

Subregional RTEP Committee – Mid-Atlantic FirstEnergy Supplemental Projects

May 16, 2024

Needs

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

Need Number: JCPL-2024-025

Process Stage: 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

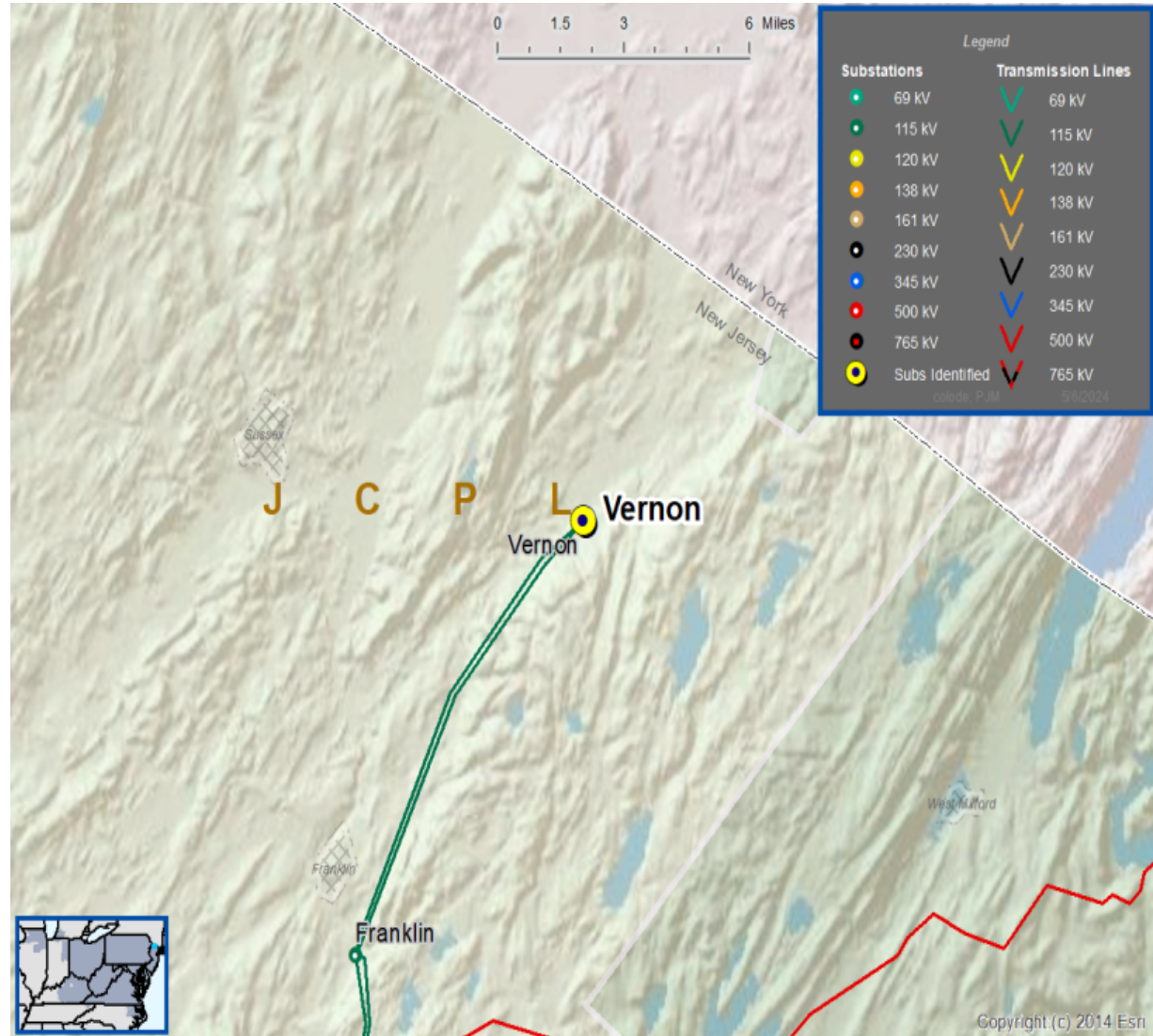
Past System Reliability/Performance

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- The transformer relaying is obsolete.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)



Need Number: JCPL-2024-026

Process Stage: Need Meeting – 05/16/2024

Project Driver:

Equipment Material Condition, Performance and Risk

Specific Assumption Reference:

System Performance Projects Global Factors

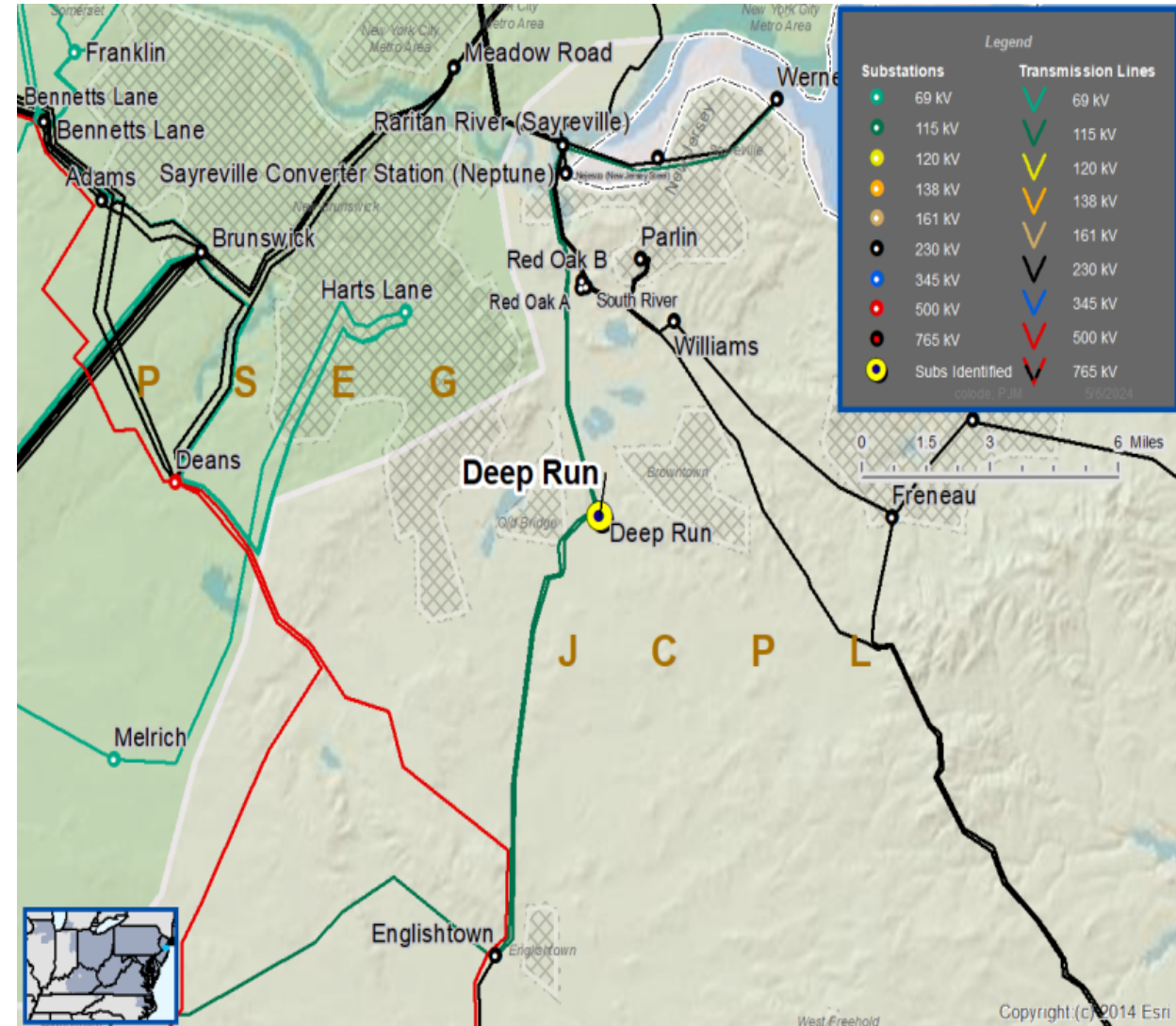
- System reliability and performance
- Add/Replace Transformers
- Past System Reliability/Performance

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 combustable 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- The transformer relaying is obsolete.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)



Need Number: JCPL-2024-027

Process Stage: Need Meeting – 05/16/2024

Project Driver:

Equipment Material Condition, Performance and Risk

Specific Assumption Reference:

System Performance Projects Global Factors

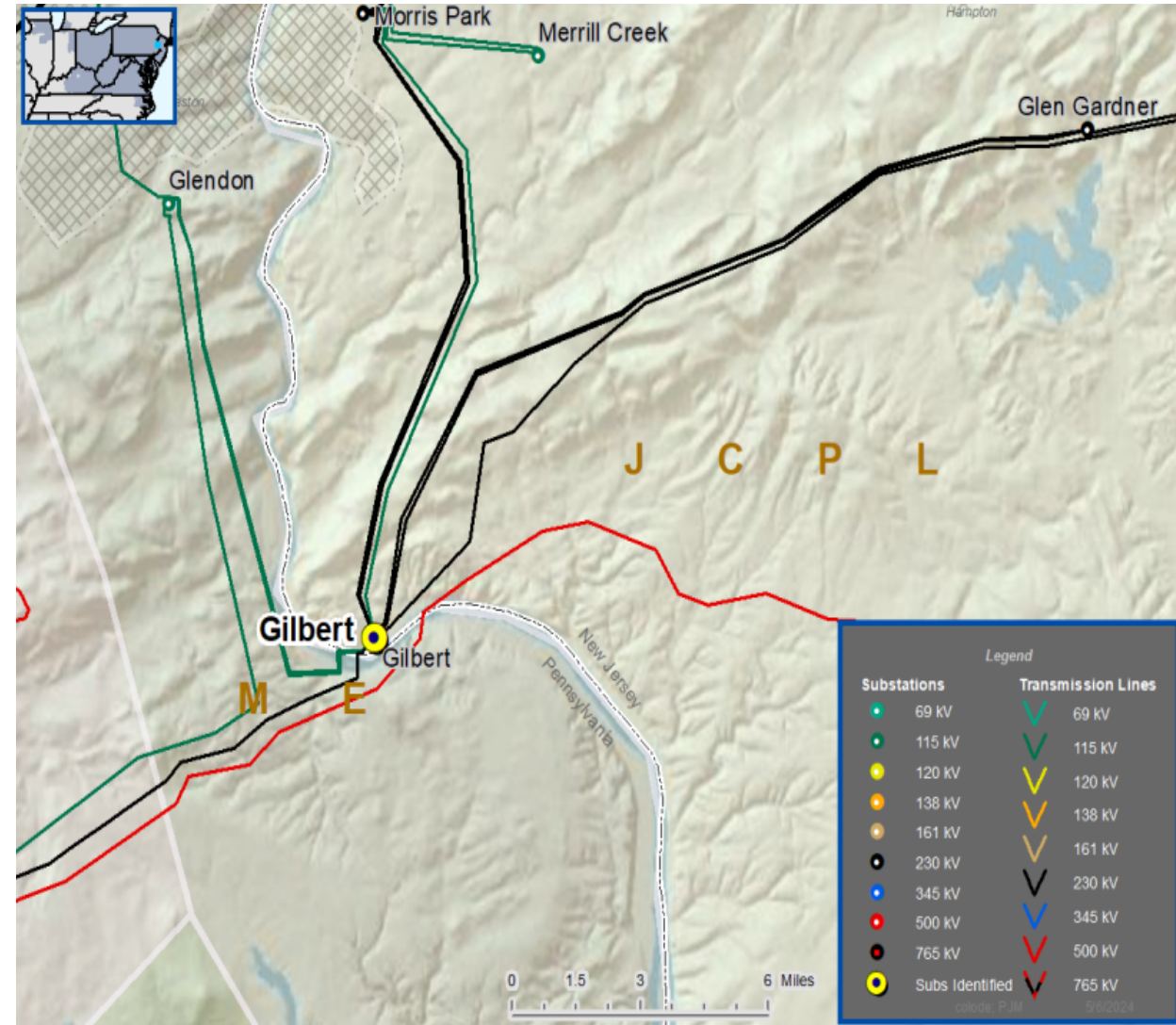
- System reliability and performance
- Add/Replace Transformers
- Past System Reliability/Performance

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)



Need Number: JCPL-2024-028

Process Stage: Need Meeting – 05/16/2024

Project Driver:

Equipment Material Condition, Performance and Risk

Specific Assumption Reference:

System Performance Projects Global Factors

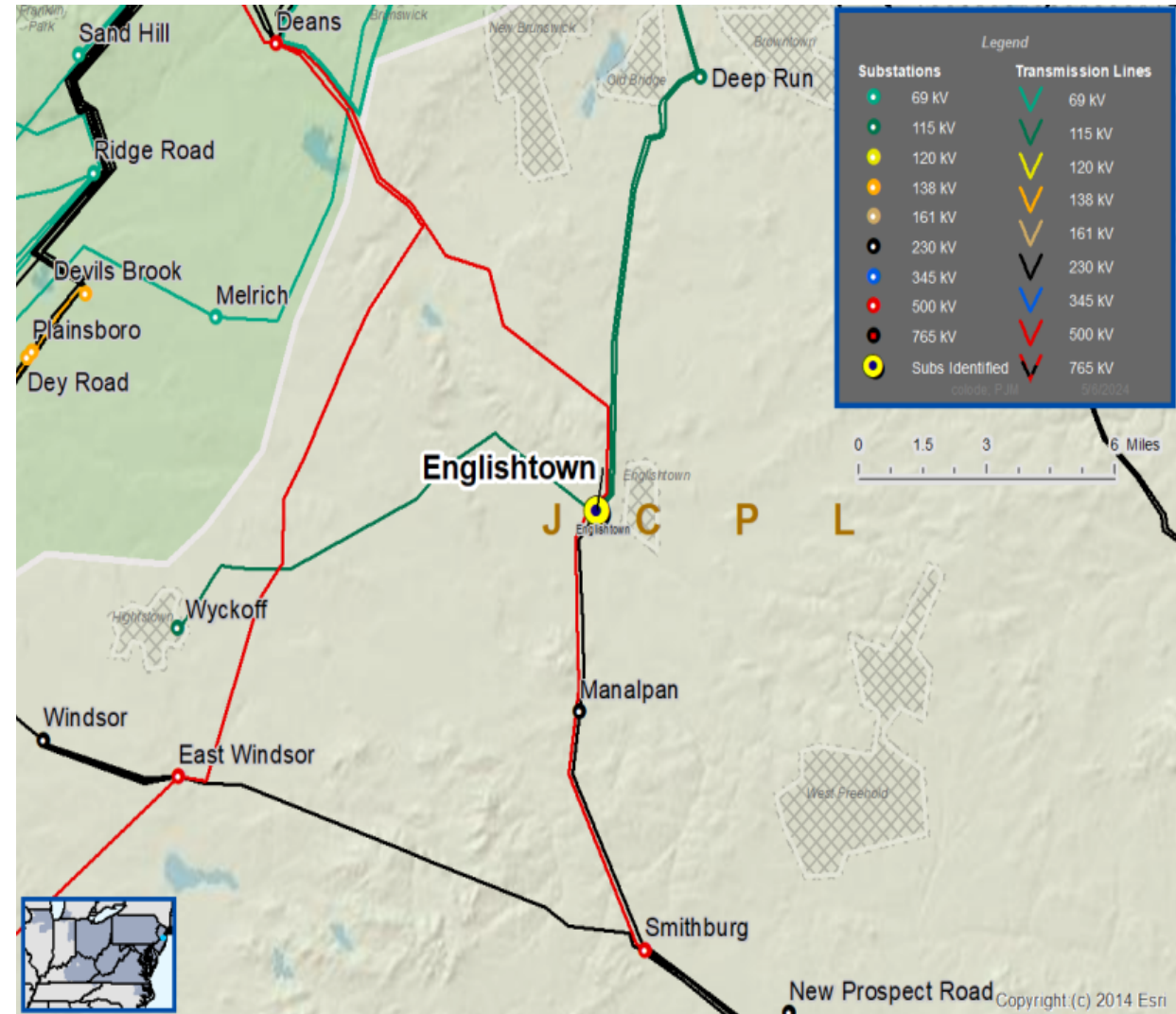
- System reliability and performance
- Add/Replace Transformers
- Past System Reliability/Performance

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



Need Number: JCPL-2024-029

Process Stage: 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

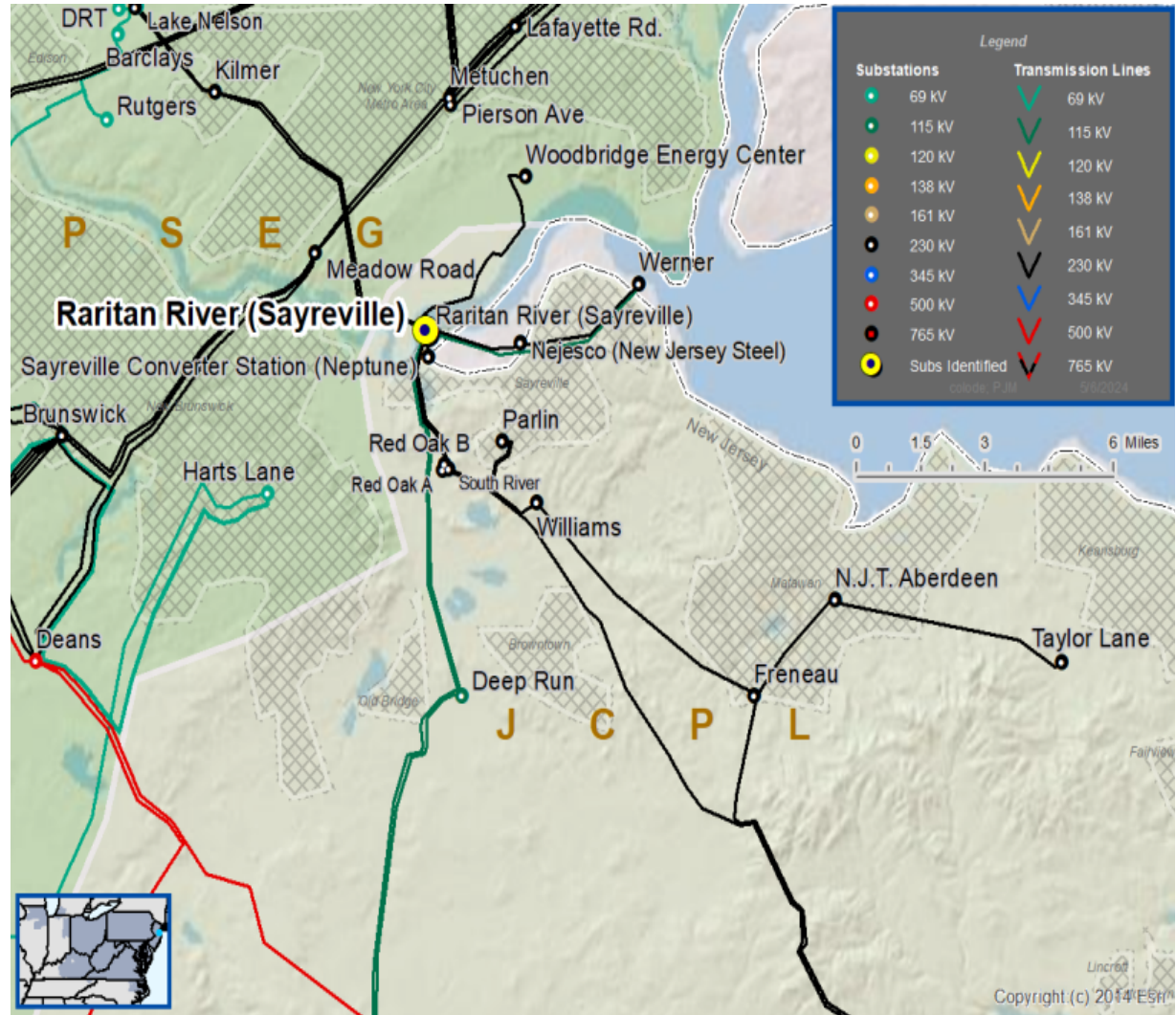
Past System Reliability/Performance

Problem Statement:

- The 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)



Need Number: JCPL-2024-030

Process Stage: Need Meeting – 05/16/2024

Project Driver:

Equipment Material Condition, Performance and Risk

Specific Assumption Reference:

System Performance Projects Global Factors

- System reliability/performance
- Substation/line equipment limits

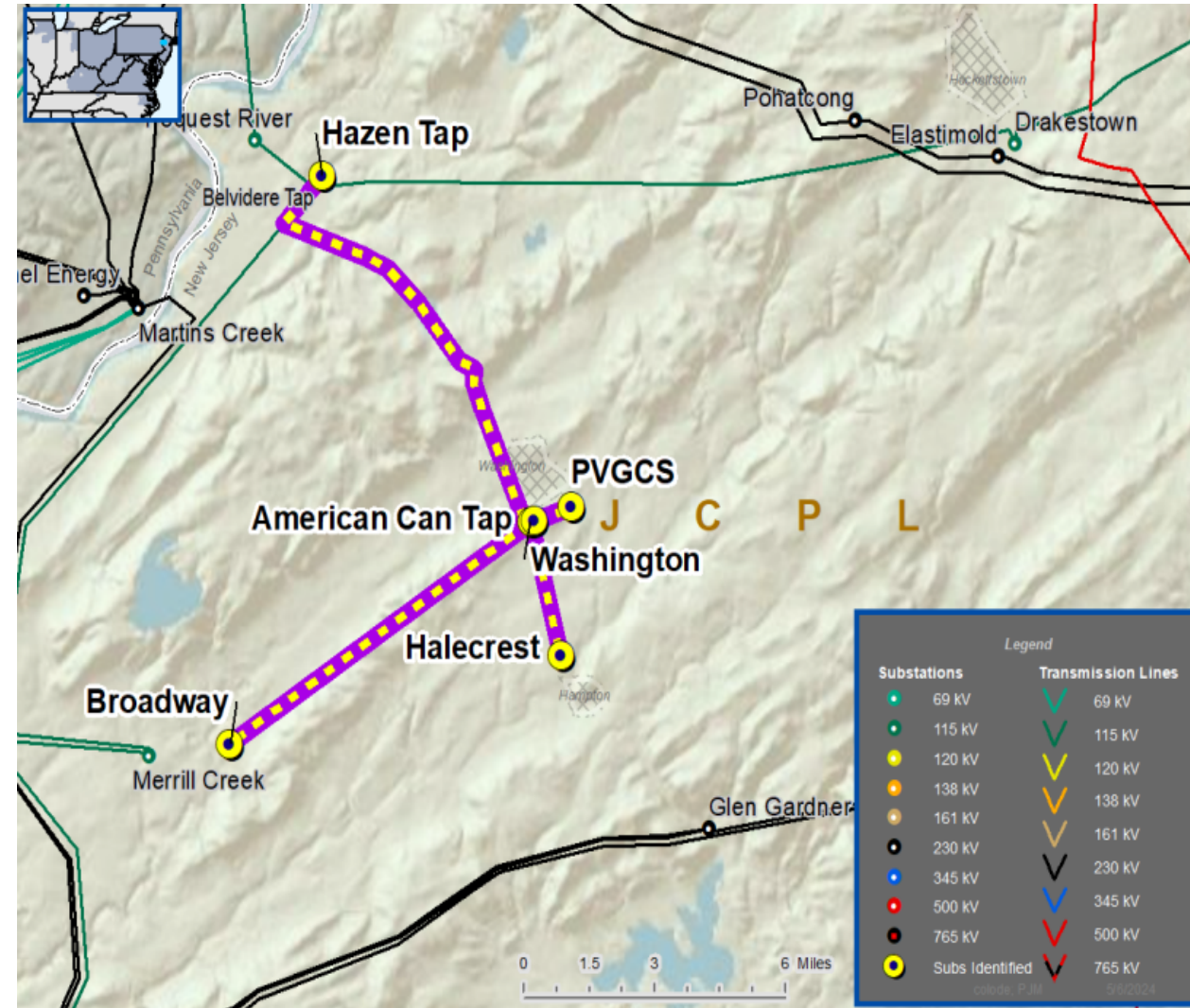
Substation Condition Rebuild/Replacement

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

Problem Statement:

- The existing Washington 34.5 kV breakers C705, P718, Q719, W23A, W23B, U723A and U723B are between 57-73 years old and are approaching end of life.
- Replacement components are difficult to source in quantity leading to non-standard repairs.
- The circuit breakers require frequent maintenance to preserve the integrity of the oil and replacement of parts on pneumatic systems.
- The line protection relaying is obsolete.
- The lines are currently 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)
JCPL-2024-030	Washington – Broadway 34.5 kV W23 Line	39 / 48 / 45 / 56	39 / 48 / 45 / 56
	Washington – Halecrest 34.5 kV U723 Line	39 / 47 / 45 / 47	39 / 48 / 45 / 56
	Washington – American Can Tap 34.5 kV P718 Line	37 / 38 / 42 / 42	37 / 38 / 42 / 42
	Washington – PVGCS Tap 34.5 kV Q719 Line	44 / 47 / 47 / 47	44 / 53 / 50 / 63
	Washington – Hazen Tap 34.5 kV C705 Line	39 / 48 / 45 / 56	39 / 48 / 45 / 56

Need Number: JCPL-2024-033

Process Stage: Need Meeting 05/16/2024

Project Driver:

Customer Service

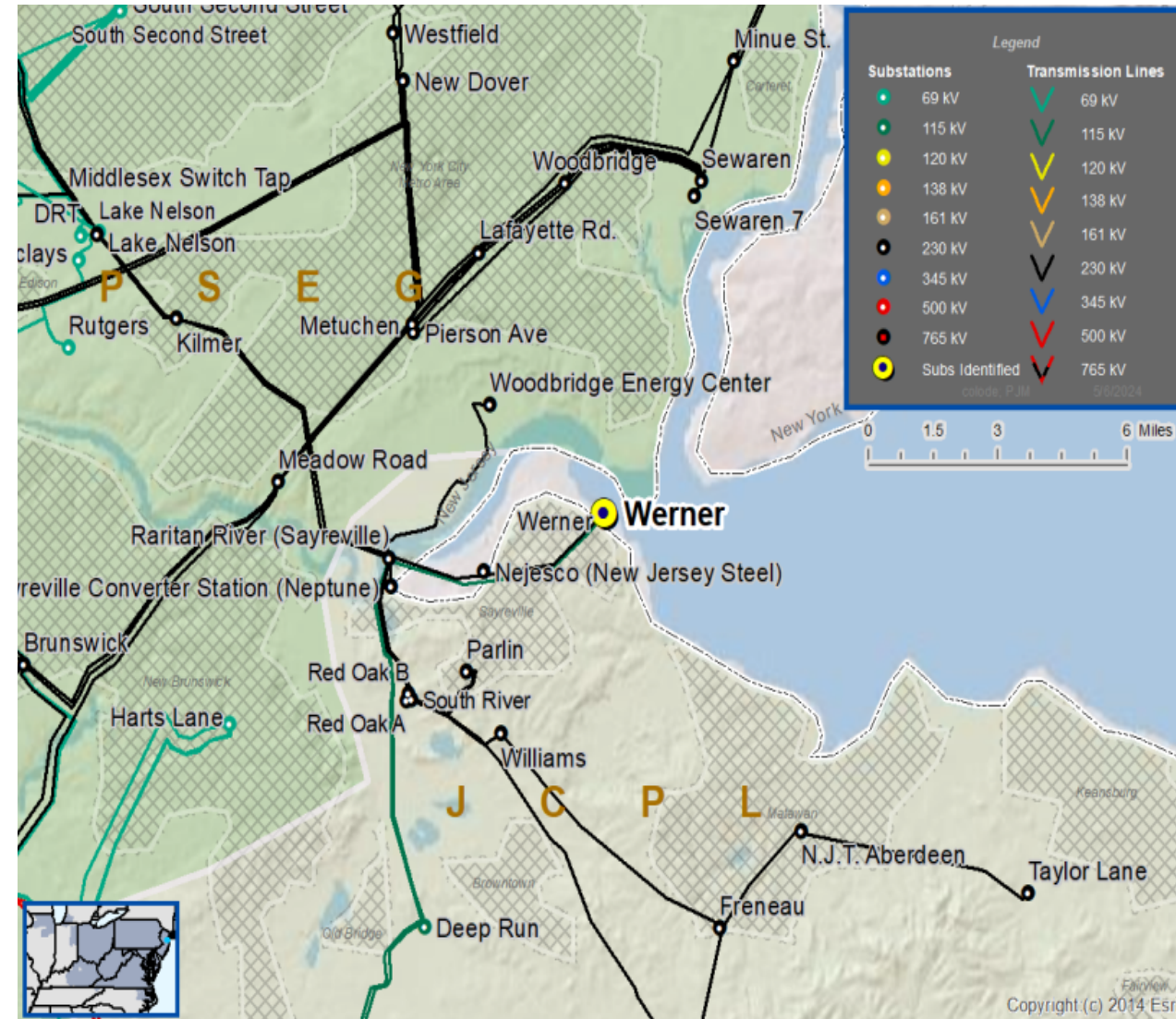
Specific Assumption Reference:

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 3 MVA near Werner Substation.

Requested in-service date is 10/01/2024



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

Need Number: JCPL-2024-034

Process Stage: Need Meeting 05/16/2024

Project Driver:

Customer Service

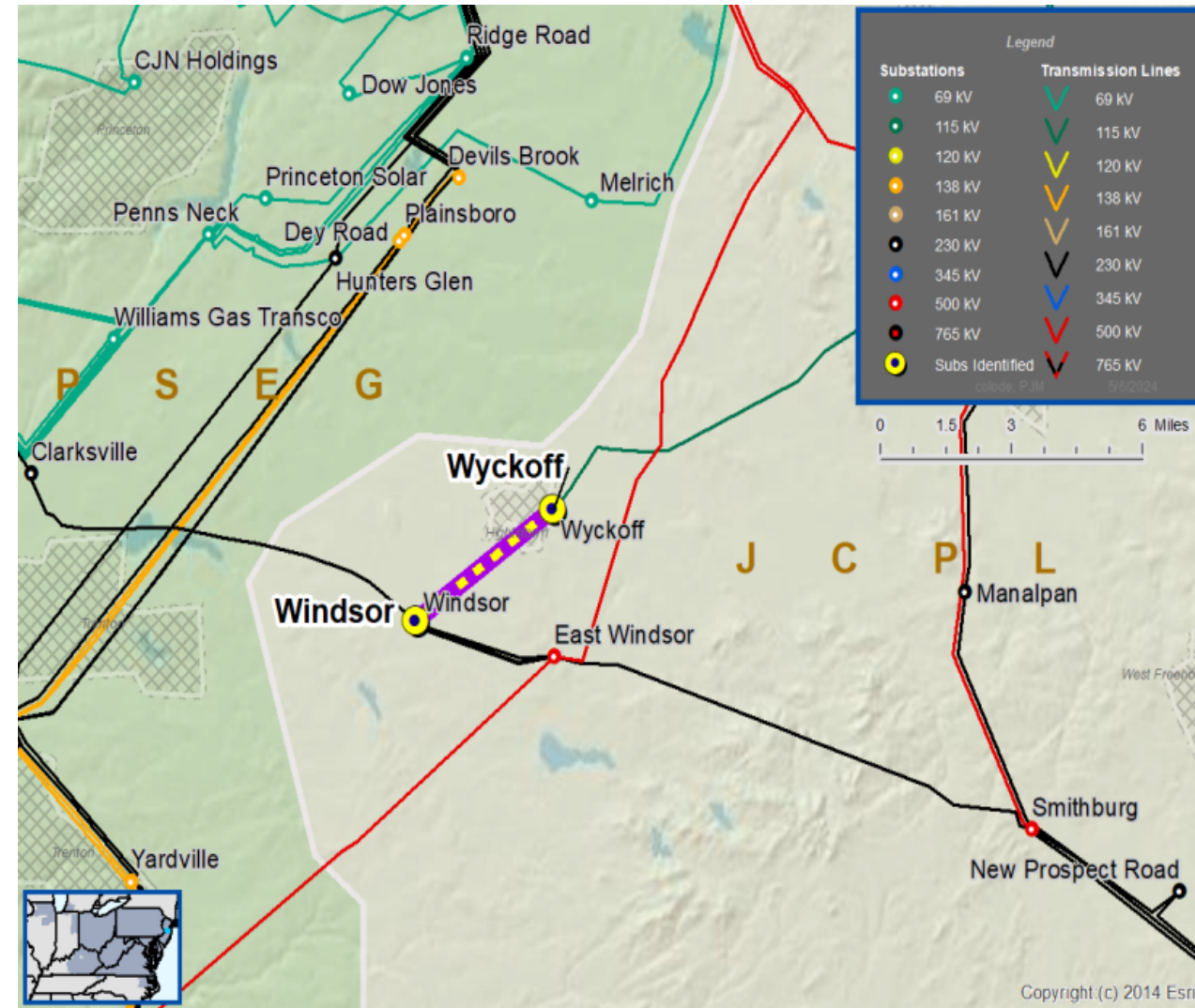
Specific Assumption Reference:

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.

Requested in-service date is 03/04/2028



Need Number: JCPL-2024-035

Process Stage: Need Meeting 05/16/2024

Project Driver:

Customer Service

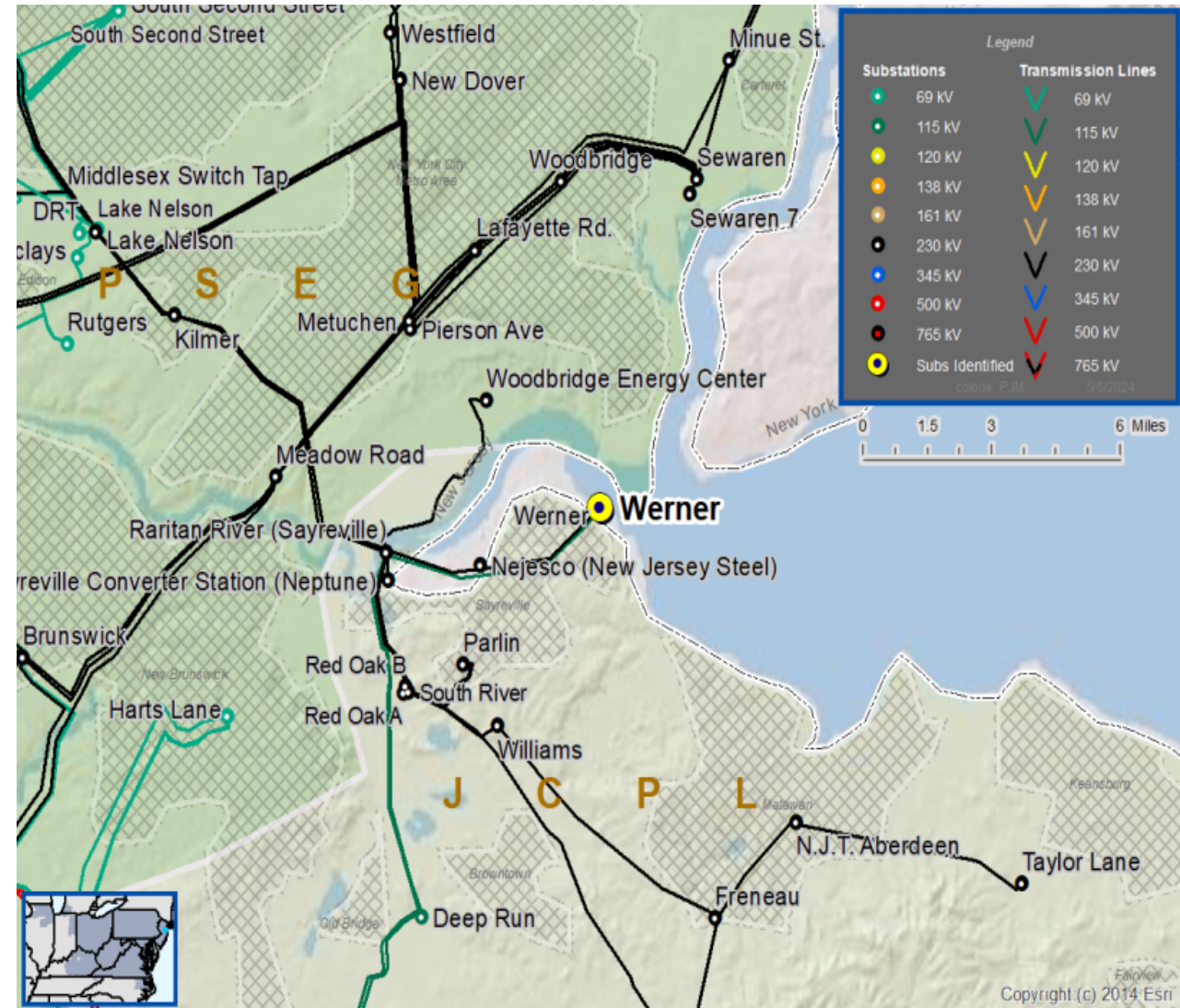
Specific Assumption Reference:

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 1.5 MVA near Werner Substation.

Requested in-service date is 01/01/2025



Need Number: JCPL-2024-036

Process Stage: 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

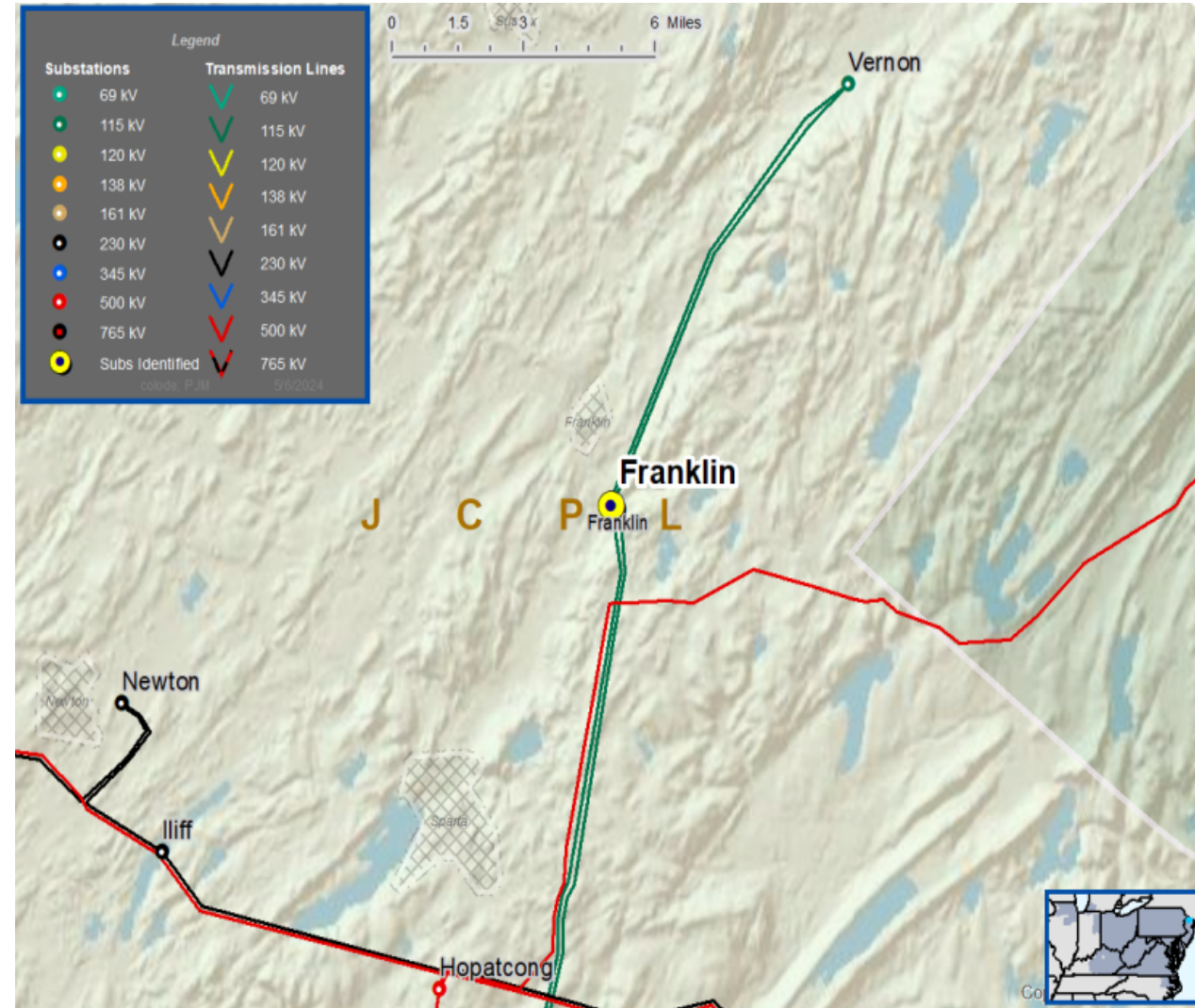
Past System Reliability/Performance

Problem Statement:

- The 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)



Need Number: JCPL-2024-037

Process Stage: Need Meeting – 05/16/2024

Project Driver:

Equipment Material Condition, Performance and Risk

Specific Assumption Reference:

System Performance Projects Global Factors

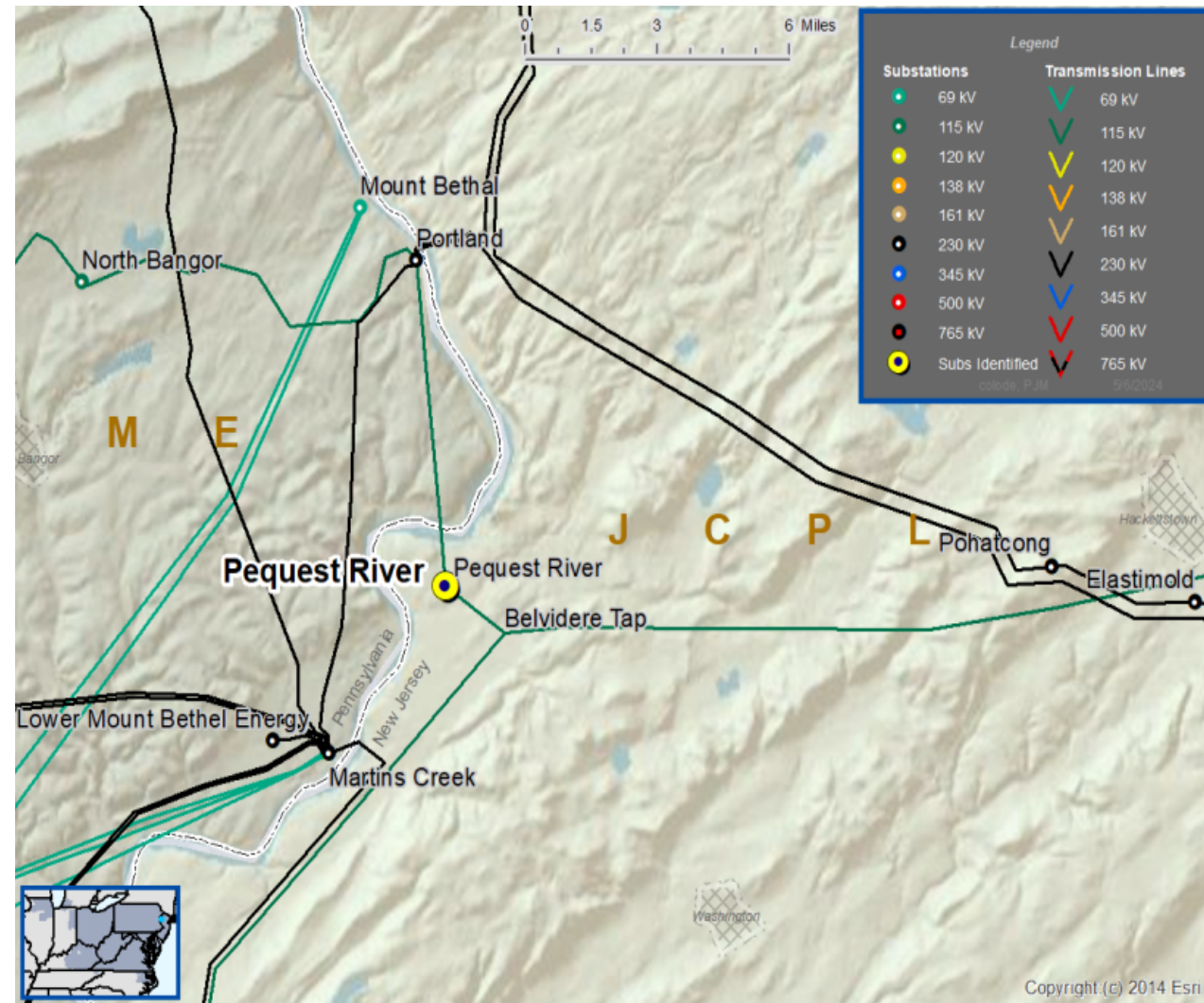
- System reliability and performance
- Add/Replace Transformers
- Past System Reliability/Performance

Problem Statement:

- The 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)



Need Number: JCPL-2024-038

Process Stage: Need Meeting – 05/16/2024

Project Driver:

Equipment Material Condition, Performance and Risk

Specific Assumption Reference:

System Performance Global Factors

- System reliability/performance

Line Condition Rebuild/Replacement

- Age/condition of wood pole transmission line structures

Problem Statement:

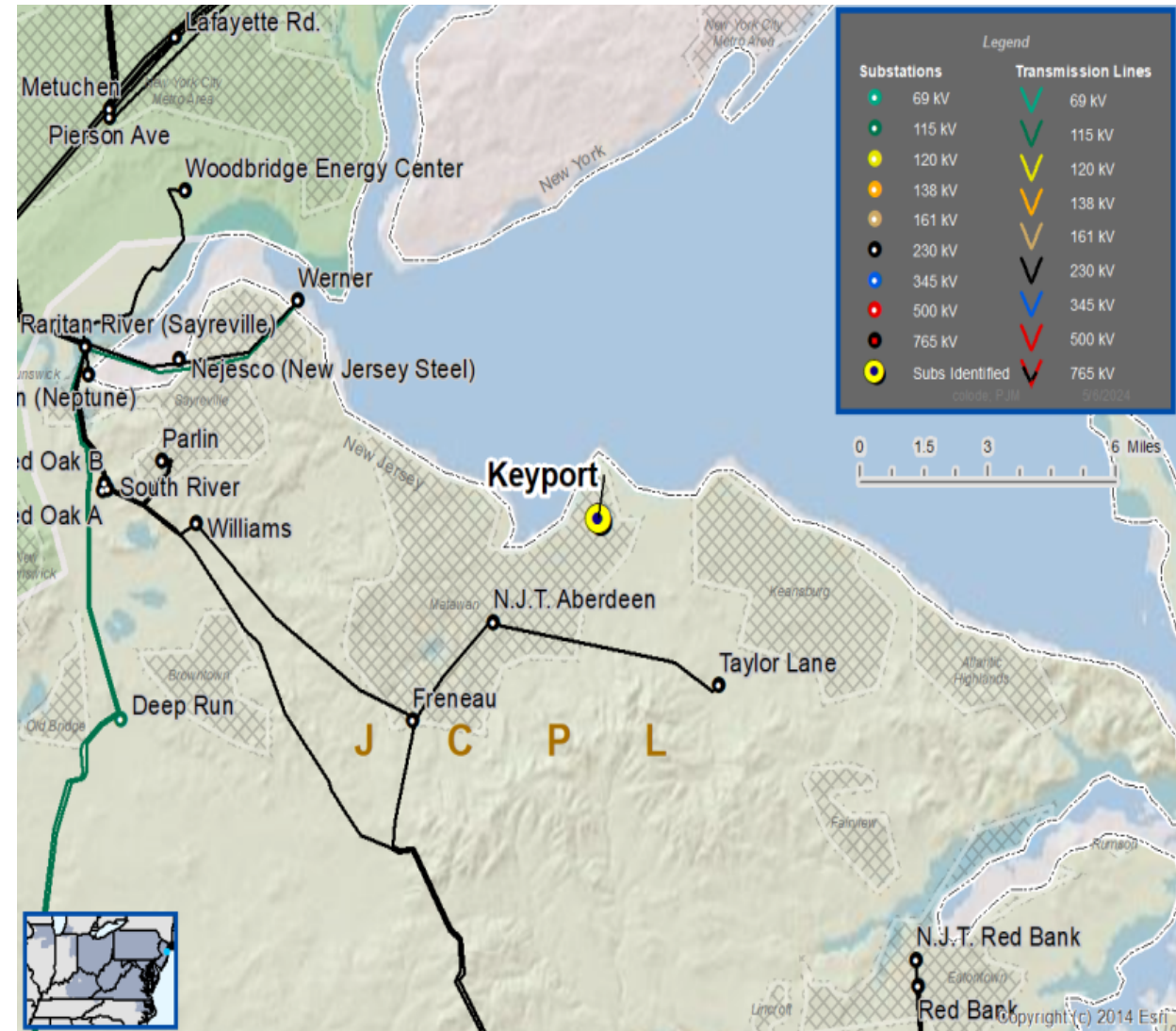
- The Keyport–EH Werner 34.5 kV V48 Line was constructed approximately 74 years ago and is approaching end of life. It is approximately 9 miles long with 273 wood pole transmission line structures.

- Recent inspections show the line is exhibiting deterioration resulting in increased maintenance costs. Inspection findings include:
 - 107 structures require replacement or repair due to deterioration.
 - 52 structures failed inspection due to sound, woodpecker damage, top rot, decay, cracking, and/or delamination of cross-arms.

- Since 2019, the line has had 19 unscheduled sustained outages.

- Existing Transmission Line Ratings:

- 41 / 50 / 48 / 60 MVA (SN/SE/WN/WE)



Need Number: JCPL-2024-039

Process Stage: Need Meeting – 05/16/2024

Project Driver:

Equipment Material Condition, Performance and Risk

Specific Assumption Reference:

System Performance Global Factors

- System reliability/performance
- Substation/Line equipment limits

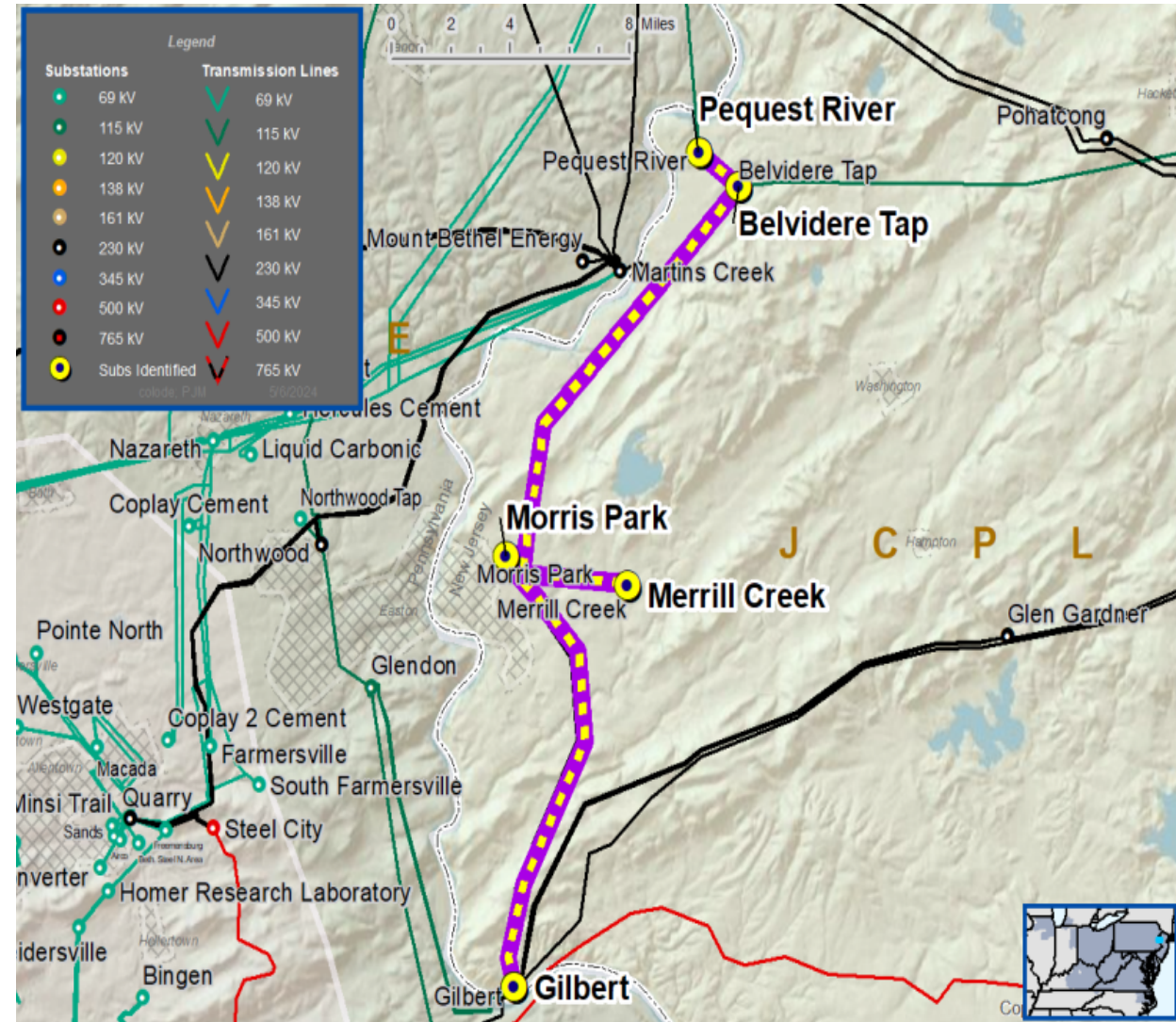
Line Condition Rebuild/Replacement

- Age/condition of wood pole transmission line structures

Problem Statement:

- The Gilbert – Pequest River 115 kV Line was constructed approximately 72 years ago and is approaching end of life. It is 23.63 miles long with 221 (197 wood pole, 22 steel pole & 2 lattice tower) transmission line structures.
- Recent inspections show the line is exhibiting deterioration resulting in increased maintenance costs. Inspection findings include:
 - 64 structures require repairs due to deterioration.
 - 80 structures require repairs to insulators and related hardware, indicating that components are reaching end of life.
 - 88 structures failed inspection due to sound, woodpecker damage, top rot, decay, cracking, and/or delamination of cross-arms.
- Since 2022, the line has had 3 unscheduled sustained outages.

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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)
JCPL-2024-039	Gilbert – Morris Park Tap 115 kV Line	118 / 152 / 168 / 189	184 / 223 / 208 / 264
	Morris Park Tap – Merrill Creek Tap 115 kV Line	184 / 223 / 208 / 264	184 / 223 / 208 / 264
	Merrill Creek Tap – Belvedere Tap 115 kV Line	184 / 223 / 208 / 264	184 / 223 / 208 / 264
	Belvedere Tap – Pequest River 115 kV Line	184 / 223 / 208 / 264	184 / 223 / 208 / 264

Solutions

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

Need Number: JCPL-2024-016

Process Stage: Solution Meeting - 05/16/2024

Previously Presented: Need Meeting - 04/18/2024

Project Driver:

Customer Service

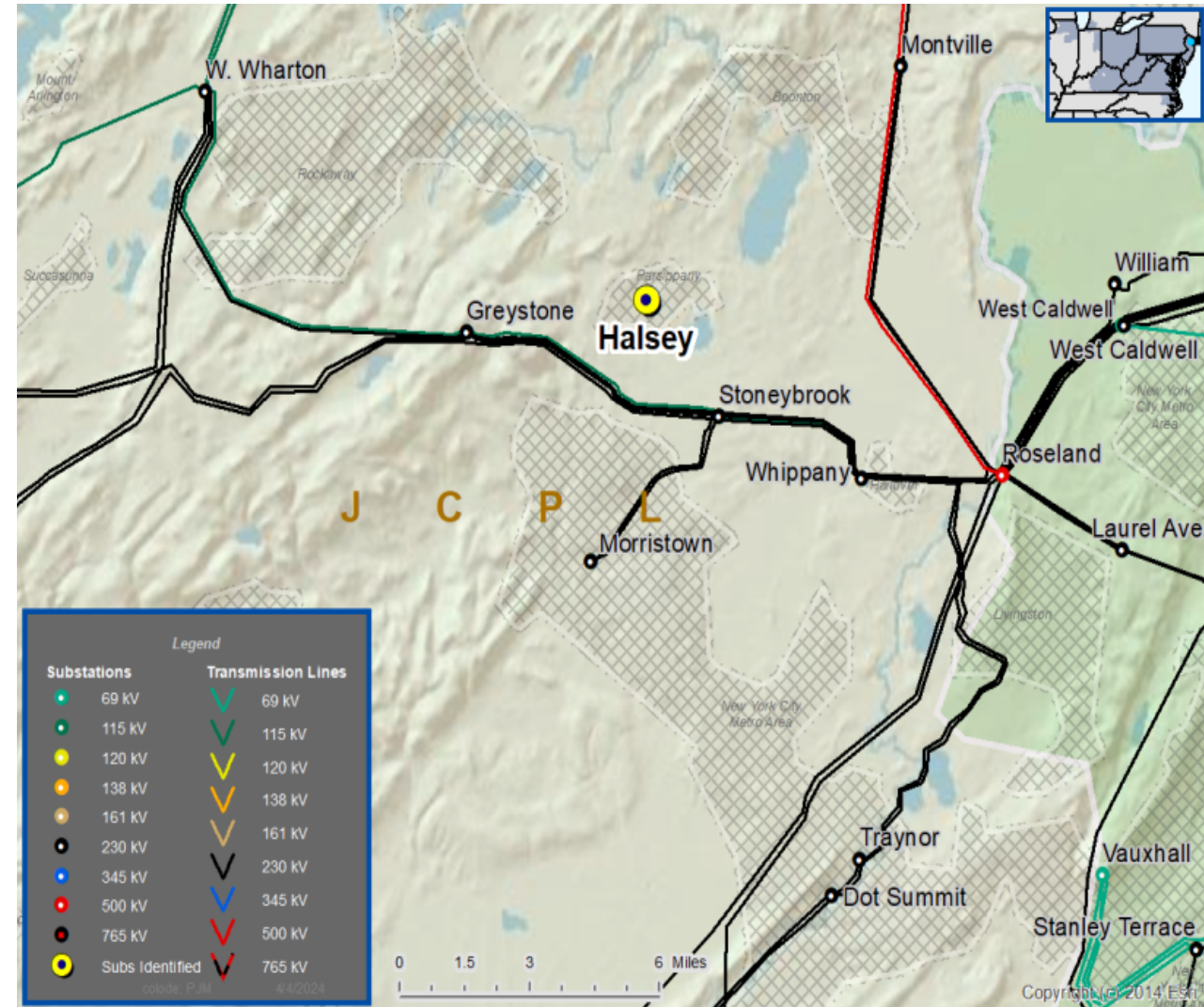
Specific Assumption Reference:

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 11 MVA; location is near the Halsey Substation.

Requested in-service date is 6/30/2024



JCPL Transmission Zone M-3 Process Halsey Substation Customer Connection

Need Number: JCPL-2024-016

Process Stage: Solution Meeting - 05/16/2024

Proposed Solution:

34.5 kV Transmission Line Tap

- Tap the Montville – Whippany 34.5 kV D4 Line
- Extend tap line approximately one span to customer
- Add SCADA controlled switches
- Modify relay settings on the Montville – Whippany 34.5 kV D4 Line

Alternatives Considered:

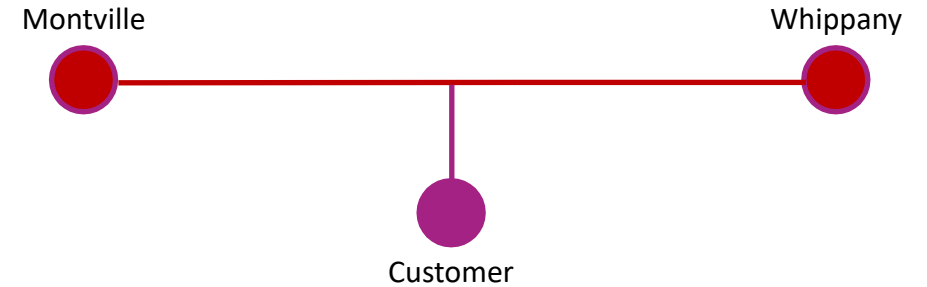
The next nearest alternative transmission facility to serve the Customer’s load is approximately one mile away from the Customer’s site. As a result, the Montville – Whippany 34.5 kV D4 Line was selected due to its proximity to the customer.

Estimated Project Cost: \$1.40M

Projected In-Service: 06/30/2024

Project Status: Conceptual

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



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



Questions?

Appendix

High level M-3 Meeting Schedule

Assumptions

Activity	Timing
Posting of TO Assumptions Meeting information	20 days before Assumptions Meeting
Stakeholder comments	10 days after Assumptions Meeting

Needs

Activity	Timing
TOs and Stakeholders Post Needs Meeting slides	10 days before Needs Meeting
Stakeholder comments	10 days after Needs Meeting

Solutions

Activity	Timing
TOs and Stakeholders Post Solutions Meeting slides	10 days before Solutions Meeting
Stakeholder comments	10 days after Solutions Meeting

Submission of Supplemental Projects & Local Plan

Activity	Timing
Do No Harm (DNH) analysis for selected solution	Prior to posting selected solution
Post selected solution(s)	Following completion of DNH analysis
Stakeholder comments	10 days prior to Local Plan Submission for integration into RTEP
Local Plan submitted to PJM for integration into RTEP	Following review and consideration of comments received after posting of selected solutions

Revision History

5/06/2024 – V1 – Original version posted to pjm.com