

Submission of Supplemental Projects for Inclusion in the Local Plan

EKPC Transmission Zone M-3 Process Fayette-Baker Lane

Need Number: EKPC-2023-004

Process Stage: Submission of Supplemental Project for inclusion in the Local Plan –August 29, 2024

Previously Presented:

Need Meeting – September 15, 2023

Solutions Meeting – October 20, 2023

Supplemental Project Driver:

Equipment Material Condition, Performance and Risk
Operational Flexibility and Efficiency & Infrastructure Resilience

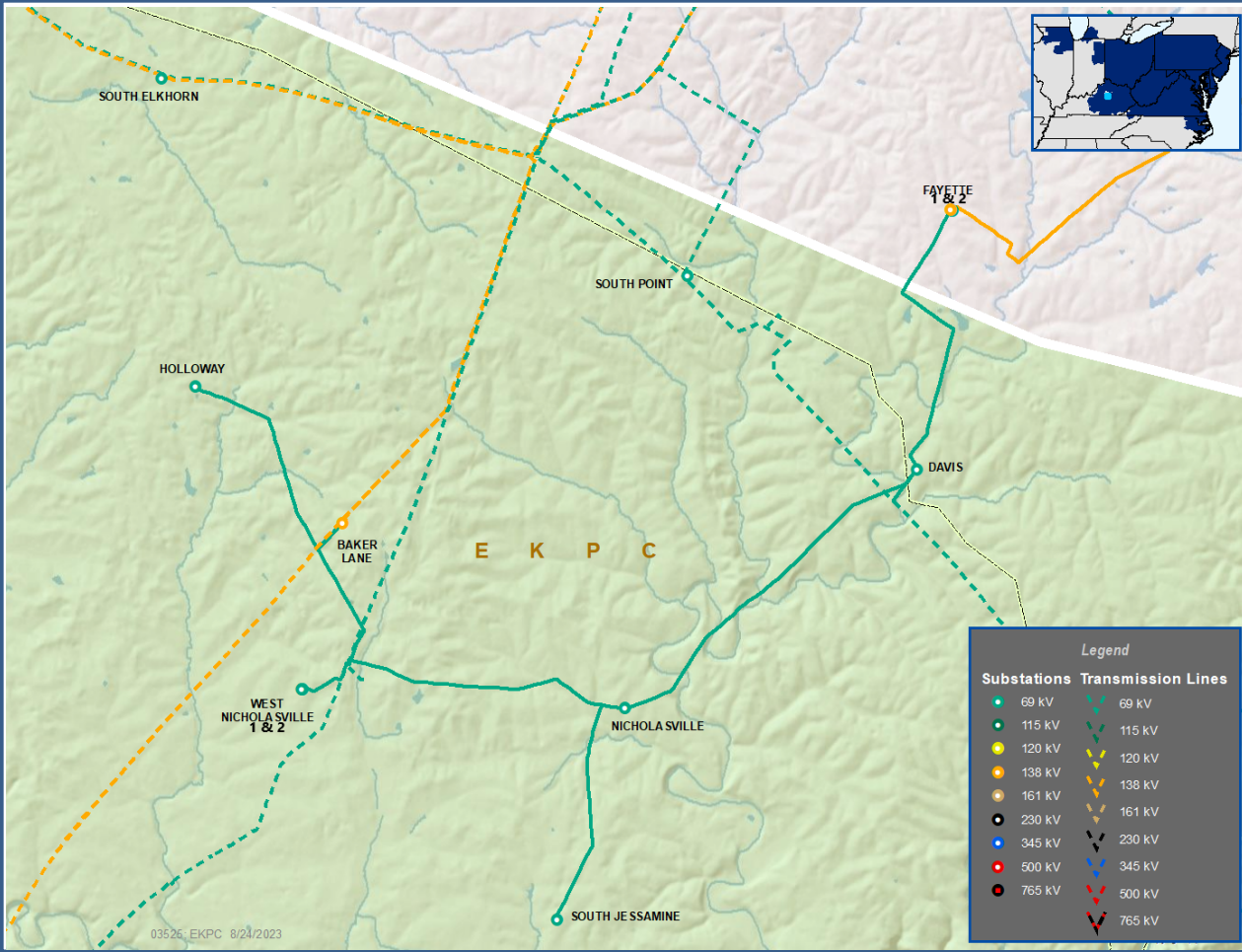
Specific Assumption Reference:

EKPC Assumptions Presentation Slides 13, 14 & 16

Problem Statement:

The 12 mile, Fayette-Baker Lane 69 KV transmission line is 1966 to 1989 vintage wood pole construction with sections of 266.8 and 556.5 conductor. This line currently serves 8 distribution substation with 15,864 customers, which is the highest number of customers of any circuit on EKPC’s system. This line section exhibits wood deterioration and overloaded structures. This combination creates a high risk for structure failures. Additionally, the makeup of this 12 mile circuit with the long tap lines for South Jessamine and Holloway substations, this creates system protection issues with the 69 KV relays reaching into the 138 KV system during certain outages. The EKPC Reliability team is evaluating alternatives to address these aging infrastructure and structure overload issues, system protection issues and to reduce the number of distribution substations between breakers.

Model: N/A



EKPC Transmission Zone M-3 Process Fayette-Baker Lane

Need Number: EKPC-2023-004

Process Stage: Submission of Supplemental Project for inclusion in the Local Plan – August 29, 2024

Proposed Solution:

Rebuild the 12 mile, Fayette-Baker Lane 69 KV circuit using 556.5 conductor and steel pole construction. Expand the scope of a current project to rebuild the Nicholasville distribution substation to include a new 69 KV double bay switching station and control building.

Transmission Cost: \$17.5M

Distribution Cost: \$4.5M

Ancillary Benefits:

- Reduces cost by expanding scope of an existing project versus doing as a separate project.

Alternatives Considered:

- No feasible alternatives

Projected In-Service:

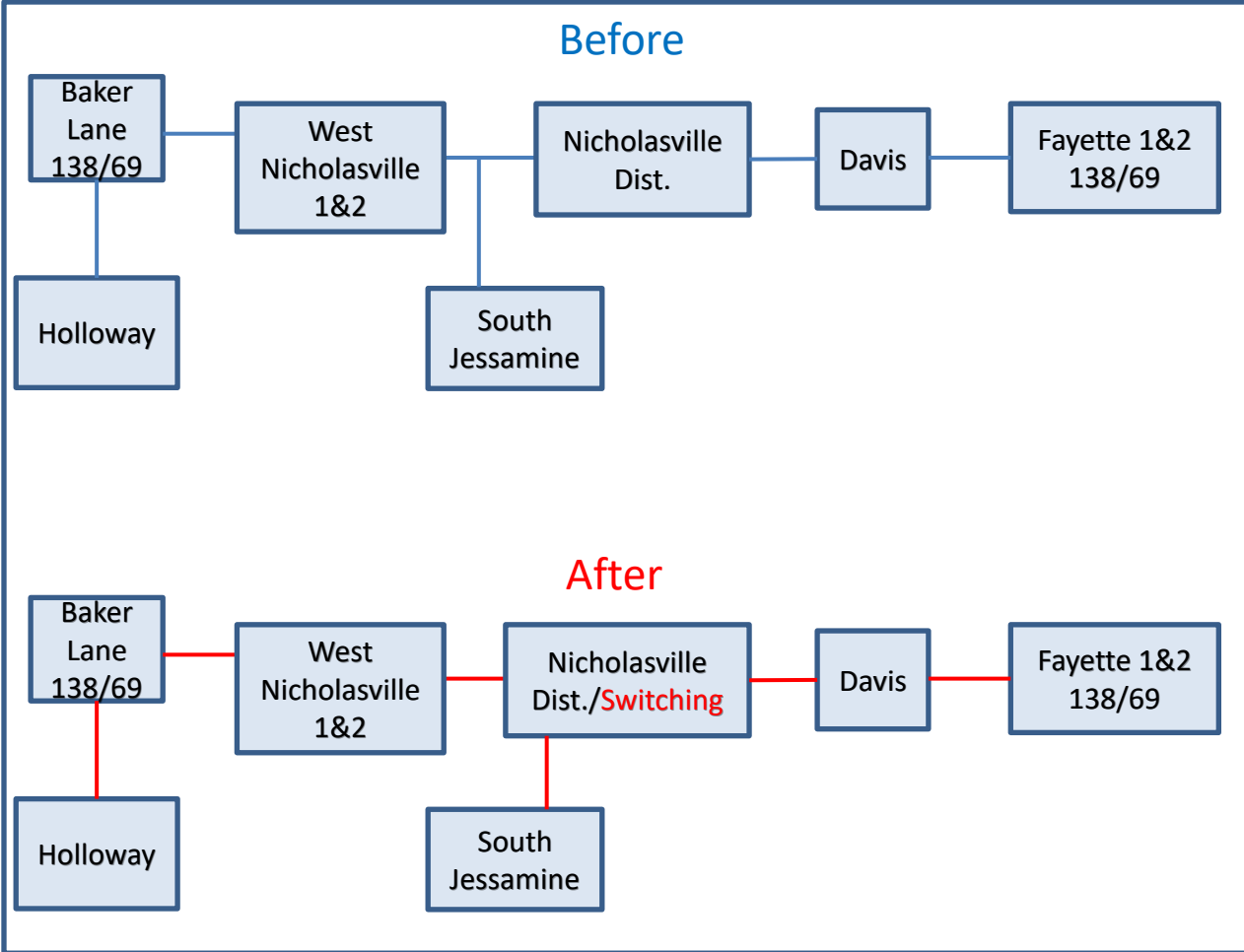
Breaker station: In-Service

T-Line rebuilds: 12/2025 – 12/2029

Project Status: Under Construction

Supplemental Project ID: s3164.0

Model: N/A



EKPC Transmission Zone M-3 Process North Lebanon

Need Number: EKPC-2023-005

Process Stage: Submission of Supplemental Project for inclusion in the Local Plan –August 29, 2024

Previously Presented:

Need Meeting – September 15, 2023

Solutions Meeting – October 20, 2023

Supplemental Project Driver:

Customer Service

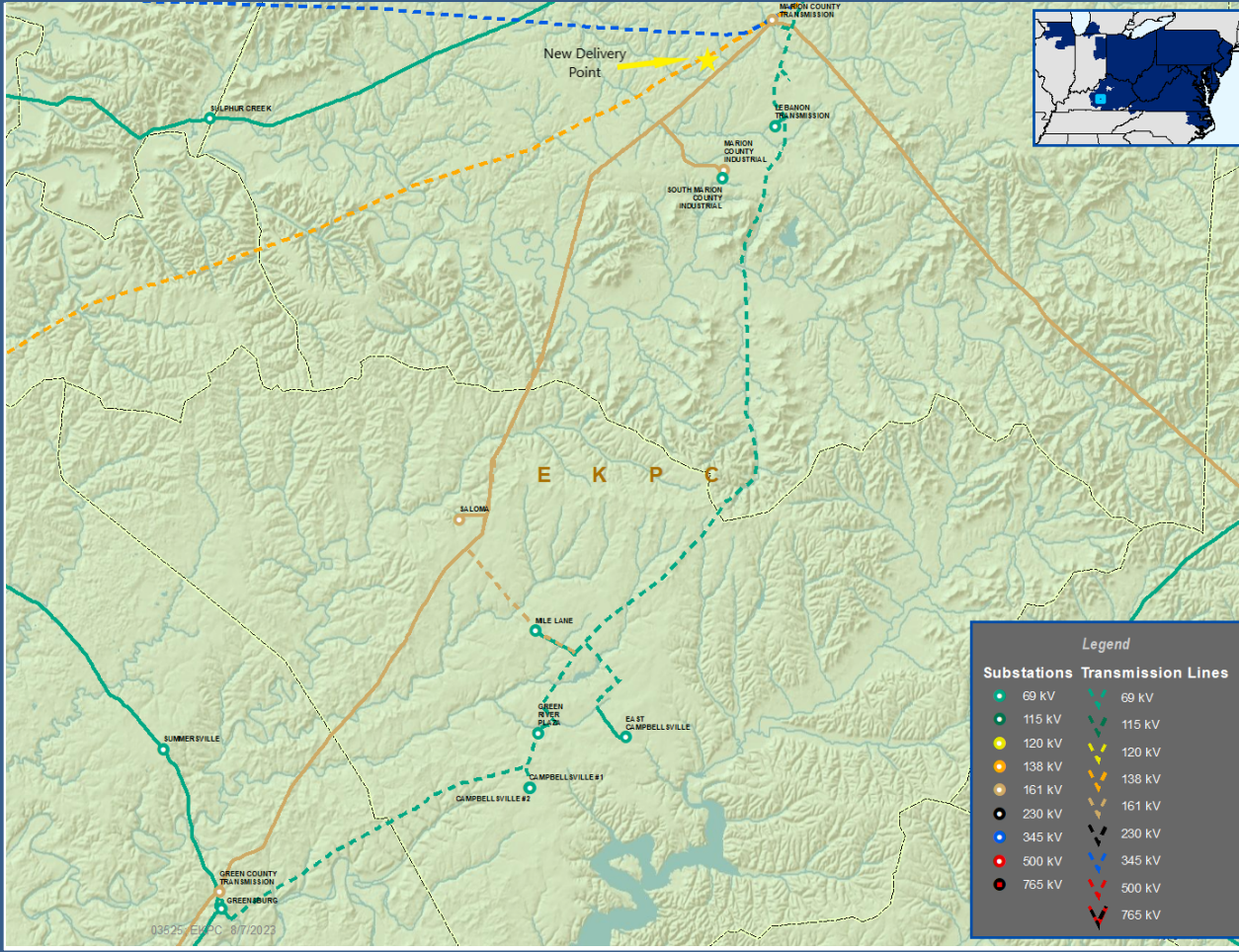
Specific Assumption Reference:

EKPC Assumptions Presentation Slide 15

Problem Statement:

A new customer has requested a delivery point for a peak demand of 18 MW by 4/1/2024. The new delivery point is located in Lebanon, KY approximately 2 mile southwest of the EKPC’s Marion County substation. The existing distribution infrastructure is not capable of serving this request.

Model: N/A



EKPC Transmission Zone M-3 Process North Lebanon

Need Number: EKPC-2023-005

Process Stage: Submission of Supplemental Project for inclusion in the Local Plan –August 29, 2024

Proposed Solution:

Construct a new 161-13.8 KV distribution substation and associated 0.25 mile 161 KV double circuit tap line. This new delivery point will tap the existing EKPC Marion County-Green County 161 KV transmission circuit approximately 2 mile southwest of the Marion County substation.

Transmission Cost: \$9.46K

Distribution Cost: \$8.15M

Ancillary Benefits:

- None

Alternatives Considered:

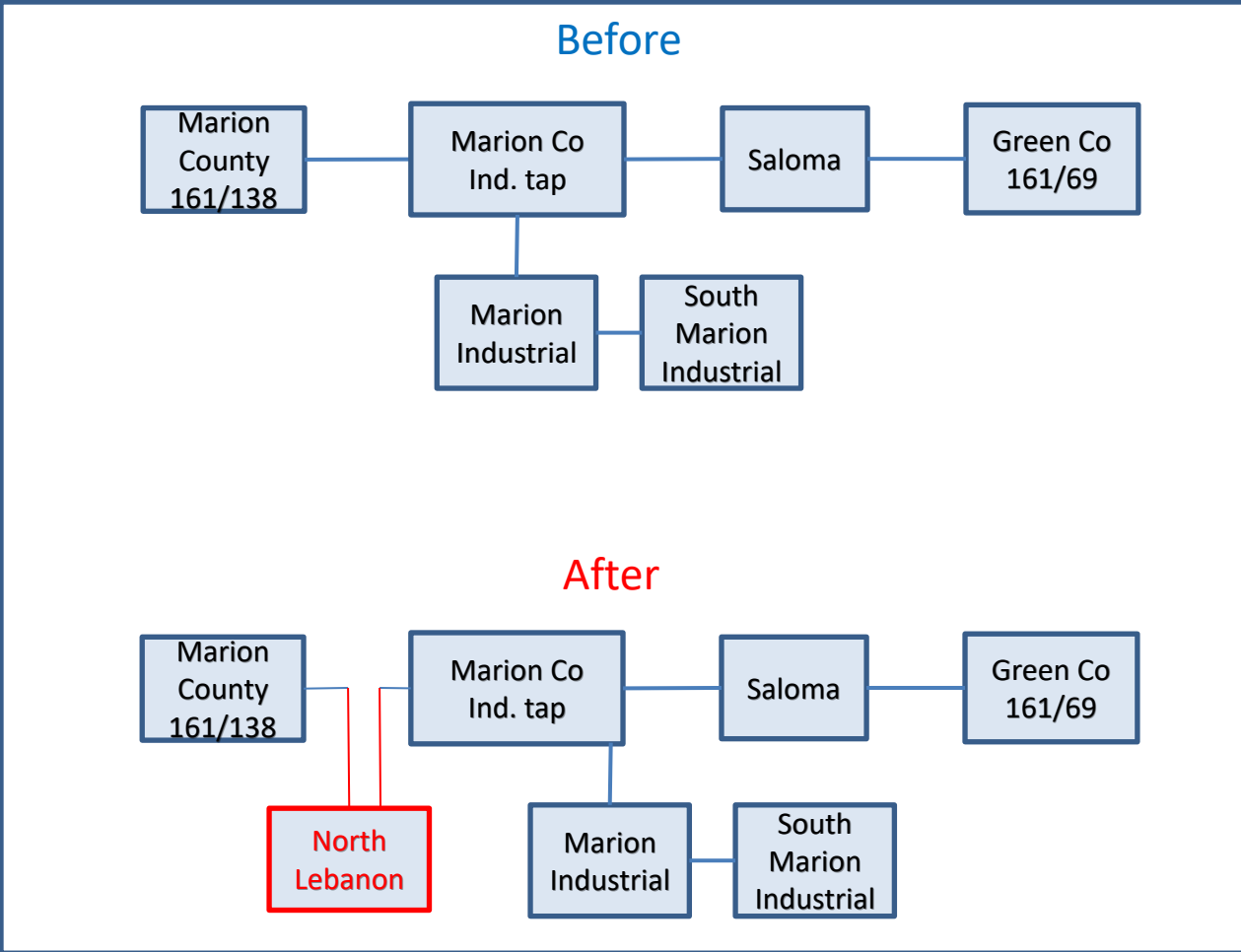
- No feasible alternatives

Projected In-Service: 7/23/2024

Project Status: In-Service

Supplemental Project ID: s3165.0

Model: N/A



EKPC Transmission Zone M-3 Process Gordon Lane

Need Number: EKPC-2023-006

Process Stage: Submission of Supplemental Project for inclusion in the Local Plan –August 29, 2024

Previously Presented:

Need Meeting – September 15, 2023

Solutions Meeting – October 20, 2023

Supplemental Project Driver:

Customer Service

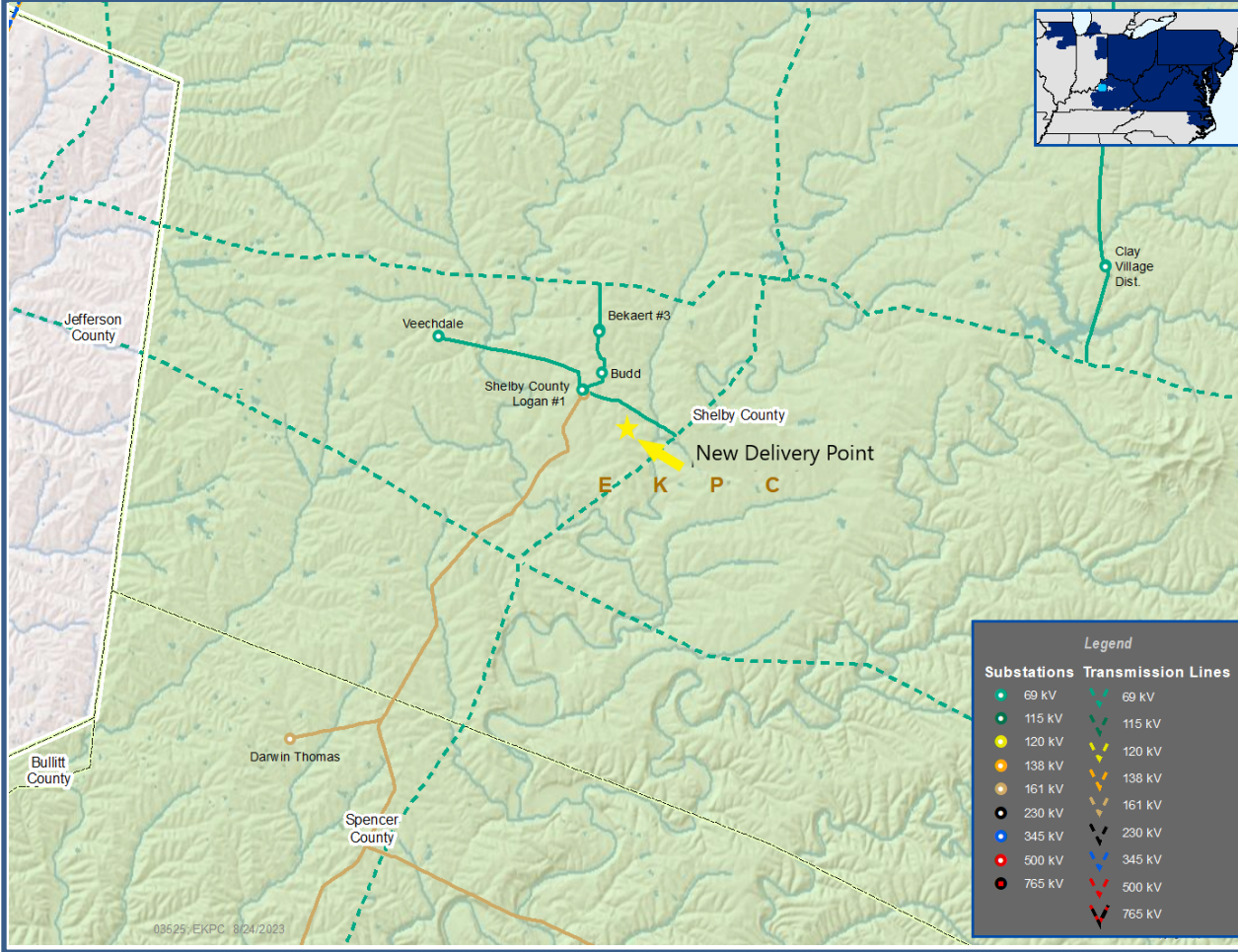
Specific Assumption Reference:

EKPC Assumptions Presentation Slide 15

Problem Statement:

A new customer has requested a delivery point for a peak demand of 9 MW by 9/1/2024. The new delivery point is located in Shelbyville, KY approximately 1.5 mile southeast of the EKPC’s Shelby County substation. The existing distribution infrastructure is not capable of serving this request.

Model: N/A



EKPC Transmission Zone M-3 Process Gordon Lane

Need Number: EKPC-2023-006

Process Stage: Submission of Supplemental Project for inclusion in the Local Plan –August 29, 2024

Proposed Solution:

Construct a new 69-26.4 KV, 18/24/30 MVA distribution substation and associated 1.4 mile 69 KV tap line. The tap line will be constructed using 556.5 conductor and steel pole construction. This new station will be served from the EKPC Shelby County substation.

Transmission Cost: \$0.0M

Distribution Cost: \$6.3M

Ancillary Benefits:

- None

Alternatives Considered:

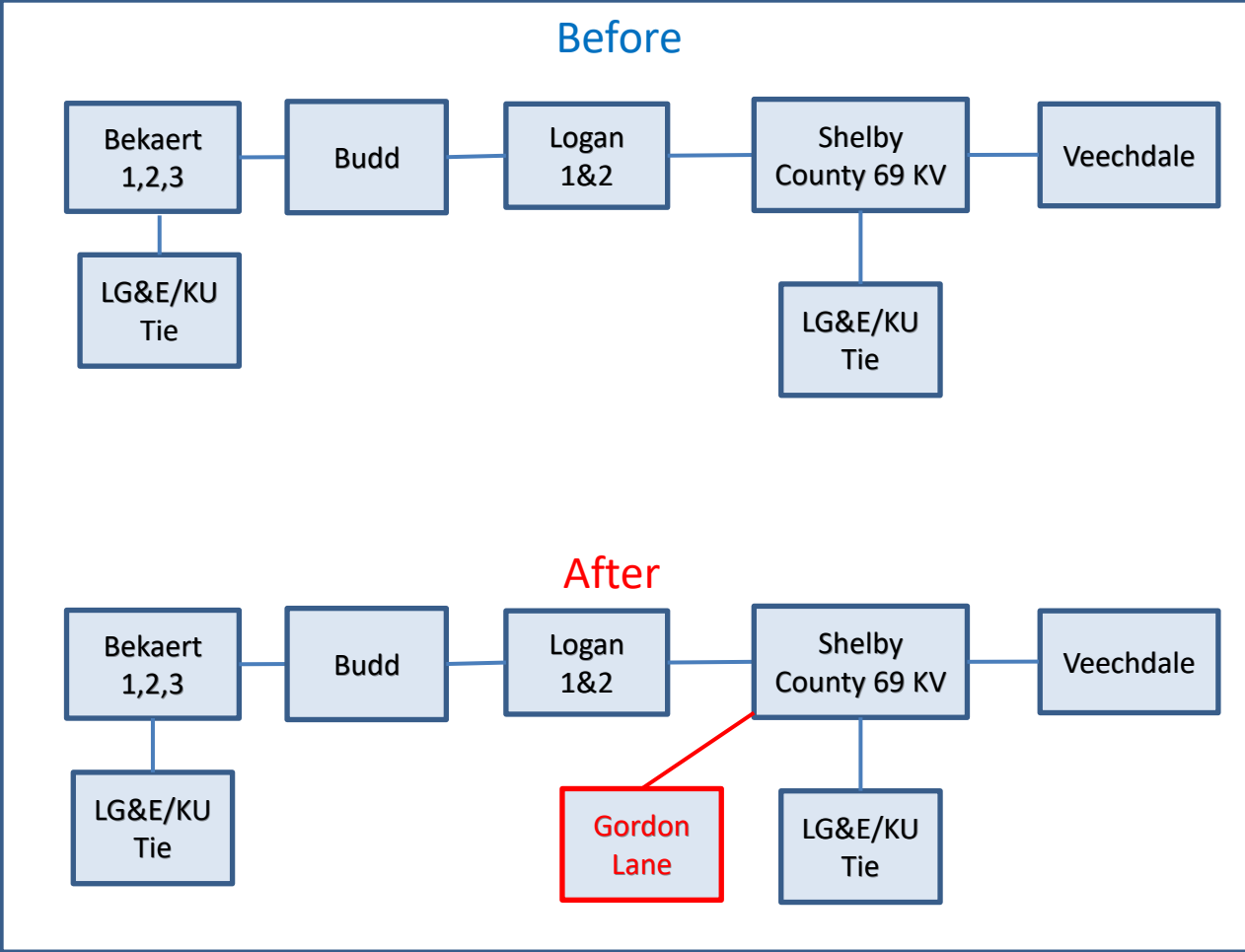
- No feasible alternatives

Projected In-Service: 5/27/2025

Project Status: Engineering

Supplemental Project ID: s3166.0

Model: N/A



EKPC Transmission Zone M-3 Process Clay Village-New Castle

Need Number: EKPC-2023-008

Process Stage: Submission of Supplemental Project for inclusion in the Local Plan –August 29, 2024

Previously Presented:

Need Meeting – September 15, 2023

Solutions Meeting – October 20, 2023

Supplemental Project Driver:

Equipment Material Condition, Performance and Risk

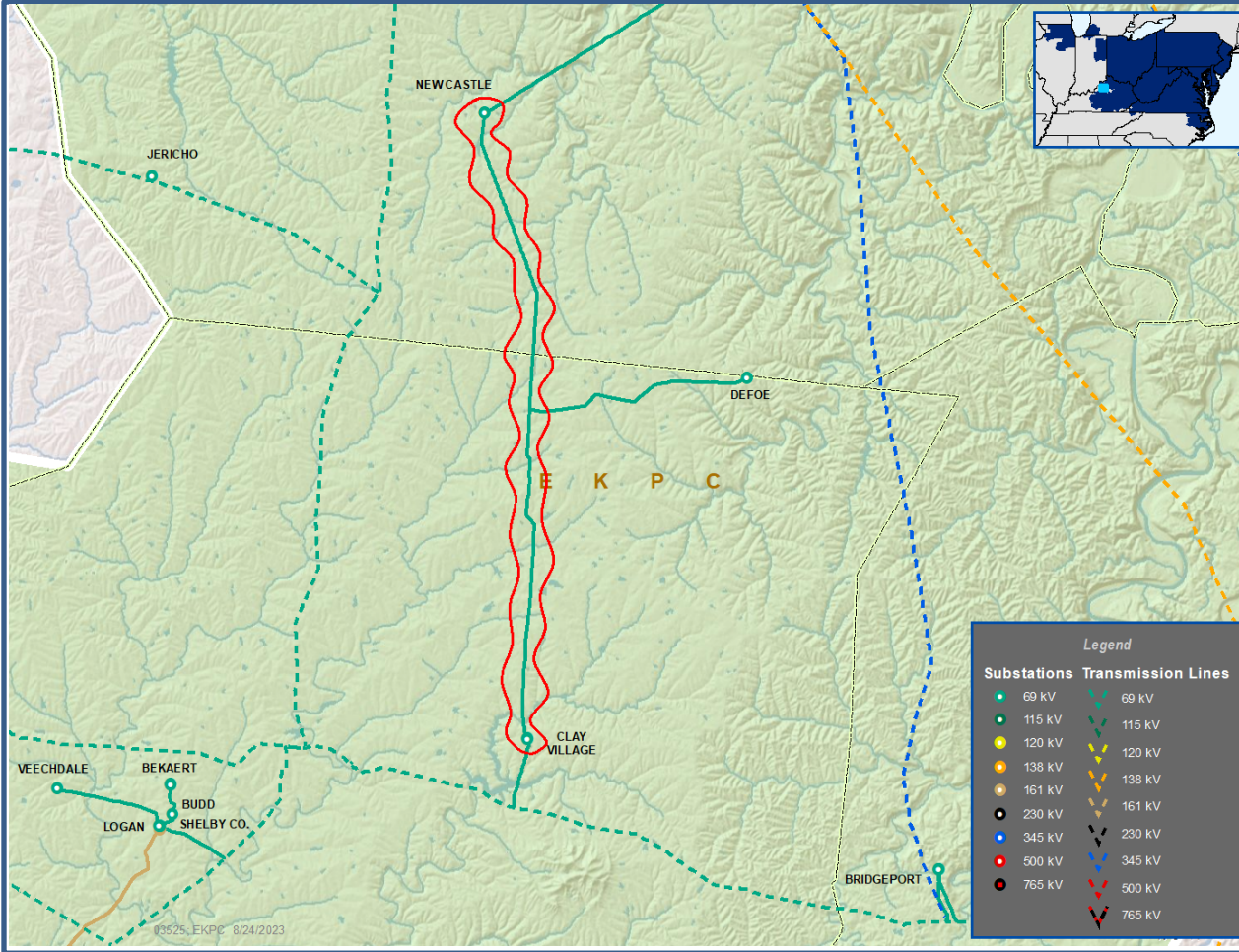
Specific Assumption Reference:

EKPC Assumptions Presentation Slide 13

Problem Statement:

The 14.29 mile, Clay Village-New Castle 69 KV is 1954 vintage wood pole construction with 1/0 conductor. This line section is expected to have condition issues such as conductor steel core and static wire deterioration, rust, pitting and possible broken strands. These condition issues have been exhibited by other 1/0 lines with similar age and environmental conditions. There are currently 36 open work orders with 17 being structure issues such as degraded poles, or cross arm issues. Based on this information, the EKPC Reliability team has concluded that this line is at or near end of life and should be addressed due to the condition.

Model: N/A



EKPC Transmission Zone M-3 Process Clay Village-New Castle

Need Number: EKPC-2023-008

Process Stage: Submission of Supplemental Project for inclusion in the Local Plan –August 29, 2024

Proposed Solution:

Rebuild the 14.29 mile, Clay Village-New Castle 69 KV line using 556.5 conductor and steel pole construction.

Transmission Cost: \$10.77M

Distribution Cost: \$0.0M

Ancillary Benefits:

- Supports future load growth in the area.

Alternatives Considered:

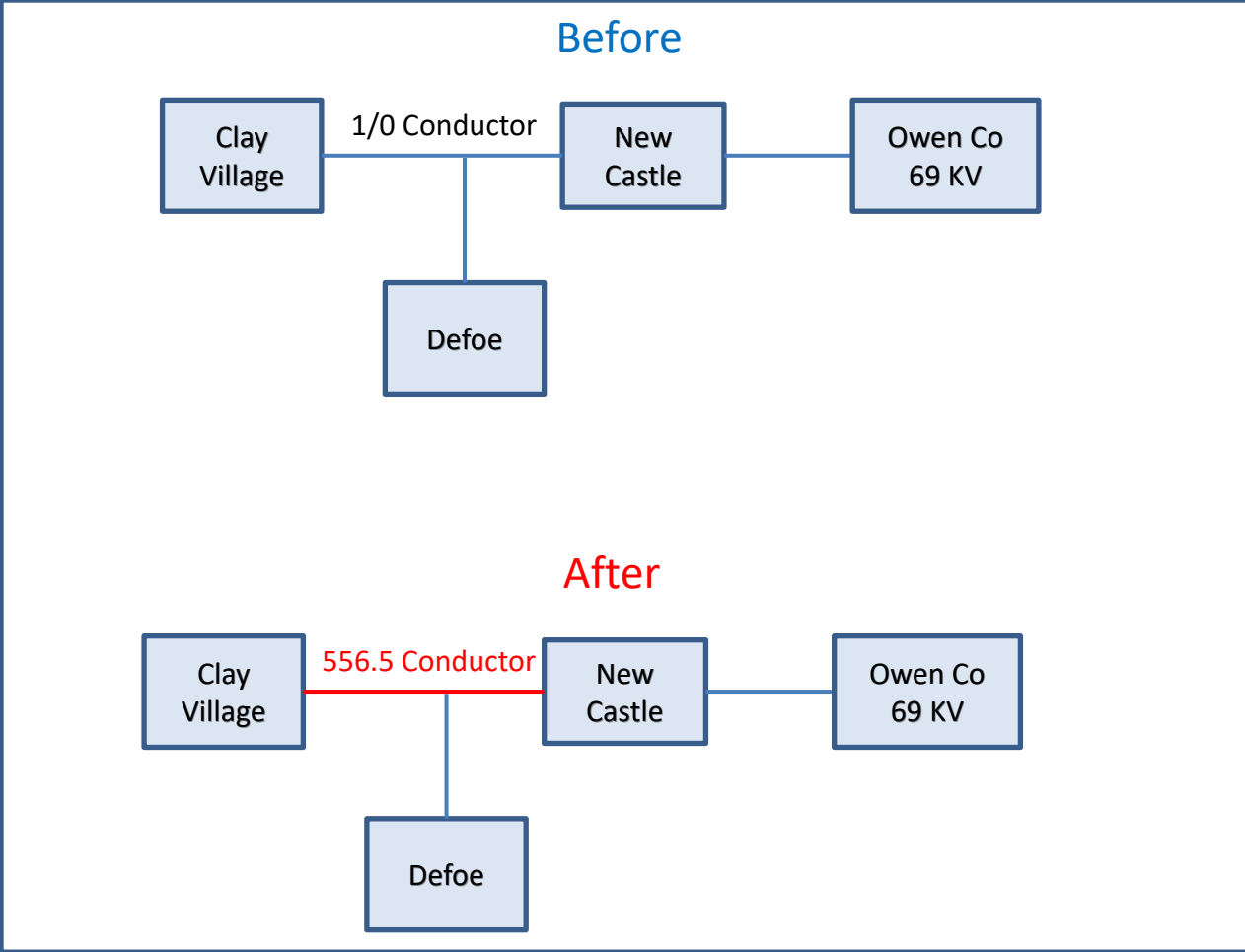
- Replace/repair as need, deemed not a feasible alternative.

Projected In-Service: 5/1/2025

Project Status: Under Construction

Supplemental Project ID: s3167.0

Model: N/A



EKPC Transmission Zone M-3 Process Hickory Plains

Need Number: EKPC-2023-010

Process Stage: Submission of Supplemental Project for inclusion in the Local Plan –August 29, 2024

Previously Presented:

Need Meeting – October 20, 2023

Solutions Meeting – November 17, 2023

Supplemental Project Driver:

Customer Service

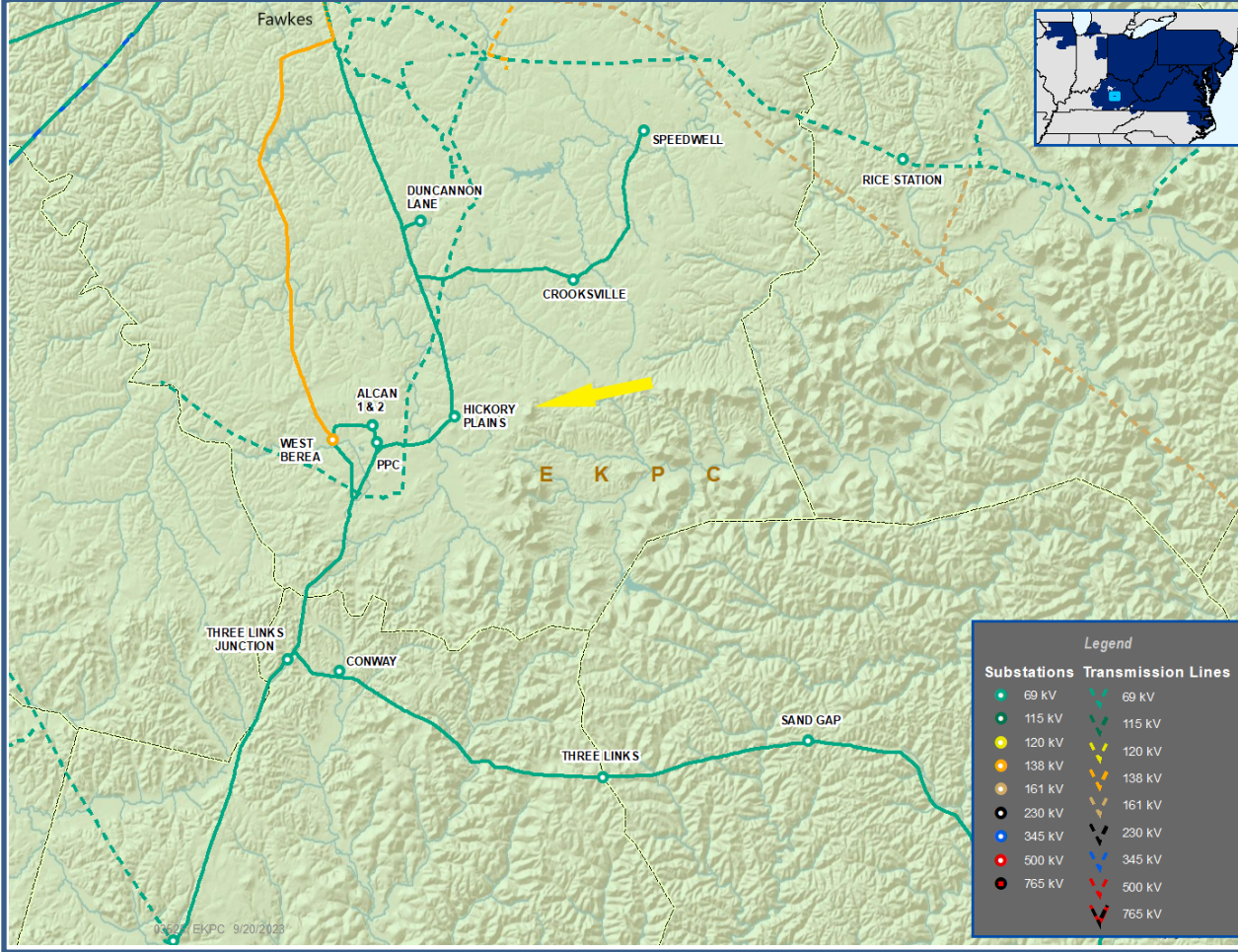
Specific Assumption Reference:

EKPC Assumptions Presentation Slide 15

Problem Statement:

The Hickory Plains distribution substation currently serves the highest numbers of customers of any distribution substation on EKPC system. Base on load forecast and steady growth in the area, the Hickory Plains 25 MVA distribution transformer is forecasted to overload in 2025/26 winter. Additionally due to the load growth, the distribution system forecasts feeder overloads and voltage constraints. Alternatives will be developed to address the transformer loading and distribution system issues.

Model: N/A



EKPC Transmission Zone M-3 Process Big Hill

Need Number: EKPC-2023-010

Process Stage: Submission of Supplemental Project for inclusion in the Local Plan –August 29, 2024

Proposed Solution:

Build a new 69-13.2 kV, 12/16/20 MVA distribution substation (Big Hill), install an 9 MVAR capacitor bank and 8.6 mile 69 KV tap line using 266.8 conductor. Tap point will be 1.2 mile from Three Link towards Sand gap, tapping the Three Link-Sand Gap 69 KV line section.

Transmission Cost: \$0.0M

Distribution Cost: \$12.0M

Ancillary Benefits:

- Reduces loading on the Fawkes-West Berea 69 KV transmission line.

Alternatives Considered:

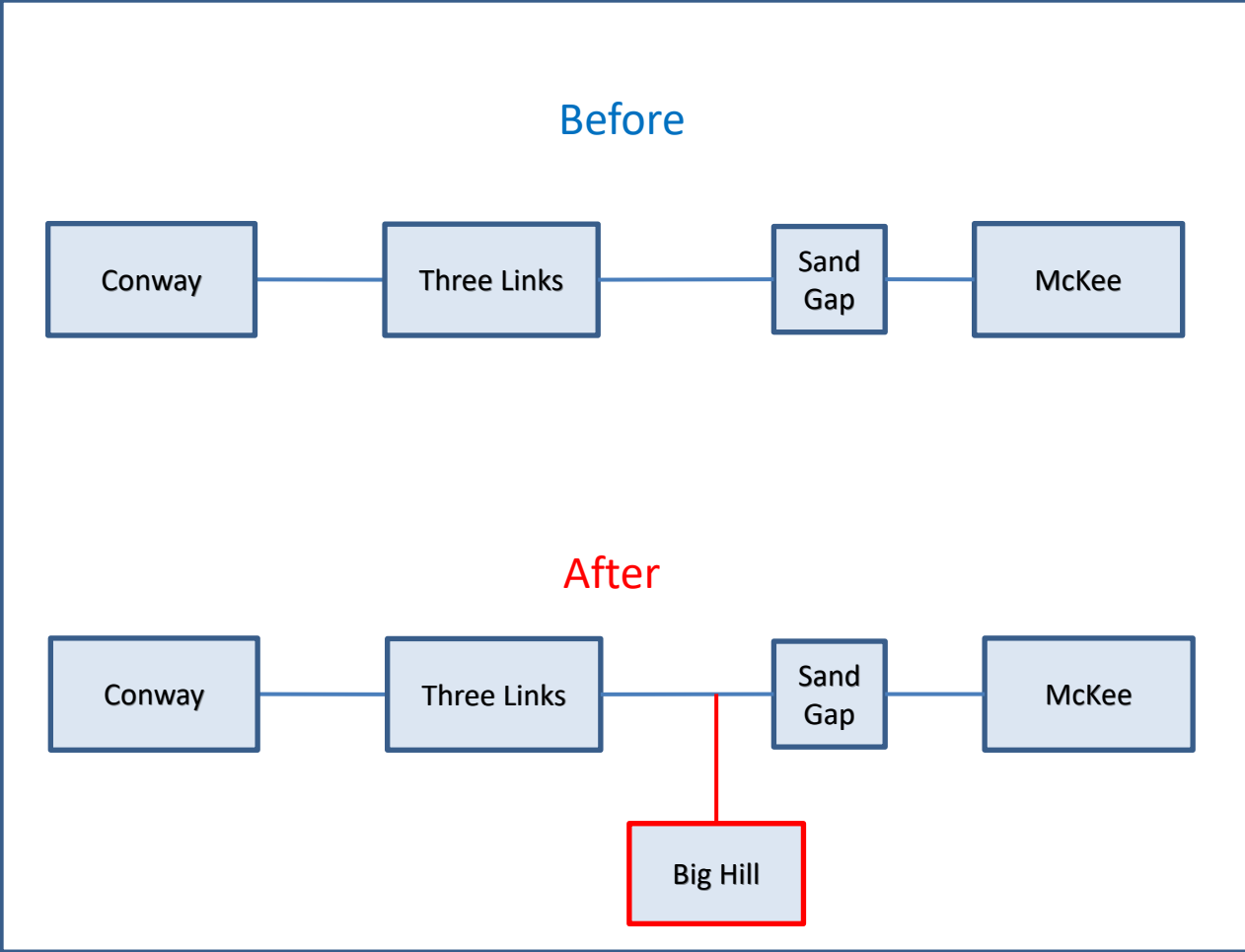
- No feasible alternatives

Projected In-Service: 11/1/2025

Project Status: Engineering

Supplemental Project ID: s3168.0

Model: N/A



EKPC Transmission Zone M-3 Process North Springfield-Loretto

Need Number: EKPC-2023-011

Process Stage: Submission of Supplemental Project for inclusion in the Local Plan – August 29, 2024

Previously Presented:

Need Meeting – October 20, 2023

Solutions Meeting – November 17, 2023

Supplemental Project Driver:

Equipment Material Condition, Performance and Risk

Specific Assumption Reference:

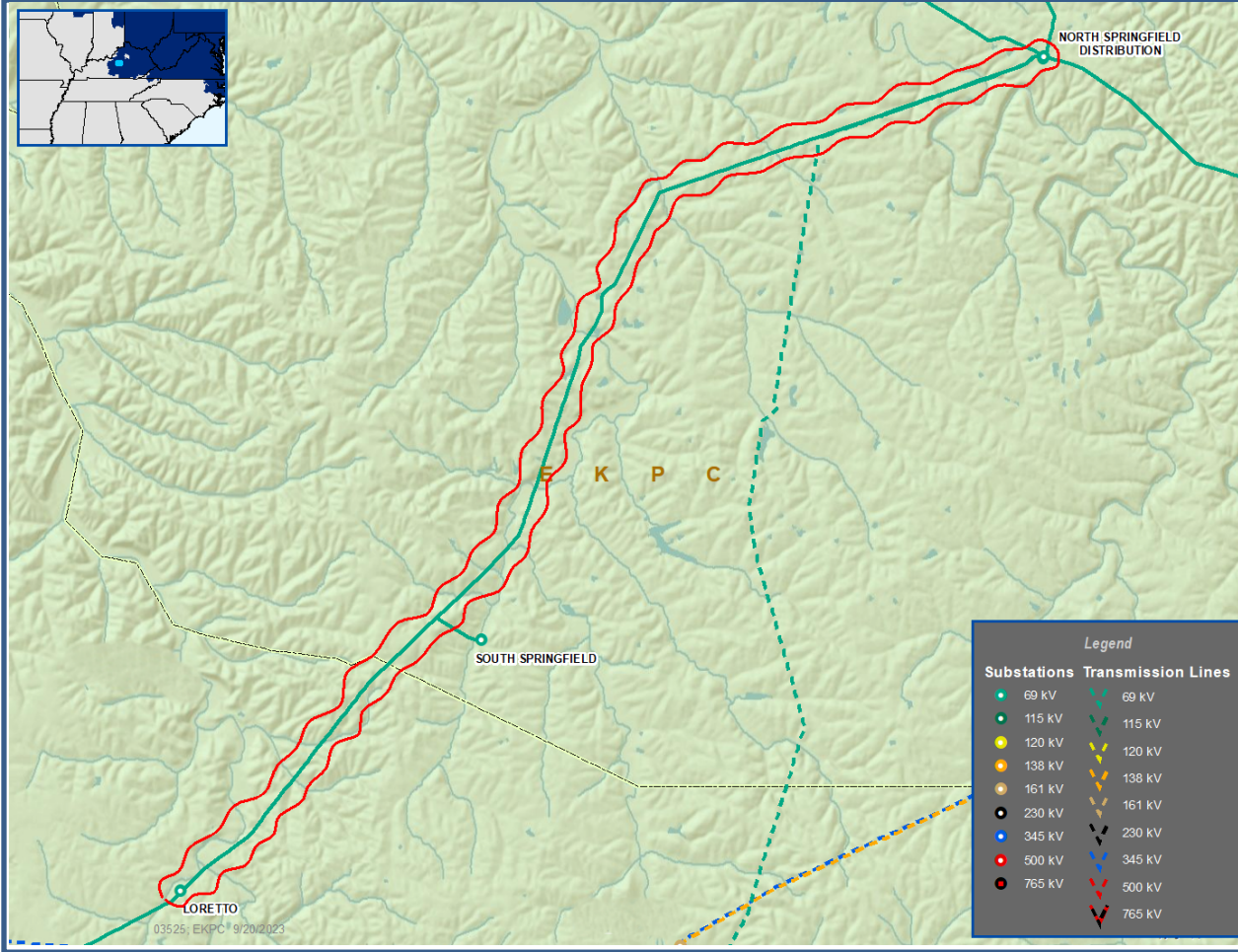
EKPC Assumptions Presentation Slide 13

Problem Statement:

The 14.11 mile, North Springfield-Loretto 69 KV line section is 1952 vintage wood pole construction with 4/0 conductor. This line section is expected to have condition issues such as, conductor steel core and static wire deterioration including rusting, pitting and possible broken strands. These condition issues have been exhibited by other 4/0 conductors with similar age and environmental conditions. There are currently 17 open work orders associated with structure issues such as degraded poles and insulator issues.

The EKPC Reliability team has concluded, that this line is at or near end of life and should be addressed due to the condition.

Model: N/A



EKPC Transmission Zone M-3 Process North Springfield-Loretto

Need Number: EKPC-2023-011

Process Stage: Submission of Supplemental Project for inclusion in the Local Plan –August 29, 2024

Proposed Solution:

Rebuild the 14.11 mile, North Springfield-Loretto 69 KV line using 556.5 conductor and steel pole construction.

Transmission Cost: \$12.97M

Distribution Cost: \$0.0M

Ancillary Benefits:

- Increases transmission line ratings

Alternatives Considered:

1. Build a new line from Marion County-S Springfield at 69kV. Rebuild Loretto-S Springfield & EKPC portion of N Springfield-Springfield KU using 556 ACSR, retire S Springfield-N Springfield

Transmission Cost: \$19.8M

Distribution Cost: \$0.0M

2. Build a new line from Marion County-S Springfield at 161kV. Rebuild Loretto-S Springfield & EKPC portion of N Springfield-Springfield KU using 556 ACSR, retire S Springfield-N Springfield

Transmission Cost: \$20.8M

Distribution Cost: \$0.0M

3. Build a new N.O. line from S Springfield-KU Springfield. Rebuild Loretto-S Springfield & EKPC portion of N Springfield-Springfield KU using 556 ACSR, retire S Springfield-N Springfield

Transmission Cost: \$12.2M

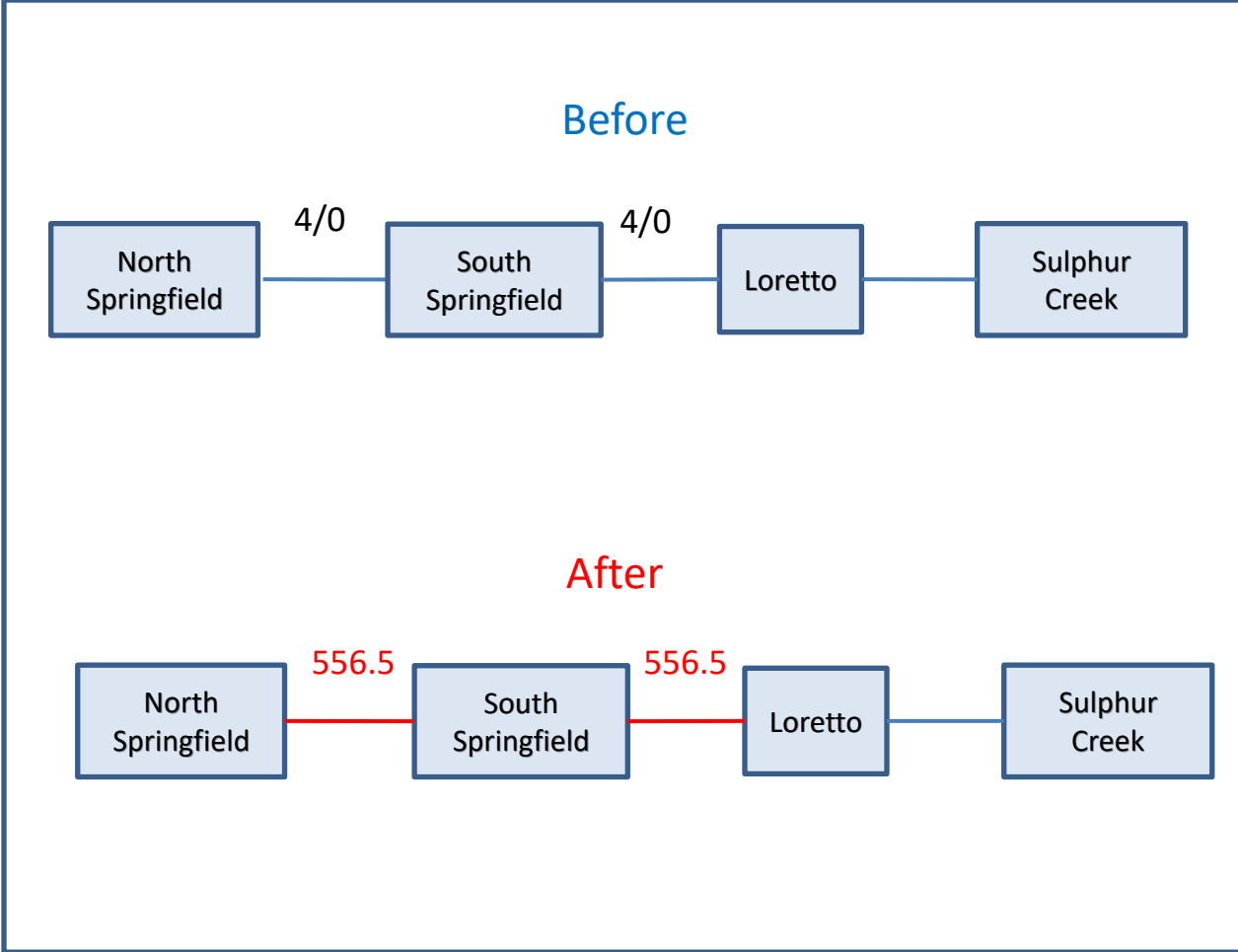
Distribution Cost: \$0.0M

Projected In-Service: 8/1/2025

Project Status: Under Construction

Supplemental Project ID: s3169.0

Model: N/A



EKPC Transmission Zone M-3 Process Snow Tap-North Albany

Need Number: EKPC-2023-012

Process Stage: Submission of Supplemental Project for inclusion in the Local Plan –August 29, 2024

Previously Presented:

Need Meeting – October 20, 2023

Solutions Meeting – November 17, 2023

Supplemental Project Driver:

Equipment Material Condition, Performance and Risk

Specific Assumption Reference:

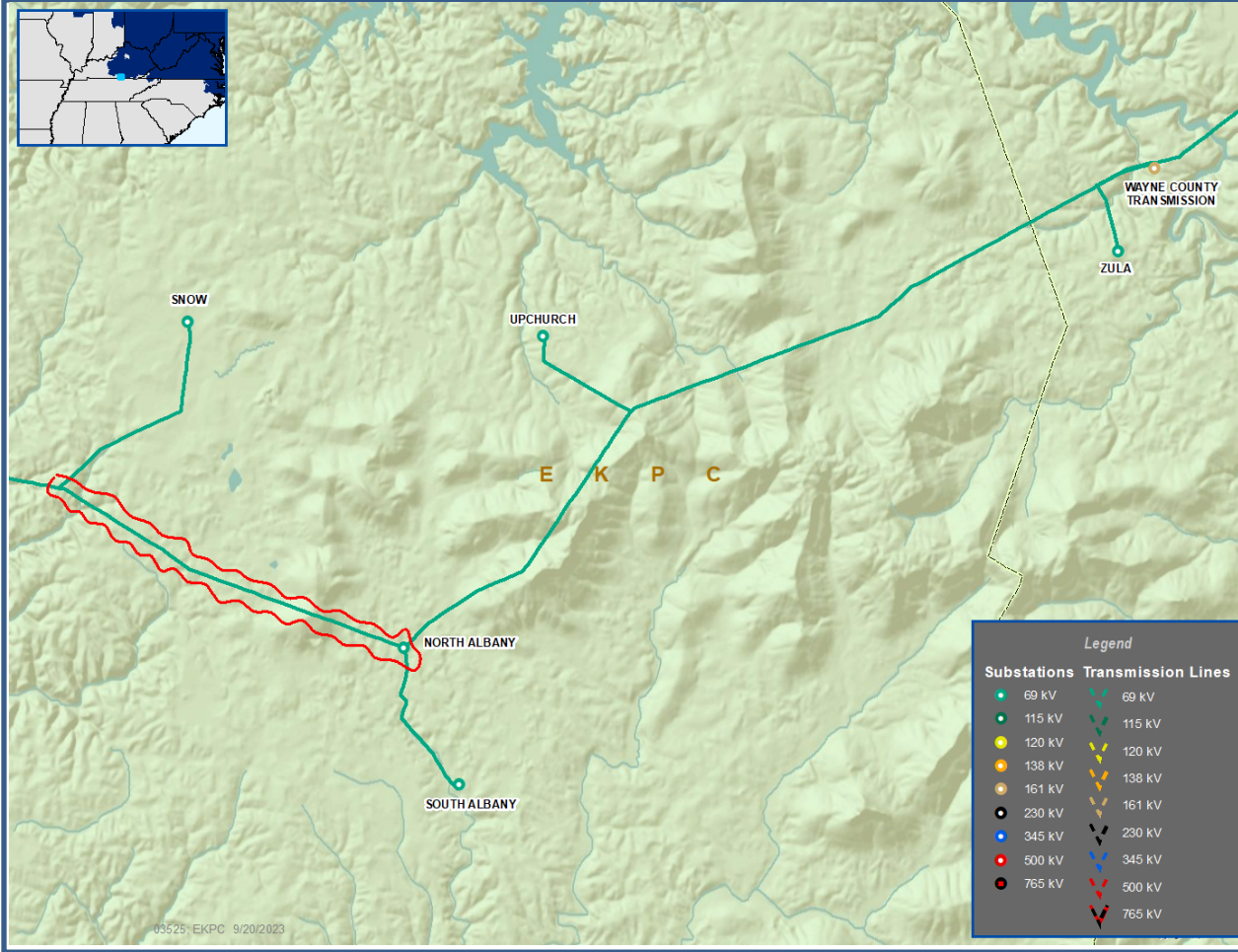
EKPC Assumptions Presentation Slide 13

Problem Statement:

The 4.4 mile, 69 kV Snow Tap-North Albany line section is 1954 vintage wood pole construction with 4/0 conductor. This line section is expected to have condition issues such as conductor steel core and static wire deterioration including rusting, pitting and possible broken strands. These condition issues have been exhibited by other 4/0 lines with similar age and environmental conditions. There are currently 12 open work orders associated with structure issues such as degraded poles.

The EKPC Reliability team has concluded, that this line is at or near end of life and should be addressed due to the condition.

Model: N/A



EKPC Transmission Zone M-3 Process Snow Tap-North Albany

Need Number: EKPC-2023-012

Process Stage: Submission of Supplemental Project for inclusion in the Local Plan –August 29, 2024

Proposed Solution:

Rebuild the 4.4 mile, Snow Tap-North Albany 69 KV line using 556.5 conductor and steel pole construction.

Transmission Cost: \$4.6M

Distribution Cost: \$0.0M

Ancillary Benefits:

- Increases transmission line ratings

Alternatives Considered:

1. Build a new line from Snow Tap to the Albany-South Albany line and retire Snow Tap-Albany.

Transmission Cost: \$5.6M

Distribution Cost: \$0.0M

2. Build a new line from Snow-Upchurch and retire Snow Tap-Albany.

Transmission Cost: \$6.3M

Distribution Cost: \$0.0M

3. Build a new line from Snow-Albany and retire Snow Tap-Albany.

Transmission Cost: \$5.8M

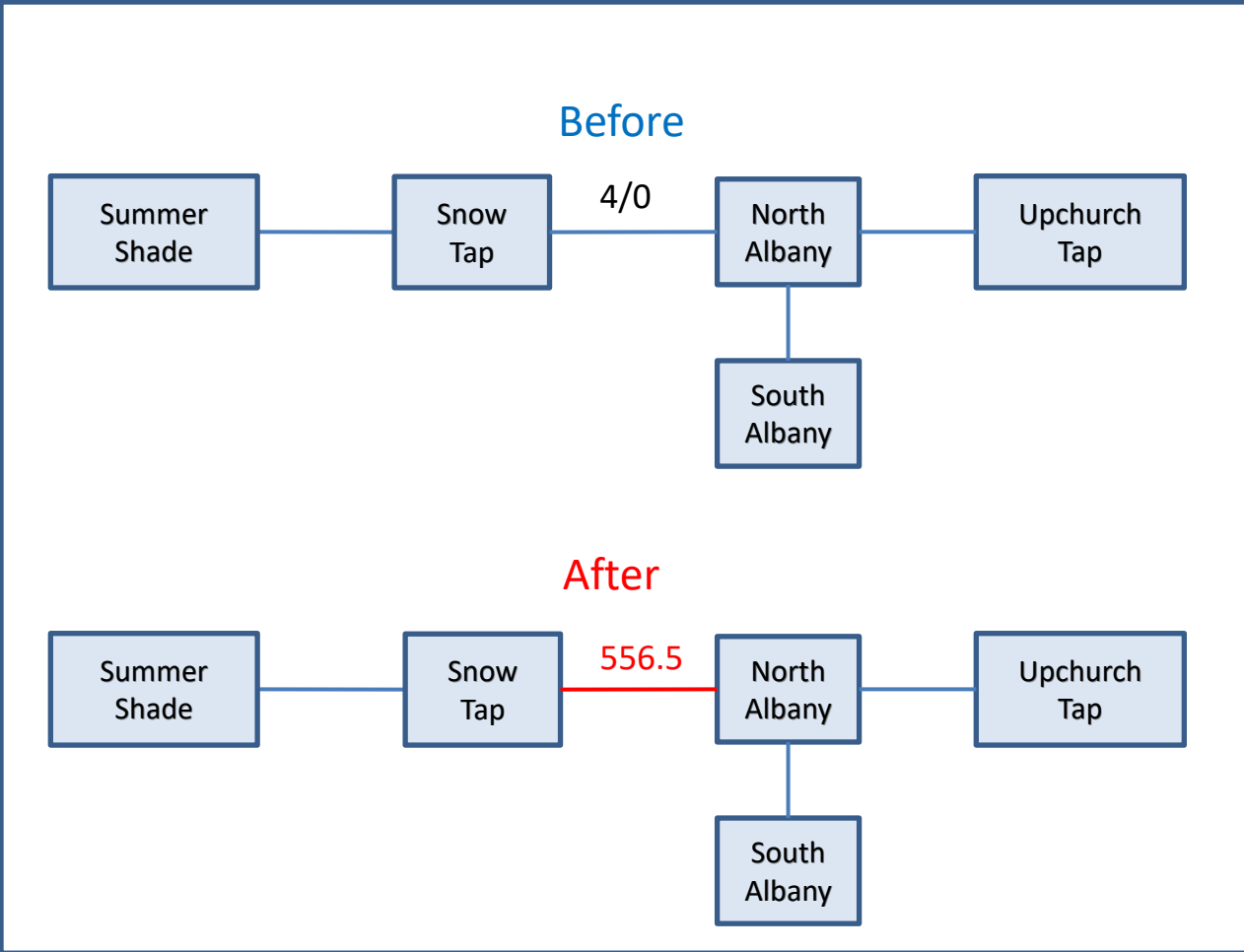
Distribution Cost: \$0.0M

Projected In-Service: 6/1/2026

Project Status: Engineering

Supplemental Project ID: s3170.0

Model: N/A



EKPC Transmission Zone M-3 Process Shepherdsville & Brooks

Need Number: EKPC-2023-013

Process Stage: Submission of Supplemental Project for inclusion in the Local Plan –August 29, 2024

Previously Presented:

Need Meeting – October 20, 2023

Solutions Meeting – November 17, 2023

Supplemental Project Driver:

Customer Service

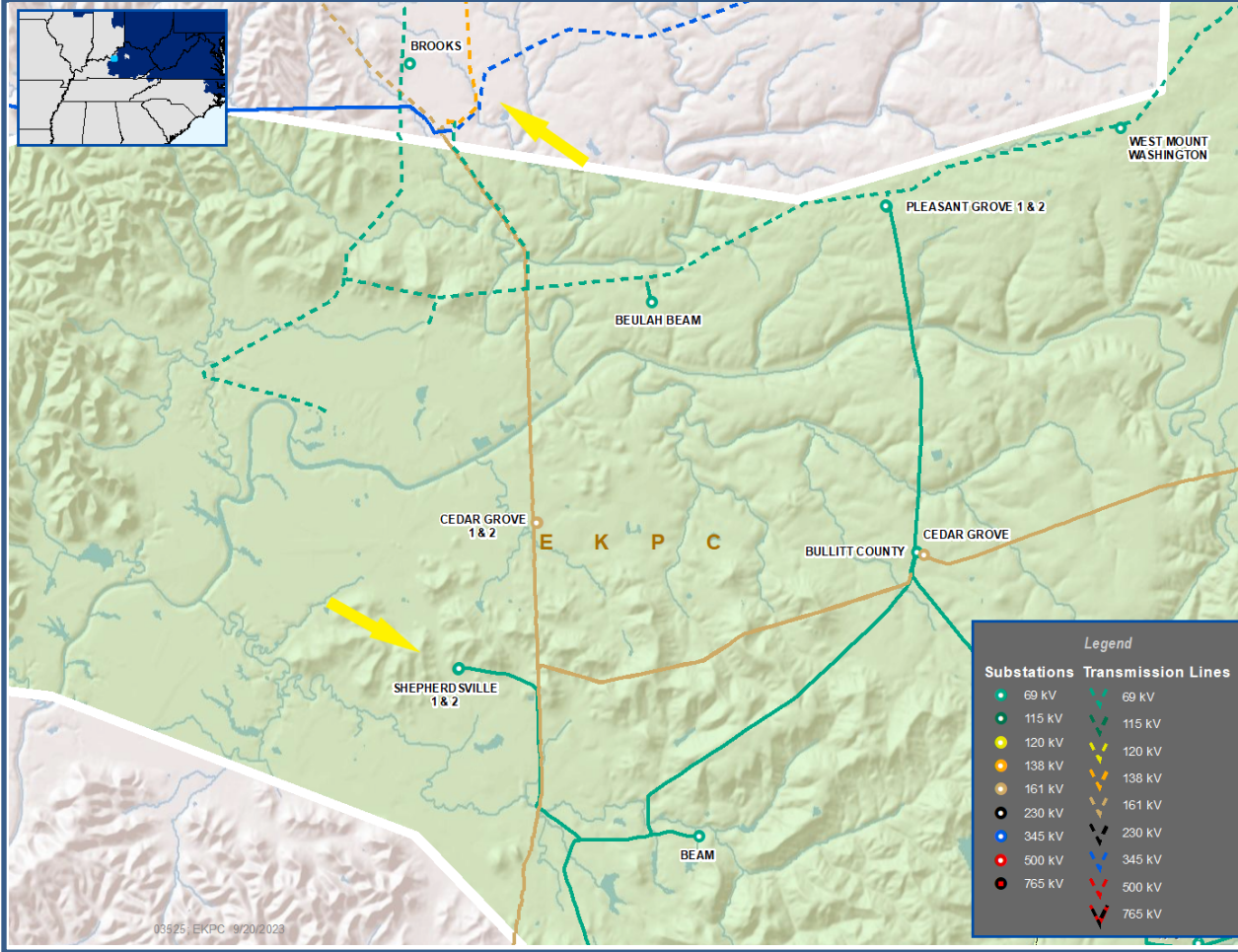
Specific Assumption Reference:

EKPC Assumptions Presentation Slide 15

Problem Statement:

Based on load forecast, the Brooks 69-12.5 kV, 15/20/25 MVA distribution transformer and the Shepherdsville #2 69-12.5 kV, 11.2/14 MVA distribution transformers are forecasted to overload during the upcoming summer peak periods. Additionally in 2022 summer, the Shepherdsville #2 transformer experienced actual loading greater than its summer rating. Alternatives will be developed to address these transformer loading issues.

Model: N/A



EKPC Transmission Zone M-3 Process West Shepherdsville

Need Number: EKPC-2023-013

Process Stage: Submission of Supplemental Project for inclusion in the Local Plan –August 29, 2024

Proposed Solution:

Construct a new West Shepherdsville 69-13.2 kV, 12/16/20 MVA substation with an associated 4.0-mile 69 kV tap line from the existing Shepherdsville substation tap.

Transmission Cost: \$0.0M

Distribution Cost: \$9.8M

Ancillary Benefits:

- Eliminates a distribution feeder upgrade between Brooks and Shepherdsville.
- Shifts load from the LG&E/KU transmission system (at Brooks) to the EKPC transmission system.

Alternatives Considered:

1. Upgrade the Brooks substation transformer using a 24/32/40 MVA unit and purchase a spare transformer. Upgrade the Shepherdsville #2 substation transformer to a 12/16/20 MVA unit.

Transmission Cost: \$0.0M

Distribution Cost: \$5.4M

2. Construct a new West Shepherdsville 69-13.2 kV, 12/16/20 MVA substation with an associated 3.9-mile 69 kV tap line from the existing Shepherdsville substation tap; construct 2.85 miles of 69 kV line parallel to the existing Shepherdsville substation tap to loop into the Bullitt County-Nelson County 69 kV line.

Transmission Cost: \$3.3M

Distribution Cost: \$7.9M

3. Construct a new West Shepherdsville 161-13.2 kV, 12/16/20 MVA substation with an associated 4.4-mile 161 kV tap line from the EKPC portion of the Cedar Grove Industrial-Bullitt County 161 kV line.

Transmission Cost: \$7.5M

Distribution Cost: \$5.4M

4. Construct a new Brooks South 69-13.2 kV, 12/16/20 MVA substation near the Sabert industrial facility with an associated 1-mile 69 kV tap line from the LG&E/KU Blue Lick-Conestoga 69 kV line. Upgrade the Shepherdsville #2 substation transformer to a 12/16/20 MVA unit.

Transmission Cost: \$0.0M

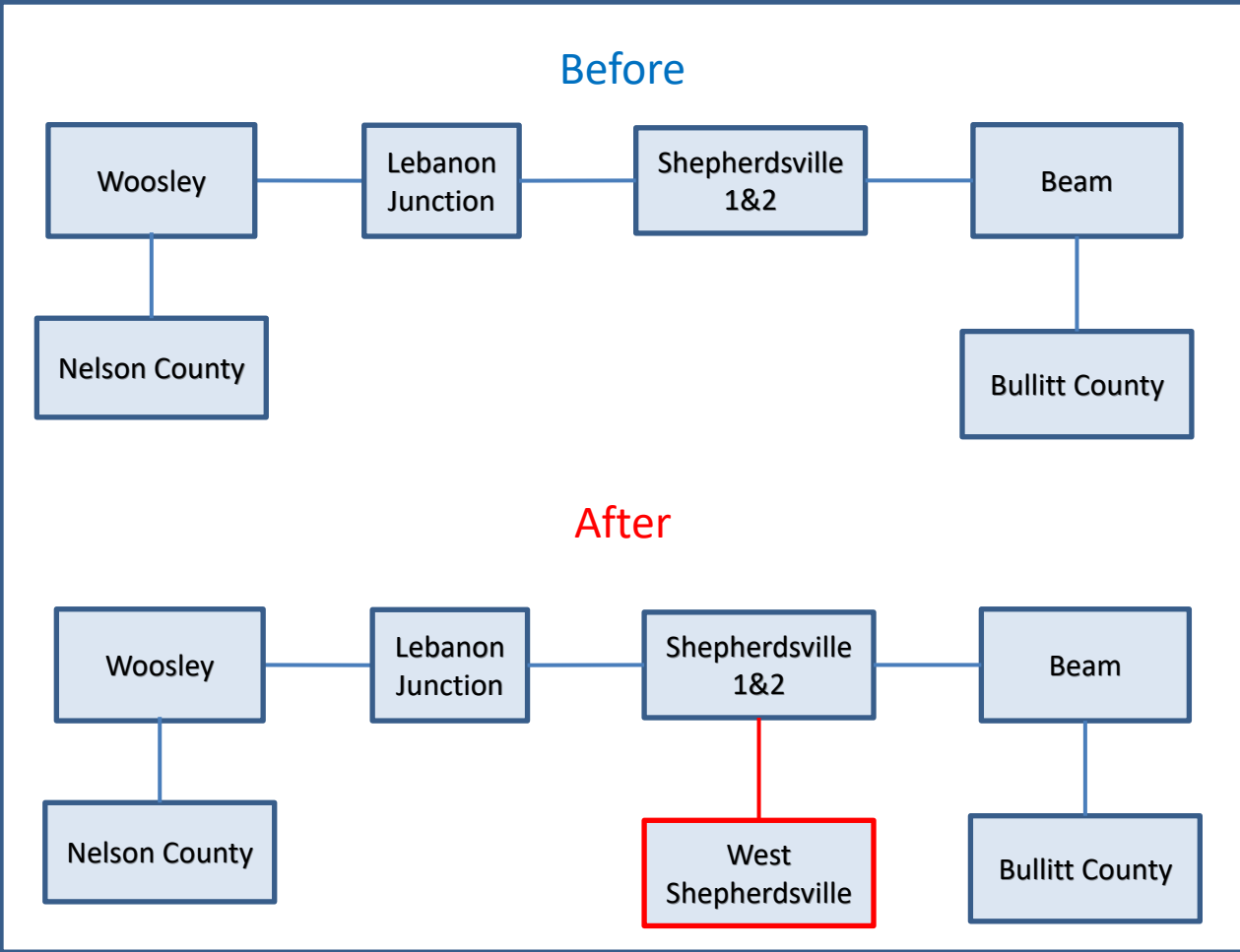
Distribution Cost: \$7.4M

Projected In-Service: 12/23/2025

Project Status: Engineering

Supplemental Project ID: s3171.0

Model: N/A



EKPC Transmission Zone M-3 Process Lebanon

Need Number: EKPC-2023-014

Process Stage: Submission of Supplemental Project for inclusion in the Local Plan –August 29, 2024

Previously Presented:

Need Meeting – October 20, 2023

Solutions Meeting – November 17, 2023

Supplemental Project Driver:

Customer Service

Specific Assumption Reference:

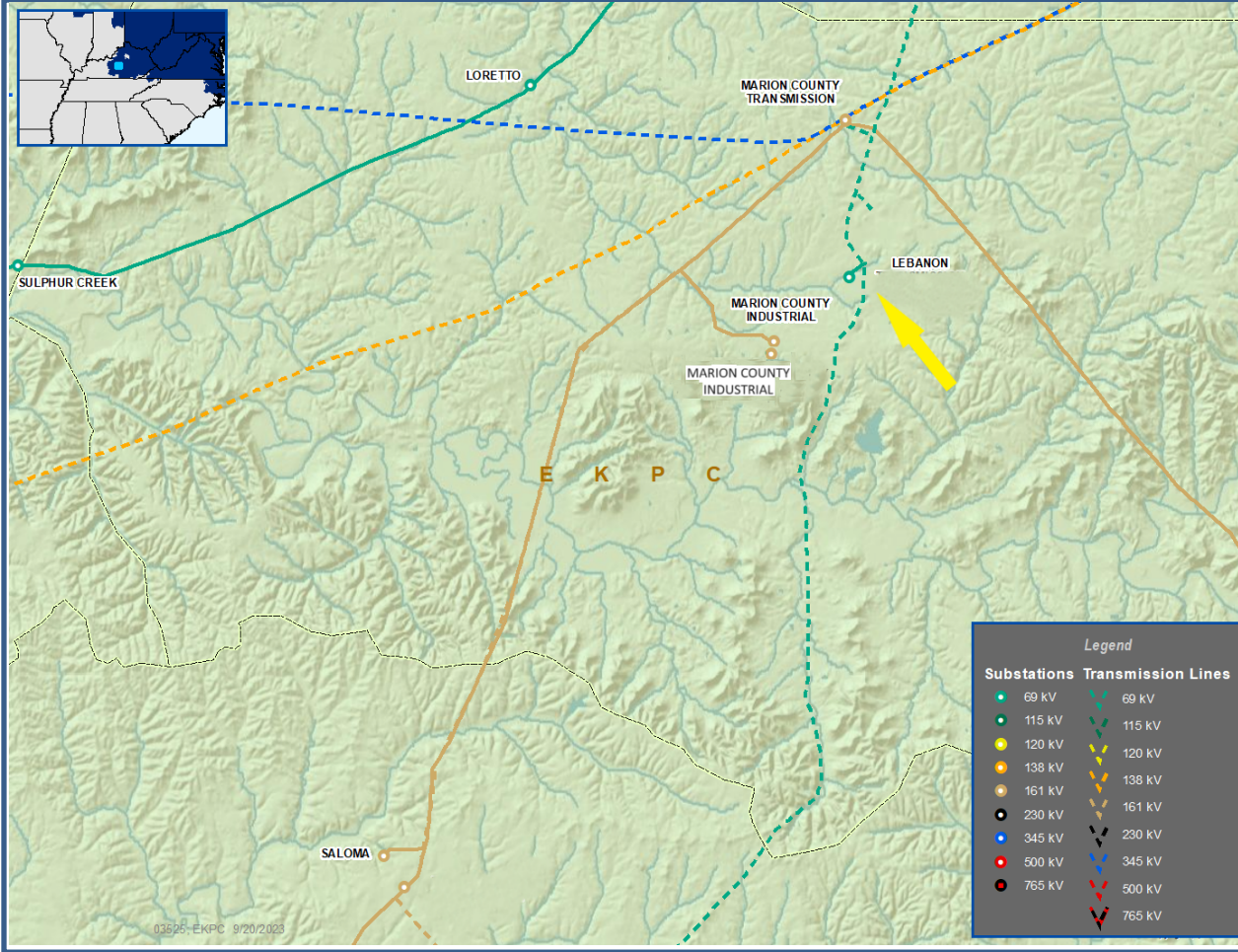
EKPC Assumptions Presentation Slide 15

Problem Statement:

The Lebanon distribution substation is located in Lebanon, KY and is served from the LG&E/KU 69 KV transmission system. Base on load forecast, the Lebanon 69-25 kV, 11.2/14 MVA distribution transformer is forecasted to overload in 2026/27 winter. Additionally, the distribution circuits in the area are experiencing high loading issues. Load transfers to a nearby substation has been utilized historically to reduce loading but have been exhausted due to the distribution circuit loading in the area.

Alternatives will be developed to address the transformer loading and distribution system issues in the area.

Model: N/A



EKPC Transmission Zone M-3 Process Metts Dr

Need Number: EKPC-2023-014

Process Stage: Submission of Supplemental Project for inclusion in the Local Plan –August 29, 2024

Proposed Solution:

Construct a new Metts Drive 161-25 kV, 12/16/20 MVA distribution substation. New substation will be served by extending the Marion County Industrial Park 161 kV tap line by 0.9 miles. Construct a new 2.28 mile, parallel 161 kV line section extending from the existing Marion County Industrial tap point to the South Marion County Industrial distribution substation. Install normally open switch at the existing Marion County Industrial tap point.

Transmission Cost: \$2.95M

Distribution Cost: \$5.4M

Ancillary Benefits:

- Shifts load from the LG&E/KU transmission system to the EKPC transmission system.

Alternatives Considered:

1. Build a new 161 KV, 12/16/20 MVA distribution substation, parallel new 161 kV line section extending from the existing Marion County Industrial tap point (1.6 mi). New substation will tap the existing Marion County Industrial/ South Marion County Industrial 161 KV tap line 1.6 miles from the tap point. Keep the existing Lebanon substation as is.

Transmission Cost: \$2.7M

Distribution Cost: \$7.1M

2. Build a new 161 KV, 12/16/20 MVA distribution substation. New substation will tap the Marion County-Green County 161 KV line. Tap point will be ~0.85 mile from the Marion County Industrial/ South Marion County Industrial 161 KV tap point towards Green County. Keep the existing Lebanon substation as is.

Transmission Cost: \$0.0M

Distribution Cost: \$7.1M

3. Build a new KU 69 kV, 12/16/20 MVA distribution substation. New substation will tap the Taylor County - Lebanon KU 69 kV line. Tap point will be ~0.5 mile south from the KU Lebanon South substation. Retire Lebanon substation.

Transmission Cost: \$0.0M

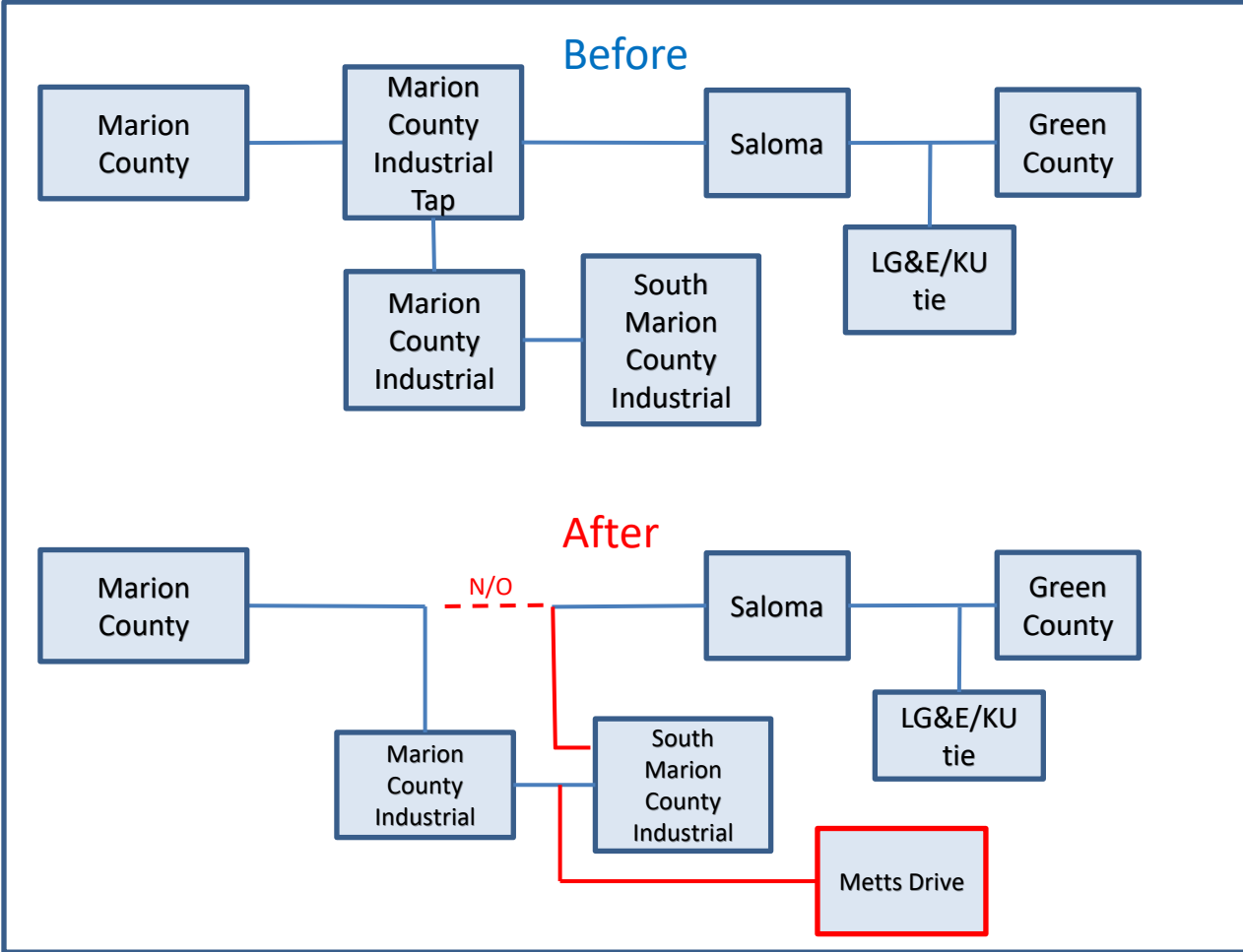
Distribution Cost: \$6.4M

Projected In-Service: 7/1/2025

Project Status: Engineering

Supplemental Project ID: s3172.0

Model: N/A



EKPC Transmission Zone M-3 Process

KU Fawkes-West Berea

Need Number: EKPC-2023-015

Process Stage: Submission of Supplemental Project for inclusion in the Local Plan –August 29, 2024

Previously Presented:

Need Meeting – October 20, 2023

Solutions Meeting – November 17, 2023

Supplemental Project Driver:

Equipment Material Condition, Performance and Risk
Operational Flexibility and Efficiency & Infrastructure Resilience

Specific Assumption Reference:

EKPC Assumptions Presentation Slide 13, 14 & 16

Problem Statement:

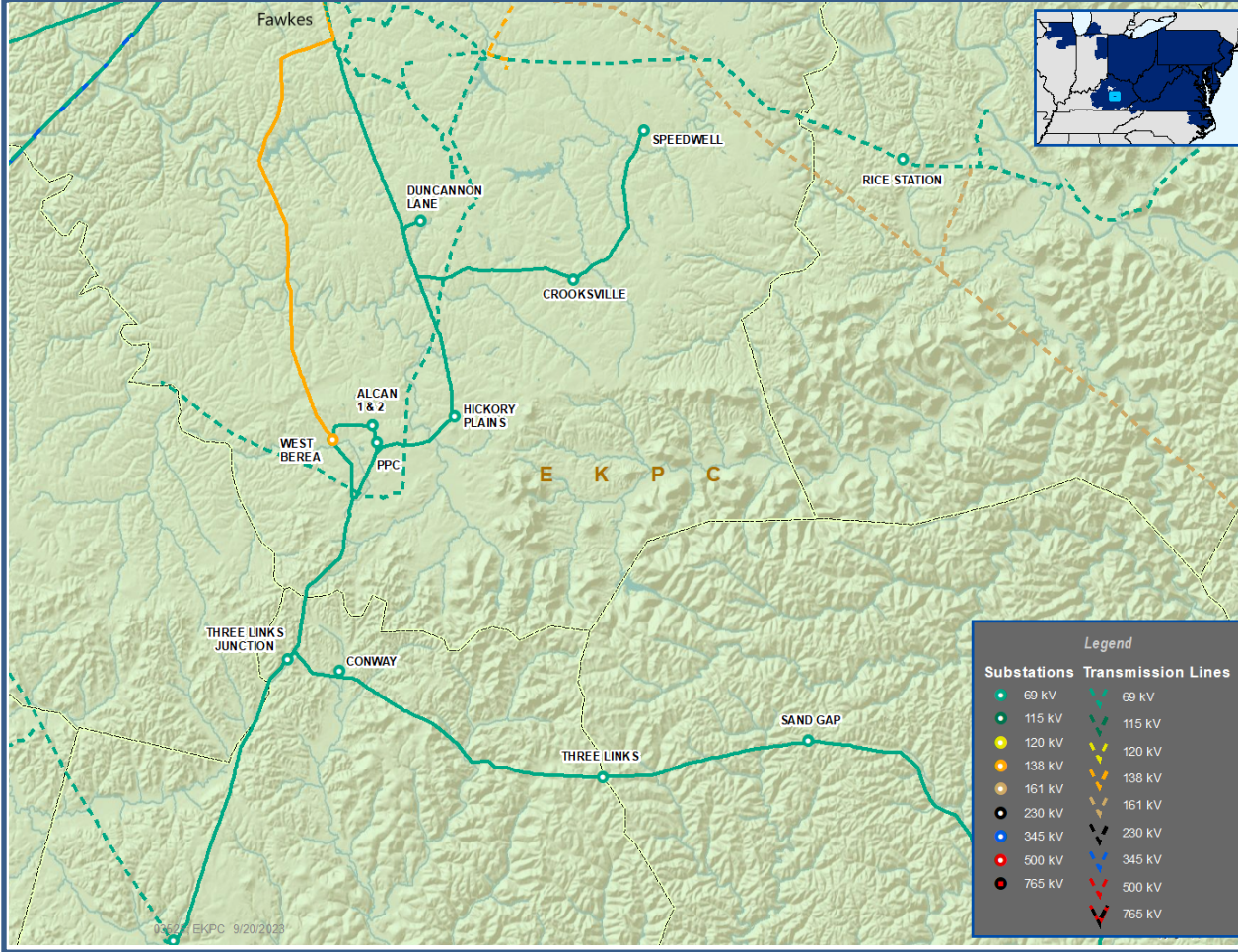
The 20.5 mile (not including tap lines), KU Fawkes-West Berea 69 KV transmission circuit currently serves nearly 6,000 customers including several industrial customers via 7 distribution substation.

This circuit currently has 16.3 miles of transmission and tap lines with reliability concerns, including wood pole deterioration, multiple identified structural loading issues as well as many recurring maintenance activities related to leaning structures/poles and cross arms failures. There are currently 66 open work orders associated with structure issues such as degraded poles.

The 9.1 mile, Speedwell 69 KV tap line creates system protection issues resulting in slow operations for faults near the Speedwell distribution substation. This does not adhere to EKPC’s setting criteria which leads to sequential tripping and remote coordination issues.

Alternatives are being evaluated to address all issues listed above.

Model: N/A



EKPC Transmission Zone M-3 Process KU Fawkes-West Berea

Need Number: EKPC-2023-015

Process Stage: Submission of Supplemental Project for inclusion in the Local Plan –August 29, 2024

Proposed Solution:

Rebuild the 16.3 mile, Duncannon Lane Tap-West Berea 69 KV line sections using 795 conductor and steel pole construction. Construct a new Madison County 69 KV switching station near the Duncannon Lane Tap point. This project will also include a new section of 69 kV double circuit line between the Crookville Tap point and the Madison County switching station (approximately 1.3 miles) to serve Crookville and Speedwell radially from the new Madison County switching station. Additionally, Duncannon Lane will be served radially from the new switching station.

Transmission Cost: \$15.5M

Distribution Cost: \$3.0M

Ancillary Benefits:

- Supports local load growth

Alternatives Considered:

1. Perform structure replacements from Duncannon Lane Tap-West Berea 69 KV line sections. Build a new 69 KV switching station in the vicinity of Crookville/Speedwell Tap. Expand the Union City 138 KV substation to step down to 69 KV, build a new 5 mile 69 KV line from Union City to Speedwell. Rebuild Crookville Tap-Crookville using 795 conductor.

Transmission Cost: \$28.5M

Distribution Cost: \$0.0M

2. Perform structure replacements from Duncannon Lane Tap-West Berea 69 KV line sections. Build a new 69 KV switching station in the vicinity of Crookville/Speedwell Tap. Replace all wood pole structures/framing w/ steel pole structures/framing along the Crookville Tap-Crookville line section while energized.

Transmission Cost: \$14.6M

Distribution Cost: \$3.6M

3. Perform structure replacements from Duncannon Lane Tap-West Berea 69 KV line sections. Build a new 69 KV switching station in the vicinity of Crookville/Speedwell Tap. Construct a new 69 KV line parallel to the existing Crookville Tap-Crookville line and retire the existing line.

Transmission Cost: \$13.8M

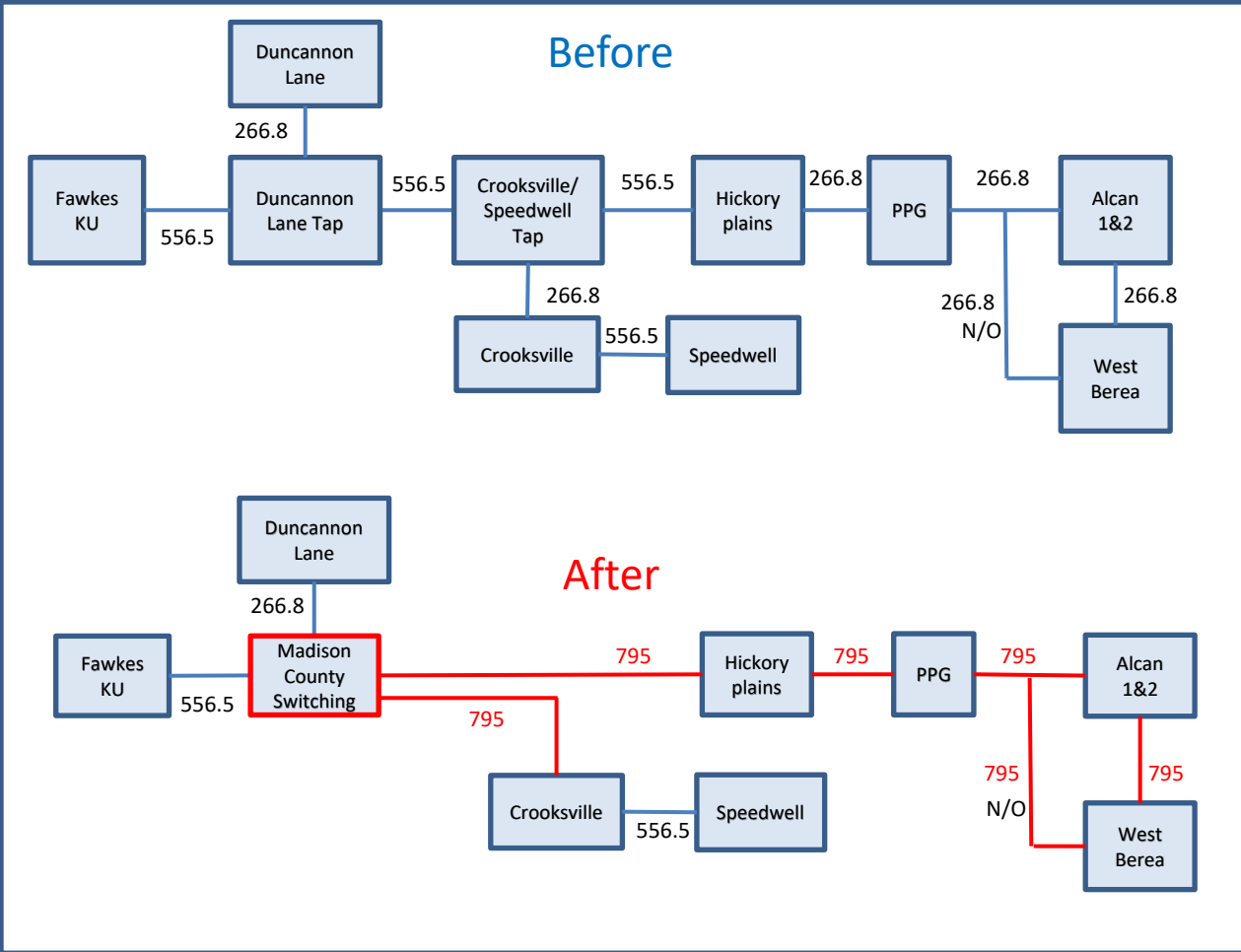
Distribution Cost: \$4.2M

Projected In-Service: 5/5/2027

Project Status: Engineering

Supplemental Project ID: s3173.0

Model: N/A



EKPC Transmission Zone M-3 Process Stephensburg-Bonnieville

Need Number: EKPC-2023-017

Process Stage: Submission of Supplemental Project for inclusion in the Local Plan –August 29, 2024

Previously Presented:

Need Meeting – November 17, 2023

Solutions Meeting – December 4, 2023

Supplemental Project Driver:

Equipment Material Condition, Performance and Risk

Specific Assumption Reference:

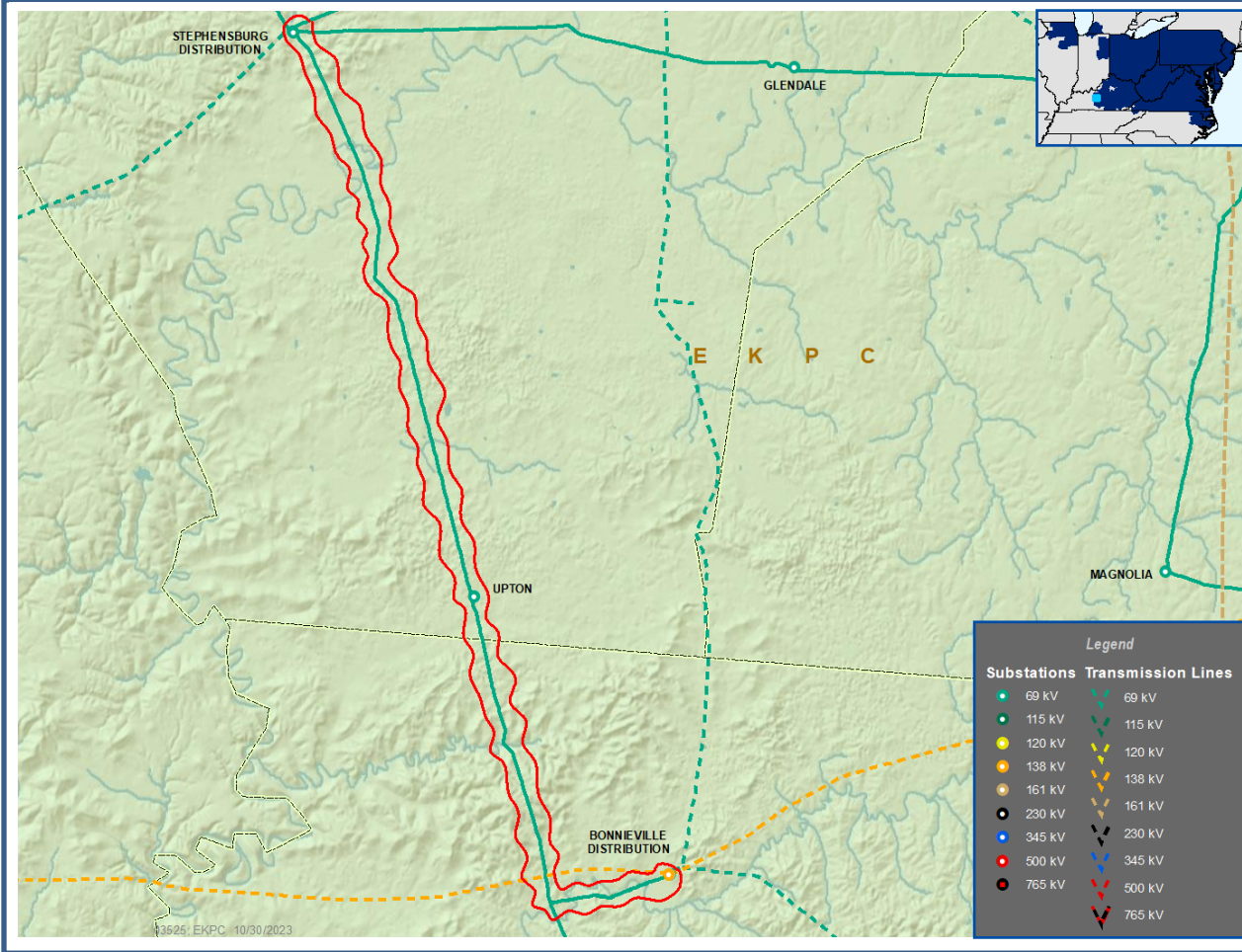
EKPC Assumptions Presentation Slide 13

Problem Statement:

The 16.42 mile, Stephensburg-Bonnieville 69 KV transmission line is 1955 vintage wood pole construction with 4/0 conductor. This line section has reliability concerns related to aging wood poles as well as conductor steel core and static wire deterioration including, rusting, pitting and possible broken strands.

The EKPC Reliability team has concluded, that this line is at or near end of life and should be addressed due to the condition.

Model: N/A



EKPC Transmission Zone M-3 Process Stephensburg-Bonnieville

Need Number: EKPC-2023-017

Process Stage: Submission of Supplemental Project for inclusion in the Local Plan –August 29, 2024

Proposed Solution:

Rebuild the 16.42 mile, Stephensburg-Bonnieville 69 KV line using 556.5 conductor and steel pole construction. This alternative was determined to be the best holistic solution to the address this need. As compared to the lower cost alternative listed below which reduced reliability, increased reliance on foreign utilities and reduced future expansion opportunities in the area.

Transmission Cost: \$12.4M

Distribution Cost: \$0.0M

Ancillary Benefits:

- Increases transmission line ratings

Alternatives Considered:

1. Rebuild the 7.9 mile, Bonnieville - Upton Tap 69 KV line section as double-circuit 556 ACSR. Retire the 10.8 mile, Stephensburg - Upton Tap 69 KV line section.

Transmission Cost: \$11.9M

Distribution Cost: \$0.0M

2. Construct a new 69 kV breaker station between the LG&E/KU Sonora Tap and Bonnieville KU substations. Construct a new 4.6 mile, 69 KV line from the new breaker station to Upton Tap. Rebuild the 7.9 mile, Bonnieville - Upton Tap 69 KV line section using 556 ACSR. Retire the 10.8 mile, Stephensburg - Upton Tap 69 kV line section.

Transmission Cost: \$23.4M

Distribution Cost: \$0.0M

3. Create a new normally-open connection to LG&E/KU by constructing a new 4.6 mile, 69 KV line using 556 ACSR to the KU Sonora Tap - Bonnieville KU line section. Rebuild the 7.9 mile, 69 KV Bonnieville - Upton Tap line section using 556 ACSR. Retire the 10.8 mile, Stephensburg - Upton Tap 69 kV line section.

Transmission Cost: \$14.5M

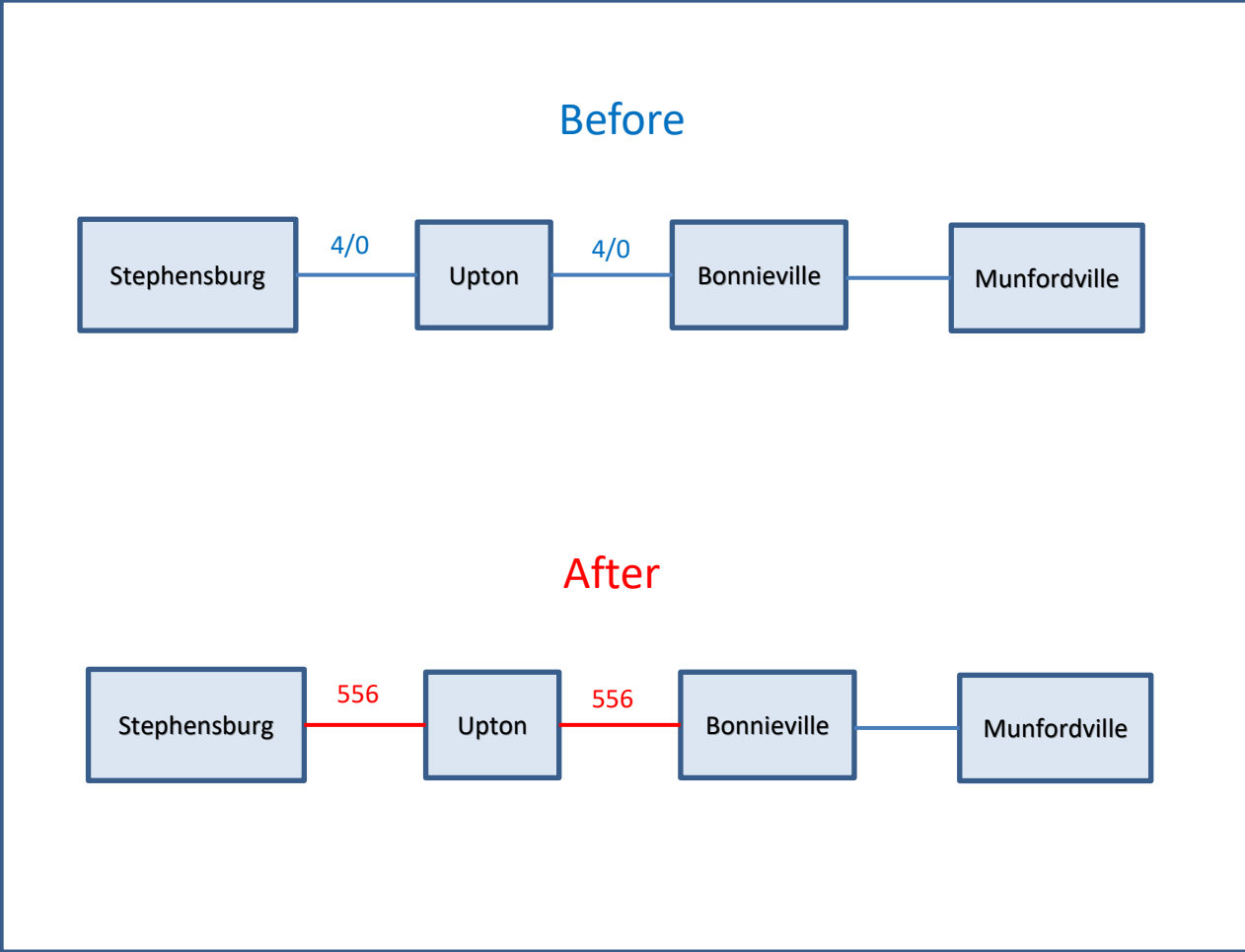
Distribution Cost: \$0.0M

Projected In-Service: 3/1/2027

Project Status: Engineering

Supplemental Project ID: s3174.0

Model: N/A



EKPC Transmission Zone M-3 Process Green County/Coburg Junction Area

Need Number: EKPC-2023-018

Process Stage: Submission of Supplemental Project for inclusion in the Local Plan – August 29, 2024

Previously Presented:

Need Meeting – November 17, 2023

Solutions Meeting – December 4, 2023

Supplemental Project Driver:

Operational Flexibility and Efficiency

Specific Assumption Reference:

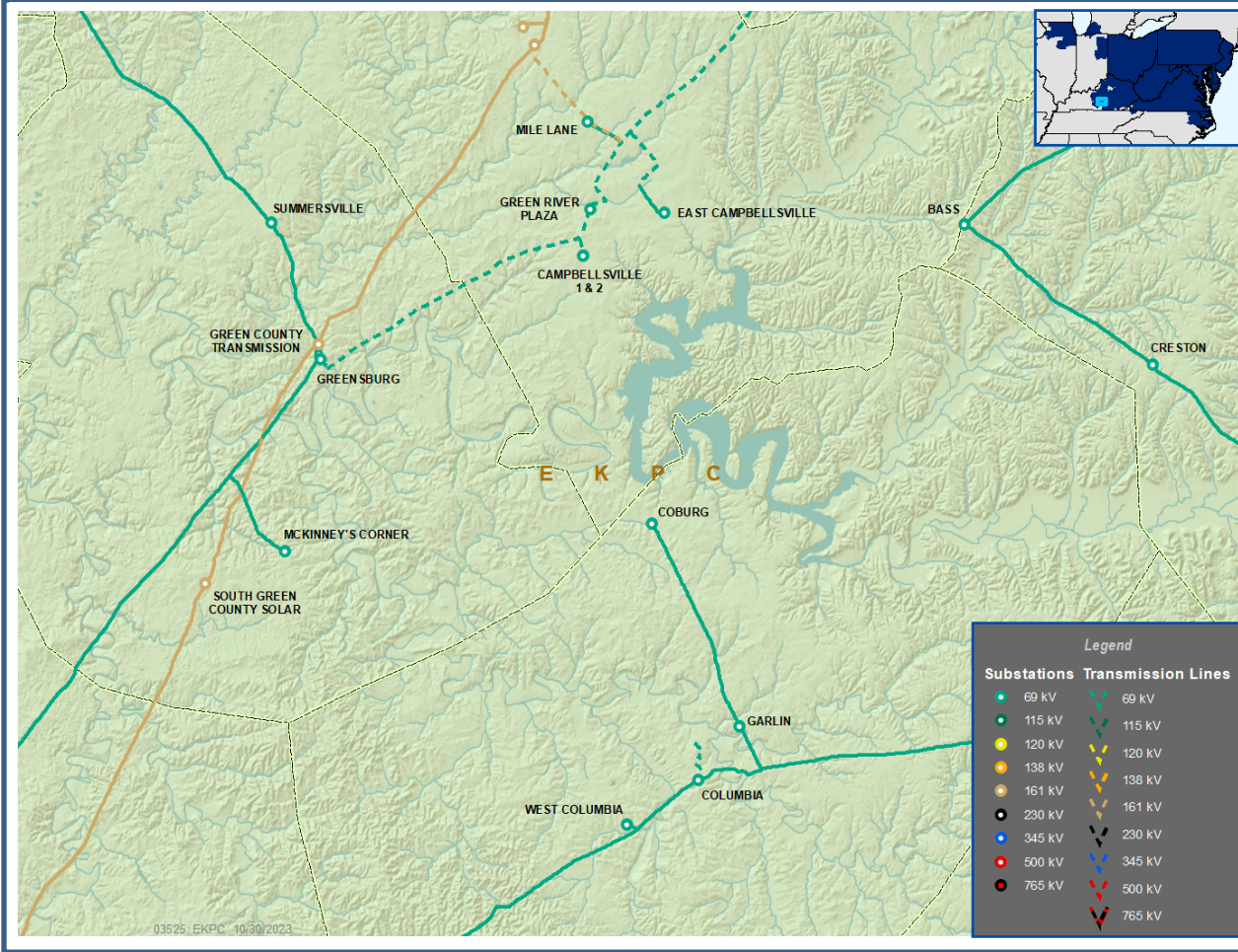
EKPC Assumptions Presentation Slide 14

Problem Statement:

System operation issues exist for, pre-existing outages of either the Green County 161/69 kV transformer or the LG&E/KU Taylor County 161/69 kV transformer (or 69 kV line sections between Taylor County and Green County), followed by another outage of one of these facilities in the area. This outage combination can result in low voltage limit violations in the area, as well as potential thermal loading violations for the Summer Shade-Green County 69 kV line. The system is often configured in a radial configuration, to segment load when an outage is occurring in the area to prevent voltage collapse and/or the thermal loading issue for a subsequent outage. Numerous PCLLRWs have been issued related to this area for potential operational violations in the area for a subsequent contingency.

Alternative will be developed to relieve the system operation concerns for this area.

Model: N/A



EKPC Transmission Zone M-3 Process Green County/Coburg Junction Area

Need Number: EKPC-2023-018

Process Stage: Submission of Supplemental Project for inclusion in the Local Plan –August 29, 2024

Proposed Solution:

Establish a new free flowing interconnection with LG&E/KU, by constructing a new 10.0 mile Coburg-Heartland 69kV line using 556 conductor and steel pole construction. Construct a new LG&E/KU owned ring bus configuration substation near Campbellsville and a new breaker station at Coburg Junction. Additionally, increase the Coburg capacitor bank to 17 MVAR and the Green River Plaza capacitor bank to 27 MVAR.

This alternative was determined to be the best holistic solution to the address this need. Importantly, it provides a significant expense reduction of NITS for the Campbellsville substation. As compared to the lower cost alternative listed below which did not satisfy the system operation concerns related to this area, or provide a NITS expense reduction.

Transmission Cost: \$22.1M

Distribution Cost: \$0.0M

Ancillary Benefits:

- Shifts load from the LG&E/KU transmission system (at Campbellsville and Heartland) to the EKPC transmission system.

Alternatives Considered:

1. Construct a new 10.0 mile, 69kV line from Bass-East Campbellsville to create a new normally closed tie with LG&E/KU and upgrade the LG&E/KU Taylor County substation to serve their Campbellsville Industrial tap directly from Taylor County. Build a new 10.0 mile, 69kV line from Coburg-Heartland with a LG&E/KU owned ring bus near Campbellsville. Add a new breaker station at Coburg Junction.

Transmission Cost: \$41.0M

Distribution Cost: \$0.0M

2. Construct a new 12.75 mile, Coburg-Green County 69kV line and a new 69kV breaker station at Coburg Junction.

Transmission Cost: \$20.1M

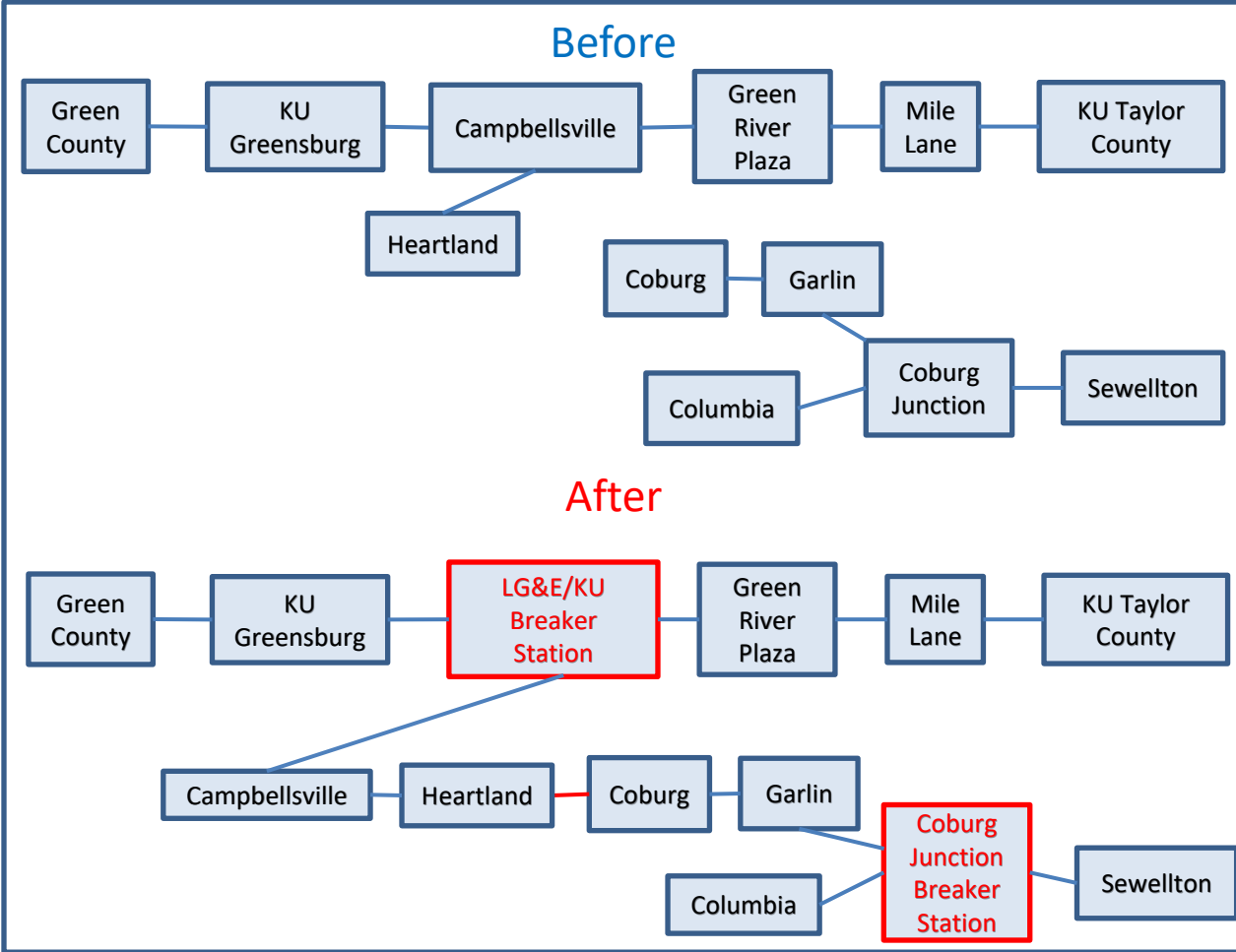
Distribution Cost: \$0.0M

Projected In-Service: 12/31/2026

Project Status: Scoping

Supplemental Project ID: s3175.0

Model: N/A



EKPC Transmission Zone M-3 Process Elizabethtown-Central Hardin-Stephensburg

Need Number: EKPC-2023-019

Process Stage: Submission of Supplemental Project for inclusion in the Local Plan –August 29, 2024

Previously Presented:

Need Meeting – November 17, 2023

Solutions Meeting – December 4, 2023

Supplemental Project Driver:

Equipment Material Condition, Performance and Risk

Specific Assumption Reference:

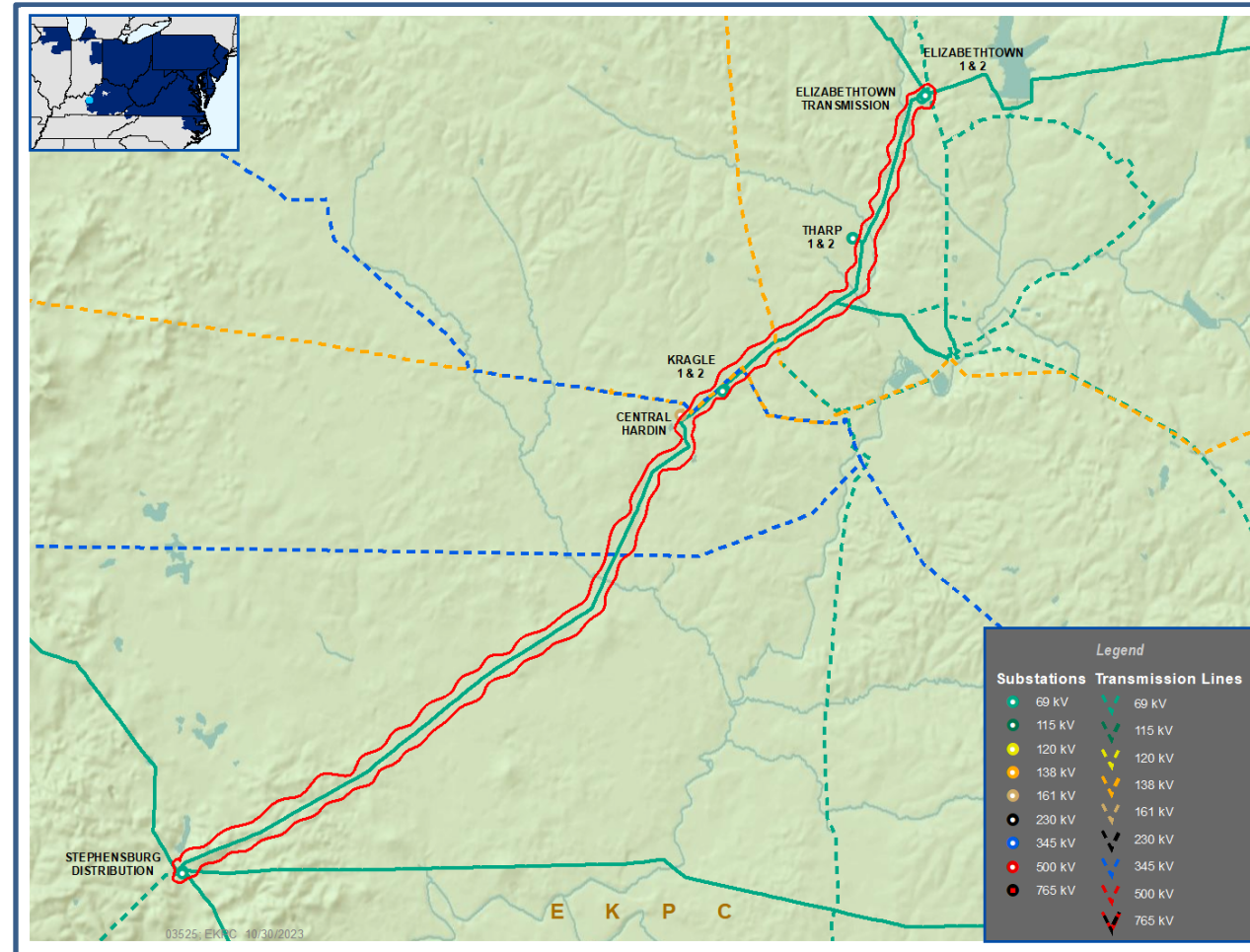
EKPC Assumptions Presentation Slide 13

Problem Statement:

The EKPC reliability team has been working to identify transmission lines sections, with single wood pole structures and 556.5 ACSR wire or larger that are known to have structural design issues. Most of the structures on these lines are believed to be over 100% capacity if the structure was new, based on EKPC current design standards. Many of the lines have been re-conducted with larger wire and very little structure design was performed at the time of the re-conductor.

The 11.7 mile, Elizabethtown-Central Hardin-Stephensburg 69 KV line sections has been identified from the above to be addressed. Alternatives will be developed to address these structural loading concerns.

Model: N/A



EKPC Transmission Zone M-3 Process Elizabethtown-Central Hardin-Stephensburg

Need Number: EKPC-2023-019

Process Stage: Submission of Supplemental Project for inclusion in the Local Plan –August 29, 2024

Proposed Solution:

Rebuild the 11.7 mile, Elizabethtown-Central Hardin-Stephensburg 69 KV line sections using existing conductor size and steel pole construction.

This alternative was determined to be the best holistic solution to the address this need. As compared to the lower cost alternative listed below which reduced reliability, increased reliance on foreign utilities and reduced future expansion opportunities in the area.

Transmission Cost: \$10.7M

Distribution Cost: \$0.0M

Ancillary Benefits:

- None

Alternatives Considered:

1. Rebuild the 7.25 mile, Stephensburg - Central Hardin with 795 conductor at 138 KV construction and operate at 69 KV. Rebuild Central Hardin-Elizabethtown using existing conductor sizes.

Transmission Cost: \$15.5M

Distribution Cost: \$0.0M

2. Retire the 7.25 mile, Stephensburg - Central Hardin line section. Rebuild Central Hardin-Elizabethtown using existing conductor sizes.

Transmission Cost: \$5.1M

Distribution Cost: \$0.0M

3. Retire the 7.25 mile, Stephensburg - Central Hardin line section. Construct a new 9.4 mile, Vertree-Rineyville 69 KV line section. Rebuild Central Hardin-Elizabethtown using existing conductor sizes.

Transmission Cost: \$16.4M

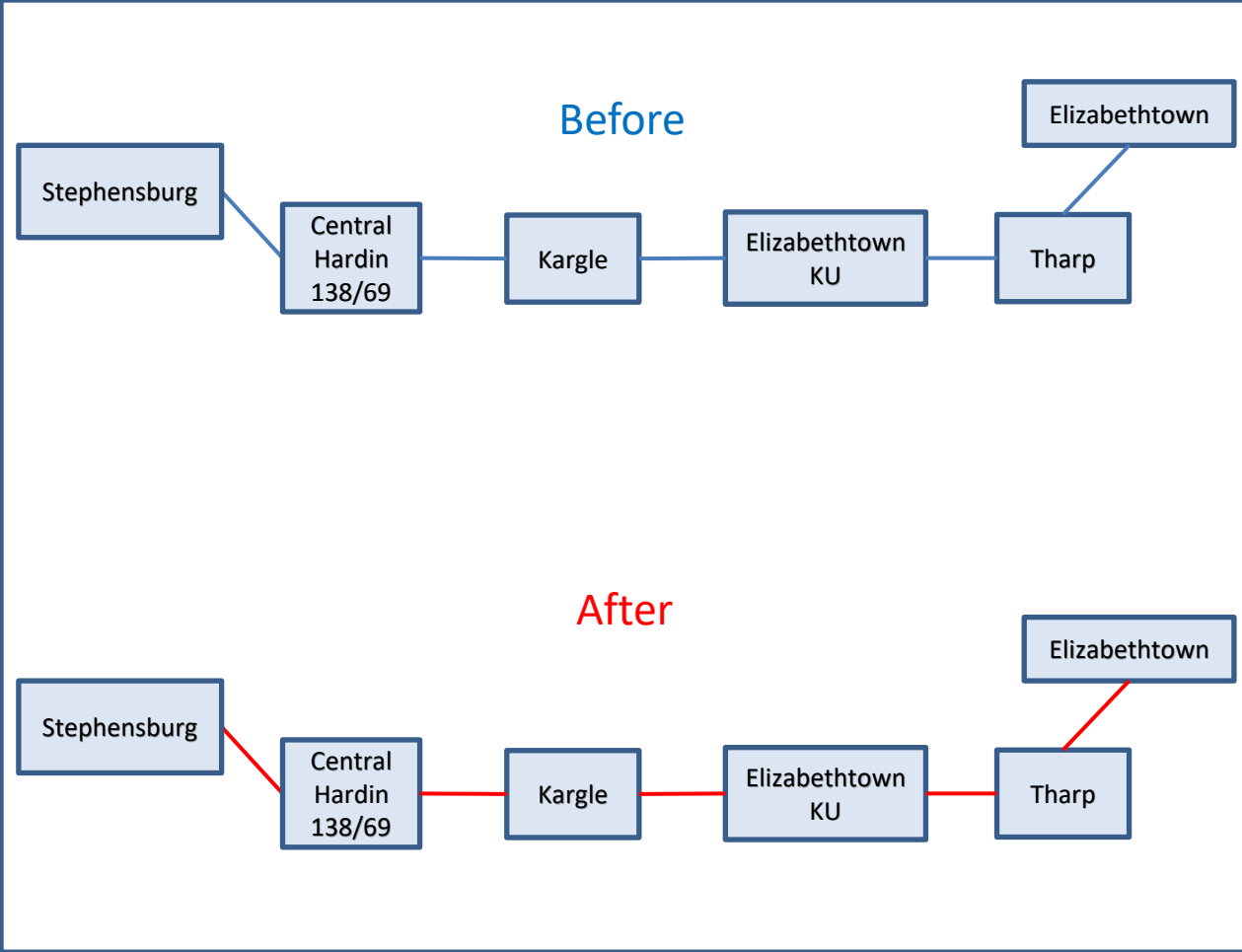
Distribution Cost: \$0.0M

Projected In-Service: 8/1/2028

Project Status: Scoping

Supplemental Project ID: s3176.0

Model: N/A



EKPC Transmission Zone M-3 Process Elizabethtown-Patriot Parkway-Vine Grove

Need Number: EKPC-2023-020

Process Stage: Submission of Supplemental Project for inclusion in the Local Plan –August 29, 2024

Previously Presented:

Need Meeting – November 17, 2023

Solutions Meeting – December 4, 2023

Supplemental Project Driver:

Equipment Material Condition, Performance and Risk

Specific Assumption Reference:

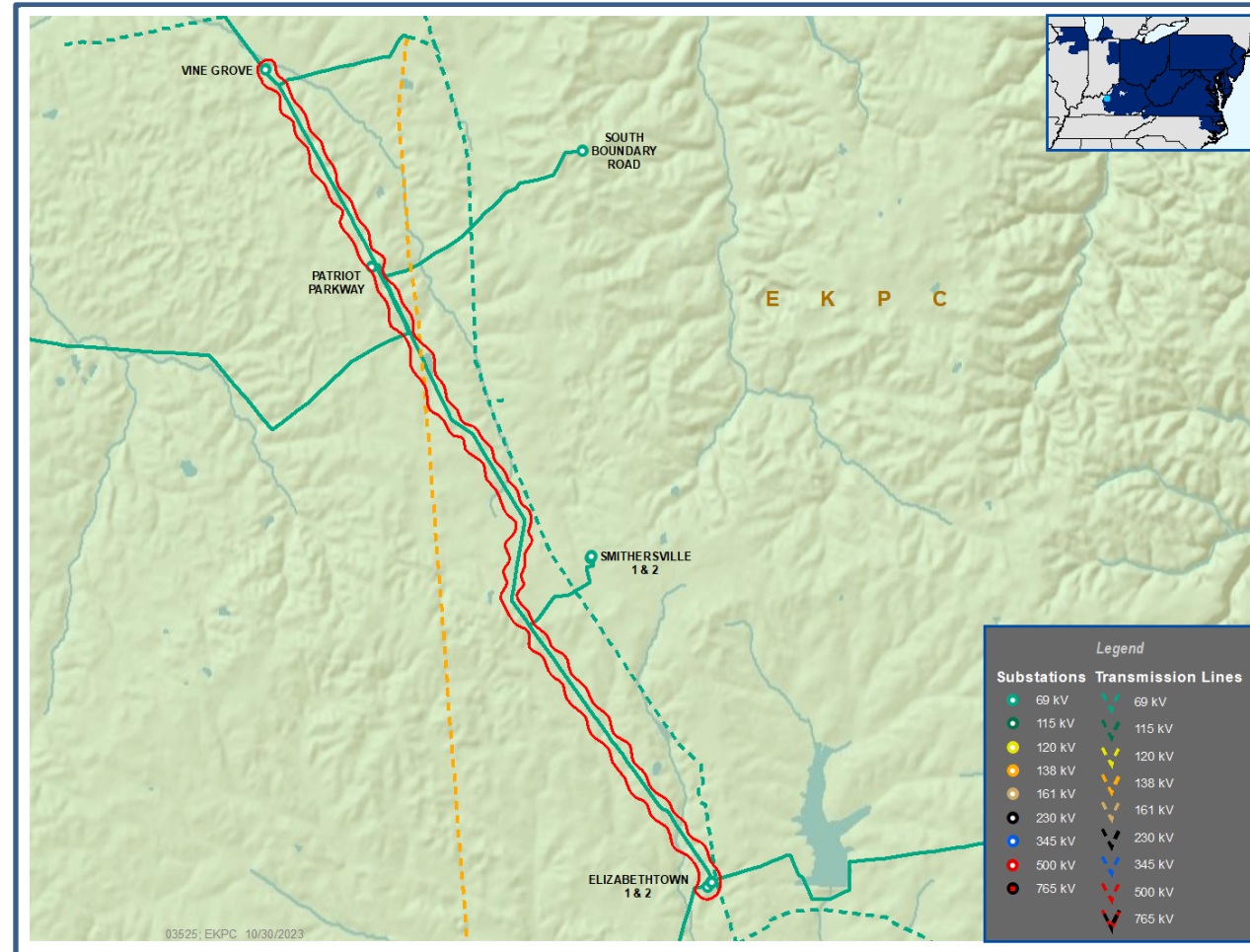
EKPC Assumptions Presentation Slide 13

Problem Statement:

The EKPC reliability team has been working to identify transmission lines sections, with single wood pole structures and 556.5 ACSR wire or larger that are known to have structural design issues. Most of the structures on these lines are believed to be over 100% capacity if the structure was new, based on EKPC current design standards. Many of the lines have been re-conducted with larger wire and very little structure design was performed at the time of the re-conductor.

The 7.45 mile, Elizabethtown-Patriot Parkway-Vine Grove 69 KV line sections has been identified from the above to be addressed. Alternatives will be developed to address these structural loading concerns.

Model: N/A



EKPC Transmission Zone M-3 Process Elizabethtown-Patriot Parkway-Vine Grove

Need Number: EKPC-2023-020

Process Stage: Submission of Supplemental Project for inclusion in the Local Plan –August 29, 2024

Proposed Solution:

Rebuild the 7.45 mile, Elizabethtown-Patriot Parkway-Vine Grove 69 KV line sections using existing conductor size and steel pole construction.

Transmission Cost: \$5.2M
Distribution Cost: \$0.0M

Ancillary Benefits:

- None

Alternatives Considered:

1. Build a new 4.6 mile, 69 KV line from Rineyville to Vine Grove using 556 conductor. Retire 1.56 mile, Rogersville Junction-Patriot Parkway 69 KV line. Rebuild Vine Grove-Rogersville Junction and Elizabethtown-Patriot Parkway using 556 conductor.

Transmission Cost: \$10.2M
Distribution Cost: \$0.0M

2. Build a new 2.5 mile, 69 KV line from Vine Grove to the Rineyville-Patriot Parkway line using 556 conductor. Retire the 1.56 mile, Rogersville Junction-Patriot Parkway 69 KV line. Rebuild Vine Grove-Rogersville Junction and Elizabethtown-Patriot Parkway using 556 conductor.

Transmission Cost: \$7.7M
Distribution Cost: \$0.0M

3. Build a new 5.75 mile, 69 KV line from Rineyville to Radcliff using 556 conductor. . Retire the 1.56 mile, Rogersville Junction-Patriot Parkway 69 KV line. Rebuild Vine Grove-Rogersville Junction, Elizabethtown-Patriot Parkway and Radcliff-Vine Grove using 556 conductor.

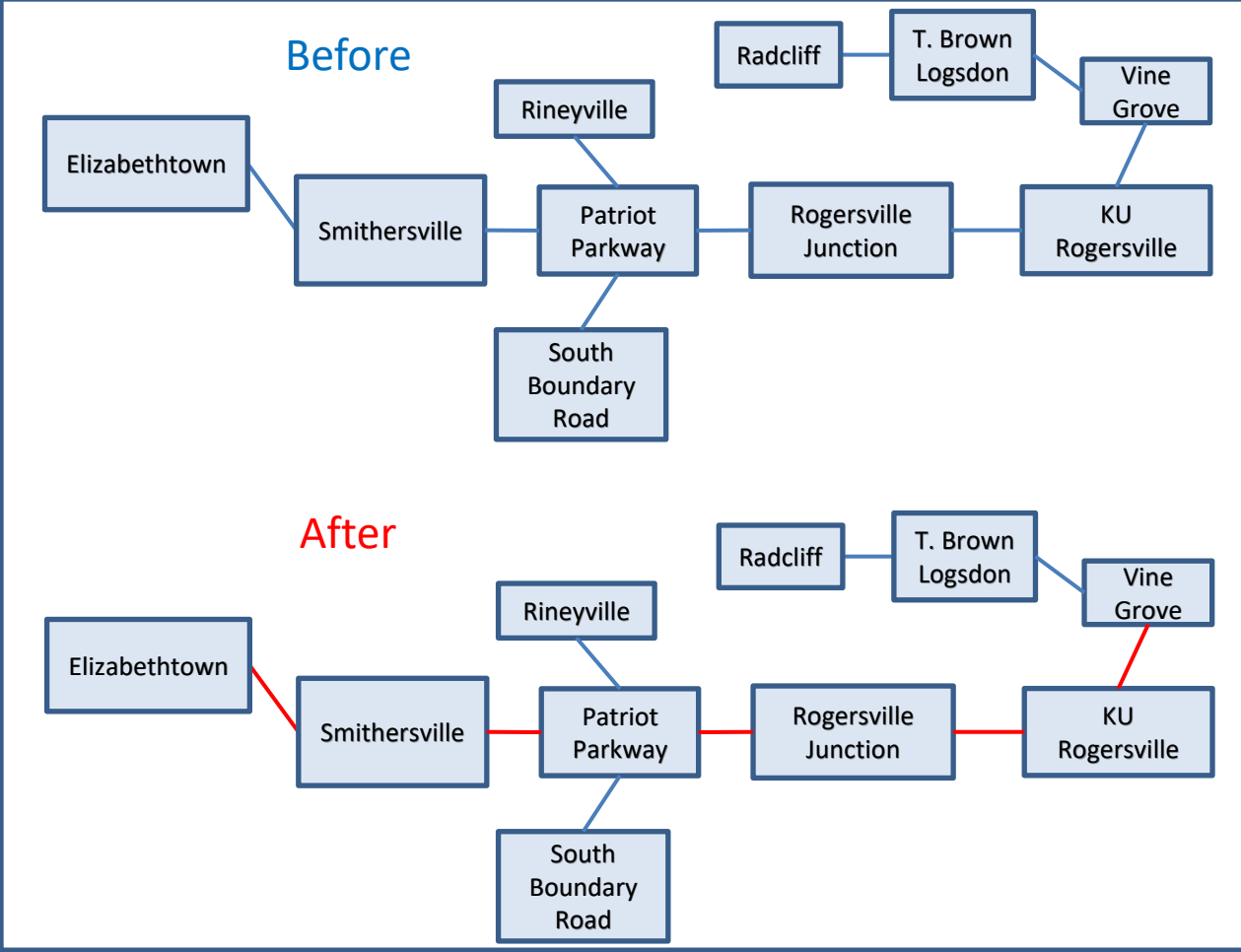
Transmission Cost: \$13.8M
Distribution Cost: \$0.0M

Projected In-Service: 8/1/2027

Project Status: Scoping

Supplemental Project ID: s3177.0

Model: N/A



EKPC Transmission Zone M-3 Process Penn-Renaker

Need Number: EKPC-2023-021

Process Stage: Submission of Supplemental Project for inclusion in the Local Plan –August 29, 2024

Previously Presented:

Need Meeting – November 17, 2023

Solutions Meeting – December 4, 2023

Supplemental Project Driver:

Equipment Material Condition, Performance and Risk

Specific Assumption Reference:

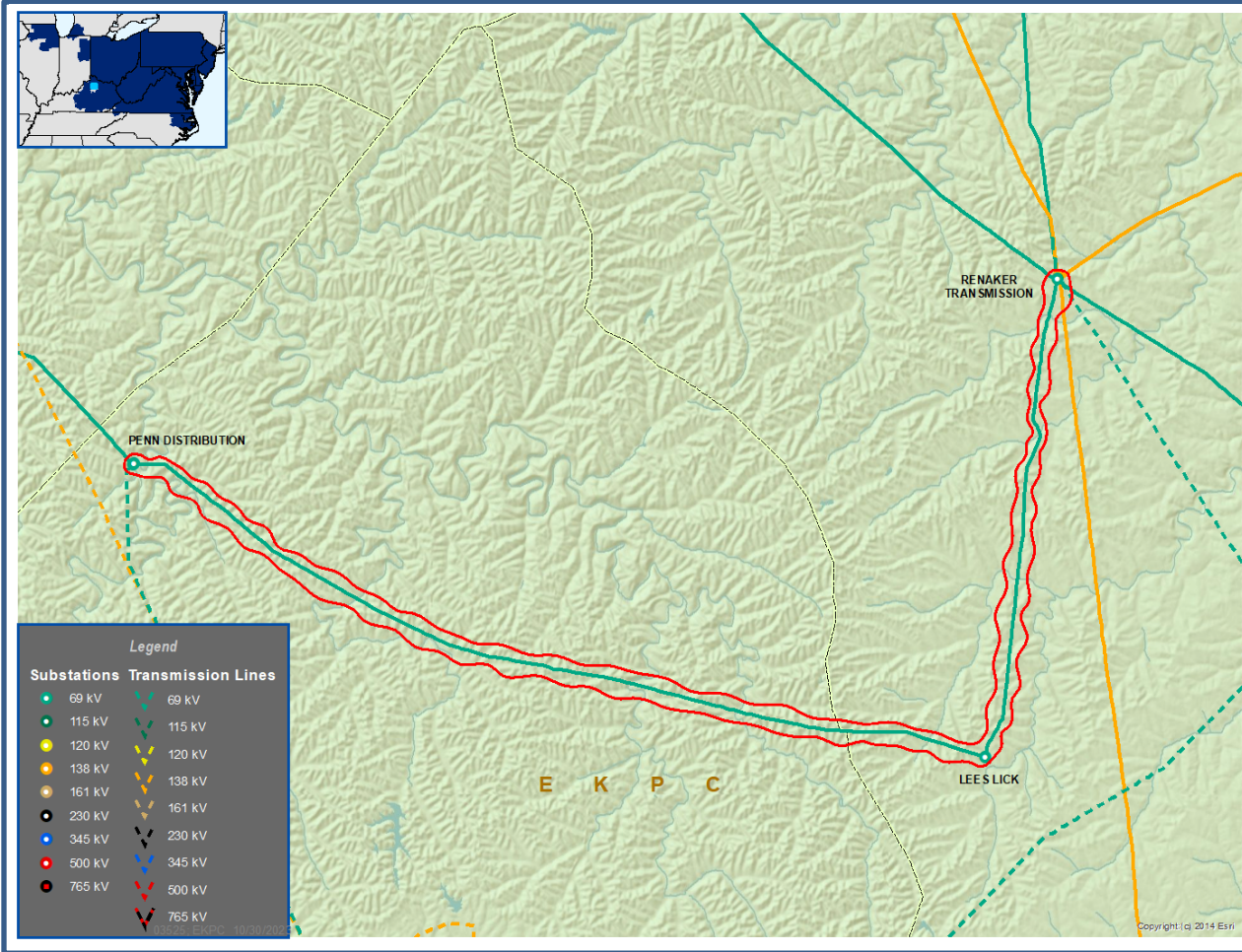
EKPC Assumptions Presentation Slide 13

Problem Statement:

The 20.79 mile, Penn-Renaker 69 KV transmission line is 1955 vintage wood pole construction with 2/0 conductor. This line section has reliability concerns related to aging wood poles as well as conductor steel core and static wire deterioration including, rusting, pitting and possible broken strands.

The EKPC Reliability team has concluded, that this line is at or near end of life and should be addressed due to the condition.

Model: N/A



EKPC Transmission Zone M-3 Process Penn-Renaker

Need Number: EKPC-2023-021

Process Stage: Submission of Supplemental Project for inclusion in the Local Plan –August 29, 2024

Proposed Solution:

Rebuild the 20.79 mile, Renaker-Penn 69 KV line sections using 556 conductor and steel pole construction.

This alternative was determined to be the best holistic solution to the address this need. As compared to the lower cost alternative listed below which reduced reliability, increased reliance on foreign utilities and reduced future expansion opportunities in the area.

Transmission Cost: \$16.4M
Distribution Cost: \$0.0M

Ancillary Benefits:

- Increases transmission line ratings

Alternatives Considered:

1. Convert Lees Lick to 138 KV, construct a new 2.0 mile tap line to connect to the Renaker-Avon 138 KV line. Retire the 20.79 mile, Renaker-Penn 69 KV line section.

Transmission Cost: \$1.1M
Distribution Cost: \$5.5M

2. Establish a new 1.5 mile, 69 KV normally open connection to the LG&E/KU Cynthiana Switch-Adams line. Retire the 7.2 mile, Renaker-Lees Lick line section. Rebuild the 13.6 mile, Penn-Lees Lick line section.

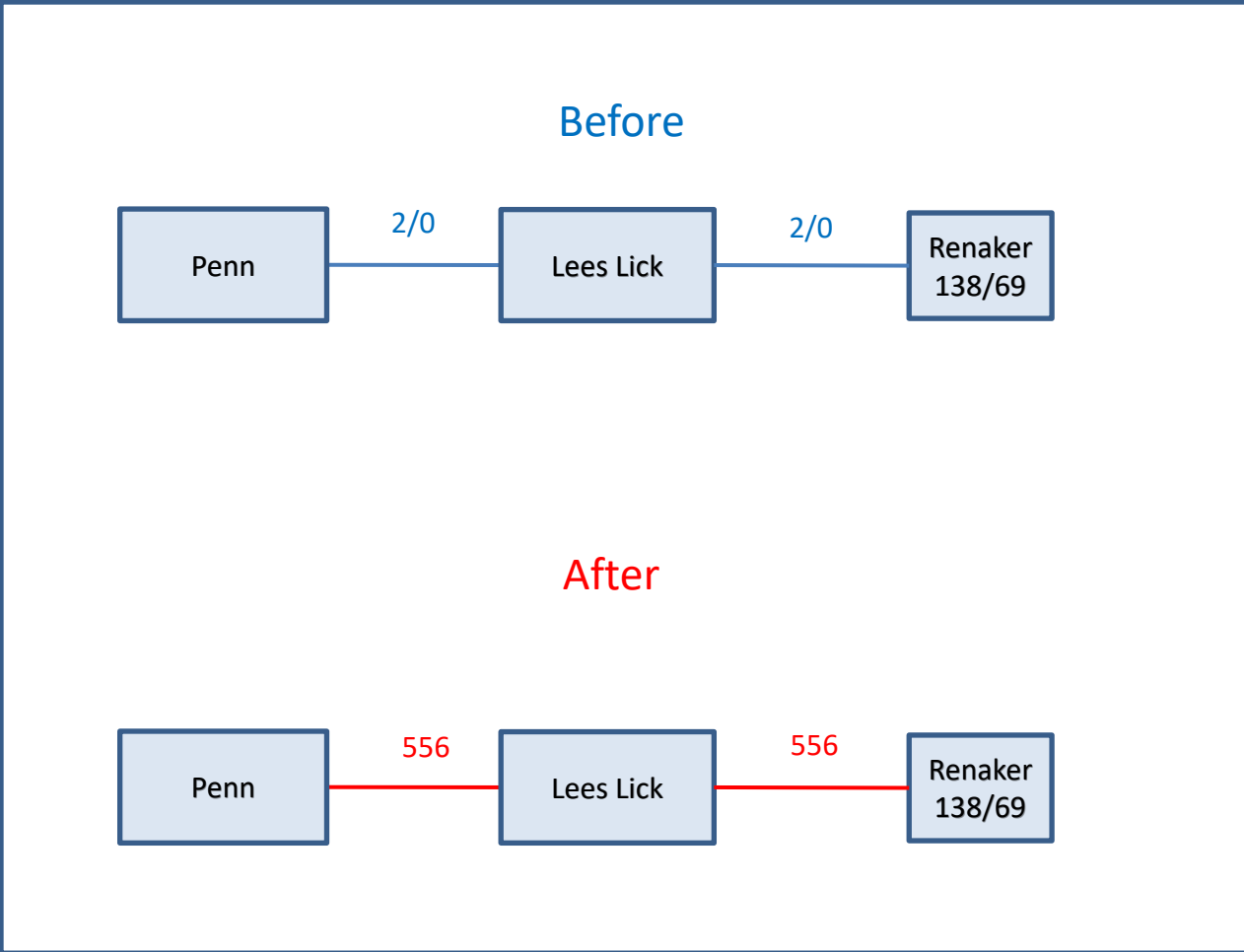
Transmission Cost: \$17.1M
Distribution Cost: \$0.0M

Projected In-Service: 12/1/2027

Project Status: Engineering & Procurement

Supplemental Project ID: s3178.0

Model: N/A



EKPC Transmission Zone M-3 Process Windsor-Somerset

Need Number: EKPC-2023-022

Process Stage: Submission of Supplemental Project for inclusion in the Local Plan – August 29, 2024

Previously Presented:

- Need Meeting – November 17, 2023
- Solutions Meeting – December 4, 2023

Supplemental Project Driver:

Equipment Material Condition, Performance and Risk

Specific Assumption Reference:

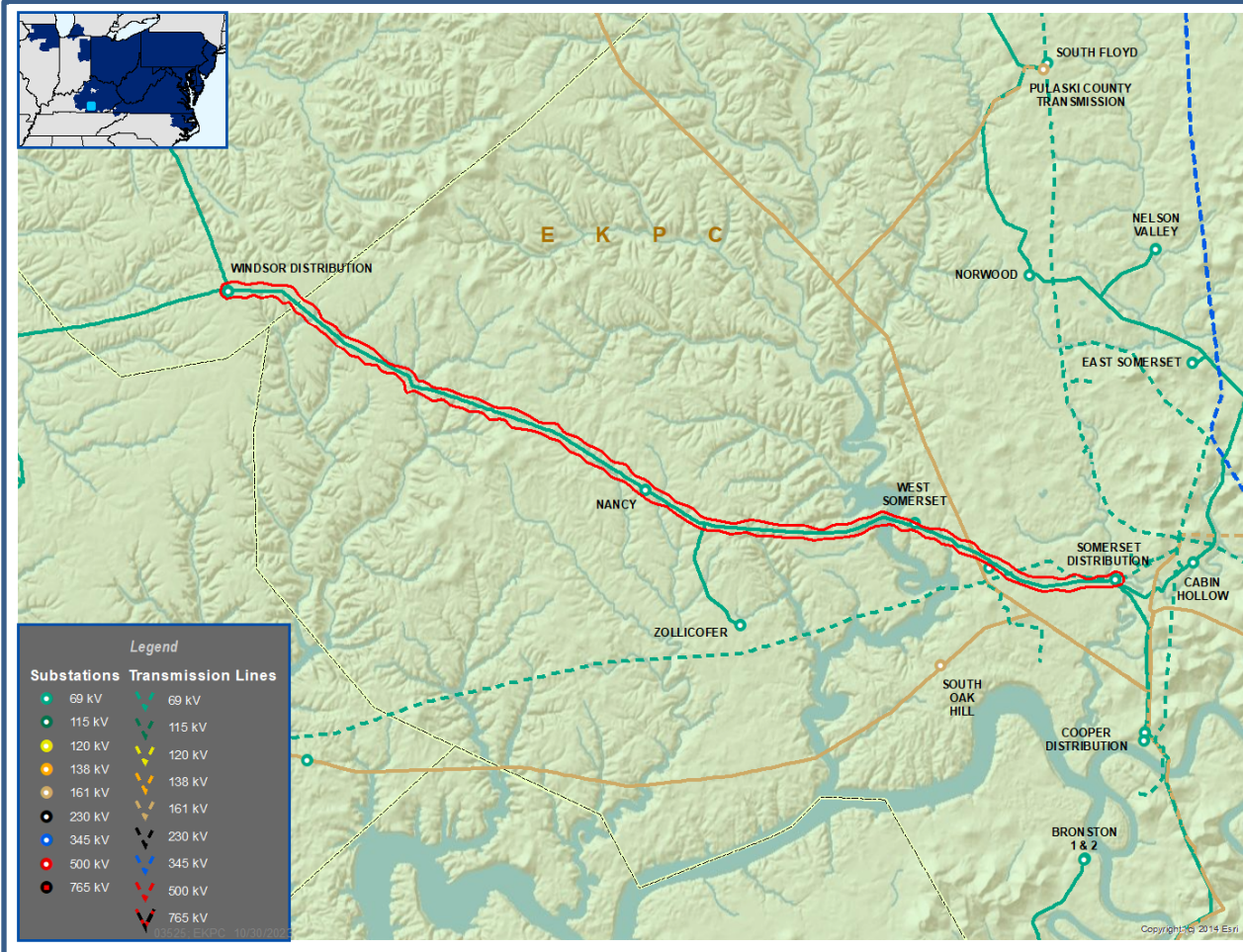
EKPC Assumptions Presentation Slide 13

Problem Statement:

The EKPC reliability team has been working to identify transmission lines sections, with single wood pole structures and 556.5 ACSR wire or larger that are known to have structural design issues. Most of the structures on these lines are believed to be over 100% capacity if the structure was new, based on EKPC current design standards. Many of the lines have been re-conducted with larger wire and very little structure design was performed at the time of the re-conductor.

The 18.97 mile, Windsor-Somerset 69 KV line sections has been identified from the above to be addressed. Alternatives will be developed to address these structural loading concerns.

Model: N/A



EKPC Transmission Zone M-3 Process Windsor-Somerset

Need Number: EKPC-2023-022

Process Stage: Submission of Supplemental Project for inclusion in the Local Plan –August 29, 2024

Proposed Solution:

Rebuild the 18.97 mile, Windsor-Somerset 69 KV line sections using existing conductor size and steel pole construction.

Transmission Cost: \$17.0M
Distribution Cost: \$0.0M

Ancillary Benefits:

- None

Alternatives Considered:

1. Establish new 69kV free flowing interconnection with LG&E/KU, constructing a new 0.6 mile line from Zollicofer to their Waitsboro-Union Underwear line section. Retire the 9.27 mile, Nancy-Windsor line section and rebuild the 1.31 mile Nancy - Zollicofer as a double circuit. Rebuild the remaining Zollicofer - Somerset line sections.

Transmission Cost: \$20.7M
Distribution Cost: \$0.0M

2. Construct a new Pulaski Co. Junction 161/69kV substation, build a new 6.1 mile 69 KV line to Nancy. Retire the 9.27 mile, Nancy-Windsor line section. . Rebuild the remaining Zollicofer - Somerset line sections.

Transmission Cost: \$26.3M
Distribution Cost: \$0.0M

3. Construct a new 161/69 kV transmission station near Oak Hill, build a new 0.18 mile 69 KV line to Oak Hill. Retire the Somerset-Oak Hill NO and Oak Hill Tap-Oak Hill NO line sections. Rebuild the remaining Windsor – Oak Hill Tap line sections.

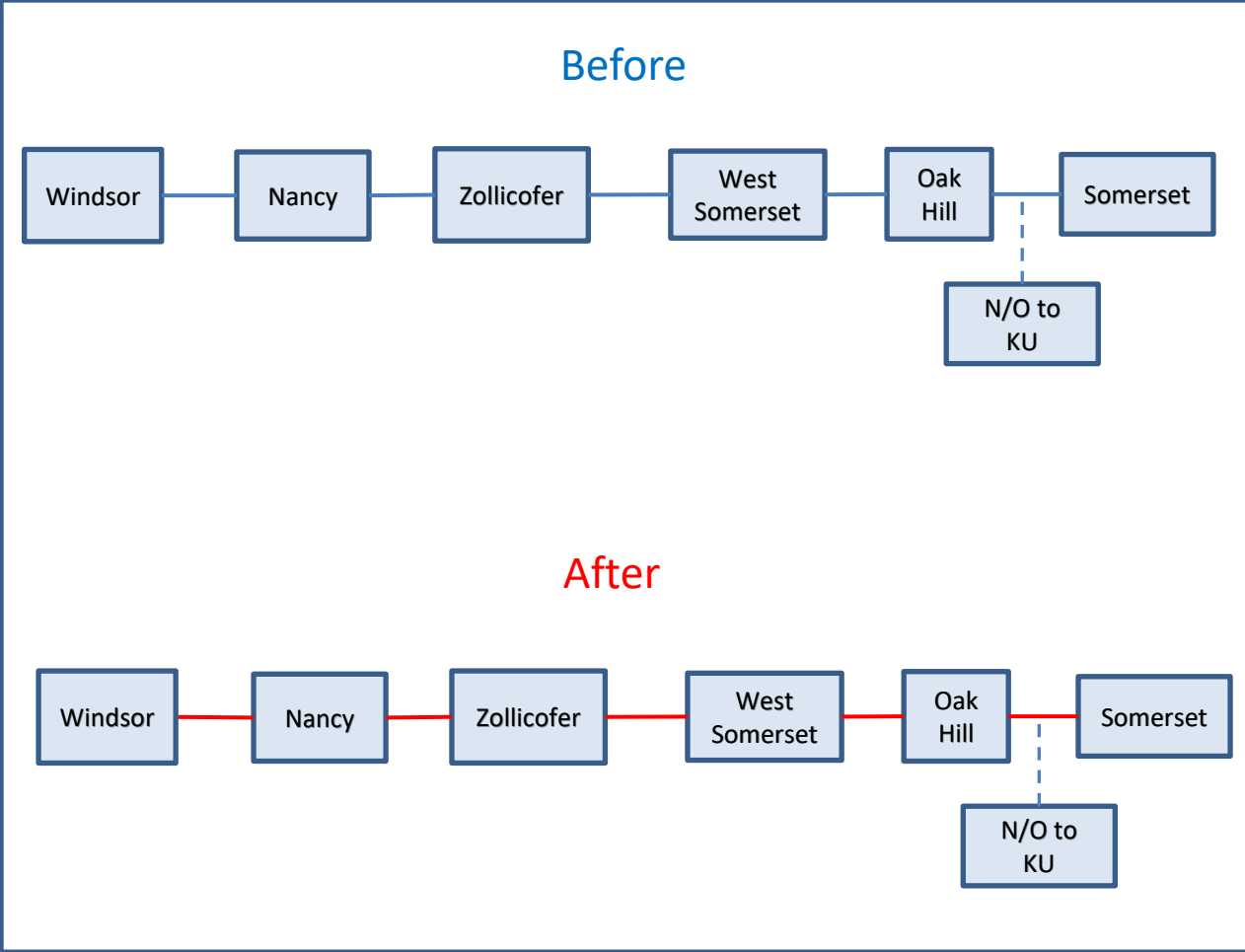
Transmission Cost: \$23.9M
Distribution Cost: \$0.0M

Projected In-Service: 12/1/2027

Project Status: Engineering

Supplemental Project ID: s3179.0

Model: N/A



Revision History

8/29/2024 – V1 – Added s3164-s3179