

Front Royal - Racefield, Warrenton - Rixlew, Warrenton - Hourglass, Mars - Ocean Court - Davis Drive

General Information

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| Proposing entity name | Proprietary business information |
| Does the entity who is submitting this proposal intend to be the Designated Entity for this proposed project? | Proprietary business information |
| Company proposal ID | Proprietary business information |
| PJM Proposal ID | 663 |
| Project title | Front Royal - Racefield, Warrenton - Rixlew, Warrenton - Hourglass, Mars - Ocean Court - Davis Drive |
| Project description | New Racefield 500kV switchyard, New Racefield - Front Royal 500 kV line, New Warrenton - Rixlew 230 kV line, New Warrenton-Hourglass 230 kV line, New Mars - Ocean Court-Davis Drive 230 kV line, plus various modifications to existing lines and substations Proposal permitting and overhead costs are captured on component 1B. See attachment 1 for flowgate information. |
| Email | Proprietary business information |
| Project in-service date | 06/2027 |
| Tie-line impact | No |
| Interregional project | No |
| Is the proposer offering a binding cap on capital costs? | Yes |
| Additional benefits | Proprietary business information |

Project Components

1. 1B - New 500kV Transmission Line from Allegheny Substation Front Royal to new Racefield switchyard
2. 01A - New 500kV line termination at Front Royal substation

3. 1F - New Racefield GIS Substation - 5 terminal
4. 33E - Warrenton substation 230kV ring bus expansion
5. 40C - Mars substation 230kV ring bus expansion
6. 40a - New 230kV transmission line from existing Mars substation to existing Ocean Court substation
7. 40b - New 230 kV transmission line from existing Ocean Court substation to existing Davis Drive substation
8. 40f - New 230kV transmission line from existing Warrenton substation to existing Hourglass substation
9. 40g - New 230kV transmission line from existing Warrenton substation to future Rixlew substation
10. 40D - Ocean Court substation 230kV Ring Bus Expansion
11. 40E - Davis Drive 230kV line termination
12. 40h - Hourglass substation 230kV single breaker expansion
13. 40i - Rixlew substation 230kV single breaker expansion
14. 50C - Mosby to Wishing Star 500kV Upgrade

Greenfield Transmission Line Component

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| Component title | 1B - New 500kV Transmission Line from Allegheny Substation Front Royal to new Racefield switchyard | |
| Project description | Proprietary business information | |
| Point A | Front Royal | |
| Point B | Racefield | |
| Point C | N/A | |
| | Normal ratings | Emergency ratings |
| Summer (MVA) | 3300.000000 | 3957.000000 |
| Winter (MVA) | 3984.000000 | 4018.000000 |
| Conductor size and type | 3x 1780 kcmil Chukar ACSR | |
| Nominal voltage | AC | |
| Nominal voltage | 500 | |

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| Line construction type | Overhead |
| General route description | <p>The route is approximately 48 miles long. Started at a new dead end structure in the existing Allegheny Power ROW at the north west corner of the Front Royal substation, the route goes north about 0.5 miles and then turns east at Rockland Rd to route around the Warren County Power Station. The route creates a new ROW until crossing the Shenandoah River at the Columbia Pipeline river crossing. The route follows the pipeline for about 5 miles and the pipeline ROW is expanded to the south to co-locate the new transmission line in the same corridor in order to reduce tree clearing impacts. The route then co-locates with Highway 50 for about 9 miles to reduce viewshed impact, with some minor route adjustments to reduce private building and residence impacts. The route deviates to the south from Highway 50 to the west of Middleburg to avoid significant residential and building impacts, for total of about 10 miles, before co-locating with Highway 50 again for about 3 miles on the eastern most portion and then terminating at the new Racefield switchyard.</p> |
| Terrain description | <p>Much of the project is located in the rolling hills and pastures of the Piedmont, where the bedrock consists mostly of gneiss, schist, and granite rocks at a typical depth of between 2 and 10 feet. Soils developed from these rocks and minerals form acid, infertile soils, with sandy loam surfaces. The rolling terrain is interrupted by steep ridges associated with the boundary of the Blue Ridge. Historically, much of the Piedmont region was cleared and farmed intensively, causing extreme erosion over much of the region. Much of the agricultural areas have since reverted to forests.</p> |
| Right-of-way width by segment | <p>The new right of way will have its own corridor and for the majority of the route, approximately 70%. Approximately 25% of the route will have a right of way adjacent to road ROW. The right of way for approximately 5% of the route will be an expansion of an existing transmission right of way. Where the transmission line is sited adjacent to existing roads, it may require partial use of road ROW and private parcels abutting the road ROW in select locations. Further refinement will be required once road right of way and property parcel boundary surveys are gathered. Approximately 85% of the route will have a 165 ft right of way, and approximately 15% of the route will have a right of way of 75 ft in congested areas.</p> |
| Electrical transmission infrastructure crossings | See Attachment 4 (Google Earth .kmz) with identified major crossings. |
| Civil infrastructure/major waterway facility crossing plan | See Attachment 4 (Google Earth .kmz) with identified major crossings and Attachment 5 - Crossing Plan for more detail. |

Environmental impacts

Environmental constraints identified are manageable through implementation of an environmental avoidance, minimization, and mitigation strategy incorporated at the beginning of the routing/siting process. Co-location with existing utilities and other infrastructure was prioritized to the greatest extent practicable to minimize the environmental impact on the landscape. The proposed route crosses 17 national wetland inventory (NWI) wetlands and 58 waterbodies, but it appears that most features are small and could be avoided without permitting. The crossing of the Shenandoah River will require additional agency consultations. The crossing of the Appalachian Trail will also require additional agency coordination and permitting with the National Parks Service. Consultation with the Army Corps of Engineers, Fish and Wildlife Service, and numerous state agencies is expected. Fatal flaws have not been identified for proposed route. A cultural resource professional assisted with the routing process to identify and minimize impacts to known areas with historic sensitivities. This proposed route will require additional consultations with historic districts and is co-located through the Unison Battlefield area. An investigation to further identify and evaluate historic properties will be conducted to determine the presence of archaeologically or historically significant resources. Federally listed species have been identified including listed bats, the rusty patched bumble bee, and clam species, but no critical habitat was identified along the proposed route. If suitable habitat is identified or regulations change, agency coordination and species-specific surveys will occur. The project intends to adhere to tree removal seasonal restriction windows to avoid and minimize impacts to protected birds and bats, such as the Tri-colored Bat, Northern Long-eared Bat, Bald Eagle, and other common raptors. Erosion control best management practices and setbacks will be engineered and utilized to prevent sedimentation from leaving the site for the protection of aquatic species and to avoid water quality impacts. Routing through the Appalachian Mountains will require additional control measures and monitoring. There are no unique or sensitive environmental concerns or impacts with the proposed transmission line that cannot be addressed.

Tower characteristics

The majority, approximately 65%, of the proposed structures will be single circuit 500kV lattice towers (TTVS-500) in a horizontal conductor configuration. Approximately 35% of the structures will be single circuit 500kV steel monopoles (TVS-500) in a delta conductor configuration. Any proposed deadend structure will either be a steel lattice tower or a 3-pole, one phase per pole configuration. See proposed structure drawing set included in attachment 10.

Construction responsibility

Proprietary business information

Benefits/Comments

Proprietary business information

Component Cost Details - In Current Year \$

Engineering & design

Proprietary business information

Permitting / routing / siting

Proprietary business information

ROW / land acquisition

Proprietary business information

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|----------------------------------|----------------------------------|
| Materials & equipment | Proprietary business information |
| Construction & commissioning | Proprietary business information |
| Construction management | Proprietary business information |
| Overheads & miscellaneous costs | Proprietary business information |
| Contingency | Proprietary business information |
| Total component cost | \$143,020,710.00 |
| Component cost (in-service year) | \$143,334,199.00 |

Substation Upgrade Component

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| Component title | 01A - New 500kV line termination at Front Royal substation |
| Project description | Proprietary business information |
| Substation name | Front Royal |
| Substation zone | Allegheny Power |
| Substation upgrade scope | Terminate new 500 kV line in the 500 kV ring bus. Add one new 500 kV circuit breaker and two new MODs. |

Transformer Information

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| None | |
| New equipment description | AC Substation: Add two (2) new 500 kV breakers to existing ring bus. |
| Substation assumptions | The use of a spare position appears to be available |
| Real-estate description | No expansion of substation fence anticipated |
| Construction responsibility | Proprietary business information |
| Benefits/Comments | Proprietary business information |

Component Cost Details - In Current Year \$

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|----------------------------------|----------------------------------|
| Engineering & design | Proprietary business information |
| Permitting / routing / siting | Proprietary business information |
| ROW / land acquisition | Proprietary business information |
| Materials & equipment | Proprietary business information |
| Construction & commissioning | Proprietary business information |
| Construction management | Proprietary business information |
| Overheads & miscellaneous costs | Proprietary business information |
| Contingency | Proprietary business information |
| Total component cost | \$2,800,000.00 |
| Component cost (in-service year) | \$3,090,676.00 |

Greenfield Substation Component

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|------------------------|---|
| Component title | 1F - New Racefield GIS Substation - 5 terminal |
| Project description | Proprietary business information |
| Substation name | Racefield |
| Substation description | New Gas Insulated Switchgear, 5-terminal, 500 kV breaker and a half configuration on ~7 acre property near the existing Buttermilk and planned Wishing Star substations in Virginia. Terminate new Front Royal - Racefield 500kV transmission line and loop in two existing Brambleton - Arcola 500kV transmission lines. |
| Nominal voltage | AC |
| Nominal voltage | 500 |

Transformer Information

None

Major equipment description

AC Gas Insulated Substation (GIS): New proposed 500 kV Substation. New Breaker and a Half (BAAH) switchyard, three (3) bay, five (5) line terminals, eight (8) 500 kV, 5000A, 63kAIC breakers

Normal ratings

Emergency ratings

Summer (MVA)

0.000000

0.000000

Winter (MVA)

0.000000

0.000000

Environmental assessment

Environmental constraints identified are manageable through implementation of an environmental avoidance, minimization, and mitigation strategy incorporated at the beginning of the siting process. Co-location with existing utilities and other infrastructure was prioritized to the greatest extent practicable to minimize the environmental impact on the landscape. The proposed site crosses no national wetland inventory (NWI) wetlands or waterbodies but is located adjacent to a small pond. Fatal flaws have not been identified. A cultural resource professional assisted with the siting process to identify and minimize impacts to known areas with historic sensitivities. An investigation to further identify and evaluate historic properties will be conducted to determine the presence of archaeologically or historically significant resources. Federally listed species have been identified in the general area, including listed bats. If suitable habitat for bats or any other protected species is identified or regulations change, agency consultation and species-specific surveys will occur. The project intends to adhere to tree removal seasonal restriction windows to avoid and minimize impacts to protected birds and bats, such as the Tri-colored Bat, Northern Long-eared Bat, Bald Eagle, and other common raptors. Erosion control best management practices and setbacks will be engineered and utilized to prevent sedimentation from leaving the site for the protection of aquatic species and to avoid water quality impacts. There are no unique or sensitive environmental concerns or impacts with the proposed substation site that cannot be addressed.

Outreach plan

The Company is committed to working with all interested stakeholders through a robust public outreach program to address/respond to community concerns and inform the public about the project to the greatest extent practicable. The Company believes a well-designed public outreach program can have numerous benefits, including fostering a cooperative relationship with landowners and other stakeholders, expediting the regulatory permitting process, and assisting with project development. In general, the purpose of the community outreach plan is to gain community support for the project. In the affected communities, the Company's public outreach plan will educate the public and relevant stakeholders on specific project details to enable timely regulatory approvals and construction activities. Elements of the public outreach plan will include the following: 1) Identify potential issues at an early stage by engagement with key community stakeholders at the outset; 2) Broaden the community engagement process to identify potential and relevant community benefits that can facilitate community support for the proposed project; 3) Develop a broad base of community support for the proposed project before the regulatory agencies; and 4) Develop a comprehensive administrative record documenting the community outreach process that can be presented to the regulatory agency or, in the event of a legal challenge, to the appropriate court. The outreach plan proposes to dedicate considerable time and resources in engaging the community, and specifically the affected community during the planning process to identify highly sensitive areas that have the least amount of cultural, environmental, and social impacts on the community. The plans will reflect avoidance of impacts rather than mitigation. However, in some cases, if avoidance is not possible, then the Company will involve the community in providing appropriate and practical mitigation measures. The Company will commence its public outreach activities following project award.

Land acquisition plan

See Attachment 9 for Land Acquisition Plan.

Construction responsibility

Proprietary business information

Benefits/Comments

Proprietary business information

Component Cost Details - In Current Year \$

Engineering & design

Proprietary business information

Permitting / routing / siting

Proprietary business information

ROW / land acquisition

Proprietary business information

Materials & equipment

Proprietary business information

Construction & commissioning

Proprietary business information

Construction management

Proprietary business information

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| Overheads & miscellaneous costs | Proprietary business information |
| Contingency | Proprietary business information |
| Total component cost | \$23,436,000.00 |
| Component cost (in-service year) | \$25,868,959.00 |

Substation Upgrade Component

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|--------------------------|---|
| Component title | 33E - Warrenton substation 230kV ring bus expansion |
| Project description | Proprietary business information |
| Substation name | Warrenton |
| Substation zone | Dominion |
| Substation upgrade scope | Add four 230kV circuit breakers and terminate two new 230kV transmission lines. |

Transformer Information

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| None | |
| New equipment description | AC substation: Add four (4) new 230kV breakers to existing ring bus. |
| Substation assumptions | Area west of the substation appears to be available. |
| Real-estate description | Expected expansion of fenceline is within utility owned property. |
| Construction responsibility | Proprietary business information |
| Benefits/Comments | Proprietary business information |

Component Cost Details - In Current Year \$

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| Engineering & design | Proprietary business information |
| Permitting / routing / siting | Proprietary business information |
| ROW / land acquisition | Proprietary business information |
| Materials & equipment | Proprietary business information |

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| Construction & commissioning | Proprietary business information |
| Construction management | Proprietary business information |
| Overheads & miscellaneous costs | Proprietary business information |
| Contingency | Proprietary business information |
| Total component cost | \$1,400,000.00 |
| Component cost (in-service year) | \$1,545,338.00 |

Substation Upgrade Component

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|--------------------------|---|
| Component title | 40C - Mars substation 230kV ring bus expansion |
| Project description | Proprietary business information |
| Substation name | Mars |
| Substation zone | Dominion (VEPC) |
| Substation upgrade scope | Add one 230kV breaker to the existing ring bus at Mars 230kV substation and terminate the new 230kV transmission line from Ocean Court. |

Transformer Information

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| None | |
| New equipment description | AC Substation: Add one (1) new 230 kV circuit breaker to existing ring. |
| Substation assumptions | The use of one (1) spare position within the existing ring appears to be available. |
| Real-estate description | No expansion of substation fence anticipated. |
| Construction responsibility | Proprietary business information |
| Benefits/Comments | Proprietary business information |

Component Cost Details - In Current Year \$

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| Engineering & design | Proprietary business information |
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| Permitting / routing / siting | Proprietary business information |
| ROW / land acquisition | Proprietary business information |
| Materials & equipment | Proprietary business information |
| Construction & commissioning | Proprietary business information |
| Construction management | Proprietary business information |
| Overheads & miscellaneous costs | Proprietary business information |
| Contingency | Proprietary business information |
| Total component cost | \$1,400,000.00 |
| Component cost (in-service year) | \$1,545,338.00 |

Greenfield Transmission Line Component

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| Component title | 40a - New 230kV transmission line from existing Mars substation to existing Ocean Court substation | |
| Project description | Proprietary business information | |
| Point A | Mars | |
| Point B | Ocean Court | |
| Point C | N/A | |

| | Normal ratings | Emergency ratings |
|-------------------------|---------------------------|--------------------------|
| Summer (MVA) | 1600.000000 | 2610.000000 |
| Winter (MVA) | 1600.000000 | 2610.000000 |
| Conductor size and type | 3x 1780 kcmil Chukar ACSR | |
| Nominal voltage | AC | |
| Nominal voltage | 230 | |

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| Line construction type | Overhead |
| General route description | <p>From a dead-end structure outside of the Mars substation, the route runs along Carters School Rd. for approximately 0.5 miles then proceeds east/northeast along Old Ox Rd. for approximately 1.1 miles. The route then enters an existing utility ROW for approximately 2.5 miles before intersecting the Dulles Greenway. A new ROW through undeveloped land from the north side of the Dulles Greenway going east for approximately 0.75 miles until Lockridge Rd. The route continues east from the intersection of Lockridge Rd. and Moran Rd. for approximately 0.25 miles. After exiting Moran Rd. on the south side, the route requires approximately 0.75 miles of new ROW until reaching a dead-end structure outside the Ocean Ct. substation.</p> |
| Terrain description | <p>The project is located in the valley south of the Potomac River in Loudon County. A former agricultural region, the area is now densely developed with commercial buildings and planned residential communities within commuting distance to Washington, D.C. The project area is located near the Dulles International Airport. Slopes are gentle, approximately 2%.</p> |
| Right-of-way width by segment | <p>The new right of way will have its own corridor for approximately 60% of the route length. The right of way will be an expansion of an existing transmission line corridor for approximately 40% of the route length. The right of way width will be 40 ft.</p> |
| Electrical transmission infrastructure crossings | <p>See Attachment 4 (Google Earth .kmz) with identified major crossings.</p> |
| Civil infrastructure/major waterway facility crossing plan | <p>See Attachment 4 (Google Earth .kmz) with identified major crossings and Attachment 5 - Crossing Plan for more detail.</p> |
| Environmental impacts | <p>Environmental constraints identified are manageable through implementation of an environmental avoidance, minimization, and mitigation strategy incorporated at the beginning of the routing/siting process. Co-location with existing utilities and other infrastructure was prioritized to the greatest extent practicable to minimize the environmental impact on the landscape. The proposed site crosses 3 national wetland inventory (NWI) wetlands and 6 waterbodies. Fatal flaws have not been identified for proposed site. A cultural resource professional assisted with the siting process to identify and minimize impacts to known areas with historic sensitivities. An investigation to further identify and evaluate historic properties will be conducted to determine the presence of archaeologically or historically significant resources. Federally listed species have been identified with potential to occur in the area including listed bats, but no critical habitat was identified in the area. If such habitat is identified or regulations change, agency coordination and species-specific surveys will occur. The project intends to adhere to tree removal seasonal restriction windows to avoid and minimize impacts to protected birds and bats, such as the northern long-eared bat, bald eagle, and other common raptors. Erosion control best management practices and setbacks will be engineered and utilized to prevent sedimentation from leaving the site for the protection of aquatic species and to avoid water quality impacts. There are no unique or sensitive environmental concerns or impacts with the proposed substation site that cannot be addressed.</p> |

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| Tower characteristics | The proposed structures will be single circuit 230kV steel monopoles (TVVS-230) in a vertical conductor configuration. Any proposed deadend structure will be a steel monopole. See proposed structure drawing set included in attachment 10. |
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| Construction responsibility | Proprietary business information |
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| Benefits/Comments | Proprietary business information |
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Component Cost Details - In Current Year \$

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| Engineering & design | Proprietary business information |
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| Permitting / routing / siting | Proprietary business information |
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| ROW / land acquisition | Proprietary business information |
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| Materials & equipment | Proprietary business information |
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| Construction & commissioning | Proprietary business information |
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| Construction management | Proprietary business information |
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| Overheads & miscellaneous costs | Proprietary business information |
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| Contingency | Proprietary business information |
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| Total component cost | \$11,509,050.00 |
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| Component cost (in-service year) | \$12,703,838.00 |
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Greenfield Transmission Line Component

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| Component title | 40b - New 230 kV transmission line from existing Ocean Court substation to existing Davis Drive substation |
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| Project description | Proprietary business information |
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|---------|-------------|
| Point A | Ocean Court |
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| Point B | Davis Drive |
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| Point C | N/A |
|---------|-----|

| | Normal ratings | Emergency ratings |
|--|--|--------------------------|
| Summer (MVA) | 1573.000000 | 1809.000000 |
| Winter (MVA) | 1648.000000 | 1896.000000 |
| Conductor size and type | 3x 1780 kcmil Chukar ACSR | |
| Nominal voltage | AC | |
| Nominal voltage | 230 | |
| Line construction type | Overhead | |
| General route description | <p>The route is approximately 2 miles long. Starting a new dead-end structure at Ocean Ct the line crosses Pacific Blvd and routes south before turning east to cross Darrell Green Blvd north of the Sterling Blvd interchange. The line then turns south on the east side of Shaw Rd, crosses over Sterling Blvd and turns east to cross over Glenn Drive and follow Carpenter Drive. The line turns east-southeast off Carpenter Drive to follow Davis Drive for less than a half mile before terminating at Davis Drive.</p> | |
| Terrain description | <p>The project is located in the valley south of the Potomac River in Loudon County. A former agricultural region, the area is now densely developed with commercial buildings and planned residential communities within commuting distance to Washington, D.C. Slopes are gentle, approximately 2%.</p> | |
| Right-of-way width by segment | <p>The new right of way will have its own corridor and will have a width of 40 ft. The transmission line is sited adjacent to existing roads with select locations that may require partial use of road ROW and private parcels abutting the road ROW. Further refinement will be required once road right of way and property parcel boundary surveys are gathered.</p> | |
| Electrical transmission infrastructure crossings | See Attachment 4 (Google Earth .kmz) with identified major crossings. | |
| Civil infrastructure/major waterway facility crossing plan | See Attachment 4 (Google Earth .kmz) with identified major crossings and Attachment 5 - Crossing Plan for more detail. | |

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| Environmental impacts | <p>Environmental constraints identified are manageable through implementation of an environmental avoidance, minimization, and mitigation strategy incorporated at the beginning of the routing/siting process. Co-location with existing utilities and other infrastructure was prioritized to the greatest extent practicable to minimize the environmental impact on the landscape. The proposed site crosses no national wetland inventory (NWI) mapped wetlands and 2 mapped waterbodies. Fatal flaws have not been identified for proposed site. A cultural resource professional assisted with the siting process to identify and minimize impacts to known areas with historic sensitivities. An investigation to further identify and evaluate historic properties will be conducted to determine the presence of archaeologically or historically significant resources. Federally listed species have been identified with potential to occur in the area including listed bats, but no critical habitat was identified in the area of the project. If suitable habitat is identified or regulations change, agency coordination and species-specific surveys will occur. The project intends to adhere to tree removal seasonal restriction windows to avoid and minimize impacts to protected birds and bats, such as the northern long-eared bat, bald eagle, and other common raptors. Erosion control best management practices and setbacks will be engineered and utilized to prevent sedimentation from leaving the site for the protection of aquatic species and to avoid water quality impacts. There are no unique or sensitive environmental concerns or impacts with the proposed substation site that cannot be addressed.</p> |
| Tower characteristics | <p>The proposed structures will be single circuit 230kV steel monopoles (TVVS-230) in a vertical conductor configuration. Any proposed deadend structure will be a steel monopole. See proposed structure drawing set included in attachment 10.</p> |
| Construction responsibility | Proprietary business information |
| Benefits/Comments | Proprietary business information |
| Component Cost Details - In Current Year \$ | |
| Engineering & design | Proprietary business information |
| Permitting / routing / siting | Proprietary business information |
| ROW / land acquisition | Proprietary business information |
| Materials & equipment | Proprietary business information |
| Construction & commissioning | Proprietary business information |
| Construction management | Proprietary business information |
| Overheads & miscellaneous costs | Proprietary business information |
| Contingency | Proprietary business information |

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| Total component cost | \$4,508,000.00 |
| Component cost (in-service year) | \$4,975,989.00 |

Greenfield Transmission Line Component

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|---------------------|---|
| Component title | 40f - New 230kV transmission line from existing Warrenton substation to existing Hourglass substation |
| Project description | Proprietary business information |
| Point A | Warrenton |
| Point B | Hourglass |
| Point C | N/A |

| | Normal ratings | Emergency ratings |
|-------------------------|---------------------------|-------------------|
| Summer (MVA) | 1573.000000 | 1809.000000 |
| Winter (MVA) | 1648.000000 | 1896.000000 |
| Conductor size and type | 3x 1780 kcmil Chukar ACSR | |
| Nominal voltage | AC | |
| Nominal voltage | 230 | |
| Line construction type | Overhead | |

General route description

The route is approximately 16 miles long. Starting at a new dead-end structure at the Warrenton substation, the line routes east-southeast along the Old Auburn Rd ROW for about 2 miles before turning northeast and creating a greenfield ROW for about 2 miles before reaching the intersection of Dumfire Rd and Rogues Rd. The line the follows Rogues Rd ROW for about 3.5 miles and then turns east and routes a new greenfield ROW for about 3.5 miles before reaching Vint Hill Rd. The line then routes adjacent to Vint Hill Rd ROW for about 2.5 miles and then turns north-northeast before reaching Nokesville Rd. The line continues northeast for about 1.25 miles, turns east for about a mile and then terminates into Hourglass substation.

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| Terrain description | The project is located in Prince William and Fauquier counties, in Virginia. In the east, flat coastal plains meet the Potomac River. To the west, the terrain gradually rises to the Piedmont Plateau in the center of the county and the rolling foothills of Bull Run Mountain further west. Bull Run sits on the boundary of Prince William and Fauquier counties and ranges to a height of 1,280 feet above sea level. |
| Right-of-way width by segment | The new right of way will have its own corridor for the majority of the route length. Approximately 70% of the route will have a right of way width of 45 ft. Approximately 30% of the route will have a right of way width of 60 ft and will accommodate 2-230kV lines (this component and component 40g) |
| Electrical transmission infrastructure crossings | See Attachment 4 (Google Earth .kmz) with identified major crossings. |
| Civil infrastructure/major waterway facility crossing plan | See Attachment 4 (Google Earth .kmz) with identified major crossings and Attachment 5 - Crossing Plan for more detail. |
| Environmental impacts | Environmental constraints identified are manageable through implementation of an environmental avoidance, minimization, and mitigation strategy incorporated at the beginning of the routing/siting process. Co-location with existing utilities and other infrastructure was prioritized to the greatest extent practicable to minimize the environmental impact on the landscape. The proposed site crosses 10 national wetland inventory (NWI) mapped wetlands and 23 mapped waterbodies. Fatal flaws have not been identified for proposed site. A cultural resource professional assisted with the siting process to identify and minimize impacts to known areas with historic sensitivities. An investigation to further identify and evaluate historic properties will be conducted to determine the presence of archaeologically or historically significant resources. Federally listed species have been identified with potential to occur in the area including listed bats, but no critical habitat was identified in the area. If such habitat is identified or regulations change, agency coordination and species-specific surveys will occur. The project intends to adhere to tree removal seasonal restriction windows to avoid and minimize impacts to protected birds and bats, such as the northern long-eared bat, bald eagle, and other common raptors. Erosion control best management practices and setbacks will be engineered and utilized to prevent sedimentation from leaving the site for the protection of aquatic species and to avoid water quality impacts. There are no unique or sensitive environmental concerns or impacts with the proposed substation site that cannot be addressed. |
| Tower characteristics | Approximately 70% of the proposed structures will be single circuit 230kV steel monopoles (TVS-230) in a delta conductor configuration. Approximately 30% of the proposed structures will be single circuit 230kV steel monopoles (TVVS-230) in a vertical conductor configuration. Any proposed dead-end structure will be a steel monopole. See proposed structure drawing set included in attachment 10. |
| Construction responsibility | Proprietary business information |
| Benefits/Comments | Proprietary business information |

Component Cost Details - In Current Year \$

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|----------------------------------|----------------------------------|
| Engineering & design | Proprietary business information |
| Permitting / routing / siting | Proprietary business information |
| ROW / land acquisition | Proprietary business information |
| Materials & equipment | Proprietary business information |
| Construction & commissioning | Proprietary business information |
| Construction management | Proprietary business information |
| Overheads & miscellaneous costs | Proprietary business information |
| Contingency | Proprietary business information |
| Total component cost | \$40,924,169.00 |
| Component cost (in-service year) | \$45,172,626.00 |

Greenfield Transmission Line Component

| | | |
|---------------------|--|--|
| Component title | 40g - New 230kV transmission line from existing Warrenton substation to future Rixlew substation | |
| Project description | Proprietary business information | |
| Point A | Warrenton | |
| Point B | Rixlew | |
| Point C | N/A | |

| | Normal ratings | Emergency ratings |
|-------------------------|---------------------------|--------------------------|
| Summer (MVA) | 1573.000000 | 1809.000000 |
| Winter (MVA) | 1648.000000 | 1896.000000 |
| Conductor size and type | 3x 1780 kcmil Chukar ACSR | |

| | |
|--|--|
| Nominal voltage | AC |
| Nominal voltage | 230 |
| Line construction type | Overhead |
| General route description | The route is approximately 18 miles long. Starting at a new deadend structure at the Warrenton substation, the line routes east-southeast along the Old Auburn Rd ROW for about a 2 miles before turning northeast and creating a greenfield ROW for about a 2 miles before reaching the intersection of Dumfire Rd and Rogues Rd. The line then follows Rogues Rd ROW for about 3.5 miles and then turns east and routes a new greenfield ROW for about 3.5 miles before reaching Vint Hill Rd. The line then routes adjacent to Vint Hill Rd ROW for about 2.5 miles and then turns north-northeast before reaching Nokesville Rd. The line continues northeast for about 1.25 miles, turns east for about 1.5 miles before reaching Godwin Drive near the Hourglass substation. The line follows Godwin Dr ROW for about a half mile before turning west-northwest for about a mile and then terminates into Rixlew substation. |
| Terrain description | The project is located in Prince William and Fauquier counties, in Virginia. In the east, flat coastal plains meet the Potomac River. To the west, the terrain gradually rises to the Piedmont Plateau in the center of the county and the rolling foothills of Bull Run Mountain further west. Bull Run sits on the boundary of Prince William and Fauquier counties and ranges to a height of 1,280 feet above sea level. |
| Right-of-way width by segment | The new right of way will have its own corridor for the majority of the route length. Approximately 70% of the route will have a right of way width of 45 ft. Approximately 30% of the route will have a right of way width of 60 ft and will accommodate 2-230kV lines (this component and component 40f). |
| Electrical transmission infrastructure crossings | See Attachment 4 (Google Earth .kmz) with identified major crossings. |
| Civil infrastructure/major waterway facility crossing plan | See Attachment 4 (Google Earth .kmz) with identified major crossings and Attachment 5 - Crossing Plan for more detail. |

Environmental impacts

Environmental constraints identified are manageable through implementation of an environmental avoidance, minimization, and mitigation strategy incorporated at the beginning of the routing/siting process. Co-location with existing utilities and other infrastructure was prioritized to the greatest extent practicable to minimize the environmental impact on the landscape. The proposed site crosses 12 national wetland inventory (NWI) mapped wetlands and 28 mapped waterbodies. Fatal flaws have not been identified for proposed site. A cultural resource professional assisted with the siting process to identify and minimize impacts to known areas with historic sensitivities. An investigation to further identify and evaluate historic properties will be conducted to determine the presence of archaeologically or historically significant resources. Federally listed species have been identified with potential to occur in the area including listed bats, but no critical habitat was identified in the area. If such habitat is identified or regulations change, agency coordination and species-specific surveys will occur. The project intends to adhere to tree removal seasonal restriction windows to avoid and minimize impacts to protected birds and bats, such as the northern long-eared bat, bald eagle, and other common raptors. Erosion control best management practices and setbacks will be engineered and utilized to prevent sedimentation from leaving the site for the protection of aquatic species and to avoid water quality impacts. There are no unique or sensitive environmental concerns or impacts with the proposed substation site that cannot be addressed.

Tower characteristics

Approximately 70% of the proposed structures will be single circuit 230kV steel monopoles (TVS-230) in a delta conductor configuration. Approximately 30% of the proposed structures will be single circuit 230kV steel monopoles (TVVS-230) in a vertical conductor configuration. Any proposed dead-end structure will be a steel monopole. See proposed structure drawing set included in attachment 10.

Construction responsibility

Proprietary business information

Benefits/Comments

Proprietary business information

Component Cost Details - In Current Year \$

Engineering & design

Proprietary business information

Permitting / routing / siting

Proprietary business information

ROW / land acquisition

Proprietary business information

Materials & equipment

Proprietary business information

Construction & commissioning

Proprietary business information

Construction management

Proprietary business information

Overheads & miscellaneous costs

Proprietary business information

| | |
|----------------------------------|----------------------------------|
| Contingency | Proprietary business information |
| Total component cost | \$43,876,770.00 |
| Component cost (in-service year) | \$48,431,744.00 |

Substation Upgrade Component

| | |
|--------------------------|---|
| Component title | 40D - Ocean Court substation 230kV Ring Bus Expansion |
| Project description | Proprietary business information |
| Substation name | Ocean Court |
| Substation zone | Dominion (VEPC) |
| Substation upgrade scope | Add two 230kV breakers to the existing ring bus at Ocean Court 230kV substation and terminate the two new 230kV transmission lines. The new transmission lines are terminated so they do not share a breaker in the ring bus. |

Transformer Information

| | |
|-----------------------------|---|
| None | |
| New equipment description | AC Substation: Add two (2) new 230 kV circuit breakers to ring bus. |
| Substation assumptions | Substation has not been built yet. Assumed that substation can accommodate new equipment as needed. |
| Real-estate description | No expansion of substation fence anticipated. |
| Construction responsibility | Proprietary business information |
| Benefits/Comments | Proprietary business information |

Component Cost Details - In Current Year \$

| | |
|-------------------------------|----------------------------------|
| Engineering & design | Proprietary business information |
| Permitting / routing / siting | Proprietary business information |
| ROW / land acquisition | Proprietary business information |

| | |
|----------------------------------|----------------------------------|
| Materials & equipment | Proprietary business information |
| Construction & commissioning | Proprietary business information |
| Construction management | Proprietary business information |
| Overheads & miscellaneous costs | Proprietary business information |
| Contingency | Proprietary business information |
| Total component cost | \$2,800,000.00 |
| Component cost (in-service year) | \$3,090,676.00 |

Substation Upgrade Component

| | |
|--------------------------|--|
| Component title | 40E - Davis Drive 230kV line termination |
| Project description | Proprietary business information |
| Substation name | Davis Drive |
| Substation zone | Dominion (VEPC) |
| Substation upgrade scope | Terminate the new 230kV transmission line in the open spare position at the Davis Drive 230kV ring bus substation. |

Transformer Information

| | |
|-----------------------------|--|
| None | |
| New equipment description | AC Substation: Terminate new 230kV line from Ocean Ct to Davis Drive |
| Substation assumptions | Spare position available on existing ring bus to terminate new line. |
| Real-estate description | No expansion of substation fence anticipated. |
| Construction responsibility | Proprietary business information |
| Benefits/Comments | Proprietary business information |

Component Cost Details - In Current Year \$

| | |
|----------------------------------|----------------------------------|
| Engineering & design | Proprietary business information |
| Permitting / routing / siting | Proprietary business information |
| ROW / land acquisition | Proprietary business information |
| Materials & equipment | Proprietary business information |
| Construction & commissioning | Proprietary business information |
| Construction management | Proprietary business information |
| Overheads & miscellaneous costs | Proprietary business information |
| Contingency | Proprietary business information |
| Total component cost | \$700,000.00 |
| Component cost (in-service year) | \$772,669.00 |

Substation Upgrade Component

| | |
|--------------------------|--|
| Component title | 40h - Hourglass substation 230kV single breaker expansion |
| Project description | Proprietary business information |
| Substation name | Hourglass |
| Substation zone | Dominion (VEPC) |
| Substation upgrade scope | Add one breaker and two MODs at Hourglass to terminate new 230kV line from Warrenton to Hourglass. |

Transformer Information

| | |
|---------------------------|---|
| None | |
| New equipment description | AC Substation: Add one (1) new 230 kV circuit breaker to ring bus. |
| Substation assumptions | Substation has not been built yet. Assumed that substation can accommodate new equipment as needed. |
| Real-estate description | No expansion of substation fence anticipated. |

| | |
|--|---|
| Construction responsibility | Proprietary business information |
| Benefits/Comments | Proprietary business information |
| Component Cost Details - In Current Year \$ | |
| Engineering & design | Proprietary business information |
| Permitting / routing / siting | Proprietary business information |
| ROW / land acquisition | Proprietary business information |
| Materials & equipment | Proprietary business information |
| Construction & commissioning | Proprietary business information |
| Construction management | Proprietary business information |
| Overheads & miscellaneous costs | Proprietary business information |
| Contingency | Proprietary business information |
| Total component cost | \$1,400,000.00 |
| Component cost (in-service year) | \$1,545,338.00 |
| Substation Upgrade Component | |
| Component title | 40i - Rixlew substation 230kV single breaker expansion |
| Project description | Proprietary business information |
| Substation name | Rixlew |
| Substation zone | Dominion (VEPC) |
| Substation upgrade scope | Add one breaker and two MODs at Rixlew substation to terminate new 230kV line from Warrenton to Rixlew. |
| Transformer Information | |
| None | |

| | |
|-----------------------------|---|
| New equipment description | AC Substation: Add one (1) new 230 kV circuit breaker to ring bus. |
| Substation assumptions | Substation has not been built yet. Assumed that substation can accommodate new equipment as needed. |
| Real-estate description | No expansion of substation fence anticipated. |
| Construction responsibility | Proprietary business information |
| Benefits/Comments | Proprietary business information |

Component Cost Details - In Current Year \$

| | |
|----------------------------------|----------------------------------|
| Engineering & design | Proprietary business information |
| Permitting / routing / siting | Proprietary business information |
| ROW / land acquisition | Proprietary business information |
| Materials & equipment | Proprietary business information |
| Construction & commissioning | Proprietary business information |
| Construction management | Proprietary business information |
| Overheads & miscellaneous costs | Proprietary business information |
| Contingency | Proprietary business information |
| Total component cost | \$1,400,000.00 |
| Component cost (in-service year) | \$1,545,338.00 |

Transmission Line Upgrade Component

| | |
|----------------------------|--|
| Component title | 50C - Mosby to Wishing Star 500kV Upgrade |
| Project description | Proprietary business information |
| Impacted transmission line | Mosby to Wishing Star 500kV (Two Circuits) |
| Point A | Mosby |

| | | |
|---|--|--------------------------|
| Point B | Wishing Star | |
| Point C | | |
| Terrain description | Work required is within existing ROW. | |
| Existing Line Physical Characteristics | | |
| Operating voltage | 500 | |
| Conductor size and type | Incumbent / Current Transmission owner specific | |
| Hardware plan description | Utilize existing line hardware to extent possible. | |
| Tower line characteristics | Utilize existing towers to extent practicable. | |
| Proposed Line Characteristics | | |
| | Designed | Operating |
| Voltage (kV) | 500.000000 | 500.000000 |
| | Normal ratings | Emergency ratings |
| Summer (MVA) | 4295.000000 | 4357.000000 |
| Winter (MVA) | 5066.000000 | 5196.000000 |
| Conductor size and type | Incumbent / Transmission Owner to select conductor to achieve the required ratings | |
| Shield wire size and type | Utilize existing shield wire to extent practicable. | |
| Rebuild line length | 1 | |
| Rebuild portion description | Proposing to upgrade limiting elements to achieve specific rating. | |
| Right of way | Use of existing ROW to extent practicable. | |
| Construction responsibility | Proprietary business information | |
| Benefits/Comments | Proprietary business information | |

Component Cost Details - In Current Year \$

| | |
|----------------------------------|----------------------------------|
| Engineering & design | Proprietary business information |
| Permitting / routing / siting | Proprietary business information |
| ROW / land acquisition | Proprietary business information |
| Materials & equipment | Proprietary business information |
| Construction & commissioning | Proprietary business information |
| Construction management | Proprietary business information |
| Overheads & miscellaneous costs | Proprietary business information |
| Contingency | Proprietary business information |
| Total component cost | \$5,000,000.00 |
| Component cost (in-service year) | \$5,519,064.00 |

Congestion Drivers

None

Existing Flowgates

None

New Flowgates

Proprietary business information

Financial Information

| | |
|--------------------------|---------|
| Capital spend start date | 09/2023 |
| Construction start date | 07/2025 |

Project Duration (In Months) 45

Cost Containment Commitment

Cost cap (in current year) Proprietary business information

Cost cap (in-service year) Proprietary business information

Components covered by cost containment

1. 1B - New 500kV Transmission Line from Allegheny Substation Front Royal to new Racefield switchyard - NEETMA
2. 1F - New Racefield GIS Substation - 5 terminal - NEETMA
3. 40a - New 230kV transmission line from existing Mars substation to existing Ocean Court substation - NEETMA
4. 40b - New 230 kV transmission line from existing Ocean Court substation to existing Davis Drive substation - NEETMA
5. 40f - New 230kV transmission line from existing Warrenton substation to existing Hourglass substation - NEETMA
6. 40g - New 230kV transmission line from existing Warrenton substation to future Rixlew substation - NEETMA

Cost elements covered by cost containment

| | |
|---------------------------------|-----|
| Engineering & design | Yes |
| Permitting / routing / siting | Yes |
| ROW / land acquisition | Yes |
| Materials & equipment | Yes |
| Construction & commissioning | Yes |
| Construction management | Yes |
| Overheads & miscellaneous costs | Yes |
| Taxes | Yes |
| AFUDC | No |
| Escalation | No |

Additional Information

Proprietary business information

Is the proposer offering a binding cap on ROE?

Yes

Would this ROE cap apply to the determination of AFUDC?

Yes

Would the proposer seek to increase the proposed ROE if FERC finds that a higher ROE would not be unreasonable?

No

Is the proposer offering a Debt to Equity Ratio cap?

Proprietary business information

Additional cost containment measures not covered above

Proprietary business information

Additional Comments

None