

Virginia State Corporation Commission eFiling CASE Document Cover Sheet

210654030

Case Number (if already assigned)	PUR-2021-00137
Case Name (if known)	Application of Virginia Electric and Power Company for approval and certification of electric transmission facilities: Line # 235 Extension to Cloud 230 kV and Related Projects
Document Type	APLA
Document Description Summary	3 of 23 Application Volume 1 of 2
Total Number of Pages	11
Submission ID	22175
eFiling Date Stamp	6/30/2021 1:52:16PM

I. NECESSITY FOR THE PROPOSED PROJECT

E. Describe the feasible project alternatives, if any, considered for meeting the identified need including any associated studies conducted by the Applicant or analysis provided to the RTO. Explain why each alternative was rejected.

Response: The Company considered electrical alternatives to the proposed Projects, including the use of distribution facilities, as well as existing and planned substations to serve the need for the Projects. Aside from the Company's preferred transmission option, which was selected for the proposed Projects, the Company considered one other transmission alternative.

Distribution Alternatives:

There are no feasible distribution alternatives to construction of the Cloud 230 kV Switching Station and Easters 230 kV Switching Station in response to ODEC's DP requests.

Transmission Alternative (Rejected Transmission Option):

The Company's transmission alternative is similar in scope to the preferred transmission option selected for the instant Projects. The proposed option and the transmission alternative each require the (i) Cloud 230 kV Switching Station; (ii) Easters 230 kV Switching Station; and (iii) Line #235 Extension. The major differences between the two options is the type of 230 kV line structures required for the Projects, the installation of a STATCOM, and the resulting cost increases for the rejected transmission alternative. For the reasons discussed below, the Company is proposing to reject the transmission alternative.

Please see Attachment I.E.1 for the rejected transmission alternative for the Projects. With this option, the Company proposed to do the following:

Cut 230 kV Line #235 at Structure #235/310 (a point starting west of Chase City Substation), and extend two 230 kV lines on double circuit structures to Easters Switching Station Junction and two 230 kV lines on single circuit structures from Easters Switching Station Junction to Cloud Switching Station

Line #235 Extension: cut the Clover-Farmville Line #235 at Structure #235/310 (a point starting west of Chase City Substation), and extend (a) one 230 kV line to the Cloud 230 kV Switching Station, resulting in the 230 kV Farmville-Cloud Line #235; (b) one 230 kV line to the Easters 230 kV Switching Station and renumber the Line #235 structures between Structure #235/310-Clover Substation, resulting in the 230kV Clover-Easters Line #2226, and (c) one 230 kV line between the Easters 230 kV Switching Station and Cloud 230 kV Switching Station, resulting in the 230 kV Easters-Cloud Line #2229. Two 230 kV lines will be installed primarily along approximately 15.3 miles of existing right-of-way with expanded right-of-way east of the Chase City Substation by less than 0.1 mile, at the Ridge

Road Junction by 0.3 mile, and at the Boydton DP by 0.4 mile to accommodate the proposed area of the Projects, totaling approximately 0.7 mile of new rights-of-way. The lines will be supported by 31 double circuit 2-pole galvanized steel structures, 72 double circuit galvanized steel poles, and 4 single circuit galvanized steel H-frame structures utilizing a three-phase twin-bundled 795 ACSR type conductor with a summer transfer capability of 1225 MVA.

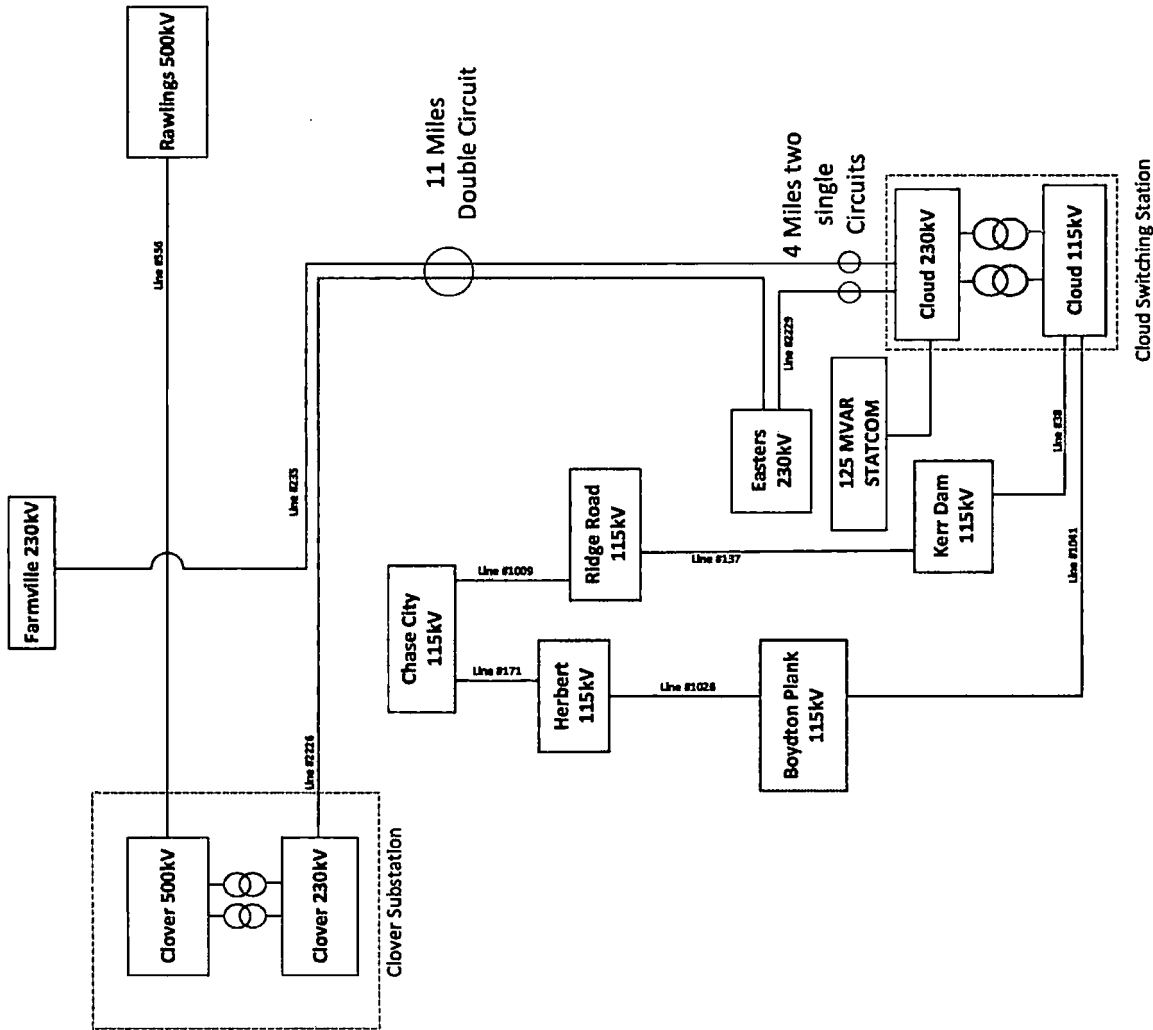
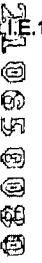
Two Separate 230 kV Single Circuits: Line #2226 and Line #235 would primarily share common transmission structures for 11 miles. Line #2229 and Line #235 will be on two separate 230 kV single circuit structures for 4 miles each and will not share any transmission structures. Since Line #2226 and Line #235 share common transmission structure for more than a mile, the loss of Line #2226 and Line #235 would be considered a tower contingency (the loss of any two adjacent circuits on common structure) per NERC TPL contingency P7 definition. When this contingency occurs, the Company would see a voltage low violation criteria violation at Cloud 230 kV and Easters 230 kV buses. One 230 kV 125 MVAR STATCOM would be needed to mitigate the voltage drop. The cost of this STATCOM solution is at least \$23.2 million more than the proposed transmission option for the Projects. Also, the Company notes that STATCOM is operationally more complex compared to the cap bank that the Company intends to use in the preferred transmission option. Therefore, the Company rejected this transmission alternative due to the increased costs for the use of the STATCOM.

Analysis of Demand-Side Resources:

Pursuant to the Commission's November 26, 2013, Order entered in Case No. PUE-2012-00029, and its November 1, 2018, Final Order entered in Case No. PUR-2018-00075 ("2018 Final Order"), the Company is required to provide analysis of demand-side resources ("DSM") incorporated into the Company's planning studies. DSM is the broad term that includes both energy efficiency ("EE") and demand response ("DR"). In this case, PJM and the Company have identified a need for the proposed Projects in order to comply with mandatory NERC Reliability Standards, while maintaining the overall long-term reliability of its transmission system.¹¹ Notwithstanding, when performing an analysis based on PJM's 50/50 load forecast, there is no adjustment in load for DR programs that are bid into the PJM reliability pricing model ("RPM") auction because PJM only dispatches DR when the system is under stress (*i.e.*, a system emergency). Accordingly, while existing DSM is considered to the extent the load forecast accounts for it, DR that has been bid into PJM's RPM market is not a factor in this particular application because of the identified need for the Projects.

¹¹ While the PJM load forecast does not directly incorporate DR, its load forecast incorporates variables derived from Itron that reflect EE by modeling the stock of end-use equipment and its usages. Further, because PJM's load forecast considers the historical non-coincident peak ("NCP") for each load serving entity ("LSE") within PJM, it reflects the actual load reductions achieved by DSM programs to the extent an LSE has used DSM to reduce its NCPs.

Based on these considerations, the evaluation of the Projects demonstrated that despite accounting for DSM consistent with PJM's methods, the Projects are necessary. As noted in the 2018 Final Order, pursuant to the Grid Transformation and Modernization Act of 2018, the Company must propose \$870 million of EE programs by 2028. Since July 1, 2018, the Company has proposed approximately \$476 million for the design, implementation, and operation of energy efficiency programs in the Commonwealth. This amount includes approximately \$128.6 million of new energy efficiency programs, designated as "Phase IX" of the Company's DSM portfolio, which the Company filed for approval of on December 2, 2020. These programs are pending before the Commission and have not been accounted for in PJM's load forecast, and thus, were not part of the Company's planning studies.



Legend

- 500KV Line
- 230KV Line
- 115KV Line
- Transformer

#1 referenced to 115 substations, #23 the location of Cloud Switching Station and Easters Switching Station

**One Line Diagram
Transmission Alternative**

I. NECESSITY FOR THE PROPOSED PROJECT

F. Describe any lines or facilities that will be removed, replaced, or taken out of service upon completion of the proposed project, including the number of circuits and normal and emergency ratings of the facilities.

Response: The proposed Projects include the *removal* of the following:

- 2 double circuit 115 kV 3-pole structures (Structure Numbers 137/66 to 137/67 and 1042/64 to 1042/63)

The proposed Projects include the *replacement* of the following (see Section II.B.5 for replacement structures):

- 1 double circuit 230 kV tower (Structure Number 235/310)
- 1 single circuit 115 kV running angle guyed steel pole (Structure Number 1045/3)
- 1 double circuit 115 kV steel pole (Structure Numbers 40/496 and 171/25)
- 1 double circuit 115 kV steel H-frame (Structure Numbers 40/495A and 1009/129)
- 1 single circuit 115 kV steel pole (Structure Number 40/495)
- 5 single circuit 115 kV H-frame structures (Structure Numbers 40/490 to 40/494)
- 4 double circuit 115 kV steel poles (Structure Numbers 1009/125 to 1009/128 and 171/26 to 171/29)

The existing Line #40 3-phase twin-bundled 336 ACSR conductors will be replaced with 3-phase twin-bundled 336 ACSR conductors between proposed Structure #40/490-Chase City Substation. The existing Line #40 3-phase twin-bundled 336 ACSR conductors have a normal/emergency transfer capability of 347 MVA. The two 3#6 alumoweld shield wires will be replaced with two 3#6 alumoweld shield wires between proposed Structure #40/490-490A and one 3#6 alumoweld shield wire between proposed Structure #40/490A-491 and 40/494-Chase City.

The existing Line #171 3-phase 768.2 ACSS/TW conductors will be replaced with 3-phase 768.2 ACSS/TW conductors between proposed Structure #171/29B-Chase City. The existing Line #171 3-phase 768.2 ACSS/TW conductor has a normal/emergency transfer capability of 393 MVA. The one optical ground wire ("OPGW") shield wire will be replaced with one OPGW shield wire.

The existing Line #1009 3-phase 768.2 ACSS/TW conductors will be replaced with 3-phase 768.2 ACSS/TW conductors between proposed Structure #1009/124A-Chase City. The existing Line #1009 3-phase 768.2 ACSS/TW conductor has a normal/emergency transfer capability of 393 MVA. The one OPGW shield wire will be replaced with one OPGW shield wire.

The existing Lines #137 and #1042 3-phase 2-795 ACSR conductors will be removed between Structure #137/66-67 (1042/64-63) to replace the 115 kV connection to the Easters DP with the proposed 230 kV Lines #2226 and #2229.

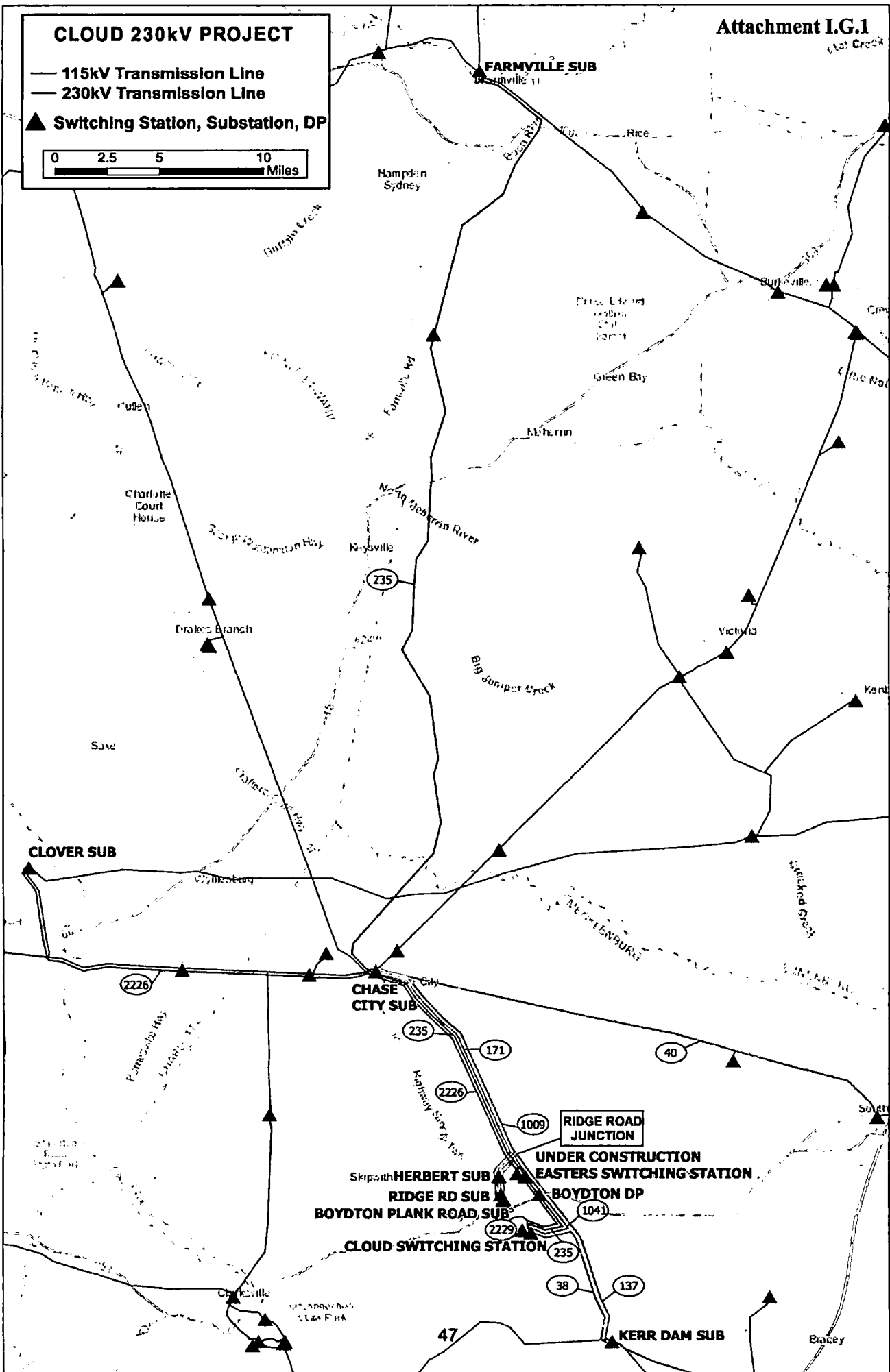
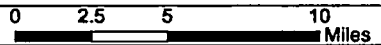
I. NECESSITY FOR THE PROPOSED PROJECT

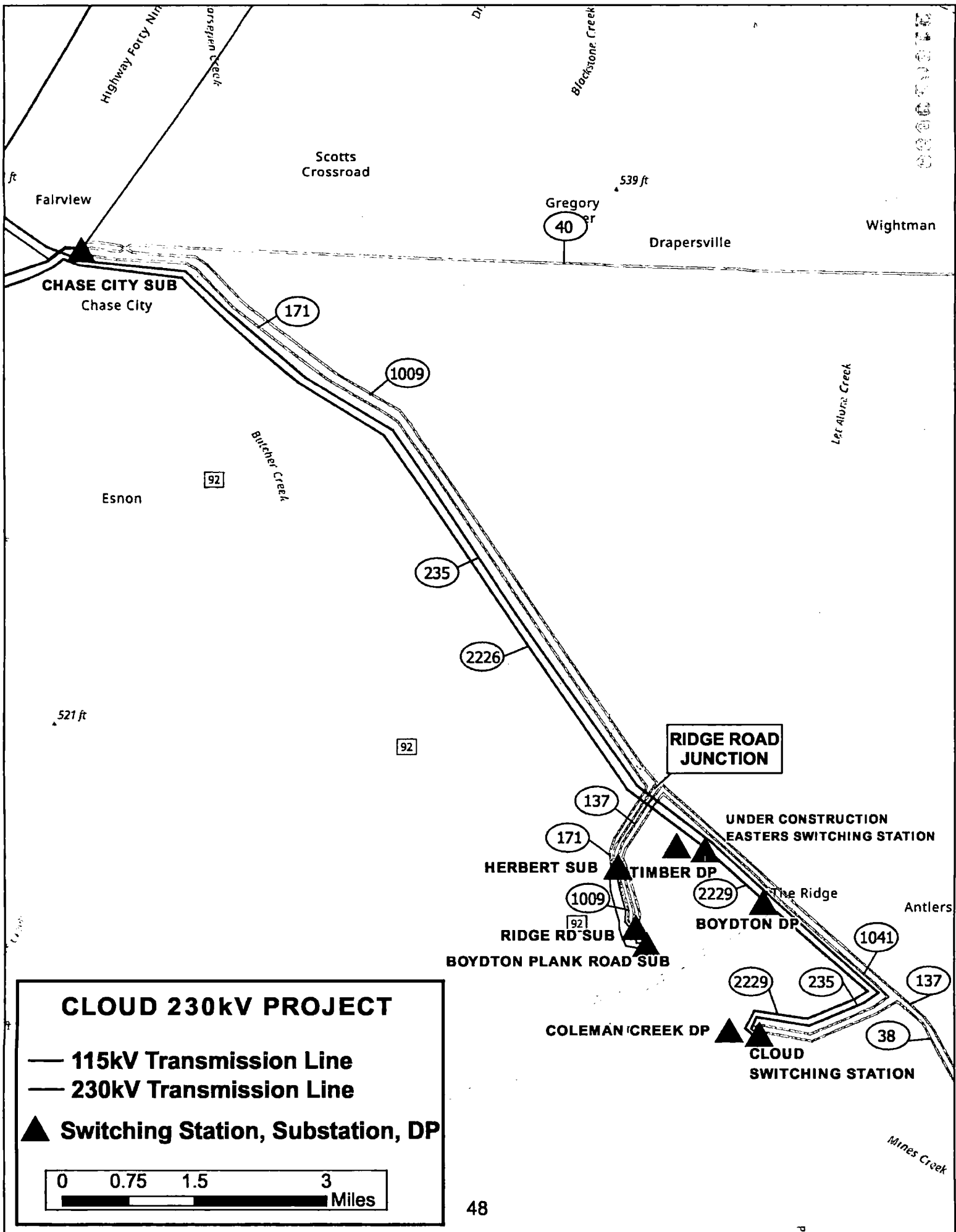
- G. Provide a system map, in color and of suitable scale, showing the location and voltage of the Applicant's transmission lines, substations, generating facilities, etc., that would affect or be affected by the new transmission line and are relevant to the necessity for the proposed line. Clearly label on this map all points referenced in the necessity statement.**

Response: See Attachment I.G.1.

CLOUD 230kV PROJECT

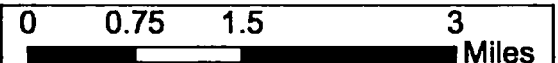
- 115kV Transmission Line
- 230kV Transmission Line
- ▲ Switching Station, Substation, DP





CLOUD 230kV PROJECT

- 115kV Transmission Line
- 230kV Transmission Line
- ▲ Switching Station, Substation, DP



I. NECESSITY FOR THE PROPOSED PROJECT

H. Provide the desired in-service date of the proposed project and the estimated construction time.

Response: The desired in-service target date for the proposed Project is June 1, 2024. The Company estimates it will take approximately 23 months for detailed engineering, materials procurement, permitting, real estate, and construction after a final order from the Commission. Accordingly, to support this estimated construction timeline and construction plan, the Company respectfully requests a final order by July 1, 2022. Should the Commission issue a final order by July 1, 2022, the Company estimates that construction should begin around April 1, 2023, and be completed by the in-service target date, which is June 1, 2024. This construction timeline will enable the Company to meet the targeted in-service date for the Projects. This schedule is contingent upon obtaining the necessary permits and transmission line outages; dates may need to be adjusted based on permitting or outage delays, or design modifications in order to comply with additional agency requirements identified during the permitting application process.

I. NECESSITY FOR THE PROPOSED PROJECT

- I. Provide the estimated total cost of the project as well as total transmission-related costs and total substation-related costs. Provide the total estimated cost for each feasible alternative considered. Identify and describe the cost classification (e.g. "conceptual cost," "detailed cost," etc.) for each cost provided.**

Response: Costs for the Proposed Project

The estimated conceptual cost of the proposed Projects is approximately \$101.5 million, which includes approximately \$66.2 million for transmission-related work and approximately \$35.3 million for substation-related¹² work (2021 dollars).

Costs for the Rejected Project Alternative

The estimated conceptual cost of the rejected alternative is approximately \$124.7 million, which includes approximately \$57.4 million for transmission-related work and approximately \$67.3 million for substation-related¹³ work (2021 dollars).

¹² See *supra* n. 3.

¹³ See *supra* n. 3.