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PUC DOCKET NO. 55067

DIRECT TESTIMONY
OF BRENDA J. PERKINS, WITNESS FOR
ONCOR ELECTRIC DELIVERY COMPANY LLC

DIRECT TESTIMONY OF BRENDA J. PERKINS

I. POSITION AND QUALIFICATIONS

Q. PLEASE STATE YOUR NAME AND ADDRESS.

A. My name is Brenda J. Perkins. I am a self-employed consultant for Oncor Electric Delivery Company LLC ("Oncor") with the role of CCN Project Manager, Sr. My business address is 777 Main Street, Suite 1311-12, Fort Worth, Texas 76102.

Q. PLEASE DESCRIBE YOUR PROFESSIONAL QUALIFICATIONS.

A. I graduated from the University of Texas at Arlington with a Bachelor of Science in Civil Engineering in 1981. I am a registered professional engineer in Texas (certificate number 59883). I first worked as an engineering intern before graduation, then as a civil engineer after graduation, for Texas Power and Light Company ("TP&L") in its Transmission Engineering department. My work assignments included providing engineering design and project management during the construction of transmission lines.

In 1986, I resigned from TP&L to become a stay-at-home mother for ten years. During this ten-year period, I briefly worked part-time for Anchor Metals, Inc. and Meyer Industries analyzing and designing tubular steel poles and steel lattice towers for transmission line structures. In 1996, I formed my corporation, BJ Perkins Corporation, and have been an engineering consultant for Oncor on numerous transmission line projects. I have provided project support for the routing, engineering, and right-of-way acquisition of numerous Competitive Renewable Energy Zone ("CREZ") projects. Recently, I have provided project support for the routing of numerous non-CREZ transmission projects. My educational and professional qualifications are outlined in Exhibit BJP-1, attached hereto.

Q: HAVE YOU EVER SUBMITTED TESTIMONY BEFORE THE PUBLIC UTILITY COMMISSION OF TEXAS ("COMMISSION")?

A: Yes. I provided testimony in Docket Nos. 37408, 37529, 37530, 38324, 38517, 38677, 42087, 42583, 47368, 47808, 48095, 48785, 48909, 49151, 49302, 49723, 50410, 52455, 53053, and 54733.

II. PURPOSE OF TESTIMONY

Q. WHAT IS THE PURPOSE OF YOUR DIRECT TESTIMONY?

A. The purpose of my direct testimony is to address certain aspects of Oncor's proposed Ramhorn Hill-Dunham 345 kV transmission line project (the "Proposed Transmission Line Project") on behalf of Oncor, including:

- the public participation meetings;
- routing considerations, including selection of the route that best meets the factors set forth in Texas Utilities Code § 37.056 and the Commission's rules, and the other alternative routes included in Oncor's Standard Application for a Certificate of Convenience and Necessity ("CCN") for a Proposed Transmission Line (the "Application");
- the adequacy and geographic diversity of Oncor's filed routes; and
- notice provided pursuant to Commission rules.

The statements and opinions expressed in this testimony are based on my: (1) previously described industry experience in the evaluation of transmission line routes; (2) independent review and evaluation of the data included in the *Environmental Assessment and Routing Study for the Proposed Ramhorn Hill Switch to Dunham Switch 345 kV Transmission Line Project in Denton and Wise Counties, Texas* ("Environmental Assessment"), prepared by Halff Associates, Inc. ("Halff") and included as Attachment No. 1 to the Application; (3) discussions with Oncor personnel; (4) discussions with Halff personnel who participated in the development of the Environmental Assessment; (5) interactions at the public participation meetings; (6) observations of the project area during reconnaissance investigations; (7) understanding of Texas Utilities Code § 37.056 and 16

Texas Administrative Code ("TAC") §§ 22.52 and 25.101 (attached hereto as Exhibits BJP-2, BJP-3 and BJP-4, respectively); and other factors.

In addition to the testimony offered herein, I sponsor Oncor's responses to Question Nos. 17-19 and 21-29 in the Application filed in this docket, as well as Attachment Nos. 7-17 to the Application. The facts and statements set forth in those responses and attachments are true and correct. The Application and its attachments, as may be amended and/or supplemented, will be offered into evidence by Oncor at the hearing on the merits.

III. PUBLIC PARTICIPATION MEETINGS

Q. DID ONCOR HOLD A PUBLIC PARTICIPATION MEETING FOR THE PROPOSED TRANSMISSION LINE PROJECT PRIOR TO FILING THE APPLICATION?

A. Yes. Oncor hosted two public open house meetings prior to filing this CCN Application. Oncor, Halff representatives, and personnel from Integra Realty Resources ("Integra"), Oncor's property abstracting contractor for the Proposed Transmission Line Project, attended these meetings. The meetings occurred on December 7 and 8, 2022, from 4:00 to 7:00 p.m. at the Marriott Hotel & Golf Club at Champions Circle in Fort Worth, Texas.

Q. WHAT WAS THE PURPOSE OF THE PUBLIC PARTICIPATION MEETINGS?

A. The purpose of the meetings was to, among other things, solicit comments and input from residents, landowners, public officials, and other interested parties concerning the Proposed Transmission Line Project, the preliminary alternative route links, and the overall transmission line certification process and schedule. Such meetings ensure that the values and concerns of the public are adequately identified and considered. Additionally, Oncor utilized the public meeting process to provide information about the Proposed Transmission Line Project, including the purpose, need, routing, potential benefits, and impacts.

Q. HOW DID ONCOR PROVIDE NOTICE OF THE PUBLIC PARTICIPATION MEETINGS?

A. Oncor mailed 2,068 individual written notices by first class mail to all owners of property within 500 feet of the proposed route centerlines for the Proposed Transmission Line Project. Given the accuracy limitations of appraisal district data and aerial photography, notice was intentionally over-inclusive and was provided to properties crossed by or within 520 feet of the proposed route centerlines. The public participation meeting notice was also sent by email to the Department of Defense Siting Clearinghouse. A representative copy of the public participation meeting notice mailed to property owners is located in Appendix B of the Environmental Assessment.

Q. WAS ANY OTHER FORM OF NOTICE USED TO ADVERTISE THE PUBLIC PARTICIPATION MEETINGS?

A. Yes. Oncor published notice of the public participation meetings on November 26 and 27, 2022, in the *Denton Record Chronicle* and on November 23, 2022, in the *Wise County Messenger*, newspapers having general circulation in Denton and Wise Counties, respectively. This notice announced the location, time, and purpose of the meetings. A representative copy of the newspaper notices for the public participation meetings can be found in Appendix B of the Environmental Assessment.

Q. PLEASE EXPLAIN THE PUBLIC PARTICIPATION MEETING PROCESS.

A. Oncor held the public participation meetings in an informal, open-house format with information stations relating to various aspects of the project's development. Oncor provided packets of information containing frequently asked questions and the responses to those questions, a map showing the location of the preliminary alternative route links, and a questionnaire for interested parties to fill out.

Each station also had exhibits, maps, aerial photography, and/or other information describing certain aspects of the Proposed Transmission Line Project and was staffed by representatives of Oncor, Halff, and/or

Integra. For example, the various stations included information regarding the CCN process, a discussion of the need for the project, property ownership information, preliminary alternative route links and routing constraints, and environmental and engineering considerations.

The various exhibit areas were arranged to provide attendees with a sequential approach to the information presented as well as the freedom to visit each of the exhibits in any order they wished and to spend as much time as desired at each station. An area was also set aside with tables and chairs to allow attendees an opportunity to complete questionnaires in close proximity to the exhibits. Other resources, such as a GIS (Geographic Information System) mapping tool, were readily available to provide further information on issues that warranted additional discussion or clarification.

The information station format was used because it is Oncor's experience that this format allows attendees to learn about the project in a relaxed manner, to focus on issues of most interest to attendees, and to ask questions of Oncor representatives with knowledge of the various topics presented. Furthermore, this format facilitates more interaction with those attendees who might have been hesitant to participate in a speaker-audience format. This format has been successfully used by Oncor in many CCN proceedings.

Q. HAS ONCOR COMPLIED WITH 16 TAC § 22.52(a)(4) CONCERNING PUBLIC MEETING REQUIREMENTS?

A. Yes. Oncor's public participation meetings satisfied all the requirements set forth in 16 TAC § 22.52(a)(4).

Q. HAVE ONCOR'S OUTREACH EFFORTS CEASED WITH THE PUBLIC PARTICIPATION MEETINGS?

A. No. Even after the public participation meetings, Oncor continued to engage with property owners, municipalities, and state officials to provide notice, solicit feedback, and encourage participation.

Q. PRIOR TO FILING THE APPLICATION, DID ONCOR HAVE FORMAL OR INFORMAL CONTACT WITH DEVELOPERS ABOUT THE PROJECT?

A. Yes, in light of rapid commercial and residential growth experienced in and around the study area—including large residential subdivisions, master planned communities, and commercial and industrial developments—Oncor had formal and/or informal contacts with several developers during routing development, prior to the Application's filing. Oncor met with the following developers regarding the Proposed Transmission Line Project before the Application was filed:

- Hillwood Property and Hillwood Communities (associated with the Treeline, Speedway North, Northlake 1171, Corral City, Harvest Commercial/Residential, and Pecan Square developments);
- DHL Supply Chain (USA) (associated with the DHL Northlake Logistics Center development);
- PMB Capital Investments (associated with Rolling V Ranch);
- GRBK Edgewood LLC and GBTM Sendera LLC d/b/a Green Brick Partners (associated with the Sendera Ranch community);
- Bloomfield Homes (associated with the Timberbrook Master Planned Community); and
- other developers.

Oncor discussed the Proposed Transmission Line Project with these developers in an effort to: (1) provide notice of the project; (2) obtain feedback concerning preliminary routing; (3) ascertain the location, status, and pace of planned development in the study area; and (4) encourage participation in the proceeding after the Application's filing. Oncor also met with BNSF Railway Company, which owns a large rail yard in the study area, for the same purpose.

Oncor sought to discuss the Proposed Transmission Line Project with developers because of the swift development occurring in and around the study area. Oncor attempted to understand where new developments

were planned to potentially mitigate the impact that a route might have on these areas. Section 6.0 of the Environmental Assessment and Routing Study provides additional details regarding additions and modifications of alternative route links.

IV. ROUTE SELECTION

Q. DID YOU SELECT ALTERNATIVE ROUTES TO BE FILED WITH THE APPLICATION?

A. Yes. As discussed in the response to Question No. 17 of the Application, I selected Route 179 as the route that best meets the requirements of the Texas Utilities Code and the Commission's Substantive Rules. I also selected 73 alternative routes in addition to Route 179 for inclusion in the Application. Additional information concerning my analysis of Route 179 and the other filed alternative routes is contained in a memorandum I prepared, which is included as Attachment No. 7 to the Application and as Exhibit BJP-5 to my direct testimony.

Q. PLEASE DESCRIBE SOME OF THE KEY ATTRIBUTES OF THE 74 FILED ROUTES.

A. Each of the 74 filed routes complies with Section 37.056(c)(4)(A)-(D) of the Texas Utilities Code and 16 TAC § 25.101, including the Commission's policy of prudent avoidance, and were developed in compliance with 16 TAC § 22.52(a)(4). The filed routes provide geographic diversity and an adequate number of alternative routes to conduct a proper evaluation. In addition, each of the filed routes were judged feasible from an engineering perspective, based on presently known conditions and constraints, although as Oncor witness Mr. Russell J. Marusak testifies, rapid development is creating new constraints and reducing the available vacant land on which to route the Proposed Transmission Line Project. All 74 filed routes meet all of the statutory and regulatory requirements and are acceptable to Oncor, though as I discuss below, Route 179 remains the route that best meets the applicable routing factors.

Q. WHY DID YOU SELECT ROUTE 179 AS THE "BEST-MEETS" ROUTE?

A. My selection of Route 179, which consists of links A0-A4-B1-B61-B62-C1-C21-C23-C7-E2-E1-E6-G1-G3-H41-H42-H8-I8-J3-K1-L5-L4-L3-L2-M1-M2-M3-R4-V2-Z, is based on the criteria established in Texas Utilities Code §37.056(c)(4)(A)-(D), 16 TAC § 25.101, including the Commission's policy of prudent avoidance, the Commission's CCN application form, the information provided to me by Oncor witness Ms. Amy L. Zapletal regarding cost estimates and engineering constraints, the information included in the Environmental Assessment, and my personal reconnaissance of the study area. As presented in the Application, I also recommend that the Commission consider the 73 additional alternative routes as potential alternatives to Route 179. All of the routes included in the Application comply with the routing requirements of Texas Utilities Code §37.056(c)(4)(A)-(D) and 16 TAC § 25.101.

Q. PLEASE EXPLAIN THE BASIS FOR YOUR SELECTION OF ROUTE 179.

A. Halff provided me with information on 221 preliminary alternative routes in the Environmental Assessment. After analyzing those 221 preliminary alternative routes, I recommended filing 74 of those routes with the Application for the Commission's consideration. In addition to geographic differences, the more significant differences between the 74 filed routes are route lengths, costs, and number of habitable structures within 500 feet. Route lengths for the filed routes range from approximately 19.9 miles to approximately 22.9 miles. The estimated transmission line costs for the filed routes range from approximately $164,581,000 to $237,423,000. The number of habitable structures within 500 feet of the filed routes ranges from 93 to 400.

Given the balance of the factors, I selected Route 179 as the route that best meets the requirements of Texas Utilities Code §37.056(c)(4)(A)-(D) and 16 TAC § 25.101. Specifically, this route:

- is approximately 21.8 miles long, which is approximately 1.9 miles longer than the shortest filed route and 1.1 miles shorter than the longest alternative route;
- has an estimated cost of $175,208,000, which is approximately 35.5% less than the most expensive alternative route and approximately 6.5% more than the least expensive alternative route; and
- has 97 habitable structures within 500 feet of its centerline, which is only four more than the lowest number of habitable structures within 500 feet of an alternative route's centerline and 303 less than the highest number of habitable structures within 500 feet of an alternative route's centerline.

In addition, Route 179 was judged to be feasible from an engineering perspective based on currently known conditions without the benefit of on-the-ground surveys.

Q. HOW HAS YOUR OPINION ON ROUTE 179 EVOLVED IN THE WEEKS SINCE YOU SELECTED IT AS THE ROUTE BEST MEETING THE APPLICABLE ROUTING FACTORS?

A. As stated previously in my testimony, the rapid development in the study area is causing a reduction in available vacant land through which the Proposed Transmission Line Project could be routed. Attached hereto as Exhibit BJP-6 is an aerial map showing development in the study area and highlighting developments that are in progress and for which Oncor received information from developers following the public meeting. Route 179 makes reasonable efforts to avoid these areas while taking into consideration costs and the Commission's policy of prudent avoidance. The rapid expansion of development in the study area weighs heavily on my view of the alternative routes, and it is another reason why Route 179 best meets the applicable routing factors.

Q. DOES ROUTE 179 COMPLY WITH TEXAS UTILITIES CODE § 37.056(c)(4)(A)-(D) AND 16 TAC §25.101(b)(3)(B)?

A. Yes. Route 179 does not significantly impact community values, recreational and park areas, historical and aesthetic values, or the environmental integrity of the area traversed by the Proposed Transmission Line Project. Route 179 limits exposures to electric and magnetic fields that can be avoided with reasonable investments of money and effort and gives adequate consideration to the utilization and paralleling of existing compatible corridors. Route 179 does not significantly impact communication facilities, airports or heliports, cropland irrigated by traveling irrigation systems, or known cultural resource sites. The proposed route is routed to the extent reasonable to moderate the impact on the affected community and directly affected landowners.

Q. WHAT IS YOUR BASIS FOR RECOMMENDING THAT THE COMMISSION CONSIDER THE OTHER 73 ALTERNATIVE ROUTES FILED WITH THE APPLICATION?

A. Each of the 73 other alternative routes filed with the Application also comply with the provisions of Texas Utilities Code § 37.056(c) and 16 TAC § 25.101. In addition, they provide geographic diversity and an adequate number of alternative routes to conduct a proper evaluation.

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

A. Yes, I am.

Q. BRIEFLY DESCRIBE YOUR UNDERSTANDING OF THE COMMISSION'S POLICY OF PRUDENT AVOIDANCE.

A. 16 TAC § 25.101 defines prudent avoidance as "the limiting of exposures to electric and magnetic fields that can be avoided with reasonable investments of money and effort." My understanding of the Commission's policy of prudent avoidance is that the process of routing a proposed transmission line should include consideration of routing options that will

reasonably avoid population centers and other locations where people gather. This does not mean that a proposed transmission line must avoid habitable structures at all costs, but that reasonable alternatives should be considered.

Q. DO THE PROPOSED ROUTING ALTERNATIVES ADHERE TO THE COMMISSION'S POLICY OF PRUDENT AVOIDANCE?

A. Yes, all of the 74 alternative routes proposed in the Application comply with the Commission's policy of prudent avoidance.

V. ADEQUACY OF ROUTES

Q. DOES THE APPLICATION ADEQUATELY CONTAIN AN ADEQUATE NUMBER OF ALTERNATIVE ROUTES TO CONDUCT A PROPER EVALUATION?

A. Yes. Visual inspection of Figures 3-1A, 3-1B, 3-1C, and 3-1D in the Environmental Assessment shows the nature of the project area. Within this area, Oncor's Application includes 74 reasonably differentiated and geographically diverse alternative routes that are reasonably forward-progressing given the area constraints and are consistent with the provisions of the Texas Utilities Code and the Commission's Substantive Rules.

Based on my experience, my visual inspection of the area on reconnaissance visits, and my detailed review and evaluation of the data presented in the Environmental Assessment, the Application contains an adequate number of alternative routes to conduct a proper evaluation. Thus, the adequacy of the routing options provided by Oncor in its Application is demonstrated both by the number of options presented to the Commission and the geographic diversity present among these options. Further, given the physical constraints—particularly in the south and east of the study area—it is unlikely that routes of lower cost or more consistent rule compatibility could be identified outside of those presented in the Application.

Q. WERE ALL PRELIMINARY ALTERNATIVE LINKS DEVELOPED BY HALFF UTILIZED IN YOUR SELECTION OF ALTERNATIVE ROUTES?.

A. Yes.

VI. NOTICE

Q. WILL ONCOR PROVIDE NOTICE OF THE FILING OF THIS APPLICATION AS REQUIRED BY THE COMMISSION'S PROCEDURAL RULES?

A. Yes. Public notice of the Application will be published in the *Denton Record Chronicle*, a paper of general circulation in Denton County, Texas, and in the *Wise County Messenger*, a paper of general circulation in Wise County, Texas. A publishers' affidavit attesting to the publication of this notice will be attached to an affidavit from Oncor attesting to the provision of newspaper notice.

On the date the Application is filed with the Commission, Oncor will also provide notice in the following ways:

- mail written notice of the Application (in the form required by the Commission) to each landowner of record, based on a review of current county property tax rolls, that would be directly affected (as defined in 16 TAC § 22.52(a)(3)) by the Commission's approval of the Application on one or more of the proposed routes;
- mail written notice of the Application to the county judge and commissioners of Denton County and Wise County, the only counties where any portion of the requested facilities will be located;
- mail written notice of the Application to the mayor and city council members of the towns of Argyle, Bartonville, Corral City, DISH, Double Oak, Flower Mound, Northlake, Trophy Club, and Westlake, and the cities of Aurora, Denton, Fort Worth, Haslet, Justin, Keller, New Fairview, Newark, Rhome, Southlake, and Roanoke, the only municipalities within five (5) miles of the requested facilities;

- mail written notice of the Application to Brazos Electric Power Cooperative, Denton Municipal Electric d/b/a CoServ Electric, Texas Municipal Power Agency, Tri-County Electric Cooperative, and Wise County Electric Cooperative, the only neighboring utilities providing electric service within a five (5) mile radius of the proposed route;
- mail courtesy written notice of the Application to certain pipeline owners and operators. A representative copy of the notice is included as an Attachment No. 15 to the Application;
- e-mail and mail written notice of the Application to the Department of Defense Siting Clearinghouse at the email and physical addresses contained in the Application;
- mail a copy of the Application and its attachments to the Office of Public Utility Counsel; and
- mail a copy of the Environmental Assessment to the Texas Parks and Wildlife Department within seven days of the Application's filing.

Q. DID ONCOR PROVIDE ANY NOTICES OF THE FILING OF THE APPLICATION IN ADDITION TO THE NOTICES REQUIRED BY THE COMMISSION'S PROCEDURAL RULES?

A. Yes. In the form required by the Commission, Oncor mailed written notice of the Application to each landowner of record, according to current county tax rolls, of property within 520 feet of the centerline of all filed routes, irrespective of whether a habitable structure was located on such properties. Oncor was intentionally over-inclusive in mailing written notice of the Application to landowners. Additionally, Oncor mailed courtesy notices to the Permian Basin Petroleum Association, Texas Oil and Gas Association, Texas Pipeline Association, and owners/operators of pipelines located in the study area.

Q. WILL ONCOR'S PROVISION OF NOTICE FOR THE PROPOSED TRANSMISSION LINE PROJECT COMPLY WITH 16 TAC § 22.52?

A. Yes. Oncor will file affidavits in the docket attesting to the provision of notice in compliance with 16 TAC § 22.52.

VII. CONCLUSION

Q. DOES THIS CONCLUDE YOUR DIRECT TESTIMONY?

A. Yes, it does.

AFFIDAVIT

STATE OF TEXAS §
§
COUNTY OF TARRANT §

BEFORE ME, the undersigned authority, on this day personally appeared Brenda J. Perkins who, having been placed under oath by me, did depose as follows:

My name is Brenda J. Perkins. I am of legal age and a resident of the State of Texas. The foregoing testimony and exhibits offered by me are true and correct, and the opinions stated therein are, to the best of my knowledge and belief, accurate, true and correct.

Brenda J. Perkins

SUBSCRIBED AND SWORN TO BEFORE ME on this 1st day of June, 2023.

MICHELE M GIBSON
Notary Public, State of Texas
Comm. Expires 06-30-2026
Notary ID 575631-8

Notary Public, State of Texas

My Commission Expires:

06-30-2026

BRENDA J. PERKINS, P.E.

President, BJ Perkins Corporation
Managing Partner, Brenda Perkins and Associates, LLP

EDUCATION:
University of Texas at Arlington
B.S., Civil Engineering, 1981

PROFESSIONAL REGISTRATION:
Licensed Professional Engineer, Texas

PROFESSIONAL AFFILIATIONS:
Transmission and Substation Design and Operation Symposium Attendee

CIVIC ACTIVITIES:
1996 – 2008: held various PTA officer positions in Arlington ISD including President at 2 schools

2014 – Present: held various HOA officer positions

Brenda Perkins has over 30 years of experience in the high voltage power line industry. The following is a brief chronological outline of her experience:

Texas Power & Light Company, Dallas, Texas
Civil Engineer (1981-1986)

- Provided engineering design, project scheduling, and engineering support during project construction of transmission and distribution lines.

Anchor Metals, Inc., Hurst, Texas
Design Engineer (1988,1989)

- Analyzed and designed tubular steel pole structures for utility company bids.

Meyer Industries/Anchor Metals, Bedford, Texas
Design Engineer (1989, 1990)

- Analyzed and designed steel lattice tower structures for utility company bids.

Brenda Perkins and Associates, LLP, Arlington, Texas
Managing Partner (1996 – Present)

- 1996-1999: Managed and was responsible for providing crews to perform maintenance services and repairs on transmission line facilities and substation equipment.
- 1999-2003: Managed turnkey transmission line relocations and line re-conductoring projects.
- 2001-2021: Manage personnel responsible for field observation and reporting of project site controls specifically related to the Storm Water Pollution Prevention Plan (SWPPP) requirements on transmission line and substation projects.

BJ Perkins Corporation, Arlington, Texas
President (1996 – Present)

- 2004 – May 2009: Provide engineering design of transmission line projects and engineering support during project construction.
- May 2009 – January 2011: Provide engineering evaluation, cost projections and engineering representation for proposed transmission line routes on behalf of Oncor Electric Delivery for their Certificate of Convenience and Necessity (CCN) application to the Public Utility Commission of Texas
- February 2011 – April 2015: Provide engineering expert testimony for transmission line right-of-way acquisition in eminent domain court proceedings
- January 2013 – Present: Provide project management and expert testimony on behalf of Oncor Electric Delivery for transmission line routing studies

CHAPTER 37. CERTIFICATES OF CONVENIENCE AND NECESSITY.

Subchapter B. CERTIFICATE OF CONVENIENCE AND NECESSITY.

Sec. 37.056. GRANT OR DENIAL OF CERTIFICATE.

(a) The commission may approve an application and grant a certificate only if the commission finds that the certificate is necessary for the service, accommodation, convenience, or safety of the public.

(b) The commission may:

(1) grant the certificate as requested;

(2) grant the certificate for the construction of a portion of the requested system, facility, or extension or the partial exercise of the requested right or privilege; or

(3) refuse to grant the certificate.

(c) The commission shall grant each certificate on a nondiscriminatory basis after considering:

(1) the adequacy of existing service;

(2) the need for additional service;

(3) the effect of granting the certificate on the recipient of the certificate and any electric utility serving the proximate area; and

(4) other factors, such as:

(A) community values;

(B) recreational and park areas;

(C) historical and aesthetic values;

(D) environmental integrity;

(E) the probable improvement of service or lowering of cost to consumers in the area if the certificate is granted, including any potential economic or reliability benefits associated with dual fuel and fuel storage capabilities in areas outside the ERCOT power region; and

(F) to the extent applicable, the effect of granting the certificate on the ability of this state to meet the goal established by Section 39.904(a) of this title.

(c-1) In considering the need for additional service under Subsection (c)(2) for a reliability transmission project that serves the ERCOT power region, the commission must consider the historical load, forecasted load growth, and additional load currently seeking interconnection.

(d) The commission by rule shall establish criteria, in addition to the criteria described by Subsection (c), for granting a certificate for a transmission project that serves the ERCOT power region, that is not necessary to meet state or federal reliability standards, and that is not included in a plan developed under Section 39.904(g). The criteria must include a comparison of the estimated cost of the transmission project for consumers and the estimated congestion cost savings for consumers that may result from the transmission project, considering both current and future expected congestion levels and the transmission project's ability to reduce those congestion levels. The commission shall include with its decision on an application for a certificate to which this subsection applies findings on the criteria.

(e) A certificate to build, own, or operate a new transmission facility that directly interconnects with an existing electric utility facility or municipally owned utility facility may be granted only to the owner of that existing facility. If a new transmission facility will directly interconnect with facilities owned by different electric utilities or municipally owned utilities, each entity shall be certificated to build, own, or operate the new facility in separate and discrete equal parts unless they agree otherwise.

(f) Notwithstanding Subsection (e), if a new transmission line, whether single or double circuit, will create the first interconnection between a load-serving station and an existing transmission facility, the entity with a load-serving responsibility or an electric cooperative that has a member with a load-serving

responsibility at the load-serving station shall be certificated to build, own, or operate the new transmission line and the load-serving station. The owner of the existing transmission facility shall be certificated to build, own, or operate the station or tap at the existing transmission facility to provide the interconnection, unless after a reasonable period of time the owner of the existing transmission facility is unwilling to build, and then the entity with the load-serving responsibility or an electric cooperative that has a member with a load-serving responsibility may be certificated to build the interconnection facility.

(g) Notwithstanding any other provision of this section, an electric utility or municipally owned utility that is authorized to build, own, or operate a new transmission facility under Subsection (e) or (f) may designate another electric utility that is currently certificated by the commission within the same electric power region, coordinating council, independent system operator, or power pool or a municipally owned utility to build, own, or operate a portion or all of such new transmission facility, subject to any requirements adopted by the commission by rule.

(h) The division of any required certification of facilities described in this section shall apply unless each entity agrees otherwise. Nothing in this section is intended to require a certificate for facilities that the commission has determined by rule do not require certification to build, own, or operate.

(i) Notwithstanding any other provision of this section, an electric cooperative may be certificated to build, own, or operate a new facility in place of any other electric cooperative if both cooperatives agree.

(V.A.C.S. art. 1446c-0, secs. 2.255(b), (c).) (Amended by Acts 2003, 78th Leg., R.S., ch. 295 (HB 2548), § 2 (added subd. (c)(4)(F)); Acts 2011, 82nd Leg., R.S., ch. 949 (HB 971), § 2(a) (added subsec. (d)); Acts 2019, 86th Leg. R.S., ch. 44 (SB 1938), § 4 (added subsecs. (e), (f), (g), (h), and (i)) Acts 2021, 87th Leg., R.S., ch. 198 (HB 1510), § 3 (amended subd. (c)(4)); Acts 2021, 87th Leg., R.S., ch. 876 (SB 1281), § 2 (added subsec. (c-1) & amended subsec. (d)).)

Subchapter D. NOTICE.

§22.52. Notice in Licensing Proceedings.

(a) **Notice in electric licensing proceedings**. In all electric licensing proceedings except minor boundary changes, the applicant shall give notice in the following ways:

(1) Applicant shall publish notice once of the applicant's intent to secure a certificate of convenience and necessity in a newspaper having general circulation in the county or counties where a certificate of convenience and necessity is being requested, no later than the week after the application is filed with the commission. This notice shall identify the commission's docket number and the style assigned to the case by Central Records. In electric transmission line cases, the applicant shall obtain the docket number and style no earlier than 25 days prior to making the application by filing a preliminary pleading requesting a docket assignment. The notice shall identify in general terms the type of facility if applicable, and the estimated expense associated with the project. The notice shall describe all routes without designating a preferred route or otherwise suggesting that a particular route is more or less likely to be selected than one of the other routes.

(A) The notice shall include all the information required by the standard format established by the commission for published notice in electric licensing proceedings. The notice shall state the date established for the deadline for intervention in the proceeding (date 45 days after the date the formal application was filed with the commission; or date 30 days after the date the formal application was filed with the commission for an application for certificate of convenience and necessity filed under PURA §39.203(e)) and that a letter requesting intervention should be received by the commission by that date.

(B) The notice shall describe in clear, precise language the geographic area for which the certificate is being requested and the location of all alternative routes of the proposed facility. This description shall refer to area landmarks, including but not limited to geographic landmarks, municipal and county boundary lines, streets, roads, highways, railroad tracks, and any other readily identifiable points of reference, unless no such references exist for the geographic area. In addition, the notice shall include a map that identifies all of the alternative locations of the proposed routes and all major roads, transmission lines, and other features of significance to the areas that are used in the utility's written notice description.

(C) The notice shall state a location where a detailed routing map may be reviewed. The map shall clearly and conspicuously illustrate the location of the area for which the certificate is being requested including all the alternative locations of the proposed routes, and shall reflect area landmarks, including but not limited to geographic landmarks, municipal and county boundary lines, streets, roads, highways, railroad tracks, and any other readily identifiable points of reference, unless no such references exist for the geographic area.

(D) Proof of publication of notice shall be in the form of a publisher's affidavit which shall specify the newspaper(s) in which the notice was published, the county or counties in which the newspaper(s) is or are of general circulation, the dates upon which the notice was published, and a copy of the notice as published. Proof of publication shall be submitted to the commission as soon as available.

(E) The applicant shall provide a copy of each environmental impact study and/or assessment for the project to the Texas Parks and Wildlife Department (TPWD) for its review within seven days of filing the application. Proof of submission of the information to TPWD shall be provided in the form of an affidavit to the commission, which shall specify the date the information was mailed or otherwise provided to TPWD, and shall provide a copy of the cover letter or other documentation that confirms that the information was provided to TPWD.

(2) Applicant shall, upon filing an application, also mail notice of its application to municipalities within five miles of the requested territory or facility, neighboring utilities providing the same utility service within five miles of the requested territory or facility, the county government(s)

of all counties in which any portion of the proposed facility or requested territory is located, and the Department of Defense Siting Clearinghouse. In addition, the applicant shall, upon filing the application, serve the notice on the Office of Public Utility Counsel using a method specified in §22.74(b) of this title (relating to Service of Pleadings and Documents). The notice shall contain the information as set out in paragraph (1) of this subsection and a map as described in paragraph (1)(C) of this subsection. An affidavit attesting to the provision of notice to municipalities, utilities, counties, the Department of Defense Siting Clearinghouse, and the Office of Public Utility Counsel shall specify the dates of the provision of notice and the identity of the individual municipalities, utilities, and counties to which such notice was provided. Before final approval of any modification in the applicant's proposed route(s), applicant shall provide notice as required under this paragraph to municipalities, utilities, and counties affected by the modification which have not previously received notice. The notice of modification shall state such entities will have 20 days to intervene.

(3) Applicant shall, on the date it files an application, mail notice of its application to the owners of land, as stated on the current county tax roll(s), who would be directly affected by the requested certificate. For purposes of this paragraph, land is directly affected if an easement or other property interest would be obtained over all or any portion of it, or if it contains a habitable structure that would be within 300 feet of the centerline of a transmission project of 230kV or less, or within 500 feet of the centerline of a transmission project greater than 230kV.

(A) The notice must contain all information required in paragraph (1) of this subsection and shall include all the information required by the standard notice letter to landowners prescribed by the commission. The commission's docket number pertaining to the application must be stated in all notices. The notice must also include a copy of the "Landowners and Transmission Line Cases at the PUC" brochure prescribed by the commission.

(B) The notice must include a map as described in paragraph (1)(C) of this subsection.

(C) Before final approval of any modification in the applicant's proposed route(s), applicant shall provide notice as required under subparagraphs (A) and (B) of this paragraph to all directly affected landowners who have not already received such notice.

(D) Proof of notice may be established by an affidavit affirming that the applicant sent notice by first-class mail to each of the persons listed as an owner of directly affected land on the current county tax roll(s). The proof of notice shall include a list of all landowners to whom notice was sent and a statement of whether any formal contact related to the proceeding between the utility and the landowner other than the notice has occurred. This proof of notice shall be filed with the commission no later than 20 days after the filing of the application.

(E) Upon the filing of proof of notice as described in subparagraph (D) of this paragraph, the lack of actual notice to any individual landowner will not in and of itself support a finding that the requirements of this paragraph have not been satisfied. If, however, the utility finds that an owner of directly affected land has not received notice, it shall immediately advise the commission by written pleading and shall provide notice to such landowner(s) by priority mail, with delivery confirmation, in the same form described in subparagraphs (A) and (B) of this paragraph, except that the notice shall state that the person has fifteen days from the date of delivery to intervene. The utility shall immediately file a supplemental affidavit of notice with the commission.

(4) The utility shall hold at least one public meeting prior to the filing of its licensing application if 25 or more persons would be entitled to receive direct mail notice of the application. Direct mail notice of the public meeting shall be sent by first-class mail to each of the persons listed on the current county tax rolls as an owner of land within 300 feet of the centerline of a transmission project of 230kV or less, or within 500 feet of the centerline of a transmission project greater than 230kV. The utility shall also provide written notice to the Department of Defense Siting Clearinghouse of the public meeting. In the notice for the public meeting, at the public meeting, and in other communications with a potentially affected person, the utility

shall not describe routes as preferred routes or otherwise suggest that a particular route is more or less likely to be selected than one of the other routes. In the event that no public meeting is held, the utility shall provide written notice to the Department of Defense Siting Clearinghouse of the planned filing of an application prior to completion of the routing study.

(5) Failure to provide notice in accordance with this section shall be cause for day-for-day extension of deadlines for intervention and for commission action on the application.

(6) Upon entry of a final, appealable order by the commission approving an application, the utility shall provide notice to all owners of land who previously received direct notice. Proof of notice under this subsection shall be provided to the commission's staff.

(A) If the owner's land is directly affected by the approved route, the notice shall consist of a copy of the final order.

(B) If the owner's land is not directly affected by the approved route, the notice shall consist of a brief statement that the land is no longer the subject of a pending proceeding and will not be directly affected by the facility.

(7) All notices of an applicant's intent to secure a certificate of convenience and necessity whether provided by publication or direct mail shall include the following language: "All routes and route segments included in this notice are available for selection and approval by the Public Utility Commission of Texas."

(b) **Notice in telephone licensing proceedings.** In all telephone licensing proceedings, except minor boundary changes, applications for a certificate of operating authority, or applications for a service provider certificate of operating authority, the applicant shall give notice in the following ways:

(1) Applicants shall publish in a newspaper having general circulation in the county or counties where a certificate of convenience and necessity is being requested, once each week for two consecutive weeks, beginning the week after the application is filed, notice of the applicant's intent to secure a certificate of convenience and necessity. This notice shall identify in general terms the types of facilities, if applicable, the area for which the certificate is being requested, and the estimated expense associated with the project. Whenever possible, the notice should state the established intervention deadline. The notice shall also include the following statement: "Persons with questions about this project should contact (name of utility contact) at (utility contact telephone number). Persons who wish to intervene in the proceeding or comment upon action sought, should contact the Public Utility Commission, P.O. Box 13326, Austin, Texas 78711-3326, or call the Public Utility Commission at (512) 936-7120 or (888) 782-8477. Hearing- and speech-impaired individuals with text telephones (TTY) may contact the commission at (512) 936-7136. The deadline for intervention in the proceeding is (date 70 days after the date the application was filed with the commission) and you must send a letter requesting intervention to the commission which is received by that date." Proof of publication of notice shall be in the form of a publisher's affidavit, which shall specify the newspaper or newspapers in which the notice was published; the county or counties in which the newspaper or newspapers is or are of general circulation; the dates upon which the notice was published and a copy of the notice as published. Proof of publication shall be submitted to the commission as soon as available.

(2) Applicant shall also mail notice of its application, which shall contain the information as set out in paragraph (1) of this subsection, to cities and to neighboring utilities providing the same service within five miles of the requested territory or facility. Applicant shall also provide notice to the county government of all counties in which any portion of the proposed facility or territory is located. The notice provided to county governments shall be identical to that provided to cities and to neighboring utilities. An affidavit attesting to the provision of notice to counties shall specify the dates of the provision of notice and the identity of the individual counties to which such notice was provided.

(3) Failure to provide notice in accordance with this section shall be cause for day-for-day extension of deadlines for intervention.

CHAPTER 25. SUBSTANTIVE RULES APPLICABLE TO ELECTRIC SERVICE PROVIDERS.

Subchapter E. CERTIFICATION, LICENSING AND REGISTRATION.

§25.101. Certification Criteria.

(a) **Definitions.** The following words and terms, when used in this section, have the following meanings unless the context indicates otherwise:

(1) **Construction or extension** -- Does not include the purchase or condemnation of real property for use as facility sites or right-of-way. Acquisition of right-of-way must not be deemed to entitle an electric utility to the grant of a certificate of convenience and necessity without showing that the construction or extension is necessary for the service, accommodation, convenience, or safety of the public.

(2) **Generating unit** -- Any electric generating facility. This section does not apply to any generating unit that is ten megawatts or less and is built for experimental purposes only.

(3) Habitable structures -- Structures normally inhabited by humans or intended to be inhabited by humans on a daily or regular basis. Habitable structures include, but are not limited to: single-family and multi-family dwellings and related structures, mobile homes, apartment buildings, commercial structures, industrial structures, business structures, churches, hospitals, nursing homes, and schools.

(4) Municipal Power Agency (MPA) -- Agency or group created under Texas Utilities Code, Chapter 163 – Joint Powers Agencies.

(5) Municipal Public Entity (MPE) -- A municipally owned utility (MOU) or a municipal power agency.

(6) Prudent avoidance -- The limiting of exposures to electric and magnetic fields that can be avoided with reasonable investments of money and effort.

(7) Tie line -- A facility to be interconnected to the Electric Reliability Council of Texas (ERCOT) transmission grid by a person, including an electric utility or MPE, that would enable additional power to be imported into or exported out of the ERCOT power grid.

(b) **Certificates of convenience and necessity for new service areas and facilities.** Except for certificates granted under subsection (e) of this section, the commission will grant an application and issue a certificate only if it finds that the certificate is necessary for the service, accommodation, convenience, or safety of the public, and complies with the statutory requirements in the Public Utility Regulatory Act (PURA) §37.056. The commission may issue a certificate as applied for, or refuse to issue it, or issue it for the construction of a portion of the contemplated system or facility or extension thereof, or for the partial exercise only of the right or privilege. The commission will render a decision approving or denying an application for a certificate within one year of the date of filing of a complete application for such a certificate, unless good cause is shown for exceeding that period. A certificate, or certificate amendment, is required for the following:

(1) **Change in service area**. Any certificate granted under this section must not be construed to vest exclusive service or property rights in and to the area certificated.

(A) Uncontested applications: An application for a certificate under this paragraph must be approved administratively within 80 days from the date of filing a complete application if:

(i) no motion to intervene has been filed or the application is uncontested;

(ii) all owners of land that is affected by the change in service area and all customers in the service area being changed have been given direct mail notice of the application; and

(iii) commission staff has determined that the application is complete and meets all applicable statutory criteria and filing requirements, including, but not limited to, the provision of proper notice of the application.

(B) Minor boundary changes or service area exceptions: Applications for minor boundary changes or service area exceptions must be approved administratively within 45 days of the filing of the application provided that:

(i) every utility whose certificated service area is affected agrees to the change;

(ii) all customers within the affected area have given prior consent; and

(iii) commission staff has determined that the application is complete and meets all applicable statutory criteria and filing requirements, including, but not limited to, the provision of proper notice of the application.

(2) **Generation facility.**

(A) In a proceeding involving the purchase of an existing electric generating facility by an electric utility that operates solely outside of ERCOT, the commission will issue a final order on a certificate for the facility not later than the 181st day after the date a request for the certificate is filed with the commission under PURA §37.058(b).

(B) In a proceeding involving a newly constructed generating facility by an electric utility that operates solely outside of ERCOT, the commission will issue a final order on a certificate for the facility not later than the 366th day after the date a request for the certificate is filed with the commission under PURA §37.058(b).

(C) An electric utility operating solely outside of the ERCOT region may, but is not required to, obtain a certificate to install, own, or operate a generation facility with a capacity of 10 megawatts or less.

(3) **Electric transmission line.** All new electric transmission lines must be reported to the commission in accordance with §25.83 of this title (relating to Transmission Construction Reports). This reporting requirement is also applicable to new electric transmission lines to be constructed by an MPE seeking to directly or indirectly construct, install, or extend a transmission facility outside of its applicable boundaries. For an MOU, the applicable boundaries are the municipal boundaries of the municipality that owns the MOU. For an MPA, the applicable boundaries are the municipal boundaries of the public entities participating in the MPA.

(A) **Determination of need**:

(i) **Economic projects.** Except as otherwise stated in this subparagraph, the following must be met for a transmission line in the ERCOT region. The applicant must present an economic cost-benefit study that analyzes the transmission project under a congestion cost savings test and a production cost savings test. The commission will give great weight to such a study if it is conducted by the ERCOT independent system operator. Adequately quantifiable and ongoing direct and indirect costs and benefits to the transmission system attributable to the project may be included in the cost-benefit study.

(I) **Congestion cost savings test.** ERCOT, in consultation with commission staff, must develop a congestion cost savings test.

(-a-) The congestion cost savings test must include an analysis of whether the levelized ERCOT-wide annual congestion cost savings attributable to the proposed project are equal to or greater than the average of the first three years annual revenue requirement of the proposed project of which the transmission line is a part.

(-b-) Prior to the effective date of the test developed by ERCOT under this subclause ERCOT may immediately, without updating its current protocols, utilize the generator revenue reduction test, effective Dec. 1, 2011 under

ERCOT Nodal Protocols §3.11.2(6), as the congestion cost benefit test required under this clause. ERCOT may continue to rely upon completed calculations using the generator revenue reduction test to evaluate ongoing applications after the effective date of the test developed under this subclause.

(II) **Production cost savings test.** The production cost savings test must include an analysis of whether the levelized ERCOT-wide annual production cost savings attributable to the proposed project are equal to or greater than the first-year annual revenue requirement of the proposed project of which the transmission line is a part.

(III) Economic cost-benefit analysis must be studied for the projected in-service date of the project using the study case identified in the ERCOT planning guide.

(IV) ERCOT may recommend, and the commission may approve, a transmission line in the ERCOT region that demonstrates a savings under either a congestion cost savings test or a production cost savings test.

(ii) **Reliability projects.**

(I) The requirements of clause (i) of this subparagraph do not apply to an application for a transmission line that is necessary to meet state or federal reliability standards, including: a transmission line needed to interconnect a transmission service customer or end-use customer; or needed due to the requirements of any federal, state, county, or municipal government body or agency for purposes including, but not limited to, highway transportation, airport construction, public safety, or air or water quality.

(II) For a transmission line not addressed by clause (i) of this subparagraph, the commission will consider, among other factors, the needs of the interconnected transmission systems to support a reliable and adequate network and to facilitate robust wholesale competition. When evaluating reliability for a proposed project in the ERCOT region, the commission will consider and any review conducted by ERCOT must incorporate the historical load, forecasted load growth, and additional load currently seeking interconnection. The forecasted load growth and additional load currently seeking interconnection must be substantiated by quantifiable evidence of projected load growth. The commission will give great weight to:

(-a-) the recommendation of an organization that meets the requirement of PURA §39.151; and/or

(-b-) written documentation provided by a transmission service provider to ERCOT that the transmission line is needed to interconnect transmission service or retail customers.

(iii) **Resiliency.** ERCOT may recommend, and the commission may approve, a transmission project that is submitted as an economic or reliability project and does not demonstrate sufficient economic savings or reliability benefits to merit approval on those grounds if ERCOT determines the line would

address a resiliency issue identified in the grid reliability and resiliency assessment required by subparagraph (E) of this paragraph. In determining whether to approve such a project the commission will consider:

(I) the margin by which the transmission project was unable to demonstrate sufficient economic savings or reliability benefits to merit approval on those grounds;

(II) whether the resiliency benefits the transmission project would provide by reducing the impacts to customers of potential outages caused by regional extreme weather scenarios are sufficient to compensate for the project's inability to demonstrate sufficient economic savings or reliability benefits to merit approval on those grounds.

(III) the cost effectiveness of the transmission project's ability to address the resiliency issue identified by ERCOT compared to other possible solutions,

(IV) other factors listed in PURA §37.056(c), as appropriate.

(B) **Routing**: An application for a new transmission line must address the criteria in PURA §37.056(c) and considering those criteria, engineering constraints, and costs, the line must be routed to the extent reasonable to moderate the impact on the affected community and landowners unless grid reliability and security dictate otherwise. The following factors must be considered in the selection of the utility's alternative routes unless a route is agreed to by the utility, the landowners whose property is crossed by the proposed line, and owners of land that contains a habitable structure within 300 feet of the centerline of a transmission project of 230 kV or less, or within 500 feet of the centerline of a transmission project greater than 230 kV, and otherwise conforms to the criteria in PURA §37.056(c):

(i) whether the routes parallel or utilize existing compatible rights-of-way for electric facilities, including the use of vacant positions on existing multiple-circuit transmission lines;

(ii) whether the routes parallel or utilize other existing compatible rights-of-way, including roads, highways, railroads, or telephone utility rights-of-way;

(iii) whether the routes parallel property lines or other natural or cultural features; and

(iv) whether the routes conform with the policy of prudent avoidance.

(C) **Uncontested transmission lines**: An application for a certificate for a transmission line will be approved administratively within 80 days from the date of filing a complete application if:

(i) no motion to intervene has been filed or the application is uncontested; and

(ii) commission staff has determined that the application is complete and meets all applicable statutory criteria and filing requirements, including, but not limited to, the provision of proper notice of the application.

(D) **Projects deemed critical to reliability**. Applications for transmission lines which have been formally designated by a PURA §39.151 organization as critical to the reliability of the system will be considered by the commission on an expedited basis. The commission will render a decision approving or denying an application for a certificate under this subparagraph within 180 days of the date of filing a complete application for such a certificate unless good cause is shown for extending that period.

(E) **Grid reliability and resiliency assessment.** ERCOT must conduct a biennial assessment of the ERCOT power grid's reliability and resiliency in extreme weather scenarios. Each assessment must:

(i) consider the impact of different levels of thermal and renewable generation availability;

(ii) identify areas of the state that face significant grid reliability and resiliency issues, taking into account the impact of potential outages caused by regional extreme weather scenarios on customers, including multiple element outage analysis when appropriate, and

(iii) recommend transmission projects that may increase the grid's reliability or resiliency in extreme weather scenarios.

(4) **Tie line**. An application for a tie line must include a study of the tie line by ERCOT. The study must include, at a minimum, an ERCOT-approved reliability assessment of the proposed tie line. If an independent system operator intends to conduct a study to evaluate a proposed tie line or intends to provide confidential information to another entity to permit the study of a proposed tie line, the independent system operator must file notice with the commission at least 45 days prior to the commencement of such a study or the provision of such information.

(c) **Projects or activities not requiring a certificate**. A certificate, or certificate amendment, is not required for the following:

(1) An extension of facilities as described in PURA §37.052(a) and (b);

(2) A new electric high voltage switching station, or substation;

(3) The repair or reconstruction of a transmission facility due to emergencies. The repair or reconstruction of a transmission facility due to emergencies should proceed without delay or prior approval of the commission and must be reported to the commission in accordance with §25.83 of this title;

(4) The construction or upgrading of distribution facilities within the electric utility's service area;

(5) Routine activities associated with transmission facilities that are conducted by transmission service providers. Nothing contained in the following subparagraphs should be construed as a limitation of the commission's authority as set forth in PURA. Any activity described in the following subparagraphs must be reported to the commission in accordance with §25.83 of this title. The commission may require additional facts or call a public hearing thereon to determine whether a certificate of convenience and necessity is required. Routine activities are defined as follows:

(A) The modification, construction, or extension of a transmission line that connects existing transmission facilities to a substation or metering point provided that:

(i) the transmission line modification, construction, or extension does not exceed:

(I) three miles if the line connects to a load-serving substation or metering point; or

(II) two miles if the line connects to a generation substation or metering point; and

(ii) all rights-of-way necessary for the modification, construction, or extension have been acquired, and

(iii) all landowners whose property is directly affected by the transmission line, as defined in §22.52(a)(3) of this title, have given written consent for the modification, construction, or extension. If the transmission line

modification, construction, or extension does not exceed one mile to provide service to a substation or metering point, written consent is only required by landowners whose property is crossed by the transmission line.

(B) The rebuilding, replacement, or respacing of structures along an existing route of the transmission line; upgrading to a higher voltage not greater than 230 kV; bundling of conductors or reconductoring of an existing transmission facility, provided that:

(i) no additional right-of-way is required; or

(ii) if additional right-of-way is required, all landowners of property crossed by the electric facilities have given prior written consent.

(C) The installation, on an existing transmission line, of an additional circuit not previously certificated, provided that:

(i) the additional circuit is not greater than 230 kV; and

(ii) all landowners whose property is crossed by the transmission facilities have given prior written consent.

(D) The relocation of all or part of an existing transmission facility due to a request for relocation, provided that:

(i) the relocation is to be done at the expense of the requesting party; and

(ii) the relocation is solely on a right-of-way provided by the requesting party.

(E) The relocation or alteration of all or part of an existing transmission facility to avoid or eliminate existing or impending encroachments, provided that all landowners of property crossed by the electric facilities have given prior written consent.

(F) The relocation, alteration, or reconstruction of a transmission facility due to the requirements of any federal, state, county, or municipal governmental body or agency for purposes including, but not limited to, highway transportation, airport construction, public safety, or air and water quality, provided that:

(i) all landowners of property crossed by the electric facilities have given prior written consent; and

(ii) the relocation, alteration, or reconstruction is responsive to the governmental request.

(6) Upgrades to an existing transmission line by an MPE that do not require any additional land, right-of-way, easement, or other property not owned by the MOU;

(7) The construction, installation, or extension of a transmission facility by an MPE that is entirely located not more than 10 miles outside of an MOU's certificated service area that occurs before September 1, 2021; or

(8) A transmission facility by an MOU placed in service after September 1, 2015, that is developed to interconnect a new natural gas generation facility to the ERCOT transmission grid and for which, on or before January 1, 2015, an MOU was contractually obligated to purchase at least 190 megawatts of capacity.

(d) **Standards of construction and operation.** In determining standard practice, the commission will be guided by the provisions of the American National Standards Institute, Incorporated, the National Electrical Safety Code, and such other codes and standards that are generally accepted by the industry, except as modified by this commission or by municipal regulations within their jurisdiction. Each electric utility must construct, install, operate, and maintain its plant, structures, equipment, and lines in accordance with these standards, and in such manner to best accommodate the public, and to prevent interference with service furnished by other public utilities insofar as practical.

(1) The standards of construction apply to, but are not limited to, the construction of any new electric transmission facilities, rebuilding, upgrading, or relocation of existing electric transmission facilities.

(2) For electric transmission line construction requiring the acquisition of new rights-of-way, an electric utility must include in the easement agreement, at a minimum, a provision prohibiting the new construction of any above-ground structures within the right-of-way. For this purpose, new construction of above-ground structures does not include necessary repairs to existing structures, farm or livestock facilities, storage barns, hunting structures, small personal storage sheds, or similar structures. A utility may negotiate appropriate exceptions in instances where the electric utility is subject to a restrictive agreement being granted by a governmental agency or within the constraints of an industrial site. Any exception to this paragraph must meet all applicable requirements of the National Electrical Safety Code.

(3) Measures must be applied when appropriate to mitigate the adverse impacts of the construction of any new electric transmission facilities, and the rebuilding, upgrading, or relocation of existing electric transmission facilities. Mitigation measures must be adapted to the specifics of each project and may include such requirements as:

(A) selective clearing of the right-of-way to minimize the amount of flora and fauna disturbed;

(B) implementation of erosion control measures;

(C) reclamation of construction sites with native species of grasses, forbs, and shrubs; and

(D) returning site to its original contours and grades.

(e) **Certificates of convenience and necessity for existing service areas and facilities.** For purposes of granting these certificates for those facilities and areas in which an electric utility was providing service on September 1, 1975, or was actively engaged in the construction, installation, extension, improvement of, or addition to any facility actually used or to be used in providing electric utility service on September 1, 1975, unless found by the commission to be otherwise, the following provisions prevail for certification purposes:

(1) The electrical generation facilities and service area boundary of an electric utility having such facilities in place or being actively engaged in the construction, installation, extension, improvement of, or addition to such facilities or the electric utility's system as of September 1, 1975, must be limited, unless otherwise provided, to the facilities and real property on which the facilities were actually located, used, or dedicated as of September 1, 1975.

(2) The transmission facilities and service area boundary of an electric utility having such facilities in place or being actively engaged in the construction, installation, extension, improvement of, or addition to such facilities or the electric utility's system as of September 1, 1975, must be, unless otherwise provided, the facilities and a corridor extending 100 feet on either side of said transmission facilities in place, used or dedicated as of September 1, 1975.

(3) The facilities and service area boundary for the following types of electric utilities providing distribution or collection service to any area, or actively engaged in the construction, installation, extension, improvement of, or addition to such facilities or the electric utility's system as of September 1, 1975, must be limited, unless otherwise found by the commission, to the facilities and the area which lie within 200 feet of any point along a distribution line, which is specifically deemed to include service drop lines, for electrical utilities.

(f) **Transferability of certificates.** Any certificate granted under this section is not transferable without approval of the commission and remains in force until further order of the commission.

CHAPTER 25. SUBSTANTIVE RULES APPLICABLE TO ELECTRIC SERVICE PROVIDERS.

Subchapter E. CERTIFICATION, LICENSING AND REGISTRATION.

(g) **Certification forms.** All applications for certificates of convenience and necessity must be filed on commission-prescribed forms so that the granting of certificates, both contested and uncontested, may be expedited. Forms may be obtained from Central Records.

(h) **Commission authority**. Nothing in this section is intended to limit the commission's authority to recommend or direct the construction of transmission under PURA §§35.005, 36.008, or 39.203(e).

Office Memorandum

Date: May 30, 2023

To: File

From: Brenda J. Perkins

Subject: Alternative Routes Evaluation: Ramhorn Hill-Dunham 345 kV Transmission Line Project

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This memorandum discusses my evaluation of routing alternatives for Oncor Electric Delivery Company LLC's ("Oncor's") proposed Ramhorn Hill-Dunham 345 kV Transmission Line Project ("Proposed Transmission Line Project"). In addition to the recommendation for a route that best meets the requirements of the Texas Utilities Code and the Substantive Rules of the Public Utility Commission of Texas ("Commission"), I also selected alternative routes to be filed with this CCN Application.

The goal of this process is to provide the Commission with an adequate number of alternative routes to conduct a proper evaluation. These alternative routes provide good geographic diversity while complying with Section 37.056(c)(4)(A)-(D) of the Texas Utilities Code, Commission Procedural Rule 22.52(a)(4), and Commission Substantive Rule 25.101(b)(3)(B), including the Commission's policy of prudent avoidance.

My recommendations are based on my reconnaissance and observations of the project area, my independent review of the data included in the *Environmental Assessment and Alternative Route Analysis for Oncor Electric Delivery Company LLC's Proposed Ramhorn Hill Switch-Dunham Switch 345 kV Transmission Line Project in Denton and Wise Counties, Texas* ("Environmental Assessment and Routing Study"), prepared by Halff Associates, Inc. ("Halff"), my discussions with Halff personnel, my discussions with Oncor personnel, my participation in the public participation meeting process, my review of correspondence related to the Proposed Transmission Line Project, my understanding of other input that Oncor received from interested parties, and other information. My recommendation incorporates consideration of engineering feasibility, the estimated cost of alternative routes, construction limitations, and other information.

Halff documented its efforts to identify potential preliminary alternative routes for the Proposed Transmission Line Project in Section 4.0 of the Environmental Assessment and Routing Study. After Halff completed the initial data gathering and constraints mapping process, they identified preliminary alternative route links on recent aerial photography obtained from NearMap (available through Halff's subscription service). These preliminary alternative route links were selected considering the location of existing corridors, apparent property boundaries and routing constraints. Some of the routing constraints within the study area are: United States Army Corp of Engineers ("USACE") owned recreational and environmentally sensitive land; many major highways where 90-

degree roadway crossings by transmission lines are required by the Texas Department of Transportation; oil and gas facilities; existing and developing residential and commercial areas; aircraft landing facilities; as well as other constraints. Numerous preliminary alternative route links were identified by Halff, prior to the public participation meetings, that when combined, formed many preliminary alternative routes to connect the proposed Ramhorn Hill Switch to the proposed Dunham Switch. The preliminary alternative route links evaluated by Halff and presented at the public participation meetings are depicted in Figures 6-1 through 6-8 located in Appendix C of the Environmental Assessment and Routing Study, along with the alternative route link deletions, additions and modifications that were made following the public participation meetings. The modified preliminary alternative route links are discussed in detail in Section 6.0 of the Environmental Assessment and Routing Study and are briefly summarized below.

In general, links were modified where possible to address public comments and routing constraints identified after additional field investigations. Following the preliminary alternative route link revisions, a total of 140 alternative route links were adopted. Halff identified several hundred thousand alternative routes using these route links. Through an iterative process that considered route length, constraints data, input from public meetings, and information from local, state, and federal officials, Halff and Oncor reduced the total number of route combinations to a smaller subset of geographically diverse and forward progressing alternative routes that were further evaluated, as discussed in Section 7.0 of the Environmental Assessment and Routing Study. A total of 221 alternative routes were selected for further analysis as provided in Table 7-2 in Appendix E of the Environmental Assessment and Routing Study.

Each of the 221 preliminary alternative routes identified possesses both positive and negative comparative attributes. I considered these attributes to select a set of geographically diverse routing alternatives to be filed as a part of this Application. Each alternative route complies with Section 37.056(c)(4)(A)-(D) of the Texas Utilities Code and the Commission's Substantive Rule 25.101, including the Commission's policy of prudent avoidance.

Below, I discuss the alternative routes that I selected to be filed with the Application. The alternative routes can be grouped in many different ways; one approach is the grouping of alternative routes into geographic corridors. I grouped the alternative routes into six different geographic corridors using State Highway ("SH") 114 as the division between north and south corridor designation. These six corridors are identified as the: (1) north corridor using Link M8; (2) north corridor using Link M7; (3) north corridor using Link M6; (4) south corridor using Link M5; (5) south corridor using Link M4; and (6) south corridor using Link M3 (*see* map attached to this Memorandum for these alternative route link locations). All alternative routes cross several major highways due to the location of this project's endpoints being on opposite sides of these highways: United States Highway ("US") 377, Interstate Highway ("IH") 35W, Farm to Market ("FM") 156, SH 114, and US 287/81.

I selected 74 geographically diverse alternative routes to be filed with the CCN Application to allow for an adequate number of alternative routes to conduct a proper evaluation. The links that comprise these alternative routes are presented in Table 1, attached to this Memorandum. Table 2, attached to this Memorandum, presents quantifiable environmental data on the 74 alternative routes filed as a part of the CCN Application. The filed alternative routes use each of the 140 alternative links in at least one route.

I then presented these 74 alternative routes to Oncor's engineer overseeing this project, Ms. Amy Zapletal, for consideration of engineering feasibility, construction limitations, and alternative route cost estimates. Below is a discussion of each of the six geographic corridors and the alternative routes selected for filing within each corridor.

The north corridor routes containing Link M8 ("Link M8 Corridor Routes") vary in length from approximately 20.8 to 22.5 miles. Transmission line costs for Link M8 Corridor Routes range from $166,165,000 to $178,245,000. Link M8 Corridor Routes contain the greatest number of habitable structures within 500 feet of the route centerline with numbers varying from 188 to 400. The 11 alternatives filed in the Application from the Link M8 Corridor Routes include Alternative Routes 1, 65, 67, 68, 69, 72, 96, 142, 143, 191 and 192.

The north corridor routes containing Link M7 ("Link M7 Corridor Routes") vary in length from approximately 20.5 to 22.5 miles. Transmission line costs for Link M7 Corridor Routes range from $167,945,000 to $188,738,000. Link M7 Corridor Routes vary in the number of habitable structures within 500 feet of the route centerline from 108 to 327. The 17 alternatives filed in the Application from the Link M7 Corridor Routes include Alternative Routes 41, 42, 54, 71, 86, 94, 103, 138, 175, 176, 184, 185, 207, 217, 218, 219 and 221.

The north corridor routes using Link M6 ("Link M6 Corridor Routes") include the longest filed route (Route 216) with routes within this corridor varying in length from approximately 20.4 to 22.9 miles. Transmission line costs for Link M6 Corridor Routes range from $171,340,000 to $237,423,000. Link M6 Corridor Routes vary in the number of habitable structures within 500 feet of the route centerline from 145 to 364. The 12 alternatives filed in the Application from the Link M6 Corridor Routes include Alternative Routes 10, 11, 19, 33, 92, 117, 154, 170, 178, 186, 187 and 216.

The south corridor routes containing Link M5 ("Link M5 Corridor Routes") contain the shortest filed route (Route 16) with route lengths varying from approximately 19.9 to 22.5 miles. Transmission line costs for Link M5 Corridor Routes range from $172,350,000 to $208,670,000. Link M5 Corridor Routes vary in the number of habitable structures within 500 feet of the route centerline from 132 to 271. The 9 alternatives filed in the Application from the Link M5 Corridor Routes include Alternative Routes 5, 16, 25, 26, 28, 61, 108, 146, and 200.

The south corridor routes using Link M4 ("Link M4 Corridor Routes") vary in length from approximately 20.0 to 22.2 miles. Transmission line costs for Link M4 Corridor Routes range from $172,226,000 to $212,686,000. Link M4 Corridor Routes vary in the number of habitable structures within 500 feet of the route centerline from 151 to 266. The 10 alternatives filed in the Application from the Link M4 Corridor Routes include Alternative Routes 3, 15, 24, 36, 44, 58, 63, 70, 78 and 137.

The south corridor routes using Link M3 ("Link M3 Corridor Routes") vary in length from approximately 20.6 to 22.5 miles. Transmission line costs for Link M3 Corridor Routes range from $164,581,000 to $224,991,000. Link M3 Corridor Routes contain the least number of habitable structures within 500 feet of the route centerline with numbers varying from 93 to 205. The 15

alternatives filed in the Application from the Link M3 Corridor Routes include Alternative Routes 13, 14, 18, 22, 23, 29, 43, 87, 116, 119, 130, 132, 164, 179 and 199.

After analyzing each of the 74 routes within the six geographic corridors, I selected Route 179 of the Link M3 Corridor Routes as the route that best meets the requirements of Texas Utilities Code Section 37.056 (c)(4)(A)-(D) and the Commission Substantive Rule 25.101(b)(3)(B). Route 179 is comprised of Links A0-A4-B1-B61-B62-C1-C21-C23-C7-E2-E1-E6-G1-G3-H41-H42-H8-I8-J3-K1-L5-L4-L3-L2-M1-M2-M3-R4-V2-Z.

Some of the significant factors which led to the selection of Route 179 include the following:

- The length of Route 179 is approximately 21.8 miles, which is only 1.9 miles longer than the shortest among all the filed routes (Route 16) and approximately 1.1 miles shorter than the longest alternative route included in the Application (Route 216 is the longest at approximately 22.9 miles);
- The transmission line estimated cost for Route 179 is $175,208,000, which is approximately 6.5% more than the least expensive alternative route (Route 29 estimated at $164,581,000) and is approximately 35.5% less than the most expensive alternative route (Route 117 estimated at $237,423,000);
- There are 97 habitable structures within 500 feet of the centerline of Route 179, which is only four more than the route with the least number (95 for Route 164) and 303 less than the route with the highest number (400 for Route 192);
- Route 179 parallels existing compatible corridors for 23% of its length (including apparent property boundaries). Route 117 possesses the highest percentage parallel to existing corridors (40%), but is longer in route length (22.7 miles) and has a higher number of habitable structures within 500 feet its centerline (263). Route 221 had the lowest percentage (17%) parallel to existing corridors;
- Route 179 has 4,607 feet of its route through commercial/industrial areas. Route lengths through commercial/industrial areas varied from 4,085 feet (Route 219) to 14,702 feet (Route 117);
- Route 179 crosses 20,248 feet of cropland/hay meadow and crosses 71,051 feet of rangeland pasture. Route lengths crossing cropland/hay meadow varied from 12,347 feet (Route 164) to 36,231 feet (Route 69). Route lengths crossing rangeland pasture varied from 46,458 feet (Route 26) to 76,318 feet (Route 187);
- Route 179 crosses 10,126 feet of upland woodlands and has 7,162 feet of its route through riparian areas. Route 26 has the greatest length (15,960 feet) of its route across upland woodlands and Route 28 has the greatest length (15,718 feet) of its route across riparian areas. The Link M5 Corridor Routes contain the greatest length across upland woodlands and riparian areas which are associated with the floodplain of Elizabeth Creek;
- Route 179 has no length of its route across potential wetlands (57 of the filed routes cross potential wetlands, with Routes 92 and 218 having the highest crossing length of 849 feet);
- Route 179 has 27 streams crossed by its centerline (the greatest number of streams crossed within the filed routes is 33);

- The length of Route 179 that is parallel to streams (within 100 feet) is 1,351 feet (the greatest amount of route length parallel to streams within the filed routes is 5,108 feet);
- Route 179 has 1,704 feet of its route across lakes or ponds (open waters). Route 185 has the greatest length (2,080 feet) across lakes or ponds of the filed routes;
- Route 179 has one known rare/unique plant location within the route right-of-way. Nine of the filed routes have four known rare/unique plant locations within the route right-of-way;
- Route 179 has one recorded cultural resource site crossed by its centerline (34 of the filed routes have one recorded cultural resource site crossed by their centerline);
- Route 179 has three recorded cultural resource sites within 1,000 feet of its centerline (all filed routes have at least one recorded cultural resource site within 1,000 feet of their centerline and two of the filed routes have five recorded cultural resource sites within 1,000 feet of their centerline);
- Route 179 has three FAA-registered airports with a runway greater than 3,200 feet within 20,000 feet of the centerline along its entire length (all filed routes have at least three FAA-registered airports with a runway greater than 3,200 feet within 20,00 feet of their centerline, with some filed routes having four);
- Route 179 has four FAA-registered airports with no runway greater than 3,200 feet within 10,000 feet of the centerline along its entire length (three of the filed routes have six FAA-registered airports with no runway greater than 3,200 feet within 10,000 feet of their centerline);
- Route 179 has two heliports located within 5,000 feet of its centerline (the range of heliports within 5,000 feet of the filed route centerlines is one to three);
- Route 179 has two electronic installations within 2,000 feet of its centerline (the range in electronic installations within 2,000 feet of the filed route centerlines is 0 to 6);
- Route 179 crosses nineteen U.S. or State Highways along its entire length (the greatest number of U.S. or State Highways crossings is twenty);
- Route 179 crosses eleven FM, county roads or other streets along its entire length (the greatest number of FM, county roads or other street crossings is fourteen); and
- Route 179 has been judged to be feasible from an engineering perspective based on currently known conditions, without the benefit of on-the-ground and subsurface surveys, and there are no currently identifiable engineering constraints that impact this alternative route that cannot be addressed with additional consideration by Oncor during the engineering and construction process.

Additional information concerning the issues addressed in this memorandum can be found in the Environmental Assessment and Routing Study, included as Attachment No. 1 to the CCN Application.

After considering all of the parameters and issues as discussed in this memo, I selected Route 179 as the alternative route that best meets the requirements of the Texas Utilities Code and the Commission's Substantive Rules.

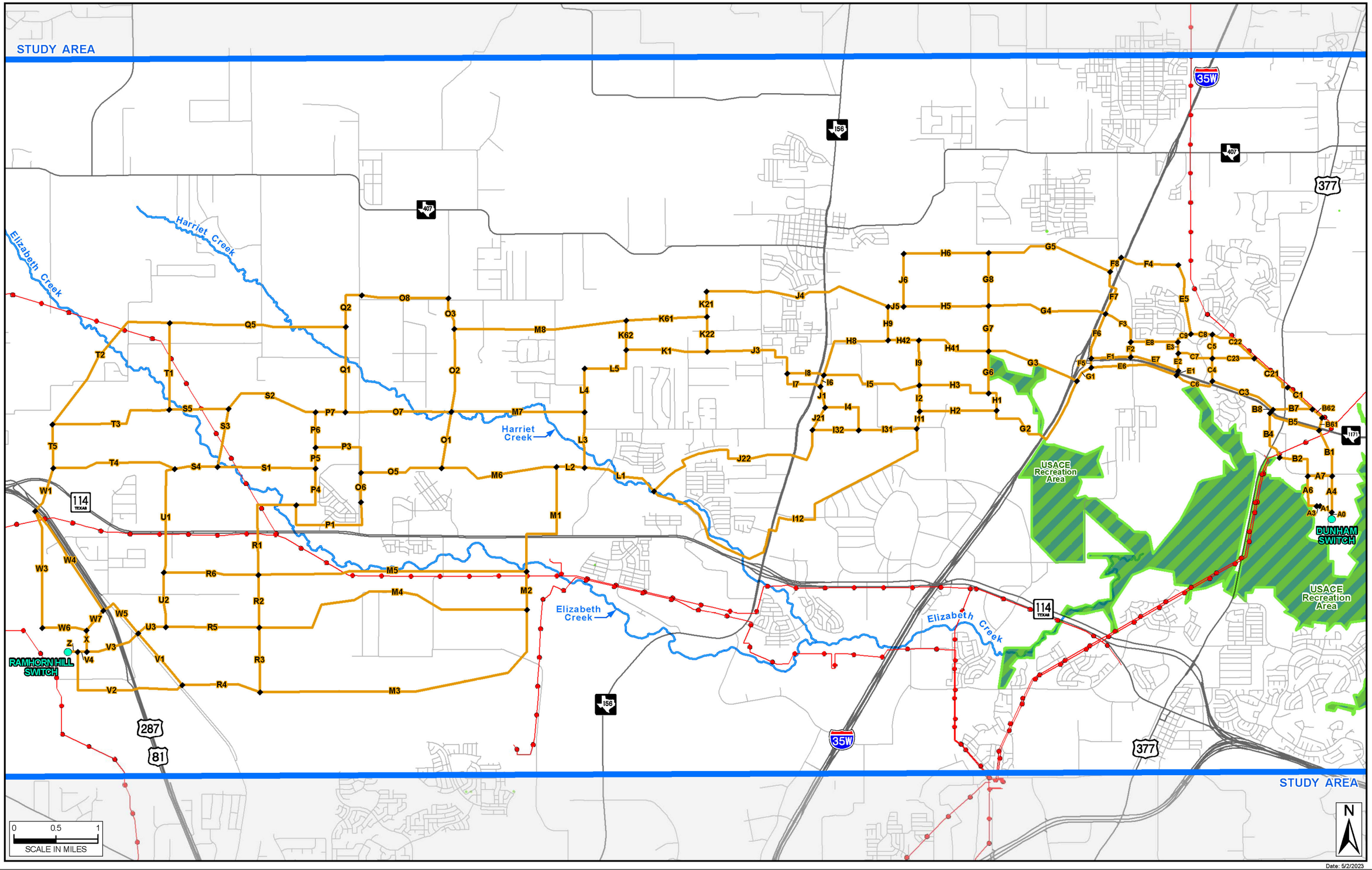
STUDY AREA
35W
156
407
377
114
TEXAS
287
81
1171
Harriet Creek
Elizabeth Creek
USACE Recreation Area
USACE Recreation Area
DUNHAM SWITCH
RAMHORN HILL SWITCH
0 0.5 1
SCALE IN MILES
N
Date: 5/2/2023

TABLE 1. Composition of Routes Filed in the CCN Application
Ramhorn Hill Switch - Dunham Switch 345 kV Transmission Line Project

Route	Link Sequence	Total Length (miles)
1	A0-A4-B1-B5-B8-C3-C6-E6-F5-F6-G4-H5-J5-J4-K21-K61-M8-O2-O7-P7-S2-S3-S4-U1-U2-U3-V3-V4-Z-	21.2
3	A0-A4-B1-B5-B8-C3-C6-E6-G1-G2-H2-I11-I12-L1-L2-M1-M2-M4-R5-U3-V3-V4-Z-	20.6
5	A0-A4-B1-B5-B8-C3-C6-E6-G1-G2-H2-I11-I12-L1-L2-M1-M5-R2-R5-U3-V3-V4-Z-	20.6
10	A0-A4-B1-B5-B8-C3-C6-E6-G1-G2-H2-I11-I31-I32-J22-L1-L2-M6-O5-O6-P1-R1-R2-R5-U3-V3-V4-Z-	20.4
11	A0-A4-B1-B5-B8-C3-C6-E6-G1-G2-H2-I11-I31-I32-J22-L1-L2-M6-O5-O6-P1-R1-R6-U2-U3-V3-V4-Z-	20.5
13	A0-A4-B1-B5-B8-C3-C6-E6-G1-G2-H2-I11-I31-I32-J22-L1-L2-M1-M2-M3-R4-V1-V3-V4-Z-	20.6
14	A0-A4-B1-B5-B8-C3-C6-E6-G1-G2-H2-I11-I31-I32-J22-L1-L2-M1-M2-M3-R3-R5-U3-V3-V4-Z-	21.1
15	A0-A4-B1-B5-B8-C3-C6-E6-G1-G2-H2-I11-I31-I32-J22-L1-L2-M1-M2-M4-R5-U3-V3-V4-Z-	20.0
16	A0-A4-B1-B5-B8-C3-C6-E6-G1-G2-H2-I11-I31-I32-J22-L1-L2-M1-M5-R2-R5-U3-V3-V4-Z-	19.9
18	A0-A4-B1-B5-B8-C3-C6-E6-G1-G2-H2-I11-I31-I4-J21-J22-L1-L2-M1-M2-M3-R4-V1-V3-V4-Z-	21.1
19	A0-A4-B1-B5-B8-C3-C6-E6-G1-G3-G7-H5-J5-J4-K21-K61-K62-L5-L4-L3-L2-M6-O5-O6-P1-R1-R2-R5-U3-V3-V4-Z-	21.6
22	A0-A1-A3-A6-B2-B4-B8-C3-C6-E6-G1-G2-H2-I11-I31-I32-J22-L1-L2-M1-M2-M3-R4-V2-Z-	20.9
23	A0-A1-A3-A6-B2-B4-B8-C3-C6-E6-G1-G2-H2-I11-I31-I32-J22-L1-L2-M1-M2-M3-R4-V1-V3-V4-Z-	20.8
24	A0-A1-A3-A6-B2-B4-B8-C3-C6-E6-G1-G2-H2-I11-I31-I32-J22-L1-L2-M1-M2-M4-R5-U3-V3-V4-Z-	20.1
25	A0-A1-A3-A6-B2-B4-B8-C3-C6-E6-G1-G2-H2-I11-I31-I32-J22-L1-L2-M1-M5-R2-R5-U3-V3-V4-Z-	20.0
26	A0-A1-A3-A6-B2-B4-B8-C3-C6-E6-G1-G2-H2-I11-I31-I32-J22-L1-L2-M1-M5-R6-U2-U3-V3-V4-Z-	20.1
28	A0-A4-B1-B5-B8-C3-C6-E6-G1-G3-G6-H3-I2-I11-I12-L1-L2-M1-M5-R2-R5-U3-V3-V4-Z-	20.9
29	A0-A4-B1-B5-B8-C3-C6-E6-G1-G3-G6-H3-I5-I8-J3-K1-L5-L4-L3-L2-M1-M2-M3-R4-V2-Z-	21.7
33	A0-A4-B1-B5-B8-C3-C6-E6-G1-G3-H41-H42-H8-I8-J3-K1-L5-L4-L3-L2-M6-O5-P3-P5-S1-S4-T4-W1-W4-W7-X-V4-Z-	22.1
36	A0-A4-B1-B5-B8-C3-C6-E6-G1-G3-H41-H42-H8-I8-J3-K1-L5-L4-L3-L2-M1-M2-M4-R5-U3-V3-V4-Z-	20.5
41	A0-A4-B1-B5-B8-C3-C6-E6-G1-G3-H41-H42-H8-I8-J3-K1-L5-L4-M7-O7-P7-S2-S3-S4-U1-U2-U3-W5-W7-X-V4-Z-	21.0
42	A0-A4-B1-B5-B8-C3-C6-E6-G1-G3-H41-H42-H8-I8-J3-K1-L5-L4-M7-O7-P7-S2-S3-S4-U1-U2-U3-V3-V4-Z-	20.5
43	A0-A4-B1-B5-B8-C3-C6-E6-G1-G3-H41-H42-H8-I6-J1-J21-J22-L1-L2-M1-M2-M3-R4-V1-V3-V4-Z-	20.8
44	A0-A4-B1-B5-B8-C3-C6-E6-G1-G3-H41-H42-H8-I6-J1-J21-J22-L1-L2-M1-M2-M4-R5-U3-V3-V4-Z-	20.2
54	A0-A1-A3-A6-B2-B4-B8-C3-C6-E6-G1-G3-H41-H42-H8-I8-J3-K1-L5-L4-M7-O1-O5-P3-P5-P4-R1-R2-R5-U3-V3-V4-Z-	21.1
58	A0-A1-A3-A6-B2-B4-B8-C3-C6-E6-G1-G3-H41-H42-H8-I6-J1-J21-J22-L1-L2-M1-M2-M4-R5-U3-V3-V4-Z-	20.3
61	A0-A4-B1-B5-B8-C3-C6-E1-E7-F1-F5-G1-G2-H2-I11-I31-I32-J22-L1-L2-M1-M5-R2-R5-U3-V3-V4-Z-	20.1
63	A0-A1-A3-A6-B2-B4-B8-C3-C6-E1-E7-F1-F5-G1-G2-H2-I11-I31-I32-J22-L1-L2-M1-M2-M4-R5-U3-V3-V4-Z-	20.3
65	A0-A4-B1-B5-B8-C3-C6-E1-E7-F1-F6-G4-H5-J5-J4-K21-K61-M8-O2-O7-P7-S2-S3-S4-U1-U2-U3-V3-V4-Z-	21.1
67	A0-A4-B1-B5-B8-C3-C6-E1-E7-F2-F3-G4-H5-J5-J4-K21-K61-M8-O3-O8-Q2-Q1-P7-S2-S3-S4-U1-U2-U3-V3-V4-Z-	21.5
68	A0-A4-B1-B5-B8-C3-C6-E1-E7-F2-F3-G4-H5-J5-J4-K21-K61-M8-O3-O8-Q2-Q5-T2-T5-W1-W4-W7-X-V4-Z-	22.0
69	A0-A4-B1-B5-B8-C3-C6-E1-E7-F2-F3-G4-H5-J5-J4-K21-K61-M8-O3-O8-Q2-Q5-T1-T3-T5-W1-W4-W7-X-V4-Z-	22.5
70	A0-A4-B1-B5-B8-C3-C6-E1-E7-F2-F3-F7-G5-G8-H5-J5-H9-H8-I6-J1-J21-J22-L1-L2-M1-M2-M4-R5-U3-V3-V4-Z-	22.2
71	A0-A4-B1-B5-B8-C3-C4-C7-E2-E1-E6-G1-G3-H41-H42-H8-I8-J3-K1-L5-L4-M7-O7-P7-S2-S5-T3-T5-W1-W4-W7-X-V4-Z-	22.0
72	A0-A4-B1-B61-B62-B7-C3-C6-E6-F5-F6-G4-H5-J5-J4-K21-K61-M8-O2-O7-P7-S2-S3-S4-U1-U2-U3-V3-V4-Z-	21.3
78	A0-A4-B1-B61-B62-B7-C3-C6-E6-G1-G2-H2-I11-I31-I32-J22-L1-L2-M1-M2-M4-R5-U3-V3-V4-Z-	20.1
86	A0-A4-B1-B61-B62-B7-C3-C6-E6-G1-G3-H41-H42-H8-I8-J3-K1-L5-L4-M7-O7-P7-S2-S3-S4-U1-U2-U3-V3-V4-Z-	20.6
87	A0-A4-B1-B61-B62-B7-C3-C6-E6-G1-G3-H41-H42-H8-I6-J1-J21-J22-L1-L2-M1-M2-M3-R4-V1-V3-V4-Z-	20.9
92	A0-A4-B1-B61-B62-C1-C21-C22-C8-C9-E8-F3-G4-H5-J5-J4-K21-K22-K1-L5-L4-L3-L2-M6-O5-P3-P5-S1-S4-T4-W1-W4-W7-X-V4-Z-	22.7
94	A0-A4-B1-B61-B62-C1-C21-C22-C8-C9-E8-F3-G4-H5-J5-J4-K21-K22-K1-L5-L4-M7-O7-P7-S2-S3-S4-U1-U2-U3-V3-V4-Z-	21.1
96	A0-A4-B1-B61-B62-C1-C21-C22-C8-C9-E8-F3-G4-H5-J5-J4-K21-K61-M8-O2-O7-P7-S2-S3-S4-U1-U2-U3-V3-V4-Z-	20.8
103	A0-A4-B1-B61-B62-C1-C21-C22-C8-C9-E8-F3-G4-H5-J5-J4-K21-K61-K62-L5-L4-M7-O7-P7-S2-S3-S4-U1-U2-U3-V3-V4-Z-	21.0
108	A0-A4-B1-B61-B62-C1-C21-C22-C8-C9-E8-F3-F7-G5-G8-H5-J5-J4-K21-K22-K1-L5-L4-L3-L2-M1-M5-R2-R5-U3-V3-V4-Z-	22.4
116	A0-A4-B1-B61-B62-C1-C21-C22-C8-C9-E8-F2-F1-F5-G1-G2-H1-H3-I5-I8-J3-K1-L5-L4-L3-L2-M1-M2-M3-R4-V2-Z-	22.5
117	A0-A4-B1-B61-B62-C1-C21-C22-C8-C9-E8-F2-F1-F5-G1-G2-H2-I11-I12-L1-L2-M6-O5-P3-P6-S2-S3-S4-U1-U2-U3-V3-V4-Z-	22.7
119	A0-A4-B1-B61-B62-C1-C21-C22-C8-C9-E8-F2-F1-F5-G1-G2-H2-I11-I12-L1-L2-M1-M2-M3-R3-R5-U3-V3-V4-Z-	22.4
130	A0-A4-B1-B61-B62-C1-C21-C22-C8-C9-E8-F2-F1-F5-G1-G3-G6-H3-I5-I8-J3-K1-L5-L4-L3-L2-M1-M2-M3-R4-V2-Z-	22.3
132	A0-A4-B1-B61-B62-C1-C21-C22-C8-C9-E8-F2-F1-F5-G1-G3-G6-H3-I5-I6-I7-J3-K1-L5-L4-L3-L2-M1-M2-M3-R4-V2-Z-	22.5
137	A0-A4-B1-B61-B62-C1-C21-C22-C8-C9-E8-F2-F1-F5-G1-G3-H41-H42-H8-I8-J3-K1-L5-L4-L3-L2-M1-M2-M4-R5-U3-V3-V4-Z-	21.1
138	A0-A4-B1-B61-B62-C1-C21-C22-C8-C9-E8-F2-F1-F5-G1-G3-H41-H42-H8-I8-J3-K1-L5-L4-M7-O7-P7-S2-S3-S4-U1-U2-U3-V3-V4-Z-	21.1
142	A0-A4-B1-B61-B62-C1-C21-C22-C8-E5-F4-F8-G5-H6-J6-J5-J4-K21-K61-M8-O2-O7-P7-S2-S3-S4-U1-U2-U3-V3-V4-Z-	22.1
143	A0-A4-B1-B61-B62-C1-C21-C22-C8-E5-F4-F8-G5-G8-H5-J5-J4-K21-K61-M8-O2-O7-P7-S2-S3-S4-U1-U2-U3-V3-V4-Z-	22.1
146	A0-A4-B1-B61-B62-C1-C21-C23-C5-C8-E5-F4-F8-G5-G8-H5-J5-J4-K21-K22-K1-L5-L4-L3-L2-M1-M5-R2-R5-U3-V3-V4-Z-	22.5
154	A0-A4-B1-B61-B62-C1-C21-C23-C7-E2-E7-F1-F5-G1-G3-H41-H42-H8-I8-J3-K1-L5-L4-L3-L2-M6-O5-P3-P5-S1-S4-T4-W1-W4-W7-X-V4-Z-	22.6
164	A0-A4-B1-B61-B62-C1-C21-C23-C7-E2-E1-E6-G1-G2-H2-I11-I12-L1-L2-M1-M2-M3-R4-V2-Z-	21.9
170	A0-A4-B1-B61-B62-C1-C21-C23-C7-E2-E1-E6-G1-G3-G7-H5-J5-J4-K21-K61-K62-L5-L4-L3-L2-M6-O5-O6-P1-R1-R2-R5-U3-V3-V4-Z-	22.1
175	A0-A4-B1-B61-B62-C1-C21-C23-C7-E2-E1-E6-G1-G3-H41-I9-I5-I8-J3-K1-L5-L4-M7-O7-P7-S2-S3-S4-T4-W1-W4-W7-X-V4-Z-	22.3
176	A0-A4-B1-B61-B62-C1-C21-C23-C7-E2-E1-E6-G1-G3-H41-I9-I5-I8-J3-K1-L5-L4-M7-O7-P7-S2-S3-S4-T4-W1-W3-W6-X-V4-Z-	22.5
178	A0-A4-B1-B61-B62-C1-C21-C23-C7-E2-E1-E6-G1-G3-H41-H42-H8-I8-J3-K1-L5-L4-L3-L2-M6-O5-P3-P5-S1-S4-T4-W1-W4-W7-X-V4-Z-	22.5
179	A0-A4-B1-B61-B62-C1-C21-C23-C7-E2-E1-E6-G1-G3-H41-H42-H8-I8-J3-K1-L5-L4-L3-L2-M1-M2-M3-R4-V2-Z-	21.8
184	A0-A4-B1-B61-B62-C1-C21-C23-C7-E2-E1-E6-G1-G3-H41-H42-H8-I6-I7-J3-K1-L5-L4-M7-O7-P7-S2-S5-T3-T5-W1-W4-W7-X-V4-Z-	22.2
185	A0-A4-B1-B61-B62-C1-C21-C23-C7-E2-E1-E6-G1-G3-H41-H42-H8-I6-I7-J3-K1-L5-L4-M7-O7-P7-S2-S3-S4-T4-W1-W4-W7-X-V4-Z-	22.2
186	A0-A4-B1-B61-B62-C1-C21-C23-C7-E3-E8-F3-G4-H5-J5-H9-H8-I8-J3-K1-L5-L4-L3-L2-M6-O5-O6-P1-R1-R2-R5-U3-V3-V4-Z-	21.7
187	A0-A4-B1-B61-B62-C1-C21-C23-C7-E3-E8-F3-G4-H5-J5-H9-H8-I6-I7-J3-K1-L5-L4-L3-L2-M6-O5-O6-P1-R1-R2-R5-U3-V3-V4-Z-	22.0
191	A0-A4-B1-B61-B62-C1-C21-C23-C7-E3-E8-F3-G4-H5-J5-J4-K21-K61-M8-O2-O1-O5-O6-P1-R1-R2-R5-U3-V3-V4-Z-	21.2
192	A0-A4-B1-B61-B62-C1-C21-C23-C7-E3-E8-F3-G4-H5-J5-J4-K21-K61-M8-O2-O1-O5-O6-P1-R1-R6-U2-U3-V3-V4-Z-	21.3
199	A0-A4-A7-B2-B4-B8-C3-C6-E6-G1-G2-H2-I11-I31-I32-J22-L1-L2-M1-M2-M3-R4-V1-V3-V4-Z-	20.8
200	A0-A4-A7-B2-B4-B8-C3-C6-E6-G1-G2-H2-I11-I31-I32-J22-L1-L2-M1-M5-R2-R5-U3-V3-V4-Z-	20.1
207	A0-A4-A7-B2-B4-B8-C3-C6-E6-G1-G3-H41-H42-H8-I8-J3-K1-L5-L4-M7-O7-P7-S2-S3-S4-U1-U2-U3-V3-V4-Z-	20.7
216	A0-A4-A7-B2-B4-B8-C3-C4-C7-E3-E8-F2-F1-F5-G1-G3-H41-H42-H8-I8-J3-K1-L5-L4-L3-L2-M6-O5-P3-P5-S1-S4-T4-W1-W4-W7-X-V4-Z-	22.9
217	A0-A4-B1-B61-B62-C1-C21-C23-C7-E3-E8-F3-G4-H5-J5-H9-H8-I8-J3-K1-L5-L4-M7-O7-P7-P6-P5-P4-R1-R2-R5-U3-V3-V4-Z-	21.2
218	A0-A4-B1-B61-B62-C1-C21-C23-C7-E3-E8-F3-G4-H5-J5-H9-H8-I8-J3-K1-L5-L4-M7-O7-P7-P6-P5-S1-S4-U1-U2-U3-V3-V4-Z-	21.2
219	A0-A4-B1-B61-B62-C1-C21-C23-C7-E3-E8-F3-G4-H5-J5-J4-K21-K22-K1-L5-L4-M7-O7-P7-P6-P5-P4-R1-R2-R5-U3-V3-V4-Z-	21.1
221	A0-A4-A7-B2-B4-B8-C3-C4-C7-E2-E1-E6-G1-G3-H41-H42-H8-I8-J3-K1-L5-L4-M7-O7-P7-P6-P5-P4-R1-R2-R5-U3-V3-V4-Z-	21.1

TABLE 2. ENVIRONMENTAL DATA FOR FILED ROUTES IN THE CCN APPLICATION
RAMHORN HILL-DUNHAM 345 kV TRANSMISSION LINE PROJECT

Alternative Route Number	1	3	5	10	11	13	14	15	16
Length of alternative route (feet)	111,751	108,960	108,537	107,966	108,190	108,924	111,501	105,547	105,124
Length of alternative route (miles)	21.2	20.6	20.6	20.4	20.5	20.6	21.1	20.0	19.9
Length of route parallel to existing electric transmission lines	0	0	0	0	0	0	0	0	0
Length of route parallel to railroads	0	0	0	5,514	5,514	9,775	5,514	5,514	5,514
Length of route parallel to existing public roads/highways	6,399	18,576	17,471	13,164	13,164	13,422	11,973	13,079	11,973
Length of route parallel to pipelines [1]	14,491	20,687	18,840	12,611	13,456	11,981	11,981	15,633	13,785
Length of route parallel to apparent property boundaries	20,181	34,445	29,455	32,172	33,585	34,587	29,931	34,920	29,931
Total length of route parallel to existing compatible rights-of-way	20,181	34,445	29,455	35,263	36,675	34,587	29,931	34,920	29,931
Number of habitable structures within 500 feet of the route centerline [2]	188	151	132	348	352	193	191	210	191
Number of parks or recreational areas within 1,000 feet of the route centerline [3]	7	8	8	5	5	4	4	4	4
Length of the route across parks/recreational areas	3,343	2,110	2,110	12	12	12	12	12	12
Length of route through commercial/industrial areas	4,442	14,410	14,072	11,359	11,360	10,757	10,651	11,029	10,691
Length of the route across cropland/hay meadow	22,786	13,846	14,791	16,078	17,856	16,701	16,701	18,200	19,144
Length across rangeland pasture	59,773	55,809	50,198	60,596	57,524	60,399	64,096	54,905	49,294
Length of route across agricultural cropland with mobile irrigation systems	0	0	0	0	0	0	0	0	0
Length of route across upland woodlands	13,402	12,571	13,010	10,920	11,755	12,043	11,427	12,184	12,622
Length of route across riparian areas	9,245	10,765	14,923	7,456	8,113	7,493	7,530	7,959	12,117
Length of route across potential wetlands	224	393	393	790	790	393	393	393	393
Number of stream crossings by the route	28	19	21	19	19	16	16	17	19
Length of route parallel to streams (within 100 feet)	3,901	504	504	0	0	0	0	0	0
Length across lakes or ponds (open waters)	1,879	1,165	1,150	768	792	1,139	704	878	863
Number of known rare/unique plant locations within the right-of-way	1	1	1	1	1	1	1	1	1
Length of route through known habitat of endangered or threatened species	0	0	0	0	0	0	0	0	0
Number of recorded cultural resource sites crossed by the route	0	1	1	0	0	1	1	1	1
Number of recorded cultural resources within 1,000 feet of the route centerline	3	3	3	2	2	3	3	3	3
Length of route across areas of high archaeological/historical site potential	37,497	42,191	59,354	32,394	32,563	33,746	34,797	36,472	53,635
Number of private airstrips within 10,000 feet of the route centerline	0	0	0	0	0	0	0	0	0
Number of FAA-registered airports with at least one runway more than 3,200 feet in length within 20,000 feet of route centerline	3	3	3	4	4	3	3	3	3
Number of FAA-registered airports with no runway greater than 3,200 feet in length within 10,000 feet of the route centerline	5	1	1	1	1	1	1	1	1
Number of heliports located within 5,000 feet of the route centerline	1	3	3	3	3	3	3	3	3
Number of commercial AM radio transmitters located within 10,000 feet of the route centerline	0	0	0	0	0	0	0	0	0
Number of FM, microwave and other electronic installations within 2,000 feet of the route centerline	1	6	6	3	3	3	3	4	4
Number of U.S. or State Highway crossings by the route	17	16	16	16	16	16	16	16	16
Number of Farm to Market (F.M.), county roads, or other street crossings by the route	9	13	11	9	10	8	8	10	8
Estimated length of right-of-way within foreground visual zone of U.S. and State Highways	42,489	56,026	72,406	55,542	61,637	50,817	48,497	48,497	64,876
Estimated length of right-of-way within foreground visual zone of park/recreational areas	42,567	45,051	45,051	55,500	55,500	43,544	43,544	43,544	43,544
Estimated transmission line cost	$ 167,829,000	$ 212,686,000	$ 208,670,000	$ 184,611,000	$ 186,578,000	$ 176,468,000	$ 179,563,000	$ 177,830,000	$ 173,814,000

NOTES: All length measurements are in feet. Measurements for many of the environmental criteria were obtained from mosaics of ortho-rectified images (NearMap, 2023), whose capture process utilizes global positioning system and precise point positioning technologies to achieve sub-meter (or approximately 7.8 inches) horizontal accuracy to true ground location.

(1) Not included in length of route parallel to existing compatible rights-of-way.

(2) Structures normally inhabited by humans on a daily or regular basis. Habitable structures include but are not limited to single-family and multi-family dwellings and related structures, mobile homes, apartment buildings, commercial structures, industrial structures, churches, hospitals, nursing homes, and schools.

(3) Defined as parks and recreational areas owned by a governmental body or an organized group, club, or church.

TABLE 2. ENVIRONMENTAL DATA FOR FILED ROUTES IN THE CCN APPLICATION
RAMHORN HILL-DUNHAM 345 kV TRANSMISSION LINE PROJECT

Alternative Route Number	18	19	22	23	24	25	26	28	29
Length of alternative route (feet)	111,183	114,265	110,345	109,621	106,244	105,821	106,045	110,319	114,320
Length of alternative route (miles)	21.1	21.6	20.9	20.8	20.1	20.0	20.1	20.9	21.7
Length of route parallel to existing electric transmission lines	0	0	0	0	0	0	0	0	0
Length of route parallel to railroads	9,775	0	5,514	9,775	5,514	5,514	5,514	0	0
Length of route parallel to existing public roads/highways	13,422	10,475	9,616	11,065	10,721	9,616	9,616	14,204	10,672
Length of route parallel to pipelines [1]	11,981	13,868	11,981	11,981	15,633	13,785	14,630	18,017	10,506
Length of route parallel to apparent property boundaries	31,685	22,421	28,537	32,798	33,131	28,141	29,554	30,367	28,240
Total length of route parallel to existing compatible rights-of-way	31,685	25,511	28,537	32,798	33,131	28,141	29,554	30,367	28,240
Number of habitable structures within 500 feet of the route centerline [2]	193	320	197	200	217	198	202	133	131
Number of parks or recreational areas within 1,000 feet of the route centerline [3]	4	9	5	5	5	5	5	9	3
Length of the route across parks/recreational areas	12	3,343	12	12	12	12	12	2,099	0
Length of route through commercial/industrial areas	10,769	5,282	11,504	11,514	11,787	11,449	11,450	11,740	5,249
Length of the route across cropland/hay meadow	19,126	20,377	13,953	13,953	15,453	16,397	18,174	14,642	18,489
Length across rangeland pasture	60,404	62,432	62,164	60,635	55,141	49,530	46,458	52,592	69,551
Length of route across agricultural cropland with mobile irrigation systems	0	0	0	0	0	0	0	0	0
Length of route across upland woodlands	12,056	13,108	13,940	14,545	14,686	15,125	15,960	13,784	12,740
Length of route across riparian areas	7,281	10,631	7,742	7,493	7,959	12,117	12,774	15,718	6,125
Length of route across potential wetlands	393	621	393	393	393	393	393	404	404
Number of stream crossings by the route	16	29	19	17	18	20	20	25	27
Length of route parallel to streams (within 100 feet)	0	3,165	656	0	0	0	0	1,018	1,865
Length across lakes or ponds (open waters)	1,154	1,814	649	1,088	826	811	835	1,440	1,763
Number of known rare/unique plant locations within the right-of-way	1	1	1	1	1	1	1	1	1
Length of route through known habitat of endangered or threatened species	0	0	0	0	0	0	0	0	0
Number of recorded cultural resource sites crossed by the route	1	0	1	1	1	1	1	1	1
Number of recorded cultural resources within 1,000 feet of the route centerline	3	4	3	3	3	3	3	3	3
Length of route across areas of high archaeological/historical site potential	36,005	48,534	35,217	34,176	36,902	54,065	54,234	64,206	39,609
Number of private airstrips within 10,000 feet of the route centerline	0	0	0	0	0	0	0	0	0
Number of FAA-registered airports with at least one runway more than 3,200 feet in length within 20,000 feet of route centerline	3	4	3	3	3	3	3	3	3
Number of FAA-registered airports with no runway greater than 3,200 feet in length within 10,000 feet of the route centerline	1	5	1	1	1	1	1	2	4
Number of heliports located within 5,000 feet of the route centerline	3	1	3	3	3	3	3	3	2
Number of commercial AM radio transmitters located within 10,000 feet of the route centerline	0	0	0	0	0	0	0	0	0
Number of FM, microwave and other electronic installations within 2,000 feet of the route centerline	3	2	4	3	4	4	4	6	3
Number of U.S. or State Highway crossings by the route	16	19	16	16	16	16	16	19	19
Number of Farm to Market (F.M.), county roads, or other street crossings by the route	8	8	10	9	11	9	10	10	10
Estimated length of right-of-way within foreground visual zone of U.S. and State Highways	52,203	49,132	47,992	49,940	47,620	63,999	70,095	68,054	43,149
Estimated length of right-of-way within foreground visual zone of park/recreational areas	43,544	59,890	49,200	44,988	44,988	44,988	44,988	46,042	42,806
Estimated transmission line cost	$ 179,754,000	$ 171,340,000	$ 183,426,000	$ 182,133,000	$ 183,495,000	$ 179,479,000	$ 181,445,000	$ 206,668,000	$ 164,581,000

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(1) Not included in length of route parallel to existing compatible rights-of-way.

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TABLE 2. ENVIRONMENTAL DATA FOR FILED ROUTES IN THE CCN APPLICATION
RAMHORN HILL-DUNHAM 345 kV TRANSMISSION LINE PROJECT

Alternative Route Number	33	36	41	42	43	44	54	58
Length of alternative route (feet)	116,619	108,375	110,686	108,034	109,788	106,411	111,219	107,108
Length of alternative route (miles)	22.1	20.5	21.0	20.5	20.8	20.2	21.1	20.3
Length of route parallel to existing electric transmission lines	0	0	0	0	0	0	0	0
Length of route parallel to railroads	0	0	2,435	0	9,775	5,514	0	5,514
Length of route parallel to existing public roads/highways	19,333	11,504	7,940	7,335	9,410	9,067	8,950	6,709
Length of route parallel to pipelines [1]	12,545	13,898	22,956	21,112	11,409	15,060	19,983	15,060
Length of route parallel to apparent property boundaries	26,245	28,120	24,374	23,769	23,357	23,690	21,050	21,901
Total length of route parallel to existing compatible rights-of-way	32,991	28,120	24,374	23,769	23,357	23,690	25,023	21,901
Number of habitable structures within 500 feet of the route centerline [2]	183	155	168	158	197	214	267	221
Number of parks or recreational areas within 1,000 feet of the route centerline [3]	3	3	3	3	5	5	4	6
Length of the route across parks/recreational areas	0	0	0	0	0	0	0	0
Length of route through commercial/industrial areas	6,015	4,958	4,730	4,507	7,998	8,270	5,547	9,028
Length of the route across cropland/hay meadow	20,260	21,747	20,443	20,443	15,589	17,089	18,902	14,341
Length across rangeland pasture	67,061	61,268	63,880	61,854	64,498	59,004	66,496	59,240
Length of route across agricultural cropland with mobile irrigation systems	0	0	0	0	0	0	0	0
Length of route across upland woodlands	11,491	11,307	11,836	11,541	11,058	11,199	11,265	13,701
Length of route across riparian areas	9,331	7,211	7,866	7,759	9,071	9,537	7,255	9,537
Length of route across potential wetlands	625	0	0	0	0	0	268	0
Number of stream crossings by the route	28	25	26	25	20	21	29	22
Length of route parallel to streams (within 100 feet)	695	695	695	695	0	0	695	0
Length across lakes or ponds (open waters)	1,836	1,883	1,930	1,930	1,574	1,312	1,486	1,261
Number of known rare/unique plant locations within the right-of-way	4	1	1	1	1	1	1	1
Length of route through known habitat of endangered or threatened species	0	0	0	0	0	0	0	0
Number of recorded cultural resource sites crossed by the route	0	1	0	0	1	1	0	1
Number of recorded cultural resources within 1,000 feet of the route centerline	2	3	1	1	3	3	1	3
Length of route across areas of high archaeological/historical site potential	42,802	40,385	40,653	40,246	38,472	41,197	40,248	41,627
Number of private airstrips within 10,000 feet of the route centerline	0	0	0	0	0	0	0	0
Number of FAA-registered airports with at least one runway more than 3,200 feet in length within 20,000 feet of route centerline	4	3	4	4	3	3	4	3
Number of FAA-registered airports with no runway greater than 3,200 feet in length within 10,000 feet of the route centerline	4	4	4	4	2	2	4	2
Number of heliports located within 5,000 feet of the route centerline	2	2	2	2	2	2	2	2
Number of commercial AM radio transmitters located within 10,000 feet of the route centerline	0	0	0	0	0	0	0	0
Number of FM, microwave and other electronic installations within 2,000 feet of the route centerline	3	3	1	1	3	4	1	4
Number of U.S. or State Highway crossings by the route	20	19	19	19	19	19	19	19
Number of Farm to Market (F.M.), county roads, or other street crossings by the route	8	11	9	10	7	9	10	10
Estimated length of right-of-way within foreground visual zone of U.S. and State Highways	48,563	44,594	45,348	42,697	52,551	50,232	45,508	49,355
Estimated length of right-of-way within foreground visual zone of park/recreational areas	49,997	41,848	41,950	38,973	47,790	47,790	44,976	49,233
Estimated transmission line cost	$ 187,535,000	$ 172,226,000	$ 173,399,000	$ 168,310,000	$ 177,923,000	$ 179,285,000	$ 181,238,000	$ 186,209,000

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RAMHORN HILL-DUNHAM 345 kV TRANSMISSION LINE PROJECT

Alternative Route Number	61	63	65	67	68	69	70	71
Length of alternative route (feet)	106,109	107,230	111,587	113,673	115,997	118,810	117,115	116,232
Length of alternative route (miles)	20.1	20.3	21.1	21.5	22.0	22.5	22.2	22.0
Length of route parallel to existing electric transmission lines	0	0	0	0	0	0	0	0
Length of route parallel to railroads	5,514	5,514	0	0	0	0	5,514	0
Length of route parallel to existing public roads/highways	17,585	16,333	12,011	8,982	14,472	15,565	18,182	13,918
Length of route parallel to pipelines [1]	13,785	15,633	14,491	12,787	10,823	11,916	19,686	22,740
Length of route parallel to apparent property boundaries	34,805	38,005	25,055	20,232	21,779	25,853	31,354	32,718
Total length of route parallel to existing compatible rights-of-way	34,948	38,148	25,198	20,376	23,326	27,400	31,498	34,121
Number of habitable structures within 500 feet of the route centerline [2]	191	217	188	252	240	234	266	146
Number of parks or recreational areas within 1,000 feet of the route centerline [3]	4	5	7	7	7	7	5	4
Length of the route across parks/recreational areas	12	12	3,343	3,343	3,343	3,343	3,062	0
Length of route through commercial/industrial areas	10,903	11,998	4,324	4,304	5,699	5,687	8,534	6,004
Length of the route across cropland/hay meadow	20,499	16,807	24,140	29,210	31,022	36,231	18,299	25,947
Length across rangeland pasture	50,266	56,113	60,097	57,538	57,509	54,065	70,487	61,783
Length of route across agricultural cropland with mobile irrigation systems	0	0	0	0	0	0	0	0
Length of route across upland woodlands	11,034	13,098	11,813	11,792	10,365	11,313	11,236	12,592
Length of route across riparian areas	12,162	8,004	9,118	9,157	9,766	9,797	7,248	7,946
Length of route across potential wetlands	393	393	224	418	418	418	224	0
Number of stream crossings by the route	19	18	28	26	29	27	21	27
Length of route parallel to streams (within 100 feet)	308	308	3,593	3,165	3,165	5,108	381	2,639
Length across lakes or ponds (open waters)	854	817	1,870	1,254	1,216	1,298	1,088	1,960
Number of known rare/unique plant locations within the right-of-way	1	1	1	1	4	4	1	4
Length of route through known habitat of endangered or threatened species	0	0	0	0	0	0	0	0
Number of recorded cultural resource sites crossed by the route	1	1	0	0	0	0	1	0
Number of recorded cultural resources within 1,000 feet of the route centerline	3	3	3	3	3	3	3	1
Length of route across areas of high archaeological/historical site potential	54,210	37,476	36,923	34,737	32,866	35,128	34,833	41,883
Number of private airstrips within 10,000 feet of the route centerline	0	0	0	0	0	0	0	0
Number of FAA-registered airports with at least one runway more than 3,200 feet in length within 20,000 feet of route centerline	3	3	3	3	3	3	3	4
Number of FAA-registered airports with no runway greater than 3,200 feet in length within 10,000 feet of the route centerline	1	1	5	6	6	6	3	4
Number of heliports located within 5,000 feet of the route centerline	3	3	1	1	1	1	2	2
Number of commercial AM radio transmitters located within 10,000 feet of the route centerline	0	0	0	0	0	0	0	0
Number of FM, microwave and other electronic installations within 2,000 feet of the route centerline	4	4	1	1	4	4	4	3
Number of U.S. or State Highway crossings by the route	19	19	18	18	19	19	18	20
Number of Farm to Market (F.M.), county roads, or other street crossings by the route	8	11	9	11	11	10	9	9
Estimated length of right-of-way within foreground visual zone of U.S. and State Highways	65,862	48,605	42,325	40,470	45,418	45,418	52,600	50,088
Estimated length of right-of-way within foreground visual zone of park/recreational areas	44,474	45,917	42,347	41,782	46,571	46,571	49,262	44,767
Estimated transmission line cost	$ 178,684,000	$ 183,279,000	$ 168,575,000	$ 170,032,000	$ 172,434,000	$ 178,245,000	$ 195,228,000	$ 182,478,000

NOTES: All length measurements are in feet. Measurements for many of the environmental criteria were obtained from mosaics of ortho-rectified images (NearMap, 2023), whose capture process utilizes global positioning system and precise point positioning technologies to achieve sub-meter (or approximately 7.8 inches) horizontal accuracy to true ground location.

(1) Not included in length of route parallel to existing compatible rights-of-way.

(2) Structures normally inhabited by humans on a daily or regular basis. Habitable structures include but are not limited to single-family and multi-family dwellings and related structures, mobile homes, apartment buildings, commercial structures, industrial structures, churches, hospitals, nursing homes, and schools.

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TABLE 2. ENVIRONMENTAL DATA FOR FILED ROUTES IN THE CCN APPLICATION
RAMHORN HILL-DUNHAM 345 kV TRANSMISSION LINE PROJECT

Alternative Route Number	72	78	86	87	92	94	96	103
Length of alternative route (feet)	112,248	106,044	108,531	110,285	119,760	111,175	110,086	110,806
Length of alternative route (miles)	21.3	20.1	20.6	20.9	22.7	21.1	20.8	21.0
Length of route parallel to existing electric transmission lines	803	803	803	803	7,149	7,149	7,149	7,149
Length of route parallel to railroads	0	5,514	0	9,775	0	0	0	0
Length of route parallel to existing public roads/highways	3,087	9,767	4,023	6,099	14,631	2,633	1,122	2,633
Length of route parallel to pipelines [1]	14,491	15,633	21,112	11,409	11,069	19,636	11,880	21,492
Length of route parallel to apparent property boundaries	19,358	34,097	22,946	22,534	21,316	18,840	16,159	18,497
Total length of route parallel to existing compatible rights-of-way	20,161	34,900	23,749	23,337	35,211	25,989	23,308	25,646
Number of habitable structures within 500 feet of the route centerline [2]	188	210	158	197	319	294	290	287
Number of parks or recreational areas within 1,000 feet of the route centerline [3]	7	4	3	5	9	9	9	9
Length of the route across parks/recreational areas	3,343	12	0	0	3,844	3,844	3,844	3,844
Length of route through commercial/industrial areas	4,259	10,846	4,324	7,815	6,084	4,576	4,547	4,512
Length of the route across cropland/hay meadow	22,786	18,200	20,443	15,589	18,429	18,612	22,930	22,354
Length across rangeland pasture	60,259	55,390	62,339	64,984	69,710	64,503	59,912	60,952
Length of route across agricultural cropland with mobile irrigation systems	0	0	0	0	0	0	0	0
Length of route across upland woodlands	13,596	12,379	11,735	11,252	12,130	12,179	11,292	11,341
Length of route across riparian areas	9,245	7,959	7,759	9,071	10,878	9,306	9,423	9,663
Length of route across potential wetlands	224	393	0	0	849	224	224	224
Number of stream crossings by the route	28	17	25	20	28	25	27	26
Length of route parallel to streams (within 100 feet)	3,901	0	695	0	2,627	2,627	3,515	3,515
Length across lakes or ponds (open waters)	1,879	878	1,930	1,574	1,681	1,775	1,758	1,761
Number of known rare/unique plant locations within the right-of-way	1	1	1	1	3	0	0	0
Length of route through known habitat of endangered or threatened species	0	0	0	0	0	0	0	0
Number of recorded cultural resource sites crossed by the route	0	1	0	1	0	0	0	0
Number of recorded cultural resources within 1,000 feet of the route centerline	3	3	1	3	4	3	3	3
Length of route across areas of high archaeological/historical site potential	37,497	36,472	40,246	38,472	40,966	38,410	36,393	43,501
Number of private airstrips within 10,000 feet of the route centerline	0	0	0	0	0	0	0	0
Number of FAA-registered airports with at least one runway more than 3,200 feet in length within 20,000 feet of route centerline	3	3	4	3	4	4	3	4
Number of FAA-registered airports with no runway greater than 3,200 feet in length within 10,000 feet of the route centerline	5	1	4	2	5	5	5	5
Number of heliports located within 5,000 feet of the route centerline	1	3	2	2	1	1	1	1
Number of commercial AM radio transmitters located within 10,000 feet of the route centerline	0	0	0	0	0	0	0	0
Number of FM, microwave and other electronic installations within 2,000 feet of the route centerline	1	4	1	3	2	0	0	0
Number of U.S. or State Highway crossings by the route	17	16	19	19	15	14	14	14
Number of Farm to Market (F.M.), county roads, or other street crossings by the route	9	10	10	7	10	12	11	10
Estimated length of right-of-way within foreground visual zone of U.S. and State Highways	42,986	48,994	43,194	53,048	43,501	37,635	37,635	37,635
Estimated length of right-of-way within foreground visual zone of park/recreational areas	41,866	42,843	38,272	47,088	51,799	40,775	40,775	40,775
Estimated transmission line cost	$ 169,334,000	$ 180,616,000	$ 172,738,000	$ 181,022,000	$ 187,986,000	$ 169,167,000	$ 166,826,000	$ 167,945,000

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TABLE 2. ENVIRONMENTAL DATA FOR FILED ROUTES IN THE CCN APPLICATION
RAMHORN HILL-DUNHAM 345 kV TRANSMISSION LINE PROJECT

Alternative Route Number	108	116	117	119	130	132	137	138
Length of alternative route (feet)	118,176	119,030	119,593	118,138	117,544	118,739	111,599	111,258
Length of alternative route (miles)	22.4	22.5	22.7	22.4	22.3	22.5	21.1	21.1
Length of route parallel to existing electric transmission lines	7,149	7,149	7,149	7,149	7,149	7,149	7,149	7,149
Length of route parallel to railroads	0	0	0	0	0	0	0	0
Length of route parallel to existing public roads/highways	10,540	14,457	20,551	17,107	10,308	10,546	11,141	6,971
Length of route parallel to pipelines [1]	12,438	11,764	18,253	14,425	7,894	7,894	11,287	18,501
Length of route parallel to apparent property boundaries	19,641	33,055	34,922	30,347	29,131	30,324	29,012	24,660
Total length of route parallel to existing compatible rights-of-way	26,791	40,204	47,414	37,496	36,281	37,473	36,161	31,809
Number of habitable structures within 500 feet of the route centerline [2]	271	203	263	205	204	204	228	231
Number of parks or recreational areas within 1,000 feet of the route centerline [3]	9	5	11	11	6	6	6	6
Length of the route across parks/recreational areas	3,844	513	2,612	2,612	502	502	502	502
Length of route through commercial/industrial areas	4,897	5,709	14,702	14,526	5,743	5,454	5,453	5,002
Length of the route across cropland/hay meadow	22,775	20,110	14,700	13,820	19,961	19,961	23,220	21,916
Length across rangeland pasture	62,995	71,502	66,109	67,864	72,415	73,723	64,132	64,718
Length of route across agricultural cropland with mobile irrigation systems	0	0	0	0	0	0	0	0
Length of route across upland woodlands	12,639	11,867	11,656	9,817	10,742	10,928	9,310	9,543
Length of route across riparian areas	12,916	7,650	10,957	10,698	6,487	6,480	7,573	8,121
Length of route across potential wetlands	224	393	393	393	404	404	0	0
Number of stream crossings by the route	26	25	22	19	28	28	26	26
Length of route parallel to streams (within 100 feet)	3,007	2,524	1,162	1,162	2,524	2,524	1,354	1,354
Length across lakes or ponds (open waters)	1,729	1,800	1,076	1,020	1,792	1,790	1,912	1,959
Number of known rare/unique plant locations within the right-of-way	0	0	0	0	0	0	0	0
Length of route through known habitat of endangered or threatened species	0	0	0	0	0	0	0	0
Number of recorded cultural resource sites crossed by the route	1	1	0	1	1	1	1	0
Number of recorded cultural resources within 1,000 feet of the route centerline	5	3	2	3	3	3	3	1
Length of route across areas of high archaeological/historical site potential	56,699	41,140	38,525	40,561	39,654	40,849	40,430	40,291
Number of private airstrips within 10,000 feet of the route centerline	0	0	0	0	0	0	0	0
Number of FAA-registered airports with at least one runway more than 3,200 feet in length within 20,000 feet of route centerline	3	3	4	3	3	3	3	4
Number of FAA-registered airports with no runway greater than 3,200 feet in length within 10,000 feet of the route centerline	5	3	1	1	4	4	4	4
Number of heliports located within 5,000 feet of the route centerline	1	2	3	3	2	2	2	2
Number of commercial AM radio transmitters located within 10,000 feet of the route centerline	0	0	0	0	0	0	0	0
Number of FM, microwave and other electronic installations within 2,000 feet of the route centerline	2	2	3	4	2	2	2	0
Number of U.S. or State Highway crossings by the route	14	15	15	15	18	18	18	18
Number of Farm to Market (F.M.), county roads, or other street crossings by the route	11	12	14	13	12	12	13	12
Estimated length of right-of-way within foreground visual zone of U.S. and State Highways	57,999	47,535	54,164	56,061	43,183	44,378	44,629	42,731
Estimated length of right-of-way within foreground visual zone of park/recreational areas	43,718	44,215	48,277	44,974	42,729	40,877	41,771	38,895
Estimated transmission line cost	$ 179,591,000	$ 187,330,000	$ 237,423,000	$ 224,991,000	$ 179,173,000	$ 184,103,000	$ 183,714,000	$ 180,852,000

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(1) Not included in length of route parallel to existing compatible rights-of-way.

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TABLE 2. ENVIRONMENTAL DATA FOR FILED ROUTES IN THE CCN APPLICATION
RAMHORN HILL-DUNHAM 345 kV TRANSMISSION LINE PROJECT

Alternative Route Number	142	143	146	154	164	170	175	176
Length of alternative route (feet)	116,653	116,661	118,637	119,463	115,482	116,686	117,796	118,808
Length of alternative route (miles)	22.1	22.1	22.5	22.6	21.9	22.1	22.3	22.5
Length of route parallel to existing electric transmission lines	7,149	7,149	5,227	5,227	5,227	5,227	5,227	5,227
Length of route parallel to railroads	0	0	0	0	0	0	0	0
Length of route parallel to existing public roads/highways	3,416	3,416	7,992	21,136	13,662	6,667	8,407	2,917
Length of route parallel to pipelines [1]	15,031	16,218	16,209	9,933	14,425	11,257	17,761	17,761
Length of route parallel to apparent property boundaries	19,899	16,575	17,903	28,426	27,158	19,728	24,005	19,918
Total length of route parallel to existing compatible rights-of-way	27,048	23,724	23,131	40,543	32,385	28,046	30,635	25,145
Number of habitable structures within 500 feet of the route centerline [2]	223	220	200	145	93	282	108	110
Number of parks or recreational areas within 1,000 feet of the route centerline [3]	9	9	8	4	9	10	4	4
Length of the route across parks/recreational areas	2,292	3,844	3,844	0	2,110	3,343	0	0
Length of route through commercial/industrial areas	5,180	5,112	4,981	5,808	14,059	5,213	5,841	4,823
Length of the route across cropland/hay meadow	25,369	23,449	21,379	21,614	12,347	20,377	21,747	21,747
Length across rangeland pasture	60,818	61,915	61,591	70,628	65,592	65,192	64,757	66,174
Length of route across agricultural cropland with mobile irrigation systems	0	0	0	0	0	0	0	0
Length of route across upland woodlands	11,597	12,766	13,779	9,418	11,390	12,673	12,035	12,288
Length of route across riparian areas	11,615	11,213	14,706	9,543	10,715	10,798	11,511	11,766
Length of route across potential wetlands	80	224	224	625	393	621	0	0
Number of stream crossings by the route	33	28	28	29	21	30	30	31
Length of route parallel to streams (within 100 feet)	4,255	4,255	3,366	1,003	1,160	3,165	695	695
Length across lakes or ponds (open waters)	1,994	1,982	1,977	1,826	986	1,812	1,906	2,010
Number of known rare/unique plant locations within the right-of-way	0	0	0	3	1	1	4	4
Length of route through known habitat of endangered or threatened species	0	0	0	0	0	0	0	0
Number of recorded cultural resource sites crossed by the route	0	0	1	0	1	0	0	0
Number of recorded cultural resources within 1,000 feet of the route centerline	3	3	5	2	3	4	1	1
Length of route across areas of high archaeological/historical site potential	43,461	39,966	59,285	42,582	39,711	47,739	47,949	49,495
Number of private airstrips within 10,000 feet of the route centerline	0	0	0	0	0	0	0	0
Number of FAA-registered airports with at least one runway more than 3,200 feet in length within 20,000 feet of route centerline	3	3	3	4	3	4	4	4
Number of FAA-registered airports with no runway greater than 3,200 feet in length within 10,000 feet of the route centerline	5	5	5	4	1	5	4	4
Number of heliports located within 5,000 feet of the route centerline	1	1	1	2	3	1	2	2
Number of commercial AM radio transmitters located within 10,000 feet of the route centerline	0	0	0	0	0	0	0	0
Number of FM, microwave and other electronic installations within 2,000 feet of the route centerline	0	0	2	2	5	1	2	2
Number of U.S. or State Highway crossings by the route	14	14	14	19	16	19	20	20
Number of Farm to Market (F.M.), county roads, or other street crossings by the route	10	10	10	9	13	9	9	8
Estimated length of right-of-way within foreground visual zone of U.S. and State Highways	37,760	34,227	55,123	51,406	58,820	51,553	49,167	46,301
Estimated length of right-of-way within foreground visual zone of park/recreational areas	42,285	42,292	46,108	49,671	48,571	59,198	39,426	34,637
Estimated transmission line cost	$ 168,407,000	$ 168,092,000	$ 172,350,000	$ 198,218,000	$ 197,240,000	$ 180,874,000	$ 185,963,000	$ 185,500,000

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(1) Not included in length of route parallel to existing compatible rights-of-way.

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TABLE 2. ENVIRONMENTAL DATA FOR FILED ROUTES IN THE CCN APPLICATION
RAMHORN HILL-DUNHAM 345 kV TRANSMISSION LINE PROJECT

Alternative Route Number	178	179	184	185	186	187	191	192
Length of alternative route (feet)	119,040	114,898	117,406	117,146	114,792	115,987	112,023	112,247
Length of alternative route (miles)	22.5	21.8	22.2	22.2	21.7	22.0	21.2	21.3
Length of route parallel to existing electric transmission lines	5,227	5,227	5,227	5,227	5,227	5,227	5,227	5,227
Length of route parallel to railroads	0	0	0	0	0	0	0	0
Length of route parallel to existing public roads/highways	15,524	6,591	10,348	9,255	8,003	8,241	2,842	2,842
Length of route parallel to pipelines [1]	9,933	7,636	20,129	18,501	11,029	11,029	6,796	7,641
Length of route parallel to apparent property boundaries	23,552	20,834	30,101	23,690	25,558	26,751	16,426	17,839
Total length of route parallel to existing compatible rights-of-way	35,525	26,061	36,732	30,321	33,876	35,068	23,374	24,786
Number of habitable structures within 500 feet of the route centerline [2]	145	97	112	112	364	364	396	400
Number of parks or recreational areas within 1,000 feet of the route centerline [3]	4	4	4	4	4	4	8	8
Length of the route across parks/recreational areas	0	0	0	0	3,062	3,062	3,343	3,343
Length of route through commercial/industrial areas	5,946	4,607	5,351	5,314	4,897	4,608	4,632	4,633
Length of the route across cropland/hay meadow	20,260	20,248	25,947	22,131	18,802	18,802	24,135	25,913
Length across rangeland pasture	69,820	71,051	63,875	65,553	75,009	76,318	63,019	59,947
Length of route across agricultural cropland with mobile irrigation systems	0	0	0	0	0	0	0	0
Length of route across upland woodlands	11,056	10,126	12,388	11,551	9,345	9,530	9,345	10,180
Length of route across riparian areas	9,498	7,162	7,939	10,516	4,586	4,579	8,923	9,580
Length of route across potential wetlands	625	0	0	0	621	621	621	621
Number of stream crossings by the route	29	27	27	29	29	29	30	30
Length of route parallel to streams (within 100 feet)	695	1,351	2,639	695	695	695	3,165	3,165
Length across lakes or ponds (open waters)	1,835	1,704	1,906	2,080	1,532	1,529	1,349	1,372
Number of known rare/unique plant locations within the right-of-way	4	1	4	4	0	0	0	0
Length of route through known habitat of endangered or threatened species	0	0	0	0	0	0	0	0
Number of recorded cultural resource sites crossed by the route	0	1	0	0	0	0	0	0
Number of recorded cultural resources within 1,000 feet of the route centerline	2	3	1	1	2	2	3	3
Length of route across areas of high archaeological/historical site potential	42,007	37,905	43,078	48,235	28,161	29,356	35,529	35,698
Number of private airstrips within 10,000 feet of the route centerline	0	0	0	0	0	0	0	0
Number of FAA-registered airports with at least one runway more than 3,200 feet in length within 20,000 feet of route centerline	4	3	4	4	4	4	3	3
Number of FAA-registered airports with no runway greater than 3,200 feet in length within 10,000 feet of the route centerline	4	4	4	4	5	5	5	5
Number of heliports located within 5,000 feet of the route centerline	2	2	2	2	2	2	1	1
Number of commercial AM radio transmitters located within 10,000 feet of the route centerline	0	0	0	0	0	0	0	0
Number of FM, microwave and other electronic installations within 2,000 feet of the route centerline	2	2	2	2	1	1	1	1
Number of U.S. or State Highway crossings by the route	20	19	20	20	14	14	14	14
Number of Farm to Market (F.M.), county roads, or other street crossings by the route	9	11	9	9	11	11	10	11
Estimated length of right-of-way within foreground visual zone of U.S. and State Highways	50,984	47,388	51,262	52,179	52,296	53,491	49,788	55,883
Estimated length of right-of-way within foreground visual zone of park/recreational areas	49,305	45,369	41,218	41,218	54,223	52,371	50,212	50,212
Estimated transmission line cost	$ 193,659,000	$ 175,208,000	$ 188,738,000	$ 187,652,000	$ 183,978,000	$ 190,513,000	$ 166,165,000	$ 168,132,000

NOTES: All length measurements are in feet. Measurements for many of the environmental criteria were obtained from mosaics of ortho-rectified images (NearMap, 2023), whose capture process utilizes global positioning system and precise point positioning technologies to achieve sub-meter (or approximately 7.8 inches) horizontal accuracy to true ground location.

(1) Not included in length of route parallel to existing compatible rights-of-way.

(2) Structures normally inhabited by humans on a daily or regular basis. Habitable structures include but are not limited to single-family and multi-family dwellings and related structures, mobile homes, apartment buildings, commercial structures, industrial structures, churches, hospitals, nursing homes, and schools.

(3) Defined as parks and recreational areas owned by a governmental body or an organized group, club, or church.

TABLE 2. ENVIRONMENTAL DATA FOR FILED ROUTES IN THE CCN APPLICATION
RAMHORN HILL-DUNHAM 345 kV TRANSMISSION LINE PROJECT

Alternative Route Number	199	200	207	216	217	218	219	221
Length of alternative route (feet)	110,007	106,206	109,117	120,969	112,061	111,817	111,226	111,588
Length of alternative route (miles)	20.8	20.1	20.7	22.9	21.2	21.2	21.1	21.1
Length of route parallel to existing electric transmission lines	0	0	0	0	5,227	5,227	5,227	0
Length of route parallel to railroads	9,775	5,514	0	0	0	0	0	0
Length of route parallel to existing public roads/highways	11,642	10,193	5,554	20,997	3,748	3,748	2,633	5,554
Length of route parallel to pipelines [1]	11,981	13,785	21,112	12,545	26,468	24,181	24,840	26,316
Length of route parallel to apparent property boundaries	32,658	28,002	21,840	28,844	20,252	21,070	14,966	19,253
Total length of route parallel to existing compatible rights-of-way	32,658	28,002	21,840	35,590	25,480	26,298	20,193	19,253
Number of habitable structures within 500 feet of the route centerline [2]	195	193	160	261	293	226	327	220
Number of parks or recreational areas within 1,000 feet of the route centerline [3]	4	4	3	4	3	3	7	4
Length of the route across parks/recreational areas	12	12	0	0	3,062	3,062	3,343	0
Length of route through commercial/industrial areas	11,447	11,381	5,197	6,952	4,236	4,211	4,085	5,612
Length of the route across cropland/hay meadow	15,743	18,187	19,486	20,775	18,117	17,065	17,110	17,983
Length across rangeland pasture	59,594	48,489	61,049	69,006	74,231	72,731	69,499	67,352
Length of route across agricultural cropland with mobile irrigation systems	0	0	0	0	0	0	0	0
Length of route across upland woodlands	14,250	14,829	13,747	12,241	8,022	9,888	9,511	10,881
Length of route across riparian areas	7,493	12,117	7,759	9,543	5,289	5,468	8,808	7,578
Length of route across potential wetlands	393	393	0	625	492	849	492	268
Number of stream crossings by the route	17	20	26	30	29	27	27	29
Length of route parallel to streams (within 100 feet)	0	0	695	1,003	695	695	2,276	695
Length across lakes or ponds (open waters)	1,088	811	1,879	1,826	1,674	1,605	1,721	1,914
Number of known rare/unique plant locations within the right-of-way	1	1	1	3	0	0	0	1
Length of route through known habitat of endangered or threatened species	0	0	0	0	0	0	0	0
Number of recorded cultural resource sites crossed by the route	1	1	0	0	0	0	0	0
Number of recorded cultural resources within 1,000 feet of the route centerline	3	3	1	2	1	1	3	1
Length of route across areas of high archaeological/historical site potential	33,746	53,635	40,246	42,582	36,350	35,086	42,395	43,701
Number of private airstrips within 10,000 feet of the route centerline	0	0	0	0	0	0	0	0
Number of FAA-registered airports with at least one runway more than 3,200 feet in length within 20,000 feet of route centerline	3	3	4	4	4	4	4	4
Number of FAA-registered airports with no runway greater than 3,200 feet in length within 10,000 feet of the route centerline	1	1	4	4	5	5	5	4
Number of heliports located within 5,000 feet of the route centerline	3	3	2	2	2	2	1	2
Number of commercial AM radio transmitters located within 10,000 feet of the route centerline	0	0	0	0	0	0	0	0
Number of FM, microwave and other electronic installations within 2,000 feet of the route centerline	3	4	1	3	0	0	0	1
Number of U.S. or State Highway crossings by the route	16	16	19	19	14	14	14	19
Number of Farm to Market (F.M.), county roads, or other street crossings by the route	9	9	11	10	10	11	10	11
Estimated length of right-of-way within foreground visual zone of U.S. and State Highways	49,947	64,007	41,827	50,960	47,041	43,353	44,534	47,958
Estimated length of right-of-way within foreground visual zone of park/recreational areas	45,373	45,373	40,802	53,467	43,188	39,448	44,592	45,602
Estimated transmission line cost	$ 182,166,000	$ 179,512,000	$ 175,650,000	$ 202,124,000	$ 177,593,000	$ 178,352,000	$ 169,570,000	$ 181,190,000

NOTES: All length measurements are in feet. Measurements for many of the environmental criteria were obtained from mosaics of ortho-rectified images (NearMap, 2023), whose capture process utilizes global positioning system and precise point positioning technologies to achieve sub-meter (or approximately 7.8 inches) horizontal accuracy to true ground location.

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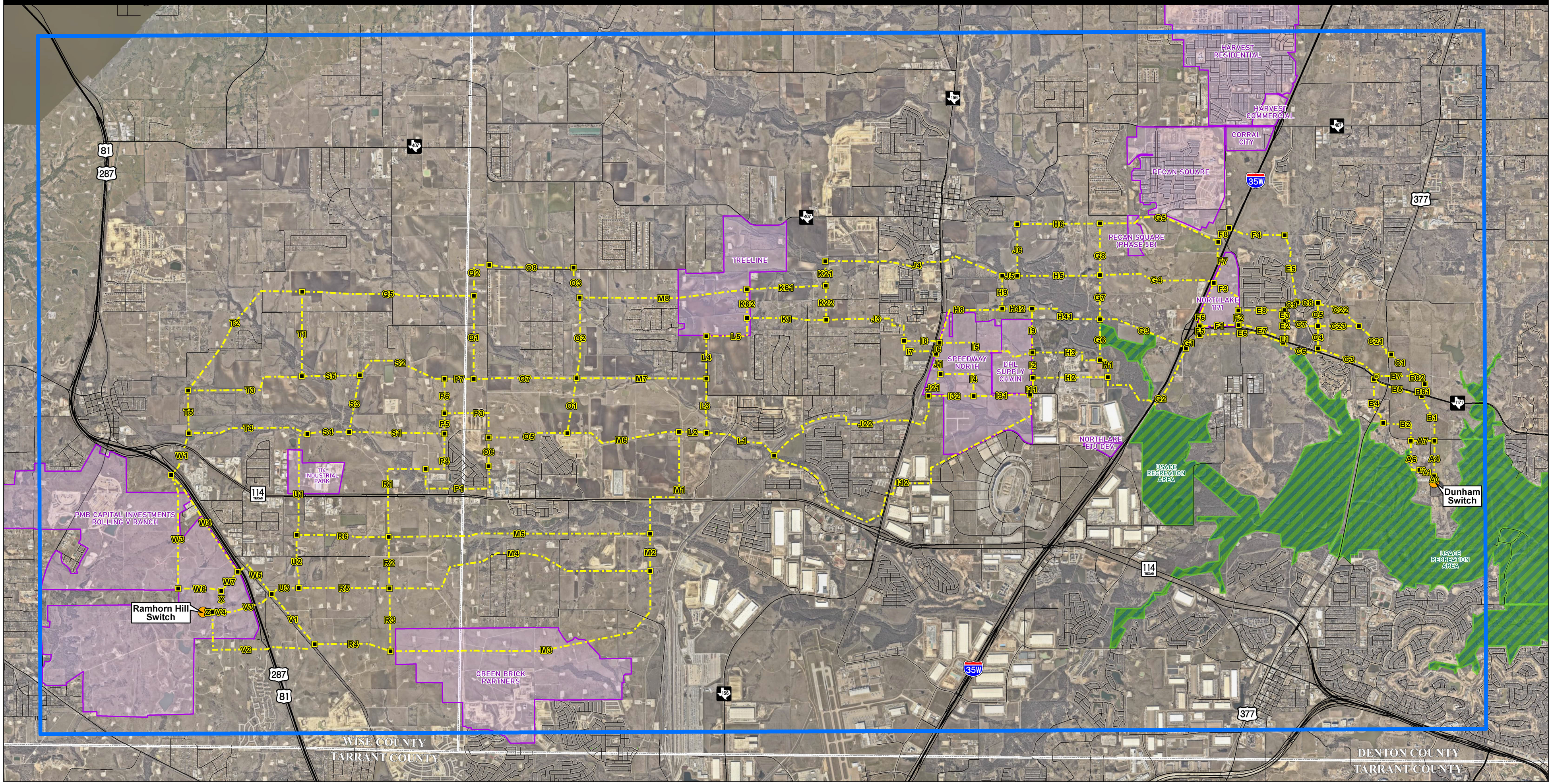
HALFF

STUDY AREA DEVELOPMENT OVERVIEW

RAMHORN HILL SWITCH -- DUNHAM SWITCH
345 kV TRANSMISSION LINE PROJECT

ONCOR



MAP FEATURES

- PROJECT ENDPOINT
- NODE BETWEEN ADJACENT ROUTE LINKS
- PRELIMINARY ALTERNATIVE ROUTE LINK
- ROADWAY
- SITE SPECIFIC DEVELOPMENT BOUNDARY
- USACE RECREATIONAL AREA
- COUNTY BOUNDARY
- STUDY AREA BOUNDARY

Notes:

1. Some legend symbols are enlarged for easier identification.
2. Aerial photography is from the most recent available database (NearMap, 2023).
3. Data are for display purposes only. All features and boundaries have been approximated based on information gathered from review of public resources and from field reconnaissance.

Date Plotted: 5/30/2023

Date Revised: 5/30/2023

N W E S

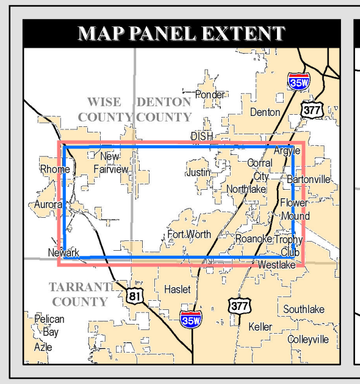
0 1,500 3,000 6,000

SCALE IN FEET

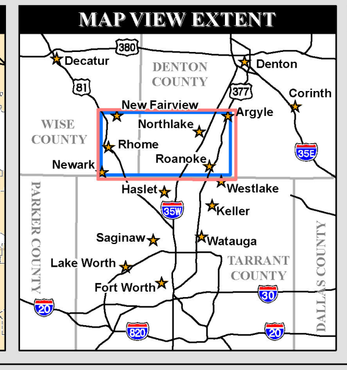
0 0.25 0.5 1

SCALE IN MILES

MAP PANEL EXTENT



MAP VIEW EXTENT



LOCATION MAP

EXHIBIT BJP-6
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