SRRTEP Committee: Western AEP Supplemental Projects

April 20, 2020

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

AEP Transmission Zone M-3 Process
South Point – West Huntington

Need Number: AEP-2020-AP021

Process Stage: Need Meeting 4/20/2020

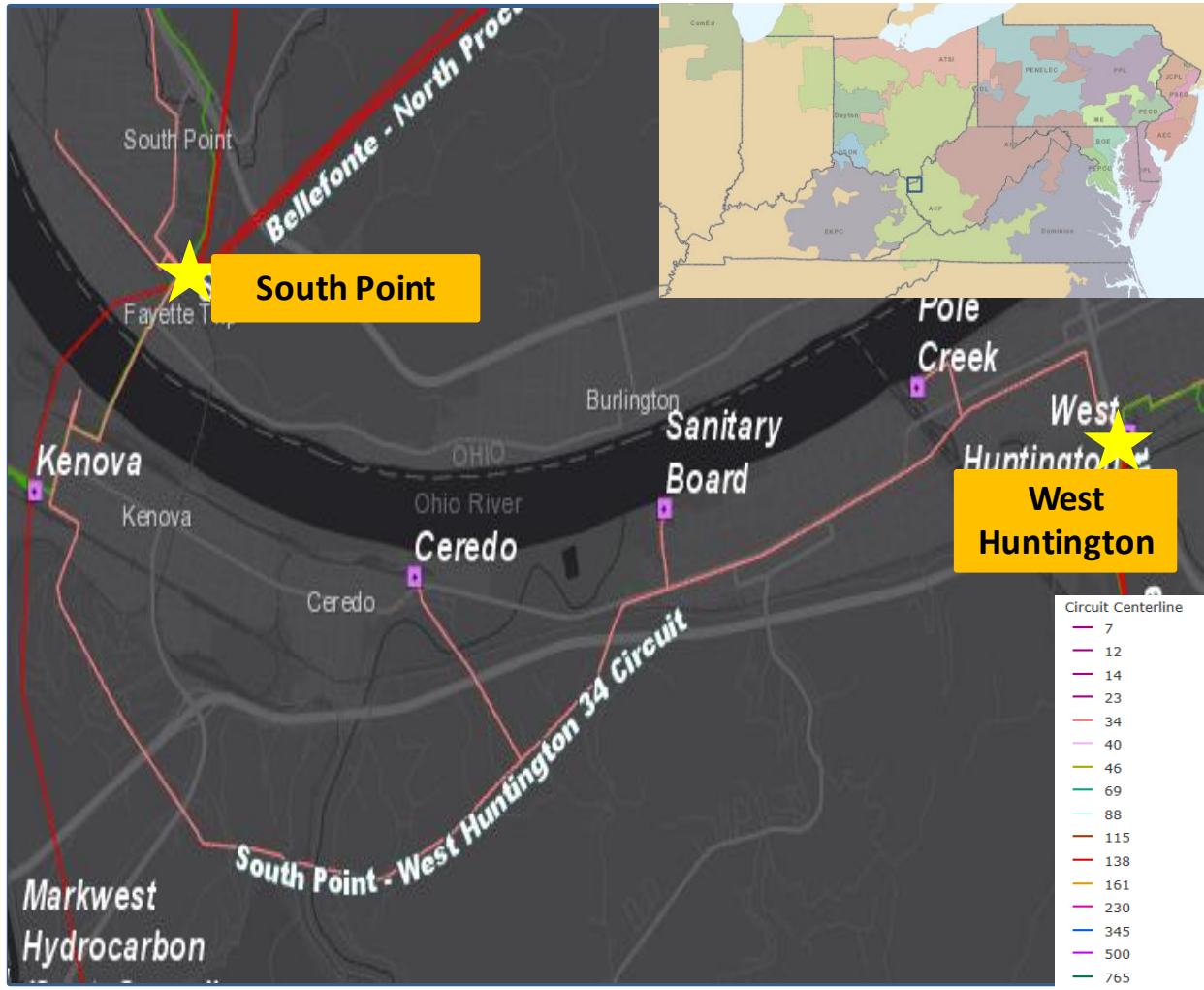
Supplemental Project Driver: Equipment Condition/Performance/Risk

Specific Assumption Reference: AEP Guidelines for Transmission Owner Identified Needs (AEP Assumptions Slide 8)

Problem Statement:

South Point – West Huntington 34.5 kV Line (~11 miles)

- The line consists of mainly wood pole (79%) structures in addition to steel (12%) and lattice steel (9%) structures.
- The line was originally built in 1926 (69%) and 1930 (10%) primarily with 4/0 copper conductor.
- Structures on the line failed to meet 2017 NESC Grade B loading criteria, failed to meet current AEP structural strength requirements, and failed to meet current ASCE structural strength requirements
- Current shielding on the majority of the line does not meet current standards.
- There are currently 93 structures (62% of the line) with at least one open condition
    - A total of 159 structural open conditions on the line primarily related to pole and crossarm rot. Other structure conditions include woodpecker damage, split crossarms/poles and bowed crossarms/poles.
    - There are 54 shielding and grounding related open conditions including missing ground wire leads, damaged shield wire and broken ground wire leads.
    - There are an additional 15 open conditions related to burnt/broken insulators and guy wire.
- Since 2014 there have been 4 permanent outages on the circuit due to arrestor failure, wind, switch failure and vegetation contact from outside the ROW. The outages resulted in a total of 198k customer minutes interrupted.



Model:

AEP Transmission Zone: Supplemental
Roanoke & Lynchburg, VA Area

Need Number: AEP-2020-AP027

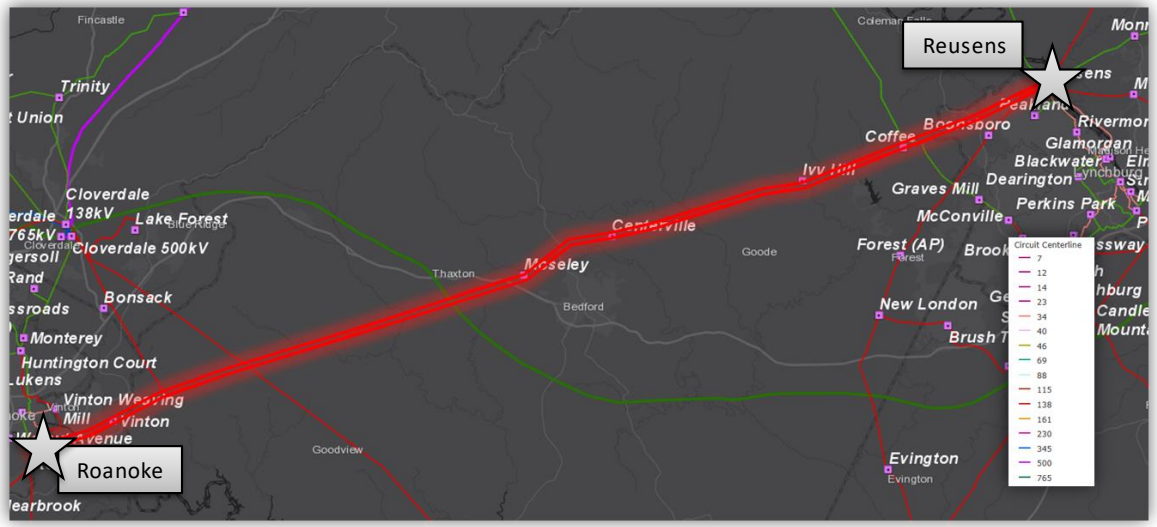
Process Stage: Needs Meeting 04/20/2020

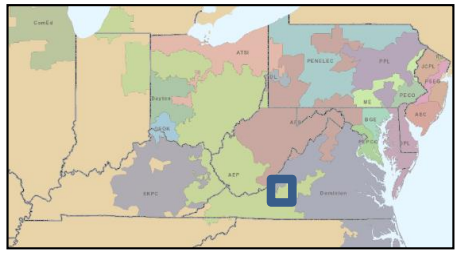
Supplemental Project Driver: Equipment Material/Condition/Performance/Risk

Specific Assumptions Reference: AEP Guidelines for Transmission Owner Identified Needs (AEP Assumptions Slide 8); AEP Eastern System Pre-1930s Era Lattice Tower and Transmission Line System

Problem Statement:

- **Reusens-Roanoke 138 kV Double Circuit Line Asset (43 mi.)**
  - Installed between 1926 and 1933 using double circuit steel lattice towers
  - Recent field assessments have identified severe ovalization of holes at hanger bar connections and severe cross arm and hanger rusting as well as uniform corrosion, pitting, and deformation of steel members below grade. Evidence of steel corrosion at joints and on upper steel members was also documented.
  - Ferrous clamps are present on this line asset; these types of clamps can cause accelerated degradation of conductor at connection points due to excess heat generated even when operated at acceptable, rated levels.
  - From 2014-2018, there have been 55 momentary and 12 permanent outages on the four circuits that comprise the Reusens-Roanoke line
    - **Cloverdale-Roanoke 138 kV Circuit***
      - From 2014-2018, 8 momentary and 1 permanent outage occurred resulting in 276,350 customer minutes of interruption impacting 69 MVA of peak load
    - **Cloverdale-Reusens 138 kV Circuit***
      - From 2014-2018, 28 momentary and 6 permanent outages occurred resulting in 1,467,704 customer minutes of interruption impacting 39 MVA of peak load
    - **Moseley-Roanoke 138 kV Circuit**
      - From 2014-2018, 9 momentary and 1 permanent outage occurred
    - **Moseley-Reusens 138 kV Circuit**
      - From 2014-2018, 10 momentary and 4 permanent outages occurred impacting 44 MVA of load (Town of Bedford)





*Note: Circuit is associated with both the Roanoke-Cloverdale and Reusens-Roanoke line assets

AEP Transmission Zone M-3 Process
Pike County, Kentucky

Need Number: AEP-2020-AP028

Process Stage: Need Meeting 04/20/2020

Supplemental Project Driver: Equipment Condition/Performance/Risk

Specific Assumption Reference:

AEP Guidelines for Transmission Owner Identified Needs (AEP Assumptions Slide 8)

Problem Statement:

Line Name: Sprigg – Stone 46kV

Original Install Date (Age): 1940

Length of Line: 8.23 mi

Total structure count: 55

Original Line Construction Type: Wood

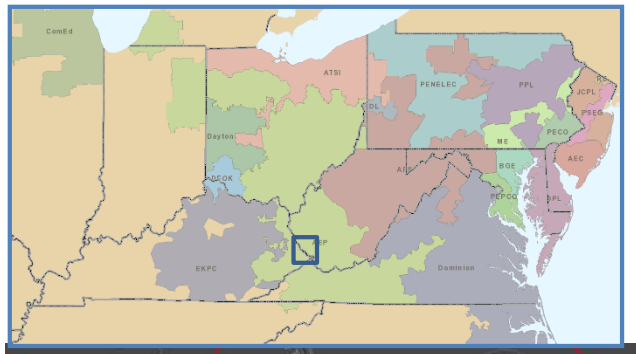
Majority Conductor Type: 3/0 ACSR 6/1 (Pigeon) and 2/0 COPPER

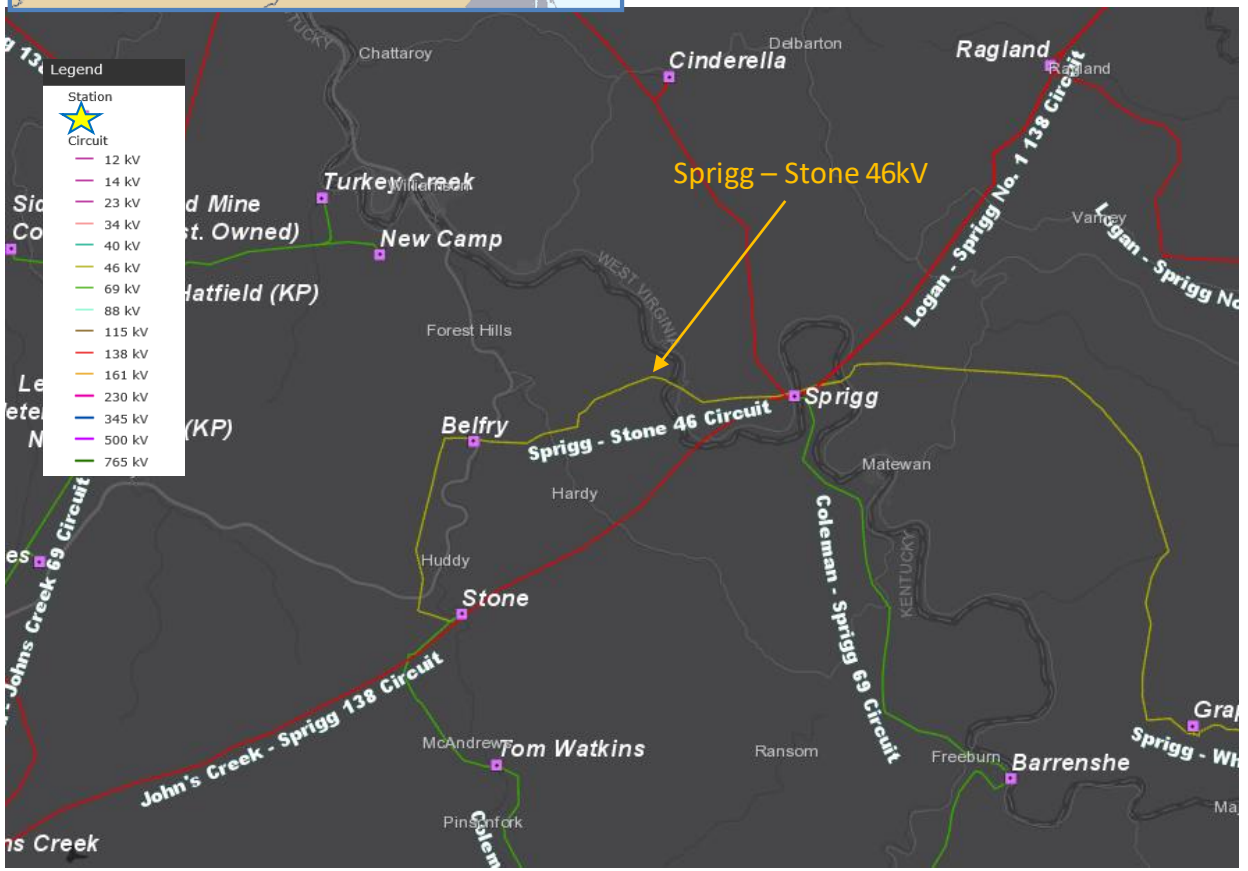
Momentary/Permanent Outages and Duration: 6 Momentary and 7 permanent Outage

CMI (last 5 years only): 1,119,129 minutes

Line conditions:

- 35 structures with at least one open condition, 64% of the structures on this circuit.
- 98 structure related conditions: rotted poles, crossarms and braces, woodpecker damage, bowed braces and loose braces, affecting the crossarm, knee/ vee brace, or pole including rot, split, woodpecker, damaged, loose, and bowed conditions
- 1 open conditions related to the broken strands on a jumper conductor
- 9 hardware related open conditions loose or broken guy wires





AEP Transmission Zone M-3 Process
Johnson County, Kentucky

Need Number: AEP-2020-AP029

Process Stage: Need Meeting 04/20/2020

Supplemental Project Driver: Equipment Condition/Performance/Risk

Specific Assumption Reference:

AEP Guidelines for Transmission Owner Identified Needs (AEP Assumptions Slide 8)

Problem Statement:

Line Name: Kenwood – Van Lear 46kV

Original Install Date (Age): 1969

Length of Line: 1.77 mi

Total structure count: 11

Original Line Construction Type: Wood

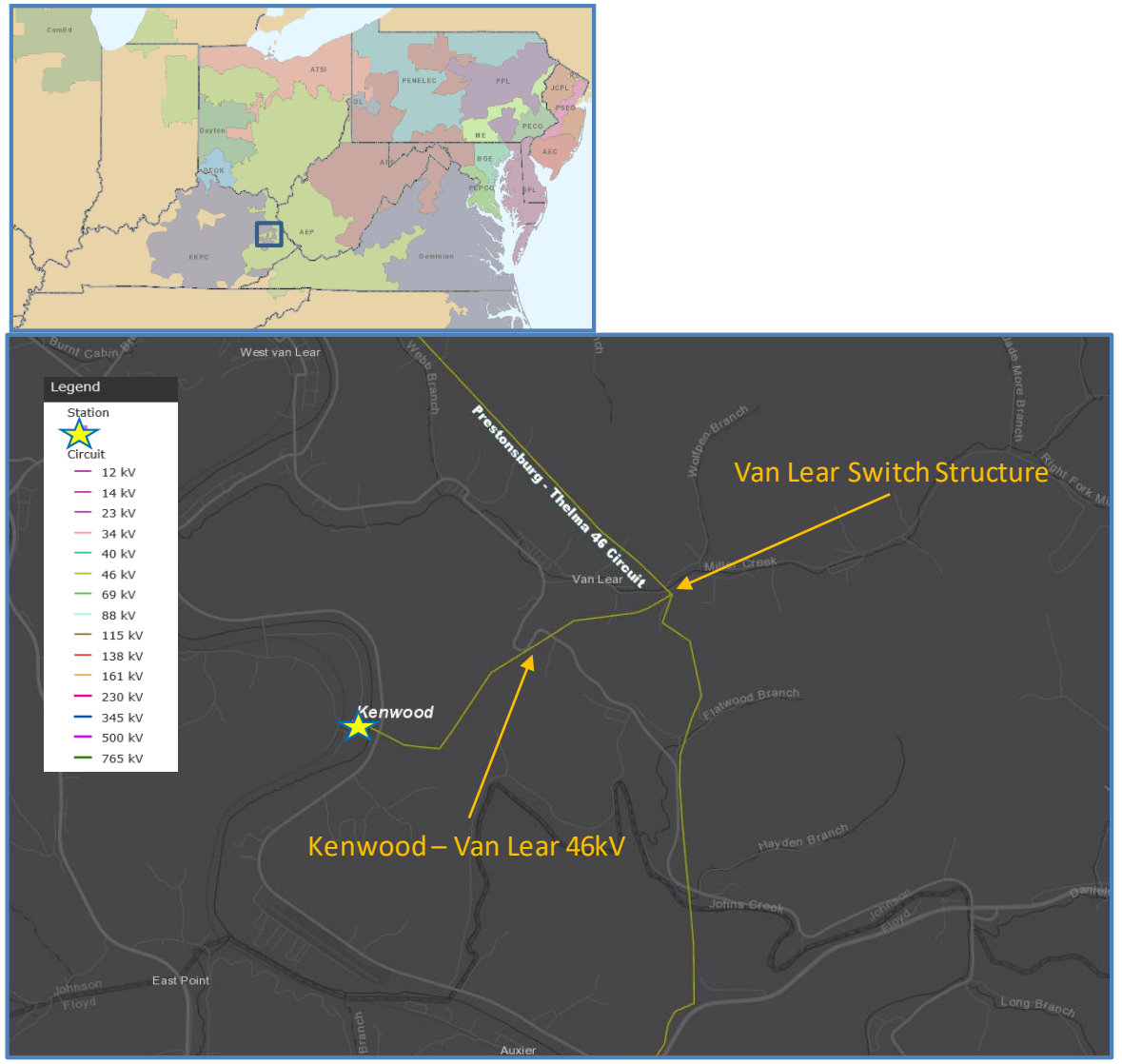
Conductor Type: 336,400 ACSR 26/7

Line conditions:

- 3 of the 11 structures have conditions that comprise 27% of the line section.
- Open conditions include: rot and woodpecker damage.
- Kenwood Station is currently radially fed with a peak load near 22 MVA.

Van Lear Switch:

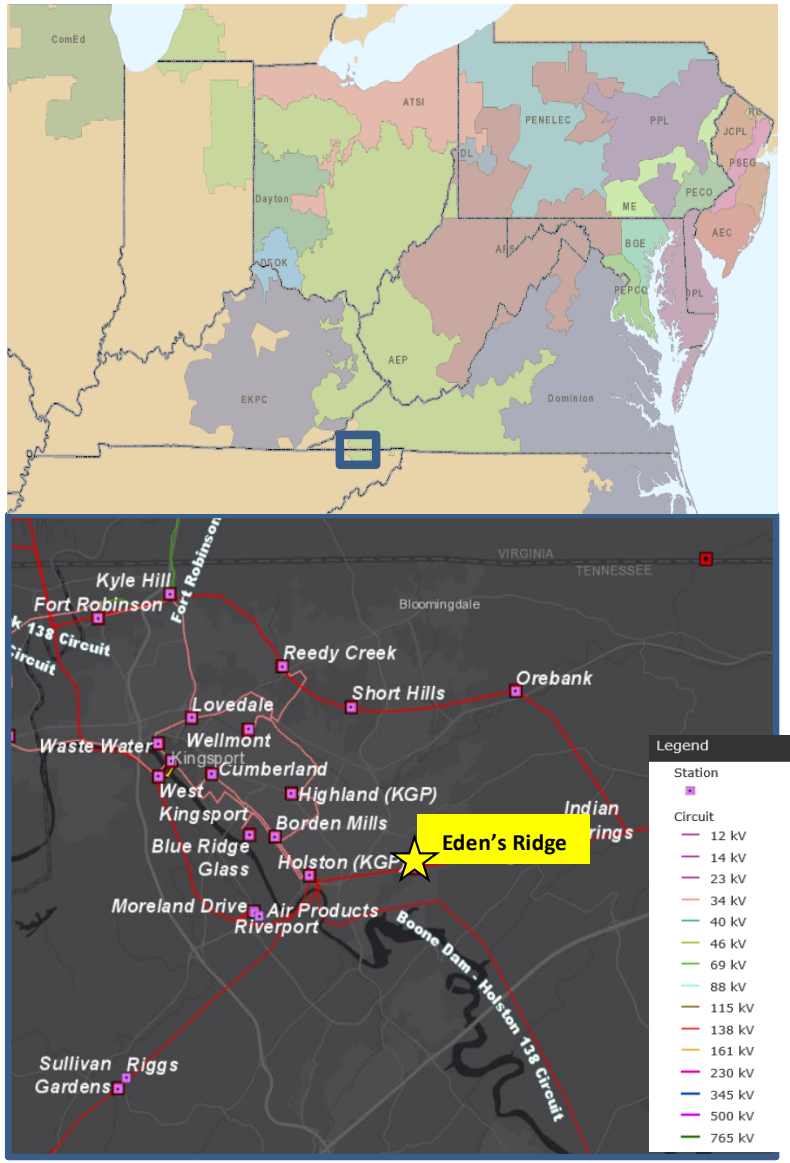
- The switches at Van Lear have been tagged as inoperable and unsafe to operate. The old hydraulic type mechanism on these switches does not operate properly, arcing horns are burnt off, and operating rod supports are damaged.



AEP Transmission Zone M-3 Process
Kingsport, TN

Need Number: AEP-2020-AP030
Process Stage: Needs Meeting 04/20/2020
Supplemental Project Driver: Customer Service
Specific Assumption References: AEP Connection Requirements for the AEP Transmission System (AEP Assumptions Slide 7)
Problem Statement:

Appalachian Power Co. (Distribution) has requested adding a new 25 MVA 138/12KV transformer at Eden's Ridge Station to serve growing load in the Kingsport area.



AEP Transmission Zone: Supplemental Colony Bay – Melita, Ft. Wayne, Indiana

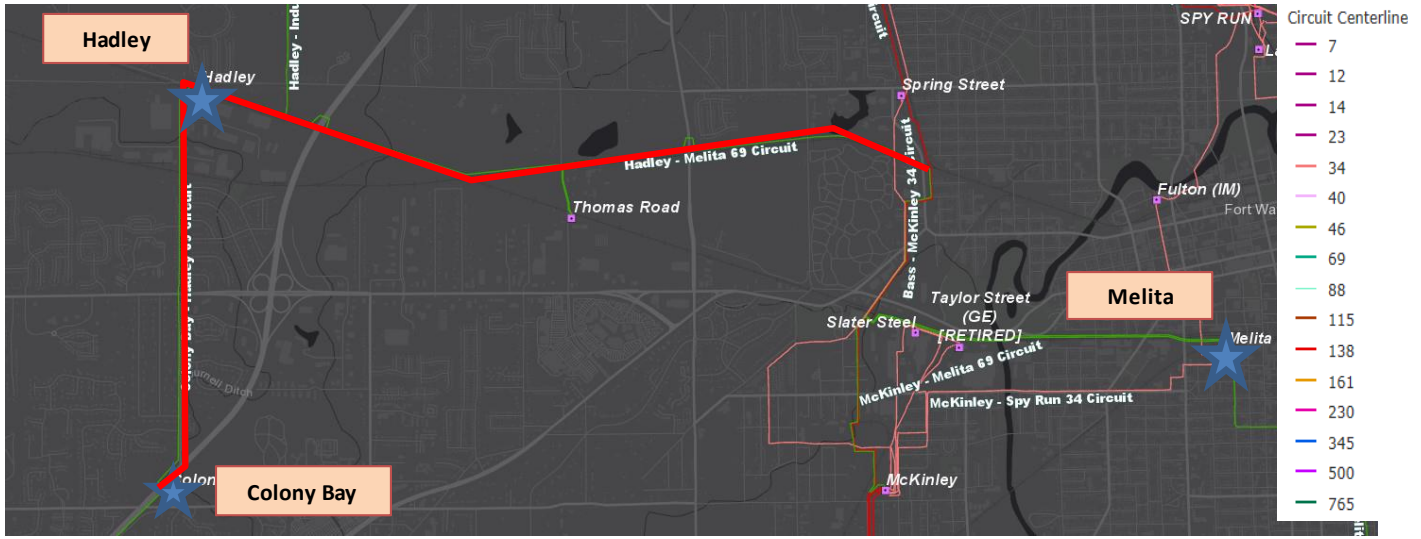
Need Number: AEP-2020-IM015
Process Stage: Needs Meeting 4/20/2020
Supplemental Project Driver: Equipment Material/Condition/Performance/Risk
Specific Assumptions Reference: AEP Guidelines for Transmission Owner Identified Needs (AEP Assumptions Slide 8)
Problem Statement:

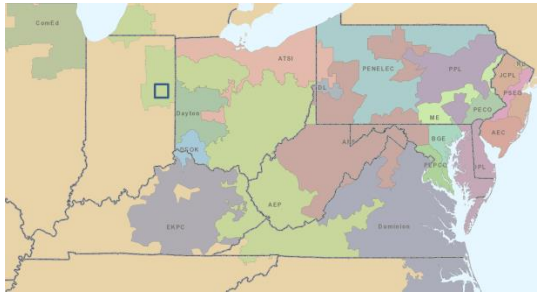
Colony Bay – Melita 69kV (5.8 miles)

- The Colony Bay – Melita circuit has ~5.8 miles of primarily 1960 wood pole structures
- This section has 34 open conditions across 26 unique poles (~17% of line). These conditions include, but aren't limited to Stolen/broken ground leads, broken insulators, damaged and rotting poles.
- An additional 23 poles on this section (~15%) were found to be decayed to the point of failure. These poles had steel reinforcers installed to allow them to last until a more permanent fix was available.
- The 2014-2019 5 year period this line was subject to 3 momentary outages and 3 permanent outages.

Hadley 69kV station

- Station has a bus tie switch that breakers the bus differential. AEP has been addressing these as we have the opportunity



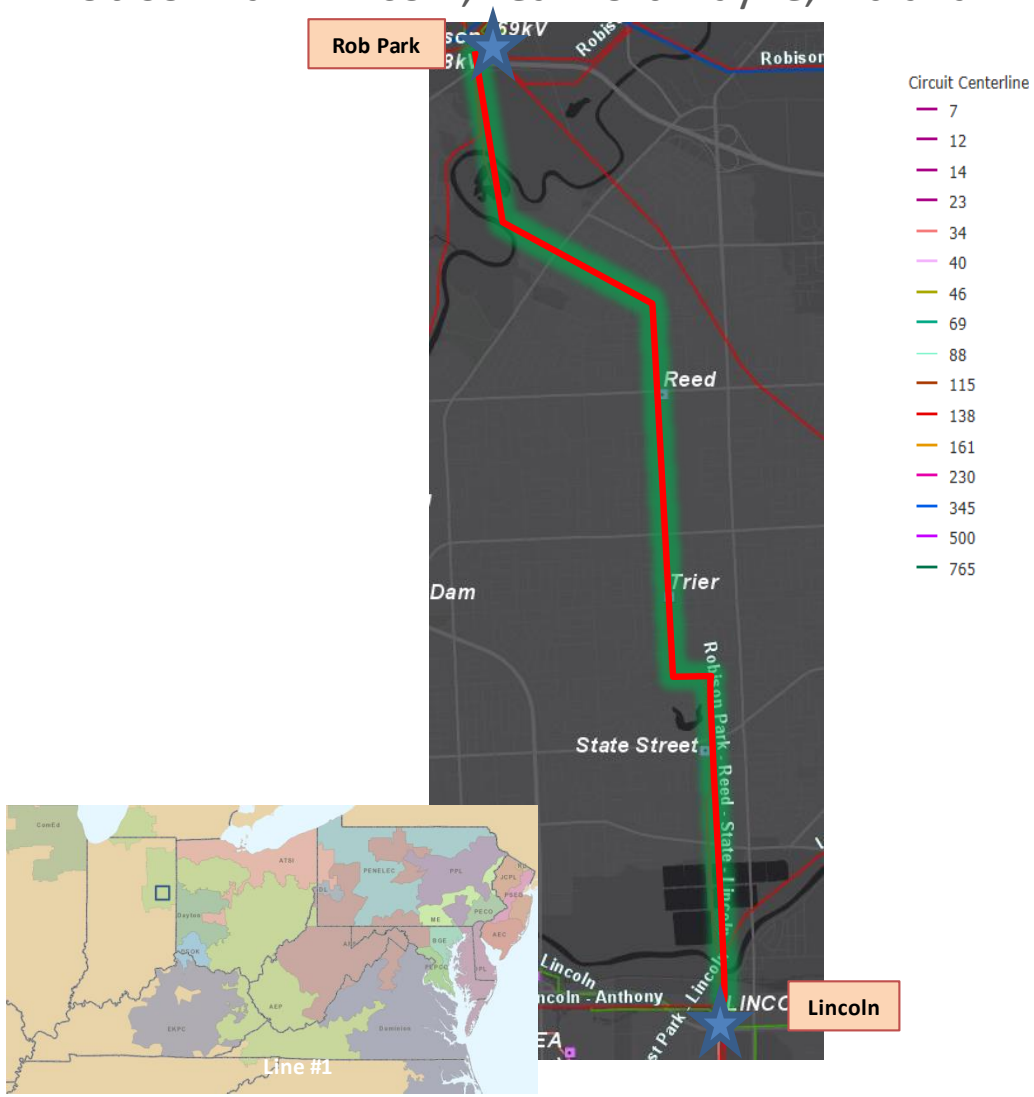


AEP Transmission Zone: Supplemental
Robison Park-Lincoln, near Fort Wayne, Indiana

Need Number: AEP-2020-IM016
Process Stage: Needs Meeting 4/20/2020
Supplemental Project Driver: Equipment Material/Condition/Performance/Risk & Operational Flexibility
Specific Assumptions Reference: AEP Guidelines for Transmission Owner Identified Needs (AEP Assumptions Slide 8)
Problem Statement:

Robison Park – Lincoln 138kV (~10.9mi)

- 44 structures with an open condition (~67%) with most revolving around rusted legs, broken/chipped insulators and rusted shield wire
- Fails to meet current AEP structural strength requirements
- Fails to meet AEP shield angle requirements
- Top half of towers were replaced and re-conductored in 1968 to allow for 138kV voltage operation, but the bottom half and foundations are original 1928 installation
- 4 MOABS in series currently which is over the AEP max of 3.



AEP Transmission Zone M-3 Process
Haviland, Ohio

Need Number: AEP-2020-OH015

Process Stage: Need Meeting 4/20/2020

Project Driver:

Equipment Material/Condition/Performance/Risk

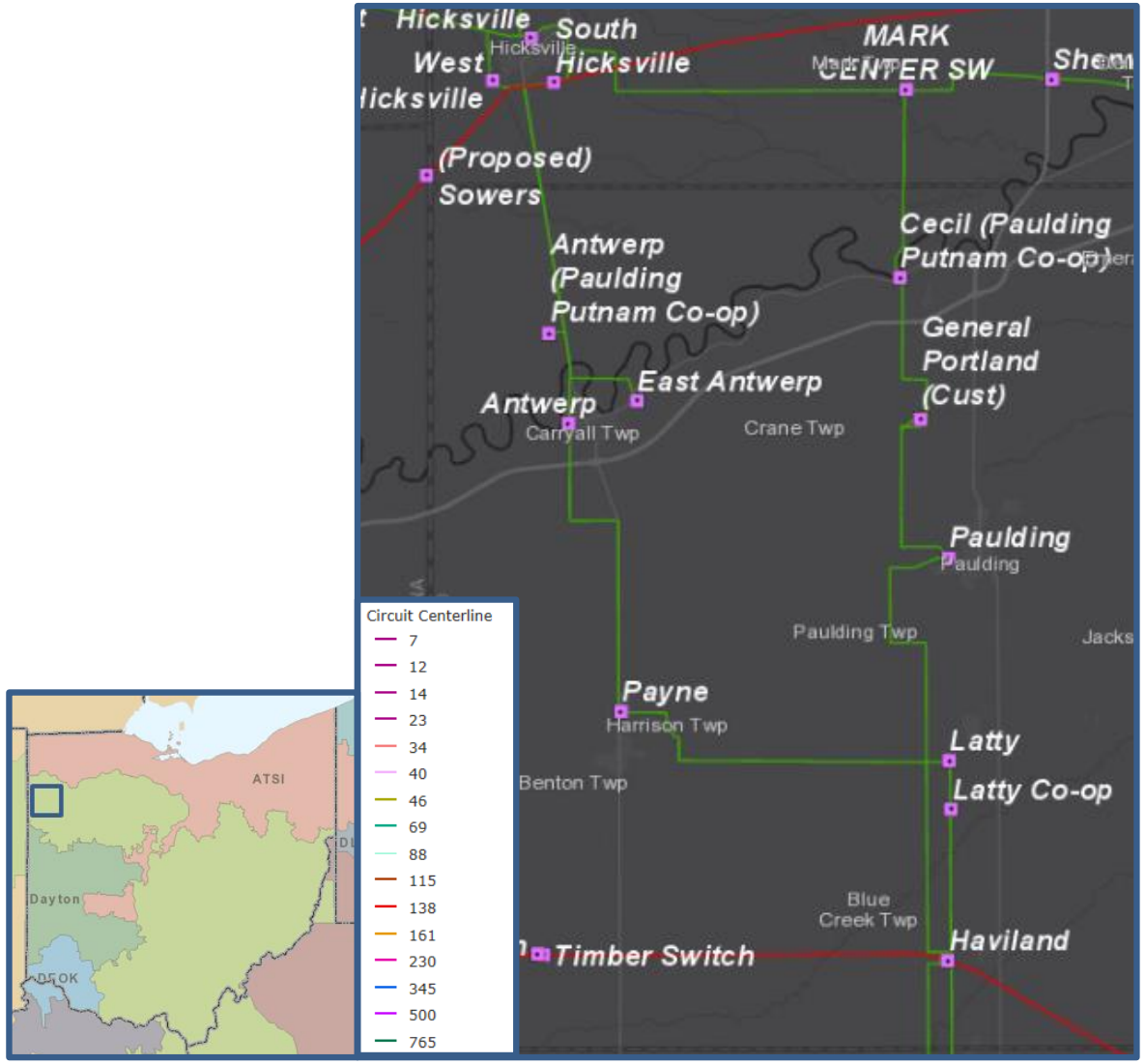
Specific Assumption Reference:

AEP Guidelines for Transmission Owner Identified Needs

Problem Statement:

Haviland – South Hicksville 69kV
Original Install Date: 1927

- **Length of Line:** 26.15
- **Total structure count:** 560
- **Original Line Construction Type:** Wood
  - 16% of structures recently replaced (~2.5 miles)
  - Wooden Cross Arms
  - Horizontal Ceramic insulators
- **Conductor Type:** 336.4 KCM ACSR 18/1 Merlin (original 1927 install)



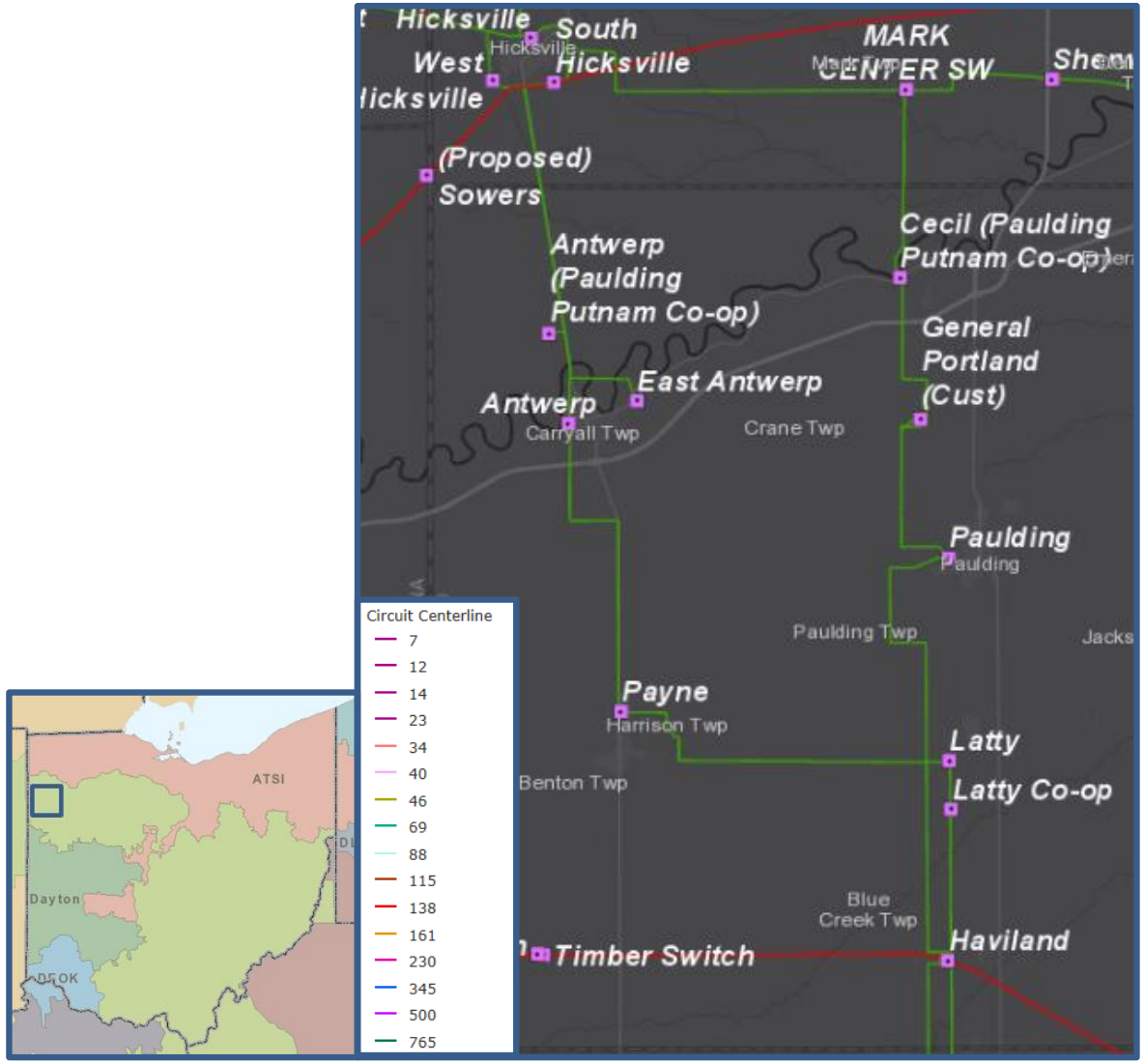
AEP Transmission Zone M-3 Process
Haviland, Ohio

CONDITION / PERFORMANCE / RISK ASSESSMENT:

- **Outage History**
  - **Momentary/Permanent Outages and Duration:** 12 Momentary and 8 Permanent – average duration of 26.32 hours
  - **CMI:** 8.2 M
  - No automatic line sectionalizing scheme through the entire length of this line.
- **Condition Summary**
  - **Number of open conditions by type / defects / inspection failures:** 40 open conditions on 39 unique structures
  - **Open conditions / defects / inspection failures include:** broken structures, rotting structures, burnt conductors, broken/missing ground lead

Risk

- **Number of Customers at Risk:** 9,639
- **Load at Risk:** 17.794 MVA
- The Antwerp (Paulding Putnam Co-op) customer is served off of a hard tap.



AEP Transmission Zone M-3 Process
Putnam/Hancock County

Need Number: AEP-2020-OH021

Process Stage: Need Meeting 4/16/2020

Project Driver:
Equipment Material/Condition/Performance/Risk, Customer Service

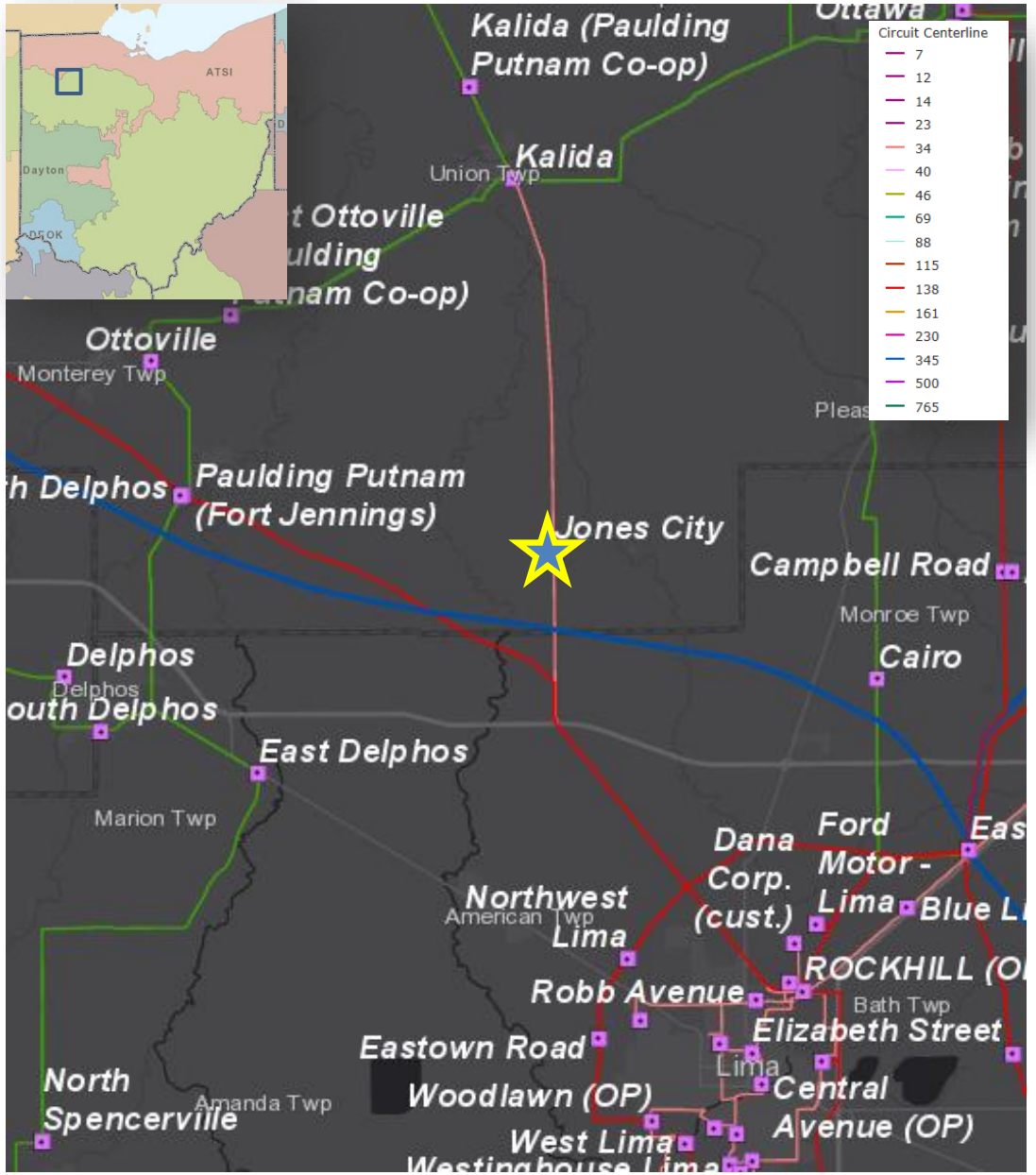
Specific Assumption Reference:
AEP Guidelines for Transmission Owner Identified Needs

Problem Statement:

Line Name: Kalida – Rockhill 34.5 kV

- **Original Install Date (Age):** 1923
- **Length of Line:** 17.22 miles
- **Total structure count:** 451
- **Original Line Construction Type:** Wood Monopoles
  - 96% of structures are from 1923, remaining 4% from 2000's.
  - Short wood poles susceptible to vegetation outages outside of the ROW.
  - Wooden Crossarm construction with vertical post insulators.
- **Conductor Type:** #1 Copper from 1923 (99%), remaining 795 ACSR (<1%)
- **5 Year Outage History**
  - **Momentary/Permanent Outages**: 2 Momentary
  - **CMI:** 222,797
- **Condition Summary**
  - **Number of open conditions:** 6
- **Additional Information**
  - The line is insulated with vertical post insulators which do not meet current AEP standards for CIFO and minimum leakage distance requirements.
  - The line shielding angle on the typical tangent structure is measured at 45 °, which is inadequate for AEP current shielding angle requirements.
  - The wood structure's current age is 191% of the 95% Probability of Failure (POF) of 51 years. The shield wire's current age is 134% of the 95% POF of 72 years. The insulator's current age is 111% of the 95% POF of 87 years. The POF values are based on CEATI Report No T144700-3257

Customer Service: AEP Ohio has requested new service to replace their existing Jones City Station.



AEP Transmission Zone M-3 Process
Tuscarawas County, Ohio

Need Number: AEP-2020-OH024

Process Stage: Need Meeting 04/17/2020

Project Driver:
Equipment Material/Condition/Performance/Risk

Specific Assumption Reference:
AEP Guidelines for Transmission Owner Identified Needs

Problem Statement:
Newcomerstown – West New Philadelphia 34.5kV (Install Date 1925)
Line Characteristics:

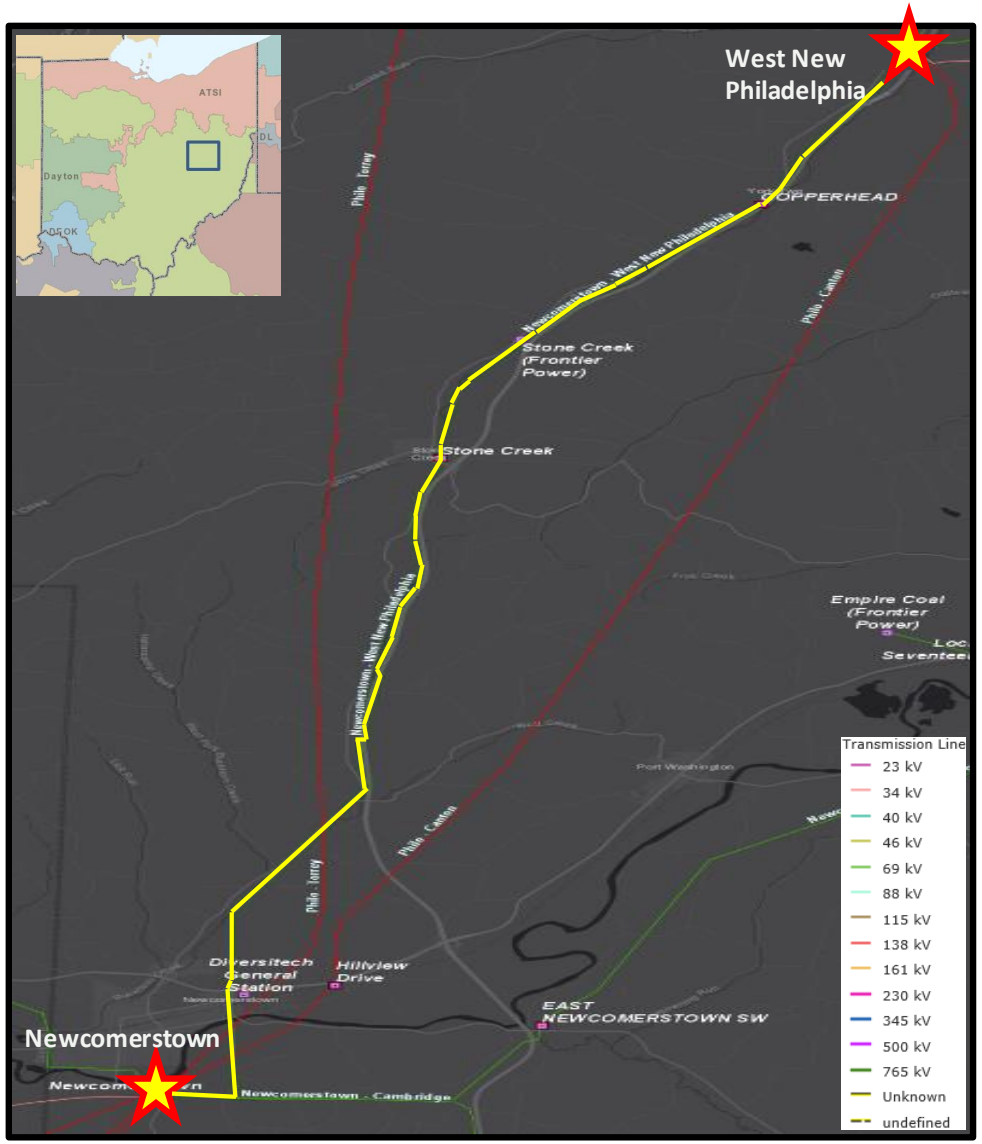
- Line Length: 17.5 Miles
- Total Structure Count: 382
- Original Construction Type: Wood
- Conductor Types: 3/0 Copper (15.13 Miles), 336.4 CM ACSR Merlin (1.21 Miles), & 556.5 CM ACSR Osprey (0.06 Miles)
  - The majority of the conductors were installed in 1925.
- The circuit serves four substations (two retail customers, one AEP distribution, and one rural co-op).

Outage History:

- Momentary/Permanent Outages and Duration: 6 momentary & 3 Permanent
- CMI (Last 5 years): 347,354 minutes

Line Conditions:

- 99 structures with at least one open condition, 25.9% of the total structures.
  - 84 structure based conditions: rot heart, siting in water, woodpecker holes, insect damage, split structures, twisted crossarm, and leaning/transverse poles.
  - 4 damaged conductor conditions.
  - 11 broken ground lead wire conditions.
  - 4 hardware based conditions: chipped insulator, missing guy guard, & split bayonet.



AEP Transmission Zone M-3 Process
Columbus, OH

Need Number: AEP-2020-OH025

Process Stage: Need Meeting 4/14/2020

Project Driver:

Equipment Material/Condition/Performance/Risk

Specific Assumption Reference:

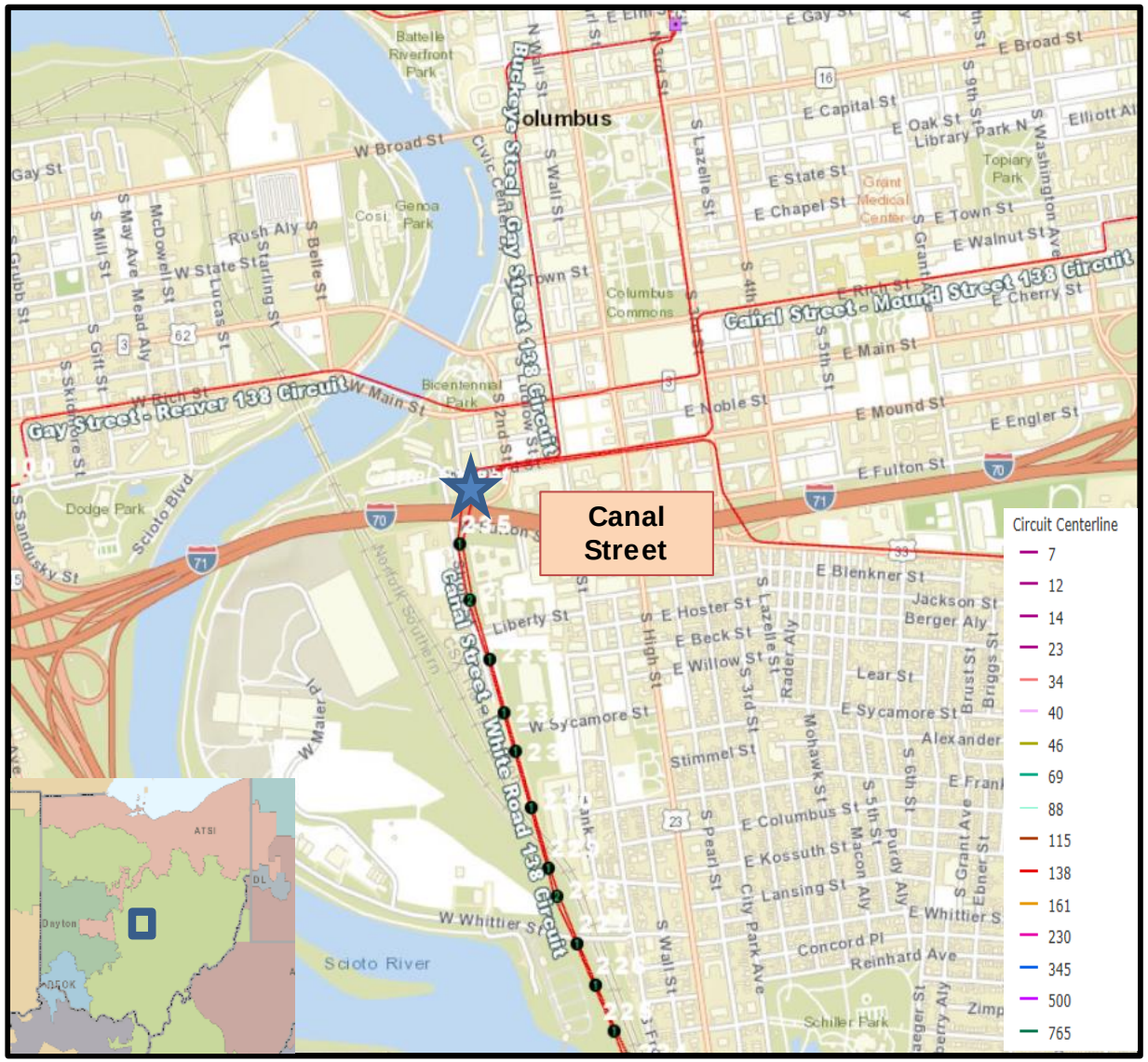
AEP Guidelines for Transmission Owner Identified Needs (AEP Assumptions Slide 8)

Problem Statement:

Canal Street 138kV

138 kV Circuit Breaker (4):

- Install Date: 1969
- Interrupting Medium: Oil
- Additional Information:
  - Interrupting Capability: 37kA
  - Fault Operations:
    - Number of Fault Operations: 15
    - Manufacturer recommended Number of Operations: 10
  - Oil breaker maintenance has become more difficult due to the oil handling required to maintain them. Oil spills are frequent with breaker failures and routine maintenance and can become an environmental hazard. This is the last remaining oil breaker at Canal Street station.



AEP Transmission Zone M-3 Process
Logan, Ohio

Need Number: AEP-2020-OH026

Process Stage: Need Meeting 04/20/2020

Supplemental Project Driver: Equipment Condition/Performance/Risk

Specific Assumption Reference:

AEP Guidelines for Transmission Owner Identified Needs (AEP Assumptions Slide 8)

Problem Statement:

Ralston – North Logan 69 kV

- Original Install Date (Age): 1950's and 1960's
- Length of Line: 15.3 miles
- Total structure count: 148
- Original Line Construction Type: Wood
- Conductor Type: 336.4 ACSR 30/7

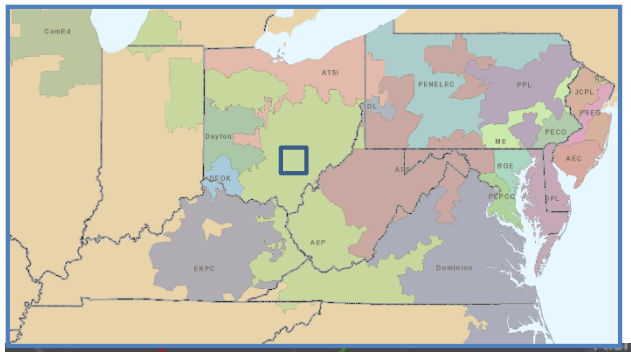
CONDITION / PERFORMANCE / RISK ASSESSMENT:

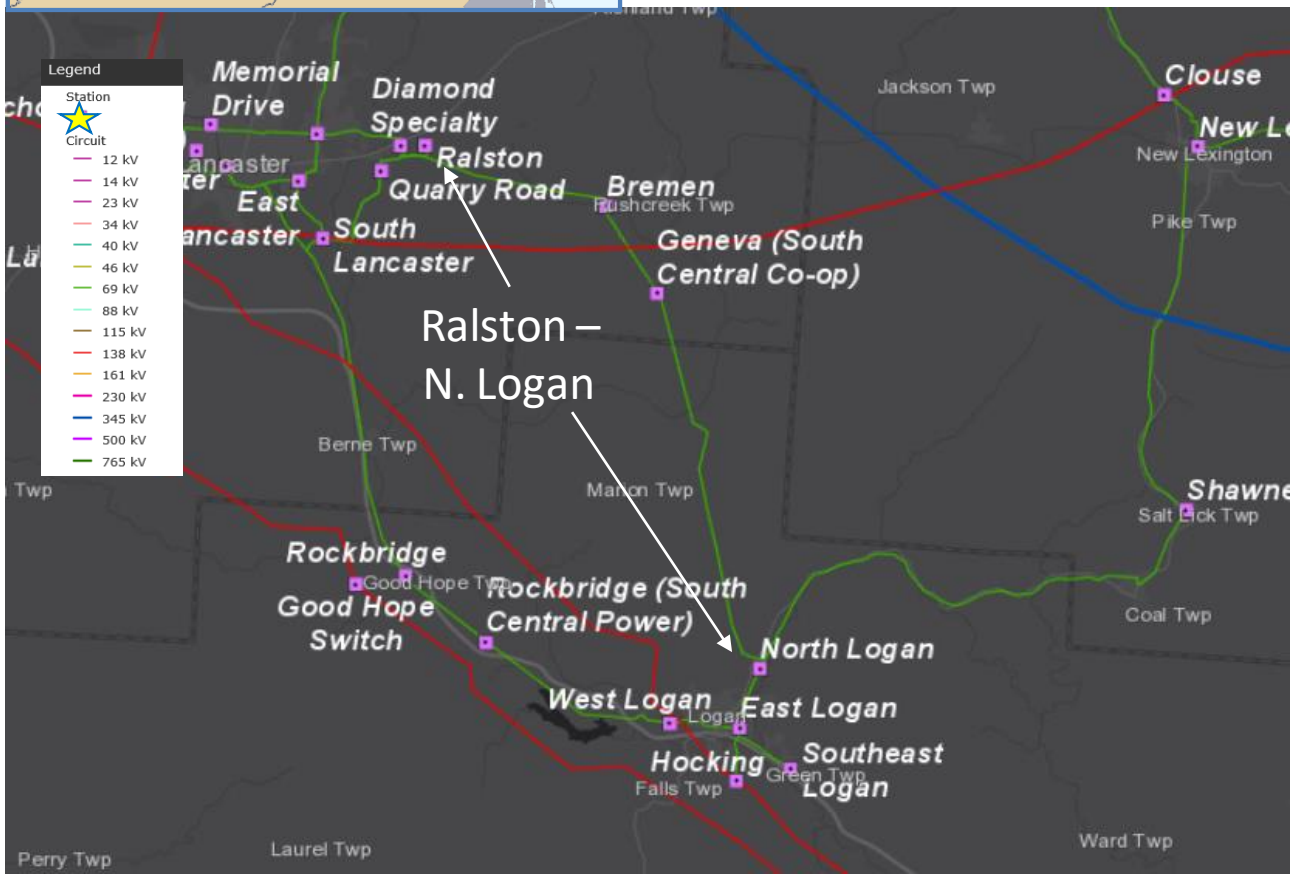
- Momentary/Permanent Outages and Duration: 13 Momentary and 5 permanent Outage
- CMI (last 5 years only): 1,496,000

Line Condition Summary:

Ralston – North Logan line section:

- 84 structures with at least one open condition.
- 59 structure related open conditions including broken crossarms, insect damage, rot heart, rot top, split poles and crossarms, and woodpecker holes
- 9 open conditions related to the conductor, including broken strands
- 7 open conditions related to the shielding wire and grounding, including broken shield wire strands
- 30 hardware related open conditions related to insulator, conductor hardware, or shield wire hardware, including broken, burnt, or chipped insulators





AEP Transmission Zone M-3 Process
Walnut Creek, Ohio

Need Number: AEP-2020-OH027

Process Stage: Needs Meeting 4/20/2020

Supplemental Project Driver: Customer Service

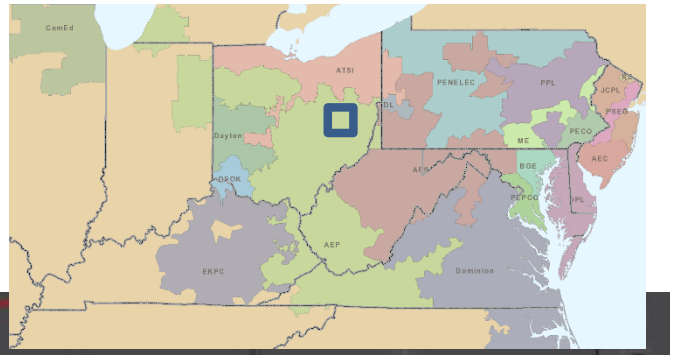
Specific Assumption Reference:

AEP Connection Requirements for the AEP Transmission System (AEP Assumptions Slide 7)

Problem Statement:

- Holmes-Wayne Electric Cooperative has a large block load increase and is replacing their Trail substation transformer with a larger unit.
- The anticipated new load is 8 MW. The load will be added incrementally starting 8/1/2020.

Model: 2024 RTEP



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

AEP Transmission Zone M-3 Process
Apple Valley Switch

Need Number: AEP-2019-OH011

Process Stage: Solutions Meeting 04/20/2020

Previously Presented: Need Meeting 03/25/2019

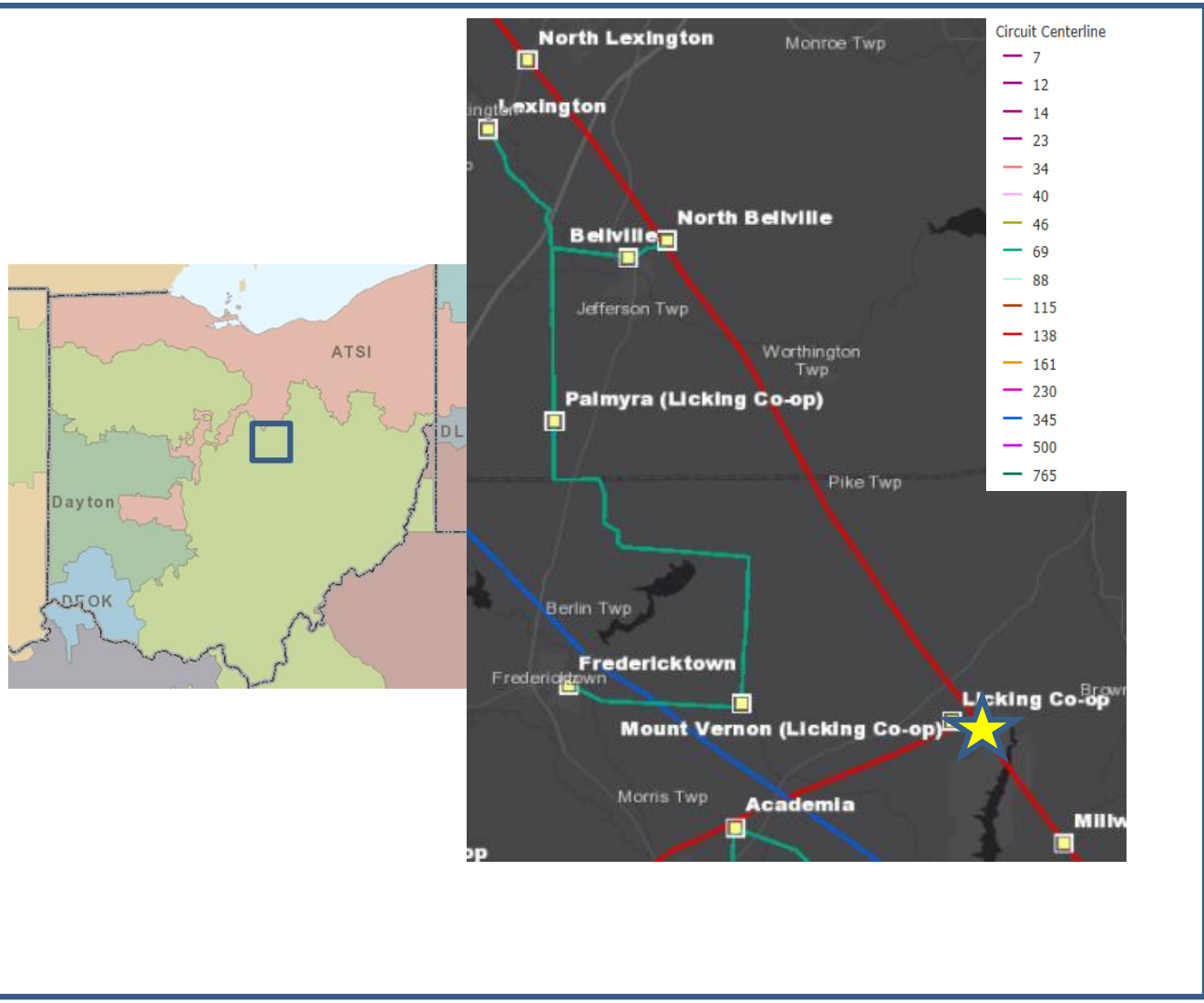
Supplemental Project Driver: Equipment Material/Condition/Performance/Risk

Specific Assumptions Reference: AEP Guidelines for Transmission Owner Identified Needs

Problem Statement:

- The Apple Valley (Licking Co-op) 138 kV delivery point serves approximately 2,300 customers with a peak demand of 6.5 MW. Apple Valley isn't 100% transferrable during all times of the year and can take several hours to complete the required switching. This delivery point has experienced 971,280 customer minutes of interruption.
- This delivery point is connected with a hard tap which limits sectionalizing during outages and maintenance. In addition, relay coordination can be difficult with hard taps.

Model: 2023 Summer RTEP



AEP Transmission Zone M-3 Process
Apple Valley Switch

Need Number: AEP-2019-OH011

Process Stage: Solutions Meeting 04/20/2020

Proposed Solution:

- Install a new 3-way phase over phase 138 kV 2000 A switch (Apple Valley Switch) with SCADA, Auto-Sectionalizing MOABs outside of the Apple Valley (Licking –Co-op) Station. **Estimated Cost: $0.84M**
- Rebuild the existing radial hard tap ~0.24 Miles as a double circuit with 556.5 ACSR 26/7. **Estimated Cost: $1.54M**

Total Estimated Cost: $2.38M

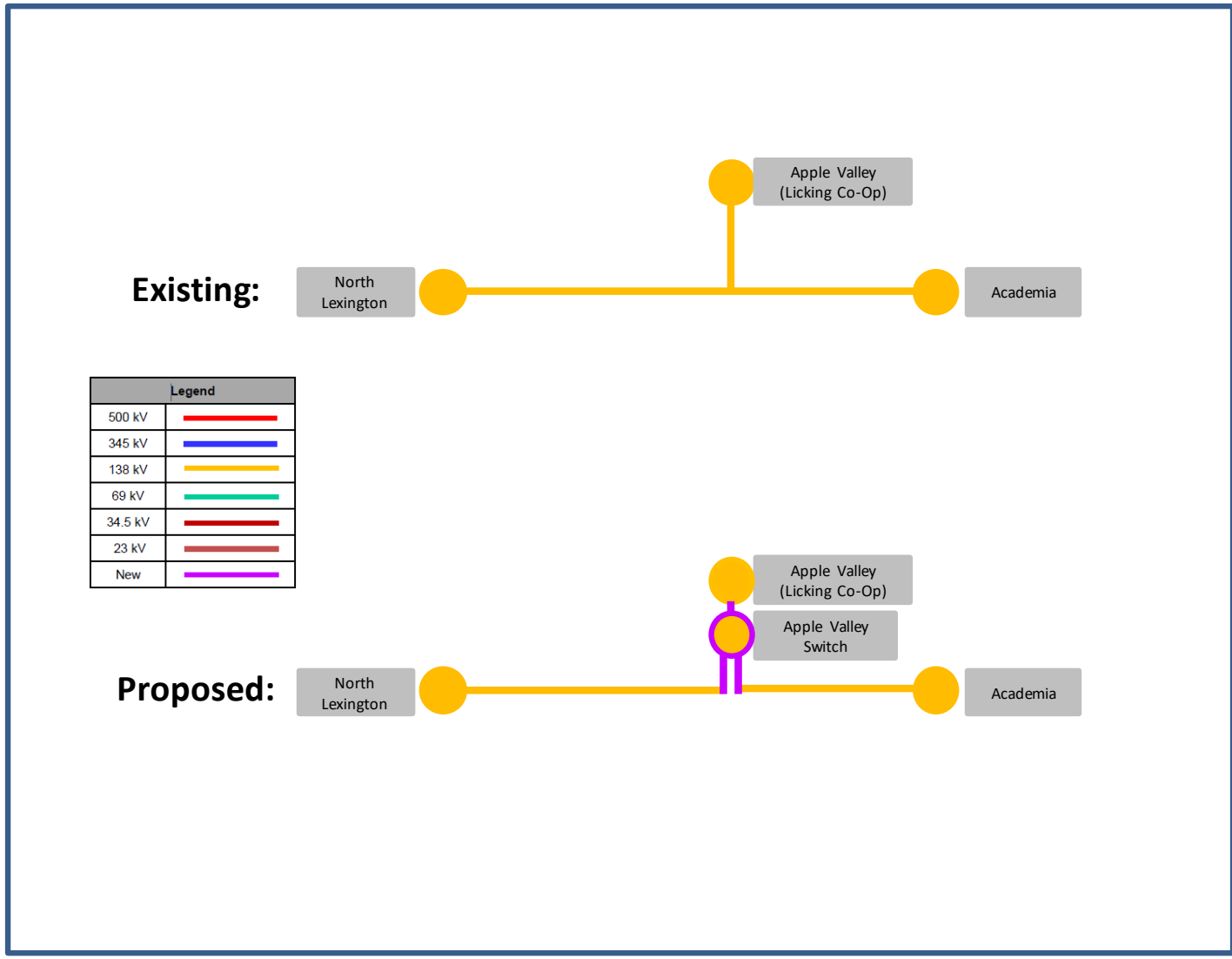
Ancillary Benefits: Removes a hard tap from the 138kV system and provides a more reliable service to customers.

Alternatives Considered:

- Install a 3 way POP switch at the existing tap point. This alternative had similar costs and required us to maintain a permanent access road to this switch rather than at the existing Apple Valley Station.

Projected In-Service: 05/01/2021

Project Status: Engineering



AEP Transmission Zone M-3 Process
Sullivan County, Tennessee

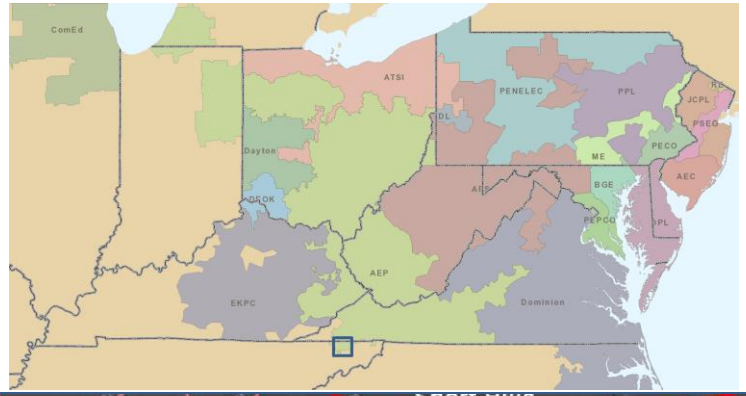
Need Number: AEP-2019-AP021
Process Stage: Solutions Meeting 04/20/2020
Process Chronology: Needs Meeting 05/20/2019
Supplemental Project Driver: Equipment Material/ Condition/Performance/Risk, Operational Flexibility and Efficiency
Specific Assumption References: AEP Guidelines for Transmission Owner Identified Needs (AEP Assumptions Slide 8)
Problem Statement:

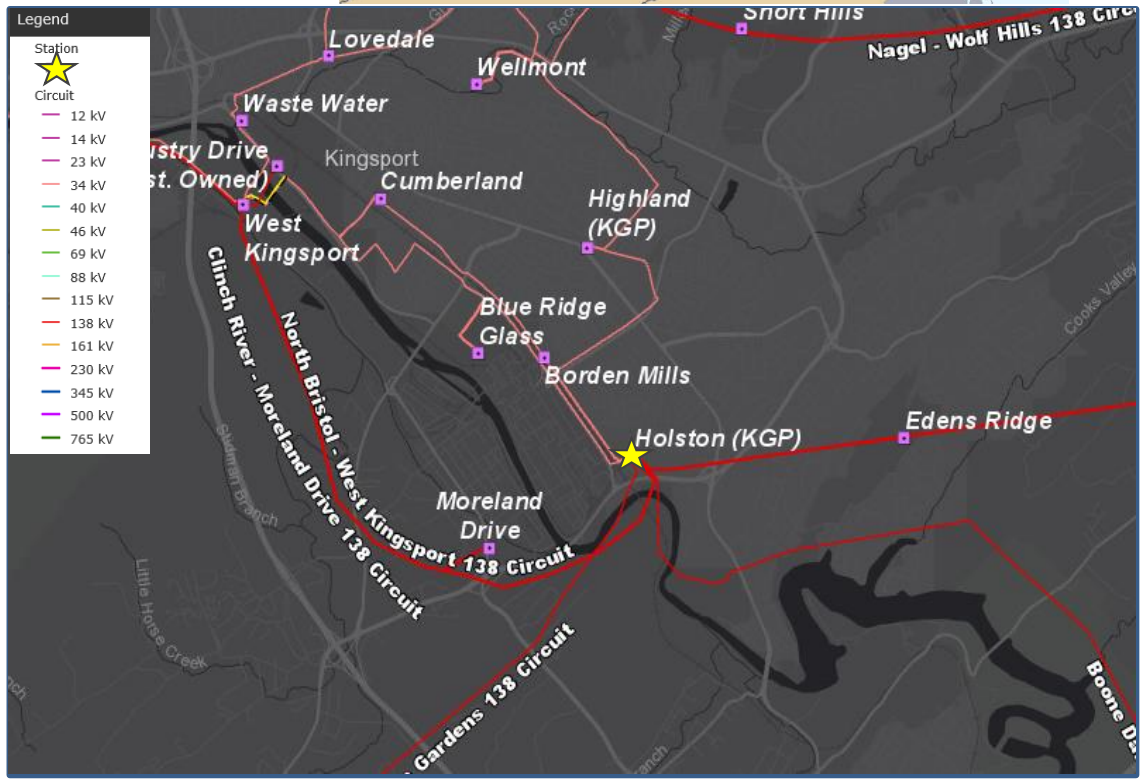
Holston Station

- 138/34.5 kV Transformer #1
  - Manufactured in 1979.
  - Showing signs of dielectric breakdown (insulation), accessory damage (bushings/windings), and short circuit breakdown (due to through faults).
  - Currently tied directly to 138 kV bus #1 via a MOAB on high side.

34.5/23-2.4 kV Transformer #8 (GND Bank)

  - Manufactured in 1954.
  - Showing signs of dielectric breakdown (insulation), accessory damage (bushings), and short circuit breakdown (due to through faults).





Continued from previous slide…

Holston Station

Capacitor switchers 'BB' and 'CC'

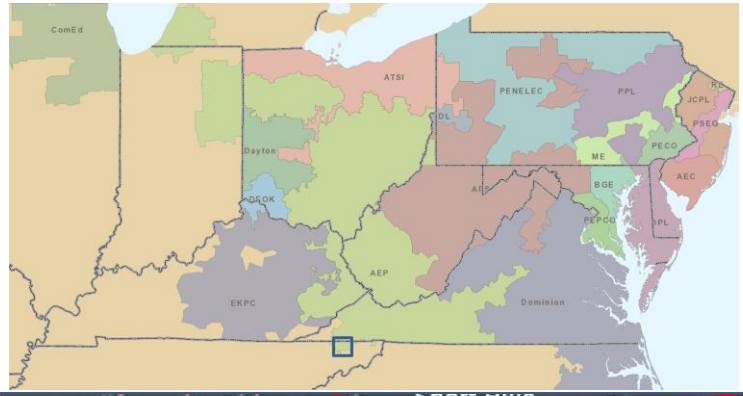
- Capacitor switchers 'BB' and 'CC' at Holston station are Mark V model which no longer support modern relaying packages.
- Mark V's have been historically prone to mechanism failures and are being replaced system wide where possible.

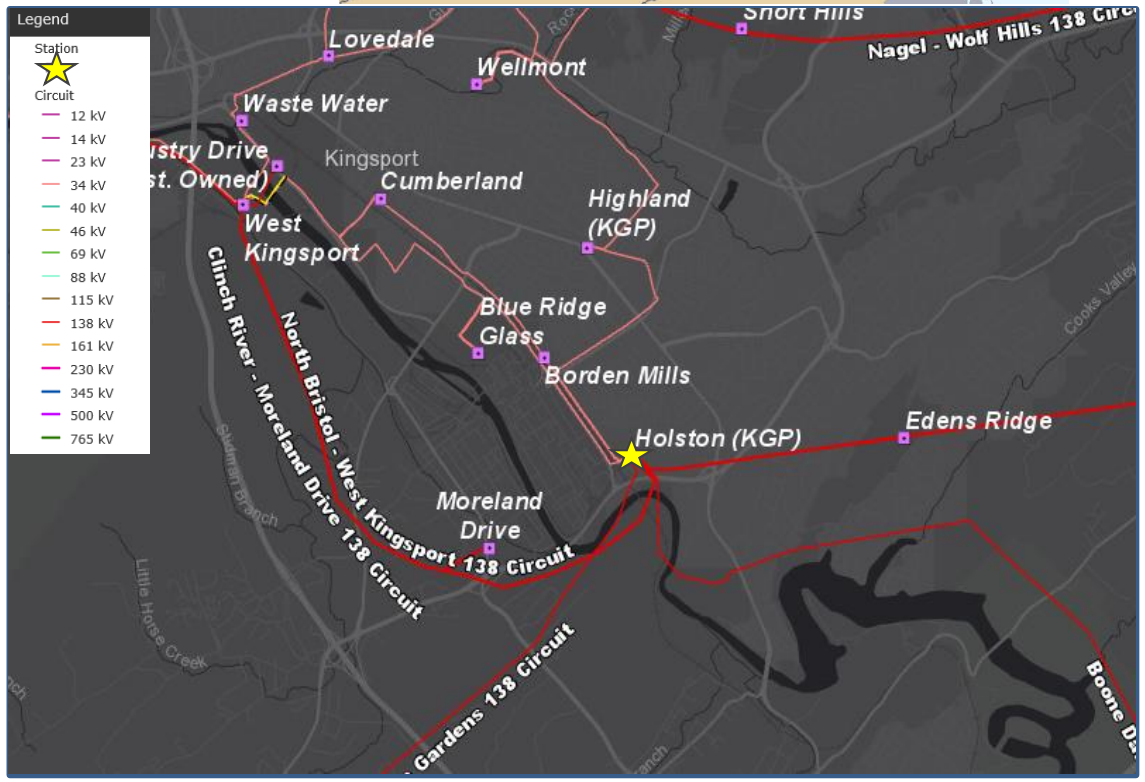
34.5/23-2.4 kV Transformer #9 (GND Bank)

- Manufactured in 1953.
- Showing signs of dielectric breakdown (insulation), accessory damage (bushings), and short circuit breakdown (due to through faults).

34.5 kV Circuit breakers E, F, and U

- FK type oil breakers. (1959, 1955, and 1950 vintage)
- These are oil breakers that are difficult to maintain due to the required oil handling. There is an increased potential for oil spills during routine maintenance and failures with these types of breakers.
- Other drivers include damage to bushings and the breakers have experienced 2,19, and 7 fault operations respectively. The manufacturer's recommendation for this type of breaker is 10.





AEP Transmission Zone M-3 Process
Sullivan County, Tennessee

Need Number: AEP-2019-AP021
Process Stage: Solutions Meeting 04/20/2020

Proposed Solution:

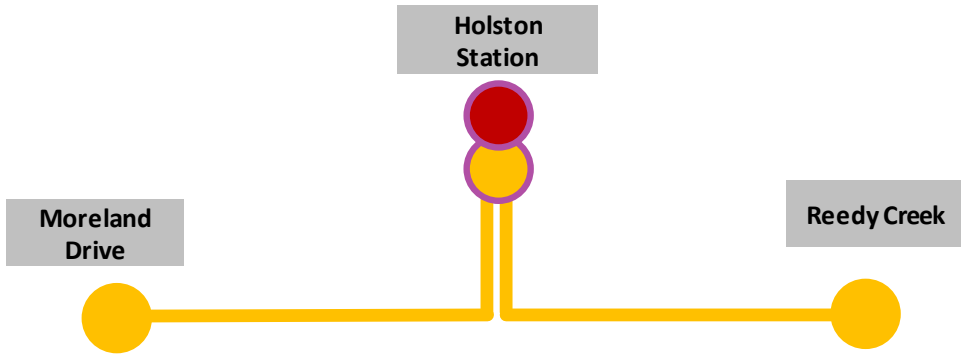
Replace existing 138/34.5 KV 45 MVA transformer #1 with a new 138/69/34.5 KV 90 MVA transformer. Replace existing high side MOAB switches on transformer#1 with new 138 KV 3000 A 40 KA circuit breaker. Replace existing ground transformers #8 and #9 with new ground banks. Reconfigure the existing 34.5 kV into a ring bus configuration with five new 34.5 kV breakers.

Estimated Cost: $11.5M

Alternatives Considered:

No viable alternates found.

Projected In-Service: 12/1/2023
Project Status: Scoping



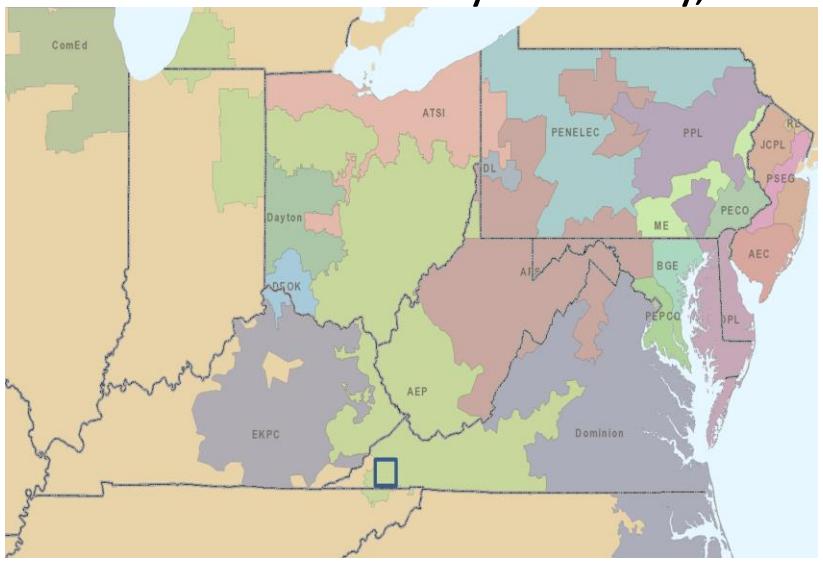
Legend	
500 kV	
345 kV	
138 kV	
69 kV	
34.5 kV	
23 kV	
New	

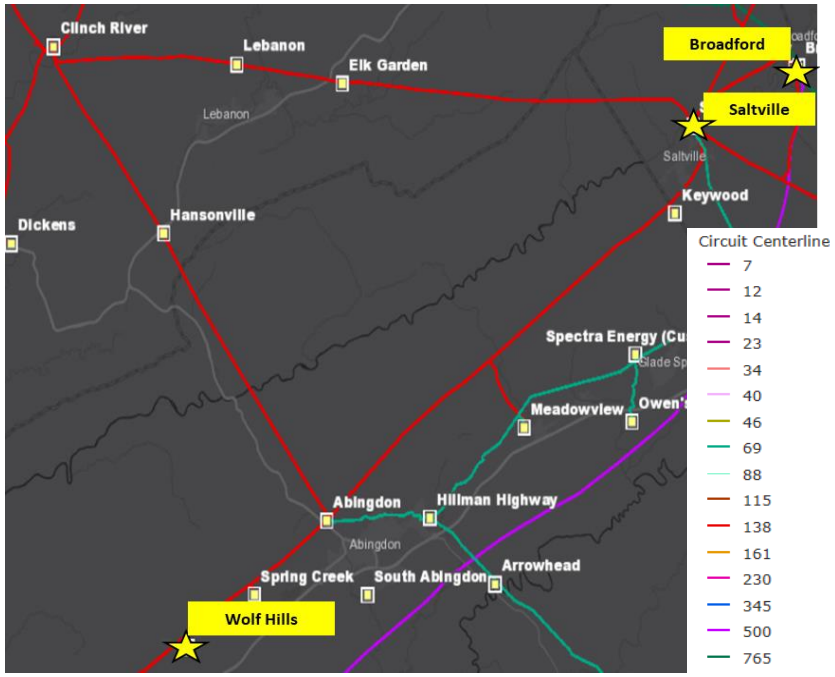
AEP Transmission Zone: Supplemental
Smyth County, WV

Need Number: AEP-2020-AP005
Process Stage: Solutions Meeting 04/20/2020
Previously Presented: Needs Meeting 1/17/2020
Supplemental Project Driver: Equipment Condition/Performance/Risk

Specific Assumption Reference:
AEP Guidelines for Transmission Owner Identified Needs (AEP Assumptions Slide 8), AEP Presentation on Pre-1930s Lines
Problem Statement:
Line:
Broadford — Wolf Hills 138 KV (~26 miles installed in the 1920's, ~5.5 miles installed in the 1960's)

- Length: 31.54 Miles
- Original Construction Type: Lattice Steel
- Original Conductor Type: 82.5% 397.5 CM ACSR 30/7, 15.2% 795 CM ACSR 45/7
- Momentary/Permanent Outages: 9/1 (5 years)
- Total structure count: 144
- Number of open conditions: 12
  - Open conditions include: broken conductor strands, broken/burnt insulators.
- Unique structure count with open conditions: 6 (7%)
- Additional Info: Insulator & Hardware Corrosion:
  - Section Loss: The connecting elements including the tower attachment hole and the insulator hook have experienced serious section loss due to corrosion and wear. This loss of metal cross-section significantly reduces the capacity of the connection
  - Corrosion: The insulator caps and connecting hardware have experienced heavy to complete loss of galvanizing. When the protective galvanized coating is gone or significantly compromised the bare steel corrodes at an accelerated rate
  - Tower members with corrosion and damage. Lattice tower structures have little structural redundancy. A failure of one member of the structure will impact the integrity of the structure and may cause the entire tower to collapse.
- **Model:** N/A





AEP Transmission Zone M-3 Process
Smyth/ Russell / Washington County, Tennessee

Need Number: AEP-2020-AP005

Process Stage: Solutions Meeting: 04/20/2020

Proposed Solution:

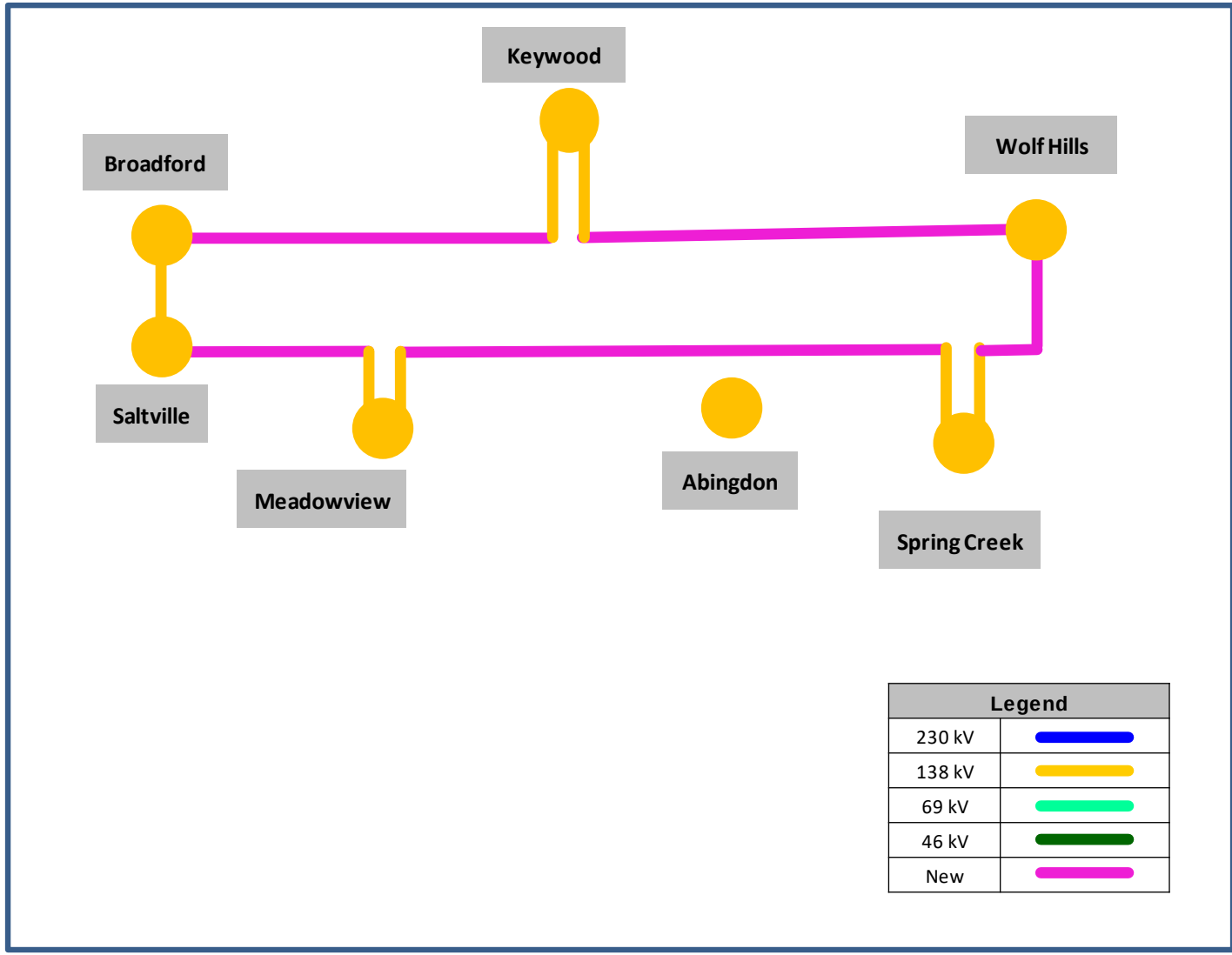
– Rebuild the existing Broadford - Wolf Hills/Clinch River - Saltville #2 138kV double circuit line (~26 miles) section between Saltville and Wolf Hills stations.

Estimated Cost: $107.1M

Alternatives Considered:
No cost effective alternates identified.

Project Status: Scoping

Projected In-Service: 5/01/2024



AEP Transmission Zone M-3 Process
Greenup County, , KY

Need Number: AEP-2020-AP008

Process Stage: Solutions Meeting 04/20/2020

Previously Presented: Needs Meeting 02/21/2020

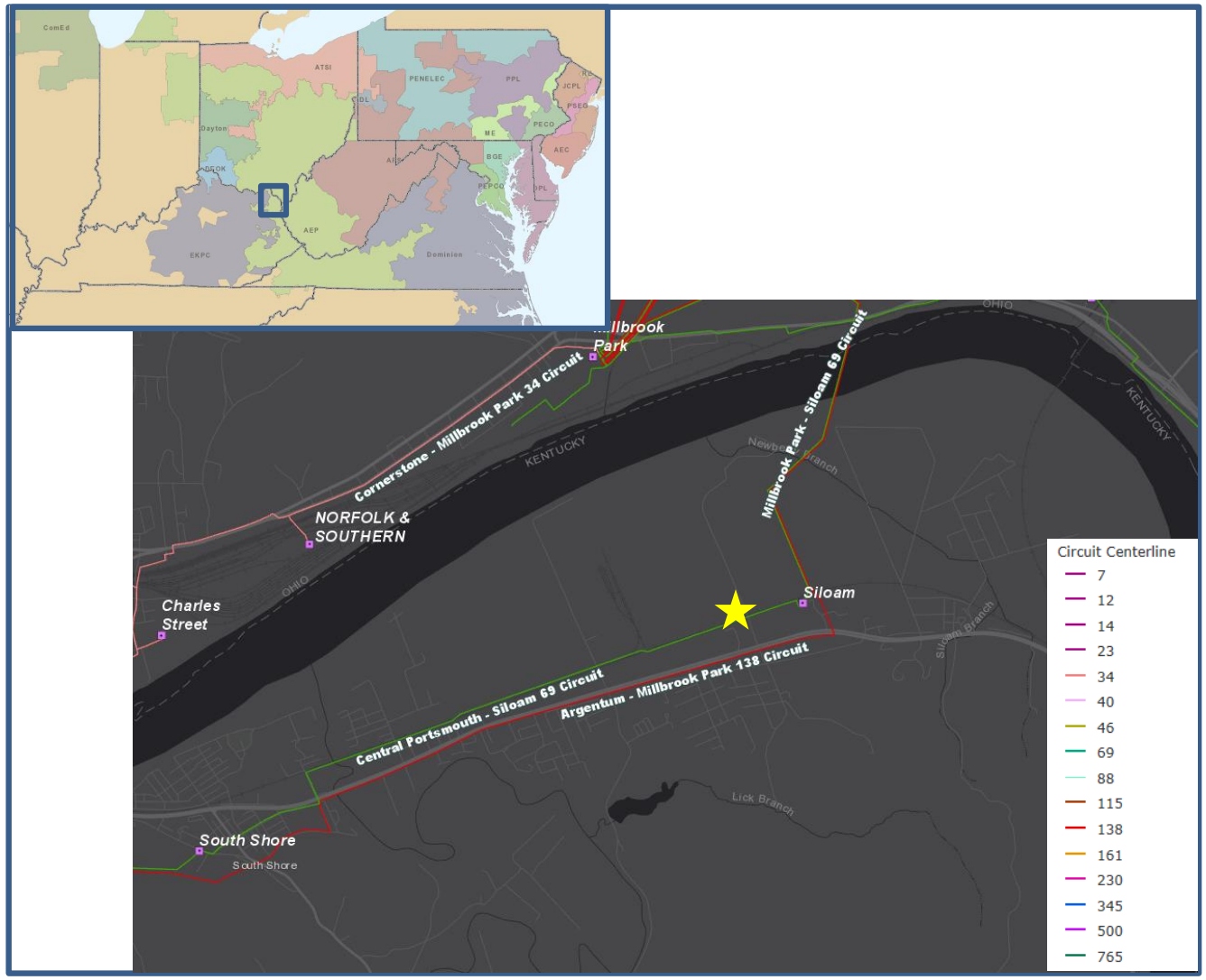
Supplemental Project Driver: Customer Service

Specific Assumption References: AEP Connection Requirements for the AEP Transmission System (AEP Assumptions Slide 7)

Problem Statement:

- Kentucky Power has requested a new 69kV Transmission delivery point in Siloam area with a projected load of 9 MW.

Model: 2024 RTEP



AEP Transmission Zone M-3 Process
Green Up County, Kentucky

Need Number: AEP-2020-AP008

Process Stage: Solutions Meeting 04/20/2020

Proposed Solution:

- Establish a new station (Tygart) and install a 69/12 kV 25 MVA transformer and two 69kV breakers. **Estimated Cost: $2.6M**
- Retire Siloam Station. **Estimated Cost $0M**
- Remote end relaying at Millbrook Park to coordinate with new breakers. **Estimated Cost: $0.4M**
- Tap the 69kV Central Portsmouth – Millbrook Park line and install 3 custom T-line structures due to proximity to the Railroad. **Estimated Cost: $0.9M**

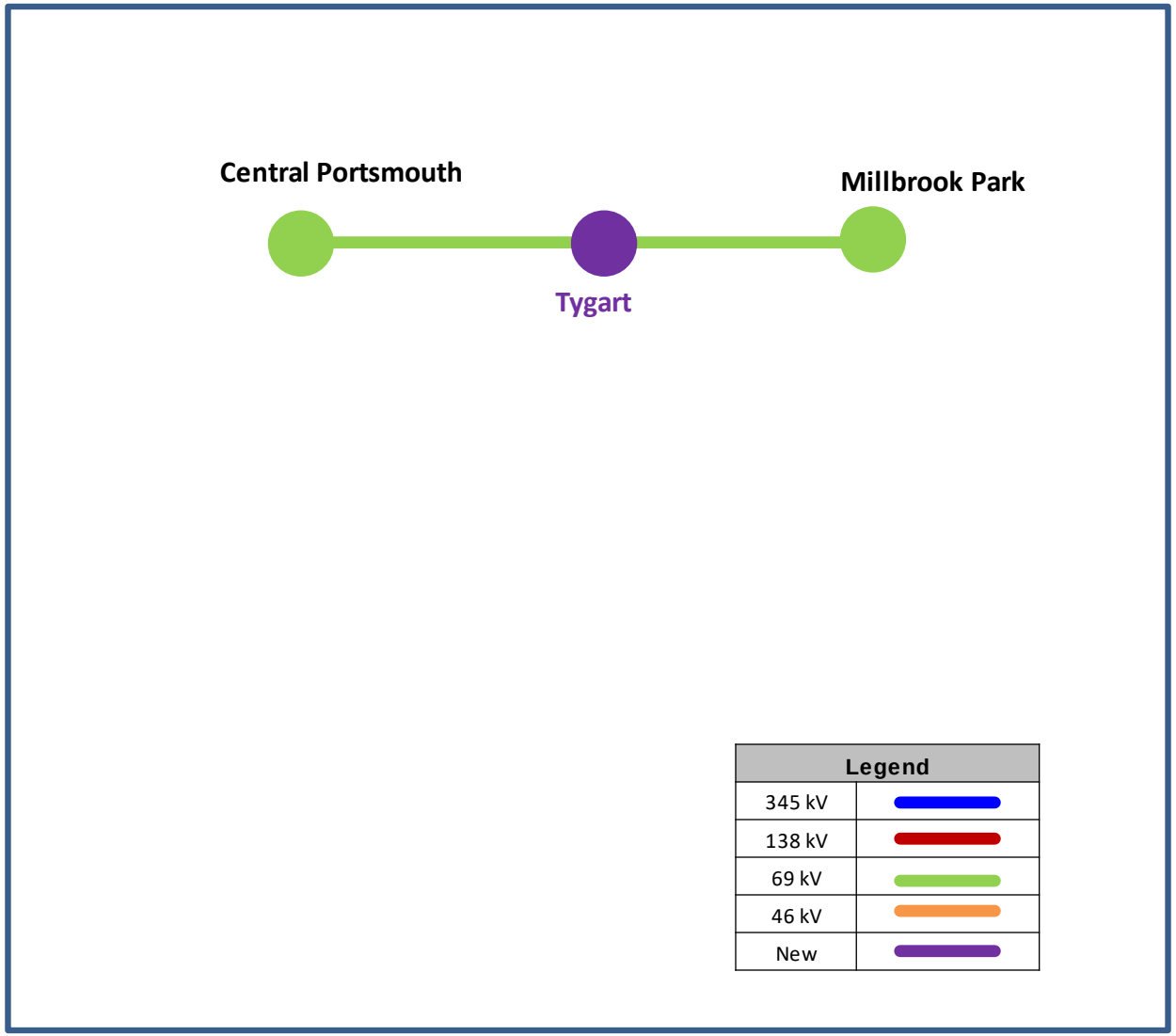
Total Estimated Transmission Cost: $3.9M

Alternatives Considered:

Considering the timing and location of the customer request, no viable alternates were identified.

Projected In-Service: 12/01/2020

Project Status: Engineering



AEP Transmission Zone M-3 Process
Salem, VA

Need Number: AEP-2020-AP020

Process Stage: Solutions Meeting 04/20/2020

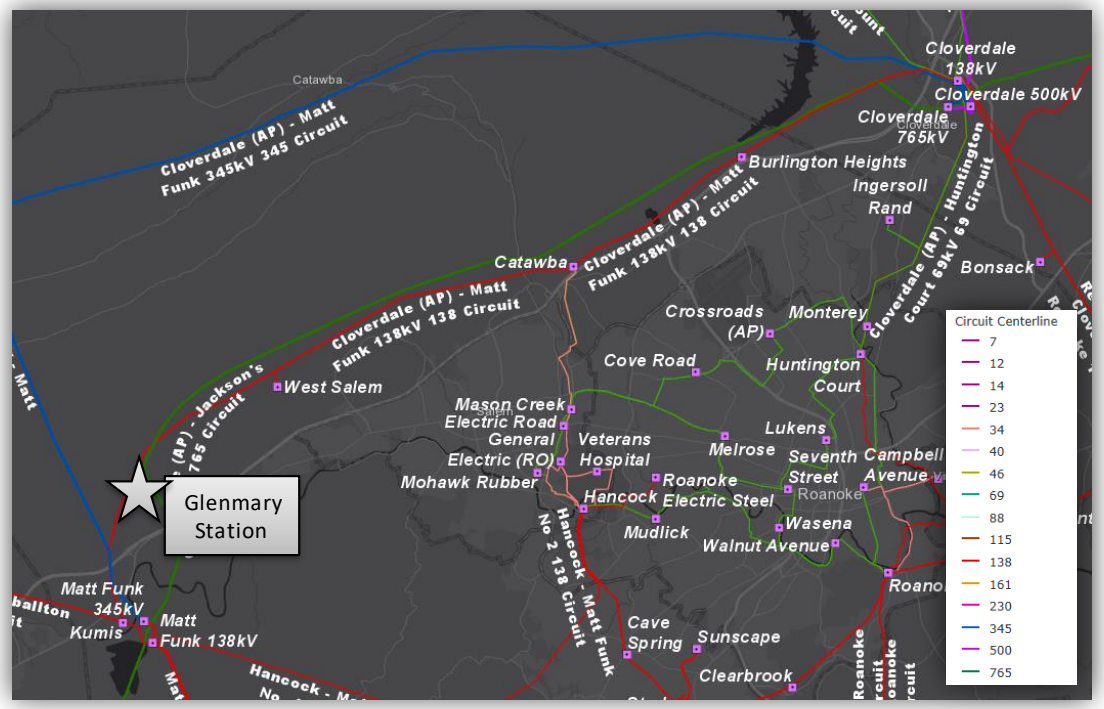
Previously Presented: Needs Meeting 03/19/2020

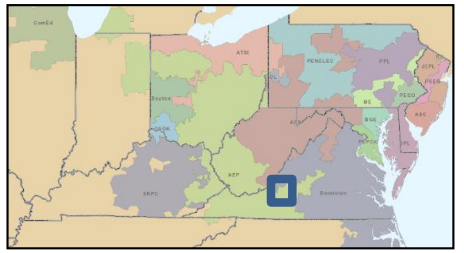
Supplemental Project Driver: Customer Service

Specific Assumption Reference: AEP Connection Requirements for the AEP Transmission System (AEP Assumptions Slide 7)

Problem Statement:

- AEP Distribution is requesting redundant service for a new critical and sensitive load in the Roanoke region, approximately 0.6 MW total.





AEP Transmission Zone M-3 Process
Salem, VA

Need Number: AEP-2020-AP020

Process Stage: Solutions Meeting 04/20/2020

Proposed Solution:

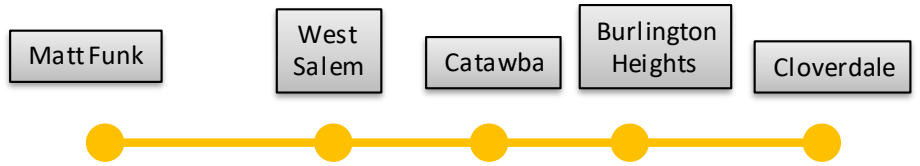
- Establish new Glenmary 138 kV station with 2-138 kV circuit breakers and a 138/12 kV, 25 MVA transformer with high-side circuit switcher and 3 distribution feeders. **Estimated Cost: $0M**
- Add a tap structure to the Kumis-Cloverdale (between Matt Funk and West Salem) 138 kV line. **Estimated Cost: $0.8M**
- Construct ~0.5 miles of double circuit 138 kV extending from the Kumis-Cloverdale 138 kV line to the new Glenmary Station. **Estimated Cost: $3.1M**
- Upgrade line relay and retire wave trap on the Matt Funk Line at Cloverdale station. **Estimated Cost: $0.5M**
- Upgrade line relay and retire wave trap on the Cloverdale Line at Matt Funk station. **Estimated Cost: $0.5M**
- Install 0.2 mi of fiber for station entrances into Glenmary station. **Estimated Cost: $0.2M**

Total Estimated Transmission Cost: $5.1 M

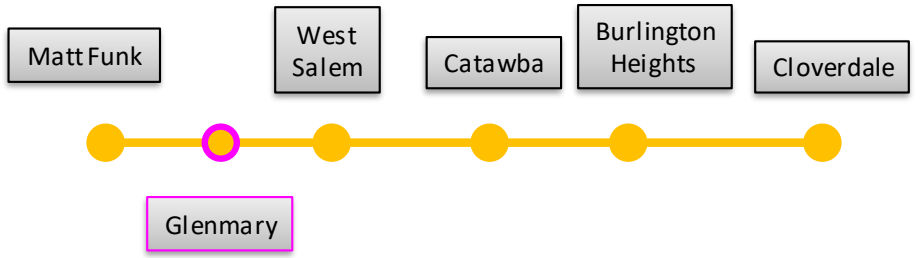
Ancillary Benefits:

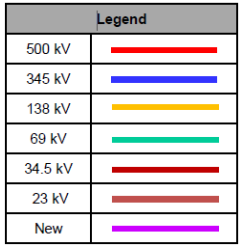
The new station will also allow for the establishment of another distribution circuit to split up an existing circuit in the area (Kumis/Glenvar 12 kV) in order to reduce exposure to over 1200 customers which experienced over 2.3 million customer minutes of interruption over the past 3 years. In addition, the new station will provide additional capacity to help restore load in the event of a station outage at Kumis.

Existing



Proposed





AEP Transmission Zone M-3 Process
Salem, VA

Alternatives Considered:

An alternative that was considered included serving the sensitive load from the existing Kumis/Corporate 12 kV circuit as the primary feed and establish a secondary feed from the West Salem/Allegheny 12 kV circuit by extending the existing circuit. A 138 kV breaker would be required at West Salem on the Matt Funk side in order to eliminate the potential of losing both Kumis and West Salem stations for either a breaker failure at Matt Funk (CB "J") or a tower outage of the double circuit line out of Matt Funk feeding both stations.

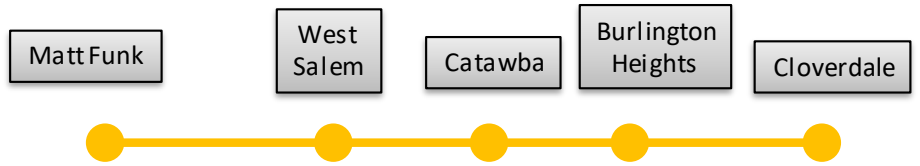
The distribution line exposure for the load from the Kumis/Corporate 12 kV and West Salem/Allegheny circuits is 2.4 miles and 5.7 miles respectively. In order to establish the secondary feed, approximately 2.5 miles of distribution line work would be required from West Salem along U.S. Route 11. A double circuit already exists on the south side of Route 11 so it was decided to investigate the possibility of a new feed for the load on the north side. After visits to the potential route, it was deemed that securing right of way was going to be difficult, if not impossible, because of significant tree cover and close proximity to residential dwellings. In addition, Distribution does not condemn to secure right of way. Triple circuit construction on the south side of Route 11 was not considered because of the potential negative impact to reliability in that a single problematic event could create an outage on three circuits.

Because of the amount of circuit exposure, a line recloser was needed on the West Salem feed which would have placed the load in the second zone of protection, versus being in the shorter breaker zone of protection, exposing the load to additional momentary outages. Due to the difficulty in securing right of way, the critical nature of the load requiring reliable service, and the ancillary benefits of the preferred solution, this option was not selected. **Estimated Cost: $800k (Transmission Cost only)**

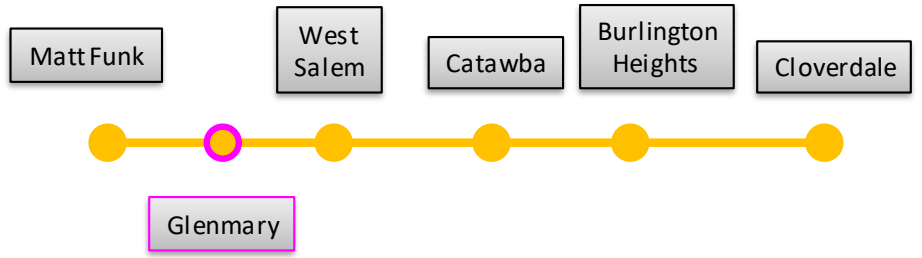
Projected In-Service: 08/01/2021

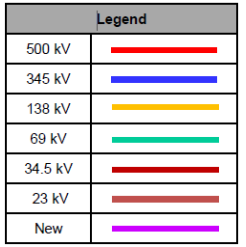
Project Status: **Scoping**

Existing



Proposed





AEP Transmission Zone M-3 Process
Pike County, Kentucky

Need Number: AEP-2020-AP022

Process Stage: Solutions Meeting 04/20/2020

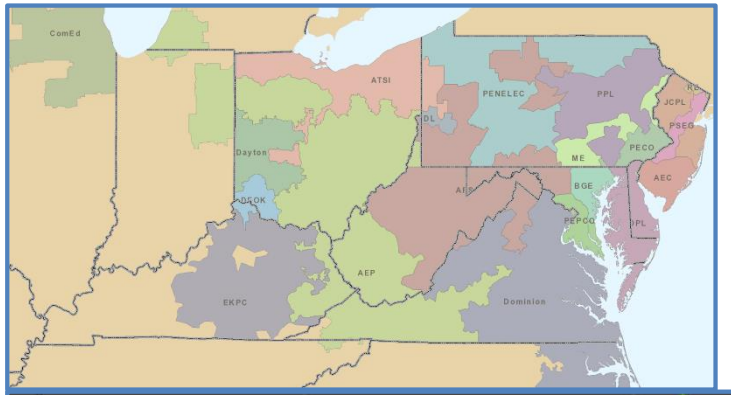
Previously Presented: Need Meeting 03/19/2020

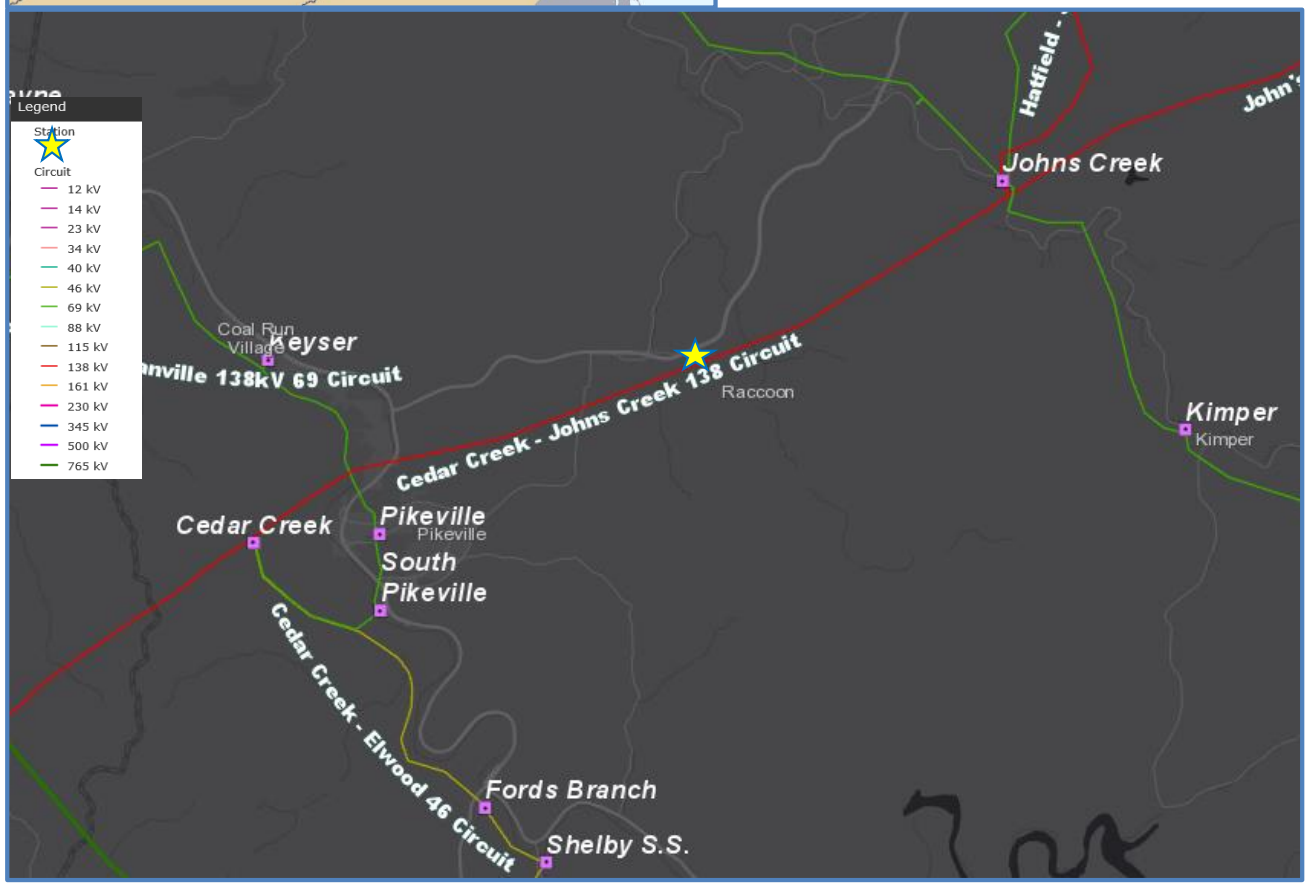
Supplemental Project Driver: Customer Service

Specific Assumptions Reference: AEP Connection Requirements for the AEP Transmission System (AEP Assumptions Slide 7)

Problem Statement:

- AEP Kentucky Power Distribution has requested a new distribution service out of the Cedar Creek – John Creek 138kV circuit near Pikeville, Kentucky. The projected Winter peak projected load is 13 MVA.





AEP Transmission Zone M-3 Process
Pike County, Kentucky

Need Number: AEP-2020-AP022

Process Stage: Solutions Meeting 04/20/2020

Proposed Solution:

Raccoon substation:

- Construct a new station (Raccoon) and install a 138/34.5kV 30 MVA transformer and 138 kV MOABs. **Estimated Cost: $0M**
- Install 0.2 mi double circuit extension from the Cedar Creek – Johns Creek 138kV circuit to cut the line into Raccoon Station. **Estimated Cost: $1.3M**

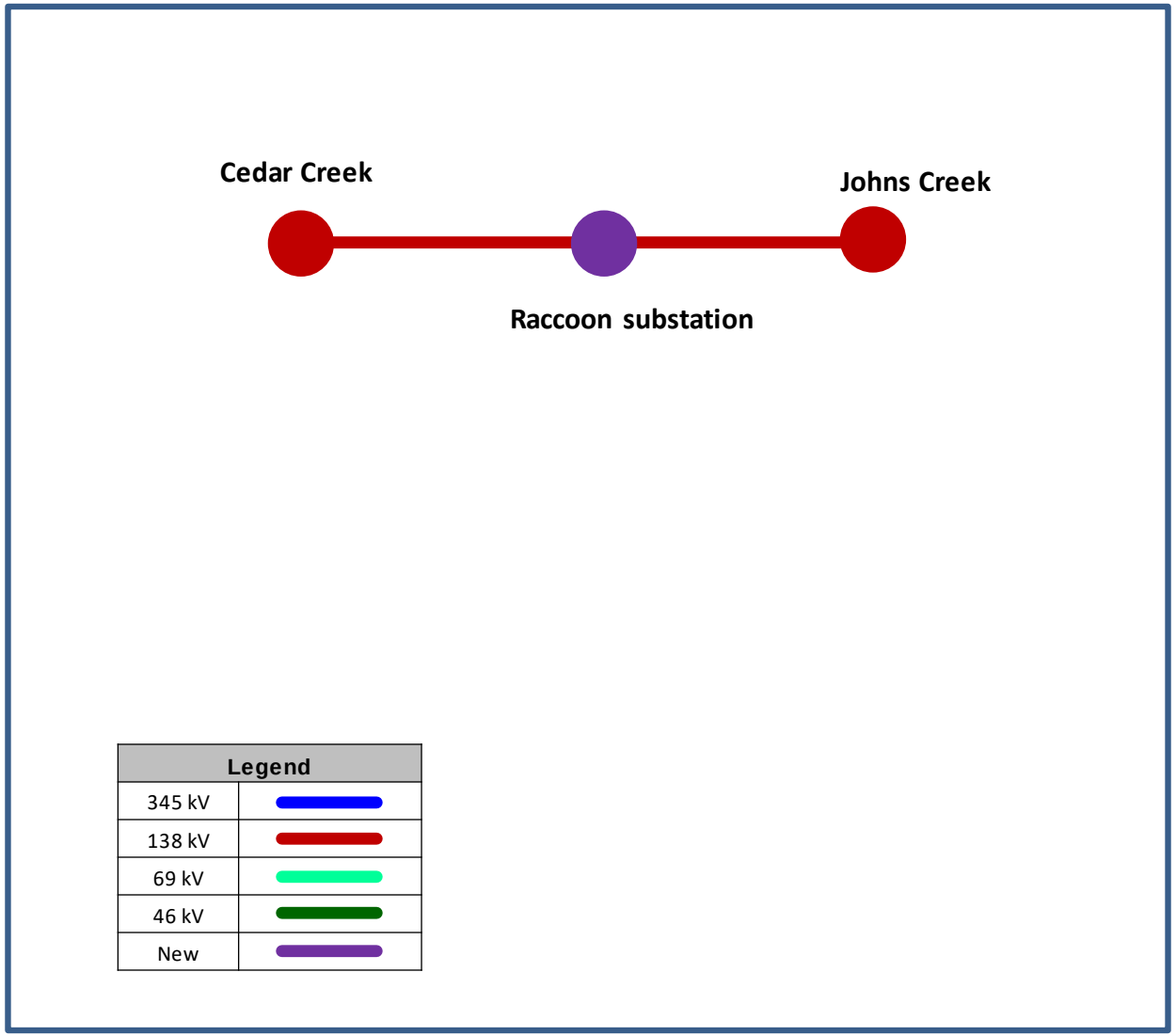
Total Estimated Transmission Cost: $1.3M

Alternatives Considered:

No other transmission alternatives were found considering the location and timing of the customer request.

Projected In-Service: 12/01/2020

Project Status: Engineering



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

4/8/2020 – V1 – Original version posted to pjm.com

4/20/2020 – V2 – Slide #13, Update outage history

7/20/2020 – V3 – Slide #31, Corrected Need number to AEP-2020-AP022