Carthage is located mostly outside the north-central edge of the study area, and Gary City is located in the central portion of the study area, east of Lake Murvaul.

Q28. WHAT ARE BURNS & MCDONNELL'S FINDINGS REGARDING PROXIMITY TO HABITABLE STRUCTURES IN THE VICINITY OF THE PROPOSED ROUTES?

A. Burns & McDonnell determined the number, distance, and direction of habitable structures located within 500 ft. of the centerline of each route through interpretation of aerial photography and verification during the reconnaissance survey along public roads, where possible. Burns & McDonnell, to the extent reasonable and in accordance with the policy of prudent avoidance, attempted to avoid habitable structures in the routing of the preliminary, primary, and proposed routes.

The number of habitable structures located within 500 ft. of the proposed routes' centerlines ranges between 13 and 27. Route RP53 (Southern) has the fewest habitable structures within 500 ft. of the centerline (13 structures). The other two Southern routes (RP50 and RP82) have between 21 and 24 structures within 500 ft. The Central routes (RP10, RP28, RP41, and RP46) followed Route RP53 with 15 to 20 structures within 500 ft., while the Northern routes (RP4, RP5, RP8, RP16, and RP93) had the most structures within 500 ft. (between 21 and 27). While the Northern routes have the greatest number of habitable structures within 500 ft., because they parallel existing transmission lines for more of their length than the other proposed routes, some of these structures are

already located close to an existing line, thereby limiting the overall impact of these proposed routes on the habitable structures. Figure 8-1 (map pocket) shows the location of each habitable structure, and Table 8-6 lists the types of habitable structure, the direction and distance from the closest segment component of each proposed route, and the unique identification number assigned to each habitable structure depicted in Figure 8-1.

Q29. WHAT ARE BURNS & MCDONNELL'S FINDINGS WITH RESPECT TO AM RADIO TRANSMITTERS WITHIN 10,000 FEET OF THE CENTERLINE AND OTHER TYPES OF ELECTRONIC INSTALLATIONS WITHIN 2,000 FEET OF THE CENTERLINES OF THE PROPOSED ALTERNATIVE ROUTES?

A. Communication towers were identified using GIS data obtained from the Federal Communications Commission, aerial interpretation, and the field reconnaissance survey. The PUCT requires the identification of the following communication towers:

- Commercial AM radio transmitters within 10,000 ft. of the route centerline; and,
- All FM radio transmitters, microwave relay stations, or other similar electronic installations within 2,000 ft. of the centerline.

There are no commercial AM communication towers within 10,000 ft. of any of the proposed routes. The Southern routes (RP50, RP53, and RP82) have the fewest other communication towers within 2,000 ft. (0 to 2 towers). The

Central routes (RP10, RP28, RP41, and RP46) have the next fewest, with between 2 and 6 towers within 2,000 ft. The Northern routes (RP4, RP5, RP8, RP16, and RP93) have the greatest amount of towers, between 6 and 11 towers within 2,000 ft. Table 8-9 in the EA lists the towers within 2,000 ft. of each route, with the type, direction, and distance to the closest segment. These towers are also shown on Figure 8-1 (map pocket).

No significant impacts to the operation of communication installations are anticipated from any of the proposed routes.

Q30. WHAT ARE BURNS & MCDONNELL'S FINDINGS WITH RESPECT TO KNOWN PRIVATE AIRSTRIPS WITHIN 10,000 FEET, FEDERAL AVIATION ADMINISTRATION ("FAA") REGISTERED AIRPORTS WITHIN 20,000 FEET, AND HELIPORTS WITHIN 5,000 FEET OF THE CENTERLINES OF THE PROPOSED ALTERNATIVE ROUTES?

A. Burns & McDonnell identified airports along the proposed routes from the field reconnaissance survey, aerial interpretation, public comments from the open houses, aeronautical charts, and GIS data obtained from the FAA National Flight Data Center. Table 8-8 in the EA shows the FAA registration status of the airstrips, the name of the airstrip (if known), and the direction and distance of the airstrip from the closest segment. Two of the Northern routes (RP16 and RP93) are within 20,000 ft. of the Panola County-Sharpe Field (shown on Figure 3-2 in the EA), which is a FAA-registered airport with a runway greater than 3,200 ft. in length. No proposed routes are within 10,000 ft. of any FAA-registered airstrips

or airports with runways less than 3,200 ft. in length. One new private airstrip (Hilltop Springs Airport) was identified within 10,000 ft. of the centerline of Routes RP5, RP8, and RP16 (Northern); RP10, RP28, RP41, and RP46 (Central); and RP50, RP53, and RP82 (Southern). No heliports were identified within 5,000 ft. of any proposed route. Based on Burns & McDonnell's preliminary calculations, FAA notification will not be required for any airstrips as a result of this Project. Due to the fact that the proposed routes in the proximity of the private airstrip are approximately 4,400 ft. away and lower in elevation, the routes are not anticipated to impact the airstrip, using a 20:1 approach slope.

Q31. WHAT ARE BURNS & MCDONNELL'S FINDINGS WITH RESPECT TO AREAS IRRIGATED BY TRAVELING IRRIGATION SYSTEMS IN THE VICINITY OF THE PROPOSED ALTERNATIVE ROUTES?

A. No mobile irrigation systems were identified that would be crossed by any of the proposed routes.

Q32. WHAT ARE BURNS & MCDONNELL'S FINDINGS WITH RESPECT TO COASTAL MANAGEMENT ZONE IMPACTS IN THE VICINITY OF THE PROPOSED ALTERNATIVE ROUTES?

A. None of the routes are located within the coastal management program boundary as defined in 31 TAC § 503.1.

Q33. PLEASE DESCRIBE THE PERMITS OR APPROVALS THAT WILL BE OBTAINED AS NECESSARY TO CONSTRUCT THE PROJECT.

A. Permits will be obtained following the selection of a route by the PUCT. Below is a list of permits that may be required for construction of the Project on any of the routes:

- Texas Department of Transportation ("TxDOT") permit(s) will be required for crossing state-maintained roadways or using TxDOT ROW to access the proposed Project (not yet obtained).
- Depending on the location of structures, floodplain development permits and road crossing permits might be required by the counties in which the approved route is located (not yet obtained).
- A Storm Water Pollution Prevention Plan ("SWPPP") will be prepared, and a Notice of Intent will be submitted at least 48 hours prior to the beginning of construction to the Texas Commission on Environmental Quality under the Texas Pollutant Discharge Elimination System General Permit (not yet obtained).
- If necessary, a cultural resources survey plan will be developed and clearance obtained from the Texas Historical Commission ("THC") for the proposed Project (not yet obtained).
- If the approved route triggers FAA criteria regarding proximity to airports, Garland / Rusk will file a Notice of Construction form with the FAA (not yet obtained).
- Following the Commission's approval of this application, consultation

with the U.S. Army Corps of Engineers ("USACE") will occur to determine appropriate requirements, if any, under Section 404/Section 10 Permit criteria (not yet obtained).

- Following the Commission's approval of this application, consultation with the U.S. Fish and Wildlife Service ("USFWS") will occur to determine appropriate requirements under the Endangered Species Act, if any (not yet obtained).
- Following the Commission's approval of this application and following consultation with the USACE and USFWS, consultation with the Texas Parks and Wildlife Department ("TPWD") will occur (not yet obtained).
- Approval from the Federal Energy Regulatory Commission ("FERC") and Sabine River Authority ("SRA") will be obtained to cross the SRA FERC project boundary for the Toledo Bend Reservoir, if needed (not yet obtained).

Q34. WHAT ARE BURNS & MCDONNELL'S FINDINGS WITH RESPECT TO THE NUMBER OF PARKS AND RECREATIONAL AREAS WITHIN 1,000 FEET OF THE CENTERLINES OF THE PROPOSED PRIMARY ALTERNATIVE ROUTES?

A. Based on field reconnaissance and a review of the TPWD, Texas Natural Resource Information System ("TNRIS"), and Environmental Systems Research Institute, Inc. ("ESRI") digital data, there are two parks or recreational areas crossed by two proposed routes: the George W. Pirtle Scout Reservation is

crossed by RP28 and land managed by the Sabine River Authority ("SRA") for hunting ("Unit #630") is crossed by RP82. Both routes appear to cross in areas of the property that are not developed and are heavily wooded. Route RP16 (Northern) is the only proposed route that does not cross any parks and has no identified park and recreation area within 1,000 ft. Route RP82 also does not have any park and recreation areas within 1,000 ft. (excluding the Unit #630 hunting area that is crossed). All of the remaining routes have one park and recreation area located within 1,000 ft. of the route. Table 8-7 in the EA (Attachment 1) shows the park and recreation areas that are crossed by or within 1,000 ft. of the proposed routes. Most of the identified parks and recreation areas that are not crossed but within 1,000 ft. are boat launches located along the Sabine River or on Lake Murvaul. Figure 8-1 of the EA shows the parks and recreation areas crossed by or within 1,000 ft. of the proposed routes. The route that crosses the SRA lands may be subject to the provisions of Chapter 26 of the Parks and Wildlife Code. Garland proposes to follow the same process employed in Docket No. 38435 for addressing the requirements of Parks and Wildlife Code Chapter 26, including providing the notice required by Chapter 26 at the appropriate time.

Q35. WHAT ARE BURNS & MCDONNELL'S FINDINGS WITH RESPECT TO POTENTIAL IMPACTS ON HISTORICAL AND AESTHETIC VALUES FROM THE PROPOSED PRIMARY ALTERNATIVE ROUTES, INCLUDING KNOWN CULTURAL RESOURCES SITES WITHIN 1,000 FEET OF THE CENTERLINES OF THE PROPOSED ALTERNATIVE ROUTES?

A. Although an on-the-ground cultural resources survey has not been conducted, HPAs have been identified by cultural specialists along the proposed routes using U.S. Geological Survey topographic maps. HPAs are locations that are usually identified as having a high probability for the occurrence of prehistoric sites and include areas where the proposed Project crosses water, stream confluences, drainages, alluvial terraces, wide floodplains, upland knolls, and areas where lithics (workable stone) could be found. The proposed routes cross between 57,740 ft. and 102,100 ft. of HPAs. The Northern routes are split between crossing a relatively small length of HPAs (RP4 and RP5 – 11.7-12.2 miles) and a relatively high length across HPAs (RP8, RP16, and RP93 – 14.1-19.3 miles). The Central routes are similarly split with RP28, RP41, and RP46 generally crossing a relatively long length of HPAs (16.0-18.2 miles) and RP10 crossing significantly shorter amounts of HPAs (12.9 miles). Likewise, the Southern routes are also split with both RP50 and RP53 crossing a relatively long amount of HPAs (13.6-15.1 miles) and RP82 crossing the least amount of HPAs of all proposed routes (10.9 miles).

Maps on file with the Texas Archaeological Laboratory and the THC Archeological Sites Atlas were reviewed in an effort to identify known and

recorded archaeological sites and historic resources within 1,000 ft. of the centerline of the proposed routes. Two Northern routes (RP16 and RP93) and one Central route (RP46) each cross one known recorded cultural resource site. Strategic pole placement and access road development could potentially avoid impacts to these sites. The proposed routes would be located within 1,000 ft. of between one and five recorded cultural sites. The Northern routes (RP4, RP5, RP8, RP16, and RP93) would have between two and five recorded cultural sites located within 1,000 ft. The Central routes (RP10, RP28, RP41, and RP46) would have fewer than the Northern routes overall, with between one and two recorded cultural sites located within 1,000 ft. The Southern routes (RP50, RP53, and RP82) would have between one and four recorded cultural sites located within 1,000 ft. Table 8-10 in the EA lists these sites as well as the direction and distance to these resources. Once a route is approved by the PUCT, Garland will work with the THC to determine what, if any, sites will be affected and what mitigation efforts could be required to limit impacts.

Q36. WHAT ARE BURNS & MCDONNELL'S FINDINGS WITH RESPECT TO IMPACTS ON ENVIRONMENTAL INTEGRITY FROM THE PROPOSED ROUTES?

A. The EA addresses impacts on environmental integrity in Chapter 8.0. Construction of the Project is not anticipated to have any significant adverse effects on the physiographic or geologic features and resources in the area. The

Project may have some minimal and short-term impacts to soil, water, and ecological resources.

Construction and operation of the transmission line would not result in any significant impacts to the existing physiography. Land clearing would consist only of tree and shrub removal. Any potential impact to topography would be minimal and temporary in nature and would be from the use of heavy construction equipment and excavation required for the construction of new foundations and support structures. All routes were designed to parallel existing ROW and disturbed areas (where possible) to limit potential impacts to land cover.

Because the majority of the study area is wooded, the majority of the proposed routes have a significant amount of woodland within the ROW. The proposed routes cross from 712.9 to 768.8 acres of woodland within the proposed ROWs. The Northern Routes (RP4, RP5, RP8, RP16, and RP93) generally have the least amount of woodland within the ROW with a range of 712.9-732.6 acres. The Southern Routes (RP50, RP53, and RP82) have a generally higher amount of woodland within the ROW with a range of 731.6-759.4 acres. The Central Routes (RP10, RP28, RP41, and RP46) generally have the largest amount of woodland within the ROW with a range of 726.6-768.8 acres. Route RP93 (Northern route) would have the least amount of woodland within the ROW, and Route RP41 (Central route) would have the greatest amount of woodland within the ROW. None of the proposed routes cross any land designated by TPWD as rangeland. Only two of the proposed routes cross land classified by TPWD as cultivated, and these routes (RP50 and RP53) cross very little (0.3 acres).

The Project would result in temporary, minor impacts to the soils within the ROW during construction activities; no significant impacts to soils are anticipated along any of the proposed routes. The primary impacts to soils would result from the use of heavy construction equipment and excavation required for construction of new foundations and support structures. These activities would be temporary in nature but could cause soil compaction, ruts, or tracks from vehicle movement, and mixing of the soil profile. Although the TPWD data indicated the presence of very little cropland in the area, all of the proposed routes traverse soils that are considered by the U.S. Department of Agriculture ("USDA") as prime farmland. Aside from potential construction-related erosion, impacts to prime farmland soils are anticipated to be minor and occur only at the base of transmission line structures. Transmission lines are typically not considered to cause a conversion of farmland because the land can still be used after construction.

During construction of the proposed transmission line, some erosion could occur within the cleared ROW, resulting in localized increases in soil loss and perhaps sedimentation of area streams. To limit erosion and sedimentation, a SWPPP and applicable permits will be prepared and obtained prior to any soil disturbance.

Potential hydrology impacts along the proposed routes were considered and evaluated by the number of streams and rivers crossed by each route, the number of Ecologically Significant Stream Segments ("ESSS") crossed, and the length of streams parallel to the routes (within 100 ft.).

The Sabine River has been designated as an ESSS between the Toledo Bend Reservoir and the Rusk/Panola County line. The only proposed route that does not cross an ESSS is Route RP82, as this route crosses the Toledo Bend Reservoir instead. Both the Sabine River and the Toledo Bend Reservoir are narrow enough that the transmission line could be built to span these water features. Garland and Rusk will also implement a SWPPP and obtain associated permits prior to any soil disturbance to reduce the potential for impacting the water quality of streams during construction.

In general, the Northern Routes RP4, RP5, and RP8 cross the fewest streams and rivers, from 83 (Route RP5) to 86 (Routes RP4). The other northern routes, Routes RP16 and RP93, cross more streams with 100 and 93 streams crossed, respectively. The Southern Routes (RP50, RP53, and RP82) cross between 94 and 100 streams. The Central Routes (RP10, RP28, RP41, and RP46) cross the most streams with between 98 and 107 streams crossed. In general, the Northern routes (RP4, RP5, RP8, RP16, and RP93) have the shortest length parallel to streams and rivers, ranging from 7,910-10,300 ft. The Central routes (RP10, RP28, RP41, and RP46) are parallel to streams and rivers the most with a length between 13,590 and 17,260 ft. The Southern routes (RP50, RP53, and RP82) have a length parallel to streams and rivers that is slightly shorter than the Central routes, with a length parallel between 11,740 and 14,810 ft.

Construction and operation of the Project would not significantly impact surface water features along the proposed transmission line. Short-term, minor water quality impacts may occur during the construction of the proposed Project.

Such impacts would be associated with soils from disturbed areas being transported into adjacent surface waters during storm events. Appropriate measures will be taken to reduce these impacts. To the extent required, Garland and Rusk would obtain the appropriate permits from the USACE for any work that crosses streams and rivers.

Impacts to groundwater and aquifers are not expected to occur from construction of the proposed Project. Precautions will be taken during construction for the proper control and handling of any petroleum products or other chemicals that may be needed during construction. Additionally, no mobile irrigation systems were identified which would be impacted by any of the proposed routes.

If structures of the approved route were to be located in a Federal Emergency Management Agency ("FEMA")-designated 100-year floodplain, then planning, structure siting, engineering design, and any necessary permitting would help mitigate construction activities impacting flood channels, and, therefore, the Project should not significantly affect flooding.

Construction and operation of the Project would result in the loss of some vegetation within the transmission line ROW due to clearing. The majority of the vegetation that would be impacted by the proposed Project consists of pine hardwood forests and young forests/grassland. Additionally, the vegetation cover along the Sabine River is classified as willow oak-water oak-blackgum forests, and all of the proposed routes would cross and require some clearing of vegetation within this cover type. Generally, clearing in these areas would be to

provide access for construction and maintenance equipment, and to prevent vegetation from growing tall enough to interfere with the lines. Where possible, proposed routes were designed to parallel existing ROW and extend through disturbed areas to minimize potential impacts to vegetation.

Potential impacts to threatened and endangered plant species were determined by reviewing data from the Texas Natural Diversity Database ("TXNDD"), maintained by the TPWD, written correspondence with the USFWS and TPWD personnel, and potential habitat within the study area. No impacts to threatened or endangered plant species are expected. The USFWS database does list the potential for one threatened plant species to occur within Rusk County; however, it is unlikely to occur within the study area. Upon approval of a route by the PUCT, detailed environmental surveys will be conducted along the proposed transmission line to identify potential habitat and/or endangered plant species. If encountered, Garland and Rusk will coordinate with both the USFWS and TPWD, as needed.

The potential impacts to wetlands were determined based on a review of aerial photography, USFWS maps, USDA NAIP infrared imagery, and topographic maps. The amount of forested/scrub-shrub wetlands within the ROW of the proposed routes ranges from 22.8 acres (Route RP5, North) to 123.7 acres (Route RP28, Central). In general, the Northern routes are split between a low (RP4, RP5, and RP8) and moderate (RP16 and RP93) amount of forested/scrub-shrub wetlands within the ROW. The three Northern routes (RP4, RP5, and RP8) have the least amount of forested/scrub-shrub wetlands impacts compared with all

the other proposed routes. The Central routes are split between a moderate (RP41 and RP46) and high (RP10 and RP28) amount of forested/scrub-shrub wetlands within the ROW. The Southern routes are split between a low (RP82) and a moderate (RP50 and RP53) amount of forested/scrub-shrub wetlands within the ROW. The amount of riverine and emergent wetlands within the ROW of the proposed routes ranges from 0.6 acre (Route RP82, South) to 5.1 acres (Routes RP10 and RP28, Central). In general, the Southern routes (Routes RP50, RP53, and RP82) cross the least amounts of riverine and emergent wetlands (less than 1 acre). The Northern routes (RP4, RP5, RP8, RP16, and RP93) cross a moderate amount of riverine and emergent wetlands (1.7-3.1 acres). Two Central routes (RP41 and RP46) cross approximately 3.1 acres of riverine and emergent wetlands, while the remaining two Central routes (RP10 and RP28) cross the most (approximately 5.1 acres). The amount of open water crossed by the proposed routes ranges from 270 ft. (Route RP28, Central) to 1,090 ft. (Route RP8, North). The Central routes (RP10, RP28, RP41, and RP46) generally have the least length across open water, with a range of 270 to 630 ft. of open water crossed. The Northern routes (RP4, RP5, RP8, RP16, and RP93) in general have the highest amount of open water crossed, ranging from 730-1,090 feet of open water crossed. The Southern routes (RP50, RP53, and RP82) have a comparatively moderate impact, ranging from 330-710 ft. of open water crossed.

To limit impacts to wetland areas, efforts were first made to identify routes that crossed as few wetlands as feasible, and the approved route will be designed to avoid or span wetland areas to the extent possible. Additionally, the

proposed routes were aligned parallel to existing ROW and through disturbed areas (where possible) to limit potential impacts to wetlands. Upon approval of a final route by the PUCT, detailed environmental surveys will be conducted along the proposed transmission line to identify jurisdictional waters of the United States. Garland and Rusk will obtain the appropriate permits from the USACE for work within wetlands.

Construction and operation of the transmission line could result in some temporary adverse impacts to wildlife, primarily from the removal of large trees within or near the proposed Project that could provide feeding, shelter, or nesting habitat for some species. Impacts to most species would be temporary and short-term during construction and would consist primarily of displacement and disturbance. Some less-mobile species occurring along the transmission line could be directly impacted, and movements between segmented habitats could be temporarily impeded due to noise and human presence. Additional temporary disturbance could occur during future maintenance of the transmission line. To the extent possible, waterways will be spanned or avoided to limit impacts to aquatic species. Proposed routes were designed to parallel existing ROWs to the extent possible to limit potential impacts to wildlife.

Potential impacts to threatened and endangered animal species were determined by reviewing data from the TXNDD, maintained by TPWD; correspondence with both USFWS and TPWD personnel; and reviewing aerial photography to determine potential habitat for threatened and endangered species likely to occur within the study area. The amount of threatened and endangered

species habitat crossed by the proposed routes (determined by the length through TXNDD elemental occurrences GIS data) ranges from 0 ft. to 22,910 ft. The Northern routes (RP4, RP5, RP8, RP16, and RP93) and one Central Route (RP10) do not cross any threatened and endangered species habitat. The remaining Central routes (RP28, RP41, and RP46) and two Southern routes (RP50 and RP53) each cross approximately 13,330 ft. of threatened and endangered species habitat. The remaining Southern route (RP82) crosses significantly more threatened and endangered species habitat, with 22,910 ft. Additionally, this route crosses an area identified by TPWD as containing a previously identified rookery. It is possible this route would not be able to meet the recommendation of TPWD to avoid clearing within 300 meters of a heronry. Once a route is approved by the PUCT, Garland and Rusk will coordinate with USFWS and TPWD to avoid impacts to threatened and endangered animal species along the approved route. Detailed surveys will also be completed, if required, and any identified habitat will be reported to both USFWS and TPWD.

V. ADDITIONAL COMMISSION ROUTING CONSIDERATIONS

Q37. HOW HAS BURNS & MCDONNELL'S ANALYSIS CONSIDERED SUCH FACTORS AS 1) USE AND PARALLELING OF EXISTING COMPATIBLE ROW, 2) USE OF VACANT POSITIONS ON EXISTING MULTIPLE CIRCUIT TRANSMISSION LINES, AND 3) USE OF PROPERTY BOUNDARIES OR OTHER NATURAL OR CULTURAL FEATURES?

A. In consideration of, and in compliance with 16 TAC § 25.101(b)(3)(B), Burns &

McDonnell's route delineation and route evaluation process considered utilizing and paralleling existing compatible ROW and property boundaries where practical and reasonable. In general, all of the proposed routes parallel existing corridors (including apparent property boundaries) for a portion of their length. Due to Garland, Rusk, and the PUCT's preference not to parallel pipeline corridors and the limited amount of other suitable utility corridors between the two proposed switching stations, identifying potential alternatives that parallel existing corridors for a substantial length (more than 50% of their length) was not possible for this Project.

The proposed routes range from 36.9 to 39.8 miles in total length, with a range of approximately 16.0 to 38.5 percent of their total length parallel to existing corridors (i.e., existing transmission lines, roads, and apparent property boundaries). The Northern routes (RP4, RP5, RP8, RP16 and RP93) are generally the shortest routes (36.9-38.0 miles), and they parallel existing transmission lines (9.8-25.7 percent) for a greater percentage of their length, compared to the other proposed routes. RP10 is the only other route that parallels existing transmission lines (11.1 percent parallel). Additionally, the Northern routes parallel all corridors, including roads and apparent property lines) more (23.4-38.5 percent) than most of the other Central and Southern proposed routes (16.0-24.4 percent). For the Central and Southern routes, the majority of existing corridor paralleled is apparent property lines, rather than an existing utility or road.

By paralleling existing corridors, potential impacts to property, community values and community resources, and viewsheds are typically limited

due to the already disturbed nature of the area crossed by the existing facility/corridor. Paralleling existing corridors is therefore normally considered preferable to creating a completely new corridor.

Natural or cultural features such as areas of concentrated residential development, wetlands, floodplains, cemeteries, parks and recreation areas, airports or airstrips, and center-pivot irrigation were avoided where reasonable and feasible. The use of vacant positions on existing multiple circuit transmission lines was not an option for the Project for several reasons. First, there were few existing transmission lines that extend in the same general direction as this Project, but even for those lines that could be used for short sections, a review of Google Earth street view imagery of the lines confirmed that there are no vacant positions on those existing lines. In addition, this Project is being proposed as a double-circuit line, so there would need to be two vacant positions on an existing line for this to be feasible. Triple-circuit lines are rare, and there were also no existing lines in the study area built with two available vacant positions.

Q38. HAVE AN ADEQUATE NUMBER OF ALTERNATIVE ROUTES BEEN FORMULATED TO CONDUCT A PROPER EVALUATION?

A. Yes. Considering the distance between the Project end points and the nature of the study area, I believe that the 12 proposed routes provide an adequate number of alternative routes for evaluation. Data for the environmental/land use criteria were collected for each segment, and all of the segments were used to develop the proposed routes filed in the application. I believe the 12 proposed routes filed in

the application represent an adequate number of reasonable, viable, geographically varied alternative routes for an approximately 37-40 mile long transmission line. In addition, the Commission can select a route made up of any combination of proposed segments.

Q39. DO ALTERNATIVE ROUTE CONFIGURATIONS EXIST THAT WOULD HAVE LESS IMPACT ON LANDOWNERS?

A. No, not based on information gathered and evaluated by Burns & McDonnell. The routing process involved the delineation of numerous routes, as depicted in Figures 3-3, 3-4, 3-5, and 8-1 of the EA. Information on community values, habitable structures, parks and recreation areas, archaeological and historic sites, aesthetics, and environmental integrity is presented for the alternative routes in the EA. Unfortunately, it is not possible to identify a route that has absolutely no impact to landowners. While many landowners affected by the proposed routes likely feel that there are other alternatives that would lessen the impact on their property, those alternatives necessarily impact other landowners. However, Burns & McDonnell's studies indicate that, on balance, the proposed routes limit adverse impacts on affected landowners to the extent practicable. The routes also limit adverse impacts on the natural environment and social resources in the area. Based on information gathered and evaluated by Burns & McDonnell, additional feasible alternative route configurations would not have less impact on landowners.

Q40. DO YOU BELIEVE THE CONCEPT OF "COMMUNITY VALUES" HAS BEEN ADEQUATELY ADDRESSED BY COMPILATION OF DATA BY BURNS & MCDONNELL, INCLUDING THE DATA THAT HAS BEEN RECEIVED FROM THE AGENCIES AND THE PUBLIC?

A. Yes. The term "community values" is included as a factor for the consideration of transmission line certification under PURA § 37.056(c)(4), although the term has not been specifically defined for regulatory purposes by the Commission. In Burns & McDonnell's experience, the PUCT typically includes the following within its discussions of community values:

- Shared appreciation of an area or other natural or social resources by a national, regional or local community;
- AM, FM, microwave, and other electronic installations in the area;
- Approvals or permits required from governmental agencies;
- Comments received from community leaders and the public;
- Description of the area traversed;
- FAA-registered airstrips, private airstrips, and heliports in the area;
- Habitable structures within 500 ft. of the Project centerline;
- Irrigated pasture or croplands using center-pivot or other traveling irrigation systems; and,
- Public meeting or public open-house participation.

Burns & McDonnell also evaluated the Project for community resources that may be important to a particular community, such as parks or recreational areas,

schools, cemeteries, historical and archaeological sites, or scenic vistas within the study area.

Burns & McDonnell's consideration of the Project's effect on "community values," which is described in Chapter 8.0 of the EA, indicates that the Project would not result in the disruption or preemption of any recreational activities or shared appreciation of an area or other natural or human resource, but could have temporary and permanent impacts on visual aesthetics. By paralleling existing corridors, potential impacts to property, community values and community resources, and viewsheds are typically limited due to the already disturbed nature of the area crossed by the existing facility/corridor. The proposed routes range from approximately 16.0 to 38.5 percent of their total length parallel to existing corridors (i.e., existing transmission lines, roads, and apparent property boundaries) to help limit impacts to community resources as well.

Burns & McDonnell's studies adequately address the requirements of PURA and PUCT Substantive Rules regarding consideration of the effects of the proposed transmission line on "community values."

Q41. ARE YOU FAMILIAR WITH THE COMMISSION'S POLICY OF "PRUDENT AVOIDANCE?"

A. Yes. 16 TAC § 25.101(a)(4) defines the term "prudent avoidance" to mean "[t]he limiting of exposures to electric and magnetic fields that can be avoided with reasonable investments of money and effort."

Q42. DO YOU BELIEVE THE ROUTES CONSIDERED BY BURNS & MCDONNELL AND THE APPLICANT CONFORM TO THE COMMISSION'S POLICY OF PRUDENT AVOIDANCE?

A. Yes. One of the more important measures of potential land use impacts is the number of habitable structures located in the vicinity of each route. Burns & McDonnell determined the number, distance, and direction of habitable structures located within 500 ft. of the centerline of each route through interpretation of aerial photography and verification during reconnaissance surveys along public roads, where possible. Burns & McDonnell, to the extent reasonable and in accordance with the policy of prudent avoidance, attempted to avoid habitable structures in the routing of the preliminary, primary, and proposed routes.

The number of habitable structures located within 500 ft. of the proposed route centerlines ranges between 13 and 27. Route RP53 (Southern) has the fewest habitable structures within 500 ft. of the centerline (13 structures). The other two Southern routes (RP50 and RP82) have between 21 and 24 structures within 500 ft. The Central routes (RP10, RP28, RP41, and RP46) followed Route RP53 with 15 to 20 structures within 500 ft., while the Northern routes (RP4, RP5, RP8, RP16, and RP93) had the most structures within 500 ft. (between 21 and 27). While the Northern routes have the greatest number of habitable structures within 500 ft., because they parallel existing transmission lines for more of their length than the other proposed routes, some of these structures are already located close to an existing line, thereby limiting the overall impact of these proposed routes on the habitable structures. Figure 8-1 (map pocket) shows

the location of each habitable structure, and Table 8-6 lists the types of habitable structure, the direction and distance from the closest segment component of each proposed route, and the unique identification number assigned to each habitable structure depicted in Figure 8-1. The routes considered in the EA conform to the Commission's policy of prudent avoidance in that they reflect reasonable investments of money and effort to limit exposure to electric and magnetic fields.

Q43. HAS BURNS & MCDONNELL REVIEWED AND CONSIDERED CERTAIN MITIGATION MEASURES FOR THIS PROJECT TO DECREASE POTENTIAL IMPACTS FROM THE PROJECT?

A. Yes, it has. Some mitigation measures are described in Chapter 8.0 of the EA. The primary form of mitigation during the routing phase of the Project was avoidance, followed by minimization of potential impacts to resources of concern. When resources could not be avoided through the routing process, coordination with the appropriate federal, state, and local agencies during the permitting phase of the Project will result in additional mitigation measures required by the agencies to minimize impacts. These measures could include, but would not be limited to, strategic pole placement during design, implementing erosion control Best Management Practices such as silt fences and barriers during construction, mitigation bank payments and/or habitat enhancements, and adjusting clearing and construction schedules to avoid disturbance during critical periods. Mitigation measures recommended and required by the agencies as part of the

permitting process will be implemented by Garland and Rusk to limit the impacts of the Project to the extent practicable.

Q44. WHAT ARE BURNS & MCDONNELL'S CONCLUSIONS REGARDING THESE MITIGATION MEASURES?

A. Mitigation measures should serve to reduce and mitigate the potential adverse effects of construction and operation of the proposed Project.

VI. SUMMARY AND CONCLUSION

Q45. PLEASE SUMMARIZE YOUR TESTIMONY.

A. In this application, Garland proposes to construct a double-circuit 345-kV transmission line from the new Rusk Switching Station to the new Panola Switching Station. Burns & McDonnell and Garland have selected 12 proposed routes for the Project. In Burns & McDonnell's opinion, all proposed route alternatives are viable, feasible, and minimize environmental impacts to the extent practicable and satisfy the criteria specified in PURA and the PUCT's Substantive Rules for transmission line siting. My testimony and the EA address the differing extent to which the proposed alternative routes satisfy such requirements.

Q46. DOES THIS CONCLUDE YOUR DIRECT TESTIMONY?

A. Yes, it does.

KRISTI K. WISE, PMP

Project Manager

Kristi Wise is a Project Management Professional-certified (PMP) project manager and biologist at Burns and McDonnell. She specializes in project and program management, transmission line routing and permitting, public involvement, and wildlife biology, including endangered species' habitat assessment.

EDUCATION

- BS, Wildlife Biology
- MS, Wildlife Biology

REGISTRATIONS

- PMP Certification

16 YEARS WITH BURNS & MCDONNELL

19 YEARS OF EXPERIENCE

TRANSMISSION LINES

Kristi has successfully managed more than 48 projects, totaling more than 5,600 miles of transmission lines in 19 different states. Projects ranged in voltage from 69 kilovolt (kV) to 765 kV and in mileage from less than one mile to approximately 1,500 miles. Kristi has managed budgets ranging from less than $100,000 to over $10 million and, as a certified PMP professional, has managed and integrated project scope, cost, schedule, quality, stakeholders, and risks, as well as managing project staff across various offices and overseeing procurement activities. Ms. Wise's project management experience includes monitoring of cost and schedule performance using earned value measurements (CPI and SPI).

Kristi has prepared written testimony, rebuttal testimony, and/or testified live before the North Carolina Utilities Commission seven times, in addition to the South Carolina Public Service Commission, the Kansas Corporation Commission twice, and the Texas Public Utility Commission. Kristi has coordinated and participated in numerous public open house meetings, several with an attendance of more than 500 people, and she has managed both permitting and right-of-way tasks for multiple projects. Permits have included: Section 404/401 water quality permits; Section 10 river crossing permits; threatened and endangered species surveys, clearances, and mitigation management for the bald eagle, Indiana bat, northern long-eared bat, lesser and greater prairie chickens, whooping cranes, and others; cultural resources and Section 106 clearances; National Pollutant Discharge Elimination System (NPDES) and Storm Water Pollution Prevention Plan permits; road and railroad crossing permits; and various state and local permits and clearances.

Kristi has investigated social, environmental, and engineering constraints for multiple transmission line routing projects. Issues have included investigating the feasibility of underground construction, restricted approach surfaces at airports and airstrips, sensitive species habitat, wetlands, residential growth areas and developments, forest and agricultural impacts, cultural resources, crossings of state and federally owned lands, and other locally significant impacts. Kristi managed and evaluated collected data to identify the most socially and environmentally acceptable routes, and prepared reports to summarize the methodology and results for the client and the public.

Public participation programs involved coordinating and preparing displays and documents for community advisory councils and public open houses. She has addressed a variety of questions and issues posed by the public and local agency personnel at project open houses and agency workshops. Kristi has also created questionnaires to elicit public concerns and compiled the responses for use in the routing analysis.

Kristi is the coordinator and a principal instructor for Burns & McDonnell's training seminar on transmission line routing and public involvement for utilities. She also coauthored Burns & McDonnell's Transmission Line Routing Manual. She has published articles on environmental issues for underground transmission lines in the International Right-of-Way

Association's Right of Way Magazine and Florida's Relay magazine. Kristi also wrote an article on the use of new technologies to help identify and evaluate transmission line routes in Transmission and Distribution World.

Below is a description of selected transmission line projects Kristi has managed or supported across the country.

Craggy to Enka 230-kilovolt (kV) Transmission Line Project | Duke Energy Progress

Asheville, North Carolina | 2014

Project director directing the routing and public involvement activities for this 10- to 20-mile 230-kV transmission line project connecting Duke Energy Progress' existing Craggy Substation with their existing Enka Substation. The project is located in a highly developed area in Asheville, North Carolina. The routing is made even more challenging by the eminent domain law in North Carolina that prohibits Duke Energy Progress from condemning yards and gardens. As a result, the project may require extending the project about twice the length to avoid the largest concentrations of development, causing the potential to extend into mountainous and wooded terrain. Duke Energy Progress is also investigating the possibility of rebuilding an existing line within a very restricted-width right-of-way that extends through heavy residential development and may result in engineering challenges to avoid having homes within the proposed right-of-way.

Foothills to Asheville 230-kilovolt (kV) Transmission Line Project | Duke Energy Progress

Southwestern North Carolina and Northwestern South Carolina | 2014

Project director directing the routing and public involvement activities for this 45-mile 230-kV transmission line project connecting Duke Energy Progress' existing Asheville Substation with a new Foothills Substation located in South Carolina, near Campobello. The project extends through mountainous terrain containing large federal, state, and local easements and lands with protected species and other concerns, as well as through a portion of the cities of Hendersonville and Asheville. The Asheville Substation is located in a highly developed area and just north of the Asheville Airport. In addition to environmental concerns and development, there are many cultural resources located throughout the study area, which present additional challenges. The project is also of significant concern to the public, as it runs through horse farms, areas of visual concern, and high-value subdivisions. The public involvement process resulted in more than 3,000 public comments.

Greentown to Reynolds 765-kilovolt (kV) Transmission Line Project | Northern Indiana Public Service Company (NIPSCO)/Pioneer

North Central Indiana | 2013–2015

Project manager for the routing, public involvement, and permitting activities for this 70-mile 765-kV transmission line project connecting the Reynolds and Greentown substations in north central Indiana. The project is jointly managed by NIPSCO and Pioneer (Duke Energy and American Electric Power). The project scope included route development and selection, advisory group meetings, two rounds of open houses, website/hotline setup and management, implementation of OneTouchPM, and other public input activities, as well as detailed wetlands, protected species, and cultural surveys and permit acquisition. The project budget exceeded $2 million and included detailed scheduling tasks, earned value reporting, cash flow estimating, and other project controls.

Reynolds to Topeka 345-kilovolt (kV) Transmission Line Project | Northern Indiana Public Service Company

North Central Indiana | 2012–2014

Project manager for the routing, public involvement, permitting, right-of-way acquisition, and preliminary substation and transmission line design activities for this 100-mile 345-kV transmission line project connecting the Reynolds, Burr Oak, and Hiple substations in north central Indiana. The project included route identification, analysis, and selection; public involvement activities, such as advisory group meetings; two rounds of open houses; website/hotline setup and management; implementation of OneTouchPM, and other public input activities; detailed environmental surveys for wetlands, protected species, and cultural resources and acquisition of necessary permits; and right-of-way acquisition for more than 600 parcels. The project budget exceeded $8 million and included detailed scheduling tasks, earned value reporting, and other project controls. The overall agreement managed by Kristi exceeded $10 million.

Dowling Substation and 138-kilovolt (kV)/345-kV Transmission Line Project | FirstEnergy

Perrysburg, Ohio | 2012–2013

Project manager for the routing and substation siting for this project near Perrysburg, Ohio. The project involved siting and construction of a new 138-kV and 345-kV substation and new 138-kV and 345-kV transmission line connections, which totaled approximately 5 miles through high-quality cropland outside of Perrysburg. Kristi directed the preparation of Letters of Notification to the Ohio Power Siting Board for approval of the proposed substation and transmission lines. She also prepared exhibits for and attended a public informational meeting.

Northern Ohio Corridor Study | FirstEnergy (FE)

Northern Ohio | 2012

Project manager for the investigation of more than 30 different potential routing corridors, totaling nearly 1,500 miles, for new 345-kilovolt (kV) transmission lines in northern Ohio for FirstEnergy. Investigations included identifying appropriately sized study areas to conduct the feasibility assessments, followed by documenting constraints and opportunities within each study area, in case FE chose to construct a new 345-kV line between the proposed new or existing substations. The team reviewed and evaluated the potential to expand existing substations, the feasibility of siting new substations in certain areas, and the feasibility of constructing a transmission line in the area. The study involved documenting cities; linear facilities, such as highways and transmission lines; large developments; cultural resources; parks and recreation areas; land uses; and other resources that would affect the potential for constructing the new line. This study ultimately resulted in a feasibility assessment by the team, which was led by Kristi.

Bowers to Howard 230-kilovolt (kV) Transmission Line Project | Southwestern Public Service (SPS) Company/Xcel Energy

Texas Panhandle | 2011–2013

Project manager for the routing and public involvement activities for this 20-mile 230-kV project in the panhandle of Texas. Several other transmission lines have been proposed and constructed in the area, so landowners and agencies are sensitive to additional construction. The project is within the estimated occupied range of the lesser prairie-chicken (LPC). Kristi and team assisted SPS with the preparation of the application for a Certificate of Convenience and Necessity from the Texas Public Utility Commission and prepared written testimony in support of the project. Following submittal of the application, Kristi and team assisted SPS with assessing the potential impact of the project to the LPC.

Goodyear to MacVicar to 17th Street and Fairlawn 115-kilovolt (kV) Transmission Line Project | Westar Energy

Topeka, Kansas | 2011–2012

Project manager for this short 10-mile 115-kV project in Topeka, Kansas. Kristi managed the routing and public involvement activities. Primary routing issues included finding routes through an urban, highly developed environment and avoiding parks and recreation areas (such as the Gage Park zoo), cemeteries, commercial developments, and tightly-spaced homes. A portion of the project also crossed the Kansas River and required a Section 10 permit from the U.S. Army Corps of Engineers.

Central A to Central C to Sam Switch to Navarro 345-kilovolt Project | Lone Star Transmission

Central Texas | 2009–2010

Assistant project manager for this 300-mile project for Lone Star Transmission, a new transmission supplier in Texas. The project was part of the Transmission Optimization Study for Competitive Renewable Energy Zones in Texas. Kristi developed more than 1,000 miles of route alternatives, participated in open houses to gather public input, and analyzed the routes according to the Texas Public Utility Commission's rules and requirements for an Application for a Certificate of Convenience and Necessity, which was filed on May 24, 2010. Kristi also helped prepare responses to Requests for Information during the discovery phase of the project, and attended the week-long hearings and provided testimony support.

Gray to Tesla, Gray to White Deer, and Silverton to Tesla 345-kilovolt Project | Cross Texas Transmission

Texas Panhandle | 2009

Assistant project manager for budgets and overall project completion activities for these three projects totaling approximately 200 miles in the Texas Panhandle. Routes were developed and analyzed according to the requirements for Competitive Renewable Energy Zones projects in Texas by the Texas Public Utilities Commission. Kristi participated in open houses for the projects. Unlike most transmission siting projects, the majority of the public potentially affected by these transmission lines actually desired the line on their property to facilitate the siting of wind farms in the vicinity. The projects also extended through potential habitat for the lesser prairie-chicken, a species unlisted at the time of the project but of utmost concern to the wildlife agencies.

Viola to Medicine Lodge, Kansas to Woodward, Oklahoma 345-kilovolt (kV) | Prairie Wind Transmission (Westar Energy and American Electric Power)

South Central Kansas | 2008–2011

Project manager for the routing and public involvement activities for this project. The project, as initially conceived in 2008, was a 230-mile 765-kV project, but was redeveloped in 2010 to be a 345-kV line from Wichita, Kansas, to Spearville, Kansas, and from Medicine Lodge, Kansas, south to Woodward, Oklahoma. Prairie Wind's portion of the revamped project extended 110 miles from Wichita to Medicine Lodge and south from Medicine Lodge to the Oklahoma border. Primary routing issues included minimizing impacts to residences, center-pivot irrigation systems, oil and gas wells, pumps and tanks, lesser prairie-chicken habitat, and the environmentally sensitive Red Hills. A routing study was prepared to support Prairie Wind Transmission's Application to the Kansas Corporation Commission (KCC) for a siting permit. Kristi also attended two public hearings held by the KCC and testified on behalf of Prairie Wind Transmission at the technical hearing.

Richmond to Fort Bragg Woodruff Street Project | Progress Energy Carolinas

Southern North Carolina | 2007–2008

Project manager for the routing and public involvement efforts for this 70-mile 230-kV transmission line, which involved crossing Fort Bragg, a military base in Fayetteville, North Carolina. The primary issues involving routing included working with military personnel to identify a workable on-base route. The project would also have to avoid or minimize potential impacts to the Lumber River, a state and federally designated Wild and Scenic River; state-owned lands, including Lumber River State Park; dedicated and registered natural areas; natural heritage sites; Nature Conservancy lands; U.S. Fish and Wildlife Service Safe Harbor lands; wetlands; private and public airstrips and airports; foraging and nesting habitat of the red-cockaded woodpecker and other sensitive species; and concentrations of residential development. The project required the preparation of an application for a Certificate of Environmental Compatibility and Public Convenience and Necessity for the North Carolina Utilities Commission. Kristi also testified on behalf of Progress Energy at a technical hearing in Raleigh.

Harris to Durham 230-kilovolt (kV) Project | Progress Energy Carolinas

Raleigh, Cary, and Durham, North Carolina | 2007

Project manager for this three-phase project that involved developing a defensible rationale for rebuilding an existing 115-kV line to 230-kVfor approximately six miles between Apex and Cary; rationale for using an alignment for another eight miles from Cary to Research Triangle Park (RTP), where no existing line had been constructed but easements had been negotiated; and developing new routes for another two sections of the project, from the Harris Nuclear Plant to Apex and from RTP into Durham. The project involved updating the information initially collected when the 115-kV line was routed, providing a cost estimate for placing the line underground along existing lines, and submitting the information to the North Carolina Utilities Commission. The primary issues related to the development of new routes between RTP and the Durham Substation were the concentration of existing and new developments (both commercial and residential) covering the project area, the presence of the Raleigh Durham International Airport and associated lands, avoidance of state parks and lands designated as "open space," and the development requirements within the RTP.

Rose Hill to Sooner Project | Westar Energy and Oklahoma Gas & Electric Company

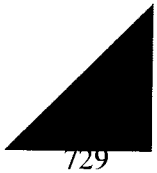
South-central Kansas and North-Central Oklahoma | 2007

Project manager for the route development, public involvement program, route analysis, and documentation for this 80-mile project. Documentation for the Kansas portion of the project was completed to satisfy the requirements for review by the Kansas Corporation Commission. The Oklahoma portion of the project did not require oversight by a utility commission. Primary issues involved avoiding concentrations of residential and commercial development, assessing potential impacts to Native American lands in Oklahoma, and minimizing impacts to agricultural operations.

Central Missouri Generation and Transmission Project | Associated Electric Cooperative

Central and Northwestern Missouri | 2005–2006

Project manager for the transmission line routing portion of this project. Kristi identified and analyzed macro-level corridors, completed a routing study, and coordinated National Environmental Policy Act-driven tasks with the Rural Utilities Service, as well as routing efforts with NW and Central Electric Cooperatives for this 345-kilovolt transmission line associated with a proposed coal-fired power plant. Corridors and routes were identified for two proposed power plant sites with four different interconnections. Approximately 250 miles of corridors were developed. Kristi was also involved in the conceptualization and development of materials for project scoping meetings. Primary issues concerning the transmission line involved impacts to homes and potential collisions of waterfowl using a nearby federal refuge.



Middletown to Norwalk Project | Northeast Utilities Service Company (NUSCO)
Southwestern Connecticut | 2002–2005

Assistant project manager who assisted with the development of routes, preparation of a Certificate of Environmental Compatibility and Public Convenience and Necessity, and public involvement for this 70-mile, 345-kilovolt transmission line, including overhead and underground construction in NUSCO. As proposed, approximately 25 miles of the transmission line would be placed underground within local streets and highways. Kristi investigated alternative routes for both the underground and overhead portions of the project, participated in multiple open houses held in each affected town, and prepared text for the application documenting the investigation of available routes and the selection of the proposed alternative. She also assisted Burns & McDonnell's Transmission and Distribution personnel with the preparation of design documentation and drawings.

Arrowhead to Weston | Wisconsin Public Service and Minnesota Power
Northwestern Wisconsin | 1999–2000

Principal investigator who assisted in the preparation of a routing application to the Public Service Commission for Wisconsin Public Service and Minnesota Power for a 250-mile 345-kilovolt transmission line extending from Wausau, Wisconsin, to Duluth, Minnesota. Kristi conducted extensive site surveys for residences and other sensitive features potentially impacted by the proposed routes, and she also designed a database for the input, organization, and presentation of an extensive amount of project data. She prepared aerial photographs, quadrangle maps, and floodplain maps for public presentation, and contacted county officials for information regarding zoning, land use, and forest impacts.

PUC DOCKET NO. 45624

APPLICATION OF THE CITY OF GARLAND, TEXAS, FOR A CERTIFICATE OF CONVENIENCE AND NECESSITY FOR THE PROPOSED RUSK TO PANOLA DOUBLE-CIRCUIT 345-KV TRANSMISSION LINE IN RUSK AND PANOLA COUNTIES, TEXAS	§	BEFORE THE PUBLIC UTILITY COMMISSION OF TEXAS

DIRECT TESTIMONY

OF

CHRIS MCCALL

ON BEHALF OF

THE CITY OF GARLAND

FEBRUARY 25, 2016

CITY OF GARLAND
DIRECT TESTIMONY OF CHRIS MCCALL

TABLE OF CONTENTS

EXHIBITS

I. INTRODUCTION

Q1. PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.

A. My name is Chris McCall, P.E. I am a Project Manager for Burns & McDonnell Engineering Inc. My current business address is 9400 Ward Parkway, Kansas City, MO 64114.

Q2. BY WHOM ARE YOU EMPLOYED AND IN WHAT CAPACITY?

A. I am a Project Manager for Burns & McDonnell Engineering Inc.

Q3. PLEASE DESCRIBE YOUR JOB RESPONSIBILITIES, PARTICULARLY AS THEY RELATE TO YOUR TESTIMONY IN THIS PROCEEDING.

A. My responsibilities for project management include preparing cost estimates and schedules for various project tasks as well as developing and managing contracts and sub-consultants. I also manage engineering personnel responsible for the detailed design tasks of transmission line facilities. Major tasks performed under my supervision include: transmission line design and structure spotting using the PLS-CADD suite of software; conductor selection studies; insulator and hardware design; grounding design; lightning performance studies; preparation of project cost estimates; preparation of procurement and construction specifications; preparation of Bills of Materials; and preparation of Issued for Construction drawing packages.

Q4. ARE YOU AND YOUR STAFF RESPONSIBLE FOR THE ENGINEERING AND DESIGN OF THE PROJECT INVOLVED IN THIS PROCEEDING?

A. Burns & McDonnell are principally responsible for creating preliminary plans and exhibits, cost estimates, specifications for the overhead transmission lines of the Rusk to Panola Transmission Line Project ("Project") as proposed by the City of Garland, dba Garland Power & Light ("Garland"), and Rusk Interconnection LLC ("Rusk"). An Engineering, Procurement and Construction ("EPC") firm will be hired to perform the final engineering and design of the project. Our team will provide engineering oversight on behalf of Garland and Rusk.

Q5. PLEASE DESCRIBE YOUR EDUCATIONAL AND PROFESSIONAL QUALIFICATIONS AND BUSINESS EXPERIENCE.

A. I am a Professional Engineer in the states of Kansas, California, and Nevada with a Bachelor Degree in Civil Engineering from Oklahoma State University. I graduated in 2005. Since 2005 I have worked for Burns & McDonnell as an Assistant, Staff, and Senior Structural engineer within the electrical transmission industry. From an engineering standpoint, I have mainly supported Overhead Transmission projects in the development of line configuration, structure design, foundation design, and overall system design. From approximately 2011 to the present I have also worked in Project Management for a number of transmission design and construction projects.

Q6. HAVE YOU PREVIOUSLY PERFORMED WORK RELATED TO TRANSMISSION LINE ADMINISTRATIVE PROCEEDINGS?

A. Yes, I have.

Q7. HAVE YOU TESTIFIED PREVIOUSLY BEFORE THE PUBLIC UTILITY COMMISSION OF TEXAS?

A. No, I have not.

II. PURPOSE OF TESTIMONY

Q8. WHAT IS THE PURPOSE OF YOUR TESTIMONY?

A. I describe the engineering design plan for the Project's high voltage alternating current ("AC") overhead transmission lines and the ability of this design to maintain safe parameters following the minimum requirements of the National Electric Safety Code ("NESC"). My testimony summarizes estimated schedule and cost for the Project, conductor and structure selection, and potential impacts on right-of-way, facilities, and other utilities.

Q9. WHAT PORTIONS OF THE APPLICATION IN THIS DOCKET DO YOU SPONSOR OR CO-SPONSOR?

A. The preliminary transmission line design expectations including sections 4, 5, 6, 7, 8, 11, 13, 15 and 16 of the CCN Application Form.

Q10. WERE YOUR TESTIMONY, AND THE INFORMATION YOU HAVE IDENTIFIED AS SPONSORING, PREPARED BY YOU OR BY KNOWLEDGEABLE PERSONS UNDER YOUR SUPERVISION AND UPON WHOSE EXPERTISE, JUDGMENT AND OPINIONS YOU RELY IN PERFORMING YOUR DUTIES?

A. Yes, my testimony was prepared by me and by knowledgeable persons under my supervision.

Q11. IS THE INFORMATION THAT IS CONTAINED IN YOUR TESTIMONY AND THAT YOU ARE SPONSORING TRUE AND CORRECT TO THE BEST OF YOUR KNOWLEDGE AND BELIEF?

A. Yes, it is correct to the best of my knowledge and belief.

III. PROJECT DESCRIPTION AND ESTIMATED SCHEDULE

Q12. PLEASE DESCRIBE THE RUSK TO PANOLA TRANSMISSION PROJECT.

A. The proposed Project is a double-circuit, 345-kilovolt ("kV") alternating current ("AC") electrical transmission line between the new Rusk Switching Station to be located in Rusk County, Texas, and the new Panola Switching Station to be located in eastern Panola County, Texas. The proposed transmission line is required to provide a physical interconnection with the Southern Cross Transmission Line ("SCT") project as directed by the Federal Energy Regulatory Commission ("FERC") under the authority of the Federal Power Act. The design and operating voltage rating for the proposed transmission line is 345-kV.

The Project is approximately 37-40 miles of proposed double circuit 345-kV transmission line expected to be supported by monopole steel structures. A typical in-line tangent structure is expected to be approximately 135-145 feet tall. The line is expected to have structures spaced at 800 foot intervals depending on terrain and crossing requirements.

Q13. WHAT IS THE ESTIMATED SCHEDULE FOR THE PROJECT?

A. The estimated schedule for the Project is set out in the following table:

Estimated Dates of:	**Estimated Start Date**	**Estimated Completion Date**
Right-of-way (ROW) and Land Acquisition	March 2017	April 2018
Engineering and Design	May 2017	February 2018
Material and Equipment Procurement	March 2018	Ongoing throughout Construction
Construction of Facilities	2018-2019	2021
Energize Facilities	2021	Within 30 days of completion of construction

Note: This is the currently anticipated schedule and is subject to change.

IV. CONDUCTOR AND STRUCTURE SELECTION

Q14. WHAT CONDUCTOR IS PROPOSED FOR THE PROJECT?

A. The conductor is anticipated to be twin-bundled (2) 1590 kcmil 54/19 "FALCON" ACSS.

Q15. WHY IS THIS CONDUCTOR TYPE PROPOSED?

A. This conductor type meets the Megavolt-amperes ("MVA")/current and temperature requirements proposed for the Project.

Q16. WHAT IS THE CURRENT RATING FOR THIS CONDUCTOR?

A. The current rating for the conductor is 2350 MVA or 4140 amps per phase.

Q17. PLEASE DESCRIBE THE TRANSMISSION STRUCTURE THAT IS EXPECTED TO BE USED ON THIS PROJECT.

A. The final transmission structures will be designed by the selected EPC contractor. However, as noted above, and based on the known project parameters, structures are expected to be approximately 135-145 feet in height on average and maintain a typical 800 foot span length. Structures are expected to be single monopoles supporting two circuits or six total phases and two overhead shield wires all on arms. There is some potential that large angle deadend structures would be constructed on two single poles supporting a single circuit and shield wire respectively. Under some circumstances, such as river crossings, lattice structures may also be used. Examples of the conceptualized structures can be seen in the sketches included with the Environmental Assessment and Alternative Route Analysis Report as Figures 2-1 through 2-4.

Q18. WHAT FACTORS LED TO THE APPLICANT'S DECISION TO USE A SINGLE-POLE STRUCTURE?

A. Single pole structures offer a limited footprint and significantly reduced construction requirements as related to similar lattice tower options. Additionally, during the public meetings held for this Project, landowners indicated a preference for the single-pole steel design.

V. PROJECT IMPACT ON RIGHT-OF-WAY, FACILITIES, AND OTHER UTILITIES

Q19. PLEASE DESCRIBE THE RIGHT-OF-WAY IMPACTED BY THIS PROJECT.

A. The Project is expected to have approximately 37 to 40 miles of right-of-way and approximately 74 to 80 miles of circuit. The right-of-way will be 150 feet wide, but may be wider in exceptional circumstances. Technical right-of-way width requirements were determined assuming the minimum electrical clearances requirements of the NESC to ground and potential obstructions, such as, but not limited to, vegetation, buildings, or sign posts located at the edge of the right-of-way. Width evaluations were made assuming the typical 800 foot span length and average 135-145 foot structure heights under mandated wind conditions providing for conductor blow out to the edge of the right-of-way.

Q20. PLEASE DESCRIBE WHETHER ANY NEW OR EXISTING HVDC CONVERTER STATIONS, SUBSTATIONS OR SWITCHING STATIONS WILL BE ASSOCIATED WITH THE PROJECT.

A. Rusk and Panola switching stations are associated with the Project. Panola Station will connect with the SCT high-voltage direct current ("HVDC") converter station located across the border in Louisiana.

Q21. WHAT EFFECT WILL THE PROJECT HAVE ON OTHER ELECTRIC UTILITIES?

A. The Rusk Switching Station will be owned and operated by Oncor Electric Delivery Company and will serve as the origination point for the Rusk to Panola double-circuit 345-kV transmission line. Mr. Parquet's direct testimony discusses reliability and interconnection studies performed by Oncor that evaluate the effect of the Project on the ERCOT grid. Other utilities in the vicinity of the project include Deep East Texas Electric Cooperative, Inc., Panola Harrison Electric Cooperative, Inc., Rusk County Electric Cooperative, Inc., and Southwestern Electric Power Company. The Project is expected to have little or no physical effect on these existing electric utilities.

VI. ESTIMATED COST AND ENGINEERING OF THE PROPOSED ROUTES

Q22. WHAT IS THE ESTIMATED COST RANGE FOR THE PROJECT AND THE PANOLA SWITCHING STATION?

A. The estimated costs for the routes proposed in the application and for the Panola Switching Station are shown in Exhibit CM-1.

Q23. DO THE ESTIMATED COSTS PROVIDED IN THE APPLICATION REFLECT THE ACTUAL TRANSMISSION PROJECT COSTS FOR THE ROUTE TO BE CONSTRUCTED?

A. No. The costs are only estimates. Since the approved line route has not yet been determined by the Commission or surveyed by the construction team, the final cost estimates for the proposed line segments have not been performed. The estimates provided in Exhibit CM-1 are based on factors such as estimated structure costs and estimated costs per mile for right-of-way, conductor, and labor.

Q24. DOES THE PROJECT ADEQUATELY CONSIDER ELECTRICAL EFFICIENCY AND RELIABILITY?

A. Yes, the proposed transmission project adequately considers electrical efficiency and reliability. A transmission line constructed on any of the alternative routes will be engineered so that the line itself will be electrically efficient and reliable.

Q25. DOES THE TRANSMISSION LINE DESIGN FOR THE PROJECT MEET THE REQUIREMENTS OF THE NATIONAL ELECTRICAL SAFETY CODE (NESC)?

A. Yes, the transmission line design will meet the requirements of the latest NESC and any local or Electric Reliability Council of Texas ("ERCOT") design requirements. In addition to being required by law, these requirements will also be specified by Garland and Rusk to the EPC contractor.

VII. ALTERNATIVES CONSIDERED

Q26. WERE OTHER ALTERNATIVES TO THE PROJECT CONSIDERED?

A. The Project is designed to connect the SCT transmission project to the ERCOT grid at the locations specified in FERC Docket No. TX11-1-001, so alternatives such as upgrades to existing facilities, distribution upgrades or distributed generation are not available.

VIII. SUMMARY AND CONCLUSION

Q27. PLEASE SUMMARIZE YOUR TESTIMONY.

A. In this application, Garland proposes a double-circuit 345-kV transmission line from the new Rusk Switching Station to the new Panola Switching Station. My testimony summarizes estimated schedule and cost for the Project, conductor and structure selection, and potential impacts on right-of-way, facilities, and other utilities.

Q28. DOES THIS CONCLUDE YOUR DIRECT TESTIMONY?

A. Yes, it does.

City of Garland
345-kV Double Circuit AC Transmission Line
Rusk Station to Panola Station, 2350 MVA

Revision Date: 2/19/2016

RUSK-PANOLA ROUTE SUMMARY

	RP4	RP5	RP8	RP10	RP16	RP28	RP41	RP46	RP50	RP53	RP82	RP93
Distance (Miles)	37.4	37.1	38	37.7	37.4	37.6	39.8	39.7	38.1	39.2	39.3	36.9
Right-of-Way and Land Acquisition	$ 4,079,592	$ 4,046,868	$ 4,145,040	$ 4,112,316	$ 4,079,592	$ 4,101,408	$ 4,341,384	$ 4,330,476	$ 4,155,948	$ 4,275,936	$ 4,286,844	$ 4,025,052
Engineering and Design (Utility)	-	-	-	-	-	-	-	-	-	-	-	-
Engineering and Design (Contract)	$ 2,888,743	$ 2,820,950	$ 2,930,499	$ 2,901,560	$ 2,852,429	$ 2,827,384	$ 2,991,380	$ 2,989,016	$ 2,841,129	$ 2,861,310	$ 2,919,860	$ 2,894,097
Procurement of Material and Equipment (Including stores)	$ 46,584,538	$ 45,680,890	$ 47,291,824	$ 46,460,647	$ 46,378,241	$ 45,549,228	$ 48,764,284	$ 48,678,053	$ 46,826,613	$ 47,462,862	$ 48,243,331	$ 46,833,168
Construction of Facilities (Utility)	-	-	-	-	-	-	-	-	-	-	-	-
Construction of Facilities	$ 52,586,908	$ 51,230,770	$ 53,271,492	$ 53,138,030	$ 51,582,715	$ 51,576,890	$ 53,828,395	$ 53,835,797	$ 50,757,673	$ 50,794,147	$ 51,965,350	$ 52,516,724
Other (all costs not included in the above categories)	-	-	-	-	-	-	-	-	-	-	-	-
Total Cost	**$ 106,139,781**	**$ 103,779,478**	**$ 107,638,855**	**$ 106,612,554**	**$ 104,892,976**	**$ 104,054,910**	**$ 109,925,443**	**$ 109,833,342**	**$ 104,581,362**	**$ 105,394,256**	**$ 107,415,385**	**$ 106,269,040**
Cost per mile	**$ 2,837,962**	**$ 2,797,291**	**$ 2,832,601**	**$ 2,827,919**	**$ 2,804,625**	**$ 2,767,418**	**$ 2,761,946**	**$ 2,766,583**	**$ 2,744,918**	**$ 2,688,629**	**$ 2,733,216**	**$ 2,879,920**

Notes
1 Costs are in 2016 dollars and do not include escalation
2 An adder for design allowances is not included Typically 10-20% is added for design allowances for projects of this size
3 Contingency costs are not included Typically 20-30% is included for contingency for projects of this size
4 A 15% contractor markup is used for all materials
5 The average span length for all routes was assumed to be 800ft
6 All structures are assumed to be tubular steel

	Panola 345kV Switchyard
Right-of-Way and Land Acquisition	$ 494,100
Engineering and Design (Utility)	$ -
Engineering and Design (Contract)	$ 1,150,000
Procurement of Material and Equipment (Including stores)	$ 4,600,000
Construction of Facilities (Utility)	$ -
Construction of Facilities	$ 5,750,000
Other (all costs not included in the above categories)	$ -
Total Cost	**$ 11,994,100**

Notes:

1. Costs are in 2016 dollars and do not include escalation.
2. An adder for design allowances is not included. Typically 10-20% is added for design allowances for projects of this size.
3. Contingency costs are not included. Typically 20-30% is included for contingency for projects of this size.
4. A 15% contractor markup is used for all materials.