FirstEnergy – JCPL – 2025
Submission of Supplemental Projects for Inclusion in the Local Plan

JCPL Transmission Zone M-3 Process
Whippany, NJ/Montville, NJ/Greystone, NJ

Need Number: JCPL-2019-024
Process Stage: Submission of Supplemental Projects for Inclusion in the Local Plan
Previously Presented: Solution Meeting – 3/13/2025
Need Meeting – 3/25/2019
Project Driver(s):
Equipment Material Condition, Performance and Risk

Specific Assumption Reference(s)
Line Condition Rebuild/Replacement

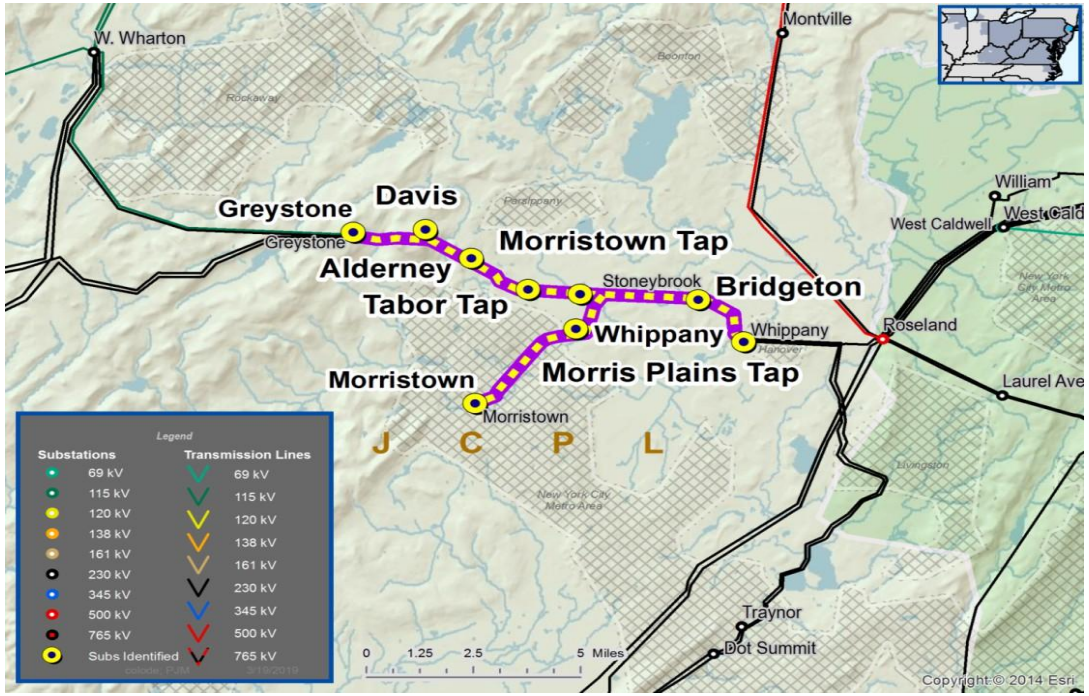
- Age/condition of wood pole transmission line structures
- Age/condition of steel tower or steel pole transmission line structures
- Age/condition of transmission line conductors

System Performance Projects

- Substation/line equipment limits

Problem Statement

- Line sections are exhibiting deterioration, increasing maintenance needs. Transmission line is approaching end of life
- Transmission line ratings are limited by terminal equipment



JCPL-2019-	Transmission Line / Substation Locations	Existing Circuit Rating (SN / SE)	Existing Conductor Rating (SN / SE)	Limiting Terminal Equipment	Length of Line (miles)	Identified Structures (end of life / total)	Failure reasons
024	Greystone – Davis 34.5 kV Line	66 / 79	70 / 85	Substation Conductor	2.2	181 / 383 (48% Failure Rate)	Age, bad/cut/missing grounds, woodpecker holes, etc.
	Davis – Alderney 34.5 kV Line	46 / 58	46 / 58	-	0.3		
	Alderney – Tabor Tap 34.5 kV Line	46 / 58	46 / 58	-	0.3		
	Tabor Tap – Morristown Tap 34.5 kV Line	44 / 53	44 / 53	-	1.1		
	Morristown Tap – Morris Plains Tap 34. 5 kV Line	44 / 53	44 / 53	-	0.2		
	Morris Plains Tap – Morristown 34.5 kV Line	34 / 43	34 / 43	-	3.6		
	Morris Plains Tap – Morris Plains 34.5 kV Line	41 / 52	83 / 100	Disconnect Switches	1.5		
	Morristown Tap – Whippany	41 / 50	41 / 50	-	6.2		

JCPL Transmission Zone M-3 Process
Whippany, NJ/Montville, NJ/Greystone, NJ

Need number: JCPL-2019-024

Process Stage: Submission of Supplemental Projects for Inclusion in the Local Plan

Selected Solution:

Montville - Whippany 34.5 kV D4 Line:

- Install new conductor on 2.3 miles of rebuilt double circuit structures, shared with the Greystone - Whippany 34.5 kV I61 Line.

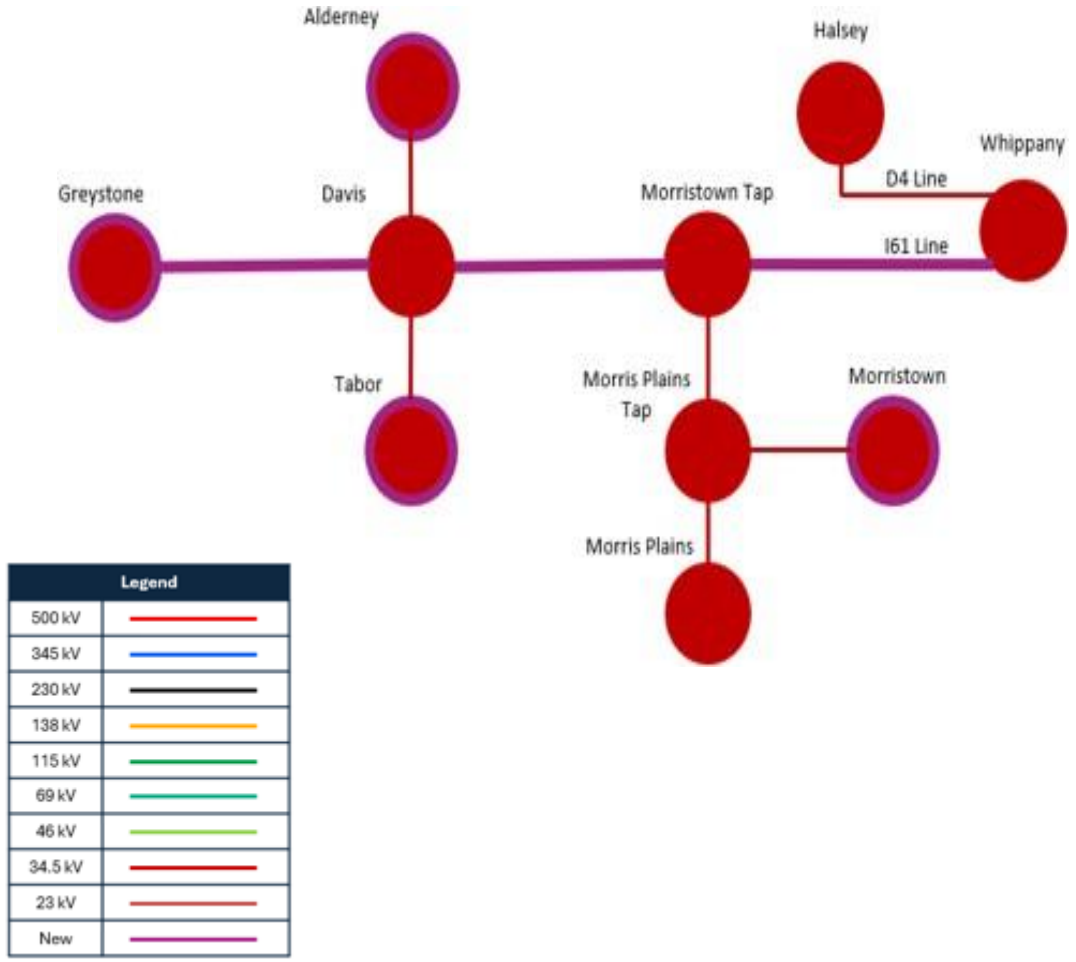
Greystone-Morristown-Whippany 34.5 kV I61 Line Rebuild:

- Rebuild approximately 14.1 miles of Greystone - Morristown - Whippany 34.5 kV I61 Line
- Rebuild approximately 11.8 miles of single circuit wood monopole structures
- Rebuild approximately 2.3 miles of double circuit wood monopole structures shared with the Montville - Whippany 34.5 kV D4 Line
- Replace three existing line switches with 1200A MOAB switches at Morristown Tap
- Replace one existing line switch with a 1200A MOAB switch at Morris Plains
- Replace relaying and terminal equipment at Greystone, Whippany, and Morristown substations.

Estimated Project Cost: $20.1 M

Projected In-Service: 06/11/2027

Supplemental Project ID: s3609.1



JCPL Transmission Zone M-3 Process
Morris Park Substation

Need Number: JCPL-2023-011

Process Stage: Submission of Supplemental Projects for Inclusion in the Local Plan

Previously Presented: Solution Meeting – 11/06/2024
Need Meeting – 10/03/2023

Project Driver:

System Performance and Operational Flexibility

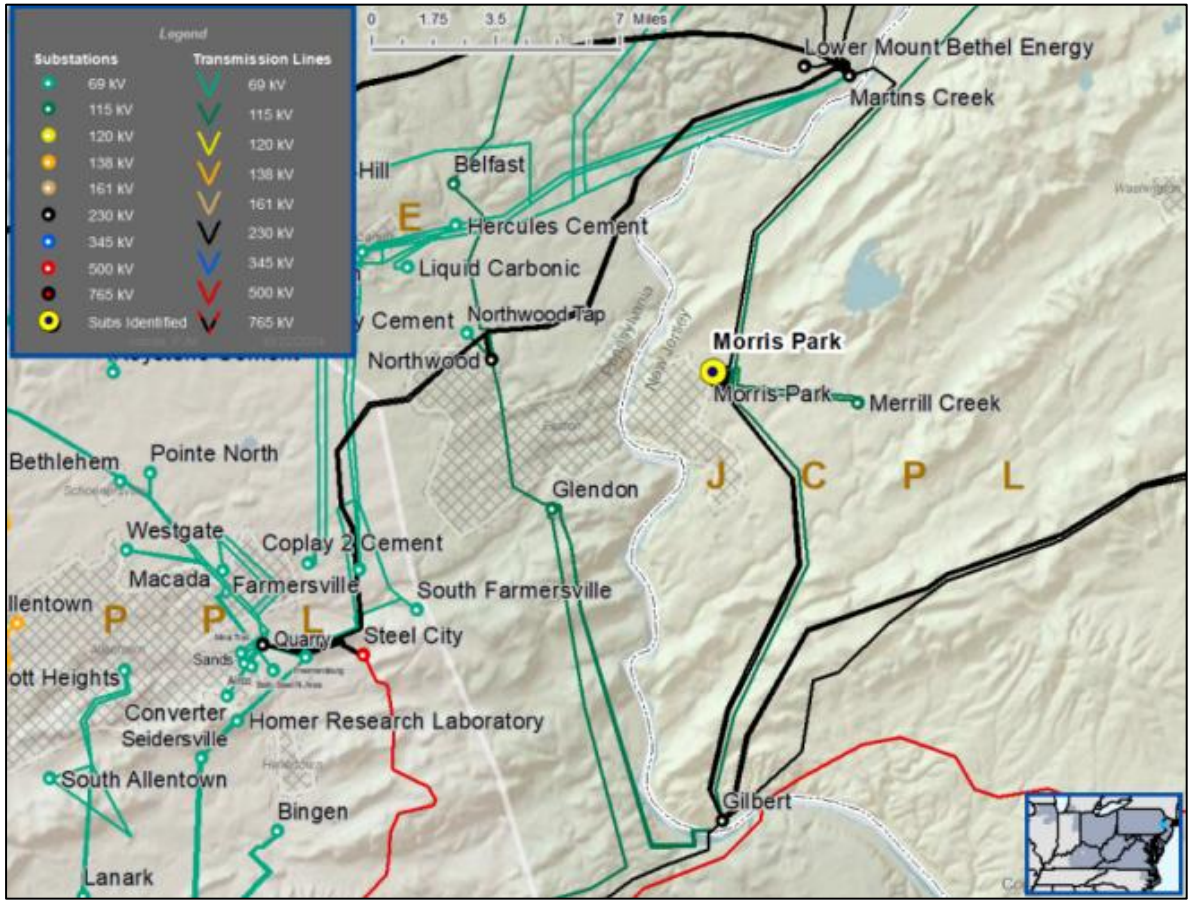
Specific Assumption Reference:

Global Factors

- System reliability and performance
- Add/Expand Bus Configuration
- Load at risk and/or customer affected

Problem Statement:

- The existing 230 kV and 115 kV sources to Morris Park Substation are fed radially. Gilbert – Martins Creek 230 kV and Gilbert – Pequest River 115 kV lines are configured as three terminal lines.
- Morris Park serves approximately 13 MW of load and 4,240 customers which will be outaged by an N-1-1 contingency of the Gilbert – Martins Creek 230 kV and Gilbert – Pequest River 115 kV lines.
- The existing 115 – 34.5 kV transformer at Morris Park was manufactured in 1953 and is approaching end of life.



JCPL Transmission Zone M-3 Process
Morris Park Substation

Need Number: JCPL-2023-011

Process Stage: Submission of Supplemental Projects for Inclusion in the Local Plan

Selected Solution:

- Convert Morris Park 230 kV Substation into a four-breaker ring bus
- Build 1600 feet of new 230 kV line to loop in the Gilbert - Martins Creek 230 kV P2016 Line into the Morris Park Substation 230 kV ring bus
- Install a 2nd 230-34.5 kV transformer at Morris Park Substation
- Remove the existing 115-34.5 kV transformer and all associated 115 kV equipment from Morris Park Substation

New Transformer Ratings:

- 189 / 198 / 221 MVA (SN/SLTE/STE)
- 237 / 238 / 242 MVA (WN/WLTE/WSTE)

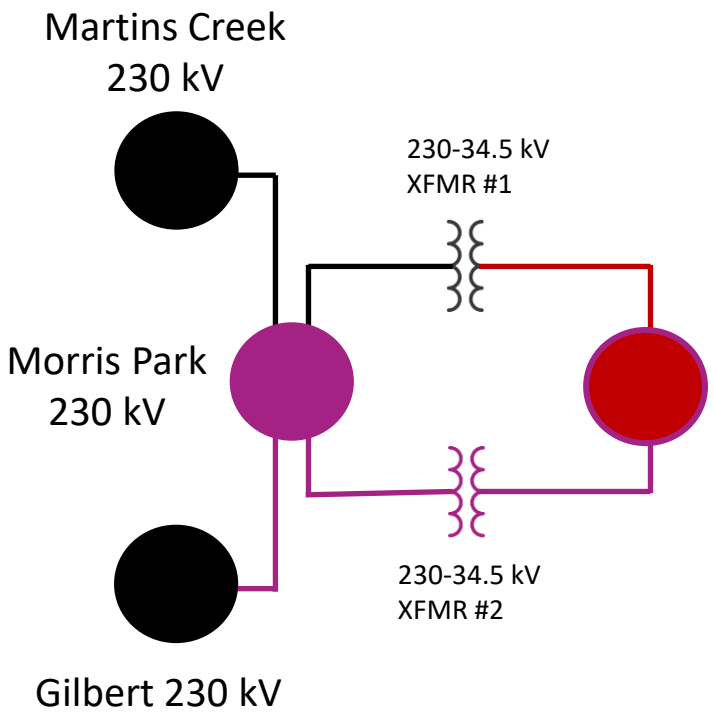
Transmission Line Ratings:

- Gilbert – Morris Park 230 kV Line
  - Before: 1306 / 1593 / 1593 / 1593 (SN/SE/WN/WE)
  - After: 1306 / 1625 / 1610 / 1875 (SN/SE/WN/WE)

Estimated Project Cost: $15.4M

Projected In-Service: 1/29/2027

Supplemental Project ID: s3611.1



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

JCPL Transmission Zone M-3 Process
Chester No. 1 230-34.5 kV Transformer

Need Number: JCPL-2024-003

Process Stage: Submission of Supplemental Projects for Inclusion in the Local Plan

Previously Presented: Solution Meeting – 03/04/2025
Need Meeting – 02/06/2024

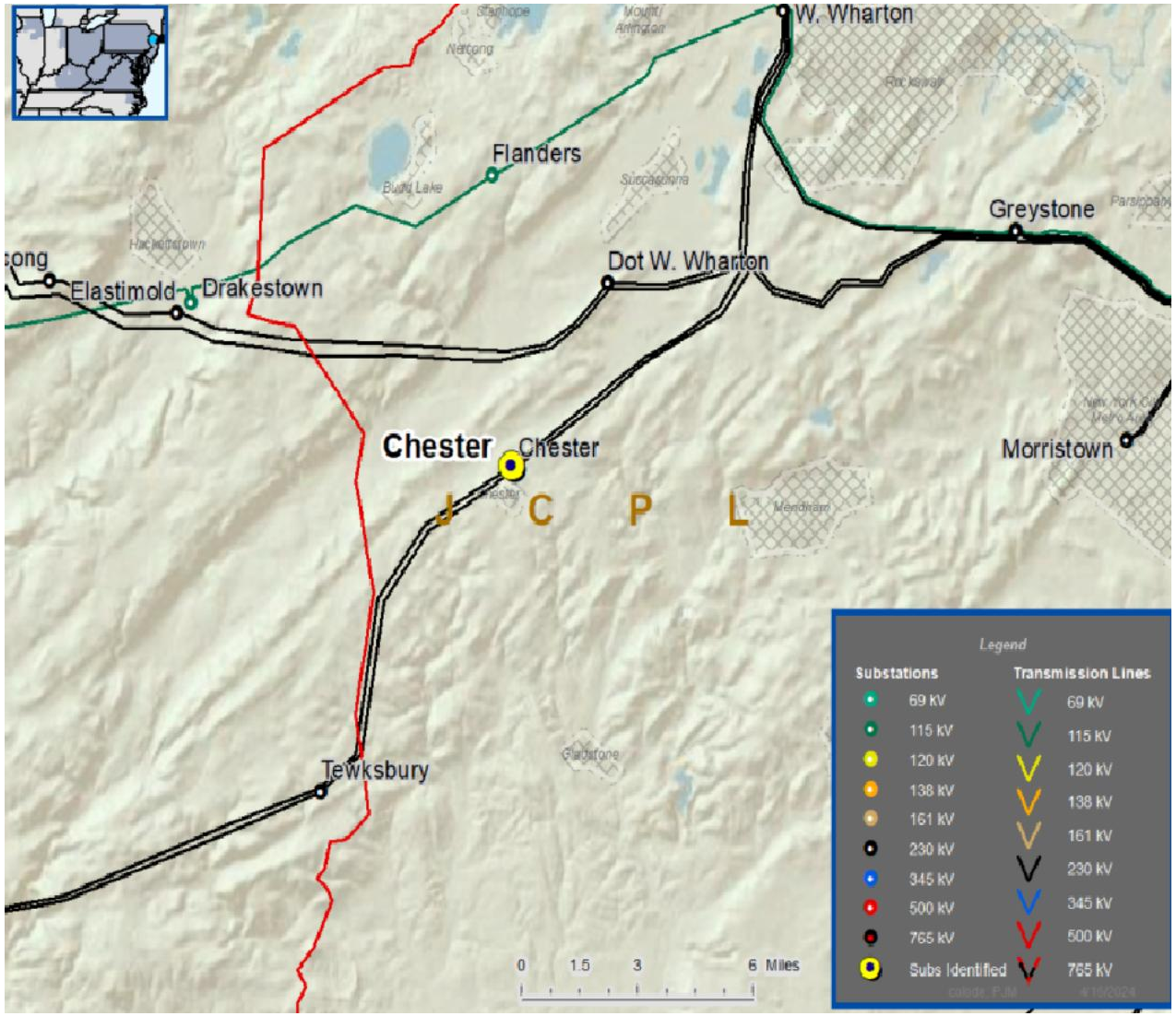
Project Driver:
Equipment Condition/Performance/Risk, Operational Flexibility and Efficiency

Specific Assumption References:

System Performance Projects Global Factors - System reliability and performance - Reliability of Non-Bulk Electric System (Non-BES) Facilities Add/Replace Transformers Past System Reliability/Performance

Problem Statement:

- The 230-34.5 kV No. 1 Transformer at Chester Substation was manufactured approximately 60 years ago and is reaching end of life.
- Recent DGA revealed high moisture and high carbon monoxide levels indicating degradation of the paper insulation.
- Existing transformer ratings: 99 / 124 / 125 / 137 MVA (SN/SSTE/WN/WSTE)
- Chester Substation serves approximately 30 MW of load via two 230-34.5 kV transformers. An N-1-1 contingency loss of the Chester – West Wharton 230 kV H2034 Line and the Kittatinny – Pohatcong 230 kV L2012 Line result in the Chester 230-34.5 kV No. 1 Transformer loading greater than 90% of its summer emergency rating



JCPL Transmission Zone M-3 Process
Chester No. 1 230-34.5 kV Transformer

Need number: JCPL-2024-003

Process Stage: Submission of Supplemental Projects for Inclusion in the Local Plan

Selected Solution:

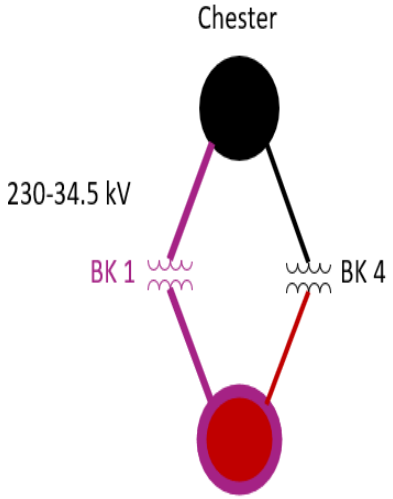
Chester No. 1 230-34.5 kV Transformer:

- Replace No. 1 230-34.5 kV Transformer at Chester Substation.
- Replace associated 34.5 kV Breaker.
- Replace Limiting Terminal Components - SCCIR, CT, DS.

Estimated Project Cost: $7.3 M

Projected In-Service: 11/12/2027

Supplemental Project ID: s3610.1



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

JCPL Transmission Zone M-3 Process
Whippany No. 12 230/115 kV Transformer

Need Number: JCPL-2024-019
Process Stage: Submission of Supplemental Projects for Inclusion in the Local Plan
Previously Presented: Solution Meeting – 03/04/2025
Need Meeting – 04/30/2024

Project Driver:

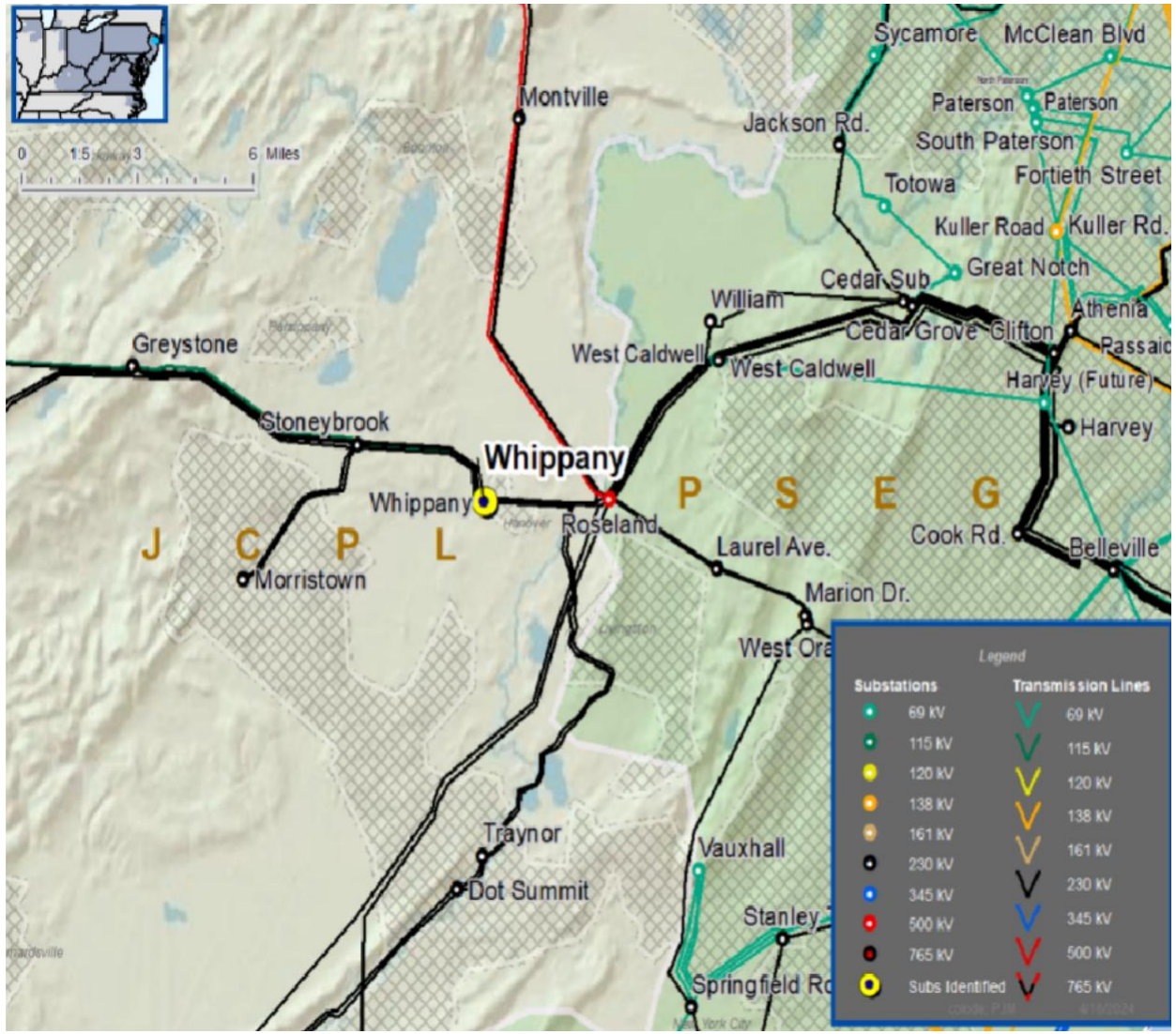
Equipment Condition/Performance/Risk

Specific Assumption References:

System Performance Projects Global Factors - System reliability and performance - Substation/line equipment limits Add/Replace Transformers Past System Reliability/Performance

Problem Statement:

- The Whippany No. 12 230/115 kV Transformer is approximately 66 years old and is approaching end of life.
- The transformer is experiencing issues with oil leaks and nitrogen gas leaks.
- The transformer is limited by terminal equipment.
- Existing Transformer Ratings:
  - 187 / 239 MVA (SN/SLTE)
  - 239 / 239 MVA (WN/WLTE)



JCPL Transmission Zone M-3 Process
Whippany No. 12 230/115 kV Transformer

Need number: JCPL-2024-019

Process Stage: Submission of Supplemental Projects for Inclusion in the Local Plan

Selected Solution:

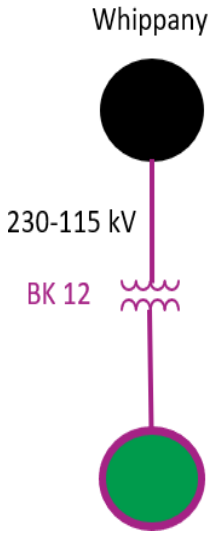
Whippany No. 12 230/115 kV Transformer:

- Replace No.12 230/115 kV Transformer at Whippany Substation.
- Replace transformer relaying and limiting substation conductor.

Estimated Project Cost: $8.1 M

Projected In-Service: 03/07/2030

Supplemental Project ID: s3613.1



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

JCPL Transmission Zone M-3 Process
Windsor No. 3 230-34.5 kV Transformer

Need Number: JCPL-2024-020

Process Stage: Submission of Supplemental Projects for Inclusion in the Local Plan

Previously Presented: Solution Meeting – 12/03/2024
Need Meeting – 04/30/2024

Project Driver:

Equipment Material Condition, Performance and Risk

Specific Assumption Reference:

System Performance Projects Global Factors

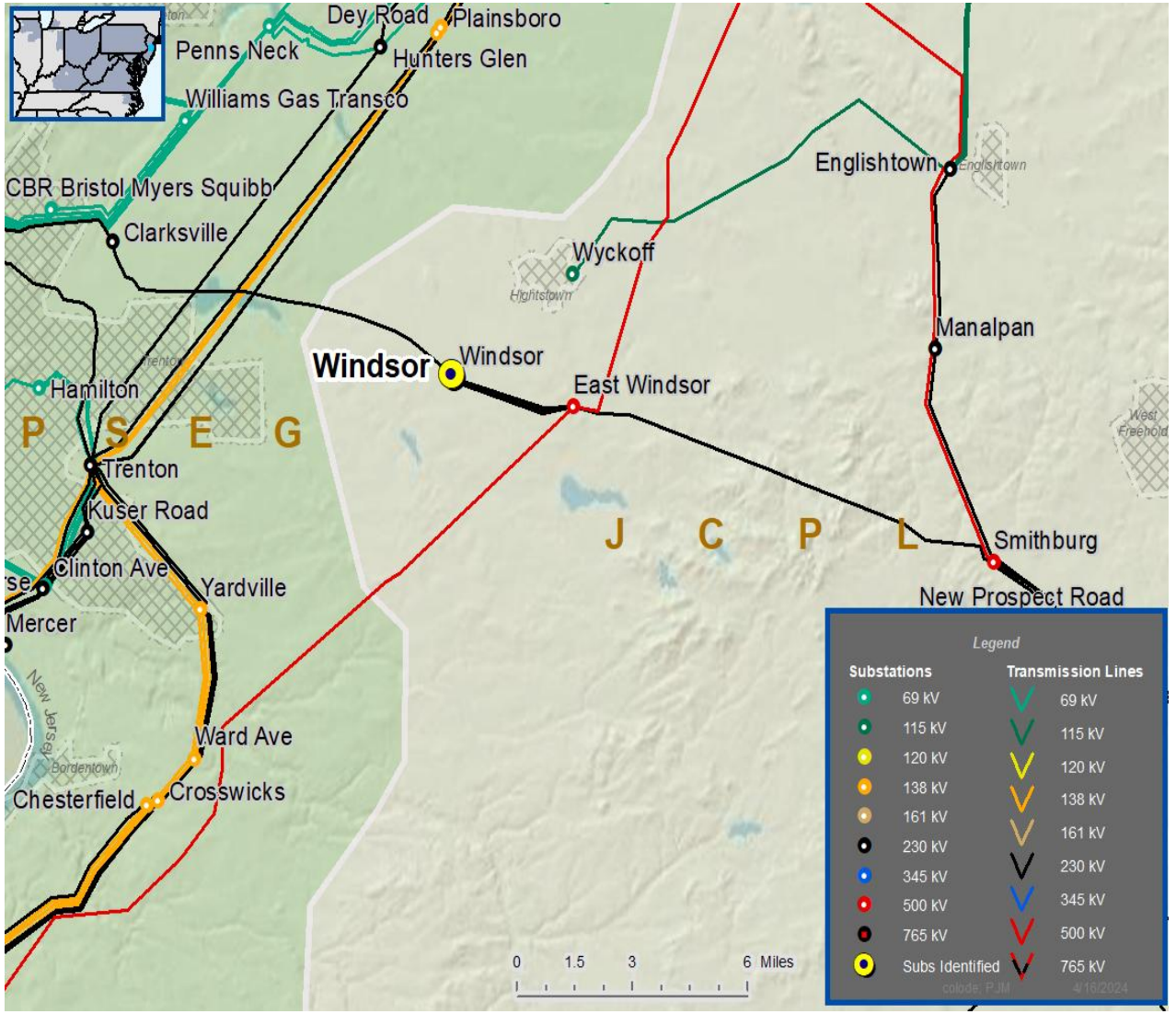
- System reliability and performance
- Substation/line equipment limits

Add/Replace Transformers

Past System Reliability/Performance

Problem Statement:

- The Windsor No. 3 230-34.5 kV Transformer is approximately 47 years old and is approaching end of life.
- The transformer is experiencing issues with oil leaks.
- The transformer has elevated methane, ethane and carbon monoxide gas in the transformer oil.
- The transformer is limited by terminal equipment.
- Existing Transformer Ratings:
  - 83 / 104 MVA (SN/SSTE)
  - 101 / 118 MVA (WN/WSTE)



JCPL Transmission Zone M-3 Process
Windsor No. 3 230-34.5 kV Transformer

Need Number: JCPL-2024-020

Process Stage: Submission of Supplemental Projects for Inclusion in the Local Plan

Selected Solution:

- Replace the Windsor No. 3 230-34.5 kV Transformer with a larger unit.
- Replace 230 kV circuit switcher with MOAB.
- Replace two 34.5 kV circuit breakers.
- Replace the transformer relaying.

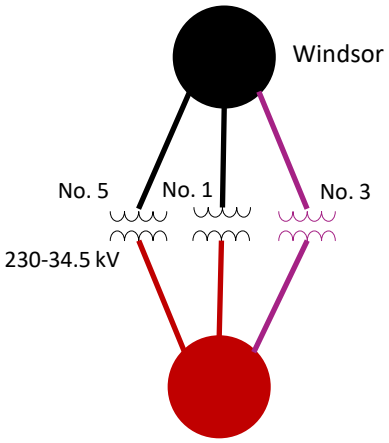
Transformer Ratings:

- Windsor No. 3 230-34.5 kV Transformer:
  - Before Proposed Solution: 83 / 104 / 101 / 118 MVA (SN/SSTE/WN/WSTE)
  - After Proposed Solution: 150 / 195 / 180 / 234 MVA (SN/SSTE/WN/WSTE)

Estimated Project Cost: $9.7M

Projected In-Service: 12/22/2028

Supplemental Project ID: s3615.1



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

JCPL Transmission Zone M-3 Process
Chester No. 4 230-34.5 kV Transformer

Need Number: JCPL-2024-021

Process Stage: Submission of Supplemental Projects for Inclusion in the Local Plan

Previously Presented: Solution Meeting - 03/04/2025
Need Meeting - 04/30/2024

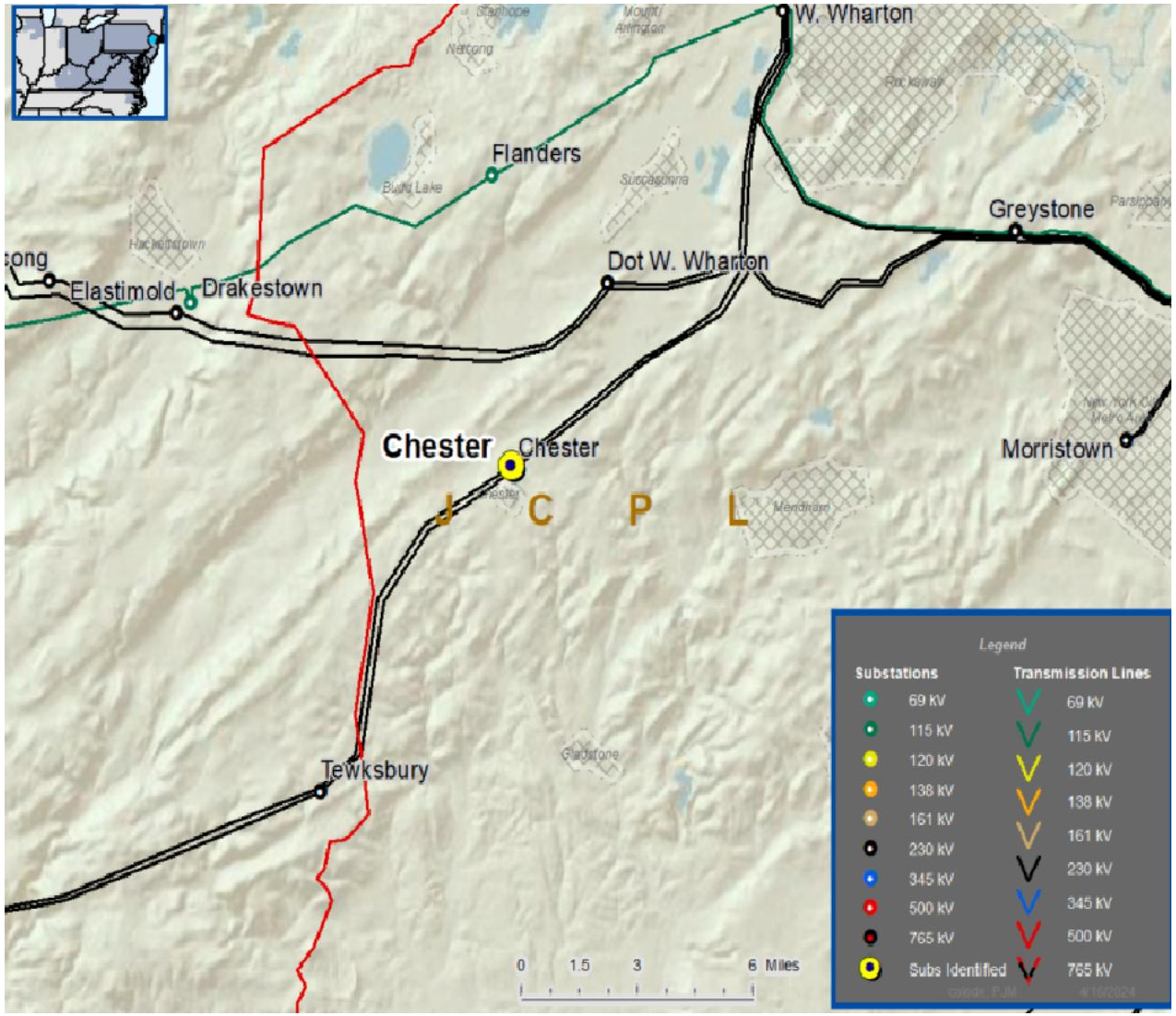
Project Driver: Equipment Condition/Performance/Risk

Specific Assumption References:

System Performance Projects Global Factors - System reliability and performance - Substation/line equipment limits Add/Replace Transformers Past System Reliability/Performance

Problem Statement:

- The Chester No. 4 230-34.5 kV Transformer is approximately 46 years old and is approaching end of life.
- The transformer has elevated ethane gas in the transformer oil.
- The transformer is limited by terminal equipment.
- Existing Transformer Ratings:
  - 75 / 90 / 94 / 100 MVA (SN/SSTE/WN/WSTE)



JCPL Transmission Zone M-3 Process
Chester No. 4 230-34.5 kV Transformer

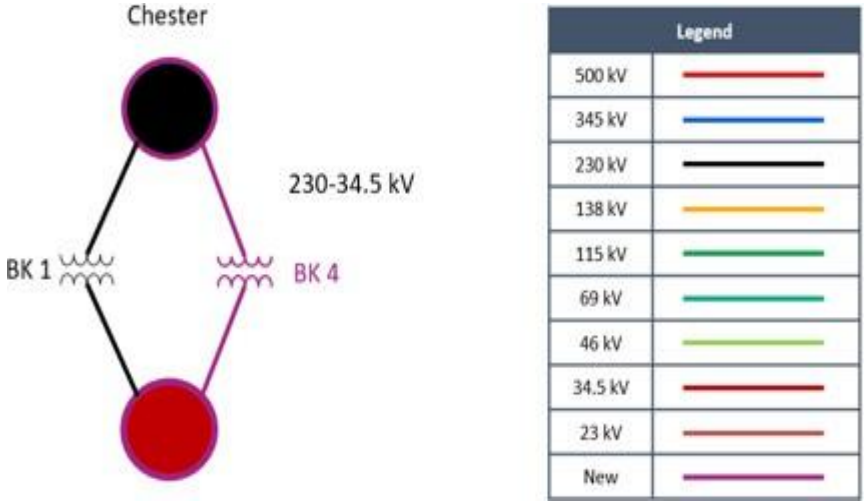
Need number: JCPL-2024-021
Process Stage: Submission of Supplemental Projects for Inclusion in the Local Plan

Selected Solution:

Chester No. 4 230-34.5 kV Transformer:

- Replace No. 4 230-34.5 kV Transformer at Chester Substation.
- Replace associated 230 kV Circuit Switcher Replace associated 34.5 kV Breaker.
- Replace Limiting Terminal Components - SCCIR, RT, CT, OC, DS.

Estimated Project Cost: $7.3 M
Projected In-Service: 12/31/2029
Supplemental Project ID: s3617.1



JCPL Transmission Zone M-3 Process
Larrabee No. 3 230-34.5 kV Transformer

Need Number: JCPL-2024-023

Process Stage: Submission of Supplemental Projects for Inclusion in the Local Plan

Previously Presented: Solution Meeting 02/04/2025
Need Meeting 04/30/2024

Project Driver

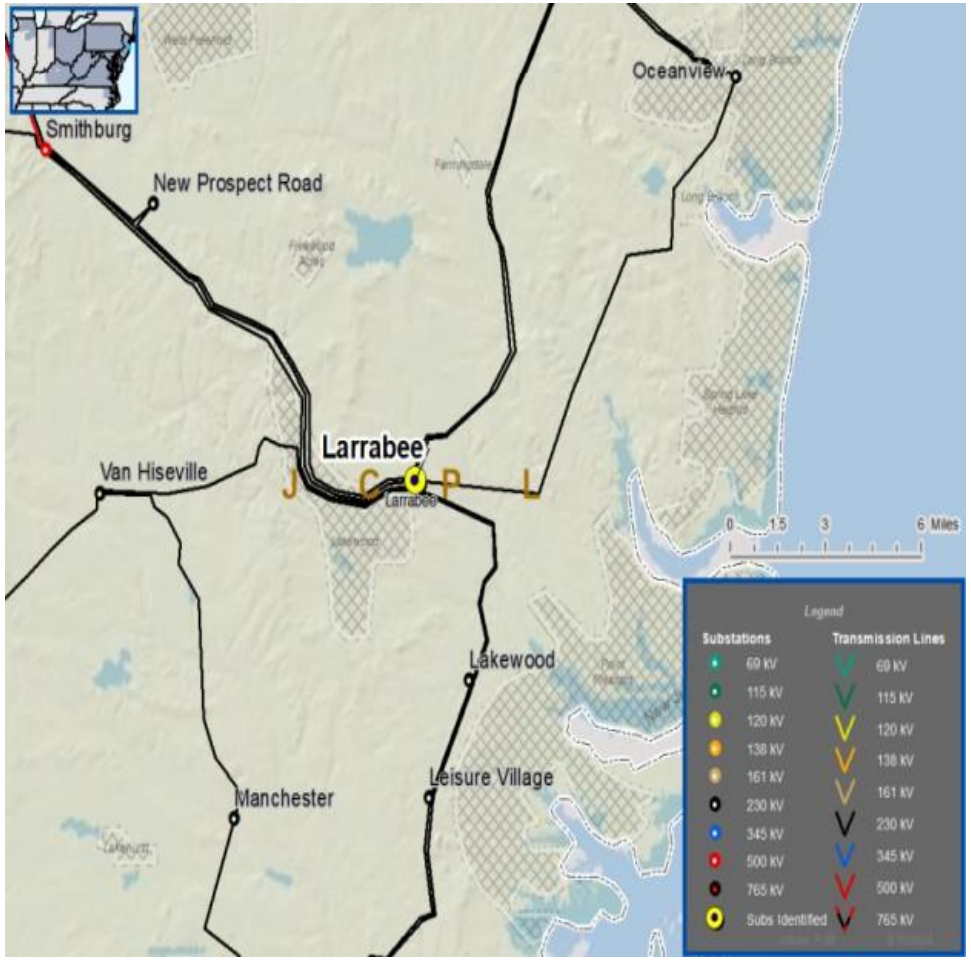
Equipment Condition/Performance/Risk

Specific Assumption References:

System Performance Projects Global Factors - System reliability and performance - Substation/line equipment limits Add/Replace Transformers Past System Reliability/Performance

Problem Statement:

- The Larrabee No. 3 230-34.5 kV Transformer is approximately 47 years old and is approaching end of life.
- The transformer is experiencing issues with the radiators leaking oil.
- The transformer has increased levels of water and carbon monoxide in the transformer oil.
- The transformer is limited by terminal equipment.
- Existing Transformer Ratings:
  - 137 / 174 / 171 / 201 MVA (SN/SSTE/WN/WSTE)



JCPL Transmission Zone M-3 Process
Larrabee No. 3 230-34.5 kV Transformer

Need number: JCPL-2024-023

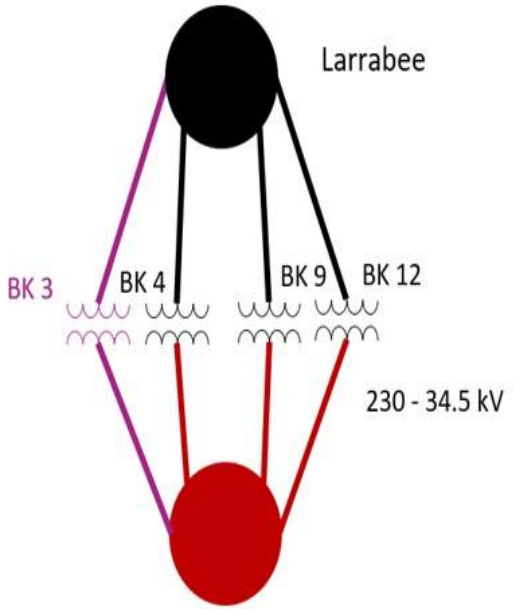
Process Stage: Submission of Supplemental Projects for Inclusion in the Local Plan

Selected Solution:

Larrabee No. 3 230-34.5 kV Transformer:

- Replace the 230-34.5 kV No. 3 transformer at Larrabee Substation.
- Replace 230 kV MOAB Replace 34.5 kV circuit breaker and disconnect switches.
- Upgrade transformer relaying.

Estimated Project Cost: $7.3 M
Projected In-Service: 04/12/2027
Supplemental Project ID: s3619.1



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

JCPL Transmission Zone M-3 Process
Vernon No. 4 115-34.5 kV Transformer

Need Number: JCPL-2024-025

Process Stage: Submission of Supplemental Projects for Inclusion in the Local Plan

Previously Presented: Solution Meeting – 11/14/2024
Need Meeting – 05/16/2024

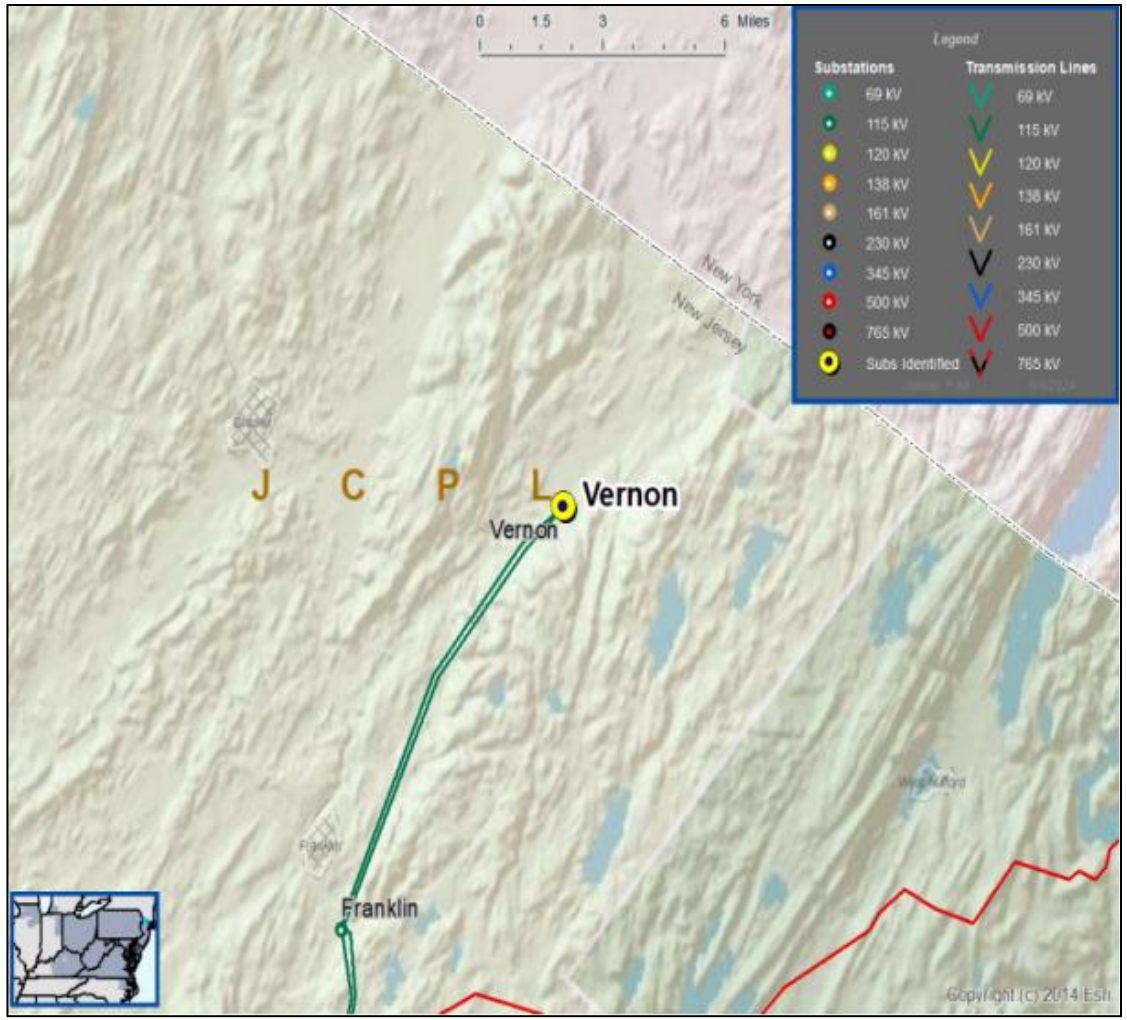
Project Driver:
Equipment Material Condition, Performance and Risk

Specific Assumption Reference:
System Performance Projects Global Factors
- System reliability and performance
- Substation/line equipment limits

Add/Replace Transformers
Past System Reliability/Performance

Problem Statement:
- The Vernon No. 4 115-34.5 kV Transformer is approximately 50 years old and is approaching end of life.
- The transformer has elevated ethane dissolved combustible gas in the transformer oil as compared to IEEE standards.
- The transformer relaying is obsolete.
- The transformer circuit is limited by terminal equipment.

Existing Transformer Ratings:
- 59 / 59 MVA (SN/SSTE)
- 59 / 59 MVA (WN/WSTE)



JCPL Transmission Zone M-3 Process
Vernon No. 4 115-34.5 kV Transformer

Need Number: JCPL-2024-025

Process Stage: Submission of Supplemental Projects for Inclusion in the Local Plan

Selected Solution:

- Replace the No. 4 115-34.5 kV Transformer at Vernon Substation
- Replace the 115 kV circuit switcher with a circuit breaker
- Replace the 34.5 kV circuit breaker
- Upgrade transformer relaying

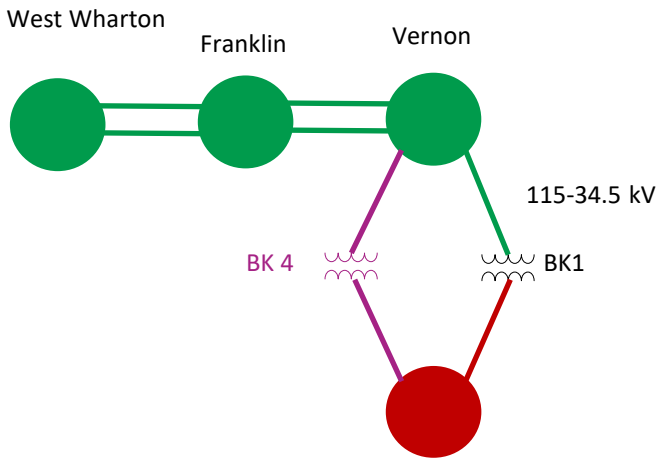
Transformer Ratings:

- Vernon No. 4 115-34.5 kV Transformer:
  - Before Proposed Solution: 59 / 59 / 59 / 59 MVA (SN/SSTE/WN/WSTE)
  - After Proposed Solution (anticipated): 125 / 162 / 150 / 194 MVA (SN/SSTE/WN/WSTE)

Estimated Project Cost: $7M

Projected In-Service: 8/31/2029

Supplemental Project ID: s3612.1



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

JCPL Transmission Zone M-3 Process
Deep Run No. 2 115-34.5 kV Transformer

Need Number: JCPL-2024-026
Process Stage: Submission of Supplemental Projects for Inclusion in the Local Plan
Previously Presented: Solution Meeting – 11/14/2024
Need Meeting – 05/16/2024

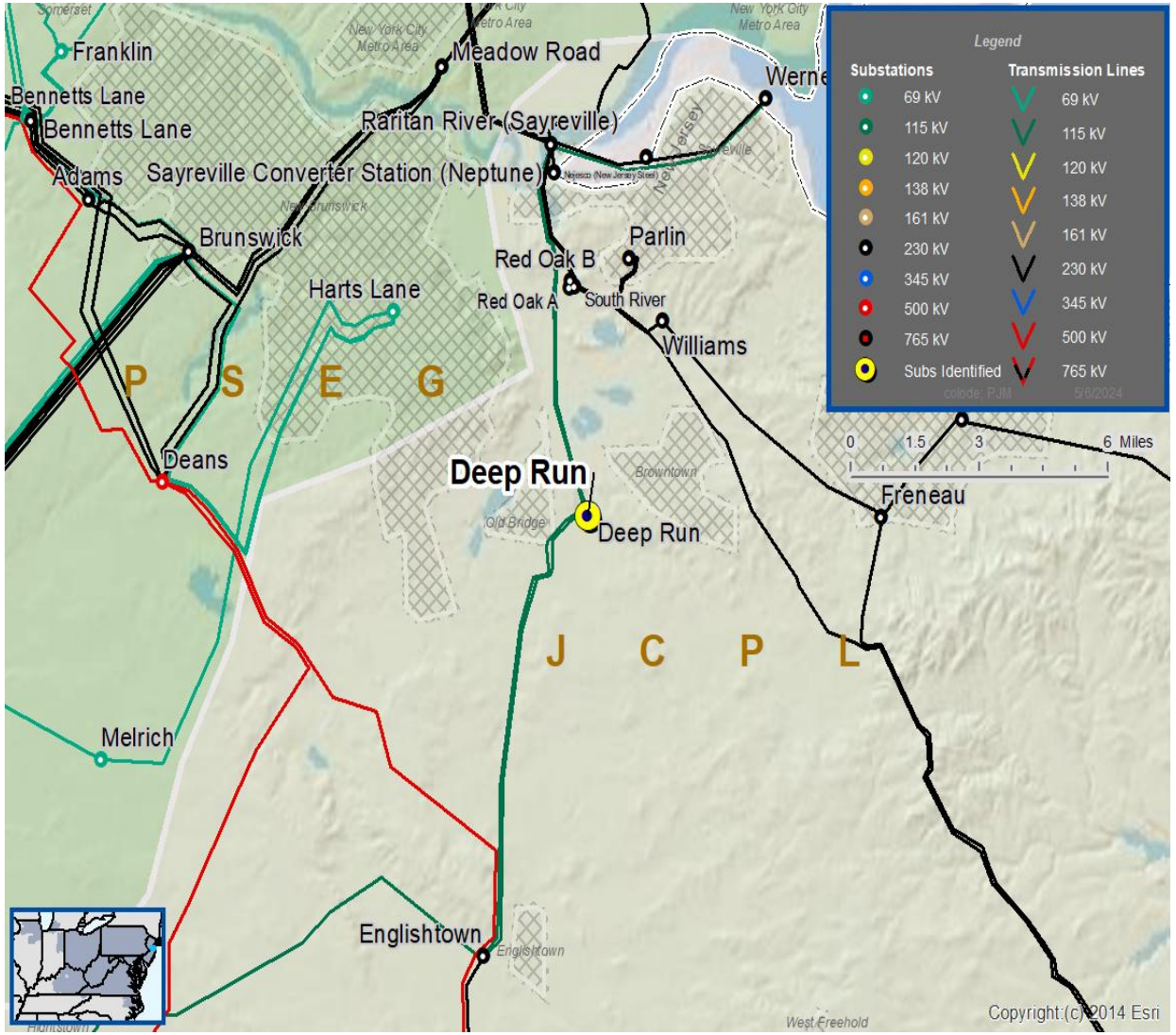
Project Driver:
Equipment Material Condition, Performance and Risk

Specific Assumption Reference:
System Performance Projects Global Factors
- System reliability and performance

Add/Replace Transformers
Past System Reliability/Performance

Problem Statement:
- The Deep Run No. 2 115-34.5 kV Transformer is approximately 49 years old and is approaching end of life.
- The transformer has elevated ethane dissolved combustible gas in the transformer oil as compared to IEEE standards.
- In recent years, there have been pump and fan failures requiring repairs.
- The transformer relaying is obsolete.

Existing Transformer Ratings:
- 128 / 157 MVA (SN/SSTE)
- 163 / 165 MVA (WN/WSTE)



JCPL Transmission Zone M-3 Process
Deep Run No. 2 115-34.5 kV Transformer

Need Number: JCPL-2024-026

Process Stage: Submission of Supplemental Projects for Inclusion in the Local Plan

Selected Solution:

- Replace the No. 2 115-34.5 kV Transformer at Deep Run Substation.
- Replace 115 kV circuit switcher with circuit breaker
- Upgrade transformer relaying

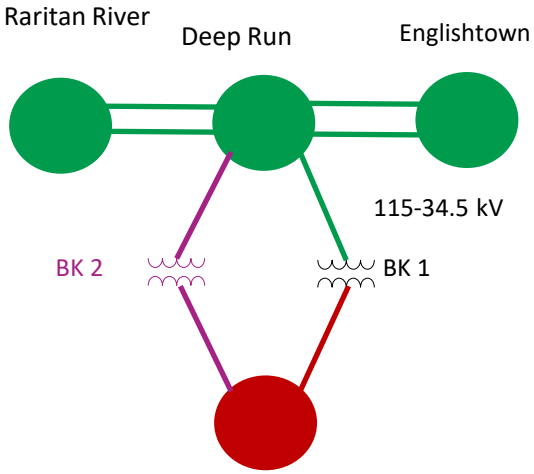
Transformer Ratings:

- Deep Run No. 2 115-34.5 kV Transformer:
  - Before Proposed Solution: 128 / 157 / 163 / 165 MVA (SN/SSTE/WN/WSTE)
  - After Proposed Solution: 160 / 164 / 202 / 205 MVA (SN/SSTE/WN/WSTE)

Estimated Project Cost: $8M

Projected In-Service: 12/31/2027

Supplemental Project ID: s3614.1



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

JCPL Transmission Zone M-3 Process
Gilbert No. 2 and No. 3 115-34.5-13.2 kV Transformers

Need Number: JCPL-2024-027

Process Stage: Submission of Supplemental Projects for Inclusion in the Local Plan

Previously Presented: Solution Meeting – 11/14/2024
Need Meeting – 05/16/2024

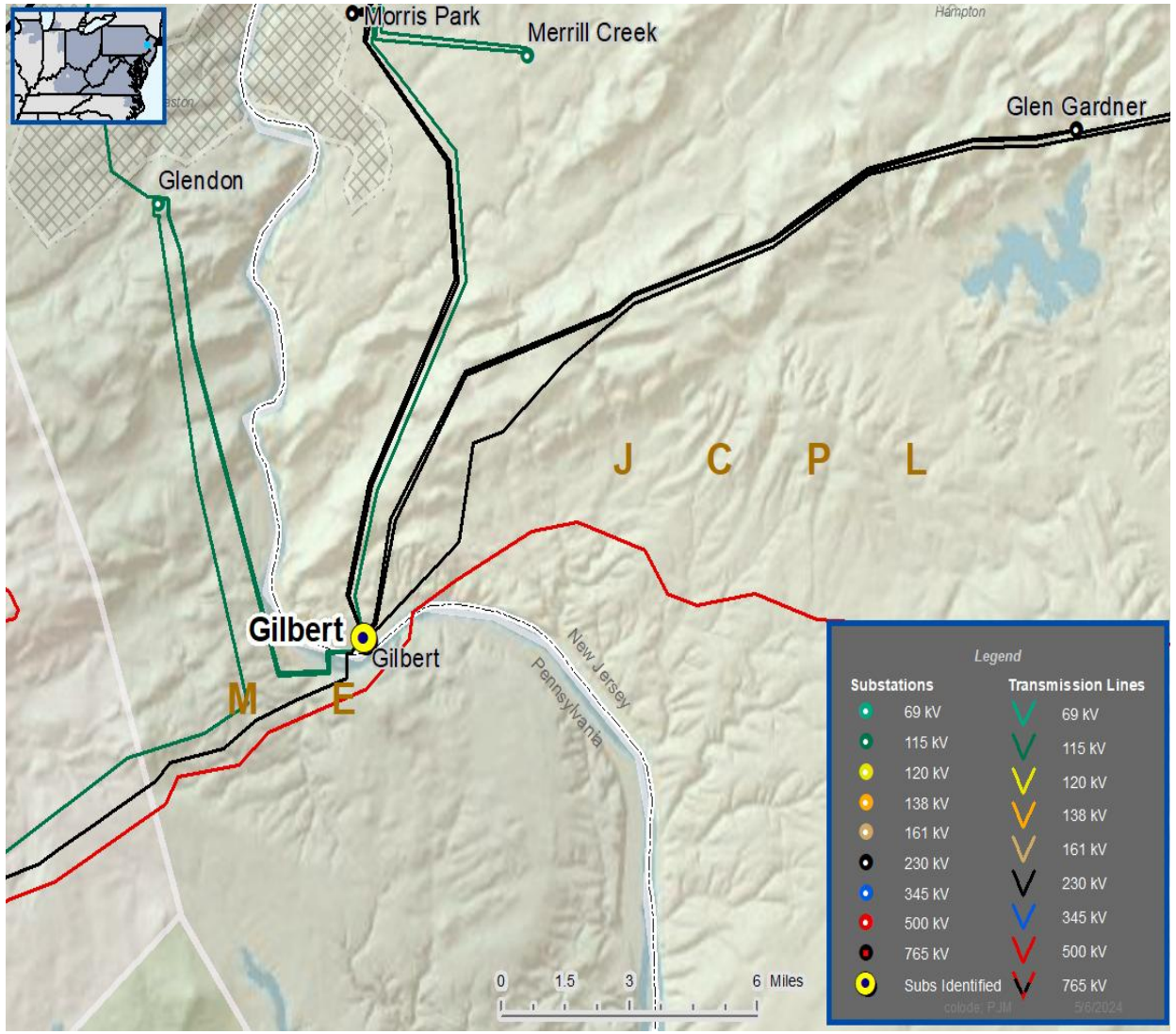
Project Driver:
Equipment Material Condition, Performance and Risk

Specific Assumption Reference:
System Performance Projects Global Factors
- System reliability and performance

Add/Replace Transformers
Past System Reliability/Performance

Problem Statement:
- The Gilbert No. 2 and No. 3 115-34.5-13.2 kV Transformers are 75 years old and approaching end of life.
- Gilbert No. 2 Transformer has elevated ethane dissolved combustible gas in the transformer oil as compared to IEEE standards.
- Gilbert No. 3 Transformer has high oxygen content and slightly low dielectric strength associated with the transformer oil.
- Both transformers are leaking nitrogen and have obsolete relaying.

Existing Gilbert No. 2 and No. 3 115-34.5-13.2 kV Transformer Ratings:
- 77 / 100 MVA (SN/SSTE)
- 102 / 116 MVA (WN/WSTE)



JCPL Transmission Zone M-3 Process
Gilbert No. 2 and No. 3 115-34.5-13.2 kV Transformers

Need Number: JCPL-2024-027

Process Stage: Submission of Supplemental Projects for Inclusion in the Local Plan

Selected Solution:

- Replace the No. 2 and No. 3 115-34.5-13.2 kV Transformers at Gilbert substation with one new unit
- Upgrade transformer relaying

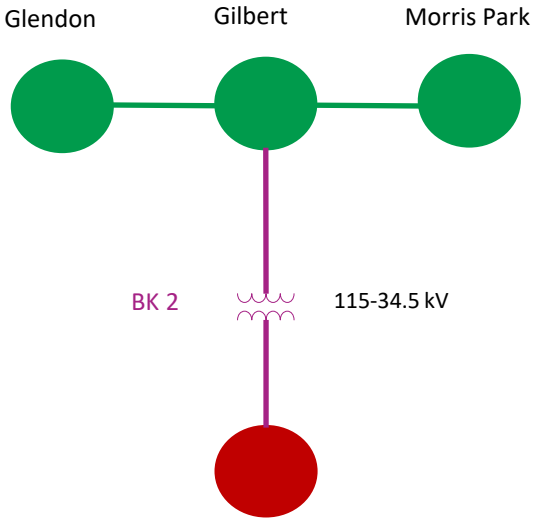
Transformer Ratings:

- Gilbert No. 2 115-34.5-13.2 kV Transformer:
  - Before Proposed Solution: 77 / 100 / 102 / 116 MVA (SN/SSTE/WN/WSTE)
  - After Proposed Solution: 125 / 162 / 150 / 194 MVA (SN/SSTE/WN/WSTE)

Estimated Project Cost: $8M

Projected In-Service: 12/31/2028

Supplemental Project ID: s3616.1



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

JCPL Transmission Zone M-3 Process
Englishtown No. 1 115-34.5 kV Transformer

Need Number: JCPL-2024-028

Process Stage: Submission of Supplemental Projects for Inclusion in the Local Plan

Previously Presented: Solution Meeting – 11/14/2024
Need Meeting – 05/16/2024

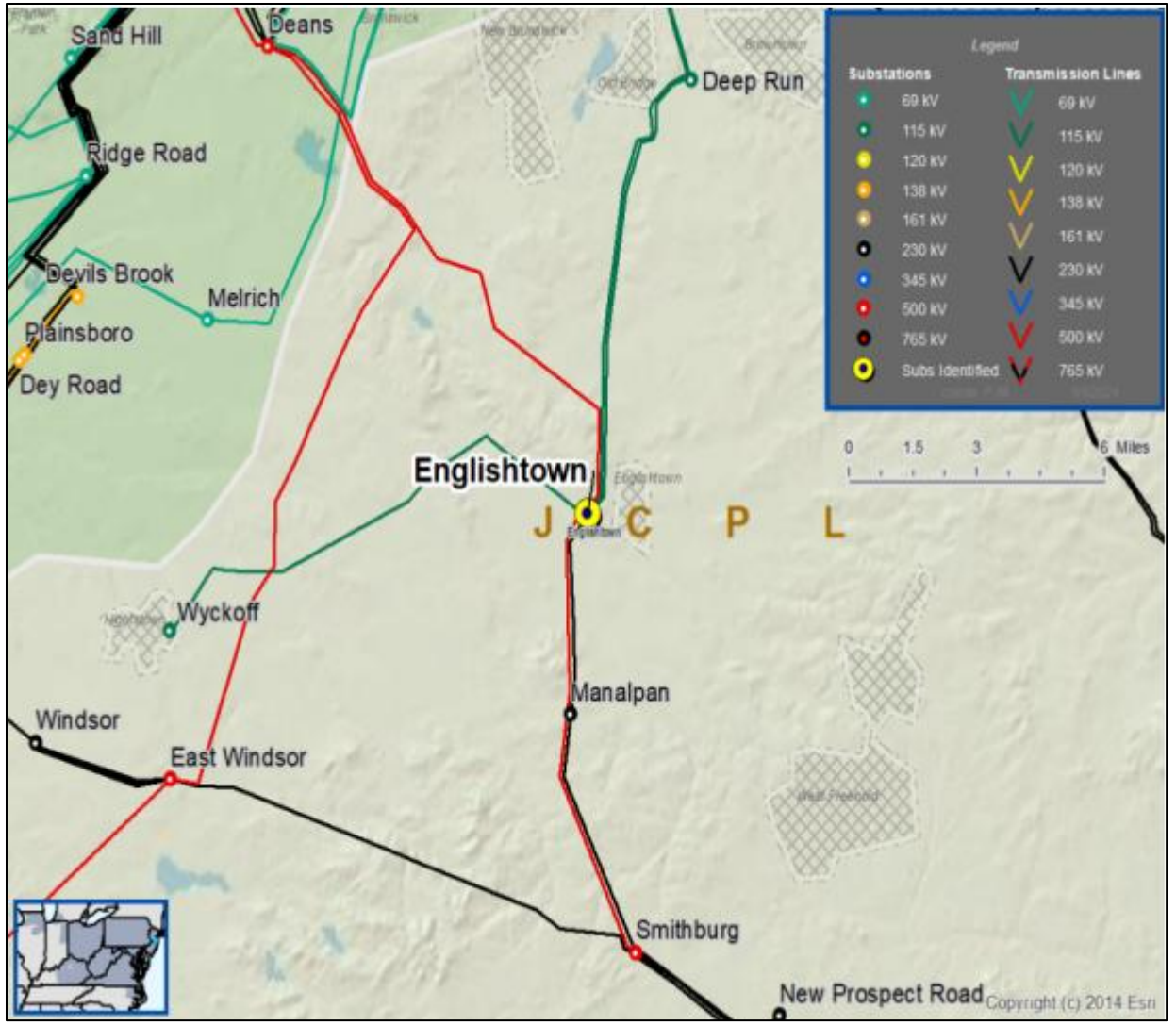
Project Driver:
Equipment Material Condition, Performance and Risk

Specific Assumption Reference:
System Performance Projects Global Factors
- System reliability and performance

Add/Replace Transformers
Past System Reliability/Performance

Problem Statement:
- The Englishtown No. 1 115-34.5 kV Transformer is approximately 69 years old and is approaching end of life.
- Recent inspections show ethane combustible dissolved gas is elevated in the transformer oil as compared to IEEE standards.
- The transformer is leaking nitrogen and has obsolete relaying.

Existing Transformer Ratings:
- 62 / 82 MVA SN/SSTE
- 82 / 93 MVA WN/WSTE



JCPL Transmission Zone M-3 Process
Englishtown No. 1 115-34.5 kV Transformer

Need Number: JCPL-2024-028

Process Stage: Submission of Supplemental Projects for Inclusion in the Local Plan

Selected Solution:

- Replace the No. 1 115-34.5 kV Transformer at Englishtown Substation
- Replace 115 kV circuit switcher with circuit breaker
- Upgrade transformer relaying

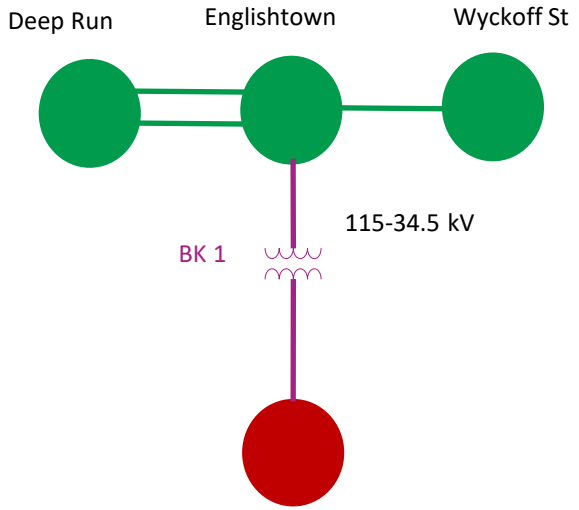
Transformer Ratings:

- Englishtown No. 1 115-34.5 kV Transformer:
  - Before Proposed Solution: 62 / 82 / 82 / 93 MVA (SN/SSTE/WN/WSTE)
  - After Proposed Solution: 125 / 162 / 150 / 194 MVA (SN/SSTE/WN/WSTE)

Estimated Project Cost: $7M

Projected In-Service: 12/31/2027

Supplemental Project ID: s3618.1



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

JCPL Transmission Zone M-3 Process
Raritan River (Sayreville), NJ

Need Number: JCPL-2024-029
Process Stage: Submission of Supplemental Projects for Inclusion in the Local Plan
Previously Presented: Solution Meeting - 04/10/2025
Need Meeting - 05/16/2024

Project Driver:
Equipment Condition/Performance/Risk

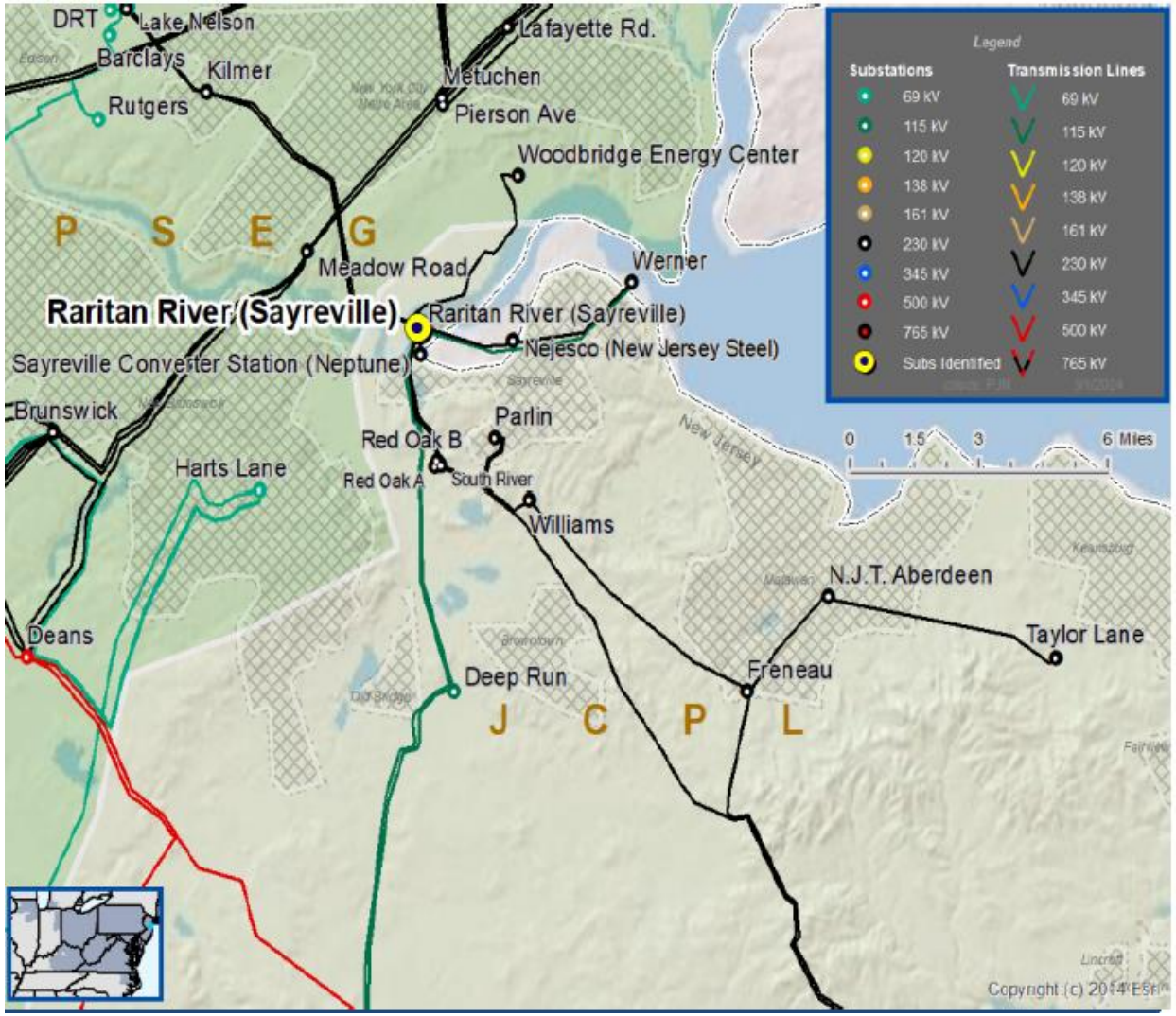
Specific Assumption References:
System Performance Projects Global Factors - System reliability and performance Add/Replace Transformers Past System Reliability/Performance

Problem Statement:

- The Raritan River No. 4 115-34.5 kV Transformer is approximately 57 years old and is approaching end of life.
- The transformer was rewound in 1992.
- Ethane/ethylene combustible dissolved gas ratio and high furan count indicate the paper insulation has deteriorated.
- The transformer has experienced numerous oil leaks requiring repair.
- The transformer relaying is obsolete.
- The transformer circuit is limited by terminal equipment.

Existing Transformer Ratings:

- 102 / 122 MVA (SN/SSTE)
- 125 / 139 MVA (WN/WSTE)



JCPL Transmission Zone M-3 Process
Raritan River (Sayreville), NJ

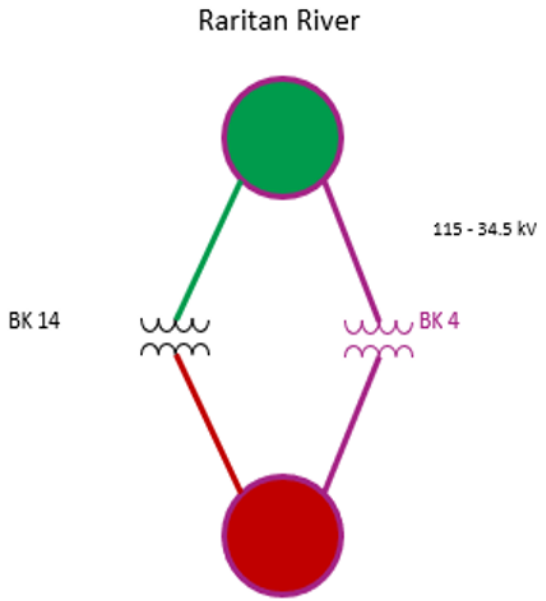
Need number: JCPL-2024-029
Process Stage: Submission of Supplemental Projects for Inclusion in the Local Plan

Selected Solution:

Raritan River No. 4 115-34.5 kV Transformer:

- Replace No.4 115-34.5 kV Transformer at Raritan River Substation
- Replace 115 kV Circuit Switcher with 115 kV Circuit Breaker
- Replace 115 kV Disconnect Switches
- Replace 34.5 kV Disconnect Switches
- Replace limiting substation conductor and relaying

Estimated Project Cost: $6.91 M
Projected In-Service: 03/30/2029
Supplemental Project ID: s3639.1



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

JCPL Transmission Zone M-3 Process
Windsor – Wyckoff Street 34.5 kV M65 Line Customer Connection

Need Number: JCPL-2024-034

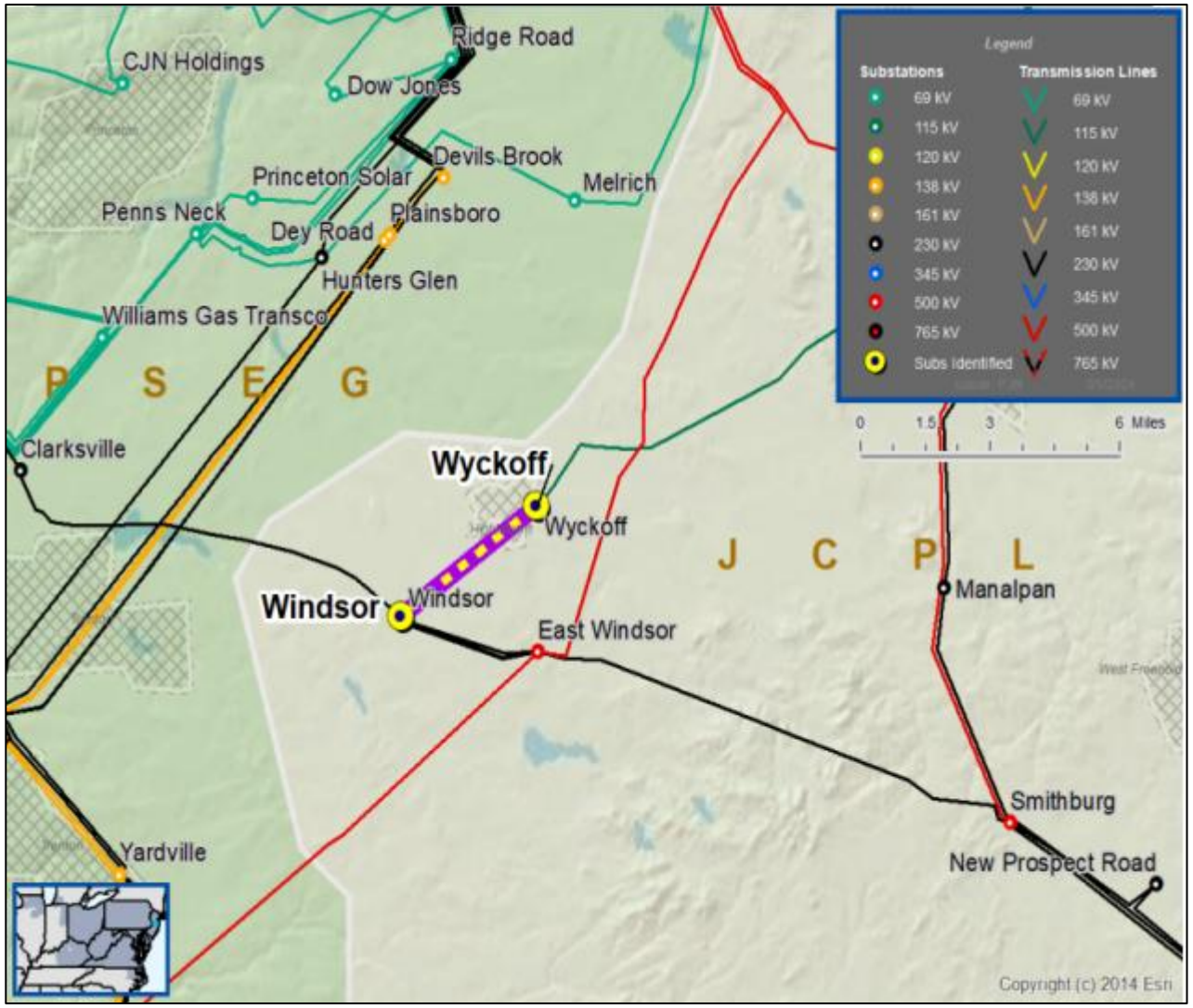
Process Stage: Submission of Supplemental Projects for Inclusion in the Local Plan

Previously Presented: Solution Meeting – 10/17/2024
Need Meeting – 05/16/2024

Project Driver:
Customer Service

Specific Assumption Reference:
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 retail customer requested 34.5 kV service for load of approximately 96 MVA near the Windsor – Wyckoff Street 34.5 kV M65 Line. The request is approximately two miles from Windsor Substation.



JCPL Transmission Zone M-3 Process
Windsor – Wyckoff Street 34.5 kV M65 Line Customer Connection

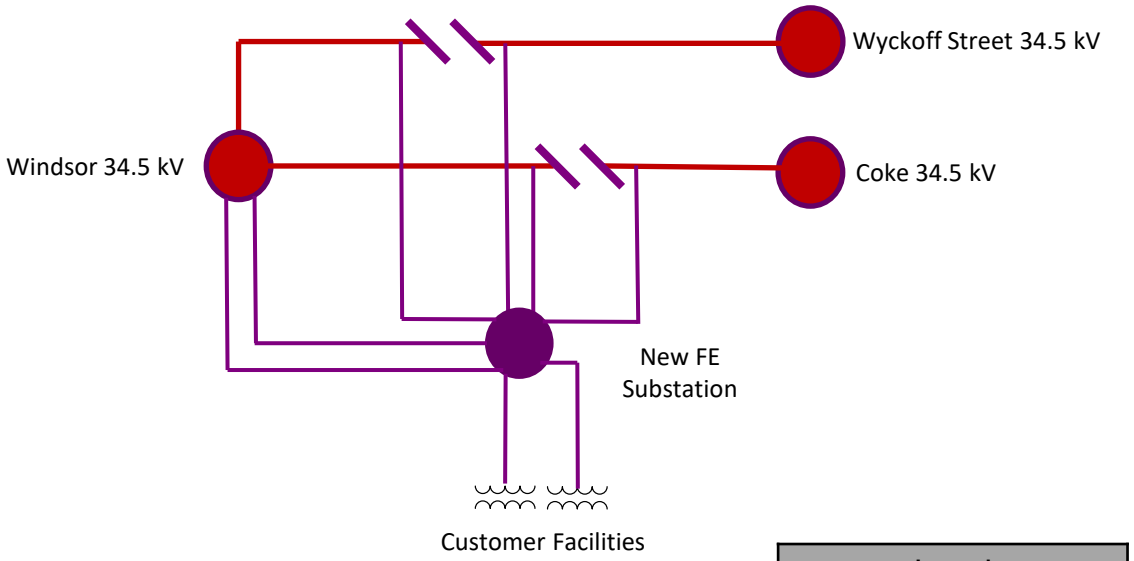
Need Number: JCPL-2024-034
Process Stage: Submission of Supplemental Projects for Inclusion in the Local Plan

Selected Solution:

New 12-Breaker Substation

- Build a new 12-breaker, breaker-and-a-half substation
- Cut into the Windsor – Wyckoff Street M65 34.5 kV Line near structure #533 and construct approximately 1-2 spans of transmission line from the M65 line to the new FE substation.
- Cut into the Windsor – Wyckoff Street J136 34.5 kV Line near structure #53 and construct approximately two 1.2-mile transmission lines from the J136 line to the new FE substation.
- Install three new 34.5 kV breakers at Windsor Substation and build two 3.0-mile transmission lines from Windsor Substation to the new FE substation on shared structures.
- Build two spans of transmission line from the new substation to the POI with the Customer.
- Install two 34.5 kV revenue metering packages at customer substation
- Modify relay settings at Wyckoff Street, Windsor, Coke and McGraw Hill substations

Estimated Project Cost: $54M
Projected In-Service: 7/24/2027
Supplemental Project ID: s3621.1



JCPL Transmission Zone M-3 Process
Franklin No. 1 115-34.5 kV Transformer

Need Number: JCPL-2024-036

Process Stage: Submission of Supplemental Projects for Inclusion in the Local Plan

Previously Presented: Solution Meeting - 04/10/2025
Need Meeting 05/16/2024

Project Driver:
Equipment Condition/Performance/Risk

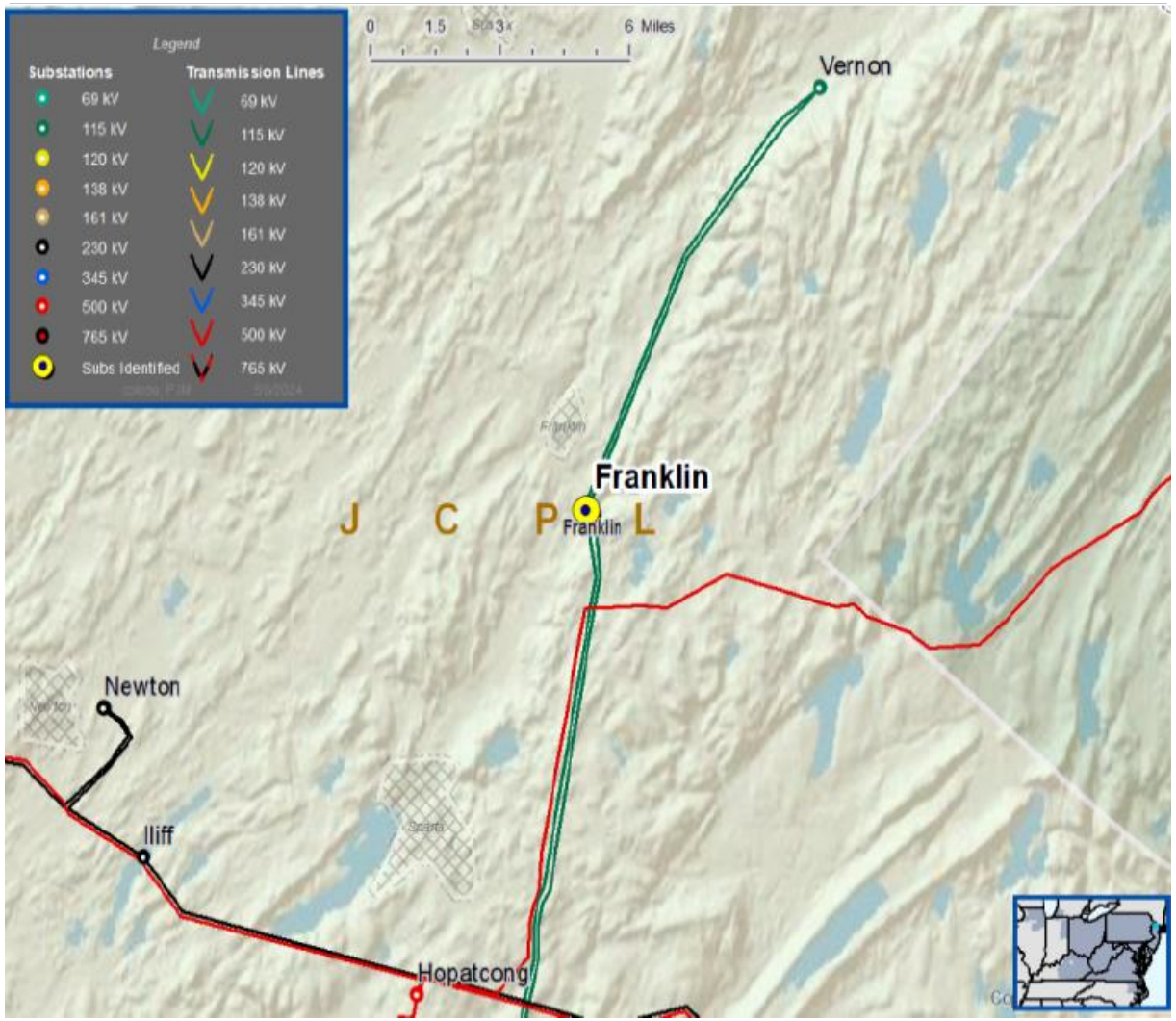
Specific Assumption References:
System Performance Projects Global Factors - System reliability and performance - Substation/line equipment limits Add/Replace Transformers Past System Reliability/Performance

Problem Statement:

- The Franklin No. 1 115-34.5 kV Transformer is approximately 49 years old and is approaching end of life.
- The transformer has elevated ethane dissolved combustible gas in the transformer oil as compared to IEEE standards.
- The transformer relaying is obsolete.
- The transformer circuit is limited by terminal equipment.

Existing Transformer Ratings:

- 65 / 72 MVA (SN/SSTE)
- 72 / 72 MVA (WN/WSTE)



JCPL Transmission Zone M-3 Process
Franklin No. 1 115-34.5 kV Transformer

Need number: JCPL-2024-036

Process Stage: Submission of Supplemental Projects for Inclusion in the Local Plan

Selected Solution:

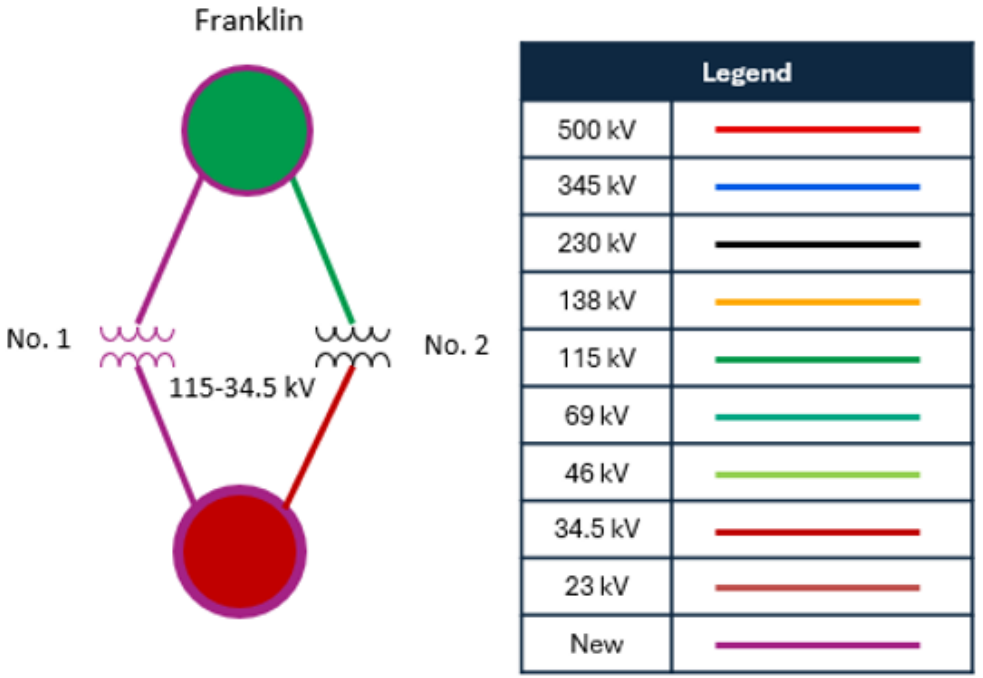
Franklin No. 1 115-34.5 kV Transformer:

- Replace 115-34.5 kV Transformer No.1 at Franklin Substation
- Replace limiting substation conductor and relaying.

Estimated Project Cost: $6M

Projected In-Service: 12/28/2029

Supplemental Project ID: s3636.1



JCPL Transmission Zone M-3 Process
Pequest River No. 1 115-34.5 kV Transformer

Need Number: JCPL-2024-037

Process Stage: Submission of Supplemental Projects for Inclusion in the Local Plan

Previously Presented: Solution Meeting - 04/10/2025
Need Meeting 05/16/2024

Project Driver:

Equipment Condition/Performance/Risk

Specific Assumption References:

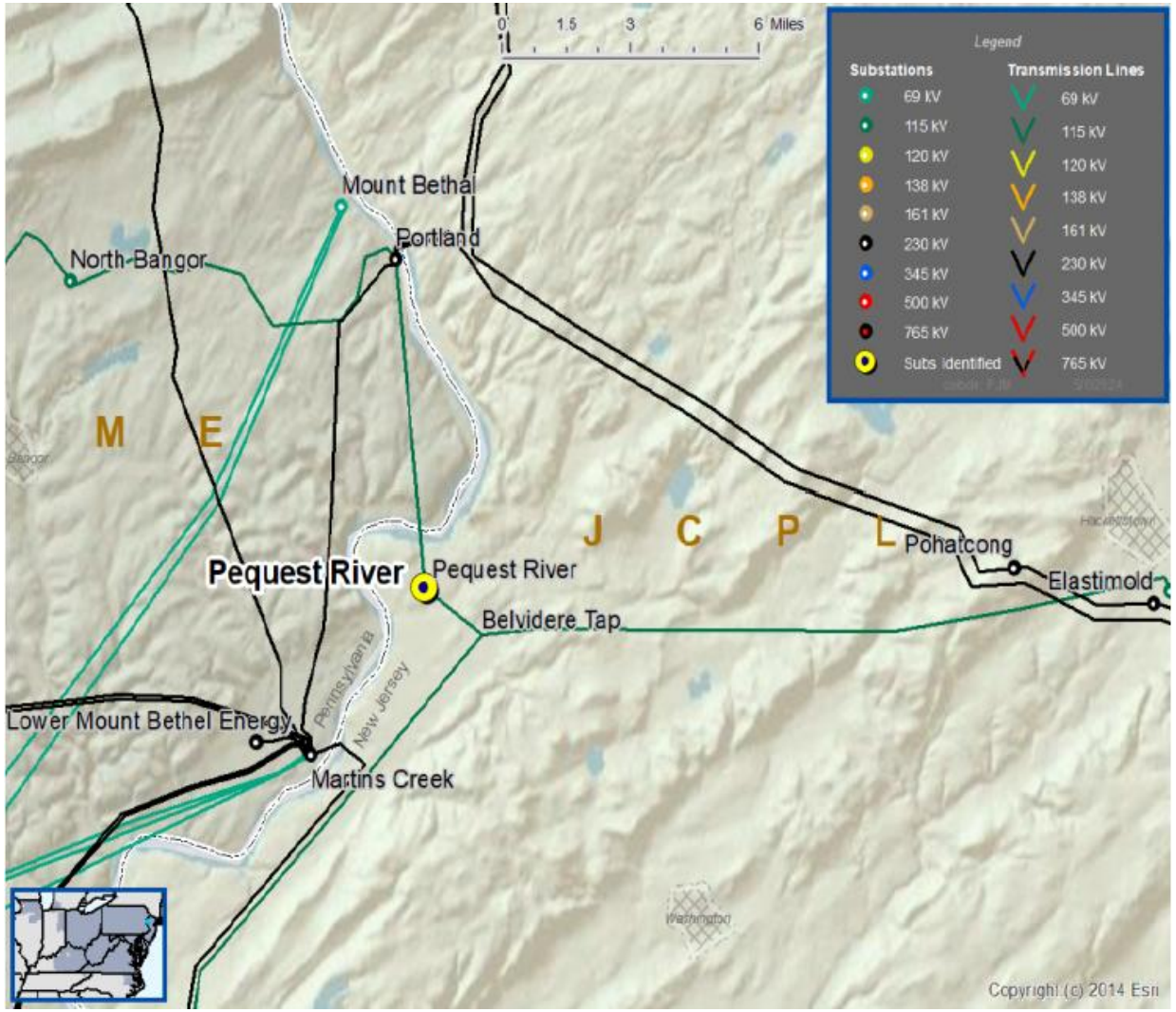
System Performance Projects Global Factors - System reliability and performance
Add/Replace Transformers Past System Reliability/Performance

Problem Statement:

- The Pequest River No. 1 115-34.5 kV Transformer is approximately 70 years old and is approaching end of life.
- The transformer is leaking nitrogen, has low dielectric strength and high moisture content.
- The transformer relaying is obsolete.

Existing Transformer Ratings:

- 58 / 63 MVA (SN/SSTE)
- 77 / 78 MVA (WN/WSTE)



JCPL Transmission Zone M-3 Process
Pequest River No. 1 115-34.5 kV Transformer

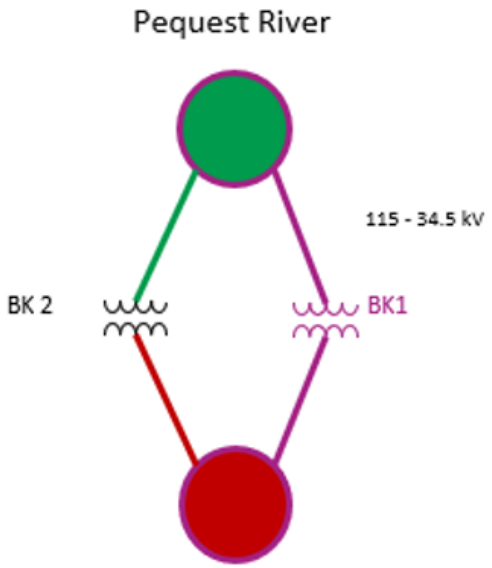
Need number: JCPL-2024-037
Process Stage: Submission of Supplemental Projects for Inclusion in the Local Plan

Selected Solution:

Pequest River No. 1 115-34.5 kV Transformer:

- Replace No. 1 115-34.5 kV Transformer at Pequest River Substation
- Replace 34.5 kV Disconnect Switches
- Replace limiting substation conductor and relaying.

Estimated Project Cost: $6.9 M
Projected In-Service: 01/30/2030
Supplemental Project ID: s3638.1



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

JCPL Transmission Zone M-3 Process
Glen Gardner No. 2 230-34.5 kV Transformer

Need Number: JCPL-2024-043

Process Stage: Submission of Supplemental Projects for Inclusion in the Local Plan

Previously Presented: Solution Meeting 02/04/2025
Need Meeting 08/06/2024

Project Driver:

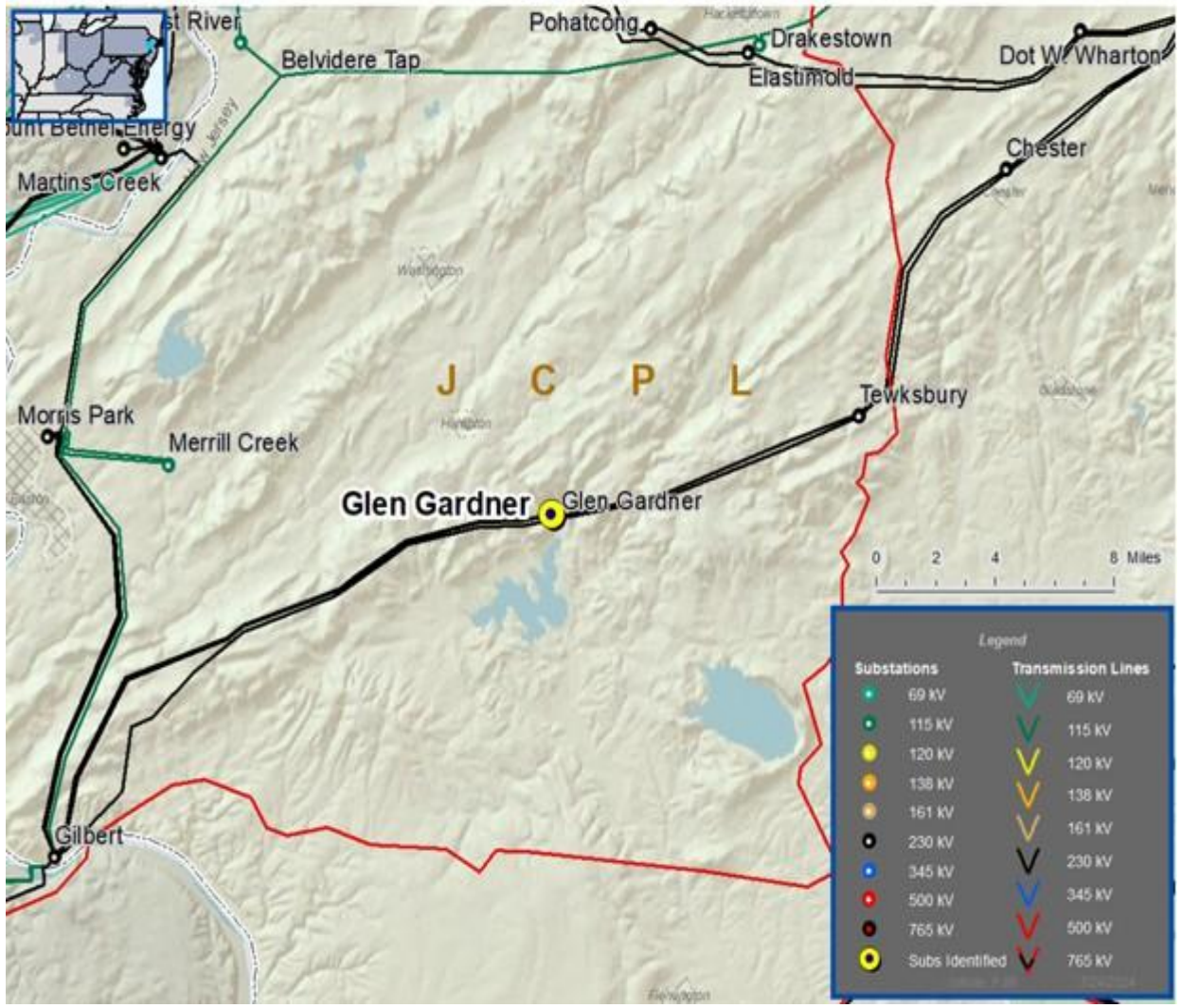
Equipment Condition/Performance/Risk

Specific Assumption References:

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

Problem Statement:

- The Glen Gardner No. 2 230-34.5 kV Transformer is approximately 57 years old and is approaching end of life.
- The transformer has increased levels of ethane, carbon monoxide and methane.
- The transformer has low dielectric strength.
- Existing Transformer Ratings:
  - 108 / 136 / 137 / 151 MVA (SN/SSTE/WN/WSTE)



JCPL Transmission Zone M-3 Process
Glen Gardner No. 2 230-34.5 kV Transformer

Need number: JCPL-2024-043

Process Stage: Submission of Supplemental Projects for Inclusion in the Local Plan

Selected Solution:

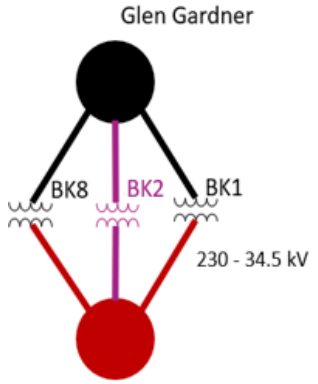
Glen Gardner No. 2 230-34.5 kV Transformer:

- Replace the 230-34.5 kV No. 2 Transformer at Glen Gardner substation.
- Replace 230 kV circuit switcher with circuit breaker.
- Replace 34.5 kV circuit breaker and disconnect switch
- Upgrade transformer relaying.

Estimated Project Cost: $7.5 M

Projected In-Service: 05/01/2025

Supplemental Project ID: s3620.1



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

JCPL Transmission Zone M-3 Process
Automatic Restoration Projects

Need Number: JCPL-2024-052

Process Stage: Submission of Supplemental Projects for Inclusion in the Local Plan

Previously Presented: Solution Meeting - 04/10/2025
Need Meeting 12/12/2024

Project Driver:

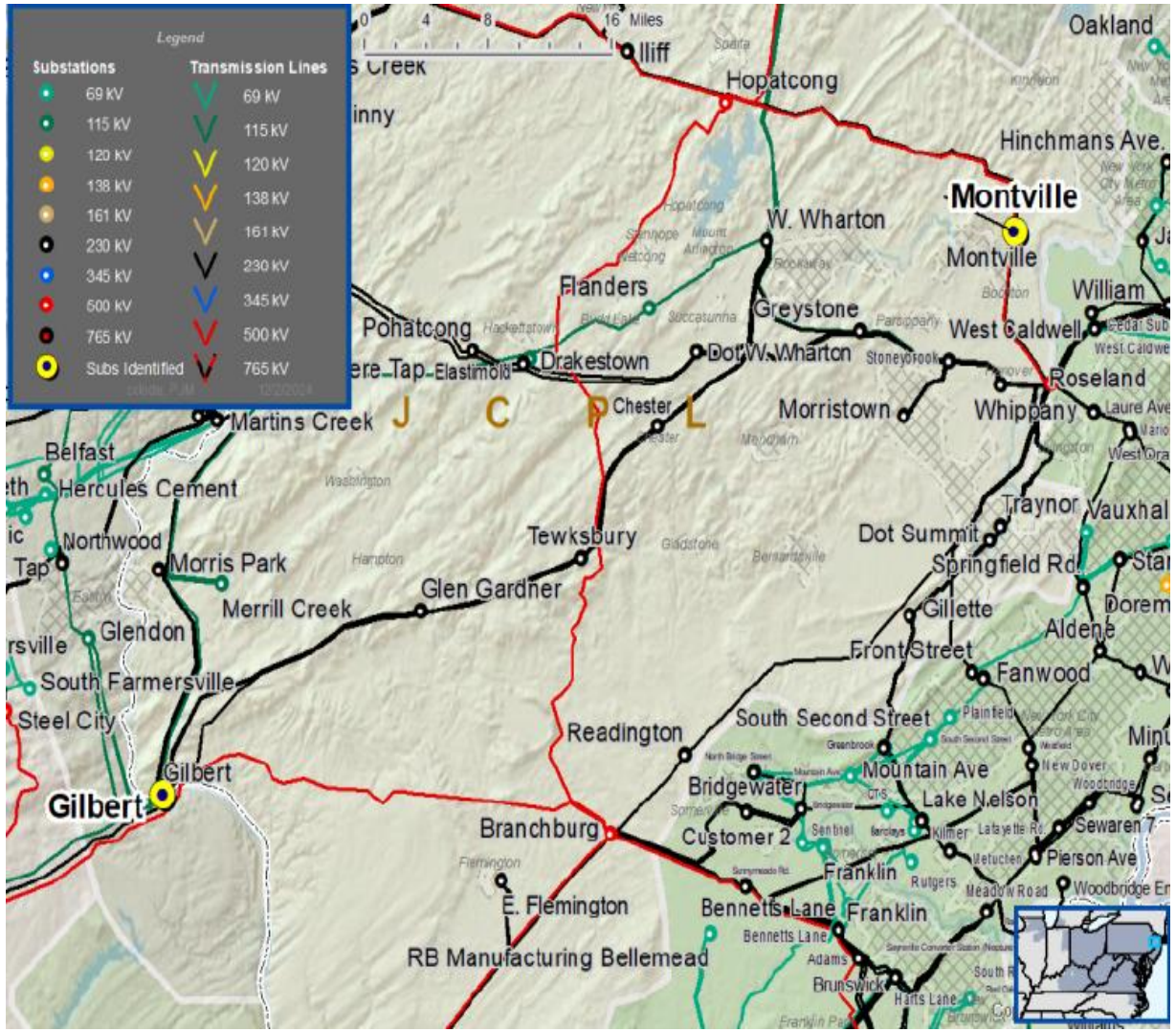
Equipment Condition/Performance/Risk

Specific Assumption References:

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

Problem Statement:

- There is a lack of automatic restoration of 34.5 kV lines following tripping events without the intervention of Transmission Operators.
- Manual restoration increases the risk of system constraints on adjacent facilities, especially for critical lines as identified by Transmission Operations.
- Obsolete electromechanical relay schemes. In many cases, the protection equipment cannot be repaired due to a lack of replacement parts and available expertise in the outdated technology. - Proper operation of the protection scheme requires all the separate components perform adequately during a fault.
- Transmission line ratings are limited by terminal equipment.
- Transmission Line / Substation Locations: Montville – Jacksonville Tap 34.5 kV L116 Line
  Existing Line Rating: 55 / 67 / 63 / 72 MVA (SN/SE/WN/WE)
  Existing Conductor Rating: 55 / 67 / 63 / 79 MVA (SN/SE/WN/WE)
- Transmission Line / Substation Locations: Montville – Jacksonville Tap 34.5 kV M117 Line
  Existing Line Rating: 55 / 67 / 63 / 72 MVA (SN/SE/WN/WE)
  Existing Conductor Rating: 55 / 67 / 63 / 79 MVA (SN/SE/WN/WE)



JCPL Transmission Zone M-3 Process
Montville, NJ

Need number: JCPL-2024-052
Process Stage: Submission of Supplemental Projects for Inclusion in the Local Plan

Selected Solution:

Montville Automatic Restoration Project:

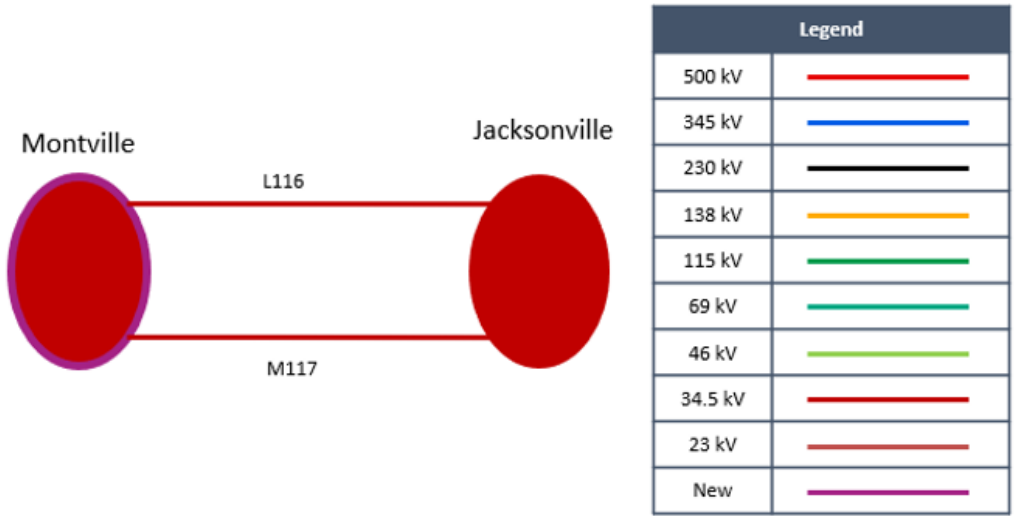
Montville - Riverdale 34.5 kV L116 Line

- Upgrade line protection at Montville Substation

Montville - Riverdale 34.5 KV M117 Line

- Upgrade line protection at Montville Substation.

Estimated Project Cost: $0.15 M
Projected In-Service: 07/05/2026
Supplemental Project ID: s3637.1



Revision History

09/26/2025 – V1
s3609
s3610
s3611
s3612
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