



Reliability Analysis Update

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Sub Regional RTEP Committee - PJM West
October 20, 2023

First Review Baseline Reliability Projects

Process Stage: First Review

Criteria: FERC 715

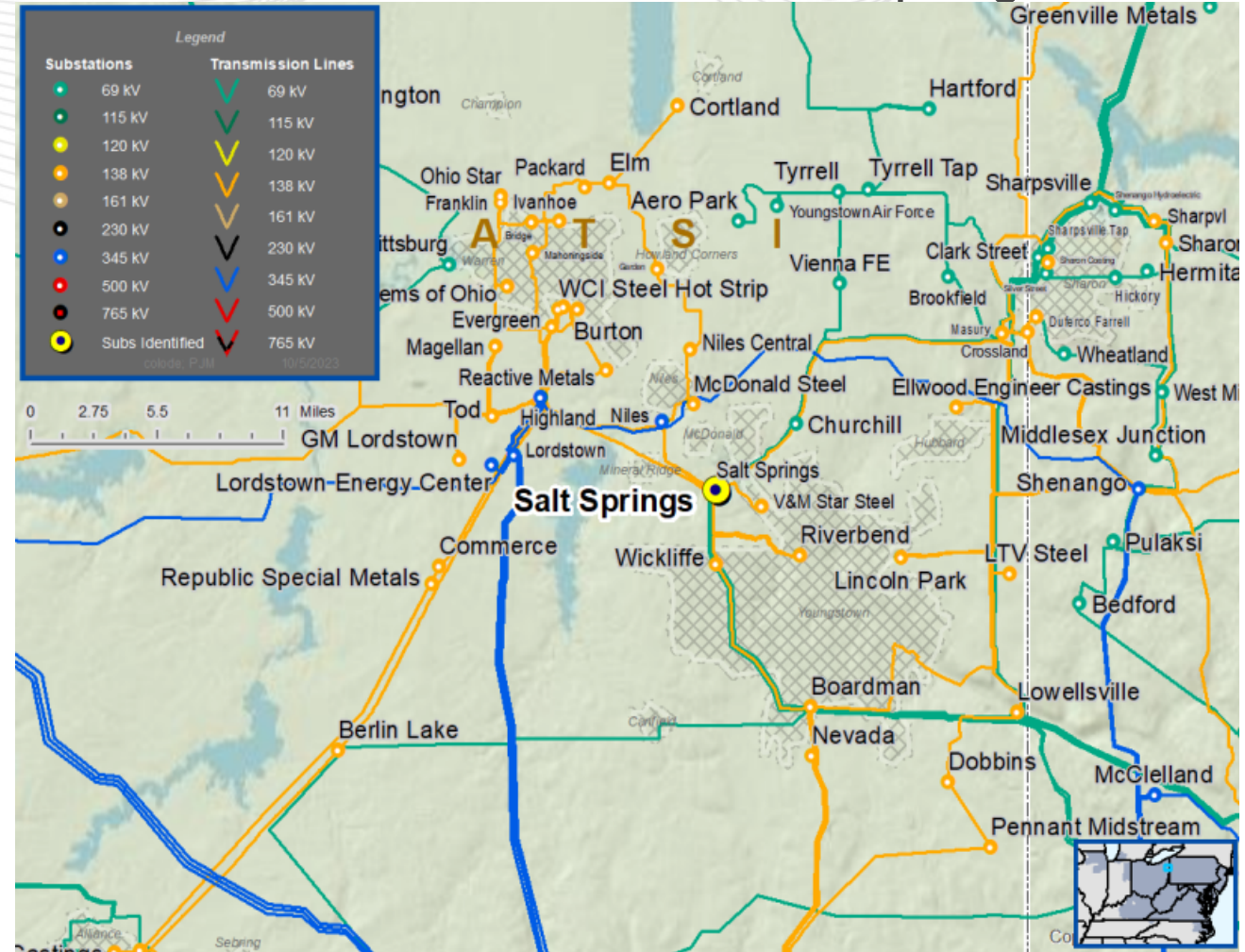
Assumption Reference: 2028 RTEP assumption

Model Used for Analysis: 2028 Light Load RTEP case

Proposal Window Exclusion: Below 200 kV Exclusion

Problem Statement: 2023W1-ATSI-VM1 to 2023W1-ATSI-VM7

In 2028 RTEP Light Load case, high voltage is observed in several buses around Salt Spring 69 kV for N-1 event





ATSI Transmission Zone: Baseline Salt Springs 69 kV

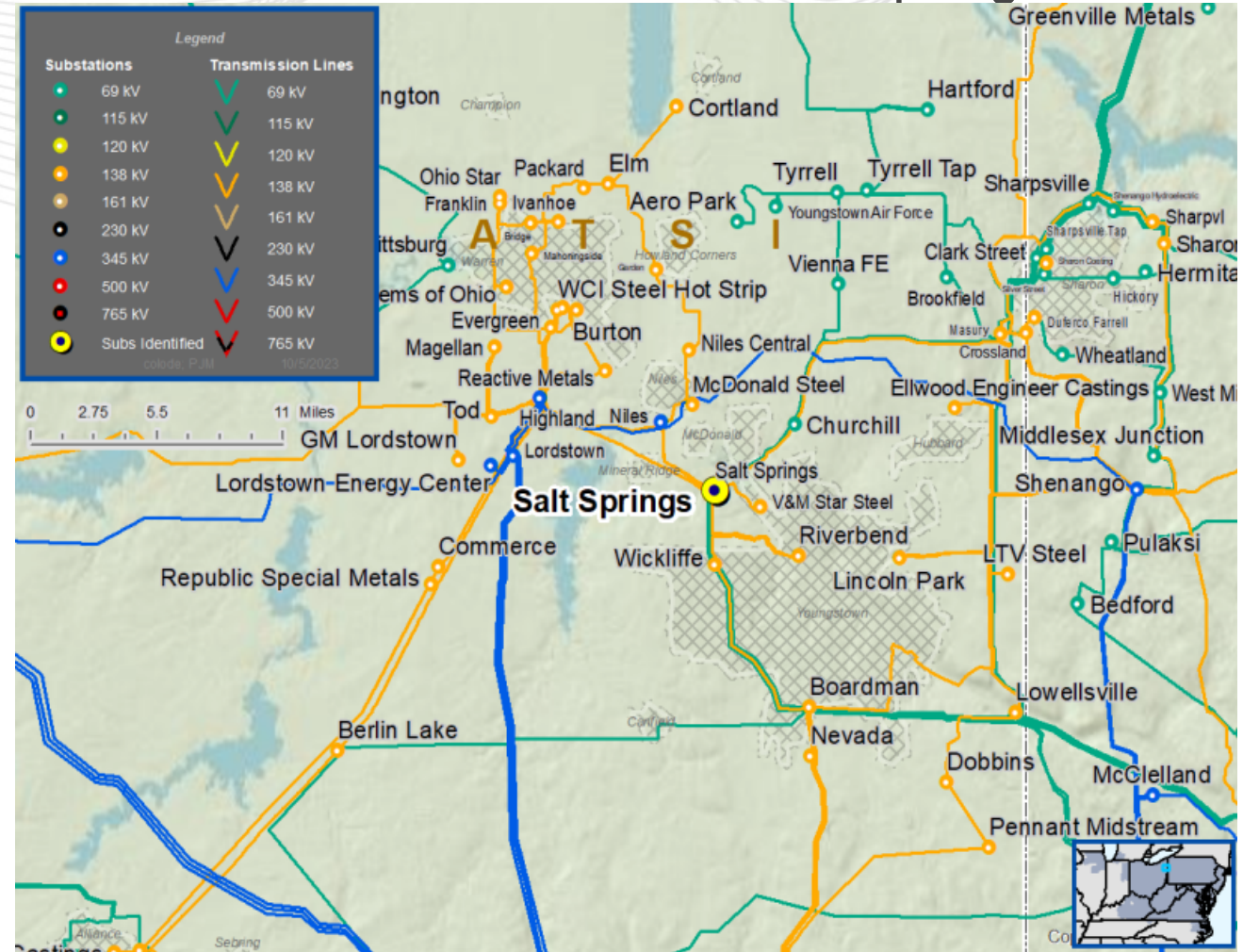
Proposed Solution: A 69 kV, 60 MVAR Shunt Reactor will be installed at the Salt Springs Substation. The reactor terminal will be connected to the existing 69 kV bus and an independent-pole operation, 1200 A circuit breaker will be installed for reactor switching.

Total Estimated Cost: \$5.45 M

Alternatives: Reactor installations were evaluated at other locations but Salt Springs provided the most benefit.

Ancillary Benefits: N/A

Required In-Service: 06/01/2028





AEP Transmission Zone: Baseline Abert – Reusens 69kV Rebuild

Process Stage: First Review

Criteria: AEP 715 Criteria

Assumption Reference: 2023 RTEP assumption

Model Used for Analysis: 2028 RTEP cases

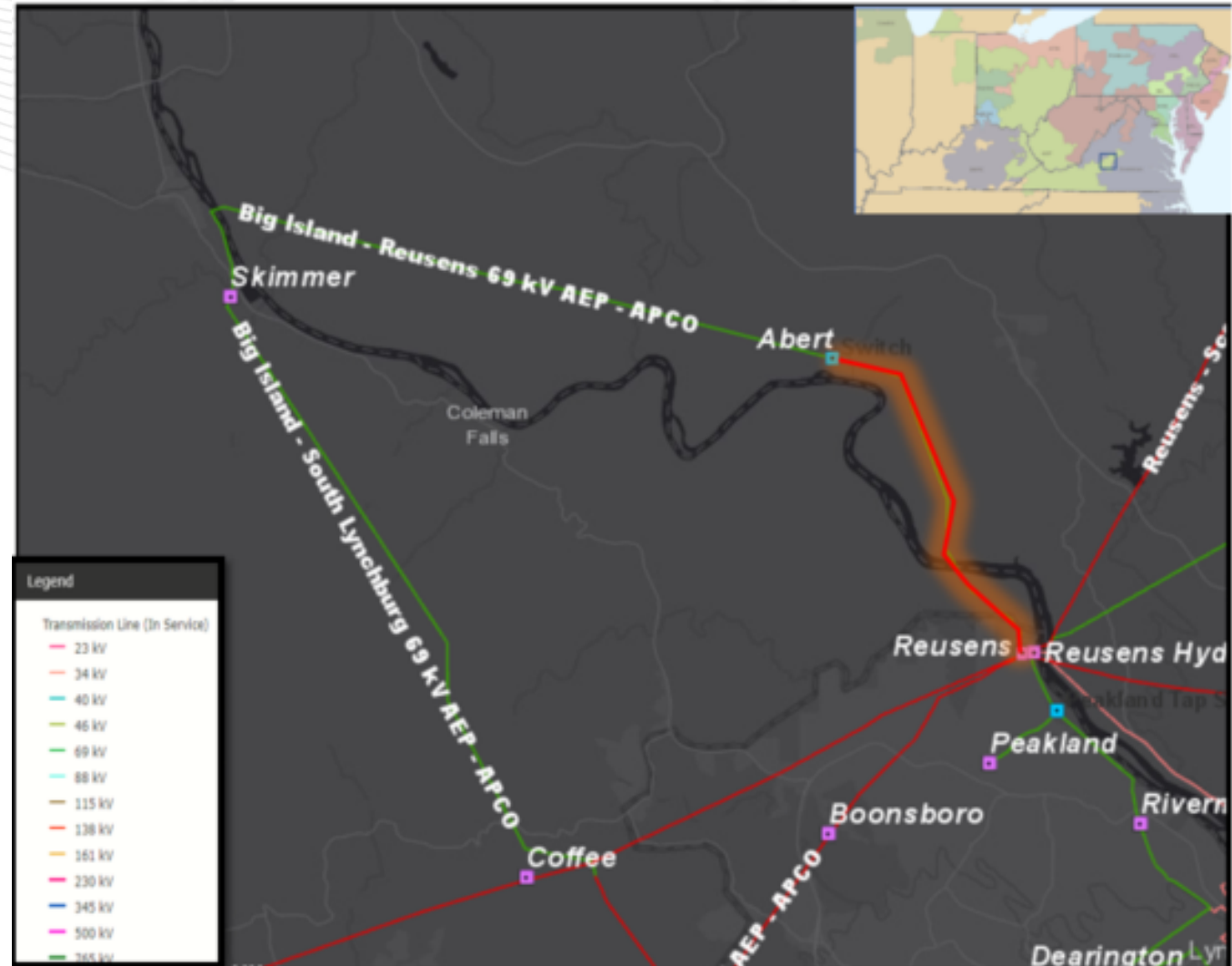
Proposal Window Exclusion: Below 200 kV Exclusion

Problem Statement: FG: 2023W1-AEP-T15, 2023W1-AEP-T16

In 2028 RTEP summer case, the Abert-Reusens 69 kV line is overloaded for N-1-1 outages .

Existing Facility Rating:

Branch	SN/SE/WN/WE (MVA)
Abert - Reusens (69)	49/49/61/61





AEP Transmission Zone: Baseline Abert – Reusens 69kV Rebuild

Proposed Solution: Rebuild ~4.5 miles of 69 kV line between Abert and Reusens Substations. Update Line Settings at Reusens and Skimmer.

Total Estimated Cost: \$14.4 M

Preliminary Facility Rating:

Branch	SN/SE/WN/WE (MVA)
Abert - Reusens 69kV line	82/90/107/113

Alternatives: Reconductor was considered but not proposed due to the existing structures install date from the 1970s and open conditions present along the line.

Ancillary Benefits: Addresses 1970s era wood pole structures that are starting to exhibit signs of deterioration and rotting along this corridor.

Required In-Service: 06/01/2028

Projected In-Service: 06/01/2028

Existing



Proposed



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



AEP Transmission Zone: Baseline Canal Street 138kV Breaker 5 Replacement

Process Stage: First Review

Criteria: Short Circuit

Assumption Reference: 2023 RTEP assumption

Model Used for Analysis: 2028 Short Circuit RTEP case

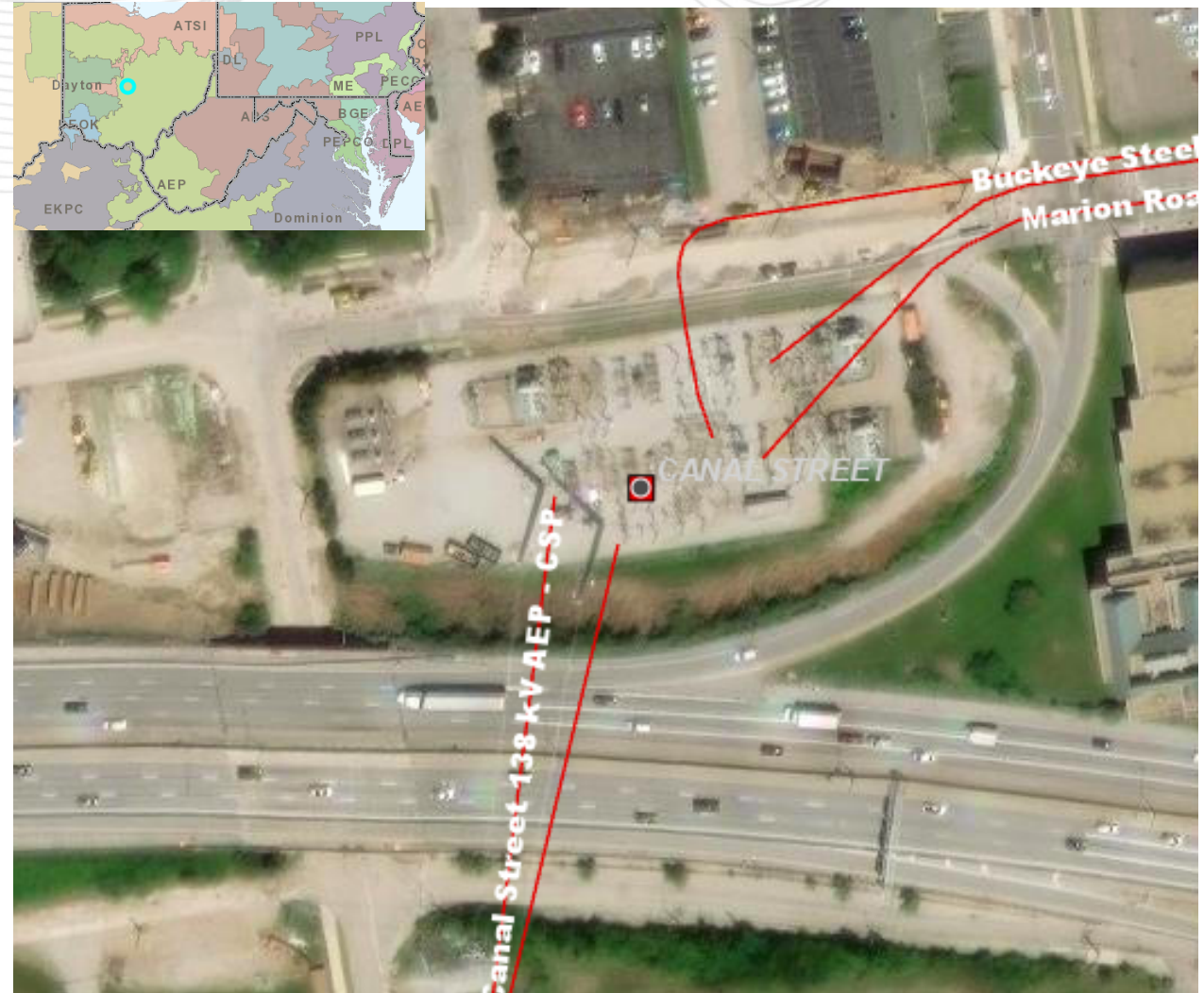
Proposal Window Exclusion: Below 200 kV Exclusion

Problem Statement: FG: 2023W1-SC-2

In 2028 RTEP short circuit case, Canal street 138 kV breaker 5 has been identified as overdutied.

Existing Facility Rating:

Breaker	Capacity (KA)
Canal Street 138kV Breaker 5	40





AEP Transmission Zone: Baseline Canal Street 138kV Breaker 5 Replacement

Proposed Solution: Replace 138kV breaker 5 at Canal St station with a new 3000A 63kA breaker.

Total Estimated Cost: \$0.5 M

Existing Facility Rating:

Breaker	Capacity (KA)
Canal Street 138kV Breaker 5	63

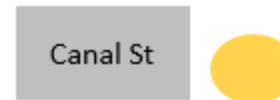
Alternatives: N/A

Ancillary Benefits: N/A

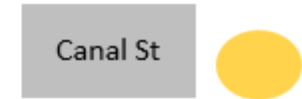
Required In-Service: 06/01/2028

Projected In-Service: 4/30/2025

Existing:



Proposed:



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



AEP Transmission Zone: Baseline Coalton Relay Upgrades

Process Stage: First Review

Criteria: AEP 715 Criteria

Assumption Reference: 2023 RTEP assumption

Model Used for Analysis: 2028 RTEP cases

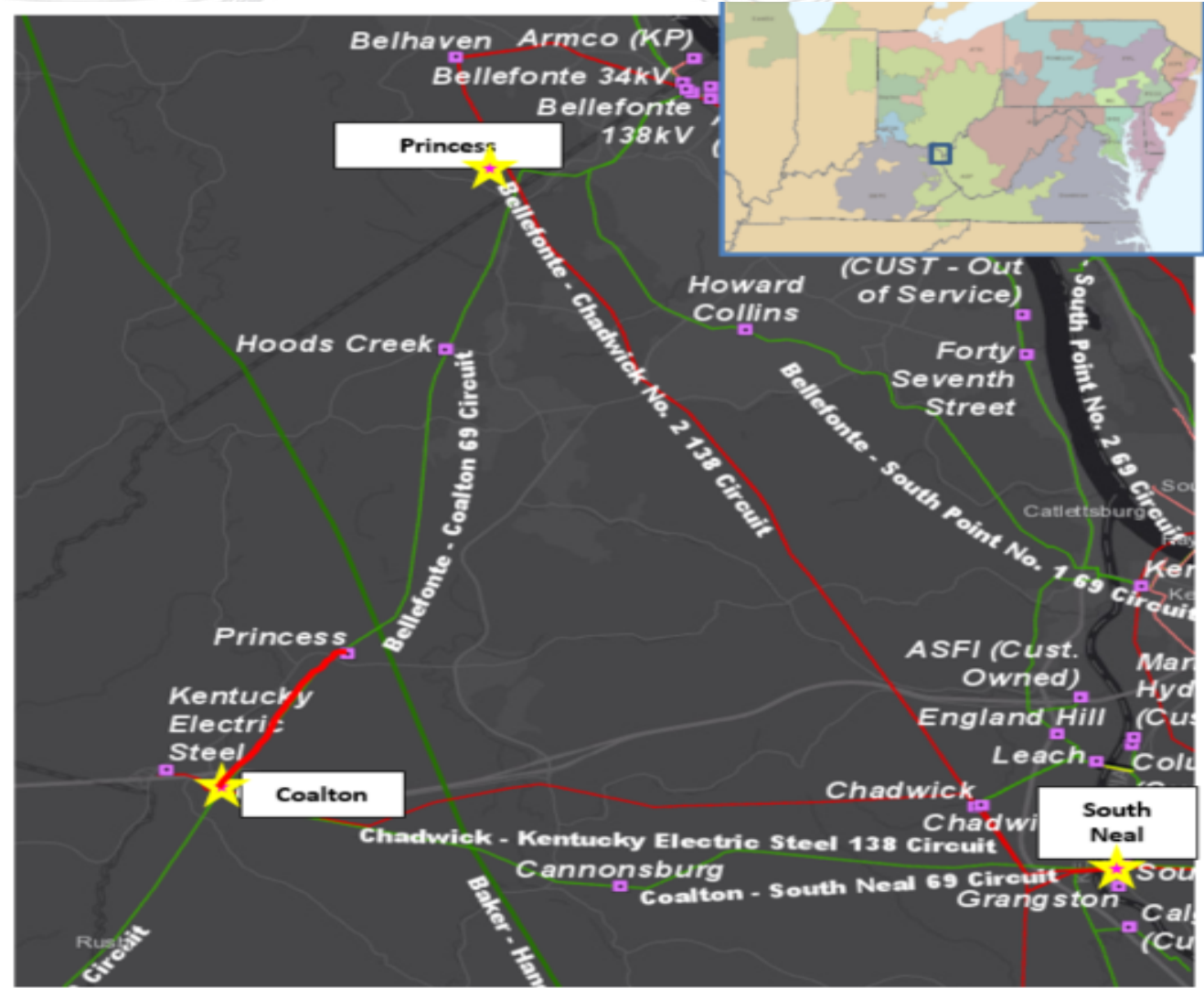
Proposal Window Exclusion: Below 200 kV Exclusion

Problem Statement: FG: 2023-W1-AEP-T19, 2023-W1-AEP-T20, 2023-W1-AEP-T21, 2023-W1-AEP-T22

In 2028 RTEP winter case, the Coalton - Princess 69 kV line is overloaded for multiple common mode contingencies.

Existing Facility Rating:

Branch	SN/SE/WN/WE (MVA)
Coalton - Princess 69kV line	64/64/64/64





AEP Transmission Zone: Baseline Coalton Relay Upgrades

Proposed Solution: Install a CCVT on 3 phase stand and remove the single phase existing CCVT on the 69kV Coalton to Bellefonte line exit. The existing CCVT is mounted to lattice on a single phase CCVT stand, which will be replaced with the 3 phase CCVT stand. The line riser between line disconnect and line take off is being replaced. This remote end work changes the MLSE of the line section between Coalton - Princess 69kV line section.

Total Estimated Cost: \$0.0 M

Preliminary Facility Rating:

Branch	SN/SE/WN/WE (MVA)
Coalton - Princess 69kV line	79/92/100/109

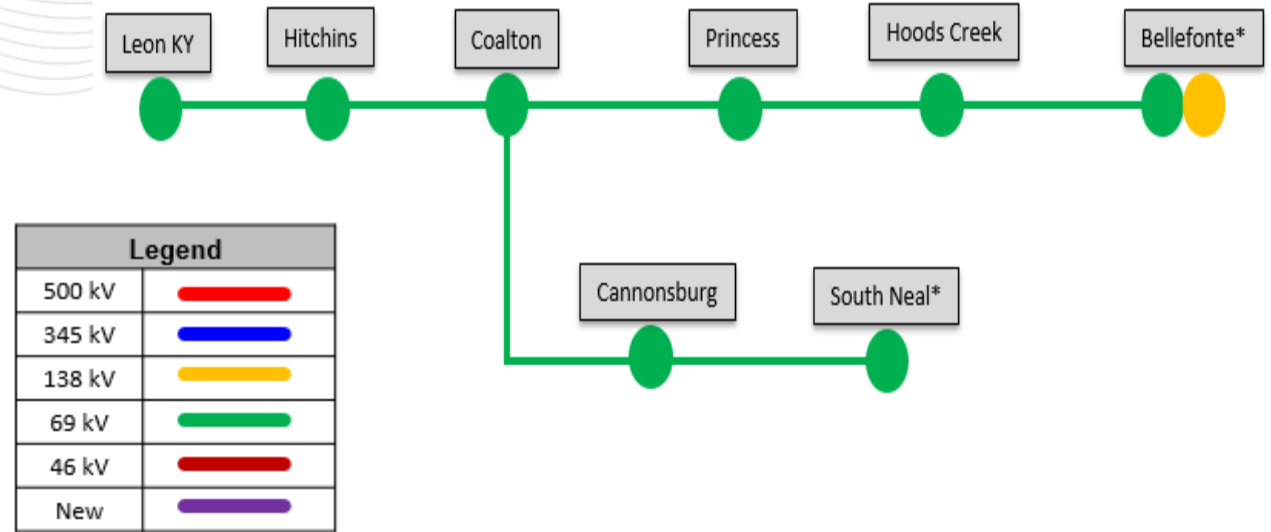
Alternatives: N/A

Ancillary Benefits: N/A

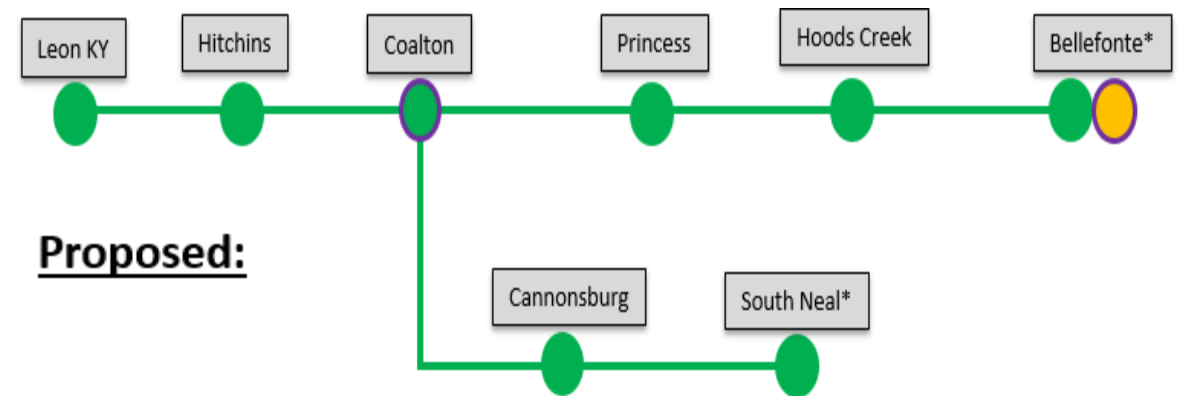
Required In-Service: 12/01/2028

Projected In-Service: 6/1/2026

Existing:



Proposed:



Process Stage: First Review

Criteria: AEP 715 Criteria

Assumption Reference: 2023 RTEP assumption

Model Used for Analysis: 2028 RTEP cases

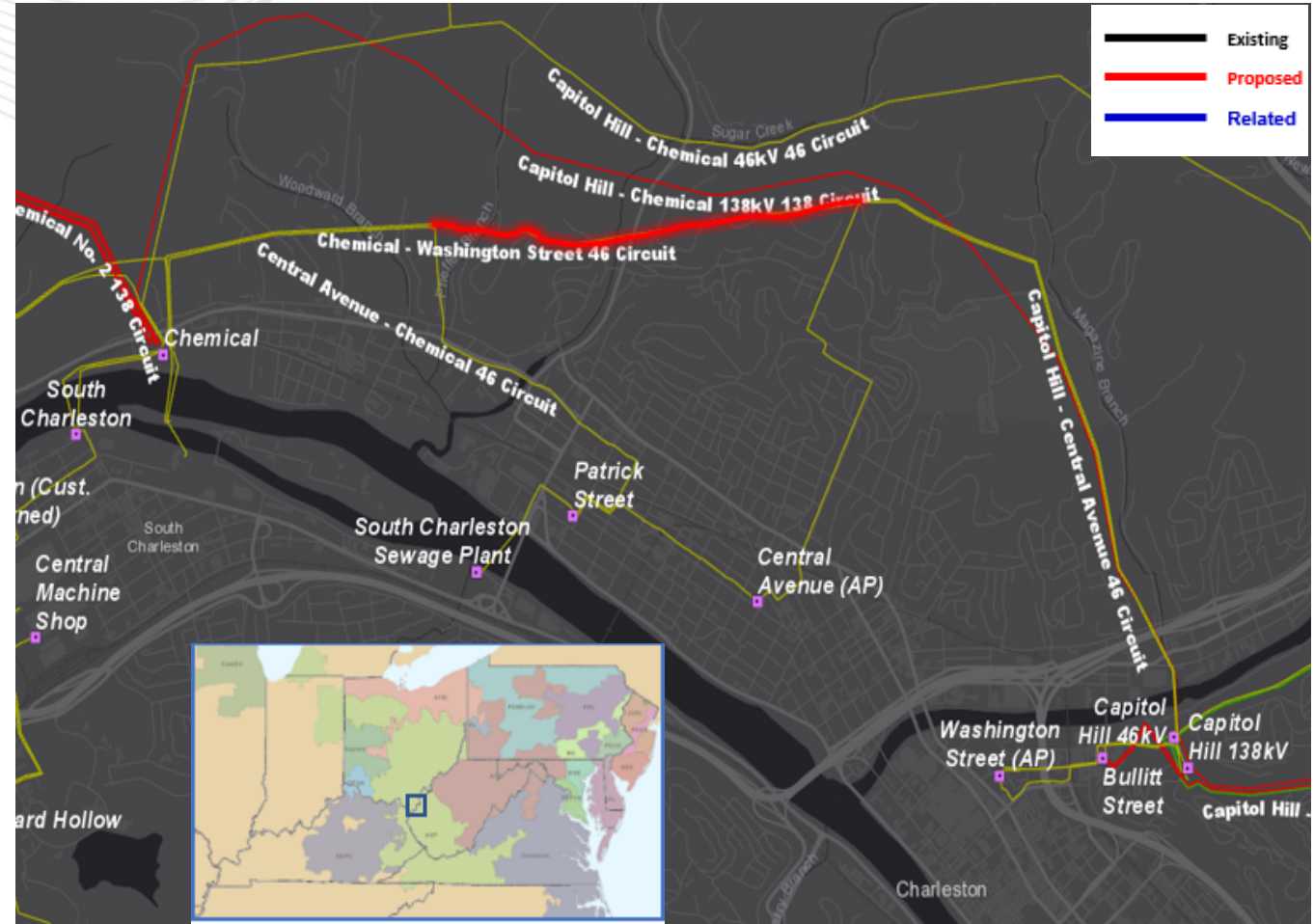
Proposal Window Exclusion: Below 200 kV Exclusion

Problem Statement: FG: 2023-W1-AEP-T17, 2023-W1-AEP-T18

In 2028 RTEP Summer case, the Chemical – Washington Street 46 kV line is overloaded for an N-1-1 contingency pair.

Existing Facility Rating:

Branch	SN/SE/WN/WE (MVA)
Chemical - Washington Street 138kV line	36/36/46/50





AEP Transmission Zone: Baseline Chemical – Washington Street 46kV Rebuild

Proposed Solution: Rebuild approximately 1.7 miles of line on the Chemical - Washington Street 46 kV circuit.

Total Estimated Cost: \$7.6 M

Preliminary Facility Rating:

Branch	SN/SE/WN/WE (MVA)
Chemical - Washington Street 138kV line	46/83/46/84

Alternatives: Reconductor option was considered, but was not feasible due to existing encroachments along the line.

Ancillary Benefits: N/A

Required In-Service: 06/01/2028

Projected In-Service: 6/1/2028

Existing:

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



Proposed:





AEP Transmission Zone: Baseline West Huntington 34.5kV Breaker Replacement

Process Stage: First Review

Criteria: AEP 715 Criteria

Assumption Reference: 2023 RTEP assumption

Model Used for Analysis: 2028 RTEP Short Circuit case

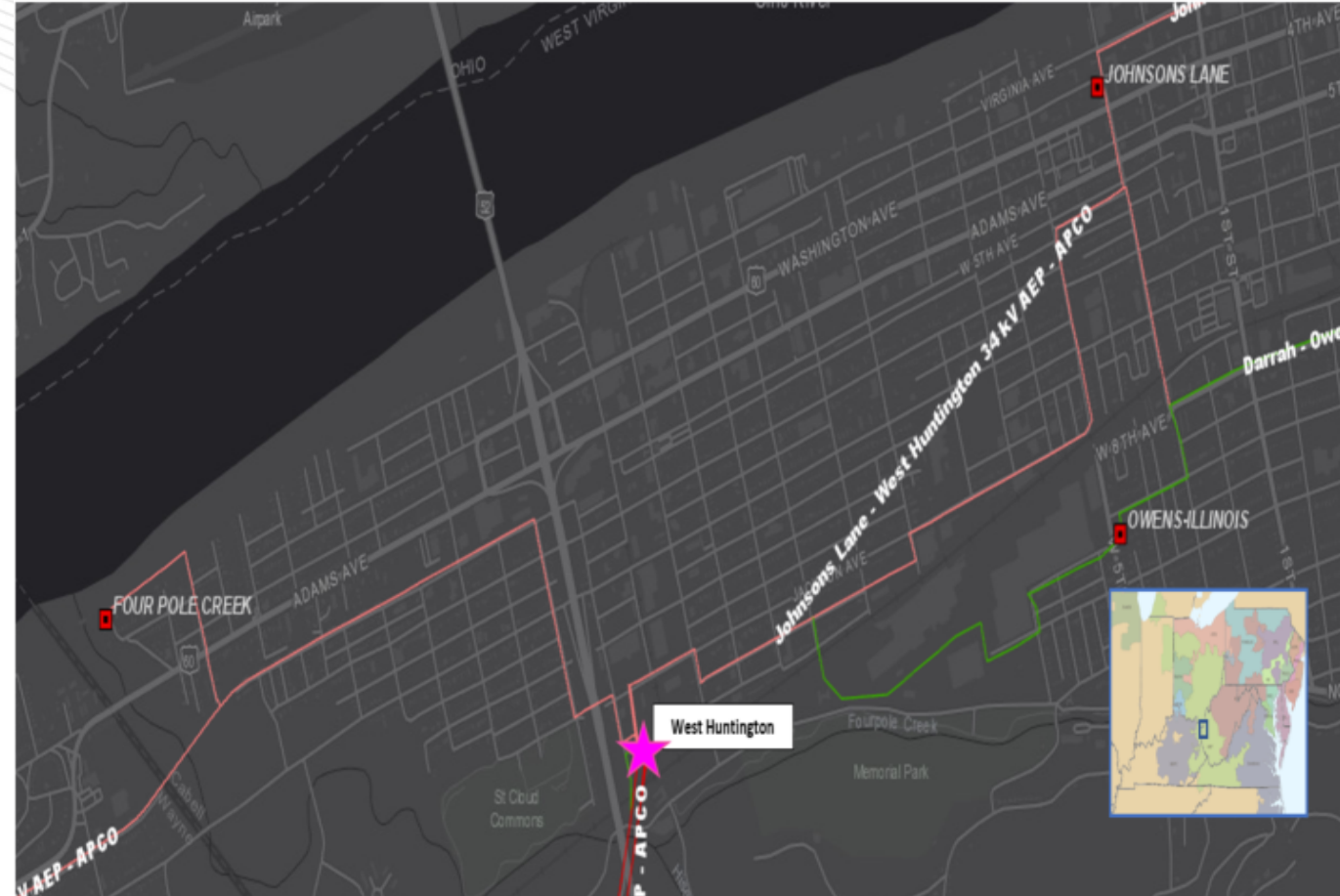
Proposal Window Exclusion: Below 200 kV Exclusion

Problem Statement: FG: 2023-W1-AEP-SC1

In 2028 RTEP Short Circuit case, the 34.5KV Breaker B at West Huntington station is overdutied .

Existing Facility Rating:

Breaker	Capacity (KA)
West Huntington 34.5kV breaker B	25





AEP Transmission Zone: Baseline West Huntington 34.5kV Breaker Replacement

Proposed Solution: Replace existing 34.5 kV, 25 kA circuit breaker B at West Huntington Station with new 69 kV, 40 kA circuit breaker.

Total Estimated Cost: \$0.365 M

Preliminary Facility Rating:

Breaker	Capacity (KA)
West Huntington 34.5kV breaker B	40

Alternatives: N/A

Ancillary Benefits: N/A

Required In-Service: 06/01/2028

Projected In-Service: 12/1/2027

Existing:

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

East Huntington



Proposed:

East Huntington





AEP Transmission Zone: Baseline Timken 138kV Breaker Replacement

Process Stage: First Review

Criteria: Short Circuit

Assumption Reference: 2023 RTEP assumption

Model Used for Analysis: 2028 RTEP Short Circuit case

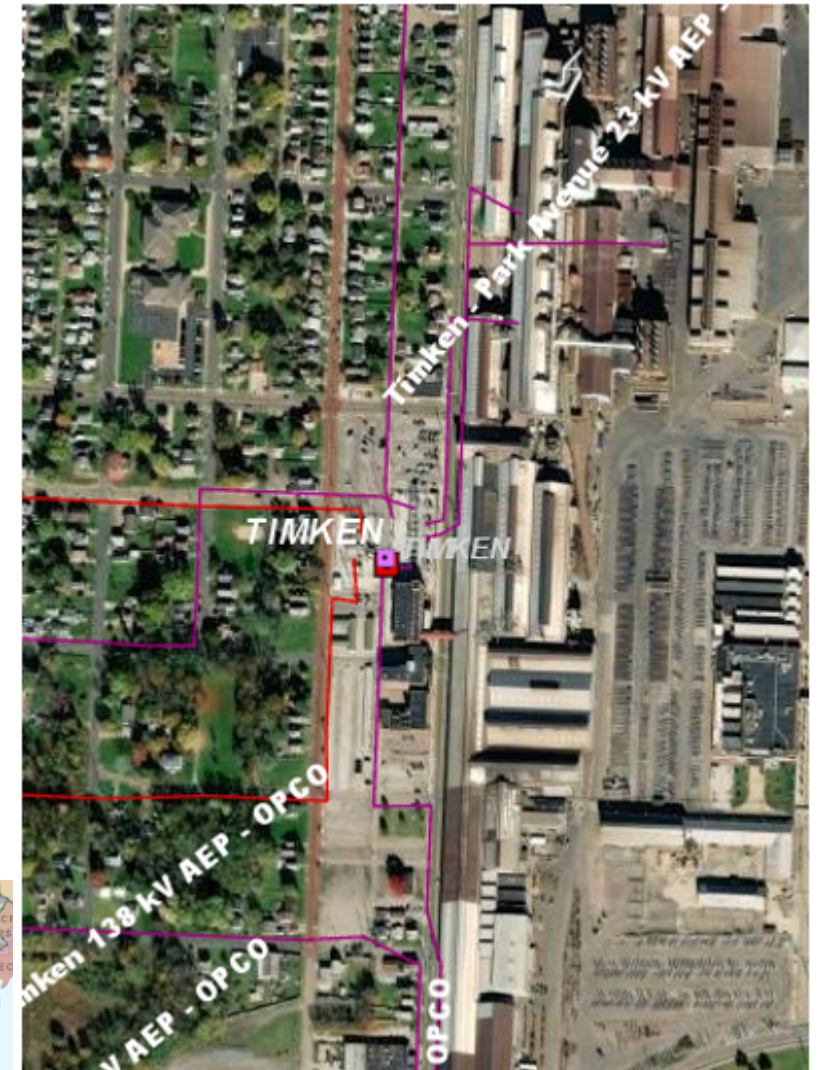
Proposal Window Exclusion: Below 200 kV Exclusion

Problem Statement: FG: 2023-W1-SC-8, 2023-W1-SC-9

In 2028 RTEP Short Circuit case, 138 kV breakers A and B at Timken station are overdutied.

Existing Facility Rating:

Breaker	Capacity (KA)
Timken 138kV Breaker A	18
Timken 138kV Breaker B	18





AEP Transmission Zone: Baseline Timken 138kV Breaker Replacement

Proposed Solution: Replace the 138kV breakers A and B at Timken Station with 40 kA breakers

Total Estimated Cost: \$1.2 M

Preliminary Facility Rating:

Breaker	Capacity (KA)
Timken 138kV Breaker A	40
Timken 138kV Breaker B	40

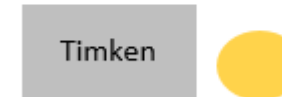
Alternatives: N/A

Ancillary Benefits: N/A

Required In-Service: 06/01/2028

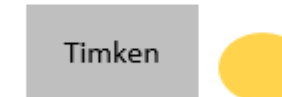
Projected In-Service: 06/01/2028

Existing:



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

Proposed:



Process Stage: First Review

Criteria: AEP 715 Criteria

Assumption Reference: 2023 RTEP assumption

Model Used for Analysis: 2028 RTEP Short Circuit case

Proposal Window Exclusion: Below 200 kV Exclusion

Problem Statement: FG: 2023W1-AEP-SC6

In 2028 RTEP Short Circuit case, 69 kV breakers C at Haviland station are overdutied

Existing Facility Rating:

Branch	SN/SE/WN/WE (MVA)
Haviland - Latty Junction Switch 69kV	68/73/90/98

Breaker	Capacity (KA)
Haviland 69kV Breaker C	9





AEP Transmission Zone: Baseline Haviland 69kV Breaker Replacement

Proposed Solution: Replace 69kV breaker C at Haviland Station with a 40 kA breaker

Total Estimated Cost: \$0.4 M

Preliminary Facility Rating:

Branch	SN/SE/WN/WE (MVA)
Haviland - Latty Junction Switch 69kV	68/86/90/103

Breaker	Capacity (KA)
Haviland 69kV Breaker C	40

Alternatives: N/A

Ancillary Benefits: N/A

Required In-Service: 06/01/2028

Projected In-Service: 06/01/2028

Existing:



Proposed:



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



AEP Transmission Zone: Baseline 24th Street Retirement

Process Stage: First Review

Criteria: AEP 715 Criteria

Assumption Reference: 2023 RTEP assumption

Model Used for Analysis: 2028 RTEP cases

Proposal Window Exclusion: Below 200 kV Exclusion

Problem Statement: FG: 2023-W1-AEP-T1, 2023-W1-AEP-T10, 2023-W1-AEP-T11, 2023-W1-AEP-T12, 2023-W1-AEP-T13, 2023-W1-AEP-T14, 2023-W1-AEP-T2, 2023-W1-AEP-T3, 2023-W1-AEP-T4, 2023-W1-AEP-T5, 2023-W1-AEP-T6, 2023-W1-AEP-T7, 2023-W1-AEP-T8, 2023-W1-AEP-T9

In 2028 RTEP Summer case, the 26th Street - 24th Street - BASF Tap line is overloaded for multiple N-1-1 contingencies.

Existing Facility Rating:

Branch	SN/SE/WN/WE (MVA)
East Huntington - 26th Street 34.5kV	25/25/31/31





AEP Transmission Zone: Baseline 24th Street Retirement

Proposed Solution: Replace Structures 382-66 and 382-63 on Darrah - East Huntington 34.5 kV line to bypass 24th Street station. Retire structures 1 through 5 on Twenty Fourth Street 34.5 kV Extension. Retire 24th Street Station. Remove conductors from BASF Tap to BASF.

Total Estimated Cost: \$1.8 M

Preliminary Facility Rating:

Branch	SN/SE/WN/WE (MVA)
East Huntington - 26th Street 34.5kV	56/56/70/70

Alternatives: Rebuild the Darrah - East Huntington 34.5 kV line. Retire 24th Street Station, BASF Station, and 23rd Street Station. Reconfigure 26th Street switch. (Estimated Cost: \$12 M)

Ancillary Benefits: This proposal retires an obsolete station and lines that are no longer serving load. Addresses asset conditions on 2 structures of the Darrah - East Huntington 34.5 kV line. 23rd St and BASF are electrically disconnected from the system.

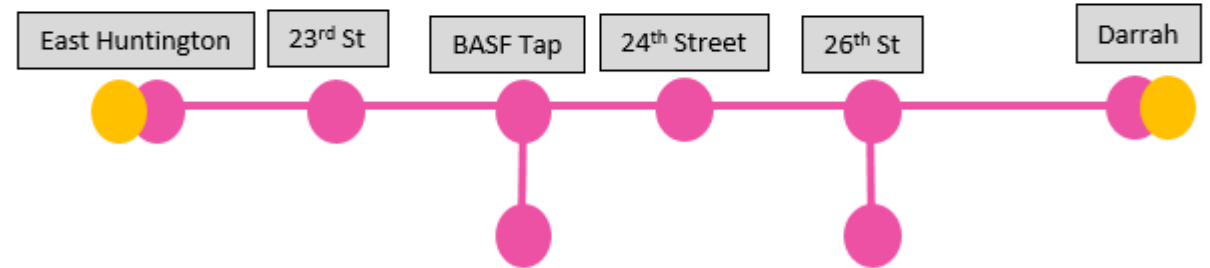
Required In-Service: 06/01/2028

Projected In-Service: 04/01/2024

Existing:

*as depicted in the model today

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



Proposed:





AEP Transmission Zone: Baseline West Clark – Ohio University UG Line Rebuild

Process Stage: First Review

Criteria: AEP 715 Criteria

Assumption Reference: 2023 RTEP assumption

Model Used for Analysis: 2028 RTEP cases

Proposal Window Exclusion: Below 200 kV Exclusion

Problem Statement: FG: 2023-W1-AEP-T23, 2023-W1-AEP-T24, 2023-W1-AEP-T25, 2023-W1-AEP-T26, 2023-W1-AEP-T27, 2023-W1-AEP-T28, 2023-W1-AEP-T29, 2023-W1-AEP-T30

In 2028 RTEP Summer case, the underground conductor section of the Ohio University-West Clark 69 kV line is overloaded under N-1-1 for multiple N-1-1 contingencies.

Existing Facility Rating:

Branch	SN/SE/WN/WE (MVA)
West Clark - Ohio University 69KV	60/67/62/68





AEP Transmission Zone: Baseline West Clark – Ohio University UG Line Rebuild

Proposed Solution: Rebuild the underground portion of the Ohio University-West Clark 69 kV line, approximately 0.65 miles.

Total Estimated Cost: \$4.6 M

Preliminary Facility Rating:

Branch	SN/SE/WN/WE (MVA)
West Clark - Ohio University 69kV	102/142/104/151

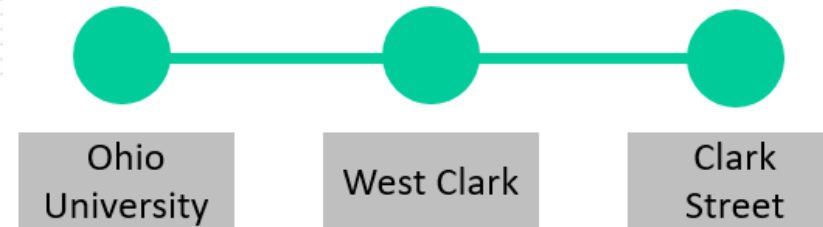
Alternatives: Depending on outage considerations, it may become necessary to rebuild the underground portion of the line in the clear. Considering the location of the UG line (going through OU campus), rebuilding as overhead is not an option. It also cannot be retired or fed from a different transmission line as the feed would still need to pass through OU's campus to their station. Estimated cost to rebuild the UG portion in the clear: \$17.3M.

Ancillary Benefits: N/A

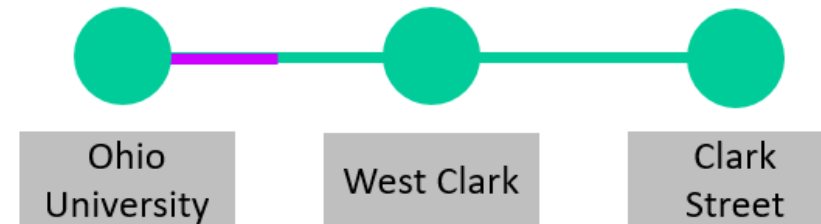
Required In-Service: 06/01/2028

Projected In-Service: 06/01/2028

Existing:



Proposed:



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

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SRRTEP-W Reliability Analysis Update

- V1 – 10/16/2023 – Original slides posted
- V2 – 10/19/2023 – Add projected IS date for AEP projects
- V3 – 10/20/2023 – Slides #19 and #20, Corrected the KV level in the slides
– Slides #20 and #22, Corrected the TO zone to AEP

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