

COMMONWEALTH OF KENTUCKY
BEFORE THE PUBLIC SERVICE COMMISSION

In the Matter of:

ELECTRONIC APPLICATION OF EAST)	
KENTUCKY POWER COOPERATIVE, INC.)	
FOR AN AMENDMENT TO ITS)	
CERTIFICATE OF PUBLIC CONVENIENCE)	CASE NO.
AND NECESSITY GRANTED IN CASE NO.)	2024-00263
2022-00314)	

APPLICATION

Comes now, East Kentucky Power Cooperative, Inc. (“EKPC”), by counsel, pursuant to the Kentucky Public Service Commission’s (“Commission”) February 23, 2023 Order, ordering paragraph 4 in Case No. 2022-00314 and requests to amend the Certificate of Public Convenience and Necessity (“CPCN”) to construct, own and operate a 138 kilovolt (“kV”)- 69 kV double circuit transmission line in Madison County, Kentucky, as well as associated projects contained in EKPC’s October 26, 2022 Application in that proceeding. This Application focuses on the portion of the project that has materially changed as the Commission has ruled upon the other requirements set forth in KRS 278.020(2) and 807 KAR 5:001E, Section 15.

I. Introduction

1. EKPC is a not-for-profit, rural electric cooperative corporation established under KRS Chapter 279 with its headquarters in Winchester, Kentucky. Pursuant to various agreements, EKPC provides electric generation capacity and electric energy to its sixteen (16) Owner-Member Cooperatives (“owner-members”), which in turn serve over

570,000 Kentucky homes, farms and commercial and industrial establishments in eighty-nine (89) Kentucky counties. EKPC's Board has stated its strategic objective is to maintain a generation fleet that prudently diversifies its fuel sources while maximizing the potential of its capital investments and minimizing stranded assets. EKPC is a "utility" as that term is defined in KRS 278.010(3)(a) and a "generation and transmission cooperative" as that term is defined in KRS 278.010(9).

2. In total, EKPC owns and operates approximately 2,963 MW of net summer generating capacity and 3,265 MW of net winter generating capacity. EKPC owns and operates coal-fired generation at the John S. Cooper Station in Pulaski County, Kentucky (341 MW) and the Hugh L. Spurlock Station (1,346 MW) in Mason County, Kentucky. EKPC also owns and operates natural gas-fired generation at the J. K. Smith Station in Clark County, Kentucky (753 MW (summer)/989 MW (winter)) and the Bluegrass Generating Station in Oldham County, Kentucky (501 MW (summer)/567 MW (winter)), landfill gas-to-energy facilities in Boone County, Greenup County, Hardin County, Pendleton County and Barren County (13.8 MW total), and a Community Solar facility (8.5 MW) in Clark County, Kentucky. Finally, EKPC purchases hydropower from the Southeastern Power Administration at Laurel Dam in Laurel County, Kentucky (70 MW), and the Cumberland River system of dams in Kentucky and Tennessee (100 MW). EKPC also has 200 MWs of interruptible load and approximately 28 MWs in peak reduction mechanisms. EKPC's record peak demand of 3,754 MW occurred on January 17, 2024.

3. EKPC owns 2,994 circuit miles of high voltage transmission lines in various voltages, mainly 69kV and greater. EKPC also owns the substations necessary to support this transmission line infrastructure. Currently, EKPC has seventy-seven (77) free-flowing

interconnections with its neighboring utilities. EKPC's transmission system is operated by PJM Interconnection, LLC ("PJM"), of which EKPC has been a fully integrated member since June 1, 2013. PJM is a regional electric grid and market operator with operational control of over 185,000 MW of regional electric generation. It operates the largest capacity and energy market in North America.

II. FILING REQUIREMENTS

4. Pursuant to 807 KAR 5:001, Section 14(1), and KRS 278.020(1), EKPC's business address is 4775 Lexington Road, Winchester, Kentucky 40391 and its mailing address is Post Office Box 707, Winchester, Kentucky 40392-0707. EKPC's telephone number is (859) 744-4812 and its fax number is (859) 744-6008. EKPC's email address is: psc@ekpc.coop. EKPC requests that the following individuals be included on the service list:

Greg Cecil, EKPC's Director of Regulatory and Compliance Services:

greg.cecil@ekpc.coop

L. Allyson Honaker and Brittany Hayes Koenig, Counsel for EKPC:

allyson@hloky.com

brittany@hloky.com

5. Pursuant to 807 KAR 5:001, Section 14(2), EKPC attests that it is a Kentucky corporation, in good standing, and was incorporated on July 9, 1941. A certificate of good standing is attached to this Application as Exhibit 1.

6. Pursuant to 807 KAR 5:001, Section 15(2)(a), the facts relied upon to show that the proposed construction is required by public convenience and necessity are contained in the Application and Exhibits filed on October 26, 2022 and in this Amended

Application and Exhibits. EKPC is filing a motion to incorporate the record of Case No. 2022-00314 into the record of this proceeding contemporaneously with this Application.

7. Pursuant to 807 KAR 5:001, Section 15(2)(b), EKPC had listed in Exhibit 1 of the October 26, 2022 Application in Case No. 2022-00314, the necessary franchises or permits that will be necessary for construction of the proposed transmission line. This list has not changed from the original application filing. EKPC will continue to file copies of each of the franchises or permits when they are obtained from the proper authorities.

8. Pursuant to 807 KAR 5:001, Section 15(2)(c), EKPC was granted a CPCN by the Commission in the February 23, 2023 Order for a rebuild of an existing 7.7 mile 69 kV transmission line as a double circuit 138 kV and 69 kV transmission line and that portion of the CPCN does not change in this Application. However, the placement of the Madison County Switching Station now needs to be relocated. This will involve the Madison County Switching Station being constructed on a different parcel of land, which impacts the length and termination point of the 138 kV line, location of the future 138-69 kV step down transformer, and the 69 kV transmission lines which terminate at the switching station. This relocation will also impact the future location area of the New 138 kV Industrial Substation. Exhibit 2 Direct Testimony of Laura LeMaster and Exhibits 4-1 through 4-3 detail the changes and implications of this relocation. Due to the critical path schedule and budgetary constraints, the completion date for the Madison County Switching Station is now December 31, 2026. The original Application stated the completion of the project was scheduled for December 31, 2025. The anticipated project cost is also increasing from \$7.5M to \$11.692M. The increased cost is a result of property acquisition and the effects of inflation on labor and material. These proposed changes are the only

material changes to the Application filed in the original matter on October 26, 2022 and if not specifically addressed, no other amendments to the October 26, 2022 application are requested.¹ A more detailed description of the requested amendments to the CPCN is contained in the Direct Testimony of Laura LeMaster contained in Exhibit 2 to this amended application.

9. Pursuant to 807 KAR 5:001, Section 15(2)(c), a description of the manner in which the rebuild and new construction will be constructed, and the names of all public utilities, corporations, or persons with whom the proposed construction or extension is likely to compete was included in the Direct Testimony of Laura LeMaster, contained in Exhibit 17 to the October 26, 2022 Application and is unchanged as granted by the Commission in its February 23, 2023 Order with the conditions expressed, therefore no updates are included in this Application.

10. Pursuant to 807 KAR 5:001, Section 15(2)(e), EKPC plans to initially finance the Project with internally available general funds and later refinance the Project and other investments through long-term debt issued by the Rural Utilities Service or other lenders. The Project will not materially affect the financial condition of EKPC. This information has not changed from the original October 26, 2022 Application.

11. Pursuant to 807 KAR 5:001, Section 15(2)(f), EKPC's estimated annual cost of operation after the 138 kV transmission line is placed into service is approximately \$560,700, and is unchanged from the October 26, 2022 Application.

12. Pursuant to 807 KAR 5:120, Section 1, EKPC filed its Notice of Intent to file this Application for amending the original CPCN on August 14, 2024. A copy of the

¹ October 26, 2022 Application, paragraph 7, p 4.

Notice of Intent is attached as Exhibit 3.

13. Pursuant to 807 KAR 5:120 Section 2(2)(a), three maps of suitable scale, no less than one-inch equals 1,000 feet, for the 138 kV and 69 kV double circuit portion of the Amended Application are attached as Exhibits 4-1 through 4-3 to the Amended Application. The map shows the location of 138-69 kV double circuit transmission line centerline and right of way, and boundaries of each property crossed by the 138-69 kV transmission line right of way, based upon the records of the Madison County Property Valuation Administrator (“PVA”).

14. An additional four maps are also provided as attachments to Exhibit 2 – Direct Testimony of Laura LeMaster, specifically Attachments LL-1 through LL-4. These four maps provide details on the requested Madison County 69 kV Switching Station location change and all other associated changes in this CPCN amendment request.

15. Pursuant to 807 KAR 5:120 Section 2(2)(b), Exhibit 4 to the October 26, 2022 Application included sketches of the proposed typical transmission line support structures for the 138 kV transmission line and those have not changed with the proposed amendments. Therefore, no new sketches are attached to this Amended Application.

16. Pursuant to 807 KAR 5:120 Section 2(2)(c), Exhibits 5-13 to the October 26, 2022 Application included additional maps that show the alternative routes considered by EKPC. These alternative routes are discussed in more detail in the siting study that was completed by NV5 Geospatial and was attached to the October 26, 2022 Application. The original preferred route that was proposed for the 138 kV transmission line alignment changed from the original Duncannon Lane Tap point as seen in Exhibit 3 – Proposed Route of the original application. The shift of the alignment for 1700 feet was required to

support the 138 kV termination point into the future Madison County 138 – 69 kV Step down, which will be executed as required by load growth and demand within the area, as described in the original Application and subsequent Data Requests and Brief.

17. Pursuant to 807 KAR 5:120 Section 2(4), EKPC gave notice by mailing to each property owner over whose property the 138 kV transmission line was proposed to cross in the original application. Those notices contained all the information required in 807 KAR 5:120 Section 15(3) and were mailed via first class mail to the addresses listed by the Madison County PVA records on or about October 10, 2022. The verification of Nick Comer, External Affairs Manager for EKPC was attached to the October 26, 2022 Application as Exhibit 14, stating he was responsible for mailing the required notices. Attached to his verification is a copy of the notice that was mailed along with a list of the names and addresses of the property owners to whom the notice was sent. All property owners impacted by the proposed Switching Station location and the alignment were notified in the original Application mailing, which was included in Exhibit 14 of the Original Application. EKPC provided a new notice to all of the landowners who were provided notice with the original Application on August 14, 2024. In addition, a new landowner that was not impacted by the original Application, but will be impacted by the proposed amendment was identified. A notice was mailed to the new landowner, via overnight mail, on September 10, 2024. A copy of the notice that was provided pursuant to this Application is attached as Exhibit 5. Attached as Exhibit 6, is the verification of Nick Comer, External Affairs Manager for EKPC stating he was responsible for mailing the new notices to inform them of the proposed amendments.

18. Pursuant to 807 KAR 5:120 Section 2(6), EKPC also published a notice of

the filing of the October 26, 2022 Application on October 11, 2022 in The Richmond Register, which is a newspaper of general circulation in Madison County, Kentucky. This notice included all of the necessary information required by 807 KAR 5:120 Section 2(5), including a map showing the proposed route, contact information for the Commission, a statement of the right to request a local public hearing, and a statement that interested persons have the right to request to intervene. EKPC attached a copy of the newspaper notice as Exhibit 15 to the October 26, 2022 Application. EKPC has also filed a notice in the Richmond Register for this application. The notice contained all of the required information pursuant to 807 KAR 5:120 Section 2(5). A copy of the new notice is attached to this application as Exhibit 7. The publisher's affidavit for the notice publishing is attached as Exhibit 8.

III. REQUEST FOR AMENDMENT TO CPCN

19. EKPC is requesting the Commission grant an amendment to the CPCN granted on February 23, 2023 as proposed in the October 26, 2022 Application. The Amendment requested is for the relocation of the Madison County Switching Station and changes associated with the relocation. The proposed location of the Madison County 69 kV Switching Station differs from the parcel originally proposed in the October 26, 2022 Application. The location change to the Madison County 69 kV Switching Station results in changes to the 69 kV transmission line routes, the 138 kV Fawkes Transmission Line termination point, the 138-69 kV Step Down Transformer location, and the future location area of the New 138 kV Industrial Substation. In the original CPCN application, EKPC identified a property for the location Madison County Switching Station in the Response 2 to the Commissions First Request for Information, and Exhibit DR1-3. In the response

provided, EKPC stated that the location of the Madison County Switching Station was based on transmission planning, and EKPC had not obtained any property or options for the property. During the preliminary phases of project development, it was determined that the best engineering solution for the placement of the Madison County Switching Station differed from the location originally shown in Exhibit DR1-3 of the original Application. The details of the required amendments are discussed in the testimony of Laura LeMaster, attached as Exhibit 2 to this Application.

20. The Commission found that EKPC demonstrated a need for the 138-kV-69kV double-circuit transmission line and the four additional projects, including the Madison County Switching Station, in its February 23, 2023 Order.² The continued need for the original projects and the amendment requested is discussed in more detail in Exhibit 9 – Direct Testimony of Darrin Adams.

21. The Commission also found that EKPC utilized the EPRI-Kentucky Transmission Line Siting Methodology and consulted with NV5 Geospatial to perform the Transmission Route Selection and the Commission discussed the multiple alternative routes considered throughout the modeling process and analysis presented by EKPC in its February 23, 2023 Order on pages 13 through 18 of that Order and found that it approved of EKPC's holistic planning to plan to build the 138 kV line and the additional projects during the required rebuild of the 69 kV line to utilize economies of scale. Additionally, the Commission's Order approved the incremental approach to wait to build certain portions to prevent wasteful duplication. The Commission found that the proposed projects resulted in no wasteful duplication in its February 23, 2023 Order and the same analysis

² *Id.* at p12.

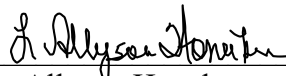
applies to the proposed amended route in this Amended Application.³ IV. CONCLUSION

22. Issuance of the requested amendment to the CPCN granted in the Commission's February 23, 2023 Order is consistent with Kentucky law and advances EKPC's efforts to achieve its strategic objectives and Sustainability Plan. The amended route does not change the findings of the February 23, 2023 Order that the Project is needed and will not result in wasteful duplication.

WHEREFORE, on the basis of the foregoing, EKPC respectfully requests that the Commission grant EKPC the amendment to the proposed placement of the Madison County Switching Station and associated changes to the 69 kV transmission line routes, 138 kV transmission line route, 138 kV-69 kV Step Down Transformer location and the future location area of the New 138 kV Industrial Substation, and the change in cost and schedule as outlined in this Application and Exhibits; grant any deviations that may be necessary for this Application and any other relief to which EKPC may be entitled.

This 17th day of September, 2024.

Respectfully submitted,



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Counsel for East Kentucky Power Cooperative, Inc.

³ *Id.* at p. 18.

CERTIFICATE OF SERVICE

This is to certify that the foregoing electronic filing was transmitted to the Commission on September 17, 2024; that there are currently no parties that the Commission has excused from participation by electronic means in this proceeding; and that pursuant to prior Commission Orders, no paper copies of this filing will be made.



Counsel, East Kentucky Power Cooperative, Inc.

EXHIBIT 1
CERTIFICATE OF GOOD STANDING

Commonwealth of Kentucky
Michael G. Adams, Secretary of State

Michael G. Adams
Secretary of State
P. O. Box 718
Frankfort, KY 40602-0718
(502) 564-3490
<http://www.sos.ky.gov>

Certificate of Existence

Authentication number: 310267

Visit <https://web.sos.ky.gov/fts/certvalidate.aspx> to authenticate this certificate.

I, Michael G. Adams, Secretary of State of the Commonwealth of Kentucky, do hereby certify that according to the records in the Office of the Secretary of State,

EAST KENTUCKY POWER COOPERATIVE, INC.

EAST KENTUCKY POWER COOPERATIVE, INC. is a corporation duly incorporated and existing under KRS Chapter 14A and KRS Chapter 273, whose date of incorporation is July 9, 1941 and whose period of duration is perpetual.

I further certify that all fees and penalties owed to the Secretary of State have been paid; that Articles of Dissolution have not been filed; and that the most recent annual report required by KRS 14A.6-010 has been delivered to the Secretary of State.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed my Official Seal at Frankfort, Kentucky, this 26th day of April, 2024, in the 232nd year of the Commonwealth.



Michael G. Adams

Michael G. Adams
Secretary of State
Commonwealth of Kentucky
310267/0015195

EXHIBIT 2 - DIRECT TESTIMONY
OF LAURA LEMASTER

COMMONWEALTH OF KENTUCKY BEFORE THE PUBLIC

SERVICE COMMISSION

IN THE MATTER OF:

**ELECTRONIC APPLICATION OF EAST)
KENTUCKY POWER COOPERATIVE, INC.)
FOR AN AMENDMENT TO ITS)
CERTIFICATE OF PUBLIC CONVENIENCE)
AND NECESSITY GRANTED IN CASE NO.)
2022-00314)**

**CASE NO.
2024-00263**

**DIRECT TESTIMONY OF LAURA LEMASTER
ON BEHALF OF EAST KENTUCKY POWER
COOPERATIVE, INC.**

Filed: September 17, 2024

COMMONWEALTH OF KENTUCKY
BEFORE THE PUBLIC SERVICE COMMISSION

In the Matter of:

ELECTRONIC APPLICATION OF EAST)
KENTUCKY POWER COOPERATIVE, INC.)
FOR AN AMENDMENT TO ITS) CASE NO.
CERTIFICATE OF PUBLIC CONVENIENCE) 2024-00263
AND NECESSITY GRANTED IN CASE NO.)
2022-00314)

VERIFICATION

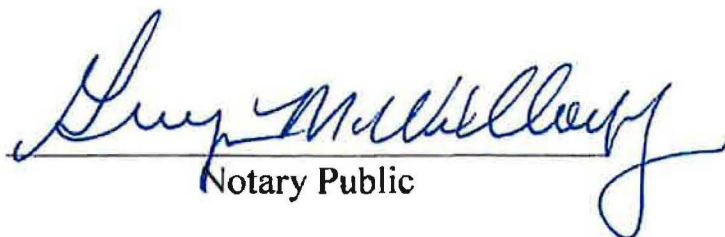
COMMONWEALTH OF KENTUCKY)
)
COUNTY OF CLARK)

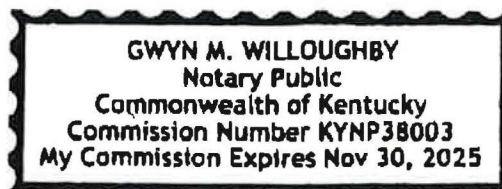
Laure LeMaster, Supervisor of Project Management for East Kentucky Power Cooperative, Inc., being duly sworn, states that he has supervised the preparation of her Direct Testimony and certain filing requirements in the above referenced case and that the matters and things set forth therein are true and accurate to the best of her knowledge, information and belief, formed after reasonable inquiry.

Laura LeMaster

Laura LeMaster, Supervisor of Project Management
East Kentucky Power Cooperative, Inc.

The foregoing Verification was verified, sworn to and affirmed before me, by Laura LeMaster, Supervisor of Project Management for East Kentucky Power Cooperative, Inc., on this the 12th day of September, 2024.


Notary Public



1 **Q. PLEASE STATE YOUR NAME, BUSINESS ADDRESS, AND**
2 **OCCUPATION.**

3 A. Laura LeMaster, my business address is East Kentucky Power Cooperative
4 (“EKPC”), 4775 Lexington Road, Winchester, KY 40391. I am the Supervisor of
5 Project Management.

6 **Q. STATE YOUR EDUCATION AND PROFESSIONAL EXPERIENCE**

7 A. I received my Bachelors and Master’s Degrees in Civil Engineering from the
8 University of Kentucky, and I am a registered Professional Engineer in the
9 Commonwealth of Kentucky. My professional experience includes time spent
10 working as a project engineer at a structural engineering firm and serving as a
11 project engineer for Tetra Tech providing consulting services to clients on water
12 and wastewater projects. I joined East Kentucky Power Cooperative in 2016,
13 working as an engineer in the Production Engineering department, where I provided
14 technical assistance to EKPC Production Facilities, including the execution of
15 construction projects. In 2017, I joined the Construction and Capital Project
16 Department.

17 **Q. PLEASE PROVIDE A BRIEF DESCRIPTION OF YOUR DUTIES AT**
18 **EKPC.**

19 A. As the Supervisor of Project Management in the Capital Construction Department,
20 I oversee the design and execution of both generation and transmission projects on
21 behalf of EKPC.

1 **Q. HAVE YOU PREVIOUSLY TESTIFIED BEFORE THE KENTUCKY PUBLIC**
2 **SERVICE COMMISSION?**

3 A. Yes, I have testified before the Commission on the KU Fawkes-Duncannon Lane Tap
4 138 kV and 69 kV Double –Circuit,¹ to which we are requesting an amendment herein. I
5 also testified for EKPC in the 2023 Amendment to the Environmental Compliance Plan
6 and for Issuance of Certificates of Public Convenience and Necessity (“CPCN”) and
7 Other Relief.² My testimony in Case No. 2023-00177 was specifically in reference to the
8 request for a CPCN for the Cooper Former Impoundment Project.³

9 **Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY IN THIS PROCEEDING?**

10 A. In 2022, EKPC developed an area transmission plan for Southern Madison County, which
11 included the construction of the KU Fawkes – Duncannon Lane Tap 138 kV and 69 kV
12 Double – Circuit and numerous substations in the area. In Case No. 2022-00314, EKPC
13 submitted an Application for a CPCN for the KU Fawkes – Duncannon Lane Tap 138 kV
14 and 69 kV Double Circuit and also requested a declaratory order confirming that a CPCN
15 was not required for the substations that comprised the Southern Madison County area
16 plan. EKPC was granted a CPCN for all projects, including the substations, submitted as
17 part of the Application.⁴ One of the substations that was granted a CPCN in Case No.

¹ Case No. 2022-00314, *Electronic Application of East Kentucky Power Cooperative, Inc. for a (1) Certificate of Public Convenience and Necessity for the Construction of Transmission of Facilities in Madison County, Kentucky; and (2) Declaratory Order Confirming that a Certificate of Public Convenience and Necessity is not Required for Certain Facilities*, (Ky PSC Feb. 23, 2023), (“Case No. 2022-00314”).

² Case No. 2023-00177, *Electronic Application of East Kentucky Power Cooperative, Inc. for Approval to Amend its Environmental Compliance Plan and Recover Costs Pursuant to its Environmental Surcharge, and for Issuance of Certificates of Public Convenience and Necessity and Other Relief*, (Ky. PSC Jan. 11, 2024) (“Case No. 2023-00177”).

³ *See Id.*

⁴ Case 2022-00314, Application filed Oct. 27, 2022.

1 2022-00314 was the Madison County 69 kV Switching Station. A preliminary layout and
2 alignment for the Madison County 69 kV Switching Station and the associated
3 transmission taps were submitted as part of Case No. 2022-00314. The purpose of my
4 testimony is to provide information regarding the proposed changes to the location of the
5 Madison County 69 kV Switching Station, associated transmission line alignment
6 changes required by the switching station relocation, a change to the in-service date of
7 this project from 2025 to 2026 and a change to the budget for the Madison County 69 kV
8 Switching Station. The requested relocation of the Madison County 69 kV Switching
9 Station will impact the location of the 138 to 69 kV Step down, the Fawkes-Duncannon
10 138 kV line termination point, and the future location area of the New 138 kV Industrial
11 Substation.

12 **Q. ARE YOU SPONSORING ANY ATTACHMENTS?**

13 A. Yes. I am sponsoring Attachment LL-1 which shows the proposed location for the site
14 location change for the Madison County 69 kV Switching Station as well as the associated
15 proposed location change for the 138 kV to 69 kV step-down transformer. I am also
16 sponsoring Attachment LL-2, which shows the transmission line centerlines included in
17 the Original Application. This includes the location outlined in the Application filed in
18 Case No. 2022-00314⁵ for the termination point of the 138 kV circuit, as well as the
19 current construction end point of the 138 kV circuit during the Fawkes – Duncannon Lane
20 138 kV and 69 kV Transmission Line Rebuild. Additionally, I am sponsoring Attachment
21 LL-3 which illustrates the 1700 linear feet (LF) of the 138 kV route realignment and the
22 proposed location for the Madison County 69 kV Switching Station. Lastly, I am

⁵ Case No. 2022-00314, Application, at 5, paragraph 12, and Exhibit 3.

1 sponsoring Attachment LL-4 which illustrates the new location area of the New 138 kV
2 Industrial Substation. These attachments were prepared by me or by subject
3 matter experts acting under my management of the project.

4 **Q. WHAT RELIEF IS EKPC SEEKING IN THIS PROCEEDING?**

5 A. EKPC received a CPCN in Case No. 2022-0314 as described above. As EKPC progressed
6 in the life cycle of the Madison County 69 kV Switching Station, EKPC is now requesting
7 an Amendment to the Original Application to permit relocation of the Madison County
8 69 kV Switching Station from the location shown in the application for Case No. 2022-
9 00314, specifically the Responses to the Commission Staff's First Request for
10 Information Item 3, Exhibit DR1-3.⁶ The proposed relocation of the Madison County
11 69 kV Switching Station also affects the transmission line alignment shown in Exhibit
12 DR1-3 in response to Staff's first Data Request in Case No. 2022-00314, as well as the
13 location of the Madison County 138 kV to 69 kV step-down transformer, and the future
14 location area of the New Industrial Substation, and most notably the relocation of the KU
15 Fawkes – Duncannon Lane Tap 138 kV and 69 kV double circuit termination point. This
16 Amendment also serves to notify the Commission of delay in the construction schedule
17 and an increase in cost as required by the Commission.⁷ The completion date for the
18 Madison County 69 kV Switching Station has changed from December 2025 to
19 December 2026, and the cost of the Madison County 69 kV Switching Station has
20 increased from the \$7.5 million included in the Original Application to \$11.692 million.
21 The schedule delay and increase in cost are outlined further below.

⁶ Case No. 2022-00314, Responses to Commission Staff's First Request for Information, Item 3, and Exhibit DR1-3, filed November 11, 2022.

⁷ Case No. 2022-00314, February 23, 2023, Order at 20.

1 In Case No. 2022-00314, EKPC provided a general alignment and preliminary site
2 location for the Madison County 69 kV Switching Station. In the Responses to
3 Commission Staff's First Information Request, Item 23, EKPC stated that no land had
4 been purchased nor an option secured for the Madison County 69 kV Switching Station
5 and that the location of the switching station was subject to change as EKPC worked
6 through the property acquisition process. As the project progressed an alternative site was
7 identified as the best engineering option for the project requiring a deviation from the
8 February 23, 2023 Order's site location. The proposed new site is shown in Attachment
9 LL-1.

10 The proposed property (the "Ramsay Property") had already been in negotiations for sale
11 with another entity which indicated the property had a willing seller. EKPC has secured
12 a site option for this property and is requesting in this amendment to move the project to
13 the new location shown in Attachment LL-1.

14 The proposed change in the Madison County 69 kV Switching Station location results in
15 changes in other projects included in the prior application and includes the 138 kV to 69
16 kV step-down transformer and the KU Fawkes-Duncannon Lane Tap 138 kV and 69 kV
17 Double Circuit Transmission Line. The alignment of the KU Fawkes – Duncannon Lane
18 Tap 138 kV and 69 kV double-circuit is altered from the location as shown on Attachment
19 LL-2 as the Fawkes – Duncannon Construction endpoint. Attachment LL-3 shows the
20 amended 138 kV proposed route into the Madison County 69 kV Switching Station. This
21 proposed alignment change on the KU Fawkes – Duncannon Lane Tap 138 kV and 69
22 kV double circuit will impact both the 138 kV and 69 kV circuits. Consistent with the
23 prior application, the 138 kV line will terminate short of the proposed Madison County

1 138 kV to 69 kV step – down transformer and will be coupled to the 69 kV circuit via
2 connecting jumpers until the time that the 138 kV circuit is required to support load
3 growth. The location of the termination point of the Fawkes - Duncannon 138 kV circuit
4 is shown on Attachment LL-3.

5 With the shift of the Madison County Substation 3000 LF to the northeast, as shown on
6 Attachment LL-1, this will impact the future location area of the New 138 kV Industrial
7 Substation. As discussed in the application for Case No. 2022-00314, specifically the
8 Responses to the Commission Staff's First Request for Information Item 3, the exact
9 location of the New Industrial Substation has not been determined and the intent of EKPC
10 is to locate in the industrial area south of Richmond along the I-75 Corridor. The New
11 Industrial Substation will be constructed at the time it is needed due to economic
12 development within the I-75 Corridor. The location and requirements (voltage levels,
13 MVA Ratings, etc.) of the New Industrial Substation will be determined by the needs of
14 the customer. With the shift of the Madison County 69 kV Switching Station 3000 feet
15 to the northeast, to maintain a 138 kV line length of less than one mile, the proposed New
16 Industrial Substation would need to be located on the industrial property in the hatched
17 area shown on Attachment LL-4. If the New Industrial Substation is required to be further
18 than the area shown on Attachment LL-4, EKPC will return to the Commission for an
19 additional CPCN for the 138 kV line, at that time.

20 The proposed property acquisition for the 69 kV switching station will allow for the future
21 expansion of the 138 kV step-down transformer when the need arises. The combined
22 station remains consistent with the approved area plan in the February 23, 2023 Order.⁸

⁸ Case No. 2022-314.

1 Lastly, the new proposed substation location will impact the alignment of the circuits
2 which terminate at the Madison County 69 kV Switching Station including, the
3 Duncannon Lane 69 kV Tap Line, the 69 kV double circuit line to Hickory Plains/West
4 Berea and, the Crooksville/Speedwell Road Tap. Please refer to Attachment LL-1 for the
5 new proposed station location and transmission line alignment and Attachment LL-2 for
6 the preliminary layout proposed in the original CPCN application.

7 **Q. PLEASE PROVIDE A DESCRIPTION FOR EACH ELEMENT OF THE**
8 **PROPOSED PROJECT.**

9 A. Please refer to my previous testimony in CPCN Case No. 2022-0314⁹ for the elements
10 presented in the prior proceeding. With the exception of the proposed changes outlined
11 in this Amendment, there are no changes to the prior proceedings.

12 **Q. WHAT ARE THE ESTIMATED CONSTRUCTION COSTS FOR EACH**
13 **ELEMENT OF THE PROPOSED PROJECT?**

14 A. The total cost of the Madison County 69 kV Switching Station Project is estimated to be
15 \$ 11.692 million. The project scope and estimate includes construction of the switching
16 station, and all associated line work including the completion of the KU-Fawkes to
17 Duncannon Tap 138 kV and 69 kV Double Circuit to allow for termination of the 69 kV
18 circuit into the Switching Station, the Duncannon Lane 69 kV Tap, and the Hickory
19 Plains/West Berea and Crooksville/Speedwell Road tap double circuit. This is an
20 increase from the \$7.5 million preliminary estimate established in the prior proceeding.
21 Currently, the Fawkes – Duncannon 138 kV and 69 kV double circuit is on track to be

⁹ Case No. 2022-00314, Application, Exhibit 17, Direct Testimony of Laura LeMaster.

completed under the budget outlined in the Original Application.¹⁰

Q. WHY HAS THE COST OF THE PROJECT INCREASED?

A. The original cost estimate was based on a preliminary design which did not have a final property selected for the substation. The site location for a substation impacts line lengths and number of structures required. The cost estimate presented in the original proceeding utilized a high-level planning estimate. The current cost estimate provided in this Application has defined line lengths and structure types allowing this estimate to be more accurate. Additionally, the cost estimate provided in this application is based upon material and labor cost data from a very similar project. The current estimate includes the material and labor actual costs seen during the design and construction of the KU Fawkes – Duncannon Lane Tap 138 kV and 69 kV Double Circuit Project. Furthermore, as has been seen throughout the industry, costs for both labor and materials have changed significantly in the past couple of years. Recent land sales in the area and interest regarding potential economic development has increased land value in the area in excess of the original estimate for property acquisition.

The project team performed an updated estimate for the original proceeding location and line alignment for the Madison County 69 kV Switching Station. The intent of this evaluation was to be able to compare the cost of the original application location and the proposed location utilizing more accurate cost as discussed above to be able to adequately compare current market conditions and a similar level of design. The original location and alignment cost has been estimated to be \$11.876 million, if submitted this year. The increase to the original estimate is a result of a more detailed design, unit rates from

¹⁰ *Id.* at 9-11.

1 similar line construction contracts, and updated property values for right of way. With
2 this estimate, a CPCN amendment would have been required for the cost increase. The
3 proposed location change from that shown in the Original Application has no material
4 impact on the cost of the Madison County 69 kV Switching Station.

5 **Q. WHY IS THE AMENDMENT REQUESTING TO MOVE THE PROJECT**
6 **CONSTRUCTION YEAR TO 2026 FROM 2025?**

7 **A.** The project team concluded that a CPCN amendment would be required due to the nature
8 of the proposed changes. The CPCN amendment preparation, submittal, and review
9 becomes the project's critical path. This required the construction schedule to be updated
10 to 2026 to account for these changes.

11 **Q. HOW IS EKPC PLANNING TO FINANCE THE COSTS OF THE PROPOSED**
12 **PROJECT?**

13 **A.** Please refer to my previous testimony in CPCN Case No. 2022-0314.¹¹

14 **Q. WILL THE PROJECT MATERIALLY AFFECT THE FINANCIAL**
15 **CONDITION OF EKPC?**

16 **A.** The Project will not materially affect the financial condition of EKPC.

17 **Q. PLEASE DESCRIBE THE PROCESS TAKEN BY EKPC TO EVALUATE THE**
18 **BEST POSSIBLE LOCATION FOR THE SWITCHING STATION AND WHAT**
19 **FACTORS WERE INCLUDED IN THAT ANALYSIS.**

20 **A.** The original site location found in the response to Commission's Staff's First Request for

¹¹ Case No. 2022-00314, Application, Exhibit 17, Direct Testimony of Laura LeMaster, at 11.

1 Information, Item 3 was preliminary in nature and EKPC was in the process of working
2 with local property owners to secure an option for property for the substation. As design
3 progressed on the Madison County 69 kV Switching Station, EKPC identified potential
4 site options, including the original location shown in Exhibit DR 1-3. The selection
5 process included conversations with area landowners to gauge interest in selling property,
6 evaluation of environmental and archeological impacts, preliminary transmission
7 alignments, and cost. Once the best engineering option was identified, the project team
8 engaged in negotiations with the landowner and cleared the site of any environmental or
9 archeological impacts. The site being presented in this amendment meets all of EKPC's
10 and Rural Utilities Services ("RUS") environmental criteria and therefore was selected.

11 **Q. WHAT PERMITS WILL BE REQUIRED FOR THE PROJECT?**

12 A. Please refer to Exhibit 1 in CPCN Case No. 2022-0314.

13 **Q. HAS EKPC APPLIED FOR OR RECEIVED ANY OF THE PERMITS OR**
14 **APPROVALS NECESSARY FOR THE PROJECT?**

15 A. EKPC has not applied for any state or local permits regarding the relocation of the
16 Madison County 69 kV Switching Station scope.

17 **Q. WILL THE PROJECT RESULT IN ANY UNNECESSARY DUPLICATION OF**
18 **INVESTMENT OR THE CLUTTERING OF THE LANDSCAPE WITH**
19 **UNNEEDED FACILITIES?**

20 A. No. Please refer to Mr. Adams' testimony both in the Original Application and herein
21 regarding the need for the Madison County 69 kV Switching Station.

22 **Q. WHAT BENEFITS WILL BE DERIVED FROM THE PROJECT?**

1 A. Please refer to the original Testimony Mr. Adams' testimony in this proceeding for the
2 benefits of the Madison County Switching Station.¹²

3 **Q. WHAT IS THE TIMELINE FOR COMPLETION OF THE PROJECT?**

4 A. The Madison County 69 kV Switching Station and associated line work is scheduled for
5 completion by December 2026. This date is driven by outage windows, project approval
6 timeframes, and material lead times. The project construction is expected to begin in
7 March of 2026.

8 **Q. WHAT IS THE STATUS OF THE PROJECTS WHICH WERE INCLUDED IN**
9 **THE ORIGINAL APPLICATION?**

10 A. The KU Fawkes-Duncannon 138 kV and 69 kV Double Circuit Project began
11 construction in October 2023 and is projected to be completed in October 2024. The
12 Madison County 69 kV Switching Station design is near completion, and the current
13 schedule includes labor and material procurement by the end of 2024. The EKPC Fawkes
14 138 kV Expansion, Madison County 138 kV to 69 kV Step-down and the Industrial
15 Substation will only progress when an electrical need exists.

16 **Q. DOES THIS CONCLUDE YOUR TESTIMONY?**

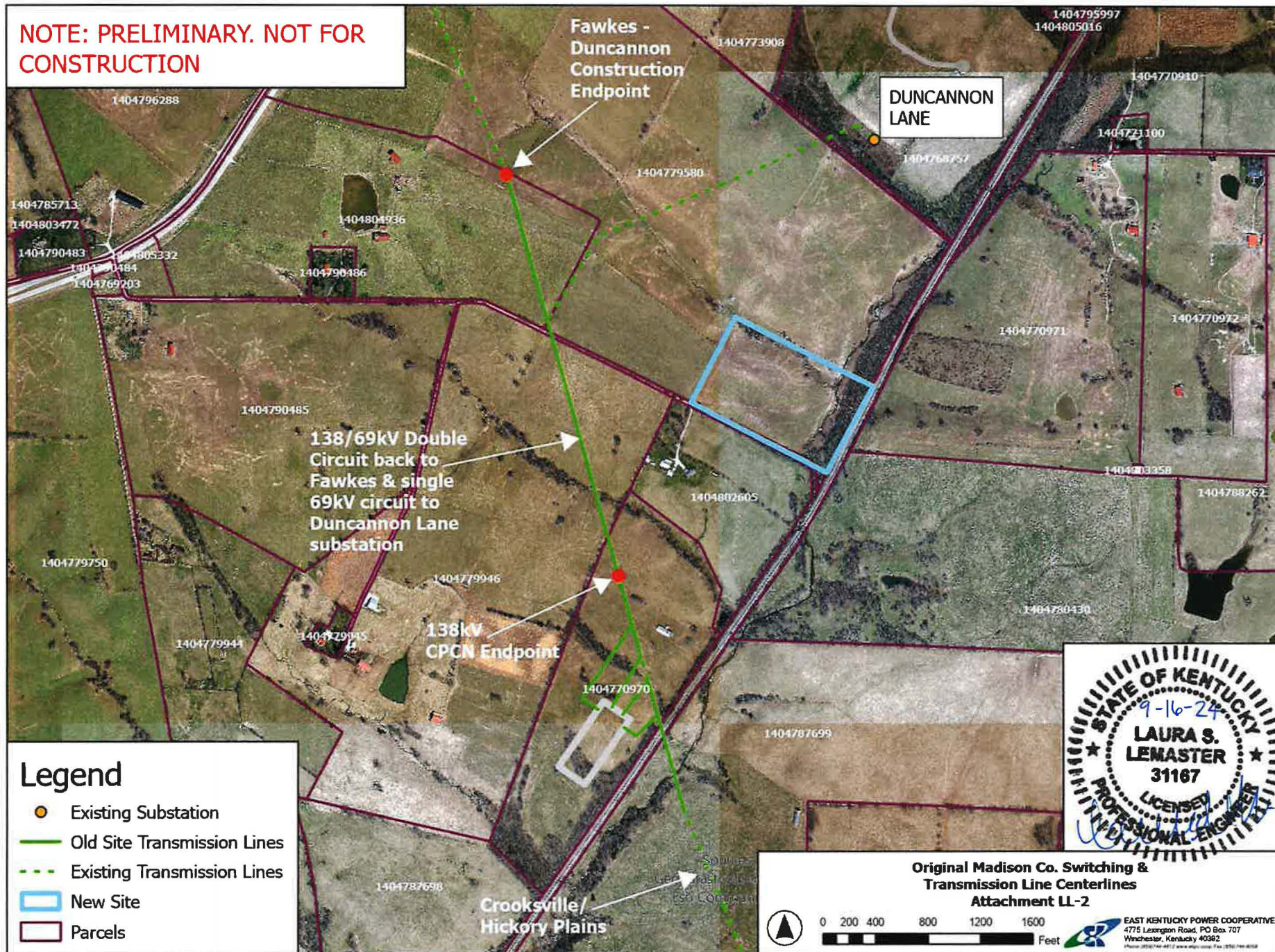
17 A. Yes.

¹² Case No. 2022-00314, Application, Exhibit 17, Direct Testimony of Darrin Adams.

Attachment LL-1

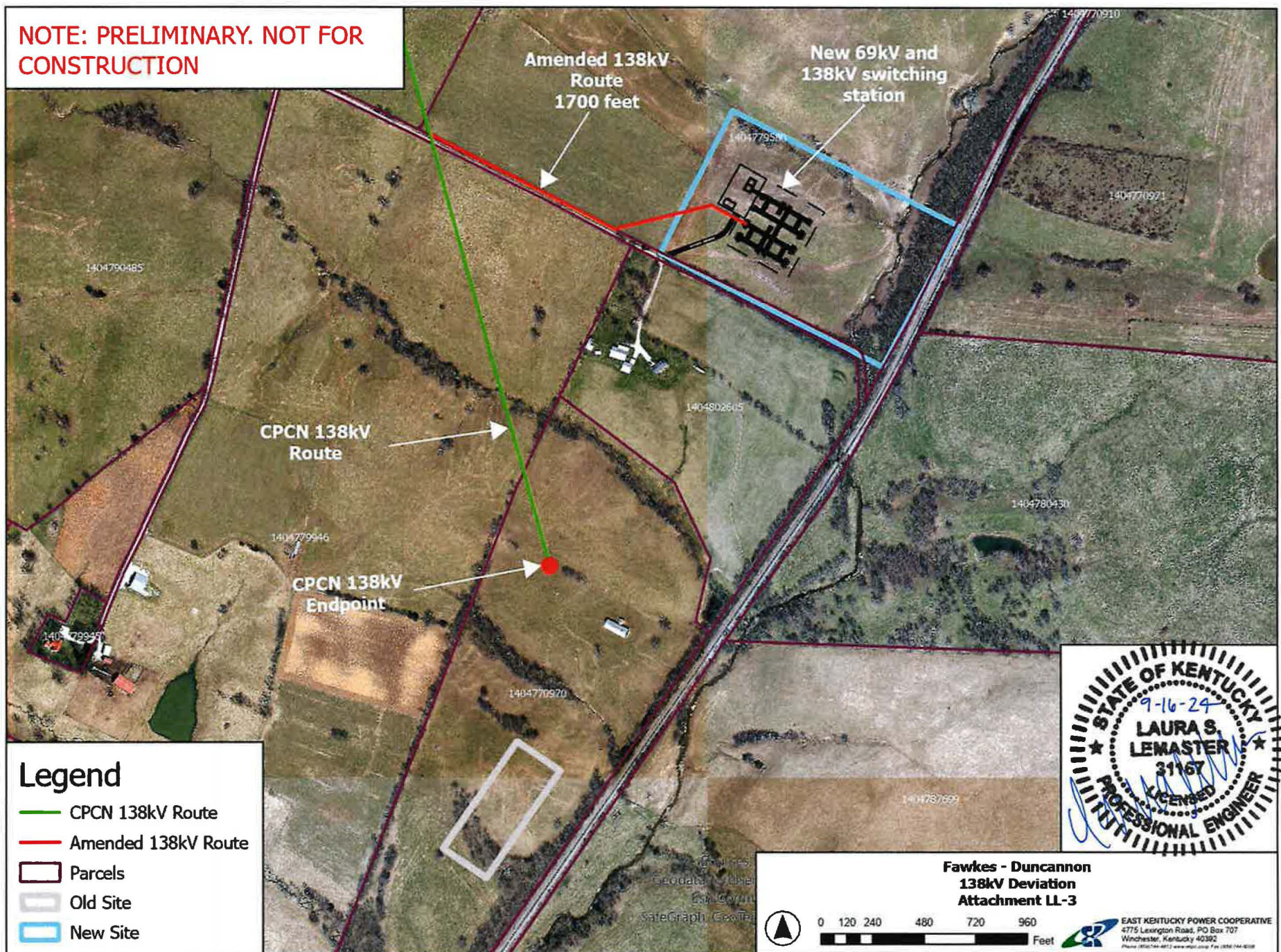
Attachment LL-2

NOTE: PRELIMINARY. NOT FOR CONSTRUCTION



Attachment LL-3

**NOTE: PRELIMINARY. NOT FOR
CONSTRUCTION**



Attachment LL-4

EXHIBIT 3 - NOTICE OF INTENT

August 13, 2024

Ms. Linda C. Bridwell, P.E.
Executive Director
Kentucky Public Service Commission
211 Sower Boulevard
Frankfort, KY 40602

Re: Electronic Application of East Kentucky Power Cooperative, Inc. for an Amendment to its Certificate of Public Convenience and Necessity for the Construction of Transmission Facilities in Madison County, Kentucky that was granted in Case No. 2022-00314- ***Case No. 2024-00263.***

Dear Ms. Bridwell:

Please let this letter serve as notice, pursuant to KRS 278.020, 807 KAR 5:001 and 807 KAR 5:120 that East Kentucky Power Cooperative, Inc. ("EKPC") plans to file on or after September 13, 2024 an Application for an amendment to the Certificate of Public Convenience and Necessity ("CPCN") that was granted in Case No. 2022-00314 for transmission facilities in Madison County, Kentucky. During the construction of the project, it has become necessary to locate the Madison County Switching Station on a different parcel of land than originally anticipated. This amendment will allow EKPC to continue to provide safe and reliable service to its Owner-Members and their end-use members as well as to add additional transmission capacity for future load growth in the area.

Pursuant to 807 KAR 5:120 Section 1(2)(a), EKPC's contact information is:

East Kentucky Power Cooperative, Inc.
4775 Lexington Road
Winchester, KY 40391
(859) 744-4812

EKPC has filed a Notice to Use Electronic Filing Procedures in this case.

Please do not hesitate to contact me with any questions or concerns.

Sincerely,

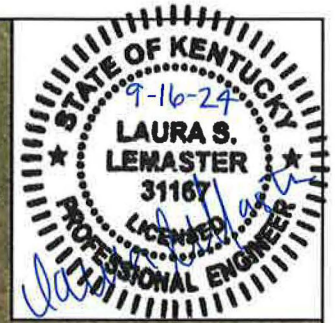
A handwritten signature in black ink, appearing to read "L. Allyson Honaker". The signature is fluid and cursive, with a large initial "L" and a long, sweeping horizontal stroke at the end.

L. Allyson Honaker

EXHIBIT 4-1 - MAP

EXHIBIT 4-2 - MAP

NOTE: PRELIMINARY. NOT FOR
CONSTRUCTION



Legend

- New 138kV/69kV Alignment
- Proposed Easement
- Parcels
- New Site
- Existing 138kV Alignment

Fawkes - Duncannon
138kV Deviation
Exhibit 4-2

SCALE - 1:1,000



0 15 30 60 90 120
Feet



EAST KENTUCKY POWER COOPERATIVE
4775 Lexington Road, PO Box 707
Winchester, Kentucky 40392
Phone: (202) 744-4812 www.ekpc.org Fax: (202) 744-4805

EXHIBIT 4-3 - MAP

EXHIBIT 5 - NOTICE TO LANDOWNERS



Aug. 14, 2024

NAME

ADDRESS

CITY ST ZIP

East Kentucky Power Cooperative (EKPC) is rebuilding an existing 69-kilovolt (kV) electric transmission line as a 138-kV and 69-kV double circuit transmission line in Madison County, Ky., from Goggins Lane and Tates Creek Road to Duncannon Lane. The 69-kV and 138-kV transmission line portion of the project will be completed this year, 2024.

On Feb. 23, 2023, EKPC was granted a Certificate of Public Convenience and Necessity (CPCN) by the Kentucky Public Service Commission (PSC) to execute this project. In addition to the transmission line replacement and construction, the CPCN included construction of a substation at the Duncannon Lane ending point for the 69-kV and 138-kV double-circuit transmission line. EKPC will be submitting a CPCN amendment to the PSC requesting to relocate the approved substation. EKPC is including maps with this notice that clearly shows the original location for the substation as well as the new proposed location. The maps will allow each landowner to determine if their property may be affected by the CPCN amendment.

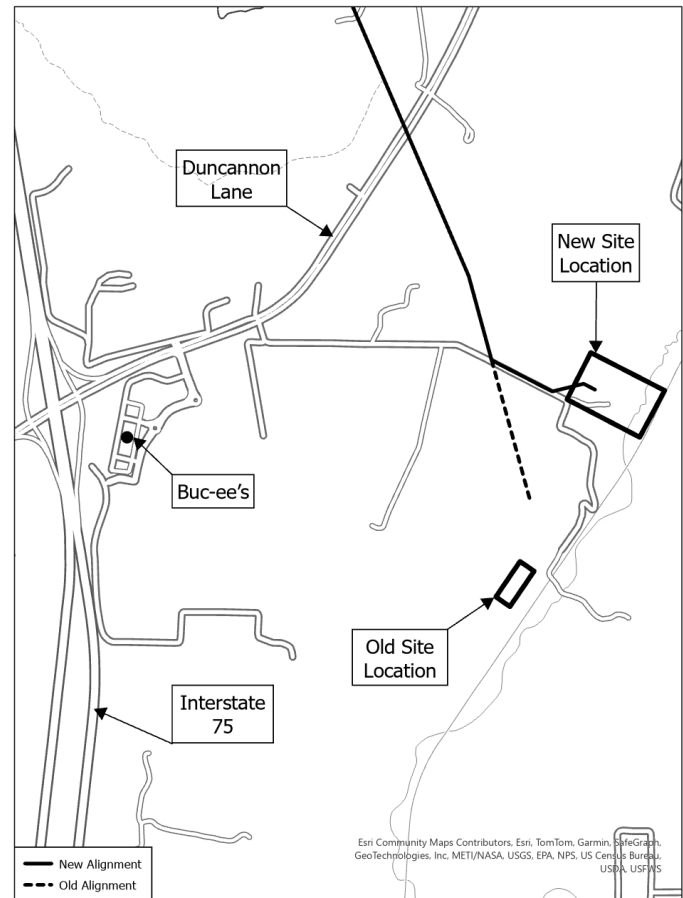
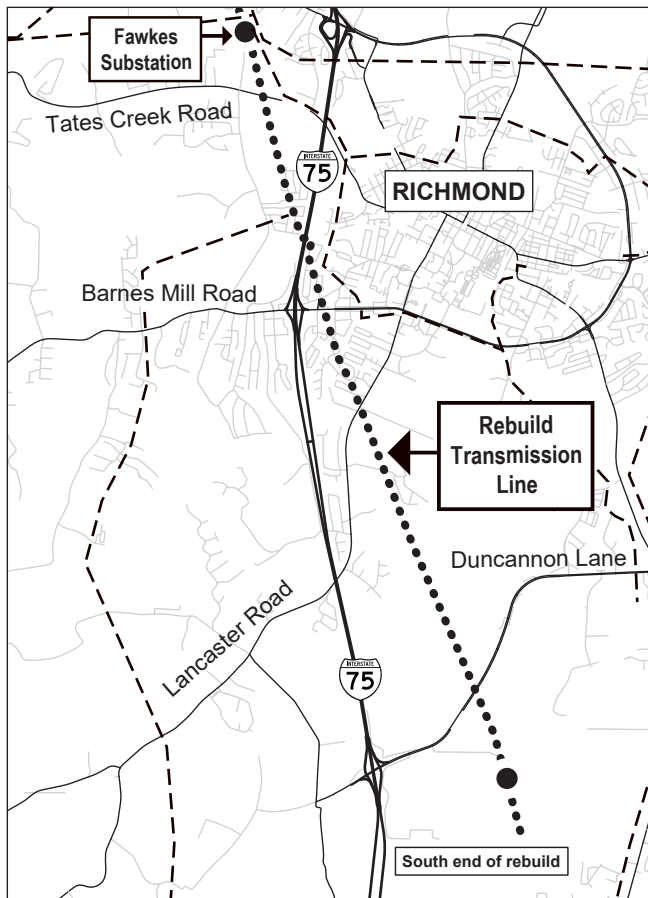
You are being notified because records indicate property you own is affected by the approved project. As required, EKPC is providing formal notice to all affected property owners of its intent to request an amendment to the approved CPCN. **Please note, the requested amendment will affect only the far southern end of the project, on the south side of Duncannon Lane.**

EKPC plans to file the CPCN amendment request with the PSC on or after Sept. 13, 2024. The amendment request will proceed on PSC Docket 2024-00263. You have the right to request to intervene in these proceedings should you desire and to request a local public hearing. Should you have any questions concerning this process, please contact Linda C. Bridwell, Executive Director, Kentucky Public Service Commission, PO Box 615, 211 Sower Boulevard, Frankfort, Kentucky 40602-0615, telephone (502) 564-3940.

Sincerely,
Bill Sharp
Land Acquisition Program Manager

Enclosures: Maps

Notice of intent to apply for CPCN amendment



East Kentucky Power Cooperative (EKPC) is rebuilding an existing 69-kilovolt (kV) electric transmission line as a 138-kV and 69-kV double-circuit transmission line in Madison County, Ky., from Goggins Lane and Bates Creek Road to Duncannon Lane. The 69-kV and 138-kV transmission line portion of the project will be completed in 2024.

On Feb. 23, 2023, EKPC was granted a Certificate of Public Convenience and Necessity (CPCN) by the Kentucky Public Service Commission (PSC) to execute this project.

In addition to the transmission line replacement and construction, the CPCN included construction of a substation at the Duncannon Lane ending point for the 69-kV and 138-kV double-circuit transmission line. EKPC plans to submit a CPCN amendment to the PSC requesting to relocate the approved substation. **The maps above display the original location for the substation, as well as the new proposed location.**

EKPC is providing formal notice to the public of its intent to request an amendment to the approved CPCN. **The requested amendment will affect only the far southern end of the project, on the south side of Duncannon Lane.**

EKPC plans to file the CPCN amendment request with the Commission on or after Sept. 13, 2024. The amendment request will proceed on PSC Docket 2024-00263. You have the right to request to intervene in these proceedings should you desire and to request a local public hearing. Should you have any questions concerning this process, please contact Linda C. Bridwell, Executive Director, Kentucky Public Service Commission, PO Box 615, 211 Sower Boulevard, Frankfort, Kentucky 40602-0615, telephone (502) 564-3940.

 **EAST KENTUCKY
POWER COOPERATIVE**

A Touchstone Energy Cooperative 



Sept. 9, 2024

James Clark and Eva Mae Clark
2016 Berea Road
Richmond, KY 40475

East Kentucky Power Cooperative (EKPC) is rebuilding an existing 69-kilovolt (kV) electric transmission line as a 138-kV and 69-kV double circuit transmission line in Madison County, Ky., from Goggins Lane and Tates Creek Road to Duncannon Lane. The 69-kV and 138-kV transmission line portion of the project will be completed this year, 2024.

On Feb. 23, 2023, EKPC was granted a Certificate of Public Convenience and Necessity (CPCN) by the Kentucky Public Service Commission (PSC) to execute this project. In addition to the transmission line replacement and construction, the CPCN included construction of a substation at the Duncannon Lane ending point for the 69-kV and 138-kV double-circuit transmission line. EKPC will be submitting a CPCN amendment to the PSC requesting to relocate the approved substation. EKPC is including maps with this notice that clearly shows the original location for the substation as well as the new proposed location. The maps will allow each landowner to determine if their property may be affected by the CPCN amendment.

You are being notified because records indicate property you own is affected by the approved project. As required, EKPC is providing formal notice to all affected property owners of its intent to request an amendment to the approved CPCN. **Please note, the requested amendment will affect only the far southern end of the project, on the south side of Duncannon Lane.**

EKPC plans to file the CPCN amendment request with the PSC on or after Sept. 13, 2024. The amendment request will proceed on PSC Docket 2024-00263. You have the right to request to intervene in these proceedings should you desire and to request a local public hearing. Should you have any questions concerning this process, please contact Linda C. Bridwell, Executive Director, Kentucky Public Service Commission, PO Box 615, 211 Sower Boulevard, Frankfort, Kentucky 40602-0615, telephone (502) 564-3940.

Sincerely,
Bill Sharp
Land Acquisition Program Manager

Enclosures: Maps

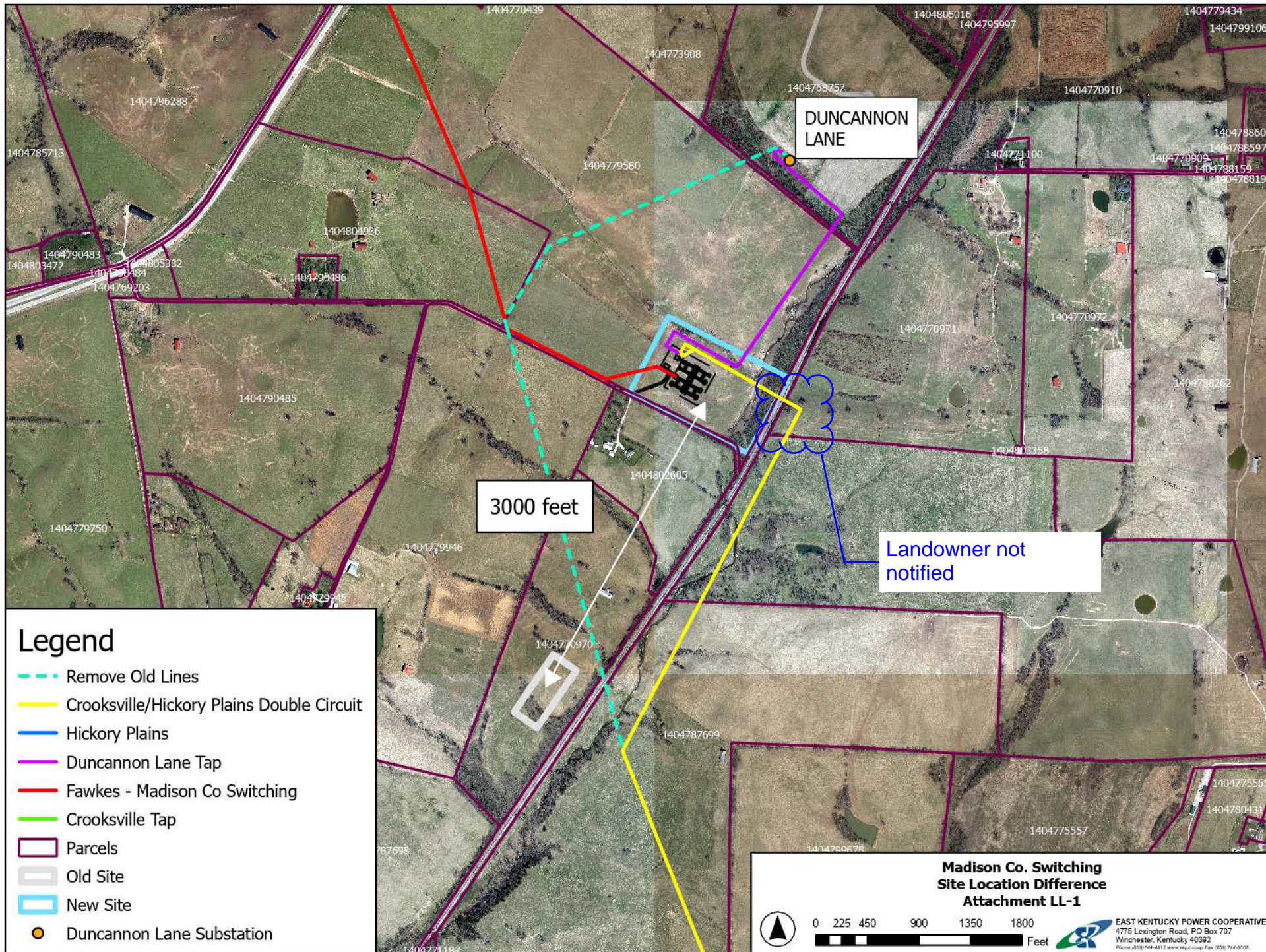


EXHIBIT 6 - NICK COMER
VERIFICATION FOR
LANDOWNER MAILINGS

VERIFICATION PURSUANT TO 807 KAR 5:120 SECTION 2(3)

The undersigned, Nick Comer, first being duly sworn, deposes and says that he is the External Affairs Manager of East Kentucky Power Cooperative, Inc., that he was responsible for mailing, first class mail, the notice of the proposed construction to each property owner, according to the Madison County property value administrator records, over whose property the transmission line right-of-way is proposed to cross. The notice was mailed on August 14, 2024, to the property owners at the owner's address as indicated by the Madison County property valuation administrator records. It was discovered after the initial mailing that a property owner would be affected by the amendment that was not part of the original construction. A notice to that property was mailed via overnight mail on September 10, 2024. All notices contained the information required by 807 KAR 5:120 Section 2(3), including the Kentucky Public Service Commission's docket number, a description of the project, a map showing the proposed route of the transmission line, the address and telephone number of the Executive Director of the Kentucky Public Service Commission, a description of the property owners' rights to intervene in the proceeding and a the right to request a public hearing. A sample copy of the notice is attached to this Verification as well as a list of the property owners – names and addresses – to whom notice was sent.


NICK COMER

STATE OF KENTUCKY)
) sct
COUNTY OF CLARK)

Subscribed, sworn and acknowledged to before me by Nick Comer this 10th day of
September, 2024.

 KYNP17358
NOTARY PUBLIC, STATE AT LARGE
MY COMMISSION EXPIRES: 12/20/2024

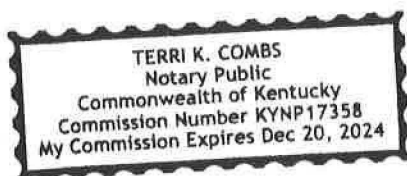


EXHIBIT 7 - NEWSPAPER NOTICE

Richmond Register

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which makes it illegal to advertise "any preference, limitation or discrimination, based on Race, color, religion, sex, handicap, familial status or national origin, or an intention, to make any such preference, limitation or discrimination." Familial status includes children under the age of 18 living with parents of legal custodians, pregnant women and people securing custody of children under 18.
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MASTER COMMISSIONER'S SALE

Pursuant to Orders of the Madison Circuit Court, except as otherwise indicated, the Commissioner will sell the property described in the following actions on:

FRIDAY, AUGUST 30, 2024
at the hour of 12:00 NOON (local time)
116 West Main Street, Courtroom #2, First Floor
Richmond, Kentucky

Unless otherwise indicated, said property shall be sold to raise the amounts hereinafter set forth, together with interest and the costs of the action. The Judgment and Order of Sale in each action shall govern the terms and conditions of each sale. At the time of the sale, the successful bidder may pay the full purchase price in cash. In the event the successful bidder elects to pay the ten percent (10%) deposit as set out in the Judgment and Order of Sale, he or she will be required to post bond and furnish an acceptable surety thereon for the unpaid balance of the sale price and said bond shall bear interest at the rate the judgment bears, from the date of sale until paid, and shall have the same force and effect of a judgment.

THE MASTER COMMISSIONER CANNOT PROVIDE LEGAL ADVICE TO PROSPECTIVE BIDDERS. ALL INTERESTED PARTIES WITH QUESTIONS ARE ADVISED AND ENCOURAGED TO SEEK LEGAL ADVICE PRIOR TO THE SALE.

PROPERTY ADDRESS	PARCEL ID	CIVIL ACTION NO.	AMOUNT TO BE RAISED
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415 BETHLEHEM RD., WACO	0112-0000-0047-BC	23-CI-47	\$ 133,925.05
105 JANWELL DR., RICHMOND	R005-0024-0022	23-CI-613	\$ 2,242.37
1795 SPEEDWELL RD., RICHMOND	0109-0000-0009	19-CI-773	\$ 151,028.85

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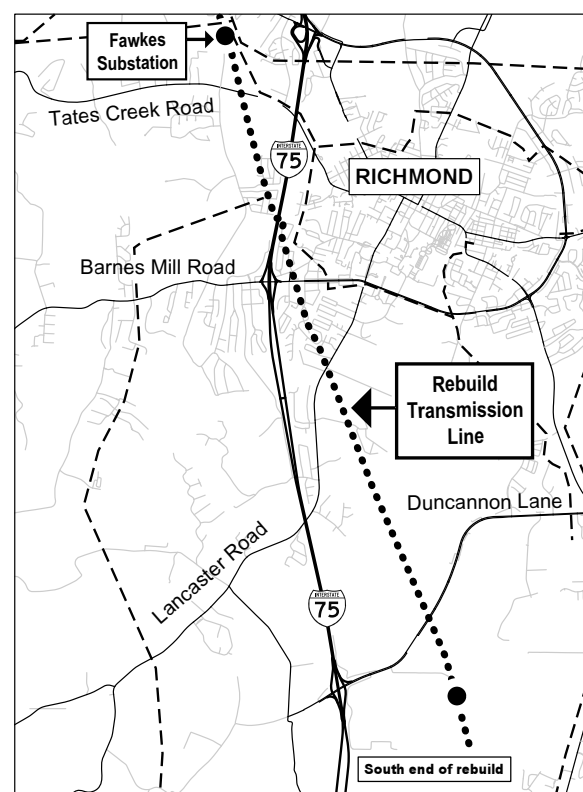
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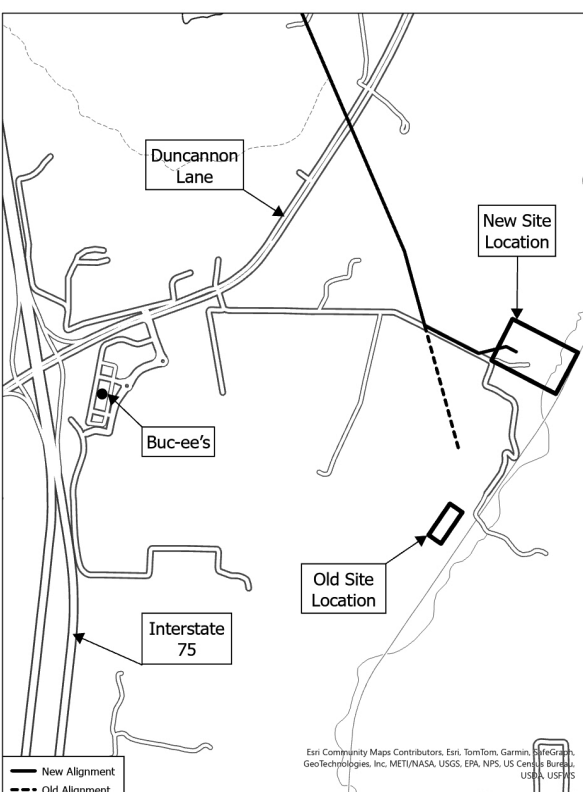
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Richmond Register

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Notice of intent to apply for CPCN amendment


Fawkes Substation
Tates Creek Road
Barnes Mill Road
Lancaster Road
Duncannon Lane
Rebuild Transmission Line
South end of rebuild


Duncannon Lane
Buc-ee's
Interstate 75
Old Site Location
New Site Location


East Kentucky Power Cooperative (EKPC) is rebuilding an existing 69-kilovolt (kV) electric transmission line as a 138-kV and 69-kV double-circuit transmission line in Madison County, Ky., from Goggins Lane and Tates Creek Road to Duncannon Lane. The 69-kV and 138-kV transmission line portion of the project will be completed in 2024.

On Feb. 23, 2023, EKPC was granted a Certificate of Public Convenience and Necessity (CPCN) by the Kentucky Public Service Commission (PSC) to execute this project.

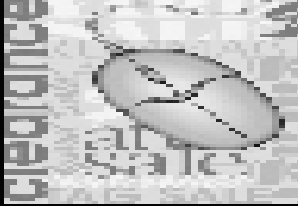
In addition to the transmission line replacement and construction, the CPCN included construction of a substation at the Duncannon Lane ending point for the 69-kV and 138-kV double-circuit transmission line. EKPC plans to submit a CPCN amendment to the PSC requesting to relocate the approved substation. The maps above display the original location for the substation, as well as the new proposed location.

EKPC is providing formal notice to the public of its intent to request an amendment to the approved CPCN. The requested amendment will affect only the far southern end of the project, on the south side of Duncannon Lane.

EKPC plans to file the CPCN amendment request with the Commission on or after Sept. 13, 2024. The amendment request will proceed on PSC Docket 2024-00263. You have the right to request to intervene in these proceedings should you desire and to request a local public hearing. Should you have any questions concerning this process, please contact Linda C. Bridwell, Executive Director, Kentucky Public Service Commission, PO Box 615, 211 Sower Boulevard, Frankfort, Kentucky 40602-0615, telephone (502) 564-3940.



EAST KENTUCKY POWER COOPERATIVE
A Touchstone Energy Cooperative


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at Sale

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EXHIBIT 8 - PUBLISHER'S
AFFIDAVIT

I, Pamela Bowlin, Advertising Representative of the Richmond Register, 1212 W. Main Street, Richmond, Kentucky 40475, hereby states the advertisement

East Kentucky Power Public Notice

did run in the Richmond Register on Saturday, August 17, 2024

Pamela Bowlin

Date: 8/19/24

Pamela Bowlin

Brenda Mackney

Date: 8/19/24

Notary Signature

Commission expires Sept. 4, 2026
KY NP 56975

EXHIBIT 9 - DIRECT TESTIMONY
OF DARRIN ADAMS

COMMONWEALTH OF KENTUCKY
BEFORE THE PUBLIC SERVICE COMMISSION

IN THE MATTER OF:

ELECTRONIC APPLICATION OF EAST)	
KENTUCKY POWER COOPERATIVE, INC.)	
FOR AN AMENDMENT TO ITS)	
CERTIFICATE OF PUBLIC CONVENIENCE)	CASE NO.
AND NECESSITY GRANTED IN CASE NO.)	2024-00263
2022-00314)	

DIRECT TESTIMONY OF DARRIN ADAMS
ON BEHALF OF EAST KENTUCKY POWER COOPERATIVE, INC.

Filed: September 17, 2024

1 **Q. PLEASE STATE YOUR NAME, BUSINESS ADDRESS, AND OCCUPATION.**

2 A. My name is Darrin Adams and my business address is East Kentucky Power Cooperative,
3 Inc. (“EKPC”), 4755 Lexington Road, Winchester, Kentucky 40391. I am the Director of
4 Transmission Planning & System Protection for EKPC.

5 **Q. PLEASE STATE YOUR EDUCATION AND PROFESSIONAL EXPERIENCE.**

6 A. I am a graduate of Transylvania University with a Bachelor of Arts degree in Liberal
7 Studies, and a graduate of the University of Kentucky with a Bachelor of Science degree
8 in Electrical Engineering. I am a licensed Professional Engineer in the Commonwealth of
9 Kentucky and have more than 30 years of experience in the electric utility industry. I have
10 been employed at EKPC since 2004, and have been responsible for transmission planning
11 activities throughout my career at EKPC. Prior to my current position at EKPC, I served
12 as a senior engineer, as the Supervisor of Transmission Planning, as the Manager of
13 Transmission Planning, and as the Director of Planning, Design, & Construction for Power
14 Delivery. Prior to commencing employment with EKPC, I was employed at LG&E
15 Energy/Kentucky Utilities for approximately 11 years in various roles in the transmission
16 planning and operations areas of those companies.

17 **Q. PLEASE PROVIDE A BRIEF DESCRIPTION OF YOUR DUTIES AT EKPC.**

18 A. In my current role, I am responsible for overseeing the planning of the electric transmission
19 line, transmission substation, and distribution substation facilities necessary to reliably and
20 economically deliver energy to EKPC’s Owner-Member systems. In addition to the
21 planning of EKPC-owned facilities, I oversee coordination of transmission-development
22 plans with other electric utilities and the PJM Interconnection Regional Transmission
23 Organization (“PJM”).

1 **Q. HAVE YOU PREVIOUSLY TESTIFIED BEFORE THE KENTUCKY PUBLIC**
2 **SERVICE COMMISSION?**

3 A. Yes, I have testified before the Commission on multiple occasions. Most recently, I
4 provided direct testimony in Case No. 2024-0108, which involves EKPC’s application for
5 Certificates of Public Convenience and Necessity (“CPCN”) for the construction of
6 projects in Marion County, Kentucky and in Case No. 2022-00314, which involved
7 EKPC’s application for a CPCN for the construction of the Fawkes-Madison County
8 transmission line and associated facilities in Madison County. I have also testified in other
9 cases involving an application for a CPCN for electric transmission lines, including Case
10 No. 2006-00463 (requesting a CPCN for the construction of the J.K. Smith-West Garrard
11 345 kV line in Clark, Madison, and Garrard Counties) and in Case No. 2005-00089 and
12 Case No. 2005-00458 (both cases requesting a CPCN for construction of the Cranston-
13 Rowan County 138 kV line in Rowan County). In addition to the direct testimony supplied
14 in these cases, I have previously sponsored responses to data requests related to
15 transmission-planning topics in numerous EKPC cases that have come before the
16 Commission.

17 **Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY IN THIS PROCEEDING?**

18 A. My testimony will provide an explanation for the continued purpose and need for the
19 projects approved in Case No. 2022-00314 given the necessary revision to the 138 kV
20 electric transmission line from the existing EKPC Fawkes substation to the new Madison
21 County 69 kV Switching Station in the Duncannon Lane area. I will describe the review
22 of the transmission-planning studies that were previously performed and included in the
23 Original Application that determined the prior needs have not changed and there is no

1 material impact expected due to the amended route for the transmission line. The proposed
2 changes are minor from an electrical perspective and the review of the transmission-
3 planning studies showed the proposed changes have no material impact on the system
4 performance improvement and overall benefits that will be provided.

5 **Q. ARE YOU SPONSORING ANY ATTACHMENTS?**

6 A. Yes, I am sponsoring the report documenting the transmission-planning studies as
7 Attachment DA-1. This report was prepared under my direction and supervision. It was
8 previously submitted in Case No. 2022-00314.

9 **Q. PLEASE DESCRIBE THE AMENDMENT TO THE PROJECT THAT EKPC IS**
10 **PROPOSING IN THIS APPLICATION AND HOW THAT AFFECTS THE CPCN**
11 **THAT EKPC RECEIVED IN CASE NO. 2022-00314.**

12 A. In Case No. 2022-00314, EKPC proposed to construct a double-circuit 138 kV and 69 kV
13 transmission line to replace an existing single-circuit 69 kV line from the existing
14 LG&E/KU Fawkes substation (“KU Fawkes”) to the new EKPC Madison County 69
15 kV switching station in the Duncannon Lane area. On the northern end, EKPC proposed
16 to expand the EKPC Fawkes substation to provide necessary terminal equipment (138
17 kV circuit breaker, switches, bus work, etc.) for connection of the 138 kV line. On the
18 southern end, EKPC proposed a new substation (“Madison County Switching Station”)
19 that will provide the ability to connect the new 138 kV line via a 138-to-69 kV step-
20 down transformer to the existing KU Fawkes-West Berea 69 kV line that currently
21 provides service to consumers in the area. This new substation will also provide a
22 connection point for future distribution substation infrastructure to serve large
23 commercial/industrial customers that may locate at a large prospective industrial site near

1 the Interstate 75/Duncannon Lane interchange south of Richmond, Kentucky. The new
2 Madison County Switching Station will be constructed in the Duncannon Lane area, with
3 only 69 kV infrastructure initially, but with the ability to add 138 kV infrastructure when
4 needs arise in the future, to address existing reliability and system-protection issues.
5 These reliability and system issues were explained in my direct testimony in Case No.
6 2022-00314.¹

7 The 69 kV portion of the Madison County Switching Station is currently scheduled to be
8 constructed and energized by December 31, 2026. Additionally, EKPC proposed to build
9 the New Industrial Substation at the industrial site near Interstate-75/Duncannon Lane to
10 serve large commercial/industrial loads locating in the area. EKPC still has no timetable
11 for the expansion of the EKPC Fawkes substation on the northern end nor the addition of
12 138 kV substation infrastructure on the southern end, which includes the 138 kV portion
13 of the Madison County substation and the New Industrial Substation. These substation
14 infrastructure upgrades/additions will be completed when a specific need arises (e.g.,
15 additional load development in the area, violation of EKPC transmission-planning criteria
16 due to changes in system conditions in the area, or future identification of real-time
17 operational or reliability concerns) that necessitates support from the new 138 kV line
18 to the area. As Ms. LeMaster explains in more detail in her direct testimony in this
19 proceeding, the proposed location of the new Madison County Switching Station has been
20 revised from the anticipated location that was identified when EKPC submitted its

¹ Case No. 2022-00314, *Electronic Application of East Kentucky Power Cooperative, Inc. for a (1) Certificate of Public Convenience and Necessity for the Construction of Transmission of Facilities in Madison County, Kentucky; and (2) Declaratory Order Confirming that a Certificate of Public Convenience and Necessity is not Required for Certain Facilities*, (Ky PSC Feb. 23, 2023), (“Case No. 2022-00314”) Application, Exhibit 16, Direct Testimony of Darrin Adams (filed Oct. 27, 2022).

1 application in Case No. 2022-00314. Subsequent to receiving approval for the CPCN in
2 that case, EKPC personnel conducted detailed siting analysis and had discussions with
3 property owners for suitable sites in the area. As a result, the required route of the Fawkes-
4 Duncannon 138 and 69 kV double-circuit line that is being rebuilt needs to deviate slightly
5 from the route that was submitted by EKPC and approved by the Commission in Case No.
6 2022-00314.

7 **Q. DESCRIBE THE SPECIFIC STUDIES THAT WERE PERFORMED TO**
8 **DETERMINE THE NEED FOR TRANSMISSION SYSTEM IMPROVEMENTS IN**
9 **THE AREA AND PROVIDE THE CITATIONS TO THOSE STUDIES AND**
10 **DISCUSSION OF SAME IN CASE NO. 2022-00314?**

11 A. As described in my testimony provided in Case No. 2022-00314,² EKPC's annual
12 transmission-planning power-flow studies identified a potential overload of the existing
13 line conductors in the KU Fawkes-Duncannon Lane Tap 69 kV line section, occurring as
14 soon as the 2022/23 winter peak-load period.³ In addition, a mechanical-loading analysis
15 of this line section determined that a number of the structures in the line section could
16 be loaded either near or over their rated strength for certain conditions.⁴ Therefore,
17 given both the electrical and mechanical loading issues identified, we determined that
18 the optimal solution to address both is to rebuild the 69 kV line section using larger
19 conductors (795 MCM ACSR 'Drake') with new steel-pole structures. EKPC recognized
20 the opportunity to address future needs in the area south of Richmond served by our

² Case No. 2022-00314 at Application, Exhibit 16, Direct Testimony of Darrin Adams.

³ Case No. 2022-00314, Application, Exhibit 16, Direct Testimony of Darrin Adams at 7.

⁴ Case No. 2022-00314, Application, Exhibit 17, Direct Testimony of Laura LeMaster at 6-7.

1 local owner-member distribution cooperative in conjunction with this necessary 69 kV
2 line rebuild. Therefore, EKPC proposed a rebuild of the existing 69 kV line as a double-
3 circuit 138 kV and 69 kV line in order to prepare for the addition of 138 kV support to the
4 area.

5 **Q. YOUR TESTIMONY IN CASE NO. 2022-00314 STATED THAT THE THERMAL**
6 **OVERLOAD OF THE KU FAWKES-DUNCANNON LANE TAP 69 KV LINE**
7 **SECTION COULD OCCUR AS SOON AS THE 2022/23 WINTER PERIOD⁵HAVE**
8 **YOU UPDATED YOUR STUDIES BASED ON THE LATEST AVAILABLE**
9 **INFORMATION, AND IF SO, WHAT ARE THE RESULTS OF THOSE STUDIES?**

10 A. Yes, EKPC has updated the transmission-planning studies for this area based on the latest
11 available information that has been incorporated into our power-flow models. This updated
12 analysis confirmed that without the planned rebuild of the Fawkes-Duncannon Lane 69 kV
13 line, the flow on the line could exceed its winter emergency rating in 2024/25 winter and
14 beyond for worst-case contingency conditions, with that flow identified at 101% of the
15 rating. This confirms that the 69 kV rebuild remains necessary to install a higher-capacity
16 conductor. As discussed in Ms. LeMaster's testimony the KU Fawkes – Duncannon Lane
17 Tap 138 and 69 kV double – circuit is scheduled to be completed by winter 2024/2025;
18 therefore, the potential overload will be avoided by timely completion of the project.

19 **Q. HAS EKPC SUBMITTED THIS PROJECT TO PJM FOR ITS REVIEW AS**
20 **EKPC'S REGIONAL TRANSMISSION PLANNER?**

21 A. Yes, as explained in my direct testimony in Case No. 2022-00314,⁶ EKPC provided

⁵ Case No. 2022-00314, Application, Exhibit 16, Direct Testimony of Darrin Adams at 7, lines 8-11.

⁶ Case No. 2022-00314, Application, Exhibit 17, Direct Testimony of Darrin Adams at 9, lines 11-18.

1 information regarding the thermal overload identified on the KU Fawkes-Duncannon Lane
2 Tap 69 kV line to PJM. PJM performed its own independent analysis to confirm the
3 potential existence of the thermal overload and that EKPC's proposed solution of
4 rebuilding the line section with 795 MCM ACSR "Drake" conductor both addresses the
5 thermal overload and does not create any other potential planning-criteria violations on
6 the transmission system. PJM Planning staff agreed that this is the optimal solution to
7 address the identified thermal overload. EKPC submitted its plan to rebuild the Fawkes-
8 Duncannon Lane 69 kV line section as a double-circuit 138 kV and 69 kV line as a
9 Supplemental Project to PJM stakeholders on January 20, 2023, PJM subsequently
10 evaluated this Supplemental Project and communicated to EKPC on May 10, 2023 that no
11 reliability issues were identified. EKPC incorporated this Supplemental Project into its
12 Local Plan on July 18, 2023.

13 The Madison County Switching Station was submitted to PJM stakeholders as a
14 Supplemental Project to address EKPC's needs in that area on November 17, 2023. PJM
15 completed its reliability analysis for this Project and informed EKPC on July 9, 2024 that
16 no reliability concerns have been identified.

17 **Q. PLEASE DESCRIBE THE CONTINUED NEED FOR ADDITIONAL**
18 **CAPACITY IN THE AREA.**

19 **A.** As discussed in my direct testimony in Case No. 2022-00314, EKPC's transmission-
20 planning studies show that the ability to serve incremental load in this area of the
21 system is very limited. In that testimony⁷ I noted that once the Fawkes-Duncannon Lane
22 69 kV line rebuild and planned rebuilds of the remaining sections of the line to the West

⁷ Case No. 2022-00314, Application, Exhibit 17, Direct Testimony of Darrin Adams at 10, lines 11-23; 11, lines 1-6.

1 Berea substation are complete, EKPC could still only accommodate 3 MW of incremental
2 demand without creating inadequate voltage levels during single-contingency conditions.
3 EKPC's current studies using our latest available power-flow models confirm that this
4 incremental demand value remains valid. Therefore, EKPC continues to see the need to
5 implement modifications to the transmission system in the area to continue to reliably and
6 adequately serve any incremental load beyond the 3 MW amount.

7 The EKPC system remains unable to serve even a modest amount of incremental load,
8 and certainly not load levels of the magnitude being contemplated in the vicinity.
9 Additionally, higher load levels than assumed in the EKPC studies could lead to real-
10 time operational issues that must be dealt with through system re-configuration and/or
11 load interruptions until additional support is provided to the area. Therefore, the planned
12 project to rebuild the Fawkes-Duncannon Lane 69 kV line section as a double-circuit 138
13 kV and 69 kV line remains necessary to prepare for additional load growth in the area, and
14 this project is currently in construction with a completion date prior to Winter 2024/2025.

15 **Q. ARE THERE ANY UPDATED PLANS FOR ECONOMIC DEVELOPMENT IN**
16 **THE AREA?**

17 A. No significant new load additions have occurred or been announced in the area in the past
18 18 months. However, EKPC and Blue Grass Energy have continued to receive
19 numerous requests for information for service to potential large-load facilities that have
20 expressed interest in locating at the nearby industrial development site. EKPC has studied
21 service for these large loads and determined that 138 kV transmission infrastructure would
22 be required for service because the 69 kV system cannot be upgraded practically and cost-
23 efficiently to serve loads of greater than 50 MWs. This remains a key factor driving

1 EKPC's proposed transmission expansion plan for the area.

2 **Q. WHAT IS THE IMPACT ON THE PLANS FOR THE UPGRADE TO EKPC'S**
3 **FAWKES SUBSTATION ON THE NORTHERN END OF THE PROJECT AND**
4 **THE NEW MADISON COUNTY SWITCHING STATION AND THE NEW**
5 **INDUSTRIAL SUBSTATION ON THE SOUTHERN END?**

6 A. From a planning perspective, there are no changes to the plans for these
7 substations. As I discussed in my testimony in Case 2022-00314,⁸ the expansion
8 of EKPC's Fawkes substation is necessary in order to connect the new 138 kV
9 circuit that is being added to the Fawkes-Duncannon Lane line as part of the
10 rebuild to a double-circuit 138 kV and 69 kV line. EKPC still plans to expand
11 the substation as described in the previous case filings when the need arises for
12 the new 138 kV circuit to be energized, for which the timeline is still
13 undetermined.

14 Additionally, as discussed in my testimony in Case 2022-00314,⁹ the Madison
15 County 69 kV Switching Station is proposed to be built in the vicinity of EKPC's existing
16 Duncannon Lane distribution substation to provide immediate reliability and
17 transmission-system protection benefits for service to existing consumers in the area.
18 This substation location will also provide an optimal opportunity to introduce further
19 system support in the area when needed. Regarding the New Industrial Substation, it will
20 be utilized to meet the needs of large industrial and commercial customers that locate in
21 that area. This new distribution substation will connect to the Madison County Switching

⁸ Case No. 2022-00314, Application, Exhibit 17, Direct Testimony of Darrin Adams at 12, lines 4-17.

⁹ Case No. 2022-00314, Application, Exhibit 17, Direct Testimony of Darrin Adams at 12, line 23; 13; and 14, lines 1-21.

1 Station, with necessary distribution transformers to meet the needs of the customer
2 facilities in the area. The specific scope of the substation design (e.g., voltage level,
3 number of transformers, nameplate rating of transformers, etc.) will be developed based on
4 the needs of customers as they commit to locate in this area. Therefore, the needs of EKPC
5 and Blue Grass Energy in this area and the plans to address those needs remain the same
6 as those previously described in Case No. 2022-00314.

7 **Q. HOW DOES THE PROPOSED AMENDMENT TO CHANGE THE LOCATION**
8 **OF THE MADISON COUNTY SWITCHING STATION IMPACT THE**
9 **ELECTRICAL PERFORMANCE OF THE PROPOSED PLAN?**

10 A. The impact on the electrical performance of the overall proposed plan for the area is
11 negligible. The electrical connectivity of the facilities being added remains the same. As
12 shown in Exhibit 3-1 to the Application, the proposed location of the Madison County
13 Switching Station is moving from the location identified in EKPC's original application,
14 resulting in a deviation of 1,700 feet for the alignment of the Fawkes-Duncannon Lane 138
15 kV & 69 kV double-circuit line. This change is minor from an electrical performance
16 perspective, and therefore has no appreciable impact on system performance.

17 **Q. IS THE OVERALL TRANSMISSION PLAN FOR THIS AREA IN MADISON**
18 **COUNTY THAT WAS ORIGINALLY SUBMITTED IN CASE 2022-00314 -- WITH**
19 **THE AMENDMENTS THAT ARE BEING SUBMITTED IN THIS CURRENT**
20 **PROCEEDING -- STILL THE RECOMMENDED PLAN TO MEET THE SYSTEM**
21 **NEEDS?**

22 A. Yes, as I discuss above, the system needs in this area are essentially identical to those
23 presented in the prior case. The amendments to the proposed transmission plan that was

1 approved in that case are minor changes from an electrical perspective and hve no material
2 impact on the system performance improvement and overall benefits that will be provided.

3 **Q. DOES THIS CONCLUDE YOUR TESTIMONY?**

4 A. Yes.

ATTACHMENT DA-1
TRANSMISSION PLANNING STUDY

Richmond-Berea Area Transmission Needs Analysis

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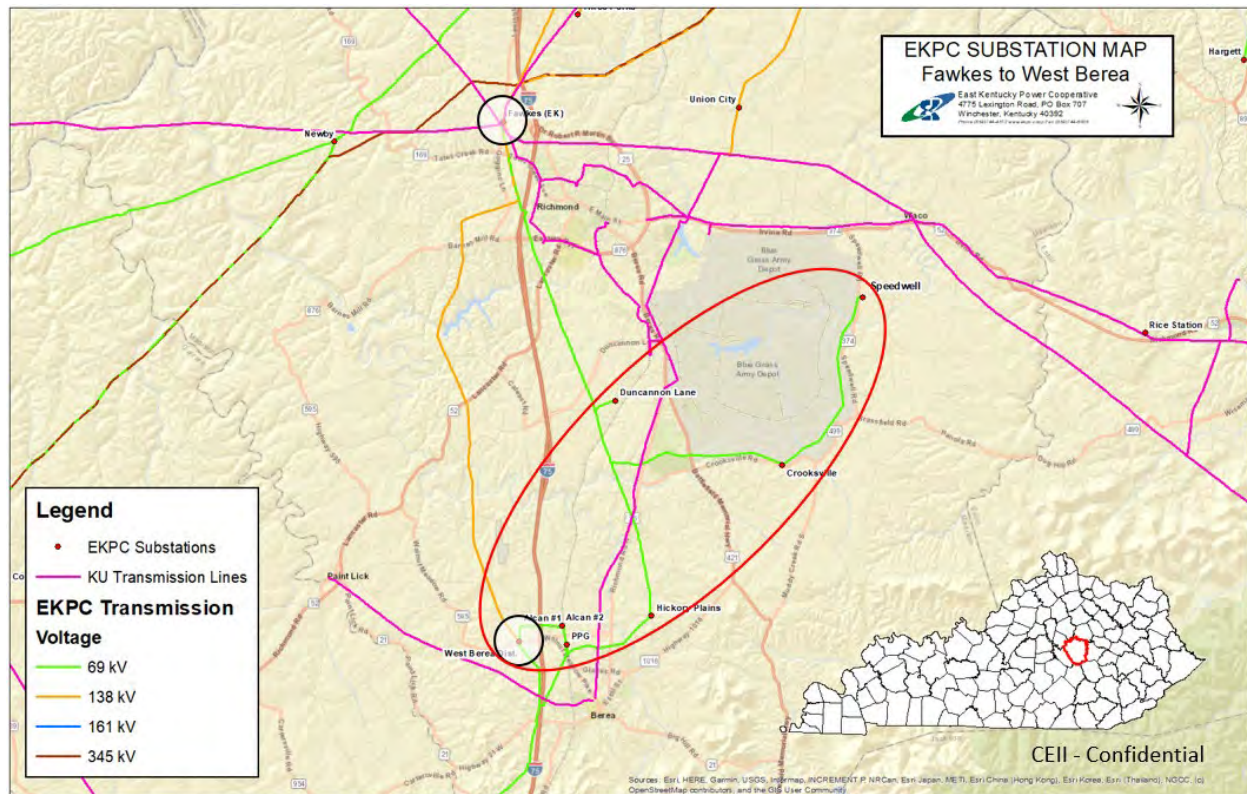
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Appendix - Economic Analysis

1.0 Introduction

The East Kentucky Power Cooperative's (EKPC) transmission system in the Richmond and Berea areas of Madison County, Kentucky was evaluated by the EKPC Transmission Planning Team to determine future transmission system needs. A current system map of the area is shown in Figure 1.1.

Figure 1.1: EKPC's Richmond and Berea area transmission system map



The Richmond and Berea area transmission system is connected to the EKPC Bulk Electric System (BES) at the EKPC Fawkes transmission substation, located on the northern edge of Richmond. The area EKPC loads (load pocket is encircled in red on Figure 1-1) are served by the 69 kilo-volt (KV) system in the area via a 69 KV interconnection with Louisville Gas & Electric/Kentucky Utilities (LG&E/KU) at the KU Fawkes substation on the northern side of the area and a 138/69 KV transformer at the EKPC West Berea substation on the southern side of the area. These sources are shown by the shaded circles on Figure 1-1. The EKPC loads in the area are dependent on these connections for active and reactive power. If one or more of the connections are not available due to an unplanned outage or planned maintenance, the area may experience thermal loading and/or under-voltage issues.

2.0 AREA TRANSMISSION SYSTEM BACKGROUND

The existing 69 KV circuit from the KU Fawkes substation to the West Berea substation is 16.87 miles long, and is entirely EKPC-owned other than the 69 KV terminal equipment owned by LG&E/KU at the KU Fawkes substation. This circuit utilizes wood-pole construction dating back to 1956. Nearly 15 miles

of the circuit was constructed between 1956 and 1957. The original installed conductor wires in these sections of this circuit were replaced with larger (heavier) 556.5 MCM ACSR conductor in the mid-to-late 1980's. However, the original wood-pole structures were not replaced, resulting in significantly increased mechanical loading on these structures.

The other sections of the KU Fawkes-West Berea circuit (approximately 2 miles) were built between 1989 and 1991. Also, an additional 9.66 miles of radial tap lines serving 7 distribution substations are connected to the circuit. Table 2.1 shows the number of customers and the forecasted (50/50 probability) peak loading for each connected substation in 2022.

Table 2.1 Existing distribution substation customer count and peak loading

Substation Name	Number of Customers (5741 total)	Forecasted Peak Loading (106.9MW total)
Duncannon Lane	7	2.9 MW
Crooksville	1736	10.7 MW
Hickory Plains	3946	26.8 MW
PPG	1	6.2 MW
Alcan #1	46	18.8 MW
Alcan #2	4	14.6 MW
Speedwell Road	1	26.9 MW

The energy provided to this load pocket mainly serves industrial customers. This circuit ranked in the top five annually for Megawatt-hours delivered on the EKPC system, with nearly 234,000 delivered in 2020. This is due primarily to the large amount of industrial load on this circuit.

Due to the attractive geographic location of Richmond and Berea, and the availability of land in the area that can be developed for large industrial customers, there is a high likelihood for an increase in the electrical demand in the area. In particular, a potential large industrial site ("New Industrial Site") located adjacent to Interstate 75 and Duncannon Lane in Madison County has been the subject of numerous inquiries by potential large (50 MW or more) industrial customers. Therefore, EKPC's analysis of system needs in the area has included this potential for future large-load additions at the New Industrial Site as a consideration.

2.2 Area current planned transmission enhancements

The following transmission projects in the area are scheduled to be completed in 2022 to address violations of EKPC planning criteria that were identified in earlier planning studies for the area. The need for these projects is driven by upcoming industrial load additions in the area. The projects are:

- An upgrade of the existing West Berea 138/69 KV, 100 MVA auto-transformer to 150 MVA. An overload of the West Berea transformer was identified during an outage of the KU Fawkes-Duncannon Lane Tap 69 KV line section for 2022/23 winter peak-load conditions. This overload is driven by the addition of the industrial load at the Speedwell Road substation. The West Berea transformer upgrade is scheduled to be completed by December 2022.
- The addition of a 138 KV circuit breaker at the EKPC Fawkes substation. Low voltage levels were identified in the area for an outage of the EKPC Fawkes-KU Fawkes 138 KV tie-line during

2022/23 winter peak-load conditions, which currently results in an outage of the entire 138 KV bus at the EKPC Fawkes substation due to the absence of a 138 KV circuit breaker on the EKPC end of the tie-line. The addition of a 138 KV circuit breaker on the EKPC end terminal of the tie-line will therefore eliminate the resulting 138 KV bus outage. This project is scheduled to be completed by December 2022.

Additionally, the following distribution substation project has been approved and is currently in development by EKPC:

- Build the new Big Hill distribution substation, tapping the EKPC Three Links Junction-Tyner 69 KV line between the existing Three Links and Sand Gap distribution substations (southeast of Berea) to offload the Hickory Plains substation. The Hickory Plains distribution substation transformer is forecasted to overload in 2025/2026 winter. Additionally, Blue Grass Energy forecasts low voltage levels, conductor overloads, and reliability issues on its distribution system in the area. This area of the Blue Grass Energy distribution system is on the southeastern edge of the Blue Grass system, limiting ability to support service via distribution infrastructure upgrades/additions. Hickory Plains currently serves the largest number of consumers for the EKPC system. The planned Big Hill substation will address both the Hickory Plains substation overload issues and the Blue Grass Energy distribution-system equipment and reliability concerns in this area, as well as shifting some existing load presently served from the KU-Fawkes-West Berea line to another transmission source outside of this area. This project is scheduled to be completed by December 2025.

2.3 Fawkes-Duncannon Lane 69 KV Line Overload

EKPC transmission-planning studies project a thermal overload of the 7.48 mile, KU Fawkes-Duncannon Lane Tap 69 KV line section resulting from an outage of either the EKPC Fawkes-West Berea 138 KV line or the West Berea 138/69 KV transformer during winter peak-load conditions beginning in 2022/23 winter. The expected loading level in 2022/23 winter is 108% of the winter emergency rating of the existing 556.5 MCM ACSR conductor. In addition to the thermal issues due to electrical loading on this line section, a mechanical-loading analysis determined that 88% of the existing structures are mechanically loaded over 80% of rated strength (based on current code requirements), and 43% of these structures are loaded over 100% of rated strength. Furthermore, those percentages are based on strength rating of new poles, cross-arms, and braces. Given that most of the poles and cross-arms are over 65 years old, the mechanical-loading concerns are likely to be worse than indicated.

Several alternatives were considered to address the thermal overload of this line section. These included the following:

- A. Increase the maximum operating temperature of the existing 556.5 MCM ACSR conductor in the KU Fawkes-Duncannon Lane Tap 69 KV line section from 212 degrees Fahrenheit to 302 degrees Fahrenheit.
- B. Rebuild the KU Fawkes-Duncannon Lane Tap 69 KV line section using 795 MCM ACSR conductor.
- C. Establish a new normally-open interconnection with LGE/KU south of the Crooksville Junction tap point.

- D. Construct a new 138 KV line from the EKPC Fawkes substation to the Crooksville Junction tap point and construct a new 138/69 KV substation near this location for connection to the existing KU Fawkes-West Berea 69 KV circuit.

While all of these alternatives would eliminate the thermal overload of the KU Fawkes-Duncannon Lane 69 KV line section, either by increasing the thermal capacity of the line (Alternatives A and B) or by providing a new source into the area to reduce the flow from the KU Fawkes source (Alternatives C and D), only Alternative B would also fully address the aging condition and mechanical-loading concerns identified on this line section. Therefore, EKPC has selected Alternative B as the recommended project to address the issues identified for this line section. The rebuild of the line section is scheduled to be completed by December 2024.

2.4 Reliability Issues and Solutions

Transmission Line Condition Issues

In addition to the KU Fawkes-Duncannon Lane Tap 69 KV line section, most of the remaining sections of the KU Fawkes-West Berea 69 KV circuit have multiple verified structural loading issues, shown in Table 2.4. The Duncannon Lane Tap-Crooksville Tap-Hickory Plains-PPG line sections, including the 4.3-mile radial Crooksville tap line, additionally have recurring issues of leaning structures and poles, along with aging infrastructure concerns -- near the end of life for the wooden poles and cross-arms in these sections. Alternatives considered for addressing these concerns are:

- A. Replace all structures on the circuit without replacement of the conductors and static wire.
- B. Completely rebuild the circuit, replacing all of the structures and upgrading the conductors to 795 MCM ACSR.

Table 2.4: Mechanical Loading of KU Fawkes-West Berea Circuit

Line Section	Number of Structures	# of Structures above 120% Mechanical Loading	# of Structures above 100% Mechanical Loading	# of Structures above 80% Mechanical Loading
KU Fawkes-Hickory Plains	149	8	59	131
Hickory Plains-PPG Tap	39	2	4	15
PPG Tap-Alcan Tap	7	0	0	0
Alcan Tap-Alcan	10	0	0	1
Alcan-West Berea	18	2	4	14
Crooksville Tap-Crooksville	51	20	37	46
Total	274	34	104	207

EKPC has determined that a complete rebuild of the KU Fawkes-West Berea 69 KV circuit (excluding all radial tap lines other than the Crooksville 69 KV tap line) is the best option to improve reliability and address all of the aging infrastructure/structural loading concerns associated with this circuit. As discussed later, these rebuilds with larger conductor also improve the voltage profile in the area,

resulting in deferral of future low-voltage issues in the area. EKPC intends to complete the rebuild of all sections by December 2026.

System Protection Issues

With the addition of the new Speedwell Road substation on a 69 KV radial line extended from the existing Crooksville tap line, multi-phase faults will be slow to clear when they occur near the Speedwell Road substation due to the length of the radial tap line. This does not adhere to EKPC's System Protection requirements and will lead to sequential tripping and remote coordination issues. Sequential tripping is an issue where transmission line relays at one terminal are reliant on the opposite terminal's breaker operation before the associated relays will be able to properly observe and respond to specific fault conditions. This leads to significantly slower operation times and protection scheme reliability issues. Alternatives considered for addressing these system-protection concerns are:

- A. Build a new 69 KV switching station near the Crooksville Junction location (where the Crooksville radial tap line connects to the KU Fawkes-West Berea 69 KV circuit).
- B. Build a new 69 KV switching station ("Madison County") near the Duncannon Lane Tap location (where the Duncannon Lane radial tap line connects to the KU Fawkes-West Berea 69 KV circuit).

These locations were chosen because they are both (a) roughly in the center of the area between the KU Fawkes and West Berea substations and (b) near the point where the Crooksville/Speedwell Road radial tap line connects to the circuit.

EKPC has elected to build the new Madison County switching station near the Duncannon Lane tap location as the preferred option to address the system protection issues.

3.0 STUDY METHODOLOGY, CRITERIA AND ASSUMPTIONS

Power-flow analysis (using Siemens PSS/E version 34.8 software package) was performed to identify any additional future planning-criteria violations in the Richmond/Berea area after installation of EKPC's planned projects, and to mitigate those identified violations as necessary. Alternative plans were developed to maximize available capacity to support service to load in the area. Cost estimates were developed to compare relative costs of the alternative plans. The studies evaluated system performance under both normal (N-0) and single-contingency (N-1) conditions for multiple study years.

Further analysis was performed to determine the incremental load-serving capacity each alternative would provide to the study area. At the end of the process, there were no remaining violations in the study area and the incremental load-serving capacity was identified for each alternative. For each alternative, the associated projects, the estimated total cost in current-year dollars, and the incremental capacity provided are summarized below in Sections 6.6 and 6.7. The incremental load that could be served with each alternative was determined at the Duncannon Lane substation location, and could be higher or lower depending on the specific location where future load locates on the circuit. Duncannon Lane was selected because it is adjacent to the location (New Industrial Substation) where significant interest from prospective industrial customers has occurred and is also in a relatively central location within the load pocket.

Thermal loading and voltage values were monitored for the EKPC Richmond/Berea area and compared with applicable planning criteria. Neighboring utility systems in the Richmond and Berea area were monitored to assess impacts on existing tie lines, and impacts on the area due to possible new interconnections.

3.1 Study Cases

The power flow models used were:

- 2027 summer and 2027/28 winter
- 2032 summer and 2032/2033 winter

The power flow models listed above modeled the following generation off-line in each model:

- EKPC Cooper generators 1 and 2 offline, replacement power imported from northern PJM. This generation dispatch scenario, when coupled with a contingency, creates the worst-case power-flow conditions for the EKPC system in the Richmond-Berea area.

3.2 Monitored Area

The monitored area was comprised of EKPC and LG&E/KU transmission equipment two transmission stations from the EKPC Fawkes and West Berea transmission stations, plus any transmission stations from which new lines into the area were assumed to be constructed. All bus voltages and branch thermal loadings were identified per the study criteria in Table 3.5 below.

3.3 Contingencies Tested

Power-flow analysis was performed with normal system (N-0 condition) as well as during a single-contingency event (N-1 condition). The N-1 analysis included the outage of a single transmission line section, transmission circuit or transformer for both the EKPC and LG&E/KU transmission systems, and included any switching plans to restore substation load. Additionally, select contingencies for other neighboring utilities adjacent to EKPC's footprint were included. New N-1 contingencies associated with each alternative were included for the power-flow analysis of the alternative, as appropriate.

3.4 Power-Flow Solutions

Load flow solution parameters used for the analysis are summarized in Table 3.4.

Table 3.4: Power-Flow Solution Parameters

Contingency	Solution Methodology	Taps	Shunts	Area Interchange Control	DC Taps	Phase Shifters
N-0	FDNS*	Adjusting	Adjusting	Tie Lines and Loads	Adjusting	Locked
N-1	FDNS*	Adjusting	Adjusting	Tie Lines and Loads	Adjusting	Locked

*FDNS: Fixed Slope Decoupled Newton-Raphson

3.5 Study Criteria

The study criteria are summarized in Table 3.5.

Table 3.5: Study Criteria

Contingency	Voltage		Thermal	
	Normal (N-0)	Emergency (N-1)	Normal (N-0)	Emergency (N-1)
	0.94 p.u.	0.90 p.u.	Rate A	Rate B
N-0	X		X	
N-1		X		X

4.0 POWER FLOW ANALYSIS

Power-flow analysis was first performed with only the following EKPC planned projects in the Richmond/Berea area included in the base-case study models:

- An upgrade of the West Berea 138/69 KV, 100 MVA transformer to 150 MVA.
- An addition of a 138 KV circuit-breaker on the EKPC Fawkes-KU Fawkes 138 KV tie-line to eliminate a resulting bus outage for this contingency.
- Rebuild of the KU Fawkes-Duncannon Lane Tap 69 KV line section using 795 MCM ACSR conductor.
- The new Big Hill distribution substation connecting to the Three Links Junction-Tyner 69 KV line.

Additional analysis was then performed with the following projects:

- Rebuild of the remaining portions of the KU Fawkes-West Berea 69 KV circuit (the sections between Duncannon Lane Tap and West Berea) using 795 MCM ACSR, and rebuild of the radial 69 KV line from the Crooksville Junction location to the Crooksville distribution substation using 556 MCM ACSR.

No alternative plans were initially included. Study methodology, criteria, and assumptions discussed in Section 3 were used for the power-flow analysis.

4.1 N-0 Analysis Results

N-0 analysis simulations were performed using the study models. The simulation results indicated that there were no N-0 thermal loading or voltage violations in the study area. The power flows on all monitored elements were below 100% of Rate A, and all monitored voltages were above applicable voltage criteria.

4.2 N-1 Analysis Results

N-1 analysis simulations were performed using the study models. The power flow analysis results showed N-1 under-voltage violations in the study area, but no thermal overloads. Monitored EKPC elements that did not meet the applicable minimum voltage criterion of 90% of nominal voltage are summarized in Table 4.2. If an N-1 simulation created a voltage violation for multiple buses, then only the most severe violation was listed.

Table 4.2: 2027 N-1 Analysis Voltage Results

Season	Monitored Facility	N-1 Contingency	Base Case Voltage	Voltage with all incremental line section rebuilds
Winter	Alcan	Fawkes-West Berea 138 KV Line	0.8984	0.9064
Winter	Speedwell Road	KU Fawkes-Duncannon Lane Tap 69 KV Line Section	0.9000	0.9165

These results indicate that rebuilding the entire KU Fawkes-West Berea 69 KV line provides some marginal benefit to the bus voltages in the area during contingency conditions, in addition to addressing the condition and mechanical-loading concerns associated with the line.

4.3 Available Remaining Load-Serving Capacity

The base case N-1 simulation results with the planned improvements discussed above show that the transmission capacity is nearing full utilization based on the contingency voltage levels being near the 90% threshold. Further analysis determined that only 3 MW of additional load can be served on the 69 KV system in the area without creating an under-voltage violation.

5.0 ALTERNATIVE PLAN DEVELOPMENT

The results of the power-flow analysis without any additional future projects in the area other than those listed for inclusion in the base-case study models (including the rebuild of the entire Fawkes-West Berea 69 kV circuit and the Crooksville Junction-Crooksville 69 kV radial line section) identified no voltage or thermal violations. However, the results show that the system with those planned projects for the area provide minimal future load-serving capacity on the 69 KV system when an outage of a critical facility in the area occurs. This indicates the need for transmission reinforcements in the area to serve potential future load additions on the 69 KV system.

For the near under-voltage issues identified, possible mitigation options include installing local capacitor banks and/or an additional transmission connection to other sources in the region to provide an additional reactive power source to the area. All of these mitigation options will help increase ability to serve additional future load in the area, but connection of an additional source(s) into the load pocket provides much more margin for load additions in the area.

Preliminary alternatives to address the marginal voltage issues in the area were identified. From this initial set of alternatives, three alternatives were selected for testing based on feasibility, expected performance, and estimated cost. The selected alternatives for further analysis were:

- Alternative 1: Rebuild the KU Fawkes-Duncannon Lane Tap line section as double-circuit 138 & 69 KV and construct a new 138/69 KV substation near the Duncannon Lane Tap location to connect the new 138 KV line to the existing 69 KV circuit.
- Alternative 2: Build a new 138/69 KV substation at the EKPC Union City distribution substation location, and build a new 69 KV line from Union City to the Speedwell Road distribution substation.
- Alternative 3: Install a 69 KV, 30 MVAR capacitor bank at the West Berea transmission substation.

Contingency analysis was performed on the models to identify any necessary projects for each alternative to address any marginal issues trending toward becoming a planning-criteria violation.

5.1 Alternative Plan 1

Alternative Plan 1 was developed to add an additional 138 KV connection to the area from the EKPC Fawkes substation. As mentioned in section 2.3, rebuilding the Fawkes-Duncannon Lane Tap 69 KV line section is the recommended solution to mitigate an identified overload of that line section, as well as to address the reliability issues associated with the line section. Alternative Plan 1 assumes utilization of the existing rights-of-way and the necessary construction outage for the Fawkes-Duncannon Lane Tap 69 KV line section to rebuild it as a 138 & 69 KV double-circuit line instead of an in-kind replacement with a single-circuit 69 KV line. This takes advantage of efficiencies in the cost, land usage, and construction to provide additional support and load-serving capacity, and operational flexibility and reliability improvement to the area in tandem with completing the required rebuild of the 69 KV line section. The following projects in Table 5.1 were identified for Alternative Plan 1:

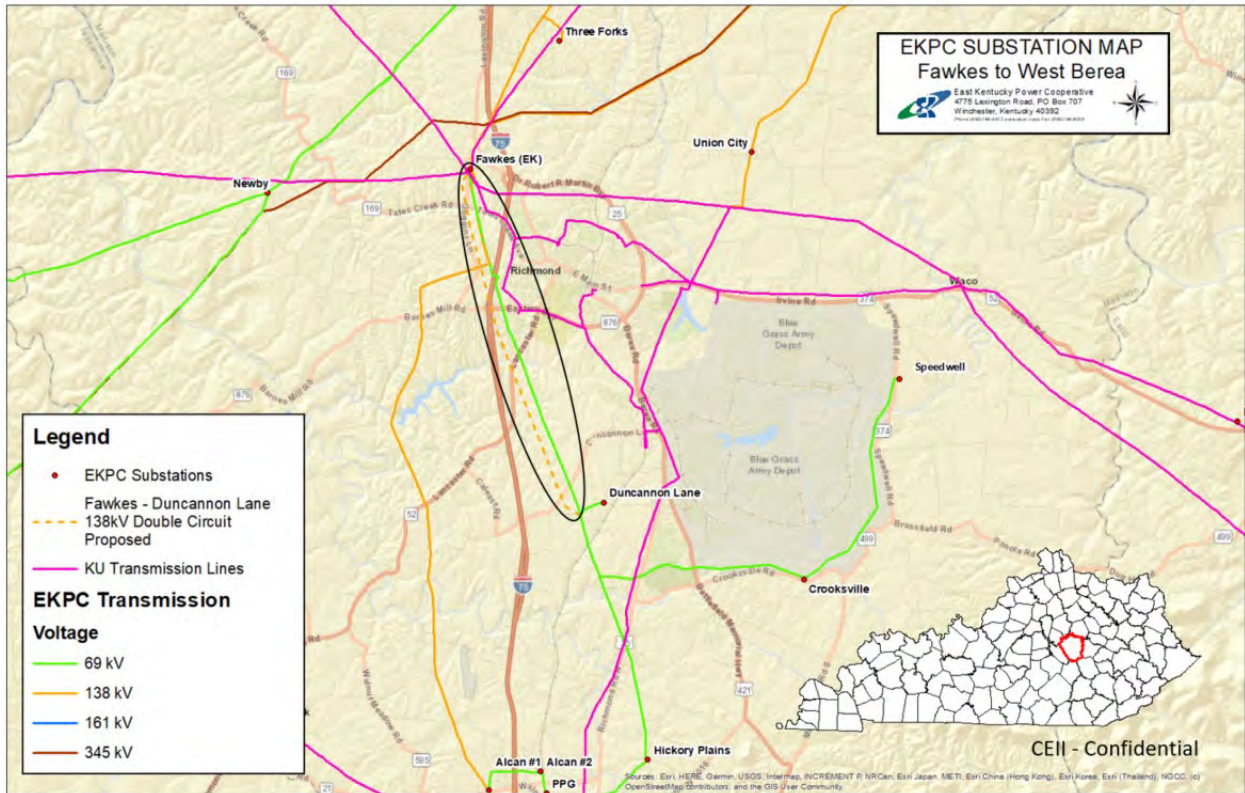
Table 5.1: Alternative Plan 1 Projects

Alternative Plan 1 Projects	Expected In-Service-Date
Modify the planned KU Fawkes-Duncannon Lane Tap 69 KV rebuild to rebuild as 138 KV & 69 KV double circuit.	December 2024
Modify the EKPC Fawkes substation to add a 138 KV terminal for the new Fawkes-Duncannon Lane Tap 138 KV line and to separate the substation into two 138 KV buses.	TBD*
Install a new 138/69 KV transformer and associated 138 KV bus at the Madison County switching station located near the Duncannon Lane Tap location.	TBD*

*The in-service date will be determined in the future based on load growth or other system conditions (such as operational or reliability needs for service to existing load) requiring execution of these projects. These projects were included in the 2027 models for this analysis.

The system configuration for Alternative Plan 1 is shown in Figure 5.1. The updates to the system configuration are inside of the oval.

Figure 5.1: Alternative Plan 1 Configuration



5.2 Alternative Plan 2

Alternative Plan 2 was developed to add an additional 69 KV connection to the area from the EKPC Union City substation northeast of Richmond. The following projects in Table 5.2 were identified for Alternative Plan 2:

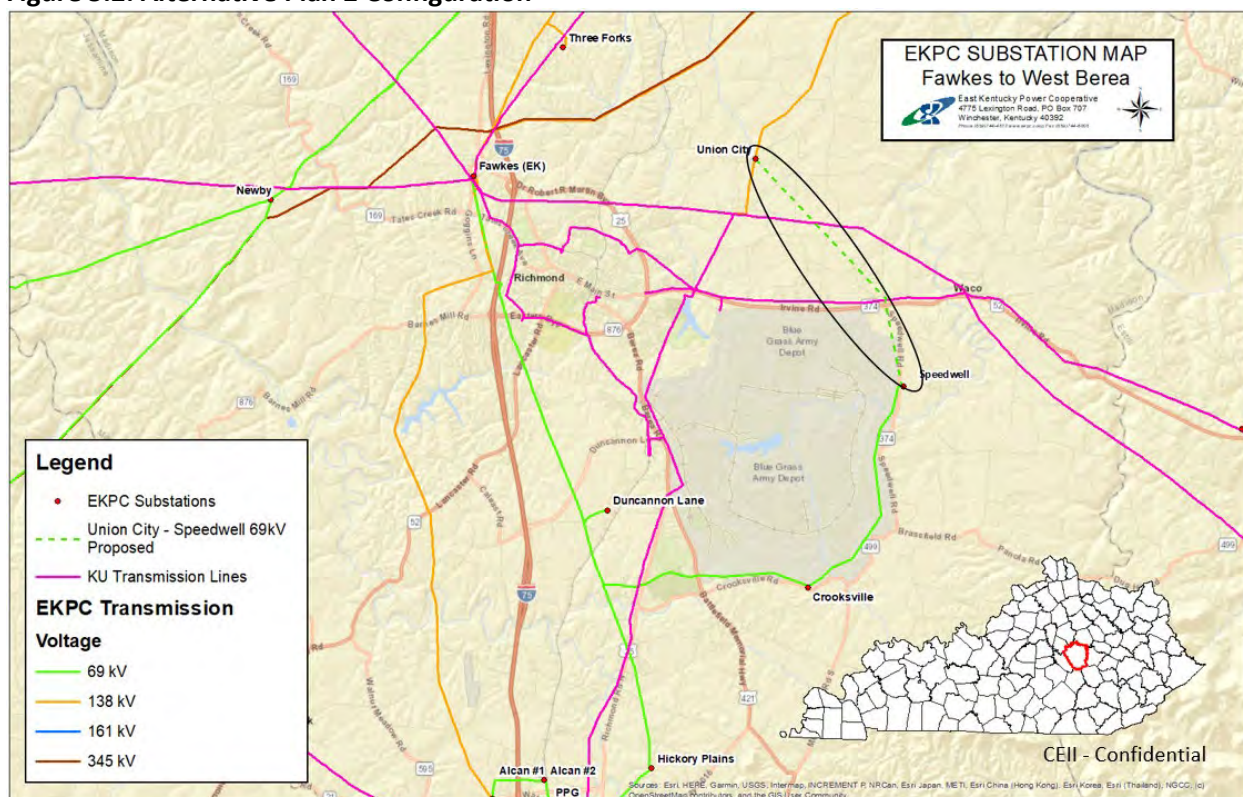
Table 5.2: Alternative Plan 2 Projects

Alternative Plan 2 Projects	Expected In-Service-Date
Build a new 138/69 KV transmission substation near the existing EKPC Union City distribution substation.	TBD*
Build a new 6.5 mile 69 KV line from Union City to the Speedwell Road distribution substation.	TBD*

*The in-service date will be determined in the future based on load growth or other system conditions (such as operational or reliability needs for service to existing load) requiring execution of these projects. These projects were included in the 2027 models for this analysis.

The system configuration for Alternative Plan 2 is shown in Figure 5.2. The updates to the system configuration are inside of the oval.

Figure 5.2: Alternative Plan 2 Configuration



5.3 Alternative Plan 3

Alternative Plan 3 was developed to provide additional voltage support to the area from the southern end. The following project in Table 5.3 was identified for Alternative Plan 3:

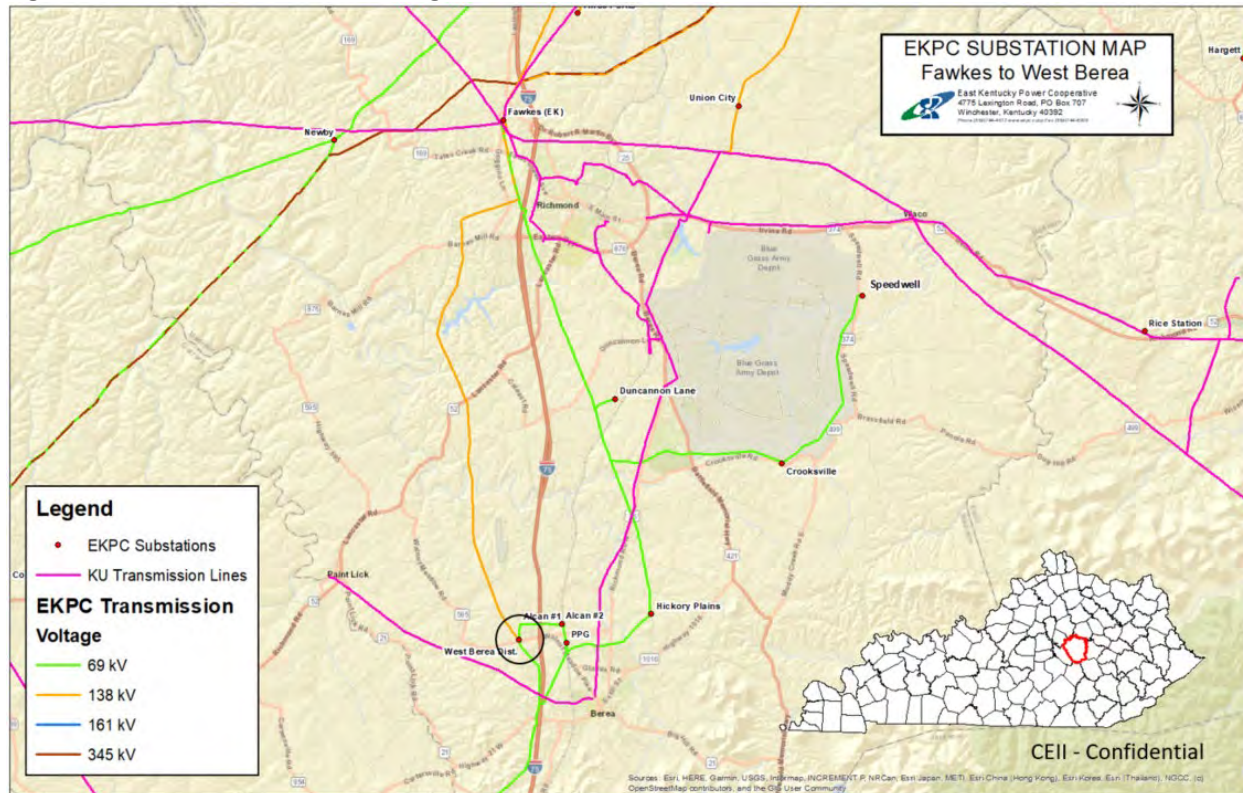
Table 5.3: Alternative Plan 3 Project

Alternative Plan 3 Project	Expected In-Service-Date
Install a new 69 KV, 30 MVAR (megavolt ampere of reactive power) capacitor bank at the EKPC West Berea substation.	TBD*

*The in-service date will be determined in the future based on load growth or other system conditions (existing-system or operational voltage concerns) requiring execution of this project. This project was included in the 2027 models for this analysis.

The system configuration for Alternative Plan 3 is shown in Figure 5.3. The system configuration is identical to its current configuration. The location of the system improvement is the existing West Berea substation, which is inside of the circle.

Figure 5.3: Alternative Plan 3 Configuration



5.4 Other Alternatives Considered

The following alternatives were considered as potential solutions to improve load-serving capacity issues on the 69 KV system in the area. However, they were eliminated from further consideration for miscellaneous reasons, including costs versus benefits, ability to sufficiently increase load-serving capacity in the area, ability to implement, etc.

1. Build a new Normally Open tie with KU near Crooksville (0.1 miles)
2. Build a new 69 KV line from Newby to Duncannon Lane Tap (10 miles)
3. Build a new normally-closed line from the LG&E/KU Lake Reba-Waco 69 KV line to Speedwell Road (6.5 miles)
4. Build a new 138 KV line from Union City and a 138/69 KV substation at Speedwell Road (6 miles)

Additionally, looping in the EKPC Fawkes-West Berea 138 KV line into the Madison County substation (3.75 miles of new double-circuit 138 kV line required) and installing a 138/69 KV transformer at Madison County was considered. However, this project does not eliminate the contingency of Fawkes-West Berea 138 KV, which is a critical outage in the area. In order to eliminate the critical contingency, support is needed in the area that is not vulnerable to the same outage. Therefore, this alternative to provide support to the 69 KV system in the area was excluded from further consideration.

6.0 POWER FLOW ANALYSIS OF ALTERNATIVE PLANS

Power-flow analysis was performed for Alternative Plans 1 through 3 described in Section 5 above.

6.1 Analysis of Alternative Plans

Models containing the alternative plans were developed for all of the study years used in the base case power-flow analysis. Power-flow analysis of the alternative plans was performed following the same methodology as the base case power-flow analysis (see Section 3). The contingency list was expanded as needed to include changes in the area system configuration created by each alternative plan.

6.2 Detailed Analysis Results

Detailed analysis was performed with the selected alternatives to analyze available incremental load-serving capacity issues on the 69 KV system in the area, and to identify any potential adverse impacts to the EKPC and neighboring LG&E/KU systems.

This analysis was performed on all models to identify the necessary projects for each alternative plan to resolve any identified thermal overloads, voltage violations and capacity issues through the study period (2027-2042). At the end of the process, there were no remaining violations in the study area.

Sections 6.3-6.5 present the detailed analysis results of the alternatives with the proposed future projects for each alternative plan modeled. The values shown in the results table are estimated year 2042 values, which were determined by extrapolating values obtained from the 2027 and 2032 models. These values show the performance of the system in the area with each alternative plan at the end of the study period.

6.3 N-0 Analysis Results

There were no N-0 violations identified in the base case analysis. Simulation results with the alternative plans showed no new violations.

6.4 N-1 Analysis Results

The N-1 analysis simulations showed that all of the alternative plans provide improved voltage support to the area. No new voltage or thermal violations were caused by the alternative plans.

6.5 N-1 Voltage Improvements

The N-1 voltage results for year 2042 with the alternative plans versus the base-case system are summarized in Table 6.5.

Table 6.5: N-1 Voltage Values for the Assumed Base-Case System and For Alternative Plans 1-3

Season	Monitored Bus	2042 Voltage (p.u.)			
		Base-Case System	Alternative Plan		
			1	2	3
Winter	Alcan (for EKPC Fawkes-West Berea 138 KV line outage)	0.9118	0.9532	0.9428	0.9729
Winter	Speedwell Road (for KU Fawkes - Duncannon Lane Tap 69 KV line section outage)	0.9273	0.9662	0.9821	0.9657

6.6 N-1 Additional 69 KV Load-Serving-Capacity Improvements

The N-1 incremental 69 KV load-serving capacity improvement results for year 2027 with the alternative plans are summarized in Table 6.6. This table provides the added MW capacity for load service on the 69 KV system (at Duncannon Lane) that each alternative provides.

Table 6.6: N-1 Capacity Improvements

Additional 69 KV MW Load Level That Can Be Served without Planning-Criteria Violations			
Base-Case System	Alternative Plan		
	1	2	3
3	55	34	20

Therefore, Alternative 1 provides the ability to serve significantly more additional load than the assumed base-case system, and provides almost three times the incremental capacity of Alternative 3 and about 60% more incremental capacity than Alternative 2.

6.7 Cost Estimate Comparison

The estimated total costs in 2022 dollars for the three alternative plans developed to provide additional load-serving capacity on the 69 KV system in the area is shown in Table 6.7 below. Additional breakdown of the estimated total cost of each alternative plan is provided in Appendix A.

Table 6.7: Alternative Plans Estimated Total Costs

Alt. Plan	Project Description	Cost Estimate (2022 \$)
1	Build a new Madison County 138/69 KV transmission substation (at Duncannon Lane Tap) and rebuild the Fawkes-Duncannon Lane Tap 69 KV line as double-circuit 138 & 69 KV construction. Add a new 138 KV exit at the EKPC Fawkes substation to terminate the 138 KV line on the northern end.	\$38,500,000 ⁽¹⁾
2	Build a new 138/69 KV transmission substation at Union City and a new 6.5 mile 69 KV line from Union City to Speedwell Road.	\$24,980,000
3	Install a new 69 KV, 30MVAR (megavolt ampere of reactive power) capacitor bank at West Berea.	\$590,000

⁽¹⁾ This cost only includes the incremental cost of the addition of the 138 KV circuit from Fawkes-Duncannon Lane Tap as part of the planned rebuild of the 69 KV line section.

Although the cost of Alternative 1 is the highest of the three alternative plans developed, it provides substantially more benefits than the other alternative plans. First, it provides much more capacity for future load growth on the 69 kV system in the area. Second, it utilizes existing rights-of-way to establish a new line into the area. Alternative 2 would likely require construction of several miles of new green-field transmission line to connect the Union City and Speedwell Road substations. Alternative 3 is a relatively easy plan to implement. However, it provides no ancillary benefits other than establishing a reactive power source on the southern end of the area. While this is beneficial in providing additional voltage support in the area, it would provide no benefits for reliability or operational flexibility. Therefore, it has very limited value from an operational perspective. Therefore, Alternative 1 is much preferred to Alternatives 2 or 3, despite the higher costs associated with this plan. Furthermore, the opportunity to begin implementing Alternative 1 exists now due to the need to rebuild the existing 69 kV line section. EKPC can begin the establishment of a 138 kV circuit from the Fawkes substation into the Duncannon Lane area while rebuilding the 69 kV circuit between those two locations, which would provide significant efficiency benefits now. If EKPC needs to establish this circuit in the future (for

instance, to serve a large amount of new load in the area), it will be much more difficult from a routing and construction perspective. Therefore, Alternative 1 is the recommended plan to increase load-serving capacity on the 69 kV system in the area.

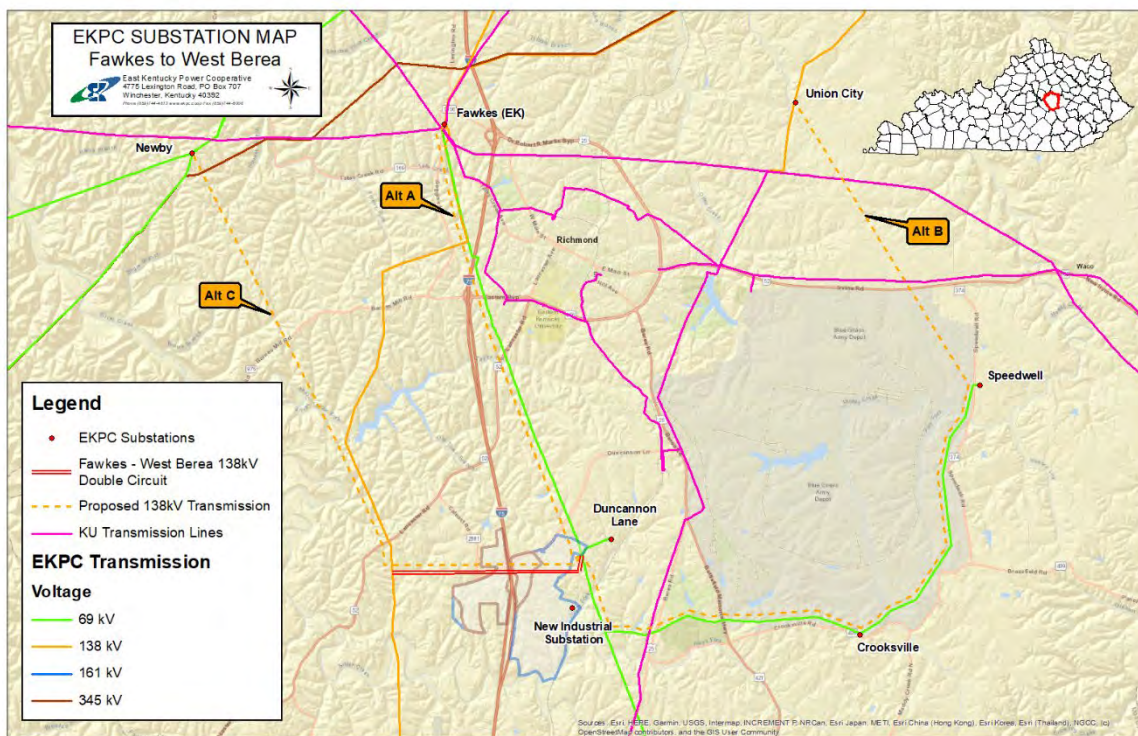
7.0 New Industrial Substation Large Load Service Capability

As discussed in section 2.1, a number of large (greater than 50 MW+ peak demand) potential industrial facilities have expressed interest in the New Industrial Site in Madison County, seen in Figure 7.2 below. Loads of this magnitude are more efficiently served from transmission facilities at higher voltages than 69 KV due to lower impedances and higher ratings increasing the power-flow capability into the area. Therefore, possible transmission alternatives to establish 138 kV facilities in the vicinity of the New Industrial Site were developed in order to serve loads in excess of 50 MW at that location. These additional alternatives were analyzed for load service capability and estimated cost (listed in Table 7.1, and shown in Figure 7.2), and provide 138 KV service to the site to adequately and reliably serve a large amount of load. A detailed breakdown of the estimated total costs of each alternative plan is included in Appendix B.

Table 7.1: New Industrial Site Large Load Service Capacity Alternatives

Alternative	Alternative Description	138 KV Load Amount Served (MW)	Cost Estimate (2022 \$)
A	Build a new Fawkes-Madison County 138 KV line on existing Fawkes-Duncannon Lane Tap 69 KV line right-of-way (rebuild as double-circuit), and loop the existing Fawkes-West Berea 138 KV line into the Madison County substation to provide a redundant 138 KV feed.	179	\$35.8M
B	Build a new Union City-Madison County 138 KV line and loop the existing Fawkes-West Berea 138 KV line into the Madison County substation to provide a redundant 138 KV feed.	103	\$39.2M
C	Rebuild one of the two Dale-Newby 69 KV circuits as a 138 KV line, and build a new 138 KV line from Newby to the Madison County substation. Loop the existing Fawkes-West Berea 138 KV line into the Madison County substation to provide a redundant 138 KV feed.	113	\$36.0M

Figure 7.2: New Industrial Site Large Load Service Capacity Configuration



8.0 CONCLUSION

With EKPC's current planned projects to address planning-criteria violations, along with reliability and system protection issues (as discussed in Sections 2.2-2.4), very limited capacity exists for future load-growth on the 69 KV system in the area (see Section 4.3). The addition of new industrial/commercial load or general load growth in the area of 3% of the current area loading (which equates to 3 MW) would result in unacceptable single-contingency voltages. This area of the EKPC system already serves many industrial facilities, and is likely to continue to see development of both expansions of existing industrial/commercial facilities and addition of new such facilities. Therefore, ensuring adequate capacity is in place is critical to be prepared to serve the additional electrical demand of these facilities.

EKPC's analysis shows that providing a new 138 KV line from the EKPC Fawkes substation to the Duncannon Lane area provides significant load-serving benefits for the area. An estimated total of 179 MW can be served at 138 KV in this area with this line addition. At 69 KV, an estimated incremental amount of 55 MW of load can be served if the 138 KV line is connected to the existing 69 KV circuit at Duncannon Lane Tap. This new 138 KV line would provide the largest load-serving capacity benefits of the alternatives considered for either 138 KV or 69 KV incremental-load service.

Furthermore constructing this new 138 kV line and connecting to the existing 69 kV circuit in the Duncannon Lane area in the future would provide improvements to reliability of service to the area and operational flexibility even without additional load growth in the area. This provides a new 138 kV line that would be a parallel line to the existing lines (Fawkes-West Berea 138 kV and 69 kV circuits) that currently serve the load pocket. This adds a new source into the area that would make scheduling of

necessary maintenance outages easier, as well as aiding in restoration efforts and maintaining adequate operational system performance during unplanned outages. Therefore, this line can provide value to the existing customers in the area in the future, even in the unlikely event that there is no load growth in the area.

Therefore, EKPC Transmission Planning recommends modifying the scope of the Fawkes-Duncannon Lane Tap single-circuit 69 KV rebuild to rebuild this line as a double-circuit 138 KV & 69 KV line at an incremental cost of \$10,500,000. This will allow EKPC to take advantage of the existing rights-of-way to establish a new 138 KV path, as well as the efficiency of constructing both circuits simultaneously. EKPC plans to energize the 69 KV portion of the double-circuit as the replacement for the existing 69 kV line between the KU Fawkes and Duncannon Lane Tap terminating points; the 138 KV portion of the double-circuit would not be terminated at either end until load growth, other future system changes in the area, or increased operational/reliability concerns drives the need for the 138 KV circuit to be connected to the system. EKPC may elect to connect the conductors in the 138 KV circuit to the conductors in the 69 KV circuit in a “six-wire” configuration in order to energize the conductors to ensure that no problems (such as damaged insulators) with the 138 KV circuit that EKPC is unaware of exist until such time as the 138 kV circuit is ultimately terminated on each end.

Establishment of this 138 KV circuit now will prepare EKPC for future transmission needs to provide additional capacity and support to the area (see Section 6.6). EKPC will be able to terminate the new 138 KV circuit at each end relatively expediently when needed to provide additional support to the area, either for loads connecting to the existing 69 KV system or for a large load that would be served at 138 KV transmission voltage, or if EKPC determines that operational and/or reliability needs necessitate that the circuit should be energized.

APPENDIX A

Table A1: Alternative Plan 1 Cost Breakdown

Associated Project Description	Estimated Cost (2022\$)
Rebuild the existing 69 KV line from KU Fawkes to Duncannon Lane Tap using 795 MCM ACSR conductor as a double-circuit 138 & 69 KV line.	\$10,500,000 ⁽¹⁾
Install 138 kV equipment at the Madison County switching station for termination of the new 138 kV line from Fawkes. Install a new 138/69 KV transformer and associated 138 kV and 69 kV equipment to connect the 138 kV and 69 kV busses at the switching station.	\$16,500,000
Add necessary equipment at the EKPC Fawkes substation to establish a new 138 KV line exit and to split the bus into two separate 138 kV busses.	\$11,500,000
Total	\$38,500,000

⁽¹⁾ This is the estimated incremental cost of modifying the scope of the rebuild from a single-circuit 69 kV line to a double-circuit 138 & 69 kV line. The estimated total cost of the project is \$19.0M.

Table A2: Alternative Plan 2 Cost Breakdown

Associated Project Description	Estimated Cost (2022\$)
Build a new 138/69 KV transmission station with associated breakers near the existing Union City distribution substation.	\$16,500,000
Build a new 6.5-mile 69 KV transmission line from Union City to Speedwell Road.	\$8,480,000
Total	\$24,980,000

Table A3: Alternative Plan 3 Cost Breakdown

Associated Project Description	Estimated Cost (2022\$)
Install a new 69 kV, 30 MVAR capacitor bank at West Berea	\$590,000
Total	\$590,000

Appendix B

Table B1: Alternative Plan A Cost Breakdown

Associated Project Description	Estimated Cost (2022\$)
Rebuild the existing 69 KV line from Fawkes to Duncannon Lane Tap using 795 MCM ACSR as a double-circuit 138 & 69 KV line.	\$10,500,000
Build a new 138 KV transmission station ("Madison County") with associated breakers near the Duncannon Lane Tap location for termination of the new 138 kV line from Fawkes, the loop in of the existing Fawkes-West Berea 138 kV line, and future connection to distribution transformers for load service at the New Industrial Site.	\$7,500,000
EKPC line work to loop the existing Fawkes-West Berea 138 KV into the Madison County 138 kV substation using 3.4 miles of double circuit 795 MCM ACSR.	\$6,340,000
Add necessary equipment at the EKPC Fawkes substation to establish a new 138 KV line exit and to split the bus into two separate 138 kV busses.	\$11,500,000
Total	\$35,840,000 ⁽¹⁾

⁽¹⁾ This does not include the costs for the new distribution substation equipment needed to serve the New Industrial Site as the full scope will be unknown until an industrial customer chooses to locate at the New Industrial Site and provides its specific load profile.

Table B2: Alternative Plan B Cost Breakdown

Associated Project Description	Estimated Cost (2022\$)
Build a new 138 KV transmission station ("Madison County") with associated breakers near the Duncannon Lane Tap location for termination of the new 138 KV line from Union City, the loop in of the existing Fawkes-West Berea 138 kV line, and future connection to distribution transformers for load service at the New Industrial Site.	\$7,500,000
EKPC line work to loop the existing Fawkes-West Berea 138 KV into the Madison County 138 KV substation using 3.4 miles of double circuit 795 MCM ACSR.	\$6,340,000
Build a new 14.5 mile 138 KV line from the Union City substation to the Madison County substation using 795 MCM ACSR	\$17,860,000
Build a new 138 KV switching station at Union City	\$7,500,000
Total	\$39,200,000 ⁽¹⁾

⁽¹⁾ This does not include the costs for the new distribution substation equipment needed to serve the New Industrial Site as the full scope will be unknown until an industrial customer chooses to locate at the New Industrial Site and provides its specific load profile.

Table B3: Alternative Plan C Cost Breakdown

Associated Project Description	Estimated Cost (2022\$)
Build a new 138 KV transmission station ("Madison County") with associated breakers near the Duncannon Lane Tap location for termination of the new 138 kV line from Newby, the loop in of the existing Fawkes-West Berea line, and future connection to distribution transformers for load service at the New Industrial Site.	\$7,500,000
EKPC line work to loop the existing Fawkes-West Berea 138 KV into the Madison County 138 kV substation using 3.4 miles of double circuit 795 MCM ACSR.	\$6,340,000
Build a new 9.7 mile 138 KV line from the Newby substation to the Madison County substation using 795 MCM ACSR	\$11,950,000
Rebuild one of the two 11.1 mile double circuit Dale-Newby 69 KV lines as a 138 kV line using 795 MCM ACSR.	\$9,990,000 ⁽¹⁾
Add necessary 138 kV terminal equipment at the Dale substation for termination of the new Dale-Newby-Madison County 138 kV line	\$200,000
Total	\$35,980,000 ⁽²⁾

⁽¹⁾ This is the incremental cost of rebuilding the double-circuit Dale-Newby 69 kV line as a double-circuit 138 & 69 kV line. EKPC already has plans to rebuild the line as double-circuit 69 kV, so this additional cost is what would be incurred for this alternative plan.

⁽²⁾ This does not include the costs for the new distribution substation equipment needed to serve the New Industrial Site as the full scope will be unknown until an industrial customer chooses to locate at the New Industrial Site and provides its specific load profile.