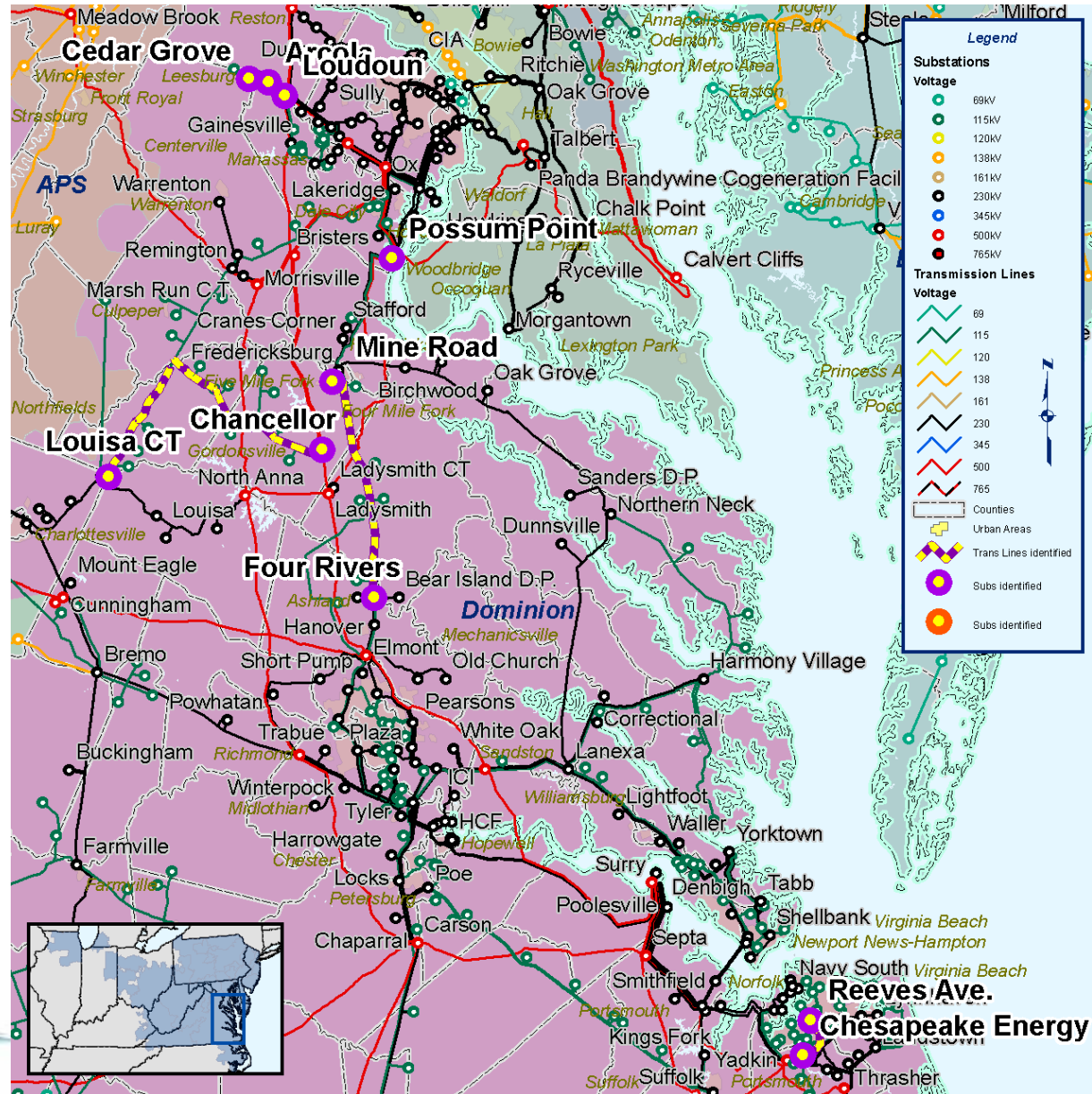




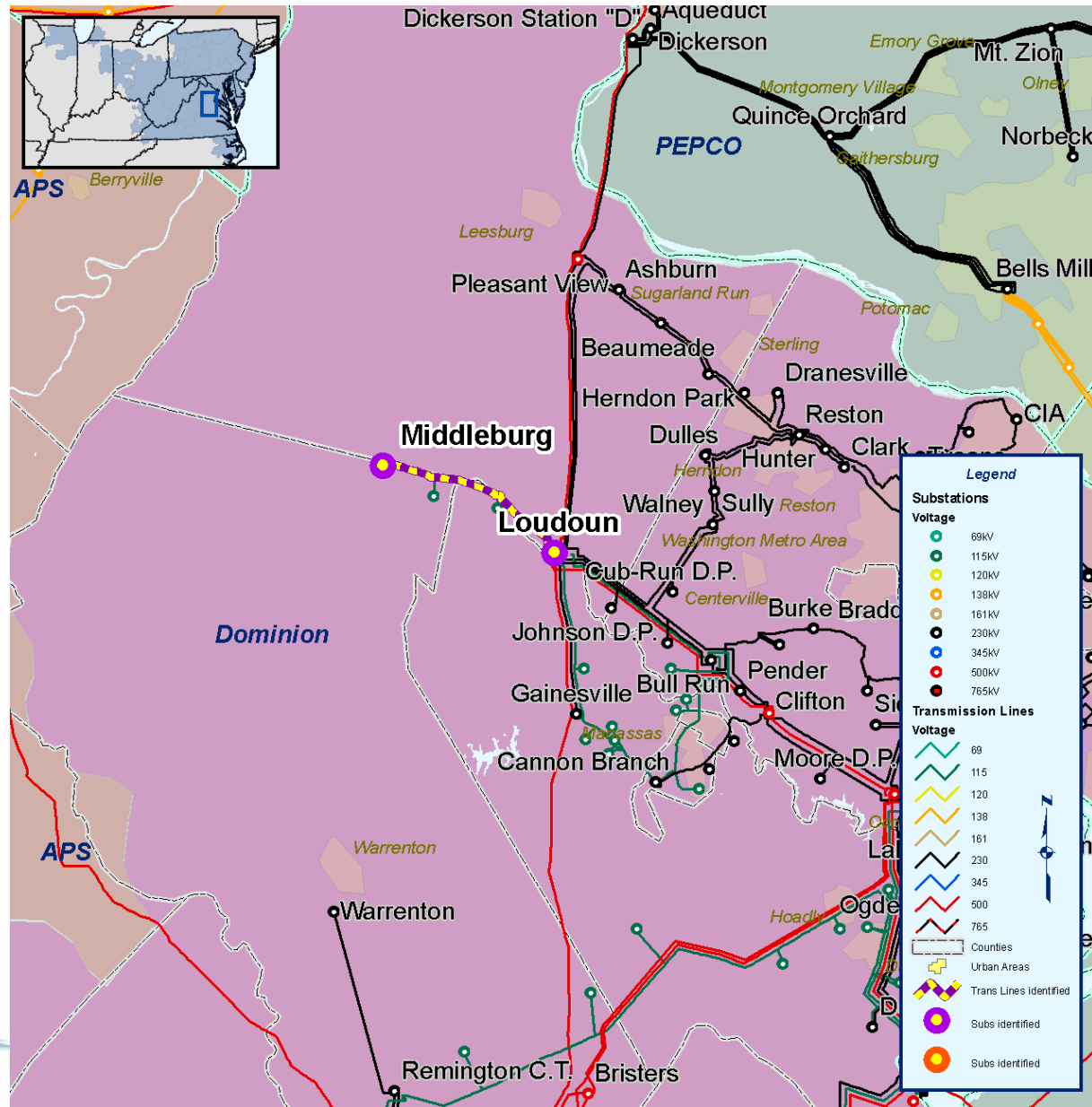
Subregional RTEP Committee PJM South

September 12, 2008

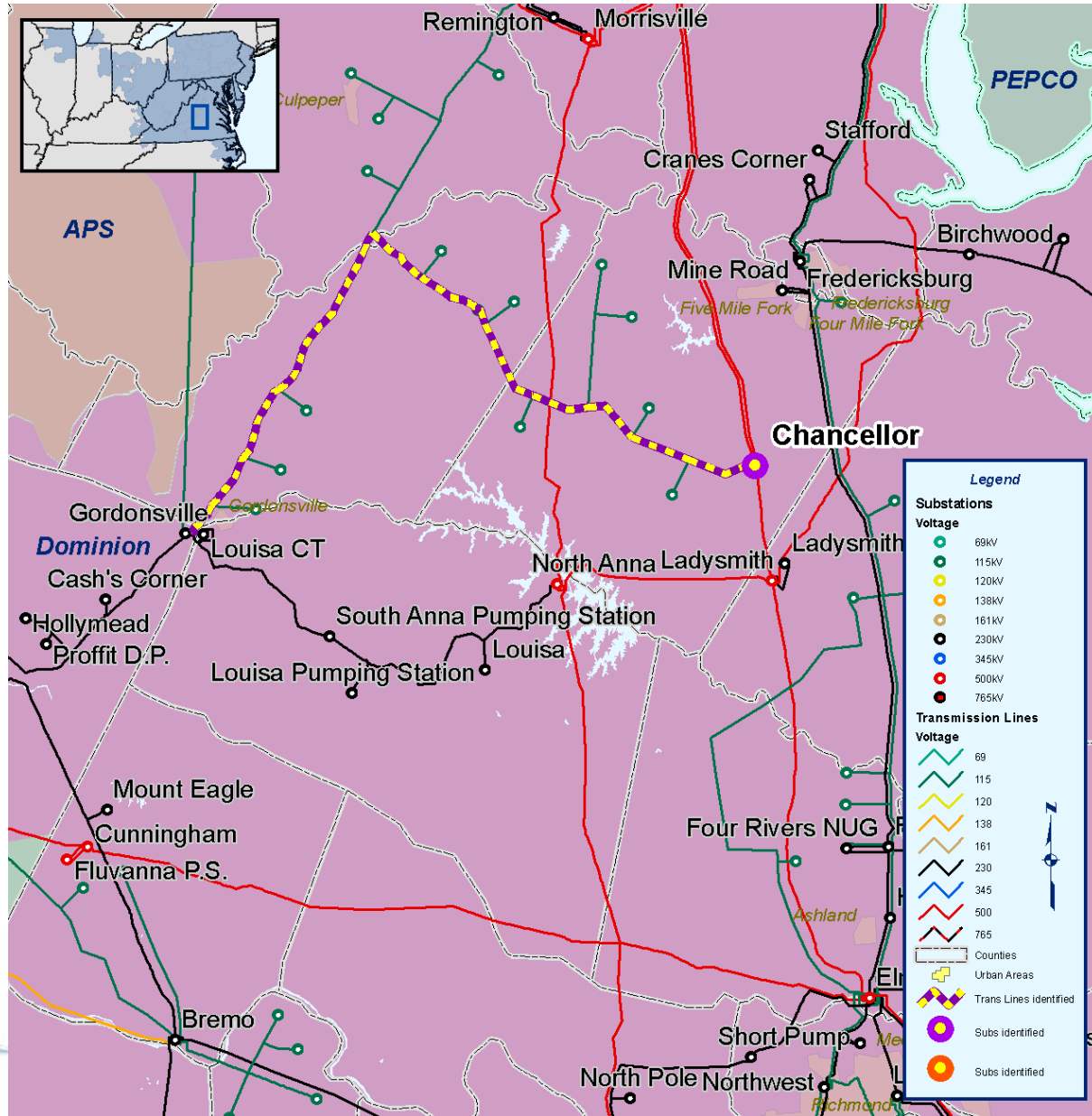
- Normal overload on line #49 Loudoun to Middleburg 115 kV
- Line #11 and #198 overloads for the loss of line #552 or the Chancellor 500-115 kV Tx.
- Possum Point 230-115 kV Tx #1 overloads for the outage of Tx #2 or vice-versa
- Line #145 and line #183 exceed 100 MVA
- Chesapeake to Reeves 115 kV for the loss of Chesapeake to Craddock 115 kV
- The outage of line #73 with Four Rivers 115 kV generation off causes low voltages at line #45 Fredricksburg to Four Rivers 115 kV.



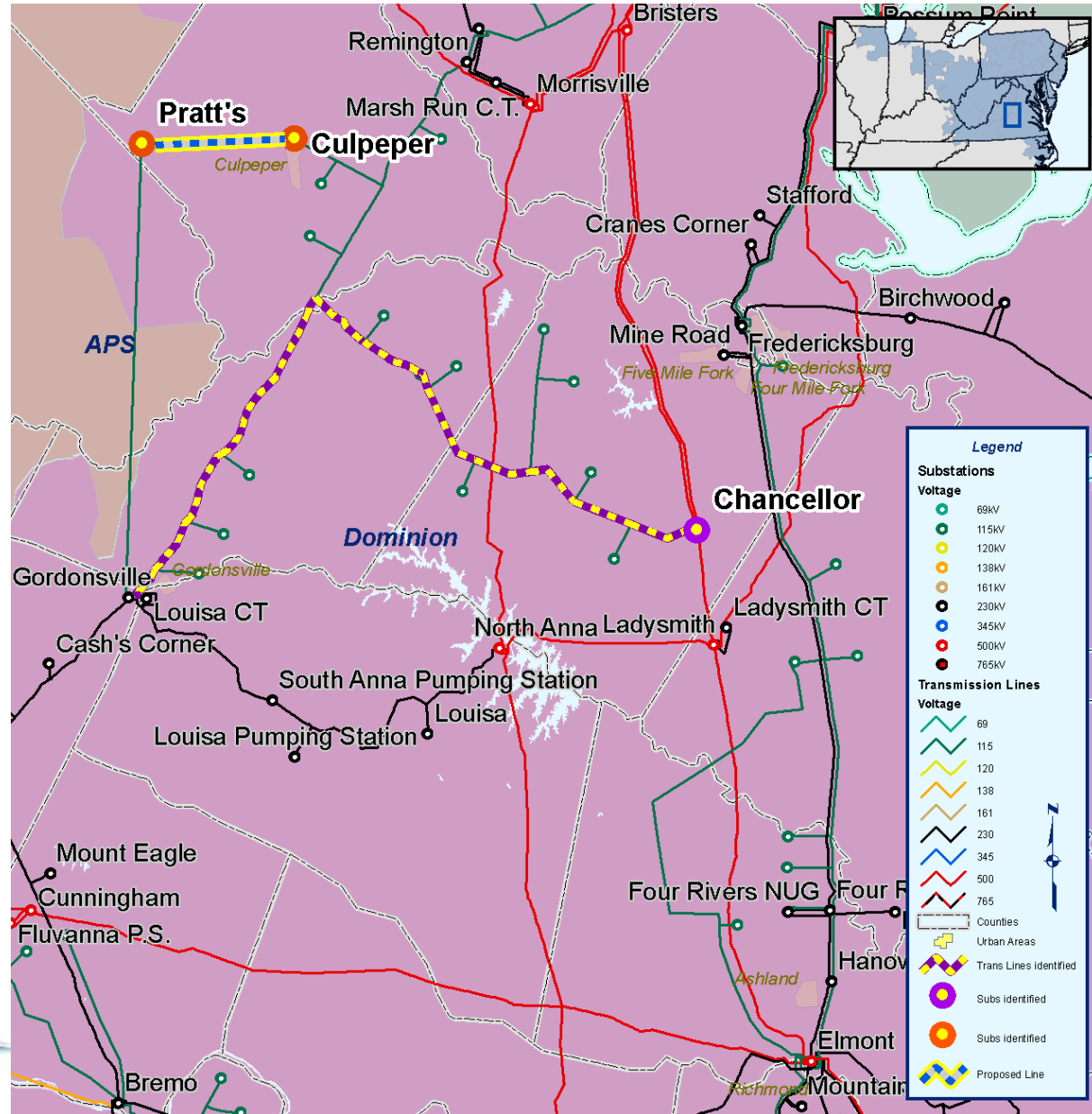
- Radial lines #49 Loudoun to Middleburg 115 kV and #2098 Pleasant View to Hamilton 230 kV line loading exceed Dominion Criteria Radial line load greater than 100 MVA.
- Solution: Build a 15-mile long 230 kV line from Hamilton to Middleburg and convert Line #49 to 230 kV (10 miles).
- Expected service date: May 2013
- Est. Cost: \$125M



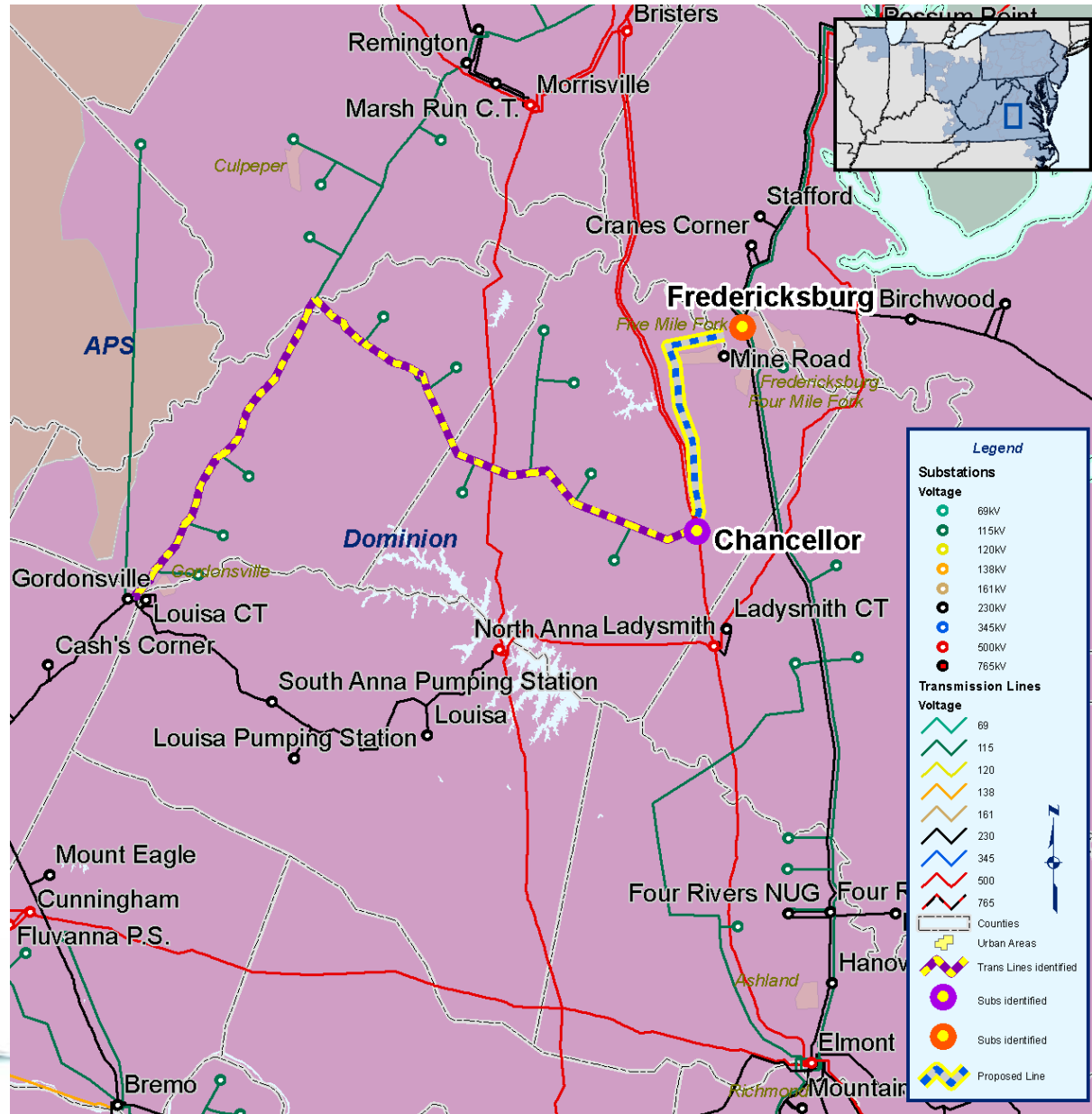
- Line #11 and #198 overloads for the loss of line #552 or the Chancellor 500-115 kV Tx.
- Several options considered
- Add a 115 kV line from Pratts to Culpeper (Option A)
- Add a 115 kV line from Chancellor to Fredericksburg (Option B)
- Add three 500 kV breakers to make a ring bus at Chancellor (Option C)
- Install a second 500-115 kV autotransformer and associated breakers at Chancellor (Option D)



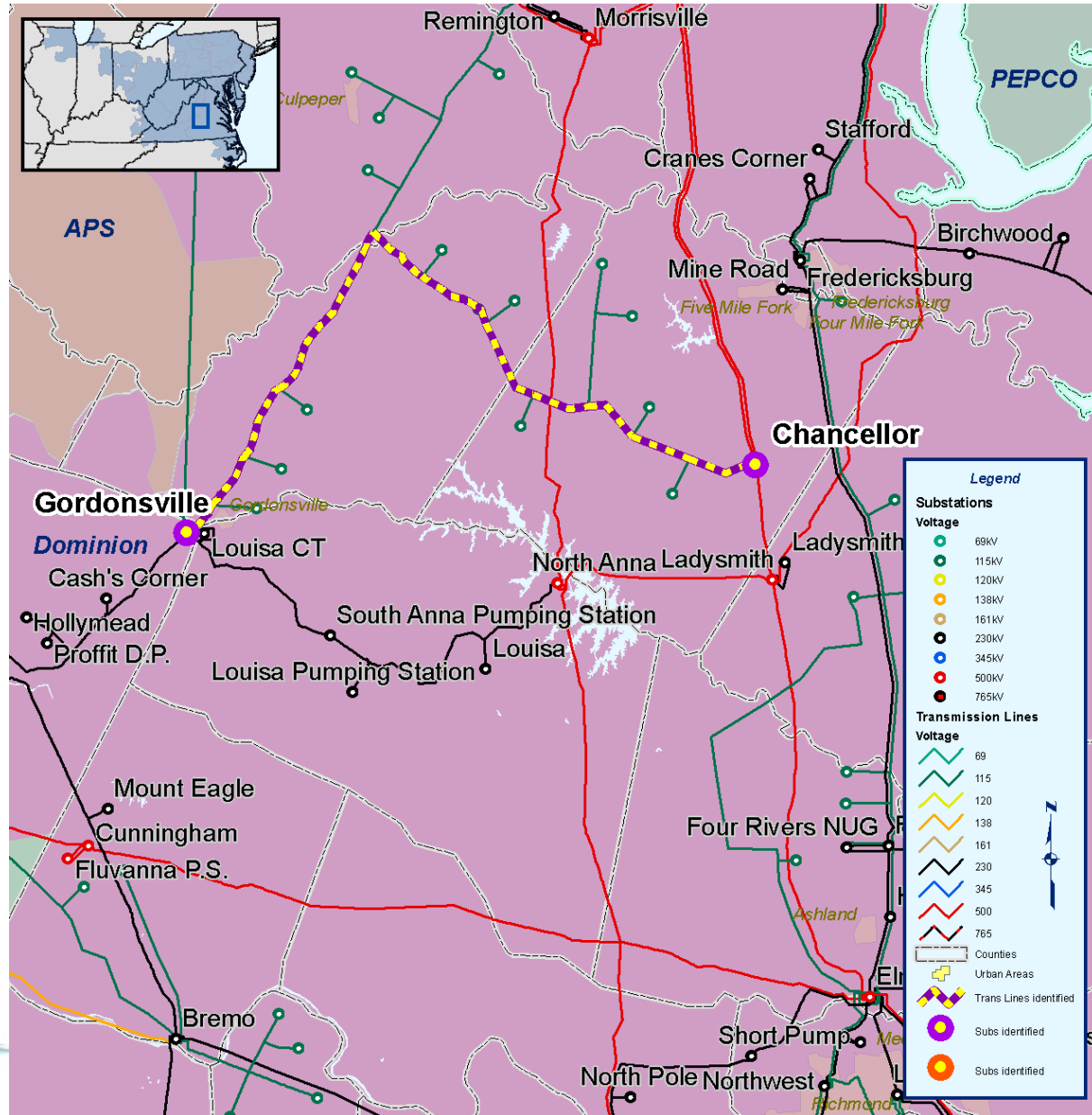
- Option A – Add a 115 kV line from Pratts to Culpeper
- Estimated cost of this solution \$30 - \$40 million for overhead construction
- Underground construction may be required in some areas
- Study results with this option modeled show:
 - The Gordonsville 230-115 kV overloads for the outage of the parallel Tx.
 - Oak Green to Chancellor 115 kV and Line # 11 overloads
 - Low voltages in the area for the outage of the Chancellor 500-115 kV Tx.



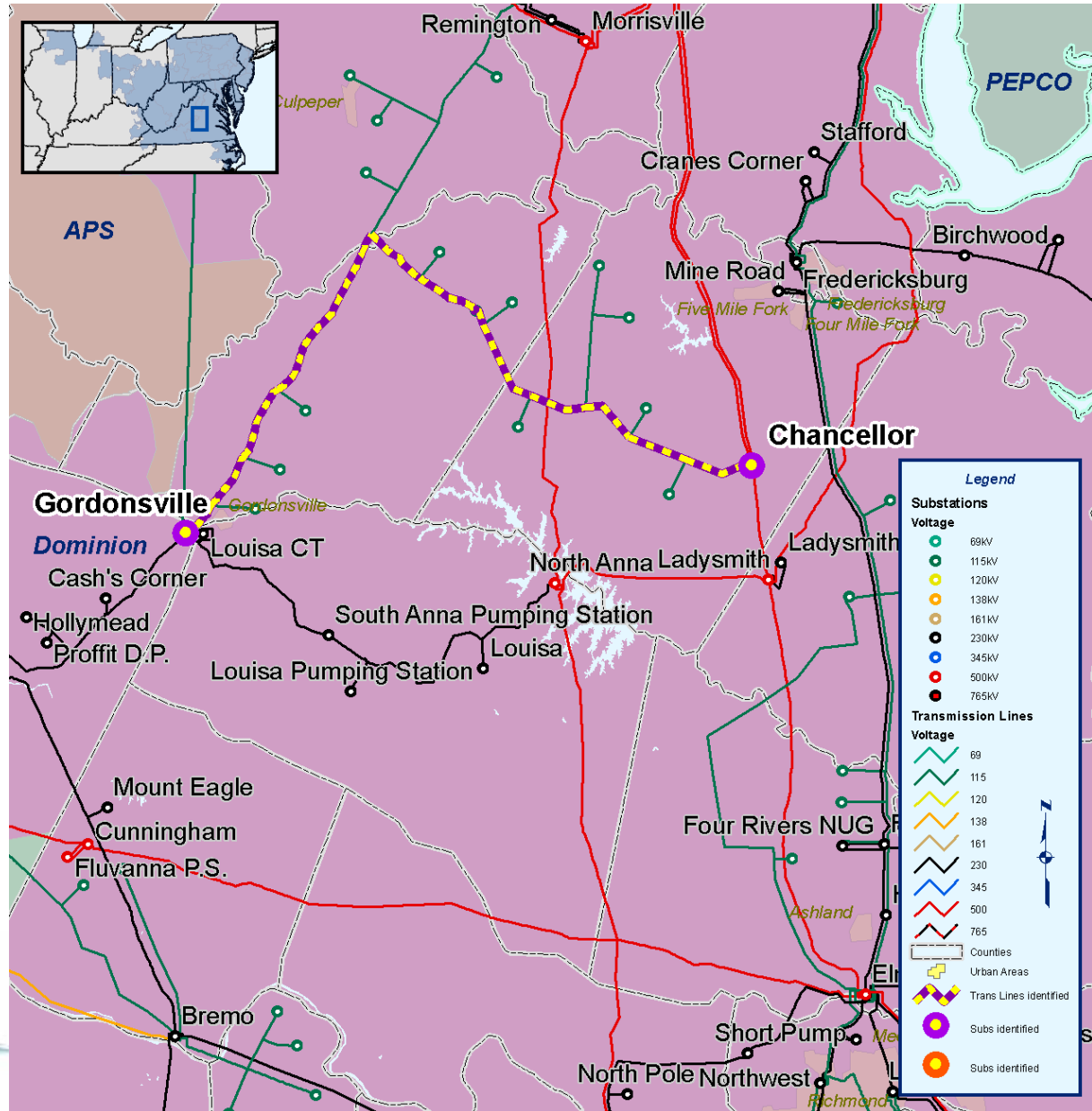
- Option B – Add a 115 kV line from Chancellor to Fredericksburg
- Estimated cost of the upgrade ~ \$40 million (this includes some underground construction)
- Study results with this option modeled show:
 - The Gordonsville 230-115 kV overloads for the outage of the parallel Tx.



- Option C – Add three 500 kV breakers to make a ring bus at Chancellor
- This option would not resolve all of the issues since an outage of the 500-115 kV transformer is not resolved.

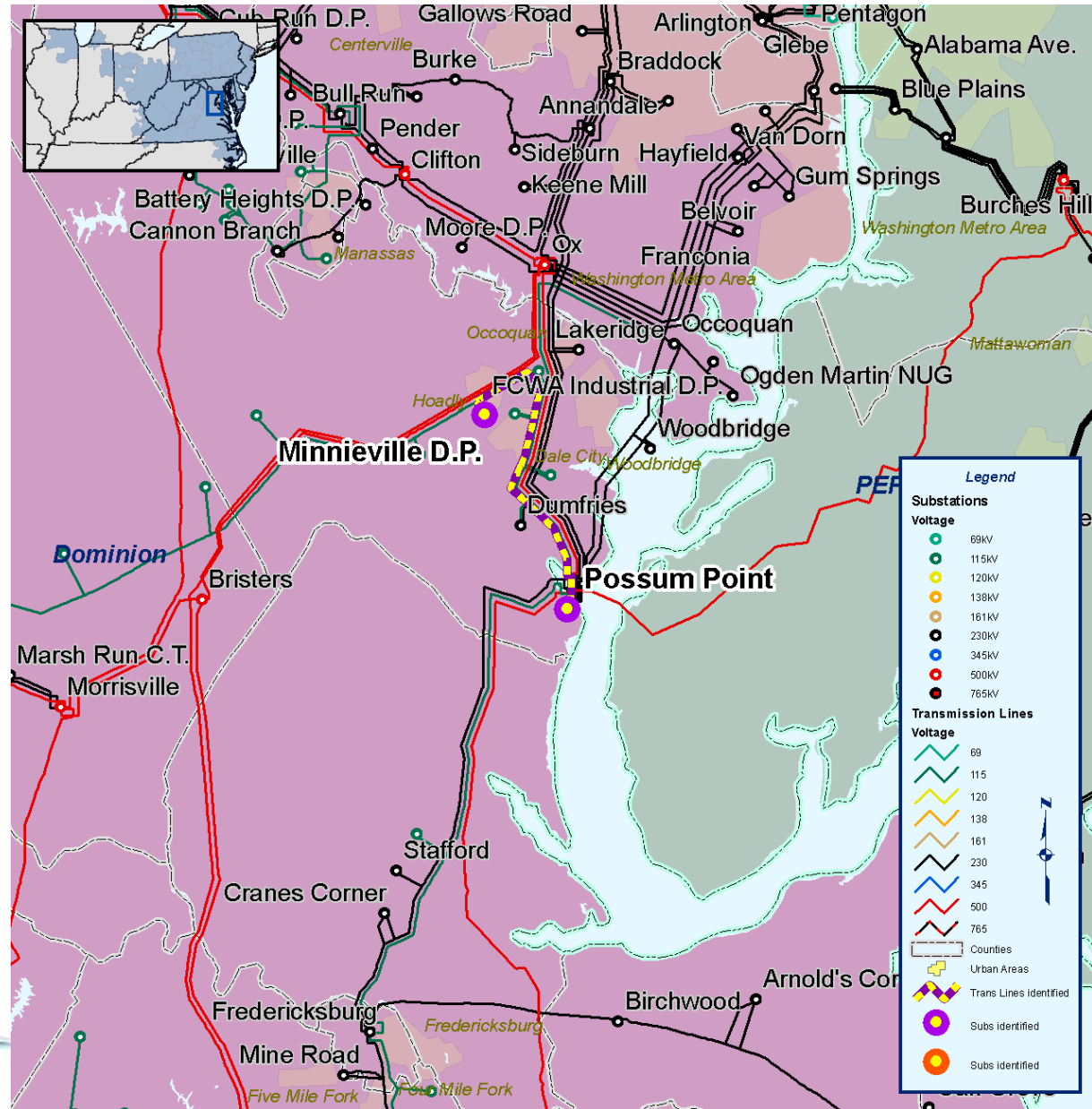


- Lines #11 Gordonsville to Oak Green and #198 Oak Green to Chancellor overloads for the loss of line #552 Ladysmith-Chancellor-Bristers 500 kV or the Chancellor 500-115 kV Tx.
- Recommended Solution: (Option D) Install two 500 kV breakers and a 2nd 500-115 kV AutoTx. at Chancellor Substation
- Expected service date: May 2013
- Est. Cost: \$16.0 M

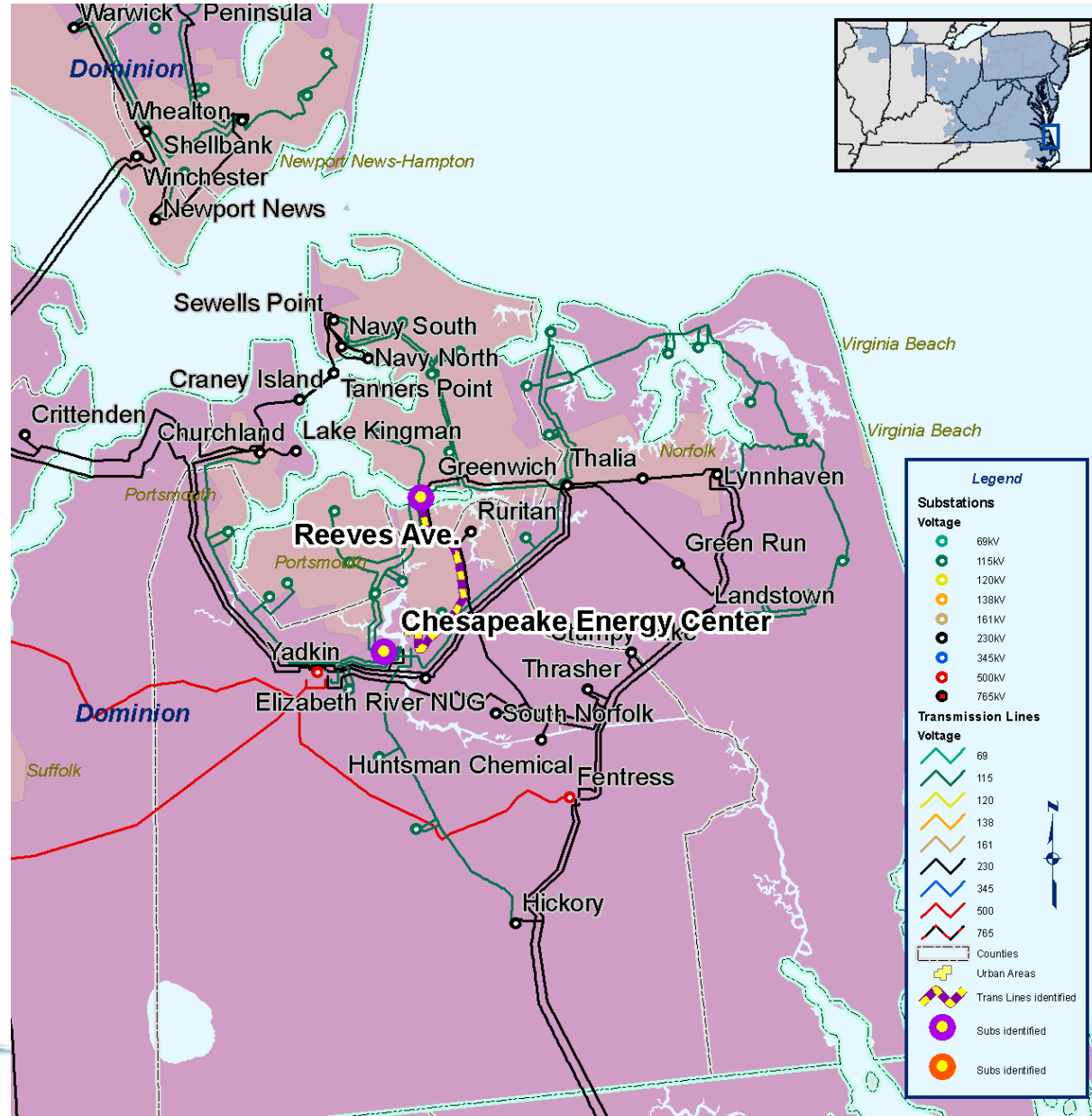


pjm Dominion Baseline Upgrade – Possum Pt to Minnieville 115 kV

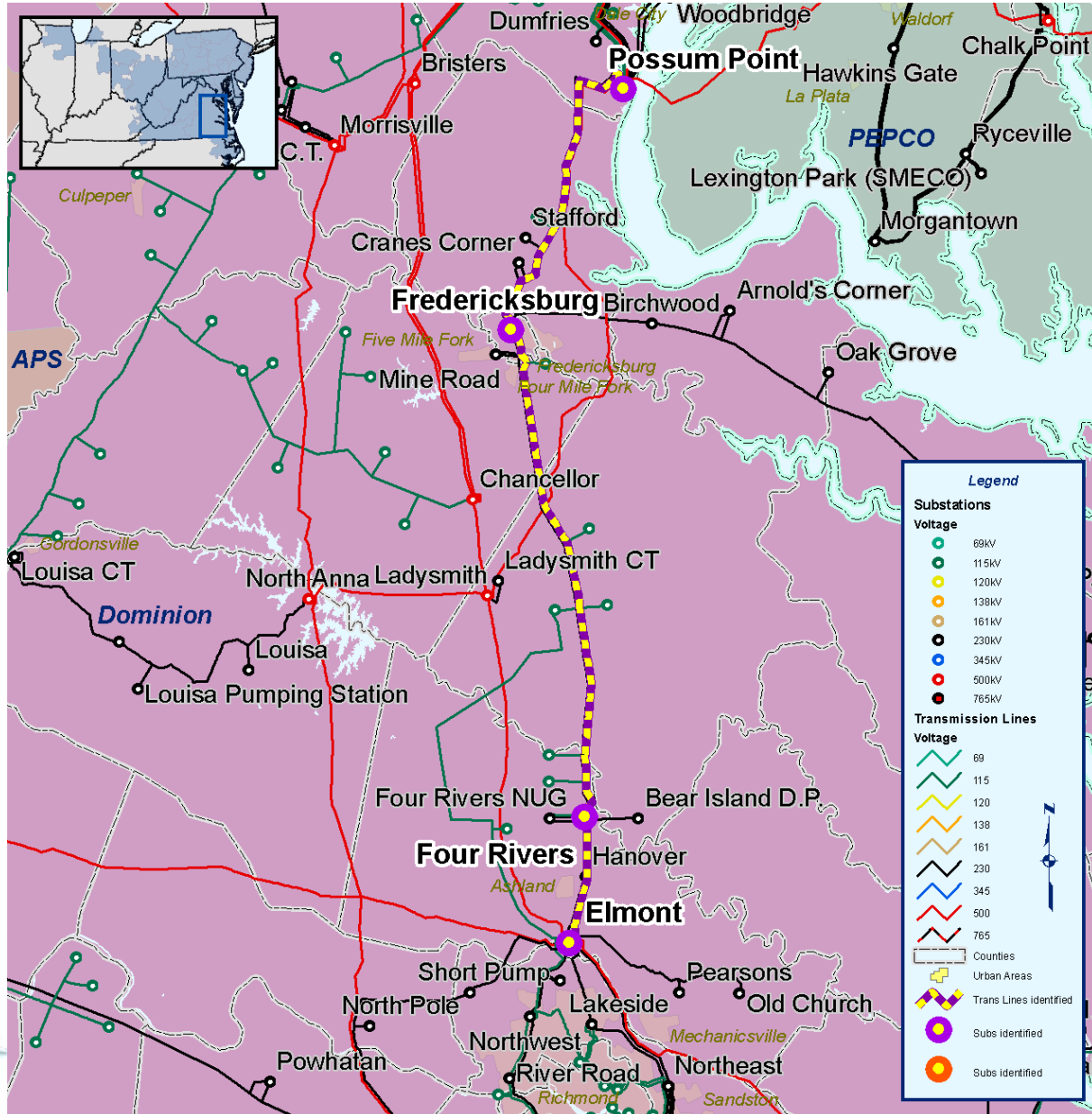
- With Possum Pt #3 off the outage of Possum Pt 230-115 Tx overloads for the outage of the parallel Tx.
- Loading on line#183 Bristers-Independent Hill 115 kV line and # 145 exceeds their 100 MVA line loading limits for Dominion Criteria for radial line loading.
- Recommended Solution: Close switch 145T183 to network the lines. Rebuild the section of Line #145 between Possum Point – Minnieville DP (15 miles),
- Expected service date: May 2013
- Est. Cost: \$9.0 M



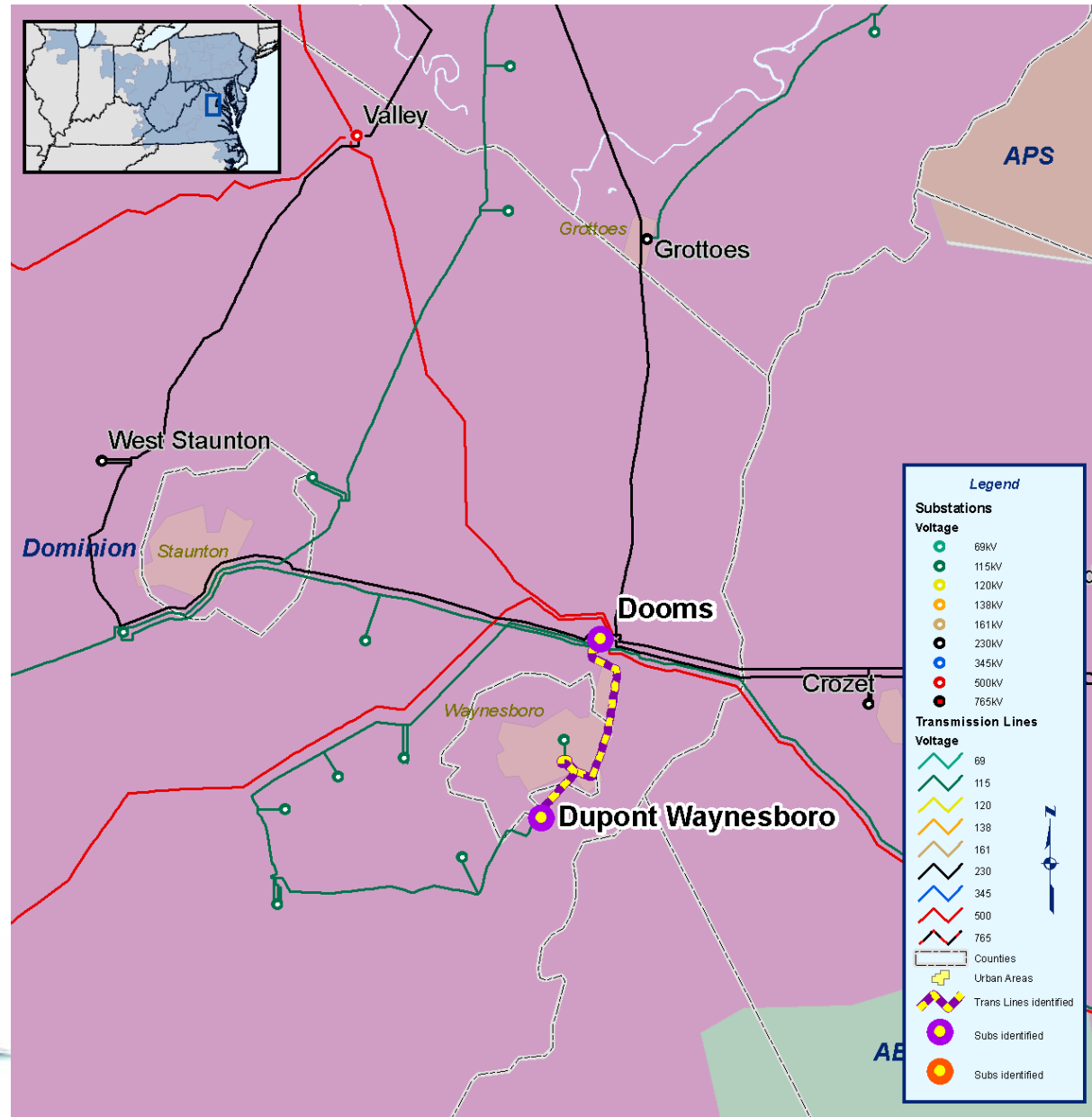
- Chesapeake to Reeves Avenue 115 kV is overloaded for the loss of Chesapeake to Craddock 115 kV
- Recommended Solution: Reconductor one mile of Chesapeake to Reeves Avenue 115 kV line
- Expected service date: May 2013
- Est. Cost: \$1.0 M



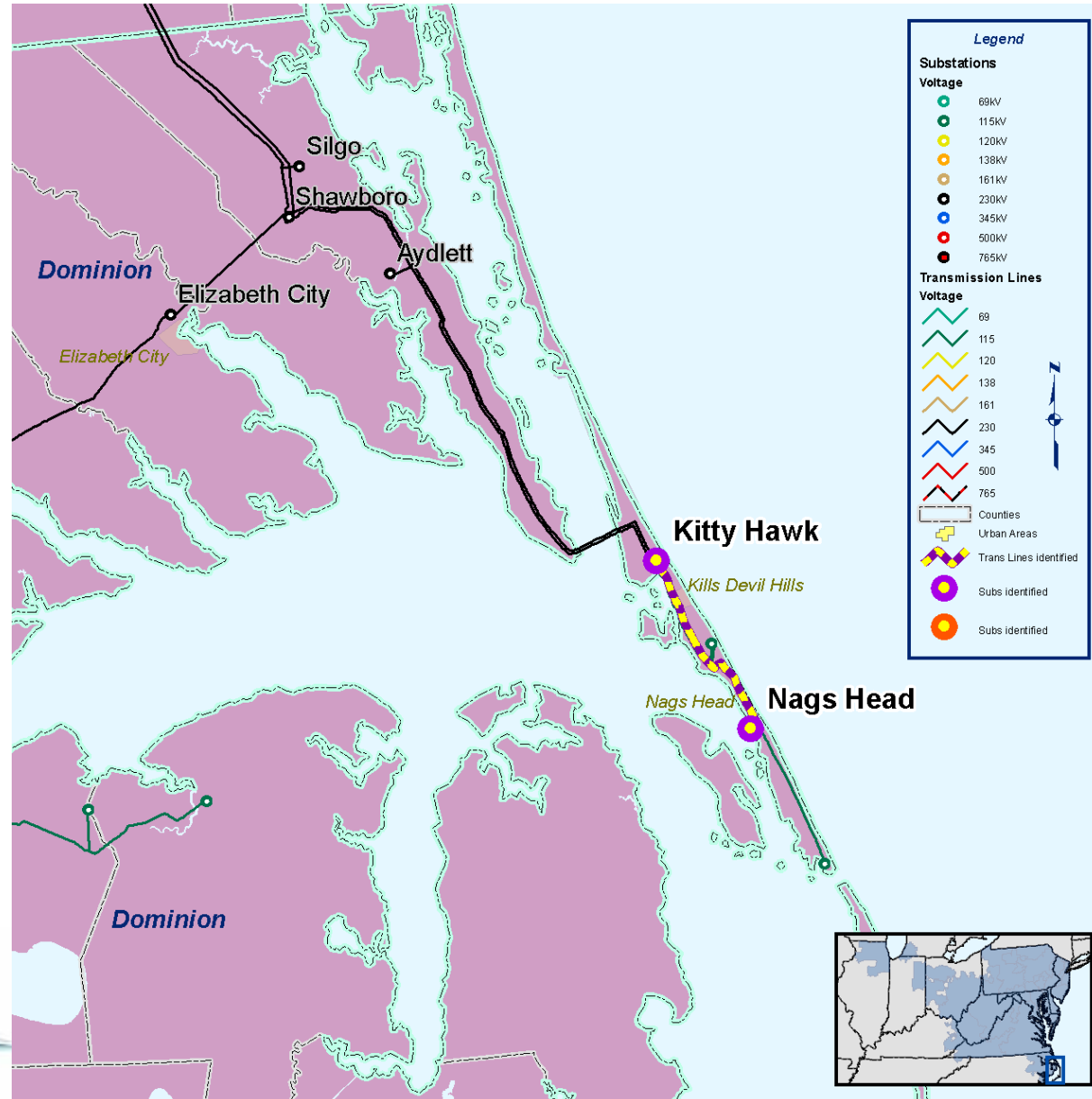
- The outage of line #73 Four Rivers to Elmont with Four Rivers 115 kV generation off causes low voltages at line #45 Four Rivers to Fredricksburg 115 kV.
- Also Line #47 Four Rivers to Fredricksburg overloads for the outage line #29 Fredricksburg to Possum Pt and Fredricksburg 230-115 kV
- Recommended Solution: Install 2nd Fredricksburg 230-115 kV AutoTx.
- Expected service date: May 2013
- Est. Cost: \$5.5 M



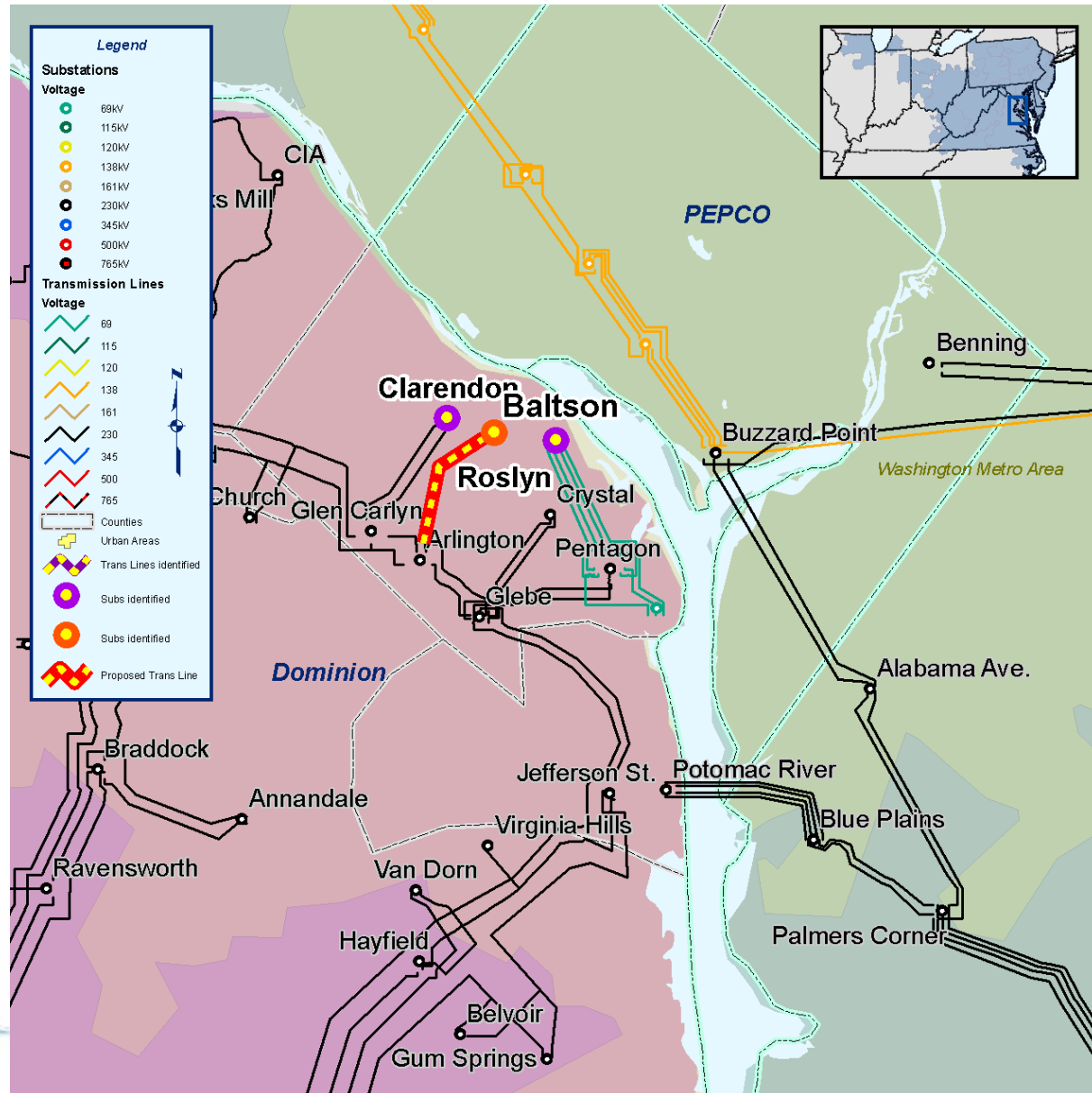
- An outage of Line #160 Doods-Dupont-Waynesboro 115 kV causes area voltage violations
- Solution: Build 2nd Doods-Dupont-Waynesboro 115 kV line
- Expected service date: May 2013
- Est. Cost: \$6.0 M



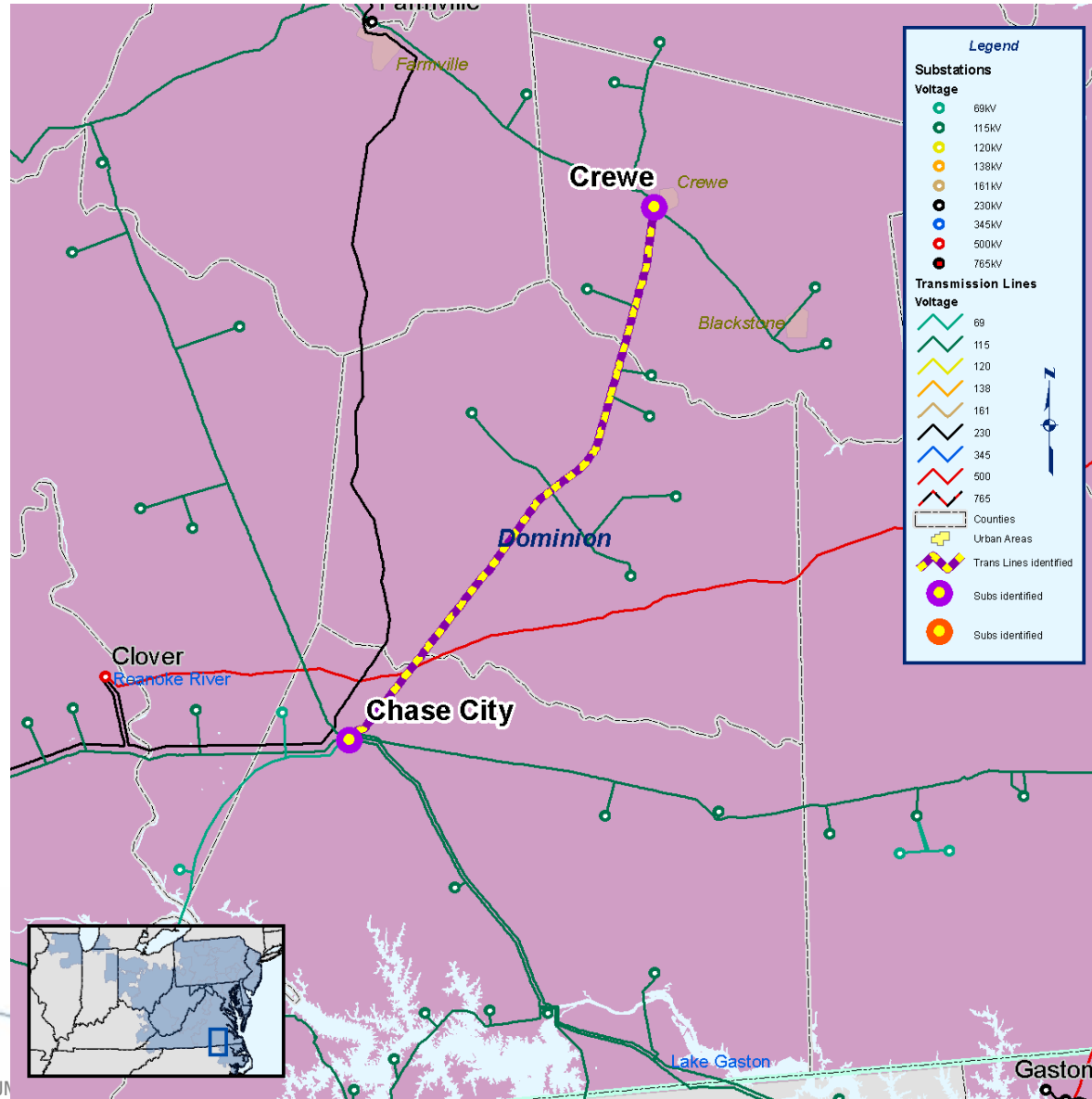
- The loading on Kitty Hawk to Nag's Head exceed 100 MW
- Solution: Build 115 kV line from Kitty Hawk to Colington 115 kV.
 - Colington on the existing line and Nag's Head and Light House DP on new line.
- Service Date: May 2009
- Est. Cost: \$9.0 M



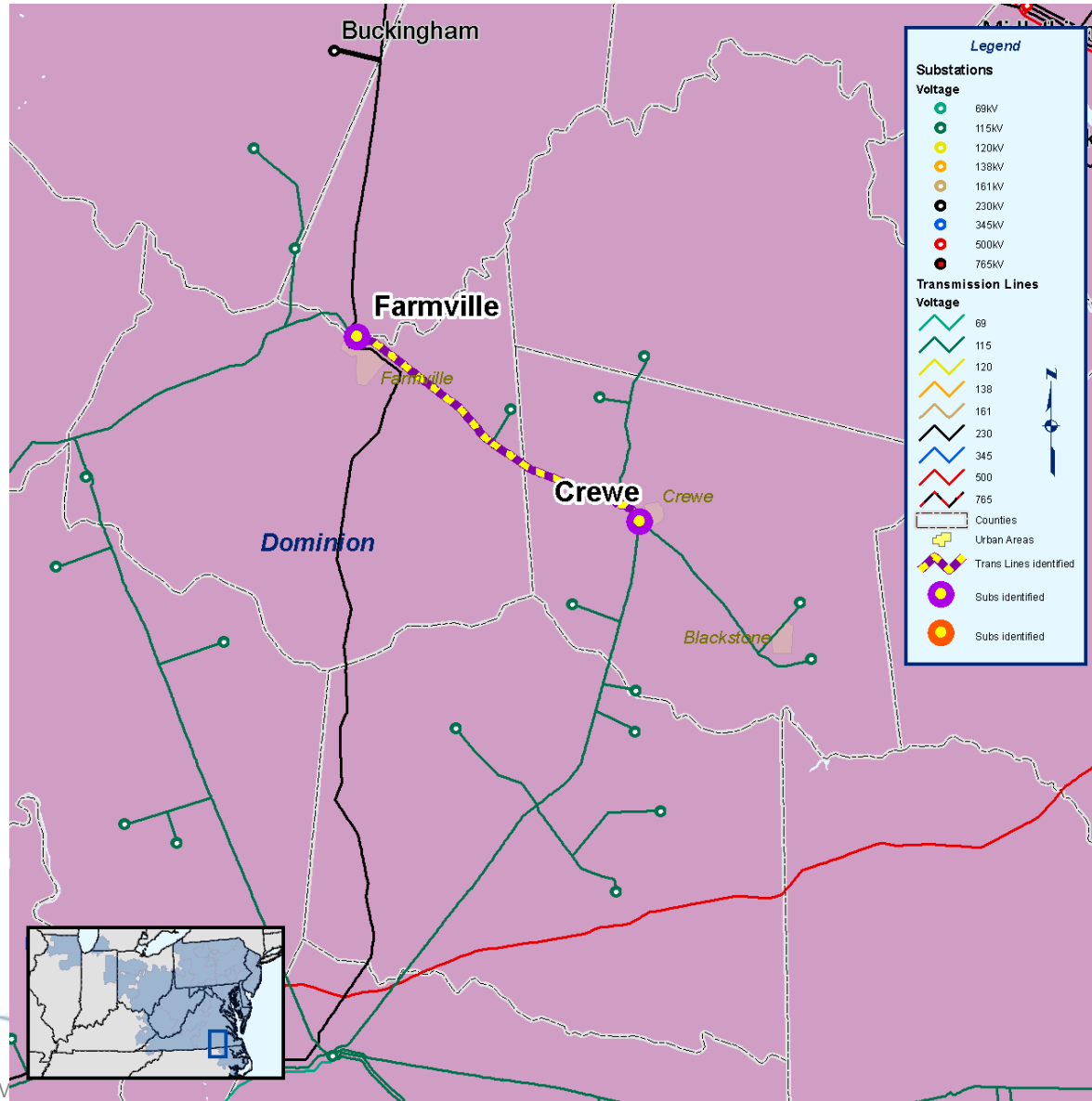
- High load area currently fed by two 230 kV underground lines originating from same substation
- N-2 contingency loss of both underground lines would leave high load area in a blackout
- Project is to establish a new transmission source into the area from a secondary substation
- Build new circuit from Arlington to Baltson
- Expected in-service date: June 2013
- Estimated cost: \$80 M



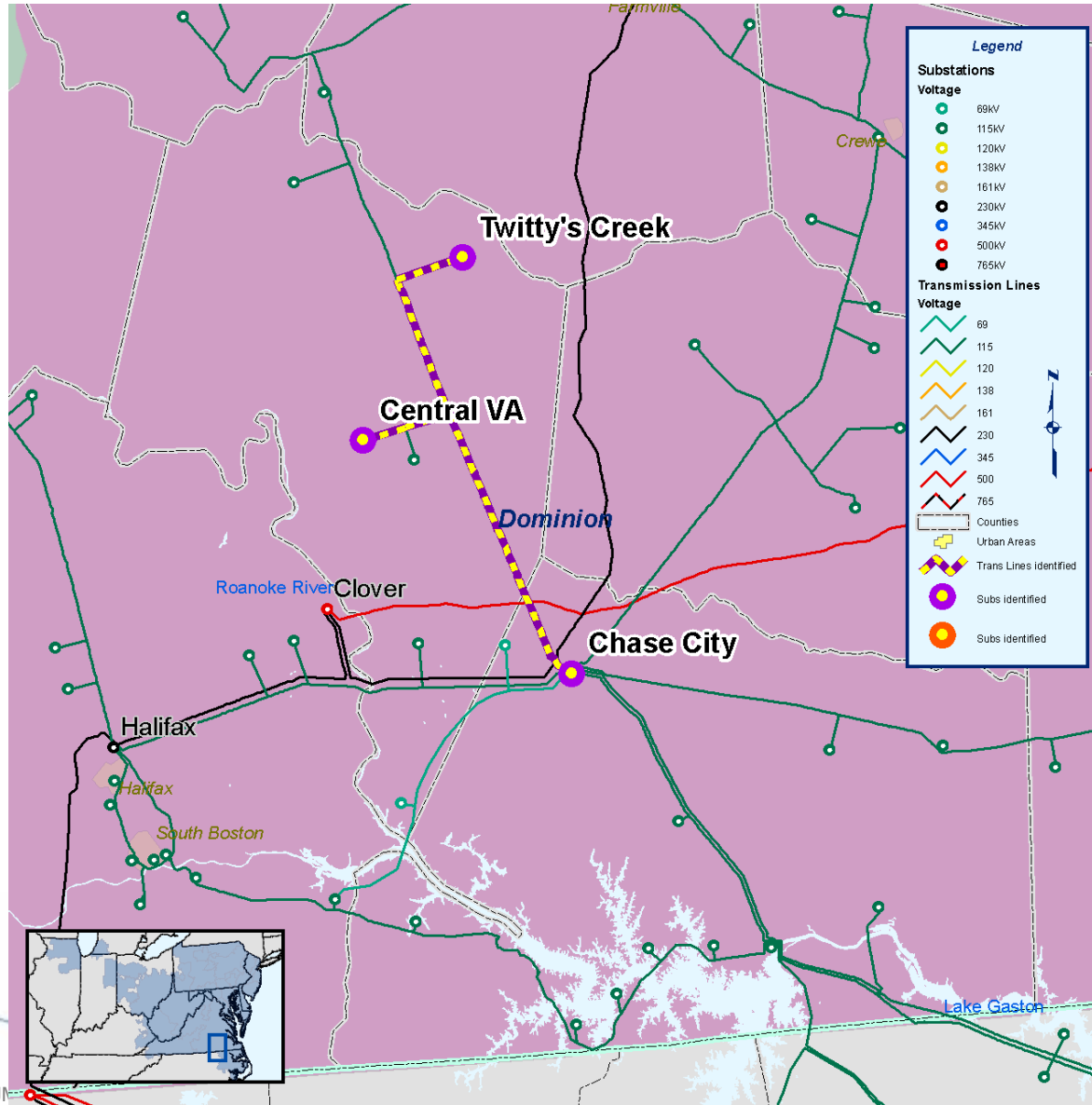
- The Chase City to Crewe line overloads when the Crewe to Farmville line is fed from Chase City
- Rebuild the Chase City to Crewe line
- In-service: Spring 2011
- Est. Cost: \$11.0 M



- The Farmville to Crewe line is overloaded for various line segment conditions
- Reconductor the Moran DP and Crewe segment.
- In-service: June 2011
- Est. Cost: \$5.0 M



- The Chase City to Pamplin line is overloaded when the Pamplin to Farmville line is fed from Pamplin
- Upgrade the Chase City to Twitty's Creek segment
- In-service: June 2011
- Est. Cost: \$7.0 M



- The Chase City to Pamplin to Farmville line overloads when the entire line is fed from the Farmville end
- Reconductor the line from Farmville to Pamplin
- Expected service date: June 2011
- Est. Cost: \$9.0 M

