Sub Regional RTEP Committee
PJM Mid-Atlantic

October 21, 2019

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- The following definitions explain the basis for excluding flowgates and/or projects from the competitive planning process and designating projects to the incumbent Transmission Owner.
- Flowgates/projects excluded from competition will include the underlined language on the corresponding slide.

  - Immediate Need Exclusion: Due to the immediate need of the violation (3 years or less), the timing required for an RTEP proposal window is infeasible. As a result, the local Transmission Owner will be the Designated Entity. - Operating Agreement, Schedule 6 § 1.5.8(m)
  - Below 200kV Exclusion: Due to the lower voltage level of the identified violation(s), the driver(s) for this project are excluded from the competitive proposal window process. As a result, the local Transmission Owner will be the Designated Entity - Operating Agreement, Schedule 6 § 1.5.8(n)
  - Substation Equipment Exclusion: Due to identification of the limiting element(s) as substation equipment, the driver(s) for this project are excluded from the competitive proposal window process. As a result, the local Transmission Owner will be the Designated Entity - Operating Agreement, Schedule 6 § 1.5.8(p)

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Second Review

Baseline Reliability Projects

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ODEC Transmission Zone: Baseline

Process Stage: Second Review
Previously Presented: 5/31/2019 and 9/24/2019

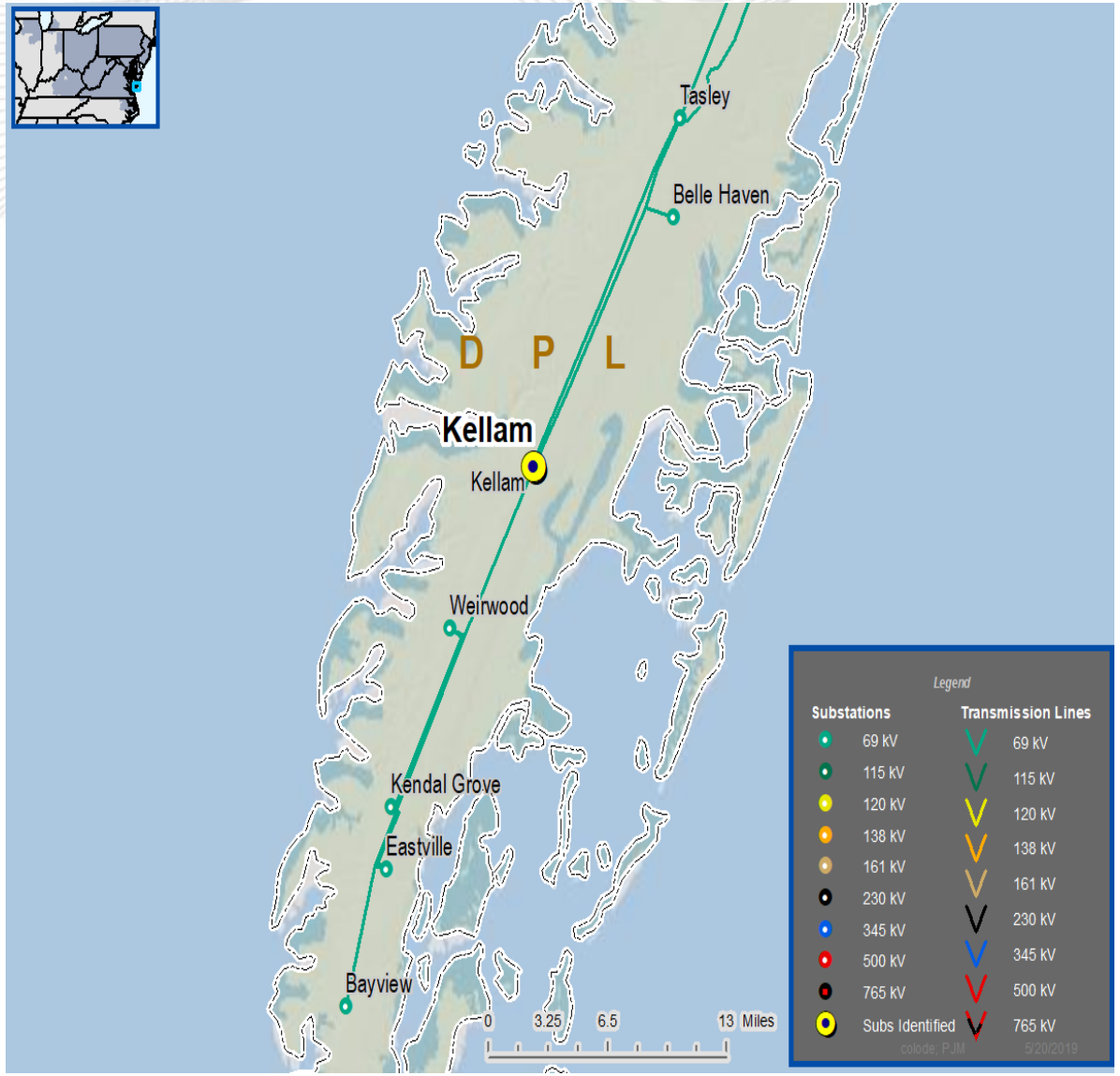
Criteria: ODEC Planning Criteria Violation

Assumption Reference: ODEC Planning Criteria 6/14/2018

- A radial 69 kV transmission line shall feed no more than 10,000 consumers, 50 megawatts of load, or have more than 700 MW-Miles of exposure (MW-Mile = Peak MW X Radial Line Length) Once a radial loading limit exceeds any of these thresholds, an additional transmission source is required. This may be a separate source, or it may be a loop back to the source of the original radial line

Proposal Window Exclusion: Below 200 kV

Problem Statement:
The load south of Kellam Substation violates the MW-Mile criteria. 21 Miles x 37.2 MW = 781.2 MW-Miles



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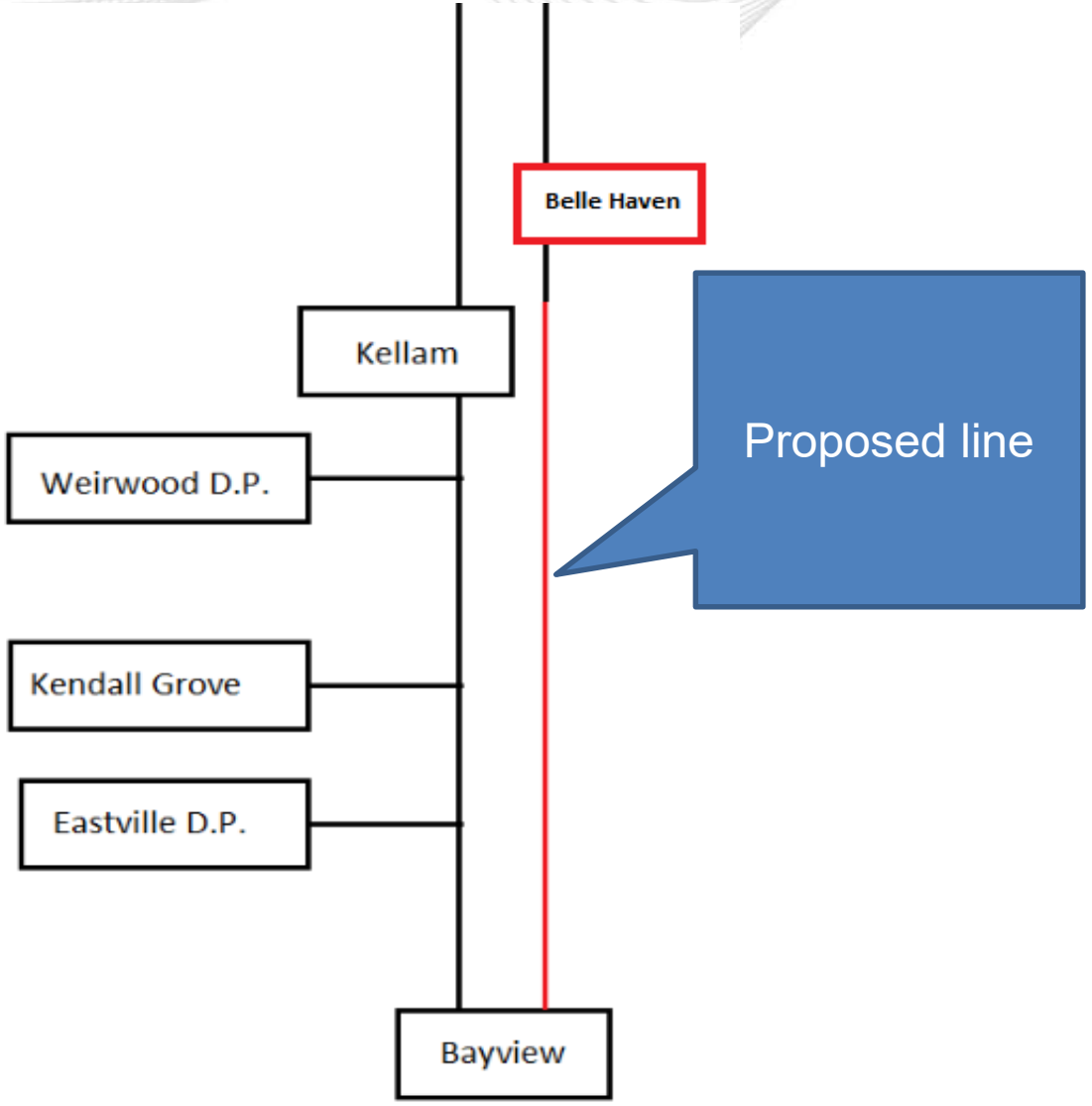
Recommended Solution:

- Create a line terminal at Belle Haven Delivery Point (three-breaker ring bus) and install a new single circuit 69kV overhead from Kellam sub to new Bayview Substation (21 miles)
- Converting Belle Haven to a terminal substation eliminates sequential tripping for faults near Kellam, and increases system reliability and resilience by avoiding loss of service to points south for a destructive physical event (e.g. fire or tornado) at Kellam. (New rating 55N/55E MVA summer) (B3134)

Estimated Cost: $22 M

Alternative: Rearrange the bus at Kellam and use that substation as the northern terminal for a similar cost.

Required IS date: Immediate
Expected IS date: 6/1/2022
Status : Conceptual



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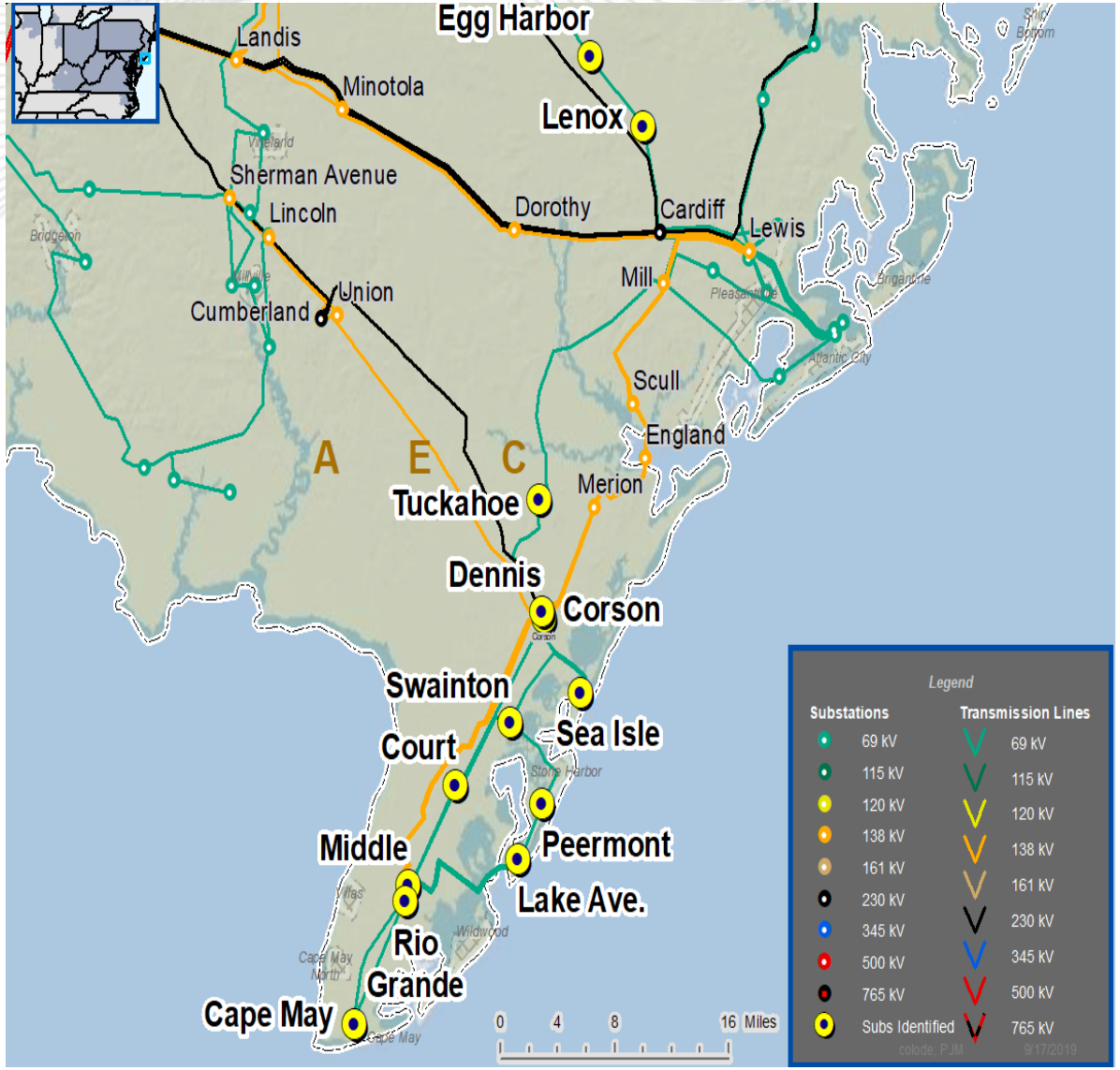
Process Stage: Second Review
Previously Presented: 9/24/2019

Summer and Light Load: (N1-ST17, N1-ST30, N1-ST42), (N1-SVM1 to N1-SVM19), (N1-SVD3, N1-SVD4, N1-SVD29 to N1-SVD48), (N1-LLVD1 to N1-LLVD15)

Problem Statement:
Thermal and Low voltage violation at several 138 kV and 69 kV stations in the Atlantic Electric area for loss of Corson 138 kV station due to fault on a line and failure of relay. The violation is identified on Light Load and Summer studies.

Proposal Window Exclusion: Immediate Need

Recommended Solution:
Install back-up relaying on the 138 kV bus at Corson substation. (B3135)
Alternatives Considered:
None
Estimated Project Cost : $0.3M
Required IS Date: 6/1/2019
Projected IS date: 6/1/2022
Status: Conceptual



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Process Stage: Second Review
Previously Presented: 9/24/2019

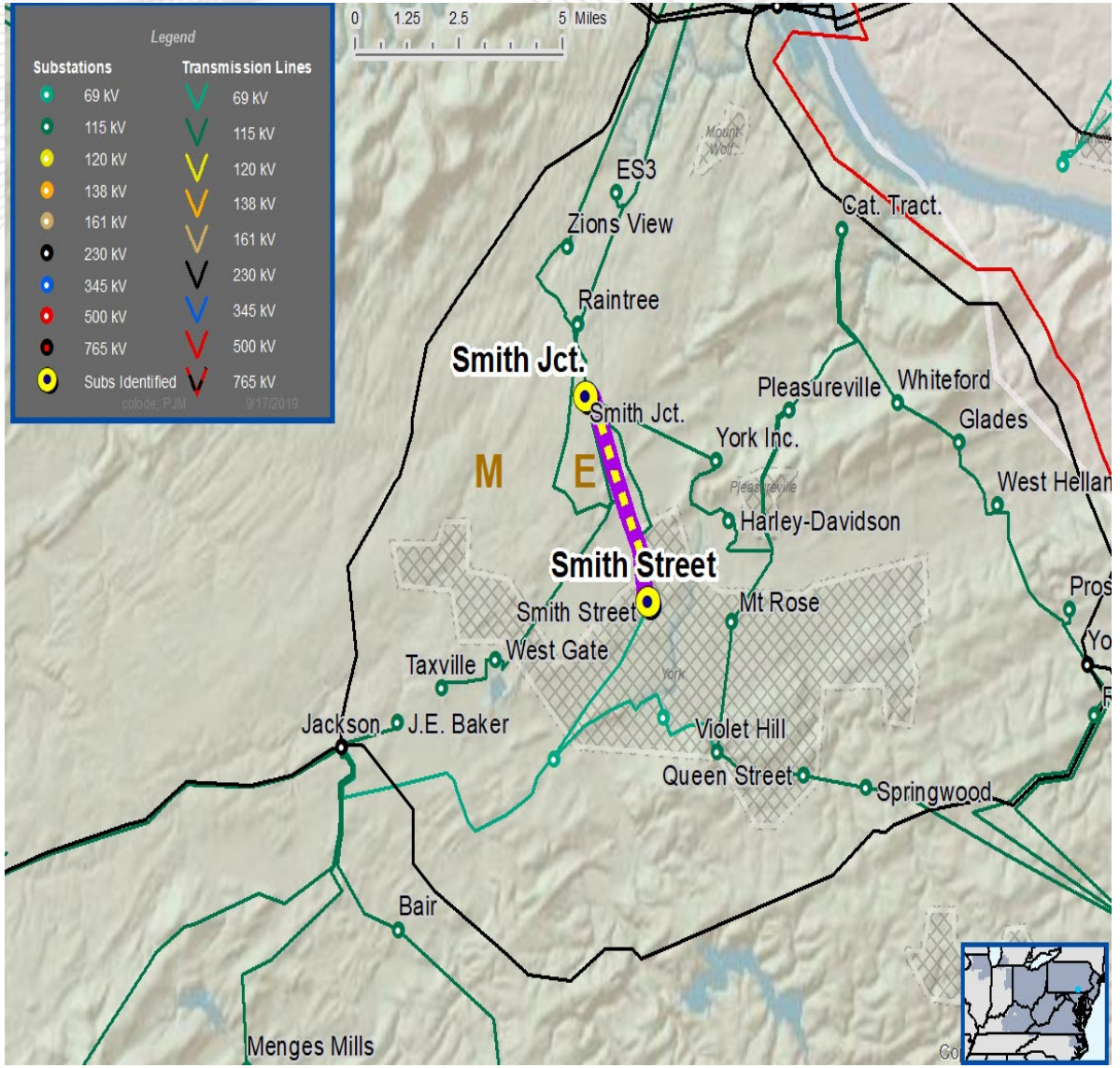
Summer: N2-ST59 and N2-ST60

Problem Statement:
The Smith Tap – Smith St. 115 kV circuit is overloaded for N-1-1 contingency loss of the Middletown Junction 230/115 kV transformer #2 and #5 in the Summer N-1-1 thermal study. The circuit is rated at 118N/152E summer and 168N/189E Winter.

Proposal Window Exclusion: Substation Equipment

Recommended Solution:
Upgrade limiting bus conductor at the Smith St 115 kV Substation. (B3136)
(New rating 163N/185E summer 186N/204E winter)
Alternatives Considered:
None

Estimated Project Cost : $0.153 M
Required IS Date: 6/1/2024
Projected IS date: 6/1/2024
Status: Conceptual



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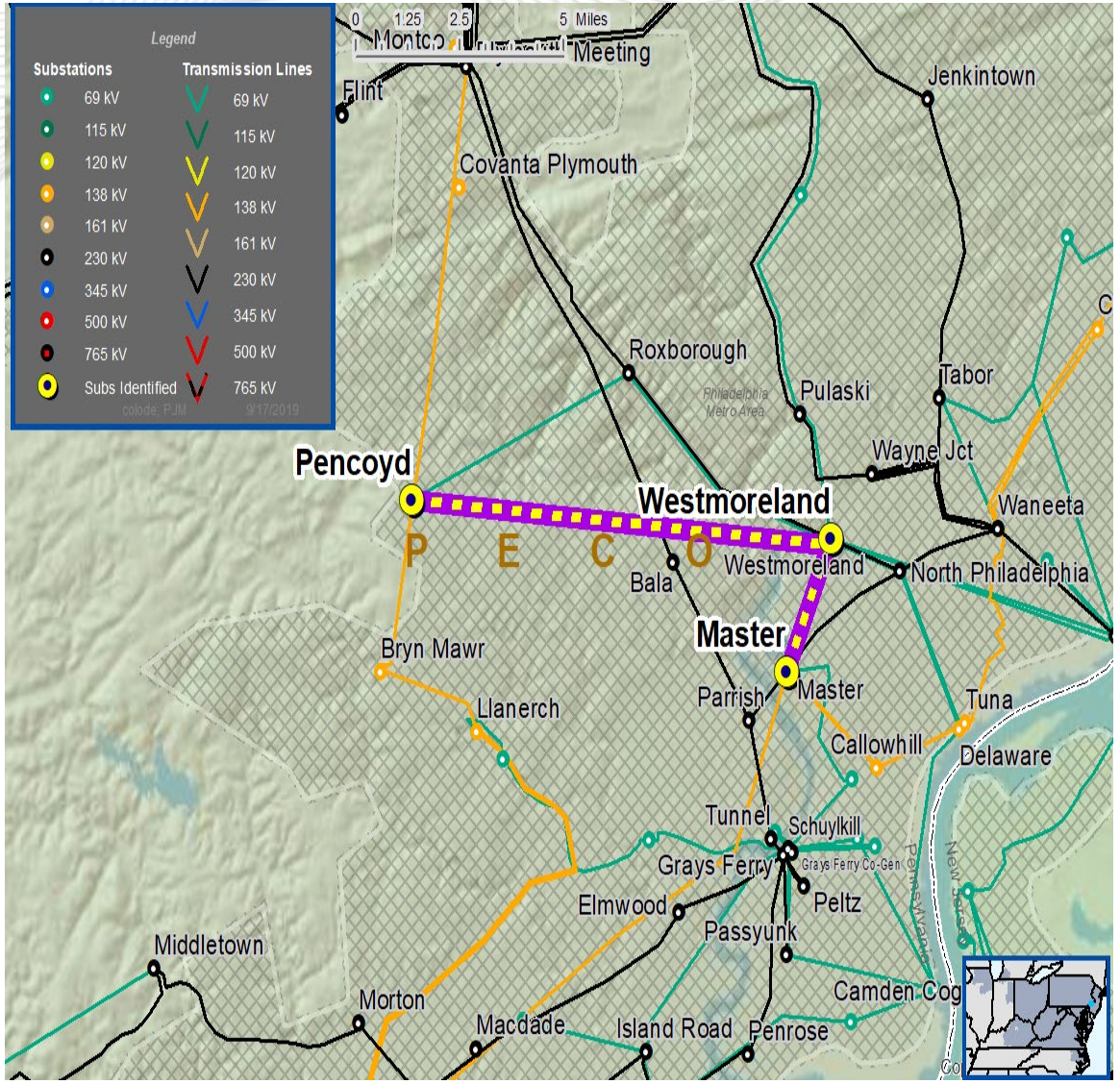
Process Stage: Second Review
Previously Presented: 9/24/2019

Summer: [N1-ST50 and N1-ST51], [GD-S315 and GD-S316]

Problem Statement:
The Master – Westmoreland East – Pencoyd 69 kV is overloaded for line fault stuck breaker contingency loss of Roxborough 230/69 kV transformer and Roxborough – Westmoreland West 69 kV circuit in the summer baseline and generation deliverability studies. The line is rated at 103N/103E Summer and 102N/103E Winter.
Proposal Window Exclusion: Below 200 kV

Recommended Solution:
Move 2 MVA load from the Roxborough to Bala substation. Adjust the tap setting on the Master 138/69 kV transformer #2. (B3138)
Alternatives Considered:
None

Estimated Project Cost : $0.015 M
Required IS Date: 6/1/2024
Projected IS date: 6/1/2024
Status: Conceptual



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Process Stage: Second Review
Previously Presented: 9/24/2019

Winter: GD-W18

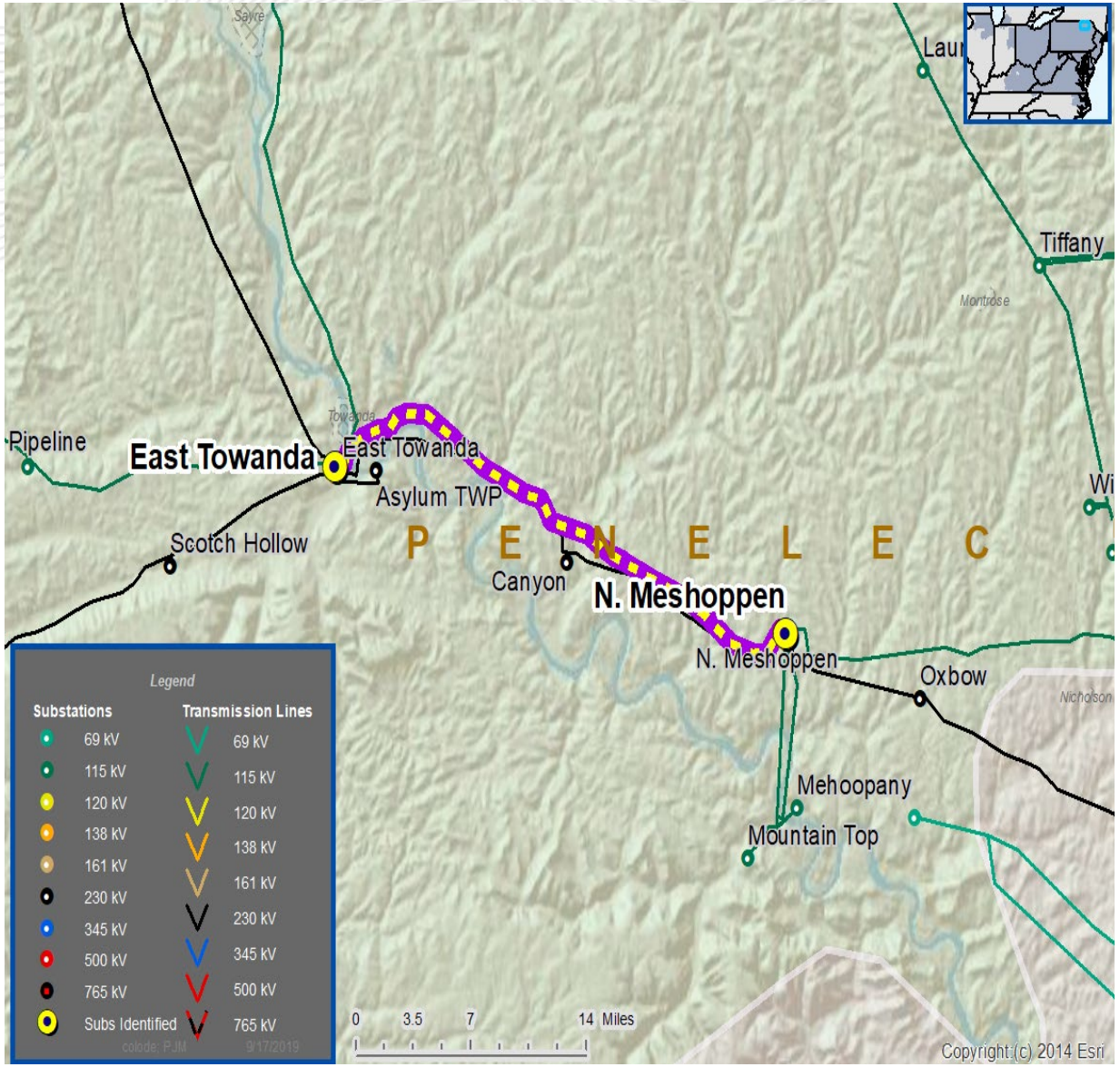
Problem Statement:
The Towanda – North Meshoppen 115 kV circuit is overloaded for single contingency the loss of the East Towanda – Canyon – North Meshoppen 230 kV circuit in the Winter generation deliverability study. The circuit is rated at 167N/202E Summer and 188N/239W Winter.

Proposal Window Exclusion: Below 200 kV

Recommended Solution:
Rebuild ~20 miles of the East Towanda - North Meshoppen 115 kV line and adjust relay settings at East Towanda and North Meshppen 115 kV. (B3137)
(New rating 202N/245E summer 228N/290E winter)

Alternatives Considered:
None

Estimated Project Cost : $58.6 M
Required IS Date: 6/1/2024
Projected IS date: 6/1/2024
Status: Conceptual

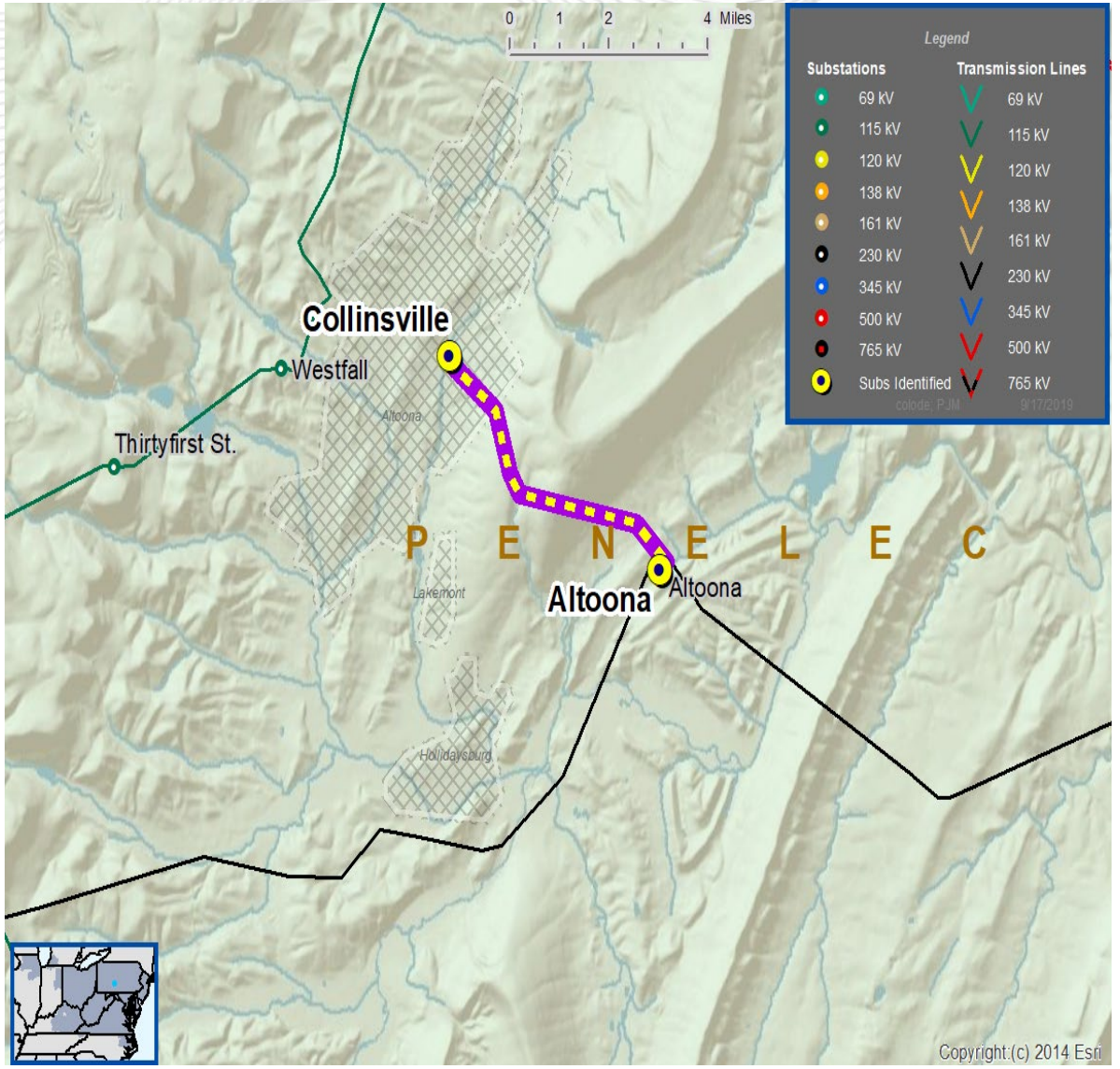


Process Stage: Second Review
Previously Presented: 9/24/2019
Criteria: First Energy Planning Criteria Violation
Assumption Reference: FERC 715
Model Used for Analysis: 2019 Series 2024 Summer RTEP

Problem Statement:
The Altoona – Collinsville 46 kV circuit #AG is overloaded pre-contingency, as well as post-contingency for the loss of several single contingencies, in both the Summer and Winter studies. The line is rated at 38N/49E MVA Summers and 54N/61E MVA Winter. The highest loading is 137% of the 49 MVA emergency Summer rating for the loss of the Altoona – Raystown 230 kV circuit..
Proposal Window Exclusion: Below 200 kV
Proposed Solution:
Supplemental Project already presented at 5/31/2019 SRRTEP (PN-2019-018)
Build a new 17th Street 46 kV substation

- Construct a new 46 kV breaker-and-a-half substation to replace the existing Collinsville substation
- New substation to include terminals for 20th Street, Greenwood, Park Plaza, Altoona F, Altoona AG, and Altoona G 46 kV lines along with terminals for two 46-12.5 kV transformers and a 46 kV capacitor

Alternatives Considered: None.
Required In-Service Date: 6/1/2024
Projected In-Service Date: 6/1/2022
Status: Conceptual



First Review

Baseline Reliability Projects

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Summer and Winter: [GD-S537, GDS538], [GD-W441 and GD-W442]

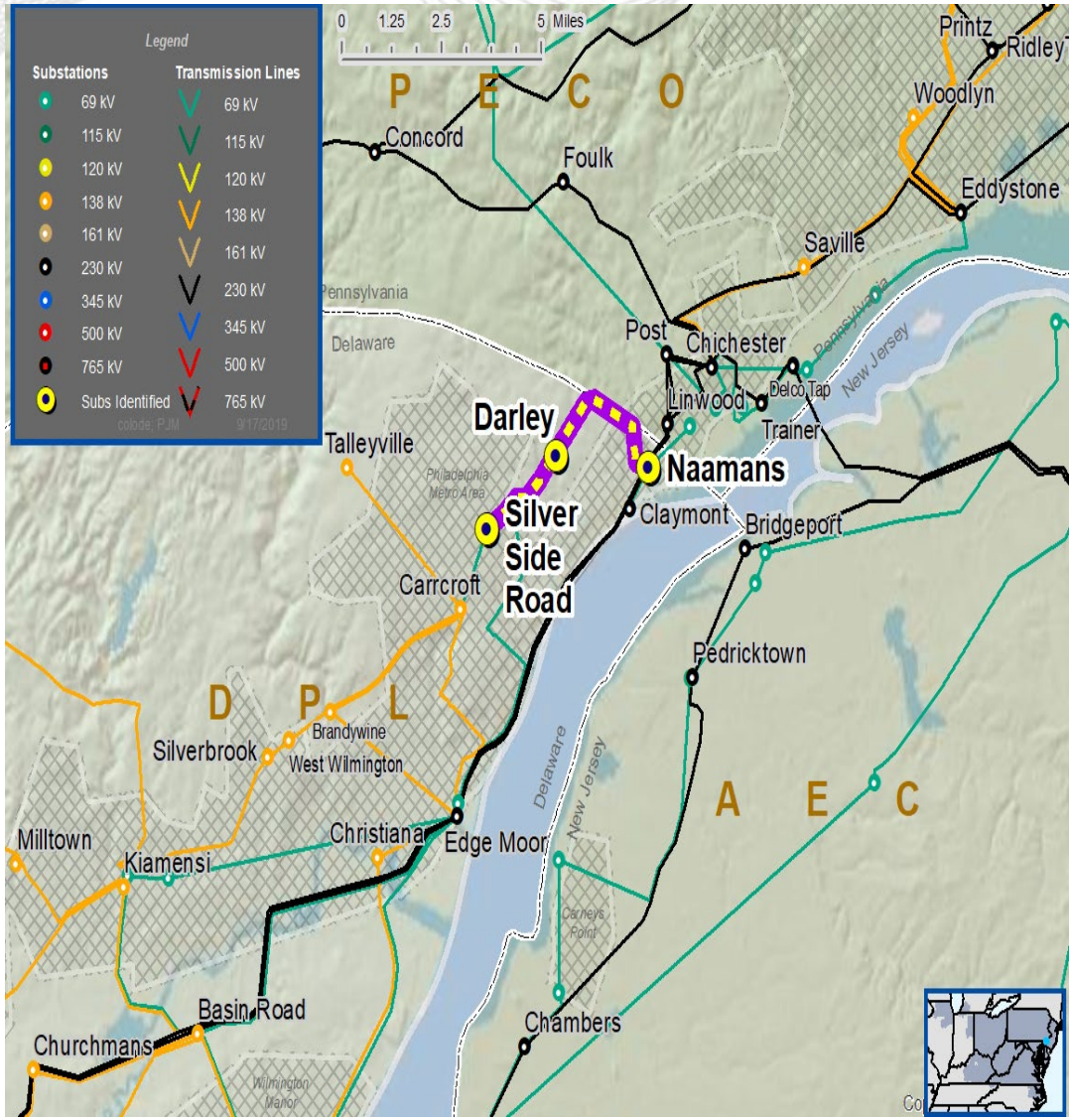
Problem Statement:

The Naamans – Darley – Silver Side Rd 69 kV circuit is overloaded for a tower line outage, loss of Edge Moor – Claymont and Edge Moor – Linwood 230 kV circuits, in the Winter generation deliverability study. The circuit is rated at 105N/136E, 137N/175E Summer and 121N/153E, 158N/197E Winter

Proposed Solution

PJM Proposal ID	Proposing Entity	Description	Cost ($M)
626	Exelon	Install a series reactor on the Silverside-Darley line	1.000
820	Exelon	Install a SmartWire device in series with the Silverside-Darley line	2.000
673	Exelon	Replace terminal equipment and implement reconductoring of the Silverside-Darley and Darley-Naamans lines to achieve ratings of 232 MVA normal and 239 MVA emergency (Silverside-Darley) and 174 MVA normal and 194 MVA emergency (Darley-Naamans)	5.500
174	Exelon	Construct a new 69 kV line between Edge Moor and Claymont Substation. Create a new terminal position at Edge Moor substation and utilize an open terminal position at Claymont Substation.	17.000
036	Exelon	Construct new 230 kV line from Edge Moor Substation to New Substation near Linwood Substation (PECO). New substation will tie in the Chichester to Linwood 230 kV Line (PECO).	36.575
522	Exelon	Construct new 230 kV line from Edge Moor to Chichester substation and perform associated upgrades at substations to accommodate new line.	37.900
637	Exelon	Construct new 230 kV line from Harmony Substation to New Substation near Linwood Substation (PECO). New substation will tie in the Chichester to Linwood 230 kV Line (PECO).	69.000
839	Exelon	Construct new 230 kV line from Harmony to Chichester substation and perform associated upgrades at substations to accommodate new line.	71.000

Required IS Date: 6/1/2024



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Short Circuit Projects

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PECO Transmission Zone: Baseline
Richmond 69kV Breaker “140” Replacement

Baseline Reliability: Immediate Need Exclusion

Problem Statement: Short Circuit
- The Richmond 69kV breaker “140" is overdutied.

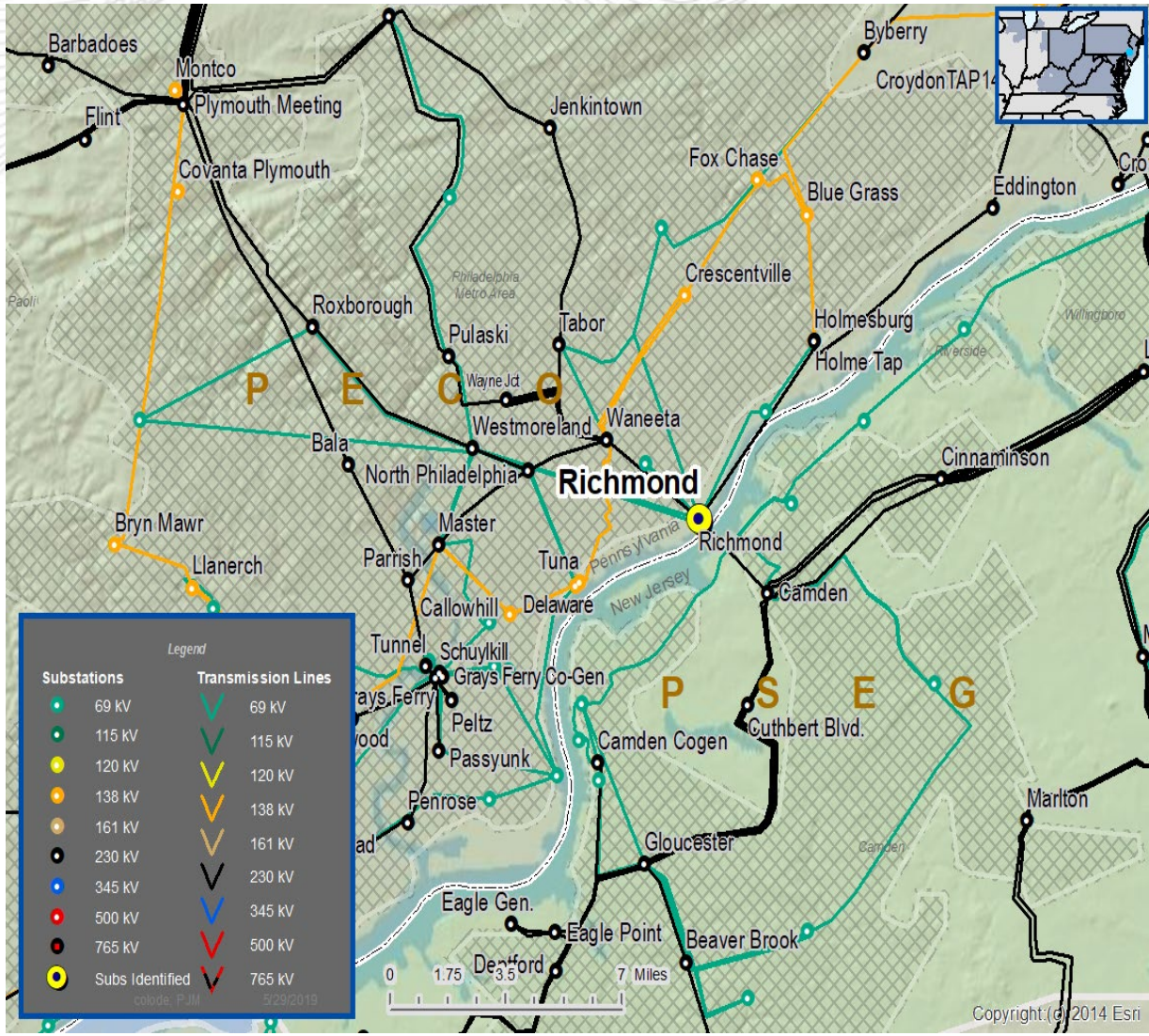
Significant Driver:
- Case Correction – Richmond 7 Transformer modeling correction

Recommended Solution:
- Replace the Richmond 69kV breaker “140" with a 40kA breaker (**b**)

Estimated Project Cost: $0.415 M

Required In-service Date: Immediate Need
Projected In-service Date: 6/1/2021

Project Status: Conceptual



Next Steps

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Upcoming Mid-Atlantic SRRTEP Meetings

Mid-Atlantic	Start	End
11/18/2019	12:00	4:00
12/16/2019	12:00	4:00

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Questions?

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Revision History

10/14/2019 – V1 – Original version posted to pjm.com

10/17/2019 - V2 – Slide # 12 corrected emergency rating of Darley – Silver Side Rd 69 kV circuit

- Slide # 10 was missing from the original posting due to technical issue, PJM is aware of the problem and will include the slide in version 2 of the presentations

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