

Submission of Supplemental Projects for Inclusion in the Local Plan

Need Number: APS-2024-110

Process Stage: Submission of Supplemental Projects for Inclusion in the Local Plan - 03/02/2026

Previously Presented: Solution Meeting SRRTEP-W - 04/11/2025

Need Meeting 12/13/2024

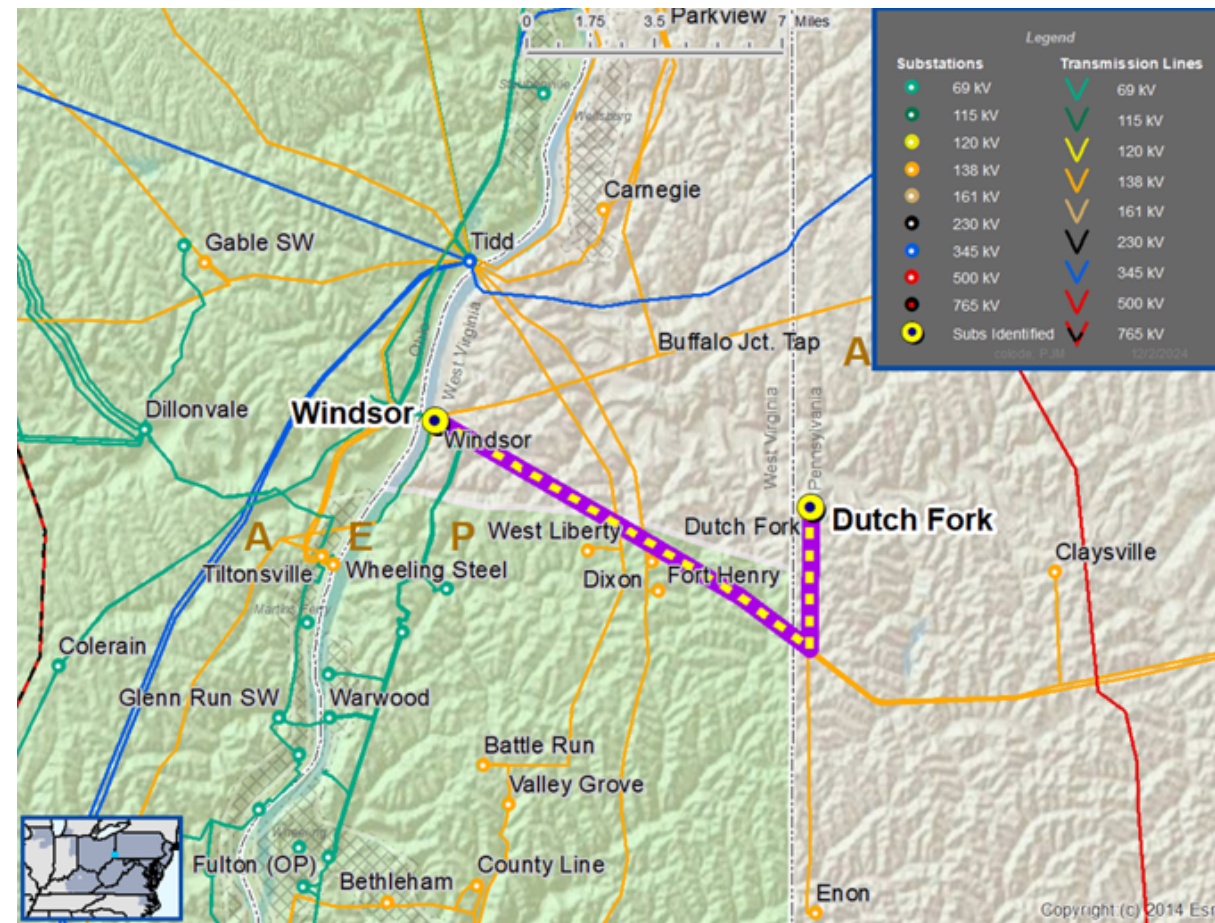
Project Driver: Customer Service

Specific Assumption References:

New customer connection request will be evaluated per FirstEnergy's "Requirements for Transmission Connected Facilities" document and "Transmission Planning Criteria" document.

Problem Statement:

New customer connection – A customer has requested a new 138 kV delivery point along the Dutch Fork – Windsor 138 kV Line. The anticipated load is 20 MW. Requested in-service date is 1/15/2026.



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APS Transmission Zone M-3 Process New Customer Connection

Need Number: APS-2024-110

Process Stage: Submission of Supplemental Projects for Inclusion in the Local Plan - 03/02/2026

Proposed Solution:

- Dutch Fork - Windsor 138 kV Line:
 - Customer Connection: Tap the Dutch Fork - Windsor 138 kV Line at/near structure 122. Install two 1200 A SCADA controlled switches at tap location Construct approximately 0.9 miles of line to the interconnection point Install 138 kV revenue metering package Adjust relay settings at Dutch Fork and Windsor substations.

Transmission Cost Estimate: \$5.8 M

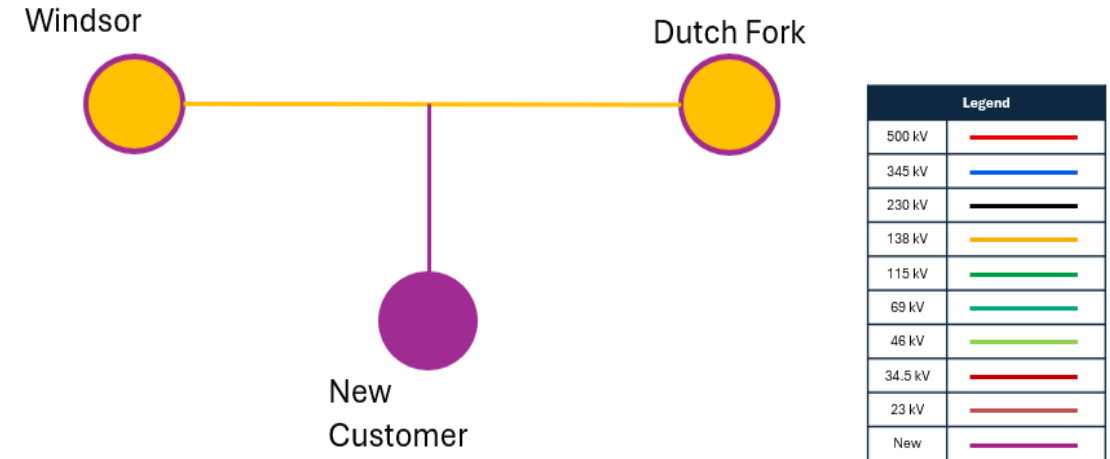
Alternatives Considered: No other reasonable alternatives due to the customer's proximity to the Dutch Fork - Windsor 138 kV Line.

Projected In-Service: 08/14/2026

Project Status: Conceptual

Model: 2023 RTEP model for 2028 Summer (50/50)

Supplemental Number: s3755.1



Need Number: APS-2024-110

Process Stage: Submission of Supplemental Projects for Inclusion in the Local Plan - 03/02/2026

Previously Presented: Need Meeting – 12/13/2024
Solution Meeting – 04/11/2025

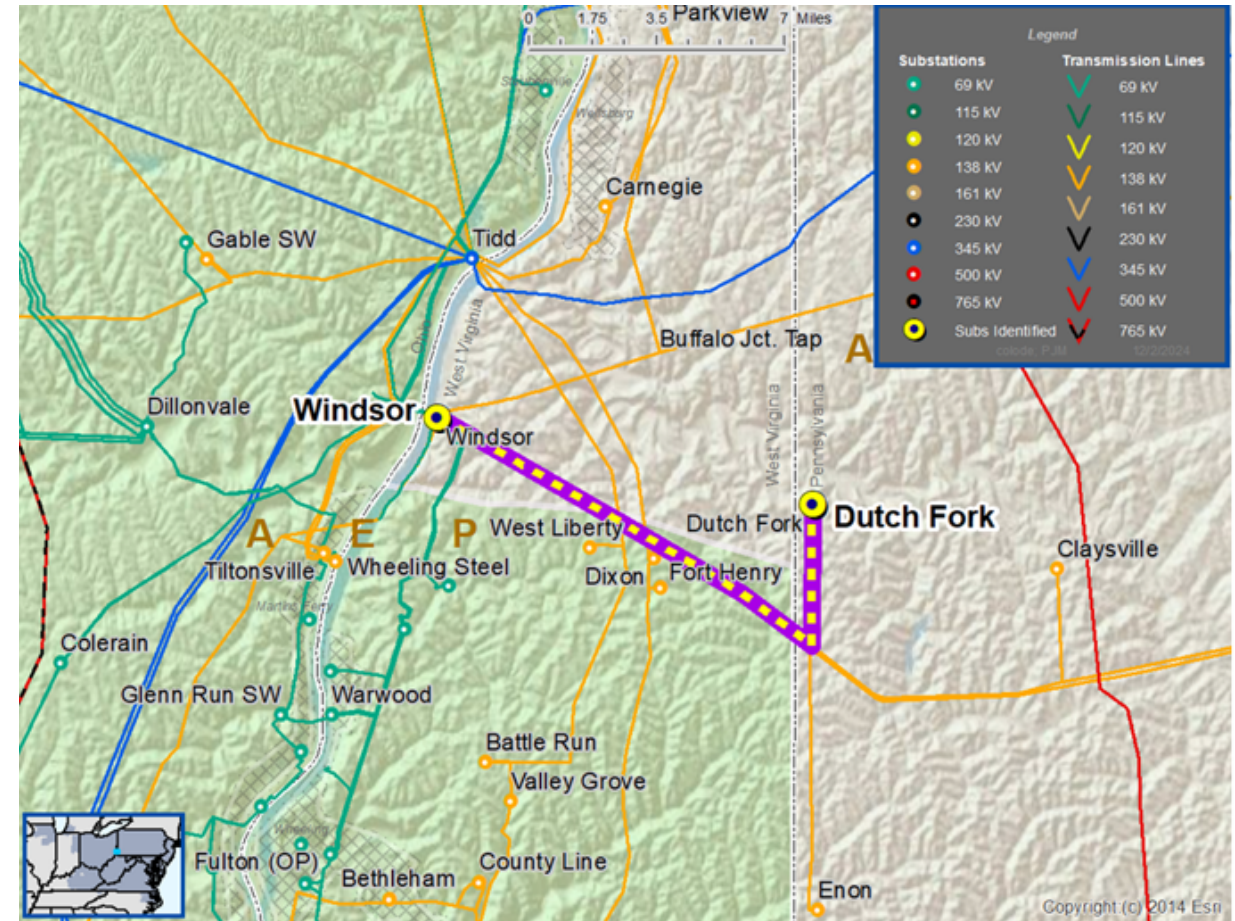
Project Driver:
Customer Service

Specific Assumption References:

New customer connection request will be evaluated per FirstEnergy’s “Requirements for Transmission Connected Facilities” document and “Transmission Planning Criteria” document.

Problem Statement:

New customer connection – A customer has requested a new 138 kV delivery point along the Dutch Fork – Windsor 138 kV Line. The anticipated load is 20 MW.



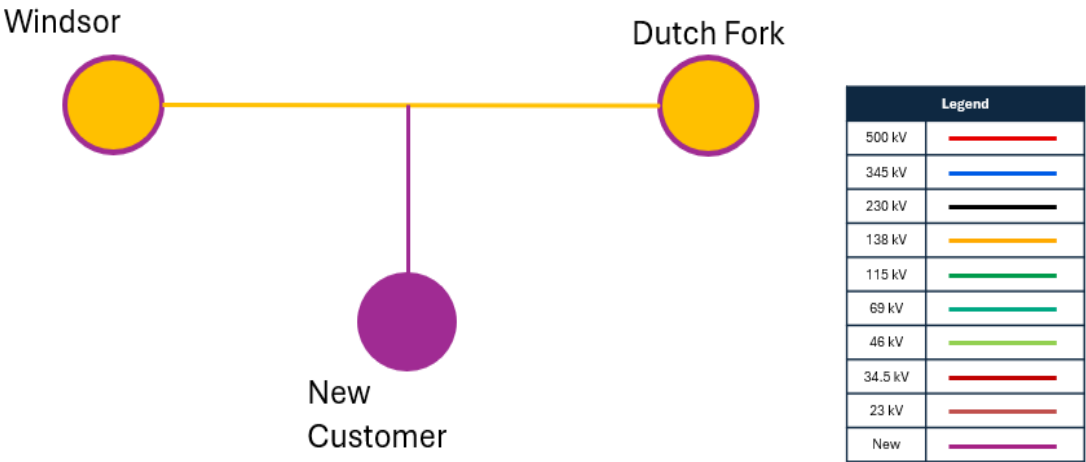
Need Number: APS-2024-110
Process Stage: Submission of Supplemental Projects for Inclusion in the Local Plan - 03/02/2026

Selected Solution:

Dutch Fork - Windsor 138 kV Line:

- Customer Connection: Tap the Dutch Fork - Windsor 138 kV Line at/near structure 122. Install two 1200 A SCADA controlled switches at tap location Construct approximately 0.9 miles of line to the interconnection point Install 138 kV revenue metering package Adjust relay settings at Dutch Fork and Windsor substations.

Estimated Project Cost: \$5.8 M
Projected In-Service: 08/14/2026
Supplemental Project ID: s3755.1



APS Transmission Zone M-3 Process Leadsville – Loughs Lane 138 kV Misoperation Relays

Need Number: APS-2024-112
Process Stage: Submission of Supplemental Projects for Inclusion in the Local Plan - 03/02/2026
Previously Presented: Need Meeting – 12/13/2024
Solution Meeting – 08/15/2025

Project Driver:

Equipment Material Condition, Performance and Risk

Specific Assumption Reference:

System Performance Projects Global Factors

- System reliability and performance
- Substation/line equipment limits

System Condition Projects

- Substation Condition Rebuild/Replacement

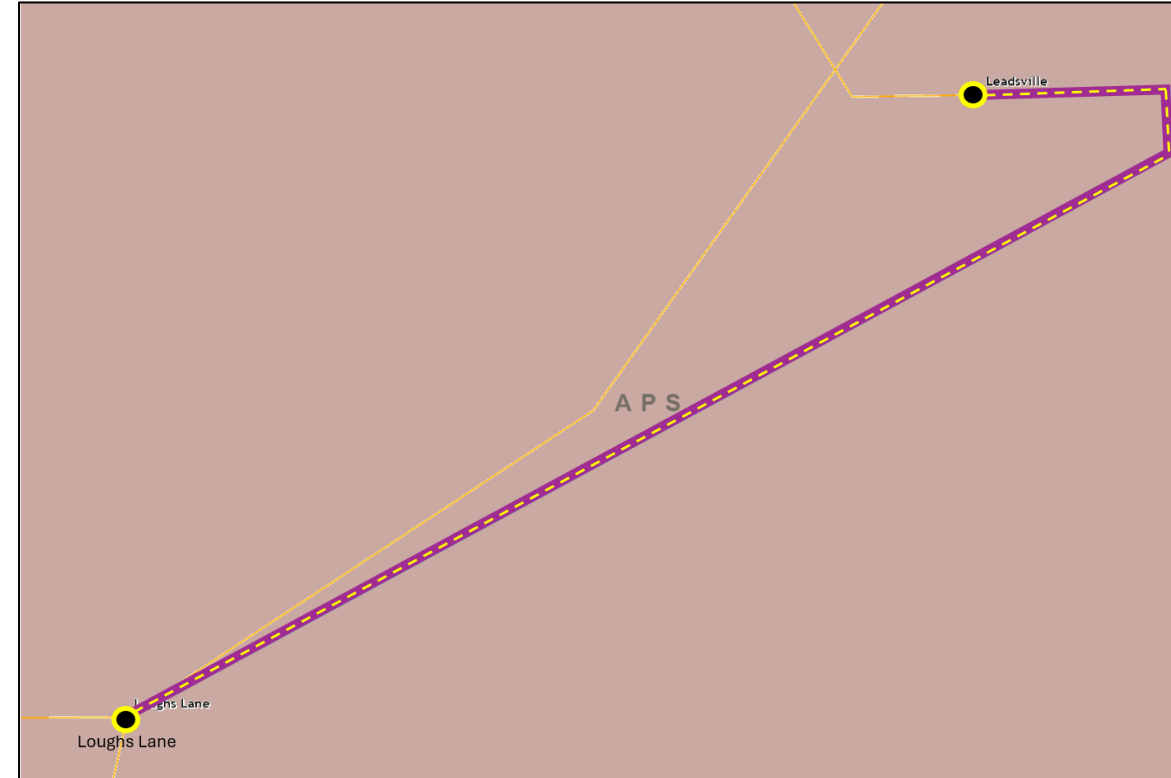
Upgrade Relay Schemes

- Obsolete and difficult to repair communication equipment (DTT, Blocking, etc.)
- Communication technology upgrades

Problem Statement:

- FirstEnergy has identified protection schemes using a certain vintage of relays and communication equipment that have a history of misoperation.
- Proper operation of the protection scheme requires all the separate components perform adequately during a fault.
- In many cases the protection equipment cannot be repaired due to a lack of replacement parts and available expertise in the outdated technology.
- Transmission line ratings are limited by terminal equipment.

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Need #	Transmission Line / Substation Locations	Existing Line Rating MVA (SN / SE / WN / WE)	Existing Conductor Rating MVA (SN / SE / WN / WE)
APS-2024-112	Leadsville – Loughs Lane 138 kV Line	169 / 213 / 217 / 229	169 / 213 / 217 / 280



APS Transmission Zone M-3 Process Leadsville – Loughs Lane 138 kV Misoperation Relays

Need Number: APS-2024-112
Process Stage: Submission of Supplemental Projects for Inclusion in the Local Plan - 03/02/2026

Selected Solution:

- Replace 138 kV relaying at Leadsville Substation
- Replace 138 kV circuit breaker, line tuner and coax, CVT, and relaying at Loughs Lane Substation

Transmission Line Ratings:

- Leadsville – Loughs Lane 138 kV Line:
 - Before Proposed Solution: 169 / 213 / 217 / 229 MVA (SN / SE / WN / WE)
 - After Proposed Solution: 169 / 213 / 217 / 280 MVA (SN / SE / WN / WE)

Estimated Project Cost: \$2.30M
Projected In-Service: 9/28/2029
Supplemental Project ID: s3770.1



Legend	
500 kV	
345 kV	
230 kV	
138 kV	
115 kV	
69 kV	
46 kV	
34.5 kV	
23 kV	
New	

APS Transmission Zone M-3 Process Weirton - Wylie Ridge 138 kV Misoperation Relays

Need Number: APS-2024-025
Process Stage: Submission of Supplemental Projects for Inclusion in the Local Plan - 03/02/2026
Previously Presented: Need Meeting – 02/16/2024
 Solution Meeting – 08/15/2025

Project Driver:

Equipment Material Condition, Performance and Risk

Specific Assumption Reference:

System Performance Projects Global Factors

- System reliability and performance
- Substation/line equipment limits

System Condition Projects

- Substation Condition Rebuild/Replacement

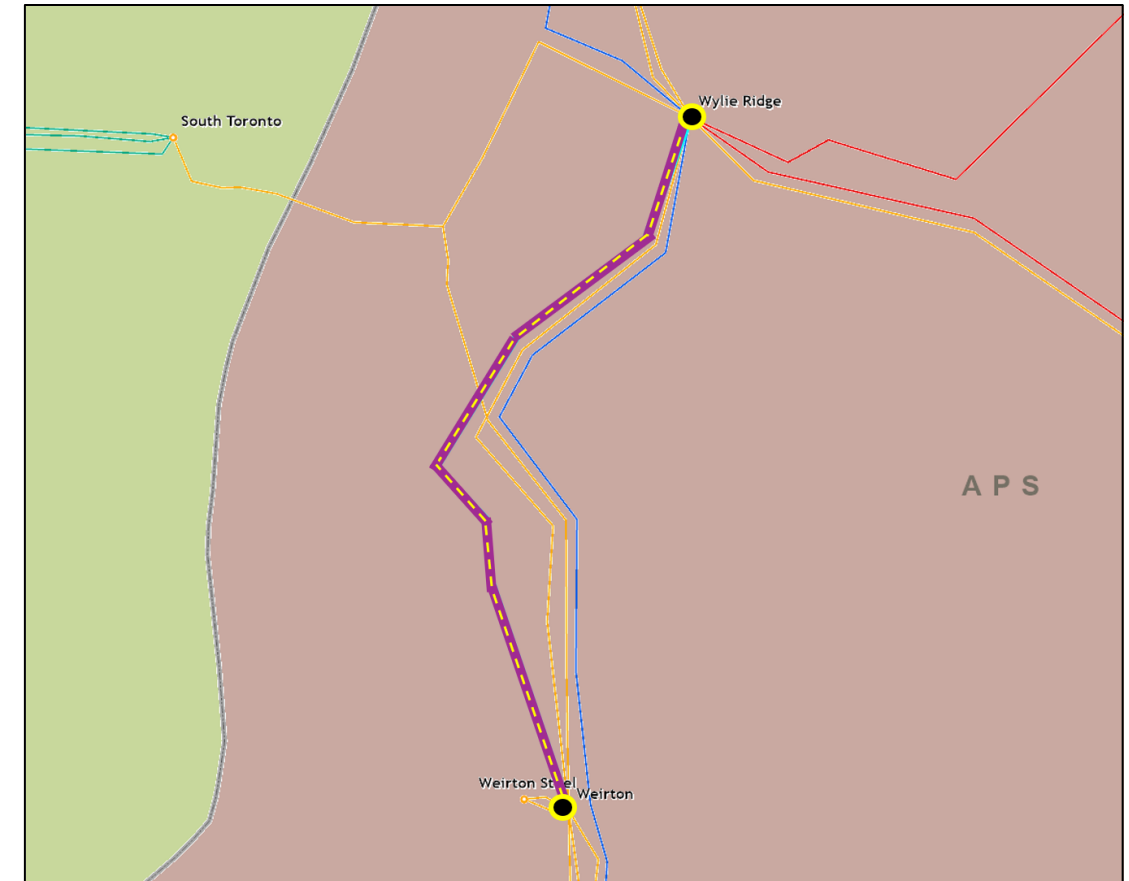
Upgrade Relay Schemes

- Obsolete and difficult to repair communication equipment (DTT, Blocking, etc.)
- Communication technology upgrades

Problem Statement:

- FirstEnergy has identified protection schemes using a certain vintage of relays and communication equipment that have a history of misoperation.
- Proper operation of the protection scheme requires all the separate components perform adequately during a fault.
- In many cases the protection equipment cannot be repaired due to a lack of replacement parts and available expertise in the outdated technology.
- Transmission line ratings are limited by terminal equipment.

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Need #	Transmission Line / Substation Locations	Existing Line Rating (SN / SE / WN / WE)	Existing Conductor Rating (SN / SE / WN / WE)
APS-2024-025	Weirton – Wylie Ridge 138 kV No. 2 Line	225 / 295 / 306 / 306	308 / 376 / 349 / 445

APS Transmission Zone M-3 Process Weirton - Wylie Ridge 138 kV Misoperation Relays

Need Number: APS-2024-025
Process Stage: Submission of Supplemental Projects for Inclusion in the Local Plan - 03/02/2026

Selected Solution:

- Replace 138 kV disconnect switches, line trap, substation conductor, line tuners, CCVT, and relaying at Weirton Substation.
- Replace 138 kV circuit breakers, disconnect switches, line trap, substation conductor, CCVT, and relaying at Wylie Ridge Substation.

Transmission Line Ratings:

- Weirton – Wylie Ridge 138 kV No. 2 Line:
 - Before Proposed Solution: 225 / 295 / 306 / 306 MVA (SN / SE / WN / WE)
 - After Proposed Solution: 308 / 376 / 349 / 445 MVA (SN / SE / WN / WE)

Estimated Project Cost: \$4.50M
Projected In-Service: 07/20/2029
Supplemental Project ID: s3771.1

Weirton



Wylie Ridge

Legend	
500 kV	
345 kV	
230 kV	
138 kV	
115 kV	
69 kV	
46 kV	
34.5 kV	
23 kV	
New	

APS Transmission Zone M-3 Process Rider – Weston 138 kV Line: Customer Connection

Need Number: APS-2025-011

Process Stage: Submission of Supplemental Projects for Inclusion in the Local Plan - 03/02/2026

Previously Presented: Need Meeting – 4/11/2025
Solution Meeting – 08/15/2025

Project Driver(s):

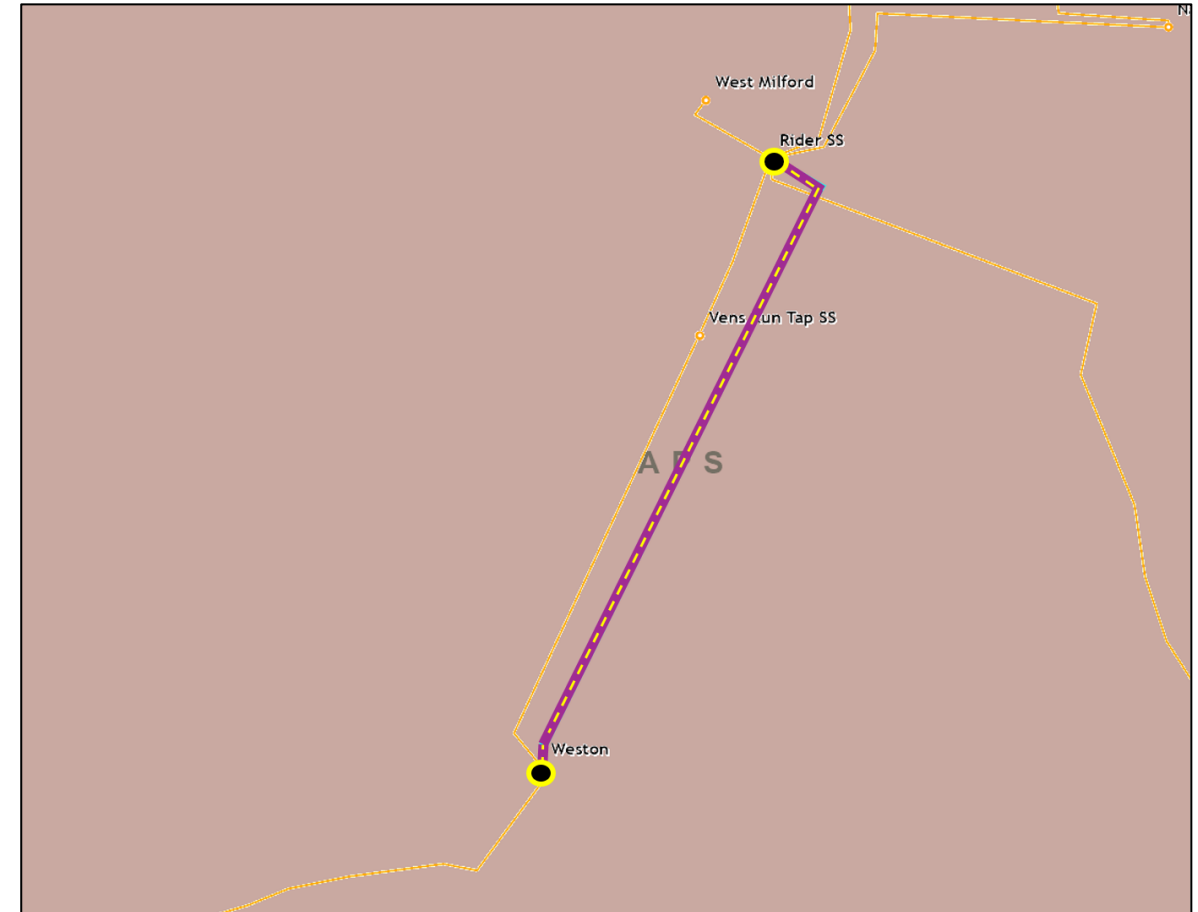
Customer Service

Specific Assumption Reference(s):

Customer connection request will be evaluated per FirstEnergy's "Requirements for Transmission Connected Facilities" document and "Transmission Planning Criteria" document.

Problem Statement:

New Customer Connection – A customer requested a new 138 kV delivery point near the Rider - Weston 138 kV Line. The requested delivery point is approximately 4.58 miles from Weston Substation. The anticipated load of the new customer connection is 22.4 MVA.





APS Transmission Zone M-3 Process Rider – Weston 138 kV Line: Customer Connection

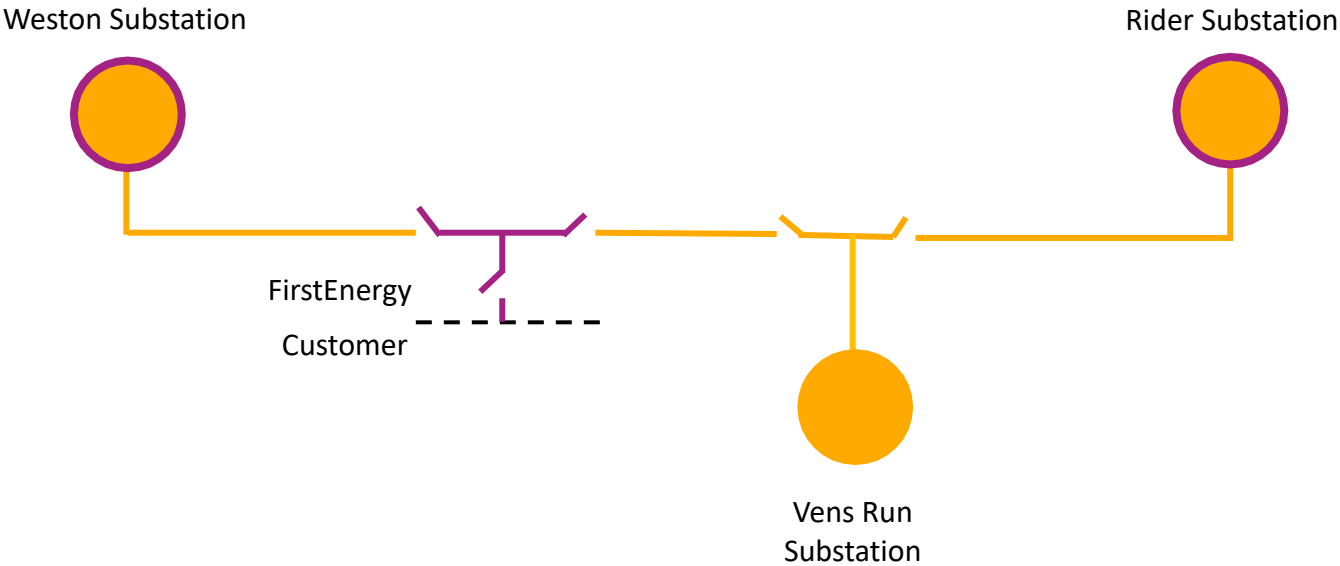
Need Number: APS-2025-011
Process Stage: Submission of Supplemental Projects for Inclusion in the Local Plan - 03/02/2026

Selected Solution:

138 kV Transmission Line Tap

- Install two main-line SCADA controlled switches
- Install one tap SCADA controlled switch
- Construct 0.1 miles of 138 kV line extension
- Adjust relay settings at Rider and Weston substations
- Install revenue metering

Estimated Project Cost: \$0.92 M
Projected In-Service: 4/29/2028
Supplemental Project ID: s3772.1



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

Need Number: APS-2024-029

Process Stage: Submission of Supplemental Projects for Inclusion in the Local Plan - 03/02/2026

Previously Presented: Need Meeting – 03/15/2024
Solution Meeting – 08/15/2025

Project Driver:

- *Equipment Material Condition, Performance and Risk*

Specific Assumption Reference:

System Performance Global Factors

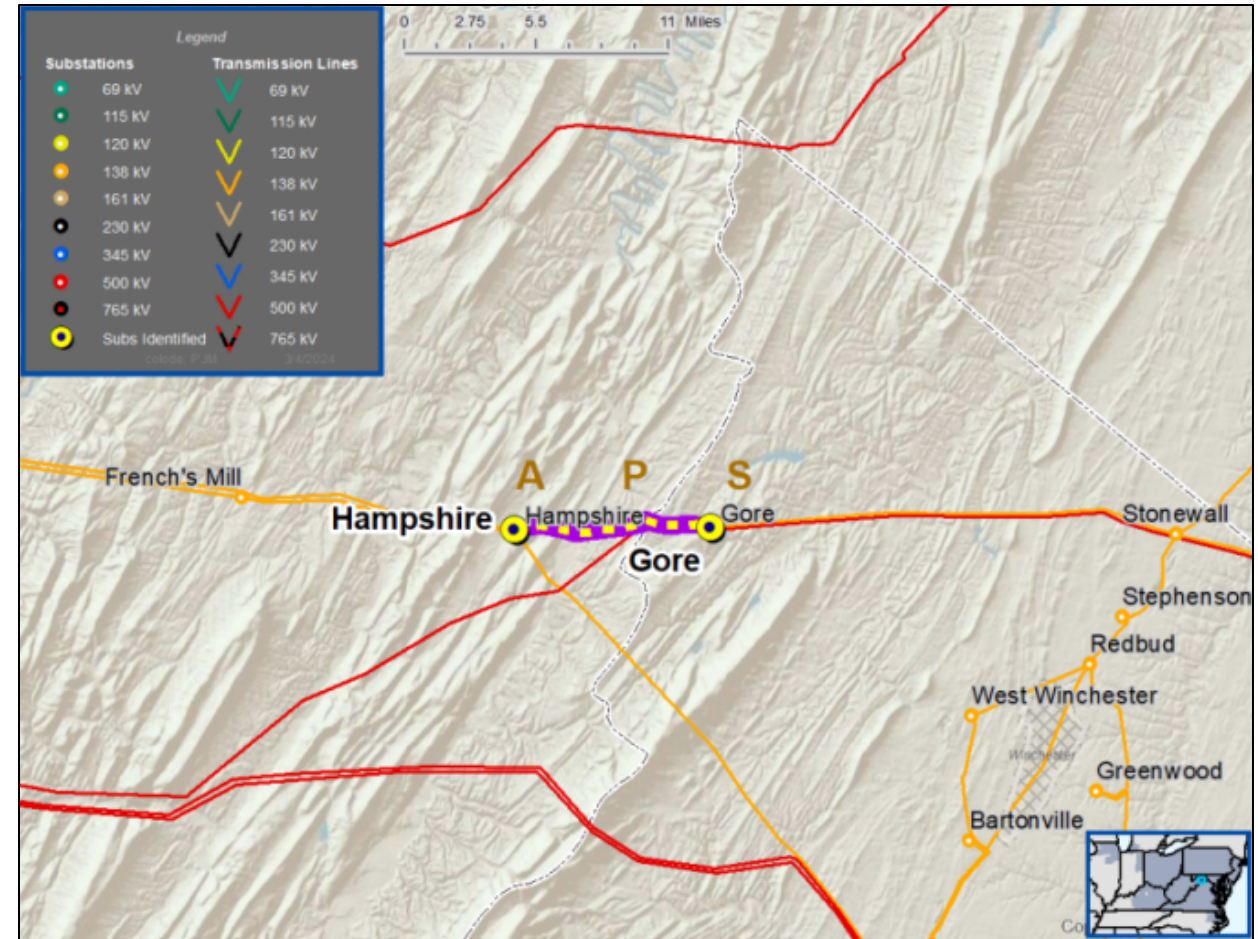
- Past system reliability/performance

Line Condition Rebuild/Replacement

- Age/condition of wood pole transmission line structures

Problem Statement:

- The Gore – Hampshire 138 kV Line was constructed in 1956. The line is approximately 6.4 miles long with 51 wood pole structures.
- Recent inspections have indicated that the 49 (96% of total) structures are exhibiting deterioration. Inspection findings include decay, sound test failure, phase raisers and woodpecker damage.
- Since 2014, the line has had one unplanned outage.
- Existing Gore – Hampshire 138 kV line and conductor rating:
 - 221 / 268 / 250 / 317 MVA (SN/SE/WN/WE)



Need Number: APS-2024-029
Process Stage: Submission of Supplemental Projects for Inclusion in the Local Plan - 03/02/2026

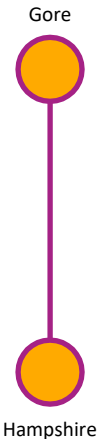
Selected Solution:

- Rebuild Gore – Hampshire 138 kV Line approximately 6.4 miles and install new conductor
- At Gore Substation, replace substation conductor and disconnect switches.
- At Hampshire Substation, replace substation conductor.

Transmission Line Ratings:
 Gore – Hampshire 138 kV Line

- Before Proposed Solution: 221 / 268 / 250 / 317 MVA (SN/SE/WN/WE)
- After Proposed Solution: 448 / 516 / 448 / 543 MVA (SN/SE/WN/WE)

Estimated Project Cost: \$23.12M
Projected In-Service: 12/29/2028
Supplemental Project ID: 3773.1



Legend	
500 kV	
345 kV	
230 kV	
138 kV	
115 kV	
69 kV	
46 kV	
34.5 kV	
23 kV	
New	

Need Number: APS-2025-020
Process Stage: Submission of Supplemental Projects for Inclusion in the Local Plan - 03/02/2026
Previously Presented: Need Meeting – 08/05/2025
 Solution Meeting – 09/09/2025

Supplemental Project Driver(s):

Equipment Condition/Performance/Risk

Specific Assumption Reference(s):

System Performance Projects Global Factors

- System Reliability and Performance
- Substation/line equipment limits
- Substation Condition Rebuild/Replacement
- Age/condition of substation equipment
- Circuit breakers and other fault interrupting devices

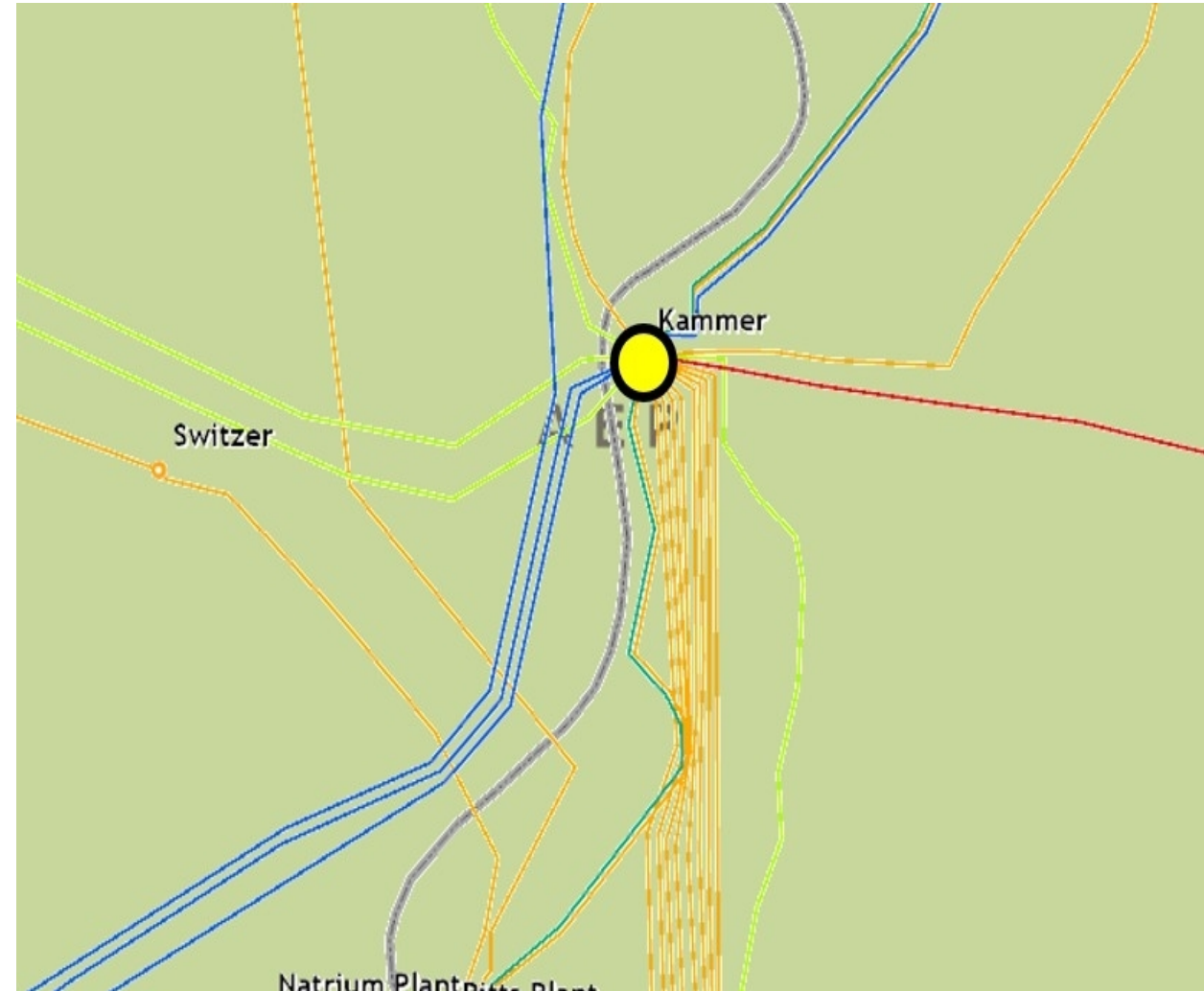
Problem Statement

The existing Kammer Substation is owned by AEP. FirstEnergy owns the Kammer No. 200 765/500 kV Transformer and its associated equipment.

Critical Infrastructure Protection (CIP) and PRC-005 compliance requires implementing and maintaining a physical security plan to protect Bulk Electric System (BES) cyber systems and associated electronic equipment. Additionally, the low side of the Kammer No. 200 765/500 kV Transformer is connected to the Kammer – 502 Junction 500 kV Line through a disconnect switch, resulting in the need to direct transfer trip breakers at 502 Junction Substation upon various fault scenarios.

Existing Kammer No. 200 765/500 kV Transformer circuit ratings:

- 2987 / 3792 / 3604 / 4140 MVA (SN/SE/WN/WE)



Need Number: APS-2025-020
 Process Stage: Submission of Supplemental Projects for Inclusion in the Local Plan - 03/02/2026

Selected Solution:

Construct a new FirstEnergy owned control building at Kammer Substation to house all relaying for FirstEnergy assets.

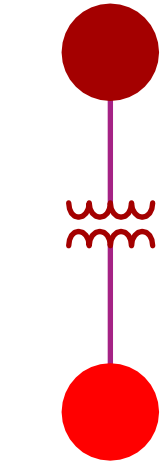
- Install prefabricated control enclosure with new relaying
- Replace 765 kV disconnect switch on the high side of the Kammer No. 200 765/500 kV transformer with a 765 kV SCADA controlled switch.
- Replace 500 kV disconnect switch on the low side of the Kammer No. 200 765/500 kV transformer with a 500 kV circuit breaker

Kammer No. 200 765/500 kV Transformer Ratings:

- No change in ratings

Estimated Project Cost: \$9.25 M
Projected In-Service: 8/15/2030
Supplemental Project ID: s3776.1

Kammer 765 kV



Kammer 500 kV

Legend	
765 kV	
500 kV	
345 kV	
230 kV	
138 kV	
115 kV	
69 kV	
46 kV	
34.5 kV	
23 kV	
New	

Need Number: APS-2024-095

Process Stage: Submission of Supplemental Projects for Inclusion in the Local Plan - 03/02/2026

Previous Stage: Need Meeting – 11/15/2024
Solution Meeting – 9/19/2025

Supplemental Project Driver(s):

Equipment Material Condition, Performance and Risk

Specific Assumption Reference(s)

System Performance Global Factors

- System reliability and performance
- Substation/line equipment limits

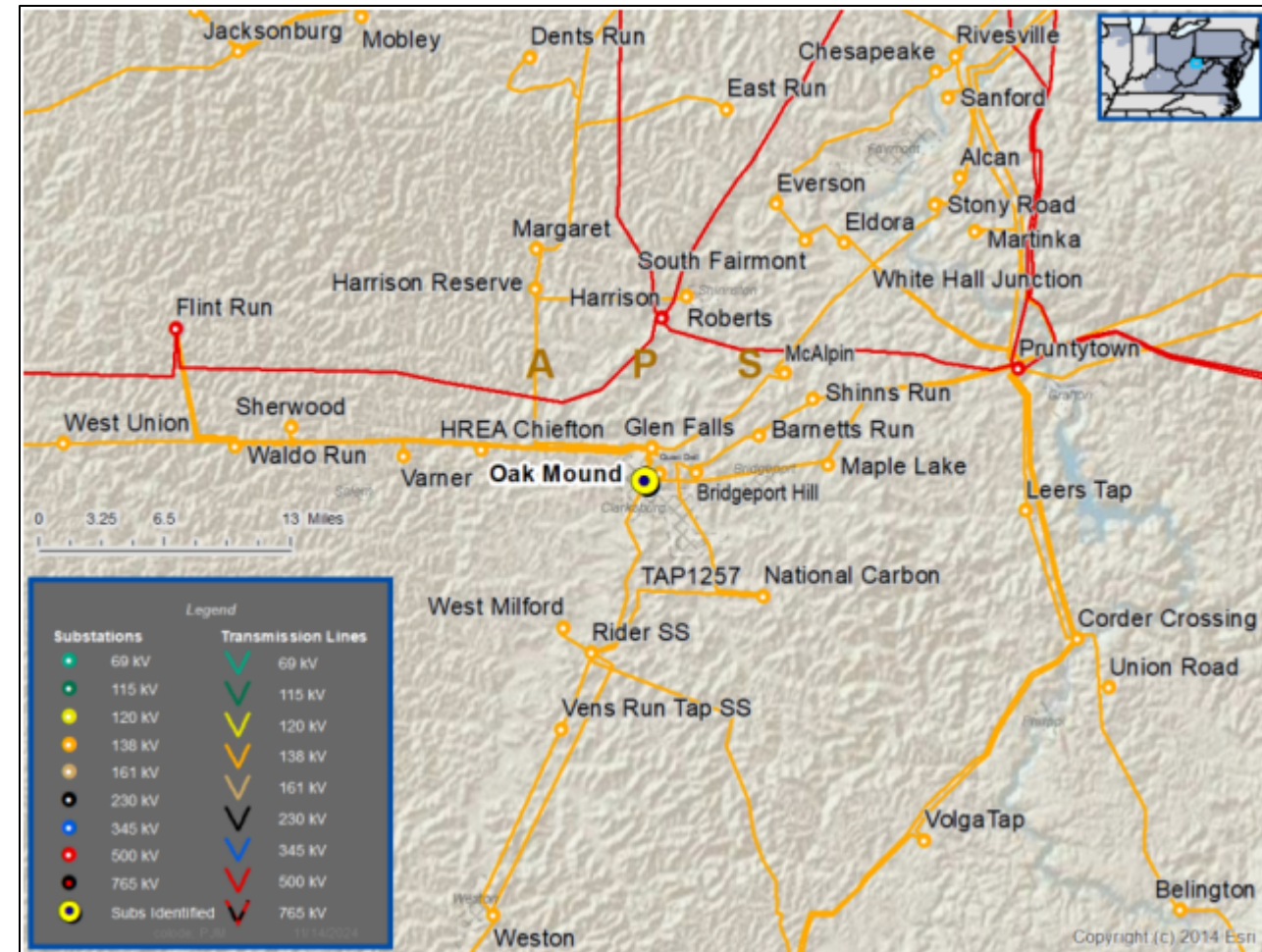
Substation Condition Rebuild/Replacement

- Age/condition of substation equipment
- Circuit breakers and other fault interrupting devices

Problem Statement:

- The existing control building at Oak Mound Substation is congested. There is not sufficient space for additional panel upgrades.
- The existing 138 kV breakers are approaching end of life:
 - Breaker 3 (bus tie) is approximately 38 years old.
 - Breaker 2 (Waldo Run No. 2) is approximately 42 years old.
 - Breaker 4 (Oak Mound) is approximately 55 years old.
- Replacement parts are difficult to source leading to non-standard repairs.
- Transmission lines are limited by terminal equipment.

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Need #	Transmission Line / Substation Locations	Existing Line Rating MVA (SN / SE / WN / WE)	Existing Conductor Rating MVA (SN / SE / WN / WE)
APS-2024-095	Oak Mound – Quiet Dell 138 kV Line*	292 / 306 / 306 / 306	308 / 376 / 349 / 445
	Oak Mound – Waldo Run No. 1 138 kV Line	278 / 339 / 315 / 401	278 / 339 / 315 / 401
	Oak Mound – Waldo Run No. 2 138 kV Line	278 / 339 / 315 / 401	278 / 339 / 315 / 401
	Oak Mound – Rider 138 kV Line	309 / 376 / 349 / 445	309 / 376 / 349 / 445
	Oak Mound – Glen Falls 138 kV Line	160 / 192 / 180 / 228	160 / 192 / 180 / 228

*Refer to APS-2024-089

APS Transmission Zone M-3 Process Oak Mound Control Building and Breakers

Need Number: APS-2024-095
Process Stage: Submission of Supplemental Projects for Inclusion in the Local Plan - 03/02/2026

Selected Solution:

- At Oak Mound Substation*: Install one prefabricated control building, surge arresters, CTs, circuit breakers, disconnect switches, substation conductor, line trap, line tuner, CVT and relaying.
- At Quiet Dell Substation*: Install surge arresters.
- At Glen Falls Substation: Replace circuit breaker, line trap/CCVT, line tuner and relaying.

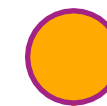
Oak Mound – Quiet Dell 138 kV Line Ratings*:

- Before Proposed Solution: 292/306/306/306 MVA (SN/SE/WN/WE)
- After Proposed Solution: 308/376/349/445 MVA (SN/SE/WN/WE)

*Refer to APS-2024-089

Estimated Project Cost: \$13.35M
Projected In-Service: 6/16/2028
Supplemental Project ID: s3777.1

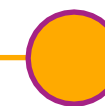
Glen Falls

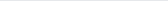


Oak Mound



Quiet Dell



Legend	
500 kV	
345 kV	
230 kV	
138 kV	
115 kV	
69 kV	
46 kV	
34.5 kV	
23 kV	
New	

APS Transmission Zone M-3 Process Misoperation Relays: Oak Mound - Quiet Dell 138 kV Line

Need Number: APS-2024-089
Process Stage: Submission of Supplemental Projects for Inclusion in the Local Plan - 03/02/2026
Previously Stage: Need Meeting – 10/18/2024
 Solution Meeting – 09/19/2025

Project Driver:

Equipment Material Condition, Performance and Risk

Specific Assumption Reference:

System Performance Projects Global Factors

- System reliability and performance
- Substation/line equipment limits

System Condition Projects

- Substation Condition Rebuild/Replacement

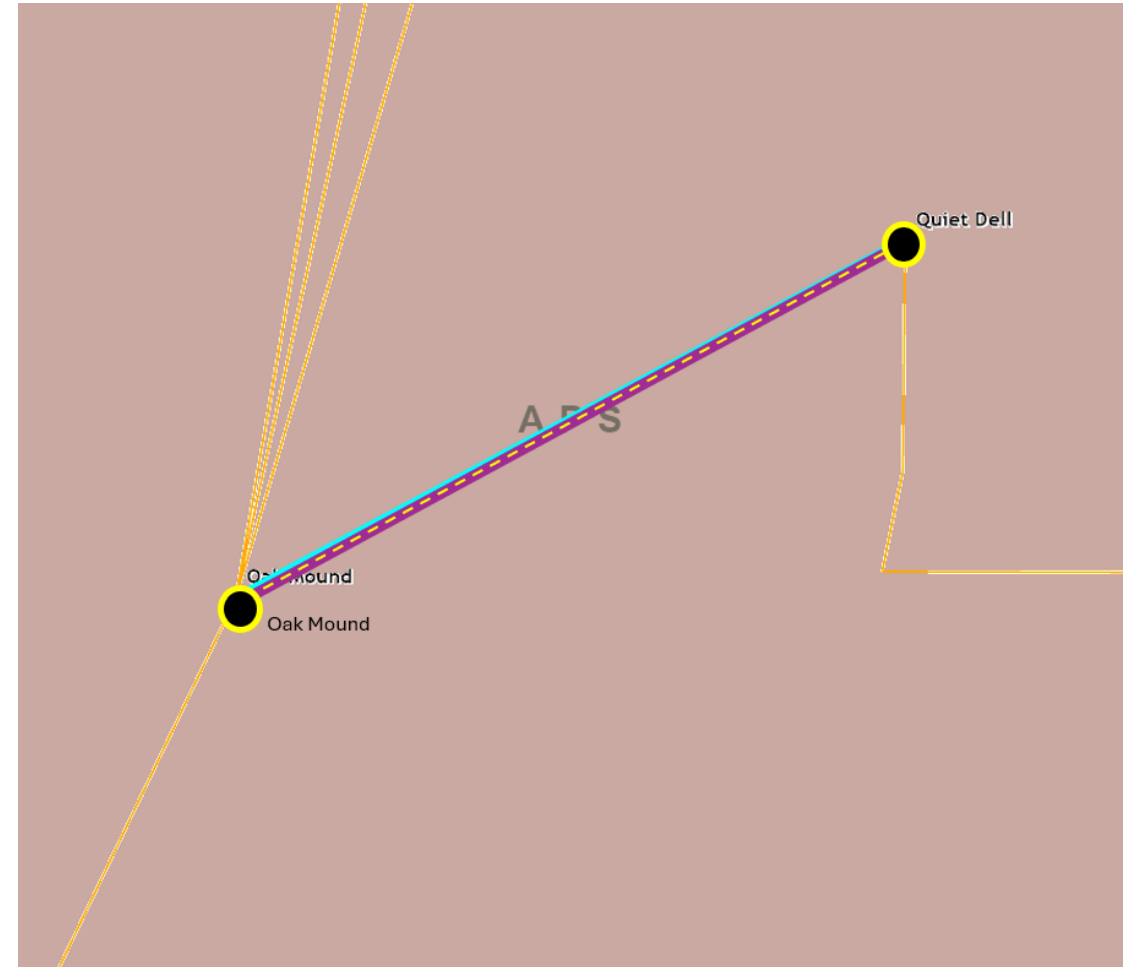
Upgrade Relay Schemes

- Obsolete and difficult to repair communication equipment (DTT, Blocking, etc.)
- Communication technology upgrades

Problem Statement:

- FirstEnergy has identified protection schemes using a certain vintage of relays and communication equipment that have a history of misoperation.
- Proper operation of the protection scheme requires all the separate components perform adequately during a fault.
- In many cases the protection equipment cannot be repaired due to a lack of replacement parts and available expertise in the outdated technology.
- Transmission line ratings are limited by terminal equipment.

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Need #	Transmission Line / Substation Locations	Existing Line Rating MVA (SN / SE / WN / WE)	Existing Conductor Rating MVA (SN / SE / WN / WE)
APS-2024-089	Oak Mound – Quiet Dell 138 kV Line	292 / 306 / 306 / 306	308 / 376 / 349 / 445

Need Number: APS-2024-089

Process Stage: Submission of Supplemental Projects for Inclusion in the Local Plan - 03/02/2026

Selected Solution:

- At Oak Mound Substation: Replace relaying.
- At Quiet Dell Substation: Replace disconnect switches, wave trap, line turner and coax, CVT and relaying.

Oak Mound – Quiet Dell 138 kV Line Ratings:

- Before Proposed Solution: 292/306/306/306 MVA (SN/SE/WN/WE)
- After Proposed Solution: 308/376/349/445 MVA (SN/SE/WN/WE)

Estimated Project Cost: \$2.63M

Projected In-Service: 6/16/2028

Supplemental Project ID: s3778.1

Quiet Dell



Oak Mound

Legend	
500 kV	
345 kV	
230 kV	
138 kV	
115 kV	
69 kV	
46 kV	
34.5 kV	
23 kV	
New	

APS Transmission Zone M-3 Process Misoperation Relays: Armstrong - Kittanning 138 kV Line

Need Number: APS-2024-010

Process Stage: Submission of Supplemental Projects for Inclusion in the Local Plan – 07/14/2026

Previously Presented: Solution Meeting - SRRTEP-W - 10/17/2025
Need Meeting - SRRTEP-W - 01/19/2024

Project Driver:

Equipment Material Condition, Performance and Risk

Specific Assumption Reference:

System Performance Projects Global Factors

- System reliability and performance
- Substation/line equipment limits

System Condition Projects

- Substation Condition Rebuild/Replacement

Upgrade Relay Schemes

- Obsolete and difficult to repair communication equipment (DTT, Blocking, etc.)
- Communication technology upgrades

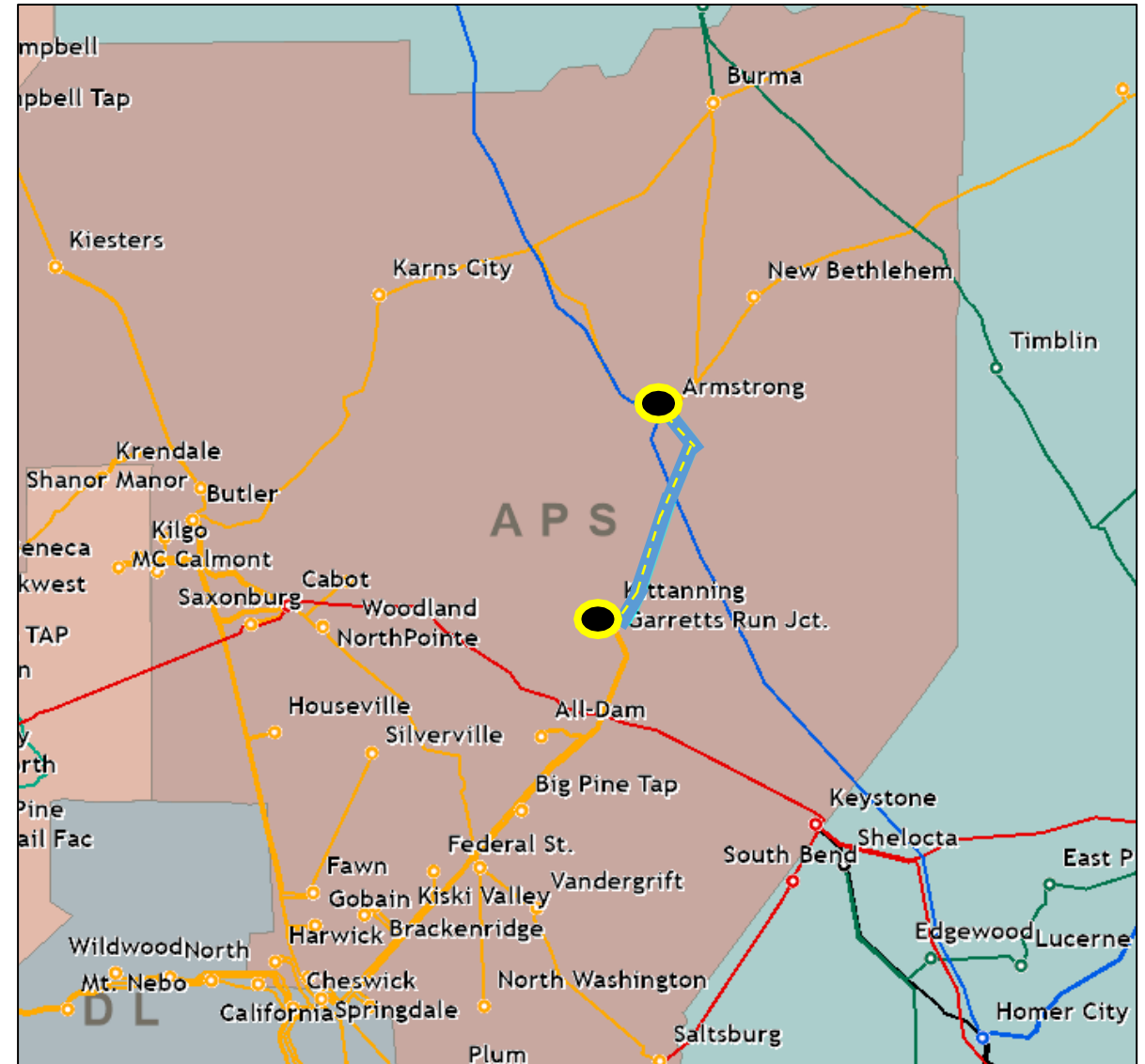
Problem Statement:

FirstEnergy has identified protection schemes using a certain vintage of relays and communication equipment that have a history of misoperation.

Proper operation of the protection scheme requires all the separate components perform adequately during a fault.

In many cases the protection equipment cannot be repaired due to a lack of replacement parts and available expertise in the outdated technology.

Transmission line ratings are limited by terminal equipment.





APS Transmission Zone M-3 Process
Misoperation Relays: Armstrong - Kittanning 138 kV Line

Need #	Transmission Line / Substation Locations	Existing Line Rating (SN / SE / WN / WE)	Existing Conductor Rating (SN / SE / WN / WE)
APS-2024-010	Armstrong – Kittanning 138 kV	195 / 209 / 217 / 229	221 / 268 / 250 / 317

APS Transmission Zone M-3 Process Misoperation Relays: Armstrong - Kittanning 138 kV Line

Need Number: APS-2024-010
Process Stage: Submission of Supplemental Projects for Inclusion in the Local Plan – 07/14/2026

Proposed Solution:

Armstrong - Kittanning 138 kV Line

- At Armstrong Substation, replace disconnect switches, line trap, line turner and coax, CVT and relaying.
- At Kittanning Substation, replace circuit breaker, disconnect switches, line trap, line turner and coax, CVT and relaying.

Ratings:

Armstrong - Kittanning 138 kV Line:

- Before Proposed Solution: 195 / 209 / 217 / 229 MVA (SN/SE/WN/WE)
- After Proposed Solution: 221 / 268 / 250 / 317 MVA (SN/SE/WN/WE)

Alternatives Considered:

Maintain equipment in existing condition with elevated risk of misoperations.

Estimated Project Cost: \$3.44M

Projected In-Service: 09/10/2029

Supplemental Project ID: s3865.1

Armstrong



Kittanning

Legend	
500 kV	
345 kV	
230 kV	
138 kV	
115 kV	
69 kV	
46 kV	
34.5 kV	
23 kV	
New	

APS Transmission Zone M-3 Process

Misoperation Relays: Shepler Hill Junction (Charleroi - Mitchell - Yukon) 138 kV Line

Need #	Transmission Line / Substation Locations	Existing Line Rating MVA (SN / SE / WN / WE)	Existing Conductor Rating MVA (SN / SE / WN / WE)
APS-2024-102	Charleroi – Belmon 138 kV Line	274 / 345 / 345 / 405	297 / 365 / 345 / 441
	Belmon – Shepler Hill Jct 138 kV Line	269 / 335 / 326 / 380	269 / 335 / 326 / 421
	Shepler Hill Jct – Mitchell 138 kV Line	295 / 375 / 349 / 441	308 / 376 / 349 / 445
	Shepler Hill Jct – Smithton Tap 138 kV Line	501 / 577 / 501 / 607	501 / 577 / 501 / 607
	Smithton Tap – Yukon 138 kV Line	501 / 577 / 501 / 607	501 / 577 / 501 / 607

Need Number: APS-2024-102

Process Stage: Submission of Supplemental Projects for Inclusion in the Local Plan – 07/14/2026

Proposed Solution:

Shepler Hill Junction (Charleroi - Mitchell - Yukon) 138 kV Line

- At Belmon Substation, replace line and disconnect switches, substation conductor, and relaying.
- At Charleroi Substation, replace substation conductor, and relaying.
- At Mitchell Substation, replace substation conductor, and relaying.
- At Smithton Substation, replace disconnect switches, and relaying.
- At Yukon, replace relaying

Ratings:

Charleroi – Belmon 138 kV Line:

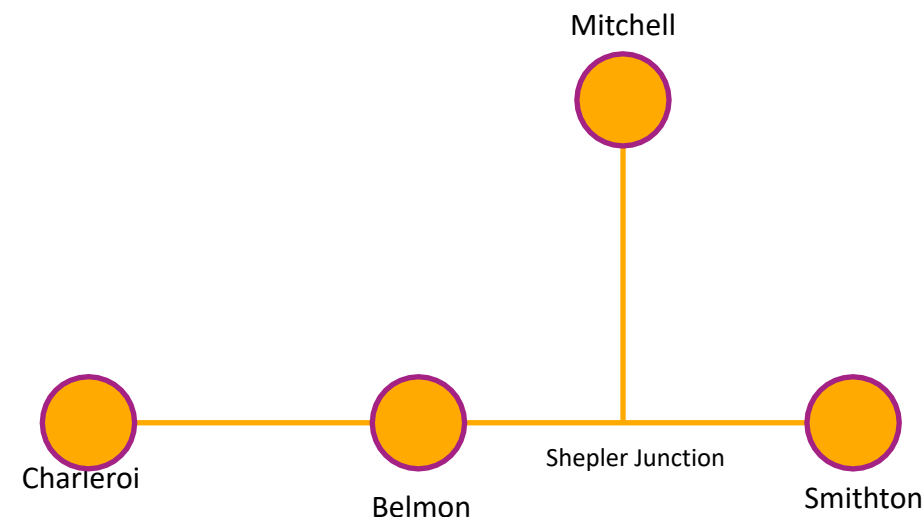
- Before Proposed Solution: 274 / 345 / 345 / 405 MVA (SN/SE/WN/WE)
- After Proposed Solution: 297 / 365 / 345 / 441 MVA (SN/SE/WN/WE)

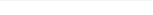
Belmon – Shepler Hill Jct 138 kV Line:

- Before Proposed Solution: 269 / 335 / 326 / 380 MVA (SN/SE/WN/WE)
- After Proposed Solution: 269 / 335 / 326 / 421 MVA (SN/SE/WN/WE)

Shepler Hill Jct – Mitchell 138 kV Line:

- Before Proposed Solution: 295 / 375 / 349 / 441 MVA (SN/SE/WN/WE)
- After Proposed Solution: 308 / 376 / 349 / 445 MVA (SN/SE/WN/WE)



Legend	
500 kV	
345 kV	
230 kV	
138 kV	
115 kV	
69 kV	
46 kV	
34.5 kV	
23 kV	
New	



APS Transmission Zone M-3 Process Misoperation Relays: Shepler Hill Junction (Charleroi - Mitchell - Yukon) 138 kV Line

Need Number: APS-2024-102
Process Stage: Submission of Supplemental Projects for Inclusion in the Local Plan – 07/14/2026

Alternatives Considered:
Maintain equipment in existing condition with elevated risk of misoperations.

Estimated Project Cost: \$3.71M
Projected In-Service: 10/31/2028
Supplemental Project ID: s3866.1

APS Transmission Zone M-3 Process Misoperation Relays: Cecil – Enlow 138 kV Line

Need Number: APS-2024-105

Process Stage: Submission of Supplemental Projects for Inclusion in the Local Plan – 07/14/2026

Previously Presented: Solution Meeting - SRRTEP-W - 10/17/2025
Need Meeting - SRRTEP-W - 12/13/2024

Project Driver:

Equipment Material Condition, Performance and Risk

Specific Assumption Reference:

System Performance Projects Global Factors

- System reliability and performance
- Substation/line equipment limits

System Condition Projects

- Substation Condition Rebuild/Replacement

Upgrade Relay Schemes

- Obsolete and difficult to repair communication equipment (DTT, Blocking, etc.)
- Communication technology upgrades

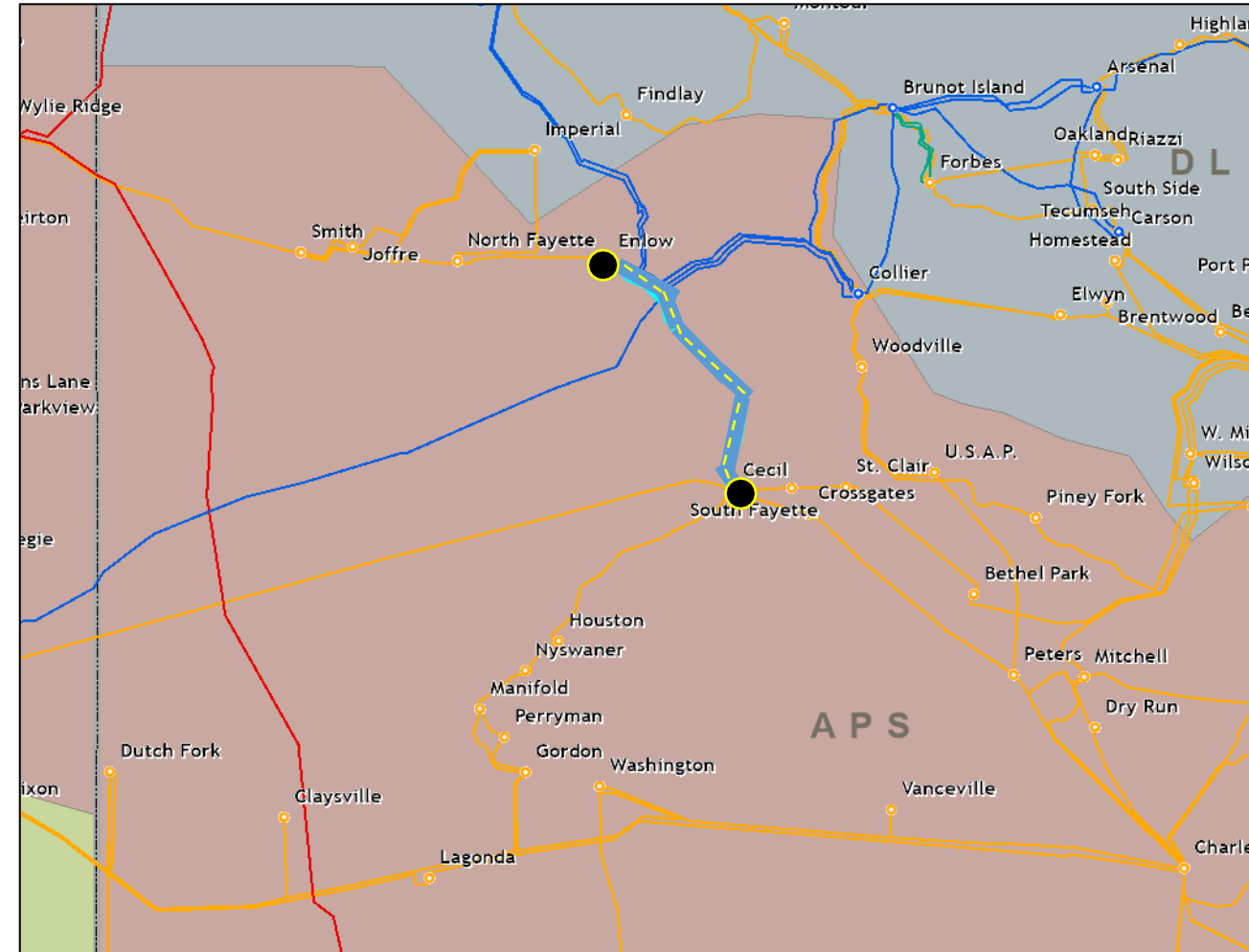
Problem Statement:

FirstEnergy has identified protection schemes using a certain vintage of relays and communication equipment that have a history of misoperation.

Proper operation of the protection scheme requires all the separate components perform adequately during a fault.

In many cases the protection equipment cannot be repaired due to a lack of replacement parts and available expertise in the outdated technology.

Transmission line ratings are limited by terminal equipment.



Need #	Transmission Line / Substation Locations	Existing Line Rating MVA (SN / SE / WN / WE)	Existing Conductor Rating MVA (SN / SE / WN / WE)
APS-2024-105	Cecil – Enlow 138 kV Line	292 / 314 / 325 / 343	308 / 376 / 349 / 445

APS Transmission Zone M-3 Process Misoperation Relays: Cecil – Enlow 138 kV Line

Need Number: APS-2024-105
Process Stage: Submission of Supplemental Projects for Inclusion in the Local Plan – 07/14/2026

Proposed Solution:

Cecil – Enlow 138 kV Line

- At Cecil Substation, replace substation conductor, line trap, line tuner and coax, CVTs and relaying.
- At Enlow Substation, replace circuit breaker, disconnect switches, line trap, line tuner and coax, CVT and relaying.

Ratings:

Cecil – Enlow 138 kV Line:

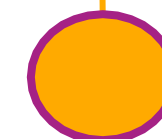
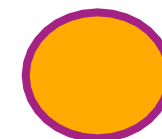
- Before Proposed Solution: 292 / 314 / 325 / 343 MVA (SN/SE/WN/WE)
- After Proposed Solution: 308 / 376 / 349 / 445 MVA (SN/SE/WN/WE)

Alternatives Considered:

Maintain equipment in existing condition with elevated risk of misoperations.

Estimated Project Cost: \$4.0M
Projected In-Service: 06/11/2029
Supplemental Project ID: s3867.1

Cecil



Enlow

Legend	
500 kV	
345 kV	
230 kV	
138 kV	
115 kV	
69 kV	
46 kV	
34.5 kV	
23 kV	
New	

Need Number: APS-2025-028

Process Stage: Submission of Supplemental Projects for Inclusion in the Local Plan – 07/14/2026

Previously Presented: Solution Meeting - SRRTEP-W - 10/17/2025
Need Meeting - SRRTEP-W - 09/19/2024

Project Driver:

Operational Flexibility and Efficiency

Specific Assumption Reference:

System Performance Global Factors

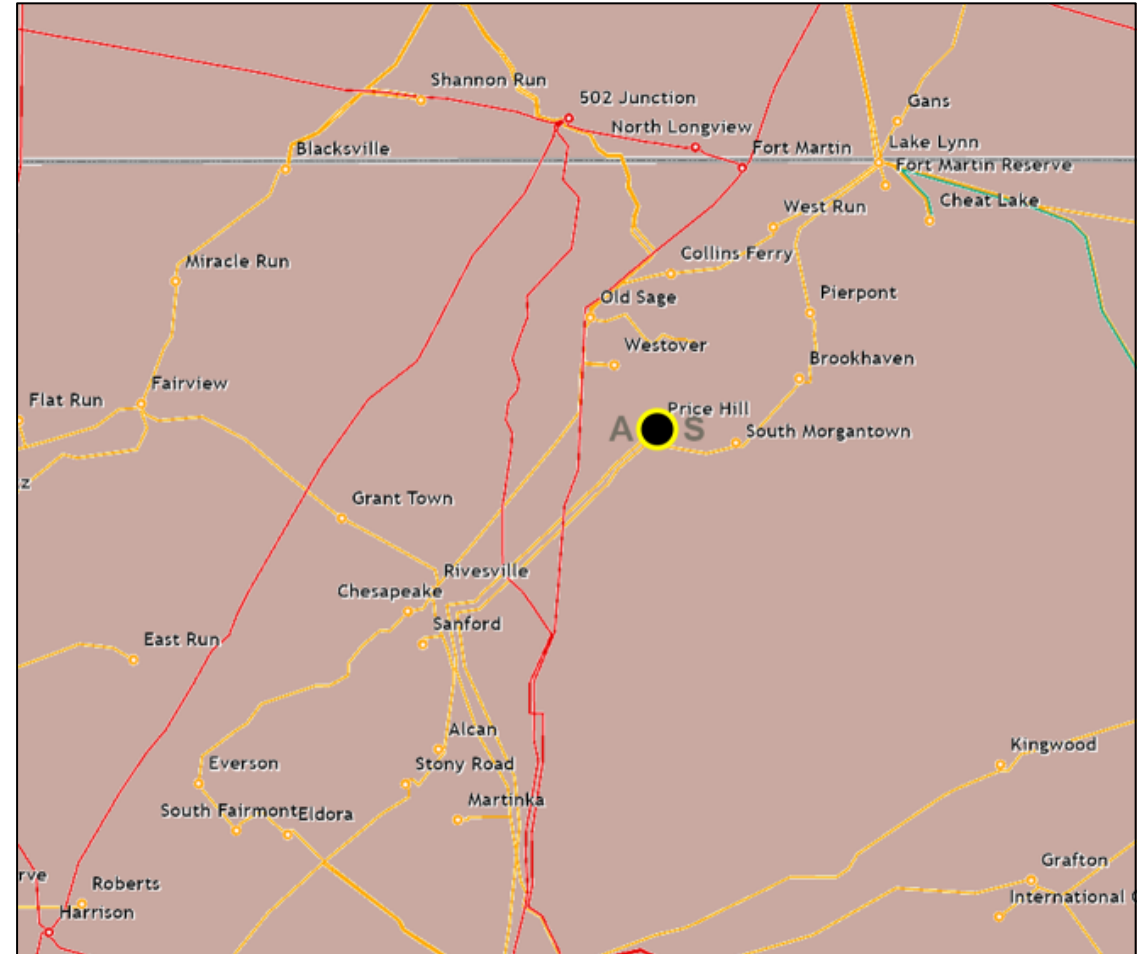
- Substation/line equipment limits

Problem Statement:

During a field inspection, a limiting substation conductor was identified on the South Morgantown - Price Hill 138 kV Line at Price Hill Substation. The substation conductor limits the capacity of the transmission line.

Existing Ratings: 224/293/323/343 MVA (SN/SE/WN/WE)

Transmission Line Ratings: 308/376/349/445 MVA (SN/SE/WN/WE)



Need Number: APS-2025-028

Process Stage: Submission of Supplemental Projects for Inclusion in the Local Plan – 07/14/2026

Proposed Solution:

Price Hill Substation

- Replace limiting substation conductor at Price Hill Substation on the South Morgantown terminal.

Ratings:

Price Hill - South Morgantown 138 kV Line:

- Before Proposed Solution: 224 / 293 / 323 / 343 MVA (SN/SE/WN/WE)
- After Proposed Solution: 262 / 314 / 325 / 343 MVA (SN/SE/WN/WE)

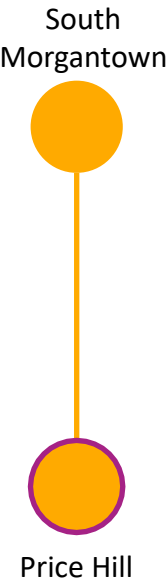
Alternatives Considered:

Maintain existing condition with reduced circuit ratings.

Estimated Project Cost: \$0.10M

Projected In-Service: 04/03/2026

Supplemental Project ID: s3868.1



Legend	
500 kV	
345 kV	
230 kV	
138 kV	
115 kV	
69 kV	
46 kV	
34.5 kV	
23 kV	
New	

Need Number: APS-2025-003

Process Stage: Submission of Supplemental Projects for Inclusion in the Local Plan – 07/14/2026

Previously Presented: Solution Meeting – 11/04/2025
Need Meeting – 03/04/2025

Project Driver:

Equipment Material Condition, Performance and Risk

Specific Assumption Reference:

System Performance Projects Global Factors

- Substation/line equipment limits
- System reliability and performance
- Substation Condition Rebuild/Replacement
- Upgrade Relay Schemes
- Obsolete and difficult to repair communication equipment (DTT, Blocking, etc.)
- Communication technology upgrades

Problem Statement:

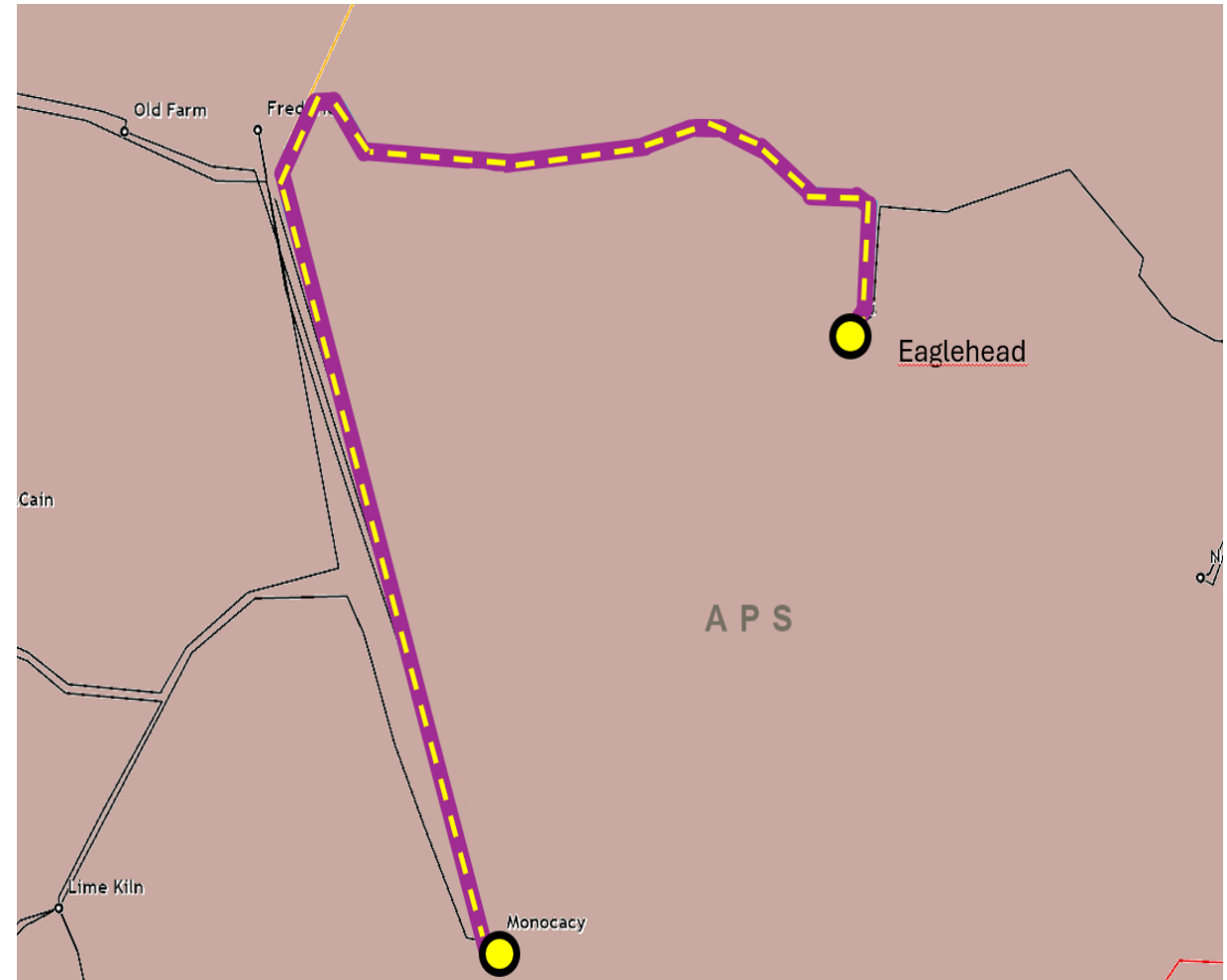
FirstEnergy has identified protection schemes using a certain vintage of relays and communication equipment that have a history of misoperation on the Eaglehead - Monocacy 230 kV Line.

Proper operation of the protection scheme requires all the separate components perform adequately during a fault.

In many cases the protection equipment cannot be repaired due to a lack of replacement parts and available expertise in the outdated technology.

Transmission line ratings are limited by terminal equipment:

- Existing line ratings: 548 / 688 / 699 / 797 MVA (SN/SE/WN/WE)
- Existing conductor ratings: 617 / 754 / 699 / 894 MVA (SN/SE/WN/WE)



Need Number: APS-2025-003

Process Stage: Submission of Supplemental Projects for Inclusion in the Local Plan – 07/14/2026

Proposed Solution:

- At Eaglehead Substation: Replace 230 kV circuit breaker, disconnect switches, substation conductor, CVT, CT, surge arresters, and relaying.
- At Monocacy Substation: Replace 230 kV disconnect switches, substation conductor, CVT, CT, surge arresters, and relaying.

Monocacy - Eaglehead 230 kV Line Ratings:

- Before Proposed Solution: 548 / 688 / 699 / 797 MVA (SN/SE/WN/WE)
- After Proposed Solution: 617 / 754 / 699 / 894 MVA (SN/SE/WN/WE)

Alternatives Considered:

Maintain equipment in existing condition with elevated risk of misoperations.

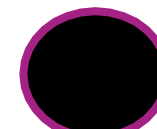
Estimated Project Cost: \$3.88M

Projected In-Service: 08/24/2029

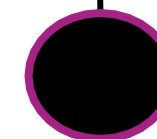
Supplemental Project ID: s3869.1

APS Transmission Zone M-3 Process Eaglehead - Monocacy 230 kV Line

Eaglehead



Legend	
500 kV	
345 kV	
230 kV	
138 kV	
115 kV	
69 kV	
46 kV	
34.5 kV	
23 kV	
New	



Monocacy

APS Transmission Zone M-3 Process Wylie Ridge No. 3 345/138 kV Transformer

Need Number: APS-2024-079

Process Stage: Submission of Supplemental Projects for Inclusion in the Local Plan – 07/14/2026

Previously Presented: Solution Meeting – 11/04/2025
Need Meeting – 11/06/2024

Project Driver:

Equipment Condition/Performance/Risk, Operational Flexibility and Efficiency

Specific Assumption Reference:

System Performance Projects Global Factors

- System reliability and performance
- Add/Replace Transformers
- Past System Reliability/Performance

Problem Statement:

The Wylie Ridge No. 3 345/138 kV Transformer is approximately 50 years old and is approaching end of life.

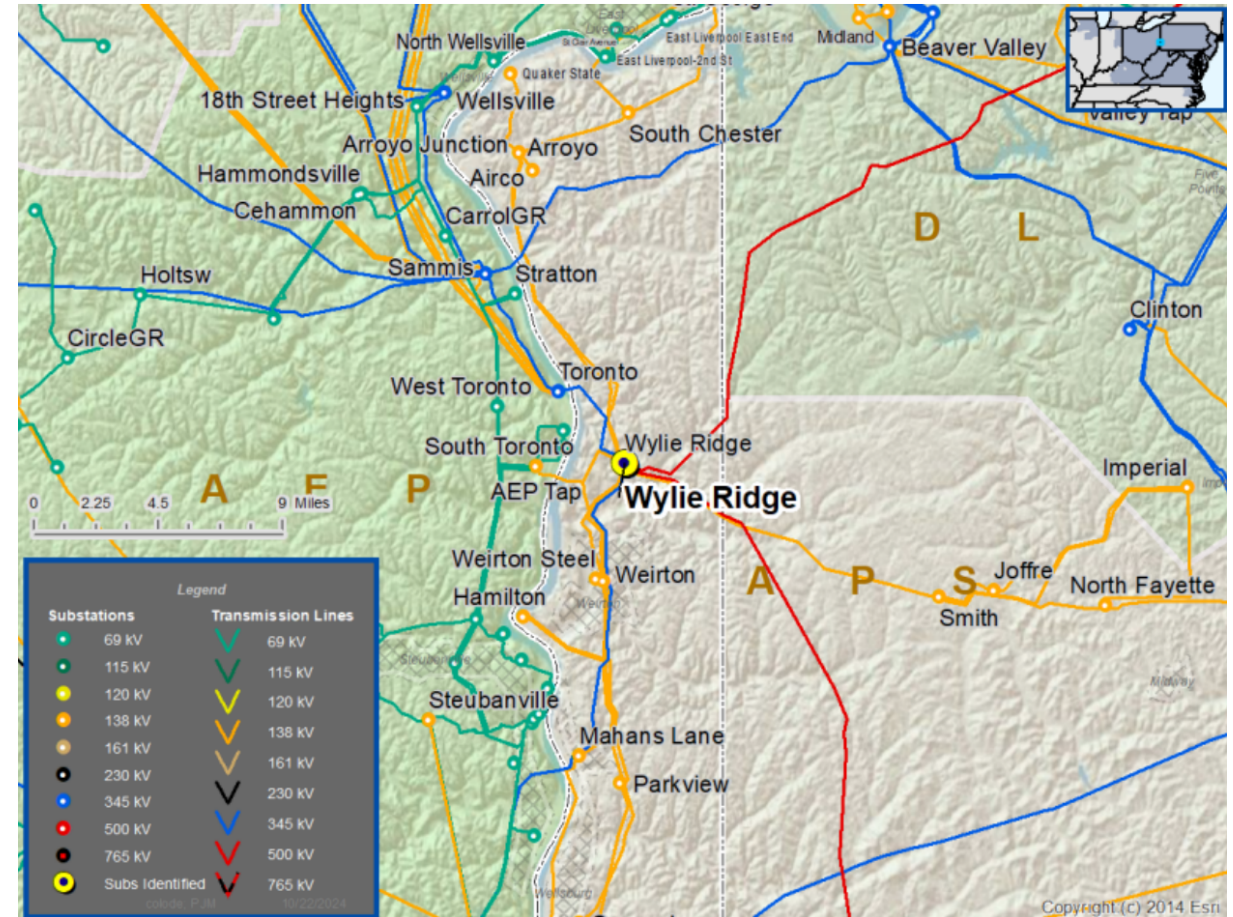
The transformer has increased hydrogen readings and low dielectric strength.

The transformer has increased moisture content which indicates presence of polar contaminants .

Replacement components are difficult to source leading to non-standard repairs.

Existing transformer ratings:

- 407 / 516 MVA (SN/SSTE)
- 480 / 548 MVA (WN/WSTE)



APS Transmission Zone M-3 Process Wylie Ridge No. 3 345/138 kV Transformer

Need Number: APS-2024-079

Process Stage: Submission of Supplemental Projects for Inclusion in the Local Plan – 07/14/2026

Proposed Solution:

- At Wylie Ridge Substation: Replace the No. 3 345/138 kV Transformer
- Replace one 138 kV disconnect switch with a circuit breaker
- Replace 345 kV disconnect switches, substation conductor, and relaying Wylie Ridge No. 3 345/138 kV Transformer:

Before Proposed Solution: 407 / 516 / 480 / 548 MVA (SN/SSTE/WN/WSTE)

After Proposed Solution: 575 / 748 / 690 / 805 MVA (SN/SSTE/WN/WSTE)

Alternatives Considered:

Maintain equipment in existing condition with elevated risk of misoperations.

Estimated Project Cost: \$13.45M

Projected In-Service: 12/13/2030

Supplemental Project ID: s3870.1

Wylie Ridge 345 kV



Wylie Ridge 138 kV

Legend	
500 kV	
345 kV	
230 kV	
138 kV	
115 kV	
69 kV	
46 kV	
34.5 kV	
23 kV	
New	

Need Number: APS-2023-058

Process Stage: Submission of Supplemental Projects for Inclusion in the Local Plan – 07/14/2026

Previously Presented: Solution Meeting – 11/04/2025
Need Meeting – 10/31/2023

Project Driver:

Equipment Condition/Performance/Risk, Operational Flexibility and Efficiency

Specific Assumption Reference:

System Performance Projects Global Factors

- System Reliability and Performance
- Line Condition Rebuild/Replacement
- Substation/line equipment limits
- Upgrade Relay Schemes

Problem Statement:

Carroll - Mount Airy 230 kV line was constructed in 1965 with wood pole HFrame and has evidence of accelerated wood pole decay and woodpecker damage.

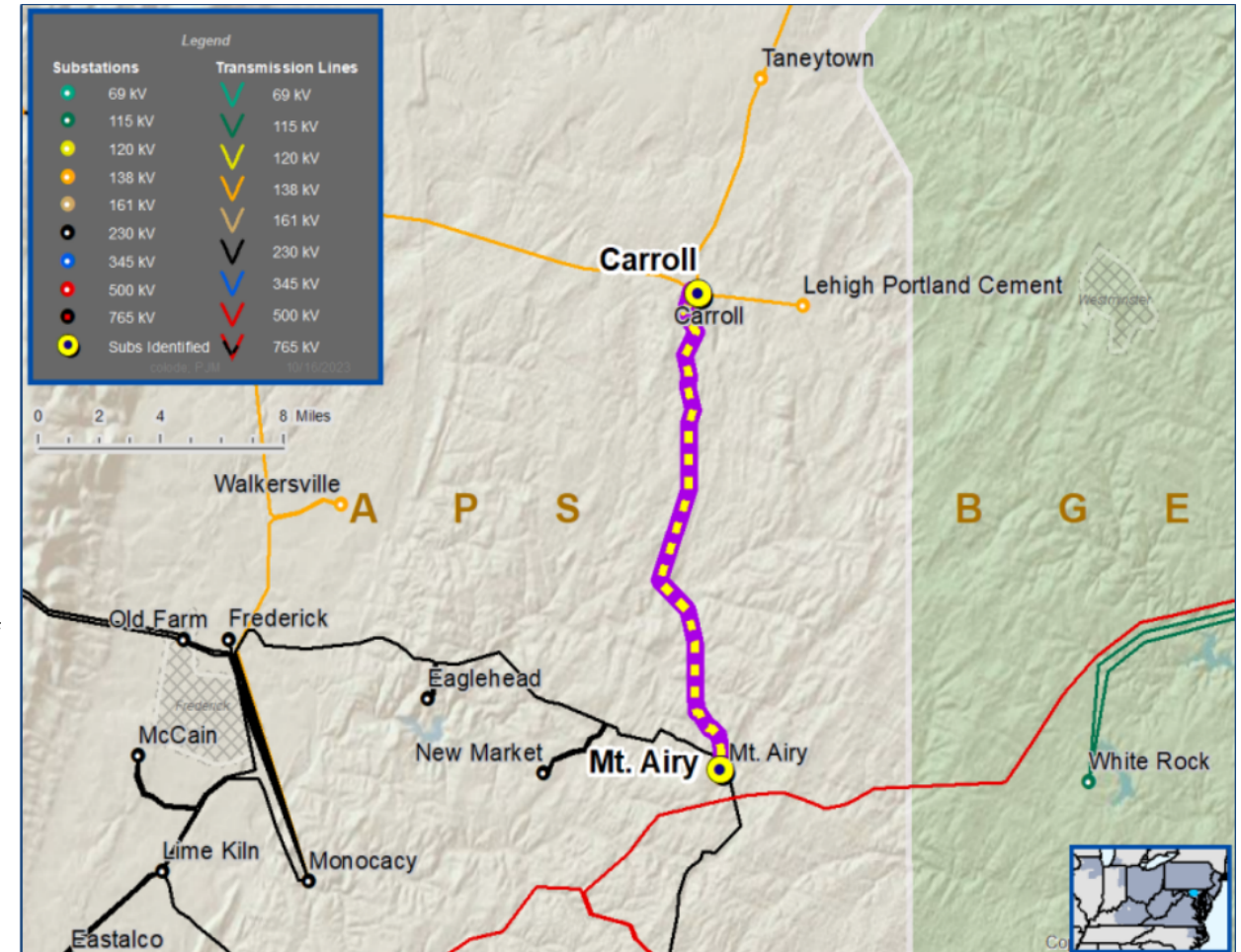
93 out of 112 structures failed inspection.

Rebuild is needed for approximately 12.7 miles of wood pole construction on the line based on condition and equipment caused outage history.

Transmission Line/Substation Locations: Carroll - Mt Airy 230kV Line

Existing Line Rating: 251 / 343 MVA (SN/SE)

Existing Conductor Rating: 617 / 754 MVA (SN/SE)



Need Number: APS-2023-058

Process Stage: Submission of Supplemental Projects for Inclusion in the Local Plan – 07/14/2026

Proposed Solution:

- Remove and replace 93 wood structures with steel structures on concrete foundation and install 12.72 miles of new conductor
- Adjust relaying at Carroll and Mt. Airy substations

Carroll – Mount Airy 230 kV Line Ratings:

- Before Proposed Solution: 251 / 343 / 302 / 370 MVA (SN/SE/WN/WE)
- After Proposed Solution: 617 / 754 / 699 / 894 MVA (SN/SE/WN/WE)

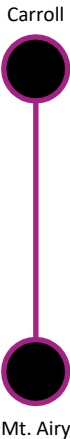
Alternatives Considered:

Maintain equipment in existing condition with elevated risk of misoperations.

Estimated Project Cost: \$50M

Projected In-Service: 06/30/2029

Supplemental Project ID: s3871.1



Legend	
500 kV	
345 kV	
230 kV	
138 kV	
115 kV	
69 kV	
46 kV	
34.5 kV	
23 kV	
New	

Need Number: APS-2025-012

Process Stage: Submission of Supplemental Projects for Inclusion in the Local Plan – 07/14/2026

Previously Presented: Solution Meeting - TEAC – 12/08/2025
Need Meeting –TEAC - 04/01/2025

Project Driver:

Equipment Condition/Performance/Risk

Specific Assumption Reference:

- System Performance Projects Global Factors
- System reliability and performance
- Add/Replace Transformers
- Past System Reliability/Performance

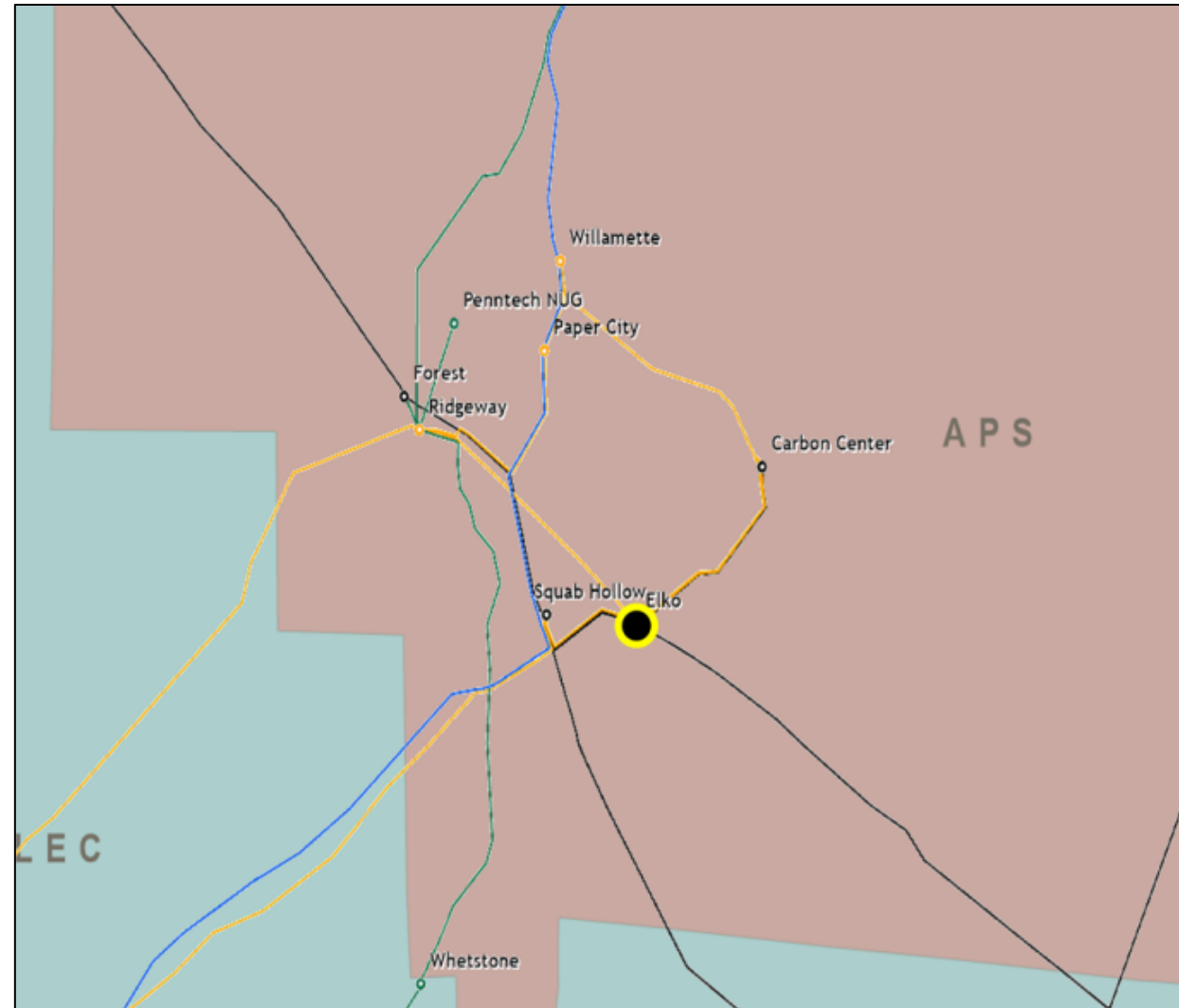
Problem Statement:

The Elko No. 1 230/138 kV Transformer is approximately 56 years old and is approaching end of life.

The transformer has exhibited high levels of dissolved gasses in oil and high nitrogen consumption.

Existing transformer ratings:

- 230 / 286 MVA (SN/SSTE)
- 280 / 325 MVA (WN/WSTE)



Need Number: APS-2025-012
Process Stage: Solution Meeting - TEAC – 12/08/2025

Proposed Solution:

At Elko Substation:

- Replace No. 1 230/138 kV transformer
- Replace 230 kV disconnect switch, limiting substation conductor and transformer relaying

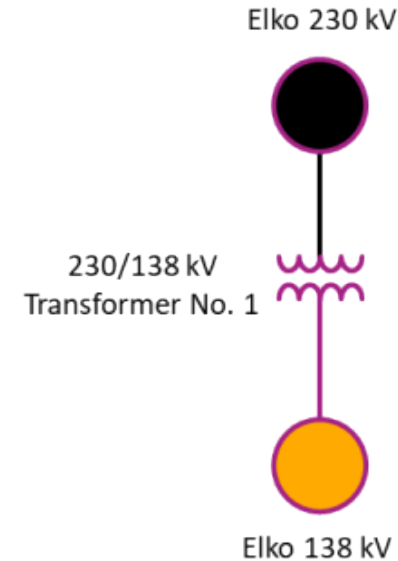
Before Proposed Solution: 230 / 286 / 280 / 325 MVA (SN/SSTE/WN/WSTE)

After Proposed Solution: 266 / 346 / 319 / 372 MVA (SN/SSTE/WN/WSTE).

Alternatives Considered:

Maintain the transformer in existing condition with elevated risk of failure.

Estimated Project Cost: \$6.69M
Projected In-Service: 06/01/2028
Supplemental Project ID: s3874.1



Legend	
500 kV	
345 kV	
230 kV	
138 kV	
115 kV	
69 kV	
46 kV	
34.5 kV	
23 kV	
New	

Need Number: APS-2024-028

Process Stage: Submission of Supplemental Projects for Inclusion in the Local Plan – 07/14/2026

Previously Presented: Solution Meeting – SRRTEP-W – 12/12/2025
Need Meeting – SRRTEP-W – 03/14/2024

Project Driver:
Equipment Condition/Performance/Risk

Specific Assumption Reference:

System Performance Global Factors

- *Past system reliability/performance Line Condition Rebuild/Replacement*
- *Age/condition of wood pole transmission line structures*

Problem Statement:

The Grand Point – Roxbury 138 kV Line was constructed in 1960. The line is approximately 14 miles long with 109 wood pole structures. Recent inspections have indicated that 87 structures are exhibiting deterioration. Inspection findings include woodpecker damage, top rot, groundline decay and cracking. Since 2014, the line has had eight unscheduled outages.

Existing Grand Point – Letterkenney 138 kV Line Rating:

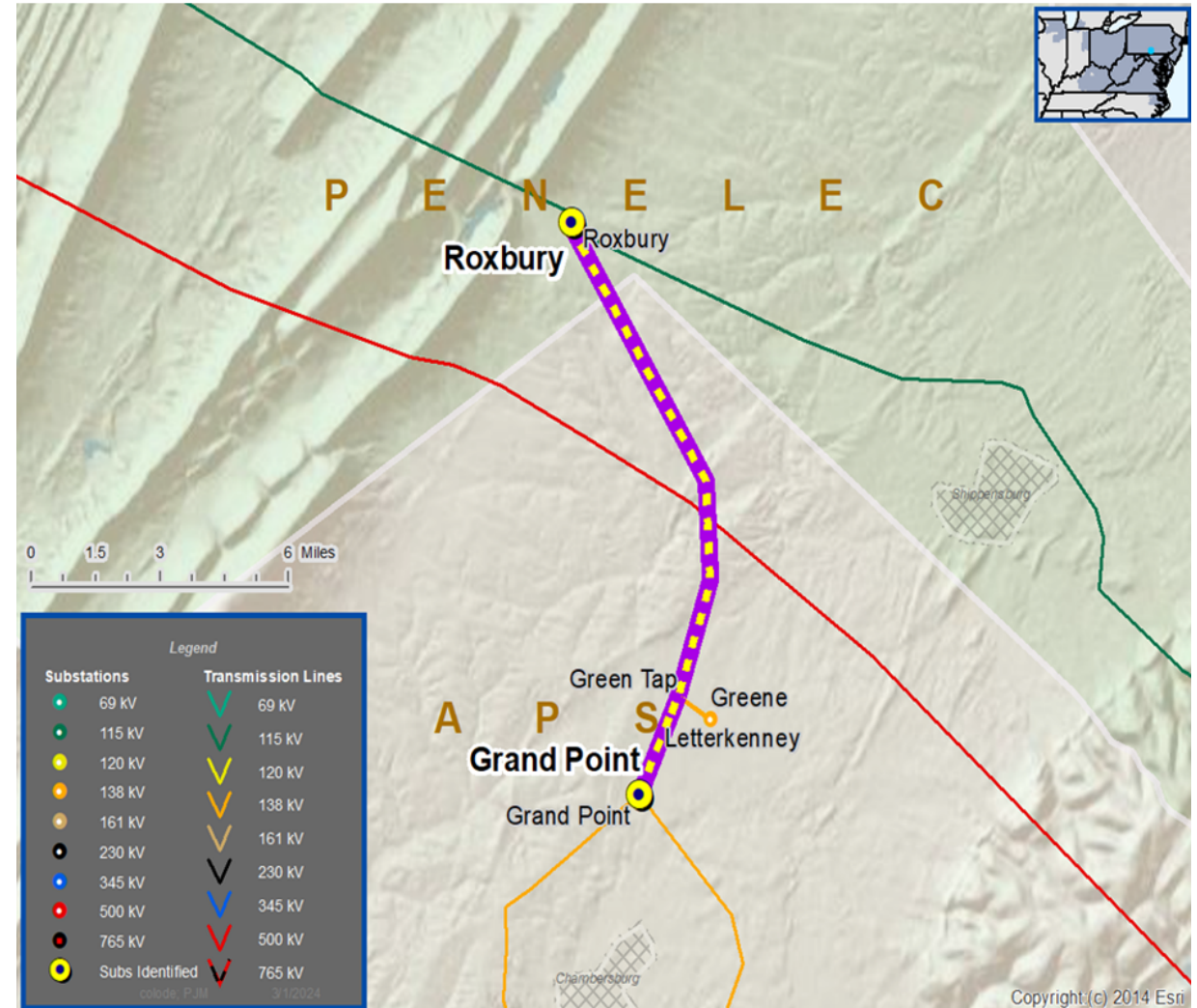
- 221 / 268 / 250 / 317 MVA (SN/SE/WN/WE)

Existing Letterkenney – Greene Tap 138 kV Line Rating:

- 221 / 268 / 250 / 317 MVA (SN/SE/WN/WE)

Existing Greene Tap – Roxbury 138 kV Line Rating:

- 221 / 268 / 250 / 317 MVA (SN/SE/WN/WE)



Need Number: APS-2024-028

Process Stage: Submission of Supplemental Projects for Inclusion in the Local Plan – 07/14/2026

Proposed Solution:

Grand Point – Roxbury 138 kV Line:

- Rebuild the Grand Point - Roxbury 138 kV Line (14 miles total) with steel H-frame structures and new conductor.
- 5.5 miles per PN-2024-012
- 8.5 miles per APS-2024-028

At Roxbury Substation (PN):

- Replace limiting substation conductor and revise relay settings.

At Greene Substation:

- Revise relay settings.

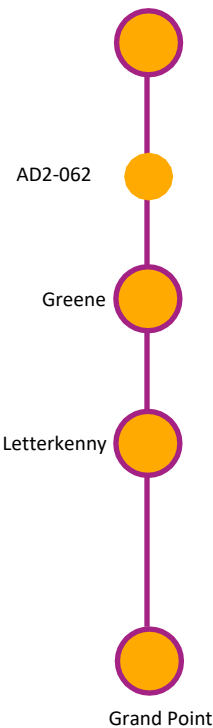
At Letterkenny Substation:

- Replace line switch and revise relay settings.

At Grand Point Substation:

- Replace substation conductor, circuit breaker, install surge arrestors and ground switch, and revise relay settings.

Continued on the next slide...



Legend	
500 kV	
345 kV	
230 kV	
138 kV	
115 kV	
69 kV	
46 kV	
34.5 kV	
23 kV	
New	

Need Number: APS-2024-028

Process Stage: Submission of Supplemental Projects for Inclusion in the Local Plan – 07/14/2026

Proposed Solution (continued):

- Transmission Line Ratings:
- Roxbury - AD2-062 138 kV Line:
- Before Proposed Solution: 221 / 268 / 250 / 317 MVA (SN/SE/WN/WE)
 - After Proposed Solution: 308 / 376 / 349 / 445 MVA (SN/SE/WN/WE)
- Greene - AD2-062 138 kV Line:
- Before Proposed Solution: 221 / 268 / 250 / 317 MVA (SN/SE/WN/WE)
 - After Proposed Solution: 308 / 376 / 349 / 445 MVA (SN/SE/WN/WE)
- Letterkenny - Greene 138 kV Line:
- Before Proposed Solution: 221 / 268 / 250 / 317 MVA (SN/SE/WN/WE)
 - After Proposed Solution: 308 / 376 / 349 / 445 MVA (SN/SE/WN/WE)
- Grand Point - Letterkenny 138 kV Line:
- Before Proposed Solution: 221 / 268 / 250 / 317 MVA (SN/SE/WN/WE)
 - After Proposed Solution: 308 / 376 / 349 / 445 MVA (SN/SE/WN/WE)

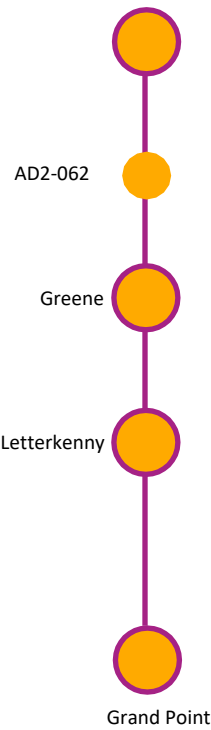
Alternatives Considered:

Maintain the line in existing condition with elevated risk of failure due to equipment deterioration.

Estimated Project Cost: \$28.34M

Projected In-Service: 06/15/2029

Supplemental Project ID: s3880.1



Legend	
500 kV	
345 kV	
230 kV	
138 kV	
115 kV	
69 kV	
46 kV	
34.5 kV	
23 kV	
New	

Need Number: APS-2024-096

Process Stage: Submission of Supplemental Projects for Inclusion in the Local Plan – 07/14/2026

Previously Presented: Solution Meeting – SRRTEP-W – 12/12/2025
Need Meeting – SRRTEP-W – 11/15/2024

Project Driver:

Equipment Condition/Performance/Risk

Specific Assumption Reference:

System Performance Global Factors

- *System reliability/performance*
- *Substation/Line equipment limits Line Condition Rebuild/Replacement*
- *Age/condition of wood transmission line structures*

Problem Statement:

The Junction – Parr Run 138 kV Line was constructed approximately 47 years ago. It is approximately 17 miles long with 98 wood pole and 18 steel lattice transmission line structures.

Per recent inspection, the line is exhibiting deterioration. Inspection findings include:

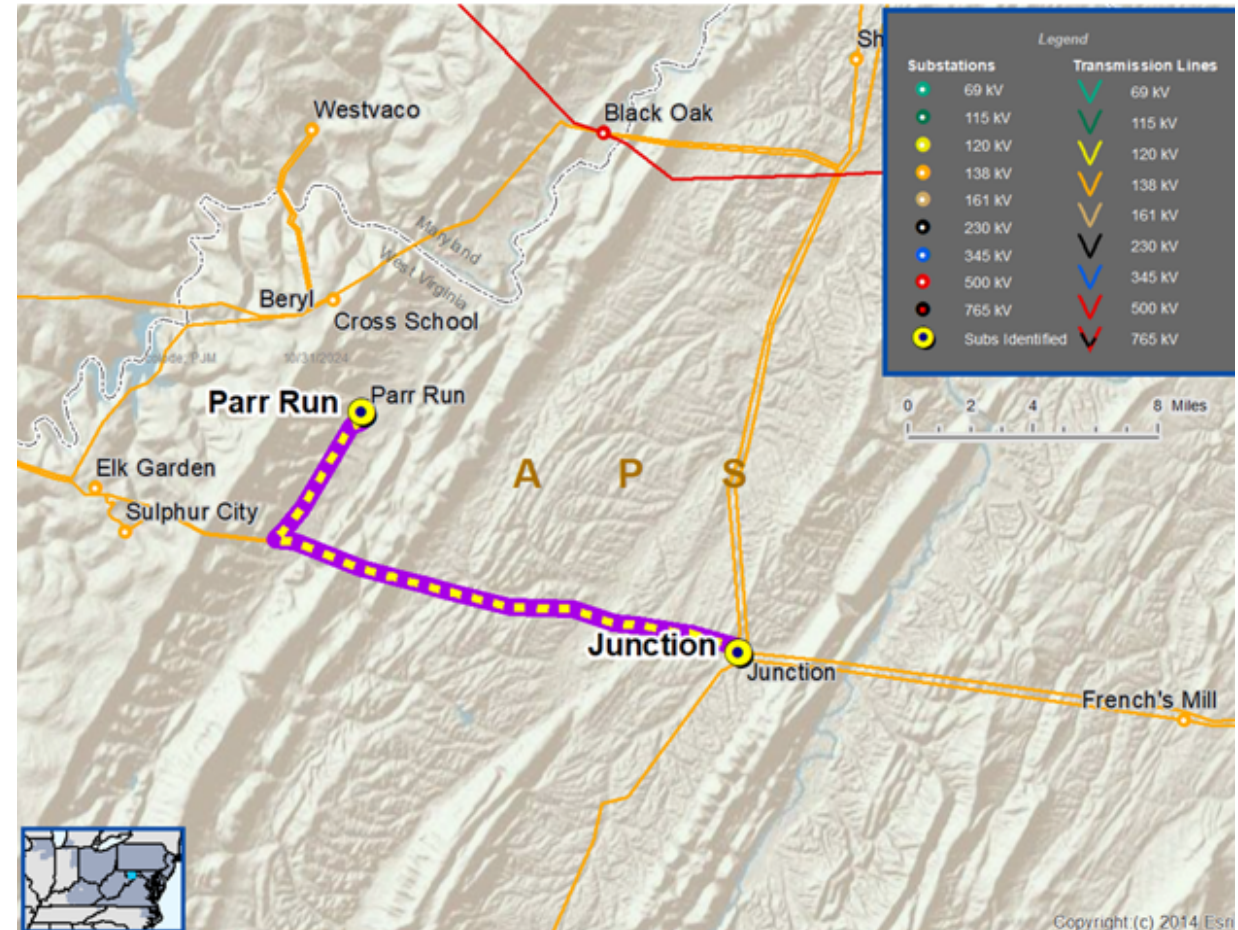
- 136 maintenance conditions were identified due to woodpecker damage, rotten cross arms, cracked and deteriorating wood poles.
- Maintenance required on steel structures with no major defects reported.
- Over the last five years, the line has not experienced any unscheduled, sustained outages.

Existing Transmission Line Ratings:

- 164 / 206 / 216 / 229 MVA (SN/SE/WN/WE)

Existing Transmission Line Conductor Ratings:

- 221 / 268 / 250 / 317 MVA (SN/SE/WN/WE)





APS Transmission Zone M-3 Process Junction – Parr Run 138 kV

Need Number: APS-2024-096
Process Stage: Submission of Supplemental Projects for Inclusion in the Local Plan – 07/14/2026

Proposed Solution:
Rebuild 12.1 miles of the Junction - Parr Run 138 kV Line. Structures 1-18 (~4.9 miles) are double circuited with the Kelso Gap - Parr Run 138 kV Line and this section does not require a rebuild at this time.

- Transmission Line Ratings:
Junction - Parr Run 138 kV Line
- Before Proposed Solution: 164 / 206 / 216 / 229 MVA (SN/SE/WN/WE)
 - After Proposed Solution: 164 / 206 / 216 / 229 MVA (SN/SE/WN/WE)

This line is currently limited by terminal equipment, which will be upgraded per APS-2024-086. Therefore, this project will not affect the ratings of the Junction - Parr Run 138 kV Line.

Alternatives Considered:
Maintain the line in existing condition with elevated risk of failure due to equipment deterioration.

Estimated Project Cost: \$35M
Projected In-Service: 06/16/2028
Supplemental Project ID: s3875.1



Legend	
500 kV	
345 kV	
230 kV	
138 kV	
115 kV	
69 kV	
46 kV	
34.5 kV	
23 kV	
New	

Need Number: APS-2023-014

Process Stage: Submission of Supplemental Projects for Inclusion in the Local Plan – 07/14/2026

Previously Presented: s3127.1 Project Cancellation - 12/12/2025
Need Meeting – 05/19/2023
Solution Meeting – 07/21/2023

Project Driver(s):

Customer Service

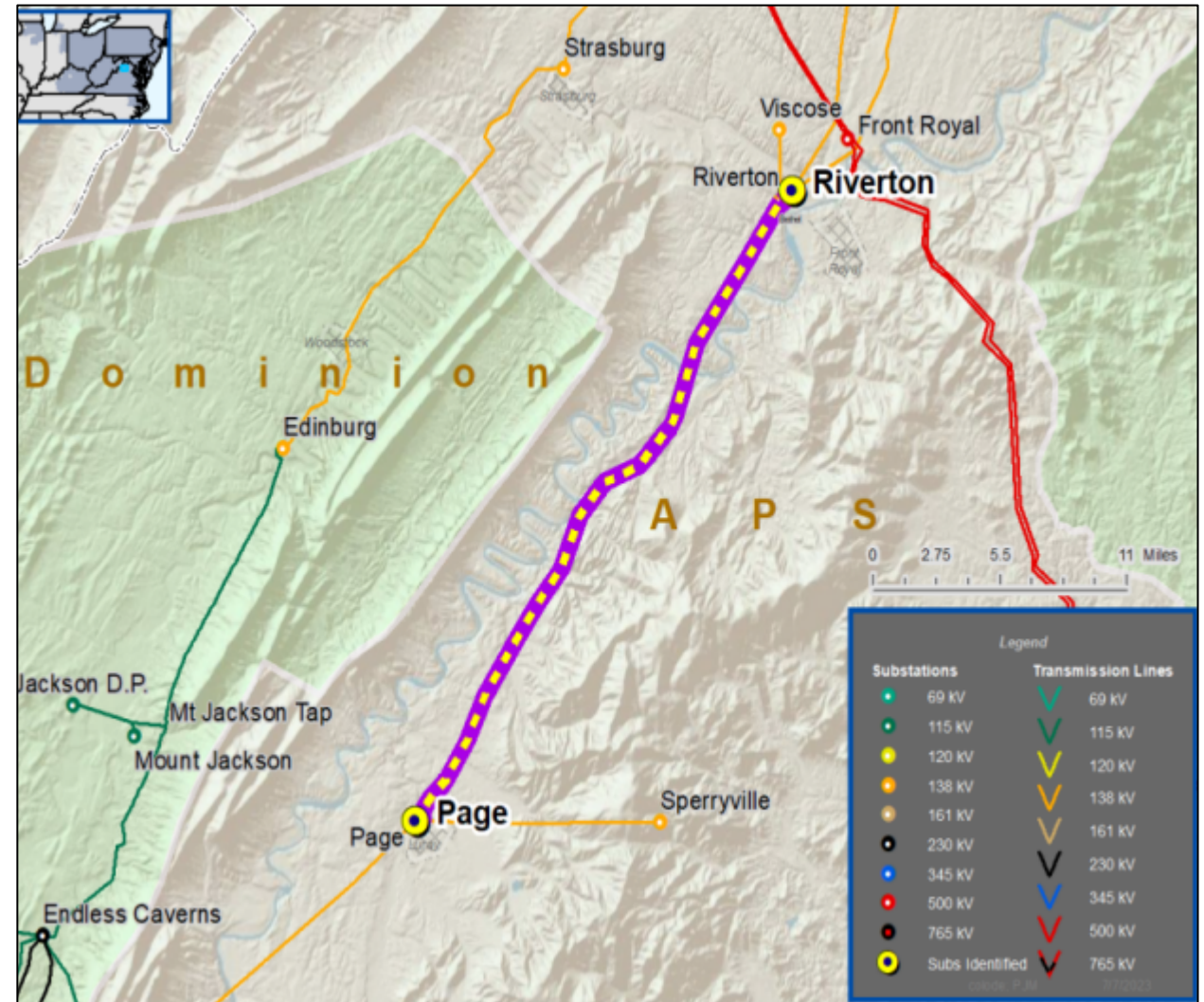
Specific Assumption Reference(s)

New customer connection request will be evaluated per FirstEnergy's "Requirements for Transmission Connected Facilities" document and "Transmission Planning Criteria" document.

Problem Statement

New Customer Connection - has requested a new 138 kV delivery point near the Page-Riverton 138 kV line. The anticipated load of the new customer connection is 35 MVA.

Requested in-service date is 05/30/2025.



Need Number: APS-2023-014

Process Stage: Submission of Supplemental Projects for Inclusion in the Local Plan – 07/14/2026

Justification for Cancellation:

Due to the customer’s decision to cancel the project, the associated transmission connection is no longer required.

Proposed Solution:

138 kV Transmission Line Tap

- Install a new 4-breaker ring bus named Catlett Mountain near 85 Russ Johnson Rd, Front Royal, VA 22630
- Cut the Page – Riverton RLU 138 kV Line near pole RLU-154 and extend 0.3-mile line in and out of the new Catlett Mountain substation
- Protection/terminal end relay settings review required
- Install revenue metering in Customer’s facilities

Line Ratings:

Catlett Mountain – Page 138 kV Line

- After project completion 160 MVA SN/ 192 MVA SE

Catlett Mountain – Riverton 238 kV Line

- After project completion 153 MVA SN/ 153 MVA SE

Alternatives Considered:

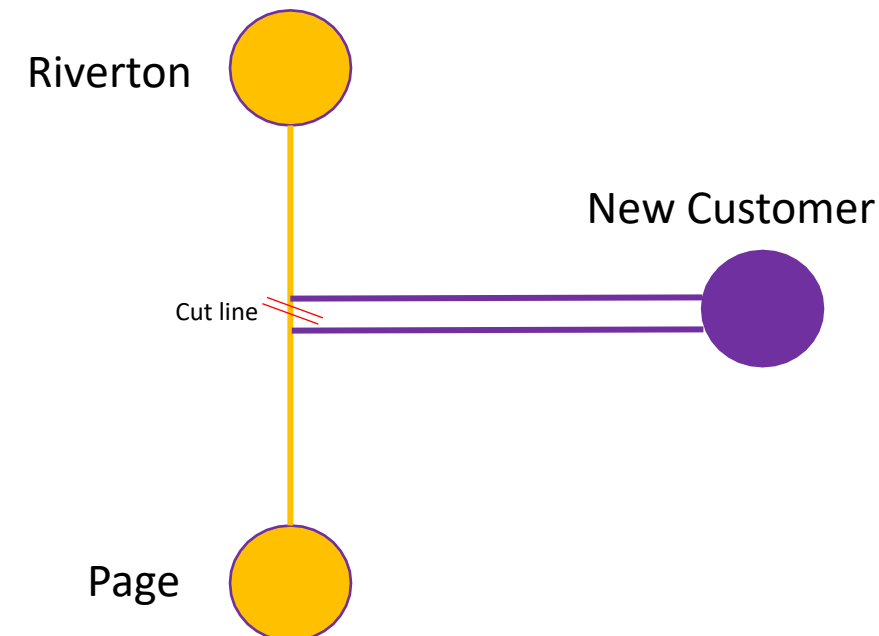
- No other reasonable transmission alternatives

Estimated Project Cost: \$16M

Projected In-Service: 05/30/2025

Supplemental Project ID: s3127.1 (Cancellation)

APS Transmission Zone M-3 Process Page-Riverton 138 kV New Customer



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

Need Number: APS-2025-030

Process Stage: Submission of Supplemental Projects for Inclusion in the Local Plan – 08/05/2026

Previously Presented: Solution Meeting - 01/06/2026
Need Meeting - 12/02/2025

Project Driver:
Operational Flexibility and Efficiency

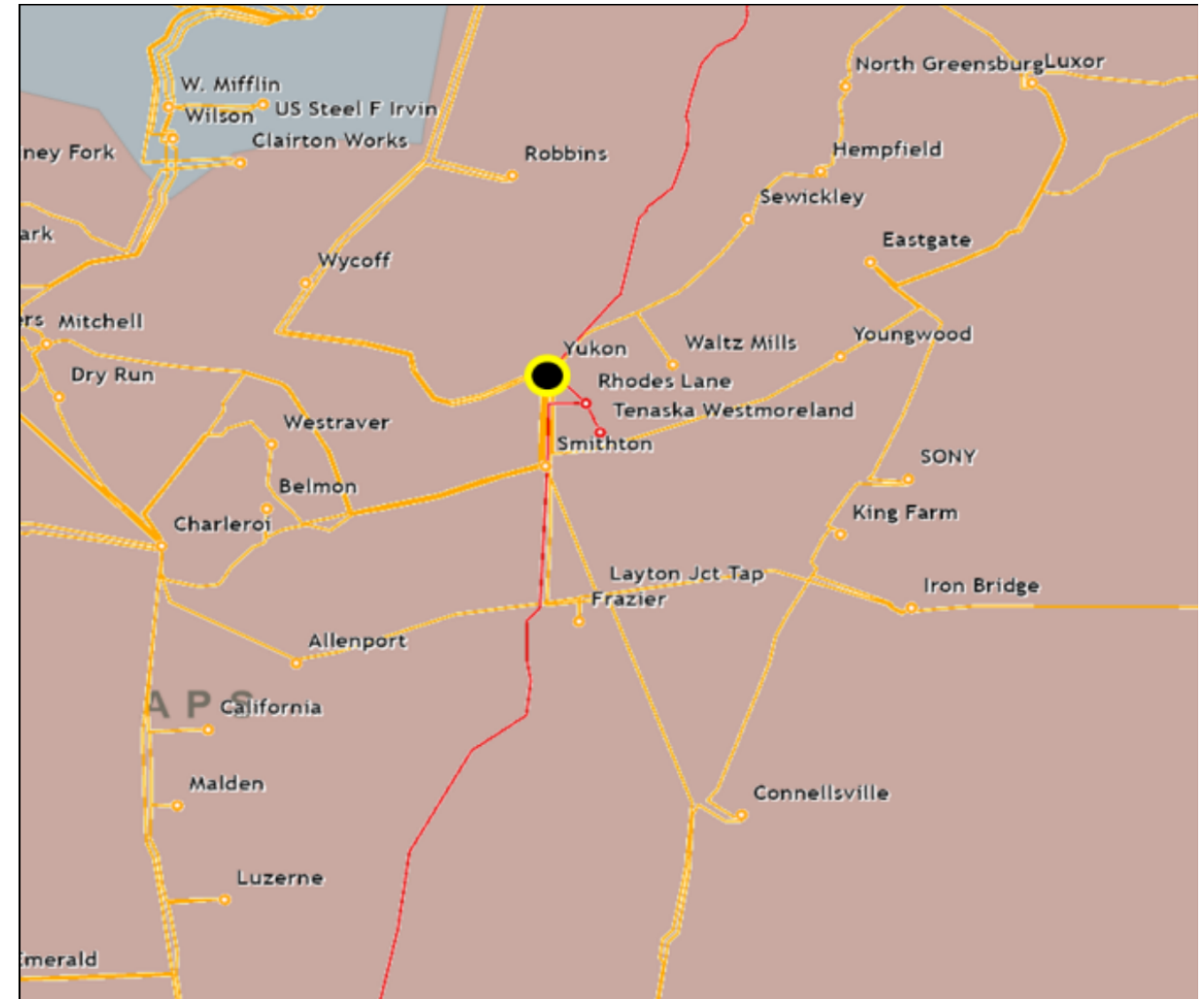
Specific Assumption Reference:
System Performance Projects Global Factors

- Substation/line equipment limits

Problem Statement:
Upon field inspection, limiting substation conductor was found on the Yukon No. 7 500/138 kV Transformer. The substation conductor caused a derate on the transformer circuit.

Existing Ratings:
1096 / 1296 / 1309 / 1375 MVA (SN/SSTE/WN/WSTE)

Existing Transformer Ratings:
1415 / 1476 / 1791 / 1746 MVA (SN/SSTE/WN/WSTE)



Need Number: APS-2025-030

Process Stage: Submission of Supplemental Projects for Inclusion in the Local Plan – 08/05/2026

Proposed Solution:

At Yukon Substation, replace the limiting conductor on the No. 7 500/138 kV Transformer.

Transformer Ratings:

- Before Proposed Solution: 1096 / 1296 / 1309 / 1375 MVA (SN/SSTE/WN/WSTE)
- After Proposed Solution: 1096 / 1365 / 1372 / 1558 MVA (SN/SSTE/WN/WSTE)

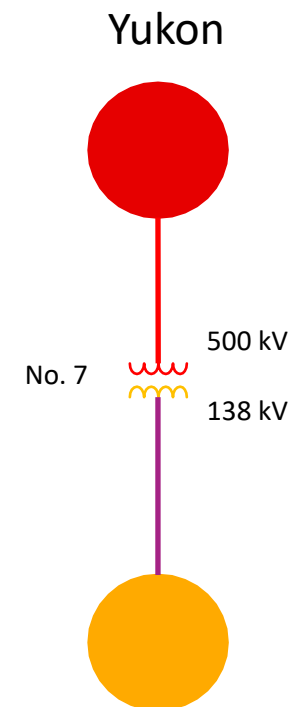
Alternatives Considered:

Maintain equipment in existing condition with limiting equipment rating.

Estimated Project Cost: \$0.41M

Projected In-Service: 12/31/2026

Supplemental Project ID: s3885.1



Legend	
500 kV	
345 kV	
230 kV	
138 kV	
115 kV	
69 kV	
46 kV	
34.5 kV	
23 kV	
New	

Need Number: APS-2025-016

Process Stage: Submission of Supplemental Projects for Inclusion in the Local Plan – 08/05/2026

Previously Presented: Solution Meeting - 01/16/2026
Need Meeting - 05/16/2025

Project Driver:

Equipment Condition/Performance/Risk

Specific Assumption Reference:

System Performance Global Factors

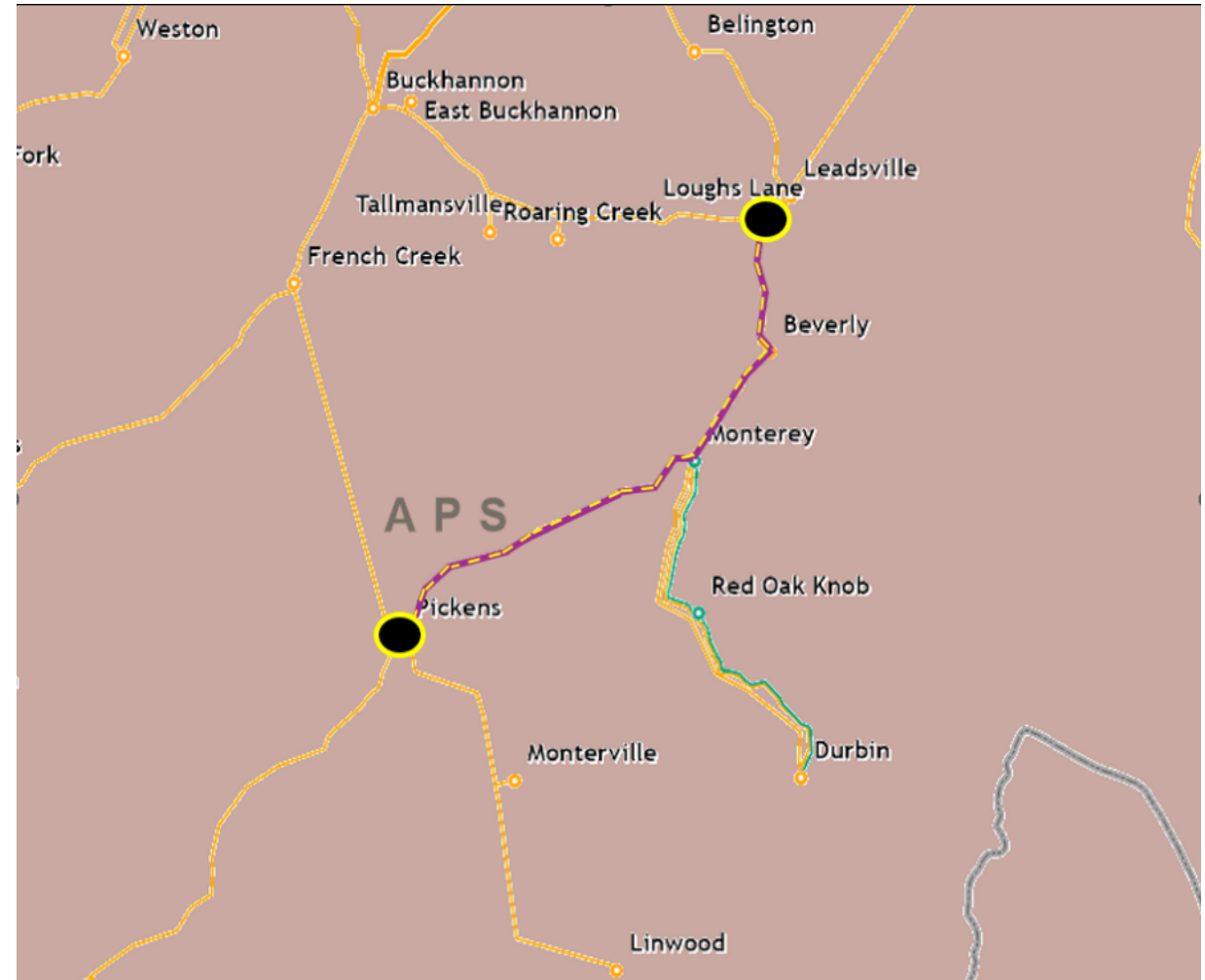
- System reliability/performance
- Substation/Line equipment limits
- Line Condition Rebuild/Replacement

Problem Statement:

- Line Switch 1007 on the Loughs Lane - Pickens 138 kV Line at Durbin Tap is obsolete and underrated.
- The Transmission Line ratings are limited by the switch.

Beverly Tap - Durbin Tap 138 kV Branch

- Existing Line Ratings: 164 / 206 / 216 / 248 MVA (SN/SE/WN/WE)
- Existing Conductor Ratings: 169 / 213 / 217 / 280 MVA (SN/SE/WN/WE)



Need Number: APS-2025-016

Process Stage: Submission of Supplemental Projects for Inclusion in the Local Plan – 08/05/2026

Proposed Solution:

Loughs Lane - Pickens 138 kV Line switch 1007

- Replace the Line Switch 1007 on the Loughs Lane - Pickens 138 kV Line at the Durbin Tap.

Beverly Tap - Durbin Tap 138 kV Line

- Before Proposed Solution: 164 / 206 / 216 / 248 MVA (SN/SE/WN/WE)
- After Proposed Solution: 169 / 213 / 217 / 280 MVA (SN/SE/WN/WE)

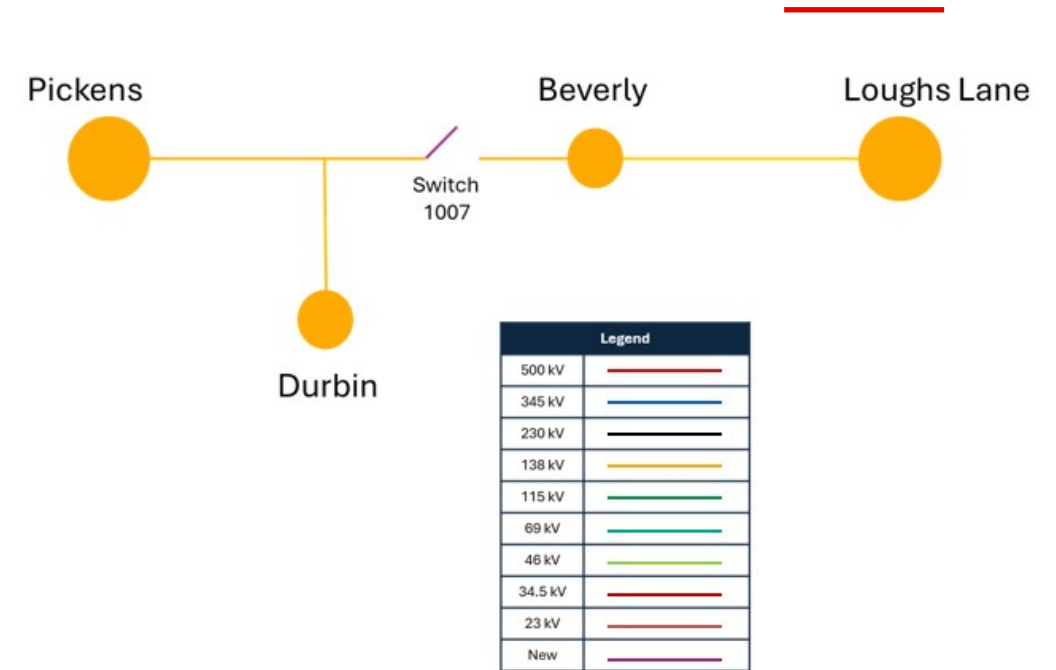
Alternatives Considered:

Maintain equipment in existing condition with elevated risk of switch failure.

Estimated Project Cost: \$1.05M

Projected In-Service: 12/31/2026

Supplemental Project ID: s3886.1



Need Number: APS-2024-074

Process Stage: Submission of Supplemental Projects for Inclusion in the Local Plan – 08/05/2026

Previously Presented: Solution Meeting - 01/16/2026
Need Meeting - 08/16/2024

Project Driver:
Equipment Condition/Performance/Risk

Specific Assumption Reference:

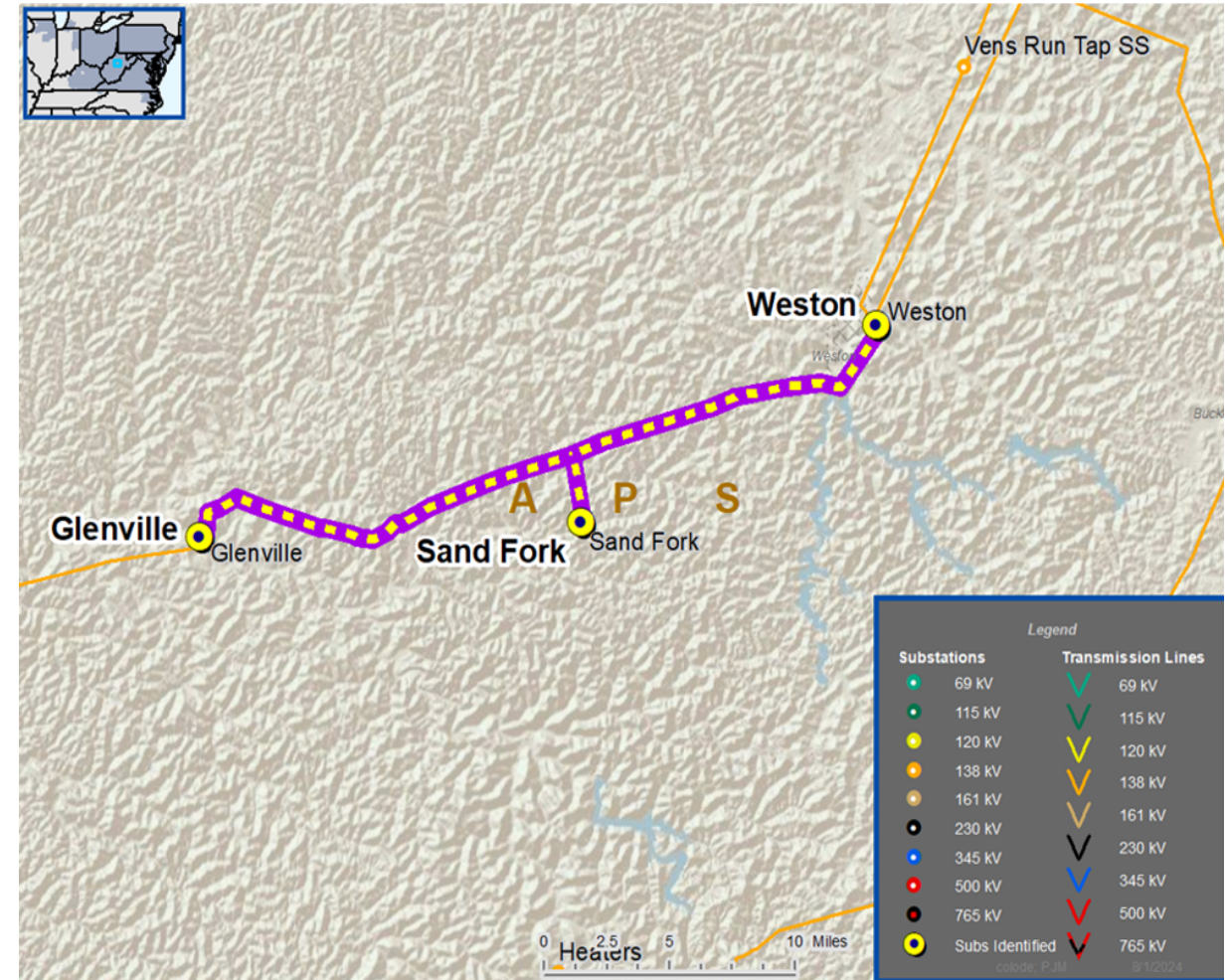
System Performance Global Factors

- System reliability/performance
- Substation/Line equipment limits Line Condition Rebuild/Replacement
- Age/condition of wood transmission line structures

Problem Statement:

- The Weston – Glenville 138 kV Line was constructed approximately 44 years ago. It is approximately 31 miles long with 30 miles of wood pole structures and one mile of steel transmission line structures.
- The line has experienced six unplanned sustained outages over the last five years. Four outages related to failure of polymer insulators on the line.
- Per recent inspections, 124 of 130 wood pole structures utilize the polymer insulators related to recent failures.

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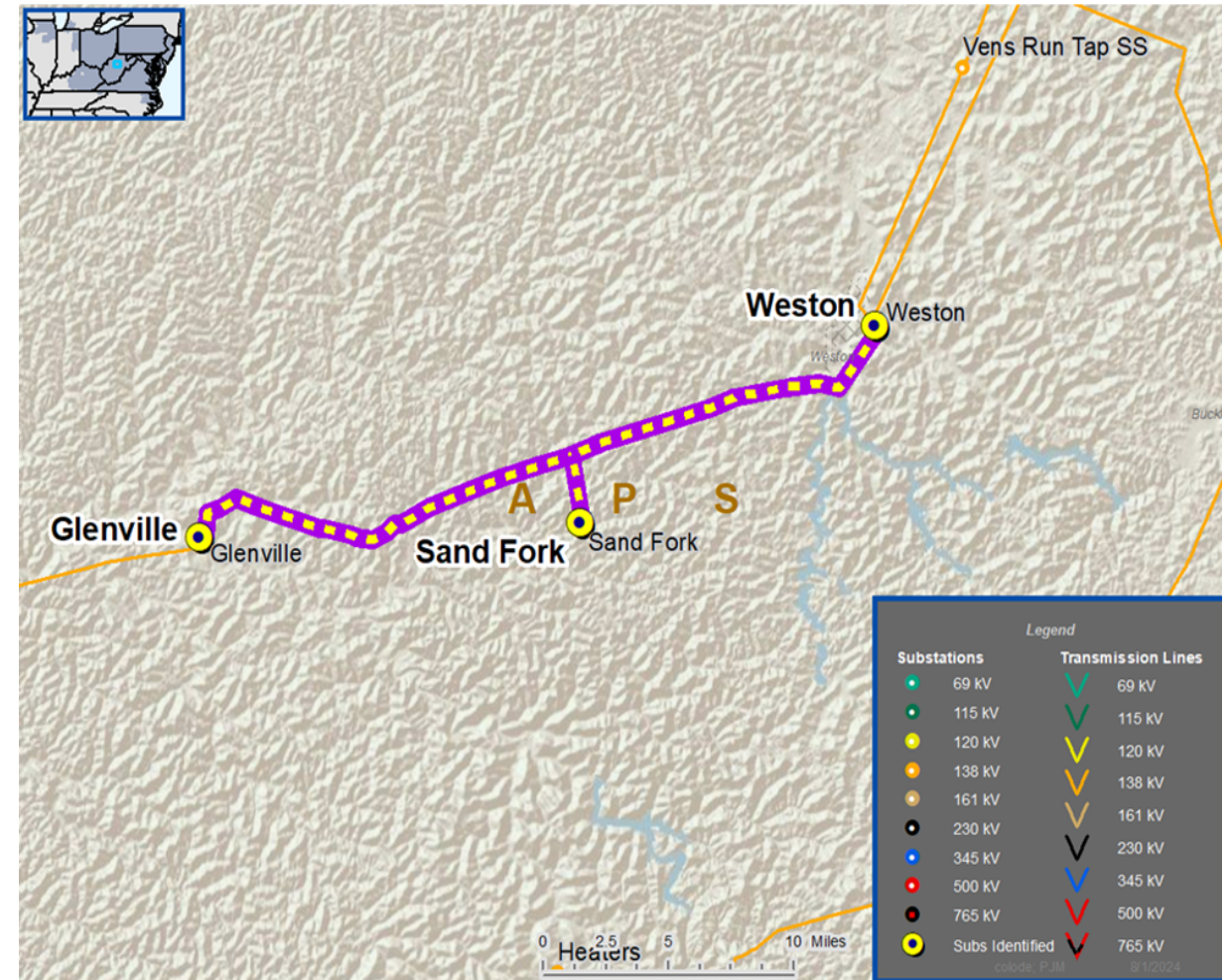
Need Number: APS-2024-074

Process Stage: Submission of Supplemental Projects for Inclusion in the Local Plan – 08/05/2026

Problem Statement:

Transmission Line / Substation Locations

- Glenville – Sand Fork Tap 138 kV Line
 - Existing Line Rating: 195 / 209 / 217 / 229 MVA (SN/SE/WN/WE)
 - Existing Conductor Rating: 221 / 268 / 250 / 317 MVA (SN/SE/WN/WE)
- Sand Fork Tap – Weston 138 kV Line
 - Existing Line Rating: 221 / 268 / 250 / 317 MVA (SN/SE/WN/WE)
 - Existing Conductor Rating: 221 / 268 / 250 / 317 MVA (SN/SE/WN/WE)



Need Number: APS-2024-074

Process Stage: Submission of Supplemental Projects for Inclusion in the Local Plan – 08/05/2026

Proposed Solution:

- Rebuild approximately 30.2 miles of Glenville - Weston 138 kV Line using steel structures and install new conductor.
- Replace one double circuit steel lattice structure #94-A with steel monopole structure.

At Glenville Substation:

- Replace line trap, substation conductor, and revise relay settings.

At Weston Substation:

- Replace substation conductor and revise relay settings.

Glenville - Sand Fork Tap 138 kV Line Ratings:

- Before Proposed Solution: 195 / 209 / 217 / 229 MVA (SN/SE/WN/WE)
- After Proposed Solution: 278 / 339 / 315 / 401 MVA (SN/SE/WN/WE)

Sand Fork Tap - Weston 138 kV Line Ratings:

- Before Proposed Solution: 221 / 268 / 250 / 317 MVA (SN/SE/WN/WE)
- After Proposed Solution: 278 / 339 / 315 / 401 MVA (SN/SE/WN/WE)

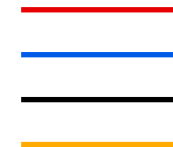
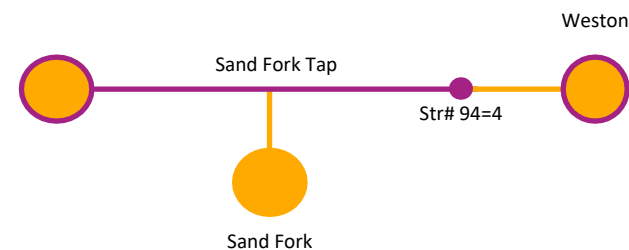
Alternatives Considered:

Maintain the line in existing condition with elevated risk of failure due polymer insulators.

Estimated Project Cost: \$89.52M

Projected In-Service: 12/15/2030

Supplemental Project ID: s3887.1



Legend	
500 kV	
345 kV	
230 kV	
138 kV	
115 kV	
69 kV	
46 kV	
34.5 kV	
23 kV	
New	

Need Number: APS-2025-026
Process Stage: Submission of Supplemental Projects for Inclusion in the Local Plan – 08/05/2026
Previously Presented: Need Meeting 09/19/2025

Reason for cancellation: Upgrades changing the ratings for Bethel Park - St. Clair are already included in APS-2024-098 (s3707.1).

Supplemental Project Driver(s):
Equipment Material Condition, Performance and Risk

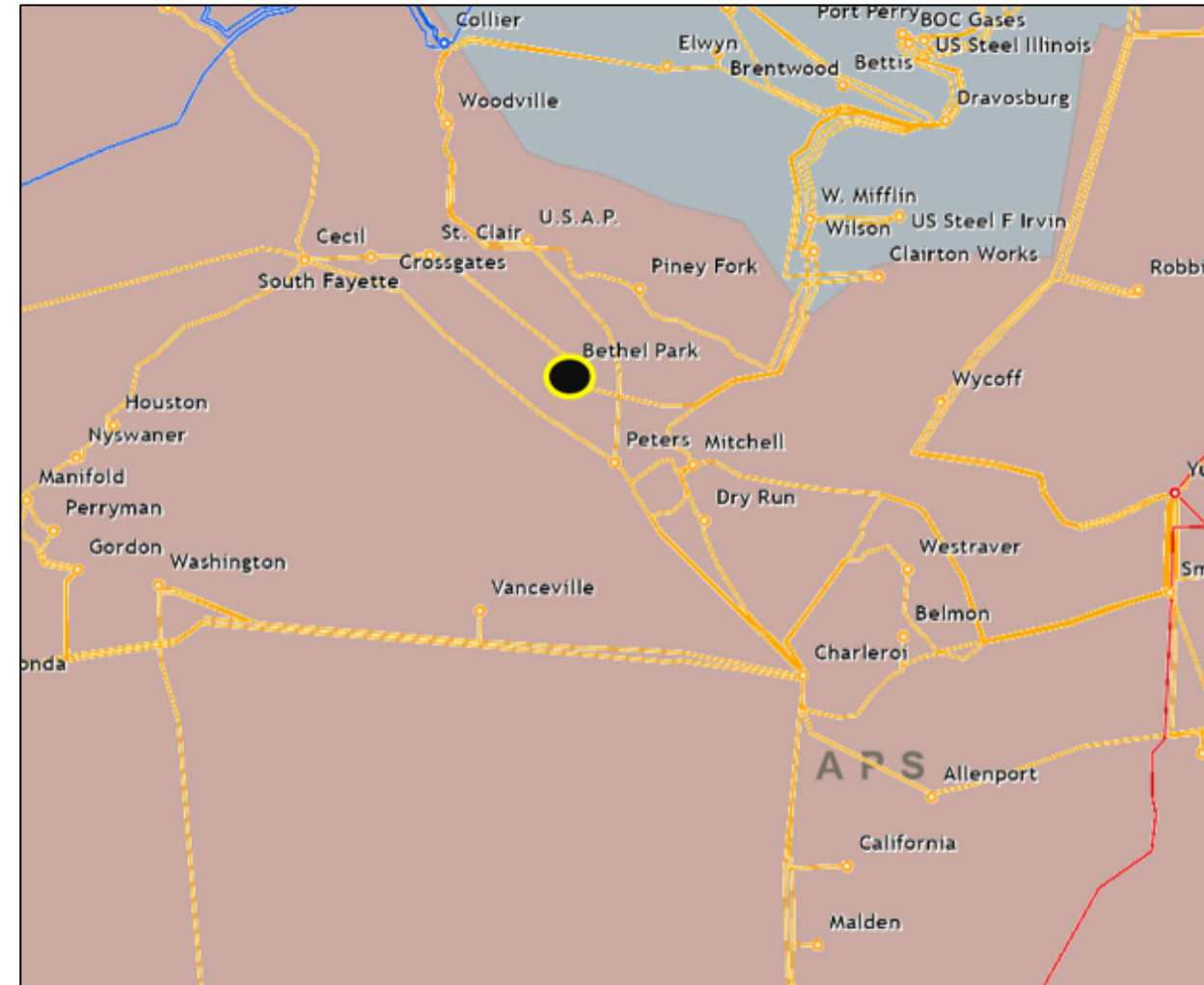
Specific Assumption Reference(s)

- Substation Condition Rebuild/Replacement
 - Age/condition of substation equipment
 - Circuit breakers and other fault interrupting devices
- System Performance Projects Global Factors
 - System reliability and performance
 - Substation/line equipment limits

Problem Statement:

- At Bethel Park Substation, the 138 kV breaker on the St. Clair line terminal was manufactured in 1956 and is approaching end of life. It continues to have hydraulic system problems due to air penetrating the pumps causing the motors to run excessively
- Transmission line ratings are limited by terminal equipment.
 - Existing line ratings: 292 / 306 / 306 / 306 MVA (SN/SE/WN/WE)
 - Existing conductor ratings: 308 / 376 / 349 / 445 MVA (SN/SE/WN/WE)

Supplemental Project ID: N/A



APS Transmission Zone M-3 Process Carroll - Mount Airy 230 kV line

Need Number: APS-2023-058
Process Stage: Submission of Supplemental Projects for Inclusion in the Local Plan – 9/22/2026
Previously Presented: Represent solution Meeting 4/7/2026
 Solutions Meeting 11/04/2025
 Need Meeting 10/31/2023

APS-2023-058: Originally presented as a need on 10/31/2023 and solution on 11/04/2025 TEAC meetings.

Reason for Scope Change:

- The solution was revised as the After Proposed Solution ratings were changed.

Original Solution Presented on 11/04/2025:

- Remove and replace 93 wood structures with steel structures on concrete foundation and install 12.72 miles of new conductor
- Adjust relaying at Carroll and Mt. Airy substations

Original Alternatives Considered:

Maintain equipment in existing condition with elevated risk of misoperations.

Original Transmission Line Ratings:

Carroll – Mount Airy 230 kV Line Ratings:

- Before Proposed Solution: 251 / 343 / 302 / 370 MVA (SN/SE/WN/WE)
- After Proposed Solution: 617 / 754 / 699 / 894 MVA (SN/SE/WN/WE)

Revised Transmission Line Ratings:

- Before Proposed Solution: 251 / 343 / 302 / 370 MVA (SN/SE/WN/WE)
- After Proposed Solution: 709 / 869 / 805 / 1031 MVA (SN / SE / WN / WE)

Estimated Project Cost: \$50M
Projected In-Service: 06/30/2029
Supplemental Project ID s3871.1



Legend	
500 kV	
345 kV	
230 kV	
138 kV	
115 kV	
69 kV	
46 kV	
34.5 kV	
23 kV	
New	

Need Number: APS-2024-085

Process Stage: Submission of Supplemental Projects for Inclusion in the Local Plan – 9/22/2026

Previously Presented: Solution Meeting SRRTEP-W – 04/15/2026
Need Meeting SRRTEP-W – 10/18/2024

Project Driver:
Equipment Condition/Performance/Risk

Specific Assumption References:

System Performance Projects Global Factors

- System reliability and performance
- Substation/line equipment limits System Condition Projects
- Substation Condition Rebuild/Replacement Upgrade Relay Schemes
- Obsolete and difficult to repair communication equipment (DTT, Blocking, etc.)
- Communication technology upgrades

Problem Statement:

FirstEnergy has identified protection schemes using a certain vintage of relays and communication equipment that have a history of misoperation.

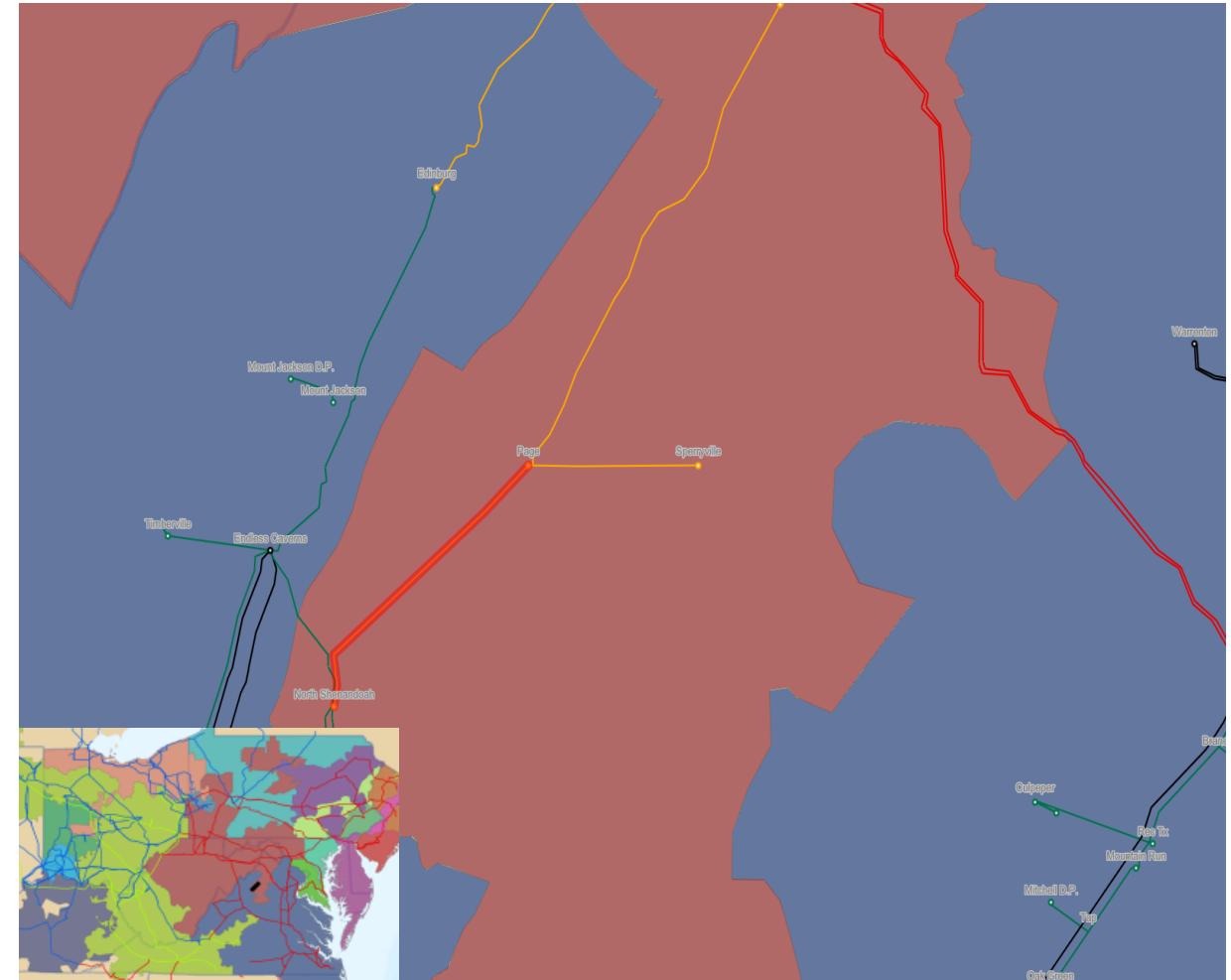
Proper operation of the protection scheme requires all the separate components perform adequately during a fault.

In many cases the protection equipment cannot be repaired due to a lack of replacement parts and available expertise in the outdated technology.

Transmission line ratings are limited by terminal equipment.

North Shenandoah – Page 138 kV Line

- Existing Line Rating MVA (SN / SE / WN / WE): 292 / 306 / 306 / 306
- Existing Conductor Rating MVA (SN / SE / WN / WE): 308 / 376 / 349 / 445



Need Number: APS-2024-085
Process Stage: Submission of Supplemental Projects for
 Inclusion in the Local Plan – 9/22/2026

Proposed Solution:

At North Shenandoah Substation, replace 138 kV substation conductor, CVT, circuit breaker and associated disconnect switches and relaying.
 At Page Substation, replace 138 kV wave trap, line turner and coax, CVT and relaying.
 North Shenandoah - Page 138 kV Line

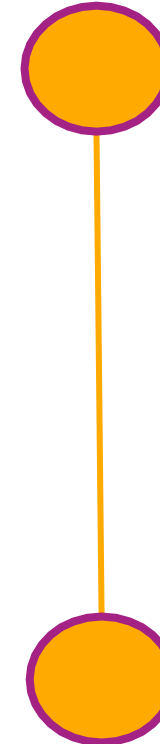
- Before Proposed Solution: 292 / 306 / 306 / 306 MVA (SN/SE/WN/WE)
- After Proposed Solution: 308 / 376 / 349 / 445 MVA (SN/SE/WN/WE)

Alternatives Considered:

Maintain equipment in existing condition with elevated risk of misoperations.

Estimated Project Cost: \$4.06M
Projected In-Service: 06/01/2029
Supplemental Project ID: s3937.1

North Shenandoah



Page

Legend	
500 kV	
345 kV	
230 kV	
138 kV	
115 kV	
69 kV	
46 kV	
34.5 kV	
23 kV	
New	

Need Number: APS-2023-032

Process Stage: Submission of Supplemental Projects for Inclusion in the Local Plan – 9/22/2026

Previously Presented: Solution Meeting SRRTEP-W - 05/15/2026
Need Meeting 10/20/2023

Project Driver: Equipment Condition/Performance/Risk

Specific Assumption Reference:

Line Condition Rebuild/Replacement

- Age/condition of wood pole transmission line structures

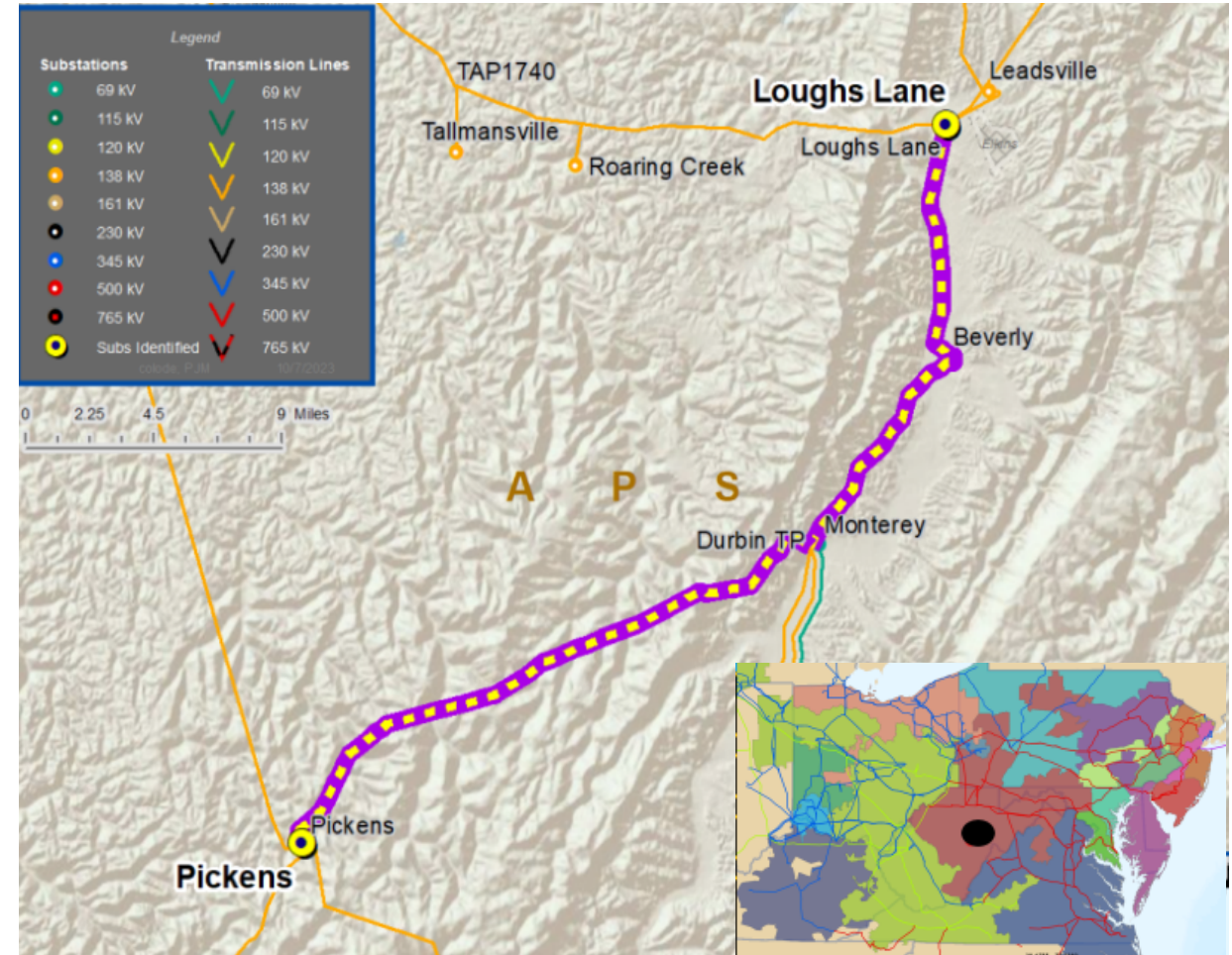
System Performance Projects Global Factors

- Substation/line equipment limits

Problem Statement:

Loughs Lane – Pickens 138 kV Line wood pole structures are nearing end of life. The line has exhibited increase trend in maintenance conditions.

- Total line distance is approximately 47.2 miles.
- 296 of 380 structures failed inspection (78% failure rate).





APS Transmission Zone M-3 Process Loughs Lane – Pickens 138 kV Line

Need Number: APS-2023-032
Process Stage: Submission of Supplemental Projects for Inclusion in the Local Plan – 9/22/2026

Proposed Solution:
Rebuild approximately 47.2 miles of the Loughs Lane - Pickens 138 kV Line and install OPGW.

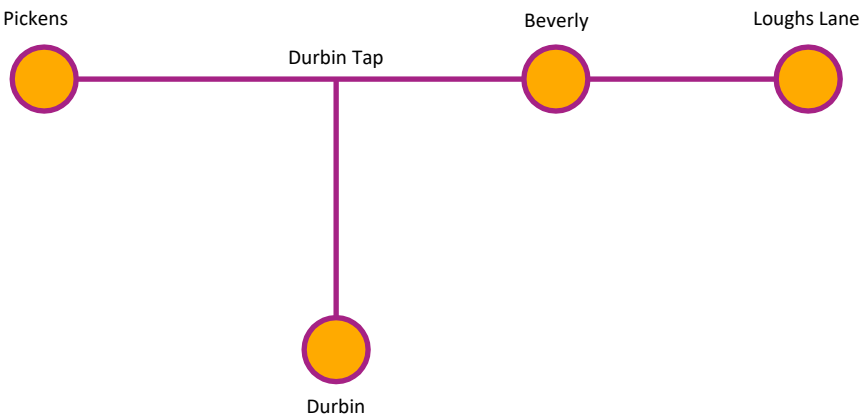
- At the Durbin Tap: Replace transmission line disconnect switches.
- At Loughs Lane Substation: Remove wave trap, replace disconnect switch, substation conductor, and relaying.
- At Durbin Substation: Remove wave trap, replace substation conductor, CVT's, and upgrade relaying.
- At Beverly Substation: Remove wave trap, replace disconnect switches, CVT's substation conductor, and relaying.
- At Pickens Substation: Remove wave trap, replace substation conductor, and relaying.

Pickens - Durbin Tap 138 kV Line Ratings:
Before Proposed Solution: 169 / 213 / 217 / 280 MVA (SN/SE/WN/WE)
After Proposed Solution: 278 / 339 / 315 / 401 MVA (SN/SE/WN/WE)

Durbin - Durbin Tap 138 kV Line Ratings:
Before Proposed Solution: 94 / 105 / 105 / 114 MVA (SN/SE/WN/WE)
After Proposed Solution: 278 / 339 / 315 / 401 MVA (SN/SE/WN/WE)

Beverly Tap - Durbin Tap 138 kV Line Ratings:
Before Proposed Solution: 164 / 206 / 216 / 248 MVA (SN/SE/WN/WE)
After Proposed Solution: 278 / 339 / 315 / 401 MVA (SN/SE/WN/WE)

Beverly Tap - Loughs Lane 138 kV Line Ratings:
Before Proposed Solution: 169 / 213 / 217 / 280 MVA (SN/SE/WN/WE)
After Proposed Solution: 278 / 339 / 315 / 401 MVA (SN/SE/WN/WE)



Legend	
500 kV	
345 kV	
230 kV	
138 kV	
115 kV	
69 kV	
46 kV	
34.5 kV	
23 kV	
New	



APS Transmission Zone M-3 Process Loughs Lane – Pickens 138 kV Line

Need Number: APS-2023-032

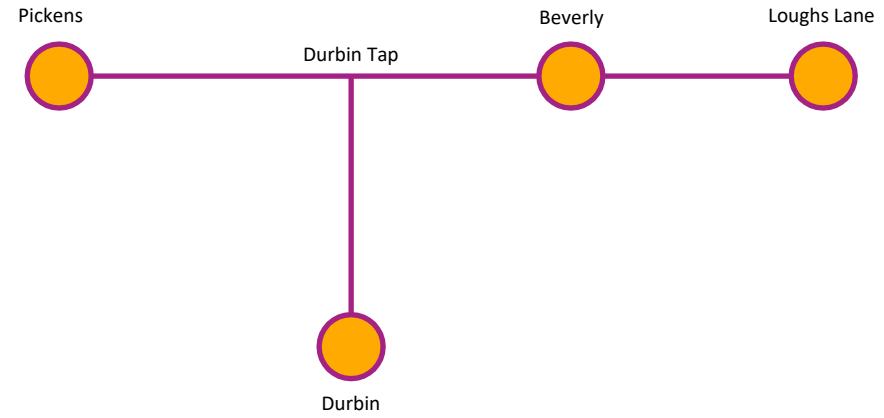
Process Stage: Submission of Supplemental Projects for Inclusion in the Local Plan – 9/22/2026

Alternatives Considered:
Maintain the line in existing condition with elevated risk of failure due to equipment deterioration.

Estimated Project Cost: \$182.84M

Projected In-Service: 11/04/2032

Supplemental Project ID: s3938.1



Legend	
500 kV	
345 kV	
230 kV	
138 kV	
115 kV	
69 kV	
46 kV	
34.5 kV	
23 kV	
New	

Need Number: APS-2024-055

Process Stage: Submission of Supplemental Projects for Inclusion in the Local Plan – 9/22/2026

Previously Presented: Solution Meeting SRRTEP-W - 05/15/2026
Need Meeting 05/17/2024

Project Driver: Equipment Condition/Performance/Risk

Specific Assumption Reference:

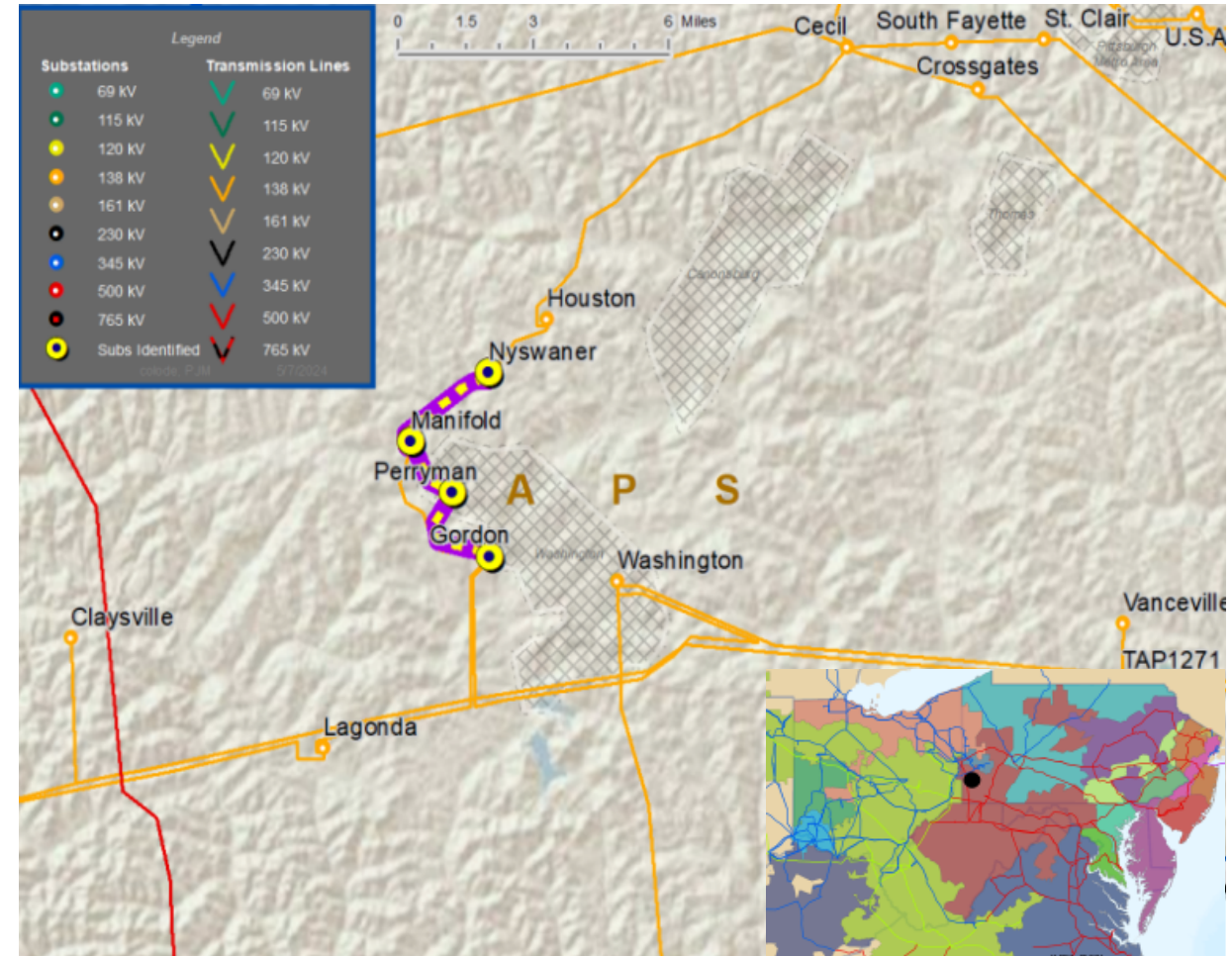
System Performance Global Factors

- System reliability/performance
- Substation/Line equipment limits Line Condition Rebuild/Replacement
- Age/condition of wood transmission line structures

Problem Statement:

The Gordon – Nyswaner 138kV Line was constructed approximately 60 years ago and is approaching end of life. It is approximately 22 miles long with 53 wood and 53 steel transmission line structures.

- Per recent inspections, the line is exhibiting deterioration. Inspection findings include:
 - 34 structure have required repairs due to deterioration since 2019.
 - 38 structures failed inspection due to sound, woodpecker damage, top rot, decay, cracking, and/or delamination of cross-arms requiring replacement.



Need #	Transmission Line / Substation Locations	Existing Line Rating (MVA SN / SE / WN / WE)	Existing Conductor Rating (MVA SN / SE / WN / WE)
APS-2024-055	Gordon – Perryman 138 kV Line	169 / 213 / 217 / 280	169 / 213 / 217 / 280
	Perryman – Manifold 138 kV Line	169 / 213 / 217 / 280	169 / 213 / 217 / 280
	Manifold – Nyswaner 138 kV Line	300 / 358 / 349 / 410	308 / 376 / 349 / 445



APS Transmission Zone M-3 Process Gordon – Nyswaner 138kV Line

Need Number: APS-2024-055
Process Stage: Submission of Supplemental Projects for Inclusion in the Local Plan – 9/22/2026

Proposed Solution:
Rebuild the 7.6 miles of the wood section of Gordon - Nyswaner 138 kV Line from Nyswaner Substation south to Gordon Substation. This includes structures 1-48 and excludes the eastern steel pole section of the line. Upgrade terminal equipment and relaying at remote end substations.

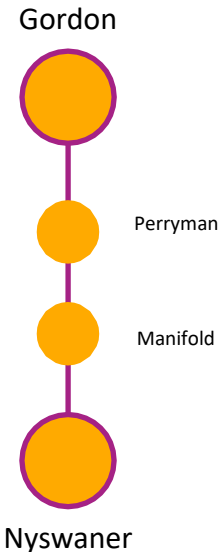
Gordon - Perryman 138 kV section ratings:
Before Proposed Solution: 169 / 213 / 217 / 280 MVA (SN/SE/WN/WE)
After Proposed Solution: 211 / 268 / 250 / 317 MVA (SN/SE/WN/WE)

Perryman - Manifold 138 kV section ratings:
Before Proposed Solution: 169 / 213 / 217 / 280 MVA (SN/SE/WN/WE)
After Proposed Solution: 221 / 268 / 250 / 317 MVA (SN/SE/WN/WE)

Manifold - Nyswaner 138 kV section ratings:
Before Proposed Solution: 300 / 358 / 349 / 410 MVA (SN/SE/WN/WE)
After Proposed Solution: 308 / 376 / 349 / 445 MVA (SN/SE/WN/WE)

Alternatives Considered:
Maintain the line in existing condition with elevated risk of failure due to equipment deterioration.

Estimated Project Cost: \$30.12M
Projected In-Service: 12/29/2028
Supplemental Project ID: s3939.1



Legend	
500 kV	
345 kV	
230 kV	
138 kV	
115 kV	
69 kV	
46 kV	
34.5 kV	
23 kV	
New	

Need Number: APS-2023-033

Process Stage: Submission of Supplemental Projects for Inclusion in the Local Plan – 9/22/2026

Previously Presented: Solution Meeting SRRTEP-W - 06/17/2026
Need Meeting 10/20/2023

Project Driver: Equipment Condition/Performance/Risk

Specific Assumption Reference:

Line Condition Rebuild/Replacement

- Age/condition of wood pole transmission line structures
- System characteristics including lightning and grounding performance, galloping overlap, insulation coordination, structural capacity needs, clearance margins, and future needs (e.g., fiber path)

System Performance Projects Global Factors

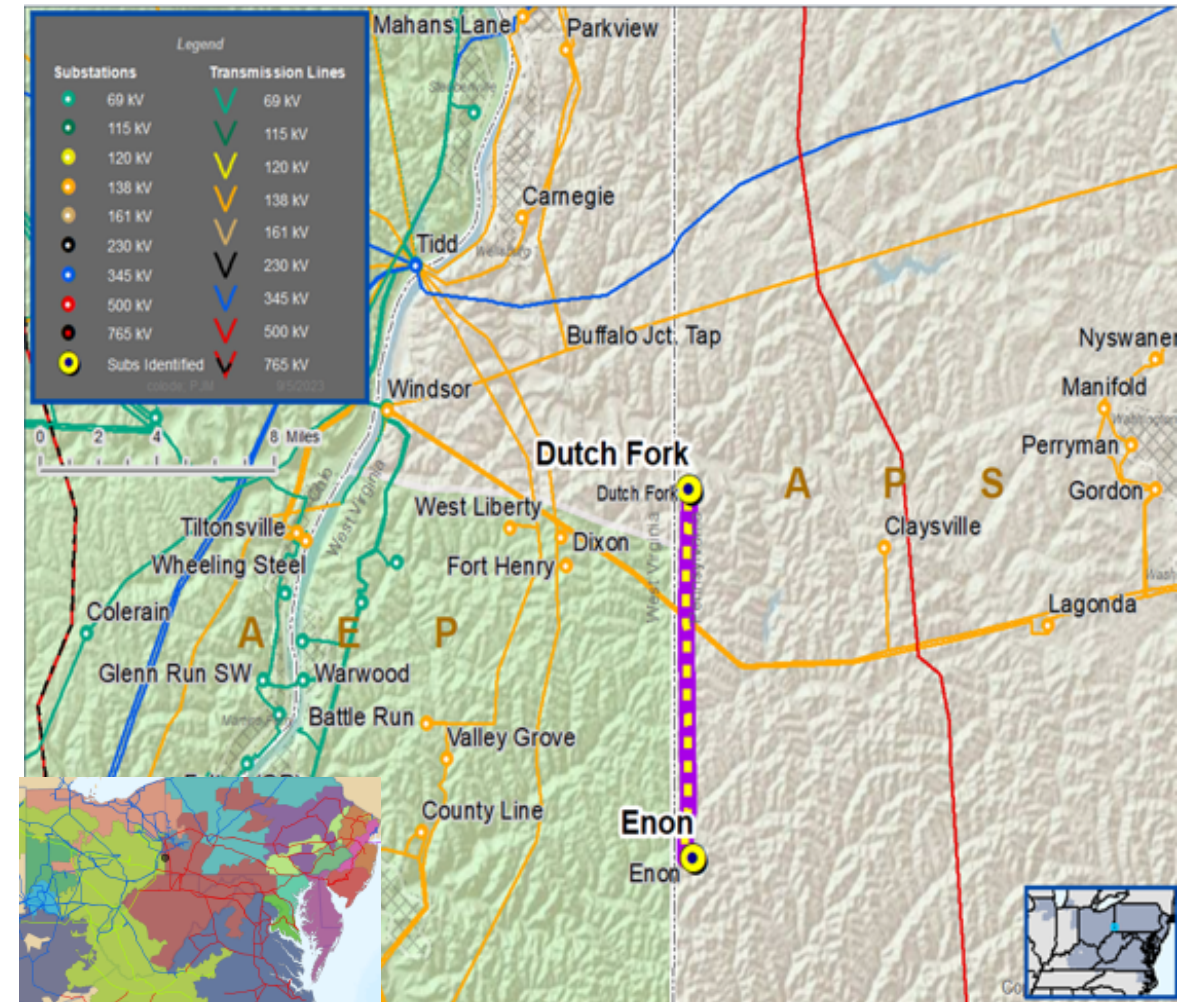
- Substation/line equipment limits

Problem Statement:

Enon Substation is fed radially from Dutch Fork. With an N-1 outage of the Dutch Fork – Enon 138 kV Line, 93 MW is lost at Enon. The Dutch Fork – Enon 138 kV Line is exhibiting deterioration.

Total line distance is approximately 12.5 miles.

39 of 79 structures failed inspection.



Need Number: APS-2023-033

Process Stage: Submission of Supplemental Projects for Inclusion in the Local Plan – 9/22/2026

Proposed Solution:

Rebuild 12.5 miles of the Dutch Fork - Enon 138 kV Line with Light Duty (LD) steel horizontal structures and install OPGW.

At Dutch Fork Substation: Remove wave trap, replace circuit breaker, disconnect switches, substation conductor and relaying.

At Enon Substation: Remove wave trap.

Dutch Fork - Enon 138 kV Line Ratings:

Existing Line Ratings: 229 / 229 / 229 / 229 MVA (SN/SE/WN/WE)

New Line Ratings: 308 / 376 / 349 / 445 MVA (SN/SE/WN/WE)

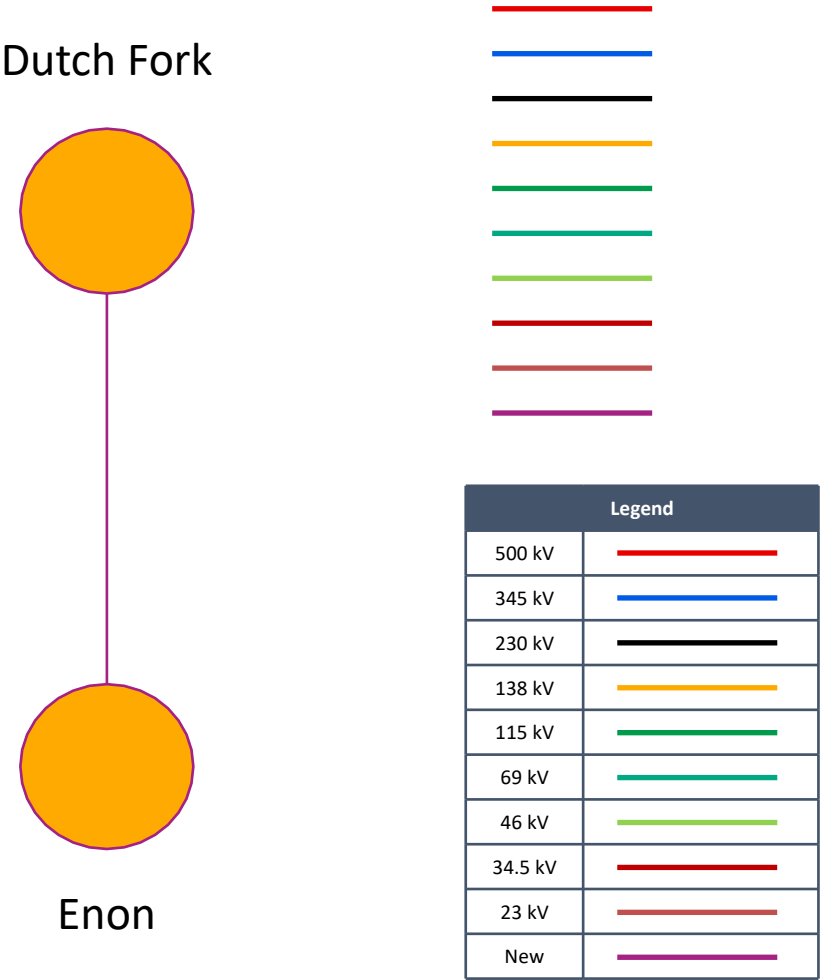
Alternatives Considered:

Maintain the line in existing condition.

Estimated Project Cost: \$41.70M

Projected In-Service: 12/08/2029

Supplemental Project ID: s3930.1



Need Number: APS-2024-101

Process Stage: Submission of Supplemental Projects for Inclusion in the Local Plan – 9/22/2026

Previously Presented: Cancellation meeting 06/17/2026
Need Meeting 12/23/2024

Project Driver: Equipment Material Condition, Performance and Risk

Specific Assumption Reference:

System Performance Projects Global Factors

- System reliability and performance
- Substation/line equipment limits

System Condition Projects

- Substation Condition Rebuild/Replacement

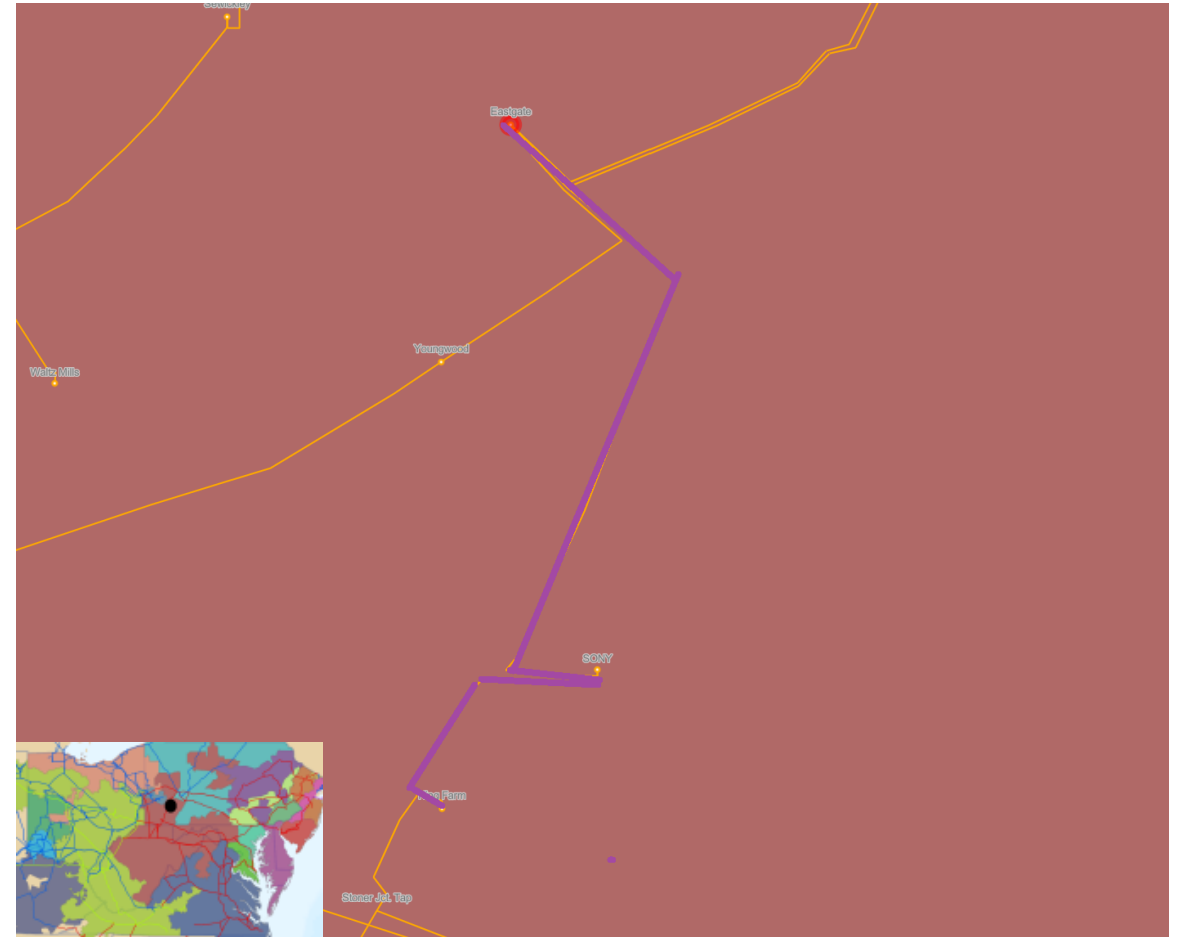
Upgrade Relay Schemes

- Obsolete and difficult to repair communication equipment (DTT, Blocking, etc.)
- Communication technology upgrades

Problem Statement:

FirstEnergy has identified protection schemes using a certain vintage of relays and communication equipment that have a history of misoperation. Proper operation of the protection scheme requires all the separate components perform adequately during a fault.

In many cases the protection equipment cannot be repaired due to a lack of replacement parts and available expertise in the outdated technology. Transmission line ratings are limited by terminal equipment.



Need #	Transmission Line / Substation Locations	Existing Line Rating MVA (SN / SE / WN / WE)	Existing Conductor Rating MVA (SN / SE / WN / WE)
APS-2024-101	King Farm – Sony 138 kV Line	160 / 192 / 180 / 228	160 / 192 / 180 / 228
	Sony – Eastgate Tap 138 kV Line	149 / 152 / 168 / 168	149 / 152 / 168 / 168
	Eastgate Tap – Luxor 138 kV Line	142 / 147 / 162 / 162	149 / 152 / 168 / 168
	Eastgate Tap – Eastgate 138 kV Line	164 / 206 / 216 / 248	221 / 268 / 250 / 317

Reason for Cancellation: Attachment M-3 no longer required.

APS Transmission Zone M-3 Process Rhodes Lane - Yukon 500 kV Line

Need Number: APS-2025-029

Process Stage: Submission of Supplemental Projects for Inclusion in the Local Plan – 9/22/2026

Previously Presented: Solution Meeting TEAC - 07/07/2026
Need Meeting 11/04/2025

Project Driver: Operational Flexibility and Efficiency

Specific Assumption References:

System Performance Projects Global Factors

- Substation/line equipment limits
- System reliability and performance

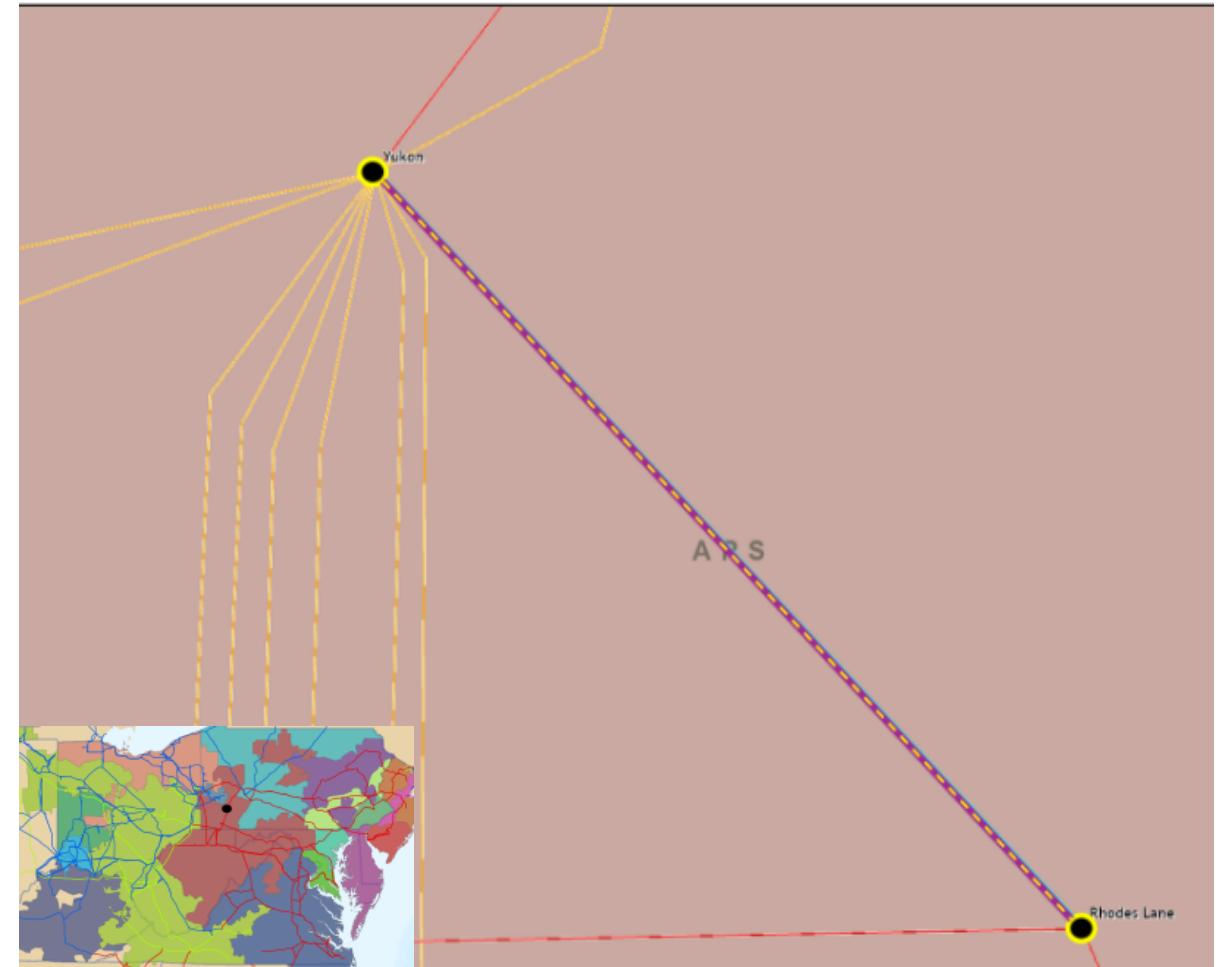
Problem Statement:

FirstEnergy has identified operational constraints when a single breaker is out of service for maintenance on the Rhodes Lane - Yukon 500 kV Line.

The Rhodes Lane - Yukon 500 kV Line is limited by terminal equipment:

Normal Ratings: 3526 / 3792 / 3928 / 4140 MVA (SN/SE/WN/WE)

Single Breaker Outage: 2707 / 3260 / 3391 / 3818 MVA (SN/SE/WN/WE)



APS Transmission Zone M-3 Process Rhodes Lane - Yukon 500 kV Line

Need Number: APS-2025-029
Process Stage: Solution Meeting TEAC - 07/07/2026

Proposed Solution:

At Yukon Substation: Replace 500 kV breakers, disconnect switches, substation conductors, and wave trap.

At Rhodes Lane Substation: Replace 500 kV breakers, disconnect switches, substation conductors, and wave trap.

Rhodes Lane - Yukon 500 kV Line Ratings:

Before Proposed Solution: 3526 / 3792 / 3928 / 4140 MVA (SN/SE/WN/WE)

After Proposed Solution: 3573 / 4378 / 4050 / 5175 MVA (SN/SE/WN/WE)

Alternatives Considered:

Maintain existing condition with operational constraints when a single breaker is out of service for maintenance.

Estimated Project Cost: \$5.45M
Projected In-Service: 05/12/2028
Supplemental Project ID: s3931.1

Yukon



Rhodes Lane

Legend	
500 kV	
345 kV	
230 kV	
138 kV	
115 kV	
69 kV	
46 kV	
34.5 kV	
23 kV	
New	

APS Transmission Zone M-3 Process Shingletown Substation

Need Number: APS-2023-059, PN-2023-022

Process Stage: Submission of Supplemental Projects for Inclusion in the Local Plan – 9/22/2026

Previously Presented: Solution Meeting TEAC - 07/07/2026
Need Meeting 10/31/2023

Project Driver: Operational Flexibility and Efficiency

Specific Assumption References:

Global Factors

- System reliability and performance
- Substation and line equipment limits
- Add/Expand Bus Configuration

Problem Statement:

- The existing 230 kV yard at Shingletown is configured as a straight bus. Shingletown serves approximately 82.7 MW of load and 1,152 customers. With a stuck breaker contingency, the entire Shingletown substation will be outaged.

- Transmission line ratings are limited by terminal equipment:

Dale Summit – Shingletown 230 kV Line

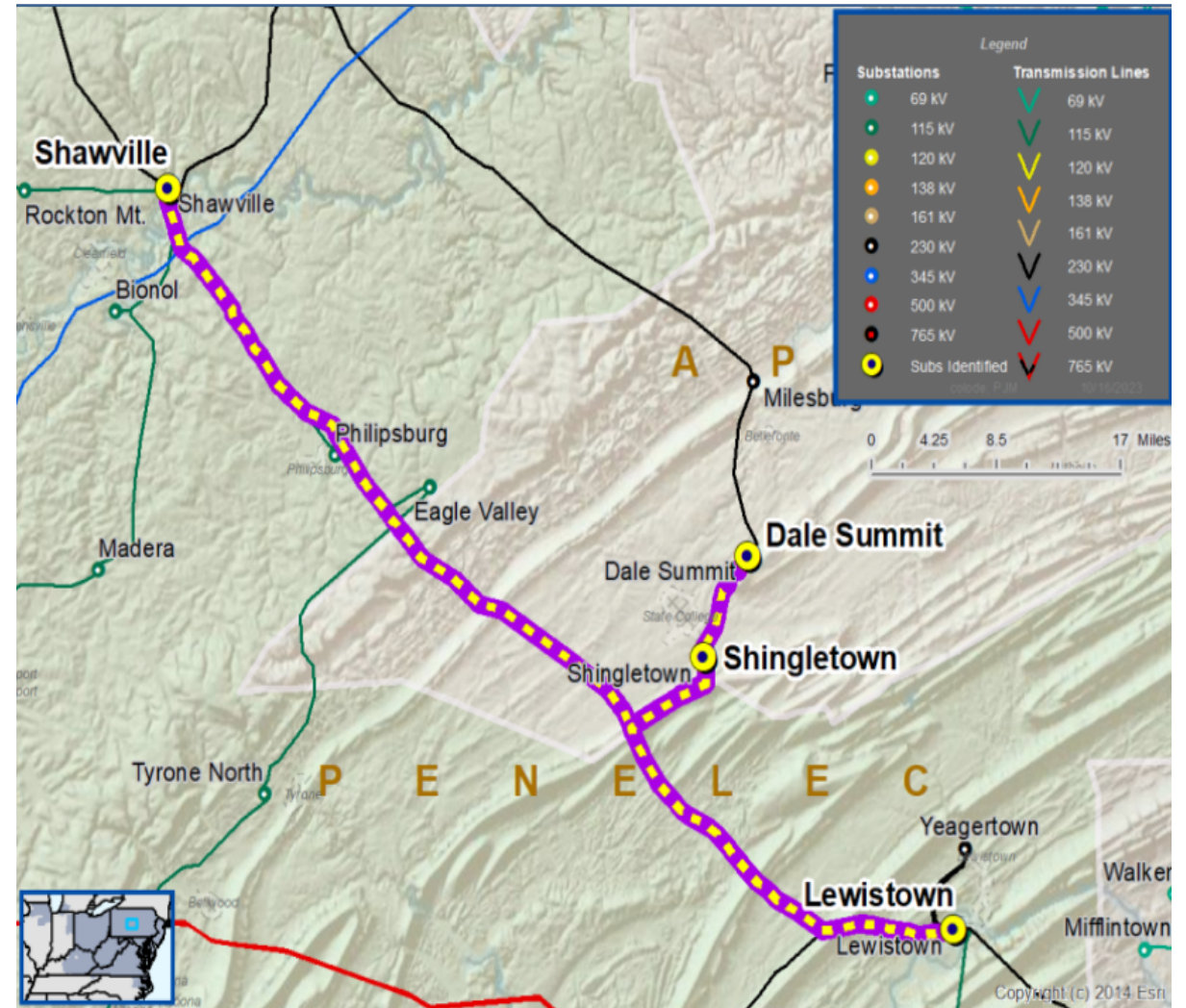
- Existing line rating: 486 / 523 MVA (SN / SE)
- Existing Transmission Conductor Rating: 617/ 754 MVA (SN / SE)

Lewistown – Shingletown 230 kV Line

- Existing line rating: 512 / 612 MVA (SN / SE)
- Existing Transmission Conductor Rating: 546 / 666 MVA (SN / SE)

Shawville – Shingletown 230 kV Line

- Existing line rating: 445 / 587 MVA (SN / SE)
- Existing Transmission Conductor Rating: 546 / 666 MVA (SN / SE)



APS Transmission Zone M-3 Process Shingletown Substation

Need Number: APS-2023-059, PN-2023-022
Process Stage: Submission of Supplemental Projects for Inclusion in the Local Plan – 9/22/2026

Proposed Solution:
Convert Shingletown Substation into a six-breaker 230 kV ring bus. (APS-2023-059)
At Shawville Substation (PN-2023-022): Replace substation conductor and revise relay settings.
At Lewistown Substation (PN-2023-022): Replace line trap and revise relay settings.

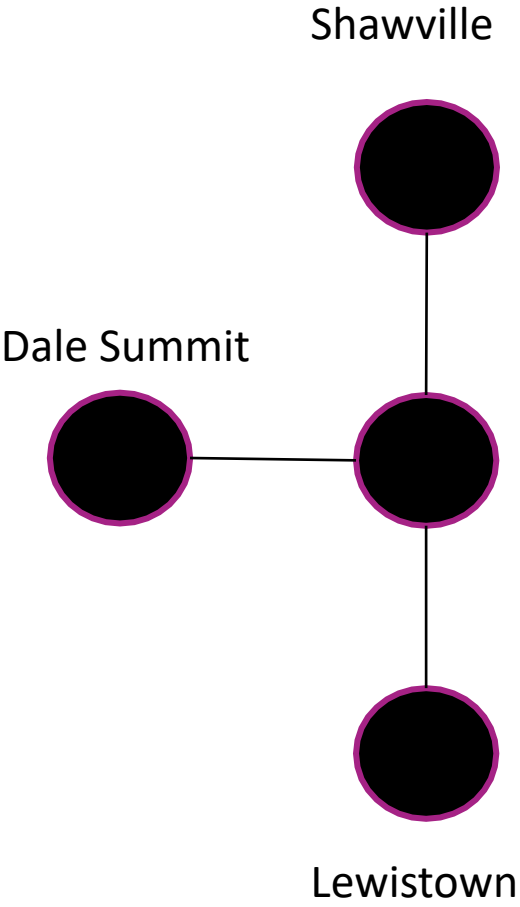
Transmission Line Ratings:
Lewistown - Shingletown 230 kV Line:
Before Proposed Solution: 512 / 612 / 619 / 700 MVA (SN/SE/WN/WE)
After Proposed Solution: 546 / 666 / 619 / 790 MVA (SN/SE/WN/WE)

Shawville - Shingletown 230 kV Line:
Before Proposed Solution: 442 / 582 / 619 / 700 MVA (SN/SE/WN/WE)
After Proposed Solution: 546 / 666 / 619 / 790 MVA (SN/SE/WN/WE)

Dale Summit - Shingletown 230 kV Line:
Before Proposed Solution: 486 / 523 / 542 / 571 MVA (SN/SE/WN/WE)
After Proposed Solution: 617 / 754 / 699 / 894 MVA (SN/SE/WN/WE)

This project is concurrent with PN-2023-022.
Alternatives Considered:
Maintain the existing configuration with risk of customer interruptions under contingency scenarios.

Estimated Project Cost: \$19.11M
Projected In-Service: 06/25/2029
Supplemental Project ID: s3932.1



Legend	
500 kV	
345 kV	
230 kV	
138 kV	
115 kV	
69 kV	
46 kV	
34.5 kV	
23 kV	
New	

Need Number: APS-2024-073

Process Stage: Submission of Supplemental Projects for Inclusion in the Local Plan – 9/22/2026

Previously Presented: Solution Meeting SRRTEP-W - 07/17/2026
Need Meeting 11/15/2024

Project Driver: Other

Specific Assumption Reference:

System Performance Global Factors

- System reliability/performance
- Substation/Line equipment limits

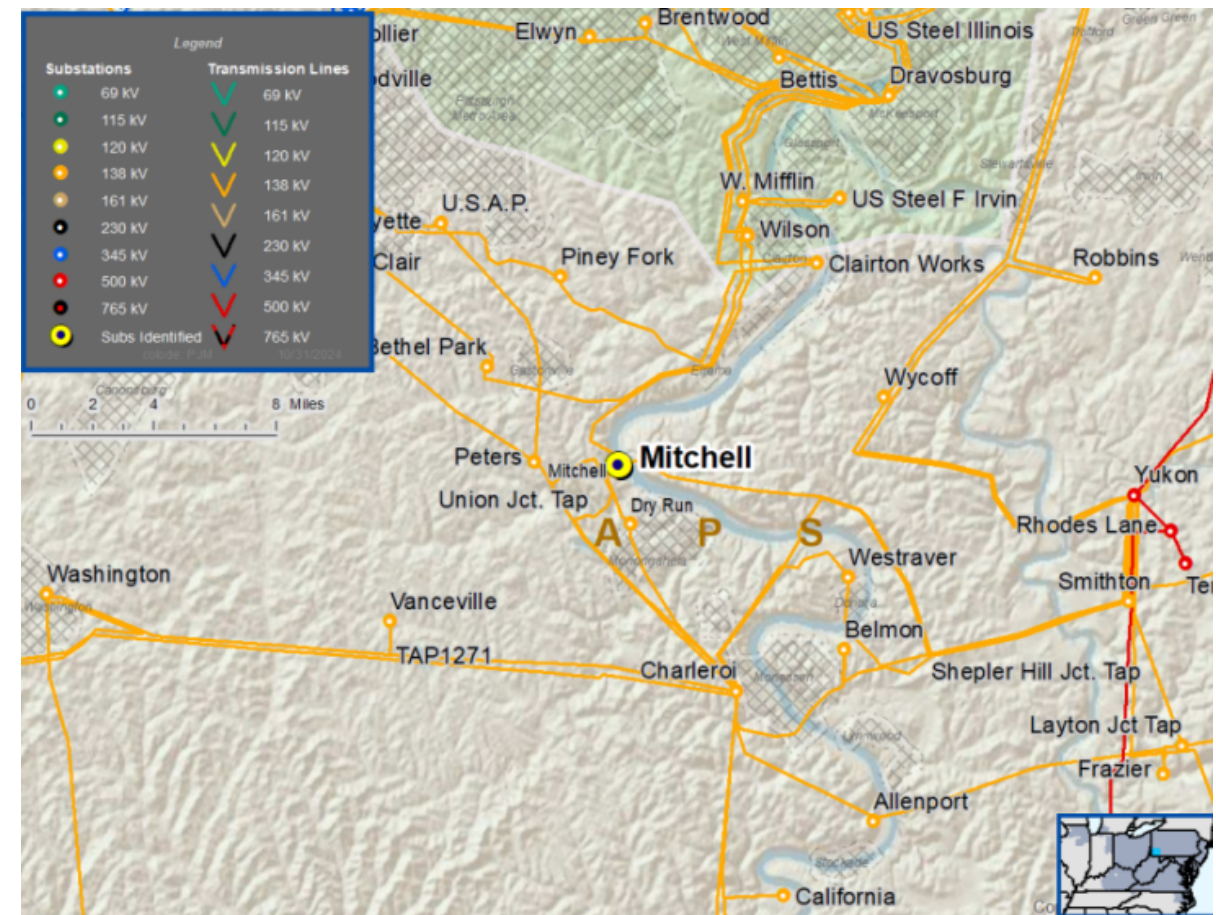
Equipment/Technology/Design Upgrades

- FirstEnergy owned equipment located in non-FirstEnergy affiliated facilities

Problem Statement:

Mitchell Plant was previously owned by FirstEnergy. With the sale of the plant, FirstEnergy must separate assets owned by FirstEnergy from assets owned by the new plant owners.

The Charleroi – Mitchell – Yukon (Shepler Hill Jct) 138 kV Line needs to be rerouted off the Mitchell Plant roof.



Need Number: APS-2024-073
Process Stage: Submission of Supplemental Projects for Inclusion in the Local Plan – 9/22/2026

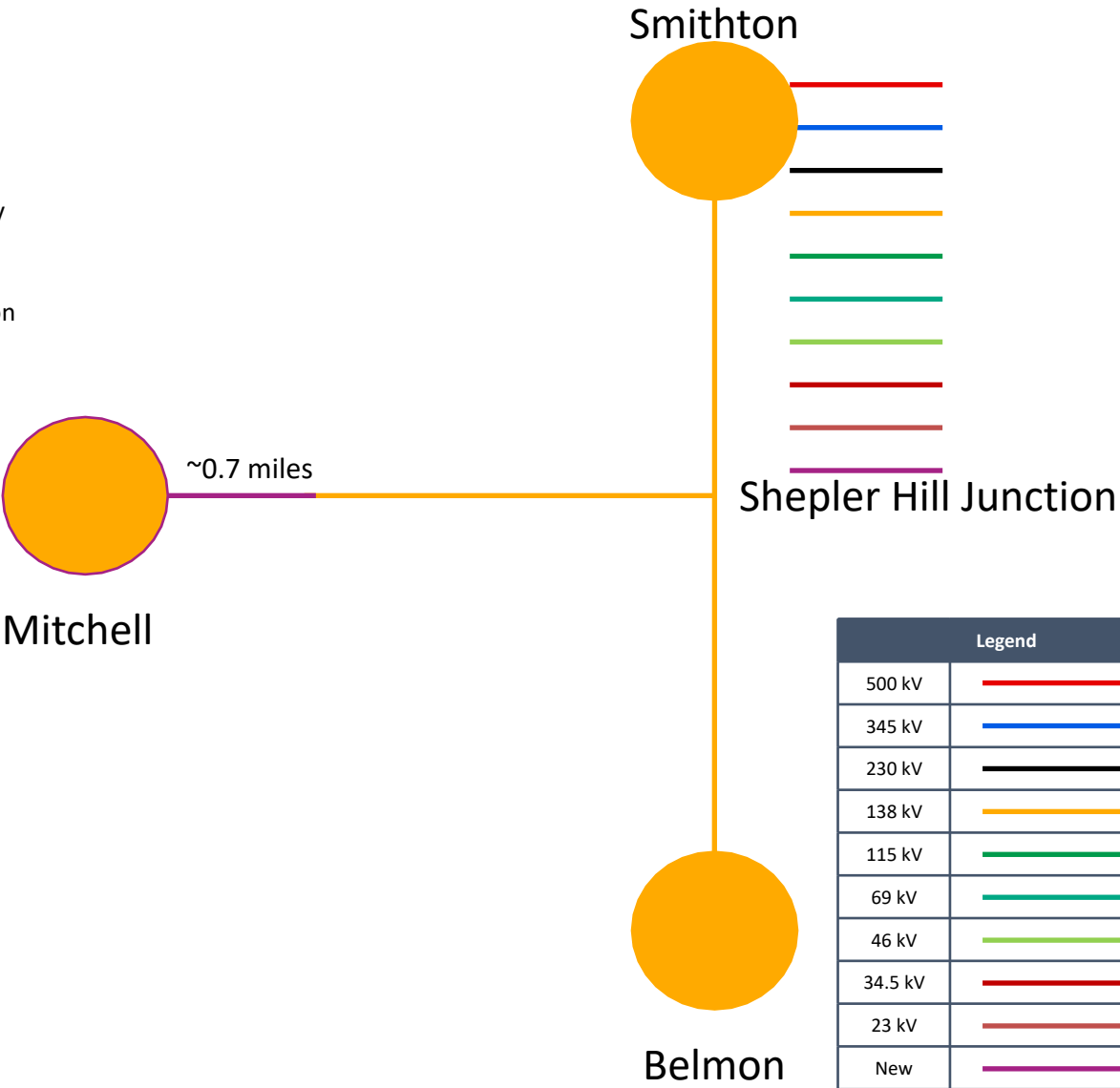
- Proposed Solution:**
- Relocate approximately 0.5 miles of the existing Charleroi - Mitchell - Yukon (Shepler Hill Jct) 138 kV Line.
- At Mitchell Substation:
- Re-terminate the Charleroi - Mitchell - Yukon (Shepler Hill Jct) 138 kV Line to isolate the transmission line from the power plant.
 - Install new CCVT, CCVT junction box and stand foundation, grounding connectors, bus support adapters, switch stands, wave trap and line turner, surge arrester and dead-end tower.
 - Replace disconnect switches.
 - Revise relay settings.

Transmission Line Ratings:
 Mitchell - Shepler Hill Jct 138 kV Line Segment:

- Before Proposed Solution: 295 / 375 / 349 / 441 MVA (SN/SE/WN/SE)
- After Proposed Solution: 308 / 376 / 349 / 445 MVA (SN/SE/WN/SE)

Alternatives Considered:
 No alternatives considered as the line needs to be rerouted off the roof of the power plant.

Estimated Project Cost: \$11.01 M
Projected In-Service: 06/02/2028
Supplemental Project ID: s3933.1



Need Number: APS-2024-086
Process Stage: Submission of Supplemental Projects for Inclusion in the Local Plan – 9/22/2026
Previously Presented: Solution Meeting SRRTEP-W - 07/17/2026
 Need Meeting 10/18/2024
Project Driver: Equipment Condition/Performance/Risk

Specific Assumption Reference:

System Performance Projects Global Factors

- System reliability and performance
- Substation/line equipment limits

System Condition Projects

- Substation Condition Rebuild/Replacement

Upgrade Relay Schemes

- Obsolete and difficult to repair communication equipment (DTT, Blocking, etc.)
- Communication technology upgrades

Problem Statement:

FirstEnergy has identified protection schemes using a certain vintage of relays and communication equipment that have a history of misoperation.

Proper operation of the protection scheme requires all the separate components perform adequately during a fault.

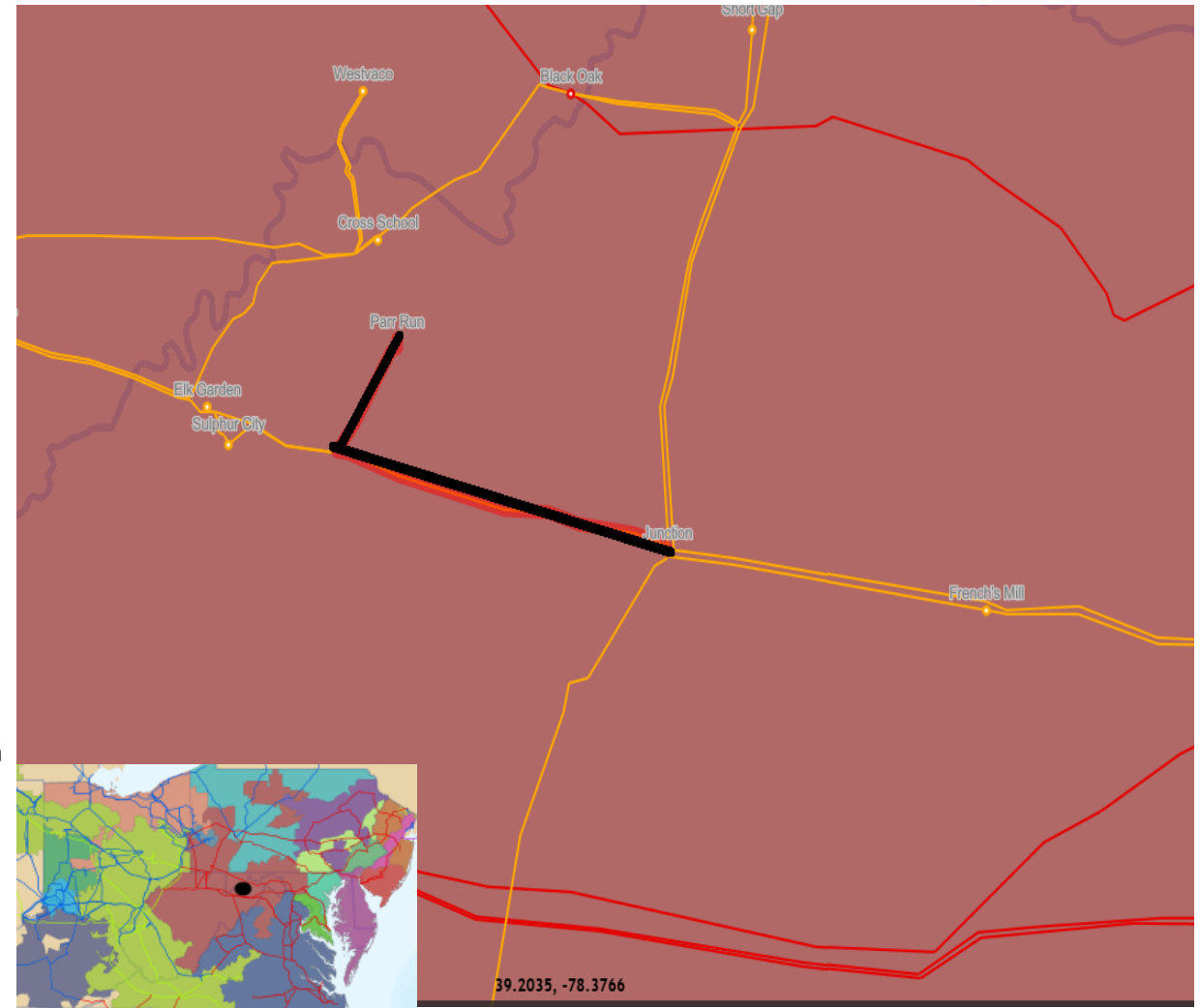
In many cases the protection equipment cannot be repaired due to a lack of replacement parts and available expertise in the outdated technology.

Transmission line ratings are limited by terminal equipment.

Parr Run – Junction 138 kV Line

Existing Line Rating: 164 / 206 / 216 / 229 MVA (SN/SE/WN/WE)

Existing Conductor Rating: 221 / 268 / 250 / 317 MVA (SN/SE/WN/WE)



Need Number: APS-2024-086
Process Stage: Submission of Supplemental Projects for Inclusion in the Local Plan – 9/22/2026

Proposed Solution:

- At Parr Run Substation: Replace substation conductor, circuit breaker, disconnect switches, line trap, PT, CCVT, and relaying.
- At Junction Substation: Replace disconnect switches, circuit breaker, CCVT, substation conductor, line trap, and relaying.

Parr Run - Junction 138 kV Line Ratings:

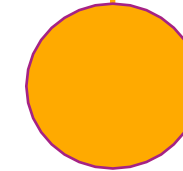
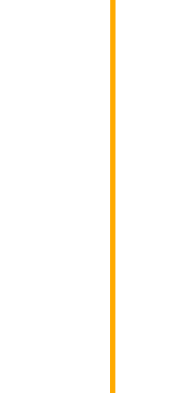
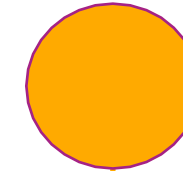
- Before Proposed Solution: 164 / 206 / 216 / 229 MVA (SN/SE/WN/WE)
- After Proposed Solution: 308 / 376 / 349 / 445 MVA (SN/SE/WN/WE)

Alternatives Considered:

Maintain equipment in existing condition with elevated risk of misoperations.

Estimated Project Cost: \$4.67 M
Projected In-Service: 12/31/2028
Supplemental Project ID: s3934.1

Parr Run



Junction

Legend	
500 kV	
345 kV	
230 kV	
138 kV	
115 kV	
69 kV	
46 kV	
34.5 kV	
23 kV	
New	

Need Number: APS-2025-005
Process Stage: Submission of Supplemental Projects for Inclusion in the Local Plan – 9/22/2026
Previously Presented: Solution Meeting SRRTEP-W - 07/17/2026
 Need Meeting 02/14/2025
Project Driver: Equipment Condition/Performance/Risk

Specific Assumption Reference:

System Performance Projects Global Factors

- Substation/line equipment limits
- System reliability and performance
- Substation Condition Rebuild/Replacement
- Upgrade Relay Schemes
- Obsolete and difficult to repair communication equipment (DTT, Blocking, etc.)
- Communication technology upgrades

Problem Statement:

FirstEnergy has identified protection schemes using a certain vintage of relays and communication equipment that have a history of misoperation on Shepherdstown - Sleepy Hollow 138 kV Line.

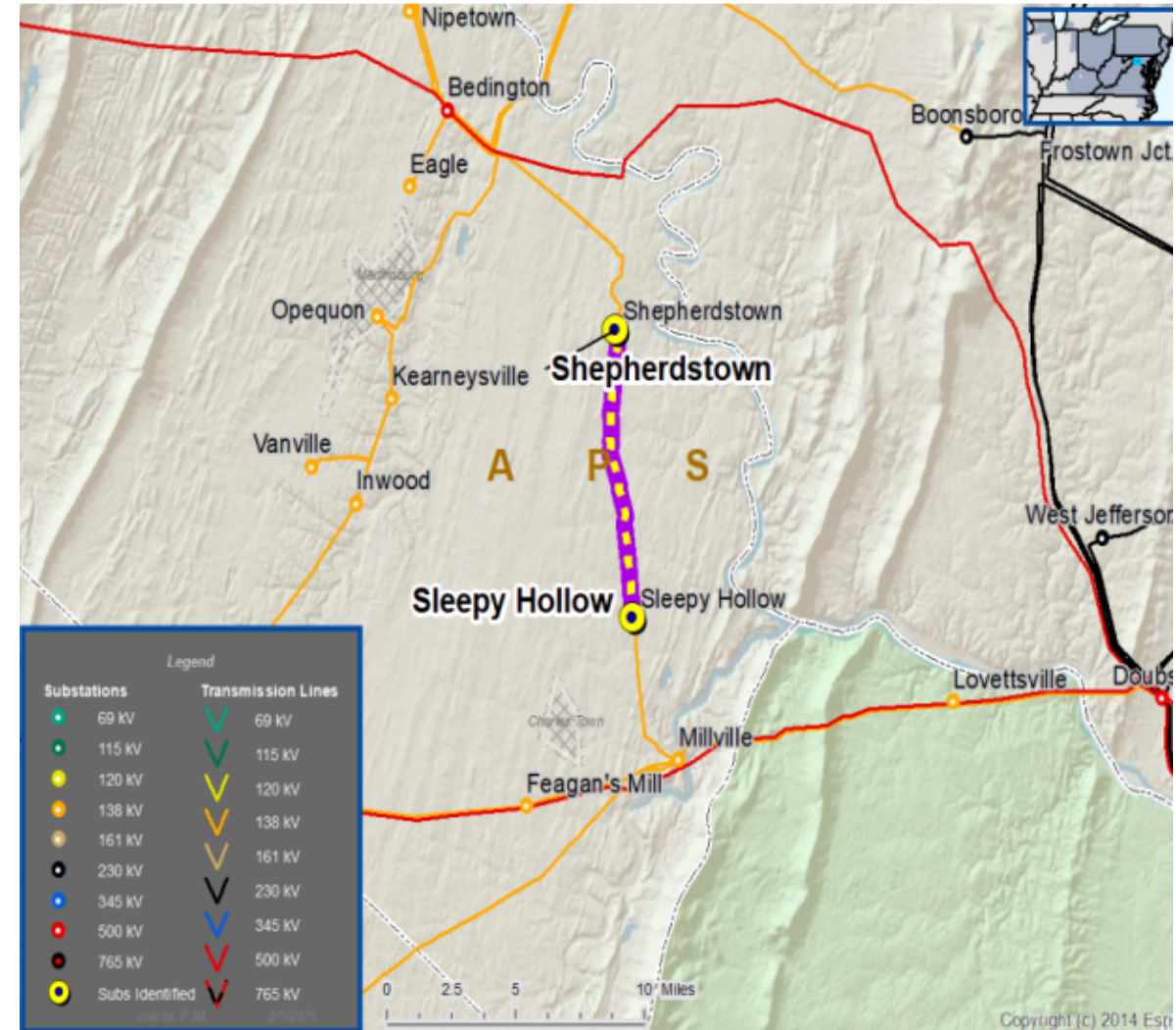
Proper operation of the protection scheme requires all the separate components perform adequately during a fault.

In many cases the protection equipment cannot be repaired due to a lack of replacement parts and available expertise in the outdated technology.

Transmission line ratings are limited by terminal equipment.

Existing line ratings: 221 / 268 / 250 / 306 MVA (SN/SE/WN/WE)

Existing conductor ratings: 221 / 268 / 250 / 317 MVA (SN/SE/WN/WE)



Need Number: APS-2025-005
Process Stage: Submission of Supplemental Projects for Inclusion in the Local Plan – 9/22/2026

Proposed Solution:

- At Shepherdstown Substation: Replace relaying, circuit switcher, disconnect switches, PT, and CCVT.
- At Sleepy Hollow Substation: Replace relaying, circuit breaker, disconnect switches, PT, CCVT, and line trap.

Shepherdstown - Sleepy Hollow 138 kV Line Ratings:

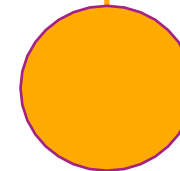
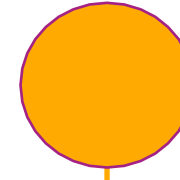
- Before Proposed Solution: 221 / 268 / 250 / 306 MVA (SN/SE/WN/WE)
- After Proposed Solution: 221 / 268 / 250 / 317 MVA (SN/SE/WN/WE)

Alternatives Considered:

Maintain equipment in existing condition with elevated risk of misoperations.

Estimated Project Cost: \$2.60 M
Projected In-Service: 08/04/2028
Supplemental Project ID: s3935.1

Shepherdstown



Sleepy Hollow

Legend	
500 kV	
345 kV	
230 kV	
138 kV	
115 kV	
69 kV	
46 kV	
34.5 kV	
23 kV	
New	

Need Number: APS-2026-001

Process Stage: Submission of Supplemental Projects for Inclusion in the Local Plan – 9/22/2026

Previously Presented: Solution Meeting SRRTEP-W - 07/17/2026
Need Meeting 01/16/2026

Project Driver: Operational Flexibility and Efficiency

Specific Assumption Reference:

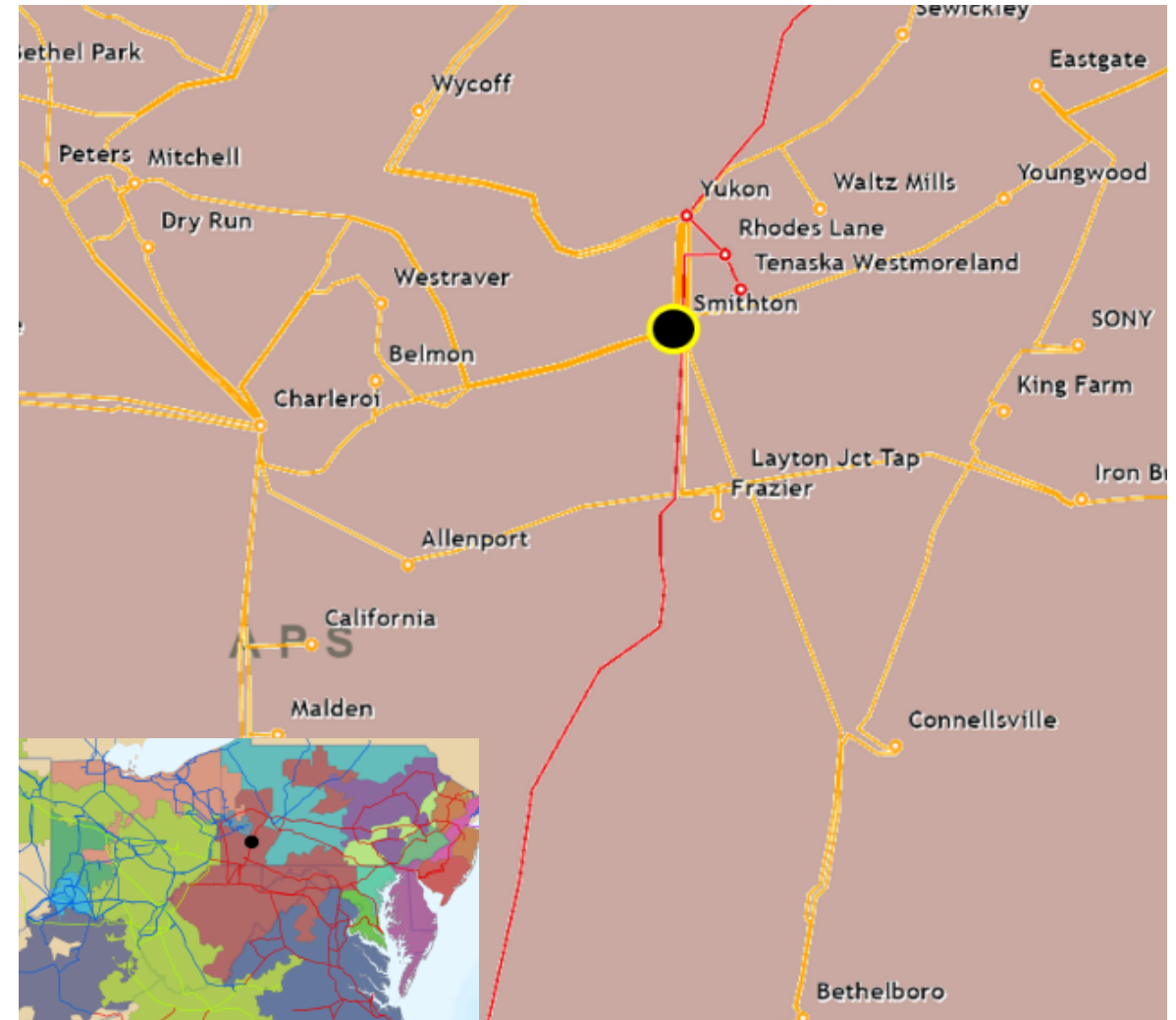
System Performance Projects Global Factors

- Add/Expand Bus Configuration
- Load at risk in planning and operational scenarios
- Reduce the amount of exposed potential local load loss during contingency conditions
- Eliminate simultaneous outages to multiple networked elements

Problem Statement:

Smithton Substation is currently configured as a 138 kV straight bus with a feed from the Charleroi - Mitchell - Yukon 138 kV Line (Shepler Hill Jct) and the Allenport - Iron Bridge - Yukon 138 kV Line (Layton Jct). Smithton Substation also serves two distribution transformers, totaling approximately 4,300 customers and 10 MW of load.

There is a normally open 138 kV bus tie that cannot be closed when the Shepler Hill Jct 138 kV Line is energized, as it does not have the ability to clear certain fault scenarios. Therefore, each distribution transformer at Smithton Substation is served radially and requires Operational switching to restore customers upon loss of 138 kV source.



Need Number:

APS-2026-001

Process Stage:

Submission of Supplemental Projects for Inclusion in the Local Plan – 9/22/2026

Proposed Solution:

At Smithton Substation:

- Eliminate the normally open bus tie configuration by installing two 138 kV line breakers and a bus tie breaker.
- Re-terminate the connection from Smithton Substation to the Charleroi - Mitchell - Yukon (Shepler Hill Jct) 138 kV Line.
- Remove the connection from Smithton Substation to the Smithton Tap that is currently connected to the Allenport - Iron Bridge - Yukon 138 kV Line.

Transmission Line Ratings:

Charleroi - Belmon 138 kV Line:

- Before Proposed Solution: 274 / 287 / 287 / 287 MVA (SN/SE/WN/WE)
- After Proposed Solution: 297 / 365 / 345 / 441 MVA (SN/SE/WN/WE)

Belmon - Shepler Hill Jct 138 kV Line:

- Before Proposed Solution: 269 / 335 / 326 / 380 MVA (SN/SE/WN/WE)
- After Proposed Solution: 297 / 358 / 345 / 410 MVA (SN/SE/WN/WE)

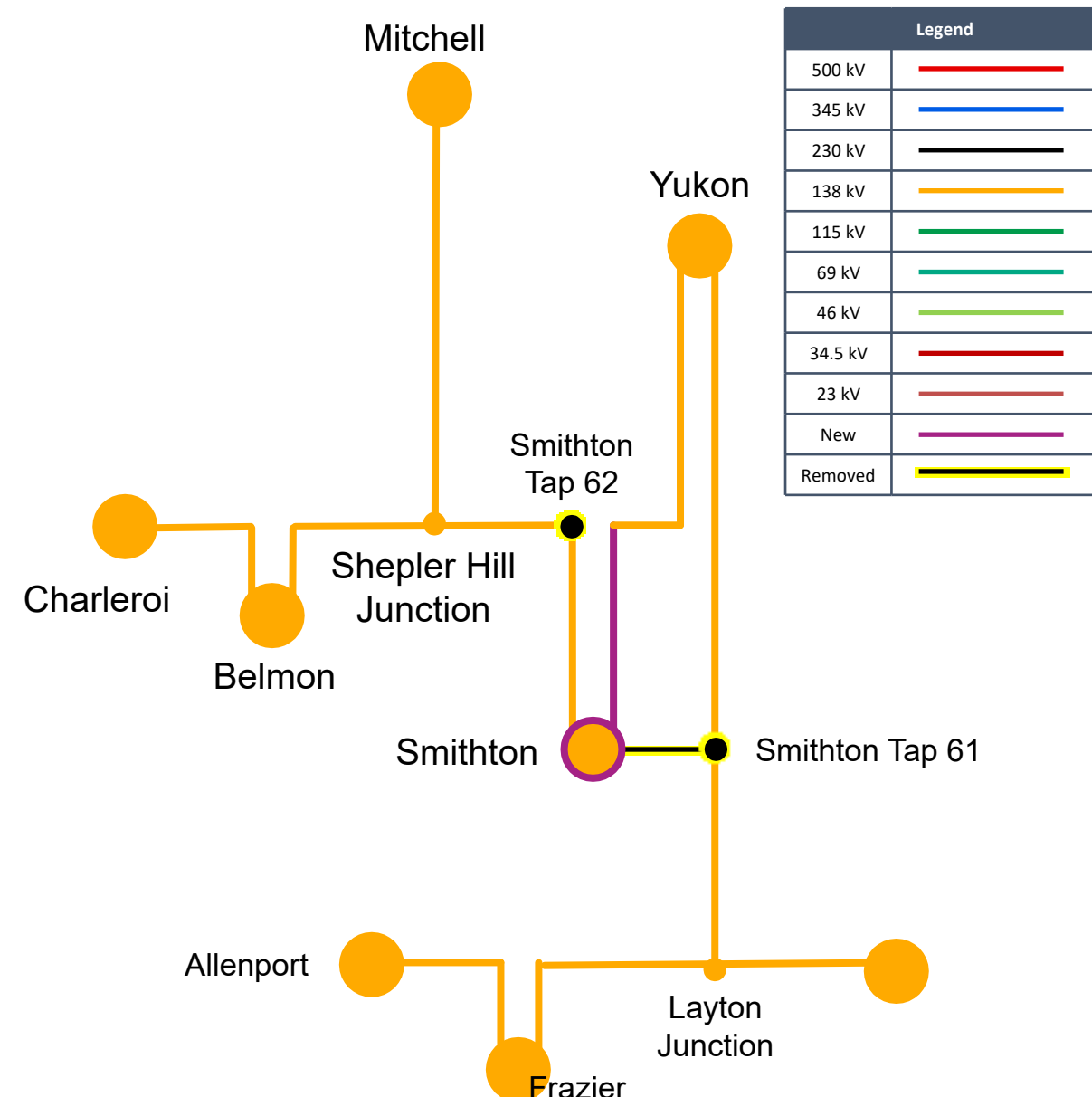
Shepler Hill Jct - Smithton 138 kV Line:

- Before Proposed Solution: 309 / 376 / 349 / 445 MVA (SN/SE/WN/WE)
- After Proposed Solution: 309 / 376 / 349 / 445 MVA (SN/SE/WN/WE)

***** Continued on next page*****

SRRTEP Committee: Western – FirstEnergy Supplemental 07/17/2026

APS Transmission Zone M-3 Process Smithton Substation





Need Number:

APS-2026-001

Process Stage:

Submission of Supplemental Projects for Inclusion in the Local Plan – 9/22/2026

Proposed Solution (CONT'):

Smithton - Yukon 138 kV Line:

- Before Proposed Solution: 294 / 350 / 349 / 401 MVA (SN/SE/WN/WE)
- After Proposed Solution: 308 / 376 / 349 / 445 MVA (SN/SE/WN/WE)

Shepler Hill Jct - Mitchell 138 kV Line:

- Before Proposed Solution: 292 / 292 / 292 / 292 MVA (SN/SE/WN/WE)
- After Proposed Solution: 308 / 376 / 349 / 445 MVA (SN/SE/WN/WE)

Alternatives Considered:

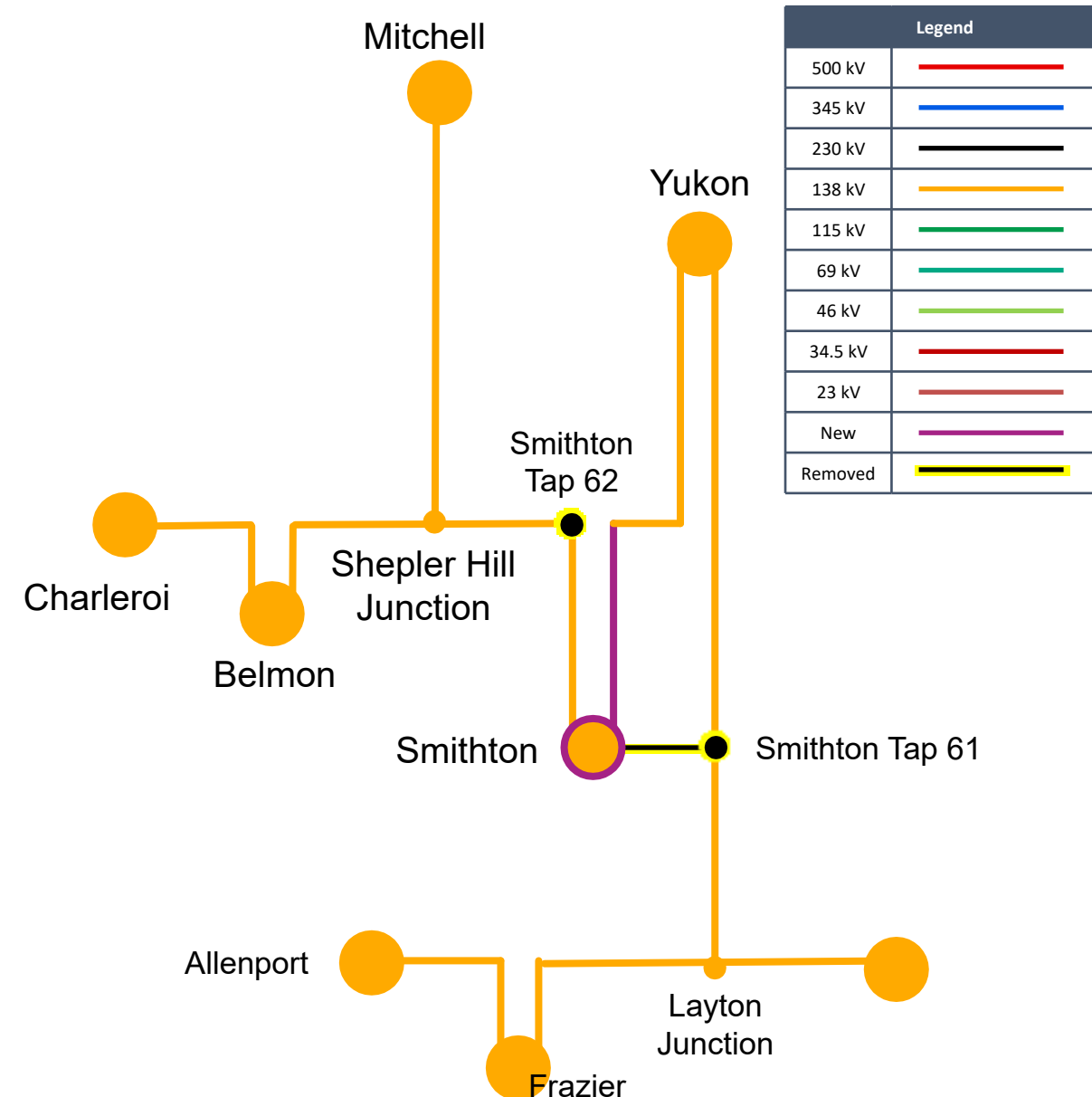
Maintain the line in existing condition with elevated risk of customer outages under contingency scenarios.

Estimated Project Cost: \$11.52 M

Projected In-Service: 12/17/2027

Supplemental Project ID: s3936.1

APS Transmission Zone M-3 Process Smithton Substation



DLCO Transmission Zone M-3 Process

Monroeville, PA

Need Number: DLC-2024-003

Process Stage: Submission of Supplemental Project for inclusion in the 2026 Local Plan – 9/21/2026

Previously Presented: Solution Meeting – 09/09/2025
Needs Meeting – 10/18/2024

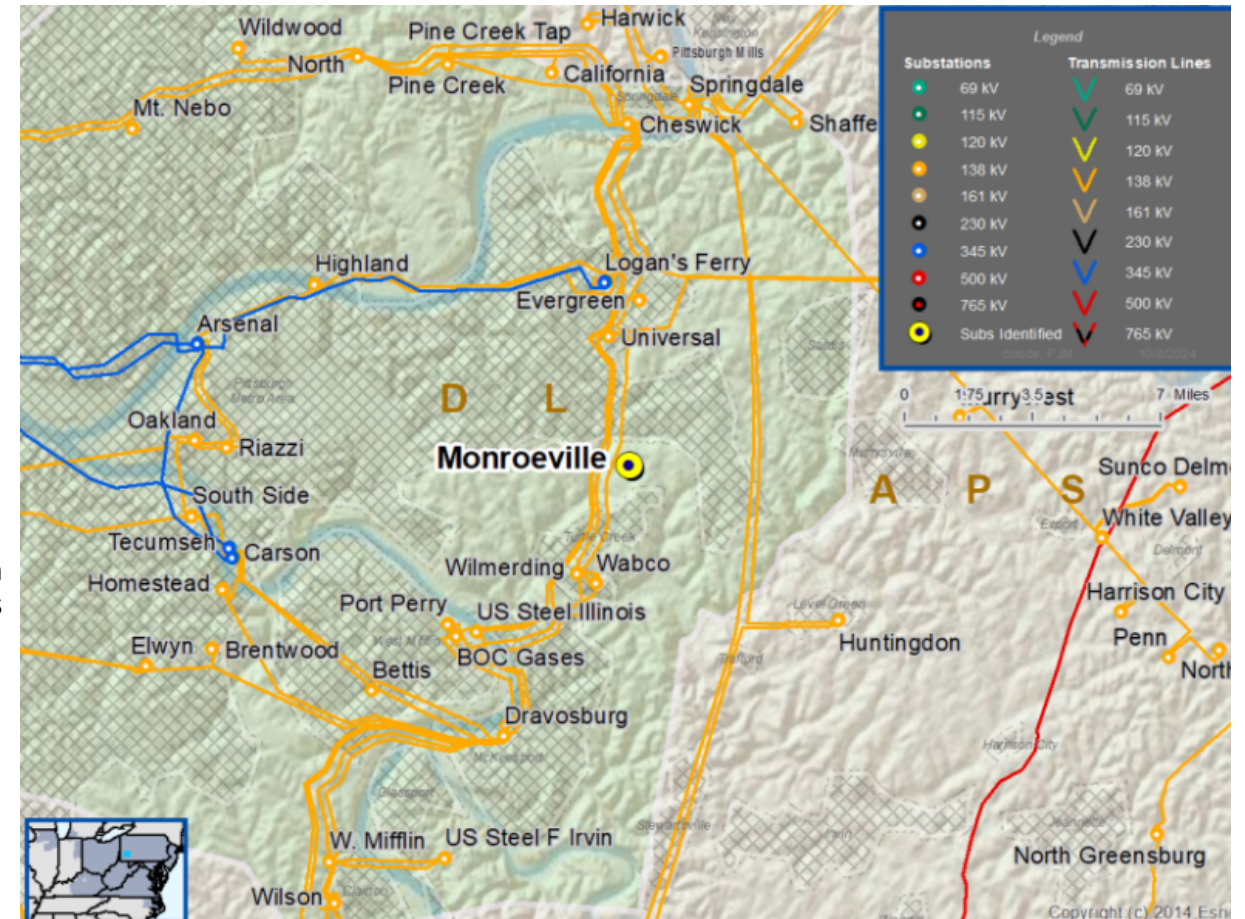
Project Driver: Customer Service

Specific Assumption References:

- Slide 9 of the DLC 2024 Local Planning Assumptions.

Problem Statement:

- Duquesne Light has received a customer request to serve a new customer in Monroeville, Pennsylvania. The request is for up to 250 MW. The customer is requesting service as soon as possible.



DLCO Transmission Zone M-3 Process Monroeville, PA

Need Number: DLC-2024-003

Process Stage: Submission of Supplemental Project for inclusion in the
2026 Local Plan – 9/21/2026

- **Proposed Solution:**

- Duquesne Light Scope of Work - Estimated Cost: \$41.1 M
 - Establish a new breaker-and-a-half substation, McGinley Substation, to serve the requested customer load. Establishing this substation requires the looping of the Cheswick (DLC) – Yukon (FE) 138 kV transmission line and the Springdale (FE) – Huntingdon (FE) 138 kV transmission line. McGinley Substation is to be comprised of twelve 138 kV breakers and a 50 MVAR capacitor bank. Upgrade and coordinate relaying at Cheswick Substation. **(s3928.1)**
 - Install mechanical refrigeration on the existing Brunot Island – Carson 345 kV HPFF transmission circuit to mitigate a violation of DLC’s local planning criteria. **(s3928.3)**
- FirstEnergy Scope of Work - Estimated Cost: \$5.2 M
 - Loop the Huntingdon – Springdale and Cheswick – Yukon 138 kV Lines into McGinley Substation.
 - Replace a 138 kV breaker at Huntingdon Substation.
 - Upgrade and coordinate relaying at remote FE substations. **(s3928.2)**

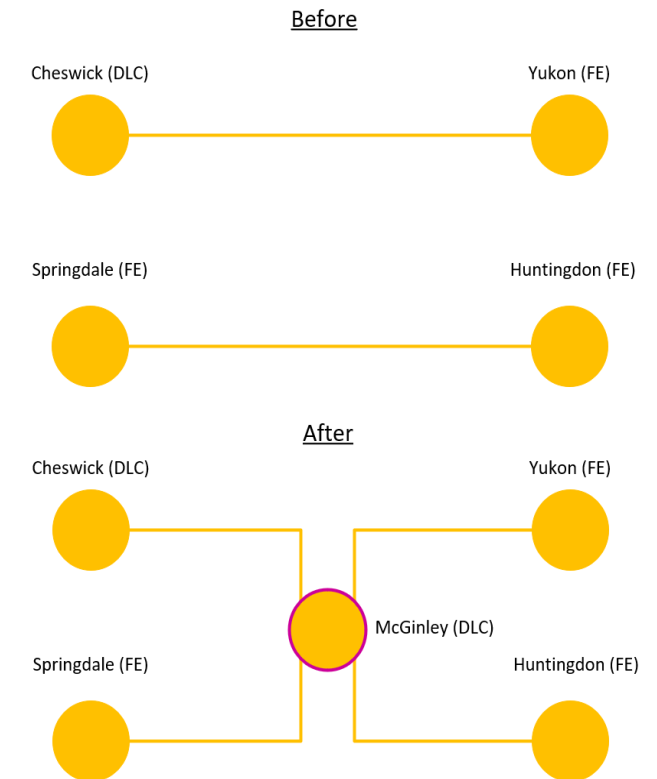
- **Total Estimated Cost:** \$46.3 M

- **Alternatives Considered:**

1. **Loop One 138 kV Circuit** – Interconnection studies determined the looping of a single 138 kV circuit is insufficient as a loss of one feed into the station would result in an undervoltage at McGinley Substation. Estimated Cost: N/A
2. **Establish new Brunot Island – Carson 345 kV Circuit** - DLC evaluated the construction of a new underground 345 kV circuit to mitigate the observed violation of DLC’s local planning criteria. This alternative was not selected due to the significant cost and lengthy timeline to construct. Estimated cost: \$210 M

- **Projected In-Service:** January 2029

- **Supplemental number:** s3928.1, s3928.2 and s3928.3



Legend	
345 kV	
138 kV	
69 kV	
23 kV	
New	

Need Number: APS-2026-004

Process Stage: Submission of Supplemental Project for inclusion in the 2026 Local Plan – 9/28/2026

Previously Presented: Solution Meeting SRRTEP-W - 03/19/2026
Need Meeting SRRTEP-W - 01/16/2026

Project Driver:
Customer Service

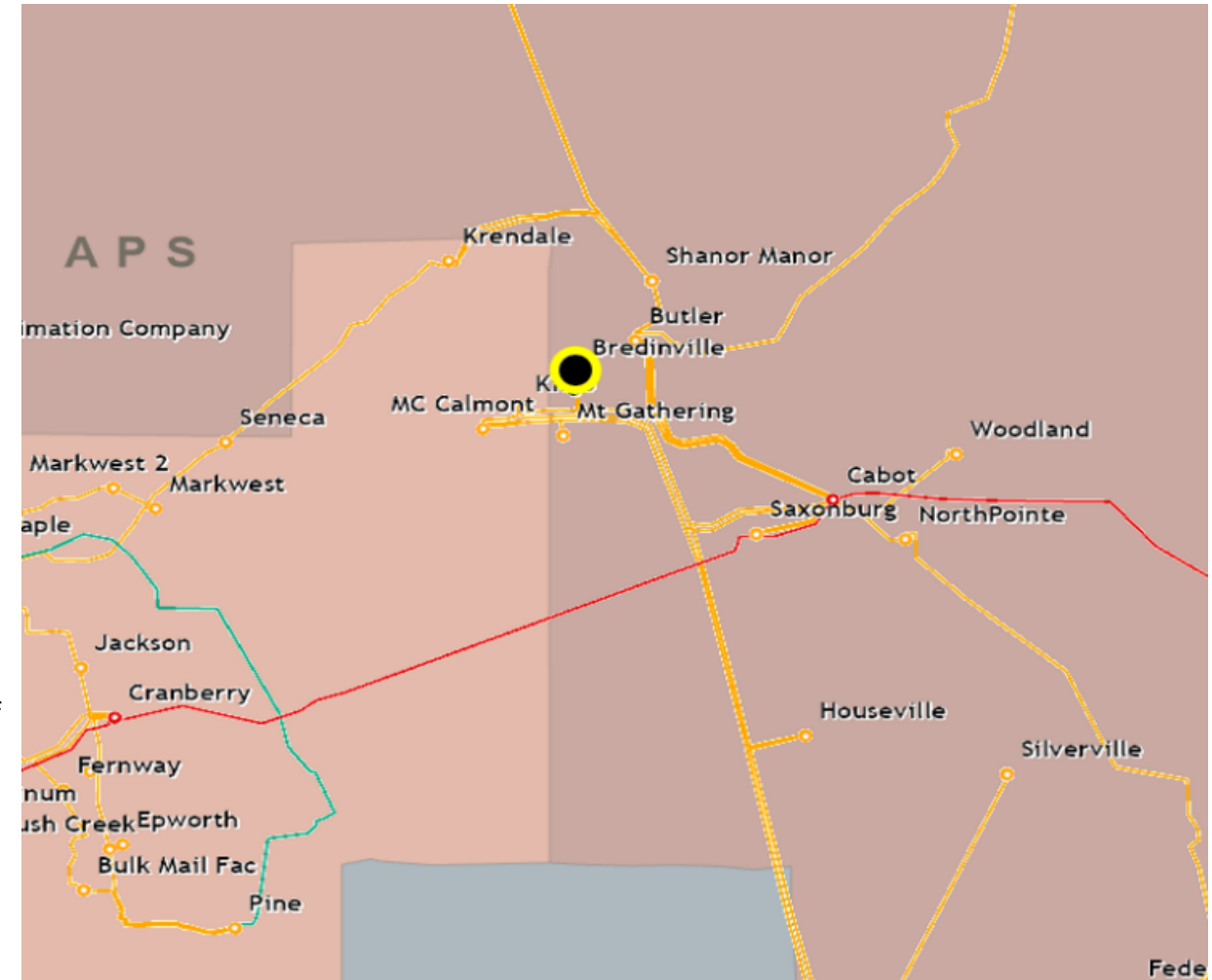
Specific Assumption References:

New customer connection requests will be evaluated per FirstEnergy's "Requirements for Transmission Connected Facilities" document and "Transmission Planning Criteria" document.

Problem Statement:

New Customer Connection - A customer located near the existing Bredinvile - McCalmont 138 kV Line requested a new 138 kV delivery point. The anticipated load of the new customer connection is 80 MW.

Anticipated in-service date is 3/15/2028.



Need Number: APS-2026-004
Process Stage: Submission of Supplemental Project for inclusion in the 2026 Local Plan – 9/28/2026

Proposed Solution:

Bredinville - McCalmont 138 kV Line Interconnection:

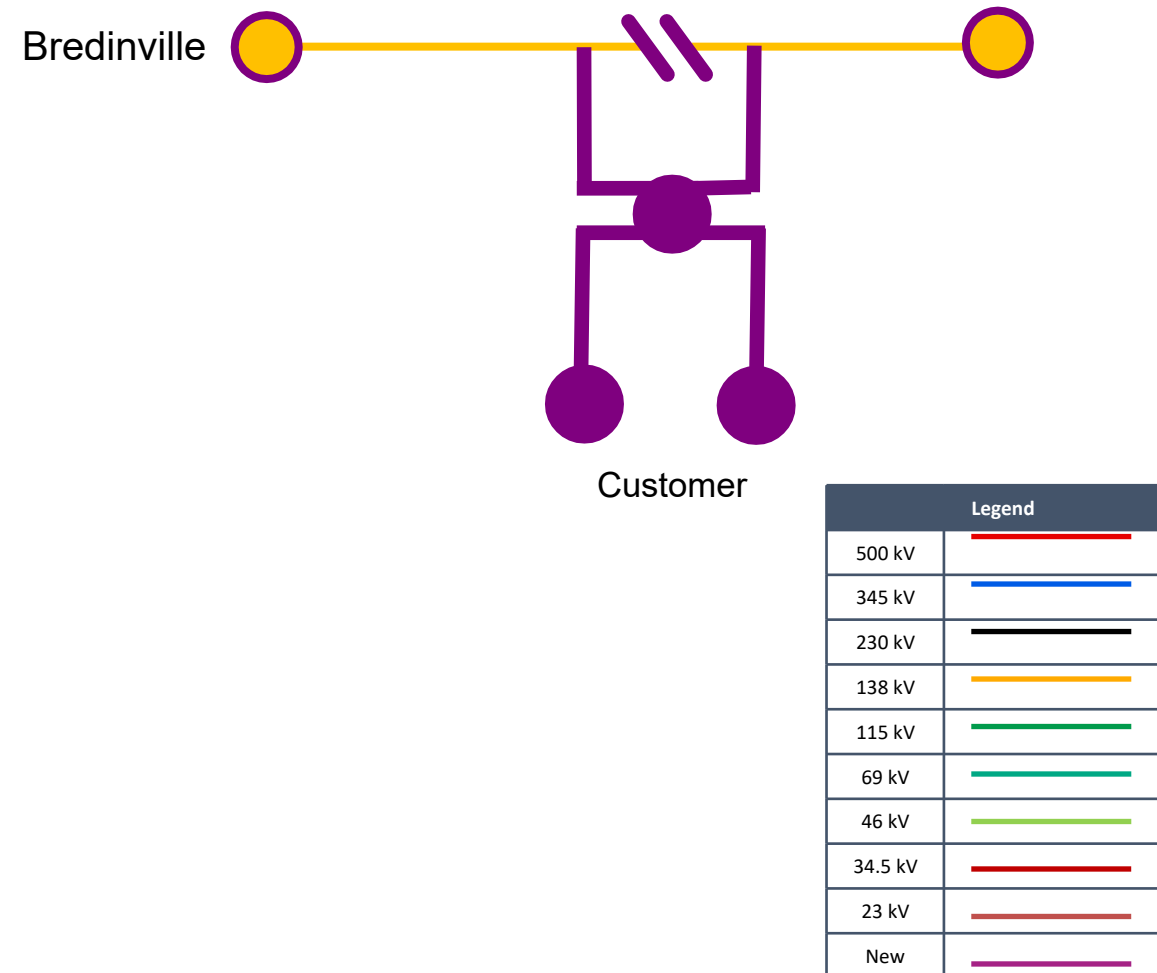
Construct a new four-breaker (future five-breaker) 138 kV station, cut into the Bredinville - Kilgo 138 kV Line and loop the line in and out of the new ring bus station. Construct two 138 kV spans from the new ring bus station to the POI with the Customer.

Transmission Line Ratings: 287 / 287 / 287 / 287 MVA (SN/SSTE/WN/WSTE)

Alternatives Considered:

No reasonable alternatives to meet the customer request due to the proximity of the Bredinville - McCalmont 138 kV Line.

Estimated Project Cost: \$22.75M
Projected In-Service: 12/18/2026
Supplemental Project ID: s3980.1





Revision History

03/02/2026 – V1 – Original Slides posted

07/14/2026 – V2 - s3865.1, s3866.1, s3867.1, s3876.1, s3869.1, s3870.1, s3871.1, s3874.1, s3868.1, s3875.1 & s3127.1 (cancellation) added

08/05/2026 – V3 – s3885.1, s3886.1, s3887.1 and s3707.1 (cancellation)

09/22/2026 – V4 - s3871.1, s3937.1, s3938.1, s3939.1, s3930.1, APS-2024-101 (cancellation), s3931.1, s3932.1, s3933.1, s3934.1, s3935.1, s3936.1 & s3928.2 added

09/28/2026 – V5 - s3980.1 added