

SRRTEP Committee: Western EKPC Supplemental Projects

December 15, 2023

Solutions

Stakeholders must submit any comments within 10 days of this meeting in order to provide time necessary to consider these comments prior to the next phase of the M-3 process

EKPC Transmission Zone M-3 Process Stephensburg-Bonnieville

Need Number: EKPC-2023-017

Process Stage: Need Meeting – November 17, 2023

Supplemental Project Driver:

Equipment Material Condition, Performance and Risk

Specific Assumption Reference:

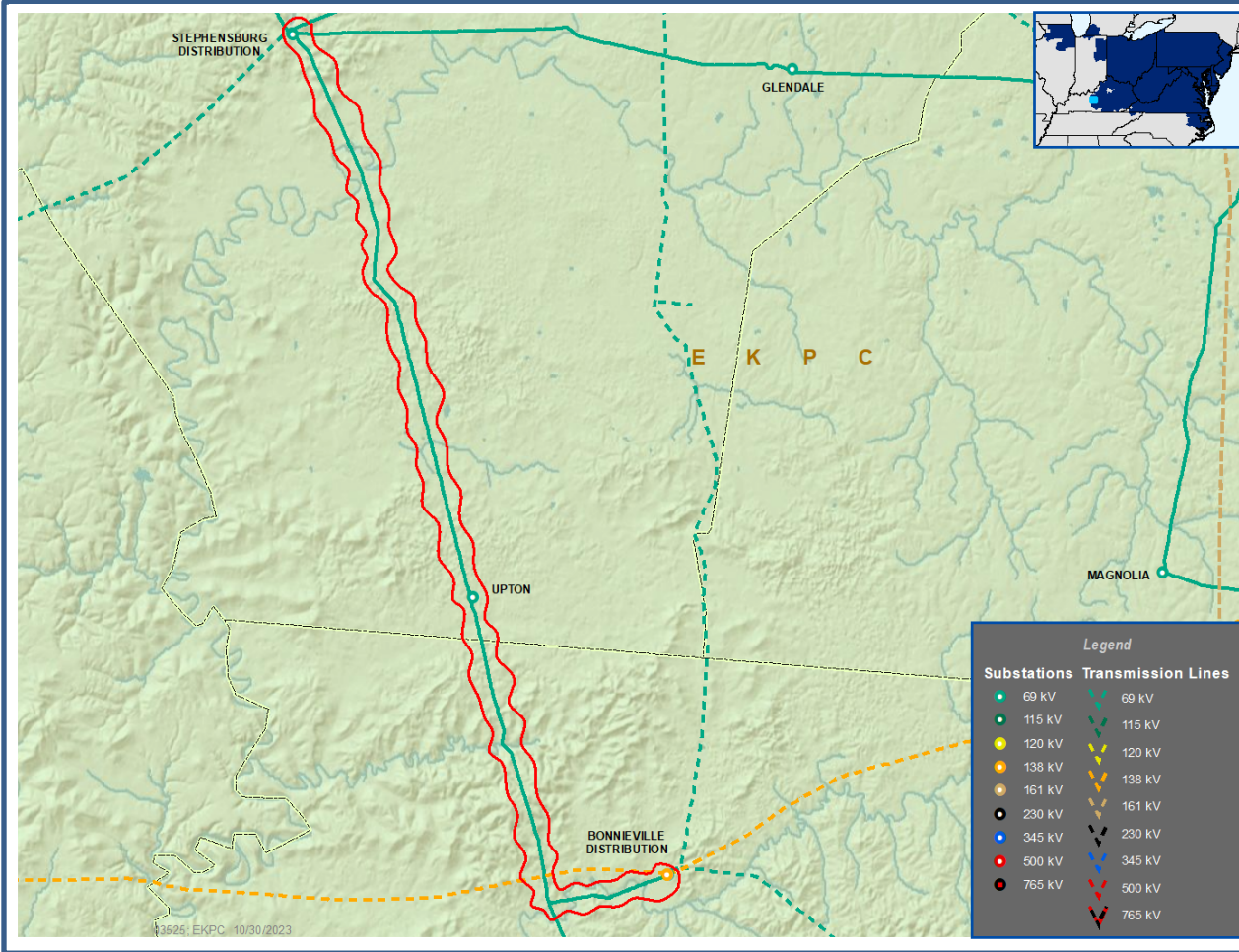
EKPC Assumptions Presentation Slide 13

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: Solutions Meeting – December 15, 2023

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

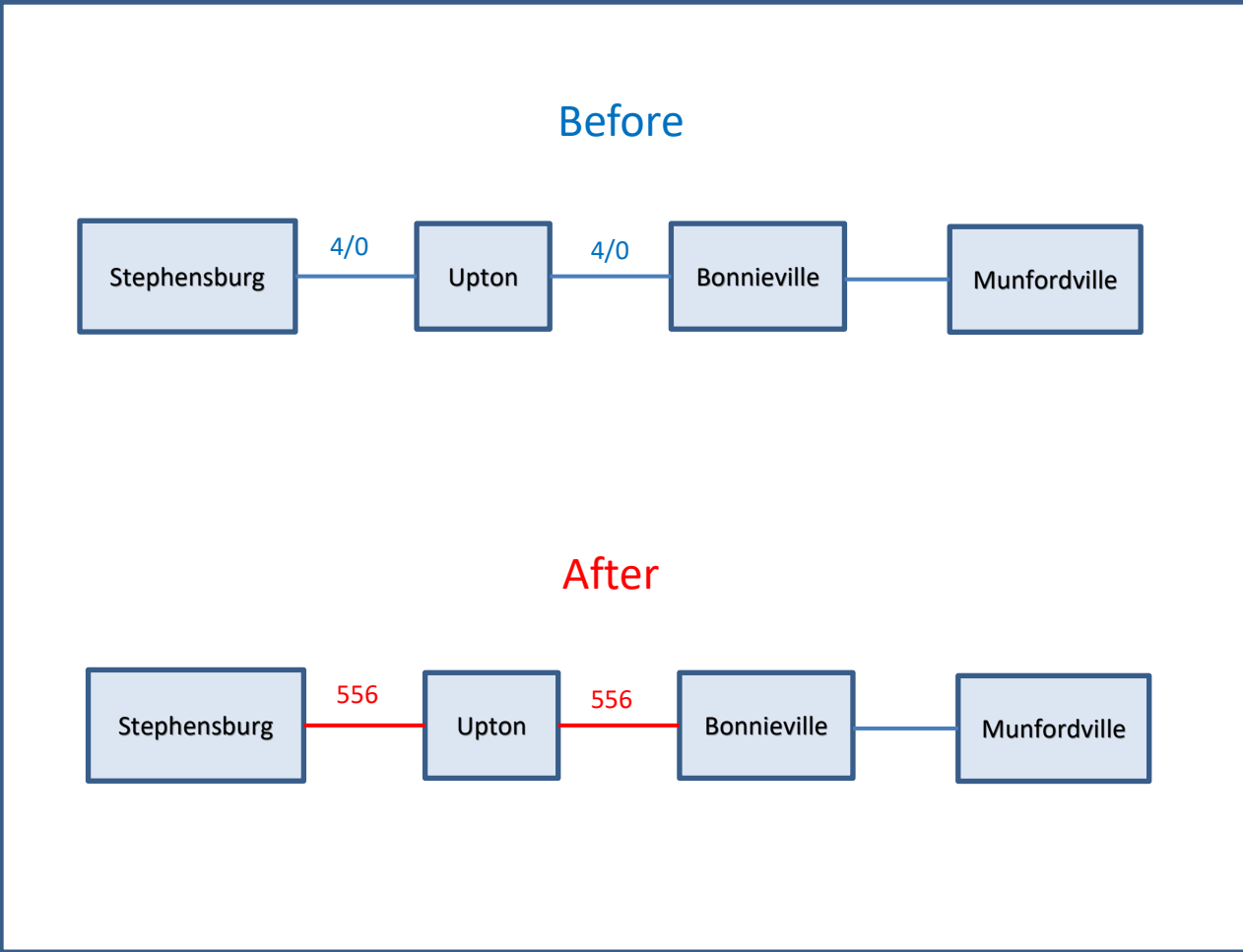
3. Create a new normally-open connection to LG&E/KU by constructing a new 4.6 mile, 69 KV line using 556 ACSR to the KU Sonora Tap - Bonnieville KU line section. Rebuild the 7.9 mile, 69 KV Bonnieville - Upton Tap line section using 556 ACSR. Retire the 10.8 mile, Stephensburg - Upton Tap 69 KV line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

Transmission Cost: \$14.5M
Distribution Cost: \$0.0M

Projected In-Service: 3/1/2027

Project Status: Scoping

Model: N/A



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

Need Number: EKPC-2023-018

Process Stage: Need Meeting – November 17, 2023

Supplemental Project Driver:
Operational Flexibility and Efficiency

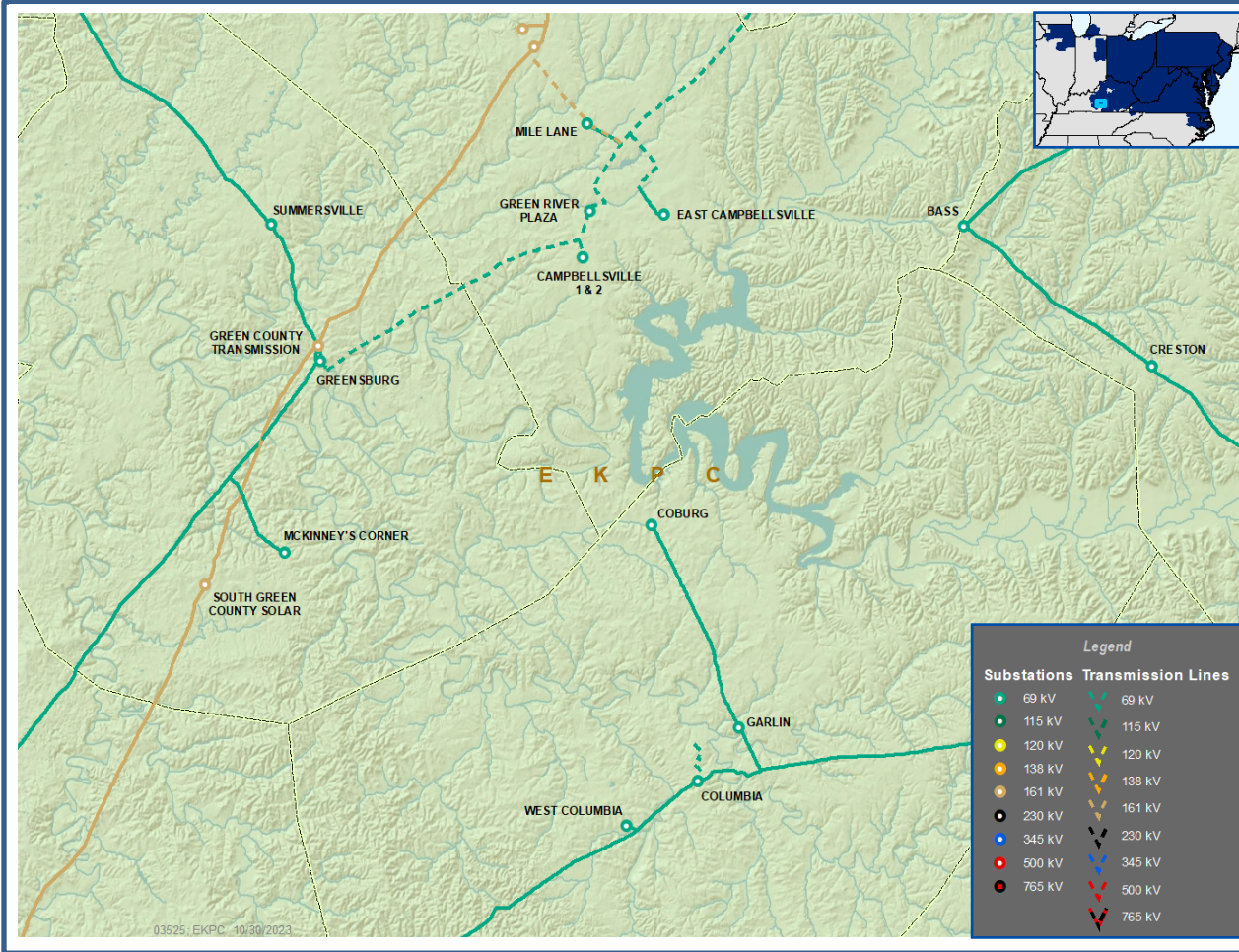
Specific Assumption Reference:
EKPC Assumptions Presentation Slide 14

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: Solutions Meeting – December 15, 2023

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

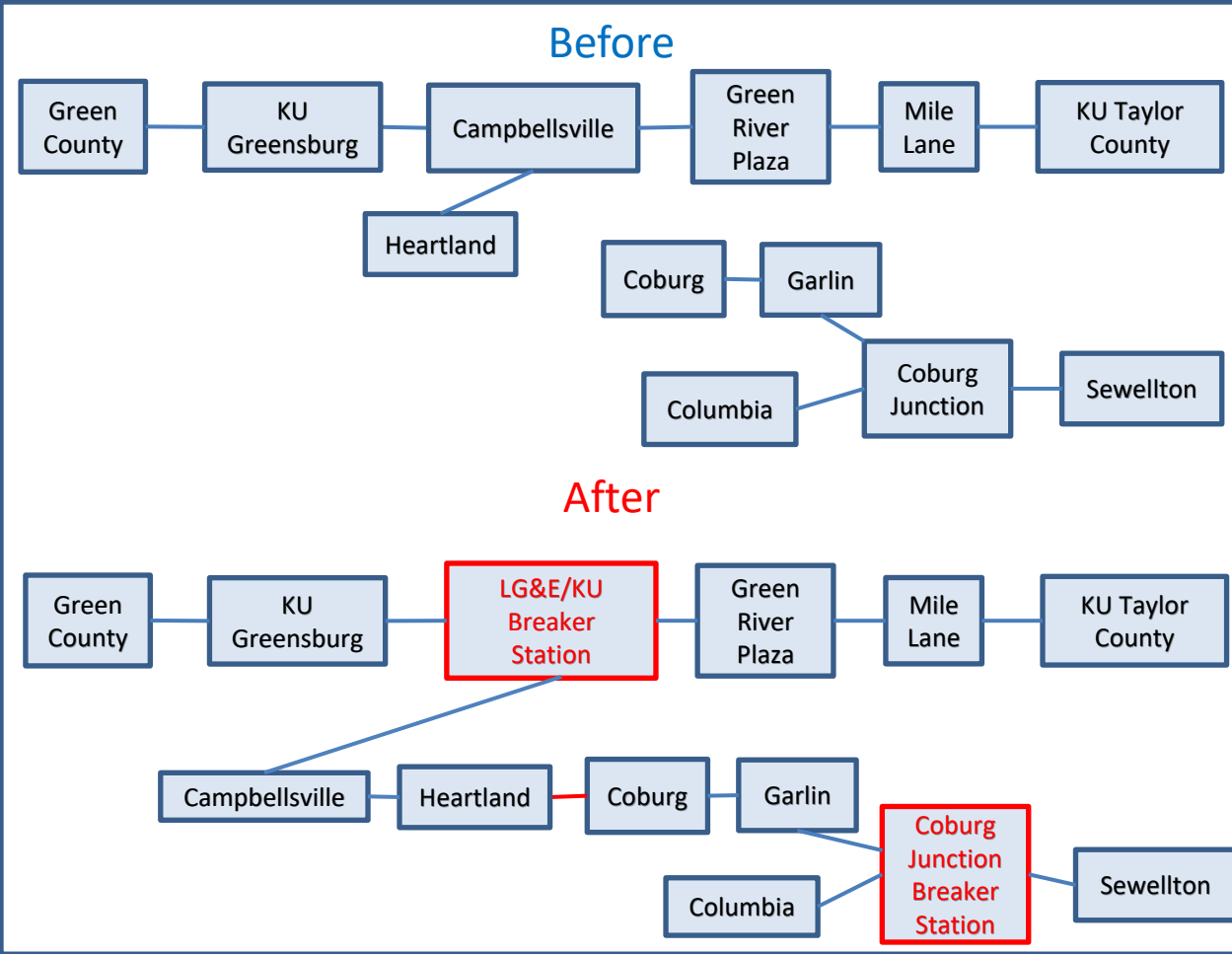
2. Construct a new 12.75 mile, Coburg-Green County 69kV line and a new 69kV breaker station at Coburg Junction.

Transmission Cost: \$20.1M
Distribution Cost: \$0.0M

Projected In-Service: 12/31/2026

Project Status: Scoping

Model: N/A



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

Need Number: EKPC-2023-019

Process Stage: Need Meeting – November 17, 2023

Supplemental Project Driver:

Equipment Material Condition, Performance and Risk

Specific Assumption Reference:

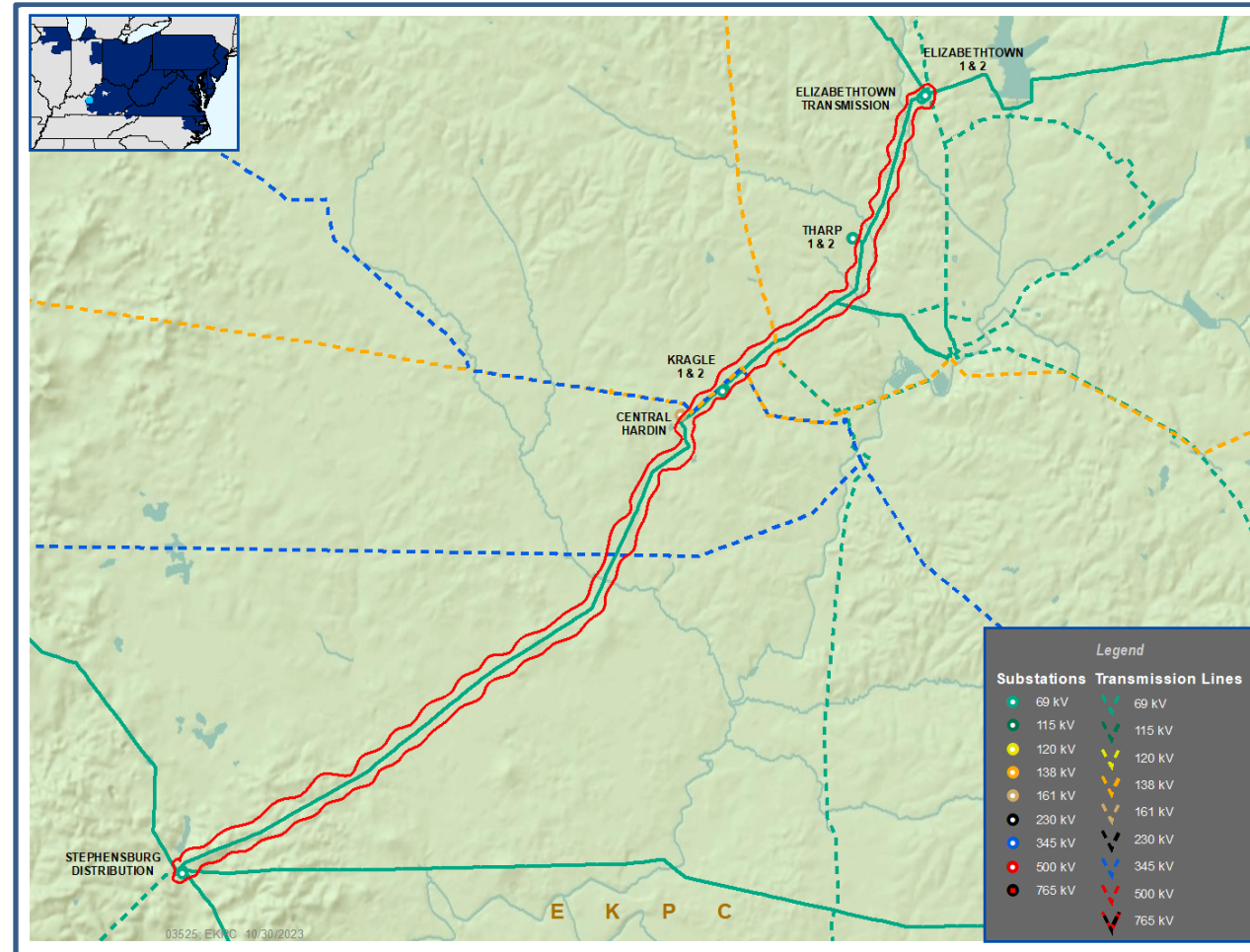
EKPC Assumptions Presentation Slide 13

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: Solutions Meeting – December 15, 2023

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

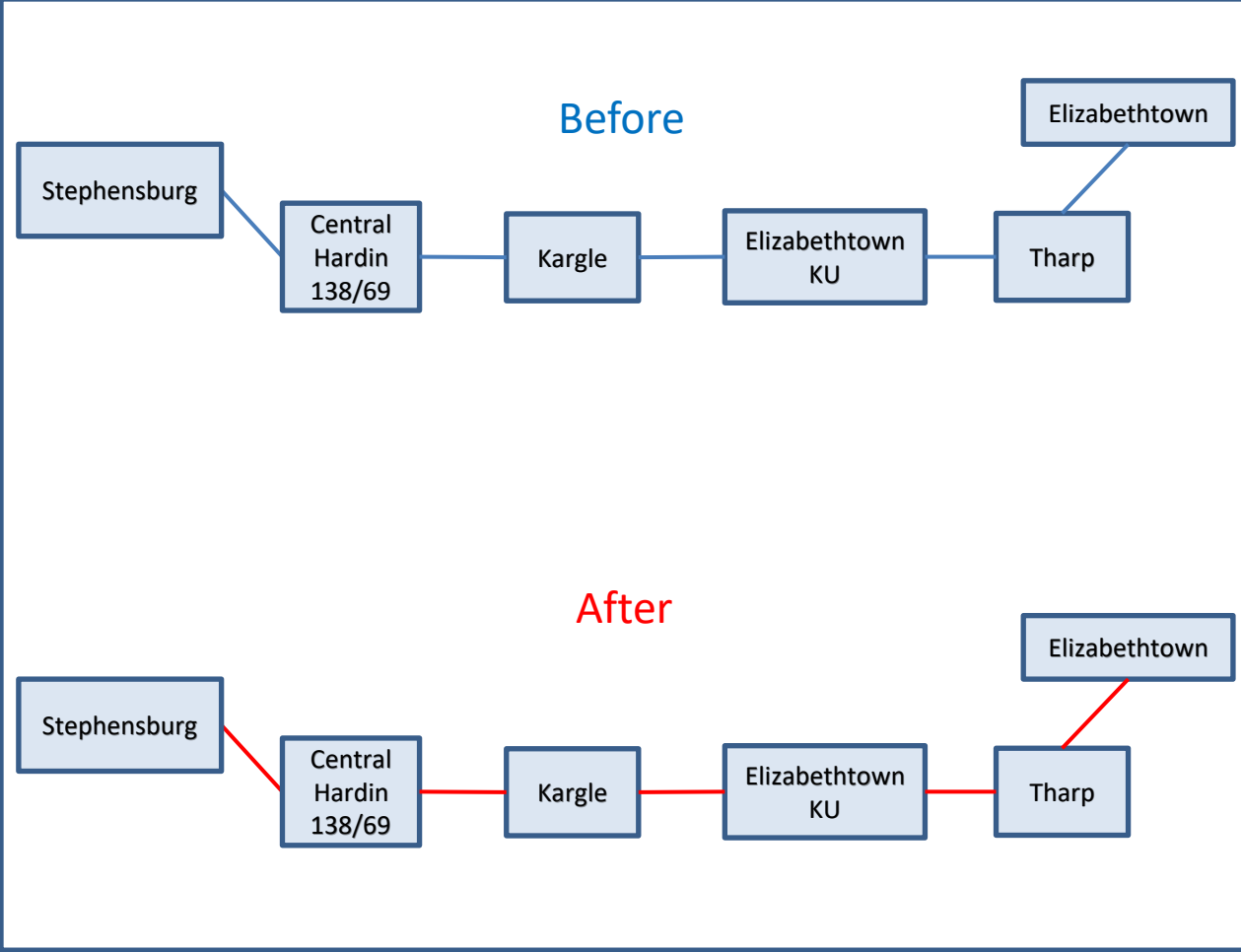
3. Retire the 7.25 mile, Stephensburg - Central Hardin line section. Construct a new 9.4 mile, Vertree-Rineyville 69 KV line section. Rebuild Central Hardin-Elizabethtown using existing conductor sizes.

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

Projected In-Service: 8/1/2028

Project Status: Scoping

Model: N/A



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

Need Number: EKPC-2023-020

Process Stage: Need Meeting – November 17, 2023

Supplemental Project Driver:

Equipment Material Condition, Performance and Risk

Specific Assumption Reference:

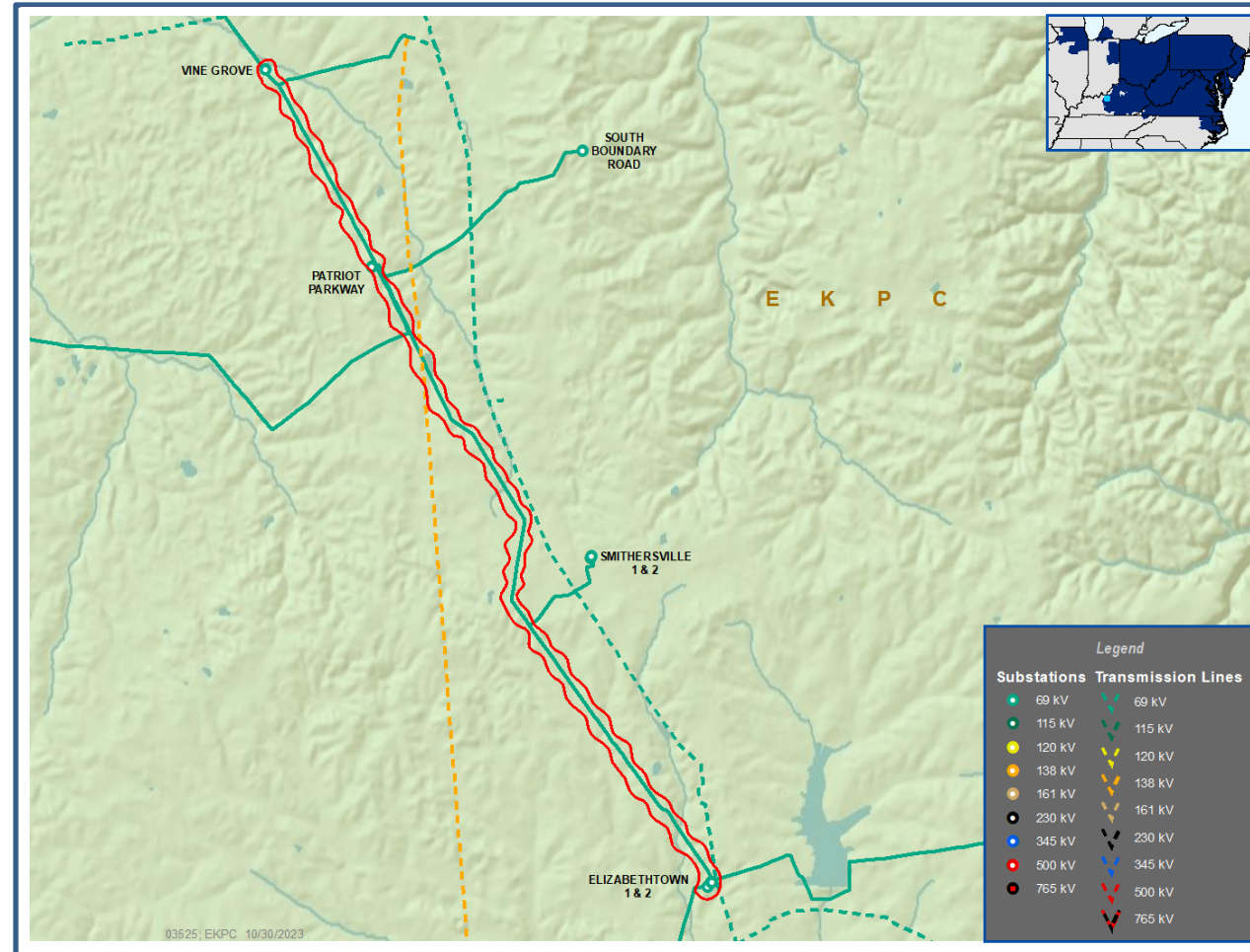
EKPC Assumptions Presentation Slide 13

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: Solutions Meeting – December 15, 2023

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.

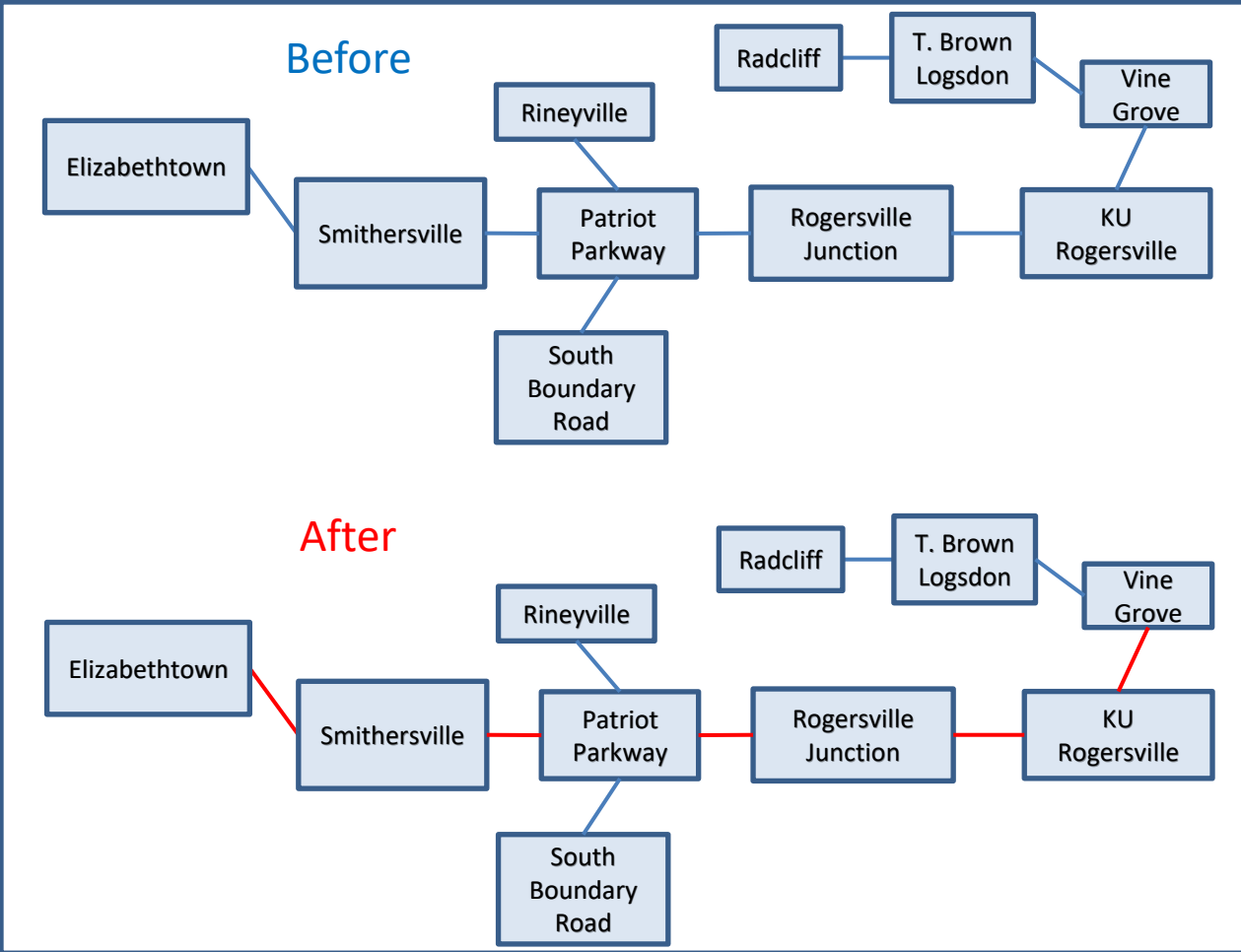
Transmission Cost: \$13.8M

Distribution Cost: \$0.0M

Projected In-Service: 8/1/2027

Project Status: Scoping

Model: N/A



EKPC Transmission Zone M-3 Process Penn-Renaker

Need Number: EKPC-2023-021

Process Stage: Need Meeting – November 17, 2023

Supplemental Project Driver:

Equipment Material Condition, Performance and Risk

Specific Assumption Reference:

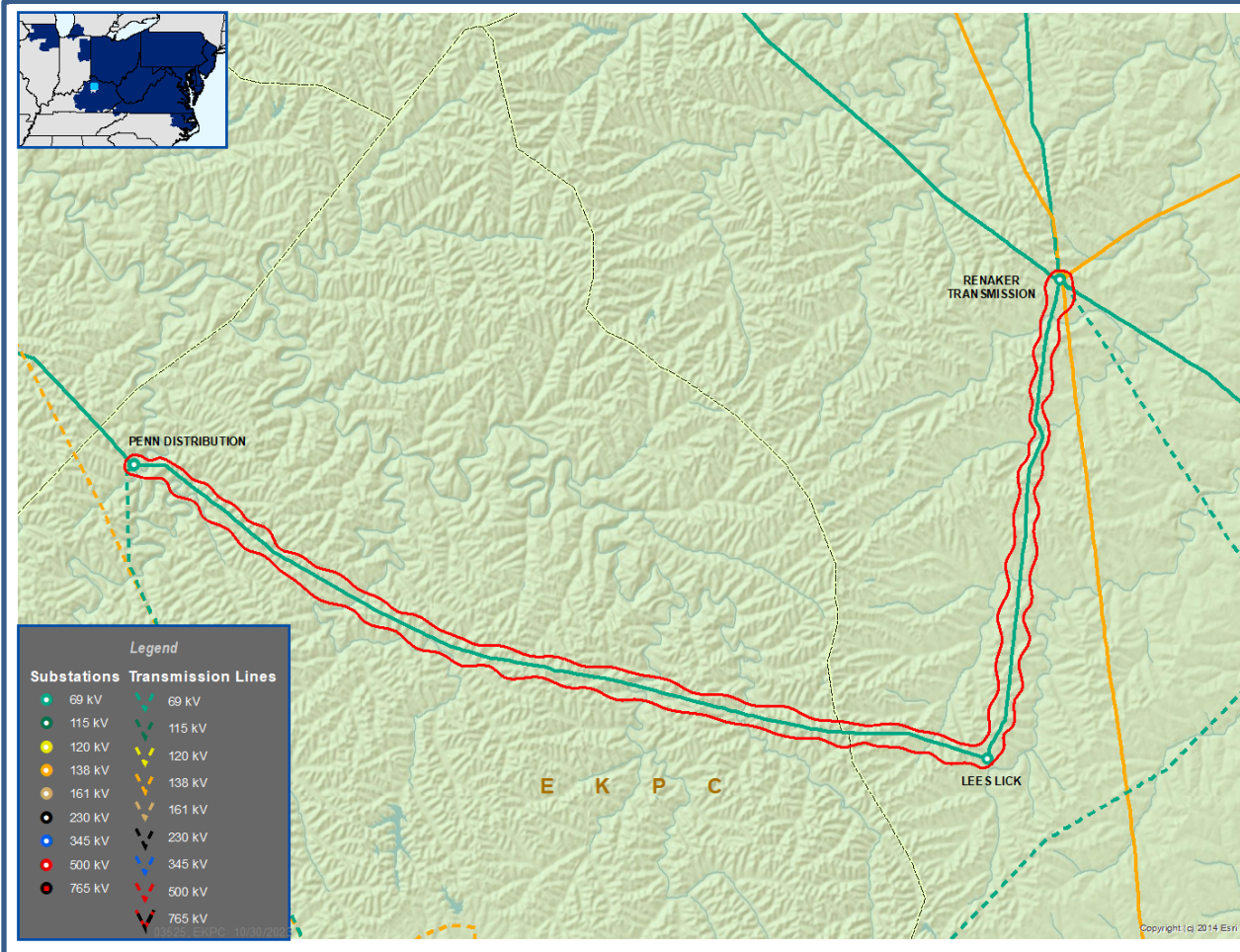
EKPC Assumptions Presentation Slide 13

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: Solutions Meeting – December 15, 2023

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:

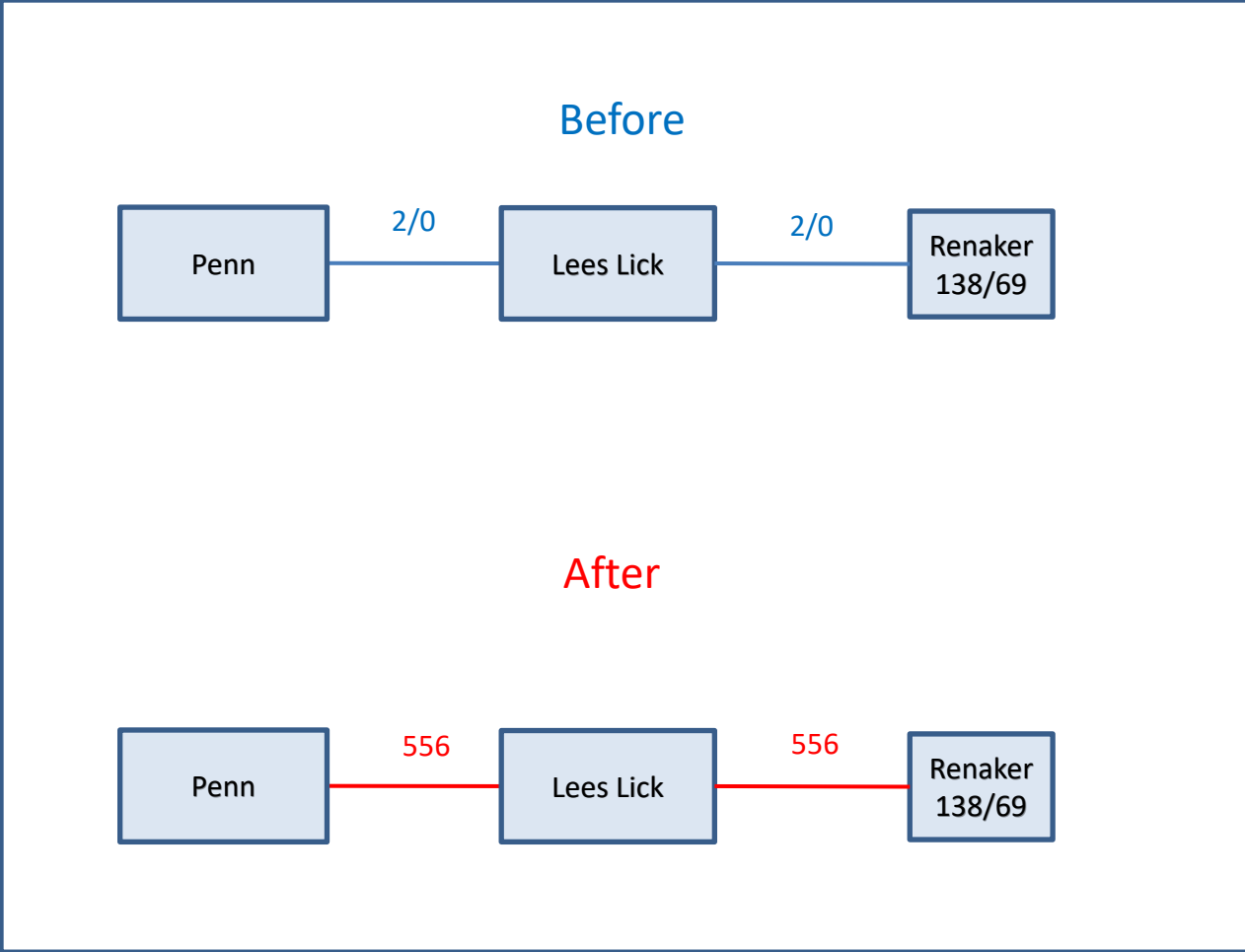
- Convert Lees Lick to 138 KV, construct a new 2.0 mile tap line to connect to the Renaker-Avon 138 KV line. Retire the 20.79 mile, Renaker-Penn 69 KV line section.

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

- 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
Model: N/A



EKPC Transmission Zone M-3 Process Windsor-Somerset

Need Number: EKPC-2023-022

Process Stage: Need Meeting – November 17, 2023

Supplemental Project Driver:
Equipment Material Condition, Performance and Risk

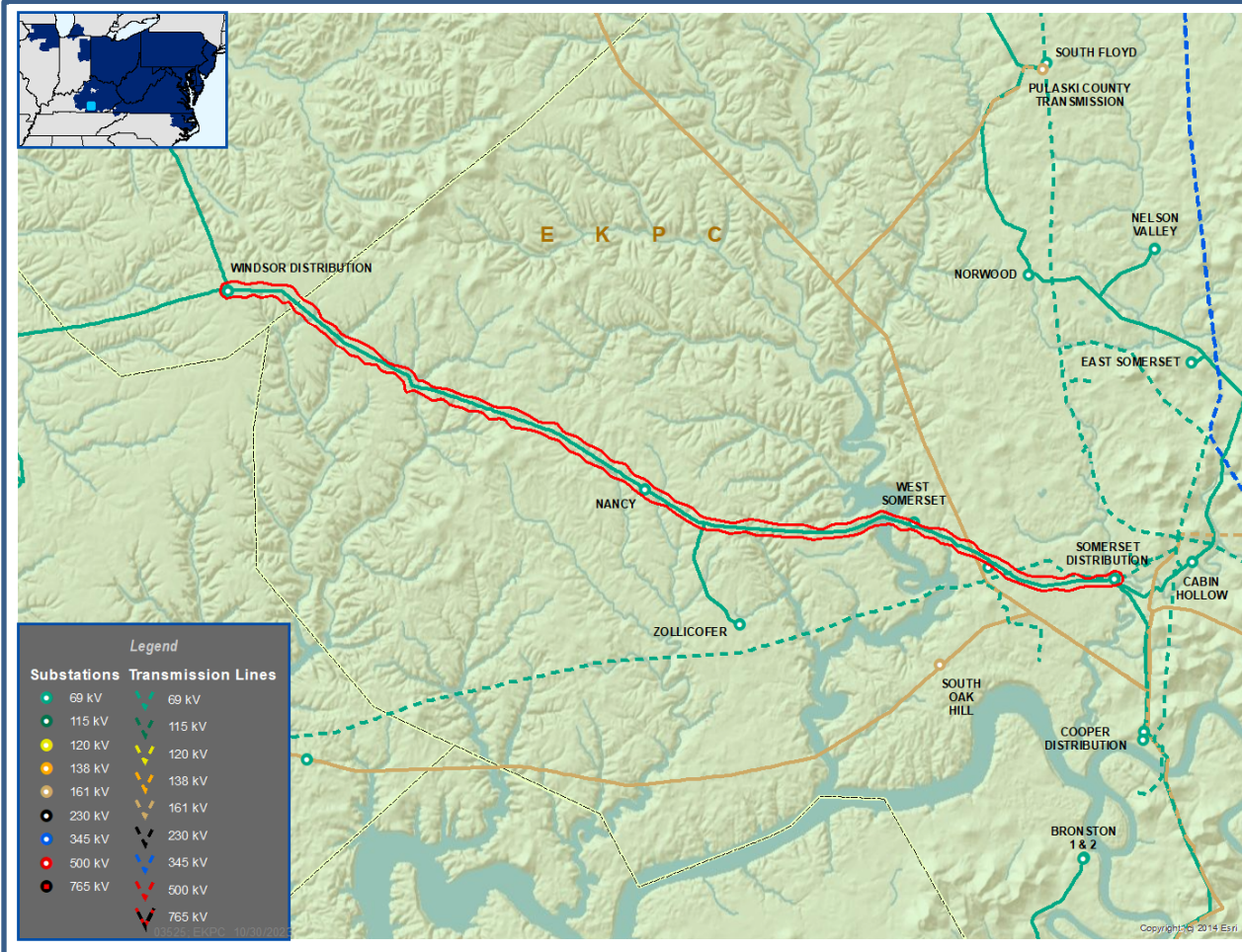
Specific Assumption Reference:
EKPC Assumptions Presentation Slide 13

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: Solutions Meeting – December 15, 2023

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

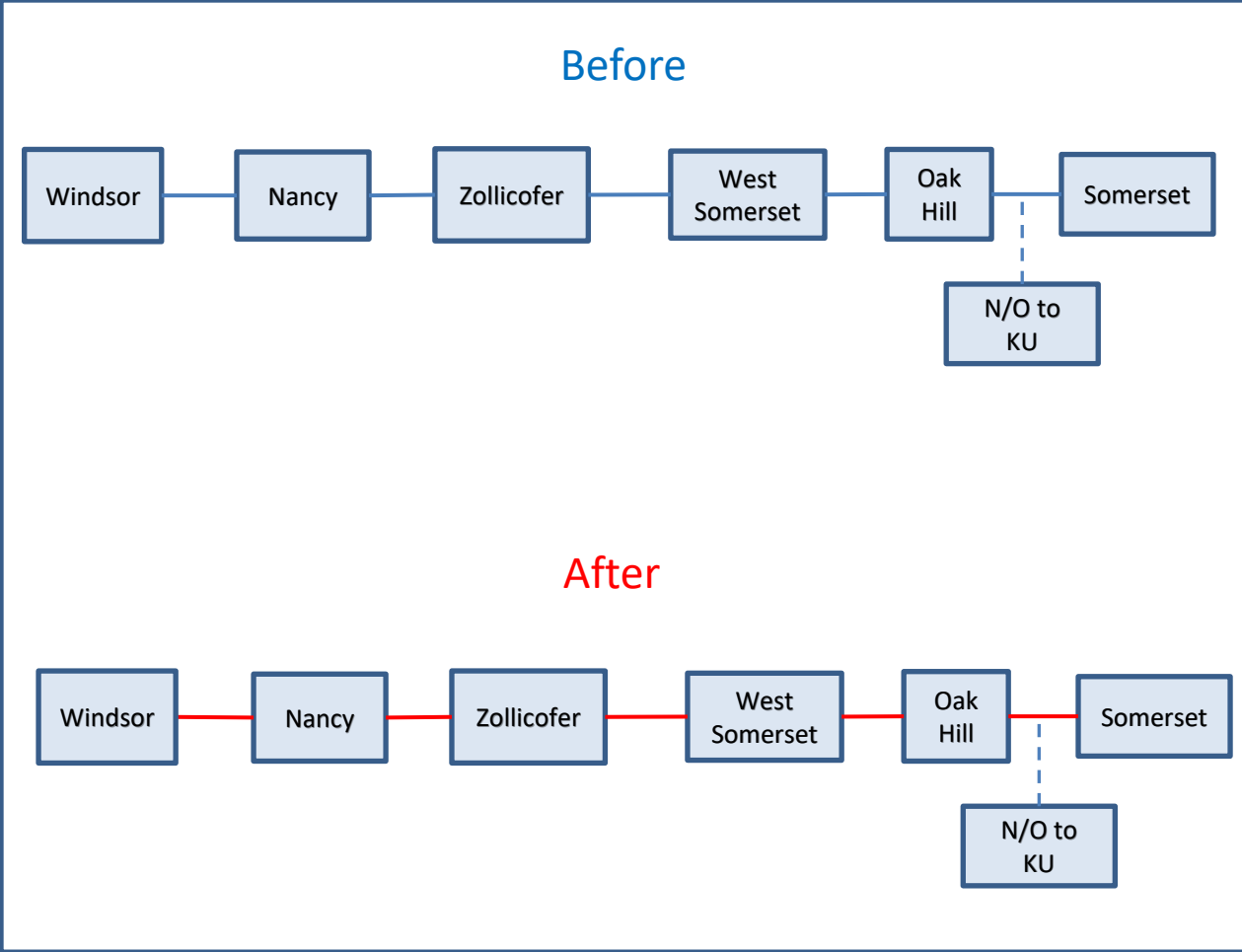
3. Construct a new 161/69 kV transmission station near Oak Hill, build a new 0.18 mile 69 KV line to Oak Hill. Retire the Somerset-Oak Hill NO and Oak Hill Tap-Oak Hill NO line sections. Rebuild the remaining Windsor – Oak Hill Tap line sections.

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

Projected In-Service: 12/1/2027

Project Status: Scoping

Model: N/A



Appendix

High Level M-3 Meeting Schedule

Assumptions	Activity	Timing
	Posting of TO Assumptions Meeting information	20 days before Assumptions Meeting
	Stakeholder comments	10 days after Assumptions Meeting
Needs	Activity	Timing
	TOs and Stakeholders Post Needs Meeting slides	10 days before Needs Meeting
	Stakeholder comments	10 days after Needs Meeting
Solutions	Activity	Timing
	TOs and Stakeholders Post Solutions Meeting slides	10 days before Solutions Meeting
	Stakeholder comments	10 days after Solutions Meeting
Submission of Supplemental Projects & Local Plan	Activity	Timing
	Do No Harm (DNH) analysis for selected solution	Prior to posting selected solution
	Post selected solution(s)	Following completion of DNH analysis
	Stakeholder comments	10 days prior to Local Plan Submission for integration into RTEP
	Local Plan submitted to PJM for integration into RTEP	Following review and consideration of comments received after posting of selected solutions

Revision History

12/5/2023 – V1 – Original version posted to pjm.com