4.5 IMPACTS ON ENVIRONMENTAL INTEGRITY

4.5.1 Impacts on Physiography and Geology

Construction of the proposed transmission line is not anticipated to have any significant adverse effects on the physiographic or geologic features and resources of the area. Erection of the structures will require the excavation and/or minor disturbance of small quantities of near-surface materials, but should have no measurable impacts on the geologic resources or features along any of the alternative routes. No geologic hazards were identified in the study area, and none are anticipated to be created by the Project. None of the hazardous waste sites identified within the study area would impact construction.

4.5.2 Impacts on Soils

Activities associated with the construction, operation, and maintenance of electrical transmission lines typically do not adversely impact soils when appropriate mitigation measures are implemented during the construction phase. Potential impacts to soils include erosion, compaction, and the conversion of prime farmland soils.

The highest risk for soil erosion and compaction is primarily associated with the construction phase of a project. In accordance with ETT and Sharyland standard construction practices, ROW clearing of woody vegetation including trees, brush, and undergrowth will be conducted within the primary ROW area (150 feet wide), unless otherwise specified in certain sensitive ROW areas (e.g., the LRGV NWR). Areas where vegetation is removed have the highest potential for soil erosion, and the use of heavy equipment on the cleared ROW creates the greatest potential for soil compaction. Prior to construction, ETT and Sharyland will develop a SWPPP to minimize potential impacts associated with soil erosion, compaction, and sedimentation of the ROW. Implementation of this plan will incorporate temporary and permanent BMPs to minimize soil erosion on the ROW during significant rainfall events. The SWPPP will also establish the criteria for re-vegetation and mitigating soil compaction to ensure adequate soil stabilization during the construction and post-construction phases. The native herbaceous layer of vegetation will be maintained, to the extent practicable, during construction, and most denuded areas with a low erosion potential will be allowed to re-vegetate with native herbaceous species. Areas with a high erosion potential, including steep slopes and areas with shallow topsoil, might require seeding and/or implementation of permanent BMPs (e.g., soil berms or interceptor slopes) to stabilize disturbed areas and minimize soil erosion potential during the post-construction phase. The ROW will be inspected prior to and during construction to ensure that potential high-erosion areas are identified and appropriate BMPs are implemented and maintained. The ROW will be inspected post-construction to identify areas where erosion control measures will need to be in place to assist in soil stabilization.

Prime farmlands, as defined by the NRCS, are soils that are best suited for producing food, feed, forage, or fiber crops. The USDA recognizes the importance and vulnerability of prime farmlands throughout the nation and encourages the wise use and conservation of these soils where possible. The Project crosses areas designated as prime farmland soils. In addition to the construction-related impacts described above, the major impact of the Project on prime farmland soils would be the physical occupation of small areas by the support structures. These occupied areas would not be available for agricultural production and could become obstacles to farm machinery. However, the USDA-NRCS does not consider the limited area of direct impact associated with these structures to

be a significant conversion of these soils, and the majority of the ROW would be available for agricultural use once construction of the transmission line is completed.

Potential impacts to soils, primarily erosion and compaction, would be minimized with the development and implementation of a SWPPP; therefore, the magnitude of potential soil impacts are considered equivalent for all of the alternative routes. No significant conversions of prime or state important soils are anticipated related to Project activities for any of the alternative routes.

4.5.3 Impacts on Water Resources

4.5.3.1 Impacts on Surface Water

Multiple surface waters within the study area would be crossed by all of the alternative routes. These surface waters include ephemeral, intermittent and perennial streams, and numerous irrigation and drainage canals. These features will often attract wildlife and can also support a fishery if they maintain a perennial characteristic. ETT and Sharyland propose to span all surface waters crossed by any of the alternative routes. None of the surface waters crossed by any of the alternative routes exceed the typical span widths of a 345 kV transmission line. Structure locations would be outside of the ordinary high water lines for any surface waters. Hand-cutting of woody vegetation within the ordinary high water lines would be implemented and limited to the removal of woody vegetation as necessary to meet conductor to ground clearances. The shorter understory and herbaceous layers of vegetation would remain, where allowable, and BMPs would be implemented in accordance with the SWPPP to reduce the potential for sedimentation outside of the ROW.

The number of stream crossings for each alternative route is tabulated in Table 4-1. The number of stream crossings range from three for Alternative Route 22 to 13 crossings for Alternative Routes 1, 5, 12, 15, and 21. Because all streams crossed will be spanned and a SWPPP will be implemented, no significant impacts are anticipated to surface water integrity or water quality.

The number of irrigation and drainage canals crossed by the alternative routes ranges from 90 crossings for Alternative Route 31 to 162 crossings for Alternative Route 29. Because ETT and Sharyland propose to span these features, no significant impacts are anticipated. Permitting with respective drainage districts may be required at each crossing location.

The alternative route lengths crossing open waters (lakes and ponds) range from 0.3 mile for Alternative Routes 24, and 29, to 1.2 miles for Alternative Route 17. No lengths of individual open water crossings for any of the alternative routes exceed the typical span length of a 345 kV transmission line. Because ETT and Sharyland propose to span these features, no significant impacts are anticipated to this resource.

Alternative Route 13 is the only route that parallels (within 100 feet) any streams. This route parallels streams for approximately 0.5 mile.

The lengths of open water crossings, lengths parallel with streams, and the number of streams crossed by each of the alternative routes is presented in Table 4-1. Since all surface waters are proposed to be spanned and a SWPPP plan will be implemented during construction, no significant impacts to these surface waters are anticipated for any of the alternative routes.

4.5.3.2 Impacts on Ground Water

The construction, operation, and maintenance of the proposed transmission line are not anticipated to adversely affect groundwater resources within the study area, though potential fuel and/or chemical spills during the construction process could potentially impact both surface water and groundwater resources. Thus, standard operating procedures and spill response specifications relating to petroleum product storage, refueling, and maintenance activities of equipment are provided as a component of the SWPPP in order to avoid and minimize potential contamination to water resources. ETT and Sharyland will take all necessary and available precautions to avoid and minimize the occurrence of such spills, and any remedial and disposal activities associated with any accidental spills will be in accordance with state and federal regulations.

4.5.3.3 Impacts on Floodplains

All of the alternative routes cross significant portions of the mapped 100-year floodplains. Alternative route lengths crossing FEMA mapped 100-year floodplains range from 17.9 miles for Alternative Route 13 to 37.5 miles for Alternative Route 5. The length of each alternative route crossing the 100-year floodplain is presented in Table 4-1. Additionally, all of the alternative routes cross at least one floodway operated and maintained by the IBWC. Permits or licensing will likely be required with the IBWC at each of the floodway crossings.

No construction activities are anticipated that would significantly impede the flow of water within watersheds. Engineering design should alleviate the potential of construction activities to adversely impact flood channels and proper structure placement would minimize any flow impedance during a major flood event. The construction of any of the alternative routes is not likely to significantly impact the overall function of a floodplain, or adversely affect adjacent or downstream properties. ETT and Sharyland will coordinate with the county floodplain administrators as necessary.

4.5.3.4 Impacts on Coastal Resources

Because of the location of the Loma Alta substation, all the alternative routes have portions located within the CMP boundary and seaward of the Coastal Facilities Designation Line.[3] The lengths of each route within these boundaries ranges from 6.9 miles each for Alternative Routes 13, 19, and 29, to 15.9 miles for Alternative Route 17. The length of each route located within the CMZ is provided in Table 4-1. ETT and Sharyland propose to construct the transmission line in accordance with the goals (31 TEX. ADMIN. CODE § 501.12) and policies (31 TEX. ADMIN. CODE § 501.16) of the Coastal Management Program and to minimize any potential impacts to coastal natural resource areas.

CNRAs crossed by the alternative routes include coastal wetlands (NWI mapped wetlands), special hazard areas (FEMA Zone A floodplains), and a coastal historic area (Palo Alto Battlefield). The length of each alternative route within each coastal natural resource area is presented in Table 4-7. The length of each alternative route crossing coastal wetlands within the coastal zone ranges from 0.07 mile each for Alternative Routes 1, 9, 15, 23, and 28, to 2.39 miles each for Alternative Routes 10, 22, 30, and 32. The lengths of the remaining alternative routes crossing coastal wetlands within the coastal zone are presented in Table 4-7.

[3] At the Project's location along the Gulf Coast, these boundaries are identical.

The length of each alternative route crossing special hazard areas within the coastal zone ranges from 3.78 miles each for Alternative Routes 4, 14, and 24, to 8.03 miles for Alternative Route 17. The lengths of the remaining alternative routes crossing these special hazard areas within the coastal zone are presented in Table 4-7.

The lengths of each alternative route crossing the coastal historic area range from zero for Alternative Routes 2, 5, 10, 11, 12, 16, 17, 20, 21, 22, 25, 30 and 32, to 3.28 miles each for Alternative Routes 14 and 24. The lengths of the remaining alternative routes crossing this coastal historic area are presented in Table 4-7.

TABLE 4-7 POTENTIAL IMPACTS TO COASTAL NATURAL RESOURCE AREAS

ALTERNATIVE ROUTE	LENGTH OF ROW WITHIN COASTAL WETLANDS (MILES)	LENGTH OF ROW WITHIN SPECIAL HAZARD AREAS (MILES)	LENGTH OF ROW WITHIN COASTAL HISTORIC AREAS (MILES)
1	0.07	4.18	3.05
2	2.10	7.90	0.00
3	1.54	7.77	2.01
4	0.10	3.78	3.28
5	1.63	7 45	0.00
6	0.84	5.74	2.61
7	1.54	7 41	2.19
8	0 84	5 74	2 61
9	0.07	4.18	3.05
10	2.39	7.98	0 00
11	1.62	7.47	0 00
12	2.16	7 44	0 00
13	0.10	4.18	3 05
14	0.10	3.78	3.28
15	0 07	4 18	3.05
16	2.10	8 02	0.00
17	2.08	8.03	0.00
18	0.84	5 74	2 61
19	0.10	4.18	3.05
20	1.63	7.45	0.00
21	2.16	7.49	0.00
22	2.39	7 98	0.00
23	0 07	4 18	3.05
24	0 10	3 78	3.28
25	2.16	7 49	0.00
26	1.53	6.52	2.19
27	1.54	7.77	2.01
28	0.07	4 18	3.05
29	0.10	4.18	3 05
30	2 39	7.98	0.00
31	0 87	5 74	2 61
32	2.39	7 98	0 00

Sources USFWS 2013, GLO 2013, FEMA 2013 and THC 2012c

4.5.4 Impacts on Ecological Resources

4.5.4.1 Impacts on Vegetation Types

Potential impacts to vegetation would result from clearing the ROW of woody vegetation and/or herbaceous vegetation. These activities facilitate ROW access for structure construction, line stringing, and future maintenance activities of the proposed transmission line. Impacts to vegetation would be limited to a 150-foot wide ROW. Woody vegetation removal within the ROW would be required within upland woodlands/brushlands, bottomland/riparian and forested wetland areas, and potentially to the cultivated orchards. ROW clearing activities would be completed while minimizing the impacts to existing groundcover vegetation when practical. Mowing and/or shredding of herbaceous vegetation might be required within grasslands/pasturelands. Future ROW maintenance activities might include periodic mowing and/or herbicide applications to maintain the herbaceous vegetation layer within the ROW.

Clearing trees and shrubs from woodland areas typically causes a degree of habitat fragmentation. The magnitude of habitat fragmentation is minimized by paralleling an existing linear feature such as a transmission line, roadway, railway, pipeline, or irrigation canal/drainage. During the route development process, consideration was given to to maximize the length of the routes parallel to existing linear corridors to minimize impact to or avoid wooded vegetation areas. Clearing would occur only where necessary to provide access, work space and future maintenance access to the ROW.

The lengths of each alternative route requiring clearing of woody vegetation and potentially cultivated orchards are provided in Table 4-1. The lengths of each route crossing upland woodlands/brushlands and riparian woodlands were interpolated from aerial photography and route lengths were digitally measured for these tabulations. The lengths of the alternative routes crossing upland woodlands/brushlands range from 1.1 miles for Alternative Route 25 to 10.4 miles for Alternative Routes 14 and 15. The lengths of the alternative routes crossing bottomland/riparian woodlands range from 0.8 mile for Alternative Route 30, to 3.3 miles each for Alternative Routes 5 and 11.

4.5.4.2 Impacts on Wetlands

Wetlands serve as habitat to a number of species and are often used as migration corridors for wildlife. Removal of vegetation within wetlands increases the potential for erosion and sedimentation, which can be detrimental to downstream plant communities and aquatic life. Removal of woody vegetation within any wetlands crossed is proposed using hand-clearing methods to avoid disturbance of the soil profile and to preserve the herbaceous vegetation layer. Additionally, mitigation measures can be implemented during construction activities to further avoid and/or minimize potential impacts to wetlands. Due to the arid nature of the region, the mapped wetland areas are typically restricted to small areas within depressions and/or associated with streams. In most instances these areas could be spanned with impacts limited to the clearing of woody vegetation necessary to obtain conductor to ground clearance requirements. No equipment would be required to traverse the wetlands or surface waters. Within the coastal zone area more extensive expanses of freshwater emergent wetlands may be crossed. While permanent loss of wetlands would be restricted to structure locations, temporary impacts to wetlands may occur as necessary to access each structure during construction. Impact minimization measures can be implemented (e.g., timber matting and access road minimization) to reduce temporary impacts.

The temporary and/or permanent placement of fill material within jurisdictional surface waters and associated wetlands requires a permit from the USACE under Section 404 of the CWA. A delineation of the wetlands crossed by the PUC approved route will be completed to determine USACE permit requirements. If necessary, ETT and Sharyland will coordinate with the USACE prior to clearing and construction to ensure compliance with Section 404 of the CWA in order to avoid, minimize, or mitigate unavoidable impacts to waters of the United States, including associated wetlands.

NWI mapped wetlands crossed by the alternative routes are primarily comprised of freshwater emergent wetlands mapped in the eastern portion of the study area. Links 330c, 331, 338, 340, and 357 cross these wetlands areas. Relatively few locations of forested wetlands remain in the region due to their conversion to agricultural uses and residential/commercial developments. Remnant areas of mapped forested or shrub/scrub wetlands are primarily associated with resacas and streams. The lengths of alternative routes crossing NWI mapped wetlands range from 0.1 mile each for Alternative Routes 9, 13, and 23, to 2.7 miles for Alternative Route 30.

ETT and Sharyland propose to implement BMPs as a component of their SWPPP to prevent off-ROW sedimentation and degradation of any wetland areas. If emergent wetland areas are traversed by equipment, matting can be used to minimize the potential temporary impacts. With ETT and Sharyland's use of these impact avoidance and minimization measures, none of the alternative routes are anticipated to have a significant impact on jurisdictional wetlands.

4.5.4.3 Impacts on Wildlife and Fisheries

The primary impacts of construction activities on terrestrial wildlife species are typically associated with temporary disturbances from construction activities, and with the removal of vegetation (habitat modification/fragmentation). Increased noise and equipment movement during construction might temporarily displace mobile wildlife species from the immediate workspace area. These impacts are considered short-term and normal wildlife movements would be expected to resume after construction is completed. Potential long-term impacts include those resulting from habitat modifications and/or fragmentation. All the alternative routes cross areas of upland and riparian woodlands which can represent the highest degree of habitat fragmentation by converting the area within the ROW to an herbaceous habitat. During the routing process, POWER attempted to minimize potential woodland habitat fragmentation by paralleling existing linear features and avoiding paralleling streams to the extent feasible.

Construction activities might also impact small, immobile, or fossorial (living underground) animal species through incidental takes or from the alteration of local habitats. Incidental takes of these species might occur due to equipment or vehicular movement on the ROW by direct impact or due to the compaction of the soil if the species is fossorial. Potential impacts of this type are not typically considered significant and are not likely to have an adverse effect on any species population dynamics.

If ROW clearing occurs during bird nesting season, potential impacts could occur within the ROW area related to migratory bird eggs and/or nestlings. Increases in noise and equipment activity levels during construction could also potentially disturb breeding or other activities of bird species nesting in areas adjacent to the ROW. ETT and Sharyland propose to complete all ROW clearing and construction activities in compliance with the MBTA to avoid or minimize potential impacts.

Transmission lines can also present additional hazards to birds due to electrocutions and/or collisions. Measures can be implemented to minimize this risk with transmission line engineering designs. The electrocution risk to birds should not be significant since the engineering design distance between conductors, conductor to structure, or conductor to ground wire for the proposed 345 kV double-circuit transmission line is greater than the wingspan of any bird potentially within the area (i.e., greater than eight feet). While the conductors are typically thick enough to be seen and avoided by birds in flight, the shield wire is thinner and can present a risk for avian collision. This risk can be minimized by installing bird flight diverters or other marking devices on the line within high bird use areas. ETT and Sharyland will coordinate with USFWS on the installation of bird flight diverters or other marking devices as determined necessary for specific locations.

Potential impacts to aquatic systems would include effects of erosion, siltation, and sedimentation. Clearing the ROW of vegetation might result in increased suspended solids in the surface waters traversed by the transmission line. Increases in suspended solids might adversely affect aquatic organisms that require relatively clear water for foraging and/or reproduction. Physical aquatic habitat loss or alteration could result wherever riparian vegetation is removed and also at temporary crossings required for access roads. Increased levels of siltation or sedimentation might also potentially impact downstream areas, primarily affecting filter feeding benthic and other aquatic invertebrates.

To avoid or minimize these impacts, ETT and Sharyland propose to span all surface waters and wetlands. Additionally, the implementation of a SWPPP and BMPs will also minimize potential impacts. Therefore, no significant adverse impacts are anticipated to any aquatic habitats crossed or located adjacent to the ROW for any of the alternative routes.

Construction of the proposed transmission line is not anticipated to have direct adverse impacts to wildlife and fisheries within the study area. Direct impacts would be associated with the loss of woodland habitat which is reflected in the vegetation analysis discussed above. Habitat fragmentation was minimized for all the alternative routes within woodland areas by avoidance and/or paralleling existing linear features to the extent feasible. While highly mobile animals might be temporarily displaced from habitats near the ROW during the construction phase, normal movement patterns should return after Project construction is complete. Implementation of a SWPPP utilizing BMPs will minimize potential impacts to aquatic habitats.

4.5.4.4 Impacts to Threatened and Endangered Species

To determine potential impacts to threatened or endangered species, POWER reviewed several sources of information: Known element occurrence data for the study area was obtained from the TXNDD and Project scoping comments were received from TPWD and USFWS (see Appendix A). Current county listings for federal and state listed threatened and endangered species and USFWS designated critical habitat locations were included in the review and were previously discussed in Section 2.6.4.5. The TXNDD data provides element occurrence data based on recorded observations of threatened, endangered or rare plant and animal species. The level of uncertainty for the precise location of each element of occurrence datapoint is represented by a polygon within the database. The greatest level of uncertainty (general precision) for any datapoint is represented by a polygon buffer with an 8,000 meter (4.97 mile) radius. Based on this information, the lengths of each alternative route can cross a single element of occurrence datapoint which could be represented by a ten-mile wide buffer. The alternative route lengths measured for the evaluation criteria (Length of ROW across known habitat of federally listed endangered or threatened species) reflect an overly conservative approach by incorporating the alternative route lengths located within these polygon

buffers of uncertainty. The data should not be interpreted as an indication of the delineation of potential suitable habitat associated with that observation or that the species observed is still located at that location. The TXNDD data is utilized to represent the potential of suitable habitat for listed species to occur within those areas.

Potential impacts to listed species include direct takes of individuals and potential degradation of optimal habitat to sub-optimal in most instances. For this Project, aside from a potential direct take of an individual, the listed species that are dependent on dense woodland habitats would be the most affected by construction of a 345 kV transmission line due to fragmentation effects.

ETT and Sharyland propose to span all surface waters and implement BMPs within their SWPPP plan so potential impacts to any listed aquatic species are minimized.

The tabulated evaluation criteria data for each alternative route reflects the length of each route extending through datapoint polygon buffers for both plant and animal species combined. Nine element of occurrence polygon buffers for six different species are intersected by multiple alternative route links. The radius of the polygon buffers intersected by the alternative routes includes 328 feet, 0.6 mile, 1.24 miles and 5.0 miles. With the exception of three element of occurrence records, one for aplomado falcon (2002) and two for jaguarundi (2002), all the other element of occurrence buffers intersected by the alternative routes are from the early to mid-twentieth century. The lengths of each alternative route crossing an element of occurrence buffer ranges from 5.7 miles for Alternative Route 4, to 17.9 miles for Alternative Route 12.

The absence of element of occurrence records within the TXNDD database for an area is not considered a substitute for a species-specific field survey, which may be necessary after a field survey for potential suitable habitat is conducted for the PUC approved route. After the PUC approves a route, if necessary, ETT and Sharyland will conduct a field survey to identify potential suitable habitats for listed species and evaluate the need for additional surveys and/or coordination with USFWS and TPWD.

Threatened and Endangered Plant Species

Federally listed plant species within the study area are only afforded federal protection from take (to "remove and reduce to possession" and/or "maliciously damage or destroy") if they are located on federal lands and/or federal funding or actions are associated with the Project. Listed plant species are also protected from commercial trade as well as import or export.

State-listed threatened and endangered plant species are afforded protection under Chapter 88 within Title 5 of the Texas Parks and Wildlife Code. Within this regulation, a "take" means to collect, pick, cut, dig up, or remove. This restricts the "take" of a listed species from public lands. It also prohibits the collection for sale, possession for commercial sale, transport for commercial sale, or sale of all or part of an endangered, threatened, or protected plant from private land unless permitted through the TPWD.

Several datapoint buffer areas historically known to have occurrences of federally listed plant species are crossed by several of the alternative routes. TXNDD data indicates alternative route crossings of datapoint buffers for Walker's manioc, South Texas ambrosia and Texas ayenia. These records are dated from the early to mid-twentieth century. A 1940 occurrence record (1.24 mile radial buffer) for Walker's manioc is crossed by Links 87, 89, 90, 93, and 94. However, a majority of the land crossed

by these links within this area is currently under cultivation. One 1939 occurrence record (1.24 mile radial buffer) of Texas ayenia is crossed by Links 268, 275, 276, 278, 280, and 281. Another 1939 occurrence record (328 feet radial buffer) of Texas ayenia is crossed by Link 281. One 1943 occurrence record (1.24 mile radial buffer) for Texas ayenia is crossed by Links 298, 299, 307, and 315. One 1938 occurrence record (1.24 mile radial buffer) for South Texas ambrosia is crossed by Links 280, 281, 282, 283, and 284.

After the PUC approves a route, field surveys will be completed, if necessary, to identify potential suitable habitat for each listed plant species and also determine the need for any additional species-specific surveys. With the development of an avoidance and impact minimization plan, the potential for any of the alternative routes to adversely affect federally listed plant species is not anticipated to be significant.

Sensitive Vegetation Communities
Review of TXNDD data also indicated the occurrences of sensitive vegetation types and state species of concern located within the study area. These were considered during the route development process and will be noted if observed during any field surveys that are conducted after a route is approved by the PUC. Based on TXNDD data, Link 293 crosses approximately 500 feet of Texas ebony-anacua series vegetation although no vegetation clearing is proposed at this crossing location.

Threatened and Endangered Animal Species

Of the federally listed threatened and endangered species described in Section 2.0, the species which are dependent on dense thornscrub or mixed thornscrub habitats include the jaguarundi and ocelot. These species would have the highest risk from potential impacts due to habitat degradation and/or fragmentation. Minimization of this impact could be achieved by spanning streams and riparian areas which would leave movement corridors for these and other wildlife species requiring woody cover. Only two known breeding populations of ocelot are known in South Texas and neither is located within the study area.

TXNDD occurrence data indicate the alternative routes intersect element occurrence buffers of three federally listed animal species at four different locations. Two 1989 occurrence records (1.24 mile radial buffers) for jaguarundi are crossed by Links 243, 244, 245, 246, 249, 253, and 255. The last confirmed USFWS sighting of a jaguarundi was from a vehicle mortality located several miles east of Brownsville in 1986 One 1946 occurrence record (5.0 mile radial buffer) for jaguar, centered in the San Benito area is crossed by a multitude of alternative route links. The jaguar and jaguarundi are generally considered extirpated from the State of Texas. One 2002 occurrence record for aplomado falcon (0.6 mile radial buffer) is crossed by Links 330c, 338, and 339.

The construction of a transmission line does not include activities associated with collecting, hooking, hunting, netting, shooting, or snaring by any means or device, and does not include an attempt to conduct such activities. Therefore, "take" of state-listed species as defined in Section 1.01(5) of the Texas Parks and Wildlife Code is not anticipated by this Project.

It should be noted that pedestrian surveys for threatened and endangered species have not been completed for any of the alternative routes; therefore suitable habitat for these species might occur within the ROW of any of the alternative routes. If necessary, a field survey for potential suitable habitat for all listed species will be completed after PUC approval of an alternative route. Additional consultation with USFWS and TPWD may also be required.

5.0 ROUTE EVALUATION

The purpose of this study was to delineate and evaluate alternative routes for ETT and Sharyland's proposed transmission line in Hidalgo and Cameron counties between the existing AEP TCC North Edinburg Substation and the existing BPUB Loma Alta Substation, routed in the vicinity of the existing AEP TCC South McAllen Substation. POWER completed an environmental analysis of 32 primary alternative routes (Section 4.0), the results of which are shown in Tables 4-1. The environmental evaluation was a comparison of the alternative routes strictly from an environmental standpoint (i.e., land use, aesthetics, ecology, and cultural resources) based upon measurement of the environmental criteria (Table 2-1) and the consensus opinion of POWER's group of evaluators. POWER used this information to evaluate and rank the alternative routes and to recommend an alternative route that provides the best balance between land use, aesthetic, ecological, and cultural resource factors. ETT and Sharyland considered this information along with engineering, construction, maintenance, and operational factors, cost estimates, and comments from agencies and the public, to identify a route that best addresses the requirements of applicable portions of PURA and P.U.C. Substantive Rules. POWER's evaluation is discussed below.

5.1 POWER'S ENVIRONMENTAL EVALUATION

POWER used a consensus process to evaluate the potential environmental impacts of the alternative routes. POWER professionals with expertise in different environmental disciplines (land use, ecology, and cultural resources), as well as POWER's Project Manager, evaluated all of the alternative routes based on the environmental conditions present along each route. This evaluation was based on the evaluation criteria, comments received from the public, and local, state, and federal agencies, and field reconnaissance of the study area. Each POWER technical expert independently analyzed the routes and the environmental data presented in Tables 4-1 and then independently ranked the routes with respect to potential impacts within their respective discipline. The evaluators then met as a group and discussed their independent results. The group as a whole determined the relationship and relative sensitivity among the major land use, ecological, and cultural resource factors. The group then ranked the alternative routes based strictly upon the land use, aesthetics, ecology, and cultural resource environmental data considered.

The evaluators agreed that all of the alternative routes were viable and acceptable from an overall land use, aesthetic, ecology, and cultural resource perspective. The evaluators each ranked the alternatives from 1st to 32nd (with 1st having the least potential impact and 32nd the greatest potential impact) from the perspective of their own area of expertise. The results of these rankings are summarized in Table 5-1.

TABLE 5-1 POWER'S ENVIRONMENTAL RANKING OF THE ALTERNATIVE ROUTES

	RANKING				
Alternative Route	Land Use Specialist	Ecology Specialist	Cultural Resources Specialist	Project Manager	Consensus
1	13th	15th	19th	12th	
2	28nd	26th	7th	22nd	
3	8th	27th	30th	3rd	
4	17th	20th	24th	14th	
5	19th	23rd	8th	17th	
6	14th	13th	32nd	10th	
7	30th	24th	27th	29th	
8	21st	22nd	31st	18th	
9	20th	19th	21st	21st	
10	3rd	16th	23rd	4th	2nd
11	6th	31st	9th	8th	
12	12th	32nd	5th	13th	
13	10th	25th	15th	20th	
14	11th	28th	20th	15th	
15	15th	30th	17th	16th	
16	7th	14th	6th	7th	5th
17	5th	17th	10th	5th	3rd
18	4th	29th	29th	6th	
19	9th	21st	22nd	9th	
20	29th	9th	4th	30th	
21	24th	8th	1st	25th	
22	23rd	7th	12th	26th	
23	31st	2nd	13th	31st	
24	27th	10th	16th	27th	
25	26th	5th	2nd	28th	
26	32nd	4th	26th	32nd	
27	18th	11th	25th	19th	
28	22nd	1st	11th	24th	
29	16th	3rd	14th	11th	
30	25th	6th	3rd	23rd	
31	2nd	12th	28th	1st	4th
32	1st	18th	18th	2nd	1st

The land use evaluation placed the greatest importance on the number of habitable structures located within 500 feet of the proposed ROW centerline, overall length of the route, length paralleling existing transmission lines, length paralleling existing ROW, and length paralleling apparent property lines. The land use specialist ranked Alternative Route 32 as having the least potential land use impact and Alternative Route 26 as having the greatest potential land use impact.

The ecology evaluation was based primarily on potential impacts to upland woodlands, bottomland/riparian woodlands, and mapped NWI wetlands. The number of stream crossings and length of ROW across open waters were secondary considerations. The ecologist ranked Alternative Route 28 as having the least potential ecological impact and Alternative Route 12 as having the most potential ecological impact.

The cultural resources evaluation was based primarily on the number of NRHP-listed properties crossed by the alternative routes and within 1,000 feet of the proposed routes. The number of recorded archeological sites crossed by and within 1,000 feet of the ROW was also a factor in the ranking of the alternative routes, followed by the amount of HPA crossed by the alternative routes. Alternative Route 21 was identified as the best alternative route from a cultural resources perspective, followed by Alternative Routes 25, 30, 20, and 12. None of these routes crossed, or were within 1,000 feet of archeological site 41CF92, the most inclusive boundary for the Palo Alto Battlefield.

The POWER project manager also ranked the alternative routes, considering all of the evaluation criteria. Given the nature of the study area, proximity to habitable structures, paralleling of existing ROW/apparent property lines, the overall length of the alternative route, as well as the length of ROW across woodlands/brushland were considered key factors. Potential impact avoidance and minimization measures typically employed during the construction of transmission (e.g., whether a feature could be spanned to minimize potential impacts) were also taken into account. Alternative Route 31 was selected by the POWER project manager as the best-balanced route considering all the evaluation criteria reviewed, followed by Alternative Routes 32, 3, 10, and 17.

Based on group discussion of the relative value and importance of each set of criteria (land use, ecology, and cultural resources) for this specific project, it was the consensus of the group of POWER evaluators that number of habitable structures located within 500 feet of the proposed ROW centerline, overall length of the route, and route lengths crossing upland woodlands/brushlands would be the primary factors in their decision selection of the recommended route and ranking of the remaining alternative routes. Secondary factors included route lengths crossing USFWS National Wildlife Refuges and proximity of routes to the Palo Alto Battlefield.

Based on these criteria, the group selected Alternative Route 32 as the alternative route that best addresses PURA and PUC environmental routing criteria and then agreed on ranking the remaining top four alternatives. The next top four alternative routes, Alternative Routes 10, 17, 31, and 16 (in order of preference), were determined to have the least potential cumulative impacts. The ranking of the alternative routes is presented in Table 5-1. All the alternative routes are considered viable, acceptable routes that are also geographically diverse.

POWER's recommendation of Alternative Route 32 as the route that best balances the PUC routing criteria related to land use, aesthetics, ecology, and cultural resources, is supported by the following evaluation criteria. Alternative Route 32:

- has the fewest habitable structures within 500 feet of the proposed ROW centerline, with 465;
- has the fewest newly affected habitable structures within 500 feet of the proposed ROW centerline, with 335;
- has the fourth fewest US and State highway crossings, at nine;
- is tied with Alternative Route 30 for having the third fewest farm-to-market road crossings, at 18;
- is tied with Alternative Routes 1 and 31 for having the fourth fewest FM radio transmitters, microwave towers, and other electronic installations within 2,000 feet of the proposed ROW centerline, with 12;
- has the third shortest length of ROW within the foreground visual zone of FM roads, at 32.3 miles;

- is tied with Alternative Routes 27 and 31 for having the tenth shortest length of ROW through bottomland/riparian woodlands, at 1.8 miles;
- is tied with six other routes for the second lowest number of stream crossings, at four;
- is tied with nine other routes for crossing the fifth fewest recorded cultural resource sites, with five; and
- has the ninth shortest length of ROW crossing areas of high archaeological site potential, at 77.7 miles.

Alternative Route 32:

- crosses no parks/recreational areas, including the Palo Alto Battlefield;
- crosses no USFWS National Wildlife Refuges;
- crosses no land irrigated by traveling systems (rolling or pivot type);
- has no heliports within 5,000 feet of its ROW centerline;
- has no AM radio transmitters within 10,000 feet of its ROW centerline;
- crosses no rivers; and
- has no length of ROW parallel (within 100 feet) to streams or rivers.

POWER's Project Director reviewed all of the data and evaluations produced by the project manager and task managers and concurred with the rankings and recommendations for the alternative routes.

Therefore, based upon its evaluation of this project and its experience and expertise in the field of transmission line routing, POWER recommends Alternative Route 32 from an overall environmental perspective and the remaining routes as alternatives. Considering all pertinent factors, it is POWER's opinion that this route best addresses the criteria related to land use, aesthetics, ecology, and cultural resources, specified in PURA § 37.056(c)(4) and the P.U.C. Substantive Rules.

Tables 5-2 through 5-33 (Appendix C) present detailed information on habitable structures and other land use features in the vicinity of the alternative routes. The items in Tables 5-2 through 5-33 and the alternative routes are illustrated on Figure 5-1 in Appendix D.

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This EA was prepared for ETT and Sharyland by POWER. A list of the POWER employees with primary responsibilities for the preparation of this document is presented below.

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7.0 REFERENCES

Alsop, Fred J. 2002. *Birds of Texas*. DK Publishing, Inc. New York, New York. 575pp.

Anderson, Andrew E. 1932. Artifacts of the Rio Grande Delta Region. *Bulletin of the Texas Archeological and Paleontological Society* 4:29-31.

Black, Stephen L. 1989. Environmental Setting. In *From the Gulf to the Rio Grande: Human Adaptation in Central South, and Lower Pecos Texas*, by Thomas R. Hester, Stephen L. Black, D. Gentry Steele, Ben W. Olive, Anne A. Fox, Karl J. Reinhard, and Leland C. Bement. Research Series No. 3, Arkansas Archaeological Survey, Fayetteville.

Blair, W.F. 1950. *The Biotic Provinces of Texas*. Texas Journal of Science 2:93-117.

Bousman, C. Britt, Barry W. Baker, and Anne C. Kerr. 2004. *Paleoindian Archeology in Texas*. In Prehistory of Texas. Ed. Timothy Perttula. Texas A&M University Press. College Station.

Bousman, C. B., S. A. Tomka, and G. L. Bailey. 1990. *Prehistoric Archaeology and Paleoenvironments in Hidalgo and Willacy Counties, South Texas: Results of the Phase II Test Excavations*. Report of Investigations No. 76, Prewitt and Associates Inc., Austin.

Brownsville Public Utility Board (BPUB). 2013. *Brownsville Weir and Reservoir Project*. Available on the internet: http://rrcs-24-173-85-148.sw.biz.rr.com/water/weir.html (accessed January 2013).

Brune, Gunnar. 2002. *Springs of Texas*, Volume I. Texas A&M University Press. College Station, Texas. 566.

Bureau of Economic Geology (BEG). 1976. Geologic Atlas of Texas, McAllen-Brownsville Sheet. Arthur Carleton Trowbridge Memorial Edition. University of Texas at Austin. scale 1:250,000.

_____. 1996. Physiographic Map of Texas. University of Texas at Austin.

Campbell, Linda. 2003. *The Endangered and Threatened Animals of Texas*. Texas Parks and Wildlife Department. 129 pp.

Cameron County Regional Mobility Authority (CCRMA). 2009. *RMA Projects*. Available on the internet: http://www.cameroncountyrma.org/RMAprojects.htm (accessed January 2, 2013).

City of Alton. 2012. Public Works. Available on the internet: http://www.alton-tx.gov/departments/public-works/ (accessed January 3, 2013).

City of Brownsville. 2009. *Imagine Brownsville Comprehensive Plan*. Available on the internet: http://unitedbrownsville.com/about-us/imagine-brownsville (accessed December 28, 2012) (dated July 21, 2009).

_____. 2011. Parks and Recreation. *Parks*. Available on the internet: http://parks.cob.us/ (accessed

January 3, 2013).

City of Edinburg. 2005. *Edinburg Gateway Plan - An Agenda for 2025*. Available on the internet: http://www.cityofedinburg.com/comprehensiveplan.php (accessed December 27, 2012) (dated October 4, 2005).

_____. 2013. Parks and Recreation Public Facilities. Available on the internet: http://www.cityofedinburg.com/epr/parks2.php (accessed January 3, 2013).

City of Harlingen. 2002. *Harlingen's Vision 2020 Comprehensive Plan*. Available on the internet: http://www.myharlingen.us/default.aspx?name=pz.comprehensivemaster (accessed December 27, 2012) (updated 2002).

_____ 2013. Parks and Recreation Department. *Parks Division*. Available on the internet: http://www.myharlingen.us/default.aspx?name=parks.parks (accessed January 3, 2013).

City of Hidalgo. 2012. Parks/Streets/Grounds. Available on the internet: http://cityofhidalgo.net/parks/ (accessed January 3, 2013).

City of La Feria. 2013. Parks and Recreation. Available on the internet: http://www.cityoflaferia.com/departments/parks-and-recreation (accessed January 3, 2013).

City of Los Fresnos. 2013. Public Works. *City of Los Fresnos Parks*. Available on the internet: http://citylf.cloudaccess.net/en/city-government/city-departments/public-works/parks-recreation.html (accessed January 3, 2013).

City of McAllen. 2007. *Foresight McAllen Comprehensive Plan*. Available on the internet: http://www.mcallen.net/devservices/planning/foresight.aspx (accessed December 27, 2012) (dated December 10, 2007).

_____. 2013. *City Parks*. Available on the internet: http://www.mcallen.net/parks/cityparks/default.aspx (accessed January 3, 2013).

City of Mercedes. 2006. *Envision Mercedes 2025. A Community Comprehensive Plan*. Available on the internet: http://www.cityofmercedes.net/index.php?section=citydepartments&page2=plandep-envisionmercedes (accessed December 27, 2012) (dated September 5, 2006).

City of Mission. 2010. Future Land Use Map. Available on the internet: http://www.missiontexas.us/city-departments/planning-department (accessed December 27, 2012) (dated May 3, 2010).

_____. 2013. Parks and Recreation Department. Available on the internet: http://www.missiontexas.us/city-departments/parks-and-recreation (accessed January 3, 2013).

City of Pharr. 2013. Parks and Recreation. *City Parks*. Available on the internet: http://www.pharr-tx.gov/departments/parks-recreation/city-parks (accessed January 3, 2013).

City of San Juan. 2010. Parks and Recreation. Available on the internet: http://www.cityofsanjuantexas.com/parks%20&%20recreation.html (accessed January 3, 2013).

City of Weslaco. 2007. *Visions and Goals*. Available on the internet: http://www.weslacotx.gov/CE/vision_and_goals_chapter_11_26_07.pdf (accessed December 27, 2012) (dated November 2, 2007).

_____. 2013. Parks and Recreation. Available on the internet: http://www.weslacotx.gov/Parks-Recreation.html (accessed January 3, 2013).

Cowardin, L. M., V. Carter, F. C. Golet, E. T. LaRoe. 1979. *Classification of Wetlands and Deepwater Habitats of the United States*. US Department of the Interior. Fish and Wildlife Service, Washington, D.C. 131 pp.

Dixon, James R. 2000. *Amphibians and Reptiles of Texas*. Number 25: W.L. Moody Jr. Natural History Series. Texas A&M University Press, College Station Texas. 421 pp.

Environmental Protection Agency (EPA). 2012a. *Final National Priorities List Sites - by State*. Available on the internet: http://www.epa.gov/superfund/sites/query/queryhtm/nplfin.htm#TX (accessed June 2012).

_____. 2012b. *Donna Reservoir and Canal Superfund Site Donna, Hidalgo County, Texas*. EPA ID: TX0000605363 http://www.epa.gov/earth1r6/6sf/pdffiles/donna-tx.pdf.

_____. 2012c. *Surf Your Watershed*. Available on the internet: http://cfpub.epa.gov/surf/huc.cfm?huc_code=13090001 (accessed December 2012).

Esri. 2011. United States Geologic Survey (USGS) 7.5 Minute Quadrangle Maps for the United States. Service: http://services.arcgisonline.com/ArcGIS/rest/services/USA_Topo_Maps/MapServer & Info: http://goto.arcgisonline.com/maps/USA_Topo_Maps , Copyright: 2013 National Geographic Society, i-cubed.

Etchieson, G.M., and D.K. Boyd. 1982. *Cultural Resources Survey for Proposed Rehabilitation and a New Drainage for Hidalgo County Irrigation District No. 16*. Department of the Interior, Bureau of Reclamation, Southwest Region, Amarillo, Texas.

Federal Aviation Administration (FAA). 2011. National Aeronautical Charting Office. Brownsville Sectional Aeronautical Chart, 88th Edition, Effective November 17, 2011.

_____. 2013. Airport Data and Contact Information. Available on the internet: http://www.faa.gov/airports/airport_safety/airportdata_5010/ (accessed January 2, 2013) (Last Updated January 10, 2013).

Federal Communication Commission (FCC). 2011. Geographic Information Systems – Licensing Database Extracts. Available on the internet:

http://wireless.fcc.gov/geographic/index.htm?job=licensing_database_extracts (accessed January 2, 2013) (Last updated August 22, 2011).

Federal Emergency Management Agency (FEMA). 2012. Flood Maps. Available on the internet: http://www.fema.gov (accessed December 2012).

_____. 2013. Map Service Center -Floodplains. Available on the internet: https://msc.fema.gov/webapp/wcs/stores/servlet/CategoryDisplay?storeId=10001&catalogId=10001&langId=-1&categoryId=12001&parent_category_rn=12001&type=CAT_MAPPANEL&stateId=13050&countyId=15523&communityId=357639&stateName=TEXAS&countyName=CAMERON+COUNTY&communityName=CAMERON+CO+*&dfirm kit id=&future=false&dfirmCatId=12009&isCountySelected=&isCommSelected=&userType=G&urlUserType=G&sfc=0&cat_state=13050&cat_county=15523&cat_community=357639 (accessed on April 1, 2013.)

Froese, R. and D. Pauly. 2011. FishBase. Available on the internet: http://www.fishbase.org/summary/Awaous-banana.html. (accessed January 2013).

Garza, Alicia A. 2012. "HIDALGO COUNTY," *Handbook of Texas Online.* http://www.tshaonline.org/handbook/online/articles/hch14 (accessed March 13, 2012). Published by the Texas State Historical Association.

Garza, Alicia A. and Christopher Long. 2012. "CAMERON COUNTY," *Handbook of Texas Online.* http://www.tshaonline.org/handbook/online/articles/hcc04 (accessed March 12, 2012). Published by the Texas State Historical Association.

General Land Office (GLO). 2013. GIS Maps at the GLO: GISWEB Viewer and STORM. Available on the internet: http://www.glo.texas.gov/GLO/agency-administration/gis/index.htmlCoastal (accessed April 01, 2013).

Gould, F. W., G. O. Hoffman and C. A. Rechenthin. 1960. *Vegetational Areas of Texas.* Texas A&M University, Texas Agriculture Experiment Station Leaflet. 492pp.

Graf, LeRoy P. 1942. *The Economic History of the Lower Rio Grande Valley, 1820-1875* – Volume 2. Harvard University.

Griffith, Glenn, Sandy Bryce, James Omernik and Anne Rogers. 2007. *Ecoregions of Texas.* Project Report to TCEQ. 125pp.

Hall, G. D., M. B. Collins, and E. R. Prewitt. 1987. *Cultural Resources Investigations Along Drainage Improvements, Hidalgo and Willacy Counties, Texas: 1986 Investigations.* Reports of Investigations No. 59, Prewitt and Associates Inc., Austin.

Hammerson, G.A. 2007. *Cemophora coccinea.* In: IUCN 2011. IUCN Red List of Threatened Species. Version 2011.2. Available on the internet: http://www.iucnredlist.org. (accessed January 2013).

Hammerson, G.A., Lavin, P. and Mendoza Quijano, F. 2007a. *Crotaphytus reticulatus*. In: IUCN 2011. IUCN Red List of Threatened Species. Version 2011.2. Available on the internet: http://www.iucnredlist.org. (accessed January 2013).

Hammerson, G.A., Mendoza-Quijano, F. and Lee, J. 2007b. *Coniophanes imperialis*. In: IUCN 2011. IUCN Red List of Threatened Species. Version 2011.2. Available on the internet: http://www.iucnredlist.org. (accessed January,2013).

Hatch, S.L., K.N. Gandhi, and L.E. Brown. 1990. *Checklist of the Vascular Plants of Texas*. MP-1655. Texas A&M University, Texas Agricultural Experiment Station, College Station, Texas. 158 pp.

Henke, Scott E. and Wm. Scott Fair. 1998. *Management of Texas Horned Lizards*. Wildlife Management Bulletin of the Caesar Kleberg Wildlife Management Institute. Texas A&M University at Kingsville. Management Bulletin No.2 8 pp.

Hester, Thomas R. 1981. Tradition and Diversity Among the Prehistoric Hunters and Gatherers of Southern Texas. *Plains Anthropologist* 26(92): 119-128.

_____. 1995. *The Prehistory of South Texas*. Texas A&M Press. Available on the internet: http://www.texasbeyondhistory.net/st-plains/prehistory/images/Hester-1995-prehistory-sTexas.pdf. Originally published in From the Gulf to the Rio Grande: human adaptation in Central, South and Lower Pecos Texas, Thomas R. Hester, Texas A&M University Press. College Station.

Hidalgo County. 2013. Hidalgo County Texas. *Parks*. Available on the internet: http://www.co.hidalgo.tx.us/index.aspx?NID=418 (accessed January 10, 2013).

Hidalgo County RMA. 2009. Hidalgo County Regional Mobility Authority. *Projects*. Available on the internet: http://www.lrgvdc.org/RMA/projects.html (accessed January 2, 2013).

Howells, Robert G., Raymond W. Neck and H. Murray. 1996. *Freshwater Mussels of Texas*. University of Texas. Austin, Texas. 224 pp.

Hubbs, C. 1957. *Distributional Patterns of Texas Freshwater Fishes*. Southwest Naturalist 2:89-104.

Hubbs, C., R.J Edwards, and G.P. Garrett. 2008. An Annotated Checklist of the Freshwater Fishes of Texas, with Keys to Identification of Species. *Texas Journal of Science*, Supplement, 2nd edition 43(4):1-87.

Johnson, R.W. 1990. *Terrestrial Testing in Remote Sensing Survey, Diver Verification and Archaeological Testing, Brownsville Ship Channel Entrance and Vicinity, Cameron County Texas*. EH&A Document No. 900161.

Jordan, Terry G., John L. Bean, and William M. Holmes. 1984. *Texas, a Geography*. Westview Press. Boulder and London.

Kane, Sharyn, and Richard Keaton. 2012. N.D. *Fort Brown, Texas: A New Frontier*. Available on the

internet: http://www.nps.gov/history/seac/brownsville/english.pdf. (accessed April 12, 2012).

Lee, J., Calderón Mandujano, R., Lopez-Luna, M.A., Vasquez Díaz, J. & Quintero Díaz, G.E. 2007. *Drymarchon melanurus*. In: IUCN 2011. IUCN Red List of Threatened Species. Version 2011.2. Available on the internet: http://www.iucnredlist.org. (accessed January 2013).

Lockwood, Mark W. and Brush Freeman. 2004. *The Texas Ornithological Society Handbook of Texas Birds*. Texas A&M University, College Station, Texas. 261.

MacNeish, Richard S. 1947. A Preliminary Report on Coastal Tamaulipas. *American Antiquity* 13(1):1-15.

___ ___. 1958. *Preliminary Archaeological Investigations in the Sierra De Tamaulipas, Mexico.* Transactions of the American Philosophical Society, No. 48(6), Philadelphia.

Mallouf, R. J., B. J. Baskin, and K. L. Killen. 1977. *A Predictive Assessment of Cultural Resources in Hidalgo and Willacy Counties, Texas.* Survey Report 23. Office of the State Archeologist, Texas Historical Commission, Austin.

Mason, J. Alden. 1935. The Place of Texas in Pre-Columbian Relationships between the United States and Mexico. Volume 7, pp 29-46. *The Bulletin of the Texas Archeological and Paleontological Society*. The Texas Archeological Society. Abilene.

McMahan, Craig, A., Roy G. Frye and Kirby L. Brown. 1984. *The Vegetation Types of Texas Including Cropland· An Illustrated Synopsis to Accompany the Map.* Texas Parks and Wildlife Department Austin, Texas. PWD Bulletin 7000-120:40.

Mercado-Allinger, P. A. 1983. *Survey, Testing, and Assessment of Cultural Resources in Portions of Willacy County Drainage District No.1, Willacy County, Texas.* Report of Investigations 20. Prewitt and Associates Inc., Austin.

Mercado-Allinger, P.A., N.A. Kenmotsu, and T.K. Perttula. 1996. *Archeology in the Central and Southern Planning Region, Texas: A Planning Document.* Division of Antiquities Protection, Cultural Resource Management Report 7. Texas Historical Commission. Austin.

Myers, Terri and Karen Weitze. 1995. *Louisiana-Rio Grande Canal Company Irrigation System.* National Register Nomination. National Register files, Texas Historical Commission, Austin, Texas.

National Aerial Imagery Program (NAIP). 2012. USDA's Farm Service Agency NAIP/Texas 2012 1M NC, Add GIS Service: *http://gis.apfo.usda.gov/arcgis/services* Service Name: NAIP/Texas_2012_1m_NC

National Butterfly Center (NBC). 2012. Experience the National Butterfly Center. Available on the internet: http://www.nationalbutterflycenter.org/ (accessed April 18, 2013).

National Park Service (NPS). 2012a. *National Historic Landmarks Program* – Lists of National Historic Landmarks - Texas. Available on the internet:

http://www.nps.gov/history/nhl/designations/listsofNHLs.htm (accessed January 4, 2013) (last updated March 22, 2012).

_____. 2012b. *National Register of Historic Places NPS Focus.* Available on the internet: http://nrhp.focus.nps.gov/natreghome.do?searchtype=natreghome (Accessed March 22, 2012).

_____. 2013. *Palo Alto Battlefield.* Available on the internet: http://tps.cr.nps.gov/nhl/detail.cfm?ResourceId=620&ResourceType=Site (accessed January 3, 2013).

National Wild and Scenic Rivers System (NWSRS). 2011. *National Wild and Scenic Rivers System Wild and Scenic Rivers by State.* Available on the internet: http://www.rivers.gov/wildriverslist.html (accessed January 4, 2013) (last updated August, 18, 2011).

Natural Resource Conservation Service (NRCS). 2012. Soil Data Mart Hydric and Prime Farmland Soils Database Search. Available on the internet: http://soildatamart.nrcs.usda.gov (accessed December 2012).

Nature Conservancy. 2012. The Nature Conservancy. *Conservation Lands.* Map provided by The Nature Conservancy of Texas GIS Department (LVTL_TNC_interested.mxd) (dated February 27, 2012).

_____. 2013. The Nature Conservancy. Texas. *Chihuahua Woods Preserve.* Available on the internet: http://www.nature.org/ourinitiatives/regions/northamerica/unitedstates/texas/placesweprotect/chihuahua-woods-preserve.xml (accessed January 4, 2013).

National Marine Fisheries Service (NMFS). 2009. *Smalltooth Sawfish Recovery Plan (Pristis pectinata).* Available on the internet: http://www.nmfs.noaa.gov/pr/pdfs/recovery/smalltoothsawfish.pdf (accessed January 2013).

_____. 2012a. National Marine Fisheries Service - Species Fact Sheet for Green Turtle. Available on the internet: http://www.nmfs.noaa.gov/pr/species/turtles/green.htm (accessed December 012).

_____. 2012b. Species Fact Sheet for Hawksbill Turtle. Available on the internet: http://www.nmfs.noaa.gov/pr/species/turtles/hawksbill.htm (accessed December 2012).

_____. 2012c. Species Fact Sheet for Kemp's Ridley Turtle. Available on the internet: http://www.nmfs.noaa.gov/pr/species/turtles/kempsridley.htm (accessed December 2012).

_____. 2012d. Species Fact Sheet for Leatherback Turtle. Available on the internet: http://www.nmfs.noaa.gov/pr/species/turtles/leatherback.htm (accessed December 2012).

_____. 2012e. Species Fact Sheet for Loggerhead Turtle. Available on the internet: http://www.nmfs.noaa.gov/pr/species/turtles/loggerhead.htm (accessed December 2012).

_____. 2012f. Species Fact Sheet for West Indian Manatee. Available on the internet: http://www.nmfs.noaa.gov/pr/pdfs/sars/fws_westindianmanatee_florida.pdf (accessed on December 2012).

PBS&J. 2003. *Draft Environmental Impact Statement for Operation Rio Grande*. PBS&J. Austin.

Pierce, Frank Cushman. 1917. *A Brief History of the Lower Rio Grande Valley*. Lower Rio Grande Valley Historical Society. New Santander Press. Harlingen.

Poole, Jackie M., William R. Carr, Dana M. Price and Jason R. Singhurst. 2007. *Rare Plants of Texas*. Texas A&M University Press, College Station Texas 640 pp.

Prewitt, E. R. 1974. *Preliminary Archaeological Investigations in the Rio Grande Delta Area of Texas*. Bulletin of the Texas Archaeological Society 45: 55-65.

Prewitt, E.R. and D. Day. 1981. An Assessment of Archaeological Sites 41WY71 and 41WY72, Willacy County, Texas. Report No. 17. Prewitt and Associates, Inc., Austin.

Quigg, J. M., D. K. Boyd, E. R. Prewitt. 1989. *An Archaeological Survey of Proposed Drainage Ditch Realignments in the Southwest and Mercedes Laterals, Hidalgo County, Texas*. Technical Reports No. 2. Prewitt and Associates, Inc., Austin.

Railroad Commission of Texas (RRC). 2012. Public GIS Map Viewer for Oil, Gas, and Pipeline Data. Available on the internet: http://www.rrc.state.tx.us/data/online/gis/index.php# (accessed September 2012) (Last updated March 29, 2012).

_____. 2013. Mining Programs. Available on the internet: http://www.rrc.state.tx.us/programs/mining/index.php (accessed April 2013).

Richardson, Alfred and King, Ken. 2011. *Plants of Deep South Texas - A field guide to the Woody and Flowering Species*. Texas A&M University Press, College Station, Texas. 457 pp.

Rogers, R. and M. Cruse. 1996. *Archaeological Excavations at Four sites at the Los Tomates/Matamoros International Bridge III, Cameron County, Texas*. EH&A Document No. 951428.

Rudine, Ken. 2009. *Old Military Road – Rio Grande City to Brownsville*. Available on the internet: http://www.texasescapes.com/KenRudine/Old-Military-Road-Rio-Grande-City-to-Brownsville-Texas.htm (accessed January 4, 2013) (dated March 1, 2009).

Sanchez, Mario Lorenzo. 1991. *A Shared Experience: The History, Architecture and Historic Designations of the Lower Rio Grande Heritage Corridor*. Los Caminos del Rio Heritage Project and the Texas Historical Commission. Austin.

Schmidly, D. J. 2004. *The Mammals of Texas*. 6th ed., University of Texas Press, Austin, 501 pp.

Soil Conservation Service (SCS). 1977. *Soil Survey of Cameron County, Texas*. Available on the internet: http://soildatamart.nrcs.usda.gov/Manuscripts/TX427/0/Starr.pdf (accessed December 2012).

_____. 1981. *Soil Survey of Hidalgo County, Texas*. Available on the internet: http://soildatamart.nrcs.usda.gov/manuscripts/TX215/0/Hidalgo.pdf (accessed December 2012).

Soil Conservation Service (SCS). 1977. *Soil Survey of Cameron County, Texas*. United States Department of Agriculture, Soil Conservation Service in Cooperation with Texas Agriculture Experiment Station. Available on the internet: http://soils.usda.gov/survey/online_surveys/texas/TX061/cameron.pdf (accessed January 2013).

_____. 1981. *Soil Survey of Hidalgo County Texas*. United States Department of Agriculture, Soil Conservation Service in Cooperation with Texas Agriculture Experiment Station. Available on the internet: http://soildatamart.nrcs.usda.gov/manuscripts/TX215/0/Hidalgo.pdf (accessed January 2013).

Staumbaugh, J. Lee and Lillian J. Staumbaugh. 1954. *The Lower Rio Grande Valley of Texas*. Naylor & Company.

Texas Education Agency (TEA). 2011. School District Locator. Available on the internet: http://wgisprd.tea.state.tx.us/SDL/ (accessed December 27, 2012) (Last updated November 10, 2011).

Terneny, Tiffany T. 2005. *A Re-Evaluation of Late Prehistoric and Archaic Chronology in the Rio Grande Delta of South Texas*. PhD. Dissertation, University of Texas, Austin.

Texas Breeding Bird Atlas (TBBA). 2013. Available on the internet: http://txtbba.tamu.edu/species-accounts/ (accessed January 2013).

Texas Commission on Environmental Quality (TCEQ). 2012a. *Index to Superfund Sites by County*. Available on the internet: http://www.tceq.state.tx.us/remediation/superfund/sites/county/index.html (accessed December 2012).

_____. 2012b. *Niagara Chemical State Superfund Site*. Available on the internet: http://www.tceq.texas.gov/remediation/superfund/state/niagara.html (accessed December 2012).

_____. 2012c. *Texas Integrated Report - Texas 303(d) List (Category 5)*. 2010. Available on the internet: http://www.tceq.texas.gov/assets/public/compliance/monops/water/10twqi/2010_303d.pdf (accessed December 2012).

Texas Cooperative Wildlife Collection (TCWC). 2013. *Herpetology*. Texas A&M University. Available on the internet: http://wfscnet.tamu.edu/tcwc/Herps online/CountyRecords.htm (accessed January 2013).

Texas Department of Transportation (TxDOT). 2012. Project Tracker. Available on the internet: http://www.txdot.gov/project_information/project_tracker.htm (accessed January 2, 2013).

Texas General Land Office (GLO). 2010. *History of Texas Public Lands.* Available on the internet: http://www.glo.texas.gov/what-we-do/history-and-archives/_documents/history-of-texas-public-lands.pdf (accessed February 12, 2012).

_____. 2013. GIS Maps at the GLO: GISWEB Viewer and STORM. Available on the internet: http://www.glo.texas.gov/GLO/agency-administration/gis/index.htmlCoastal (accessed April 01, 2013.

Texas Historical Commission (THC). 2012a. *Texas Heritage Trails Program – Texas Tropical Trail Region.* Available on the internet: http://www.texastropicaltrail.com/index.aspx?page=10 (accessed January 4, 2013).

_____. 2012b. *Texas Historic Sites Atlas*. Available on the internet: http://atlas.thc.state.tx.us/ (accessed June 13, 2012).

_____. 2012c. *Texas Archeological Sites Atlas*. Available on the internet (Restricted Access): http://nueces.thc.state.tx.us/ (Accessed June 13, 2012).

_____. 2013 *Cultural Landscapes*. Available on the internet: http://www.thc.state.tx.us/preserve/buildings-and-property/cultural-landscapes (Accessed January 3, 2013)

Texas Natural Diversity Database (TXNDD). 2012. Texas Biological and Conservation Data System, Texas Parks and Wildlife Department. Austin, Texas. Retrieved in April 2012.

Texas Parks and Wildlife Department (TPWD). 2013. *Ecologically Significant Stream Segments.* Water Planning Data Region M (RioGrande) http://www.tpwd.state.tx.us/landwater/water/environconcerns/water_quality/sigsegs/regionm.phtml (accessed January 2013).

_____. 2013a. Eskimo Curlew (*Numernsius borealis*). Available on the Internet: http://www.tpwd.state.tx.us/huntwild/wild/species/eskcurl/ (accessed January 2013).

_____. 2013b. *Great Texas Coastal Birding Trail - Lower Texas Coast.* Available on the internet: http://www.tpwd.state.tx.us/huntwild/wildlife/wildlife-trails/coastal/lower (accessed January 4, 2013).

_____. 2013c. *Las Palomas WMA, Lower Rio Grande Valley Units.* Available on the internet: http://www.tpwd.state.tx.us/huntwild/hunt/wma/find_a_wma/list/?id=47 (accessed January 9, 2013).

_____. 2013d. *South Texas Plains Travel Region.* Available on the internet: http://www.tpwd.state.tx.us/spdest/findadest/south_texas_plains/ (accessed January 3, 2013).

_____. 2013e. *Texas Parks and Wildlife Annotated County List of Rare Species.* Available on the

internet: http://gis2.tpwd.state.tx.us/ReportServer$GIS_EPASDE_SQL/Pages/ReportViewer.aspx?%2fReport+Project2%2fReport5&rs%3aCommand=Render&county=Cameron (accessed January 2013).

_____. 2013f. *Texas GEMS - South Bay Coastal Preserve.* Available on the internet: http://www.tpwd.state.tx.us/landwater/water/conservation/txgems/southbay/index.phtml. (accessed April 1, 2013).

Texas Speleological Survey (TSS). 1994. *The Caves and Karst of Texas. A Guidebook for the 1994 Convention of the National Speleological Society with Emphasis on the Southwestern Edwards Plateau.* William R. Elliot and George Veni Eds. National Speleological Society, Inc. Huntsville, Alabama. 342 pp.

Texas Water Development Board (TWDB).011. *2011 Regional and 2012 State Water Plan Population Projections Data.* Available on the internet: http://www.twdb.state.tx.us/waterplanning/data/projections/2012/popproj.asp (accessed January 3, 2013) (Last updated April 7, 2011).

_____. 2011a. *Aquifers of Texas* by Peter G. George, Robert E. Mace and Rima Petrossian. TWDB Report 380. Available on the internet: http://www.twdb.state.tx.us/publications/reports/numbered_reports/doc/R380_AquifersofTexas.pdf (accessed December 2012).

_____. 2011b. *Region M Regional Water Plan.* NRS Consulting Engineers. Available on the internet: http://www.twdb.state.tx.us/wrpi/rwp/3rdRound/2011_RWP/RegionM/ (accessed January 2013).

_____. 2012. Maps and GIS. Available on the internet: http://www.twdb.state.tx.us/mapping/ (accessed January 2, 2013).

_____. 2012a. WIID Water well data interactive mapper. Available on the internet: http://wiid.twdb.state.tx.us/ims/wwm_drl/viewer.htm?DISCL=1& (accessed August 2012).

Thomas, Chad, Bonner, Timothy H., and Bobby G. Whiteside. 2007. *Freshwater Fishes of Texas - A Field Guide.* Texas A&M University Press. College Station Texas. 202 pp.

Travel Texas. 2012. Travel Texas. Things to Do. Attractions. Anzalduas Park. Available on the internet: http://www.traveltex.com/things-to-do/attractions/anzalduas-park (accessed January 10, 2013).

Uetz, P., and J. Hallermann. 2012. The Reptile Database. Available on the internet: http://www.reptile-database.org. (accessed January 2013).

US Bureau of the Census (USBOC). 2000. Census 2000 Gateway. State and County Quick Facts. Available on the internet: http://www.census.gov/main/www/cen2000.html (accessed January 3, 2013).

_____. 2010. Census 2010. Available on the internet: http://www census.gov/2010census/ (accessed January 3, 2013).

_____. 2011. American Fact Finder. Available on the internet: http://factfinder2.census.gov/main.html (accessed January 3, 2013).

US Department of Agriculture (USDA). 2007. 2007 Census of Agriculture – Texas – State and County Profiles. Available on the internet: http://www.agcensus.usda.gov/Publications/2007/Online_Highlights/County_Profiles/Texas/index.asp (accessed December 28, 2012).

US Fish and Wildlife Service (USFWS). 2007 Status of the Red Knot (*Calidris canutus rufa*) in the Western Hemisphere. USFWS Ecological Services, New Jersey Field Office. Available on the internet: http://www.fws.gov/northeast/PDF/RedKnotAssessmentMay2007.pdf (accessed December 2012).

_____. 2009. Plan for Translocation of Northern Ocelots (*Leopardus pardalis albescens*) in Texas and Tamaulipas Prepared by the Translocation Team, A Subcommittee of the Ocelot Recovery Team May 2009. Available on the internet: http://www.fws.gov/southwest/es/Documents/R2ES/Plan%20for%20Translocation%20of%20Northern%20Ocelots%20in%20Texas%20and%20Tamaulipas.pdf (accessed January 2013).

_____. 2011. Sprague's pipit. *USFWS Species Assessment and Listing Priority Assignment Form.* Available on the internet: http://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B0GD (accessed January 2013).

_____. 2011a. Species Profile for Eskimo Curlew (*Numenius borealis*). Available on the internet: http://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B01A (accessed January 2013).

_____. 2012. Gulf Coast Jaguarundi Recovery Plan (*Puma yagouaroundi cacomitli*). Draft First Revision. Available on the Internet: http://www.fws.gov/southwest/es/Documents/R2ES/Gulf_Coast_Jagarundi_DRAFT_Recovery_Plan_24Dec2012.pdf (accessed January 2013).

_____. 2012a. *Lower Rio Grande Valley National Wildlife Refuge.* Available on the internet: http://www.fws.gov/southwest/refuges/texas/STRC/lrgv/Index_LRGV.html (accessed January 3, 2013) (Last updated July 9, 2012).

_____. 2012b. National Wetland Inventory Mapping. Available on the internet: http://www.fws.gov/nwi/ (accessed January 2013).

_____. 2012c. Santa Ana National Wildlife Refuge. Available on the internet: http://www.fws.gov/refuge/santa_ana/ (accessed January 3, 2013) (Last updated November 26, 2012).

_____. 2013. USFWS Southwest Region Ecological Services. List of species by county for Texas. Available on the internet: http://www.fws.gov/southwest/es/EndangeredSpecies/lists/ListSpecies.cfm (accessed January 2013).

_____. 2013a. Brown Pelican (*Pelecanus occidentalis*) Species Profile. Available on the internet: http://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B02L (accessed January 2013).

_____. 2013b. USFWS Critical Habitat Mapper. Available on the internet: http://criticalhabitat.fws.gov/crithab/flex/crithabMapper.jsp (accessed January 2013).

_____. 2013c. Coastal Barrier Resources System Mapper - Beta. Available on the internet: http://www.fws.gov/cbra/CBRS-Mapper.html (accessed April 1, 2013).

Valley Land Fund. 2013. The Valley Land Fund – VLF Conservation Efforts. Available on the internet: http://www.valleylandfund.com/conservation/vlf-conservation-efforts/ (accessed January 2, 2013) (last updated 2013).

Victor, Sally S. 1981. Toluca Ranch Historic District. National Register of Historic Places Registration Form. Victor and Victor Consultants, Inc. Austin.

Ventyx. 2013. EV Energy Map. Boulder, Colorado. Updated September, 2012.

Werler, John E. and James R. Dixon. 2007. *Texas Snakes: Identification, Distribution, and Natural History*. University of Texas Press. Austin, Texas. 437.

World Birding Center (WBC). 2010. The World Birding Center. Available on the internet: http://www.theworldbirdingcenter com/index.html (accessed January 11, 2013).

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Appendix A

Agency Correspondence

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Agency Correspondence Table				
Agency Contact Information	**Consultation Type (Issued/Received)**	**Date Consultation Issued**	**Date Consultation Received**	**Comments**
Federal Agencies				
Federal Aviation Administration (FAA) Ms. Teresa Bruner Southwest Regional Administrator 2601 Meacham Boulevard Fort Worth, TX 76137-4298	Letter/Letter	03-20-12	04-10-12	Indicated FAA cannot comment until routes are final and structure distances to facilities identified.
Federal Emergency Management Agency (FEMA) Ms. Terry Lukes Deputy REO FRC 800 N Loop 288 Denton, TX 76209-3698	Letter	03-20-12		Sent initial consultation letter requesting input on the project study area.
International Boundary and Water Commission (IBWC) - U.S. Section Mr Ed Drusina Commissioner 4171 North Mesa, Suite C-100 El Paso, TX 79902-1441	Letter/Letter	03-20-12	05-09-12	Indicated a license/easement will be required for any activity on government property and crossing/encroachments on US portion of Rio Grande and its interior floodway system.
	Phone memo	06-22-12	----------	Indicated poles within the floodways is possible. Referred to Realty section of the IBWC website for requirements to request a license. Mentioned an informal review of the routes is possible to determine licensing feasibility.
	Email/Email	12-4-12	12-11-12	Indicated links paralleling the inside of the floodway levee was not possible to license. Shorter perpendicular crossings are allowed.

Agency Correspondence Table				
Agency Contact Information	**Consultation Type (Issued/Received)**	**Date Consultation Issued**	**Date Consultation Received**	**Comments**
IBWC cont.	Email	----------	01-22-13	Received requirements to obtain a license through IBWC.
	Letter	03-19-13		Sent summary of meetings with ETT/Sharyland and IBWC.
	Email	03-20-13	03-21-13	Received hydraulic model data for the Lower Rio Grande Flood Control Project as requested.
National Park Service (NPS) – Intermountain Mr. John Wessels Regional Director Region 12795 Alameda Parkway Denver, CO 80225	Letter	03-20-12	05-07-13	Indicated concerns about the Palo Alto Battlefield viewshed and recommended a route that avoided the National Historic Park (NHP) and National Historic Landmark (NHL) completely.
National Resources Conservation Service (NRCS) - Texas State Office Mr. Salvador Salinas State Conservationist 101 South Main Street Temple, TX 76501	Letter/Email	03-20-12	04-03-12	Clarified the project was not funded by a federal agency.
	Email/Letter	04-03-12	04-04-12	Indicated construction of transmission lines is not considered a conversion of Important Farmland soils. Requested the use of accepted erosion control methods during construction.

Agency Correspondence Table				
Agency Contact Information	**Consultation Type (Issued/Received)**	**Date Consultation Issued**	**Date Consultation Received**	**Comments**
US Army Corps of Engineers (USACE) - Galveston District Colonel Christopher W. Sallese Commander P.O Box 1229 Galveston, Texas 77553-1229	Letter/Letter	03-20-12	04-23-12	Indicated project may impact waters of the US and therefore may require a permit. Requested project specific details when available.
	Letter	03-14-13	03-26-13	Requested a review of the proposed links crossing IBWC managed ROW for any permitting issues. The project has been assigned tracking number SWG-2012-00347.
US Customs and Border Patrol (CBP) - Rio Grande Valley Sector Mr. Rosendo Hinojosa Chief Border Patrol Agent 4400 South Expressway 281 Edinburg, TX 78539	Letter	03-20-12		Sent initial consultation letter requesting input on the project study area.
US Department of Agriculture, Farm Service Agency (USDA FSA) – Texas State Office Mr. James B Douglass Acting State Executive Director PO Box 2900 College Station, TX 77841	Letter	03-20-12		Sent initial consultation letter requesting input on the project study area.
U. S. Environmental Protection Agency (USEPA) Mr Al Armendariz Region 6 Administrator 1445 Ross Avenue, Suite 1200 Dallas, TX 75202	Letter	03-20-12	04-17-12	Provided information (types of constraints in project area) to assist with EA preparation. Recommended line follow existing disturbed ROW and roads where practical.

Agency Correspondence Table				
Agency Contact Information	**Consultation Type (Issued/Received)**	**Date Consultation Issued**	**Date Consultation Received**	**Comments**
USEPA cont.	Phone memo	02-05-13	----------	Indicated samples taken from the Donna Reservoir to date do not indicate any likelihood of contamination outside the reservoir or channel.
U.S. Fish & Wildlife Service (USFWS) Mr. Adam Zerrenner Field Supervisor 10711 Burnet Rd., Ste. 200 Austin, TX 78758-4455	Letter	03-20-12	09-10-12	Provided information on threatened and endangered species in the project study area as well as other concerns about the project.
	Email	----------	10-18-12	Received contact information for the USFWS Realty Department in Albuquerque.
	Email	----------	01-03-13	Provided information on how to request a compatibility and appropriate use finding for new easement requests.
	Email	----------	01-17-13	Provided guidance for an easement request based on the compressed timeline.
	Email	----------	01-18-13	Received additional maps from USFWS.
	Letter	03-14-13		Requested a review of the proposed links crossing IBWC managed ROW for any permitting issues.
	Letter/Letter/ Email	04-01-13	05-07-13/ 05-10-13	Indicated power lines are not generally an appropriate use however a line may be considered if it was co-located with an existing line across USFWS property.

Agency Correspondence Table				
Agency Contact Information	**Consultation Type (Issued/Received)**	**Date Consultation Issued**	**Date Consultation Received**	**Comments**
State and Non-Government Agencies				
The Archaeological Conservancy Mr. Jim Walker Southwest Regional Director 5301 Central Avenue NE, Suite 902 Albuquerque, NM 87108	Letter	03-20-12		Sent initial consultation letter requesting input on the project study area.
Coastal Bend Land Trust Mr. Jake Herring Executive Director 1305 N. Shoreline Blvd. Suite 205 Corpus Christi, TX 78401	Letter	03-20-12		Sent initial consultation letter requesting input on the project study area.
Gulf Coast Bird Observatory Ms. Cecilia Riley Executive Director 103 West Hwy 332 Lake Jackson, TX 77566	Letter	03-20-12		Sent initial consultation letter requesting input on the project study area.
Lower Rio Grande Valley Development Mr. Kenneth N. Jones, Jr. Executive Director Council 301 W. Railroad St. Weslaco, Texas 78591	Letter	03-20-12		Sent initial consultation letter requesting input on the project study area.
Ms. Marianna Trevino-Wright Executive Director National Butterfly Center 3333 Butterfly Park Dr. Mission, TX 78572	Letter	04-17-13		Sent initial consultation letter requesting input on the project study area.

Agency Correspondence Table				
Agency Contact Information	**Consultation Type (Issued/Received)**	**Date Consultation Issued**	**Date Consultation Received**	**Comments**
Native Prairies Association of Texas Ms. Dalmara Bayne Executive Director 2002-A Guadalupe Street PMB 290 Austin, TX 78705-5609	Letter	03-20-12		Sent initial consultation letter requesting input on the project study area.
The Nature Conservancy - Texas Ms. Laura Huffman State Director 318 Congress Avenue Austin, TX 78701	Letter	03-20-12		Sent initial consultation letter requesting input on the project study area.
Ms. Sonia Najera Program Director – South Texas 205 N. Carrizo St. Corpus Christi, TX 78401	Letter	03-20-12	04-25-13	Indicated a preference for links 71a and 71b to avoid clearing of rare Tamaulipan thornscrub and to minimize loss of wildlife habitat.
Railroad Commission of Texas (RRC) Ms. Jill Hybner Program Manager, Environmental Permits 1701 North Congress Avenue Austin, TX 78711-2967	Letter	03-20-12		Sent initial consultation letter requesting input on the project study area.
Central Records Department Adminstration Division digital@rrc.state.tx.us	Email/Email	03-21-12	03-21-12	Received digital data as requested.
Texas Agricultural Land Trust Ms. Blair Fitzsimons Executive Director 4040 Broadway, Suite 430 San Antonio, TX 78209	Letter	03-20-12		Sent initial consultation letter requesting input on the project study area.

Agency Correspondence Table				
Agency Contact Information	**Consultation Type (Issued/Received)**	**Date Consultation Issued**	**Date Consultation Received**	**Comments**
Texas Archaeolgy Research Laboratory 10100 Burnet Road JJ Pickle Research Campus Building 5, Room 4 Austin, TX 78758-4445	Email/Email	04-04-12	04-04-12	Received digital data as requested.
Texas Cave Management Association Mr. Allen Cobb President P.O. Box 7427 Austin, TX 78713	Letter	03-20-12		Sent initial consultation letter requesting input on the project study area.
Texas Commission on Environmental (TCEQ) Mr. Mark R. Vickery, P.G. Executive Director Quality P.O. Box 13087 Austin, TX 78711-3087	Letter/Email	03-20-12	04-05-12	Recommended EA address actions that will be taken to prevent surface and groundwater contamination. Indicated project poses no significant impact on air quality standards. Dust and particulate emissions should be controlled by using standard dust mitigation techniques.
	Letter	03-14-13		Requested a review of the proposed links crossing IBWC managed ROW for any permitting issues.
Mr. Erasmo Yarrito, Jr. Rio Grande Watermaster 1804 West Jefferson Avenue Harlingen, TX 78550-5247	Letter	03-20-12		Sent initial consultation letter requesting input on the project study area.
Texas Department of Transportation (TX DOT) Mr. James L. Randall Director, Planning & Programming Department of Aviation 125 E. 11th Street Austin, TX 78701-2483	Letter/Letter	03-20-12	04-12-12	Indicated there are 6 public use airports in/near the project study area.

Agency Correspondence Table				
Agency Contact Information	**Consultation Type (Issued/Received)**	**Date Consultation Issued**	**Date Consultation Received**	**Comments**
Mr. Mark A. Marek, P.E. Director, Environmental Affairs Division 125 E. 11th Street Austin, TX 78701-2483	Letter	03-20-12		Sent initial consultation letter requesting input on the project study area.
Texas General Land Office (TX GLO) Mr. Jerry Patterson Commissioner 1700 N. Congress Ave., Suite 935 Austin, TX 78701-1495	Letter/Letter	03-20-12	04-10-12	Requested detailed maps when a final route has been determined to evaluate any crossings of state-owned lands.
Texas Historical Commission (THC) Mr. Mark Wolfe Executive Director P.O. Box 12276 Austin, TX 78711	Letter/Letter	03-20-12	04-04-12	Requested detailed maps when a final route has been determined. Indicated the final route may need to be surveyed by a professional archeologist and an antiquity permit must be obtained prior to work on state-owned lands.
	Letter	03-14-13	04-05-13	Indicated that levees that are eligible for NRHP will need to be identified should a Section 106 consultation be required.
Texas Land Conservancy Mr. Mark Steinbach Executive Director P. O. Box 162481 Austin, TX 78716	Letter	03-20-12		Sent initial consultation letter requesting input on the project study area.
Texas Parks and Wildlife Department (TPWD) Ms. Kathy Boydston Wildlife Habitat Assessment Program 4200 Smith School Road Austin, TX 78744	Letter	03-20-12	05-31-12	Received recommendations.

Agency Correspondence Table				
Agency Contact Information	**Consultation Type (Issued/Received)**	**Date Consultation Issued**	**Date Consultation Received**	**Comments**
	Letter	03-14-13		Requested a review of the proposed links crossing IBWC managed ROW for any permitting issues.
Texas Natural Diversity Database (TXNDD) txndd@tpwd.state.tx.us	Email/Email	04-02-12	04-11-12	Received digital data as requested.
Texas State Soil and Water Conservation Board Mr. Luis Pena Program Supervisor - Harlingen Regional Office 1824 W Jefferson Ave, Ste A, Harlingen, TX 78550-5247	Letter	03-20-12		Sent initial consultation letter requesting input on the project study area.
Texas Water Conservation Association Mr. Leroy Goodson General Manager 221 East 9th Street, Suite 206 Austin, Texas 78701	Letter	03-20-12		Sent initial consultation letter requesting input on the project study area.
Texas Water Development Board Ms. Carolyn Brittin Deputy Executive Administrator 1700 N Congress Avenue Austin, TX 78701	Letter/Letter	03-20-12	04-25-12	Indicated project does not conflict with any regional/state water management strategies.
Valley Land Fund Mr. Grant Ellis Executive Director 2400 North 10th Street, Suite A McAllen, TX 78501	Letter	03-20-12		Sent initial consultation letter requesting input on the project study area.
County Agencies – Cameron County				

Agency Correspondence Table				
Agency Contact Information	**Consultation Type (Issued/Received)**	**Date Consultation Issued**	**Date Consultation Received**	**Comments**
Cameron County Farm Bureau Office Mr. William Goad President P.O. Box 1779 San Benito, TX 78586	Letter	03-20-12		Sent initial consultation letter requesting input on the project study area.
Cameron County Historical Chair Ms. Mary Torres Chair 2009 N. Parkwood Dr. Harlingen, TX 78550	Letter	03-20-12		Sent initial consultation letter requesting input on the project study area.
County Agencies - Cameron County Judge & Commissioners				
County Judge - Cameron County The Honorable Carlos H Cascos 1100 E. Monroe St. Brownsville, TX 78520	Letter	03-20-12		Sent initial consultation letter requesting input on the project study area.
Cameron County Commissioner - Precinct 1 The Honorable Sofia C. Benavides 1100 E. Monroe St. Brownsville, TX 78520	Letter	03-20-12		Sent initial consultation letter requesting input on the project study area.
Cameron County Commissioner - Precinct 2 The Honorable Ernie Hernandez 1100 E. Monroe St. Brownsville, TX 78520	Letter	03-20-12		Sent initial consultation letter requesting input on the project study area.
Cameron County Commissioner - Precinct 3 The Honorable David A. Garza P O. Box 182 San Benito, TX 78586	Letter	03-20-12		Sent initial consultation letter requesting input on the project study area.

Agency Correspondence Table				
Agency Contact Information	**Consultation Type (Issued/Received)**	**Date Consultation Issued**	**Date Consultation Received**	**Comments**
Cameron County Commissioner - Precinct 4 The Honorable Dan Sanchez 201 North T St Harlingen, TX 78550	Letter	03-20-12		Sent initial consultation letter requesting input on the project study area.
County Agencies – Cameron County City Officials				
City of Brownsville - City Manager Mr. Charlie Cabler P.O. Box 911 Brownsville, TX 78522-0911	Letter	03-20-12		Sent initial consultation letter requesting input on the project study area.
City of Brownsville - Mayor The Honorable Tony Martinez P.O. Box 911 Brownsville, TX 78522-0911	Letter	03-20-12		Sent initial consultation letter requesting input on the project study area.
City of Harlingen - City Manager Mr. Carlos R. Yerena P.O. Box 2207 Harlingen, TX 78551-2207	Letter	03-20-12		Sent initial consultation letter requesting input on the project study area.
City of Harlingen - Mayor The Honorable Chris Boswell 515 E. Harrison, Ste A Harlingen, TX 78550	Letter	03-20-12		Sent initial consultation letter requesting input on the project study area.
City of La Feria - City Manager Mr. Sunny K. Phillip 115 E. Commercial Ave. La Feria, TX 78559	Letter	03-20-12		Sent initial consultation letter requesting input on the project study area.

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Agency Contact Information	**Consultation Type (Issued/Received)**	**Date Consultation Issued**	**Date Consultation Received**	**Comments**
City of La Feria - Mayor The Honorable Steve Brewer 115 E. Commercial Ave. La Feria, TX 78559	Letter	03-20-12		Sent initial consultation letter requesting input on the project study area.
City of Los Fresnos - City Manager Mr. Mark W. Milum 200 N. Brazil Los Fresnos, TX 78566	Letter	03-20-12		Sent initial consultation letter requesting input on the project study area.
City of Los Fresnos - Mayor The Honorable Polo Narvaez 200 N. Brazil Los Fresnos, TX 78566	Letter	03-20-12		Sent initial consultation letter requesting input on the project study area.
City of Los Indios - City Administrator Ms. Beatrice Weaver P.O. Box 280 Los Indios, TX 78567	Letter	03-20-12		Sent initial consultation letter requesting input on the project study area.
City of Los Indios - Mayor The Honorable Rick H. Bennett P.O. Box 280 Los Indios, TX 78567	Letter	03-20-12		Sent initial consultation letter requesting input on the project study area.
City of Palm Valley - Mayor The Honorable Dean Hall 5619 La Cana Dr. Harlingen, TX 78552	Letter	03-20-12		Sent initial consultation letter requesting input on the project study area.
City of Rancho Viejo - Mayor The Honorable Roberto Medrano 3301 Carmen Ave. Rancho Viejo, TX 78575	Letter	03-20-12		Sent initial consultation letter requesting input on the project study area.

Agency Correspondence Table

Agency Contact Information	Consultation Type (Issued/Received)	Date Consultation Issued	Date Consultation Received	Comments
City of Rangerville - Mayor The Honorable Wayne Halbert 31850 Rangerville Road San Benito, TX 78586	Letter	03-20-12		Sent initial consultation letter requesting input on the project study area.
City of San Benito - City Manager Mr. Manuel Lara 401 N. Sam Houston San Benito, TX 78586	Letter	03-20-12		Sent initial consultation letter requesting input on the project study area.
City of San Benito - Mayor The Honorable Joe H. Hernandez 401 N. Sam Houston San Benito, TX 78586	Letter	03-20-12		Sent initial consultation letter requesting input on the project study area.
County Agencies - Cameron County Irrigation/Drainage Districts				
Cameron Co. Drainage District #1 Mr. Carlos C. Ayala General Manager 3510 Old Port Isabel Rd. Brownsville, TX 78526	Letter	03-20-12		Sent initial consultation letter requesting input on the project study area.
Cameron Co. Drainage District #3 Ms. Sonia Lambert General Manager P.O. Box 937 San Benito, TX 78586-0937	Letter/Letter	03-20-12	04-18-12	Indicated easement requests (under/over/through) district ROW require Board of Director approval at regularly scheduled Board meetings.
Cameron Co. Drainage District #5 Mr. Alan Moore General Manager 301 E. Pierce Harlingen, TX 78550	Letter	03-20-12		Sent initial consultation letter requesting input on the project study area.

Agency Correspondence Table				
Agency Contact Information	**Consultation Type (Issued/Received)**	**Date Consultation Issued**	**Date Consultation Received**	**Comments**
Cameron Co. Irrigation District #16 Mr. Guillermo Cruz General Manager 34360 FM 1577 San Benito, TX 78586	Letter/Letter	03-20-12	04-24-12	Indicated a permit is required to cross an irrigation facility and ROW.
Cameron Co. Irrigation District #2 Ms Sonia Kaniger General Manager P.O. Box 687 San Benito, TX 78586	Letter/Letter	03-20-12	04-18-12	Indicated easement requests (under/over/ through) district ROW require Board of Director approval at regularly scheduled Board meetings.
Cameron Co. Irrigation District #6 Mr. Juan F. Ruiz General Manager P.O. Box 295 Los Fresnos, TX 78566	Letter	03-20-12		Sent initial consultation letter requesting input on the project study area.
Brownsville Irrigation District Mr. Joe Barrera General Manager 6025 Coffee Port Rd. Brownsville, TX 78521	Letter	03-20-12		Sent initial consultation letter requesting input on the project study area.
Harlingen Irrigation District - Cameron Co. #1 Wayne M. Halbert General Manager P O Box 148 Harlingen, TX 78551-0148	Letter	03-20-12		Sent initial consultation letter requesting input on the project study area.
Hidalgo & Cameron Co. Irrigation District #9 Mr. Frank JR. White General Manager P.O. Box 237 Mercedes, TX 78570-0237	Letter	03-20-12		Sent initial consultation letter requesting input on the project study area.

Agency Correspondence Table

Agency Contact Information	Consultation Type (Issued/Received)	Date Consultation Issued	Date Consultation Received	Comments
La Feria Irrigation District Cameron Co. #3 Mr. Richard Smith General Manager P O. Box 158 La Feria, TX 78559-158	Letter	03-20-12		Sent initial consultation letter requesting input on the project study area.
Cameron Co. Water Improvement District #10 Mr. John J. Walsdorf Director 30098 Tract 43 Rd. Los Fresnos, TX 78566-4547	Letter	03-20-12		Sent initial consultation letter requesting input on the project study area.
Cameron Co. Water Improvement District #17 Mr. Julio Gonzalez General Manager 9501 Marti Gras Ct. Los Fresnos, TX 78566-5097	Letter	03-20-12		Sent initial consultation letter requesting input on the project study area.
County Agencies - Cameron County School Districts				
Brownsville ISD Dr. Carl A. Montoya Superintendent 1900 Price Road Brownsville, TX 78521	Letter	03-20-12		Sent initial consultation letter requesting input on the project study area.
Harlingen CISD Dr. Steve Flores Superintendent 407 N. 77 Sunshine Strip Harlingen, Texas 78550	Letter/Phone memo	03-20-12	05-03-12	Requested notification of the public Open Houses and copies of the proposed routes.
La Feria ISD Dr Nabor Cortez, Jr. Superintendent 203 E Oleander La Feria, TX 78559	Letter	03-20-12		Sent initial consultation letter requesting input on the project study area.

Agency Correspondence Table				
Agency Contact Information	**Consultation Type (Issued/Received)**	**Date Consultation Issued**	**Date Consultation Received**	**Comments**
Los Fresnos CISD Mr. Gonzalo Salazar Superintendent P.O. Box 309 Los Fresnos, TX 78566	Letter	03-20-12		Sent initial consultation letter requesting input on the project study area.
San Benito CISD Mr. Antonio Limon Superintendent 240 North Crockett St. San Benito, TX 78586	Letter	03-20-12		Sent initial consultation letter requesting input on the project study area.
Santa Maria ISD Ms. Maria Chavez Superintedent P.O. Box 448 Santa Maria, TX 78592	Letter	03-20-12		Sent initial consultation letter requesting input on the project study area.
County Agencies - Hidalgo County				
Hidalgo County Farm Bureau Office Mr. Bradley Cowan President P O Box 1699 Pharr, TX 78577-1630	Letter	03-20-12		Sent initial consultation letter requesting input on the project study area.
Hidalgo County Historical Chair Ms. Adela Ortega Chair 900 Doherty Mission, TX 78572	Letter	03-20-12		Sent initial consultation letter requesting input on the project study area.
County Agencies - Hidalgo County Judge & Commissioners				
County Judge - Hidalgo County The Honorable Ramon Garcia 1615 S. Closner, Suite J Edinburg, TX 78539	Letter/Email	03-20-12	04-04-12	Indicated the county would consult with their planning and environmental health department to determine which county permits/authorizations may be required.

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Agency Contact Information	**Consultation Type (Issued/Received)**	**Date Consultation Issued**	**Date Consultation Received**	**Comments**
Hidalgo County Commissioner - Precinct 1 The Honorable Joel Quintanilla 1902 Joe Stephens Ave. Weslaco, TX 78596	Letter	03-20-12		Sent initial consultation letter requesting input on the project study area.
Hidalgo County Commissioner - Precinct 2 The Honorable Hector 'Tito' Palacios 300 W. Hall Acres Suite G Pharr, TX 78577	Letter	03-20-12		Sent initial consultation letter requesting input on the project study area.
Hidalgo County Commissioner - Precinct 3 The Honorable Joe M. Flores P.O. Box 607 Mission, TX 78574	Letter	03-20-12		Sent initial consultation letter requesting input on the project study area.
Hidalgo County Commissioner - Precinct 4 The Honorable Joseph Palacios 1102 N. Doolittle Edinburg, TX 78539	Letter	03-20-12		Sent initial consultation letter requesting input on the project study area.
County Agencies - Hidalgo County City Officials				
City of Alamo - City Manager Mr. Luciano Ozuna, Jr. 420 N. Tower Rd. Alamo, TX 78516	Letter	03-20-12		Sent initial consultation letter requesting input on the project study area.
City of Alamo - Mayor The Honorable Diana Martinez 420 N. Tower Rd. Alamo, TX 78516	Letter	03-20-12		Sent initial consultation letter requesting input on the project study area.
City of Alton - City Manager Mr. Jorge Arcaute 509 S. Alton Blvd Alton, TX 78573	Letter	03-20-12		Sent initial consultation letter requesting input on the project study area.

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Agency Contact Information	**Consultation Type (Issued/Received)**	**Date Consultation Issued**	**Date Consultation Received**	**Comments**
City of Alton - Mayor The Honorable Salvador Vela 509 S. Alton Blvd. Alton, TX 78573	Letter	03-20-12		Sent initial consultation letter requesting input on the project study area.
City of Donna - City Manager Mr. Oscar E. Ramirez 307 S. 12th St. Donna, TX 78537	Letter	03-20-12		Sent initial consultation letter requesting input on the project study area.
City of Donna - Mayor The Honorable David S. Simmons 307 S. 12th St. Donna, TX 78537	Letter	03-20-12		Sent initial consultation letter requesting input on the project study area.
City of Edcouch - City Manager Mr. Mike Mesa P.O. Box 100 Edcouch, TX 78538-0100	Letter	03-20-12		Sent initial consultation letter requesting input on the project study area.
City of Edcouch - Mayor The Honorable Robert Schmaizried P.O. Box 100 Edcouch, TX 78538-0100	Letter	03-20-12		Sent initial consultation letter requesting input on the project study area.
City of Edinburg - City Manager Mr. Ramiro Garza, Jr. P.O. Box 1079 Edinburg, TX 78540-1079	Letter/Email	03-20-12	04-26-12	Indicated concern about the city owned/operated Regional Sanitary Landfill on 2812 (0.6 mile east of 281) and the properties surrounding 100 acres. The city would oppose a line that would impede the continual operation of this facility.
City of Edinburg - Mayor The Honorable Richard H. Garcia P.O. Box 1079 Edinburg, TX 78540-1079	Letter	03-20-12		Sent initial consultation letter requesting input on the project study area.

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Agency Contact Information	**Consultation Type (Issued/Received)**	**Date Consultation Issued**	**Date Consultation Received**	**Comments**
City of Elsa - Mayor The Honorable Al Perez P.O. Box 427 Elsa, TX 78543-0427	Letter	03-20-12		Sent initial consultation letter requesting input on the project study area.
City of Granjeno - City Manager Mr. Yvette Cabrera 6603 S. FM 494 Mission, TX 78572	Letter	03-20-12		Sent initial consultation letter requesting input on the project study area.
City of Granjeno - Mayor The Honorable Rafael "Ralph" Garza 6603 S. FM 494 Mission, TX 78572	Letter	03-20-12		Sent initial consultation letter requesting input on the project study area.
City of Hidalgo - City Manager Mr. Joe Vera III 704 E. Texano Dr. Hidalgo, TX 78557	Letter	03-20-12		Sent initial consultation letter requesting input on the project study area.
City of Hidalgo - Mayor The Honorable John David Franz 704 E. Texano Dr. Hidalgo, TX 78557	Letter	03-20-12		Sent initial consultation letter requesting input on the project study area.
City of La Joya - Mayor The Honorable Jose A. Salinas Frito P.O. Drawer H La Joya, TX 78560	Letter	03-20-12		Sent initial consultation letter requesting input on the project study area.
City of McAllen - City Manager Mr. Mike R. Perez P.O. Box 220 McAllen, TX 78505-0220	Letter/Email Email	03-20-12	08-10-12/ 12-11-12	Received the ETJ boundaries map and shapefiles for the City of McAllen.