

A decorative graphic consisting of several thin, overlapping, wavy lines in shades of grey and white, positioned at the top of the slide.

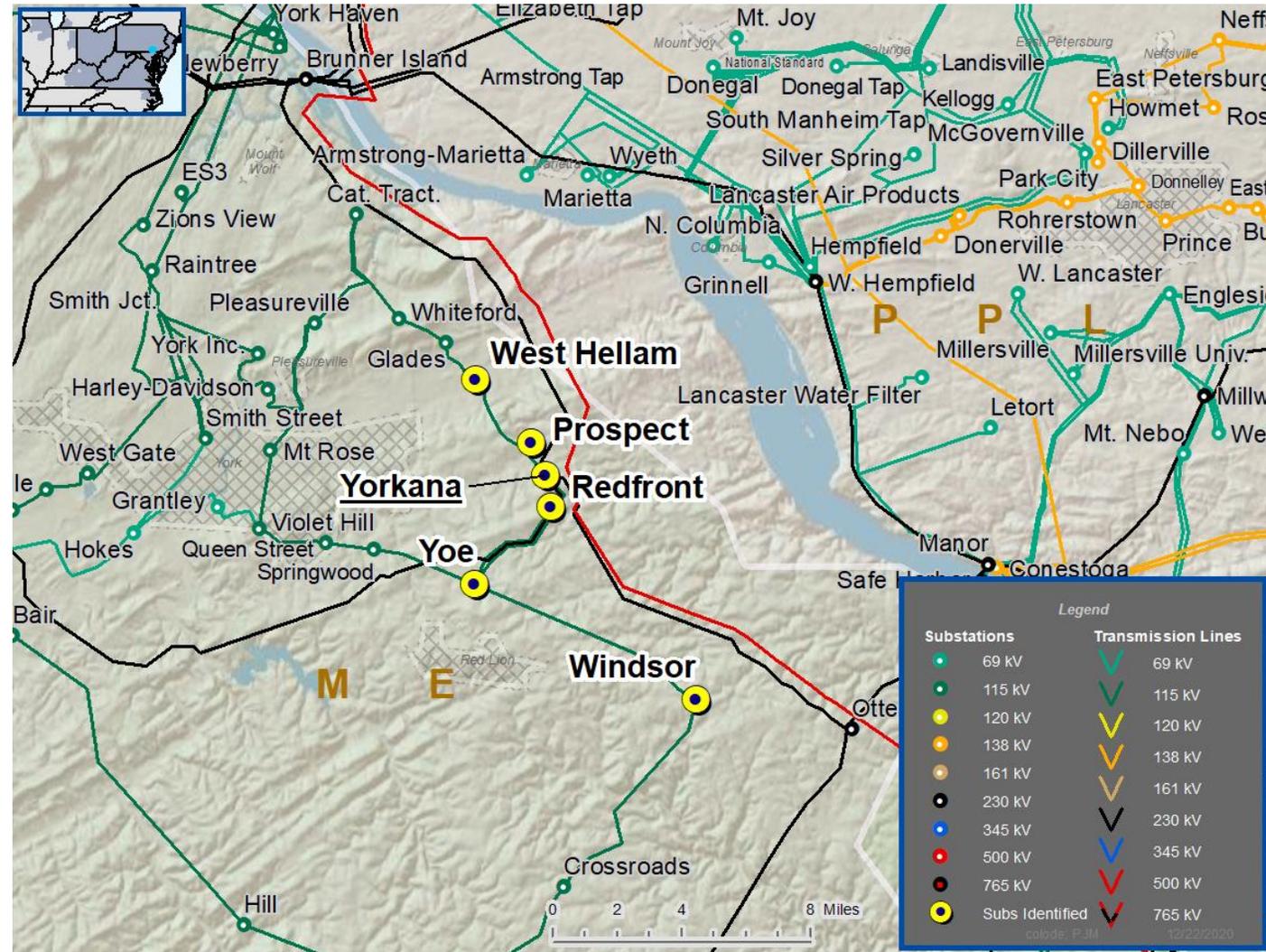
# Appendix: Previously Reviewed Baseline Upgrade Recommendations for the April 2021 PJM Board Review

Note: Items presented at the March 2021 SRRTEP(s) will also be recommended for Board approval.

## Problem Statement – N-1-1 voltage magnitude:

### York generation facility deactivation

- Voltage magnitude violations identified at West Hellam 115 kV, Prospect 115 kV, Yorkana 115 kV, Redfront 115kV, Yoe 115 kV, and Windsor 115 kV buses.
- Loss of Yorkana 230/115 kV #3 transformer followed by Yorkana 230 – Brunner Island 230 kV line and Yorkana 230/115 #1 transformer.
- **Recommended Solution**
  - Install a 120.75 kV 79.4 MVAR capacitor bank at Yorkana 115 kV (B3311).
  - Estimated Project Estimate: \$2.2M
- Required ISD: 5/31/2022
- Projected ISD: 5/31/2022



# Dominion Transmission Zone: Baseline Harrisonburg Area

**Process Stage:** Recommended Solution

**Criteria:** FERC 715 (TO Criteria)

**Assumption Reference:** 2025 RTEP assumption

**Model Used for Analysis:** 2025 RTEP Winter case

**Proposal Window Exclusion:** Below 200 kV

**Problem Statement:**

DOM-VM17, DOM-VD37, DOM-VD38

Voltage magnitude and drop violations around the Harrisonburg area. The loss of 230/115kV transformer #5 and the cap bank at Harrisonburg results in a low voltage violation of 0.896pu and a voltage drop of more than 10% around Harrisonburg.

**Recommended Solution:**

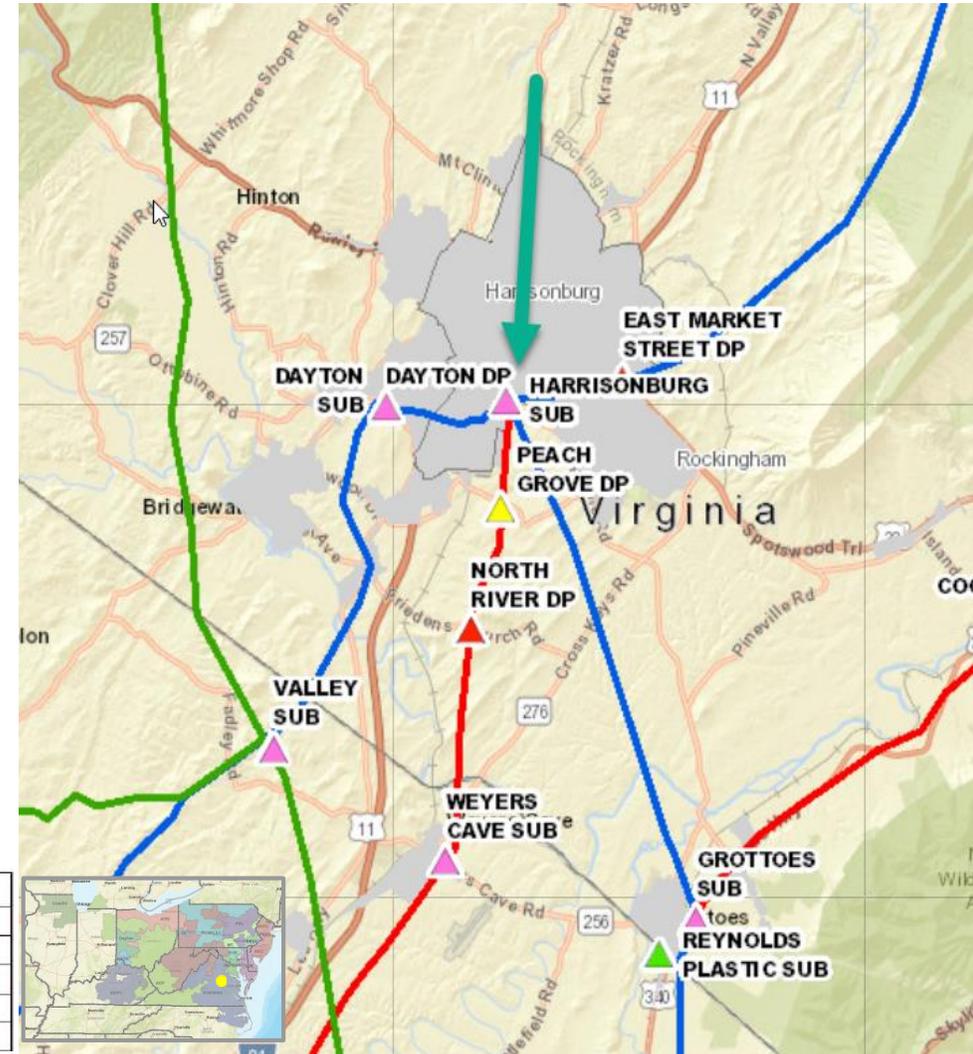
Install a second 115kV 33.67MVar cap bank at Harrisonburg substation along with a 115kV breaker. **(b3262)**

**Estimated Cost:** \$1.25 M

- Substation work for conversion: \$ 1.25 M

**Required In-Service:** 12/1/2025

**Projected In-Service:** 12/1/2025



# Dominion Transmission Zone: Baseline James River DP Area

**Process Stage:** Recommended Solution

**Criteria:** N-1-1 (Winter Voltage Drop), FERC 715 (TO Criteria)

**Assumption Reference:** 2025 RTEP assumption

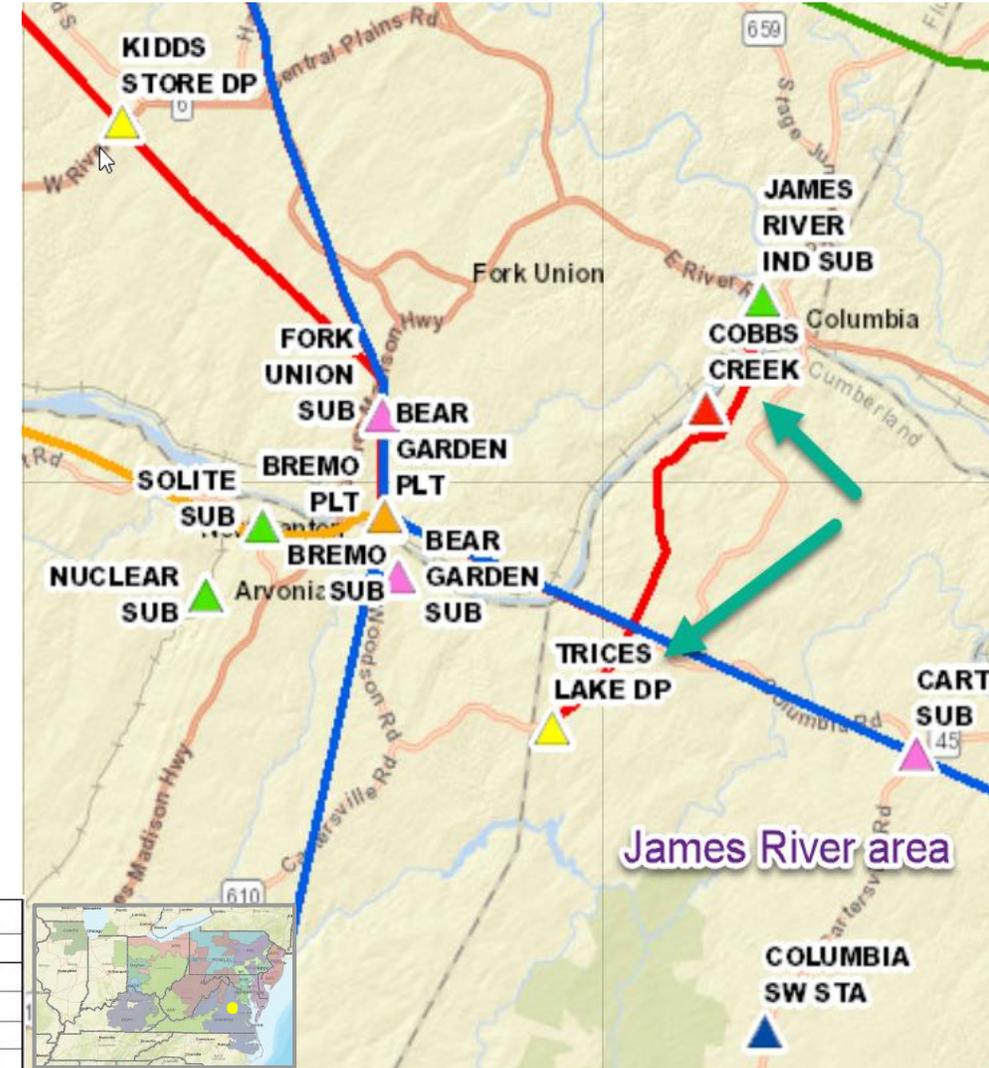
**Model Used for Analysis:** 2025 RTEP Winter case

**Proposal Window Exclusion:** Below 200 kV

**Problem Statement:**

N2-WVD61 to N2-WVD71, DOM-VM1 to DOM-VM16, DOM-VD21 to DOM-VD36

Voltage magnitude and drop violations around the James River area. The loss of 230/115kV transformer #9 at Bremo along with either 115kV Line #1030 or transformer #1 at Fork Union results in low voltage below 0.85 per unit and voltage drop of more than 10% around James River.



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# Dominion Transmission Zone: Baseline James River DP Area

**Recommended Solution:**

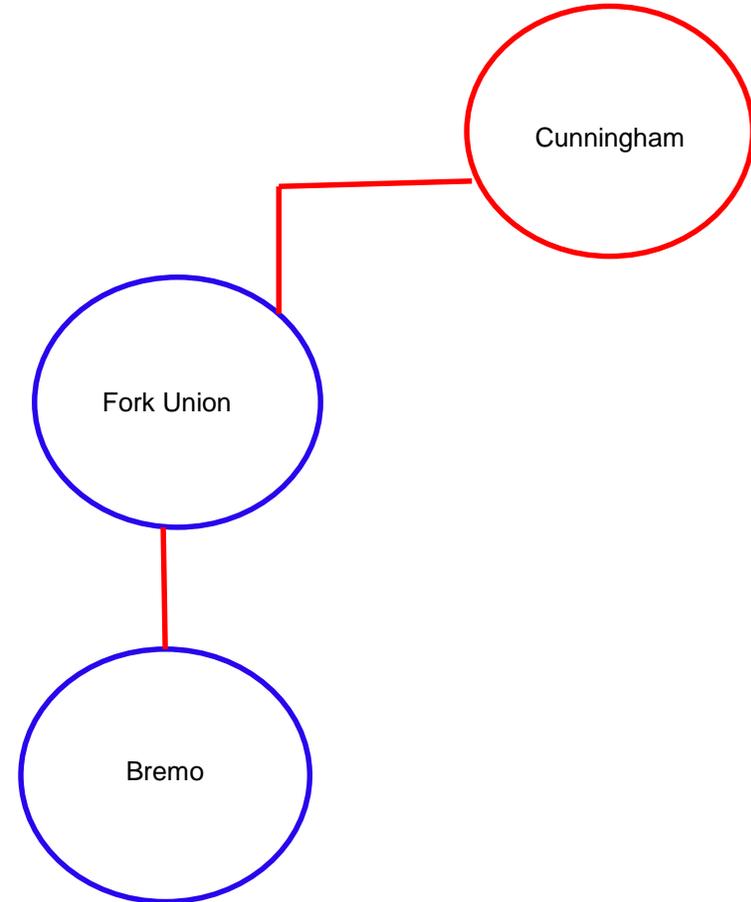
Cut existing 115kV Line #5 between Bremo and Cunningham substations and loop in and out of Fork Union substation. At Fork Union substation, replace the single structure backbone to a double structure backbone and install two new 115kV breakers to terminate the two lines. **(b3263)**

**Estimated Cost:** \$2.5 M

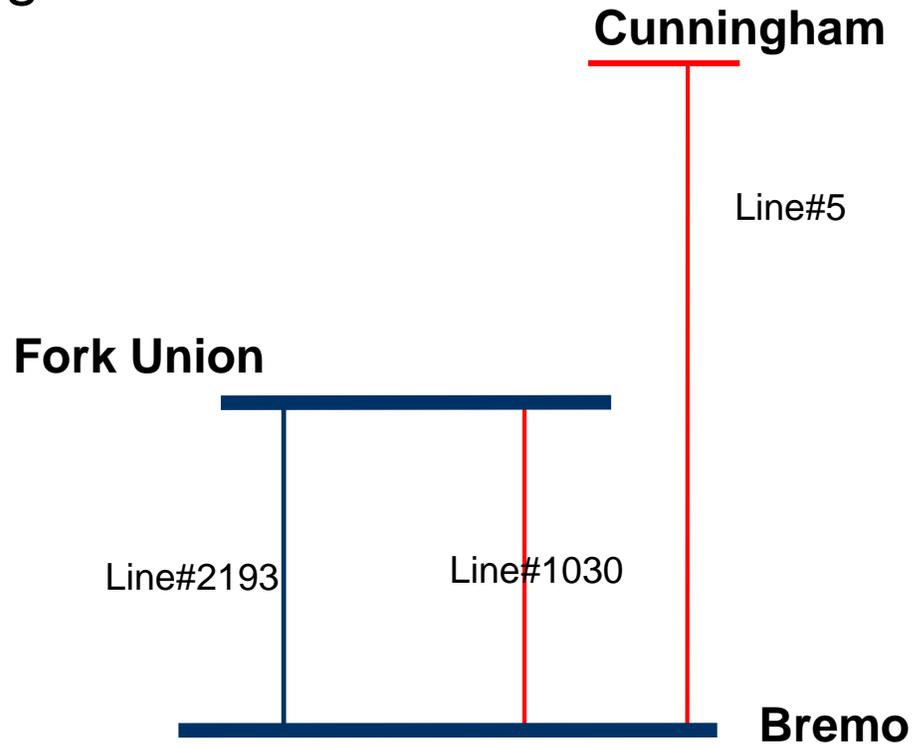
- Transmission work for conversion: \$ 1 M
- Substation work for conversion: \$ 1.5 M

**Required In-Service:** 12/1/2025

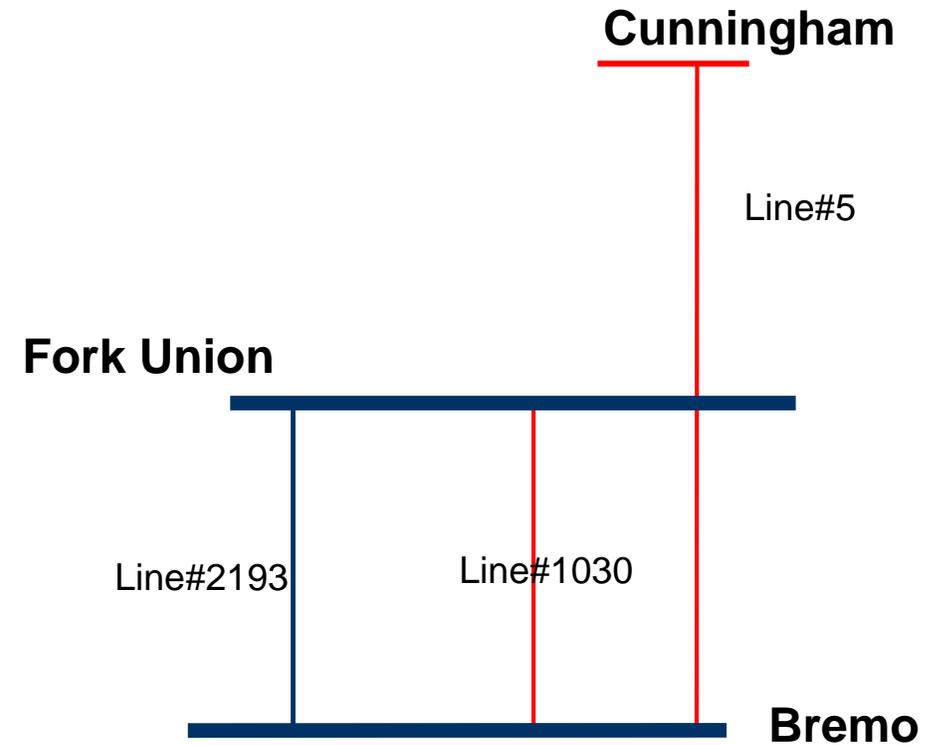
**Projected In-Service:** 12/1/2025



## Existing Oneline



## Proposed Oneline



# Dominion Transmission Zone: Baseline 115kV Line#117 Doods to Dupont-Waynesboro

**Process Stage:** Recommended Solution

**Criteria:** FERC 715 (TO Criteria) C2.7 Network transmission lines - Taps > 4

**Assumption Reference:** 2025 RTEP assumption

**Model Used for Analysis:** 2025 RTEP Summer + Winter cases

**Proposal Window Exclusion:** Below 200 kV

**Problem Statement:**

DOM-02

Currently there are 5 taps on 115kV Line#117 (Doods to Dupont-Waynesboro)

**Recommended Solution:**

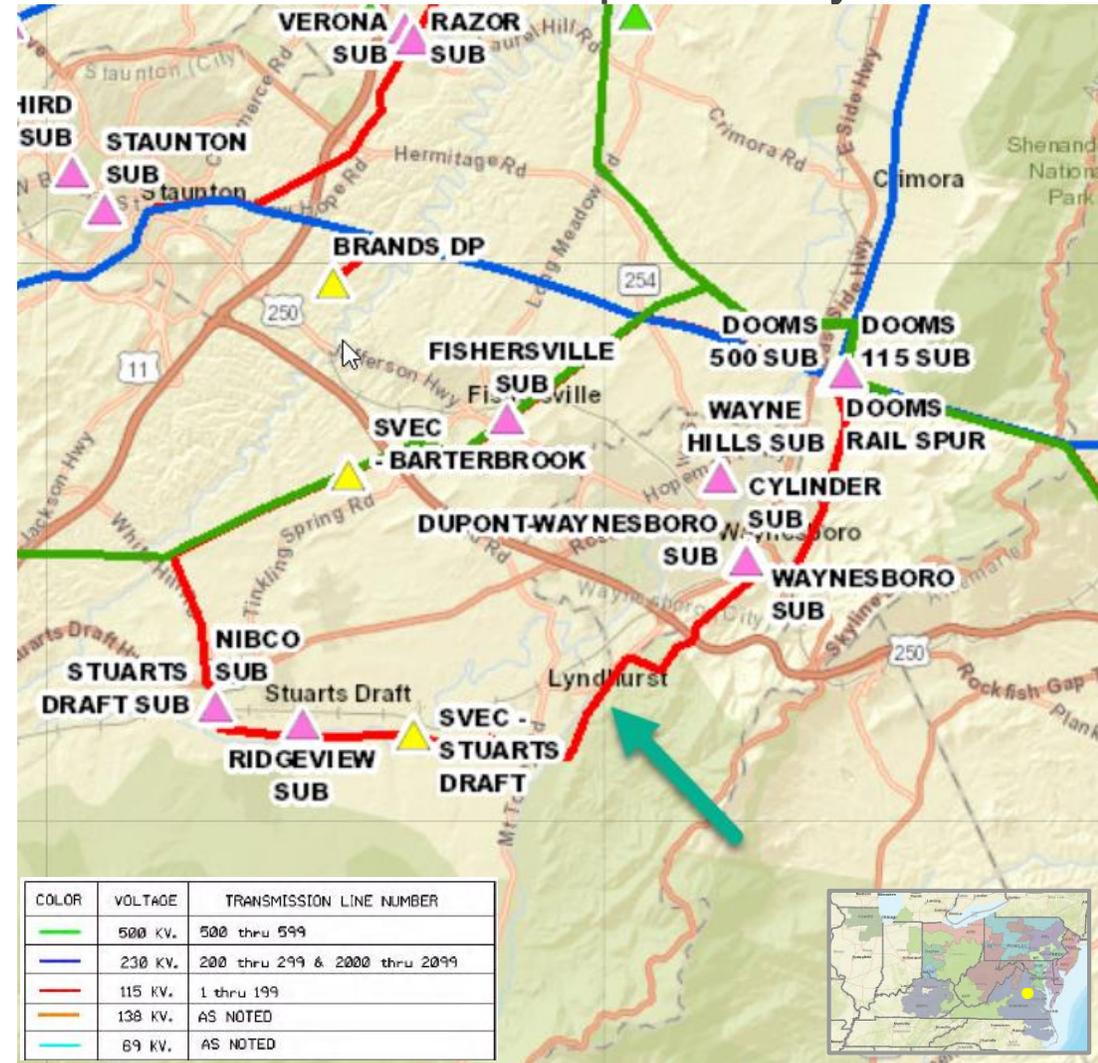
Install a breaker at Stuarts Draft station and section Line#117 into two 115kV lines. (b3264)

**Estimated Cost:** \$5 M

- Transmission work for conversion: \$ 2 M
- Substation work for conversion: \$ 3 M

**Required In-Service:** 6/1/2025

**Projected In-Service:** 12/31/2021



# Dominion Transmission Zone: Baseline Midway and Red Hill Area

**Process Stage:** Recommended Solution

**Criteria:** FERC 715 (TO Criteria)

**Assumption Reference:** 2025 RTEP assumption

**Model Used for Analysis:** 2025 RTEP Winter case

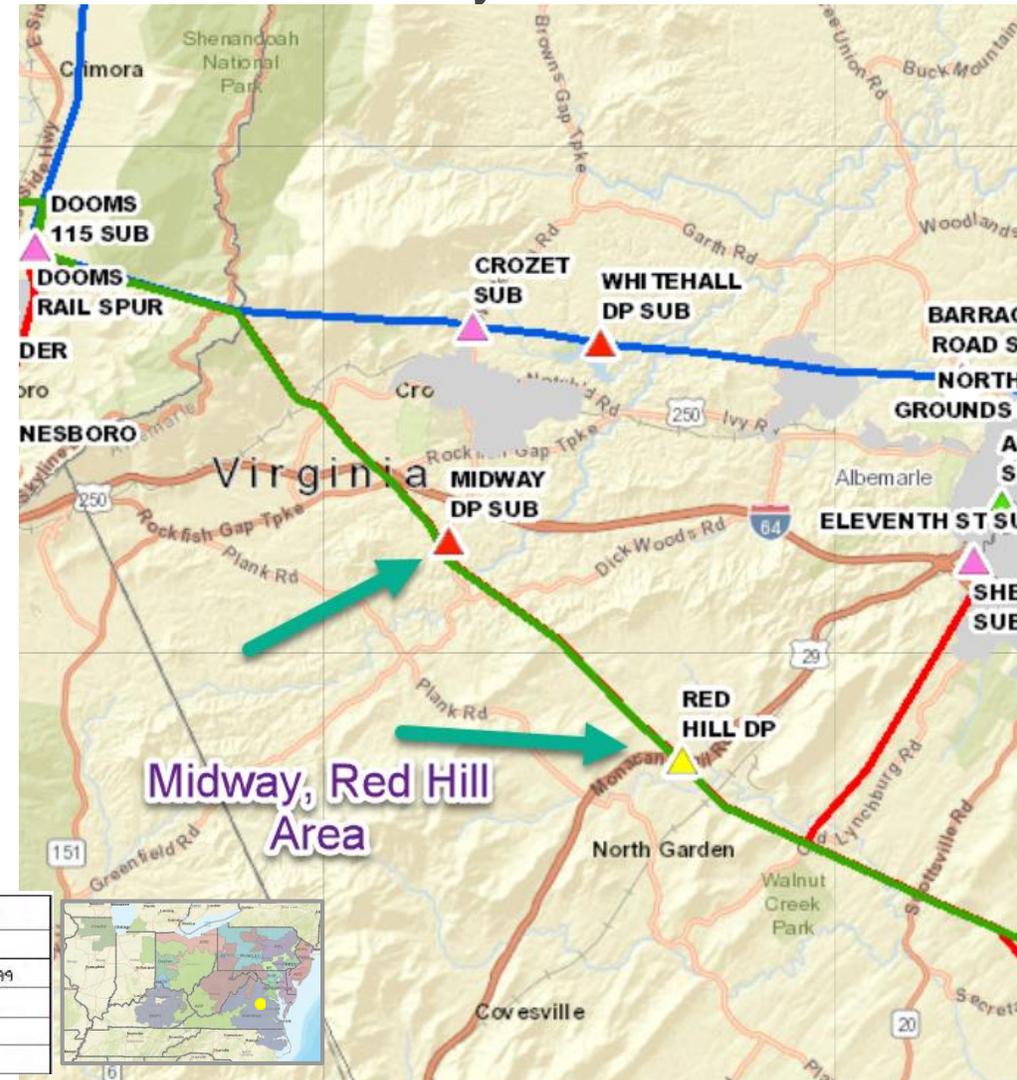
**Proposal Window Exclusion:** Below 200 kV

**Problem Statement:**

DOM-VD1 to DOM-VD20

Various voltage drop violations around the Midway - Red Hill area. Any one of the following contingencies will result in a voltage drop of more than 10% in the Midway - Red Hill area.

- Doms 115kV Bus 2 outage
- Breaker failure on any one of the following breakers at Doms: 10242, 16042, 16043, 16044, 16045, L542-2 and L842-2



COLOR	VOLTAGE	TRANSMISSION LINE NUMBER
Green	500 KV.	500 thru 599
Blue	230 KV.	200 thru 299 & 2000 thru 2099
Red	115 KV.	1 thru 199
Orange	138 KV.	AS NOTED
Cyan	89 KV.	AS NOTED

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# Dominion Transmission Zone: Baseline Midway and Red Hill Area

## Recommended Solution:

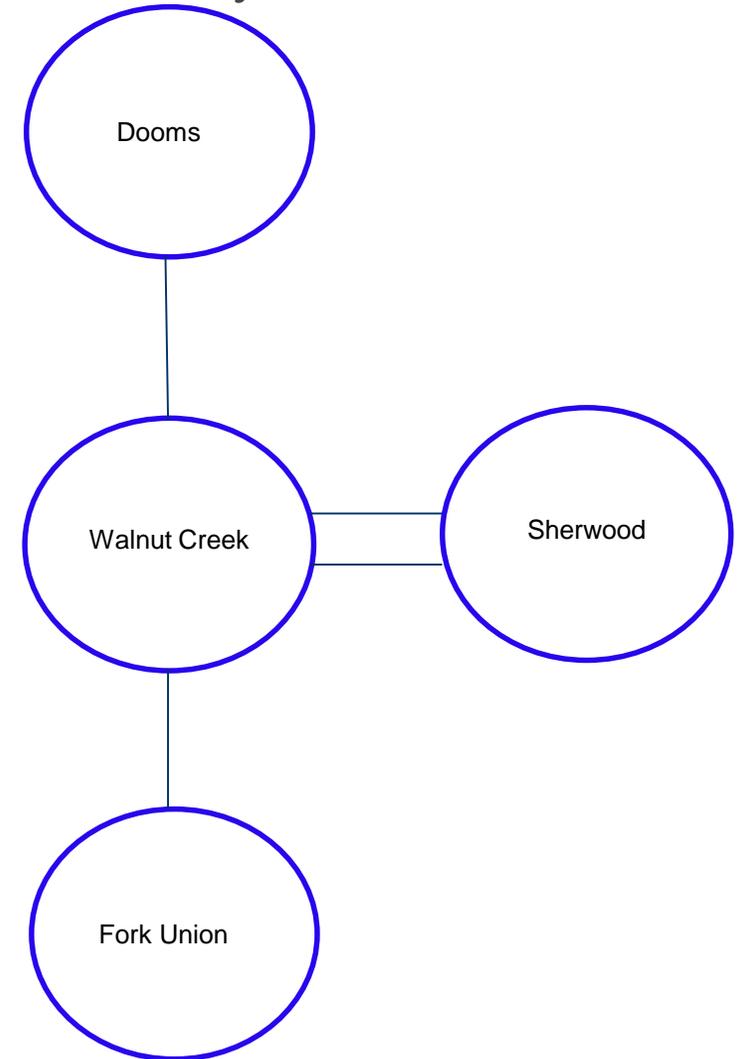
Build a 230kV switching station called Walnut Creek and operate it at 115kV voltage level at the junction where both 115kV lines #91 and #39 start to share a common structure. The station arrangement will be a new 4-115kV breaker ring bus station with an additional 115kV 33.67MVar cap bank. 115kV line #91 and 115kV line #39 will loop in and out of the new station. **(b3268)**

## Estimated Cost: \$12 M

- Transmission work for conversion: \$ 3 M
- Substation work for conversion: \$ 9 M

**Required In-Service:** 12/1/2025

**Projected In-Service:** 12/1/2025



# AEP Transmission Zone: Baseline B3131 Additional Scope

**B3131 Previously Presented:** 9/25/2019, 10/25/2019 and 3/19/2020 SRRTEP

**Criteria:** Winter Generator Deliverability and Basecase Analysis

**Assumption Reference:** PJM RTEP Study

**Model Used for Analysis:** 2024 RTEP Winter Peak Model

**Proposal Window Exclusion:** Substation Equipment and Below 200kV

**Problem Statement:**

The Haviland – East Lima 138kV line is overloaded for multiple contingencies in winter generator deliverability test and basecase analysis test. (N1-WT18, N1-WT19, N1-WT20, N1-WT21, N1-WT22, N1-WT23, N1-WT24, N1-WT25, GD-W244, GD-W3, GD-W4, GD-W5, GD-W7, GD-W8, GD-W19)

**Original Scope:**

At East Lima and Haviland 138 kV stations, replace line relays and wavetrapp, on the East Lima-Haviland 138 kV facility. In addition, replace 500 MCM Cu Risers and Bus conductors at Haviland 138 kV. **(B3131)**

**Estimated Cost:** \$1.5 M

**Existing Facility Ratings:**

From Bus ID	From Bus Name	To Bus ID	To Bus Name	Ckt Id	SN	SE	WN	WE
242989	05E LIMA 138.00	243017	05HAVILAND1 138.00	1	143	143	143	143

**Preliminary Facility Ratings:**

From Bus ID	From Bus Name	To Bus ID	To Bus Name	Ckt Id	SN	SE	WN	WE
242989	05E LIMA 138.00	243017	05HAVILAND1 138.00	1	167	245-167	210	274-210



**Additional Scope:**(Convert part of S1563.2 ) Rebuild approximately 12.3 miles of remaining Lark conductor on the double circuit line between Haviland and East Lima with 1033 54/7 ACSR conductor. (**B3131.1**) S1563.2 estimated cost is reduced from \$32.4M to \$6.5M due to the conversion.

**Estimated Cost for the additional Scope: \$25.9M**

**Preliminary Facility Rating:**

From Bus Name	To Bus Name	Ckt Id	SN	SE	WN	WE
05E LIMA 138.00	05HAVILAND1 138.00	1	210	210	258	258

**Reason for the additional scope:** The original scope for b3131 incorrectly included ratings that indicated the ground clearances on the line conductors between Haviland and East Lima stations would allow for the line to operate at its maximum operating temperature. As the detailed design and engineering effort for the supplemental line rebuild was underway, it was determined that the assumed sag clearances were not available and therefore the emergency ratings could only match the normal ratings of the line conductor. There was no derate on the line required due to the limiting element setting the line ratings to 143; however, additional scope is now needed to mitigate the identified overload by replacing the existing Lark conductor.

**Required In-Service: 12/1/2024**

**Projected In-Service: 12/1/2024**



# ATSI Transmission Zone: Baseline Greenfield 69 kV Substation

**Process Stage:** Recommended Solution

**Criteria:** Short Circuit

**Assumption Reference:** 2025 RTEP assumption

**Model Used for Analysis:** 2025 RTEP cases

**Proposal Window Exclusion:** Below 200 kV

**Problem Statement:**

FG: ATSI-SC100

In the 2020 RTEP 2025 FERC 715 analysis breaker 501-B-251 at Greenfield substation was identified as over its Short Circuit capability

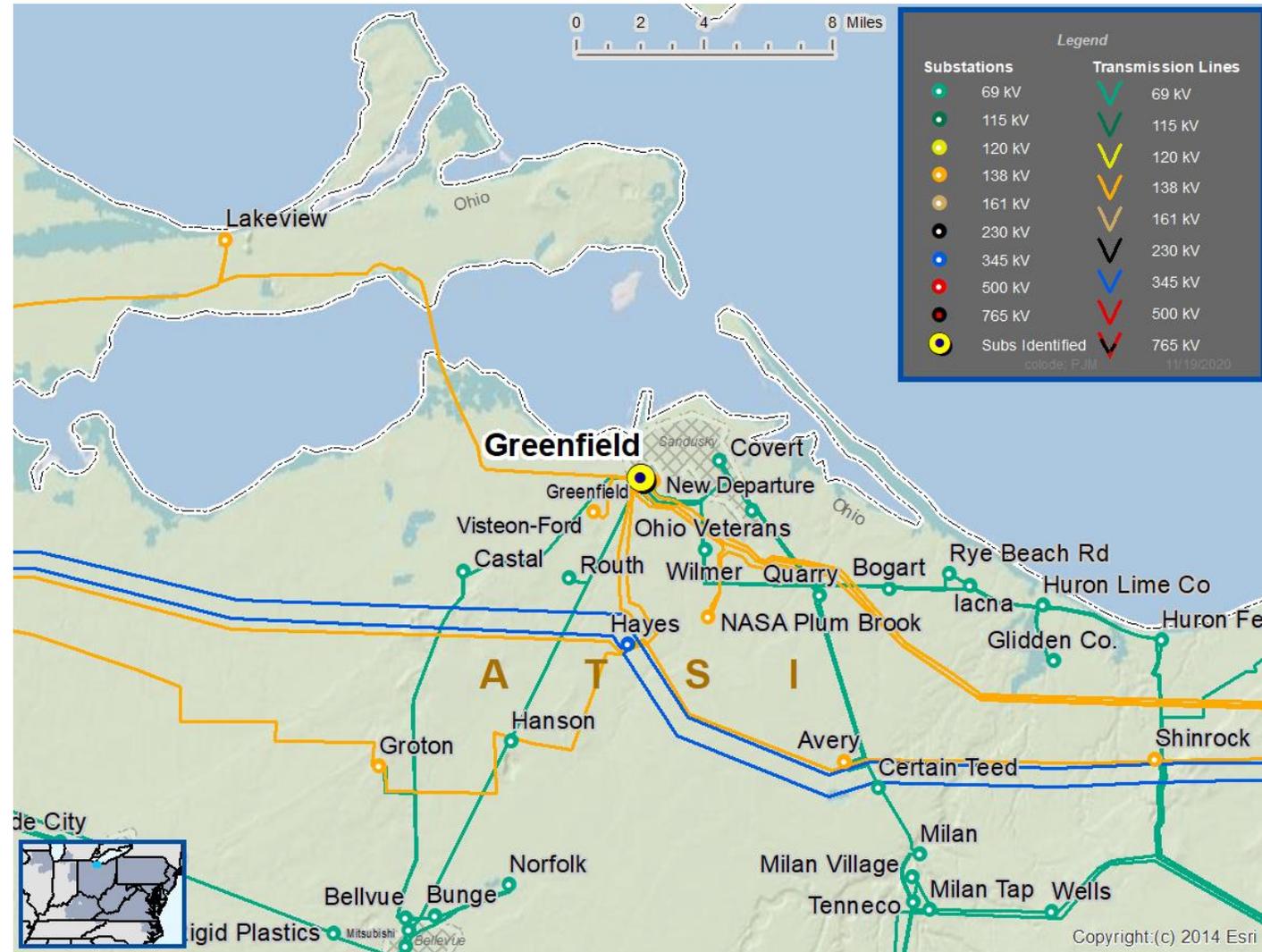
**Proposed Solution:** Replace the existing breaker 501-B-251 with a new 69 kV breaker with a higher (40 kA) interrupting capability (**B3260**)

**Estimated Cost:** \$0.86M

**Alternatives:** N/A

**Required In-Service:** 12/1/2021

**Previously Presented:** 12/18/2020



# AEP Transmission Zone: Baseline Cabin Creek – Kelly Creek Rebuild

**Process Stage:** Recommended Solution

**Criteria:** AEP 715 criteria

**Assumption Reference:** 2025 RTEP assumption

**Model Used for Analysis:** 2025 RTEP cases

**Proposal Window Exclusion:** Below 200 kV

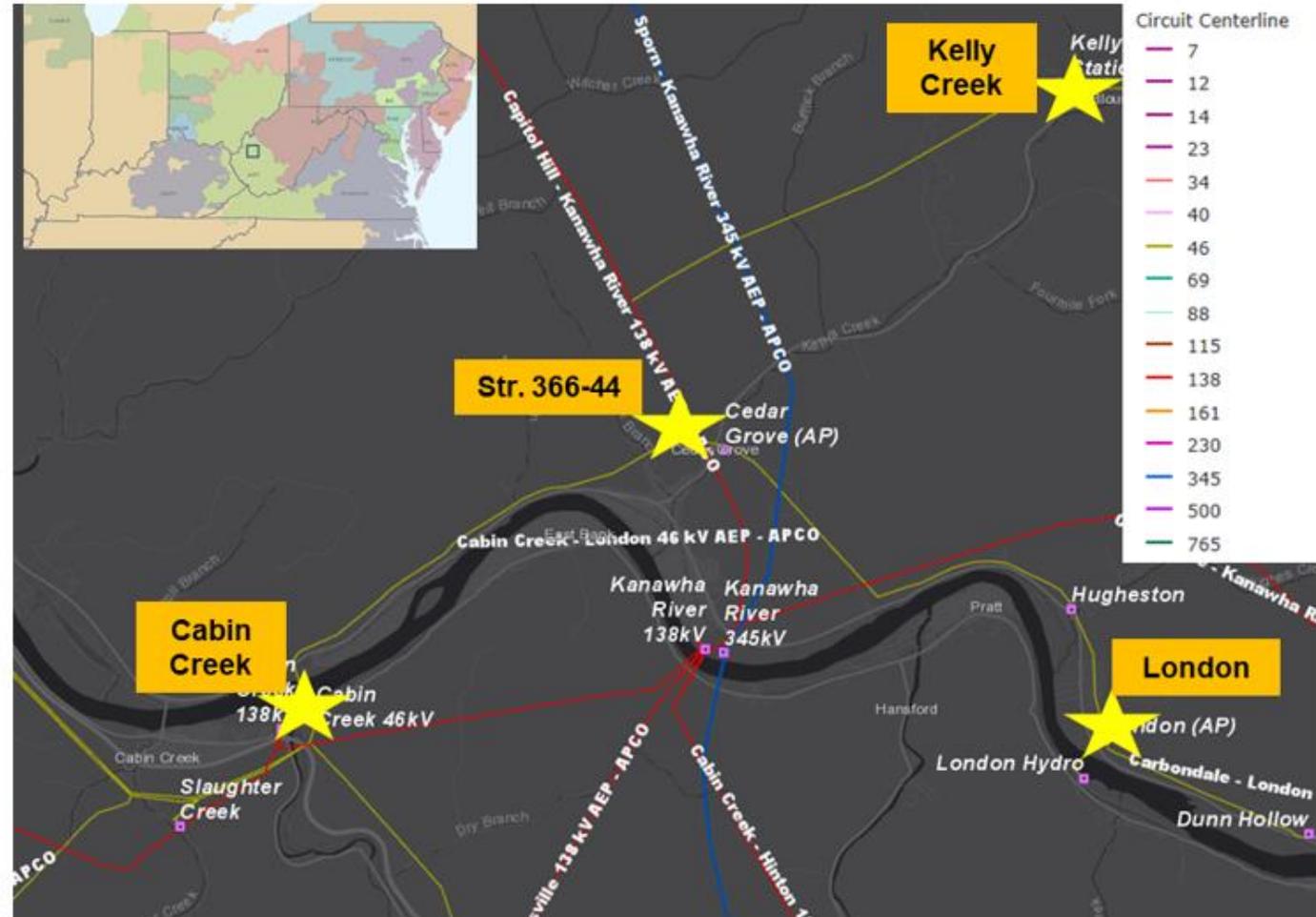
**Problem Statement:**

FG: AEP-T409 and AEP-410

In the 2025 Summer RTEP case, the Cabin Creek - Kelly Creek 46 kV line is overload for N-1-1 outage of the loss of the Amber Ridge – Linden Road 138kV line and the loss of Dagoon - Irelan– Jackson Road 138KV line and Dagoon 138/34.5kV transformer.

**Existing Facility Rating:**

Branch	SN/SE/WN/WE (MVA)
03KELLY CK – 05CABNCRK1 46kV	31/31/43/43



# AEP Transmission Zone: Baseline Cabin Creek – Kelly Creek Rebuild

## Recommended Solution:

Rebuild the existing Cabin Creek - Kelly Creek 46 kV line (to structure 366-44), approximately 4.4 miles. This section is double circuit with the existing Cabin Creek - London 46 kV line so a double circuit rebuild would be required (**B3280**)

**Estimated Cost:** \$17.9M

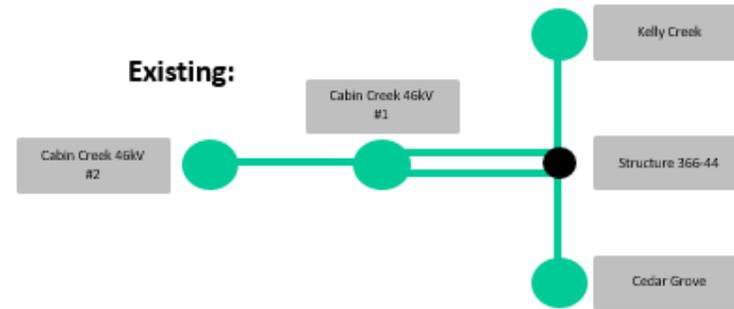
## Preliminary Facility Rating:

Branch	SN/SE/WN/WE (MVA)
05KELLY CK – 05CABNCRK1 46kV	45/50/60/63

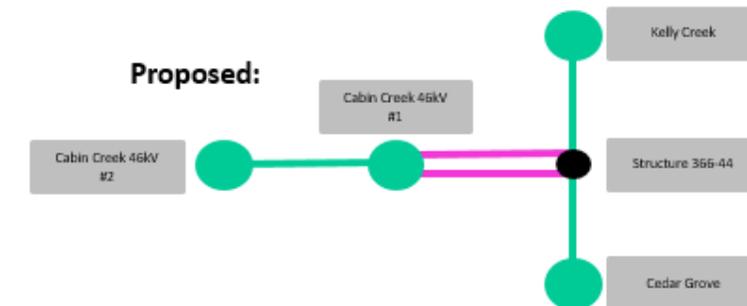
**Required In-Service:** 6/1/2025

**Projected In-Service:** 6/1/2025

**Previously Presented:** 12/18/2020



Legend	
500 kV	
345 kV	
138 kV	
46 kV	
34.5 kV	
23 kV	
New	



# AEP Transmission Zone: Baseline Lock Lane - Point Pleasant Rebuild

**Process Stage:** Recommended Solution

**Criteria:** AEP 715 criteria

**Assumption Reference:** 2025 RTEP assumption

**Model Used for Analysis:** 2025 RTEP cases

**Proposal Window Exclusion:** Below 200 kV

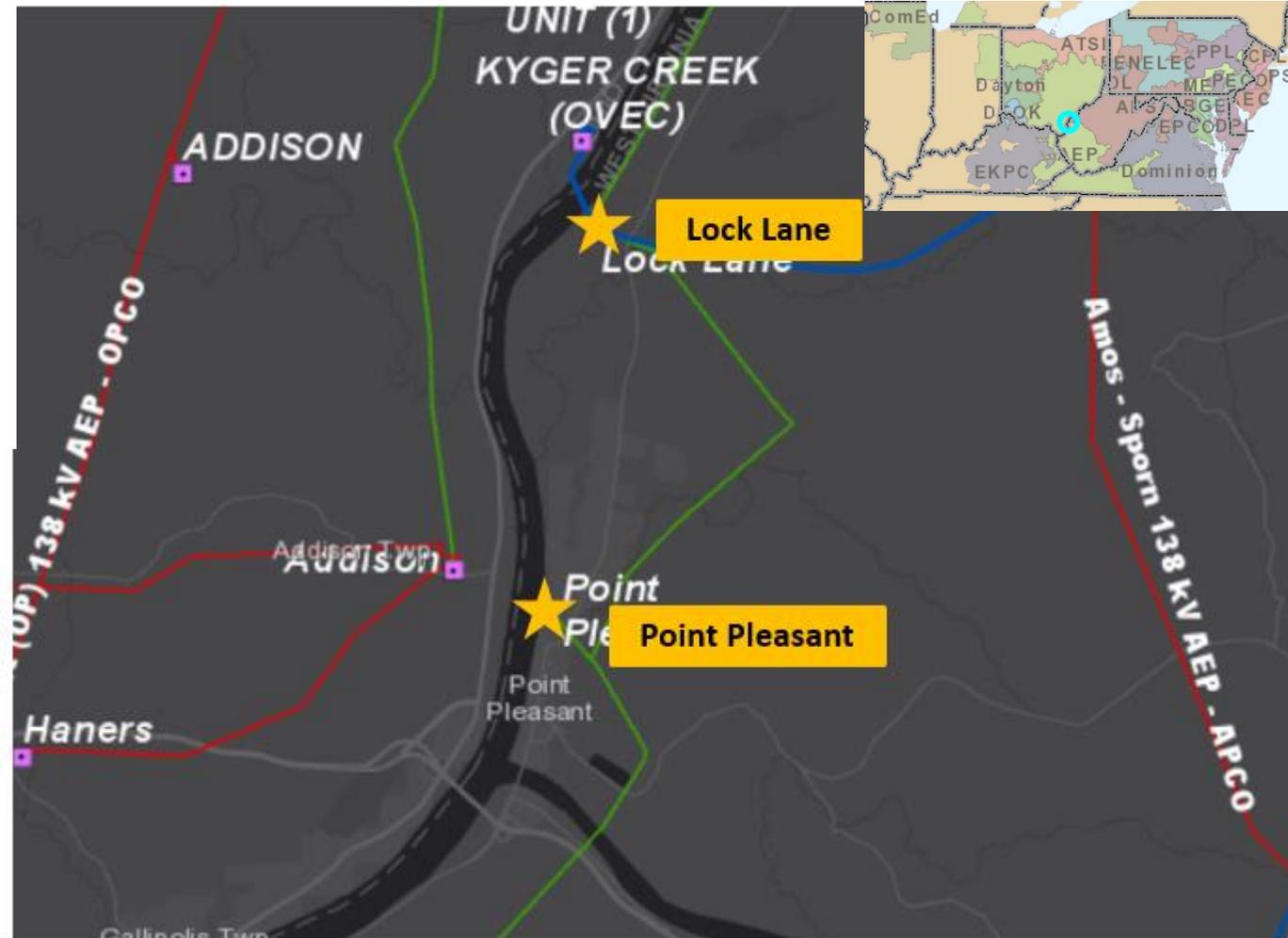
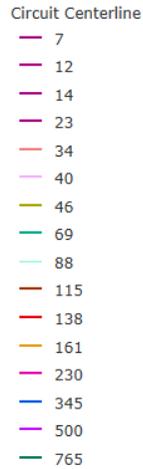
**Problem Statement:**

FG: AEP-T37, AEP-T38, AEP-T39, AEP-T40, AEP-T41, AEP-T42, AEP-T43

In the 2025 Summer and Winter RTEP cases, the Lock Lane – Point Pleasant 69kV line is overloaded in the event of an N-1-1 scenario that includes the loss of both 138kV sources into Apple Grove (Apple Grove – Sporn 138 kV and Apple Grove – South Point 138 kV).

**Existing Facility Rating:**

Branch	SN/SE/WN/WE (MVA)
05LOCK LAN – 05PTPLEASN 69kV	44/44/56/56



# AEP Transmission Zone: Baseline Lock Lane - Point Pleasant Rebuild

## Recommended Solution:

Rebuild ~5.44 miles of 69kV line from Lock Lane to Point Pleasant. **(B3284) Estimated Cost: \$13.5M**

## Preliminary Facility Rating:

Branch	SN/SE/WN/WE (MVA)
05LOCK LAN – 05PTPLEASN 69kV	102/102/129/129

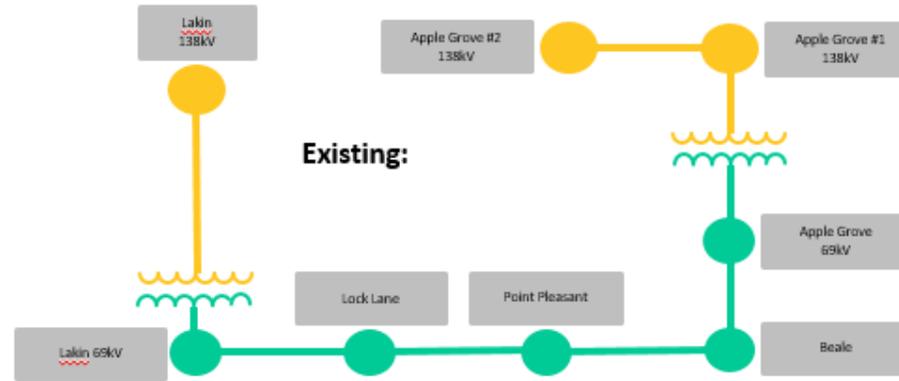
## Ancillary Benefits:

Addresses needs presented to stakeholders as AEP-2020-AP017.

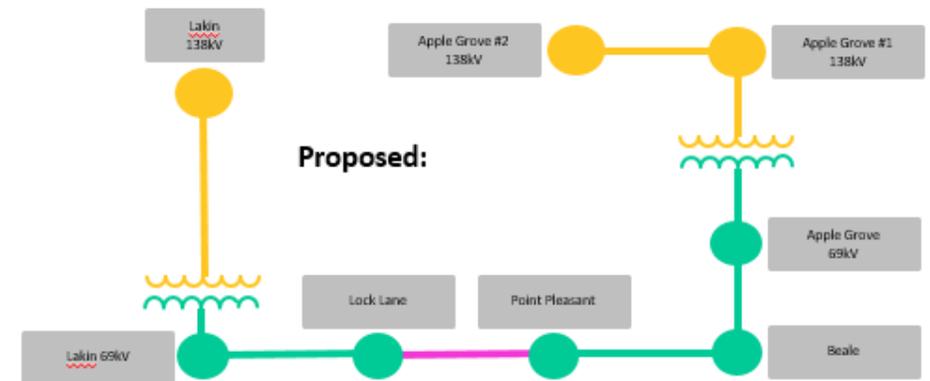
**Required In-Service: 6/1/2025**

**Projected In-Service: 6/1/2025**

**Previously Presented: 12/18/2020**



Legend	
500 kV	
345 kV	
138 kV	
69 kV	
34.5 kV	
23 kV	
New	



# AEP Transmission Zone: Baseline Meigs Area Upgrades

**Process Stage:** Recommended Solution

**Criteria:** AEP 715 criteria

**Assumption Reference:** 2025 RTEP assumption

**Model Used for Analysis:** 2025 RTEP cases

**Proposal Window Exclusion:** Below 200 kV & Substation equipment exclusion

**Problem Statement:**

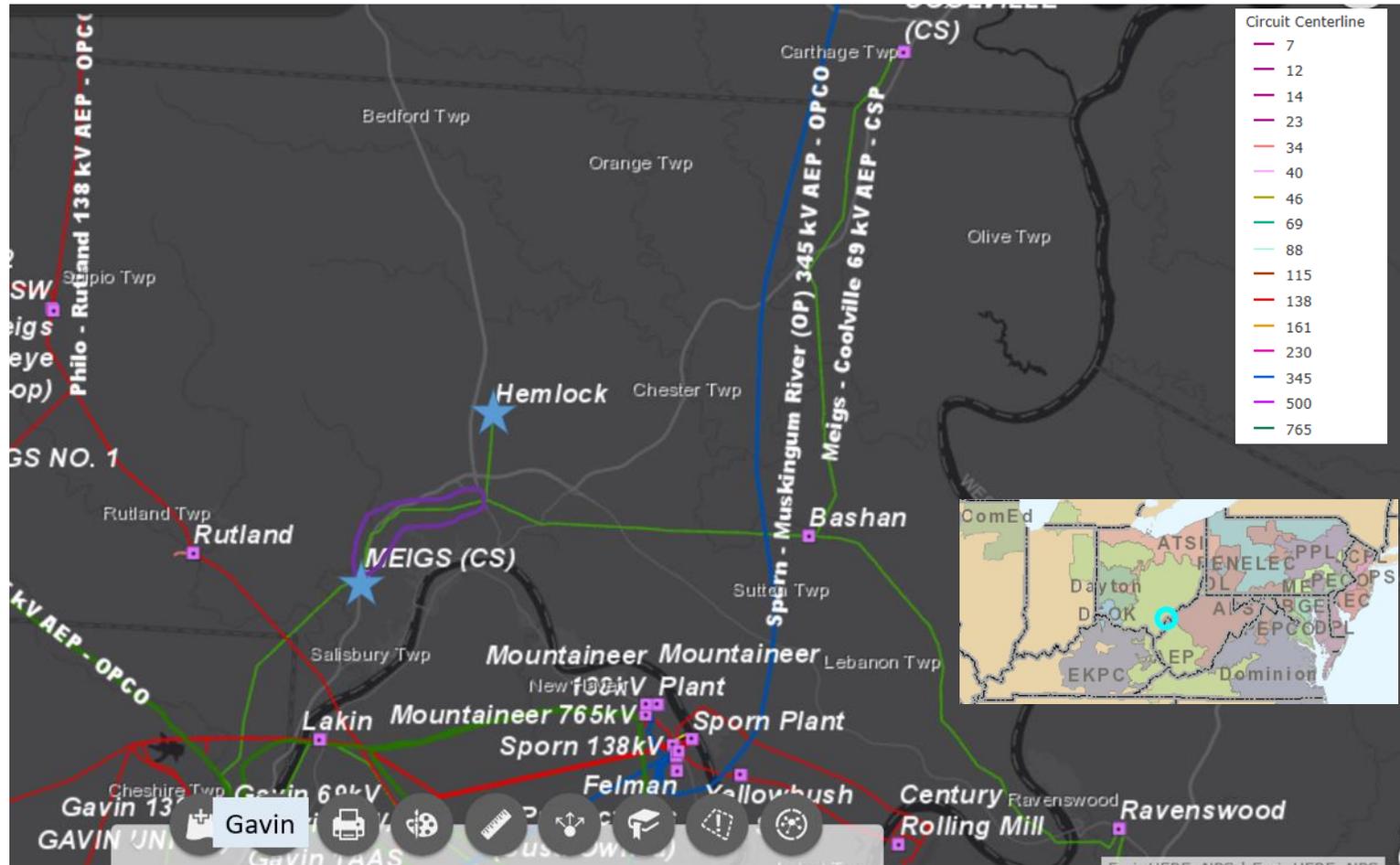
FG: AEP-T12, AEP-T13, AEP-T14, AEP-T15, AEP-T143, AEP-T144, AEP-T145, AEP-T146, AEP-T182, AEP-T183, AEP-T184, AEP-T185

In 2025 Summer and Winter RTEP cases, the N-1-1 of the Ripley 138/69 kV 130 MVA transformer and the Ravenswood – Racine 69 kV and the N-1-1 of the Leon - Ripley 138 kV and the Ravenswood – Racine 69 kV overloads the following:

- \*Meigs – Gavin 69 kV to 101.75% of its WE rating of 82 MVA
- \*Meigs – Hemlock 69 kV to 120.11% of its WE rating of 63 MVA
- \*Meigs – Hemlock 69 kV to 121.74% of its SE rating of 50MVA

**Existing Facility Rating:**

Branches	SN/SE/WN/WE (MVA)
05MEIGS – 05HEMLOCK 69KV	50/50/63/63
05GAVIN1 – 05MEIGS 69KV	55/69/72/82



# AEP Transmission Zone: Baseline Meigs Area Upgrades

## Recommended Solution:

Replace the Meigs 69 kV 4/0 Cu station riser towards Gavin and rebuild the section of the Meigs – Hemlock 69 kV circuit from Meigs to approximately structure #40 (~4 miles) replacing the line conductor 4/0 ACSR with the line conductor size 556.5 ACSR. (B3285)

**Estimated Cost:** \$12.14M

## Preliminary Ratings:

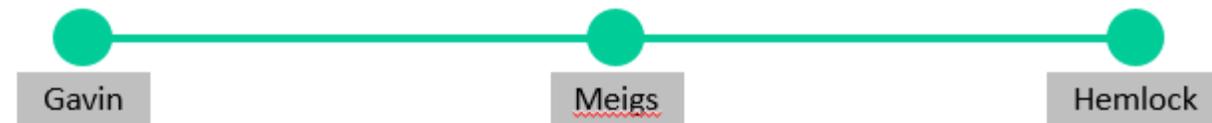
Branches	SN/SE/WN/WE (MVA)
05MEIGS – 05HEMLOCK 69KV	79/90/100/109
05GAVIN1 – 05MEIGS 69KV	75/75/94/94

**Required In-Service:** 6/1/2025

**Projected In-Service:** 9/15/2024

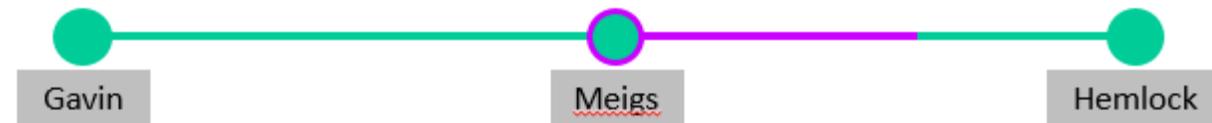
**Previously Presented:** 12/18/2020

## Existing:



Legend	
500 kV	
345 kV	
138 kV	
69 kV	
34.5 kV	
23 kV	
New	

## Proposed:



# AEP Transmission Zone: Baseline Merrimac - Midway 69 kV Line

**Process Stage:** Recommended Solution

**Criteria:** AEP 715 criteria

**Assumption Reference:** 2025 RTEP assumption

**Model Used for Analysis:** 2025 RTEP cases

**Proposal Window Exclusion:** Below 200 kV

**Problem Statement:**

FG: AEP-T413, AEP-T414, AEP-T418, AEP-T423

In 2025 Summer and Winter RTEP cases, the Merrimac - Midway 69 kV branch is overloaded for the N-1-1 contingencies of the loss of the Matt Funk – Tech Drive 138kV line and the loss of the South Christiansburg – Claytor - Hazel Hollow 138kV line

**Existing Facility Rating:**

Branch	SN/SE/WN/WE (MVA)
05MERRIMAC – 05MIDWAY 69KV	44/65/56/73



# AEP Transmission Zone: Baseline Merrimac - Midway 69 kV Line

## Recommended Solution:

Reconductor the first 3 spans from Merrimac station to Str. 464-3 of 3/0 ACSR conductor utilizing 336 ACSR on the existing Merrimac – Midway 69 kV circuit. **(B3286)**

**Estimated Cost:** \$0.45M

## Preliminary Ratings:

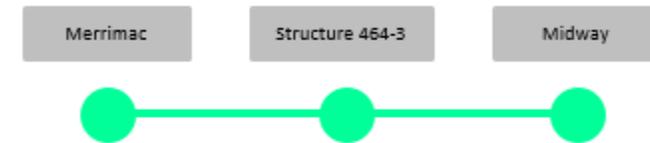
Branch	SN/SE/WN/WE (MVA)
05MERRIMAC – 05MIDWAY 69KV	75/110/94/121

**Required In-Service:** 6/1/2025

**Projected In-Service:** 6/1/2025

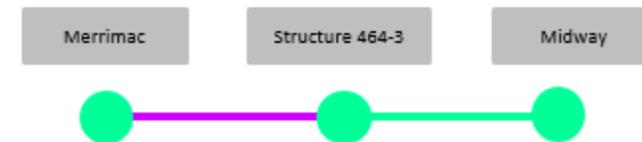
**Previously Presented:** 12/18/2020

## Existing Configuration:



Legend	
500 kV	
345 kV	
138 kV	
69 kV	
34.5 kV	
23 kV	
New	

## Future Configuration:



# AEP Transmission Zone: Baseline Moundsville 69kV Riser Upgrade

**Process Stage:** Recommended Solution

**Criteria:** AEP 715 criteria

**Assumption Reference:** 2025 RTEP assumption

**Model Used for Analysis:** 2025 RTEP cases

**Proposal Window Exclusion:** Substation equipment exclusion

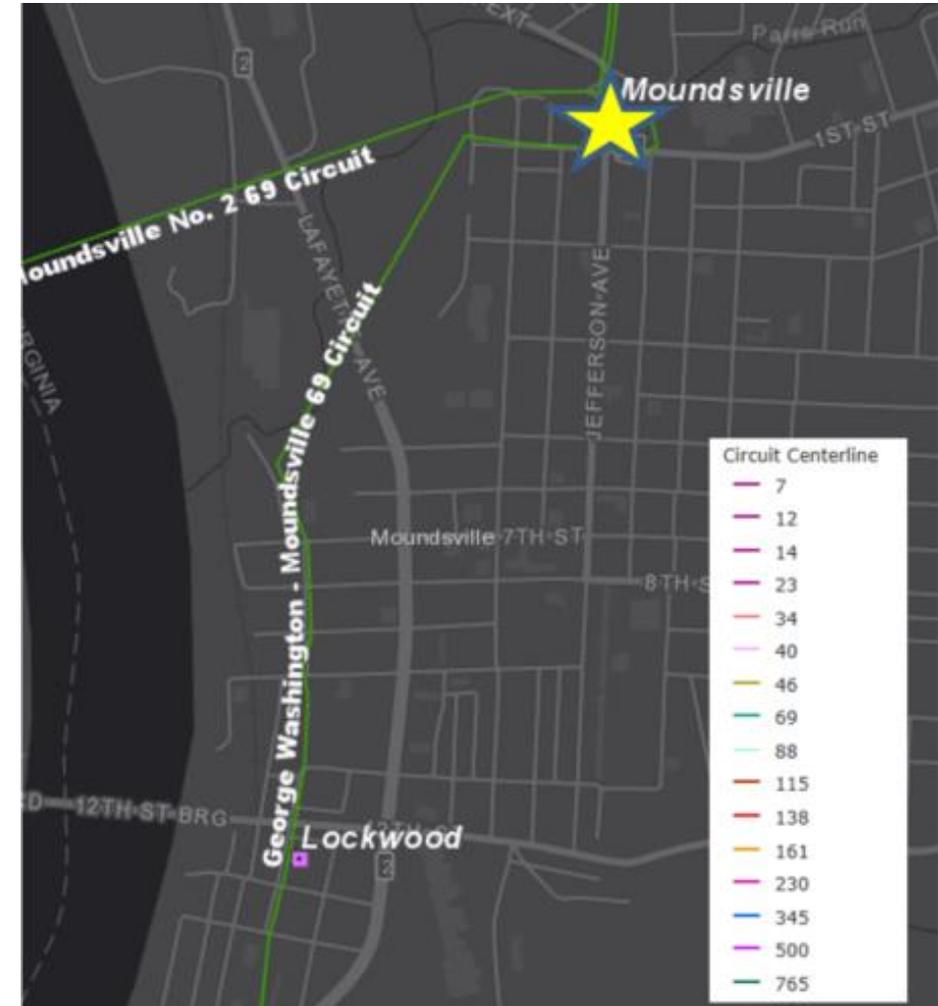
**Problem Statement:**

FG:AEP-T271, AEP-T272

In 2025 Summer RTEP case, risers at Moundsville station are overloading for the N-1-1 contingency of the loss of the Kammer – West Bellaire 138kV line and the loss of the West Bellaire 345/138 transformer #3

**Existing Facility Rating:**

Branch	SN/SE/WN/WE (MVA)
05LOCKWOODSS – 05MOUNVIL 69KV	68/86/90/103



# AEP Transmission Zone: Baseline Moundsville 69kV Riser Upgrade

## Recommended Solution:

Upgrade 69kV risers at Moundsville station towards George Washington. (B3287)

**Estimated Cost:** \$0.05M

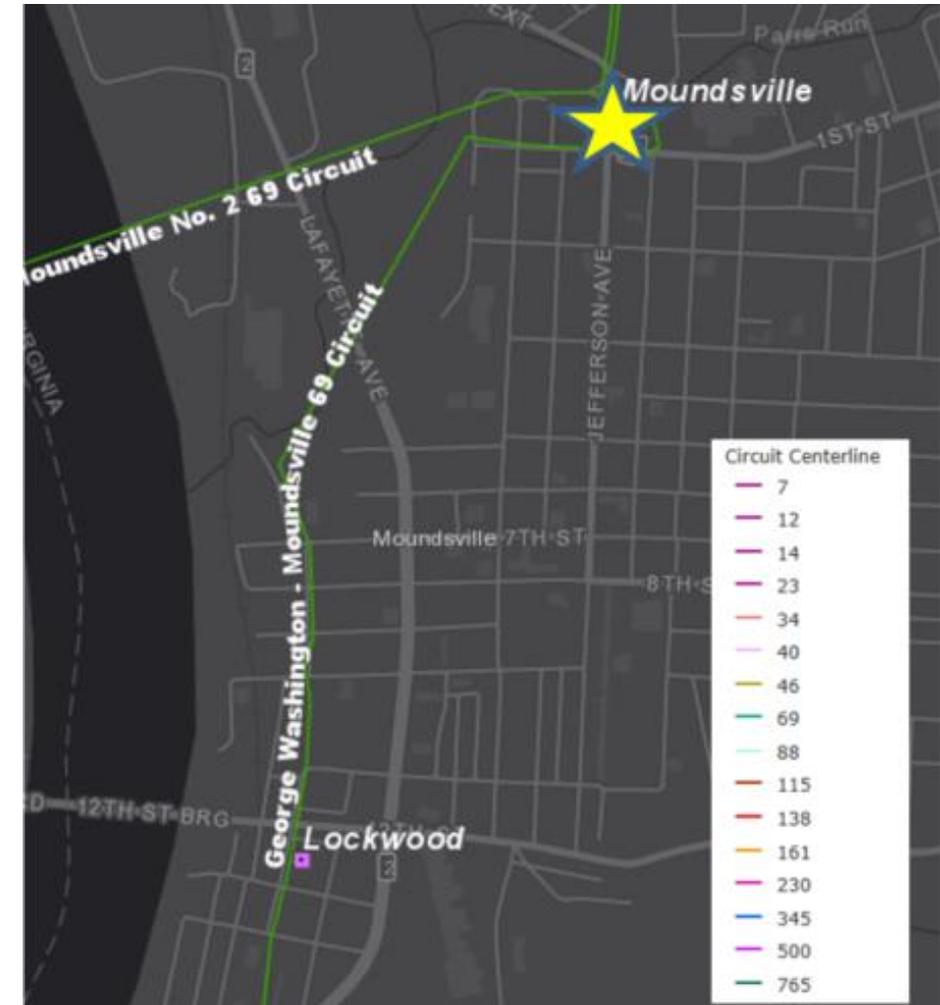
## Preliminary Ratings:

Branch	SN/SE/WN/WE (MVA)
05LOCKWOODSS – 05MOUNVIL 69KV	110/127/139/152

**Required In-Service:** 6/1/2025

**Projected In-Service:** 9/1/2024

**Previously Presented:** 12/18/2020



# AEP Transmission Zone: Baseline New Camp - Stone 69kV

**Process Stage:** Recommended Solution

**Criteria:** AEP 715 criteria

**Assumption Reference:** 2025 RTEP assumption

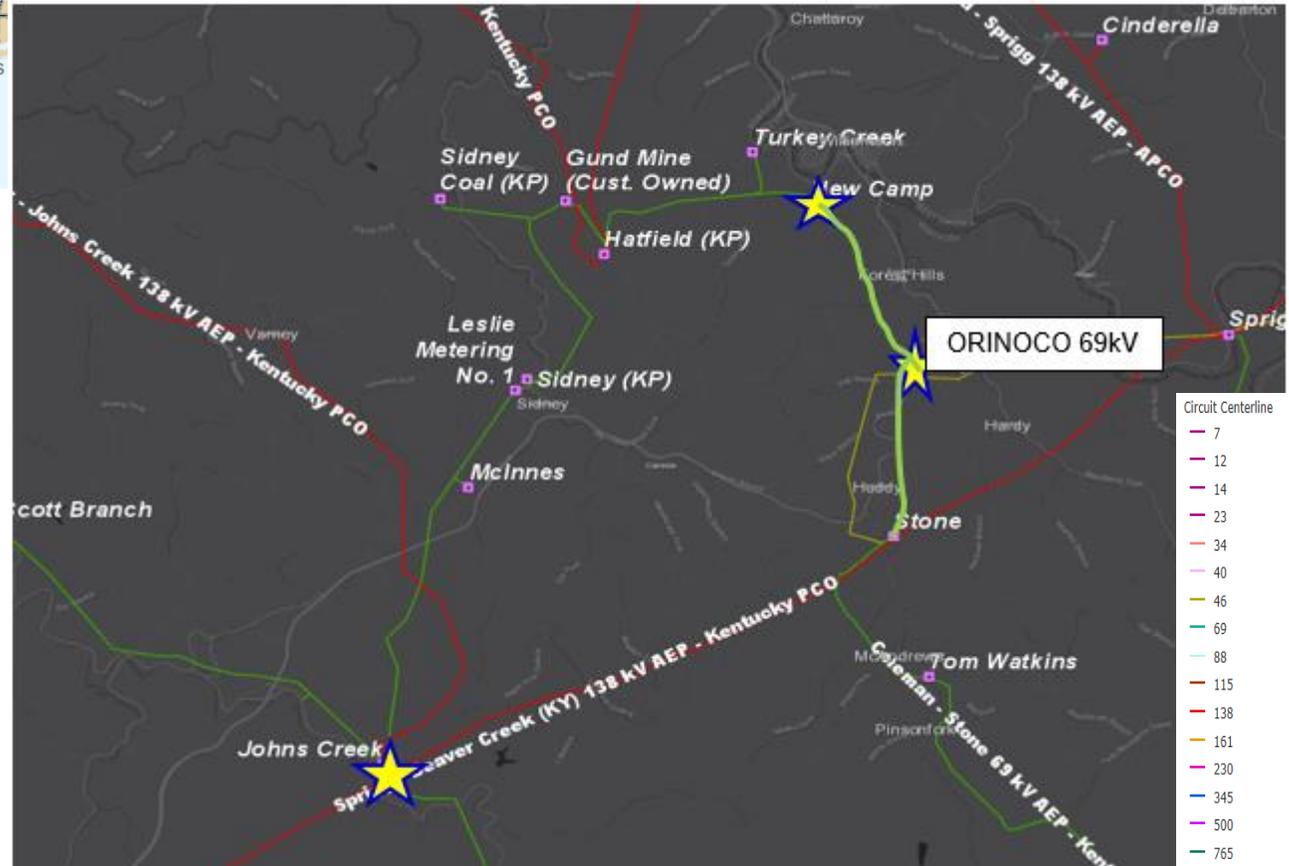
**Model Used for Analysis:** 2025 RTEP cases

**Proposal Window Exclusion:** Below 200 kV

**Problem Statement:**

AEP-VD1160, AEP-VD1161.

In the 2025 Winter RTEP case, voltage drop violations at New Camp 69kV in the event of an N-1-1 scenario that involves the loss 138/69 kV transformer at Johns Creek and loss of Inez - Sprigg 138kV line.



# AEP Transmission Zone: Baseline New Camp - Stone 69kV

## Recommended Solution:

Construct ~ 2.75 mi Orinoco - Stone 69kV transmission line in the clear between Orinoco station and Stone station.

**(B3288.1) Estimated Transmission Cost: \$9.23 M**

Construct ~ 3.25 mi Orinoco – New Camp 69kV transmission line in the clear between Orinoco station and New Camp station.

**(B3288.2) Estimated Transmission Cost: \$9.95 M**

At Stone substation, Circuit breaker A to remain in place and be utilized as T1 low side breaker, Circuit Breaker B to remain in place and be utilized as new Hatfield (via Orinoco and New Camp) 69KV line breaker. Add new 69KV Circuit Breaker E for Coleman Line exit.

**(B3288.3) Estimated Transmission Cost: \$0.66 M**

Reconfigure the New Camp tap which includes access road improvements/installation, temporary wire and permanent wire work along with dead end structures installation.

**(B3288.4) Estimated Transmission Cost: \$0.45 M**

At New Camp substation, rebuild the 69kV bus, add 69KV MOAB W and replace the 69KV Ground switch Z1 with a 69kV Circuit Switcher on the New Camp Transformer.

**(B3288.5) Estimated Transmission Cost: \$1.18 M**

## Total estimated baseline Cost: \$21.47 M

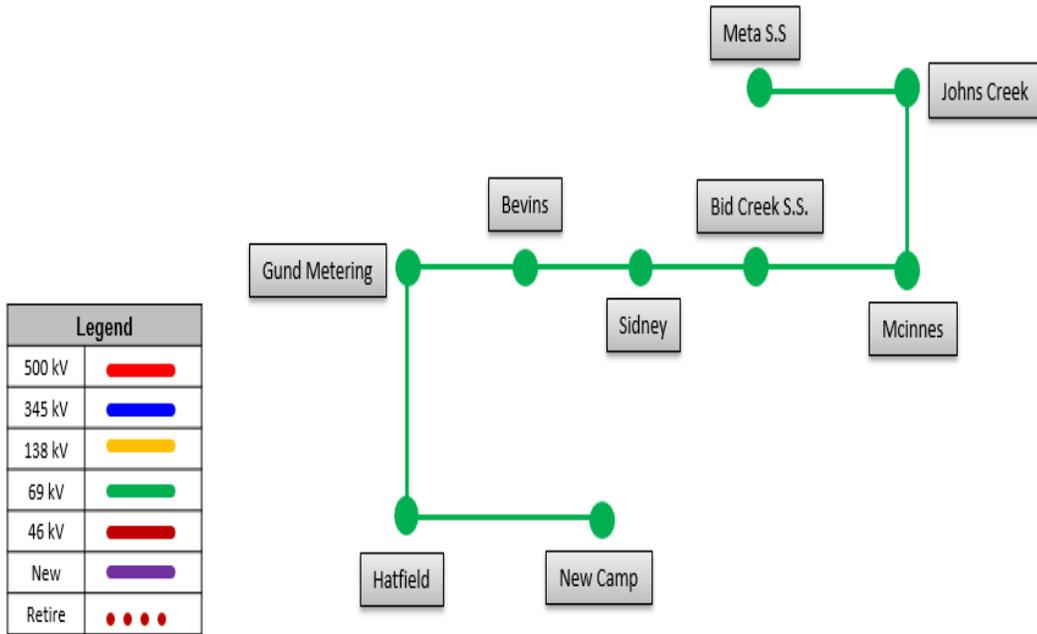
### Preliminary Facility Rating:

Branch	SN/SE/WN/WE (MVA)
05ORINOCO – 05STONE 69KV	102/142/129/160
05ORINOCO – 05NEWCAMP 69KV	102/142/129/150

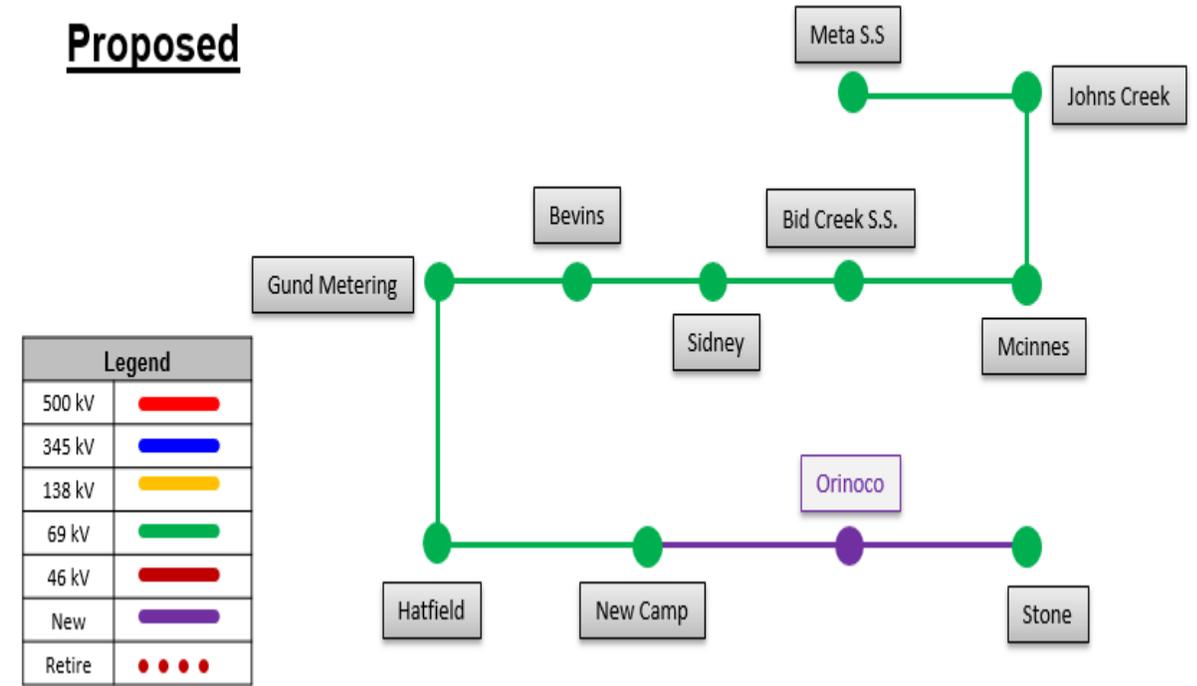
# AEP Transmission Zone: Baseline

## New Camp - Stone 69kV

### Existing



### Proposed



### Ancillary Benefits:

This work addresses the needs identified in AEP-2020-AP028. Removal of obsolete ~8.23 mi of 46kV transmission line, Looped service to New Camp station which is served via a radial ~4.14 mile, 69 kV line from Hatfield Station and serves approximately 14.6 MVA of peak load..

**Required In-Service:** 12/1/2025

**Projected In-Service:** 12/1/2025

**Previously Presented:** 12/18/2020

# AEP Transmission Zone: Baseline Roanoke & Huntington Court Circuit Switchers

**Process Stage:** Recommended Solution

**Criteria:** AEP 715 criteria

**Assumption Reference:** 2025 RTEP assumption

**Model Used for Analysis:** 2025 RTEP cases

**Proposal Window Exclusion:** Substation equipment exclusion

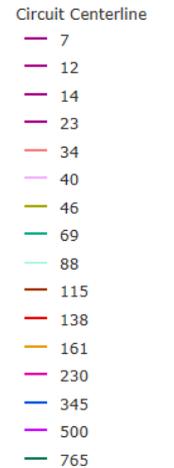
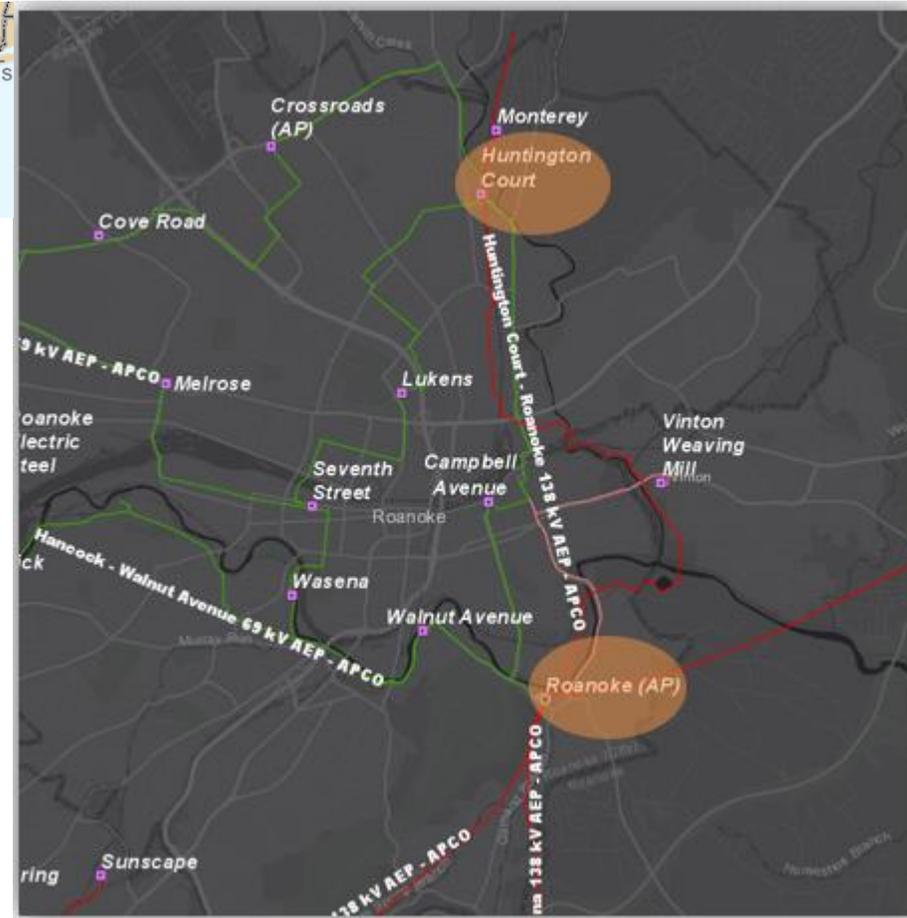
**Problem Statement:**

FG: AEP-T49, AEP-T50, AEP-T51, AEP-T52, AEP-T53, AEP-T54, AEP-T55, AEP-T56, AEP-T57, AEP-T58, AEP-T59, AEP-T60, AEP-T61

IN 2025 Summer RTEP case, the Cloverdale-Ingersol – Monterey - Huntington Court 69 kV Circuits are overload for multiple N-1-1 contingency pairs.

**Existing Facility Rating:**

Branch	SN/SE/WN/WE (MVA)
05CLOV 1 – 05ING RAND 69KV	82/90/107/113
ONMONTERAV – 05ING RAND 69KV	79/90/100/109
ONMONTERAV – 05HUNTCRT2 69KV	82/90/107/113



# AEP Transmission Zone: Baseline Roanoke & Huntington Court Circuit Switchers

## Recommended Solution:

Roanoke Station: Install high-side circuit switcher on 138/69-12 kV T5 (**B3289.1**) **Estimated Cost:** \$1.102 M

Huntington Court Station: Install high-side circuit switcher on 138/69-34.5 kV T1 (**B3289.2**) **Estimated Cost:** \$1.415 M

**Total Estimated Cost:** \$2.517 M

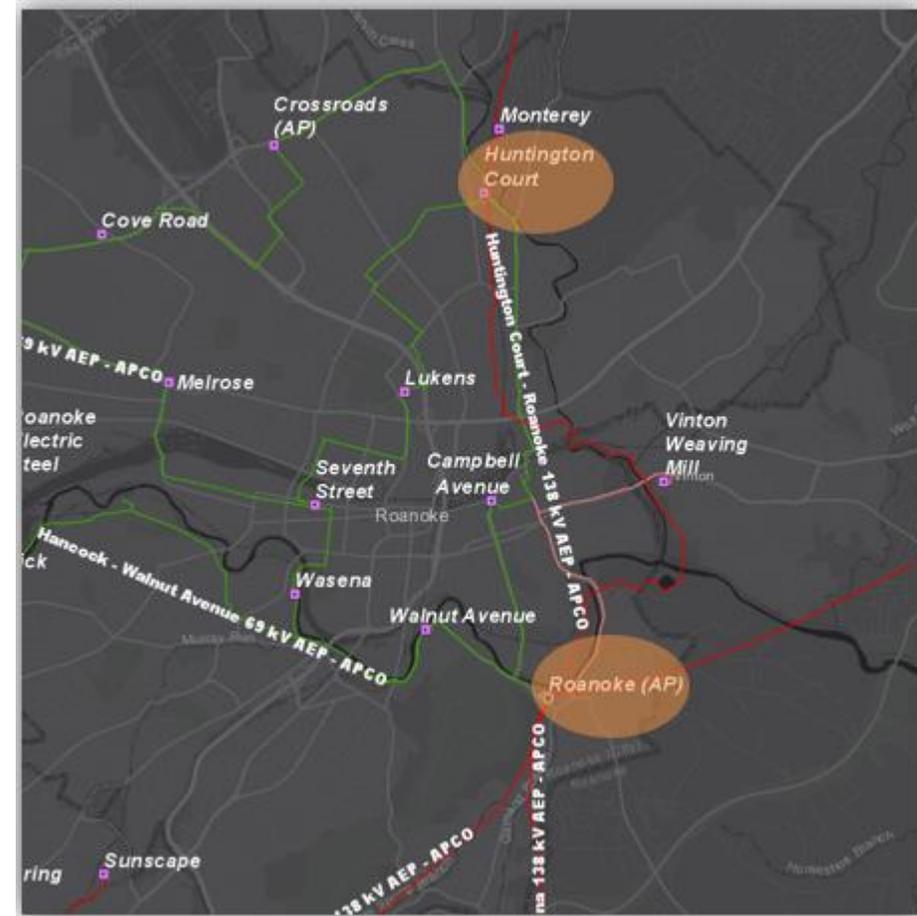
**Preliminary Facility Rating:** No change

**Ancillary Benefits:** Addresses part of AEP-2020-AP033 Need

**Required In-Service:** 6/1/2025

**Projected In-Service:** 6/1/2025

**Previously Presented:** 12/18/2020



# AEP Transmission Zone: Baseline Roselms - Kalida 69 kV

**Process Stage:** Recommended Solution

**Criteria:** AEP 715 criteria

**Assumption Reference:** 2025 RTEP assumption

**Model Used for Analysis:** 2025 RTEP cases

**Proposal Window Exclusion:** Below 200 kV

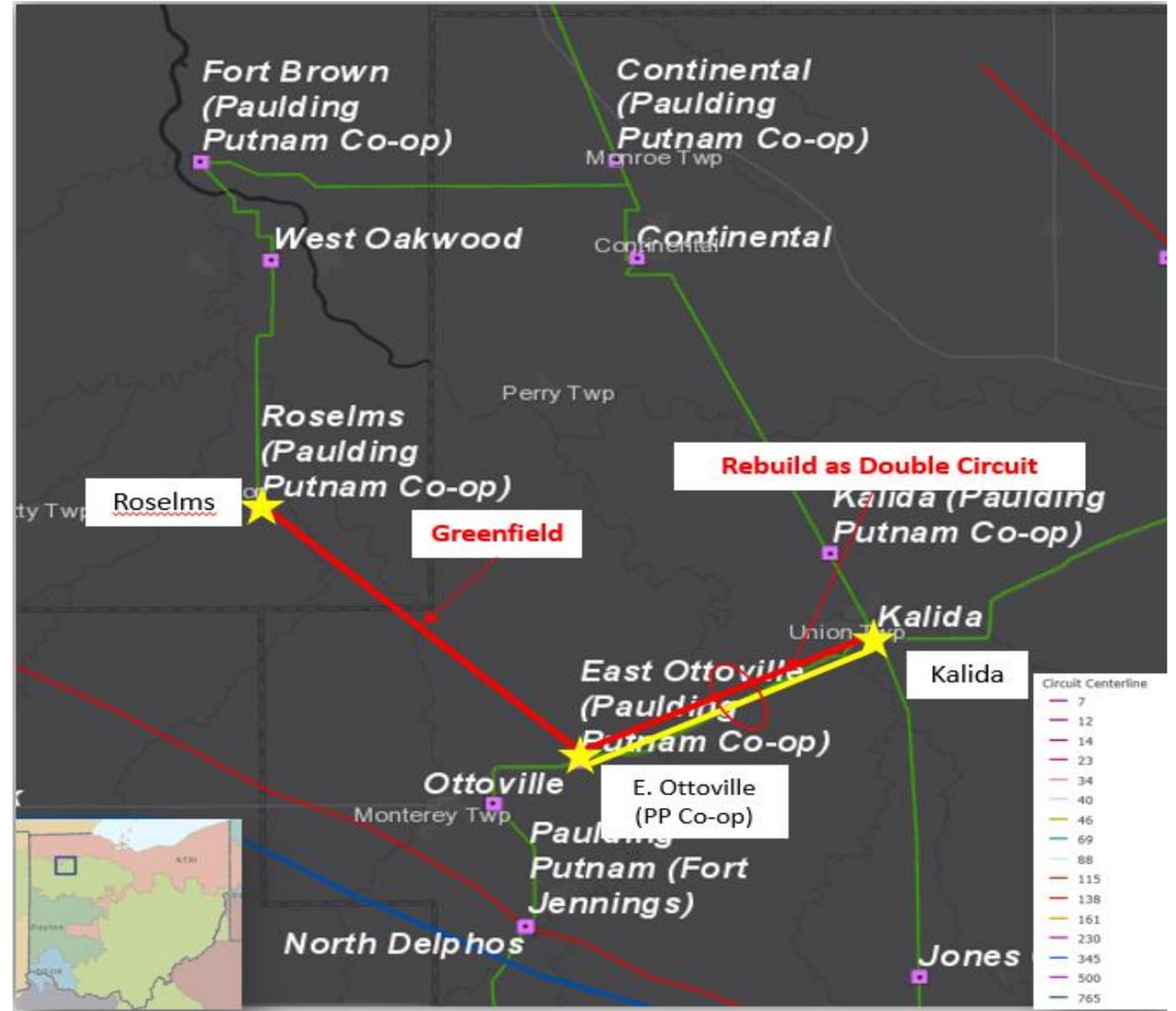
**Problem Statement:**

FG: AEP-T1 , AEP-T2 and AEP-VD502 through AEP-VD523

In 2025 Summer RTEP case, the Haviland - Paulding 69 kV circuit is overloaded for the N-1-1 contingency of the loss the South Hicksville- Mark Center 69kV line and the loss of the Continental – Kalida 69kV line. In 2025 Summer and Winter RTEP cases, the same N-1-1 contingency pair causes voltage drop violation at Roselms, West Oakwood, Fort Brown, Continental, Auglaize, Sherwood and Mark Center 69 kV buses.

**Existing Facility Rating:**

Branch	SN/SE/WN/WE (MVA)
05HAVILAND2 – 05PAULDING 69KV	49/50/54/60



# AEP Transmission Zone: Baseline

## Roselms - Kalida 69 kV

### Recommended Solution:

Convert S2215.2: Build 9.4 miles of single circuit 69 kV line from Roselms to near East Ottoville 69 kV Switch. **(B3290.1) Estimated Cost: \$13.7M**

Convert S2215.3: Rebuild 7.5 miles of double circuit 69kV line between East Ottoville Switch and Kalida Station (combining with the new Roselms to Kalida 69 kV circuit). **(B3290.2) Estimated Cost: \$23.6M**

Convert S2215.8: At Roselms Switch, install a new three way 69kV, 1200 A phase-over-phase switch, with sectionalizing capability. **(B3290.3) Estimated Cost: \$0.6M**

Convert S2215.9: At Kalida station, terminate the new line from Roselms Switch. Move the CS XT2 from high side of T2 to the high side of T1. Remove existing T2 transformer. **(B3290.4) Estimated Cost: \$1.0M**

**Total Estimated Cost: \$38.9M**

### Preliminary Facility Rating:

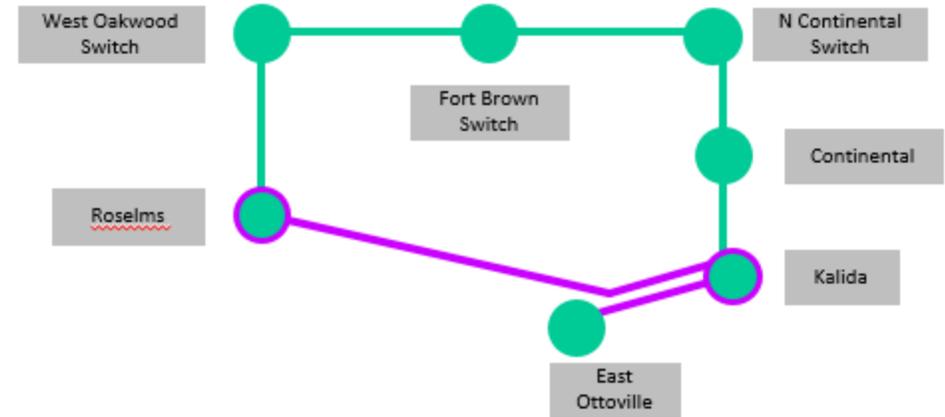
Branch	SN/SE/WN/WE (MVA)
05KALIDA – 05E.OTTOVLSS 69KV	79/92/100/109
05ROSELMS8 – 05KALIDA 69KV	102/142/129/160

**Ancillary Benefits:** Most of the Kalida - E. Ottoville line still has the original 4/0 copper 7 conductor from 1914. Proposal converts s2215.2, .3, .8, and .9 to baseline.

**Required In-Service:** 6/1/2025

**Projected In-Service:** 10/25/2024

**Previously Presented:** 12/18/2020



Legend	
500 kV	
345 kV	
138 kV	
69 kV	
34.5 kV	
23 kV	
New	

# AEP Transmission Zone: Baseline Russ St. Switch

**Process Stage:** Recommended Solution

**Criteria:** AEP 715 criteria

**Assumption Reference:** 2025 RTEP assumption

**Model Used for Analysis:** 2025 RTEP cases

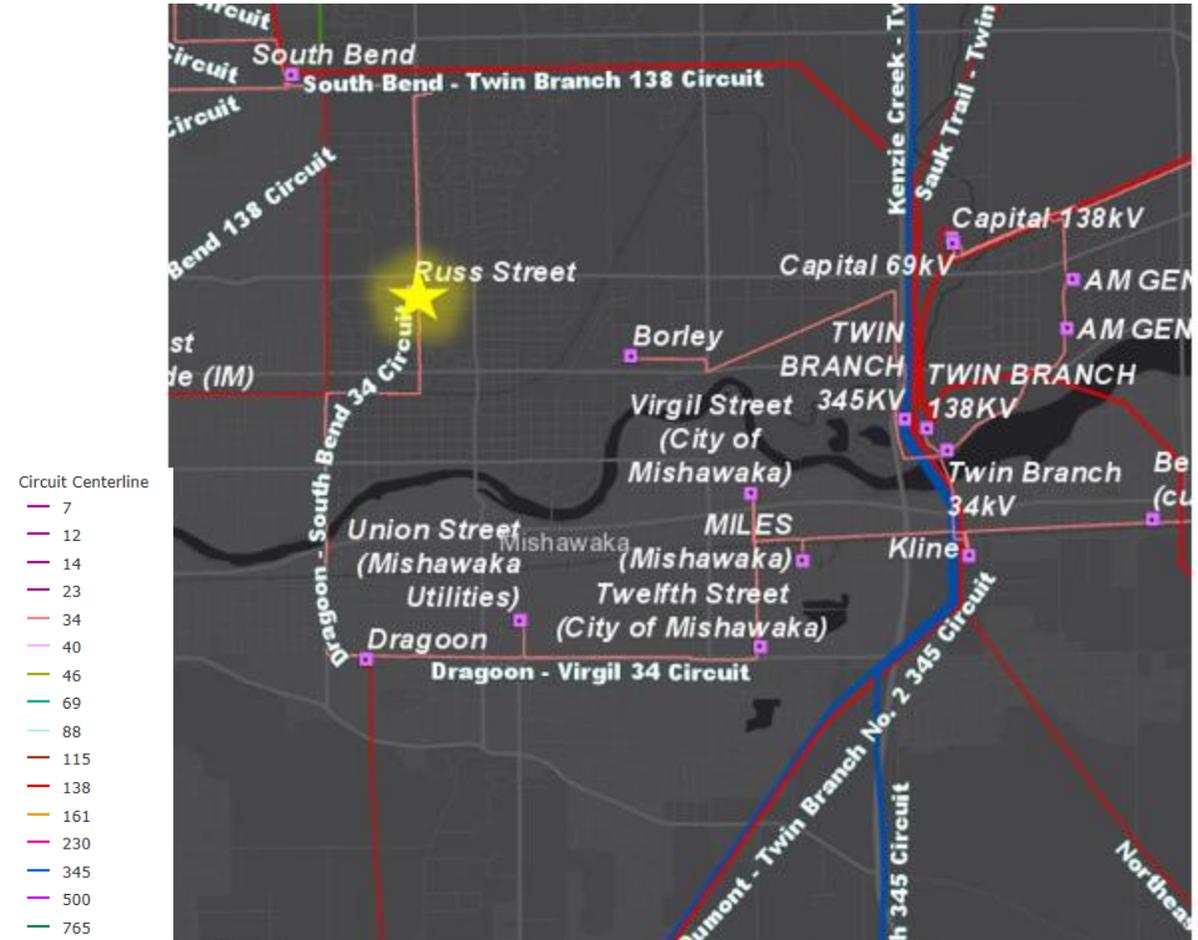
**Proposal Window Exclusion:** Substation equipment exclusion

**Problem Statement:**

FG: AEP-T406, AEP-T425, AEP-T405, AEP-T426, AEP-T294  
 IN 2025 Summer RTEP case, the Russ St. 34.5KV Switch on the Russ St. – Liberty 34.5kV line is overloaded for multiple N-1-1 contingency pairs.

**Existing Facility Rating:**

Branch	SN/SE/WN/WE (MVA)
05RUSS ST – 05LIBERTYTSS 34.5KV	41/45/53/57



# AEP Transmission Zone: Baseline Russ St. Switch

## Recommended Solution:

To mitigate capacity issues on Russ St. – Liberty 34.5kV Branch, replace the Russ St. 34.5kV Switch. (B3291)

**Estimated Cost:** \$1.5M

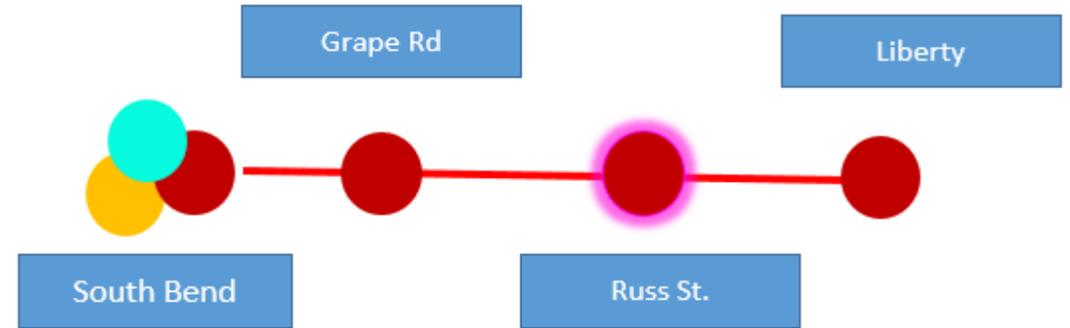
## Preliminary Facility Rating:

Branch	SN/SE/WN/WE (MVA)
05RUSS ST – 05LIBERTYTSS 34.5KV	62/62/78/78

**Required In-Service:** 6/1/2025

**Projected In-Service:** 12/1/2022

**Previously Presented:** 12/18/2020



Legend	
500 kV	
345 kV	
138 kV	
69 kV	
34.5 kV	
23 kV	
New	

# AEP Transmission Zone: Baseline Stuart Cap Bank

**Process Stage:** Recommended Solution

**Criteria:** AEP 715 criteria

**Assumption Reference:** 2025 RTEP assumption

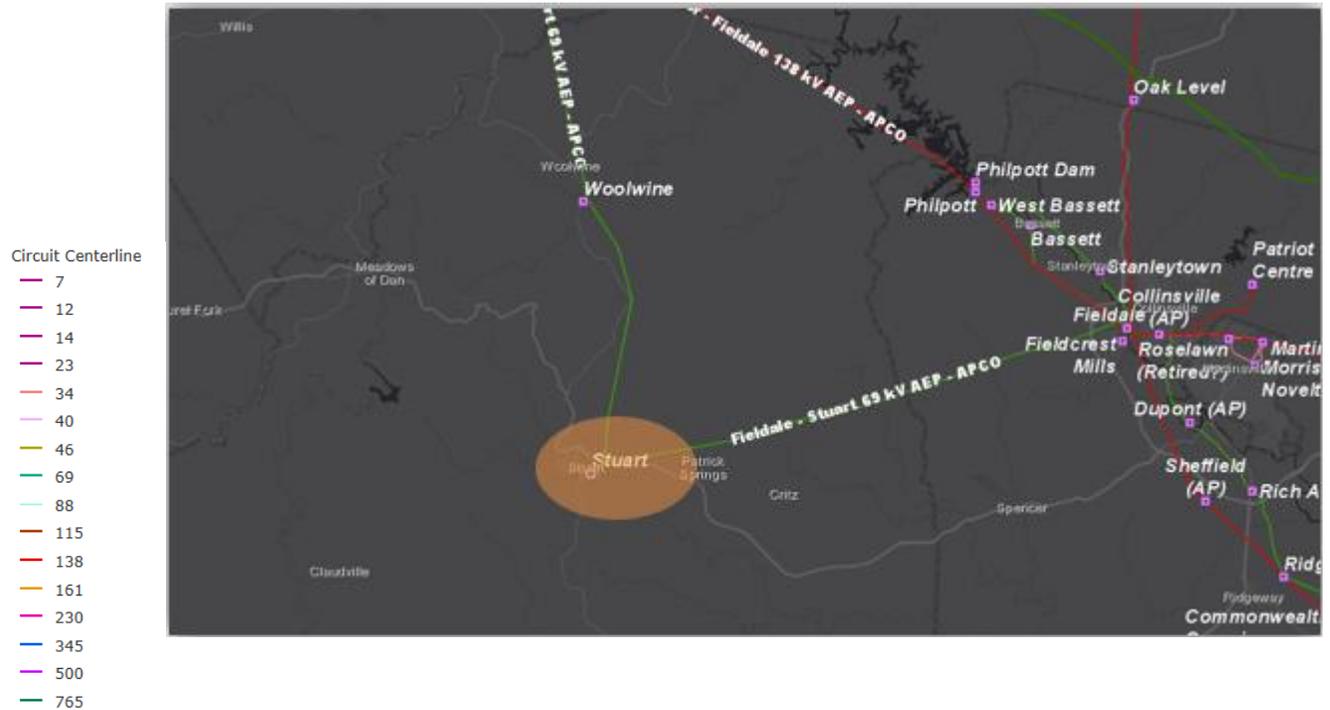
**Model Used for Analysis:** 2025 RTEP cases

**Proposal Window Exclusion:** Below 200 kV

**Problem Statement:**

FG: AEP-VD431, AEP-VD432, AEP-VD433, AEP-VD434, AEP-VD435, AEP-VD437

In 2025 Winter RTEP case, The Stuart 69kV bus has voltage drop violations in multiple contingencies involving the loss of Fielddale – Stuart 69kV line .



# AEP Transmission Zone: Baseline Stuart Cap Bank

## Recommended Solution:

Replace existing 69 kV capacitor bank at Stuart Station with a 17.2 MVar capacitor bank (**B3292**)

**Estimated Cost:** \$0M (\$0.856M Distribution cost)

**Alternatives:** N/A

**Required In-Service:** 12/1/2025

**Projected In-Service:** 12/1/2025

**Previously Presented:** 12/18/2020



# AEP Transmission Zone: Baseline Upper Sandusky 69 kV Upgrades

**Process Stage:** Recommended Solution

**Criteria:** AEP 715 criteria

**Assumption Reference:** 2025 RTEP assumption

**Model Used for Analysis:** 2025 RTEP cases

**Proposal Window Exclusion:** Below 200 kV & Substation equipment exclusion

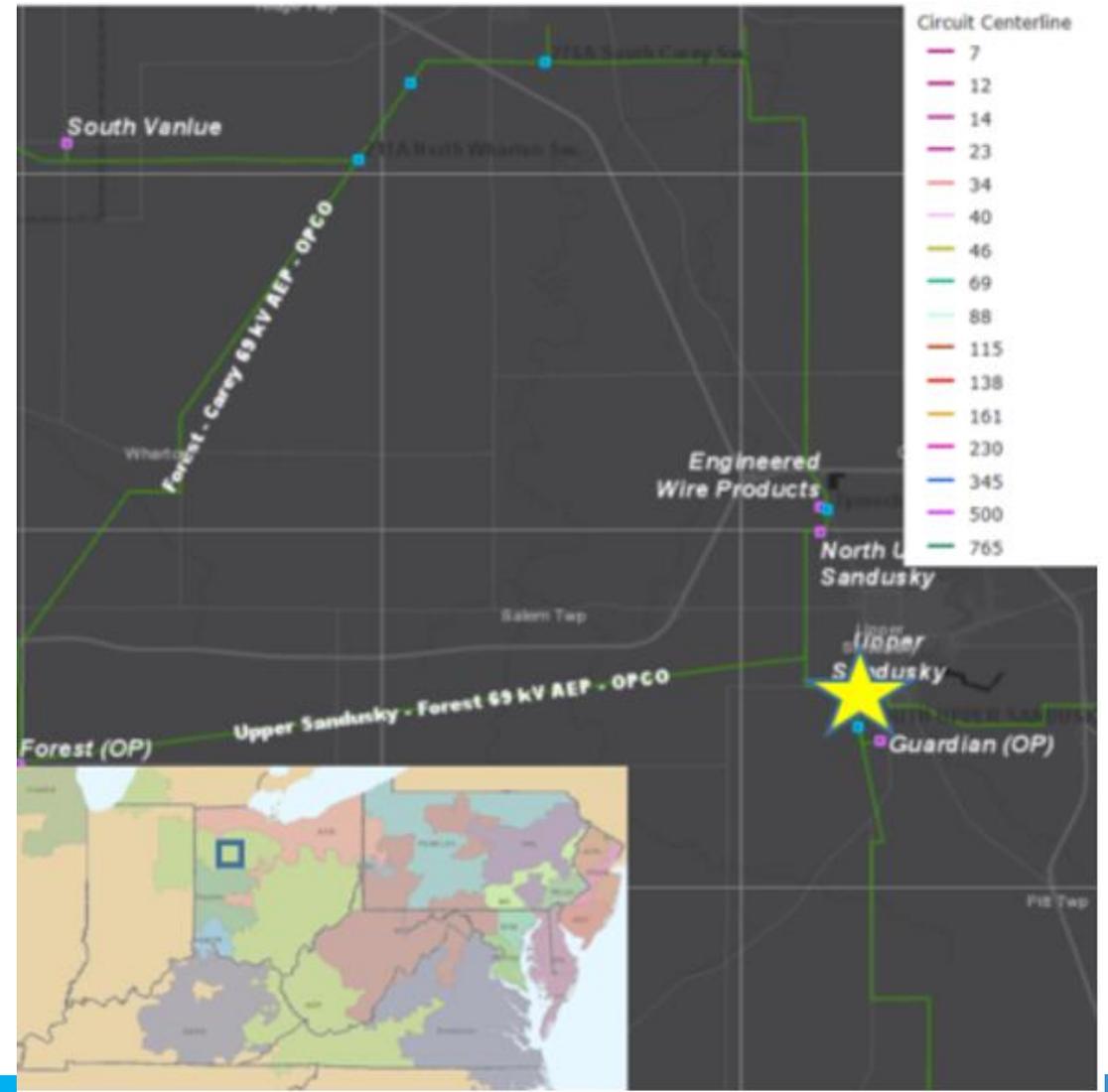
**Problem Statement:**

FG: AEP-T433, AEP-T438, and AEP-T468

In 2025 Summer RTEP case, the S. Upper Sandusky - Upper Sandusky 69 kV entrance span conductor to Upper Sandusky station and the 69 kV Riser/bus at Upper Sandusky towards Forest are overloaded for the N-1-1 contingency of the loss of and the loss of West Mount Vernon – Academia 138kV line, the HEDDSS- West Mount Vernon 138KV line, Sharp Road –West Mount Vernon 138kV line, the W Mount Vernon 138/69kV transformer and Pittsburgh Ave – West Mount Vernon 69kV line, and the loss of the Lynn – South Kenton 138kV line and South Kenton – Wild Creek 138kV line, South Kenton 138/69kV transformers 1&2 and the Fontaine – South Kenton 69kV line

**Existing Facility Rating:**

Branches	SN/SE/WN/WE (MVA)
05S.UPSDSS – 05U SANDSK 69KV	40/40/56/56
05FOREST – 05U SANDSK 69KV	55/69/72/82



# AEP Transmission Zone: Baseline Upper Sandusky 69 kV Upgrades

## Recommended Solution:

Replace 2/0 Cu entrance span conductor on the South Upper Sandusky 69kV line and 4/0 Cu Risers/Bus conductors on the Forest line at Upper Sandusky 69kV Station. (B3293)

**Estimated Cost:** \$0.54M

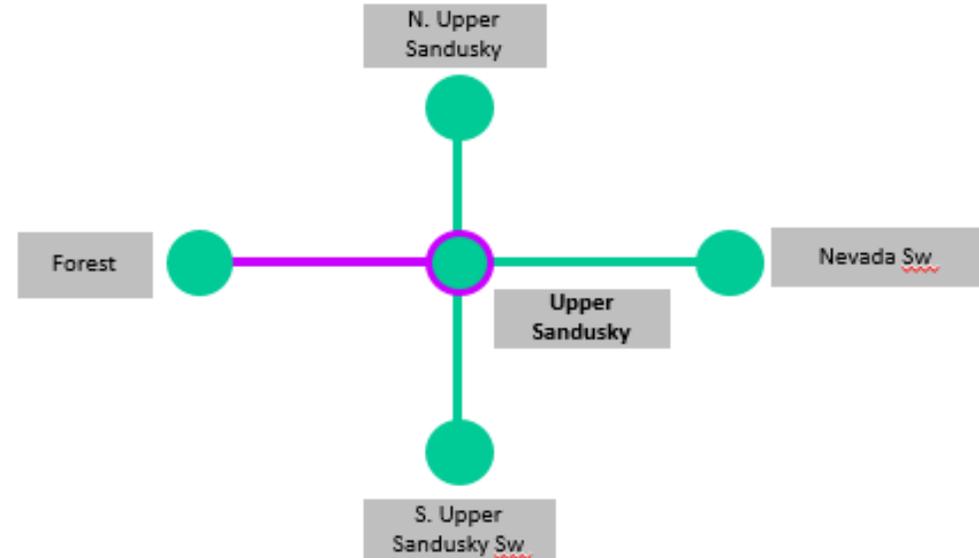
## Preliminary Facility Rating:

Branches	SN/SE/WN/WE (MVA)
05S.UPSDSS – 05U SANDSK 69KV	50/50/63/63
05FOREST – 05U SANDSK 69KV	68/86/89/89

**Required In-Service:** 6/1/2025

**Projected In-Service:** 6/1/2025

**Previously Presented:** 12/18/2020



Legend	
500 kV	
345 kV	
138 kV	
69 kV	
34.5 kV	
23 kV	
New	

# AEP Transmission Zone: Baseline Walnut Ave Switch Replacements

**Process Stage:** Recommended Solution

**Criteria:** AEP 715 criteria

**Assumption Reference:** 2025 RTEP assumption

**Model Used for Analysis:** 2025 RTEP cases

**Proposal Window Exclusion:** Substation equipment exclusion

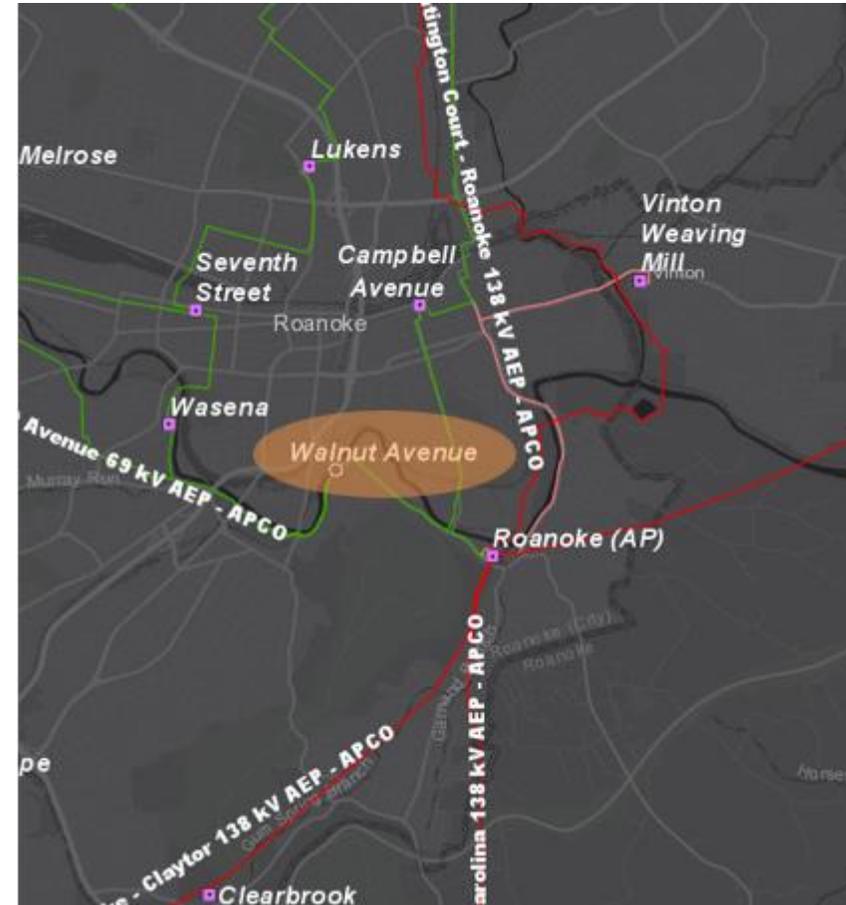
**Problem Statement:**

FG: AEP-T193, AEP-T194

In 2025 Summer RTEP case, the Roanoke-Walnut Ave 69 kV line is overloaded for the N-1-1 contingency of the loss of the Hancock 138/69/34.5kV transformer and the loss of the Catawba 138/69/34.5kV transformer, Catawba – Cleveland 69KV line, and Catawba – Mason Creek 69kV line

**Existing Facility Rating:**

Branch	SN/SE/WN/WE (MVA)
05ROANOKE- 05WALNUTA2 69KV	82/90/107/113



# AEP Transmission Zone: Baseline Walnut Ave Switch Replacements

## Recommended Solution:

Replace existing 69 kV disconnect switches for circuit breaker "C" at Walnut Avenue Station (B3294)

**Estimated Cost:** \$0M ( \$0.067M distribution cost)

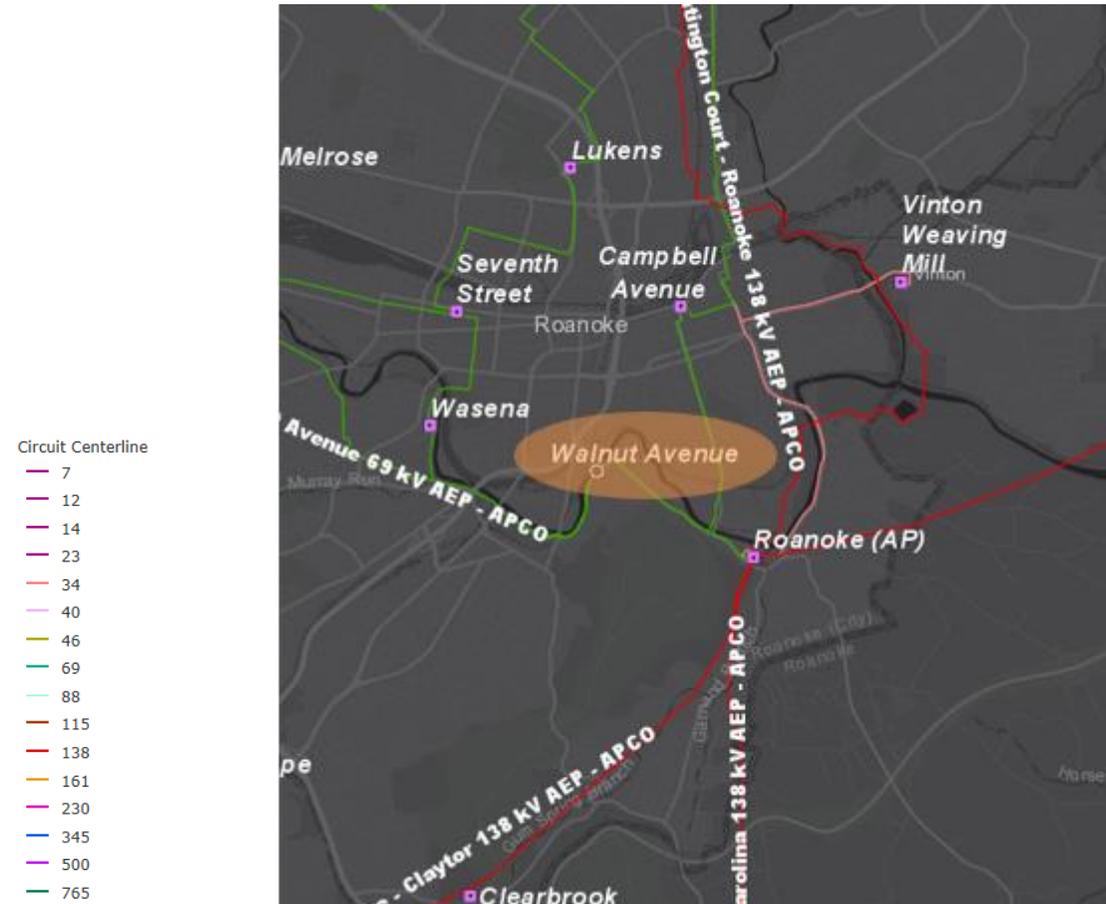
## Preliminary Facility Rating:

Branch	SN/SE/WN/WE (MVA)
05ROANOKE- 05WALNUTA2 69KV	99/99/125/125

**Required In-Service:** 6/1/2025

**Projected In-Service:** 6/1/2025

**Previously Presented:** 12/18/2020



# AEP Transmission Zone: Baseline Concord-Whitaker 34.5kV Line Rebuild

**Process Stage:** Recommended Solution

**Criteria:** AEP 715 criteria

**Assumption Reference:** 2025 RTEP assumption

**Model Used for Analysis:** 2025 RTEP cases

**Proposal Window Exclusion:** Below 200 kV

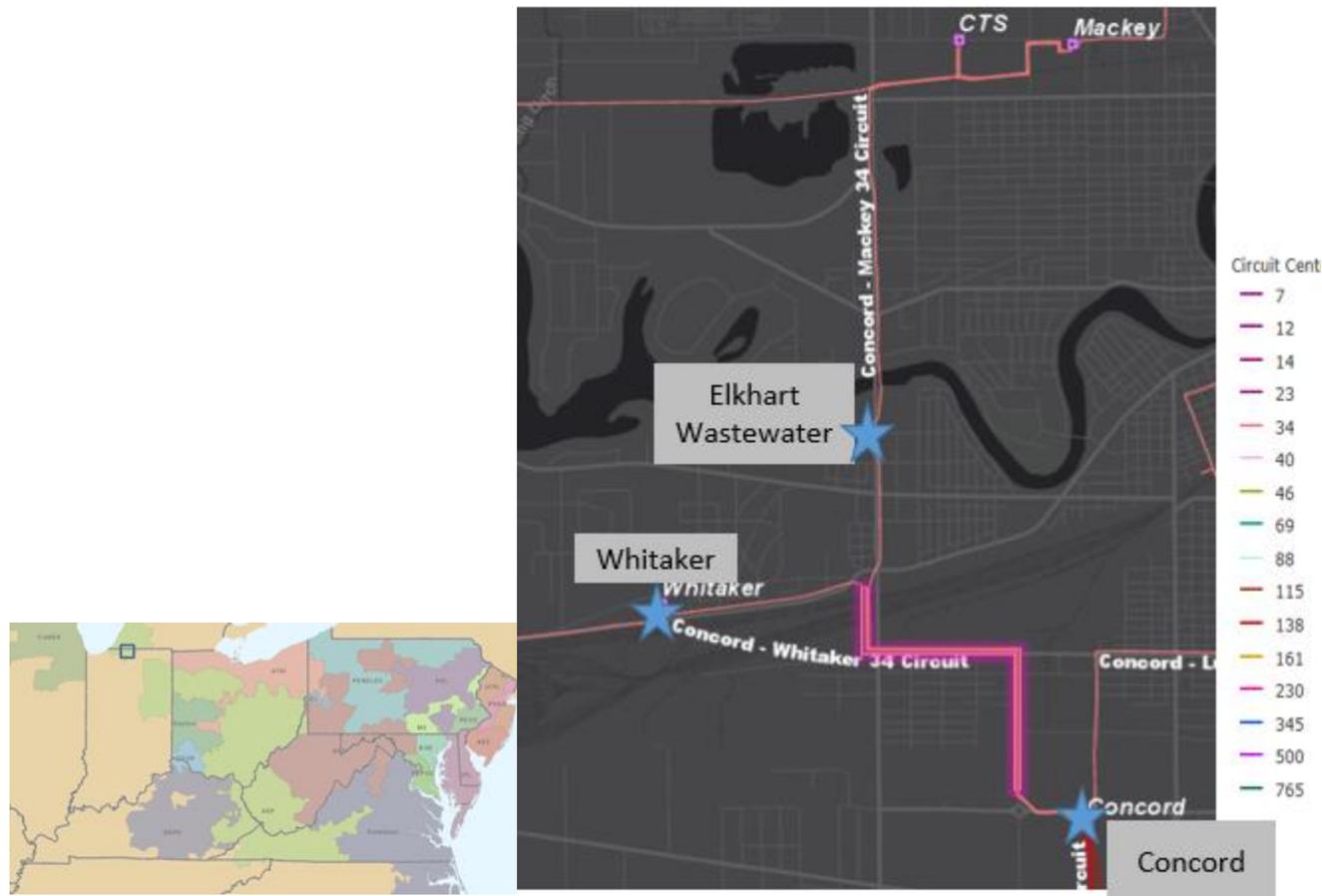
**Problem Statement:**

FG: AEP-T83, AEP-T85, AEP-T86, AEP-T87, AEP-VM742, AEP-VM743, AEP-VM744

In 2025 Summer RTEP case, the Concord-Whitaker 34.5kV line is overloaded for the loss of Kline-Bercado 34.5kV line

**Existing Facility Rating:**

Branches	SN/SE/WN/WE (MVA)
05CONCORD– 05WHITAKER 34.5KV	37/37/47/47
05CONCORD– 05WASTEWAT 34.5KV	37/37/47/47



# AEP Transmission Zone: Baseline Concord-Whitaker 34.5kV Line Rebuild

## Recommended Solution:

Rebuild the overloaded portion of the Concord-Whitaker 34.5kV line. Rebuild is double circuit and will utilize 795 ACSR conductor. The rebuild is 1.13 miles long. **(B3296)**

**Estimated Cost:** \$2.8M

## Preliminary Facility Rating:

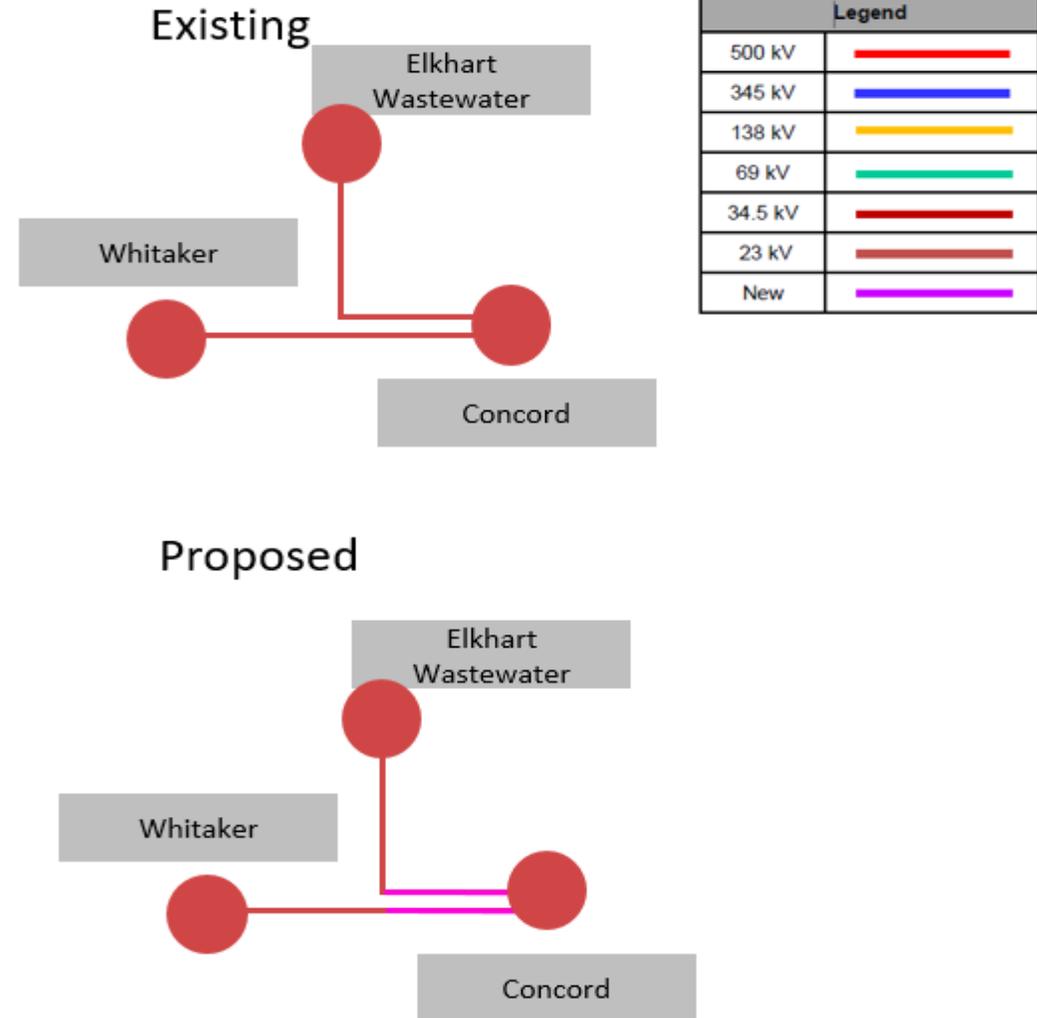
Branches	SN/SE/WN/WE (MVA)
05CONCORD- 05WHITAKER 34.5KV	62/62/78/78
05CONCORD- 05WASTEWAT 34.5KV	41/45/53/57

**Ancillary Benefits:** The existing wood H-Frames are very deteriorated and have cracks in the structures. The existing double circuit wood crossarm structures are also deteriorated, and a lot of these structures have decaying crossarms, woodpecker damage and shell rot. The portion of line to be rebuilt was originally installed in 1956.

**Required In-Service:** 6/1/2025

**Projected In-Service:** 3/17/2024

**Previously Presented:** 12/18/2020



# AEP Transmission Zone: Baseline North Columbus 69 kV line Rebuilds

**Process Stage:** Recommended Solution

**Criteria:** AEP 715 criteria

**Assumption Reference:** 2025 RTEP assumption

**Model Used for Analysis:** 2025 RTEP cases

**Proposal Window Exclusion:** Below 200 kV & Substation equipment exclusion

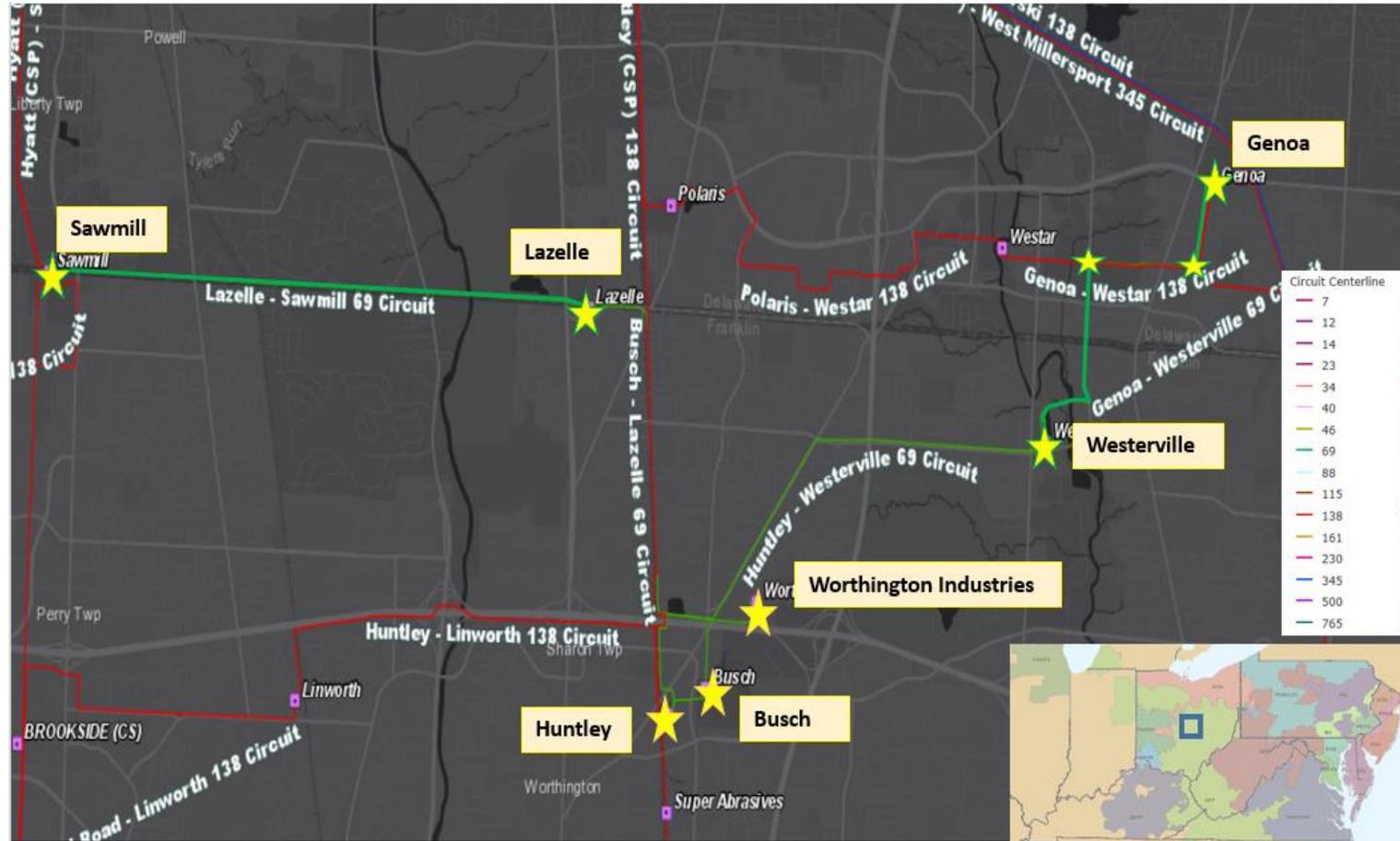
**Problem Statement:**

FG: AEP-T205 through AEP-T208, AEP-T213, AEP-T218, AEP-T260 through AEP-T262, AEP-T265, AEP-T369, AEP-T370, AEP-T371, AEP-T372

In 2025 Summer RTEP case, the Sawmill - Lazelle and Westerville - Genoa 69 kV lines along with station equipment at Lazelle, Westerville, and Genoa are overloading for N-1-1 contingency scenarios

**Existing Facility Rating:**

Branches	SN/SE/WN/WE (MVA)
05SAWMILL – 05LAZELLE N 69KV	55/69/72/82
05GENOA - 05LAZELLE N 69KV	82/90/107/113
05LAZELLE S– 05LAZELLE N 69KV	55/69/72/82



# AEP Transmission Zone: Baseline North Columbus 69 kV line Rebuilds

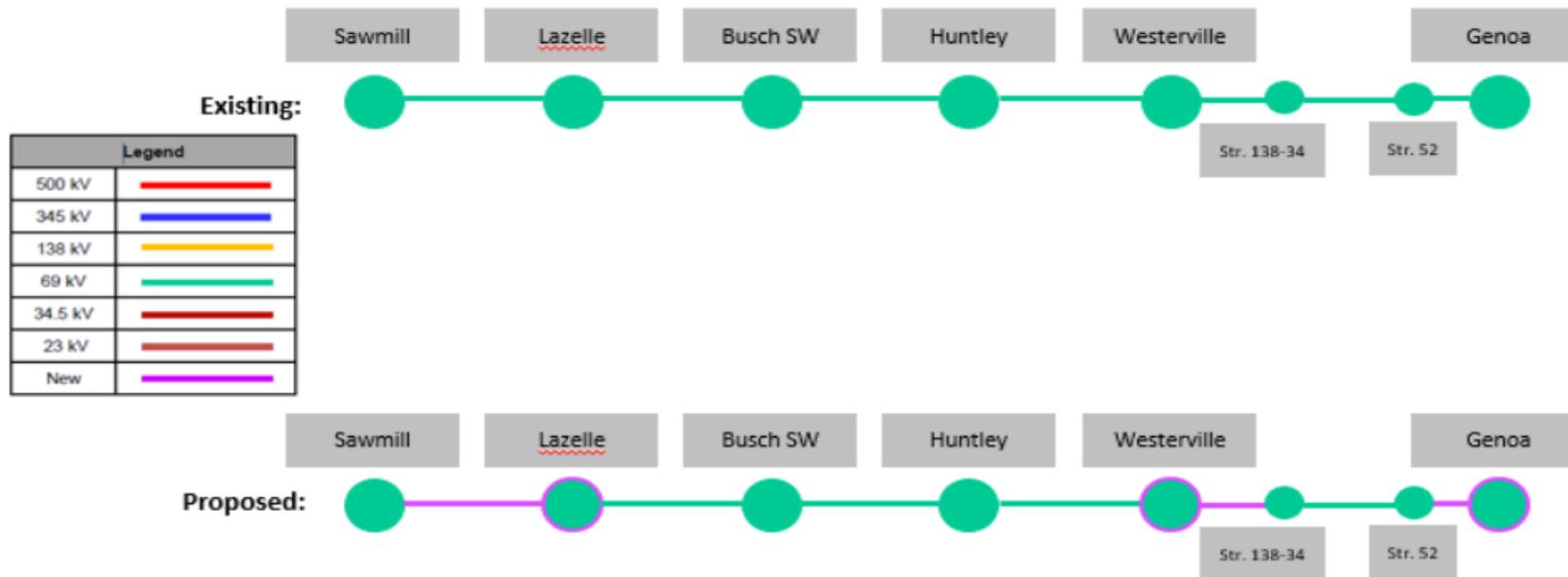
## Recommended Solution:

Rebuild 4.23 miles of 69 kV line between Sawmill and Lazelle station, using 795 ACSR 26/7 conductor. **(B3297.1) Estimated Cost: \$12.0 M**

Rebuild 1.94 miles of 69kV Line between Westerville and Genoa stations, using 795 ACSR 26/7 conductor. **(B3297.2) Estimated Cost: \$5.9 M**

Replace risers and switchers at Lazelle, Westerville, and Genoa stations. Upgrade associated relaying accordingly. **(B3297.3) Estimated Cost: \$1.9 M**

**Total Estimated Cost: \$19.8M**



# AEP Transmission Zone: Baseline North Columbus 69 kV line Rebuilds

## Preliminary Facility Rating:

Branches	SN/SE/WN/WE (MVA)
05SAWMILL – 05LAZELLE N 69KV	121/151/163/185
05GENOA - 05LAZELLE N 69KV	100/111/126/139
05LAZELLE S– 05LAZELLE N 69KV	121/149/162/192

**Ancillary Benefits:** The Recommended Solution will rebuild the Sawmill - Lazelle 69 kV line. The majority of the line is made up of wooden structures and conductor that date back to 1926. 25 of the 49 structures that make up the line have at least one open condition attributed to them.

**Required In-Service:** 6/1/2025

**Projected In-Service:** 6/1/2025

**Previously Presented:** 12/18/2020

# AEP Transmission Zone: Baseline

## West End Fostoria - Lumberjack Sw 69 kV Rebuild

**Process Stage:** Recommended Solution

**Criteria:** AEP 715 criteria

**Assumption Reference:** 2025 RTEP assumption

**Model Used for Analysis:** 2025 RTEP cases

**Proposal Window Exclusion:** Below 200 kV

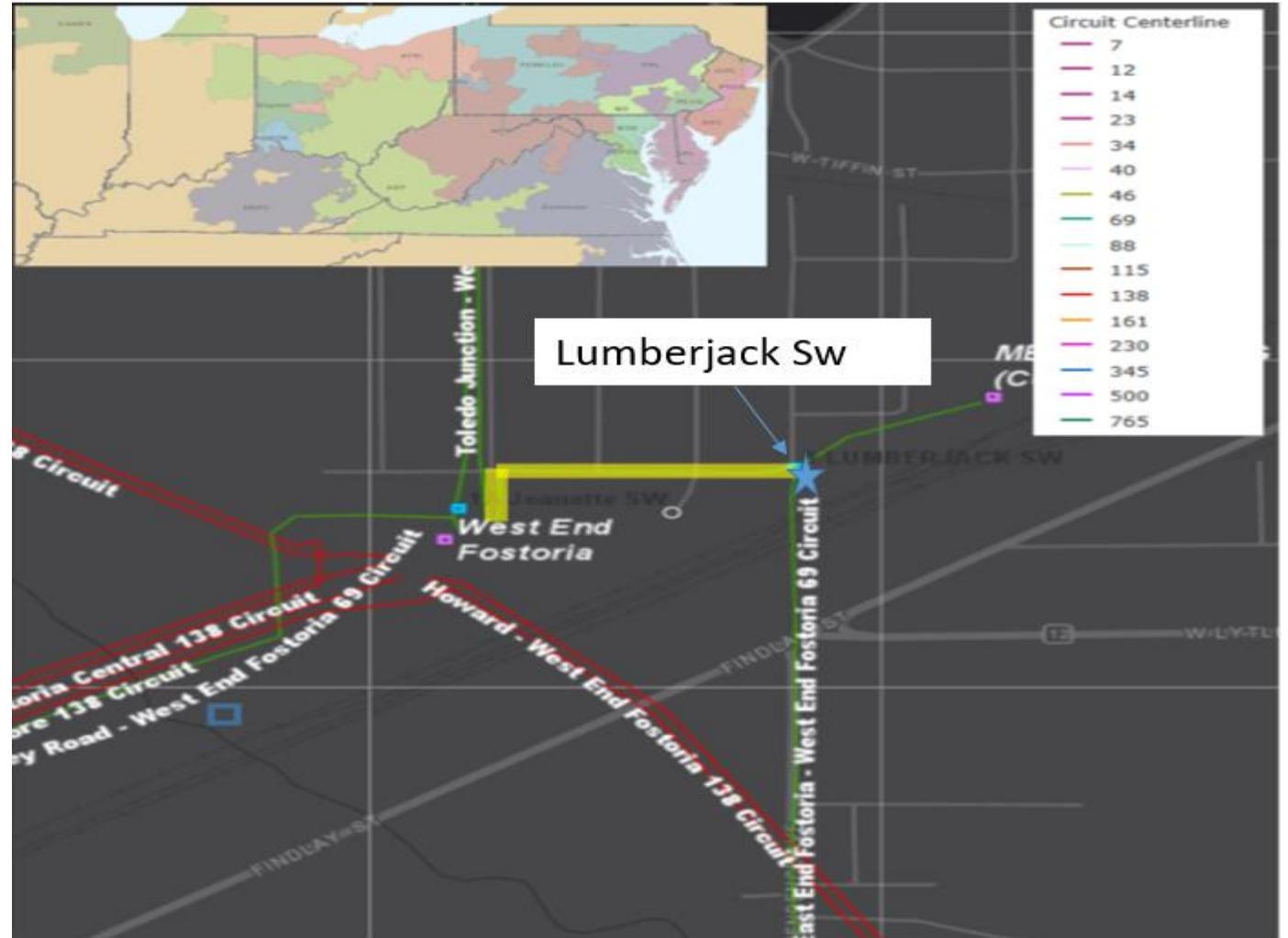
**Problem Statement:**

FG: AEP-T450, AEP-T451, AEP-T454, AEP-T455

In 2025 Summer RTEP case, the West End Fostoria - Lumberjack Switch 69 kV line is overloaded for multiple N-1-1 contingency pairs.

**Existing Facility Rating:**

Branch	SN/SE/WN/WE (MVA)
05W END – 05LUMBERJ SS 69KV	40/40/56/56



# AEP Transmission Zone: Baseline

## West End Fostoria - Lumberjack Sw 69 kV Rebuild

### Recommended Solution:

Rebuild 0.2 mile of the West End Fostoria - Lumberjack Switch 69 kV line with 556 ACSR (Dove) conductors. Replace jumpers on West End Fostoria line at Lumberjack Switch. **(B3299)**

**Estimated Cost:** \$0.47M

### Preliminary Facility Rating:

Branch	SN/SE/WN/WE (MVA)
05W END – 05LUMBERJ SS 69KV	102/42/129/160

**Required In-Service:** 6/1/2025

**Projected In-Service:** 6/1/2025

**Previously Presented:** 12/18/2020



Legend	
500 kV	
345 kV	
138 kV	
69 kV	
34.5 kV	
23 kV	
New	

# AEP Transmission Zone: Baseline Fleming station ring bus

**Process Stage:** Recommended Solution

**Criteria:** AEP 715 criteria

**Assumption Reference:** 2025 RTEP assumption

**Model Used for Analysis:** 2025 RTEP cases

**Proposal Window Exclusion:** Below 200 kV

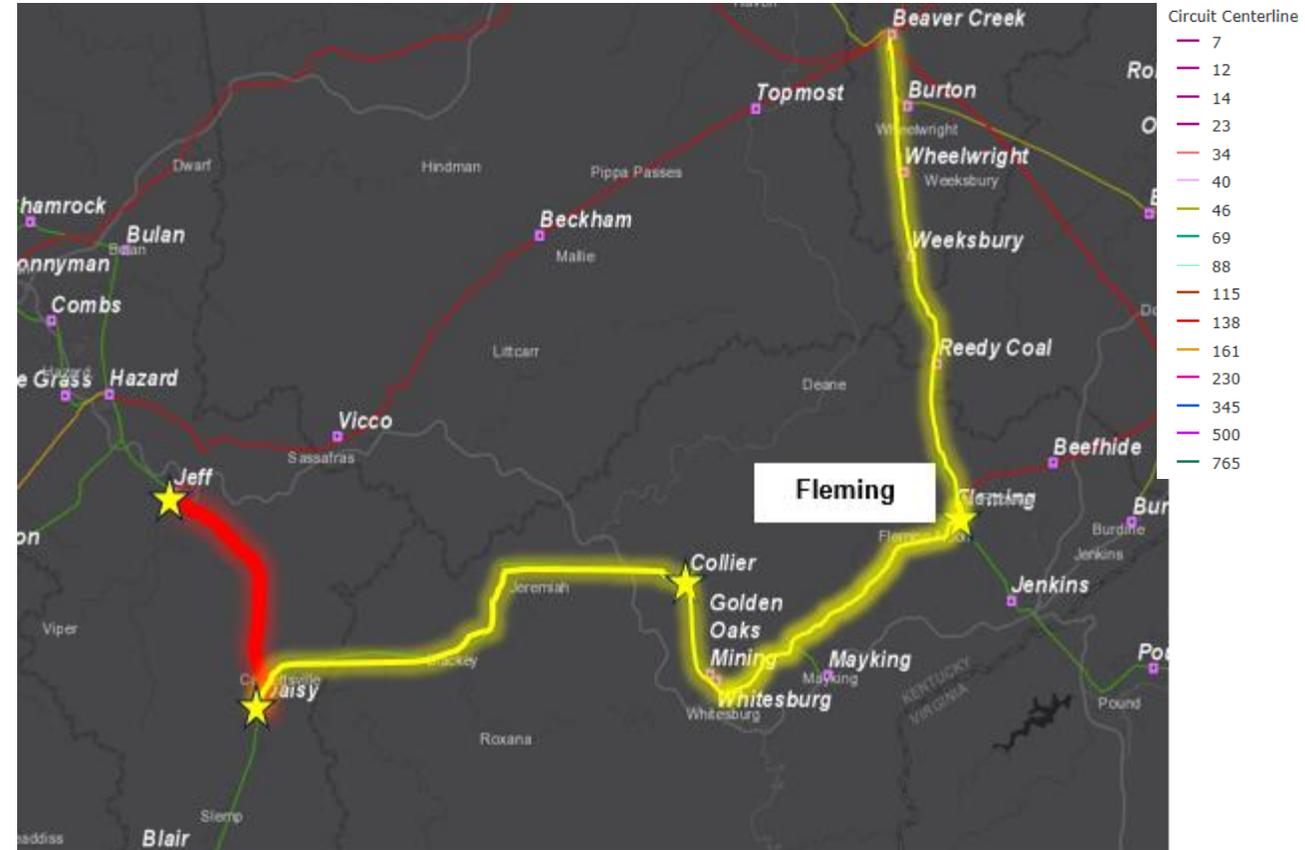
**Problem Statement:**

FG: AEP-T344, AEP-T345, AEP-T346, AEP-T347, AEP-T348, AEP-T349, AEP-T350, AEP-T351, AEP-VM545, AEP-VM546, AEP-VM547, AEP-VM548, AEP-VM549, AEP-VM550, AEP-VD552, AEP-VD553, AEP-VD554, AEP-VD555, AEP-VD566, AEP-VD567, AEP-VD570, AEP-VD571, AEP-VD556, AEP-VD557, AEP-VD558, AEP-VD559, AEP-VD572, AEP-VD573, AEP-VD574, AEP-VD575, AEP-VD576, AEP-VD577, AEP-VD578, AEP-VD579, AEP-VD526, AEP-VD527, AEP-VD529, AEP-VD531, AEP-VD532, AEP-VD534, AEP-VD536, AEP-VD538, AEP-VD548, AEP-VD549, AEP-VD550, AEP-VD551, AEP-VD560, AEP-VD561, AEP-VD568, AEP-VD569, AEP-VD542, AEP-VD543, AEP-VD546, AEP-VD547, AEP-VD562, AEP-VD563, AEP-VD564, AEP-VD565, AEP-VD540, AEP-VD541, AEP-VD544, AEP-VD545, AEP-VD524, AEP-VD525, AEP-VD528, AEP-VD530, AEP-VD533, AEP-VD535, AEP-VD537, AEP-VD539

In the 2025 Winter RTEP case, the Jeff – Daisy 69KV line overload and voltage violations at Weeksbury, Reedy Coal, Mayking, Daisy, Fleming, Collier, Golden Oaks, Slemp, and Whitesburg 69kV buses are identified for various N-1-1 outages.

**Existing Facility Rating:**

Branch	SN/SE/WN/WE (MVA)
05DAISY – 05JEFF 69KV	44/44/56/56



# AEP Transmission Zone: Baseline Fleming station ring bus

## Recommended Solution:

Convert s2219 to baseline:

Rebuild Fleming station in the clear; Replace 138/69kV Fleming Transformer #1 with 138/69kV 130 MVA transformer with high side 138 kV CB; Install a 5 breaker 69 kV ring bus on the low side of the transformer, replace 69 kV circuit switcher AA, replace 69/12kV transformer #3 with 69/12kV 30 MVA transformer, Replace 12 kV CB A and D. Retire existing Fleming substation. **(B3307)**

**Estimated Cost:** \$21.1M

## Preliminary Facility Rating:

Branches	SN/SE/WN/WE (MVA)
05JACKHORN 138/69kV	130/130/130/130
05JACKHORN – 05BEEFHI 138kV	221/278/279/322
05JACKHORN – 05JENKINS 69V	87/101/110/120

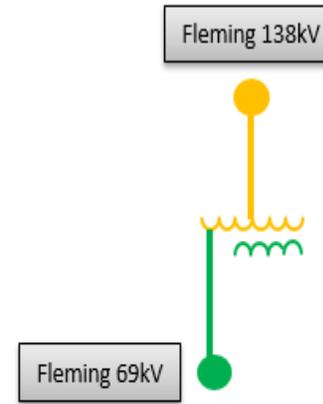
**Ancillary Benefits:** This project is a conversion of s2219, and no additional costs are incurred to implement a separate baseline solution.

**Required In-Service:** 12/1/2025

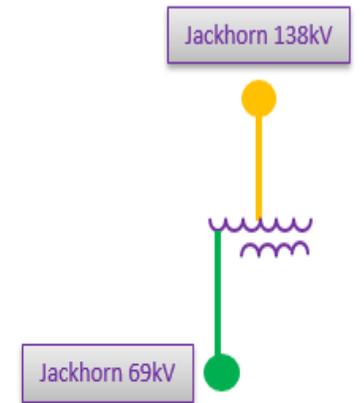
**Projected In-Service:** 12/1/2025

**Previously Presented:** 12/18/2020

## Existing



## Proposed



Legend	
500 kV	
345 kV	
138 kV	
69 kV	
46 kV	
New	

# AEP Transmission Zone: Baseline Fort Steuben - Sunset Blvd 69kV T-Line Upgrade

**Process Stage:** Recommended Solution

**Criteria:** AEP 715 criteria

**Assumption Reference:** 2025 RTEP assumption

**Model Used for Analysis:** 2025 RTEP cases

**Proposal Window Exclusion:** Below 200 kV

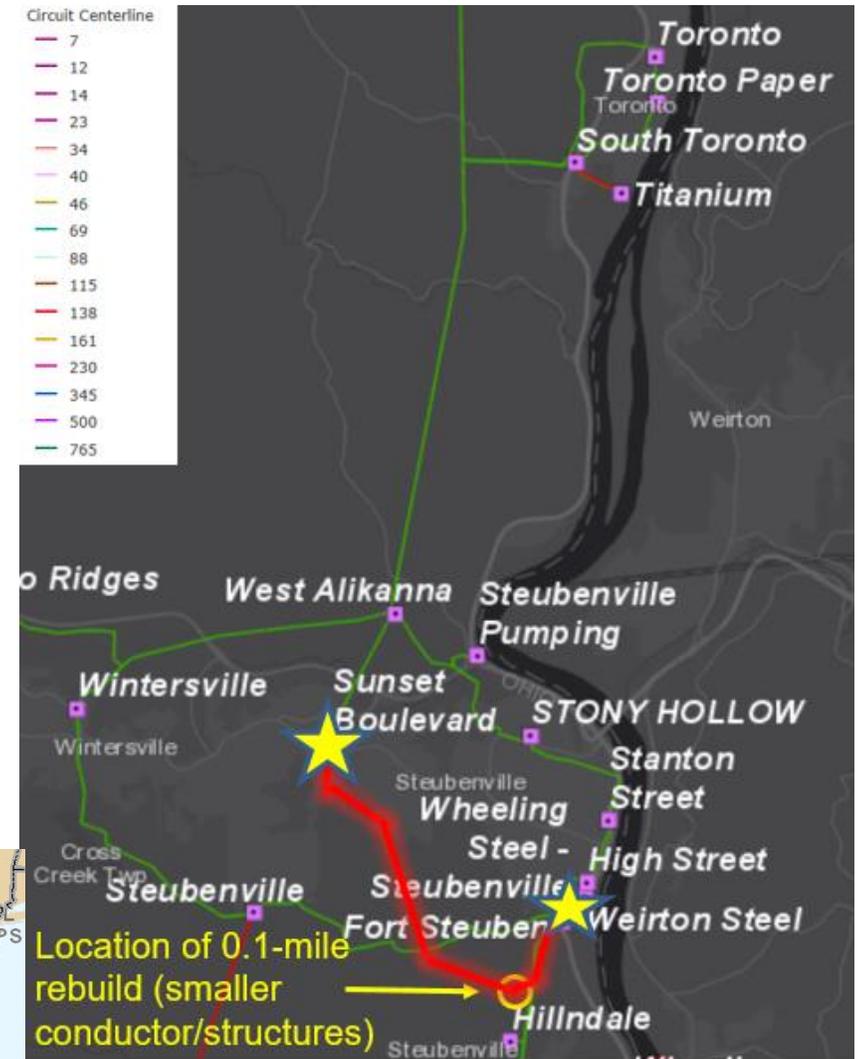
**Problem Statement:**

AEP-T488; AEP-T491; AEP-T494; AEP-T495

In the 2025 Summer RTEP case, the Fort Steuben-Sunset Blvd 69kV branch is overloaded for various N-1-1 outages.

**Existing Facility Rating:**

Branch	SN/SE/WN/WE (MVA)
05FT STB 2 – 05SUNST BL 69KV	54/54/76/76



# AEP Transmission Zone: Baseline Fort Steuben - Sunset Blvd 69kV T-Line Upgrade

## Recommended Solution:

Reconductor and rebuild 1 span of T-line on the Fort Steuben-Sunset Blvd 69kV branch with 556 ACSR.

(B3308)

**Estimated Cost:** \$0.73M

**Preliminary Facility Rating:**

Branch	SN/SE/WN/WE (MVA)
05FT STB 2 – 05SUNST BL 69KV	64/64/90/96

**Required In-Service:** 6/1/2025

## Existing:



Legend	
500 kV	
345 kV	
138 kV	
69 kV	
34.5 kV	
23 kV	
New	

## Proposed:



# AEP Transmission Zone: Baseline Greenlawn - East Tiffin

**Process Stage:** Recommended Solution

**Criteria:** AEP 715 criteria

**Assumption Reference:** 2025 RTEP assumption

**Model Used for Analysis:** 2025 RTEP cases

**Proposal Window Exclusion:** Below 200 kV & Substation equipment exclusion

**Problem Statement:**

AEP-T21 through AEP-T30, AEP-T398, AEP-T399, AEP-T403

In the 2025 Summer and Winter RTEP cases, the Greenlawn – East Tiffin 69KV line overload for various N-1-1 outages and line with stuck breaker contingencies.

**Existing Facility Rating:**

Branch	SN/SE/WN/WE (MVA)
05GREENLAW– 05E.TIFF2 69KV	39/39/42/42



# AEP Transmission Zone: Baseline Greenlawn - East Tiffin

## Recommended Solution:

Rebuild 1.75 miles of the Greenlawn - East Tiffin line section of the Carrothers - Greenlawn 69kV circuit containing 133 ACSR conductor with 556 ACSR conductor. Upgrade relaying as required (**B3309**)

**Estimated Cost:** \$3.45M

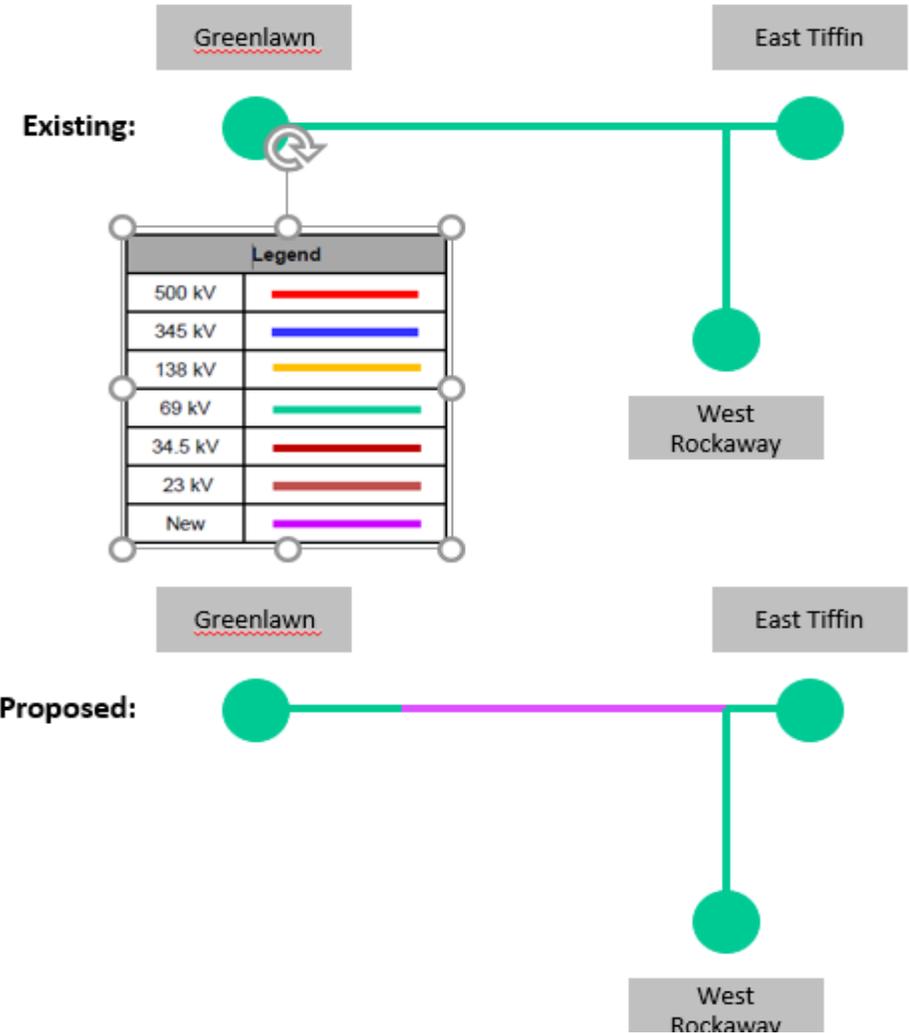
## Preliminary Facility Rating:

Branch	SN/SE/WN/WE (MVA)
05GREENLAW-05E.TIFF2 69KV	73/73/91/91

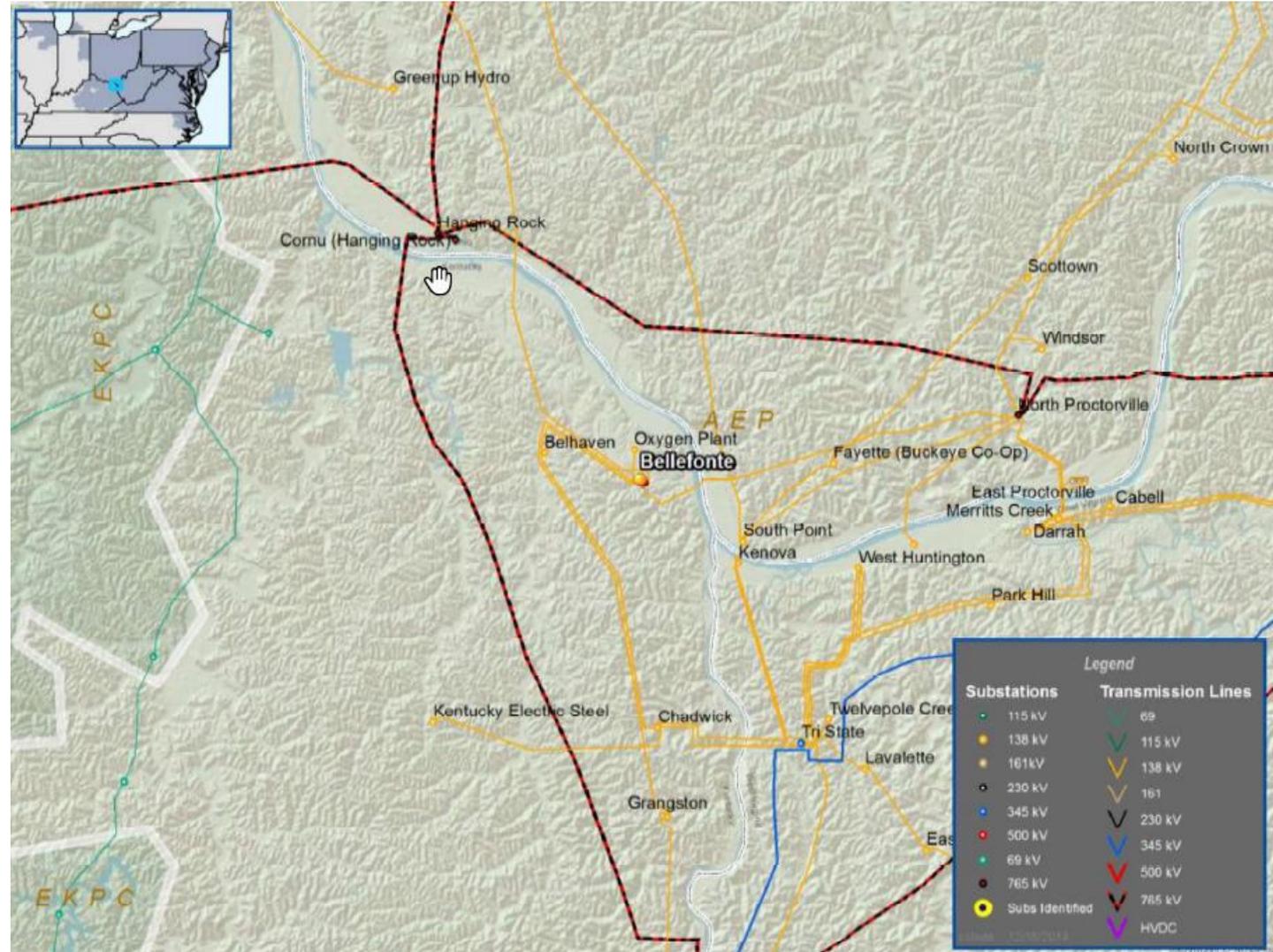
**Required In-Service:** 6/1/2025

**Projected In-Service:** 6/1/2025

**Previously Presented:** 12/18/2020



## B2604 Scope change: Millbrook Park – Franklin Furnace



**B2604 (2014-2-2L):** Previously presented on 01/7/2015 TEAC

**Problem Statement:**

AEP Critical Thermal Violation:

- The Bellefonte 138/69 kV transformer is overloaded for an N-1 contingency.
- The Franklin – Wheelersburg 69 kV line is overloaded for an N-1 contingency.

# AEP Baseline Millbrook Park – Franklin Furnace

## Original Proposed Solution: B2604

- Bellefonte: Install new 138/69-34.5 kV 200 MVA transformer at Bellefonte station. Install circuit switcher and 34.5 breaker on highside and lowside of transformer #5. **In-service (estimated \$3M).**
- ~~Franklin Furnace - Hayport Rd S.S 69kV line: Rebuild 1.73 mile line utilizing 795 ACSR built to 138 kV standards.~~
- ~~Hayport Rd S.S - Wheelersburg 69kV line: Rebuild 2.87 mile line utilizing 795 ACSR built to 138 kV standards~~
- ~~Sciotoville - Wheelersburg 69kV line: Rebuild 4.56 mile line utilizing 795 ACSR built to 138 kV standards~~
- ~~Millbrook Park - Sciotoville 69kV line: Rebuild 2.6 mile line utilizing 795 ACSR built to 138 kV standards~~

**Total Estimated Transmission Cost: ~~\$31.65M~~ \$3M**

Through detailed engineering on the original solution, significant siting and ROW encroachment concerns were identified that made the proposed rebuild of the existing 69 kV line between Millbrook and Franklin Furnace infeasible from a constructability perspective. Expanded easements for the line rebuild along the river and through New Boston, Sciotoville, and Wheelersburg are not possible to obtain, at which point AEP started investigating other alternatives.



## Millbrook Park – Franklin Furnace

### Proposed Solution:

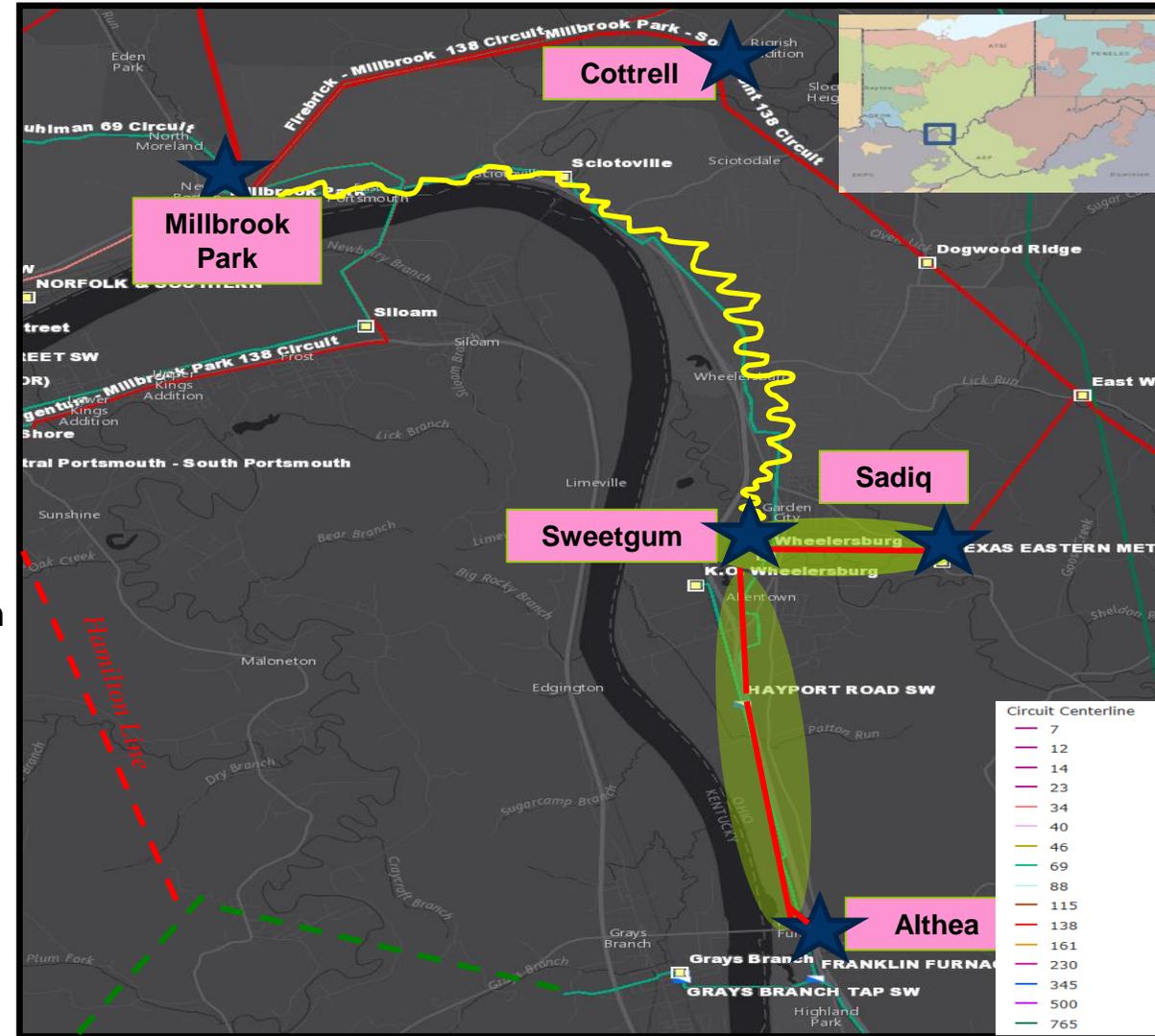
- Remove ~ 11.32 miles of the 69kV Line between Millbrook Park and Franklin Furnace. **Estimated Cost: \$1.13M**
- At Millbrook Park station, add a new 138-69kV transf #2 (90 MVA) w/3000A 40kA breakers on the high and low side. Replace the 600A MOAB Switch and add a 3000A circuit switcher on the high side of transf #1. **Estimated Cost: \$3.05M**
- Replace Sciotoville station with a new 138-12kV in-out station (Cottrell) with 2000A line MOABs facing Millbrook Park & East Wheelersburg. **Estimated Cost: \$1.4M**

Note: Cost of Distribution scope of work not included.

- Tie Cottrell switch into the Millbrook Park – East Wheelersburg circuit by constructing 0.50 miles of line using 795 ACSR 26/7 Drake (SE 359 MVA). **Existing Cost: \$1.96M**
- Install a new 2000A 3-way POP Switch outside of Texas Eastern substation (Sadiq switch). **Estimated Cost: \$1.08M**
- Replace Wheelersburg station with a new 138-12kV in-out station (Sweetgum) with a 3000A 40kA breaker facing Sadiq Switch and a 2000A 138kV MOAB facing Althea. **Estimated Cost: \$2.16M**

Note: Cost of Distribution scope of work not included.

- Build approximately 1.4 miles of new 138kV line using 795 ACSR 26/7 Drake (SE 359 MVA) between the new Sadiq switch and the new Sweetgum station. **Estimated Cost: \$3.41M**
- Remove the existing 69 kV Hayport Road Switch. **Estimated Cost: \$0.1M**



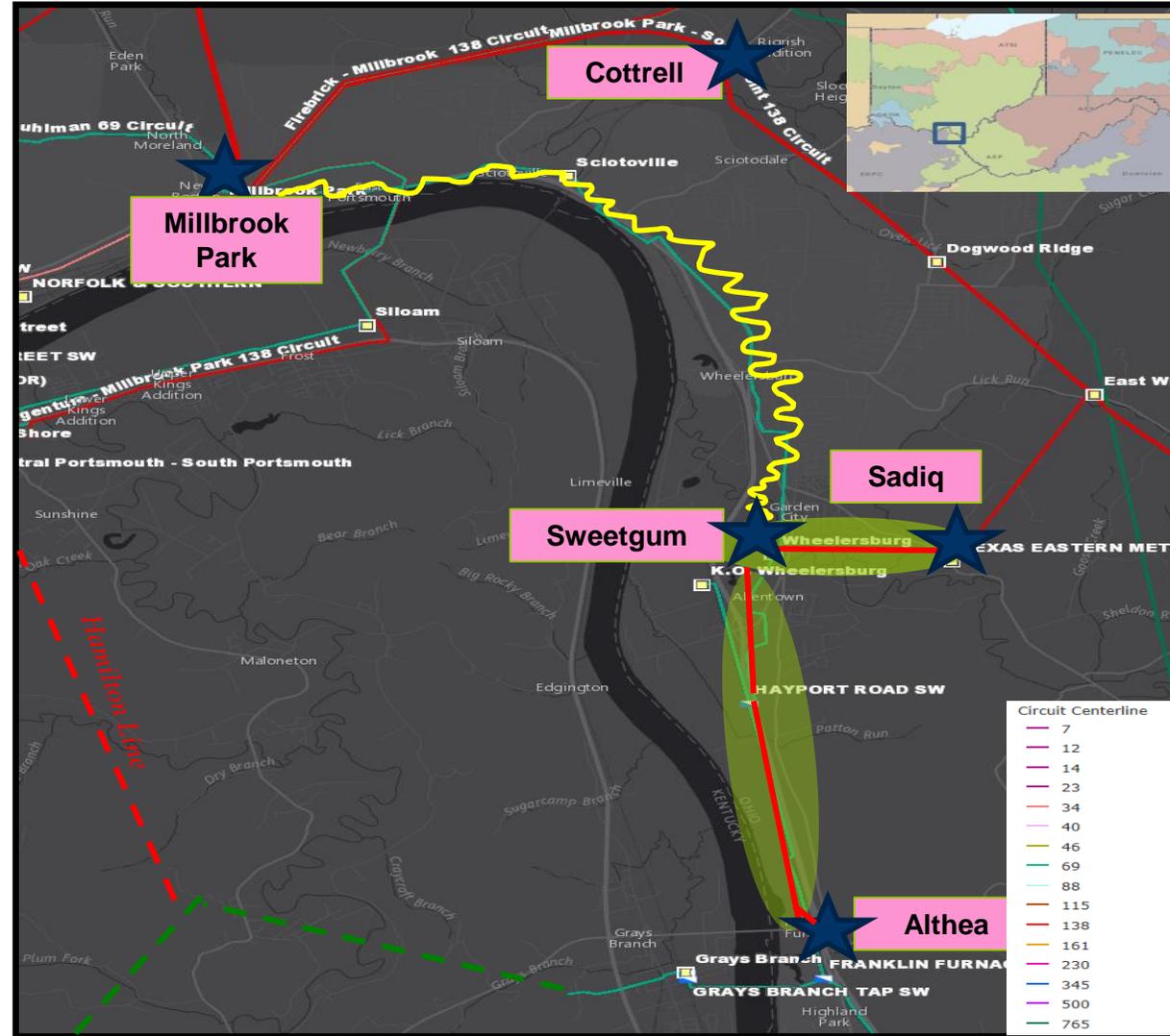
# AEP Baseline Millbrook Park – Franklin Furnace

## Proposed Solution Continued:

- Rebuild ~2.3 miles along existing ROW from Sweetgum to the Hayport Rd switch location as 138kV single circuit and rebuild ~2.0 miles from the Hayport Road switch to Althea with double circuit 138kV construction, one side operated at 69 kV to continue service to K.O. Wheelersburg, using 795 ACSR 26/7 Drake (SE 359 MVA). **(B2604.9) Estimated Cost: \$10.76M**
- Build a new station (Althea) with a 138-69 kV, 90 MVA transformer. The 138kV side will have a single 2000A 40kA circuit breaker and the 69kV side will be a 2000A 40kA three breaker ring bus. **(B2604.10) Estimated Cost: \$11.07M**
- Remote end work at Hanging Rock, East Wheelersburg, & North Haverhill. **(B2604.11) Estimated Cost: \$0.06M**

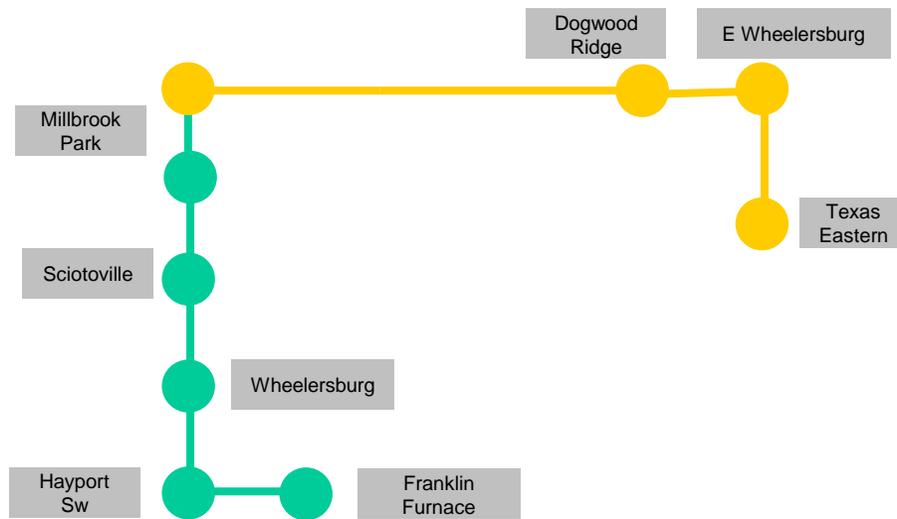
**Total Estimated Transmission Cost: \$36.18M**

**Ancillary Benefits:** The new proposal also addresses needs identified under AEP-2018-OH030, including Sciotoville station, Wheelersburg station, and the three terminal 69 kV line. Constructing 1.4 miles of new 138 kV line allows for the retirement of over 11 miles of deteriorating 69 kV line. Sweetgum is proposed as in and out with a breaker to prevent more than three auto-sectionalizing MOABs in series. There is no room at the existing customer-owned Texas Eastern station site to add breakers, so a phase over phase switch is proposed.

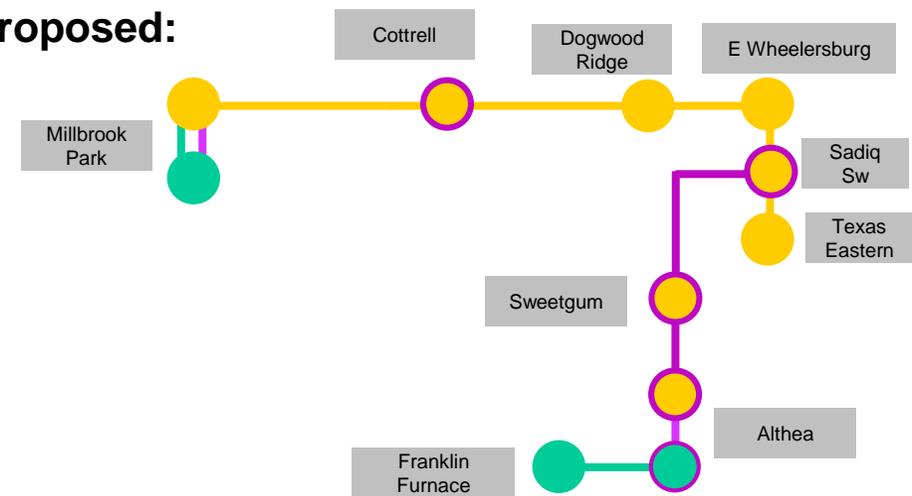


# AEP Baseline Millbrook Park – Franklin Furnace

## Existing:

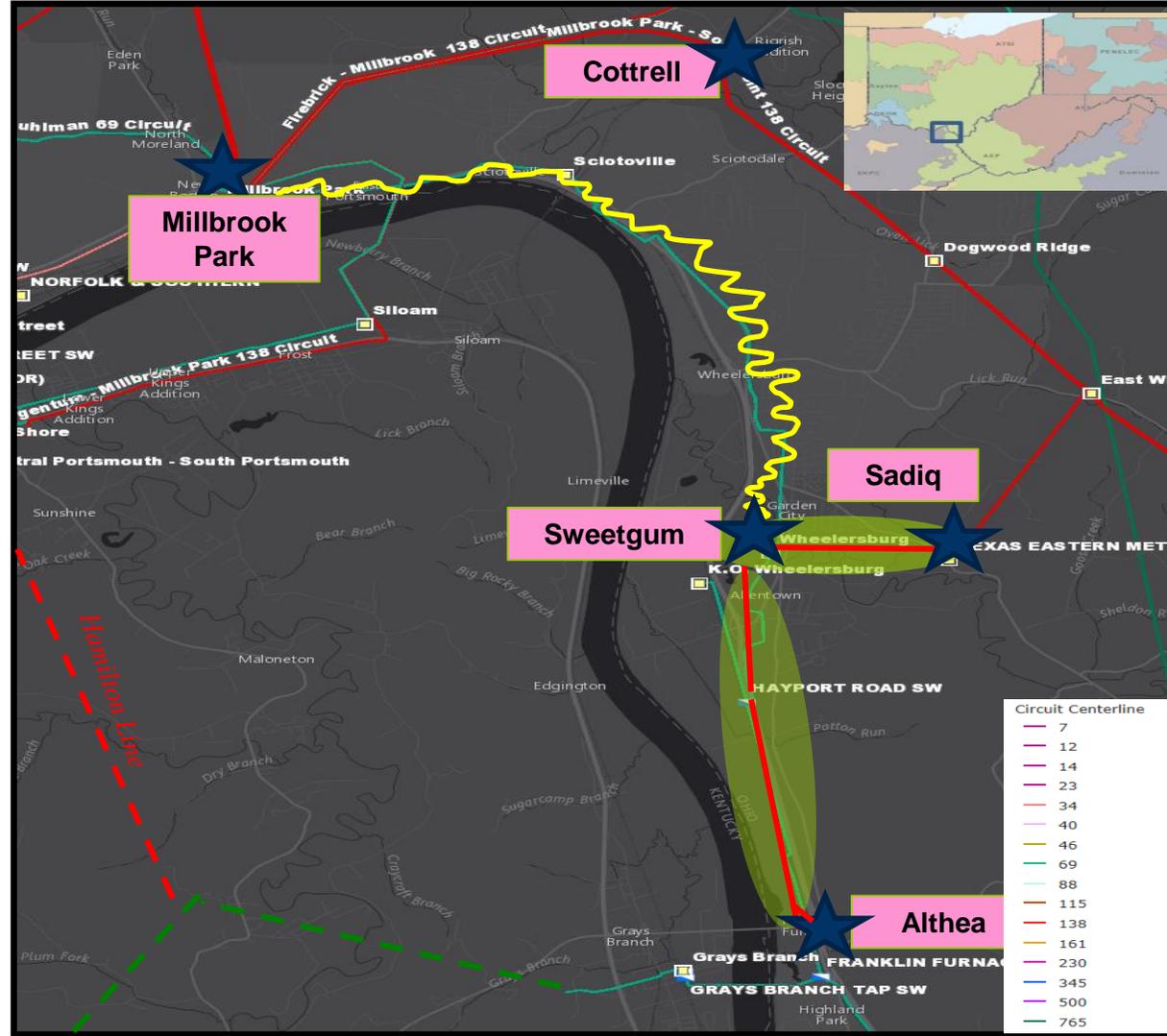


## Proposed:



Legend	
500 kV	
345 kV	
138 kV	
69 kV	
34.5 kV	
23 kV	
New	

# AEP Baseline Millbrook Park – Franklin Furnace



## Alternatives:

A variation of the alternate design was considered to route the 69kV line from Millbrook Park to Wheelersburg across Kentucky. As in the proposed project, Sciotoville would still need to be relocated and there would be a 138kV extension from Wheelersburg to 138kV Texas Eastern. The remaining 69kV line from Wheelersburg to Franklin Furnace would be retired. This option was not chosen because it would leave a weak northern source for North Haverhill which serves several large loads and generation. There are additional ROW risks and costs associated with a 7-mile greenfield line and the two river crossings. **Estimated Cost: \$53.7M**

**Required IS Date:** 6/1/2019

**Projected IS Date:** 04/15/2025

# AEP Transmission Zone: Baseline Chatfield - Melmore Rebuild

**Process Stage:** Recommended Solution

**Criteria:** Summer Generation Deliverability

**Assumption Reference:** 2025 RTEP assumption

**Model Used for Analysis:** 2025 RTEP cases

**Proposal Window Exclusion:** Below 200 kV

**Problem Statement:**

FG: GD-S293

The Chatfield – Melmore 138kV line is overloaded for a line with stuck breaker contingency.

**Existing Facility Rating:**

Branch	SN/SE/WN/WE (MVA)
05CHATFL – 05MELMOR	167/167/210/210

Circuit Centerline

- 7
- 12
- 14
- 23
- 34
- 40
- 46
- 69
- 88
- 115
- 138
- 161
- 230
- 345
- 500
- 765



# AEP Transmission Zone: Baseline Chatfield - Melmore Rebuild

**Proposed Solution:** Rebuild the Chatfield – Melmore 138kV line (~10miles) to 1033 ACSR conductor (**B3249**)

**Preliminary Facility Rating:**

Branch	SN/SE/WN/WE (MVA)
05CHATFL – 05MELMOR	296/413/375/464

**Estimated Cost:** \$27.2M

**Ancillary Benefit:**

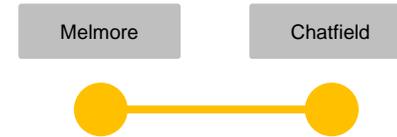
Project will rebuild approximately 10 miles of the 45 mile long Howard – Fostoria 138 kV double circuit line that utilizes lattice structures and 397.5 ACSR conductor that date back to the 1920’s.

- From 2014-2019 there were 6 momentary and 3 permanent outages on the line.
- There are currently 232 open conditions identified on the 45 mile long Howard – Fostoria line related to structure and hardware issues.
- 248 of the 258 structures that make up the 45 mile Howard – Fostoria double circuit 138 kV line are lattice structures from the 1920’s. The other 10 structures that make up the line are a mix of steel and wood structures dating between 1962 and 2016.
- ~99% of the circuit conductor is 397.5 ACSR that was installed in the 1920’s.
- The baseline proposal is rebuilding 10 miles of the existing 45 mile long line to address the overloaded 397.5 ACSR conductor between Chatfield and Melmore.

**Required In-Service:** 6/1/2025

**Previously Presented:** 1/15/2021

**Existing Configuration:**



Legend	
500 kV	
345 kV	
138 kV	
69 kV	
34.5 kV	
23 kV	
New	

**Future Configuration:**



# AEP Transmission Zone: Baseline Howard – Willard 69kV Rebuild

**Process Stage:** Recommended Solution

**Criteria:** AEP 715 criteria

**Assumption Reference:** 2025 RTEP assumption

**Model Used for Analysis:** 2025 RTEP cases

**Proposal Window Exclusion:** Below 200 kV

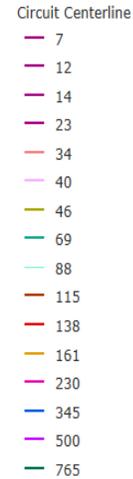
**Problem Statement:**

AEP-T31 through AEP-T36, AEP- T407

In the 2025 Summer RTEP case, The Howard - Willard 69 kV line overloads for various N-1 and N-1-1 contingencies in the Willard area.

**Existing Facility Rating:**

Branch	SN/SE/WN/WE (MVA)
05HOWARD – 05WILLARD 69KV	44/44/56/56



# AEP Transmission Zone: Baseline Howard – Willard 69kV Rebuild

## Proposed Solution:

Rebuild 10.5 miles of the Howard - Willard 69 kV line utilizing 556 ACSR conductor. **Estimated Cost: 19.0M (B3310.1)**

Upgrade relaying at Howard station. **Estimated Cost: 0.23M (B3310.2)**

Upgrade relaying at Willard station. **Estimated Cost: 0.23M (B3310.3)**

**Total Estimated Cost: \$19.46M.**

## Preliminary Facility Rating:

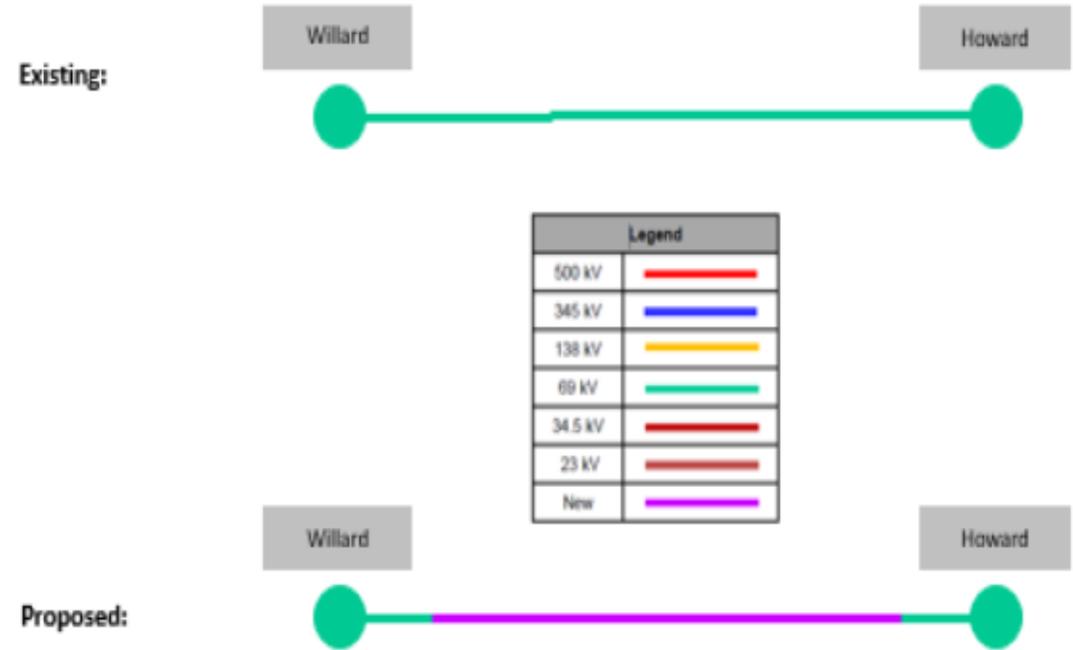
Branch	SN/SE/WN/WE (MVA)
05HOWARD – 05WILLARD 69KV	82/90/107/113

**Ancillary Benefits:** The project will rebuild approximately 10.5 miles of the 14 mile Howard – Willard 69 kV line that utilizes 1920’s vintage 3/0 ACSR and 3/0 Copper conductor. Howard – Willard 69kV Circuit (~14 miles):

- From 2015-2020 this circuit has experienced 1 permanent and 11 momentary outages.
- Majority of structures are wood poles. Close to half of the wood pole structures are 1970’s or older, with the bulk of them being 1940’s vintage. Other structures have been replaced sporadically on the line throughout the years (80’s-90’s) with like for like wood pole replacements that would not support a larger conductor than the existing 3/0 ACSR/Copper.
- Certain portions of the line have been rebuilt in the 1990’s and 2000’s associated with relocations and utilize a larger 556 ACSR conductor. These sections will not be rebuilt as a part of this proposal.
- ~75% of the circuit conductor is 3/0 ACSR and Copper type that was installed in the 1920’s. The other ~25% is 556 ACSR conductor on sections that will not be rebuilt as a part of this proposal.

**Required In-Service:** 6/1/2025

**Previously Presented:** 1/15/2021



# AEP Transmission Zone: Baseline Abingdon Area

**Process Stage:** Recommended Solution

**Criteria:** AEP 715 criteria

**Assumption Reference:** 2025 RTEP assumption

**Model Used for Analysis:** 2025 RTEP cases

**Proposal Window Exclusion:** Below 200 kV

**Problem Statement:**

FG: AEP-T44, AEP-T45, AEP-T46, AEP-T47, AEP-T48, AEP-T62, AEP-VM121 through AEP-VM132, AEP-VD74 through AEP-VD10

In the 2025 Winter RTEP, for multiple N-1-1 contingency pairs, thermal violation is identified on the existing Meadowview's 138/69 34.5 kV TR#2. Furthermore, voltage violations are identified on the existing Glade, Owens Drive, Medallion, Hillman Highway, Arrowhead and Damascus 69KV busses.

**Existing Facility Rating:**

Branch	SN/SE/WN/WE (MVA)
05MEADWV – 05MEADWVW 138/69kV	60/70/69/78



# AEP Transmission Zone: Baseline Abingdon Area

## Recommended Solution:

Saltville Station: Replace H.S. MOAB Switches on the high side of the 138/69-34.5 kV T1 with a H.S. Circuit Switcher. **(B3278.1)**

**Estimated Cost:** \$0.72M

Meadowview Station: Replace existing 138/69-34.5 kV transformer T2 with a new 130 MVA 138/69-13 kV transformer **(B3278.2)**

**Estimated Cost:** \$3.14M

**Total Estimated Cost:** \$3.86M

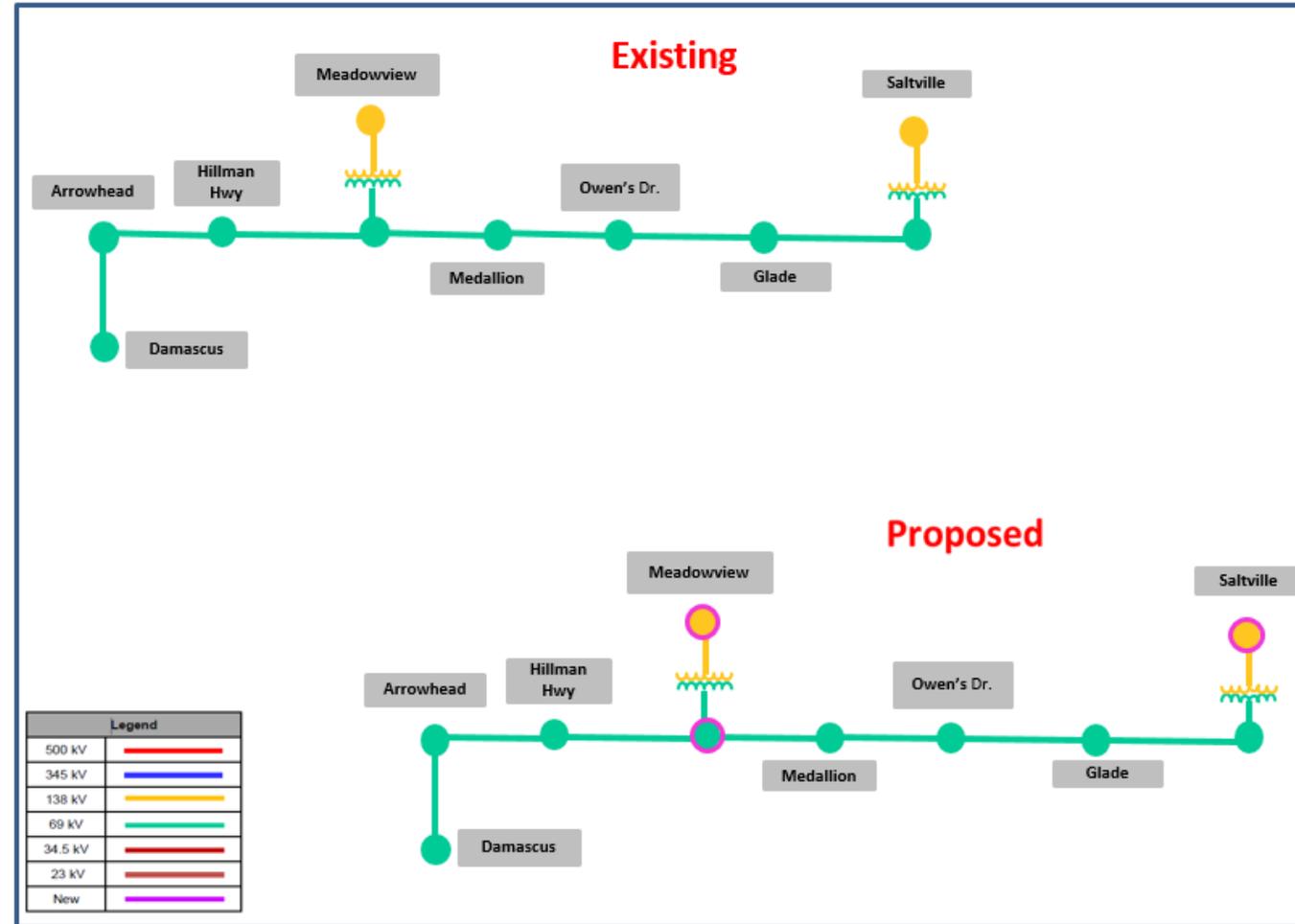
Branch	SN/SE/WN/WE (MVA)
05MEADWV T2 138/69/13 kV	130/130/130/130

**Ancillary Benefits:** Addresses Need AEP-2020-AP024 and partially addresses Need AEP-2020-AP037

**Required In-Service:** 12/1/2025

**Projected In-Service:** 12/1/2025

**Previously Presented:** 12/18/2020



# AEP Transmission Zone: Baseline Apple Grove Cap Bank

**Process Stage:** Recommended Solution

**Criteria:** AEP 715 criteria

**Assumption Reference:** 2025 RTEP assumption

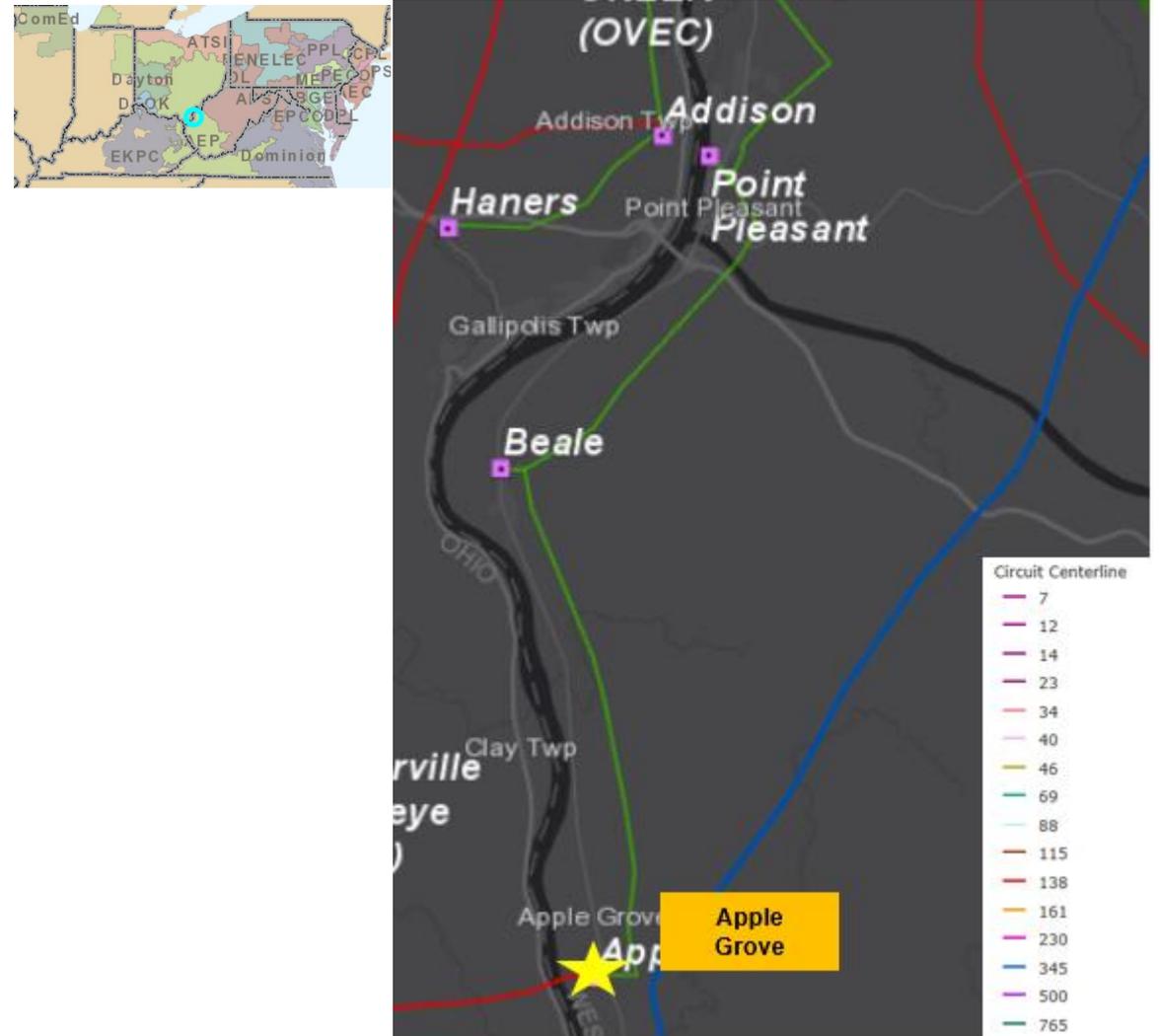
**Model Used for Analysis:** 2025 RTEP cases

**Proposal Window Exclusion:** Below 200 kV

**Problem Statement:**

FG: AEP-VM89 through AEP-VM120, AEP-VD41 through AEP-VD73, AEP-VD580, AEP-VD583, AEP-VD606, AEP-VD607, AEP-VD608, AEP-VD609, AEP-VD614, AEP-VD615, AEP-VD616, AEP-VD617, AEP-VD785, AEP-VD788, AEP-VD897, AEP-VD898

In the 2025 RTEP summer, winter and light load cases, there are voltage violations at Apple Grove and Beale 69kV Stations for the tower contingency and multiple N-1-1 scenarios



# AEP Transmission Zone: Baseline Apple Grove Cap Bank

## Recommended Solution:

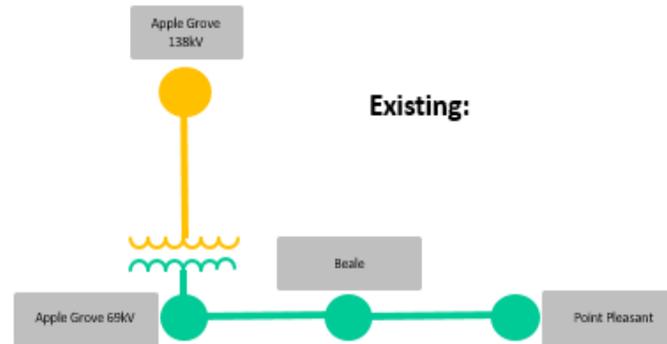
Install a new 138 kV, 21.6 MVAR cap bank and circuit switcher at Apple Grove Station. (B3279)

Estimated Cost: \$1.0M

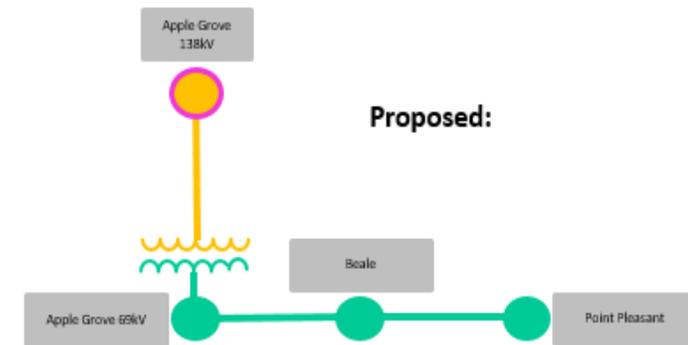
Required In-Service: 6/1/2025

Projected In-Service: 6/1/2025

Previously Presented: 12/18/2020



Legend	
500 kV	
345 kV	
138 kV	
69 kV	
34.5 kV	
23 kV	
New	



# AEP Transmission Zone: Baseline Sectionalizing at Dewey

**Process Stage:** Recommended Solution

**Criteria:** AEP 715 criteria

**Assumption Reference:** 2025 RTEP assumption

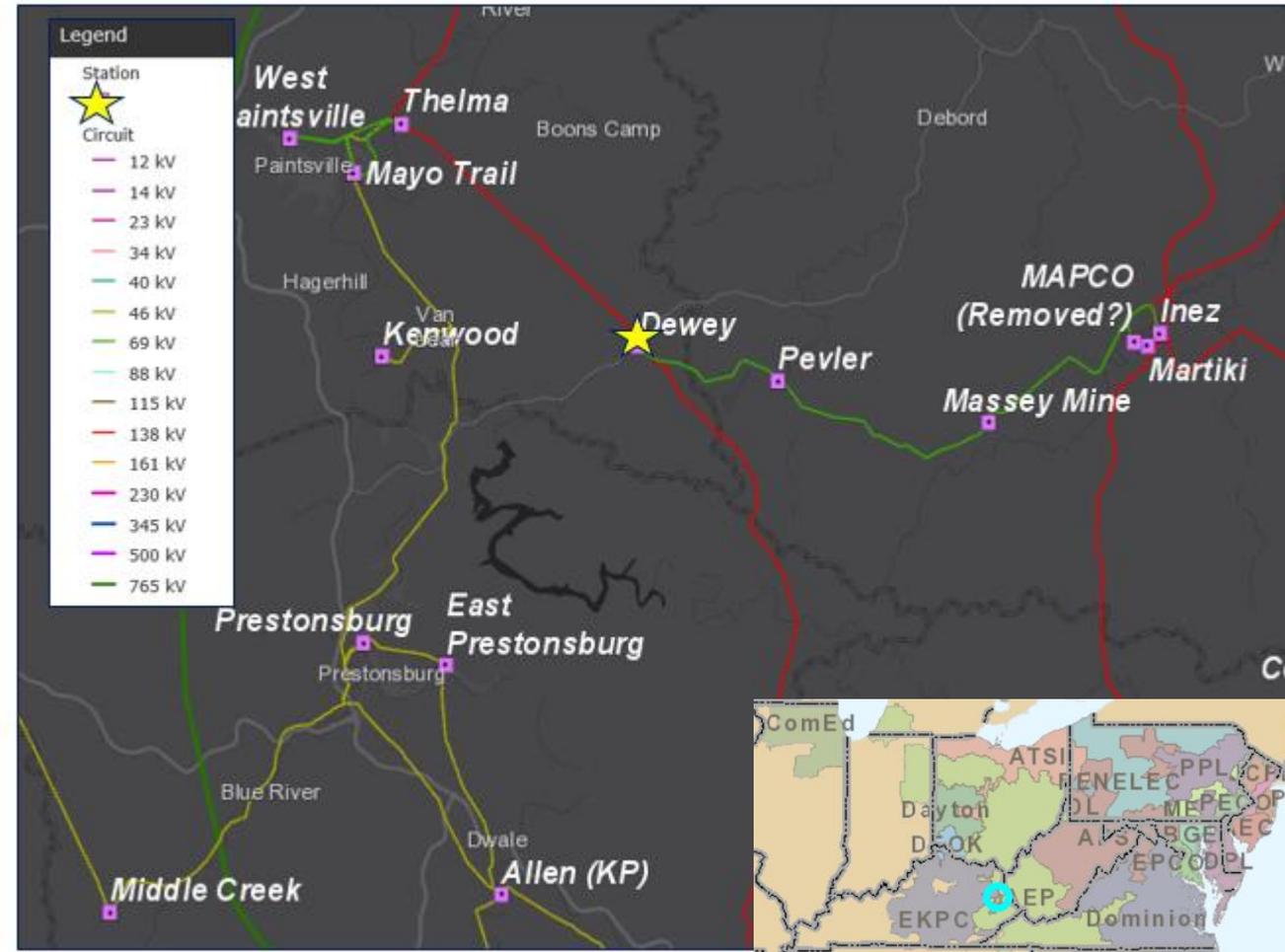
**Model Used for Analysis:** 2025 RTEP cases

**Proposal Window Exclusion:** Below 200 kV

**Problem Statement:**

FG: AEP-VM502 through AEP-VM510, AEP-VM561, AEP-VM562, AEP-VM812 through AEP-VM816, AEP-VD481, AEP-VD482, AEP-VD483, AEP-VD1

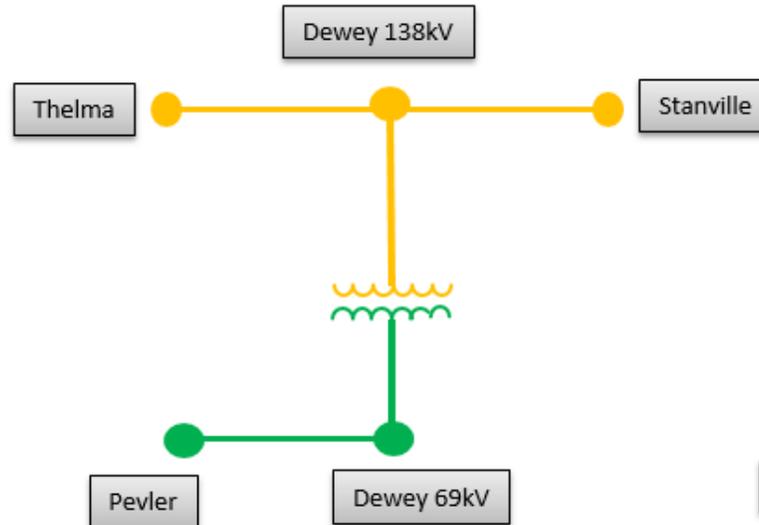
In the 2025 Winter RTEP case, there are voltage violations at Stanville and Hays Branch 138kV buses, Mayo Trail and West Paintville 69kV buses and Kenwood, Prestonsburg, East Prestonsburg, Allen and Middle Creek 46KV in the event of an N-1-1 scenario



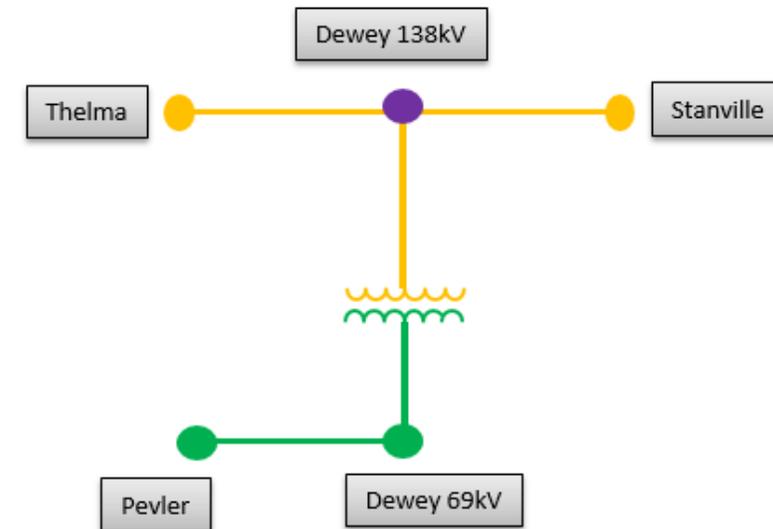
# AEP Transmission Zone: Baseline Sectionalizing at Dewey

Legend	
500 kV	
345 kV	
138 kV	
69 kV	
46 kV	
New	

## Existing



## Proposed



### Recommended Solution:

Install 138kV Circuit Switcher on the 138/69kV XF #1 and 138/34.5kV XF #2 at Dewey. Install 138kV 2000A breaker on Stanville line at Dewey 138kV substation. (B3281)

**Estimated Cost:** \$1.4M

**Required In-Service:** 12/1/2025

**Projected In-Service:** 12/1/2025

**Previously Presented:** 12/18/2020

# AEP Transmission Zone: Baseline East Huntington - North Proctorville 138 kV

**Process Stage:** Recommended Solution

**Criteria:** AEP 715 criteria

**Assumption Reference:** 2025 RTEP assumption

**Model Used for Analysis:** 2025 RTEP cases

**Proposal Window Exclusion:** Below 200 kV & Substation equipment exclusion

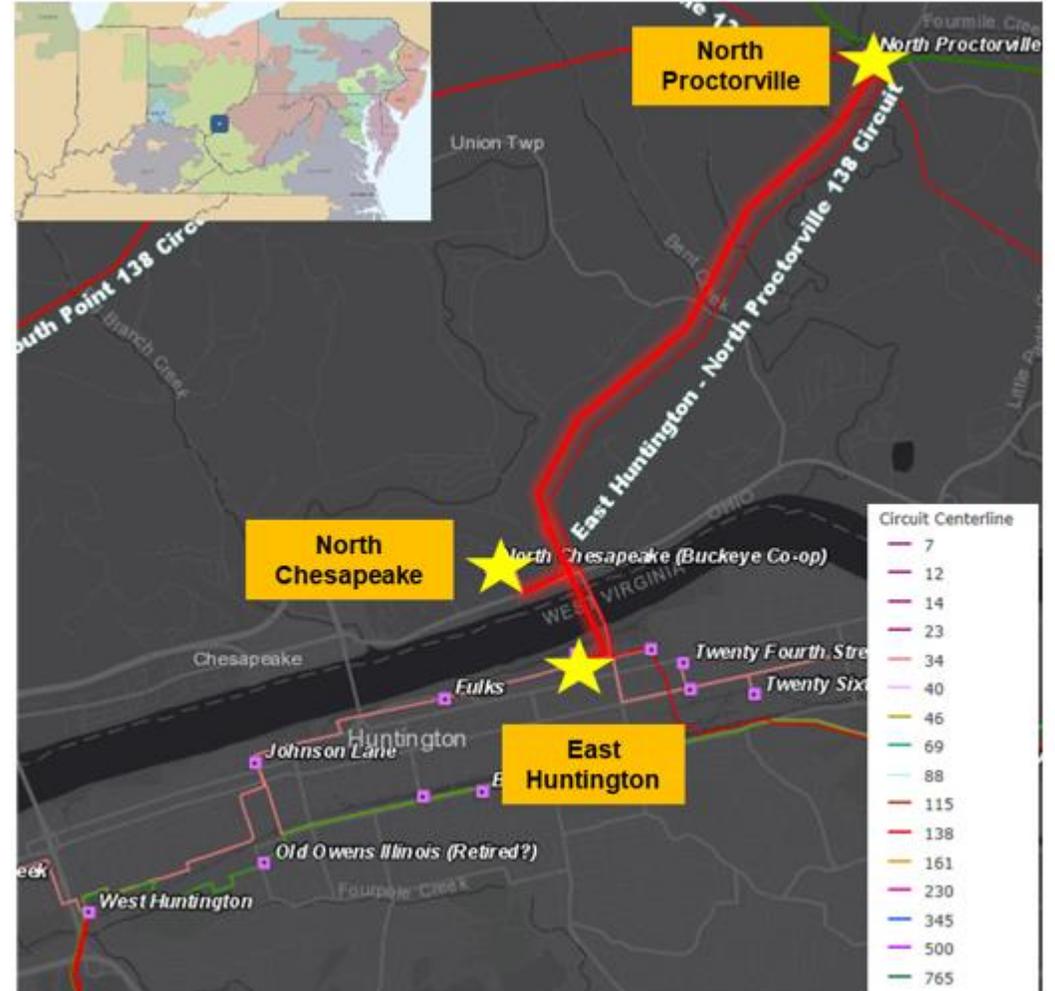
**Problem Statement:**

FG: AEP-T273, AEP-T274, AEP-VM555, AEP-VM556, AEP-VM557, AEP-VM558, AEP-V653, AEP-VM654, AEP-VM655, AEP-VM656, AEP-VM664, AEP-VM665, AEP-VM670, AEP-VM671, AEP-VM674, AEP-VM675, AEP-VM700, AEP-VM701, AEP-VM702, AEP-VM703, AEP-VM721, AEP-VM722, AEP-VM723, AEP-VM724, AEP-VM727, AEP-VM728, AEP-VM740, AEP-VM741, AEP-VM817, AEP-VM819, AEP-VM828, AEP-VM829, AEP-VM830, AEP-VM831, AEP-VM838, AEP-VM839, AEP-VM840, AEP-VM841, AEP-VD603, AEP-VD604, AEP-VD611, AEP-VD613, AEP-VD738, AEP-VD747, AEP-VD753, AEP-VD754, AEP-VD761, AEP-VD763, AEP-VD765, AEP-VD767, AEP-VD768, AEP-VD772, AEP-VD812, AEP-VD814, AEP-VD829, AEP-VD830, AEP-VD860, AEP-VD865, AEP-VD866, AEP-VD867, AEP-VD871, AEP-VD882, AEP-VD890, AEP-VD894, AEP-VD1012, AEP-VD1013, AEP-VD1022, AEP-VD1023, AEP-VD1117, AEP-VD1118, AEP-VD1119, AEP-VD1120, AEP-VD1126, AEP-VD1127, AEP-VD1129, AEP-VD1130, AEP-T257, AEP-T258, AEP-T259, AEP-T266, AEP-T269, AEP-T270, AEP-T277, AEP-T278, AEP-T279, AEP-T908

In the 2025 Summer case, Fulks – Johnson Lane 34.5kV line is overload and in the 2025 Summer and Winter RTEP cases, voltage violations at East Huntington 138KV buses, 23<sup>rd</sup> Street, 24<sup>th</sup> street, 26<sup>th</sup> Street, BASF, East Huntington, Johnson Lane, Fulks, Connor Street, Inco Fur and Connor F 34.5kV buses due to an N-1-1 scenario.

**Existing Facility Rating:**

Branch	SN/SE/WN/WE (MVA)
05FULKS – 05JOHNSON LN 34.5kV	31/43/45/51



# AEP Transmission Zone: Baseline East Huntington - North Proctorville 138 kV

## Preliminary Ratings:

Branch	SN/SE/WN/WE (MVA)
05NPROCT – 05N. CHESPK 138KV	257/360/325/404
05E. HUNTING2 – 05N. CHESPK 138KV	257/360/325/404

## Recommended Solution:

Install a second 138 kV circuit utilizing 795 ACSR conductor on the open position of the existing double circuit towers from East Huntington - North Proctorville. Remove the existing 34.5 kV line from East Huntington - North Chesapeake and rebuild this section to 138 kV served from a new PoP switch off the new East Huntington - North Proctorville 138 kV #2 line. **(B3282.1)**

**Estimated Cost:** \$7.1M

Install a 138 kV circuit breaker at North Proctorville. **(B3282.2)**

**Estimated Cost:** \$1.4M

Install a 138 kV circuit breaker at East Huntington. **(B3282.3)**

**Estimated Cost:** \$1.1M

Convert the existing 34/12 kV North Chesapeake to a 138/12 kV station. **(B3282.4)** **Estimated Cost:** \$0.8M

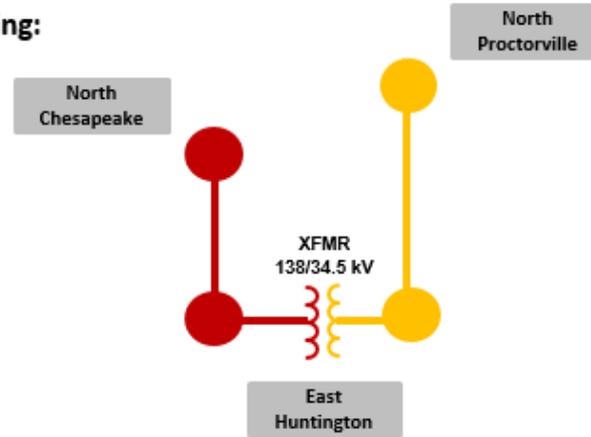
**Total Estimated Cost:** \$10.4M

**Required In-Service:** 6/1/2025

**Projected In-Service:** 6/1/2025

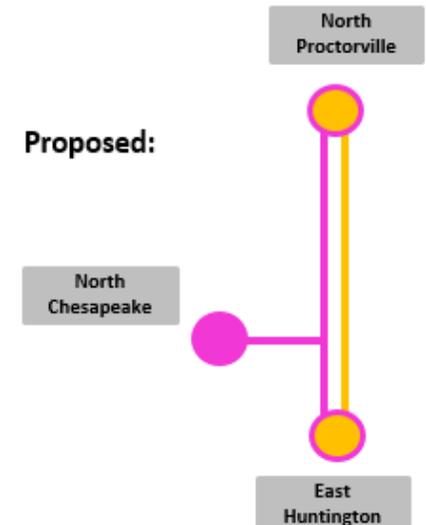
**Previously Presented:** 12/18/2020

### Existing:



Legend	
500 kV	
345 kV	
138 kV	
46 kV	
34.5 kV	
23 kV	
New	

### Proposed:



# AEP Transmission Zone: Baseline Inez 138kV

**Process Stage:** Recommended Solution

**Criteria:** AEP 715 criteria

**Assumption Reference:** 2025 RTEP assumption

**Model Used for Analysis:** 2025 RTEP cases

**Proposal Window Exclusion:** Below 200 kV

**Problem Statement:**

FG: AEP-T158, AEP-T160, AEP-T161, AEP-T162

In the 2025 Winter RTEP case, the Inez 138/69kV transformer overloads in the event of an N-1-1 scenario

**Existing Facility Rating:**

Branch	SN/SE/WN/WE (MVA)
05INEZ 138/69KV	70/78/70/78



# AEP Transmission Zone: Baseline Inez 138kV

## Recommended Solution:

Replace the existing Inez 138/69kV 50 MVA autotransformer with a 138/69kV 90 MVA autotransformer. This is a conversion of part of s2281.1 to baseline. (**B3283**)

s2281.1 estimated cost is reduced from \$10.7M to \$7.74M due to the conversion.

**Estimated Cost:** \$2.96M

## Preliminary Facility Rating:

Branch	SN/SE/WN/WE (MVA)
05INEZ 138/69/13KV	136.6/138.3/154.4/160.9

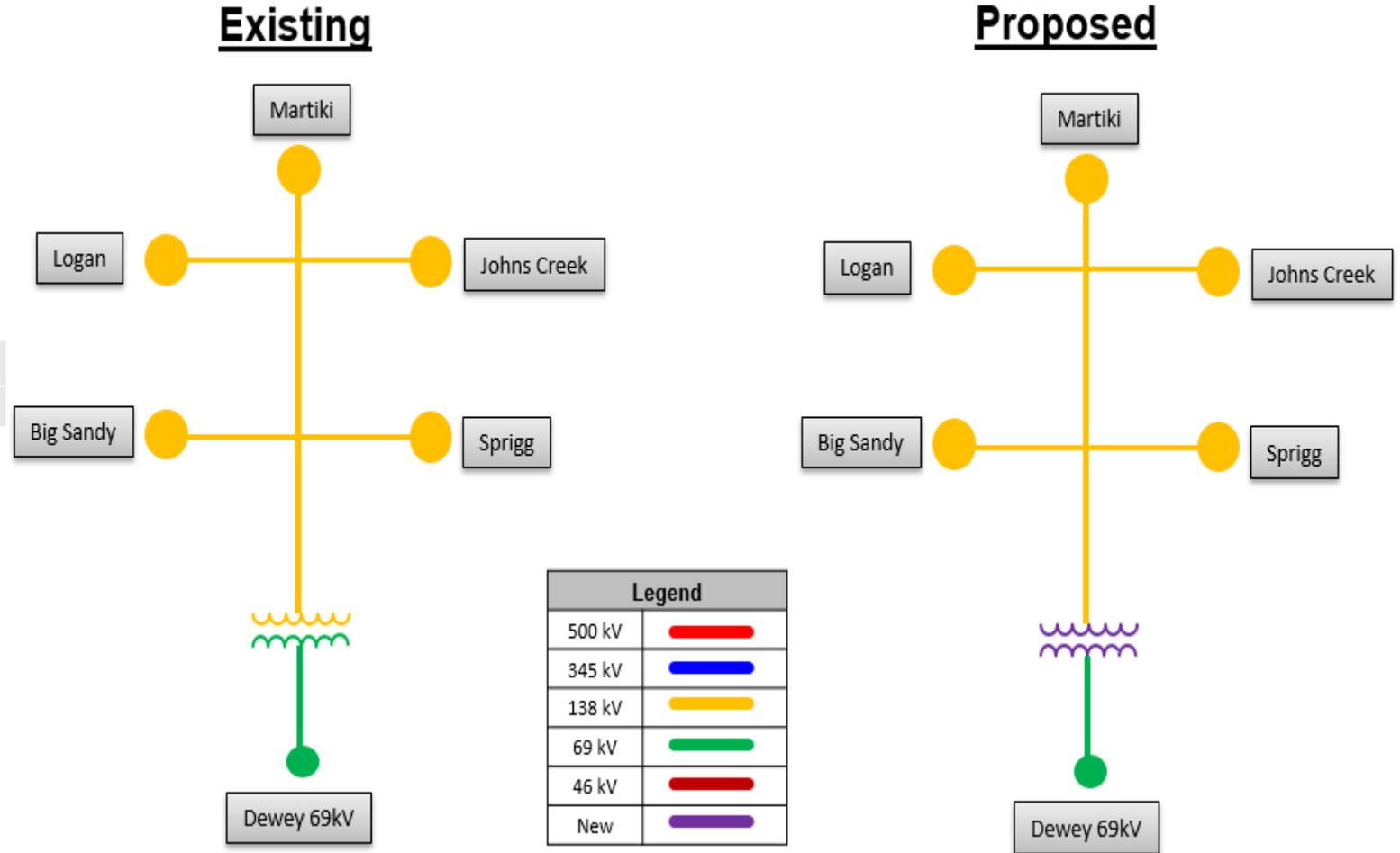
## Ancillary Benefits:

This work also addresses the identified issues in AEP-2019-AP047 on the Inez 138/69kV transformer. This proposal is a conversion of a portion of s2281.1 to baseline.

**Required In-Service:** 12/1/2025

**Projected In-Service:** 12/1/2025

**Previously Presented:** 12/18/2020



# AEP Transmission Zone: Baseline Grundy Area

**Process Stage:** Recommended Solution

**Criteria:** AEP 715 criteria

**Assumption Reference:** 2025 RTEP assumption

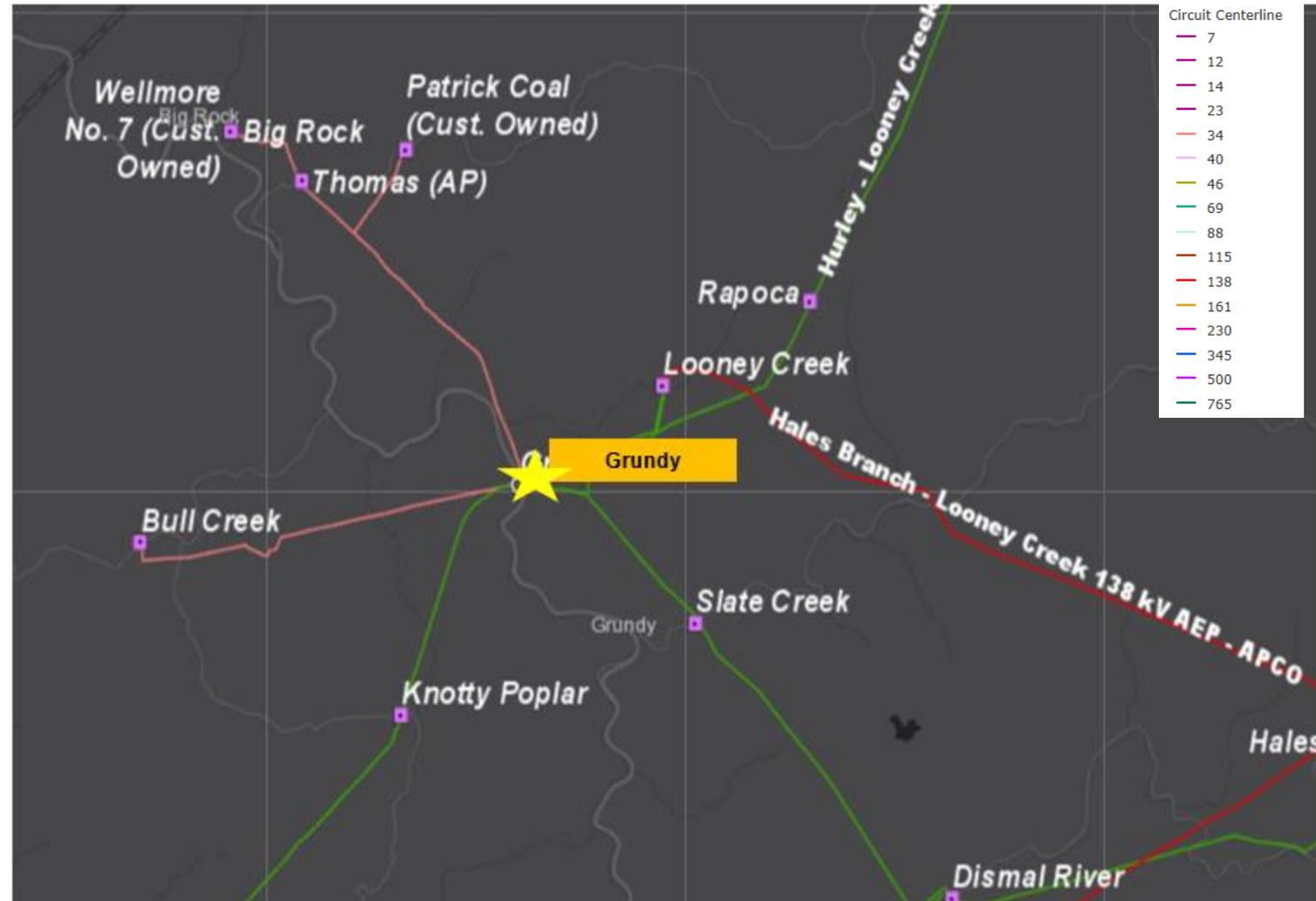
**Model Used for Analysis:** 2025 RTEP cases

**Proposal Window Exclusion:** Below 200 kV

**Problem Statement:**

FG: AEP-VD704 AEP-VD705 AEP-VD707 AEP-VD708 AEP-VD1002 AEP-VD1084 AEP-VD1085 AEP-VD1088 AEP-VD1089 AEP-VD1091 AEP-VD1092 AEP-VD1093 AEP-VD1148 AEP-VD1149 AEP-VD1150 AEP-VD1151 AEP-VD1152 AEP-VD1153 AEP-VD1154 AEP-VD1155 AEP-VD1156 AEP-VD1157 AEP-VD1158 AEP-VD1159

In the 2025 Summer and Winter RTEP cases, voltage violations are identified on the existing Big Rock 34.5kV, Patrick 34.5 kV, Thomas 34.5 kV, Bull Creek 34.5 kV, Grundy 34.5 kV, Grundy 69kV and Knotty Poplar 69 kV buses for one line with stuck breaker contingency and multiple N-1-1 contingency pairs.



# AEP Transmission Zone: Baseline Grundy Area

**Recommended Solution:**

Grundy 34.5 kV: Install a 34.5 kV 9.6 MVAR cap bank (**B3295**)

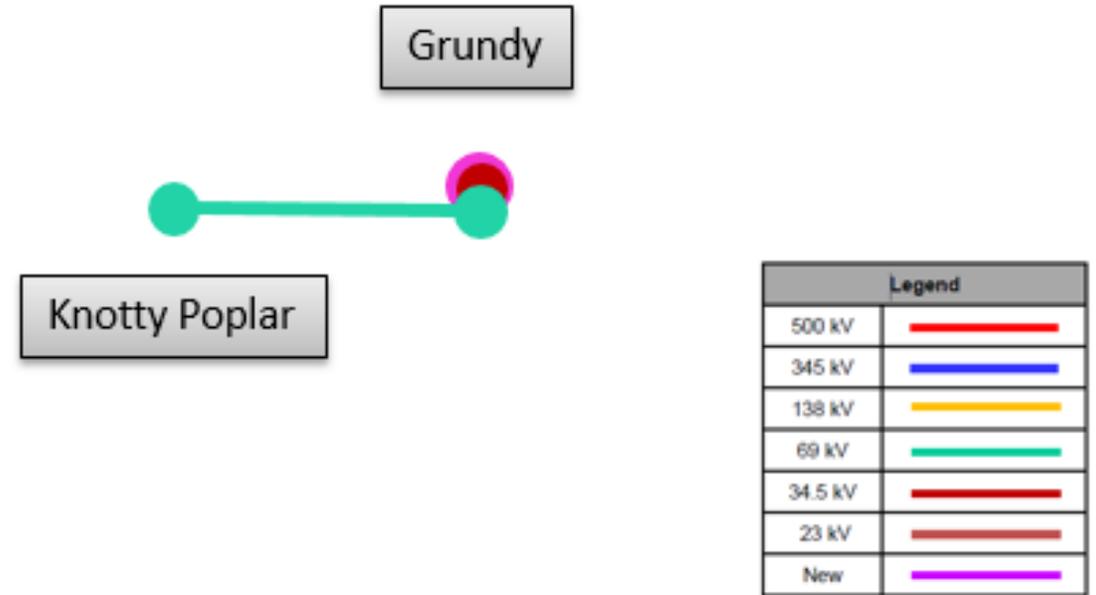
**Estimated Cost:** \$0.8M

**Alternatives:** Build a ~3.2 miles long 69 KV single circuit line with 556 ACSR conductor from Turkey Pen Station to Grundy Station. Estimated Cost: \$8M

**Required In-Service:** 6/1/2025

**Projected In-Service:** 6/1/2025

**Previously Presented:** 12/18/2020



# AEP Transmission Zone: Baseline South Toronto - West Toronto 69 kV Rebuild

**Process Stage:** Recommended Solution

**Criteria:** AEP 715 criteria

**Assumption Reference:** 2025 RTEP assumption

**Model Used for Analysis:** 2025 RTEP cases

**Proposal Window Exclusion:** Below 200 kV

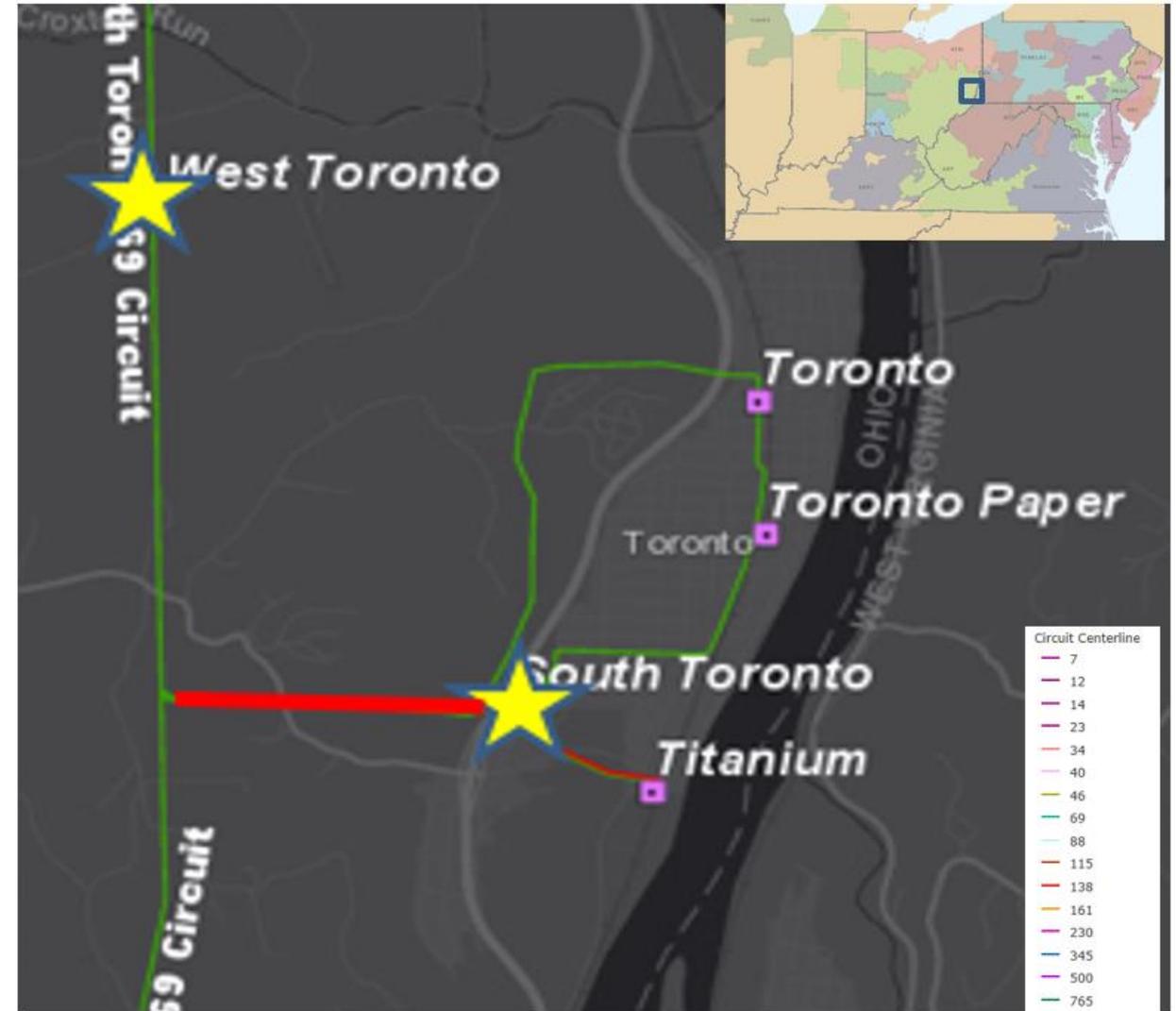
**Problem Statement:**

FG: AEP-T486, AEP-T487, AEP-T489, AEP-T490, AEP-T492, AEP-T493, AEP-T496, AEP-T497

In 2025 Summer RTEP case, the South Toronto-West Toronto 69kV branch is overloaded for multiple N-1-1 contingency pairs.

**Existing Facility Rating:**

Branch	SN/SE/WN/WE (MVA)
05S TORONT- 05W TORONT 69KV	49/49/61/61
05S.TORONTOZ - 05SUNSTBL 69KV	54/54/76/76



# AEP Transmission Zone: Baseline South Toronto - West Toronto 69 kV Rebuild

## Recommended Solution:

Rebuild 0.8 miles of double circuit 69kV line between South Toronto and West Toronto. Replace 219 kcmil ACSR with 556 ACSR. **(B3298) Estimated Cost: \$2.83M**

Replace the 69kV breaker D at South Toronto station with 40 KA breaker **(B3298.1) Estimated Cost: \$0.7M**

**Total Estimated Cost: \$3.53M**

## Preliminary Facility Rating:

Branch	SN/SE/WN/WE (MVA)
05S TORONT- 05W TORONT 69KV	68/68/90/103
05S.TORONTOZ - 05SUNSTBL 69KV	64/64/90/96

**Required In-Service: 6/1/2025**

**Projected In-Service: 6/1/2025**

**Previously Presented: 12/18/2020**

Legend	
500 kV	
345 kV	
138 kV	
69 kV	
34.5 kV	
23 kV	
New	

