek	Perennial	Rail	Viaduct	0.00	0.00	--	--
120	Bliss Creek	Perennial	Access Road	Viaduct	0.00	0.00	--	--
120	Unnamed	Intermittent	Access Road	Viaduct	0.00	0.00	--	--
120	Unnamed	Intermittent	Rail	Viaduct	0.00	0.00	--	--
121	Right Branch	Intermittent	Access Road	Viaduct	0.00	0.00	--	--
121	Right Branch	Intermittent	Rail	Viaduct	0.00	0.00	--	--
121	Unnamed	Intermittent	Access Road	Viaduct	0.00	0.00	--	--
121	Unnamed	Intermittent	Rail	Viaduct	0.00	0.00	--	--
174	CEY10S7	Ephemeral	Access Road	Viaduct	--	--	0.00	0.00
174	CEY10S7	Ephemeral	Rail	Viaduct	--	--	0.00	0.00
175	Unnamed	Intermittent	Access Road	Viaduct	--	--	0.00	0.00
175	Unnamed	Intermittent	Rail	Viaduct	--	--	0.00	0.00
122	Unnamed	Intermittent	Access Road	Viaduct	0.00	0.00	--	--
122	Unnamed	Intermittent	Rail	Viaduct	0.00	0.00	--	--
175	CEY10S8	Intermittent	Access Road	Viaduct	--	--	0.00	0.00
175	CEY10S8	Intermittent	Rail	Viaduct	--	--	0.00	0.00
175	CEY10S9	Ephemeral	Access Road	Viaduct	--	--	0.00	0.00
122	Unnamed	Intermittent	Access Road	Viaduct	0.00	0.00	--	--
122	Unnamed	Intermittent	Rail	Viaduct	0.00	0.00	--	--
175	Unnamed	Intermittent	Access Road	Viaduct	--	--	0.00	0.00
123	Unnamed	Intermittent	Access Road	Viaduct	0.00	0.00	--	--
123	Unnamed	Intermittent	Rail	Viaduct	0.00	0.00	--	--
123	Unnamed	Intermittent	Access Road	Excavation	0.00	108.8	--	--
176	CEZ11S2	Intermittent	Rail	Viaduct	--	--	0.00	0.00
123	Unnamed	Intermittent	Access Road	Fill	0.00	280.0	--	--
123	Unnamed	Intermittent	Rail	Fill	0.00	210.9	--	--

Table 16: Estimated Stream Impacts – Leon County								
Natural Resources Mapbook Page #	Stream ID/Name*	Classification	Construction Type	Crossing Type	Segment 3C		Segment 4	
					Temp	Perm	Temp	Perm
					linear feet		linear feet	
123	Unnamed	Intermittent	Stormwater Drainage	Excavation	0.00	0.0	--	--
123	Unnamed	Intermittent	Access Road	Fill	0.00	116.0	--	--
123	Unnamed	Intermittent	Rail	Fill	0.00	139.3	--	--
123	Unnamed	Intermittent	Stormwater Drainage	Excavation	0.00	107.8	--	--
123	Unnamed	Intermittent	Access Road	Fill	0.00	108.6	--	--
177	CEZ11S8	Perennial	Access Road	Viaduct	--	--	0.00	0.00
177	CEZ11S8	Perennial	Rail	Viaduct	--	--	0.00	0.00
124	Unnamed	Intermittent	Access Road	Viaduct	0.00	0.00	--	--
124	Unnamed	Intermittent	Rail	Viaduct	0.00	0.00	--	--
177	CEZ11S11	Intermittent	Access Road	Viaduct	--	--	0.00	0.00
177	CEZ11S10	Intermittent	Access Road	Viaduct	--	--	0.00	0.00
178	Unnamed	Intermittent	Stormwater Drainage	Excavation	--	--	0.00	31.0
177	Unnamed	Intermittent	Rail	Fill	--	--	0.00	242.1
178	Unnamed	Intermittent	Temporary Fill	Fill	--	--	894.7	0.00
178	Unnamed	Intermittent	Maintenance Facility	Fill	--	--	0.00	131.5
178	Cedar Creek	Intermittent	Temporary Fill	Fill	--	--	146.0	0.00
178	Cedar Creek	Intermittent	Access Road	Viaduct	--	--	0.00	0.00
178	Cedar Creek	Intermittent	Rail	Viaduct	--	--	0.00	0.00
178	Unnamed	Intermittent	Temporary Fill	Fill	--	--	245.1	0.00
178	Unnamed	Intermittent	Maintenance Facility	Fill	--	--	0.00	16.0
178	Unnamed	Intermittent	Access Road	Viaduct	--	--	0.00	0.00
178	Unnamed	Intermittent	Rail	Viaduct	--	--	0.00	0.00
125	Unnamed	Intermittent	Access Road	Viaduct	0.00	0.00	--	--
125	Smith Branch	Intermittent	Access Road	Viaduct	0.00	0.00	--	--
125	Lower Keechi Creek	Artificial	Access Road	Viaduct	0.00	0.00	--	--
125	Lower Keechi Creek	Artificial	Access Road	Viaduct	0.00	0.00	--	--

Table 16: Estimated Stream Impacts – Leon County								
Natural Resources Mapbook Page #	Stream ID/Name*	Classification	Construction Type	Crossing Type	Segment 3C		Segment 4	
					Temp	Perm	Temp	Perm
					linear feet		linear feet	
125	Lower Keechi Creek	Artificial	Rail	Viaduct	0.00	0.00	--	--
178	Unnamed	Intermittent	Rail	Fill	--	--	0.00	663.8
178	Unnamed	Artificial	Stormwater Drainage	Excavation	--	--	0.00	31.1
178	Unnamed	Artificial	Access Road	Fill	--	--	0.00	89.5
125	Unnamed	Intermittent	Access Road	Viaduct	0.00	0.00	--	--
125	Unnamed	Intermittent	Rail	Viaduct	0.00	0.00	--	--
179	Brushy Creek	Intermittent	Maintenance Facility	Fill	--	--	0.00	33.1
179	Brushy Creek	Intermittent	Access Road	Viaduct	--	--	0.00	0.00
179	Brushy Creek	Intermittent	Rail	Viaduct	--	--	0.00	0.00
179	Unnamed	Intermittent	Access Road	Viaduct	--	--	0.00	0.00
179	Unnamed	Intermittent	Rail	Viaduct	--	--	0.00	0.00
126	Unnamed	Intermittent	Access Road	Viaduct	0.00	0.00	--	--
126	Unnamed	Intermittent	Rail	Viaduct	0.00	0.00	--	--
179	Unnamed	Intermittent	Access Road	Viaduct	--	--	0.00	0.00
179	Unnamed	Intermittent	Rail	Viaduct	--	--	0.00	0.00
126	Tiger Branch	Intermittent	Access Road	Excavation	0.00	218.9	--	--
126	Tiger Branch	Intermittent	Stormwater Drainage	Excavation	0.00	65.2	--	--
179	Unnamed	Intermittent	Rail	Fill	--	--	0.00	142.7
179	Unnamed	Intermittent	Access Road	Viaduct	--	--	0.00	0.00
126	Mill Branch	Intermittent	Access Road	Viaduct	0.00	0.00	--	--
126	Mill Branch	Intermittent	Rail	Viaduct	0.00	0.00	--	--
180	Little Brushy Creek	Intermittent	Access Road	Viaduct	--	--	0.00	0.00
180	Little Brushy Creek	Intermittent	Rail	Viaduct	--	--	0.00	0.00
127	Bain Branch	Intermittent	Access Road	Viaduct	0.00	0.00	--	--
127	Bain Branch	Intermittent	Rail	Viaduct	0.00	0.00	--	--
127	Unnamed	Intermittent	Access Road	Viaduct	0.00	0.00	--	--
127	Unnamed	Intermittent	Rail	Viaduct	0.00	0.00	--	--

Table 16: Estimated Stream Impacts – Leon County								
Natural Resources Mapbook Page #	Stream ID/Name*	Classification	Construction Type	Crossing Type	Segment 3C		Segment 4	
					Temp	Perm	Temp	Perm
					linear feet		linear feet	
127	Unnamed	Intermittent	Stormwater Drainage	Excavation	0.00	64.6	--	--
127	Unnamed	Intermittent	Access Road	Fill	0.00	351.8	--	--
181	Unnamed	Intermittent	Access Road	Viaduct	--	--	0.00	0.00
181	Unnamed	Intermittent	Rail	Viaduct	--	--	0.00	0.00
128	Unnamed	Intermittent	Stormwater Drainage	Excavation	0.00	132.3	--	--
128	Unnamed	Intermittent	Rail	Fill	0.00	33.6	--	--
181	CEAA13S11	Ephemeral	Rail	Fill	--	--	0.00	116.0
181	CEAA13S10	Ephemeral	Rail	Fill	--	--	0.00	80.7
181	CEAA13S12	Ephemeral	Access Road	Excavation	--	--	0.00	14.2
181	CEAA13S12	Ephemeral	Access Road	Viaduct	--	--	0.00	0.00
182	Spring Creek	Perennial	Access Road	Viaduct	--	--	0.00	0.00
182	Spring Creek	Perennial	Rail	Viaduct	--	--	0.00	0.00
128	Beaver Creek	Perennial	Access Road	Viaduct	0.00	0.00	--	--
128	Beaver Creek	Perennial	Rail	Viaduct	0.00	0.00	--	--
128	Unnamed	Intermittent	Access Road	Viaduct	0.00	0.00	--	--
128	Unnamed	Intermittent	Rail	Viaduct	0.00	0.00	--	--
182	Unnamed	Artificial	Access Road	Viaduct	--	--	0.00	0.00
182	Unnamed	Intermittent	Rail	Viaduct	--	--	0.00	0.00
182	Unnamed	Intermittent	Temporary Fill	Fill	--	--	216.8	0.00
182	Spring Creek	Perennial	Access Road	Fill	--	--	0.00	79.9
182	Unnamed	Intermittent	Stormwater Drainage	Excavation	--	--	0.00	222.4
182	Unnamed	Intermittent	Access Road	Viaduct	--	--	0.00	0.00
182	Unnamed	Intermittent	Rail	Viaduct	--	--	0.00	0.00
131	McDaniel Creek	Perennial	Maintenance Facility	Fill	0.00	155.9	--	--
130	Unnamed	Intermittent	Maintenance Facility	Fill	0.00	189.5	--	--
130	Unnamed	Intermittent	Maintenance Facility	Fill	0.00	161.9	--	--

Table 16: Estimated Stream Impacts – Leon County								
Natural Resources Mapbook Page #	Stream ID/Name*	Classification	Construction Type	Crossing Type	Segment 3C		Segment 4	
					Temp	Perm	Temp	Perm
					linear feet		linear feet	
130	Unnamed	Intermittent	Maintenance Facility	Fill	0.00	260.2	--	--
130	Cedar Creek	Intermittent	Maintenance Facility	Fill	0.00	418.3	--	--
131	Unnamed	Intermittent	Maintenance Facility	Fill	0.00	388.9	--	--
132	Unnamed	Intermittent	Maintenance Facility	Fill	0.00	180.1	--	--
132	Unnamed	Intermittent	Maintenance Facility	Fill	0.00	518.4	--	--
129	Unnamed	Intermittent	Maintenance Facility	Fill	0.00	235.0	--	--
129	Unnamed	Intermittent	Maintenance Facility	Fill	0.00	126.7	--	--
129	Unnamed	Intermittent	Access Road	Viaduct	0.00	0.00	--	--
129	Unnamed	Intermittent	Rail	Viaduct	0.00	0.00	--	--
131	Unnamed	Intermittent	Maintenance Facility	Fill	0.00	154.7	--	--
132	Unnamed	Intermittent	Maintenance Facility	Fill	0.00	168.8	--	--
132	Unnamed	Intermittent	Maintenance Facility	Fill	0.00	160.4	--	--
132	Unnamed	Intermittent	Maintenance Facility	Fill	0.00	185.1	--	--
132	Spring Creek	Perennial	Maintenance Facility	Fill	0.00	217.8	--	--
132	Unnamed	Intermittent	Access Road	Viaduct	--	--	0.00	0.00
132	Unnamed	Intermittent	Rail	Viaduct	--	--	0.00	0.00
134	Unnamed	Intermittent	Rail	Viaduct	0.00	0.00	--	--
135, 185	Boggy Creek	Perennial	Access Road	Viaduct	0.00	0.00	0.00	0.00
135, 185	Boggy Creek	Perennial	Rail	Viaduct	0.00	0.00	0.00	0.00
135	Unnamed	Intermittent	Access Road	Viaduct	0.00	0.00	--	--
135	Unnamed	Intermittent	Rail	Viaduct	0.00	0.00	--	--
136	Unnamed	Intermittent	Access Road	Viaduct	0.00	0.00	--	--
136	Unnamed	Intermittent	Rail	Viaduct	0.00	0.00	--	--

Table 16: Estimated Stream Impacts – Leon County								
Natural Resources Mapbook Page #	Stream ID/Name*	Classification	Construction Type	Crossing Type	Segment 3C		Segment 4	
					Temp	Perm	Temp	Perm
					linear feet		linear feet	
185	Unnamed	Intermittent	Access Road	Viaduct	--	--	0.00	0.00
185	Unnamed	Intermittent	Rail	Viaduct	--	--	0.00	0.00
136	Leona Branch	Intermittent	Access Road	Viaduct	0.00	0.00	--	--
136	Leona Branch	Intermittent	Rail	Viaduct	0.00	0.00	--	--
186	Unnamed	Intermittent	Access Road	Viaduct	--	--	0.00	0.00
186	Unnamed	Intermittent	Rail	Viaduct	--	--	0.00	0.00
186	Unnamed	Intermittent	Facility	Fill	--	--	0.00	83.7
186	Unnamed	Intermittent	Access Road	Viaduct	--	--	0.00	0.00
186	Unnamed	Intermittent	Rail	Viaduct	--	--	0.00	0.00
186	Unnamed	Intermittent	Rail	Viaduct	--	--	0.00	0.00
137	Unnamed	Intermittent	Access Road	Viaduct	0.00	0.00	--	--
137	Unnamed	Intermittent	Rail	Viaduct	0.00	0.00	--	--
186	Unnamed	Intermittent	Access Road	Viaduct	--	--	0.00	0.00
186	Unnamed	Intermittent	Rail	Viaduct	--	--	0.00	0.00
187	Yellow Branch	Intermittent	Access Road	Viaduct	--	--	0.00	0.00
187	Yellow Branch	Intermittent	Rail	Viaduct	--	--	0.00	0.00
138	Mustang Creek	Perennial	Access Road	Viaduct	0.00	0.00	--	--
138	Mustang Creek	Perennial	Rail	Viaduct	0.00	0.00	--	--
138	Spring Branch	Intermittent	Access Road	Viaduct	0.00	0.00	--	--
138	Spring Branch	Intermittent	Rail	Viaduct	0.00	0.00	--	--
188	CEAD13S2	Intermittent	Stormwater Drainage	Excavation	--	--	0.00	284.1
188	CEAD13S2	Intermittent	Access Road	Fill	--	--	0.00	89.2
188	CEAD13S8	Ephemeral	Rail	Fill	--	--	0.00	448.7
188	CEAD13S2	Intermittent	Rail	Fill	--	--	0.00	658.3
188	CEAD13S5	Ephemeral	Access Road	Fill	--	--	0.00	33.5
188	CEAD13S5	Ephemeral	Rail	Fill	--	--	0.00	55.1
188	CEAD13S2	Intermittent	Access Road	Viaduct	--	--	0.00	0.00
188	CEAD13S2	Intermittent	Rail	Viaduct	--	--	0.00	0.00

Table 16: Estimated Stream Impacts – Leon County								
Natural Resources Mapbook Page #	Stream ID/Name*	Classification	Construction Type	Crossing Type	Segment 3C		Segment 4	
					Temp	Perm	Temp	Perm
					linear feet		linear feet	
188	Copeland Branch	Intermittent	Rail	Fill	--	--	0.00	29.9
188	Copeland Branch	Intermittent	Access Road	Viaduct	--	--	0.00	0.00
188	CEAD13S6	Ephemeral	Stormwater Drainage	Excavation	--	--	0.00	514.1
188	CEAD13S6	Ephemeral	Access Road	Fill	--	--	0.00	63.5
188	CEAD13S7	Ephemeral	Stormwater Drainage	Excavation	--	--	0.00	77.1
188	CEAD13S7	Ephemeral	Access Road	Fill	--	--	0.00	43.0
139	Unnamed	Intermittent	Access Road	Viaduct	0.00	0.00	--	--
139	Unnamed	Intermittent	Rail	Viaduct	0.00	0.00	--	--
139	Unnamed	Intermittent	Access Road	Viaduct	0.00	0.00	--	--
139	Unnamed	Intermittent	Access Road	Viaduct	0.00	0.00	--	--
189	Unnamed	Intermittent	Stormwater Drainage	Excavation	--	--	0.00	353.4
189	Unnamed	Intermittent	Access Road	Fill	--	--	0.00	30.6
189	East Caney Creek	Intermittent	Access Road	Viaduct	--	--	0.00	0.00
189	East Caney Creek	Intermittent	Rail	Viaduct	--	--	0.00	0.00
190	Unnamed	Intermittent	Access Road	Viaduct	--	--	0.00	0.00
190	Unnamed	Intermittent	Utilities	Viaduct	--	--	0.00	0.00
190	Unnamed	Intermittent	Stormwater Drainage	Excavation	--	--	0.00	382.0
190	Unnamed	Intermittent	Access Road	Fill	--	--	0.00	216.8
				Total	50.4	5,843.3	1,502.7	5,256.6

Source: USGS, 2016; FNI, 2017

*Stream ID # (C) indicates a specific feature recorded in the field whereas stream names (or those "unnamed") indicate features mapped via data not yet field-verified. Jurisdictional determinations to be confirmed by the USACE. Each stream is separated by construction type.

'--' - not present

Table 17: Estimated Wetland Impacts – Leon County								
Natural Resources Mapbook Page #	Wetland ID/ Classification*	Wetland Type	Construction Type	Crossing Type	Segment 3C		Segment 4	
					Temp	Perm	Temp	Perm
					acres		acres	
118	PEM1C	Emergent	Temporary Fill	Fill	0.02	0.00	--	--
118	PEM1C	Emergent	Access Road	Viaduct	0.00	0.00	--	--
118	PEM1C	Emergent	Rail	Viaduct	0.00	0.00	--	--
119	PSS1/EM1A	Scrub/Shrub	Access Road	Viaduct	0.00	0.00	--	--
119	PFO1A	Forested	Access Road	Viaduct/Conversion	0.00	0.05	--	--
120	PFO1C	Forested	Access Road	Viaduct/Conversion	0.00	<0.01	--	--
120	PFO1C	Forested	Rail	Viaduct/Conversion	0.00	0.05	--	--
120	PEM1C	Emergent	Access Road	Viaduct	0.00	0.00	--	--
121	PEM1C	Emergent	Access Road	Viaduct	0.00	0.00	--	--
121	PEM1C	Emergent	Rail	Viaduct	0.00	0.00	--	--
121	PEM1A	Emergent	Access Road	Viaduct	0.00	0.00	--	--
176	CEZ11EW5	Emergent	Access Road	Viaduct	--	--	0.00	0.00
176	CEZ11EW5	Emergent	Rail	Viaduct	--	--	0.00	0.00
177	CEZ11FW3	Forested	Access Road	Viaduct/Conversion	--	--	0.00	0.12
177	CEZ11FW3	Forested	Rail	Viaduct/Conversion	--	--	0.00	0.03
177	CEZ11FW4	Forested	Access Road	Viaduct/Conversion	--	--	0.00	0.06
177	CEZ11FW4	Forested	Access Road	Viaduct/Conversion	--	--	0.00	0.01
177	CEZ11EW4	Emergent	Access Road	Viaduct	--	--	0.00	0.00
178	PFO1C	Forested	Access Road	Viaduct/Conversion	--	--	0.00	0.07
178	PFO1C	Forested	Rail	Viaduct/Conversion	--	--	0.00	0.11
125	PEM1C	Emergent	Access Road	Viaduct	0.00	0.00	--	--
125	PEM1C	Emergent	Rail	Viaduct	0.00	0.00	--	--
125	PEM1A	Emergent	Access Road	Viaduct	0.00	0.00	--	--
125	PEM1A	Emergent	Rail	Viaduct	0.00	0.00	--	--
179	PFO1C	Forested	Maintenance Facility	Fill	--	--	0.00	0.06
179	PFO1C	Forested	Access Road	Viaduct/Conversion	--	--	0.00	0.01
179	PFO1C	Forested	Rail	Viaduct/Conversion	--	--	0.00	0.18

Table 17: Estimated Wetland Impacts – Leon County								
Natural Resources Mapbook Page #	Wetland ID/ Classification*	Wetland Type	Construction Type	Crossing Type	Segment 3C		Segment 4	
					Temp	Perm	Temp	Perm
					acres		acres	
179	PEM1C	Emergent	Access Road	Viaduct	--	--	0.00	0.00
179	PEM1C	Emergent	Rail	Viaduct	--	--	0.00	0.00
179	PFO1C	Forested	Rail	Viaduct/Conversion	--	--	0.00	0.11
179	PFO1A	Forested	Access Road	Viaduct/Conversion	--	--	0.00	0.19
179	PFO1A	Forested	Rail	Viaduct/Conversion	--	--	0.00	0.23
179	PFO1C	Forested	Access Road	Viaduct/Conversion	--	--	0.00	0.01
179	PFO1C	Forested	Rail	Viaduct/Conversion	--	--	0.00	0.06
179	PEM1A	Emergent	Access Road	Viaduct	--	--	0.00	0.00
179	PEM1A	Emergent	Rail	Viaduct	--	--	0.00	0.00
180	PFO1C	Forested	Access Road	Viaduct/Conversion	--	--	0.00	0.08
180	PFO1C	Forested	Rail	Viaduct/Conversion	--	--	0.00	0.22
181	CEAA12EW2	Emergent	Access Road	Viaduct	--	--	0.00	0.00
181	CEAA12EW2	Emergent	Rail	Viaduct	--	--	0.00	0.00
181	CEAA12EW3	Emergent	Rail	Viaduct	--	--	0.00	0.00
181	CEAA12EW3	Emergent	Temporary Fill	Fill	--	--	0.08	0.00
181	CEAA13EW1	Emergent	Temporary Fill	Fill	--	--	0.07	0.00
128	PFO1C	Forested	Access Road	Viaduct/Conversion	0.00	0.16	--	--
128	PFO1C	Forested	Rail	Viaduct/Conversion	0.00	0.07	--	--
182	PFO1C	Forested	Access Road	Viaduct/Conversion	--	--	0.00	0.05
182	PFO1C	Forested	Rail	Viaduct/Conversion	--	--	0.00	0.13
131	PFO1C	Forested	Maintenance Facility	Fill	0.00	0.07	--	--
130	PFO1C	Forested	Maintenance Facility	Fill	0.00	0.25	--	--
132	PEM1A	Emergent	Rail	Viaduct	--	--	0.00	0.00
129	PFO1C	Forested	Maintenance Facility	Fill	0.00	0.08	--	--
132	PFO1C	Forested	Maintenance Facility	Fill	0.00	0.16	--	--
134	PFO1C	Forested	Rail	Viaduct/Conversion	0.00	0.05	--	--
135	PFO/EM1F	Forested	Access Road	Viaduct/Conversion	0.00	0.59	--	--

Table 17: Estimated Wetland Impacts – Leon County								
Natural Resources Mapbook Page #	Wetland ID/ Classification*	Wetland Type	Construction Type	Crossing Type	Segment 3C		Segment 4	
					Temp	Perm	Temp	Perm
					acres		acres	
135	PFO1A	Forested	Access Road	Viaduct/Conversion	0.00	0.12	--	--
135	PEM1C	Emergent	Access Road	Viaduct	0.00	0.00	--	--
135	PEM1C	Emergent	Rail	Viaduct	0.00	0.00	--	--
135	PEM1/FO1F	Emergent	Access Road	Viaduct	0.00	0.00	--	--
135	PEM1F	Emergent	Access Road	Viaduct	0.00	0.00	--	--
135	PEM1F	Emergent	Rail	Viaduct	0.00	0.00	--	--
135	PFO1F	Forested	Access Road	Viaduct/Conversion	0.00	0.25	--	--
185	PEM1Ch	Emergent	Access Road	Viaduct	--	--	0.00	0.00
137	PFO1A	Forested	Access Road	Viaduct/Conversion	0.00	2.1	--	--
138	PFO1A	Forested	Rail	Viaduct/Conversion	0.00	0.25	--	--
138	PFO1C	Forested	Access Road	Viaduct/Conversion	0.00	0.21	--	--
138	PFO1C	Forested	Rail	Viaduct/Conversion	0.00	0.06	--	--
187	PEM1A	Emergent	Access Road	Fill	--	--	0.00	0.15
187	PEM1C	Emergent	Access Road	Fill	--	--	0.00	>0.01
187	PEM1Ch	Emergent	Stormwater Drainage	Excavation	--	--	0.00	<0.01
187	PEM1Ch	Emergent	Rail	Fill	--	--	0.00	0.34
187	PEM1Ch	Emergent	Access Road	Fill	--	--	0.00	0.17
138	PSS1C	Forested	Access Road	Viaduct/Conversion	0.00	0.01	--	--
138	PSS1C	Forested	Rail	Viaduct/Conversion	0.00	0.05	--	--
188	CEAD13EW1	Emergent	Rail	Fill	--	--	0.00	0.02
188	PFO1C	Forested	Rail	Fill	--	--	0.00	0.02
188	PFO1C	Forested	Access Road	Viaduct/Conversion	--	--	0.00	0.03
189	PFO1C	Forested	Access Road	Viaduct/Conversion	--	--	0.00	0.02
189	PFO1C	Forested	Rail	Viaduct/Conversion	--	--	0.00	0.06
190	PFO1C	Forested	Access Road	Viaduct/Conversion	--	--	0.00	0.14
190	PEM1C	Emergent	Stormwater Drainage	Excavation	--	--	0.00	0.22
190	PEM1C	Emergent	Access Road	Fill	--	--	0.00	0.11

Table 17: Estimated Wetland Impacts – Leon County								
Natural Resources Mapbook Page #	Wetland ID/ Classification*	Wetland Type	Construction Type	Crossing Type	Segment 3C		Segment 4	
					Temp	Perm	Temp	Perm
					acres		acres	
				Total	0.02	4.6	0.15	3.0

Source: USFWS, 2016; FNI, 2017

*Wetland ID # (C) indicates a specific feature recorded in the field. Wetland classifications (P) indicate wetlands not yet field-verified. Jurisdictional determinations to be confirmed by the USACE. Each wetland is separated by construction type.

P - Palustrine
EM - Emergent
EM1 - Persistent Emergent
FO - Forested
FO1 - Broad-leaved Deciduous Forested
SS - Scrub-Shrub
SS1 - Broad-leaved Deciduous Scrub-Shrub
A - Temporarily Flooded
C - Seasonally Flooded
F – Semi-permanently Flooded
h - Diked/Impounded
'--' - not present

Table 18: Estimated Waterbody Impacts – Leon County								
Natural Resources Mapbook Page #	Waterbody ID/Name *	Waterbody Type	Construction Type	Crossing Type	Segment 3C		Segment 4	
					Temp	Perm	Temp	Perm
					acres		acres	
174	Unnamed	Pond	Access Road	Viaduct	--	--	0.00	0.00
174	Unnamed	Pond	Rail	Viaduct	--	--	0.00	0.00
174	CEY10PD16	Pond	Access Road	Viaduct	--	--	0.00	0.00
174	CEY10PD16	Pond	Rail	Viaduct	--	--	0.00	0.00
176	CEZ11PD2	Pond	Access Road	Viaduct	--	--	0.00	0.00
176	CEZ11PD2	Pond	Rail	Viaduct	--	--	0.00	0.00
123	Unnamed	Pond	Access Road	Fill	0.00	0.04	--	--
123	Unnamed	Pond	Access Road	Excavation	0.00	0.06	--	--
177	CEZ11PD3	Pond	Access Road	Viaduct	--	--	0.00	0.00
177	CEZ11PD3	Pond	Rail	Viaduct	--	--	0.00	0.00
177	CEZ11PD4	Pond	Access Road	Viaduct	--	--	0.00	0.00
177	CEZ11PD4	Pond	Rail	Viaduct	--	--	0.00	0.00
177	CEZ11PD11	Pond	Rail	Viaduct	--	--	0.00	0.00
177	Unnamed	Pond	Access Road	Fill	--	--	0.00	0.05

Table 18: Estimated Waterbody Impacts – Leon County								
Natural Resources Mapbook Page #	Waterbody ID/Name *	Waterbody Type	Construction Type	Crossing Type	Segment 3C		Segment 4	
					Temp	Perm	Temp	Perm
					acres		acres	
177	Unnamed	Pond	Rail	Fill	--	--	0.00	0.10
177	Unnamed	Pond	Rail	Fill	--	--	0.00	0.10
178	Unnamed	Pond	Temporary Fill	Fill	--	--	0.11	0.00
178	Unnamed	Pond	Temporary Fill	Fill	--	--	0.07	0.00
178	CEZ11PD7	Pond	Access Road	Viaduct	--	--	0.00	0.00
178	CEZ11PD7	Pond	Rail	Viaduct	--	--	0.00	0.00
178	Unnamed	Pond	Access Road	Viaduct	--	--	0.00	0.00
178	Unnamed	Pond	Rail	Fill	--	--	0.00	0.10
125	Unnamed	Pond	Access Road	Viaduct	0.00	0.00	--	--
178	Unnamed	Pond	Rail	Fill	--	--	0.00	0.01
178	Unnamed	Pond	Stormwater Drainage	Excavation	--	--	0.00	0.15
178	Unnamed	Pond	Access Road	Fill	--	--	0.00	0.18
179	Unnamed	Pond	Rail	Fill	--	--	0.00	0.38
126	Unnamed	Pond	Access Road	Viaduct	0.00	0.00	--	--
127	Unnamed	Pond	Rail	Viaduct	0.00	0.00	--	--
127	Unnamed	Pond	Access Road	Viaduct	0.00	0.00	--	--
181	CEAA12PD7	Pond	Access Road	Viaduct	--	--	0.00	0.00
181	CEAA12PD7	Pond	Rail	Viaduct	--	--	0.00	0.00
127	Unnamed	Pond	Access Road	Fill	0.00	0.02	--	--
127	Unnamed	Pond	Stormwater Drainage	Excavation	0.00	0.07	--	--
181	CEAA12PD9	Pond	Rail	Viaduct	--	--	0.00	0.00
181	CEAA12PD9	Pond	Temporary Fill	Fill	--	--	0.01	0.00
181	CEAA13PD10	Pond	Rail	Viaduct	--	--	0.00	0.00
181	Unnamed	Pond	Rail	Viaduct	--	--	0.00	0.00
182	Unnamed	Pond	Access Road	Viaduct	--	--	0.00	0.00
182	Unnamed	Pond	Temporary Fill	Fill	--	--	0.01	0.00
182	Unnamed	Pond	Access Road	Viaduct	--	--	0.00	0.00

Table 18: Estimated Waterbody Impacts – Leon County								
Natural Resources Mapbook Page #	Waterbody ID/Name *	Waterbody Type	Construction Type	Crossing Type	Segment 3C		Segment 4	
					Temp	Perm	Temp	Perm
					acres		acres	
182	Unnamed	Pond	Temporary Fill	Fill	--	--	0.01	0.00
129	Unnamed	Pond	Maintenance Facility	Fill	0.00	0.12	--	--
130	Unnamed	Pond	Maintenance Facility	Excavation	0.00	0.09	--	--
135	Unnamed	Pond	Access Road	Viaduct	0.00	0.00	--	--
136	Unnamed	Pond	Access Road	Viaduct	0.00	0.00	--	--
136	Unnamed	Pond	Access Road	Viaduct	0.00	0.00	--	--
188	CEAD13PD14	Pond	Access Road	Fill	--	--	0.00	0.04
188	Unnamed	Pond	Rail	Fill	--	--	0.00	0.03
188	Unnamed	Pond	Access Road	Fill	--	--	0.00	0.05
188	Unnamed	Pond	Rail	Excavation	--	--	0.00	<0.01
188	CEAD13PD15	Pond	Access Road	Excavation	--	--	0.00	0.10
188	CEAD13PD15	Pond	Rail	Excavation	--	--	0.00	0.10
188	CEAD13PD17	Pond	Stormwater Drainage	Excavation	--	--	0.00	0.01
188	CEAD13PD17	Pond	Access Road	Fill	--	--	0.00	0.18
188	CEAD13PD17	Pond	Rail	Fill	--	--	0.00	0.27
122	Unnamed	Pond	Access Road	Viaduct	0.00	0.00	--	--
122	Unnamed	Pond	Rail	Viaduct	0.00	0.00	--	--
185	Unnamed	Lake	Access Road	Viaduct	--	--	0.00	0.00
185	Unnamed	Lake	Rail	Viaduct	--	--	0.00	0.00
137	Unnamed	Pond	Stormwater Drainage	Excavation	0.00	0.02	--	--
187	Unnamed	Pond	Stormwater Drainage	Excavation	--	--	0.00	0.03
187	Unnamed	Pond	Rail	Fill	--	--	0.00	0.05
187	Unnamed	Pond	Access Road	Fill	--	--	0.00	0.11
174	Unnamed	Pond	Access Road	Viaduct	--	--	0.00	0.00
174	Unnamed	Pond	Rail	Viaduct	--	--	0.00	0.00
174	CEY10PD16	Pond	Access Road	Viaduct	--	--	0.00	0.00

Table 18: Estimated Waterbody Impacts – Leon County								
Natural Resources Mapbook Page #	Waterbody ID/Name *	Waterbody Type	Construction Type	Crossing Type	Segment 3C		Segment 4	
					Temp	Perm	Temp	Perm
					acres		acres	
174	CEY10PD16	Pond	Rail	Viaduct	--	--	0.00	0.00
176	CEZ11PD2	Pond	Access Road	Viaduct	--	--	0.00	0.00
176	CEZ11PD2	Pond	Rail	Viaduct	--	--	0.00	0.00
123	Unnamed	Pond	Access Road	Fill	0.00	0.04	--	--
123	Unnamed	Pond	Access Road	Excavation	0.00	0.06	--	--
177	CEZ11PD3	Pond	Access Road	Viaduct	--	--	0.00	0.00
177	CEZ11PD3	Pond	Rail	Viaduct	--	--	0.00	0.00
177	CEZ11PD4	Pond	Access Road	Viaduct	--	--	0.00	0.00
177	CEZ11PD4	Pond	Rail	Viaduct	--	--	0.00	0.00
177	CEZ11PD11	Pond	Rail	Viaduct	--	--	0.00	0.00
177	Unnamed	Pond	Access Road	Fill	--	--	0.00	0.05
177	Unnamed	Pond	Rail	Fill	--	--	0.00	0.10
177	Unnamed	Pond	Rail	Fill	--	--	0.00	0.10
178	Unnamed	Pond	Temporary Fill	Fill	--	--	0.11	0.00
178	Unnamed	Pond	Temporary Fill	Fill	--	--	0.07	0.00
178	CEZ11PD7	Pond	Access Road	Viaduct	--	--	0.00	0.00
178	CEZ11PD7	Pond	Rail	Viaduct	--	--	0.00	0.00
178	Unnamed	Pond	Access Road	Viaduct	--	--	0.00	0.00
178	Unnamed	Pond	Rail	Fill	--	--	0.00	0.10
125	Unnamed	Pond	Access Road	Viaduct	0.00	0.00	--	--
178	Unnamed	Pond	Rail	Fill	--	--	0.00	0.01
178	Unnamed	Pond	Stormwater Drainage	Excavation	--	--	0.00	0.15
178	Unnamed	Pond	Access Road	Fill	--	--	0.00	0.18
179	Unnamed	Pond	Rail	Fill	--	--	0.00	0.38
126	Unnamed	Pond	Access Road	Viaduct	0.00	0.00	--	--
127	Unnamed	Pond	Rail	Viaduct	0.00	0.00	--	--
127	Unnamed	Pond	Access Road	Viaduct	0.00	0.00	--	--
181	CEAA12PD7	Pond	Access Road	Viaduct	--	--	0.00	0.00

Table 18: Estimated Waterbody Impacts – Leon County								
Natural Resources Mapbook Page #	Waterbody ID/Name *	Waterbody Type	Construction Type	Crossing Type	Segment 3C		Segment 4	
					Temp	Perm	Temp	Perm
					acres		acres	
181	CEAA12PD7	Pond	Rail	Viaduct	--	--	0.00	0.00
127	Unnamed	Pond	Access Road	Fill	0.00	0.02	--	--
127	Unnamed	Pond	Stormwater Drainage	Excavation	0.00	0.07	--	--
181	CEAA12PD9	Pond	Rail	Viaduct	--	--	0.00	0.00
181	CEAA12PD9	Pond	Temporary Fill	Fill	--	--	0.01	0.00
181	CEAA13PD10	Pond	Rail	Viaduct	--	--	0.00	0.00
181	Unnamed	Pond	Rail	Viaduct	--	--	0.00	0.00
182	Unnamed	Pond	Access Road	Viaduct	--	--	0.00	0.00
182	Unnamed	Pond	Temporary Fill	Fill	--	--	0.01	0.00
182	Unnamed	Pond	Access Road	Viaduct	--	--	0.00	0.00
182	Unnamed	Pond	Temporary Fill	Fill	--	--	0.01	0.00
129	Unnamed	Pond	Maintenance Facility	Fill	0.00	0.12	--	--
130	Unnamed	Pond	Maintenance Facility	Excavation	0.00	0.09	--	--
135	Unnamed	Pond	Access Road	Viaduct	0.00	0.00	--	--
136	Unnamed	Pond	Access Road	Viaduct	0.00	0.00	--	--
136	Unnamed	Pond	Access Road	Viaduct	0.00	0.00	--	--
188	CEAD13PD14	Pond	Access Road	Fill	--	--	0.00	0.04
188	Unnamed	Pond	Rail	Fill	--	--	0.00	0.03
188	Unnamed	Pond	Access Road	Fill	--	--	0.00	0.05
188	Unnamed	Pond	Rail	Excavation	--	--	0.00	<0.01
188	CEAD13PD15	Pond	Access Road	Excavation	--	--	0.00	0.10
188	CEAD13PD15	Pond	Rail	Excavation	--	--	0.00	0.10
188	CEAD13PD17	Pond	Stormwater Drainage	Excavation	--	--	0.00	0.01
188	CEAD13PD17	Pond	Access Road	Fill	--	--	0.00	0.18
188	CEAD13PD17	Pond	Rail	Fill	--	--	0.00	0.27
122	Unnamed	Pond	Access Road	Viaduct	0.00	0.00	--	--

Table 18: Estimated Waterbody Impacts – Leon County								
Natural Resources Mapbook Page #	Waterbody ID/Name *	Waterbody Type	Construction Type	Crossing Type	Segment 3C		Segment 4	
					Temp	Perm	Temp	Perm
					acres		acres	
122	Unnamed	Pond	Rail	Viaduct	0.00	0.00	--	--
185	Unnamed	Lake	Access Road	Viaduct	--	--	0.00	0.00
185	Unnamed	Lake	Rail	Viaduct	--	--	0.00	0.00
137	Unnamed	Pond	Stormwater Drainage	Excavation	0.00	0.02	--	--
187	Unnamed	Pond	Stormwater Drainage	Excavation	--	--	0.00	0.03
187	Unnamed	Pond	Rail	Fill	--	--	0.00	0.05
187	Unnamed	Pond	Access Road	Fill	--	--	0.00	0.11
				Total	0.00	0.42	0.21	2.0

Source: USGS, 2016; USFWS, 2016; FNI, 2017

*Waterbody ID # (C) indicates a specific feature recorded in the field. Waterbody classifications (P) indicate waterbodies not yet field-verified. Jurisdictional determinations to be confirmed by the USACE. Each waterbody is separated by construction type.

'--' - not present

Madison County

Table 19: Estimated Stream Impacts – Madison County								
Natural Resources Mapbook Page #	Stream ID/Name*	Classification	Construction Type	Crossing Type	Segment 3C		Segment 4	
					Temp	Perm	Temp	Perm
					linear feet		linear feet	
140	Unnamed	Intermittent	Access Road	Viaduct	0.00	0.00	--	--
140	Unnamed	Intermittent	Rail	Viaduct	0.00	0.00	--	--
140	Twomile Creek	Intermittent	Access Road	Viaduct	0.00	0.00	--	--
140	Twomile Creek	Intermittent	Rail	Viaduct	0.00	0.00	--	--
140	Larrison Creek	Intermittent	Access Road	Fill	0.00	1,369.2	--	--
141	Unnamed	Intermittent	Stormwater Drainage	Excavation	0.00	48.7	--	--
141	Unnamed	Intermittent	Access Road	Fill	0.00	153.3	--	--

Table 19: Estimated Stream Impacts – Madison County								
Natural Resources Mapbook Page #	Stream ID/Name*	Classification	Construction Type	Crossing Type	Segment 3C		Segment 4	
					Temp	Perm	Temp	Perm
					linear feet		linear feet	
141	Larrison Creek	Intermittent	Access Road	Fill	0.00	181.2	--	--
141	Larrison Creek	Intermittent	Rail	Fill	0.00	507.6	--	--
190	Unnamed	Intermittent	Access Road	Fill	--	--	0.00	4.5
190	CEAD14S2	Intermittent	Access Road	Fill	--	--	0.00	685.7
190	CEAE14S1	Ephemeral	Access Road	Viaduct	--	--	0.00	0.00
190	Unnamed	Intermittent	Rail	Viaduct	--	--	0.00	0.00
141	Unnamed	Intermittent	Access Road	Viaduct	0.00	0.00	--	--
141	Unnamed	Intermittent	Rail	Viaduct	0.00	0.00	--	--
191	Unnamed	Artificial	Access Road	Viaduct	--	--	0.00	0.00
191	Salt Creek	Intermittent	Access Road	Viaduct	--	--	0.00	0.00
191	Salt Creek	Intermittent	Rail	Viaduct	--	--	0.00	0.00
191	Salt Creek	Intermittent	Utilities	Viaduct	--	--	0.00	0.00
142	Greenbriar Creek	Intermittent	Stormwater Drainage	Excavation	0.00	461.6	--	--
191	Caney Creek	Intermittent	Access Road	Viaduct	--	--	0.00	0.00
191	Caney Creek	Intermittent	Rail	Viaduct	--	--	0.00	0.00
192	CEAE14S5	Ephemeral	Access Road	Viaduct	--	--	0.00	0.00
192	CEAE14S5	Ephemeral	Rail	Viaduct	--	--	0.00	0.00
192	Unnamed	Intermittent	Access Road	Viaduct	--	--	0.00	0.00
192	Unnamed	Intermittent	Rail	Viaduct	--	--	0.00	0.00
143	Unnamed	Intermittent	Stormwater Drainage	Excavation	0.00	338.4	--	--
143	Unnamed	Intermittent	Access Road	Viaduct	0.00	0.00	--	--
143	Unnamed	Intermittent	Rail	Viaduct	0.00	0.00	--	--
143	Unnamed	Artificial	Rail	Fill	0.00	170.7	--	--
143, 144	Greenbriar Creek	Intermittent	Access Road	Viaduct	0.00	0.00	--	--
143, 144	Greenbriar Creek	Intermittent	Rail	Viaduct	0.00	0.00	--	--
193	CEAE14S7	Intermittent	Utilities	Viaduct	--	--	9.7	0.00
193	CEAE14S7	Intermittent	Access Road	Viaduct	--	--	0.00	0.00

Table 19: Estimated Stream Impacts – Madison County								
Natural Resources Mapbook Page #	Stream ID/Name*	Classification	Construction Type	Crossing Type	Segment 3C		Segment 4	
					Temp	Perm	Temp	Perm
					linear feet		linear feet	
193	CEAE14S7	Intermittent	Rail	Viaduct	--	--	0.00	0.00
193	Brushy Creek	Intermittent	Access Road	Viaduct	--	--	0.00	0.00
193	Brushy Creek	Intermittent	Rail	Viaduct	--	--	0.00	0.00
144	Unnamed	Intermittent	Access Road	Viaduct	0.00	0.00	--	--
144	Unnamed	Intermittent	Rail	Viaduct	0.00	0.00	--	--
193	Unnamed	Intermittent	Access Road	Viaduct	--	--	0.00	0.00
193	Unnamed	Intermittent	Rail	Viaduct	--	--	0.00	0.00
194	CEAF14S11	Ephemeral	Access Road	Fill	--	--	0.00	283.8
194	CEAF14S12	Ephemeral	Access Road	Fill	--	--	0.00	217.4
145	Caney Creek	Intermittent	Access Road	Viaduct	0.00	0.00	--	--
145	Caney Creek	Intermittent	Rail	Viaduct	0.00	0.00	--	--
194	Unnamed	Intermittent	Access Road	Viaduct	--	--	0.00	0.00
194	Unnamed	Intermittent	Rail	Viaduct	--	--	0.00	0.00
194	Unnamed	Intermittent	Utilities	Viaduct	--	--	0.00	0.00
194	Unnamed	Intermittent	Utilities	Viaduct	--	--	232.2	0.00
194	CEAF14S10	Ephemeral	Rail	Viaduct	--	--	0.00	0.00
145	Unnamed	Intermittent	Rail	Viaduct	0.00	0.00	--	--
195	Unnamed	Intermittent	Access Road	Viaduct	--	--	0.00	0.00
195	Unnamed	Intermittent	Access Road	Viaduct	--	--	0.00	0.00
195	Unnamed	Intermittent	Access Road	Viaduct	--	--	0.00	0.00
195	Unnamed	Intermittent	Rail	Viaduct	--	--	0.00	0.00
145	Ferry Branch	Intermittent	Access Road	Viaduct	0.00	0.00	--	--
145	Ferry Branch	Intermittent	Rail	Viaduct	0.00	0.00	--	--
145	Unnamed	Intermittent	Access Road	Viaduct	0.00	0.00	--	--
145	Unnamed	Intermittent	Rail	Viaduct	0.00	0.00	--	--
195	Unnamed	Intermittent	Stormwater Drainage	Excavation	--	--	0.00	116.7
195	Unnamed	Intermittent	Access Road	Fill	--	--	0.00	204.1
195	Unnamed	Intermittent	Rail	Fill	--	--	0.00	101.1

Table 19: Estimated Stream Impacts – Madison County								
Natural Resources Mapbook Page #	Stream ID/Name*	Classification	Construction Type	Crossing Type	Segment 3C		Segment 4	
					Temp	Perm	Temp	Perm
					linear feet		linear feet	
195	CEAF14S7	Ephemeral	Stormwater Drainage	Excavation	--	--	0.00	29.1
195	CEAF14S7	Ephemeral	Rail	Fill	--	--	0.00	458.8
146	Unnamed	Intermittent	Access Road	Viaduct	0.00	0.00	--	--
146	Unnamed	Intermittent	Rail	Viaduct	0.00	0.00	--	--
195	CEAF14S13	Ephemeral	Access Road	Viaduct	--	--	0.00	0.00
195	CEAF14S13	Ephemeral	Rail	Viaduct	--	--	0.00	0.00
196	CEAF14S9	Intermittent	Access Road	Viaduct	--	--	0.00	0.00
196	CEAF14S9	Intermittent	Rail	Viaduct	--	--	0.00	0.00
196	CEAF14S9	Intermittent	Utilities	Viaduct	--	--	312.9	0.00
196	CEAG14S20	Ephemeral	Rail	Viaduct	--	--	0.00	0.00
196	CEAG14S20	Ephemeral	Utilities	Viaduct	--	--	13.9	0.00
196	CEAG14S19	Ephemeral	Access Road	Viaduct	--	--	0.00	0.00
196	CEAG14S19	Ephemeral	Rail	Viaduct	--	--	0.00	0.00
196	Unnamed	Intermittent	Access Road	Viaduct	--	--	0.00	0.00
196	Unnamed	Intermittent	Rail	Viaduct	--	--	0.00	0.00
147	Unnamed	Intermittent	Access Road	Fill	0.00	128.5	--	--
147	Unnamed	Intermittent	Rail	Fill	0.00	59.2	--	--
196	Unnamed	Intermittent	Access Road	Viaduct	--	--	0.00	0.00
196	Unnamed	Intermittent	Rail	Viaduct	--	--	0.00	0.00
196	Unnamed	Intermittent	Access Road	Viaduct	--	--	0.00	0.00
196	Unnamed	Intermittent	Rail	Viaduct	--	--	0.00	0.00
196	CEAG14S6	Ephemeral	Rail	Viaduct	--	--	0.00	0.00
196	CEAG14S7	Ephemeral	Access Road	Viaduct	--	--	0.00	0.00
196	CEAG14S7	Ephemeral	Rail	Viaduct	--	--	0.00	0.00
147	Pooles Branch	Intermittent	Access Road	Viaduct	0.00	0.00	--	--
147	Pooles Branch	Intermittent	Rail	Viaduct	0.00	0.00	--	--
148	Iron Creek	Intermittent	Access Road	Viaduct	0.00	0.00	--	--
148	Iron Creek	Intermittent	Rail	Viaduct	0.00	0.00	--	--

Table 19: Estimated Stream Impacts – Madison County								
Natural Resources Mapbook Page #	Stream ID/Name*	Classification	Construction Type	Crossing Type	Segment 3C		Segment 4	
					Temp	Perm	Temp	Perm
					linear feet		linear feet	
197	Unnamed	Intermittent	Access Road	Viaduct	--	--	0.00	0.00
198	Unnamed	Intermittent	Rail	Viaduct	--	--	0.00	0.00
197	Unnamed	Intermittent	Utilities	Viaduct	--	--	0.00	0.00
148	Unnamed	Intermittent	Access Road	Viaduct	0.00	0.00	--	--
148	Unnamed	Intermittent	Rail	Viaduct	0.00	0.00	--	--
198	CEAG14S10	Intermittent	Access Road	Viaduct	--	--	0.00	0.00
198	CEAG14S10	Intermittent	Rail	Viaduct	--	--	0.00	0.00
198	CEAG14S10	Intermittent	Utilities	Viaduct	--	--	0.00	0.00
198	CEAG14S18	Perennial	Access Road	Viaduct	--	--	0.00	0.00
198	CEAG14S18	Perennial	Rail	Viaduct	--	--	0.00	0.00
198	CEAG14S18	Perennial	Utilities	Viaduct	--	--	0.00	0.00
149, 198	Kickapoo Creek	Intermittent	Access Road	Viaduct	0.00	0.00	0.00	0.00
149, 198	Kickapoo Creek	Intermittent	Rail	Viaduct	0.00	0.00	0.00	0.00
198	Kickapoo Creek	Intermittent	Utilities	Viaduct	--	--	0.00	0.00
198	Unnamed	Intermittent	Access Road	Viaduct	--	--	0.00	0.00
198	Unnamed	Intermittent	Rail	Viaduct	--	--	0.00	0.00
198	Unnamed	Intermittent	Utilities	Viaduct	--	--	0.00	0.00
149	Unnamed	Intermittent	Access Road	Viaduct	0.00	0.00	--	--
149	Unnamed	Intermittent	Rail	Viaduct	0.00	0.00	--	--
149	Unnamed	Intermittent	Access Road	Viaduct	0.00	0.00	--	--
149	Unnamed	Intermittent	Rail	Viaduct	0.00	0.00	--	--
198	Unnamed	Intermittent	Stormwater Drainage	Excavation	--	--	0.00	85.6
198	Unnamed	Intermittent	Access Road	Viaduct	--	--	0.00	0.00
198	Unnamed	Intermittent	Rail	Viaduct	--	--	0.00	0.00
198	Unnamed	Intermittent	Utilities	Viaduct	--	--	0.00	0.00
199	Unnamed	Intermittent	Access Road	Viaduct	--	--	0.00	0.00
199	Unnamed	Intermittent	Rail	Viaduct	--	--	0.00	0.00
199	Unnamed	Intermittent	Utilities	Viaduct	--	--	0.00	0.00

Table 19: Estimated Stream Impacts – Madison County								
Natural Resources Mapbook Page #	Stream ID/Name*	Classification	Construction Type	Crossing Type	Segment 3C		Segment 4	
					Temp	Perm	Temp	Perm
					linear feet		linear feet	
150	Unnamed	Artificial	Access Road	Viaduct	0.00	0.00	--	--
150	Unnamed	Artificial	Rail	Viaduct	0.00	0.00	--	--
199	CEAH14S1	Ephemeral	Stormwater Drainage	Excavation	--	--	0.00	12.7
199	CEAH14S1	Ephemeral	Access Road	Viaduct	--	--	0.00	0.00
199	CEAH14S1	Ephemeral	Rail	Viaduct	--	--	0.00	0.00
199	CEAH14S1	Ephemeral	Utilities	Viaduct	--	--	0.00	0.00
199	Unnamed	Intermittent	Rail	Viaduct	--	--	0.00	0.00
199	Unnamed	Intermittent	Utilities	Viaduct	--	--	34.7	0.00
150	Unnamed	Intermittent	Rail	Viaduct	0.00	0.00	--	--
199	CEAH14S2	Intermittent	Access Road	Viaduct	--	--	0.00	0.00
199	CEAH14S2	Intermittent	Rail	Viaduct	--	--	0.00	0.00
199	CEAH14S2	Intermittent	Utilities	Viaduct	--	--	0.00	0.00
199	Unnamed	Intermittent	Utilities	Viaduct	--	--	0.00	0.00
151	Unnamed	Intermittent	Rail	Viaduct	0.00	0.00	--	--
151	CEAH14S4	Intermittent	Access Road	Viaduct	--	--	0.00	0.00
151	CEAH14S4	Intermittent	Rail	Viaduct	--	--	0.00	0.00
151	Bedias Creek	Perennial	Access Road	Viaduct	--	--	0.00	0.00
151	Bedias Creek	Perennial	Rail	Viaduct	0.00	0.00	0.00	0.00
151	Bedias Creek	Perennial	Utilities	Viaduct	--	--	0.00	0.00
				Total	0.00	3,418.3	603.4	2,199.6

Source: USGS, 2016; FNI, 2017

*Stream ID # (C) indicates a specific feature recorded in the field whereas stream names (or those "unnamed") indicate features mapped via data not yet field-verified. Jurisdictional determinations to be confirmed by the USACE. Each stream is separated by construction type.

'--' - not present

Table 20: Estimated Wetland Impacts – Madison County								
Natural Resources Mapbook Page #	Wetland ID/ Classification*	Wetland Type	Construction Type	Crossing Type	Segment 3C		Segment 4	
					Temp	Perm	Temp	Perm
					acres		acres	
140	PEM1C	Emergent	Access Road	Fill	0.00	0.44	--	--
190	PFO1C	Forested	Access Road	Fill	--	--	0.00	<0.01
190	PEM1C	Emergent	Access Road	Viaduct	--	--	0.00	0.00
190	PEM1C	Emergent	Rail	Viaduct	--	--	0.00	0.00
190	PFO1Fh	Forested	Rail	Viaduct/Conversion	--	--	0.00	0.04
191	PEM1C	Emergent	Utilities	Fill	--	--	0.00	0.06
191	PFO1C	Forested	Utilities	Fill	--	--	0.00	0.04
191	PFO1C	Forested	Access Road	Viaduct/Conversion	--	--	0.00	0.02
191	PFO1C	Forested	Rail	Viaduct/Conversion	--	--	0.00	0.07
191	PEM1C	Emergent	Rail	Viaduct	--	--	0.00	0.00
191	PFO1C	Forested	Access Road	Viaduct/Conversion	--	--	0.00	0.02
191	PFO1C	Forested	Rail	Viaduct/Conversion	--	--	0.00	0.10
143	PFO1C	Forested	Access Road	Viaduct/Conversion	0.00	0.07	--	--
143	PFO1C	Forested	Rail	Viaduct/Conversion	0.00	0.12	--	--
193	PFO1A	Forested	Access Road	Viaduct/Conversion	--	--	0.00	0.02
193	PFO1A	Forested	Rail	Viaduct/Conversion	--	--	0.00	0.40
144	PFO1A	Forested	Access Road	Viaduct/Conversion	0.00	0.07	--	--
144	PFO1A	Forested	Rail	Viaduct/Conversion	0.00	0.11	--	--
144	PEM1C	Emergent	Utilities	Fill	0.02	0.00	--	--
145	PEM1C	Emergent	Access Road	Viaduct	0.00	0.00	--	--
145	PEM1C	Emergent	Rail	Viaduct	0.00	0.00	--	--
145	PEM1A	Emergent	Facility	Fill	0.00	1.3	--	--
145	PEM1A	Emergent	Rail	Viaduct	0.00	0.00	--	--
195	CEAF14EW2	Emergent	Rail	Fill	--	--	0.00	0.03
195	CEAF14EW3	Emergent	Rail	Fill	--	--	0.00	0.01
147	PFO1A	Forested	Access Road	Viaduct/Conversion	0.00	<0.01	--	--

Table 20: Estimated Wetland Impacts – Madison County								
Natural Resources Mapbook Page #	Wetland ID/ Classification*	Wetland Type	Construction Type	Crossing Type	Segment 3C		Segment 4	
					Temp	Perm	Temp	Perm
					acres		acres	
147	PFO1A	Forested	Rail	Viaduct/Conversion	0.00	0.09	--	--
148	PFO1A	Forested	Access Road	Viaduct/Conversion	0.00	<0.01	--	--
148	PFO1A	Forested	Rail	Viaduct/Conversion	0.00	0.06	--	--
197	CEAG14EW9	Emergent	Rail	Viaduct	--	--	0.00	0.00
198	PFO1A	Forested	Utilities	Fill	--	--	0.00	0.41
198	PFO1A	Forested	Access Road	Viaduct/Conversion	--	--	0.00	0.15
198	PFO1A	Forested	Rail	Viaduct/Conversion	--	--	0.00	0.80
198	PFO1A	Forested	Utilities	Fill	--	--	0.00	0.06
198	PFO1A	Forested	Rail	Viaduct/Conversion	--	--	0.00	0.01
198	PFO1A	Forested	Access Road	Viaduct/Conversion	--	--	0.00	0.02
198	PEM1Ah	Emergent	Utilities	Fill	--	--	0.00	0.23
149	PFO1A	Forested	Access Road	Viaduct/Conversion	0.00	0.28	--	--
149	PFO1A	Forested	Rail	Viaduct/Conversion	0.00	3.7	--	--
199	PEM1A	Emergent	Stormwater Drainage	Excavation	--	--	0.00	0.06
199	PEM1A	Emergent	Access Road	Excavation	--	--	0.00	0.15
199	CEAH14FW12	Forested	Utilities	Fill	--	--	0.00	0.01
199	CEAH14FW12	Forested	Access Road	Viaduct/Conversion	--	--	0.00	0.01
199	CEAH14FW12	Forested	Rail	Viaduct/Conversion	--	--	0.00	0.01
199	CEAH14EW18	Emergent	Utilities	Fill	--	--	0.00	0.05
199	CEAH14EW18	Emergent	Access Road	Viaduct	--	--	0.00	0.00
199	CEAH14EW18	Emergent	Rail	Viaduct	--	--	0.00	0.00
199	CEAH14EW3	Emergent	Rail	Viaduct	--	--	0.00	0.00
151	PFO1A	Forested	Rail	Viaduct/Conversion	0.00	7.1	--	--
151	CEAH14EW4	Emergent	Access Road	Viaduct	--	--	0.00	0.00
151	CEAH14EW4	Emergent	Rail	Viaduct	--	--	0.00	0.00
151	CEAH14EW5	Emergent	Rail	Viaduct	--	--	0.00	0.00

Table 20: Estimated Wetland Impacts – Madison County								
Natural Resources Mapbook Page #	Wetland ID/ Classification*	Wetland Type	Construction Type	Crossing Type	Segment 3C		Segment 4	
					Temp	Perm	Temp	Perm
					acres		acres	
151	PFO1A	Forested	Utilities	Fill	--	--	0.00	3.1
151	PFO1A	Forested	Access Road	Viaduct/Conversion	--	--	0.00	0.74
151	PFO1A	Forested	Rail	Viaduct/Conversion	--	--	0.00	4.9
151	PFO1F	Forested	Utilities	Fill	--	--	0.00	0.19
				Total	0.02	13.4	0.00	11.7

Source: USFWS, 2016; FNI, 2017

*Wetland ID # (C) indicates a specific feature recorded in the field. Wetland classifications (P) indicate wetlands not yet field-verified. Jurisdictional determinations to be confirmed by the USACE. Each wetland is separated by construction type.

P - Palustrine
EM - Emergent
EM1 - Persistent Emergent
FO - Forested
FO1 - Broad-leaved Deciduous Forested
A - Temporarily Flooded
C - Seasonally Flooded
F - Semipermanently Flooded
h - Diked/Impounded
'--' - not present

Table 21: Estimated Waterbody Impacts – Madison County								
Natural Resources Mapbook Page #	Waterbody ID/Name *	Waterbody Type	Construction Type	Crossing Type	Segment 3C		Segment 4	
					Temp	Perm	Temp	Perm
					acres		acres	
140	Unnamed	Pond	Access Road	Fill	0.00	0.26	--	--
190	Unnamed	Pond	Temporary Fill	Fill	--	--	0.10	0.00
191	Unnamed	Pond	Access Road	Viaduct	--	--	0.00	0.00
191	Unnamed	Pond	Rail	Viaduct	--	--	0.00	0.00
191	Unnamed	Pond	Utilities	Fill	--	--	0.00	0.40
141	Unnamed	Pond	Access Road	Fill	0.00	0.06	--	--
141	Unnamed	Pond	Stormwater Drainage	Excavation	0.00	0.19	--	--
191	Unnamed	Pond	Utilities	Fill	--	--	0.00	<0.01

Table 21: Estimated Waterbody Impacts – Madison County								
Natural Resources Mapbook Page #	Waterbody ID/Name *	Waterbody Type	Construction Type	Crossing Type	Segment 3C		Segment 4	
					Temp	Perm	Temp	Perm
					acres		acres	
141	Unnamed	Pond	Access Road	Excavation	0.00	<0.01	--	--
141	Unnamed	Pond	Rail	Excavation	0.00	0.15	--	--
141	Unnamed	Pond	Rail	Excavation	0.00	0.06	--	--
142	Unnamed	Pond	Access Road	Fill	0.00	0.13	--	--
192	CEAE14PD8	Pond	Access Road	Viaduct	--	--	0.00	0.00
192	CEAE14PD8	Pond	Rail	Viaduct	--	--	0.00	0.00
143	Unnamed	Pond	Stormwater Drainage	Excavation	0.00	0.04	--	--
143	Unnamed	Pond	Access Road	Fill	0.00	0.01	--	--
143	Unnamed	Pond	Rail	Fill	0.00	0.40	--	--
143	Unnamed	Pond	Rail	Fill	0.00	0.03	--	--
193	CEAF14PD10	Pond	Access Road	Excavation	--	--	0.00	<0.01
193	CEAF14PD10	Pond	Facility	Excavation	--	--	0.00	0.03
193	CEAF14PD10	Pond	Stormwater Drainage	Excavation	--	--	0.00	0.11
193	CEAF14PD9	Pond	Facility	Fill	--	--	0.00	0.22
194	CEAF14PD5	Pond	Access Road	Fill	--	--	0.00	0.05
194	CEAF14PD6	Pond	Access Road	Fill	--	--	0.00	0.22
145	Unnamed	Swamp	Rail	Viaduct	0.00	0.00	--	--
145	Unnamed	Swamp	Facility	Fill	0.00	1.5	--	--
145	Unnamed	Pond	Rail	Viaduct	0.00	0.00	--	--
195	CEAG14PD23	Pond	Rail	Viaduct	--	--	0.00	0.00
146	Unnamed	Pond	Rail	Fill	0.00	0.13	--	--
147	Unnamed	Swamp	Access Road	Viaduct	0.00	0.00	--	--
147	Unnamed	Swamp	Rail	Viaduct	0.00	0.00	--	--
148	Unnamed	Pond	Access Road	Viaduct	0.00	0.00	--	--
148	Unnamed	Pond	Rail	Viaduct	0.00	0.00	--	--
148	Unnamed	Pond	Access Road	Viaduct	0.00	0.00	--	--
198	CEAG14PD16	Pond	Access Road	Viaduct	--	--	0.00	0.00

Table 21: Estimated Waterbody Impacts – Madison County								
Natural Resources Mapbook Page #	Waterbody ID/Name *	Waterbody Type	Construction Type	Crossing Type	Segment 3C		Segment 4	
					Temp	Perm	Temp	Perm
					acres		acres	
198	CEAG14PD24	Pond	Rail	Viaduct	--	--	0.00	0.00
198	CEAG14PD99	Pond	Access Road	Viaduct	--	--	0.00	0.00
198	CEAG14PD99	Pond	Rail	Viaduct	--	--	0.00	0.00
150	Unnamed	Pond	Access Road	Viaduct	0.00	0.00	--	--
150	Unnamed	Pond	Rail	Viaduct	0.00	0.00	--	--
199	CEAH14PD3	Pond	Access Road	Fill	--	--	0.00	0.06
199	CEAH14PD4	Pond	Access Road	Viaduct	--	--	0.00	0.00
199	CEAH14PD4	Pond	Utilities	Fill	--	--	0.00	<0.01
199	CEAH14PD4	Pond	Stormwater Drainage	Excavation	--	--	0.00	0.21
150	Unnamed	Pond	Rail	Viaduct	0.00	0.00	--	--
150	Unnamed	Pond	Rail	Viaduct	0.00	0.00	--	--
151	CEAH14PD6	Pond	Access Road	Viaduct	--	--	0.00	0.00
151	CEAH14PD6	Pond	Rail	Viaduct	--	--	0.00	0.00
142	Unnamed	Pond	Access Road	Viaduct	0.00	0.00	--	--
142	Unnamed	Pond	Rail	Viaduct	0.00	0.00	--	--
142	Unnamed	Pond	Stormwater Drainage	Excavation	0.00	0.15	--	--
198	Unnamed	Pond	Access Road	Viaduct	--	--	0.00	0.00
198	Unnamed	Pond	Rail	Viaduct	--	--	0.00	0.00
198	Unnamed	Pond	Utilities	Fill	--	--	0.00	0.04
				Total	0.00	3.1	0.10	1.3

Source: USGS, 2016; USFWS, 2016; FNI, 2017

*Waterbody ID # (C) indicates a specific feature recorded in the field. Waterbody classifications (P) indicate waterbodies not yet field-verified. Jurisdictional determinations to be confirmed by the USACE. Each waterbody is separated by construction type.

'--' - not present

Table 22: Estimated Stream Impacts – Grimes County										
Natural Resources Mapbook Page #	Stream ID/Name*	Classification	Construction Type	Crossing Type	Segment 3C		Segment 4		Segment 5	
					Temp	Perm	Temp	Perm	Temp	Perm
					linear feet		linear feet		linear feet	
151	Unnamed	Intermittent	Rail	Viaduct	0.00	0.00	--	--	--	--
151	CEAH14S7	Ephemeral	Access Road	Viaduct	--	--	0.00	0.00	--	--
151	CEAH14S7	Ephemeral	Rail	Viaduct	--	--	0.00	0.00	--	--
151	CEAH14S7	Ephemeral	Utilities	Viaduct	--	--	0.00	0.00	--	--
151	Unnamed	Intermittent	Rail	Viaduct	0.00	0.00	--	--	--	--
151	CEAH14S8	Ephemeral	Access Road	Viaduct	--	--	0.00	0.00	--	--
151	CEAH14S8	Ephemeral	Rail	Viaduct	--	--	0.00	0.00	--	--
151	CEAH14S10	Ephemeral	Access Road	Viaduct	--	--	0.00	0.00	--	--
151	CEAH14S10	Ephemeral	Rail	Viaduct	--	--	0.00	0.00	--	--
152	CEAH14S11	Intermittent	Access Road	Viaduct	--	--	0.00	0.00	--	--
152	CEAH14S11	Intermittent	Rail	Viaduct	--	--	0.00	0.00	--	--
152	Unnamed	Intermittent	Rail	Viaduct	0.00	0.00	--	--	--	--
152, 153	Panky Creek	Intermittent	Rail	Viaduct	0.00	0.00	--	--	0.00	0.00
152	Panky Creek	Intermittent	Stormwater Drainage	Excavation	0.00	71.8	--	--	--	--
152	Unnamed	Intermittent	Stormwater Drainage	Excavation	0.00	978.5	--	--	--	--
152	Unnamed	Intermittent	Rail	Viaduct	0.00	0.00	--	--	--	--
152	CEAI15S1	Ephemeral	Access Road	Viaduct	--	--	0.00	0.00	--	--
152	CEAI15S1	Ephemeral	Rail	Viaduct	--	--	0.00	0.00	--	--
152	CEAI15S7	Ephemeral	Access Road	Viaduct	--	--	0.00	0.00	--	--
152	CEAI15S7	Ephemeral	Rail	Viaduct	--	--	0.00	0.00	--	--
152	Unnamed	Intermittent	Stormwater Drainage	Excavation	0.00	335.8	--	--	--	--
152	Unnamed	Intermittent	Access Road	Viaduct	0.00	0.00	--	--	--	--
152	Unnamed	Intermittent	Rail	Viaduct	0.00	0.00	--	--	--	--
152	CEAI15S2	Ephemeral	Access Road	Viaduct	--	--	0.00	0.00	--	--
152	Unnamed	Intermittent	Access Road	Viaduct	--	--	0.00	0.00	--	--

Table 22: Estimated Stream Impacts – Grimes County											
Natural Resources Mapbook Page #	Stream ID/Name*	Classification	Construction Type	Crossing Type	Segment 3C		Segment 4		Segment 5	
					Temp	Perm	Temp	Perm	Temp	Perm
					linear feet		linear feet		linear feet	
152	CEAI15S2	Ephemeral	Rail	Viaduct	--	--	0.00	0.00	--	--
152	Unnamed	Intermittent	Access Road	Fill	0.00	62.1	--	--	--	--
152	Unnamed	Intermittent	Rail	Fill	0.00	108.1	--	--	--	--
152	Unnamed	Intermittent	Stormwater Drainage	Excavation	--	--	0.00	108.1	--	--
152	Unnamed	Intermittent	Access Road	Fill	--	--	0.00	62.1	--	--
152	Unnamed	Intermittent	Rail	Fill	--	--	0.00	108.1	--	--
152	Unnamed	Intermittent	Stormwater Drainage	Excavation	0.00	108.1	--	--	--	--
153	Unnamed	Intermittent	Rail	Viaduct	0.00	0.00	--	--	--	--
153	Unnamed	Intermittent	Facility	Fill	--	--	0.00	101.4	--	--
153	Unnamed	Intermittent	Access Road	Viaduct	--	--	0.00	0.00	--	--
153	Unnamed	Intermittent	Rail	Viaduct	--	--	0.00	0.00	--	--
153	Unnamed	Intermittent	Access Road	Viaduct	0.00	0.00	--	--	--	--
153	Unnamed	Intermittent	Rail	Viaduct	--	--	0.00	0.00	--	--
153	Unnamed	Intermittent	Access Road	Viaduct	0.00	0.00	--	--	--	--
153	Unnamed	Intermittent	Access Road	Viaduct	--	--	0.00	0.00	--	--
153	Unnamed	Intermittent	Rail	Viaduct	0.00	0.00	--	--	--	--
153	Panky Creek	Intermittent	Access Road	Viaduct	--	--	--	--	0.00	0.00
153	Unnamed	Intermittent	Rail	Viaduct	--	--	--	--	0.00	0.00
204	CEAJ15S11	Ephemeral	Access Road	Viaduct	--	--	--	--	0.00	0.00
204	CEAJ15S11	Ephemeral	Rail	Viaduct	--	--	--	--	0.00	0.00
204	CEAJ15S12	Ephemeral	Access Road	Viaduct	--	--	--	--	0.00	0.00
204	CEAJ15S12	Ephemeral	Rail	Viaduct	--	--	--	--	0.00	0.00
204	CEAJ15S1	Ephemeral	Stormwater Drainage	Excavation	--	--	--	--	0.00	288.6
204	CEAJ15S1	Ephemeral	Access Road	Fill	--	--	--	--	0.00	114.5
204	CEAJ15S1	Ephemeral	Rail	Viaduct	--	--	--	--	0.00	0.00
204	Unnamed	Intermittent	Stormwater Drainage	Excavation	--	--	--	--	0.00	230.2

Table 22: Estimated Stream Impacts – Grimes County										
Natural Resources Mapbook Page #	Stream ID/Name*	Classification	Construction Type	Crossing Type	Segment 3C		Segment 4		Segment 5	
					Temp	Perm	Temp	Perm	Temp	Perm
					linear feet		linear feet		linear feet	
204	Unnamed	Intermittent	Access Road	Fill	--	--	--	--	0.00	116.8
204	Unnamed	Intermittent	Access Road	Fill	--	--	--	--	0.00	66.8
204	Unnamed	Intermittent	Access Road	Fill	--	--	--	--	0.00	82.6
205	Unnamed	Intermittent	Access Road	Viaduct	--	--	--	--	0.00	0.00
205	Unnamed	Intermittent	Rail	Viaduct	--	--	--	--	0.00	0.00
205	South Bedias Creek	Intermittent	Access Road	Viaduct	--	--	--	--	0.00	0.00
205	South Bedias Creek	Intermittent	Rail	Viaduct	--	--	--	--	0.00	0.00
205	Turkey Creek	Artificial	Rail	Fill	--	--	--	--	0.00	996.8
205	Turkey Creek	Intermittent	Stormwater Drainage	Excavation	--	--	--	--	0.00	334.5
205	Turkey Creek	Intermittent	Access Road	Fill	--	--	--	--	0.00	176.1
205	Turkey Creek	Intermittent	Maintenance Facility	Fill	--	--	--	--	0.00	676.0
206	Unnamed	Intermittent	Access Road	Viaduct	--	--	--	--	0.00	0.00
206	Unnamed	Intermittent	Rail	Viaduct	--	--	--	--	0.00	0.00
206	Unnamed	Intermittent	Access Road	Viaduct	--	--	--	--	0.00	0.00
206	Unnamed	Intermittent	Rail	Viaduct	--	--	--	--	0.00	0.00
206	Unnamed	Intermittent	Rail	Viaduct	--	--	--	--	0.00	0.00
206	Unnamed	Intermittent	Access Road	Viaduct	--	--	--	--	0.00	0.00
206	Unnamed	Intermittent	Rail	Viaduct	--	--	--	--	0.00	0.00
207	Unnamed	Intermittent	Access Road	Viaduct	--	--	--	--	0.00	0.00
207	Unnamed	Intermittent	Rail	Viaduct	--	--	--	--	0.00	0.00
207	Unnamed	Intermittent	Access Road	Viaduct	--	--	--	--	0.00	0.00
207	Unnamed	Intermittent	Rail	Viaduct	--	--	--	--	0.00	0.00
207	Unnamed	Intermittent	Stormwater Drainage	Excavation	--	--	--	--	0.00	86.9
207	Unnamed	Intermittent	Access Road	Viaduct	--	--	--	--	0.00	0.00
207	Unnamed	Intermittent	Rail	Viaduct	--	--	--	--	0.00	0.00
207	Unnamed	Intermittent	Access Road	Viaduct	--	--	--	--	0.00	0.00

Table 22: Estimated Stream Impacts – Grimes County										
Natural Resources Mapbook Page #	Stream ID/Name*	Classification	Construction Type	Crossing Type	Segment 3C		Segment 4		Segment 5	
					Temp	Perm	Temp	Perm	Temp	Perm
					linear feet		linear feet		linear feet	
207	Unnamed	Intermittent	Rail	Viaduct	--	--	--	--	0.00	0.00
207	Unnamed	Intermittent	Access Road	Viaduct	--	--	--	--	0.00	0.00
207	Unnamed	Intermittent	Rail	Viaduct	--	--	--	--	0.00	0.00
208	Unnamed	Intermittent	Access Road	Viaduct	--	--	--	--	0.00	0.00
208	Unnamed	Intermittent	Rail	Viaduct	--	--	--	--	0.00	0.00
208	CEAK15S8	Ephemeral	Access Road	Viaduct	--	--	--	--	0.00	0.00
208	CEAK15S8	Ephemeral	Rail	Viaduct	--	--	--	--	0.00	0.00
208	CEAK15S8	Ephemeral	Temporary Fill	Fill	--	--	--	--	778.2	0.00
208	CEAK15S17	Ephemeral	Temporary Fill	Fill	--	--	--	--	205.2	0.00
209	CEAK15S9	Ephemeral	Access Road	Viaduct	--	--	--	--	0.00	0.00
209	CEAK15S9	Ephemeral	Rail	Viaduct	--	--	--	--	0.00	0.00
209	CEAK15S15	Ephemeral	Temporary Fill	Fill	--	--	--	--	276.6	0.00
209	CEAK15S18	Ephemeral	Facility	Fill	--	--	--	--	0.00	526.7
209	CEAK15S16	Ephemeral	Temporary Fill	Fill	--	--	--	--	376.8	0.00
209	CEAK15S9	Ephemeral	Facility	Fill	--	--	--	--	0.00	166.4
209	CEAK15S18	Ephemeral	Temporary Fill	Fill	--	--	--	--	174.1	0.00
209	CEAK15S10	Ephemeral	Temporary Fill	Fill	--	--	--	--	1,036.5	0.00
209	CEAK15S9	Ephemeral	Temporary Fill	Fill	--	--	--	--	717.4	0.00
209	Unnamed	Intermittent	Temporary Fill	Fill	--	--	--	--	73.9	0.00
209	CEAK15S10	Ephemeral	Access Road	Viaduct	--	--	--	--	0.00	0.00
209	CEAK15S10	Ephemeral	Rail	Viaduct	--	--	--	--	0.00	0.00
209	Unnamed	Intermittent	Temporary Fill	Fill	--	--	--	--	56.8	0.00
209	CEAK15S14	Ephemeral	Access Road	Viaduct	--	--	--	--	0.00	0.00
209	CEAK15S14	Ephemeral	Rail	Viaduct	--	--	--	--	0.00	0.00
209	CEAK15S13	Ephemeral	Access Road	Viaduct	--	--	--	--	0.00	0.00
209	CEAK15S13	Ephemeral	Rail	Viaduct	--	--	--	--	0.00	0.00
209	CEAK15S11	Perennial	Access Road	Viaduct	--	--	--	--	0.00	0.00
209	CEAK15S11	Perennial	Rail	Viaduct	--	--	--	--	0.00	0.00

Table 22: Estimated Stream Impacts – Grimes County										
Natural Resources Mapbook Page #	Stream ID/Name*	Classification	Construction Type	Crossing Type	Segment 3C		Segment 4		Segment 5	
					Temp	Perm	Temp	Perm	Temp	Perm
					linear feet		linear feet		linear feet	
209	CEAK15S12	Ephemeral	Access Road	Viaduct	--	--	--	--	0.00	0.00
209	CEAK15S12	Ephemeral	Rail	Viaduct	--	--	--	--	0.00	0.00
210	Unnamed	Intermittent	Access Road	Fill	--	--	--	--	0.00	202.3
210	Unnamed	Artificial	Stormwater Drainage	Excavation	--	--	--	--	0.00	115.2
210	Unnamed	Artificial	Rail	Fill	--	--	--	--	0.00	305.7
210	Sulphur Creek	Intermittent	Access Road	Viaduct	--	--	--	--	0.00	0.00
210	Sulphur Creek	Intermittent	Rail	Viaduct	--	--	--	--	0.00	0.00
210	Unnamed	Intermittent	Access Road	Viaduct	--	--	--	--	0.00	0.00
210	Unnamed	Intermittent	Access Road	Viaduct	--	--	--	--	0.00	0.00
210	Unnamed	Intermittent	Access Road	Viaduct	--	--	--	--	0.00	0.00
210	Unnamed	Intermittent	Rail	Viaduct	--	--	--	--	0.00	0.00
211	CEAL15S5	Ephemeral	Access Road	Viaduct	--	--	--	--	0.00	0.00
211	CEAL15S5	Ephemeral	Rail	Viaduct	--	--	--	--	0.00	0.00
211	CEAL15S8	Ephemeral	Access Road	Fill	--	--	--	--	0.00	254.2
211	CEAL15S9	Ephemeral	Access Road	Fill	--	--	--	--	0.00	87.1
211	Unnamed	Intermittent	Access Road	Viaduct	--	--	--	--	0.00	0.00
211	Unnamed	Intermittent	Rail	Viaduct	--	--	--	--	0.00	0.00
212	Unnamed	Intermittent	Stormwater Drainage	Excavation	--	--	--	--	0.00	111.8
212	Unnamed	Intermittent	Access Road	Fill	--	--	--	--	0.00	168.6
212	Unnamed	Intermittent	Rail	Fill	--	--	--	--	0.00	451.8
212	Unnamed	Intermittent	Station	Fill	--	--	--	--	0.00	77.8
212	CEAL15S7	Ephemeral	Station	Fill	--	--	--	--	0.00	265.7
213	Unnamed	Intermittent	Rail	Viaduct	--	--	--	--	0.00	0.00
213	CEAM16S13	Ephemeral	Rail	Viaduct	--	--	--	--	0.00	0.00
213	CEAM16S3	Intermittent	Rail	Viaduct	--	--	--	--	0.00	0.00
213	Rocky Creek	Intermittent	Rail	Viaduct	--	--	--	--	0.00	0.00

Table 22: Estimated Stream Impacts – Grimes County										
Natural Resources Mapbook Page #	Stream ID/Name*	Classification	Construction Type	Crossing Type	Segment 3C		Segment 4		Segment 5	
					Temp	Perm	Temp	Perm	Temp	Perm
					linear feet		linear feet		linear feet	
213	Unnamed	Artificial	Stormwater Drainage	Excavation	--	--	--	--	0.00	147.0
213	Unnamed	Artificial	Rail	Fill	--	--	--	--	0.00	448.8
213	Unnamed	Intermittent	Access Road	Fill	--	--	--	--	0.00	205.3
213	Unnamed	Intermittent	Access Road	Excavation	--	--	--	--	0.00	86.2
213	Unnamed	Intermittent	Stormwater Drainage	Excavation	--	--	--	--	0.00	176.1
213	Unnamed	Intermittent	Rail	Excavation	--	--	--	--	0.00	208.3
214	CEAM16S6	Intermittent	Stormwater Drainage	Excavation	--	--	--	--	0.00	419.4
214	Unnamed	Intermittent	Stormwater Drainage	Excavation	--	--	--	--	0.00	191.8
214	Unnamed	Intermittent	Rail	Viaduct	--	--	--	--	0.00	0.00
214	CEAM16S6	Intermittent	Access Road	Viaduct	--	--	--	--	0.00	0.00
214	CEAM16S6	Intermittent	Rail	Viaduct	--	--	--	--	0.00	0.00
214	CEAM16S11	Intermittent	Access Road	Viaduct	--	--	--	--	0.00	0.00
214	CEAM16S11	Intermittent	Rail	Viaduct	--	--	--	--	0.00	0.00
214	Unnamed	Intermittent	Access Road	Viaduct	--	--	--	--	0.00	0.00
215	CEAM16S9	Ephemeral	Access Road	Viaduct	--	--	--	--	0.00	0.00
215	CEAM16S9	Ephemeral	Rail	Viaduct	--	--	--	--	0.00	0.00
215	CEAM16S10	Ephemeral	Access Road	Viaduct	--	--	--	--	0.00	0.00
215	CEAM16S10	Ephemeral	Rail	Viaduct	--	--	--	--	0.00	0.00
215	Unnamed	Intermittent	Access Road	Viaduct	--	--	--	--	0.00	0.00
215	Unnamed	Intermittent	Rail	Viaduct	--	--	--	--	0.00	0.00
215	Unnamed	Artificial	Access Road	Viaduct	--	--	--	--	0.00	0.00
215	Unnamed	Artificial	Rail	Viaduct	--	--	--	--	0.00	0.00
216	Unnamed	Intermittent	Access Road	Viaduct	--	--	--	--	0.00	0.00
216	Unnamed	Intermittent	Rail	Viaduct	--	--	--	--	0.00	0.00
216	Unnamed	Intermittent	Stormwater Drainage	Excavation	--	--	--	--	0.00	331.5
216	Unnamed	Intermittent	Access Road	Fill	--	--	--	--	0.00	99.1

Table 22: Estimated Stream Impacts – Grimes County										
Natural Resources Mapbook Page #	Stream ID/Name*	Classification	Construction Type	Crossing Type	Segment 3C		Segment 4		Segment 5	
					Temp	Perm	Temp	Perm	Temp	Perm
					linear feet		linear feet		linear feet	
216	Unnamed	Intermittent	Rail	Fill	--	--	--	--	0.00	276.0
217	CEAN16S3	Ephemeral	Access Road	Fill	--	--	--	--	0.00	287.4
218	CEAO16S1	Intermittent	Access Road	Viaduct	--	--	--	--	0.00	0.00
218	CEAO16S1	Intermittent	Rail	Viaduct	--	--	--	--	0.00	0.00
218	CEAO16S2	Intermittent	Access Road	Viaduct	--	--	--	--	0.00	0.00
218	CEAO16S2	Intermittent	Rail	Viaduct	--	--	--	--	0.00	0.00
218	Bums Creek	Intermittent	Access Road	Viaduct	--	--	--	--	0.00	0.00
218	Bums Creek	Intermittent	Rail	Viaduct	--	--	--	--	0.00	0.00
218	Unnamed	Intermittent	Maintenance Facility	Fill	--	--	--	--	0.00	65.0
218	Unnamed	Intermittent	Access Road	Viaduct	--	--	--	--	0.00	0.00
218	Unnamed	Intermittent	Rail	Viaduct	--	--	--	--	0.00	0.00
218	CEAO16S9	Ephemeral	Stormwater Drainage	Excavation	--	--	--	--	0.00	17.9
218	CEAO16S9	Ephemeral	Access Road	Viaduct	--	--	--	--	0.00	0.00
218	CEAO16S9	Ephemeral	Rail	Viaduct	--	--	--	--	0.00	0.00
219	Haynie Creek	Intermittent	Access Road	Viaduct	--	--	--	--	0.00	0.00
219	Haynie Creek	Intermittent	Rail	Viaduct	--	--	--	--	0.00	0.00
219	Unnamed	Intermittent	Access Road	Viaduct	--	--	--	--	0.00	0.00
219	Unnamed	Intermittent	Rail	Viaduct	--	--	--	--	0.00	0.00
219	Unnamed	Intermittent	Stormwater Drainage	Excavation	--	--	--	--	0.00	239.8
219	Unnamed	Intermittent	Access Road	Viaduct	--	--	--	--	0.00	0.00
219	Unnamed	Intermittent	Rail	Viaduct	--	--	--	--	0.00	0.00
220	Unnamed	Intermittent	Stormwater Drainage	Excavation	--	--	--	--	0.00	91.4
221	Caney Creek	Intermittent	Access Road	Viaduct	--	--	--	--	0.00	0.00
221	Caney Creek	Intermittent	Rail	Viaduct	--	--	--	--	0.00	0.00
221	Unnamed	Intermittent	Access Road	Viaduct	--	--	--	--	0.00	0.00
221	Unnamed	Intermittent	Rail	Viaduct	--	--	--	--	0.00	0.00

Table 22: Estimated Stream Impacts – Grimes County										
Natural Resources Mapbook Page #	Stream ID/Name*	Classification	Construction Type	Crossing Type	Segment 3C		Segment 4		Segment 5	
					Temp	Perm	Temp	Perm	Temp	Perm
					linear feet		linear feet		linear feet	
221	Unnamed	Intermittent	Access Road	Viaduct	--	--	--	--	0.00	0.00
221	Unnamed	Intermittent	Rail	Viaduct	--	--	--	--	0.00	0.00
222	Unnamed	Intermittent	Stormwater Drainage	Excavation	--	--	--	--	0.00	156.9
222	CEAP16S10	Intermittent	Rail	Viaduct	--	--	--	--	0.00	0.00
222	CEAP16S9	Intermittent	Access Road	Viaduct	--	--	--	--	0.00	0.00
222	CEAP16S9	Intermittent	Rail	Viaduct	--	--	--	--	0.00	0.00
223	Unnamed	Intermittent	Access Road	Viaduct	--	--	--	--	0.00	0.00
223	Unnamed	Intermittent	Rail	Viaduct	--	--	--	--	0.00	0.00
224	Hurricane Creek	Intermittent	Temporary Fill	Fill	--	--	--	--	1,465.1	0.00
224	Hurricane Creek	Intermittent	Access Road	Viaduct	--	--	--	--	0.00	0.00
224	Hurricane Creek	Intermittent	Rail	Viaduct	--	--	--	--	0.00	0.00
224	Unnamed	Intermittent	Access Road	Viaduct	--	--	--	--	0.00	0.00
224	Unnamed	Artificial	Temporary Fill	Fill	--	--	--	--	2,341.6	0.00
225	Kickapoo Creek	Intermittent	Access Road	Viaduct	--	--	--	--	0.00	0.00
225	Kickapoo Creek	Intermittent	Rail	Viaduct	--	--	--	--	0.00	0.00
225	Unnamed	Intermittent	Access Road	Viaduct	--	--	--	--	0.00	0.00
225	Unnamed	Intermittent	Rail	Viaduct	--	--	--	--	0.00	0.00
226	Unnamed	Intermittent	Access Road	Viaduct	--	--	--	--	0.00	0.00
226	Unnamed	Intermittent	Rail	Viaduct	--	--	--	--	0.00	0.00
226	CEAR17S97	Ephemeral	Stormwater Drainage	Excavation	--	--	--	--	0.00	80.8
226	CEAR17S97	Ephemeral	Rail	Viaduct	--	--	--	--	0.00	0.00
226	CEAR17S8	Ephemeral	Stormwater Drainage	Excavation	--	--	--	--	0.00	95.5
226	CEAR17S8	Ephemeral	Access Road	Fill	--	--	--	--	0.00	80.1
226	CEAR17S10	Ephemeral	Access Road	Fill	--	--	--	--	0.00	77.2

Table 22: Estimated Stream Impacts – Grimes County										
Natural Resources Mapbook Page #	Stream ID/Name*	Classification	Construction Type	Crossing Type	Segment 3C		Segment 4		Segment 5	
					Temp	Perm	Temp	Perm	Temp	Perm
					linear feet		linear feet		linear feet	
226	CEAR17S10	Ephemeral	Rail	Fill	--	--	--	--	0.00	49.7
226	CEAR17S8	Intermittent	Rail	Fill	--	--	--	--	0.00	232.9
226	CEAR17S9	Ephemeral	Stormwater Drainage	Excavation	--	--	--	--	0.00	105.4
226	CEAR17S9	Ephemeral	Access Road	Fill	--	--	--	--	0.00	88.4
226	CEAR17S9	Ephemeral	Rail	Fill	--	--	--	--	0.00	236.0
227	CEAR17S13	Ephemeral	Rail	Fill	--	--	--	--	0.00	84.0
227	CEAR17S11	Ephemeral	Access Road	Fill	--	--	--	--	0.00	74.0
227	CEAR17S11	Ephemeral	Rail	Fill	--	--	--	--	0.00	30.6
227	CEAR17S12	Ephemeral	Rail	Fill	--	--	--	--	0.00	217.3
227	CEAR17S14	Ephemeral	Rail	Fill	--	--	--	--	0.00	124.3
227	CEAR17S2	Intermittent	Stormwater Drainage	Excavation	--	--	--	--	0.00	213.4
227	CEAR17S2	Intermittent	Rail	Fill	--	--	--	--	0.00	476.5
227	CEAR17S2	Intermittent	Access Road	Fill	--	--	--	--	0.00	158.6
227	Unnamed	Intermittent	Access Road	Fill	--	--	--	--	0.00	334.8
227	Unnamed	Intermittent	Stormwater Drainage	Excavation	--	--	--	--	0.00	160.0
227	Unnamed	Intermittent	Access Road	Fill	--	--	--	--	0.00	163.4
227	Unnamed	Intermittent	Rail	Fill	--	--	--	--	0.00	222.6
227	CEAR17S3	Ephemeral	Access Road	Fill	--	--	--	--	0.00	1.7
228	CEAR17S98	Ephemeral	Rail	Viaduct	--	--	--	--	0.00	0.00
228	CEAR17S7	Ephemeral	Rail	Viaduct	--	--	--	--	0.00	0.00
228	CEAR17S4	Intermittent	Rail	Viaduct	--	--	--	--	0.00	0.00
				Total	0.00	1,664.4	0.00	379.7	7,502.1	12,657.9

Source: USGS, 2016; FNI, 2017

*Stream ID # (C) indicates a specific feature recorded in the field whereas stream names (or those "unnamed") indicate features mapped via data not yet field-verified. Jurisdictional determinations to be confirmed by the USACE. Each stream is separated by construction type.

'--' - not present

Table 23: Estimated Wetland Impacts – Grimes County										
Natural Resources Mapbook Page #	Wetland ID/ Classification*	Wetland Type	Construction Type	Crossing Type	Segment 3C		Segment 4		Segment 5	
					Temp	Perm	Temp	Perm	Temp	Perm
					acres		acres		acres	
151	PFO1A	Forested	Access Road	Viaduct/Conversion	--	--	0.00	0.09	--	--
151	PFO1A	Forested	Utilities	Fill	--	--	0.00	0.33	--	--
151	PFO1A	Forested	Rail	Viaduct/Conversion	--	--	0.00	0.69	--	--
151	CEAH14EW17	Emergent	Rail	Viaduct	--	--	0.00	0.00	--	--
151	CEAH14FW10	Forested	Access Road	Viaduct/Conversion	--	--	0.00	0.05	--	--
151	CEAH14FW10	Forested	Rail	Viaduct/Conversion	--	--	0.00	0.39	--	--
152	CEAH14FW11	Forested	Access Road	Viaduct/Conversion	--	--	0.00	0.04	--	--
152	CEAH14FW11	Forested	Rail	Viaduct/Conversion	--	--	0.00	0.63	--	--
152	CEAH14EW15	Emergent	Access Road	Viaduct	--	--	0.00	0.00	--	--
152	CEAH14EW15	Emergent	Rail	Viaduct	--	--	0.00	0.00	--	--
152	CEAH14FW9	Forested	Rail	Viaduct/Conversion	--	--	0.00	0.29	--	--
152	CEAH15SW1	Scrub/Shrub	Rail	Viaduct	--	--	0.00	0.00	--	--
152	CEAH15EW5	Emergent	Access Road	Viaduct	--	--	0.00	0.00	--	--
152	CEAH15EW5	Emergent	Rail	Viaduct	--	--	0.00	0.00	--	--
152	PFO1A	Forested	Stormwater Drainage	Excavation	0.00	0.06	--	--	--	--
152	PFO1A	Forested	Rail	Viaduct/Conversion	0.00	0.10	--	--	--	--
153	PFO1A	Forested	Access Road	Viaduct/Conversion	--	--	--	--	0.00	0.04
153	PFO1A	Forested	Rail	Viaduct/Conversion	--	--	--	--	0.00	0.23
208	CEAK15EW100	Emergent	Rail	Fill	--	--	--	--	0.00	0.01
208	CEAK15EW100	Emergent	Stormwater Drainage	Excavation	--	--	--	--	0.00	0.10
208	CEAK15EW100	Emergent	Access Road	Fill	--	--	--	--	0.00	0.11
208	CEAK15EW2	Emergent	Temporary Fill	Fill	--	--	--	--	0.08	0.00
208	CEAK15EW3	Emergent	Temporary Fill	Fill	--	--	--	--	0.07	0.00
208	CEAK15FW1	Forested	Temporary Fill	Fill	--	--	--	--	0.22	0.00
208	CEAK15EW1	Emergent	Temporary Fill	Fill	--	--	--	--	2.1	0.00
209	CEAK15EW101	Emergent	Temporary Fill	Fill	--	--	--	--	0.04	0.00
209	CEAK15EW102	Emergent	Facility	Fill	--	--	--	--	0.00	0.31

Table 23: Estimated Wetland Impacts – Grimes County										
Natural Resources Mapbook Page #	Wetland ID/ Classification*	Wetland Type	Construction Type	Crossing Type	Segment 3C		Segment 4		Segment 5	
					Temp	Perm	Temp	Perm	Temp	Perm
					acres		acres		acres	
210	PEM1F	Emergent	Access Road	Viaduct	--	--	--	--	0.00	0.00
210	PEM1F	Emergent	Rail	Viaduct	--	--	--	--	0.00	0.00
212	PEM1A	Emergent	Rail	Viaduct	--	--	--	--	0.00	0.00
213	CEAM16EW2	Emergent	Rail	Viaduct	--	--	--	--	0.00	0.00
218	PFO1A	Forested	Access Road	Viaduct/Conversion	--	--	--	--	0.00	0.05
218	PFO1A	Forested	Rail	Viaduct/Conversion	--	--	--	--	0.00	0.07
219	PFO1A	Forested	Access Road	Viaduct/Conversion	--	--	--	--	0.00	0.02
219	PFO1A	Forested	Rail	Viaduct/Conversion	--	--	--	--	0.00	0.13
220	CEAO16SW1	Scrub/Shrub	Access Road	Fill	--	--	--	--	0.00	0.10
221	PEM1A	Emergent	Access Road	Viaduct	--	--	--	--	0.00	0.00
221	PEM1C	Emergent	Access Road	Viaduct	--	--	--	--	0.00	0.00
221	PEM1C	Emergent	Rail	Viaduct	--	--	--	--	0.00	0.00
221	PEM1A	Emergent	Access Road	Viaduct	--	--	--	--	0.00	0.00
221	PEM1A	Emergent	Rail	Viaduct	--	--	--	--	0.00	0.00
222	PFO1A	Forested	Access Road	Fill	--	--	--	--	0.00	0.01
223	PFO1A	Forested	Access Road	Viaduct/Conversion	--	--	--	--	0.00	0.03
223	PFO1A	Forested	Rail	Viaduct/Conversion	--	--	--	--	0.00	0.08
224	PEM1C	Emergent	Temporary Fill	Fill	--	--	--	--	0.12	0.00
224	PFO1C	Forested	Temporary Fill	Fill	--	--	--	--	0.57	0.00
224	PFO1C	Forested	Access Road	Viaduct/Conversion	--	--	--	--	0.00	0.01
224	PFO1C	Forested	Rail	Viaduct/Conversion	--	--	--	--	0.00	0.11
224	PEM1C	Emergent	Temporary Fill	Fill	--	--	--	--	0.08	0.00
224	PEM1C	Emergent	Access Road	Viaduct	--	--	--	--	0.00	0.00
224	PEM1C	Emergent	Rail	Viaduct	--	--	--	--	0.00	0.00
224	PEM1C	Emergent	Temporary Fill	Fill	--	--	--	--	0.10	0.00
224	PEM1C	Emergent	Temporary Fill	Fill	--	--	--	--	0.10	0.00
224	PEM1C	Emergent	Temporary Fill	Fill	--	--	--	--	0.25	0.00

Table 23: Estimated Wetland Impacts – Grimes County										
Natural Resources Mapbook Page #	Wetland ID/ Classification*	Wetland Type	Construction Type	Crossing Type	Segment 3C		Segment 4		Segment 5	
					Temp	Perm	Temp	Perm	Temp	Perm
					acres		acres		acres	
224	PEM1C	Emergent	Temporary Fill	Fill	--	--	--	--	0.43	0.00
225	PFO1A	Forested	Access Road	Viaduct/Conversion	--	--	--	--	0.00	0.02
225	PFO1A	Forested	Rail	Viaduct/Conversion	--	--	--	--	0.00	0.06
226	CEAR17EW99	Emergent	Rail	Viaduct	--	--	--	--	0.00	0.00
226	CEAR17EW99	Emergent	Stormwater Drainage	Excavation	--	--	--	--	0.00	0.09
226	CEAR17EW98	Emergent	Rail	Viaduct	--	--	--	--	0.00	0.00
228	CEAR17EW1	Emergent	Rail	Viaduct	--	--	--	--	0.00	0.00
228	CEAR17EW3	Emergent	Rail	Viaduct	--	--	--	--	0.00	0.00
228	CEAR17FW3	Forested	Rail	Viaduct/Conversion	--	--	--	--	0.00	0.11
228	CEAR17FW1	Forested	Access Road	Viaduct/Conversion	--	--	--	--	0.00	0.01
228	CEAR17FW1	Forested	Access Road	Viaduct/Conversion	--	--	--	--	0.00	0.01
228	CEAR17FW1	Forested	Rail	Viaduct/Conversion	--	--	--	--	0.00	0.14
228	CEAR17FW1	Forested	Access Road	Viaduct/Conversion	--	--	--	--	0.00	0.14
228	CEAR17FW1	Forested	Rail	Viaduct/Conversion	--	--	--	--	0.00	0.57
228	PFO1C	Forested	Rail	Viaduct/Conversion	--	--	--	--	0.00	0.13
228	PFO1A	Forested	Access Road	Fill	--	--	--	--	0.00	<0.01
228	PFO1A	Forested	Rail	Fill	--	--	--	--	0.00	0.17
				Total	0.00	0.16	0.00	2.5	4.2	2.9

Source: USFWS, 2016; FNI, 2017

*Wetland ID # (C) indicates a specific feature recorded in the field. Wetland classifications (P) indicate wetlands not yet field-verified. Jurisdictional determinations to be confirmed by the USACE. Each wetland is separated by construction type.

P - Palustrine
EM - Emergent
EM1 - Persistent Emergent
FO - Forested
FO1 - Broad-leaved Deciduous Forested
A - Temporarily Flooded
C - Seasonally Flooded
F - Semipermanently Flooded
'--' - not present

Table 24: Estimated Waterbody Impacts – Grimes County										
Natural Resources Mapbook Page #	Waterbody ID/Name *	Waterbody Type	Construction Type	Crossing Type	Segment 3C		Segment 4		Segment 5	
					Temp	Perm	Temp	Perm	Temp	Perm
					acres		acres		acres	
151	CEAH14PD7	Pond	Rail	Viaduct	--	--	0.00	0.00	--	--
151	Unnamed	Pond	Rail	Viaduct	0.00	0.00	--	--	--	--
152	Unnamed	Pond	Rail	Viaduct	0.00	0.00	--	--	--	--
152	Unnamed	Pond	Stormwater Drainage	Excavation	0.00	0.27	--	--	--	--
152	Unnamed	Pond	Rail	Fill	0.00	0.29	--	--	--	--
152	Unnamed	Pond	Stormwater Drainage	Excavation	--	--	0.00	0.27	--	--
152	Unnamed	Pond	Rail	Fill	--	--	0.00	0.29	--	--
153	Unnamed	Pond	Stormwater Drainage	Excavation	0.00	0.02	--	--	--	--
153	Unnamed	Pond	Rail	Fill	0.00	0.31	--	--	--	--
153	Unnamed	Pond	Stormwater Drainage	Excavation	--	--	0.00	0.02	--	--
153	Unnamed	Pond	Rail	Fill	--	--	0.00	0.31	--	--
203	Unnamed	Pond	Access Road	Viaduct	--	--	--	--	0.00	0.00
203	Unnamed	Pond	Rail	Viaduct	--	--	--	--	0.00	0.00
204	Unnamed	Pond	Access Road	Fill	--	--	--	--	0.00	0.14
205	Unnamed	Pond	Rail	Fill	--	--	--	--	0.00	0.09
205	Unnamed	Pond	Stormwater Drainage	Excavation	--	--	--	--	0.00	0.04
205	Unnamed	Pond	Rail	Fill	--	--	--	--	0.00	0.17
206	Unnamed	Pond	Access Road	Viaduct	--	--	--	--	0.00	0.00
206	Unnamed	Pond	Stormwater Drainage	Excavation	--	--	--	--	0.00	0.01
208	CEAK15PD2	Pond	Rail	Excavation	--	--	--	--	0.00	0.27
208	CEAK15PD100	Pond	Access Road	Fill	--	--	--	--	0.00	0.02
208	CEAK15PD100	Pond	Rail	Fill	--	--	--	--	0.00	0.52
208	CEAK15PD4	Pond	Access Road	Fill	--	--	--	--	0.00	0.23
208	CEAK15PD4	Pond	Rail	Fill	--	--	--	--	0.00	0.32
208	CEAK15PD10	Pond	Temporary Fill	Fill	--	--	--	--	0.18	0.00
209	CEAK15PD9	Pond	Facility	Fill	--	--	--	--	0.00	0.63

Table 24: Estimated Waterbody Impacts – Grimes County										
Natural Resources Mapbook Page #	Waterbody ID/Name *	Waterbody Type	Construction Type	Crossing Type	Segment 3C		Segment 4		Segment 5	
					Temp	Perm	Temp	Perm	Temp	Perm
					acres		acres		acres	
209	CEAK15PD5	Pond	Access Road	Viaduct	--	--	--	--	0.00	0.00
209	CEAK15PD5	Pond	Rail	Viaduct	--	--	--	--	0.00	0.00
209	CEAK15PD5	Pond	Temporary Fill	Fill	--	--	--	--	<0.01	0.00
209	CEAK15PD6	Pond	Access Road	Viaduct	--	--	--	--	0.00	0.00
209	CEAK15PD6	Pond	Rail	Viaduct	--	--	--	--	0.00	0.00
210	Unnamed	Pond	Access Road	Fill	--	--	--	--	0.00	0.24
210	Unnamed	Reservoir	Rail	Fill	--	--	--	--	0.00	0.19
210	Unnamed	Pond	Stormwater Drainage	Excavation	--	--	--	--	0.00	0.16
210	Unnamed	Pond	Rail	Fill	--	--	--	--	0.00	0.37
210	Unnamed	Reservoir	Stormwater Drainage	Excavation	--	--	--	--	0.00	0.01
210	Unnamed	Pond	Stormwater Drainage	Excavation	--	--	--	--	0.00	<0.01
211	CEAL15PD8	Pond	Rail	Viaduct	--	--	--	--	0.00	0.00
211	CEAL15PD9	Pond	Rail	Fill	--	--	--	--	0.00	0.94
211	CEAL15PD10	Pond	Access Road	Fill	--	--	--	--	0.00	0.08
211	CEAL15PD11	Pond	Rail	Fill	--	--	--	--	0.00	0.10
211	CEAL15PD24	Pond	Access Road	Fill	--	--	--	--	0.00	0.72
211	Unnamed	Pond	Access Road	Fill	--	--	--	--	0.00	0.16
211	Unnamed	Pond	Stormwater Drainage	Excavation	--	--	--	--	0.00	0.26
211	Unnamed	Pond	Access Road	Viaduct	--	--	--	--	0.00	0.00
211	CEAL15PD16	Pond	Access Road	Viaduct	--	--	--	--	0.00	0.00
211	CEAL15PD16	Pond	Rail	Viaduct	--	--	--	--	0.00	0.00
212	Unnamed	Pond	Stormwater Drainage	Excavation	--	--	--	--	0.00	0.12
212	Unnamed	Pond	Rail	Fill	--	--	--	--	0.00	0.61
212	CEAM16PD1	Pond	Temporary Fill	Fill	--	--	--	--	0.27	0.00
213	CEAM16PD5	Pond	Rail	Viaduct	--	--	--	--	0.00	0.00
213	Unnamed	Pond	Access Road	Fill	--	--	--	--	0.00	0.04

Table 24: Estimated Waterbody Impacts – Grimes County										
Natural Resources Mapbook Page #	Waterbody ID/Name *	Waterbody Type	Construction Type	Crossing Type	Segment 3C		Segment 4		Segment 5	
					Temp	Perm	Temp	Perm	Temp	Perm
					acres		acres		acres	
213	Unnamed	Pond	Stormwater Drainage	Excavation	--	--	--	--	0.00	0.29
213	Unnamed	Pond	Rail	Fill	--	--	--	--	0.00	0.70
213	Unnamed	Pond	Rail	Excavation	--	--	--	--	0.00	0.11
214	CEAM16PD8	Pond	Access Road	Fill	--	--	--	--	0.00	0.05
214	CEAM16PD9	Pond	Rail	Viaduct	--	--	--	--	0.00	0.00
214	CEAM16PD9	Pond	Access Road	Fill	--	--	--	--	0.00	0.06
215	Unnamed	Pond	Access Road	Viaduct	--	--	--	--	0.00	0.00
215	Unnamed	Pond	Rail	Viaduct	--	--	--	--	0.00	0.00
215	Unnamed	Pond	Access Road	Viaduct	--	--	--	--	0.00	0.00
215	Unnamed	Pond	Rail	Viaduct	--	--	--	--	0.00	0.00
215	Unnamed	Pond	Access Road	Fill	--	--	--	--	0.00	0.15
215	Unnamed	Pond	Access Road	Fill	--	--	--	--	0.00	0.05
216	Unnamed	Pond	Rail	Fill	--	--	--	--	0.00	0.06
216	Unnamed	Pond	Stormwater Drainage	Excavation	--	--	--	--	0.00	0.07
216	Unnamed	Pond	Access Road	Viaduct	--	--	--	--	0.00	0.00
216	Unnamed	Pond	Access Road	Excavation	--	--	--	--	0.00	<0.01
217	CEAN16PD9	Pond	Access Road	Fill	--	--	--	--	0.00	0.20
217	Unnamed	Pond	Access Road	Fill	--	--	--	--	0.00	0.34
217	CEAN16PD12	Pond	Access Road	Fill	--	--	--	--	0.00	<0.01
217	CEAN16PD12	Pond	Rail	Fill	--	--	--	--	0.00	0.08
217	CEAN16PD13	Pond	Access Road	Fill	--	--	--	--	0.00	0.12
218	Unnamed	Pond	Access Road	Viaduct	--	--	--	--	0.00	0.00
218	Unnamed	Pond	Rail	Viaduct	--	--	--	--	0.00	0.00
218	Unnamed	Pond	Rail	Fill	--	--	--	--	0.00	0.01
218	Unnamed	Pond	Access Road	Fill	--	--	--	--	0.00	0.15
218	CEAO16PD14	Pond	Access Road	Excavation	--	--	--	--	0.00	0.01
218	Unnamed	Pond	Access Road	Viaduct	--	--	--	--	0.00	0.00
219	Unnamed	Pond	Access Road	Viaduct	--	--	--	--	0.00	0.00

Table 24: Estimated Waterbody Impacts – Grimes County										
Natural Resources Mapbook Page #	Waterbody ID/Name *	Waterbody Type	Construction Type	Crossing Type	Segment 3C		Segment 4		Segment 5	
					Temp	Perm	Temp	Perm	Temp	Perm
					acres		acres		acres	
219	Unnamed	Pond	Rail	Viaduct	--	--	--	--	0.00	0.00
220	CEAO16PD11	Pond	Access Road	Fill	--	--	--	--	0.00	0.15
221	Unnamed	Pond	Access Road	Excavation	--	--	--	--	0.00	0.02
221	Unnamed	Pond	Rail	Excavation	--	--	--	--	0.00	0.14
222	Unnamed	Pond	Access Road	Viaduct	--	--	--	--	0.00	0.00
222	Unnamed	Pond	Rail	Viaduct	--	--	--	--	0.00	0.00
222	Unnamed	Pond	Access Road	Fill	--	--	--	--	0.00	0.01
222	Unnamed	Pond	Rail	Fill	--	--	--	--	0.00	0.36
224	Unnamed	Pond	Rail	Viaduct	--	--	--	--	0.00	0.00
224	Unnamed	Pond	Temporary Fill	Fill	--	--	--	--	0.53	0.00
224	Unnamed	Pond	Rail	Viaduct	--	--	--	--	0.00	0.00
224	Unnamed	Pond	Temporary Fill	Fill	--	--	--	--	1.4	0.00
225	Unnamed	Pond	Access Road	Viaduct	--	--	--	--	0.00	0.00
225	Unnamed	Pond	Rail	Viaduct	--	--	--	--	0.00	0.00
226	CEAR17PD2	Pond	Access Road	Excavation	--	--	--	--	0.00	0.06
226	CEAR17PD3	Pond	Stormwater Drainage	Excavation	--	--	--	--	0.00	0.01
227	CEAR17PD5	Pond	Access Road	Fill	--	--	--	--	0.00	0.09
227	CEAR17PD7	Pond	Stormwater Drainage	Excavation	--	--	--	--	0.00	0.02
228	CEAR17PD11	Pond	Rail	Excavation	--	--	--	--	0.00	0.01
228	CEAR17PD12	Pond	Rail	Viaduct	--	--	--	--	0.00	0.00
228	CEAR17PD13	Pond	Rail	Viaduct	--	--	--	--	0.00	0.00
228	Unnamed	Pond	Rail	Viaduct	--	--	--	--	0.00	0.00
				Total	0.00	0.89	0.00	0.89	2.4	9.8

Source: USGS, 2016; USFWS, 2016; FNI, 2017

*Waterbody ID # (C) indicates a specific feature recorded in the field. Waterbody classifications (P) indicate waterbodies not yet field-verified. Jurisdictional determinations to be confirmed by the USACE. Each waterbody is separated by construction type.

'--' - not present

Table 25: Estimated Stream Impacts – Waller County						
Natural Resources Mapbook Page #	Stream ID/ Name*	Classification	Construction Type	Crossing Type	Segment 5	
					Temp	Perm
					linear feet	
229	SCAS17S4	Ephemeral	Access Road	Fill	0.00	37.7
229	Unnamed	Intermittent	Stormwater Drainage	Excavation	0.00	17.6
229	Unnamed	Intermittent	Access Road	Fill	0.00	63.0
229	SCAS17S4	Ephemeral	Stormwater Drainage	Excavation	0.00	95.1
230	Walnut Creek	Perennial	Access Road	Viaduct	0.00	0.00
230	Walnut Creek	Perennial	Rail	Viaduct	0.00	0.00
230	Unnamed	Artificial	Access Road	Viaduct	0.00	0.00
230	Unnamed	Artificial	Rail	Viaduct	0.00	0.00
231	Brushy Creek	Intermittent	Access Road	Viaduct	0.00	0.00
231	Brushy Creek	Intermittent	Rail	Viaduct	0.00	0.00
232	Threemile Creek	Intermittent	Access Road	Viaduct	0.00	0.00
232	Threemile Creek	Intermittent	Rail	Viaduct	0.00	0.00
232	Unnamed	Intermittent	Access Road	Viaduct	0.00	0.00
232	Unnamed	Intermittent	Rail	Viaduct	0.00	0.00
232	Unnamed	Intermittent	Access Road	Viaduct	0.00	0.00
232	Unnamed	Intermittent	Rail	Viaduct	0.00	0.00
233	Unnamed	Intermittent	Maintenance Facility	Fill	0.00	186.3
233	Unnamed	Intermittent	Access Road	Viaduct	0.00	0.00
233	Unnamed	Intermittent	Rail	Viaduct	0.00	0.00
234	Unnamed	Intermittent	Maintenance Facility	Fill	0.00	345.4
234	Unnamed	Intermittent	Access Road	Viaduct	0.00	0.00
234	Unnamed	Intermittent	Rail	Viaduct	0.00	0.00
234	Unnamed	Intermittent	Access Road	Viaduct	0.00	0.00
234	Unnamed	Intermittent	Rail	Viaduct	0.00	0.00
				Total	0.00	745.1

Source: USGS, 2016; FNI, 2017

*Stream ID # (S) indicates a specific feature recorded in the field whereas stream names (or those "unnamed") indicate features mapped via data not yet field-verified. Jurisdictional determinations to be confirmed by the USACE. Each stream is separated by construction type.

Table 26: Estimated Wetland Impacts – Waller County						
Natural Resources Mapbook Page #	Wetland ID/Classification*	Wetland Type	Construction Type	Crossing Type	Segment 5	
					Temp	Perm
					acres	
229	PEM1F	Emergent	Stormwater Drainage	Excavation	0.00	<0.01
229	SCAS17EW2	Emergent	Stormwater Drainage	Excavation	0.00	0.01
230	PFO1A	Forested	Access Road	Viaduct/Conversion	0.00	0.03
230	PFO1A	Forested	Rail	Viaduct/Conversion	0.00	0.09
230	PFO1C	Forested	Rail	Viaduct/Conversion	0.00	0.05
232	PFO1A	Forested	Access Road	Viaduct/Conversion	0.00	0.16
232	PFO1A	Forested	Rail	Viaduct/Conversion	0.00	0.84
232	PFO1C	Forested	Access Road	Viaduct/Conversion	0.00	0.08
232	PFO1C	Forested	Rail	Viaduct/Conversion	0.00	0.31
232	PFO1A	Forested	Access Road	Viaduct/Conversion	0.00	0.36
232	PFO1A	Forested	Rail	Viaduct/Conversion	0.00	1.9
232	PFO1A	Forested	Access Road	Viaduct/Conversion	0.00	0.01
232	PFO1A	Forested	Rail	Viaduct/Conversion	0.00	0.07
233	PEM1A	Emergent	Maintenance Facility	Fill	0.00	0.06
233	PEM1A	Emergent	Rail	Fill	0.00	0.10
233	PEM1A	Emergent	Access Road	Fill	0.00	0.22
233	PEM1C	Emergent	Rail	Viaduct	0.00	0.00
233	PFO1C	Forested	Access Road	Viaduct/Conversion	0.00	0.04
233	PFO1C	Forested	Rail	Viaduct/Conversion	0.00	0.05
233	PFO1C	Forested	Maintenance Facility	Fill	0.00	0.09
233	PEM1C	Emergent	Rail	Viaduct	0.00	0.00
233	PEM1Fh	Emergent	Access Road	Fill	0.00	0.18
233	PEM1Fh	Emergent	Maintenance Facility	Fill	0.00	0.50
233	PEM1Fh	Emergent	Access Road	Fill	0.00	0.27
234	PEM1C	Emergent	Access Road	Viaduct	0.00	0.00

Table 25: Estimated Stream Impacts – Waller County						
Natural Resources Mapbook Page #	Stream ID/ Name*	Classification	Construction Type	Crossing Type	Segment 5	
					Temp	Perm
					linear feet	
234	PEM1C	Emergent	Rail	Viaduct	0.00	0.00
234	PFO1C	Forested	Rail	Viaduct/Conversion	0.00	0.02
				Total	0.00	5.5

Source: USFWS, 2016; FNI, 2017

*Wetland ID # (S) indicates a specific feature recorded in the field. Wetland classifications (P) indicate wetlands not yet field-verified. Jurisdictional determinations to be confirmed by the USACE. Each wetland is separated by construction type.

P - Palustrine
EM - Emergent
EM1 - Persistent Emergent
FO - Forested
FO1 - Broad-leaved Deciduous Forested
A - Temporarily Flooded
C - Seasonally Flooded
F – Semi-permanently Flooded
h - Diked/Impounded

Table 27: Estimated Waterbody Impacts – Waller County						
Natural Resources Mapbook Page #	Waterbody ID/ Name *	Waterbody Type	Construction Type	Crossing Type	Segment 5	
					Temp	Perm
					acres	
229	Unnamed	Pond	Stormwater Drainage	Excavation	0.00	0.01
229	SCAS17PD99	Pond	Stormwater Drainage	Excavation	0.00	0.01
229	SCAS17PD1	Pond	Facility	Excavation	0.00	<0.01
229	SCAS17PD1	Pond	Rail	Fill	0.00	0.13
229	SCAS17PD2	Pond	Rail	Excavation	0.00	0.02
229	SCAS17PD2	Pond	Access Road	Fill	0.00	0.05
229	SCAS17PD2	Pond	Access Road	Excavation	0.00	0.01
229	SCAS17PD2	Pond	Rail	Excavation	0.00	0.04
229	SCAS17PD3	Pond	Stormwater Drainage	Excavation	0.00	0.10
229	SCAS17PD4	Pond	Access Road	Excavation	0.00	0.03
229	SCAS17PD4	Pond	Stormwater Drainage	Excavation	0.00	0.04
229	SCAS17PD4	Pond	Rail	Excavation	0.00	<0.01
232	Unnamed	Pond	Access Road	Viaduct	0.00	0.00
232	Unnamed	Pond	Rail	Viaduct	0.00	0.00

Table 27: Estimated Waterbody Impacts – Waller County						
Natural Resources Mapbook Page #	Waterbody ID/ Name *	Waterbody Type	Construction Type	Crossing Type	Segment 5	
					Temp	Perm
					acres	
233	Unnamed	Pond	Rail	Fill	0.00	0.01
233	Unnamed	Pond	Access Road	Fill	0.00	0.08
				Total	0.00	0.53

Source: USGS, 2016; USFWS, 2016; FNI, 2017

*Waterbody ID # (S) indicates a specific feature recorded in the field. Waterbody classifications (P) indicate waterbodies not yet field-verified. Jurisdictional determinations to be confirmed by the USACE. Each waterbody is separated by construction type.

Harris County

Table 28: Estimated Stream Impacts – Harris County						
Natural Resources Mapbook Page #	Stream ID/ Name*	Classification	Construction Type	Crossing Type	Segment 5	
					Temp	Perm
					linear feet	
234	Spring Creek	Intermittent	Access Road	Viaduct	0.00	0.00
234	Spring Creek	Intermittent	Rail	Viaduct	0.00	0.00
235	Unnamed	Perennial	Access Road	Viaduct	0.00	0.00
235	Unnamed	Perennial	Rail	Viaduct	0.00	0.00
237	Unnamed	Artificial	Access Road	Viaduct	0.00	0.00
240	Unnamed	Artificial	Access Road	Fill	0.00	123.1
240	Unnamed	Artificial	Stormwater Drainage	Excavation	0.00	374.0
240	Unnamed	Artificial	Access Road	Fill	0.00	195.2
240	Unnamed	Artificial	Rail	Fill	0.00	470.5
240	Unnamed	Artificial	Stormwater Drainage	Excavation	0.00	10.2
240	Unnamed	Intermittent	Stormwater Drainage	Excavation	0.00	8.1
240	Unnamed	Artificial	Access Road	Fill	0.00	1,154.4
240	Unnamed	Artificial	Rail	Fill	0.00	197.5
241	Unnamed	Artificial	Stormwater Drainage	Excavation	0.00	107.0
241	Unnamed	Artificial	Access Road	Fill	0.00	52.2

Table 28: Estimated Stream Impacts – Harris County						
Natural Resources Mapbook Page #	Stream ID/ Name*	Classification	Construction Type	Crossing Type	Segment 5	
					Temp	Perm
					linear feet	
241	Unnamed	Artificial	Maintenance Facility	Fill	0.00	3,629.8
241	Unnamed	Artificial	Rail	Fill	0.00	192.8
241	Unnamed	Artificial	Stormwater Drainage	Excavation	0.00	135.4
241	Unnamed	Artificial	Access Road	Fill	0.00	49.1
241	Unnamed	Artificial	Maintenance Facility	Fill	0.00	824.3
241	Unnamed	Artificial	Rail	Fill	0.00	232.8
241	Unnamed	Artificial	Maintenance Facility	Fill	0.00	18.1
241	SCAW18S3	Intermittent	Stormwater Drainage	Excavation	0.00	190.5
241	SCAW18S3	Intermittent	Maintenance Facility	Fill	0.00	537.0
241	SCAW18S3	Intermittent	Rail	Fill	0.00	175.9
241	Unnamed	Artificial	Maintenance Facility	Fill	0.00	115.7
241	SCAW18S2	Ephemeral	Stormwater Drainage	Excavation	0.00	49.2
241	SCAW18S2	Ephemeral	Maintenance Facility	Fill	0.00	36.5
241	SCAW18S2	Ephemeral	Rail	Fill	0.00	170.6
242	Unnamed	Artificial	Stormwater Drainage	Excavation	0.00	7.6
242	Unnamed	Artificial	Access Road	Fill	0.00	73.5
242	Unnamed	Artificial	Maintenance Facility	Fill	0.00	20.7
242	Unnamed	Artificial	Rail	Fill	0.00	995.2
243	Unnamed	Intermittent	Temporary Fill	Fill	3,890.0	0.00
242	Unnamed	Intermittent	Access Road	Viaduct	0.00	0.00
242	Unnamed	Intermittent	Rail	Viaduct	0.00	0.00
243	Unnamed	Intermittent	Access Road	Viaduct	0.00	0.00
243	Unnamed	Intermittent	Rail	Viaduct	0.00	0.00
243	Unnamed	Intermittent	Access Road	Viaduct	0.00	0.00
243	Unnamed	Intermittent	Rail	Viaduct	0.00	0.00
243	Unnamed	Artificial	Stormwater Drainage	Excavation	0.00	158.6
243	Unnamed	Artificial	Access Road	Fill	0.00	56.1
243	Unnamed	Artificial	Rail	Fill	0.00	193.8

Table 28: Estimated Stream Impacts – Harris County						
Natural Resources Mapbook Page #	Stream ID/ Name*	Classification	Construction Type	Crossing Type	Segment 5	
					Temp	Perm
					linear feet	
244	SCAW19S5	Perennial	Access Road	Viaduct	0.00	0.00
244	SCAW19S5	Perennial	Rail	Viaduct	0.00	0.00
244	SCAW19S6	Intermittent	Access Road	Viaduct	0.00	0.00
244	SCAW19S6	Intermittent	Rail	Viaduct	0.00	0.00
246	Cypress Creek	Perennial	Rail	Viaduct	0.00	0.00
246	SCAW20S1	Perennial	Access Road	Viaduct	0.00	0.00
246	SCAW20S1	Perennial	Rail	Viaduct	0.00	0.00
246	Unnamed	Artificial	Rail	Viaduct	0.00	0.00
246	SCAW20S2	Ephemeral	Rail	Viaduct	0.00	0.00
247	SCAX20S2	Ephemeral	Rail	Viaduct	0.00	0.00
247	SCAX20S1	Ephemeral	Access Road	Viaduct	0.00	0.00
247	Unnamed	Artificial	Access Road	Viaduct	0.00	0.00
249	Unnamed	Artificial	Maintenance Facility	Fill	0.00	74.9
249	Unnamed	Artificial	Access Road	Viaduct	0.00	0.00
249	Unnamed	Artificial	Rail	Viaduct	0.00	0.00
249	SCAX21S2	Intermittent	Maintenance Facility	Fill	0.00	33.0
249	SCAX21S2	Intermittent	Access Road	Viaduct	0.00	0.00
249	SCAX21S2	Intermittent	Rail	Viaduct	0.00	0.00
249	SCAX22S1	Perennial	Access Road	Viaduct	0.00	0.00
249	SCAX22S1	Perennial	Rail	Viaduct	0.00	0.00
250	Cole Creek	Intermittent	Access Road	Viaduct	0.00	0.00
250	SCAY22S1	Perennial	Facility	Fill	0.00	98.6
250	SCAY22S1	Perennial	Access Road	Viaduct	0.00	0.00
250	SCAY22S1	Perennial	Rail	Viaduct	0.00	0.00
252	Unnamed	Intermittent	Access Road	Viaduct	0.00	0.00
252	Unnamed	Intermittent	Rail	Viaduct	0.00	0.00
252	SCAY22S2	Intermittent	Access Road	Viaduct	0.00	0.00
254	Unnamed	Artificial	Access Road	Viaduct	0.00	0.00

Table 28: Estimated Stream Impacts – Harris County						
Natural Resources Mapbook Page #	Stream ID/ Name*	Classification	Construction Type	Crossing Type	Segment 5	
					Temp	Perm
					linear feet	
254	Unnamed	Artificial	Rail	Viaduct	0.00	0.00
				Total	3,890.0	10,761.6

Source: USGS, 2016; FNI, 2017

*Stream ID # (S) indicates a specific feature recorded in the field whereas stream names (or those "unnamed") indicate features mapped via data not yet field-verified. Jurisdictional determinations to be confirmed by the USACE. Each stream is separated by construction type.

Table 29: Estimated Wetland Impacts – Harris County								
Natural Resources Mapbook Page #	Wetland ID/ Classification*	Wetland Type	Construction Type	Crossing Type	Segment 5		Northwest Transit Center Terminal	
					Temp	Perm	Temp	Perm
					acres		acres	
234	PFO1A	Forested	Access Road	Viaduct/Conversion	0.00	0.01	--	--
234	PFO1A	Forested	Rail	Viaduct/Conversion	0.00	0.08	--	--
235	SCAU17EW1	Emergent	Rail	Fill	0.00	0.13	--	--
235	SCAU17EW1	Emergent	Access Road	Fill	0.00	0.24	--	--
236	PEM1C	Emergent	Access Road	Fill	0.00	0.41	--	--
236	PEM1C	Emergent	Rail	Fill	0.00	1.7	--	--
236	SCAU17EW7	Emergent	Rail	Viaduct	0.00	0.00	--	--
236	SCAU17EW4	Emergent	Access Road	Viaduct	0.00	0.00	--	--
236	SCAU17EW4	Emergent	Rail	Viaduct	0.00	0.00	--	--
236	SCAU17EW4	Emergent	Access Road	Viaduct	0.00	0.00	--	--
236	SCAU17EW4	Emergent	Rail	Viaduct	0.00	0.00	--	--
237	PEM1C	Emergent	Rail	Viaduct	0.00	0.00	--	--
237	SCAU17EW5	Emergent	Access Road	Viaduct	0.00	0.00	--	--
237	SCAU17EW5	Emergent	Rail	Viaduct	0.00	0.00	--	--
237	PEM1C	Emergent	Access Road	Viaduct	0.00	0.00	--	--
237	PEM1Cx	Emergent	Access Road	Viaduct	0.00	0.00	--	--
237	Pf	Other	Rail	Viaduct	0.00	0.00	--	--
237	Pf	Other	Access Road	Viaduct	0.00	0.00	--	--

Table 29: Estimated Wetland Impacts – Harris County								
Natural Resources Mapbook Page #	Wetland ID/ Classification*	Wetland Type	Construction Type	Crossing Type	Segment 5		Northwest Transit Center Terminal	
					Temp	Perm	Temp	Perm
					acres		acres	
238	Pf	Other	Rail	Viaduct	0.00	0.00	--	--
238	PSS1Cx	Scrub/Shrub	Temporary Fill	Fill	0.83	0.00	--	--
238	SCAV17EW10	Emergent	Rail	Viaduct	0.00	0.00	--	--
238	SCAV17EW9	Emergent	Access Road	Viaduct	0.00	0.00	--	--
239	SCAV17EW6	Emergent	Rail	Viaduct	0.00	0.00	--	--
239	SCAV17EW7	Emergent	Access Road	Viaduct	0.00	0.00	--	--
239	SCAV17EW7	Emergent	Rail	Viaduct	0.00	0.00	--	--
239	PEM1A	Emergent	Stormwater Drainage	Excavation	0.00	1.0	--	--
239	PEM1A	Emergent	Access Road	Fill	0.00	0.34	--	--
239	PEM1A	Emergent	Rail	Fill	0.00	3.4	--	--
239	PEM1C	Emergent	Stormwater Drainage	Excavation	0.00	0.38	--	--
239	PEM1C	Emergent	Access Road	Fill	0.00	0.47	--	--
239	PEM1C	Emergent	Rail	Fill	0.00	2.0	--	--
239	Pf	Other	Temporary Fill	Fill	0.63	0.00	--	--
239	Pf	Other	Stormwater Drainage	Excavation	0.00	0.11	--	--
239	Pf	Other	Access Road	Fill	0.00	0.09	--	--
239	Pf	Other	Rail	Fill	0.00	0.72	--	--
239	SCAV17EW8	Emergent	Stormwater Drainage	Excavation	0.00	0.28	--	--
240	SCAV17EW8	Emergent	Access Road	Fill	0.00	2.3	--	--
240	SCAV17EW8	Emergent	Rail	Fill	0.00	6.7	--	--
240	SCAW17EW1	Emergent	Stormwater Drainage	Excavation	0.00	0.74	--	--
240	SCAW17EW1	Emergent	Rail	Fill	0.00	5.2	--	--
240	SCAW17EW1	Emergent	Access Road	Viaduct	0.00	0.00	--	--
240	Pf	Other	Rail	Fill	0.00	0.24	--	--
240	PEM1Cx	Emergent	Rail	Fill	0.00	0.09	--	--
240	PEM1Cx	Emergent	Access Road	Fill	0.00	0.55	--	--
240	Pf	Other	Stormwater Drainage	Excavation	0.00	0.51	--	--
240	Pf	Other	Stormwater Drainage	Excavation	0.00	0.50	--	--

Table 29: Estimated Wetland Impacts – Harris County								
Natural Resources Mapbook Page #	Wetland ID/ Classification*	Wetland Type	Construction Type	Crossing Type	Segment 5		Northwest Transit Center Terminal	
					Temp	Perm	Temp	Perm
					acres		acres	
240	Pf	Other	Rail	Fill	0.00	0.12	--	--
241	Pf	Other	Maintenance Facility	Fill	0.00	2.7	--	--
241	Pf	Other	Stormwater Drainage	Excavation	0.00	1.4	--	--
241	Pf	Other	Rail	Fill	0.00	0.30	--	--
241	Pf	Other	Stormwater Drainage	Excavation	0.00	<0.01	--	--
243	PEM1C	Emergent	Temporary Fill	Fill	<0.01	0.00	--	--
243	PEM1A	Emergent	Temporary Fill	Fill	0.10	0.00	--	--
243	PEM1C	Emergent	Temporary Fill	Fill	0.47	0.00	--	--
243	PEM1C	Emergent	Temporary Fill	Fill	0.26	0.00	--	--
243	Pf	Other	Temporary Fill	Fill	2.8	0.00	--	--
243	PEM1F	Emergent	Rail	Viaduct	0.00	0.00	--	--
243	PEM1F	Emergent	Access Road	Viaduct	0.00	0.00	--	--
243	PEM1Cx	Emergent	Stormwater Drainage	Excavation	0.00	0.02	--	--
243	PEM1Cx	Emergent	Access Road	Fill	0.00	0.02	--	--
243	PEM1Cx	Emergent	Rail	Fill	0.00	0.09	--	--
243	SCAW19EW6	Emergent	Stormwater Drainage	Excavation	0.00	0.14	--	--
243	SCAW19EW6	Emergent	Access Road	Fill	0.00	1.3	--	--
243	SCAW19EW6	Emergent	Rail	Fill	0.00	4.3	--	--
243	Pf	Other	Stormwater Drainage	Excavation	0.00	0.28	--	--
243	Pf	Other	Rail	Fill	0.00	8.6	--	--
243	Pf	Other	Access Road	Viaduct	0.00	0.00	--	--
243	SCAW19EW6	Emergent	Stormwater Drainage	Excavation	0.00	4.8	--	--
244	SCAW19EW6	Emergent	Rail	Fill	0.00	0.69	--	--
244	SCAW19EW6	Emergent	Access Road	Fill	0.00	3.8	--	--
244	SCAW19EW7	Emergent	Access Road	Fill	0.00	0.19	--	--
244	SCAW19EW7	Emergent	Rail	Fill	0.00	0.37	--	--
244	Pf	Other	Rail	Fill	0.00	0.01	--	--
244	Pf	Other	Access Road	Viaduct	0.00	0.00	--	--

Table 29: Estimated Wetland Impacts – Harris County								
Natural Resources Mapbook Page #	Wetland ID/ Classification*	Wetland Type	Construction Type	Crossing Type	Segment 5		Northwest Transit Center Terminal	
					Temp	Perm	Temp	Perm
					acres		acres	
244	SCAW19EW8	Emergent	Access Road	Fill	0.00	0.02	--	--
244	SCAW19EW8	Emergent	Rail	Fill	0.00	0.12	--	--
244	SCAW19EW9	Emergent	Access Road	Fill	0.00	0.11	--	--
244	SCAW19EW9	Emergent	Rail	Fill	0.00	0.42	--	--
245	PEM1F	Emergent	Rail	Viaduct	0.00	0.00	--	--
245	PEM1A	Emergent	Rail	Viaduct	0.00	0.00	--	--
245	PEM1A	Emergent	Access Road	Viaduct	0.00	0.00	--	--
245	SCAW20SW2	Scrub/Shrub	Rail	Viaduct	0.00	0.00	--	--
245	SCAW20SW2	Scrub/Shrub	Access Road	Viaduct	0.00	0.00	--	--
246	SCAW20EW1	Emergent	Access Road	Viaduct	0.00	0.00	--	--
247	SCAX20EW2	Emergent	Rail	Viaduct	0.00	0.00	--	--
247	PEM1Cx	Emergent	Access Road	Viaduct	0.00	0.00	--	--
247	SCAX21EW3	Emergent	Access Road	Viaduct	0.00	0.00	--	--
247	SCAX21EW3	Emergent	Rail	Viaduct	0.00	0.00	--	--
247	SCAX21EW2	Emergent	Access Road	Viaduct	0.00	0.00	--	--
247	SCAX21EW2	Emergent	Rail	Viaduct	0.00	0.00	--	--
247	PEM1Cx	Emergent	Rail	Viaduct	0.00	0.00	--	--
247	PEM1C	Emergent	Stormwater Drainage	Excavation	0.00	0.04	--	--
247	PEM1C	Emergent	Access Road	Viaduct	0.00	0.00	--	--
247	PSS1A	Scrub/Shrub	Stormwater Drainage	Excavation	0.00	0.08	--	--
247	PSS1C	Scrub/Shrub	Stormwater Drainage	Excavation	0.00	0.05	--	--
248	SCAX21EW4	Emergent	Rail	Viaduct	0.00	0.00	--	--
249	PFO1Ad	Forested	Access Road	Viaduct/Conversion	0.00	0.01	--	--
249	SCAX21SW1	Scrub/Shrub	Rail	Viaduct	0.00	0.00	--	--
249	PFO1Ad	Forested	Maintenance Facility	Fill	0.00	0.01	--	--
249	SCAX22FW2	Forested	Rail	Viaduct/Conversion	0.00	<0.01	--	--
249	SCAX22FW2	Forested	Access Road	Viaduct/Conversion	0.00	0.03	--	--
249	SCAX22EW2	Emergent	Rail	Viaduct	0.00	0.00	--	--

Table 29: Estimated Wetland Impacts – Harris County								
Natural Resources Mapbook Page #	Wetland ID/ Classification*	Wetland Type	Construction Type	Crossing Type	Segment 5		Northwest Transit Center Terminal	
					Temp	Perm	Temp	Perm
					acres		acres	
249	SCAX22EW2	Emergent	Access Road	Viaduct	0.00	0.00	--	--
249	SCAX22EW1	Emergent	Access Road	Viaduct	0.00	0.00	--	--
250	SCAX22FW3	Forested	Temporary Fill	Fill	<0.01	0.00	--	--
250	SCAX22FW3	Forested	Temporary Fill	Fill	<0.01	0.00	--	--
250	SCAX22FW3	Forested	Temporary Fill	Fill	0.03	0.00	--	--
250	SCAY22EW2	Emergent	Temporary Fill	Fill	<0.01	0.00	--	--
250	SCAX22SW1	Scrub/Shrub	Temporary Fill	Fill	0.44	0.00	--	--
250	SCAY22EW2	Emergent	Access Road	Viaduct	0.00	0.00	--	--
250	SCAY22EW2	Emergent	Rail	Viaduct	0.00	0.00	--	--
250	SCAY22EW2	Emergent	Access Road	Viaduct	0.00	0.00	--	--
250	SCAY22EW2	Emergent	Rail	Viaduct	0.00	0.00	--	--
250	SCAY22EW2	Emergent	Temporary Fill	Fill	0.17	0.00	--	--
250	PEM1A	Emergent	Facility	Fill	0.00	0.02	--	--
250	PEM1A	Emergent	Rail	Viaduct	0.00	0.00	--	--
250	PEM1A	Emergent	Access Road	Viaduct	0.00	0.00	--	--
250	PEM1Cx	Emergent	Access Road	Viaduct	0.00	0.00	--	--
255	SCAZ24EW1	Emergent	Facility	Fill	--	--	0.00	<0.01
255	SCAZ24EW1	Emergent	Rail	Viaduct	--	--	0.00	0.00
				Total	5.8	58.0	0.00	<0.01

Source: USFWS, 2016; FNI, 2017

*Wetland ID # (S) indicates a specific feature recorded in the field. Wetland classifications (P) indicate wetlands not yet field-verified. Jurisdictional determinations to be confirmed by the USACE. Each wetland is separated by construction type.

P - Palustrine
EM - Emergent
EM1 - Persistent Emergent
FO - Forested
FO1 - Broad-leaved Deciduous Forested
SS - Scrub-Shrub
SS1 - Broad-leaved Deciduous Scrub-Shrub
A - Temporarily Flooded
C - Seasonally Flooded
F - Semipermanently Flooded
d- Partly Drained/Ditched
f - Farmed
x – Excavated
'--' - not present

Table 30: Estimated Waterbody Impacts – Harris County								
Natural Resources Mapbook Page #	Waterbody ID/Name *	Waterbody Type	Construction Type	Crossing Type	Segment 5		Northwest Transit Center Terminal	
					Temp	Temp	Temp	Perm
					acres		acres	
235	SCAU17PD2	Pond	Access Road	Fill	0.00	0.18	--	--
235	SCAU17PD2	Pond	Rail	Fill	0.00	0.30	--	--
235	Unnamed	Pond	Rail	Viaduct	0.00	0.00	--	--
236	SCAU17PD7	Pond	Rail	Viaduct	0.00	0.00	--	--
236	SCAU17PD8	Pond	Access Road	Viaduct	0.00	0.00	--	--
236	SCAU17PD8	Pond	Rail	Viaduct	0.00	0.00	--	--
238	Unnamed	Pond	Access Road	Viaduct	0.00	0.00	--	--
238	Unnamed	Pond	Rail	Viaduct	0.00	0.00	--	--
239	SCAV17PD2	Pond	Rail	Viaduct	0.00	0.00	--	--
239	Unnamed	Pond	Access Road	Fill	0.00	0.01	--	--
239	Unnamed	Pond	Rail	Fill	0.00	0.06	--	--
239	Unnamed	Swamp	Temporary Fill	Fill	3.23	0.00	--	--
239	Unnamed	Swamp	Access Road	Fill	0.00	0.30	--	--
239	Unnamed	Swamp	Stormwater Drainage	Excavation	0.00	1.73	--	--
239	Unnamed	Swamp	Rail	Fill	0.00	1.49	--	--
242	Unnamed	Pond	Access Road	Viaduct	0.00	0.00	--	--
242	Unnamed	Pond	Rail	Viaduct	0.00	0.00	--	--
245	Unnamed	Pond	Rail	Viaduct	0.00	0.00	--	--
246	SCAW20PD3	Pond	Access Road	Viaduct	0.00	0.00	--	--
246	SCAW20PD4	Pond	Access Road	Viaduct	0.00	0.00	--	--
246	SCAW20PD4	Pond	Rail	Viaduct	0.00	0.00	--	--
248	Unnamed	Pond	Access Road	Viaduct	0.00	0.00	--	--
248	Unnamed	Pond	Rail	Viaduct	0.00	0.00	--	--
248	SCAX21PD3	Pond	Access Road	Viaduct	0.00	0.00	--	--
248	SCAX21PD3	Pond	Rail	Viaduct	0.00	0.00	--	--
255	SCAZ24PD2	Pond	Rail	Viaduct	--	--	0.00	0.00
255	SCAZ24PD2	Pond	Station	Fill	--	--	0.00	0.04

Table 30: Estimated Waterbody Impacts – Harris County								
Natural Resources Mapbook Page #	Waterbody ID/Name *	Waterbody Type	Construction Type	Crossing Type	Segment 5		Northwest Transit Center Terminal	
					Temp	Temp	Temp	Perm
					acres		acres	
				Total	3.2	4.1	0.00	0.04

Source: USGS, 2016; USFWS, 2016; FNI, 2017

*Waterbody ID # (S) indicates a specific feature recorded in the field. Waterbody classifications (P) indicate waterbodies not yet field-verified. Jurisdictional determinations to be confirmed by the USACE. Each waterbody is separated by construction type.

'--' – Not Present

AECOM

TECHNICAL MEMORANDUM
TRANSPORTATION

To: Jerry Smiley, AICP, AECOM

From: Sam Higgins, AECOM

Date: November 1, 2017

RE: DALLAS TO HOUSTON HSR –TRANSPORTATION

This technical memorandum summarizes the data collection used as inputs for determining the station area traffic impacts for the Dallas to Houston High-Speed Rail Project (the Project) and to summarize the results of the traffic impact analyses and street modifications needed to maintain No Build, or better, intersection Level of Service (LOS) and delay condition.

The traffic data collection includes descriptions of the required data and data sources for the traffic operational analysis, including:

- Traffic counts
- Signal timing plans
- Intersection geometry
- Travel demand models

The traffic operation overview describes the station area traffic volumes and patterns and the subsequent impact they have on the roadway network and the modification needed to mitigate the impacts. The subsections include:

- Trip generation and distribution
- Trip assignment
- Existing conditions
- Traffic impacts
- Intersection mitigation

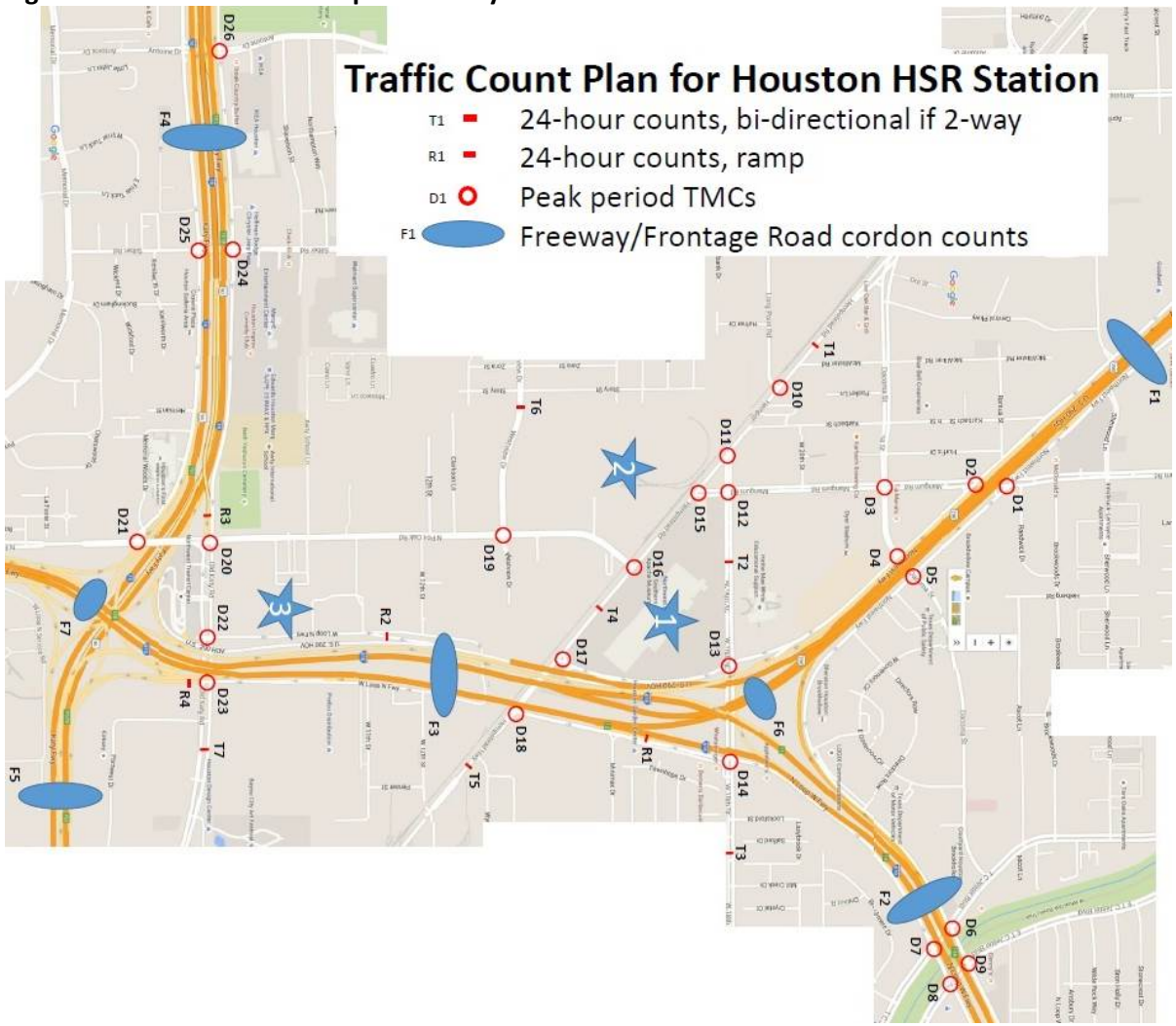
DATA COLLECTION

To establish existing conditions and to assist in developing future year conditions, traffic counts in the station areas were collected, as depicted in **Figures 1** and **2**.

Figure 1: Dallas Terminal Study Area Traffic Counts

Source: Freese and Nichols, 2015

Figure 2: Houston Terminal Options Study Area Traffic Counts



Source: Freese and Nichols, 2015

In addition to the Dallas and Houston study areas, traffic counts were conducted at and near the intersection of SH 30 and SH 90 in Grimes County for the Brazos Valley Station.

All of the traffic counts collected for the project are included in **Attachment A**.

Signal Timing Plans

For the signalized intersections in Dallas and Houston, the existing signal timing plans were needed to determine existing LOS and to establish the specifics of the signal operations. The signal timing plans for Dallas and Houston are located in **Attachment B**.

Intersection Geometry

Existing aerial photography and field observations were used to determine the existing intersection geometries. Future year intersection geometries were determined using roadway design schematics for committed improvement projects on Riverfront Boulevard and the Horseshoe (IH-30/IH-35) in Dallas, and US 290 and IH-610 in Houston.

Travel Demand Models

Metropolitan Planning Organizations (MPOs) use travel demand models to estimate the traffic volumes for future year conditions. The Dallas Terminal area is within the travel demand model operated by the North Central Texas Council of Governments. The study area for the Houston Terminal options falls within the travel demand model area operated by the Houston-Galveston Area Council. Year 2040 model runs were prepared for this study and were obtained from the MPOs. The models provide 2040 AM and PM peak hour approach volumes which were distributed into turning movements based on the existing turning percentages. These 2040 volumes were used as the background volume to describe the No Build conditions.

TRAFFIC OPERATIONS OVERVIEW

The collected data informed the analysis of the station area traffic impacts and corresponding mitigation measures. This section summarizes the traffic operations of the stations and the operational analyses of the traffic impacts and mitigation.

Trip Generation and Distribution

The vehicle trips generated by the stations are based on a variety of factors, including ridership forecasts, station locations, mode choice for travel to and from the stations and the proposed operations of the Project. These factors were incorporated into a Station Area Guidance Memorandum (see **Attachment C**) which summarized the trip generation and distribution for the stations.

Trip Assignment

The station layouts include areas of access and parking that are categorized as drive and park (D&P), rental cars (RC), pick-up/drop-off (PU/DO) or taxi/shuttle (T&S). The generated station trips were assigned to the roadway network using the overall distribution from the Station Area Guidance Memorandum. The roadway routing needed to get to the proper driveway or parking facility at the station was also determined based on vehicular mode. The resulting volumes were then added to the 2040 background volumes to develop Build conditions to analyze the intersection traffic impacts. The Vehicle Trip Allocation Figures are included in **Attachment D**.

Existing Conditions

Tables 1 through **3** describe the existing LOS and delay at the station area intersections. The Synchro reports are provided in **Attachment E**.

Table 1: Dallas Terminal Existing LOS (Delay in Seconds per Vehicle)			
Map ID	**Intersection**	**AM**	**PM**
		Existing	**Existing**
1	Woodall Rodgers Fwy / River Front Blvd	C (33)	D (37)
2	Riverfront Blvd / Commerce St	D (40)	D (46)
3	Reunion Blvd / Riverfront Blvd	A (8)	A (8)
4	WB IH-30 / Riverfront Blvd	A (8)	B (11)
5	EB I-30 / Riverfront Blvd	B (17)	C (23)
6	IH-35E / Riverfront Blvd	A (6)	A (10)
7	Riverfront Blvd / Cadiz St	D (53)	C (34)
8	Cadiz St / Hotel St (unsignalized)	A (1)	A (1)
9	Cadiz St / Lamar St	B (15)	B (15)
10	Canton St / Lamar St	B (12)	B (12)
11	Hotel St / Memorial Dr (unsignalized)	A (4)	A (4)
13	Lamar St / Memorial Dr	B (12)	B (13)
14	Griffin St / Memorial Dr	C (24)	B (19)
15	Canton St / Griffin St	A (9)	B (12)
16	Cadiz St / Griffin St	B (14)	A (8)
17	Canton St / Akard St	B (12)	B (17)
18	Cadiz St / Akard St	B (13)	B (11)
19	Griffin St W / Akard St	B (11)	B (13)
20	Griffin St E / Akard St	B (12)	B (12)
21	Belleview St / Akard St (unsignalized)	A (3)	A (10)
22	Griffin St W / Ervay St	A (5)	A (6)
23	Griffin St E / Ervay St	B (12)	C (20)
24	Griffin St E / St Paul St	A (8)	A (7)
25	Griffin St W / St Paul St	B (10)	C (20)
26	Lamar St / Belleview St	B (13)	B (11)
27	Lamar St / Corinth St	C (21)	B (20)
28	Corinth St / Riverfront Blvd	C (21)	D (53)

*Intersection 12 was removed from the analysis.

Table 2: Brazos Valley Station Existing LOS (Delay in Seconds per Vehicle)			
Map ID	Intersection	AM	PM
		Existing	Existing
1	SH 30 / SH 90 (unsignalized)	B (10)	B (11)

Table 3: Houston Terminal Options Existing LOS (Delay in Seconds per Vehicle)			
Map ID	Intersection	AM	PM
		Existing	Existing
1	NB US 290 / Mangum Rd	C (29)	C (25)
2	SB US 290 / Mangum Rd	C (33)	C (34)
3	Mangum Rd / Dacoma St	C (33)	C (29)
4	SB US 290 / Dacoma St	C (32)	C (29)
5	NB US 290 / Dacoma St	C (25)	C (33)
6	WB IH-610 / TC Jester Blvd	**E** (73)	D (40)
7	EB IH-610 / TC Jester Blvd	D (48)	D (46)
8	EB IH-610 / E TC Jester Blvd	D (39)	D (37)
9	WB IH-610 / E TC Jester Blvd	**F** (91)	C (29)
10	Long Point Rd / Hempstead Rd	B (17)	B (18)
11	18th St / Hempstead Rd (unsignalized)	A (2)	A (2)
12	Mangum Rd / 18th St	C (26)	C (34)
13	SB IH-610 / 18th St	C (28)	D (43)
14	NB IH-610 / 18th St	D (38)	C (35)
15	Mangum Rd / Hempstead Rd	C (25)	C (29)
16	Post Oak Rd / Hempstead Rd	C (27)	C (29)
17	SB IH-610 / Hempstead Rd	C (29)	C (31)
18	NB IH-610 / Hempstead Rd	B (12)	B (16)
19	Post Oak Rd / Westview Dr	B (19)	C (31)
20	Post Oak Rd / Old Katy Rd	D (46)	**F** (98)
21	Post Oak Rd / EB IH-10	C (24)	B (17)
22	SB IH-610 / Old Katy Rd	C (24)	**E** (59)
23	NB IH-610 / Old Katy Rd	C (23)	D (52)
24	WB IH-10 / Silber Rd	C (25)	C (28)
25	EB IH-10 / Silber Rd	C (24)	D (47)
26	WB IH-10 / Antoine Dr	C (31)	C (26)

Traffic Impacts

The impacts of the station traffic on the study area intersections are indicated in **Tables 4** through **8**. The tables list peak period intersection conditions in the No Build and Build Alternative conditions, with a column identifying intersections that would experience a

substantial impact from the traffic generated by the station. The Project would have a substantial impact if it:

(a) Would worsen the horizon year LOS (in either peak period) from D or better to E or F, or
(b) Would increase average seconds of delay where the No Build LOS is already E or F.

The Synchro reports are provided in **Attachment E**.

Table 4: Dallas Terminal Impacts
LOS (Delay in Seconds per Vehicle)

Map ID	Intersection	AM NB	PM NB	AM Build	PM Build	Impact
1	Woodall Rodgers Fwy/Riverfront Blvd	**F (119)**	D (48)	**F (128)**	**E (76)**	**Y**
2	Riverfront Blvd/Commerce St	**F (90)**	**F (98)**	**F (155)**	**F (100)**	**N**
3	Reunion Blvd/Riverfront Blvd	C (25)	B (17)	C (28)	B (17)	N
4	WB IH-30/Riverfront Blvd	A (9)	B (13)	A (9)	C (20)	N
5	EB IH-30/Riverfront Blvd	C (28)	C (23)	C (35)	D (35)	N
6	IH-35E/Riverfront Blvd	A (8)	B (13)	B (14)	B (15)	N
7	Riverfront Blvd/Cadiz St	**F (175)**	**F (127)**	**F (412)**	**F (303)**	**N**
8	Cadiz St/Hotel St (unsignalized)	A (1)	A (3)	A (1)	A (3)	N
9	Cadiz St/Lamar St	**E (61)**	**F (90)**	**F (85)**	**F (151)**	**Y**
10	Canton St/Lamar St	B (13)	B (15)	B (13)	B (15)	N
11	Hotel St/Memorial Dr (unsignalized)	A (4)	A (4)	A (9)	B (10)	N
13	Lamar St/Memorial Dr	B (16)	B (14)	B (17)	B (15)	N
14	Griffin St/Memorial Dr	D (53)	C (28)	C (27)	C (30)	N
15	Canton St/Griffin St	A (10)	C (21)	B (16)	C (22)	N
16	Cadiz St/Griffin St	B (15)	B (13)	C (27)	C (25)	N
17	Canton St/Akard St	C (26)	**E (66)**	C (32)	**F (107)**	**N**
18	Cadiz St/Akard St	C (29)	B (14)	D (36)	C (25)	N
19	Griffin St W/Akard St	B (15)	B (11)	C (26)	B (17)	N
20	Griffin St E/Akard St	B (15)	C (21)	B (11)	C (32)	N
21	Belleview St/Akard St (unsignalized)	**E (47)**	**F (1710)**	**F (95)**	**F (1897)**	**Y**
22	Griffin St W/Ervay St	B (16)	A (6)	C (25)	A (4)	N
23	Griffin St E/Ervay St	B (15)	B (12)	C (29)	B (15)	N
24	Griffin St E/St Paul St	A (7)	D (42)	A (8)	D (47)	N
25	Griffin St W/St Paul St	B (18)	B (15)	B (15)	C (28)	N
26	Lamar St/Belleview St	B (19)	B (16)	F (145)	D (48)	Y
27	Lamar St/Corinth St	D (35)	**E (56)**	D (45)	**E (62)**	N
28	Corinth St/Riverfront Blvd	**F (189)**	**F (189)**	**F (214)**	**F (193)**	**N**

*Intersection 12 was removed from the analysis.

Table 5: Brazos Valley Station Impact LOS (Delay in Seconds per Vehicle)						
Map ID	Intersection	AM No Build	PM No Build	AM Build	PM Build	Impact
1	SH 30/SH 90	D (52)	D (33)	**F (63)**	**F (50)**	**Y**

Table 6: Northwest Transit Center Terminal Impacts LOS (Delay in Seconds per Vehicle)						
Map ID	Intersection	AM No Build	PM No Build	AM Build	PM Build	Impact
1	NB US 290/Mangum Rd	D (43)	**E (76)**	D (47)	**F (117)**	**N**
2	SB US 290/Mangum Rd	D (39)	D (54)	E (60)	**E (76)**	**N**
3	Mangum Rd/Dacoma St	D (46)	**E (62)**	**D (53)**	**F (83)**	**Y**
4	SB US 290/Dacoma St	**F (141)**	**F (104)**	**F (154)**	**F (146)**	**Y**
5	NB US 290/Dacoma St	**F (89)**	**F (97)**	**F (98)**	**F (123)**	**Y**
6	WB IH-610/TC Jester Blvd	**F (329)**	**F (188)**	**F (201)**	**F (181)**	**Y**
7	EB IH-610/TC Jester Blvd	**F (110)**	**F (202)**	**F (107)**	**F (191)**	**Y**
8	EB IH-610/E TC Jester Blvd	**F (122)**	**F (121)**	**F (153)**	**E (74)**	**Y**
9	WB IH-610/E TC Jester Blvd	**F (315)**	**F (128)**	**F (367)**	**F (137)**	**Y**
10	Long Point Rd/Hempstead Rd	**F (81)**	**F (92)**	**F (85)**	**F (86)**	**Y**
11	18th St/Hempstead Rd (unsignalized)	**F (61)**	**F (184)**	**F (67)**	**F (192)**	**Y**
12	Mangum Rd/18th St	D (41)	**E (67)**	**D (53)**	**F (92)**	**N**
13	SB IH-610/18th St	D (52)	**F (124)**	**E (63)**	**F (148)**	**Y**
14	NB IH-610/18th St	**E (67)**	**F (106)**	**F (81)**	**F (142)**	**Y**
15	Mangum Rd/Hempstead Rd	C (24)	C (32)	C (30)	D (45)	Y
16	Post Oak Rd/Hempstead Rd	**F (96)**	**F (102)**	**F (190)**	**F (170)**	**Y**
17	SB IH-610/Hempstead Rd	**E (63)**	**F (99)**	**E (55)**	**F (112)**	**Y**
18	NB IH-610/Hempstead Rd	C (27)	**F (107)**	C (27)	**F (83)**	**Y**
19	Post Oak Rd/Westview Dr	**F (92)**	**E (77)**	**F (137)**	**F (119)**	**Y**
20	Post Oak Rd/Old Katy Rd	**F (179)**	**F (354)**	**F (351)**	**F (490)**	**Y**
21	Post Oak Rd/EB IH-10	**F (117)**	**F (95)**	**F (92)**	**E (67)**	**Y**
22	SB IH-610/Old Katy Rd	D (35)	**F (145)**	**E (70)**	**F (161)**	**Y**
23	NB IH-610/Old Katy Rd	**E (56)**	**F (143)**	**F (117)**	**F (252)**	**Y**
24	WB IH-10/Silber Rd	D (51)	**F (132)**	**F (83)**	**F (87)**	**Y**
25	EB IH-10/Silber Rd	**E (74)**	**F (253)**	**F (111)**	**F (250)**	**Y**
26	WB IH-10/Antoine Dr	**F (119)**	**F (83)**	**F (125)**	**F (91)**	**Y**

Table 7: Northwest Mall Terminal Impacts LOS (Delay in Seconds per Vehicle)						
Map ID	Intersection	AM No Build	PM No Build	AM Build	PM Build	Impact
1	NB US 290/Mangum Rd	D (43)	**E (76)**	**E (70)**	**F (118)**	**Y**
2	SB US 290/Mangum Rd	D (39)	D (54)	**E (73)**	**F (82)**	**Y**
3	Mangum Rd/Dacoma St	D (46)	**E (62)**	**E (64)**	**F (98)**	**Y**
4	SB US 290/Dacoma St	**F (141)**	**F (104)**	**F (161)**	**F (147)**	**Y**
5	NB US 290/Dacoma St	**F (89)**	**F (97)**	**F (107)**	**F (142)**	**Y**
6	WB IH-610/TC Jester Blvd	**F (329)**	**F (188)**	**F (220)**	**F (165)**	**Y**
7	EB IH-610/TC Jester Blvd	**F (110)**	**F (202)**	**F (109)**	**F (177)**	**Y**
8	EB IH-610/E TC Jester Blvd	**F (122)**	**F (121)**	**F (144)**	**F (89)**	**Y**
9	WB IH-610/E TC Jester Blvd	**F (315)**	**F (128)**	**F (393)**	**F (188)**	**Y**
10	Long Point Rd/Hempstead Rd	**F (81)**	**F (92)**	**F (85)**	**F (88)**	**Y**
11	18th St/Hempstead Rd (unsignalized)	**F (61)**	**F (184)**	**F (67)**	**F (192)**	**Y**
12	Mangum Rd/18th St	D (41)	**E (67)**	**E (57)**	**F (93)**	**N**
13	SB IH-610/18th St	D (52)	**F (124)**	**F (134)**	**F (257)**	**Y**
14	NB IH-610/18th St	E (67)	**F (106)**	**F (120)**	**F (203)**	**Y**
15	Mangum Rd/Hempstead Rd	C (24)	C (32)	C (24)	C (34)	**N**
16	Post Oak Rd/Hempstead Rd	**F (96)**	**F (102)**	**F (216)**	**F (248)**	**Y**
17	SB IH-610/Hempstead Rd	**E (63)**	**F (99)**	**E (80)**	**F (134)**	**Y**
18	NB IH-610/Hempstead Rd	C (27)	**F (107)**	D (36)	**F (87)**	**Y**
19	Post Oak Rd/Westview Dr	**F (92)**	**E (77)**	**F (119)**	**F (153)**	**Y**
20	Post Oak Rd/Old Katy Rd	**F (179)**	**F (354)**	**F (245)**	**F (399)**	**Y**
21	Post Oak Rd/EB IH-10	**F (117)**	**F (95)**	**E (70)**	**E (64)**	**Y**
22	SB IH-610/Old Katy Rd	D (35)	**F (145)**	D (48)	**F (132)**	**Y**
23	NB IH-610/Old Katy Rd	**E (56)**	**F (143)**	**D (51)**	**F (154)**	**Y**
24	WB IH-10/Silber Rd	D (51)	**F (132)**	**F (83)**	**E (74)**	**Y**
25	EB IH-10/Silber Rd	**E (74)**	**F (253)**	**F (107)**	**F (235)**	**Y**
26	WB IH-10/Antoine Dr	**F (119)**	**F (83)**	**F (125)**	**F (89)**	**Y**

Table 8: Industrial Site Terminal Impacts LOS (Delay in Seconds per Vehicle)						
Map ID	Intersection	AM No Build	PM No Build	AM Build	PM Build	Impact
1	NB US 290/Mangum Rd	D (43)	**E (76)**	**E (70)**	**F (123)**	**Y**
2	SB US 290/Mangum Rd	D (39)	D (54)	**E (54)**	D (52)	**N**
3	Mangum Rd/Dacoma St	D (46)	**E (62)**	**F (105)**	**F (121)**	**Y**
4	SB US 290/Dacoma St	**F (141)**	**F (104)**	**F (108)**	**F (127)**	**Y**
5	NB US 290/Dacoma St	**F (89)**	**F (97)**	**F (89)**	**F (94)**	**N**
6	WB IH-610/TC Jester Blvd	**F (329)**	**F (188)**	**F (329)**	**F (188)**	**N**
7	EB IH-610/TC Jester Blvd	**F (110)**	**F (202)**	**F (110)**	**F (193)**	**N**
8	EB IH-610/E TC Jester Blvd	**F (122)**	**F (121)**	**F (122)**	**F (121)**	**N**
9	WB IH-610/E TC Jester Blvd	**F (315)**	**F (128)**	**F (315)**	**F (128)**	**N**
10	Long Point Rd/Hempstead Rd	**F (81)**	**F (92)**	**F (87)**	**F (81)**	**Y**
11	18th St/Hempstead Rd (unsignalized)	**F (61)**	**F (184)**	**F (69)**	**F (194)**	**Y**
12	Mangum Rd/18th St	D (41)	**E (67)**	**F (99)**	**F (177)**	**Y**
13	SB IH-610/18th St	D (52)	**F (124)**	**F (112)**	**F (236)**	**Y**
14	NB IH-610/18th St	E (67)	**F (106)**	**F (123)**	**F (142)**	**Y**
15	Mangum Rd/Hempstead Rd	C (24)	C (32)	**E (74)**	**F (122)**	**Y**
16	Post Oak Rd/Hempstead Rd	**F (96)**	**F (102)**	**F (375)**	**F (374)**	**Y**
17	SB IH-610/Hempstead Rd	**E (63)**	**F (99)**	**F (139)**	**F (112)**	**Y**
18	NB IH-610/Hempstead Rd	C (27)	**F (107)**	D (36)	**F (126)**	**Y**
19	Post Oak Rd/Westview Dr	**F (92)**	**E (77)**	**F (452)**	**F (292)**	**Y**
20	Post Oak Rd/Old Katy Rd	**F (179)**	**F (354)**	**F (272)**	**F (452)**	**Y**
21	Post Oak Rd/EB IH-10	**F (123)**	**F (95)**	**F (141)**	**F (119)**	**Y**
22	SB IH-610/Old Katy Rd	D (35)	**F (145)**	D (36)	**F (141)**	**N**
23	NB IH-610/Old Katy Rd	**E (56)**	**F (143)**	**F (131)**	**F (206)**	**Y**
24	WB IH-10/Silber Rd	D (51)	**F (132)**	**E (63)**	**F (151)**	**Y**
25	EB IH-10/Silber Rd	**E (74)**	**F (253)**	**F (84)**	**F (251)**	**Y**
26	WB IH-10/Antoine Dr	**F (119)**	**F (83)**	**F (140)**	**F (84)**	**Y**

Intersection Mitigation

For the Dallas station, the recommended mitigation for the substantial impacts include:

2 − Riverfront Boulevard/Commerce Street

- Add right-turn bay to northbound approach to provide dual-right turn bays

7 − Riverfront Boulevard/Cadiz Street

- Add one right-turn bay to provide dual right turns for south westbound approach
- Add one left-turn bay to northeast approach to provide dual left-turn bays

9 − Lamar Street/Cadiz Street

- Add one right-turn bay to southwestbound approach (IH-30 exit ramp)
- Add right-turn bay to south eastbound approach

17 – Canton Street/Akard Street

- Add a protected left phase and signal head for north westbound approach

21 – Belleview Street/S Akard Street

- Provide stop control on both approaches of Akard Street to make the intersection four-way stop-controlled

The resulting, mitigated LOS and delays are provided in **Table 9**.

Table 9: Dallas Terminal with Mitigation LOS (Delay in Seconds per Vehicle)

Map ID	Intersection	AM	PM
		Mitigated	Mitigated
1	Woodall Rodgers Fwy/Riverfront Blvd	**F (128)**	E (76)
2	Riverfront Blvd/Commerce St	**F (116)**	**F (100)**
3	Reunion Blvd/Riverfront Blvd	C (28)	B (17)
4	WB IH-30/Riverfront Blvd	A (9)	C (20)
5	EB IH-30/Riverfront Blvd	C (35)	D (35)
6	IH-35E/Riverfront Blvd	B (14)	B (15)
7	Riverfront Blvd/Cadiz St	**F (259)**	**F (210)**
8	Cadiz St/Hotel St (unsignalized)	A (1)	A (3)
9	Cadiz St/Lamar St	**D (52)**	**F (88)**
10	Canton St/Lamar St	B (13)	B (15)
11	Hotel St/Memorial Dr (unsignalized)	A (9)	B (10)
13	Lamar St/Memorial Dr	B (17)	B (15)
14	Griffin St/Memorial Dr	C (27)	C (30)
15	Canton St/Griffin St	B (16)	C (22)
16	Cadiz St/Griffin St	C (26)	C (25)
17	Canton St/Akard St	B (16)	C (24)
18	Cadiz St/Akard St	D (36)	C (29)
19	Griffin St W/Akard St	C (26)	B (17)
20	Griffin St E/Akard St	B (11)	C (32)
21	Belleview St/Akard St (unsignalized)	**F (73)**	**F (69)**
22	Griffin St W/Ervay St	C (25)	A (4)
23	Griffin St E/Ervay St	C (29)	B (15)
24	Griffin St E/St Paul St	A (8)	D (47)
25	Griffin St W/St Paul St	B (15)	C (28)
26	Lamar St/Belleview St	**F (145)**	D (48)
27	Lamar St/Corinth St	D (45)	**E (62)**
28	Corinth St/Riverfront Blvd	**F (214)**	**F (193)**

For the Brazos Valley Station, the recommended mitigation for the substantial impacts include:

1 – SH 30 at SH 90

- Add eastbound and westbound left turn bays

The resulting LOS and delay are provided in **Table 10**.

Table 10: Brazos Valley Station with Mitigation LOS (Delay in Seconds per Vehicle)			
Map ID	**Intersection**	**AM**	**PM**
		Mitigated	**Mitigated**
1	SH 30/SH 90	**E (45)**	D (27)

For the Houston Northwest Transit Center Terminal Option, the recommended mitigation for the substantial impacts include:

1 − Mangum Road/US 290 NBFR

- Add one left-turn bay to northbound approach
- Add one through lane to southbound approach

2 − Mangum Road/US 290 SBFR

- Add one through lane to northbound approach

3 − Mangum Road/Dacoma Street

- Add one right-turn bay to northbound approach

7 − West T C Jester Boulevard/LP 610 Eastbound FR

- Convert north eastbound shared through/left-turn lane to through-only lane

8 − Jester Boulevard/LP 610 EBFR

- Convert southeastbound center lane from through to shared through/left

10 − Hempstead Road/Long Point Road

- Prohibit left turns from south eastbound approach

11 − W 18th Street/Hempstead Road

- Prohibit left turns at westbound approach

12 − Mangum Road/18th Street

- Add one right-turn bay to westbound approach
- Convert the left turns at all approaches to protected then permissive

13 − W 18th Street/Loop 610 SBFR

- Add one right-turn bay to eastbound approach

16 − Post Oak Road/Hempstead Road

- Add one right-turn bay to eastbound approach
- Convert northwestbound approach to dual left-turn bays, a shared through and right-turn lane, and one right-turn bay
- Convert southeastbound approach outside through lane to a shared through/right-turn lane, providing two lanes permitting right-turns

19 − Post Oak Road/Westview Drive

- Add one right-turn bay to southbound approach
- Convert the left turns at all approaches to protected then permissive

20 − Post Oak Road/Old Katy Road

- Add one right-turn bay to each approach
- Add one left-turn bay to the northbound and southbound approaches

21 − Post Oak Road/IH-10 EBFR

- Add one through lane to northbound approach

22 − Old Katy Road/Loop 610 SBFR

- Convert southbound approach shared through/left-turn lane to through-only
- Add one left-turn bay to southbound approach
- Add one through lane to the westbound approach

23 − Old Katy Road/Loop 610 NBFR

- Convert northbound approach to dual left-turn bays and a shared through/right-turn lane
- Add one through lane to westbound approach
- Add one left-turn bay to eastbound approach

24 − Silber Road/IH-10 WBFR

- Convert southbound approach to two through lanes and one right-turn lane

25 − Silber Road at IH-10 EBFR

- Convert eastbound approach shared through/left-turn lane to a through-only lane

26 − Antoine Drive at IH-10 WBFR

- Convert westbound approach shared through/left-turn lane to a through-only lane
- Add one right-turn bay to southbound approach

The peak period LOS and delay resulting from these mitigations are provided in **Table 11**.

Table 11: Northwest Transit Center Terminal Option with Mitigation
LOS (Delay in Seconds per Vehicle)

Map ID	Intersection	AM	PM
		Mitigated	**Mitigated**
1	NB US 290/Mangum Rd	D (45)	D (52)
2	SB US 290/Mangum Rd	D (45)	D (51)
3	Mangum Rd/Dacoma St	D (53)	**F (80)**
4	SB US 290/Dacoma St	**F (154)**	**F (139)**
5	NB US 290/Dacoma St	**F (98)**	**F (134)**
6	WB IH-610/TC Jester Blvd	**F (196)**	**F (167)**
7	EB IH-610/TC Jester Blvd	**F (97)**	**F (177)**
8	EB IH-610/E TC Jester Blvd	**F (112)**	**E (69)**
9	WB IH-610/E TC Jester Blvd	**F (367)**	**F (132)**
10	Long Point Rd/Hempstead Rd	**E (78)**	**F (88)**
11	18th St/Hempstead Rd (unsignalized)	**F (54)**	**F (175)**
12	Mangum Rd/18th St	D (41)	D (52)
13	SB IH-610/18th St	**F (86)**	**F (106)**
14	NB IH-610/18th St	**F (108)**	**F (130)**
15	Mangum Rd/Hempstead Rd	C (31)	D (48)
16	Post Oak Rd/Hempstead Rd	**F (119)**	**F (148)**

Table 11: Northwest Transit Center Terminal Option with Mitigation LOS (Delay in Seconds per Vehicle)			
Map ID	**Intersection**	**AM**	**PM**
		Mitigated	**Mitigated**
17	SB IH-610/Hempstead Rd	**E (55)**	**F (114)**
18	NB IH-610/Hempstead Rd	C (27)	**F (74)**
19	Post Oak Rd/Westview Dr	**F (109)**	**E (63)**
20	Post Oak Rd/Old Katy Rd	**F (261)**	**F (388)**
21	Post Oak Rd/EB IH-10	**F (85)**	**D (47)**
22	SB IH-610/Old Katy Rd	D (48)	**F (107)**
23	NB IH-610/Old Katy Rd	**D (52)**	**F (139)**
24	WB IH-10/Silber Rd	**E (71)**	**E (65)**
25	EB IH-10/Silber Rd	**F (83)**	**F (197)**
26	WB IH-10/Antoine Dr	**E (74)**	**F (106)**

For the Northwest Mall Terminal Option, the recommended mitigation for the substantial impacts include:

1 − Mangum Road/US 290 NBFR
- Add one left-turn bay to northbound approach to provide dual left-turn bays
- Add one through lane to southbound approach

2 − Mangum Road/US 290 SBFR
- Add one through lane to northbound approach

3 − Mangum Road/Dacoma Street
- Add one right-turn bay to northbound approach
- Convert the left turns at all approaches to protected then permissive

4 − Dacoma Street/US 290 SBFR
- Add a one right-turn bay to the north eastbound and south eastbound approaches

8 − E T C Jester Boulevard/LP 610 EBFR
- Convert the center lane of the south eastbound approach from a through lane to a shared through and left-turn lane

10 − Hempstead Road/Long Point Road
- Prohibit left turns at south eastbound approach

11 − W 18th Street/Hempstead Road
- Prohibit left turns at westbound approach

12 − Mangum Road/18th Street
- Add one right-turn bay to westbound approach
- Convert the left turns at all approaches to protected then permissive

13 − W 18th Street/Loop 610 SBFR
- Add two right-turn bays and one through lane on the eastbound approach

14 − W 18th Street/Loop 610 NBFR
- Add one right-turn bay and one through lane to westbound approach
- Add one right-turn bay to northbound approach

16 − Post Oak Road/Hempstead Road

- Add one right-turn bay to south eastbound approach
- Convert southwestbound approach center left-through lane to through lane
- Add one lane to north eastbound approach and convert to dual lefts, one through/right, and one right-turn lane

19 − Post Oak Road/Westview Drive
- Add one right-turn bay to southbound approach
- Convert the left turns at all approaches to protected then permissive

20 − Post Oak Road/Old Katy Road
- Add one right-turn bay to the northbound and eastbound approaches

21 − Post Oak Road/IH-10 EBFR
- Add one through lane to northbound approach

24 − Silber Road/IH-10 WBFR
- Convert the northbound approach center through/left-turn lane to a through-only lane
- Convert southbound approach to two through lanes and one right-turn lane

26 − Antoine Drive/IH-10 WBFR
- Convert the westbound approach shared through/left-turn lane to a through-only lane

The resulting LOS and delay are provided in **Table 12**.

Table 12: Northwest Mall Terminal with Mitigation LOS (Delay in Seconds per Vehicle)

Map ID	Intersection	AM	PM
		Mitigated	Mitigated
1	NB US 290/Mangum Rd	D (43)	**D (41)**
2	SB US 290/Mangum Rd	D (47)	E (78)
3	Mangum Rd/Dacoma St	D (44)	**E (59)**
4	SB US 290/Dacoma St	**F (161)**	**F (96)**
5	NB US 290/Dacoma St	**F (107)**	**D (51)**
6	WB IH-610/TC Jester Blvd	**F (220)**	**F (181)**
7	EB IH-610/TC Jester Blvd	**F (109)**	**F (239)**
8	EB IH-610/E TC Jester Blvd	**F (144)**	**E (73)**
9	WB IH-610/E TC Jester Blvd	**F (393)**	**F (141)**
10	Long Point Rd/Hempstead Rd	**E (78)**	**F (88)**
11	18th St/Hempstead Rd (unsignalized)	**F (54)**	**F (175)**
12	Mangum Rd/18th St	D (42)	**D (52)**
13	SB IH-610/18th St	F (81)	**F (124)**
14	NB IH-610/18th St	**E (70)**	**F (81)**
15	Mangum Rd/Hempstead Rd	C (27)	D (36)
16	Post Oak Rd/Hempstead Rd	**F (118)**	**F (163)**
17	SB IH-610/Hempstead Rd	**E (80)**	**F (134)**
18	NB IH-610/Hempstead Rd	D (36)	**F (87)**
19	Post Oak Rd/Westview Dr	**E (65)**	**E (68)**
20	Post Oak Rd/Old Katy Rd	**F (186)**	**F (280)**

Table 12: Northwest Mall Terminal with Mitigation LOS (Delay in Seconds per Vehicle)			
Map ID	Intersection	AM	PM
		Mitigated	Mitigated
21	Post Oak Rd/EB IH-10	**E (69)**	**D (38)**
22	SB IH-610/Old Katy Rd	D (48)	**F (133)**
23	NB IH-610/Old Katy Rd	**D (51)**	**F (154)**
24	WB IH-10/Silber Rd	F (81)	**E (72)**
25	EB IH-10/Silber Rd	**F (94)**	**F (259)**
26	WB IH-10/Antoine Dr	**F (114)**	**F (87)**

For the Industrial Site Terminal Option, the recommended mitigation for the substantial impacts include:

1 − Mangum Road/US 290 NBFR
- Add one left-turn bay to northbound approach
- Add one through lane to southbound approach

3 − Mangum Road/Dacoma Street
- Add one right-turn bay to northbound approach
- Convert the left turns of all approaches to protected then permissive

4 − Dacoma Street/US 290 SBFR
- Add one right-turn bay to the south eastbound approach and north eastbound approaches

10 − Hempstead Road/Long Point Road
- Prohibit left turns for south eastbound approach

11 − W 18th Street/Hempstead Road
- Prohibit left turns at westbound approach

12 − Mangum Road/18th Street
- Add one right-turn aby to westbound and northbound approaches
- Convert the left turns of all approaches to protected then permissive

13 − W 18th Street/Loop 610 SBFR
- Add one right-turn bay and one through lane to eastbound approach

14 − W 18th Street/Loop 610 NBFR
- Add one through lane to westbound approach

15 − Hempstead Road/Mangum Road
- Add one right-turn bay to northwestbound approach on Hempstead Road

16 − Post Oak Road/Hempstead Road
- Add one right-turn bay to south eastbound approach
- Add one left-turn bay to north westbound approach
- Convert southwest bound approach center left/through lane to through lane
- Add one lane to northeast bound approach and convert to dual lefts, one through/right and one right-turn lane

17 − Hempstead Road/IH-610 SBFR
- Add one through lane to northwest bound approach to provide three through lanes

18 − Hempstead Road/IH-610 NBFR

- Convert northwest bound approach right-turn lane to a shared through/right-turn lane

19 − Post Oak Road/Westview Drive
- Add one right-turn bay to southbound approach
- Add one right-turn bay to eastbound approach to provide two right-turn bays

20 − Post Oak Road/Old Katy Road
- Add one right-turn bay and one left-turn bay to northbound approach
- Add one right-turn bay to the southbound, eastbound, and westbound approaches

21 − Post Oak Road/IH-10 EBFR
- Add one through lane to northbound approach

23 − Old Katy Road/Loop 610 NBFR
- Convert northbound approach center lane from through lane to shared through/left-turn lane

24 − Silber Road/IH-10 WBFR
- Convert northbound approach center lane from a shared through/left-turn lane to a through-only lane
- Convert southbound approach to two through lanes and one right-turn lane

25 − Silber Road/IH-10 EBFR
- Convert eastbound approach shared through/left to through-only lane

26 − Antoine Drive/IH-10 WBFR
- Convert westbound approach shared through/left lane to through-only lane
- Add one right-turn bay to southbound approach

Table 13 shows the mitigated LOS and delay at each intersection under the Houston Industrial Site Terminal Option.

Table 13: Industrial Site Terminal With Mitigation LOS (Delay in Seconds per Vehicle)

Map ID	Intersection	AM	PM
		Mitigated	**Mitigated**
1	NB US 290/Mangum Rd	**E (57)**	D (40)
2	SB US 290/Mangum Rd	**E (61)**	**E (79)**
3	Mangum Rd/Dacoma St	**E (56)**	**E (60)**
4	SB US 290/Dacoma St	**F (107)**	**F (147)**
5	NB US 290/Dacoma St	**E (76)**	**F (162)**
6	WB IH-610/TC Jester Blvd	**F (220)**	**F (182)**
7	EB IH-610/TC Jester Blvd	**F (109)**	**F (239)**
8	EB IH-610/E TC Jester Blvd	**F (144)**	**E (67)**
9	WB IH-610/E TC Jester Blvd	**F (393)**	**F (144)**
10	Long Point Rd/Hempstead Rd	**E (79)**	**F (87)**
11	18th St/Hempstead Rd (unsignalized)	**F (84)**	**F (251)**
12	Mangum Rd/18th St	**E (62)**	**E (64)**
13	SB IH-610/18th St	D (46)	**F (109)**
14	NB IH-610/18th St	D (50)	**E (65)**
15	Mangum Rd/Hempstead Rd	C (28)	D (37)

Table 13: Industrial Site Terminal With Mitigation LOS (Delay in Seconds per Vehicle)			
Map ID	**Intersection**	**AM**	**PM**
		Mitigated	**Mitigated**
16	Post Oak Rd/Hempstead Rd	**F (118)**	**F (118)**
17	SB IH-610/Hempstead Rd	**F (115)**	**E (79)**
18	NB IH-610/Hempstead Rd	**E (73)**	**E (70)**
19	Post Oak Rd/Westview Dr	**F (118)**	**F (113)**
20	Post Oak Rd/Old Katy Rd	**F (145)**	**F (213)**
21	Post Oak Rd/EB IH-10	**E (76)**	D (42)
22	SB IH-610/Old Katy Rd	D (46)	**F (126)**
23	NB IH-610/Old Katy Rd	D (52)	**F (149)**
24	WB IH-10/Silber Rd	**E (73)**	**E (73)**
25	EB IH-10/Silber Rd	**F (86)**	**F (241)**
26	WB IH-10/Antoine Dr	**E (74)**	**F (106)**