



# Sub Regional RTEP Committee PJM Mid-Atlantic Met-Ed

April 26, 2019

# 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:** ME-2019-001 to ME-2019-003  
ME-2019-005 to ME-2019-014 &  
ME-2019-020

**Process Stage:** Solutions Meeting 4/26/2019

**Previously Presented:** Need Meeting 2/22/2019

**Supplemental Project Driver:**  
*Equipment Material Condition, Performance and Risk*

**Specific Assumption References:**

Line Condition Rebuild/Replacement

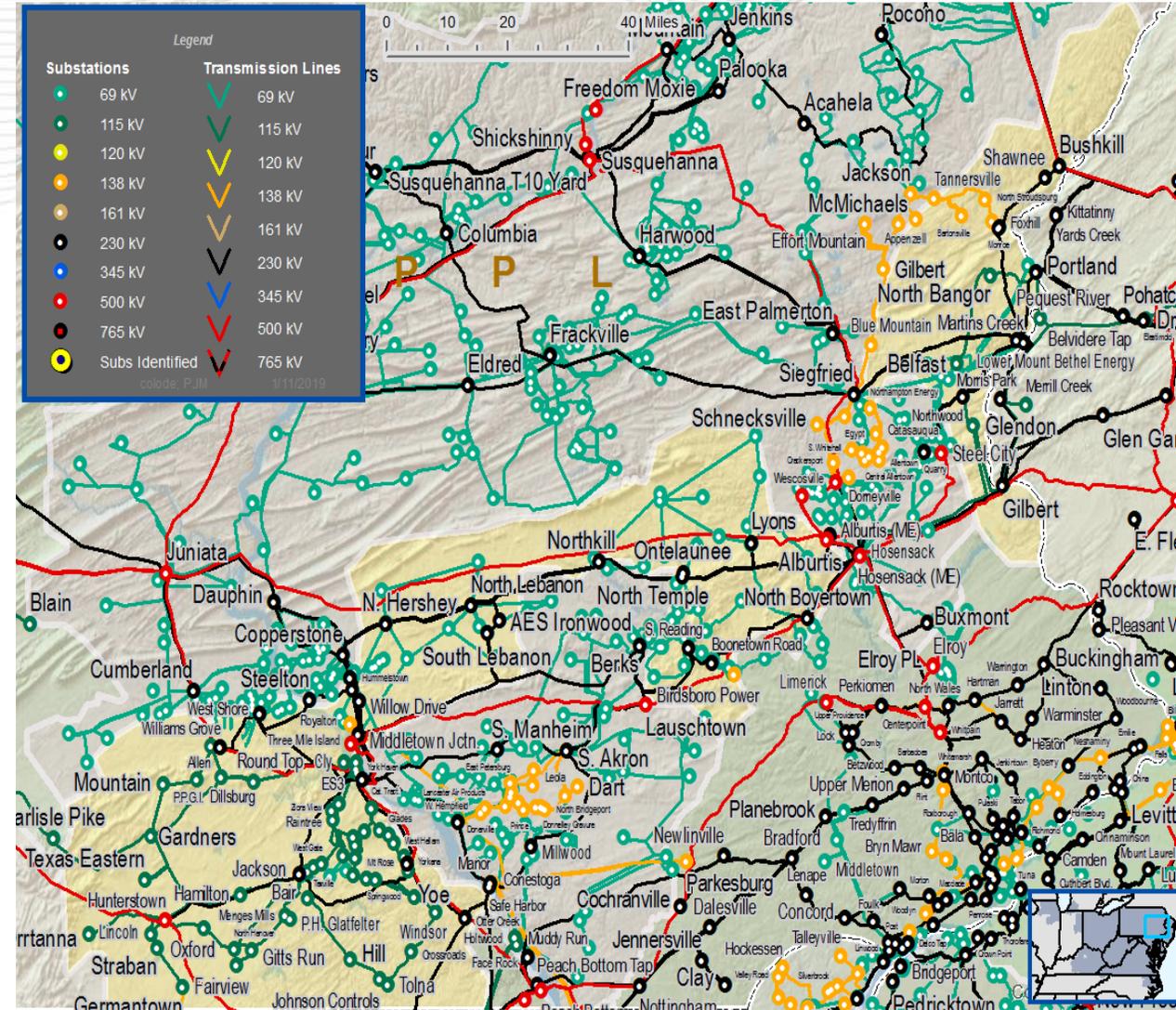
- Age/condition of wood pole transmission line structures
- Age/condition of steel tower or steel pole transmission line structures
- Age/condition of transmission line conductors

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.





# Met-Ed Transmission Zone M-3 Process Multiple Line Rebuild/Rehab Projects

ME-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
001	Adamstown – Flying Hills 69 kV Line	53 / 64	53 / 64	-	6.6	79 / 92 (86% Failure Rate)	Age, top rot, voids, woodpecker holes, etc.
	Flying Hills – South Reading 69 kV Line	53 / 64	80 / 96	Substation Conductor / Drops	2.4		
002	Baldy – Weisenberg 69 kV Line	62 / 62	80 / 96	Relays, Substation Conductor	9.1	180 / 514 (35% Failure Rate)	Top rot, voids, woodpecker holes, etc.
	Weisenberg – Lynnville 69 kV Line	89 / 107	89 / 107	-	5.0		
	Lynnville – South Hamburg 69 kV Line	51 / 66	74 / 90	Substation Conductor	15.1		
003	North Temple – Berkley Tap 69 kV Line	113 / 148	139 / 169	Substation Conductor	1.0	43 / 150 (29% Failure Rate)	Top rot, voids, woodpecker holes, etc.
	Berkley Tap - Berkley 69 kV Line	51 / 66	55 / 56	Substation Conductor	0.01		
	Berkley Tap – Cambridge Lee 69 kV Line	139 / 169	139 / 169	-	0.1		
	Cambridge Lee – Bern Church 69 kV Line	55 / 56	55 / 56	-	4.8		
	Bern Church – Northkill 69 kV line	80 / 96	80 / 96	-	6.4		
005	Carsonia – South Reading 813 69 kV Line	78 / 94	162 / 198	Substation Conductor / Drops	3.7	3 / 37 (8% Failure Rate)	Top rot
006	East Tipton – Huffs Church 69 kV Line	50 / 50	80 / 96	Relays, Substation Conductor	5.3	92 / 227 (41% Failure Rate)	Top rot, bottom rot, woodpecker holes, etc.
	Huffs Church – Barto 69 kV Line	80 / 96	80 / 96	-	5.4		
	Barto – North Boyertown 69 kV Line	80 / 96	80 / 96	-	3.9		



# Met-Ed Transmission Zone M-3 Process Multiple Line Rebuild/Rehab Projects

ME-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
007	Alcoa – South Lebanon 69 kV Line	82 / 103	111 / 134	Disconnect Switches, Relays	4.0	93 / 103 (90% Failure Rate)	Age, decay, woodpecker holes
008	Bernville – State Street 69 kV Line	52 / 66	60 / 75	Substation Conductor	10.7	155 / 181 (86% Failure Rate)	Age, sound, woodpecker holes
	State Street – South Hamburg 69 kV Line	88 / 93	139 / 169	Substation Conductor, Relays	0.8		
009	Campbelltown – Swatara Hill 69 kV Line	71 / 90	74 / 90	Substation Conductor	10.5	57 / 288 (20% Failure Rate)	Age, top rot, voids, woodpecker holes
	Swatara Hill – Middletown Junction 69 kV Line	71 / 91	121 / 150	Substation Conductor, Disconnect Switches	2.5		
010	Middletown Junction – York Haven 115 kV Line	129 / 156	129 / 156	-	4.0	100 / 120 (83% Failure Rate)	Age, bad/cut/missing grounds, etc.
	York Haven – Zions View 115 kV Line	129 / 156	129 / 156	-	4.8		
	Zions View – Smith Street 115 kV Line	126 / 149	129 / 156	Substation Conductor	6.6		
011	Allentown Cement – St Peters 69 kV Line	53 / 64	53 / 64	-	2.0	148 / 225 (70% Failure Rate)	Age, bad/cut/missing grounds, sound, woodpecker holes, etc.
	St Peters – South Hamburg 69 kV Line	51 / 64	53 / 64	Substation Conductor	7.5		
	St Peters – Moselem 69 kV Line	132 / 158	139 / 169	Substation Conductor	1.5		
	Moselem – Lyons 69 kV Line	51 / 64	53 / 64	Substation Conductor	4.2		
012	North Temple – Royal Green Tap 69 kV Line	82 / 103	139 / 169	Disconnect Switches, Substation Conductor, Relays	0.4	159 / 208 (76% Failure Rate)	Age, bad/cut/missing grounds, rot, sound, woodpecker holes
	Royal Green Tap – Royal Green 69 kV Line	82 / 103	89 / 107	Disconnect Switch	0.1		
	Royal Green Tap – Berkley Tap 69 kV Line	82 / 103	139 / 169	Disconnect Switch	0.6		
	Berkley Tap – Berkley 69 kV Line	51 / 64	53 / 64	Substation Conductor	0.01		
	Berkley Tap – Leesport 69 kV Line	53 / 64	53 / 64	-	3.6		
	Leesport – South Hamburg 69 kV Line	51 / 64	53 / 64	Substation Conductor	7.2		



# Met-Ed Transmission Zone M-3 Process Multiple Line Rebuild/Rehab Projects

ME-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
013	Alcoa – North Cornwall 69 kV Line	82 / 103	102 / 124	Disconnect Switches	3.1	126 / 164 (77% Failure Rate)	Age, bad/cut/missing grounds, top rot/decay, woodpecker holes, etc.
	North Cornwall – Broad Street 69 kV Line	82 / 103	111 / 134	Disconnect Switches, Substation Conductor	2.0		
014	North Hershey – Grantville 69 kV Line	80 / 96	80 / 96	-	1.5	79 / 91 (87% Failure Rate)	Age, bad/cut/missing grounds, decay, woodpecker holes, etc.
	Grantville – Turf Club 69 kV Line	64 / 65	64 / 65	-	3.0		
020	South Lebanon – Bayer Labs 69 kV Line	51/56	55/56	Substation Conductor	5.9	163 / 203 (80% Failure Rate)	Age, bad/cut/missing grounds, decay, split top, static bayonet, woodpecker holes, etc.
	Bayer Labs – Myerstown 69 kV Line	55/56	55/56	-	1.1		



# Met-Ed Transmission Zone M-3 Process Adamstown – South Reading 69 kV Line Rehab/Rebuild

Need Number: ME-2019-001

Process Stage: Solutions Meeting 4/26/2019

Previously Presented: Need Meeting 2/22/2019

## Project Driver(s):

*Equipment Material Condition, Performance and Risk*

## Specific Assumption Reference(s)

Line Condition Rebuild/Replacement

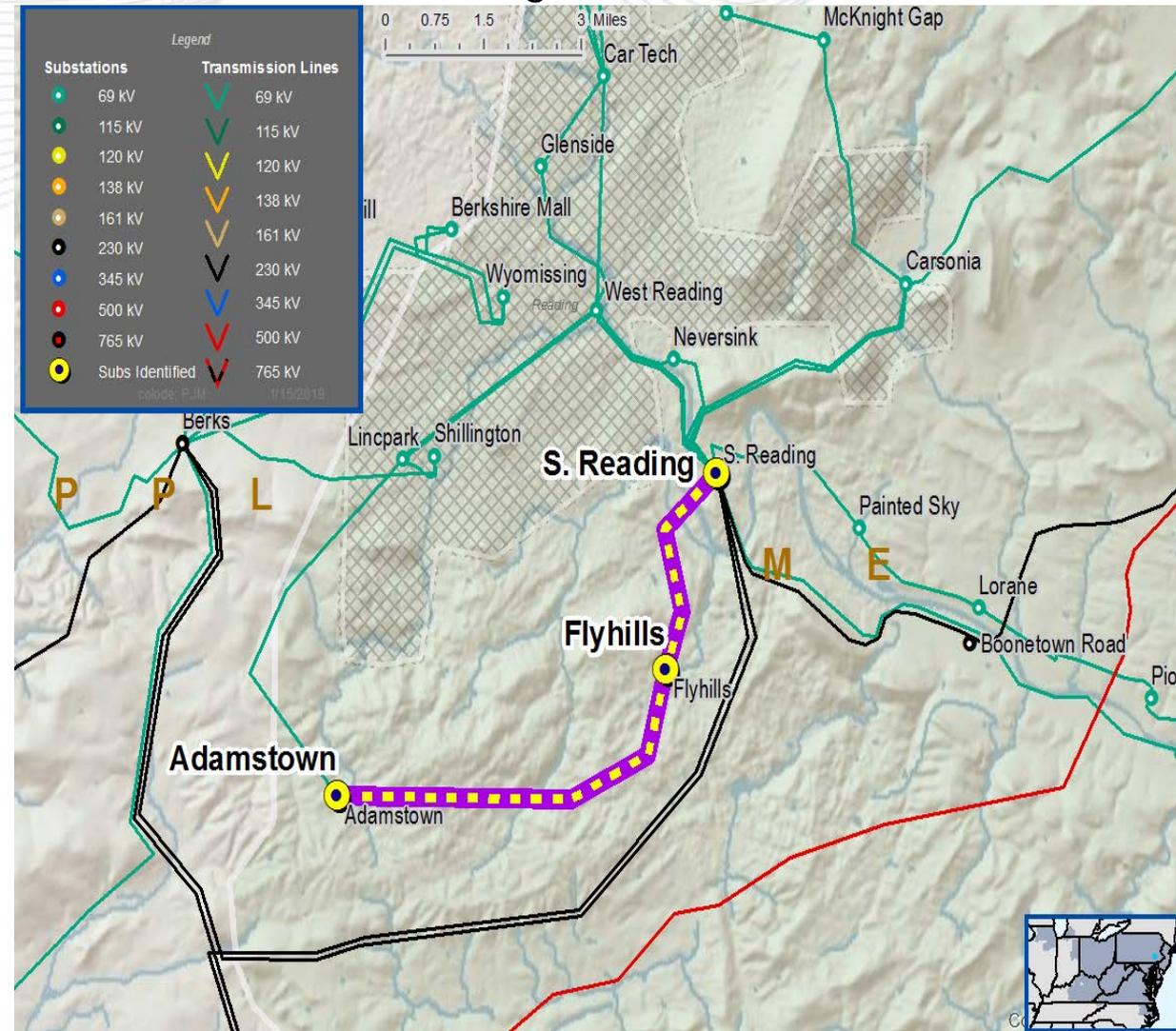
- Age/condition of wood pole transmission line structures
- Age/condition of steel tower or steel pole transmission line structures
- Age/condition of transmission line conductors

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.



**Need Number:** ME-2019-001

**Process Stage:** Solutions Meeting 4/26/2019

**Potential Solution:**

*Adamstown – South Reading 69 kV line Rehab/Rebuild \$9.4M*

- Rehab/Rebuild Adamstown – South Reading. Reconductor 7.2 miles of the 9 mile line.
  - 5.4 miles of reconductoring on Adamstown-Flying Hills.
  - 1.8 miles of reconductoring on Flying Hills-South Reading.
- Replace substation conductor and drops at Flying Hills

**Transmission Line Ratings:**

- Adamstown– Flying Hills 69 kV Line:
  - Before Proposed Solution: 53/64 MVA (SN/SE)
  - After Proposed Solution: 80/96 MVA (SN/SE)
- Flying Hills – South Reading 69 kV Line:
  - Before Proposed Solution: 53/64 MVA (SN/SE)
  - After Proposed Solution: 80/96 MVA (SN/SE)

**Alternatives Considered:**

Maintain existing condition and elevated risk of failure

**Projected In-Service:** 12/31/2019

**Status:** Conceptual



Legend	
500 kV	
230 kV	
138 kV	
115 kV	
69 kV	
46 kV	
New	



# Met-Ed Transmission Zone M-3 Process Baldy – South Hamburg 69 kV Line Rehab/Rebuild

Need Number: ME-2019-002

Process Stage: Solutions Meeting 4/26/2019

Previously Presented: Need Meeting 2/22/2019

## Project Driver(s):

*Equipment Material Condition, Performance and Risk*

## Specific Assumption Reference(s)

Line Condition Rebuild/Replacement

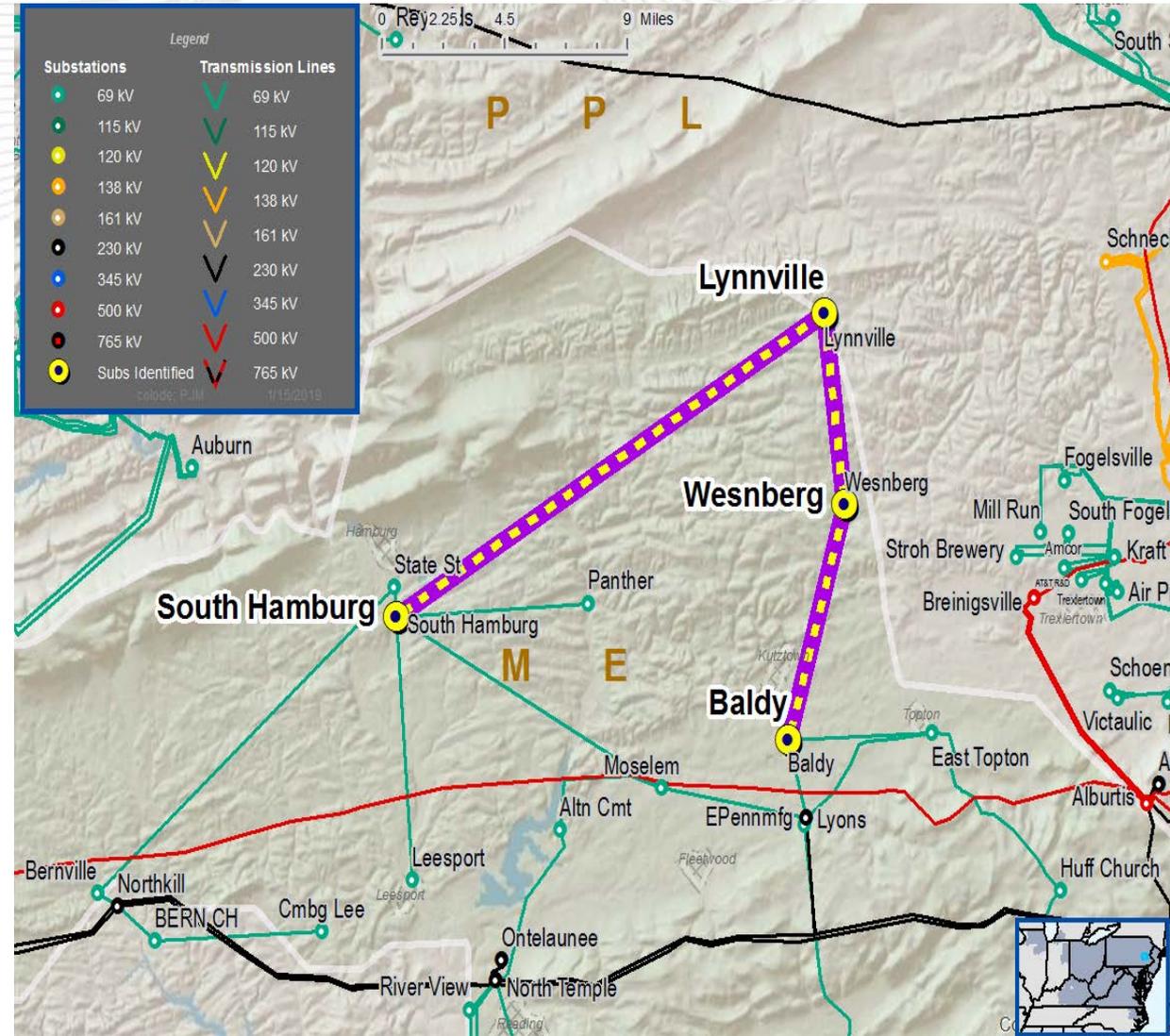
- Age/condition of wood pole transmission line structures
- Age/condition of steel tower or steel pole transmission line structures
- Age/condition of transmission line conductors

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.





# Met-Ed Transmission Zone M-3 Process Baldy – South Hamburg 69 kV Line Rehab/Rebuild

**Need Number:** ME-2019-002

**Process Stage:** Solutions Meeting 4/26/2019

**Potential Solution:**

*Baldy - South Hamburg 69 kV line Rehab/Rebuild \$12.3M*

- Rehab/Rebuild Baldy – South Hamburg (~29.3 miles)
- Replace line relaying and substation conductor at Baldy
- Replace substation conductor at South Hamburg

**Transmission Line Ratings:**

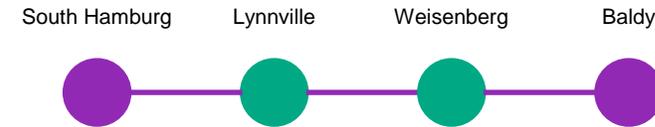
- Baldy– Weisenberg 69 kV Line:
  - Before Proposed Solution: 62/62 MVA (SN/SE)
  - After Proposed Solution: 80/96 MVA (SN/SE)
- Weisenberg– Lynnville 69 kV Line:
  - Before Proposed Solution: 89/107 MVA (SN/SE)
  - After Proposed Solution: 89/107 MVA (SN/SE)
- Lynnville– South Hamburg 69 kV Line:
  - Before Proposed Solution: 51/66 MVA (SN/SE)
  - After Proposed Solution: 74/90 MVA (SN/SE)

**Alternatives Considered:**

Maintain existing condition and elevated risk of failure

**Projected In-Service:** 12/31/2019

**Status:** Conceptual



Legend	
500 kV	
230 kV	
138 kV	
115 kV	
69 kV	
46 kV	
New	



# Met-Ed Transmission Zone M-3 Process North Temple – North Kill 69 kV Line Rehab/Rebuild

Need Number: ME-2019-003

Process Stage: Solutions Meeting 4/26/2019

Previously Presented: Need Meeting 2/22/2019

## Project Driver(s):

*Equipment Material Condition, Performance and Risk*

## Specific Assumption Reference(s)

Line Condition Rebuild/Replacement

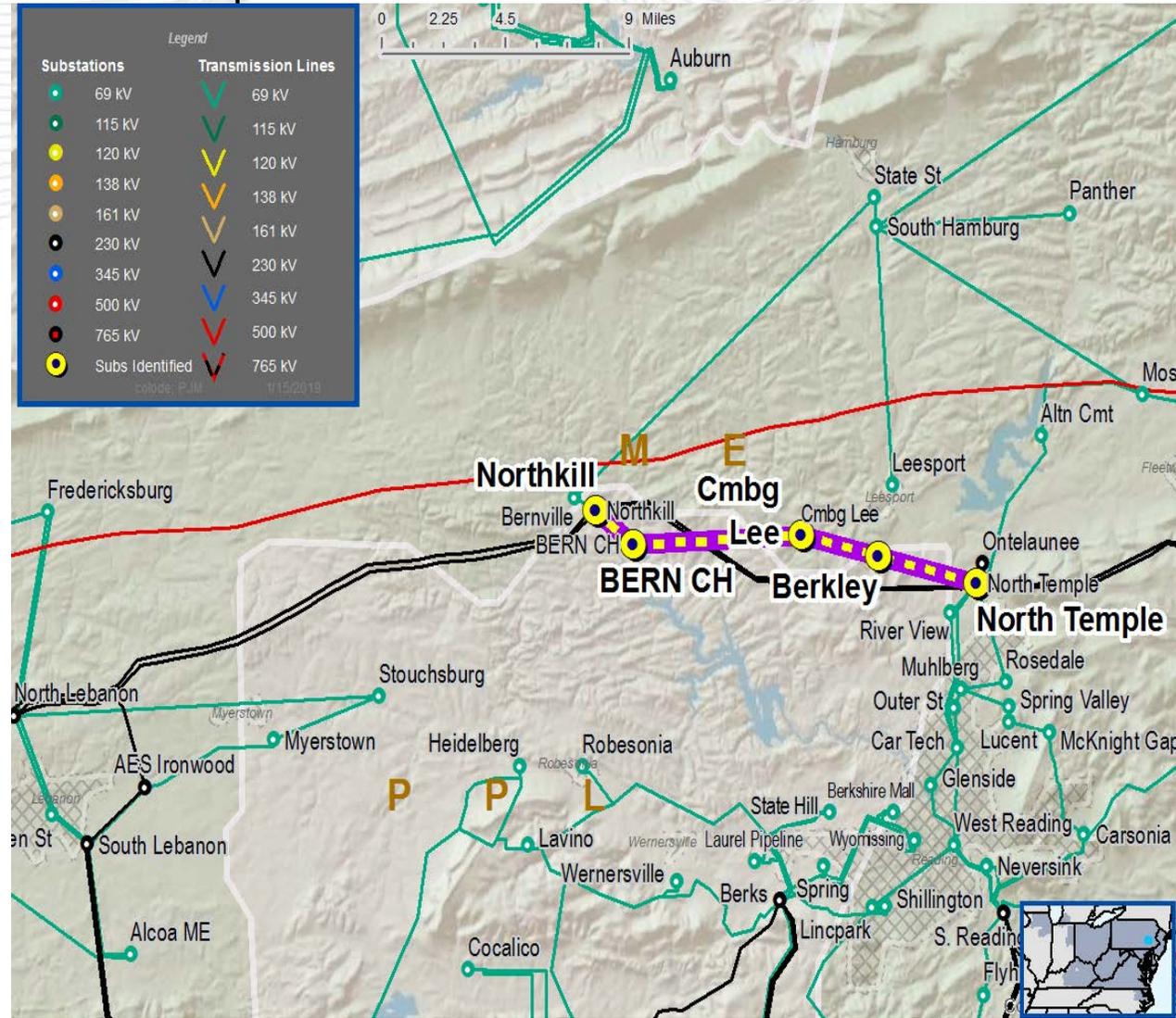
- Age/condition of wood pole transmission line structures
- Age/condition of steel tower or steel pole transmission line structures
- Age/condition of transmission line conductors

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.





# Met-Ed Transmission Zone M-3 Process North Temple – North Kill 69 kV Line Rehab/Rebuild

**Need Number:** ME-2019-003

**Process Stage:** Solutions Meeting 4/26/2019

**Potential Solution:**

*North Temple - Northkill 69 kV line Rehab/Rebuild \$14.2M*

- Rehab/Rebuild North Temple – Northkill. Reconductor ~5.8 miles on Cambridge Lee-Bern Church section.
- Replace substation conductor at North Temple

**Transmission Line Ratings:**

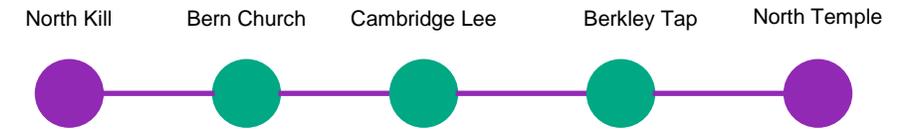
- North Temple – Berkley Tap 69 kV Line:
  - Before Proposed Solution: 113/148 MVA (SN/SE)
  - After Proposed Solution: 139/169 MVA (SN/SE)
- Berkley Tap – Cambridge Lee 69 kV Line:
  - Before Proposed Solution: 139/169 MVA (SN/SE)
  - After Proposed Solution: 139/169 MVA (SN/SE)
- Cambridge Lee – Bern Church 69 kV Line:
  - Before Proposed Solution: 55/56 MVA (SN/SE)
  - After Proposed Solution: 80/96 MVA (SN/SE)

**Alternatives Considered:**

Maintain existing condition and elevated risk of failure

**Projected In-Service:** 6/1/2020

**Status:** Conceptual



Legend	
500 kV	
230 kV	
138 kV	
115 kV	
69 kV	
46 kV	
New	



# Met-Ed Transmission Zone M-3 Process Carsonia – South Reading 69 kV Line Rehab/Rebuild

Need Number: ME-2019-005

Process Stage: Solutions Meeting 4/26/2019

Previously Presented: Need Meeting 2/22/2019

## Project Driver(s):

*Equipment Material Condition, Performance and Risk*

## Specific Assumption Reference(s)

Line Condition Rebuild/Replacement

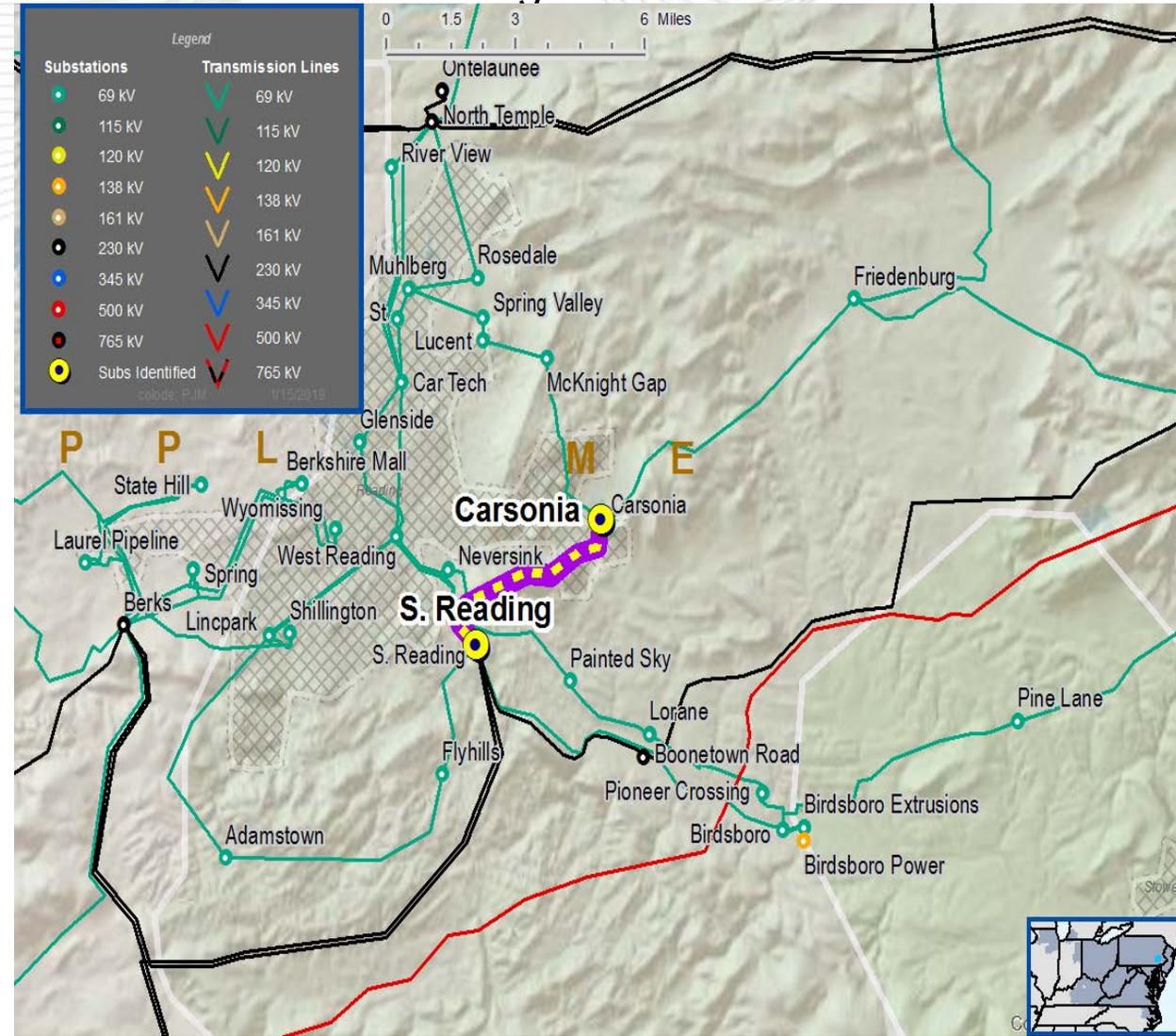
- Age/condition of wood pole transmission line structures
- Age/condition of steel tower or steel pole transmission line structures
- Age/condition of transmission line conductors

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.





# Met-Ed Transmission Zone M-3 Process Carsonia – South Reading 69 kV Line Rehab/Rebuild

**Need Number:** ME-2019-005

**Process Stage:** Solutions Meeting 4/26/2019

**Potential Solution:**

*Carsonia – South Reading 69 kV line Rehab/Rebuild \$8.3M*

- Rehab/Rebuild Carsonia – South Reading
- Replace substation conductor and line drops at Carsonia.

**Transmission Line Ratings:**

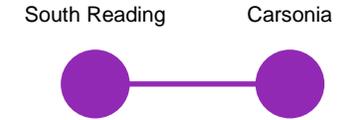
- Carsonia – South Reading 69 kV Line:
  - Before Proposed Solution: 78/94 MVA (SN/SE)
  - After Proposed Solution: 162/198 MVA (SN/SE)

**Alternatives Considered:**

Maintain existing condition and elevated risk of failure

**Projected In-Service:** 12/31/2019

**Status:** Conceptual



Legend	
500 kV	
230 kV	
138 kV	
115 kV	
69 kV	
46 kV	
New	



# Met-Ed Transmission Zone M-3 Process East Tipton – North Boyertown 69 kV Line Rehab/Rebuild

Need Number: ME-2019-006

Process Stage: Solutions Meeting 4/26/2019

Previously Presented: Need Meeting 2/22/2019

## Project Driver(s):

*Equipment Material Condition, Performance and Risk*

## Specific Assumption Reference(s)

Line Condition Rebuild/Replacement

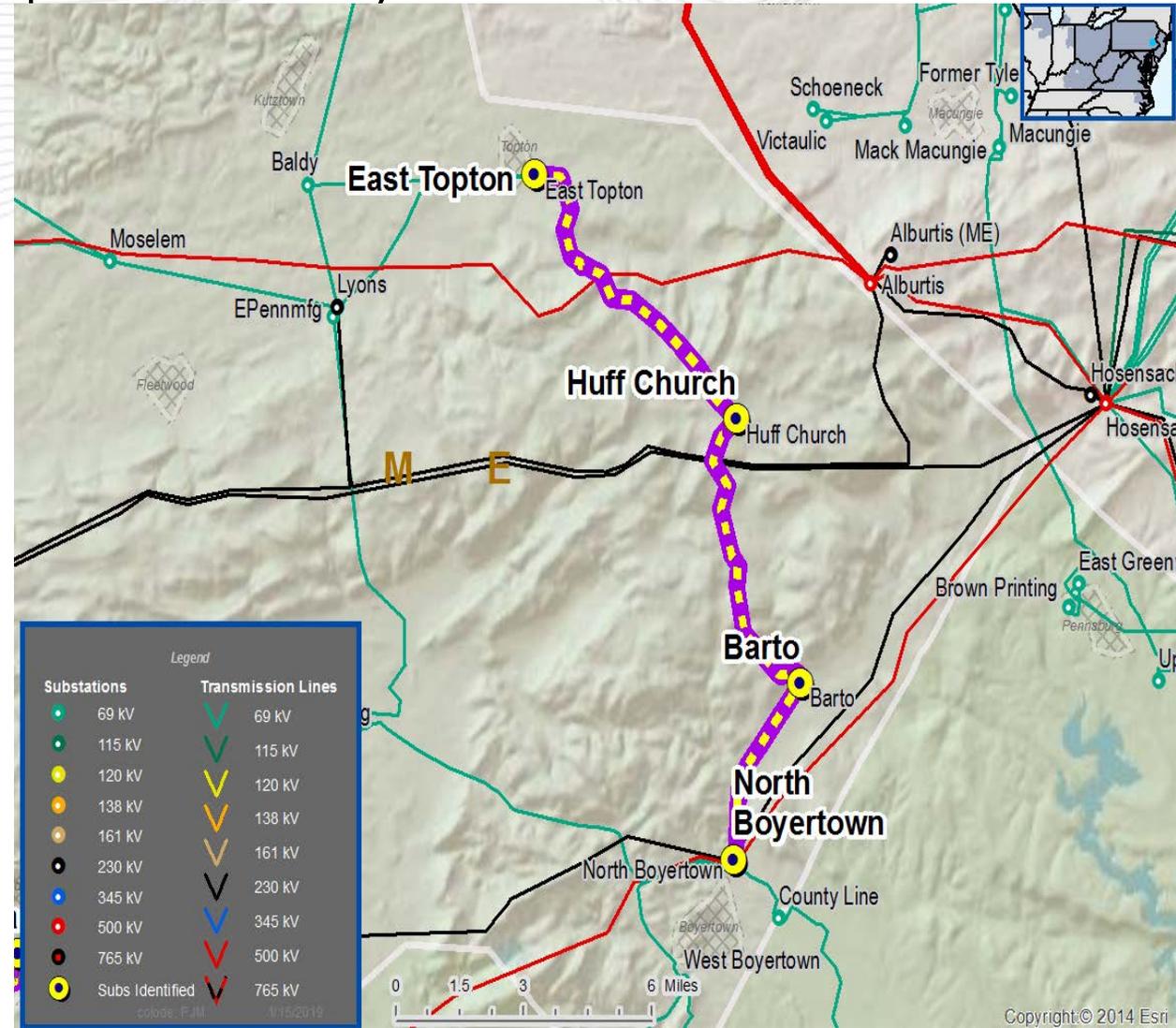
- Age/condition of wood pole transmission line structures
- Age/condition of steel tower or steel pole transmission line structures
- Age/condition of transmission line conductors

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.





# Met-Ed Transmission Zone M-3 Process East Tipton – North Boyertown 69 kV Line Rehab/Rebuild

**Need Number:** ME-2019-006

**Process Stage:** Solutions Meeting 4/26/2019

**Potential Solution:**

*East Tipton – North Boyertown 69 kV line Rehab/Rebuild \$18.2M*

- Rehab/Rebuild East Tipton – North Boyertown
- Replace line relaying and substation conductor at East Tipton.

**Transmission Line Ratings:**

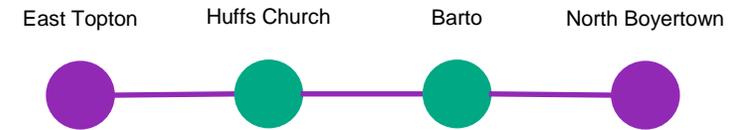
- Huffs Church – East Tipton 69 kV Line:
  - Before Proposed Solution: 50/50 MVA (SN/SE)
  - After Proposed Solution: 80/96 MVA (SN/SE)

**Alternatives Considered:**

Maintain existing condition and elevated risk of failure

**Projected In-Service:** 12/31/2019

**Status:** Conceptual



Legend	
500 kV	
230 kV	
138 kV	
115 kV	
69 kV	
46 kV	
New	



# Met-Ed Transmission Zone M-3 Process Alcoa – South Lebanon 69 kV Line Rehab/Rebuild

Need Number: ME-2019-007

Process Stage: Solutions Meeting 4/26/2019

Previously Presented: Need Meeting 2/22/2019

## Project Driver(s):

*Equipment Material Condition, Performance and Risk*

## Specific Assumption Reference(s)

Line Condition Rebuild/Replacement

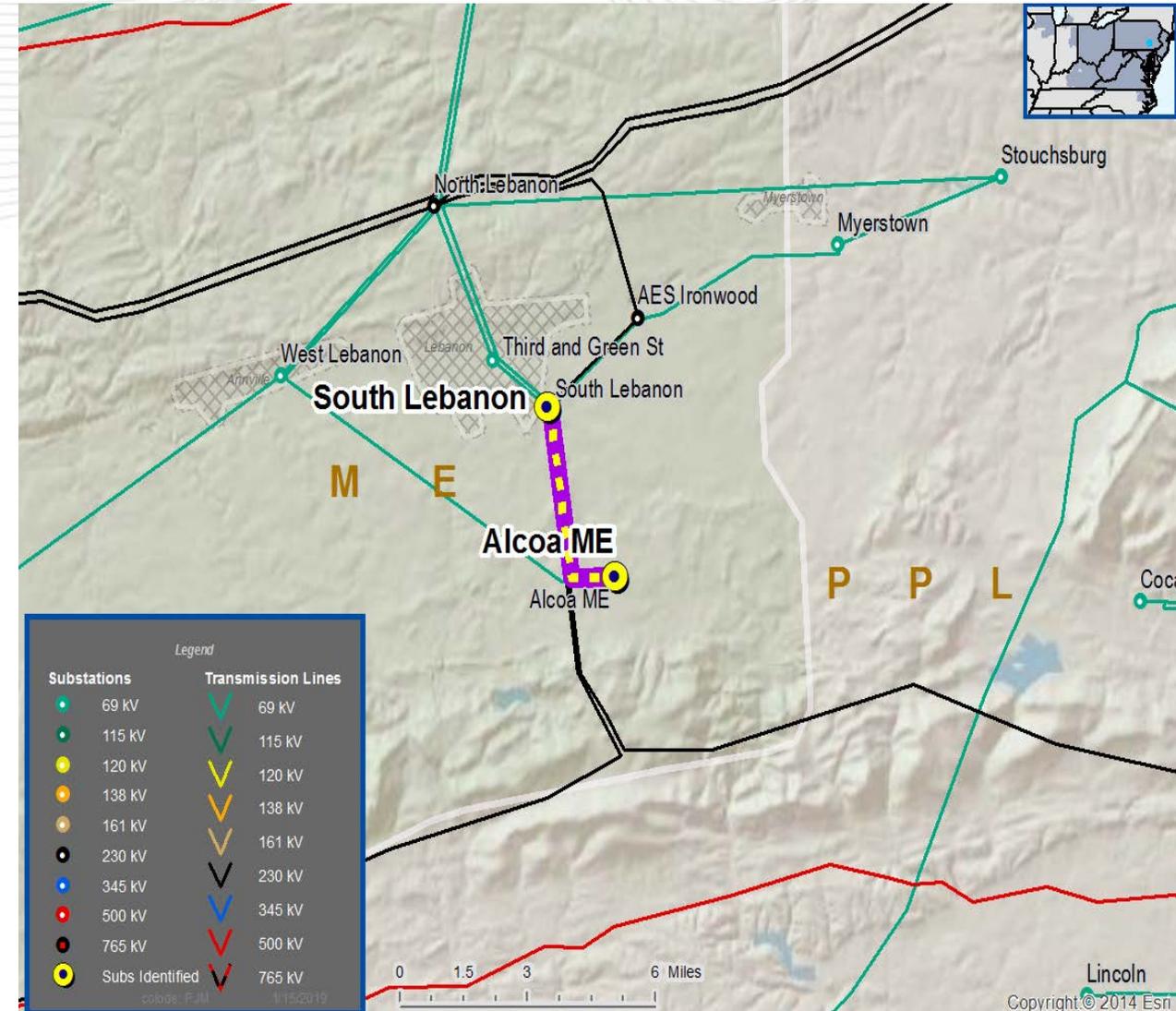
- Age/condition of wood pole transmission line structures
- Age/condition of steel tower or steel pole transmission line structures
- Age/condition of transmission line conductors

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.



**Need Number:** ME-2019-007

**Process Stage:** Solutions Meeting 4/26/2019

**Potential Solution:**

*Alcoa – South Lebanon 69 kV line Rehab/Rebuild \$3.2M*

- Rehab/Rebuild Alcoa – South Lebanon
- Replace disconnect switches and relays at Alcoa and South Lebanon

**Transmission Line Ratings:**

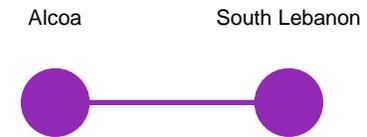
- Alcoa – South Lebanon 69 kV Line:
  - Before Proposed Solution: 82/103 MVA (SN/SE)
  - After Proposed Solution: 111/134 MVA (SN/SE)

**Alternatives Considered:**

Maintain existing condition and elevated risk of failure

**Projected In-Service:** 12/31/2020

**Status:** Conceptual



Legend	
500 kV	
230 kV	
138 kV	
115 kV	
69 kV	
46 kV	
New	

Need Number: ME-2019-008

Process Stage: Solutions Meeting 4/26/2019

Previously Presented: Need Meeting 2/22/2019

### Project Driver(s):

*Equipment Material Condition, Performance and Risk*

### Specific Assumption Reference(s)

Line Condition Rebuild/Replacement

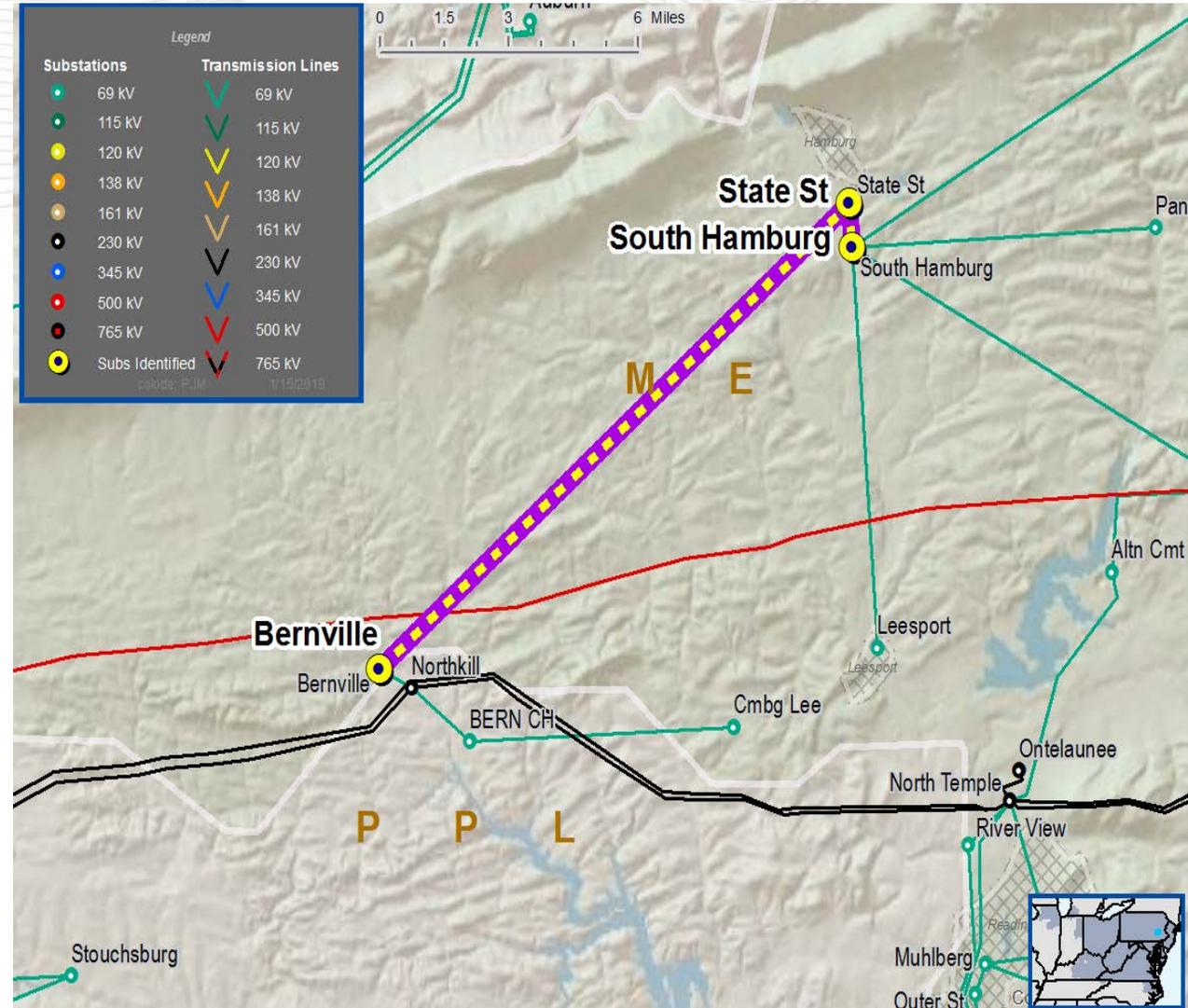
- Age/condition of wood pole transmission line structures
- Age/condition of steel tower or steel pole transmission line structures
- Age/condition of transmission line conductors

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.



Need Number: ME-2019-008

Process Stage: Solutions Meeting 4/26/2019

**Potential Solution:**

*Bernville – South Hamburg 69 kV line Rehab/Rebuild \$14.9M*

- Rehab/Rebuild Bernville – South Hamburg
- Reconductor Bernville – State Street section
- Replace substation conductor and relays at South Hamburg
- Replace substation conductor at Bernville

**Transmission Line Ratings:**

- Bernville – State Street Tap 69 kV Line:
  - Before Proposed Solution: 52/66 MVA (SN/SE)
  - After Proposed Solution: 82/103 MVA (SN/SE)
- State Street Tap – South Hamburg 69 kV Line:
  - Before Proposed Solution: 88/93 MVA (SN/SE)
  - After Proposed Solution: 139/169 MVA (SN/SE)

**Alternatives Considered:**

Maintain existing condition and elevated risk of failure

Projected In-Service: 6/1/2020

Status: Conceptual



Legend	
500 kV	
230 kV	
138 kV	
115 kV	
69 kV	
46 kV	
New	

- Intentionally left blank

Intentionally left blank



# Met-Ed Transmission Zone M-3 Process Middletown Junction – Smith Street 115 kV Line Rehab/Rebuild

Need Number: ME-2019-010

Process Stage: Solutions Meeting 4/26/2019

Previously Presented: Need Meeting 2/22/2019

## Project Driver(s):

*Equipment Material Condition, Performance and Risk*

## Specific Assumption Reference(s)

Line Condition Rebuild/Replacement

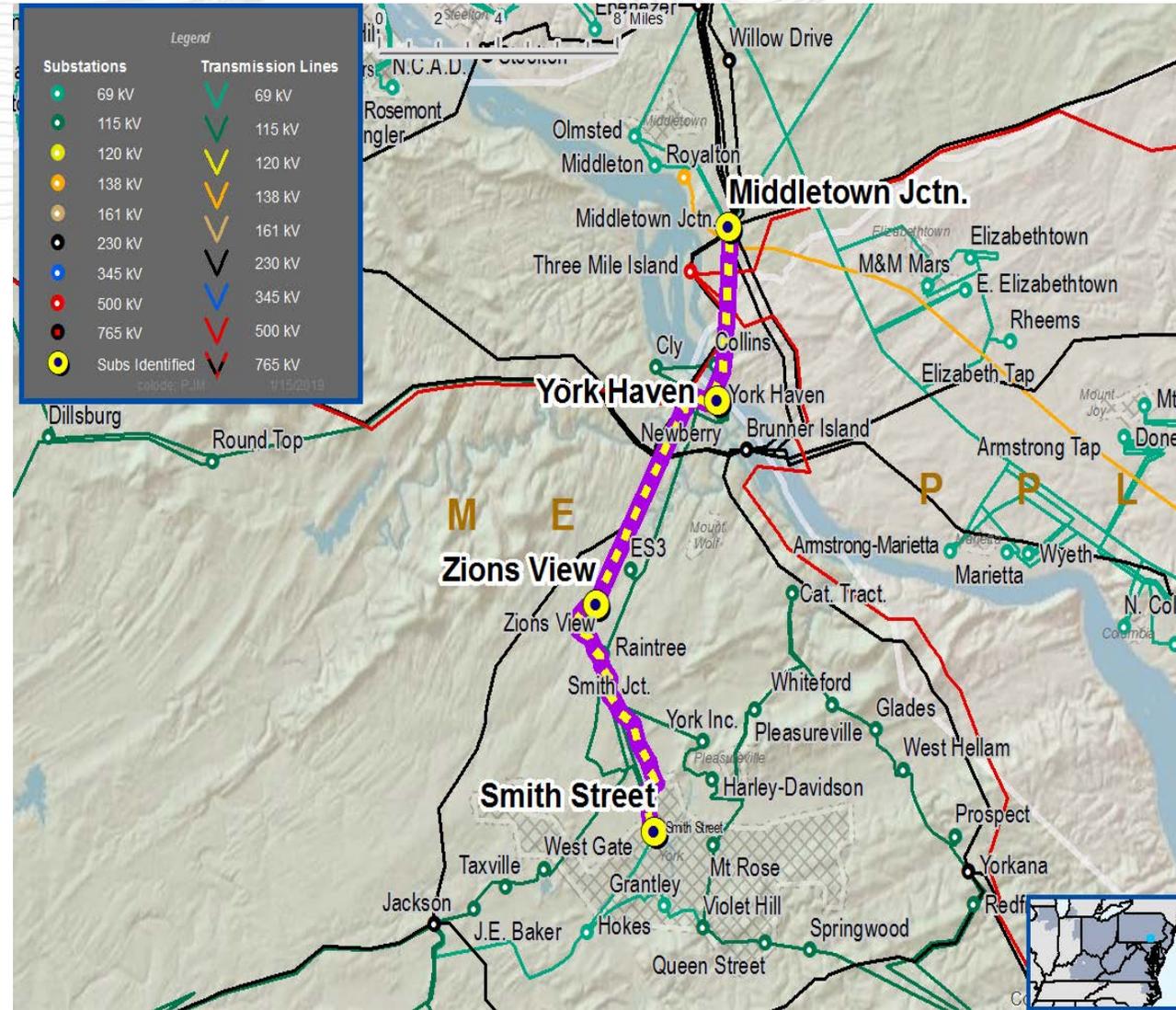
- Age/condition of wood pole transmission line structures
- Age/condition of steel tower or steel pole transmission line structures
- Age/condition of transmission line conductors

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.





# Met-Ed Transmission Zone M-3 Process Middletown Junction – Smith Street 115 kV Line Rehab/Rebuild

Need Number: ME-2019-010

Process Stage: Solutions Meeting 4/26/2019

### Potential Solution:

*Middletown Junction – Smith Street 115 kV line Rehab/Rebuild \$2.1M*

- Rehab/Rebuild Middletown Junction – Smith Street
- Replace substation conductor at Smith Street.

### Transmission Line Ratings:

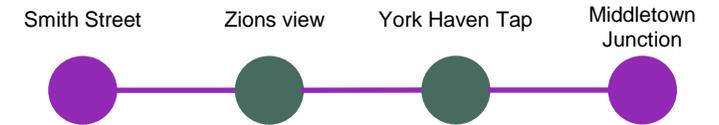
- Zions view – Smith Street 115 kV Line:
  - Before Proposed Solution: 126/149 MVA (SN/SE)
  - After Proposed Solution: 129/156 MVA (SN/SE)

### Alternatives Considered:

Maintain existing condition and elevated risk of failure

Projected In-Service: 12/31/2022

Status: Conceptual



Legend	
500 kV	
230 kV	
138 kV	
115 kV	
69 kV	
46 kV	
New	



# Met-Ed Transmission Zone M-3 Process Allentown Cement – Lyons – South Hamburg 69 kV Line Rehab/Rebuild

Need Number: ME-2019-011

Process Stage: Solutions Meeting 4/26/2019

Previously Presented: Need Meeting 2/22/2019

## Project Driver(s):

*Equipment Material Condition, Performance and Risk*

## Specific Assumption Reference(s)

Line Condition Rebuild/Replacement

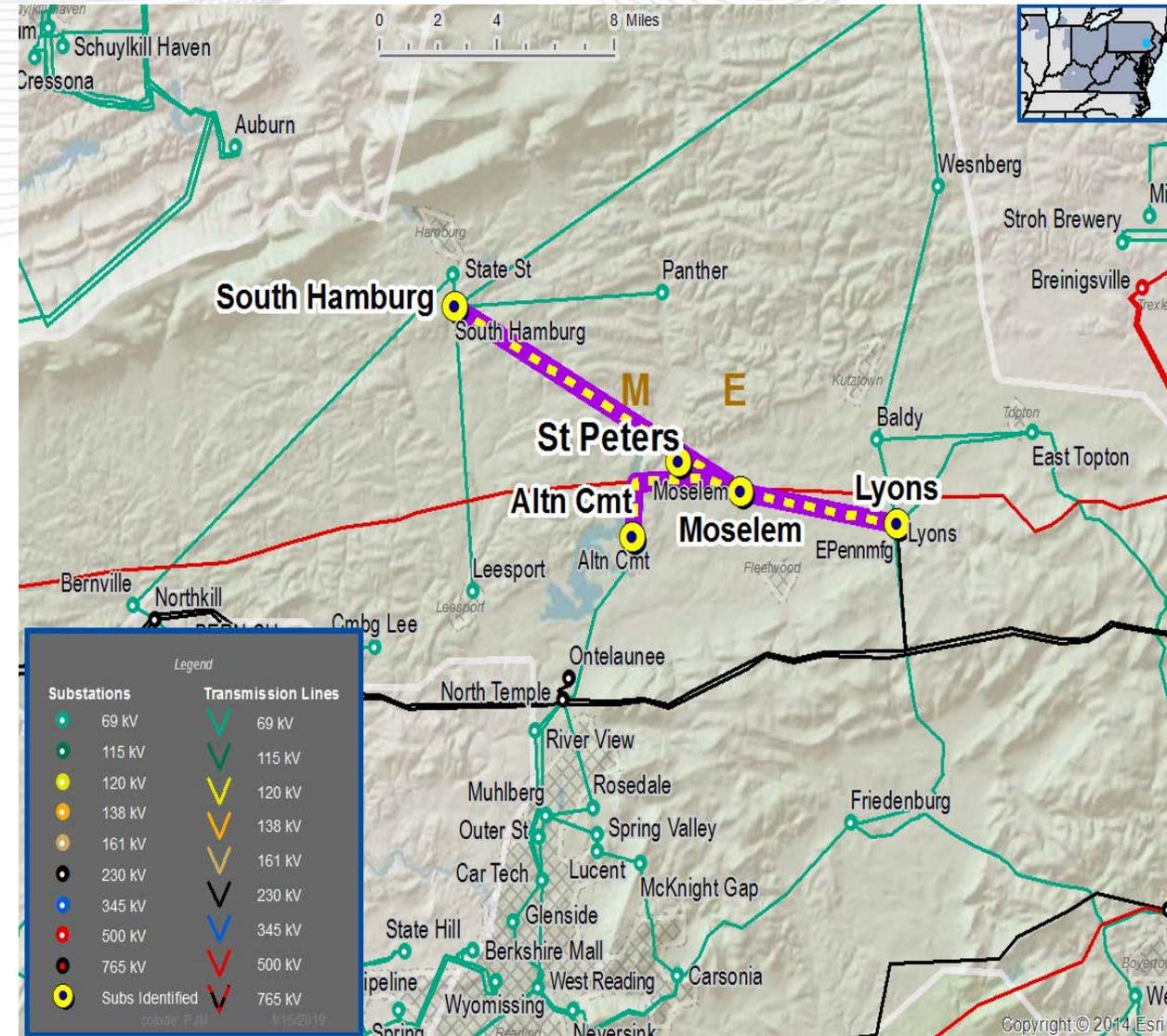
- Age/condition of wood pole transmission line structures
- Age/condition of steel tower or steel pole transmission line structures
- Age/condition of transmission line conductors

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.





# Met-Ed Transmission Zone M-3 Process Allentown Cement – Lyons – South Hamburg 69 kV Line Rehab/Rebuild

Need Number: ME-2019-011

Process Stage: Solutions Meeting 4/26/2019

**Potential Solution:**

*Allentown Cement – Lyons – South Hamburg 69 kV line Rehab/Rebuild \$15.7M*

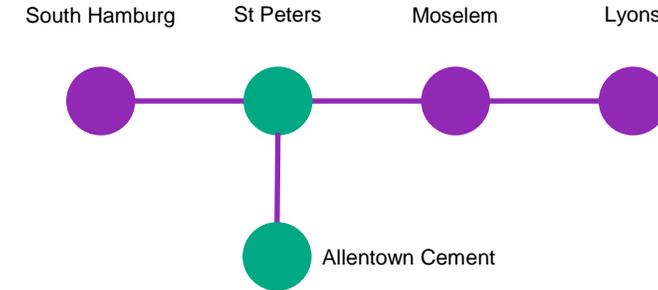
- Rehab/Rebuild Allentown – Lyons – South Hamburg
- Reconductor ~15.2 miles
- Replace substation conductor at South Hamburg, Moselem, and Lyons

Transmission Line Ratings:

- Lyons – Moselem 69 kV Line:
  - Before Proposed Solution: 51/64 MVA (SN/SE)
  - After Proposed Solution: 139/169 MVA (SN/SE)
- Moselem – St Peters 69 kV Line:
  - Before Proposed Solution: 132/158 MVA (SN/SE)
  - After Proposed Solution: 139/169 MVA (SN/SE)
- St Peters – Allentown Cement 69 kV Line:
  - Before Proposed Solution: 53/64 MVA (SN/SE)
  - After Proposed Solution: 139/169 MVA (SN/SE)
- St Peters – South Hamburg 69 kV Line:
  - Before Proposed Solution: 51/64 MVA (SN/SE)
  - After Proposed Solution: 139/169 MVA (SN/SE)

**Alternatives Considered:**

Maintain existing condition and elevated risk of failure



Legend	
500 kV	
230 kV	
138 kV	
115 kV	
69 kV	
46 kV	
New	

**Projected In-Service:** 12/31/2021

**Status:** Conceptual



# Met-Ed Transmission Zone M-3 Process North Temple – South Hamburg 69 kV Line Rehab/Rebuild

Need Number: ME-2019-012

Process Stage: Solutions Meeting 4/26/2019

Previously Presented: Need Meeting 2/22/2019

## Project Driver(s):

*Equipment Material Condition, Performance and Risk*

## Specific Assumption Reference(s)

Line Condition Rebuild/Replacement

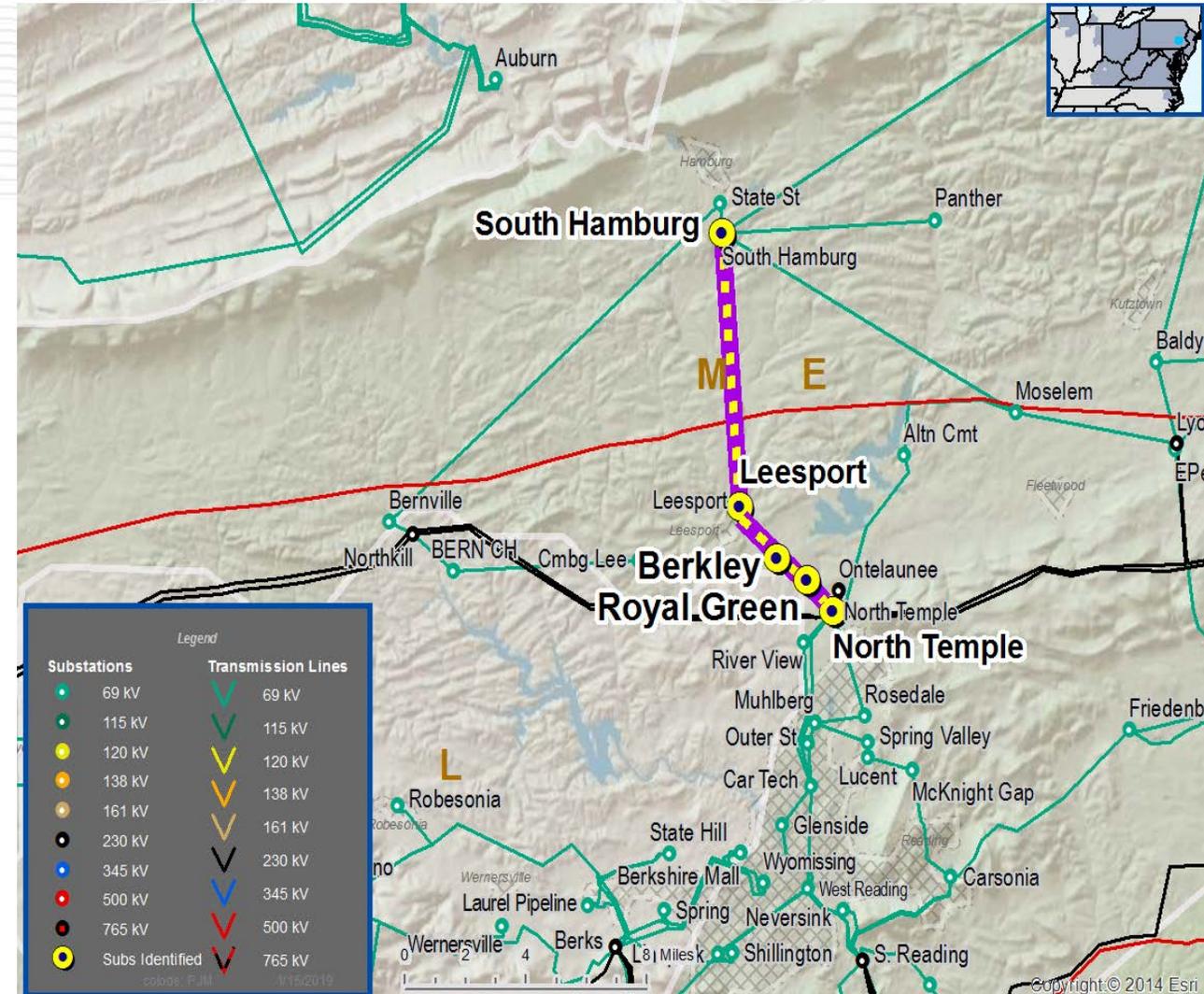
- Age/condition of wood pole transmission line structures
- Age/condition of steel tower or steel pole transmission line structures
- Age/condition of transmission line conductors

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.





Need Number: ME-2019-012

Process Stage: Solutions Meeting 4/26/2019

**Potential Solution:**

*North Temple – South Hamburg 69 kV line Rehab/Rebuild \$13.8M*

- Rehab/Rebuild North Temple – South Hamburg. Reconductor ~11.86 miles
- Replace Switches at North Temple and Royal Green Tap
- Replace Substation Conductor at North Temple and South Hamburg

**Transmission Line Ratings:**

- North Temple – Royal Green Tap 69 kV Line:
  - Before Proposed Solution: 82/103 MVA (SN/SE)
  - After Proposed Solution: 139/169 MVA SE (SN/SE)
- Royal Green Tap – Berkley 69 kV Line:
  - Before Proposed Solution: 82/103 MVA (SN/SE)
  - After Proposed Solution: 139/169 MVA (SN/SE)
- Berkley – Leesport 69 kV Line:
  - Before Proposed Solution: 53/64 MVA (SN/SE)
  - After Proposed Solution: 139/169 MVA (SN/SE)
- Leesport – South Hamburg 69 kV Line:
  - Before Proposed Solution: 51/64 MVA (SN/SE)
  - After Proposed Solution: 139/169 MVA (SN/SE)

**Alternatives Considered:**

Maintain existing condition and elevated risk of failure

Projected In-Service: 12/31/2021

Status: Conceptual

# Met-Ed Transmission Zone M-3 Process North Temple – South Hamburg 69 kV Line Rehab/Rebuild



Legend	
500 kV	
230 kV	
138 kV	
115 kV	
69 kV	
46 kV	
New	

Need Number: ME-2019-013

Process Stage: Solutions Meeting 4/26/2019

Previously Presented: Need Meeting 2/22/2019

### Project Driver(s):

*Equipment Material Condition, Performance and Risk*

### Specific Assumption Reference(s)

Line Condition Rebuild/Replacement

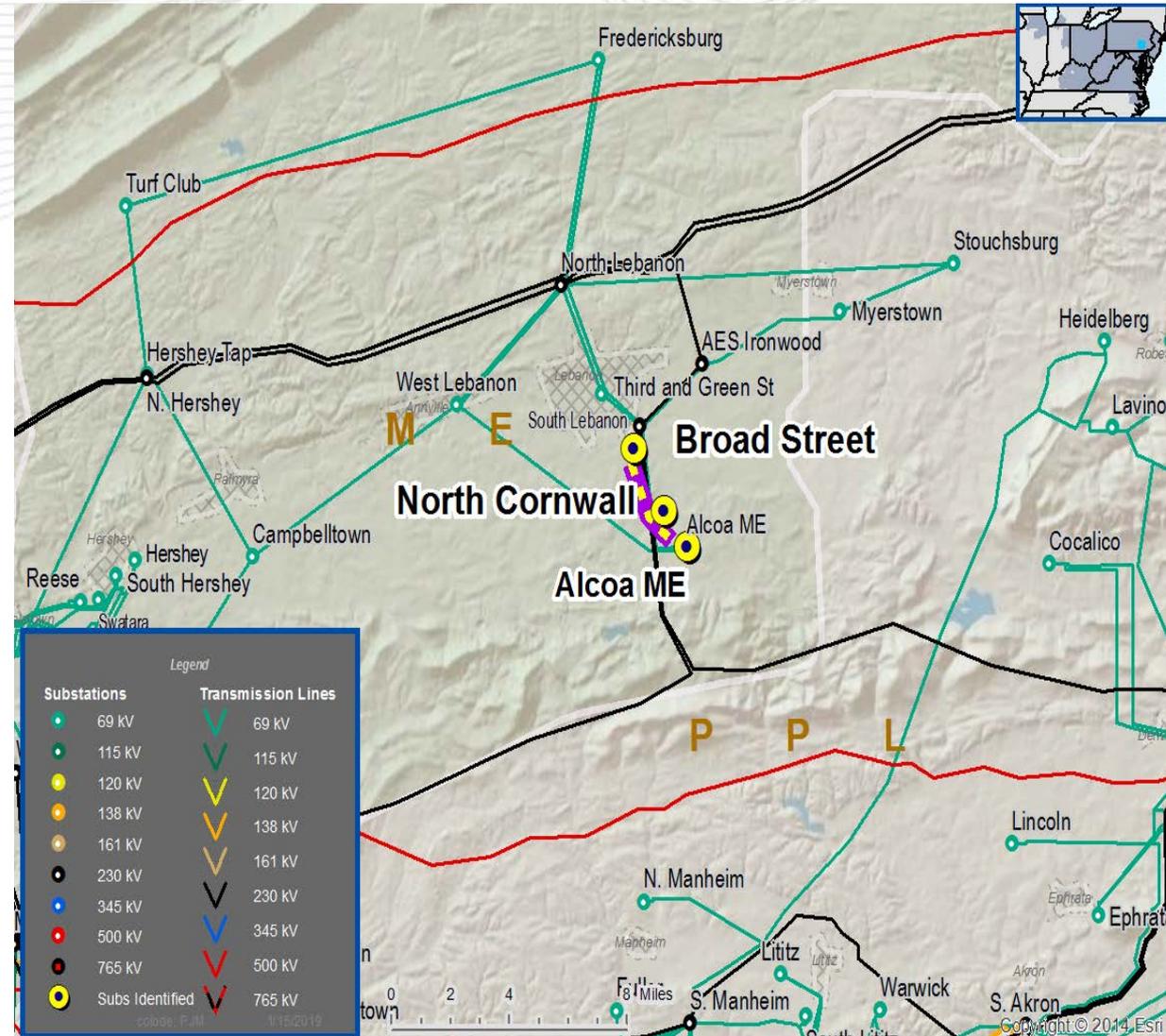
- Age/condition of wood pole transmission line structures
- Age/condition of steel tower or steel pole transmission line structures
- Age/condition of transmission line conductors

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.





# Met-Ed Transmission Zone M-3 Process Alcoa – Broad Street 69 kV Line Rehab/Rebuild

**Need Number:** ME-2019-013

**Process Stage:** Solutions Meeting 4/26/2019

**Potential Solution:**

*Alcoa – Broad Street 69 kV line Rehab/Rebuild \$6.5M*

- Rehab/Rebuild Alcoa – Broad Street
- Replace Substation Conductor and Switches at Broad Street
- Replace Switches at Alcoa

**Transmission Line Ratings:**

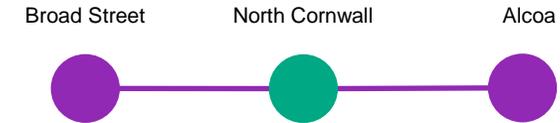
- Alcoa – North Cornwall 69 kV Line:
  - Before Proposed Solution: 82/103 MVA (SN/SE)
  - After Proposed Solution: 102/124 MVA (SN/SE)
- North Cornwall – Broad Street 69 kV Line:
  - Before Proposed Solution: 82/103 MVA (SN/SE)
  - After Proposed Solution: 111/134 MVA (SN/SE)

**Alternatives Considered:**

Maintain existing condition and elevated risk of failure

**Projected In-Service:** 12/31/2021

**Status:** Conceptual



Legend	
500 kV	
230 kV	
138 kV	
115 kV	
69 kV	
46 kV	
New	





# Met-Ed Transmission Zone M-3 Process North Hershey – Turf Club 69 kV Line Rehab/Rebuild

**Need Number:** ME-2019-014

**Process Stage:** Solutions Meeting 4/26/2019

**Potential Solution:**

*North Hershey – Turf Club 69 kV line Rehab/Rebuild \$6.4M*

- Rehab/Rebuild North Hershey – Turf Club. Reconductor ~4.5 miles.

**Transmission Line Ratings:**

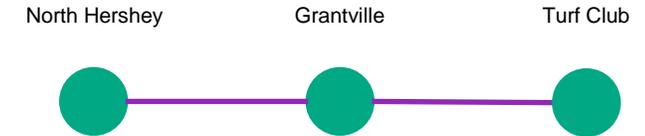
- North Hershey – Grantville 69 kV Line:
  - Before Proposed Solution: 80/96 MVA (SN/SE).
  - After Proposed Solution: 111/134 MVA (SN/SE).
- Grantville – Turf Club 69 kV Line:
  - Before Proposed Solution: 64/65 MVA (SN/SE).
  - After Proposed Solution: 111/134 MVA (SN/SE).

**Alternatives Considered:**

Maintain existing condition and elevated risk of failure

**Projected In-Service:** 12/31/2021

**Status:** Conceptual



Legend	
500 kV	
230 kV	
138 kV	
115 kV	
69 kV	
46 kV	
New	

**Need Number:** ME-2019-015

**Process Stage:** Solutions Meeting 4/26/2019

**Previously Presented:**

Need Meeting 2/22/2019

**Supplemental Project Driver:**

*Equipment Material Condition, Performance and Risk*

**Specific Assumption References:**

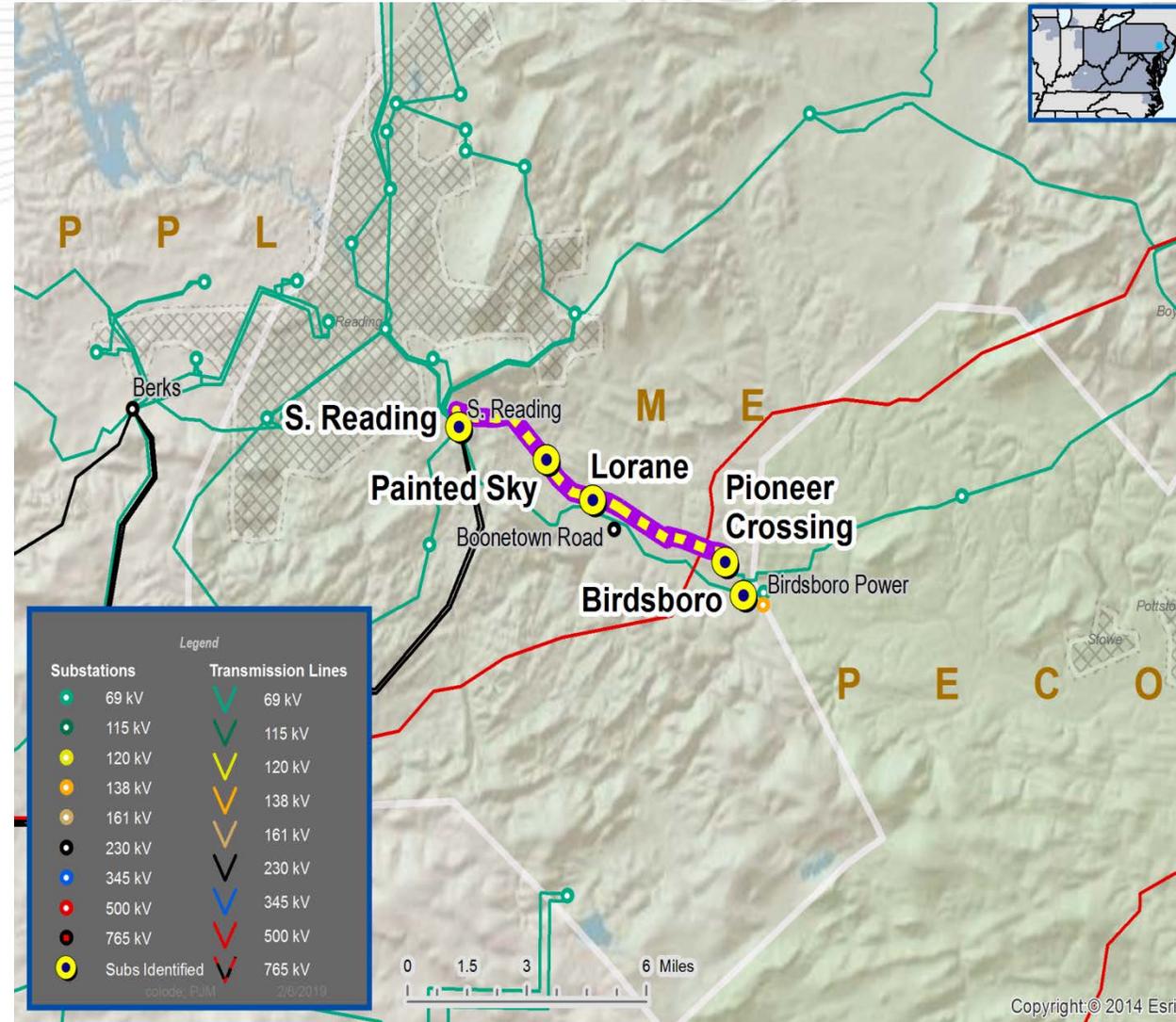
- Line Condition Rebuild/Replacement – Age/condition of transmission line conductors, wood pole transmission line structures
- System Performance Projects – Substation/Line Equipment Limits
- Reconductor/Rebuild Transmission Lines – Transmission lines with high loading

**Problem Statement:**

The South Reading-Painted Sky-Lorane-Pioneer Crossing-Birdsboro 69 kV line is exhibiting deterioration resulting in increased maintenance. The Transmission line is approaching end of life

- 28 out of 125 structures failed inspection (22% Failure Rate).
- Failure reasons include bad/cut/missing grounds, static bayonet, broken guy, woodpecker damage, etc.
- Total line distance is approximately 7.5 miles.

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Need Number: ME-2019-015

Process Stage: Solutions Meeting 4/26/2019

Previously Presented:

Need Meeting 2/22/2019

**Problem Statement (Continued):**

Thermal loading on the Lorane-Pioneer Crossing 69 kV section is ~115% of the SE rating for loss of the N. Boyertown 230-69 kV transformer & S. Reading-Birdsboro 828 69 kV line.

*(2018 RTEP Model – 2023 Summer)*

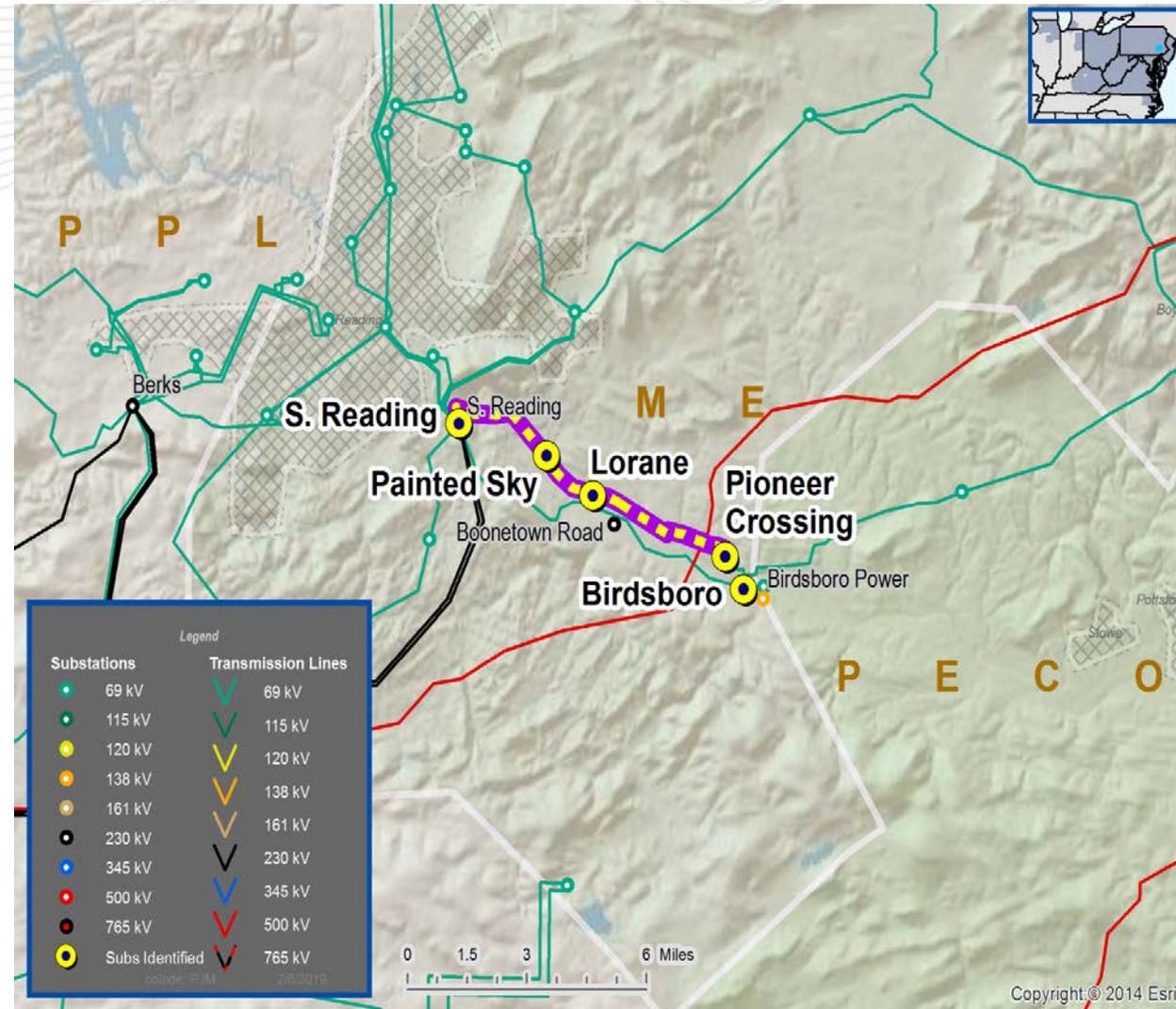
Transmission line rating is limited by terminal equipment.

South Reading-Painted Sky 69 kV line: *(substation conductor)*

- Existing line rating is 88 / 114 MVA (SN / SE).
- Existing conductor rating is 139 / 169 MVA (SN / SE).

Painted Sky-Lorane 69 kV line: *(substation conductor)*

- Existing line rating is 137 / 169 MVA (SN / SE).
- Existing conductor rating is 139 / 169 MVA (SN / SE).





# Met-Ed Transmission Zone M-3 Process Birdsboro – South Reading 69 kV Line Rebuild/Rehab

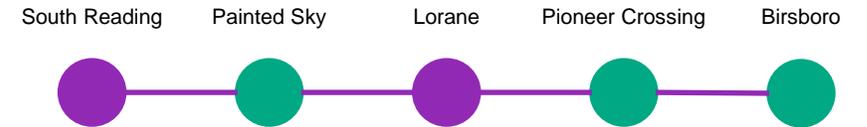
Need Number: ME-2019-015

Process Stage: Solutions Meeting 4/26/2019

## Potential Solution:

*Birdsboro – South Reading 69 kV line Rehab/Rebuild \$4.1M*

- Rehab/Rebuild Birdsboro – South Reading
- Reconductor 2.68 miles
  - 2.23 miles on Lorane-Pioneer Crossing
  - 0.45 miles on Pioneer Crossing-Birdsboro
- Replace substation conductor at Lorane and South Reading



Legend	
500 kV	
230 kV	
138 kV	
115 kV	
69 kV	
46 kV	
New	

Continued on next slide...



# Met-Ed Transmission Zone M-3 Process Birdsboro – South Reading 69 kV Line Rebuild/Rehab

Need Number: ME-2019-015

Process Stage: Solutions Meeting 4/26/2019

Potential Solution (Continued):

Transmission Line Ratings:

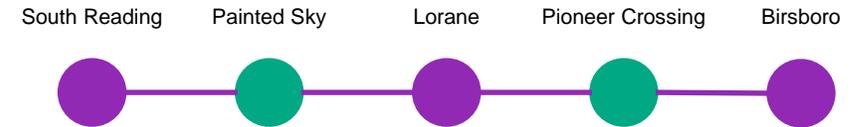
- South Reading– Painted Sky 69 kV Line:
  - Before Proposed Solution: 88/114 MVA (SN/SE)
  - After Proposed Solution: 139/169 MVA (SN/SE)
- Painted Sky– Lorane 69 kV Line:
  - Before Proposed Solution: 137/169 MVA (SN/SE)
  - After Proposed Solution: 139/169 MVA (SN/SE)
- Lorane– Pioneer Crossing 69 kV Line:
  - Before Proposed Solution: 55/56 MVA (SN/SE)
  - After Proposed Solution: 139/169 MVA (SN/SE)
- Pioneer Crossing– Birdsboro 69 kV Line:
  - Before Proposed Solution: 74/90 MVA (SN/SE)
  - After Proposed Solution: 139/169 MVA (SN/SE)

Alternatives Considered:

Maintain existing condition and elevated risk of failure

Projected In-Service: 12/1/2019

Status: Conceptual



Legend	
500 kV	
230 kV	
138 kV	
115 kV	
69 kV	
46 kV	
New	

**Need Number:** ME-2019-016

**Process Stage:** Solutions Meeting 4/26/2019

**Previously Presented:**

Need Meeting 2/22/2019

**Supplemental Project Driver:**

*Equipment Material Condition, Performance and Risk*

**Specific Assumption References:**

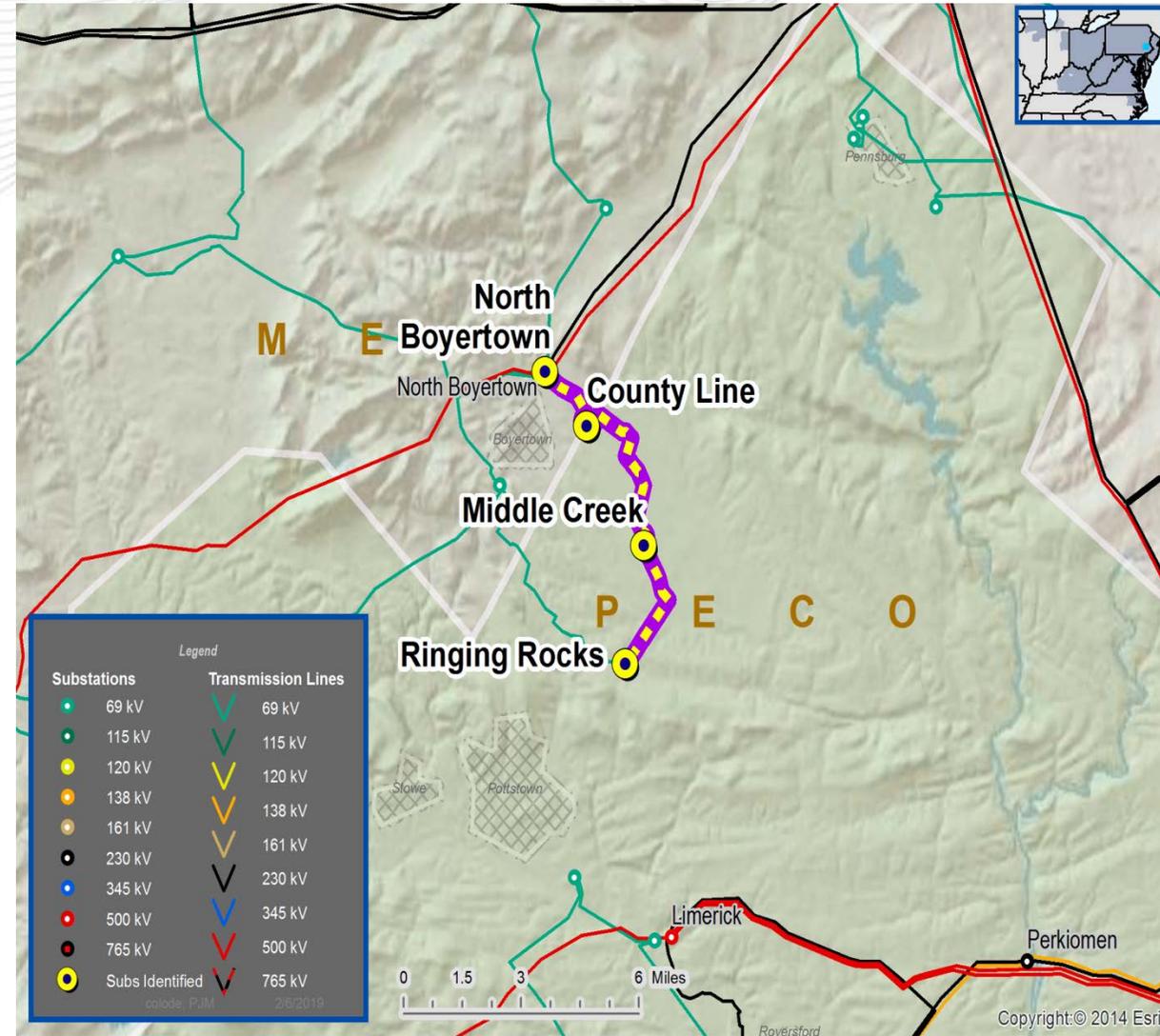
- Line Condition Rebuild/Replacement – Age/condition of transmission line conductors, wood pole transmission line structures, and steel pole transmission line structures
- System Performance Projects – Substation/Line Equipment Limits
- Reconductor/Rebuild Transmission Lines – Transmission lines with high loading

**Problem Statement:**

The N. Boyertown-Cabot-County Line-Middle Creek-Ringing Rocks 69 kV line is exhibiting deterioration resulting in increased maintenance. The Transmission line is approaching end of life

- 41 out of 147 structures failed inspection (28% Failure Rate).
- Failure reasons include split top, cracking, etc.
- Total line distance is approximately 7.7 miles.

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Need Number: ME-2019-016

Process Stage: Solutions Meeting 4/26/2019

Previously Presented:

Need Meeting 2/22/2019

**Problem Statement (Continued):**

Thermal loading on North Boyertown-Cabot 69 kV section and Cabot-County Line 69 kV sections are loaded to approximately 112% and 100% of their SE ratings respectively for loss of the North Boyertown-West Boyertown 69 kV line & Birdsboro-West Boyertown 69 kV line.

*(2018 RTEP Model – 2023 Summer)*

Transmission line rating is limited by terminal equipment.

North Boyertown – Cabot Tap 69 kV line: *(relay and substation conductor)*

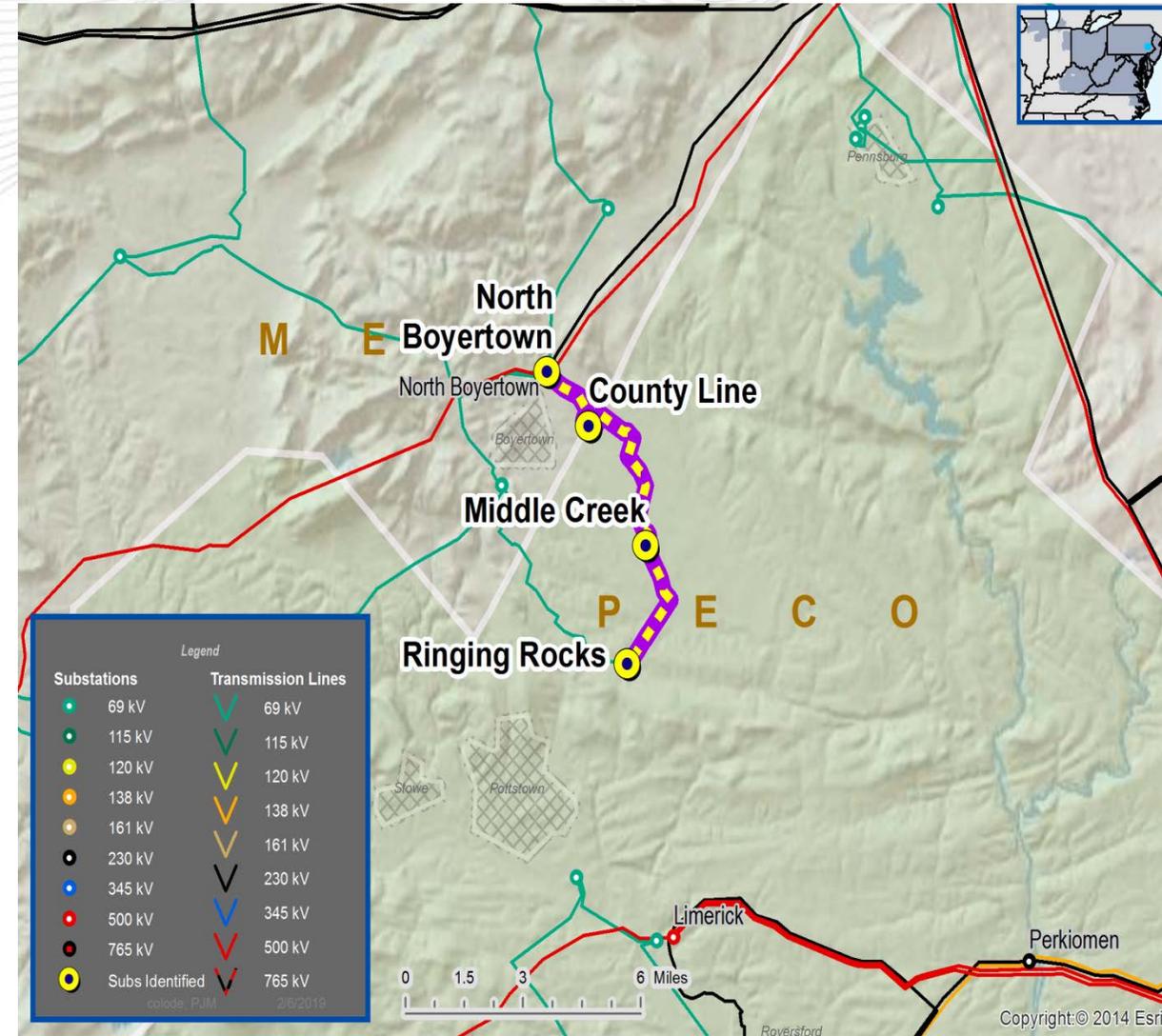
- Existing line rating is 62 / 72 MVA (SN / SE).
- Existing conductor rating is 72 / 72 MVA (SN / SE).

County Line – Middle Creek 69 kV line: *(substation conductor)*

- Existing line rating is 132 / 158 MVA (SN / SE).
- Existing conductor rating is 139 / 169 MVA (SN / SE).

Middle Creek – Ringing Rocks 69 kV line: *(relay, disconnect switch)*

- Existing line rating is 62 / 62 MVA (SN / SE).
- Existing conductor rating is 99 / 99 MVA (SN / SE).



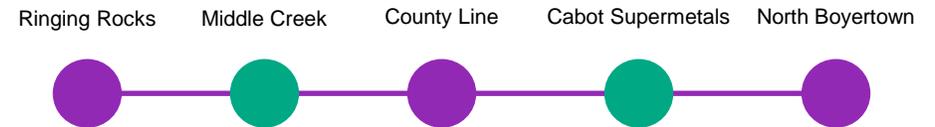
Need Number: ME-2019-016

Process Stage: Solutions Meeting 4/26/2019

**Potential Solution:**

*North Boyertown – Ringing Rocks 69 kV line Rehab/Rebuild \$4.5M*

- Rehab/Rebuild North Boyertown – Ringing Rocks
- Reconductor approximately 1.5 miles on North Boyertown-County Line section
- Replace Substation Conductor and Relay at North Boyertown
- Replace Substation Conductor at County Line
- Replace Relay and Disconnect at Ringing Rocks



Legend	
500 kV	
230 kV	
138 kV	
115 kV	
69 kV	
46 kV	
New	

Continued on next slide...

Need Number: ME-2019-016

Process Stage: Solutions Meeting 4/26/2019

**Potential Solution (Continued):**

Transmission Line Ratings:

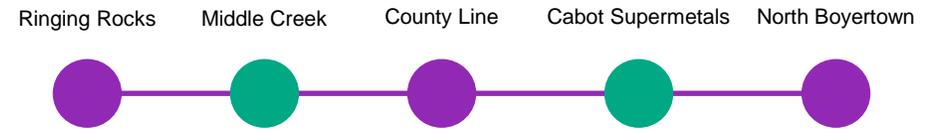
- North Boyertown – Cabot Supermetals 69 kV Line:
  - Before Proposed Solution: 62/72 MVA (SN/SE)
  - After Proposed Solution: 139/169 MVA (SN/SE)
- Cabot Supermetals – County Line 69 kV Line:
  - Before Proposed Solution: 62/77 MVA (SN/SE)
  - After Proposed Solution: 139/169 MVA (SN/SE)
- County Line – Middle Creek 69 kV Line:
  - Before Proposed Solution: 132/158 MVA (SN/SE)
  - After Proposed Solution: 139/169 MAV (SN/SE)
- Middle Creek – Ringing Rocks 69 kV Line:
  - Before Proposed Solution: 62/62 MVA (SN/SE)
  - After Proposed Solution: 139/169 MVA (SN/SE)

**Alternatives Considered:**

Maintain existing condition and elevated risk of failure

Projected In-Service: 12/31/2020

Status: Conceptual



Legend	
500 kV	
230 kV	
138 kV	
115 kV	
69 kV	
46 kV	
New	

Need Number: ME-2019-017

Process Stage: Solutions Meeting 4/26/2019

Previously Presented: Need Meeting 2/22/2019

Supplemental Project Driver:

*Equipment Material Condition, Performance and Risk*

Specific Assumption References:

- Line Condition Rebuild/Replacement – Age/condition of transmission line conductors, wood pole transmission line structures
- System Performance Projects – Substation/Line Equipment Limits
- Reconductor/Rebuild Transmission Lines – Transmission lines with high loading

Problem Statement:

The N. Lebanon-Cleona-W. Lebanon 69 kV line is exhibiting deterioration resulting in increased maintenance. The Transmission line is approaching end of life

- 58 out of 73 structures failed inspection (79% Failure Rate).
- Failure reasons include top rot, voids, woodpecker holes, etc.
- Total line distance is approximately 7.1 miles.

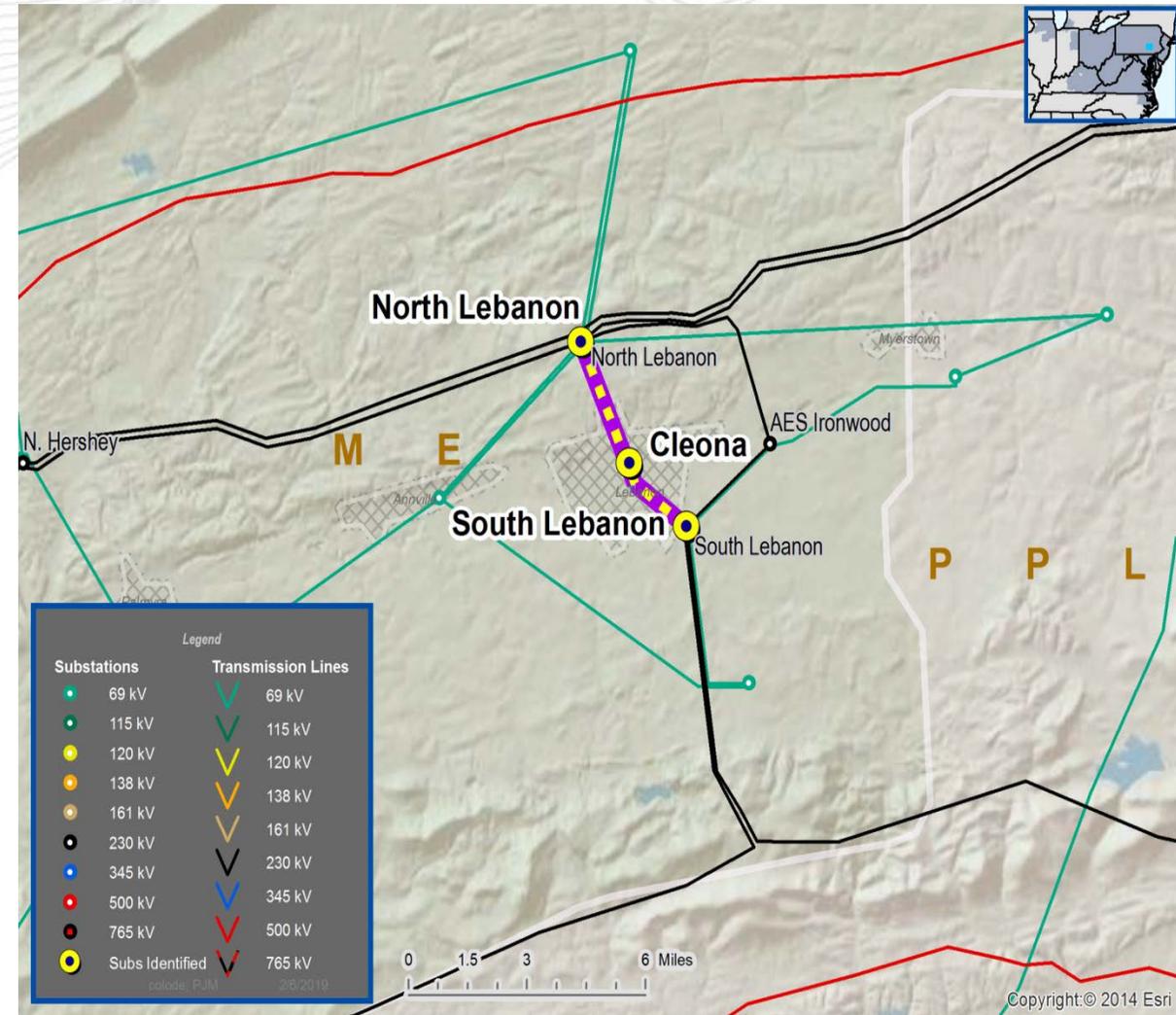
Thermal loading on Cleona-West Lebanon 69 kV section is approximately 98% of the SE rating for loss of the South Lebanon 230-69 kV #1 & #2 transformers.

*(2018 RTEP Model – 2023 Summer)*

Transmission line rating is limited by terminal equipment.

North Lebanon – Cleona 69 kV line: *(relay and disconnect switches)*

- Existing line rating is 78 / 82 MVA (SN / SE).
- Existing conductor rating is **111/134** MVA (SN / SE).





# Met-Ed Transmission Zone M-3 Process Cleona – West Lebanon 69 kV Line Rebuild/Rehab

**Need Number:** ME-2019-017

**Process Stage:** Solutions Meeting 4/26/2019

**Potential Solution:**

*Cleona - West Lebanon 69 kV line Rehab/Rebuild \$3.1M*

- Rehab/Rebuild Cleona – West Lebanon.
- Reconductor ~2.4 miles of Cleona-West Lebanon section.
- Replace relay and switches at North Lebanon.

**Transmission Line Ratings:**

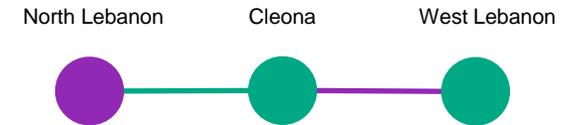
- North Lebanon – Cleona 69 kV Line:
  - Before Proposed Solution: 78/82 MVA (SN/SE)
  - After Proposed Solution: 111/134 MVA (SN/SE)
- Cleona – West Lebanon 69 kV Line:
  - Before Proposed Solution: 55/56 MVA (SN/SE)
  - After Proposed Solution: 111/134 MVA (SN/SE)

**Alternatives Considered:**

Maintain existing condition and elevated risk of failure

**Projected In-Service:** 12/31/2019

**Status:** Conceptual



Legend	
500 kV	
230 kV	
138 kV	
115 kV	
69 kV	
46 kV	
New	

# South Lebanon #1 and #2 230-69 kV Transformer Replacement and 230 kV Ring Bus

Need Number: ME-2019-018

Process Stage: Solutions Meeting 4/26/2019

Previously Presented: Need Meeting 2/22/2019

**Supplemental Project Driver:**

*Equipment Material Condition, Performance and Risk*

**Specific Assumption References:**

- Substation Condition Rebuild/Replacement
- Add/Expand Bus Configuration

- Eliminate simultaneous outages to multiple networked elements for stuck breakers, bus outages, N-2 events, etc...

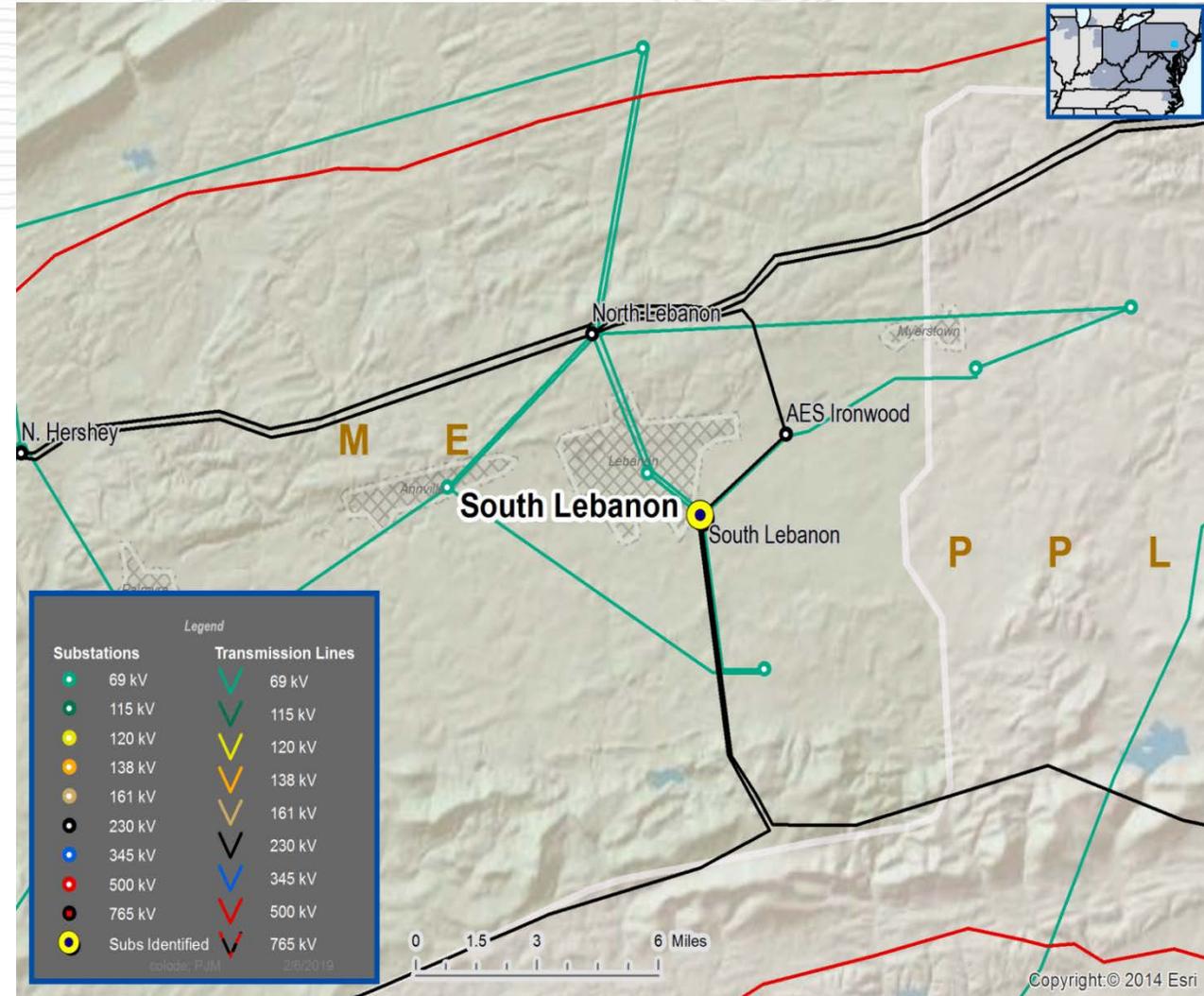
**Problem Statement:**

South Lebanon #1 230-69 kV:

- Transformer is 49 years old
- Experiencing dissolved gasses in oil
- Analysis shows breaking down of paper insulation

South Lebanon #2 230-69 kV:

- Transformer is 50 years old and at end of life
- History of oil leaks
- Analysis shows breaking down of paper insulation
- Broken fans and deteriorating bushings
- Tank temp has to be read with a thermal gun



# South Lebanon #1 and #2 230-69 kV Transformer Replacement and 230 kV Ring Bus

Need Number: ME-2019-018

Process Stage: Solutions Meeting 4/26/2019

**Potential Solution:**

*South Lebanon #1 and #2 230-69 kV transformer replacement and 230 kV ring bus \$13.9M*

- Replace the 230-69 kV 60/80/100 MVA #1 transformer and associated equipment with a new 230-69 kV 100/134/168 MVA transformer.
- Replace the 230-69 kV 60/80/100 MVA #2 transformer and associated equipment with a new 230-69 kV 100/134/168 MVA transformer.
- Expand the South Lebanon 230 kV bus into a 5 breaker ring bus.

**Transformer Ratings:**

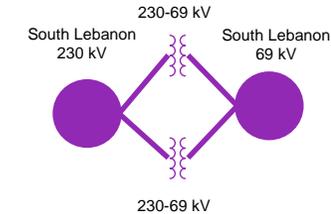
- South Lebanon #1 230/69 kV transformer:
  - Before Proposed Solution: 131/139 MVA (SN/SE)
  - After Proposed Solution (anticipated): 211/232 MVA (SN/SE)
- South Lebanon #2 230/69 kV transformer:
  - Before Proposed Solution: 127/135 MVA (SN/SE)
  - After Proposed Solution (anticipated): 211/232 MVA (SN/SE)

**Alternatives Considered:**

Maintain existing condition and elevated risk of failure

Projected In-Service: 12/31/2021

Status: Conceptual



Legend	
500 kV	
230 kV	
138 kV	
115 kV	
69 kV	
46 kV	
New	

Need Number: ME-2019-019

Process Stage: Solutions Meeting 4/26/2019

Previously Presented: Need Meeting 2/22/2019

**Supplemental Project Driver:**

*Equipment Material Condition, Performance and Risk  
Operational Flexibility and Efficiency*

**Specific Assumption References:**

System Performance Projects Global Factors

- System reliability and performance
  - Substation/line equipment limits
- Upgrade Relay Schemes
- Relay schemes that have a history of misoperation
  - Obsolete and difficult to repair communication equipment (DTT, Blocking, etc.)
  - Communication technology upgrades
  - Bus protection schemes

**Problem Statement:**

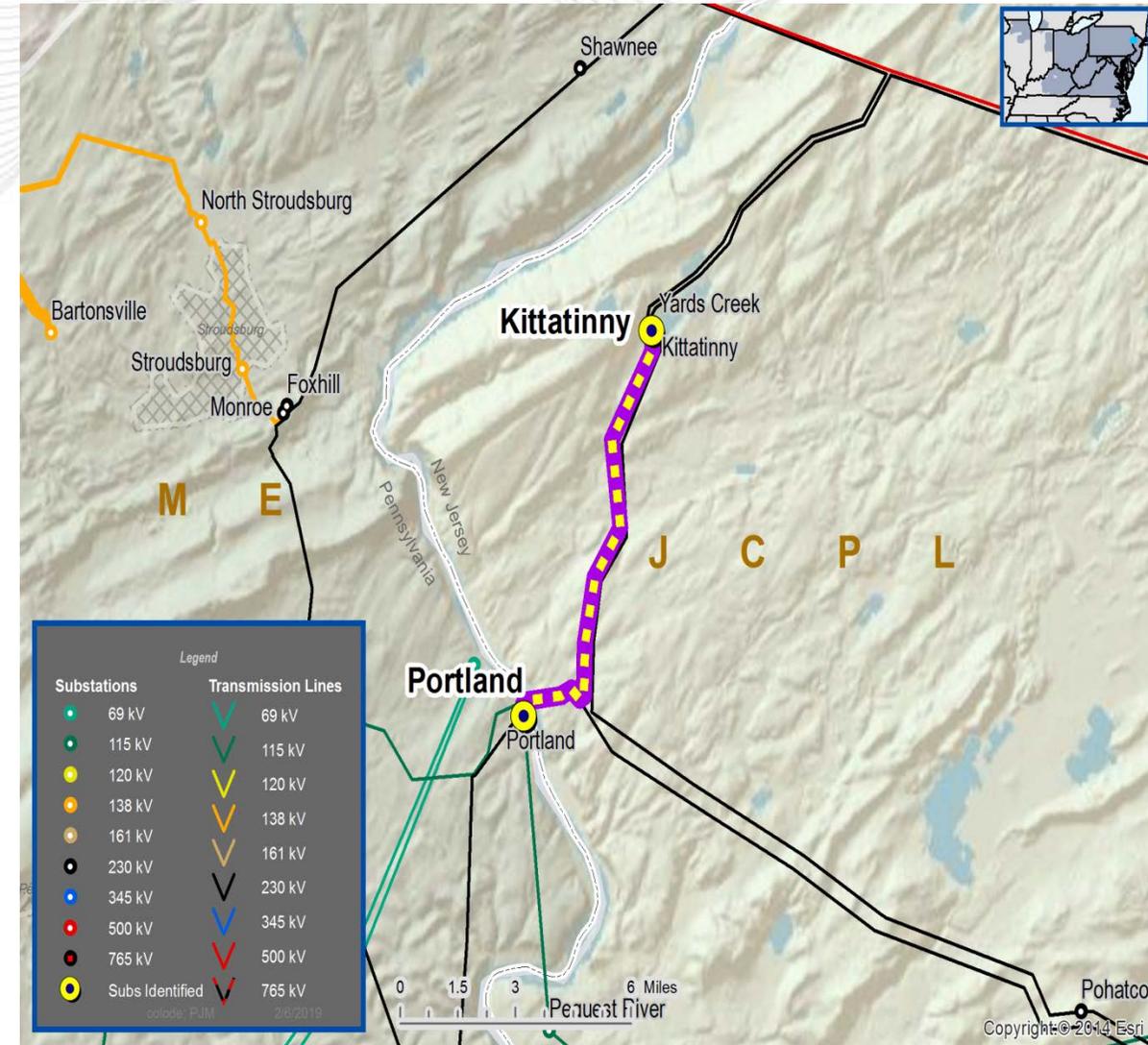
Relays on Kittatinny – Portland 230 kV line have been identified as protection schemes using a certain vintage of relays and communication equipment that have a history of misoperation. Proper operation of the protection scheme requires all the separate components perform adequately during a fault.

- Kittatinny – Portland 230 kV line:

Existing line rating: 1114 / 1195 MVA (SN / SE).

Existing conductor rating: 1114 / 1285 MVA (SN / SE).

*(relaying)*





# Met-Ed Transmission Zone M-3 Process Kittatinny – Portland 230 kV Relay Replacement

Need Number: ME-2019-019

Process Stage: Solutions Meeting 4/26/2019

### Potential Solution:

*Kittatinny – Portland 230 kV Relay Replacement \$1.0M*

- Replace line relaying.

### Transmission Line Ratings:

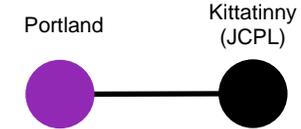
- Kittatinny – Portland 230 kV Line:
  - Before Proposed Solution: 1114/1195 MVA (SN/SE)
  - After Proposed Solution: 1114/1285 MVA (SN/SE)

### Alternatives Considered:

Maintain existing condition and elevated risk of failure

Projected In-Service: 12/31/2019

Status: Conceptual



Legend	
500 kV	
230 kV	
138 kV	
115 kV	
69 kV	
46 kV	
New	

Need Number: ME-2019-020

Process Stage: Solutions Meeting 4/26/2019

Previously Presented: Need Meeting 2/22/2019

### Project Driver(s):

*Equipment Material Condition, Performance and Risk*

### Specific Assumption Reference(s)

#### Line Condition Rebuild/Replacement

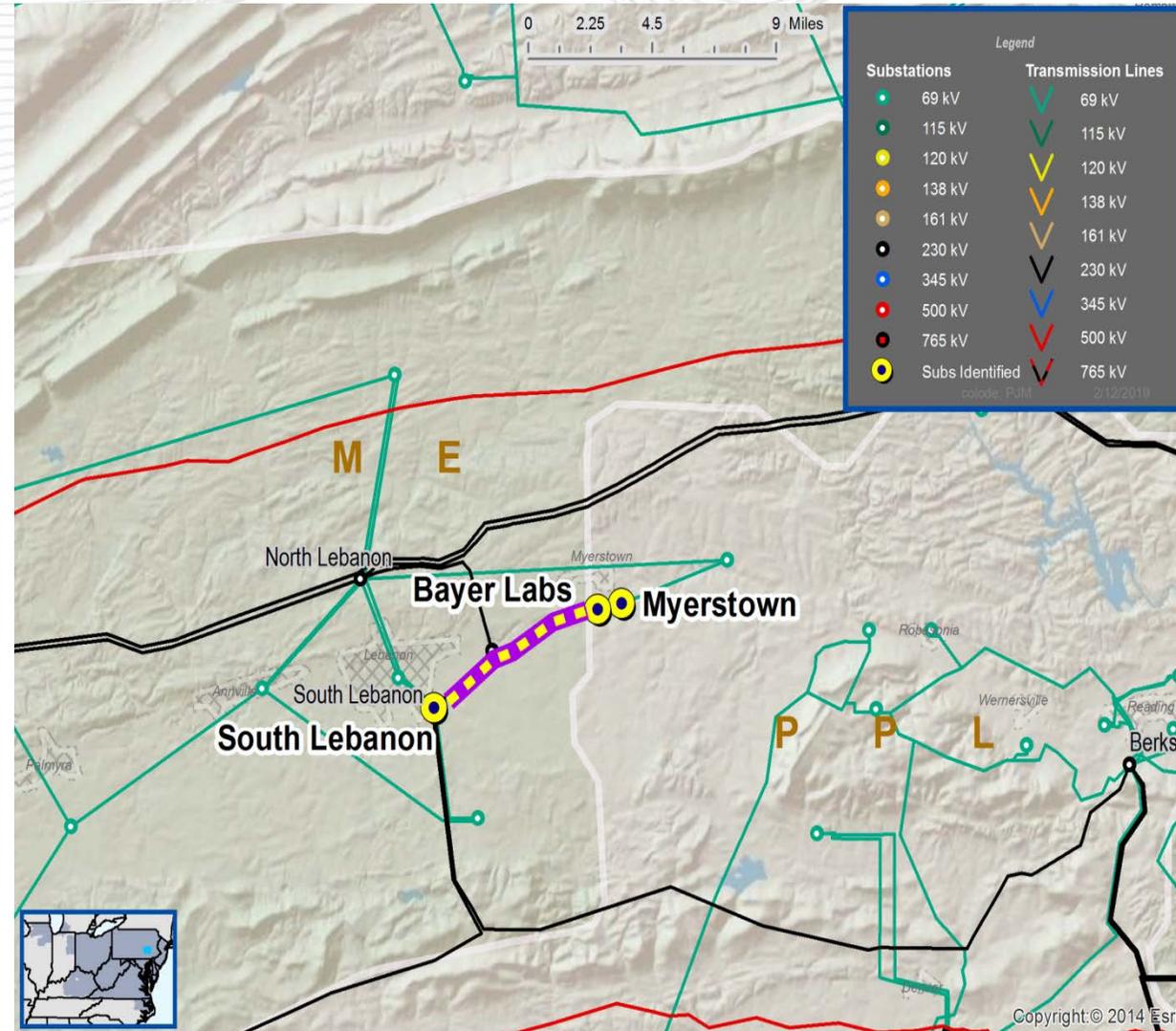
- Age/condition of wood pole transmission line structures
- Age/condition of steel tower or steel pole transmission line structures
- Age/condition of transmission line conductors

#### 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.



**Need Number:** ME-2019-020

**Process Stage:** Solutions Meeting 4/26/2019

**Potential Solution:**

*South Lebanon – Myerstown 69 kV line Rehab/Rebuild \$10.4M*

- Rehab/Rebuild South Lebanon – Myerstown. Reconductor ~7 miles.
- Replace substation conductor at South Lebanon

**Transmission Line Ratings:**

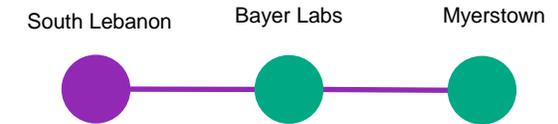
- South Lebanon – Bayer Labs 69 kV Line:
  - Before Proposed Solution: 51/56 MVA (SN/SE)
  - After Proposed Solution: 111/134 MVA (SN/SE)
- Bayer Labs – Myerstown 69 kV Line:
  - Before Proposed Solution: 55/56 MVA (SN/SE)
  - After Proposed Solution: 111/134 MVA (SN/SE)

**Alternatives Considered:**

Maintain existing condition and elevated risk of failure

**Projected In-Service:** 12/31/2021

**Status:** Conceptual



Legend	
500 kV	
230 kV	
138 kV	
115 kV	
69 kV	
46 kV	
New	



Need Number: ME-2019-021

Process Stage: Solutions Meeting 4/26/2019

Previously Presented: Need Meeting 2/22/2019

Supplemental Project Driver:

Equipment Material Condition, Performance and Risk

Specific Assumption References:

- Line Condition Rebuild/Replacement – Age/condition of transmission line conductors, wood pole transmission line structures, and steel pole transmission line structures
- System Performance Projects – Substation/Line Equipment Limits
- Reconductor/Rebuild Transmission Lines – Transmission lines with high loading

Problem Statement:

The North Lebanon – Turf Club 69 kV line is exhibiting deterioration resulting in increased maintenance. The Transmission line is approaching end of life

- 236 out of 360 structures failed inspection. (66% Failure Rate)
- Failure reasons include decay, woodpecker holes, cracking, bad/cut/missing ground wires, etc.
- Total line distance is approximately 23 miles.

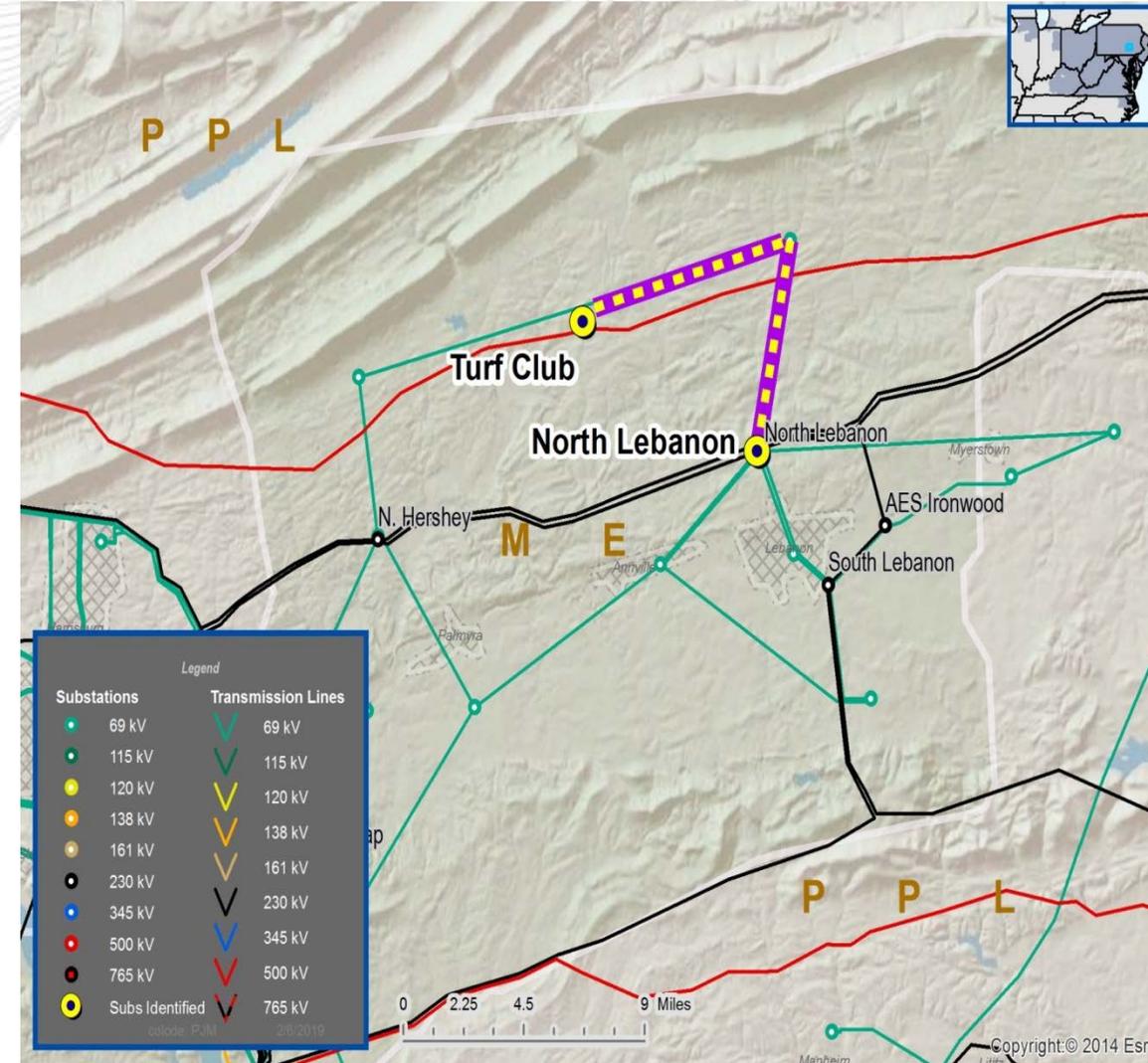
Thermal loading on Turf Club – Indiantown Gap 69 kV and Indiantown Gap – Lickdale 69 kV line sections are approximately 97% and 86% of their SE ratings respectively for loss of North Lebanon – Fredericksburg 69 kV line section.

(2018 RTEP Model – 2023 Summer)

Transmission line ratings limited by terminal equipment.

- North Lebanon – Fredericksburg 69 kV line:
  - Existing line rating: 82 / 103 MVA (SN / SE).
  - Existing conductor rating is 139 / 169 MVA (SN / SE).
  - (disconnect switches)

# Met-Ed Transmission Zone M-3 Process North Lebanon – Turf Club 69 kV Line Rehab/Rebuild





# Met-Ed Transmission Zone M-3 Process North Lebanon – Turf Club 69 kV Line Rehab/Rebuild

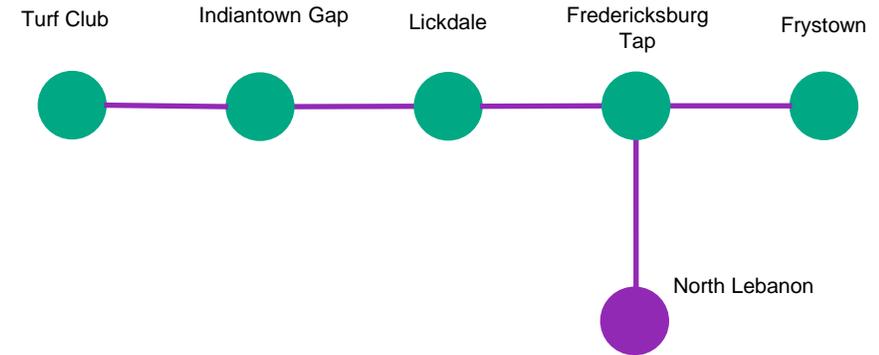
Need Number: ME-2019-021

Process Stage: Solutions Meeting 4/26/2019

## Potential Solution:

*North Lebanon – Turf Club 69 kV line Rehab/Rebuild \$21.1M*

- Rehab/Rebuild North Lebanon – Turf Club
- Reconductor approximately 18.5 miles of Frystown – Turf Club line
- Replace switches at North Lebanon



Continued on next slide...

Legend	
500 kV	
230 kV	
138 kV	
115 kV	
69 kV	
46 kV	
New	



# Met-Ed Transmission Zone M-3 Process North Lebanon – Turf Club 69 kV Line Rehab/Rebuild

Need Number: ME-2019-021

Process Stage: Solutions Meeting 4/26/2019

## Potential Solution (Continued):

Transmission Line Ratings:

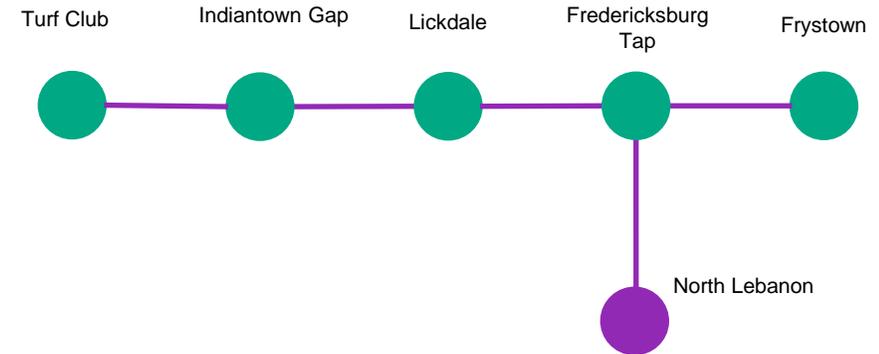
- North Lebanon – Fredericksburg 69 kV Line:
  - Before Proposed Solution: 82/103 MVA (SN/SE)
  - After Proposed Solution: 139/169 MVA (SN/SE)
- Fredericksburg – Frysstown 69 kV Line:
  - Before Proposed Solution: 80/96 MVA (SN/SE)
  - After Proposed Solution: 111/134 MVA (SN/SE)
- Fredericksburg – Lickdale 69 kV Line:
  - Before Proposed Solution: 80/96 MVA (SN/SE)
  - After Proposed Solution: 111/134 MVA (SN/SE)
- Lickdale – Indiantown Gap 69 kV Line:
  - Before Proposed Solution: 64/65 MVA (SN/SE)
  - After Proposed Solution: 111/134 MVA (SN/SE)
- Indiantown Gap – Turf Club 69 kV Line:
  - Before Proposed Solution: 64/65 MVA (SN/SE)
  - After Proposed Solution: 111/134 MVA (SN/SE)

## Alternatives Considered:

Maintain existing condition and elevated risk of failure

Projected In-Service: 12/31/2021

Status: Conceptual



Legend	
500 kV	
230 kV	
138 kV	
115 kV	
69 kV	
46 kV	
New	

**Need Number:** ME-2019-022

**Process Stage:** Solutions Meeting 4/26/2019

**Previously Presented:** Need Meeting 2/22/2019

**Supplemental Project Driver:**

*Equipment Material Condition, Performance and Risk*

**Specific Assumption References:**

- Line Condition Rebuild/Replacement – Age/condition of transmission line conductors, wood pole transmission line structures
- Reconductor/Rebuild Transmission Lines – Transmission lines with high loading

**Problem Statement:**

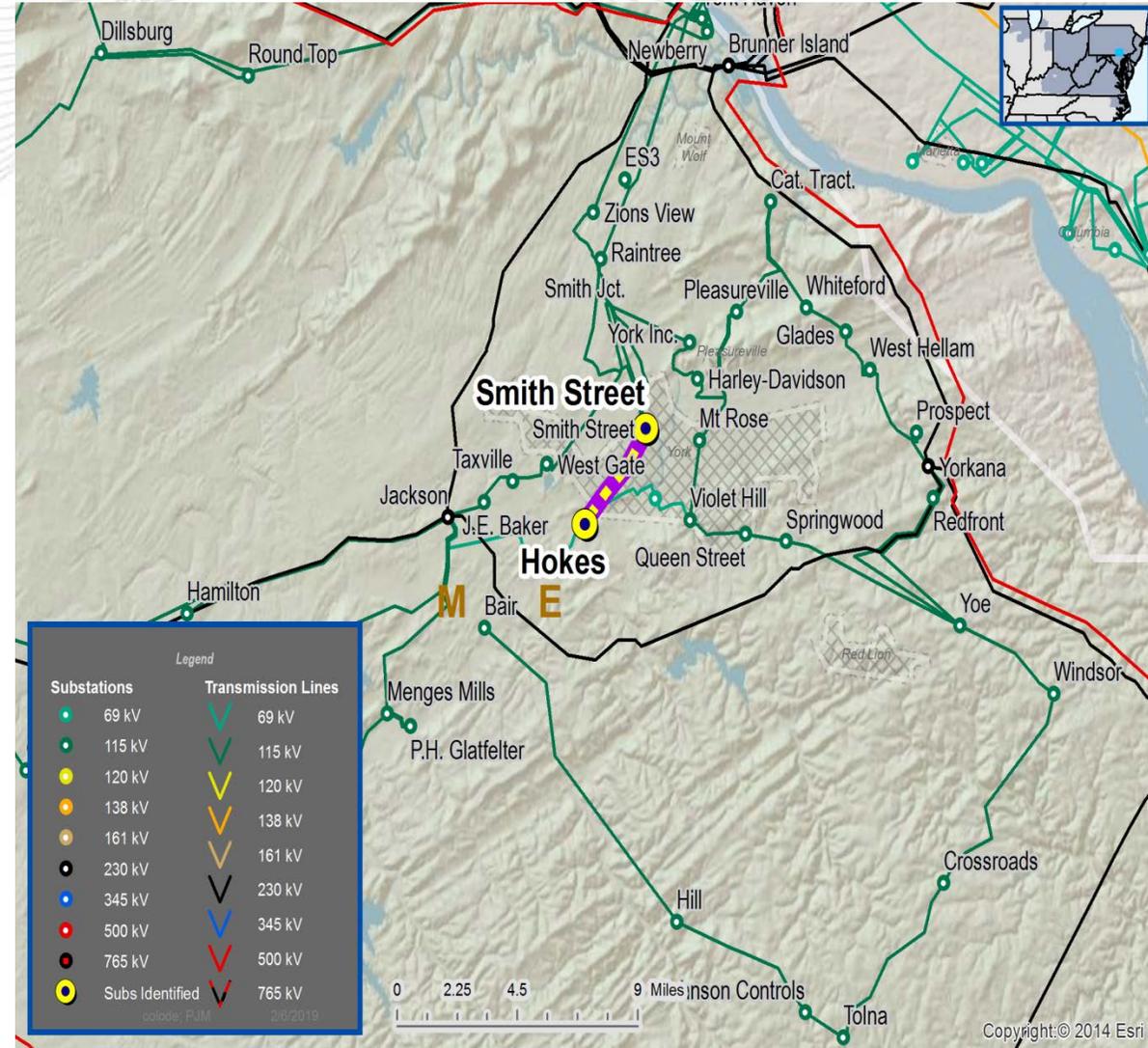
The Hokes – Smith St 69 kV is exhibiting deterioration resulting in increased maintenance. The Transmission line is approaching end of life.

- 83 out of 122 structures failed inspection. (68% Failure Rate)
- Failure reasons include contamination, sound, bad/cut/missing ground wires, etc.
- Total line distance is approximately 5.4 miles.

Thermal loading on Hokes-Smith Street 69 kV line is loaded to approximately 158% of the SE rating for loss of the Jackson-Hokes 69 kV line & the Violet Hill 69 kV transformer.

*(2018 RTEP Model – 2023 Summer)*

Transmission line rating is currently limited by the conductor: 43 / 44 MVA (SN / SE).



**Need Number:** ME-2019-022

**Process Stage:** Solutions Meeting 4/26/2019

**Potential Solution:**

*Hokes – Smith Street 69 kV line Rehab/Rebuild \$5.8M*

- Rehab/Rebuild Hokes – Smith Street.
- Reconductor 5.4 miles.

**Transmission Line Ratings:**

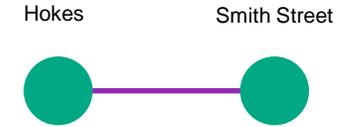
- Hokes – Smith Street 69 kV Line:
  - Before Proposed Solution: 43/44 MVA (SN/SE)
  - After Proposed Solution: 139/169 MVA (SN/SE)

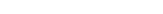
**Alternatives Considered:**

Maintain existing condition and elevated risk of failure

**Projected In-Service:** 12/31/2021

**Status:** Conceptual



Legend	
500 kV	
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Questions?



# Appendix



## 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

4/16/2019 – V1 – Original version posted to [pjm.com](http://pjm.com)

4/25/2019 – V2 – Added the status of the projects to all potential solutions

8/20/2019 – V3 – Removed slide # 21 and 22 (ME-2019-009 will be presented in the future)