

**DIRECT TESTIMONY
OF
JOHN B. BAILEY
ON BEHALF OF
VIRGINIA ELECTRIC AND POWER COMPANY
BEFORE THE
STATE CORPORATION COMMISSION OF VIRGINIA
CASE NO. PUE-2007-_____**

1 **Q. Please state your name and position with Virginia Electric and Power Company**
2 **(“Dominion Virginia Power” or “Company”).**

3 A. My name is John B. Bailey, and I am Coordinator - Siting and Permitting for the
4 Company.

5 **Q. What is your educational and professional background?**

6 A. I graduated from Hanover College in 1976 with a Bachelor of Arts degree in Biology. I
7 also hold a Master of Science degree in Biology from Virginia Commonwealth
8 University. From 1978 to 1982, I worked as an ecologist for James R. Reed & Associates
9 in Newport News, Virginia. In 1982, I joined Dominion Virginia Power in the Water
10 Quality Department where I served as an Environmental Specialist for approximately four
11 years.

12 In 1986, I was transferred to the Engineering Services Section of the Transmission and
13 Distribution Projects Department as a Senior Construction Specialist. In 1989, I was
14 promoted to Supervisor of Transmission and Substation Siting. In 1994, I was promoted
15 to Director - Engineering Services. I have been Coordinator - Siting and Permitting since
16 1997.

17 I have been an active participant in the Edison Electric Institute’s Natural Resources
18 Subcommittee, where I was Chairman of the Environmental Planning and Siting Task

1 Force from 1996-2000. I have previously testified before the State Corporation
2 Commission in transmission certification proceedings.

3 **Q. What are your responsibilities as Coordinator - Siting and Permitting?**

4 A. My responsibilities include identification of appropriate routes for transmission lines and
5 sites for substations and obtaining necessary federal, state, and local approvals and
6 environmental permits for those facilities. In this position I work closely with
7 government officials, permitting agencies, property owners, and other interested parties,
8 as well as with other Company personnel, to develop facilities needed by the public so as
9 to reasonably minimize environmental and other impacts on the public in a reliable and
10 cost-effective manner.

11 **Q. What is the purpose of your testimony in this proceeding?**

12 A. I will discuss the selection and impacts of the Company's Proposed Route and Alternate
13 Route as shown in the maps contained as Attachments II.A.2.a, II.A.2.b, II.A.2.c and
14 II.A.2.d to the Appendix. I also will discuss the factors considered in the choice of the
15 Company's Proposed Route and the Alternate Route and explain why certain other
16 potential routes were considered but not included as alternates. In addition, I am
17 sponsoring Sections II.A.1, 2, 4, 7, 8 and 9, and III and V of the Appendix.

18 **Q. How did the Company choose its Proposed Route?**

19 A. We looked to existing transmission right-of-way, as is favored by public policy. One
20 hundred percent of the Proposed Route is either in or adjacent to existing transmission
21 line rights-of-way. These existing electric transmission corridors run from the west side
22 of the Appalachian Trail, where Dominion Virginia Power's routing begins, to the
23 Loudoun Substation at the end point of the project. Specifically, these rights-of-way

1 consist of two 500 kV line corridors (Line #580 and Line #569), a 115 kV corridor (Line
2 #183) and a short length of 230 kV corridor near Remington.

3 **Q. Please provide more detail regarding the relationship of the Proposed Route to**
4 **existing transmission rights-of-way.**

5 A. The Proposed Route is somewhat “U-shaped” from the Appalachian Trail to Loudoun
6 Substation with west, south and east sides.

7 On the west side of the “U,” there is an existing 150’ wide right-of-way that is occupied
8 by 500 kV Line #580. In areas where space is available, we will widen this right-of-way
9 100 feet, but in areas constrained by residential development or open-space easements we
10 will construct the new line completely within the existing 150 foot wide right-of-way. For
11 approximately 11 miles along the west side of the #580 Line there is an existing steel pole
12 34.5 kV line. In this area, the right-of-way was previously widened an additional 19’ to
13 169 feet. For this portion of the project the existing 34.5 kV line poles will be removed
14 and the new line will be built as a 500/34.5 kV double circuit structure adjacent to the
15 #580 line as described in Mr. Allen’s testimony. Thus, in this area, there will be two sets
16 of structures, the existing 500 kV Line #580 structures and the new double circuit
17 500/34.5 kV structures, and the existing right-of-way will be widened by 100’.

18 On the south side of the “U” near Remington, the Proposed Route turns east for
19 approximately one mile between Line #580 and the Remington Combustion Turbine
20 Station parallel to a 115/230 kV corridor. In this area, the right-of-way will be widened
21 100-125’ with the new 500 kV structure built adjacent to and south of these double circuit
22 structures. Proceeding east from the Combustion Turbine Station there is an existing 100’

1 wide 115 kV right-of-way that is occupied by 115 kV Line #183. This corridor would be
2 widened an additional 50' and the structure will be designed as a double circuit 500/115
3 kV line as described in Mr. Allen's testimony. This results in a single set of structures in
4 this section.

5 On the east side of the "U" the Proposed Route is on an existing 240' wide right-of-way
6 that is occupied only by 500 kV Line #569 for approximately 14.5 miles to Gainesville
7 Substation with vacant right-of-way adjacent to Line #569. The Commission recently
8 approved construction of a double circuit 230 kV transmission line in this right-of-way,
9 and we now propose to locate the 230 kV lines on structures with the 500 kV lines. For
10 the final 7.8 miles between Gainesville Substation and Loudoun Substation the corridor
11 has the same 240' wide right-of-way, but there are existing 230 kV structures adjacent to
12 Line #569 that will have to be removed and replaced as described in Section I.D of the
13 Appendix.

14 Given these criteria, Burns & McDonnell Engineering Company, Inc. ("Burns &
15 McDonnell") and the Company reviewed the existing right-of-way to determine where
16 these corridors could be widened and where a "narrowing" of the project would need to
17 occur. The areas that require "narrowing" include seven open-space easement areas, ten
18 residential areas and at the Appalachian Trail. Another area of special concern is along
19 the 115 kV Line #183 in the vicinity of the Flying Circus Aerodrome where the existing
20 #183 line is approximately 200 feet north of the Flying Circus runway. In this area the
21 #183 Line is an average of 71 feet high. In this area the Company is proposing to
22 construct the new 500 kV line using a lower profile H-frame design described in Mr.

1 Allen's testimony which can be built in the vicinity of the runway at an elevation of 75
2 feet. As a private, grass strip airport this facility is not subject to FAA regulations.
3 Dominion Virginia Power has reviewed the site and the line heights and we do not
4 anticipate any significant impact to air navigation as described in Mr. Allen's testimony.

5 Constructing two 500 kV lines within the existing right-of-way as described in the
6 Appendix and Mr. Allen's testimony presents planning issues addressed in Mr. Ronnie
7 Bailey's testimony. One parameter established for Burns & McDonnell by Dominion
8 Virginia Power was to limit the length of line where both 500 kV circuits were placed
9 within the existing 150' wide right-of-way to less than one continuous mile. The
10 reliability reasons for this one mile limit are described in Mr. Ronnie Bailey's testimony.

11 **Q. Please provide a detailed description of the alignment of the Proposed Route.**

12 A. The Proposed Route is approximately 65 miles long and originates at the intersection of
13 Dominion Virginia Power's existing 500 kV transmission line and the western edge of
14 the Appalachian Trail property. The route proceeds south parallel to the existing 500 kV
15 line through northwestern Fauquier County crossing Route 635, continues parallel to the
16 existing 500 kV line, through northeastern Rappahannock County crossing Routes 637
17 (twice), 647, 645, 643 and 669, and then through Culpeper County crossing Routes 613,
18 211, 229, 802 and 623. The Proposed Route re-enters Fauquier County at the
19 Rappahannock River and continues to parallel the 500 kV line crossing Routes 651, 660,
20 786, 657, 29, Business 29 and 656 to a point approximately one mile east of Remington.
21 At this point the route intersects with an existing east/west transmission line corridor
22 occupied by 115 kV and 230 kV lines. The Proposed Route turns eastward and parallels

1 this line approximately one mile past Remington Substation and the Remington
2 Combustion Turbine Station crossing Routes 655 and 782. Immediately east of the
3 Combustion Turbine Station the route continues eastward following an existing 115 kV
4 corridor (the #183 Line) crossing Routes, 17, 602, 610, 607, 806 (three times), 748 and
5 616 where it intersects with an existing north/south 500 kV transmission line corridor (the
6 #569 Line). Here the Proposed Route turns north within this existing corridor through
7 eastern Fauquier County crossing Routes 609, 611 and 640. The route then proceeds
8 through northern Prince William County on existing right-of-way crossing Routes 773,
9 652, 215, 619, 647, 698, 234 (twice), 781, I-66, 705 and 29 and into southern Loudoun
10 County, terminating at Loudoun Substation.

11 **Q. Why did the Company choose the Proposed Route?**

12 A. The Route was selected based on several factors. Most importantly, it utilizes existing
13 electric transmission right-of-way for the complete route. As I have noted, 100% of the
14 route is either in or adjacent to existing electric transmission right-of-way. The length
15 through historic districts is the lowest compared to other routes considered and the route
16 also has the fewest listed historic/archeological sites of the overhead alternatives
17 considered. Most of the homes affected already have an existing transmission line within
18 500', so there are fewer new impacts with this route. Use of a corridor that already has
19 such impacts is clearly preferable. This route crosses the fewest scenic roads and those
20 crossings are already affected by existing transmission lines at the same locations.

21 **Q. Has the Company identified an Alternate Route?**

22 A. Yes. We have identified a route which primarily utilizes the I-66 right-of-way. The
23 Company has met with the Virginia Department of Transportation ("VDOT") to discuss

1 the feasibility of placing the line route within the limited access area of VDOT interstate
2 right-of-way. The concept was to be on either the north or south side of the interstate and
3 to maximize the distance of the foundations from the road. A portion of the 150' wide
4 right-of-way would overhang outside of VDOT right-of-way. In some areas, this
5 overhang would be adjacent to existing frontage roads and in other cases the overhang
6 would be on private property.

7 **Q. Please summarize the key advantages and disadvantages of the Alternate Route.**

8 A. The Alternate Route is approximately 37 miles long with approximately 30 miles on I-66
9 from the point just east of Linden to the point where the #569 Line crosses I-66 just east
10 of Haymarket. The route would be on or immediately adjacent to I-66 (as described in
11 Mr. Welter's testimony) and then turn north on the #569 corridor to Loudoun Substation
12 where the existing structures would be removed and rebuilt to accommodate the new 500
13 kV line.

14 There are some advantages to this route. It utilizes a portion of existing electric
15 transmission line and makes use of highway right-of-way for the remainder. This route is
16 the shortest route considered and has relatively low impacts on residences. It crosses the
17 least acres of wetlands and does not cross any agricultural/forestral district. However, this
18 route has the highest number of historic/archaeological sites, there would be a significant
19 added visual impact to the commuting public on I-66, and the Virginia Department of
20 Transportation has not committed to support the route within the limited access right-of-
21 way of I-66.

1 **Q. Is the Alternate Route you have described feasible?**

2 A. Yes. The Alternate Route is technically feasible but, as mentioned, has certain
3 drawbacks. The Alternate Route also has some cultural resource impact as it is on the
4 edge of two large rural historic districts with a number of National Register Eligible and
5 Listed sites, it would traverse through Thoroughfare Gap. While Dominion Virginia
6 Power believes that the Alternate Route is technically feasible and should be considered
7 by the Commission, the Proposed Route offers the best overall route to both serve the
8 electrical needs and minimize the impacts through its use of an existing 500 kV corridor.

9 **Q. Please describe the Alternate Route, including its general alignment.**

10 Dominion Virginia Power's portion of the Alternate Route is approximately 37 miles
11 long and originates at a point just east of Linden. The route proceeds east on I-66 for
12 approximately 30 miles through Fauquier and Prince William Counties to where another
13 existing Dominion Virginia Power 500 kV line (Line #569) crosses I-66 approximately
14 2000 feet east of the intersection of Rt. 234 Bypass and I-66. At this point the route turns
15 north within this existing 500 kV corridor through northern Prince William County
16 crossing Routes 705, and 29 into southern Loudoun County and terminates at Loudoun
17 Substation.

18 **Q. How were the Proposed and Alternate Routes selected in this case?**

19 A. The Proposed and Alternate Routes are the culmination of the Company's evaluation
20 efforts and analysis, listening to interested parties and taking into account very different
21 perspectives, while also keeping in mind the Company's responsibility to provide
22 reliable, cost-effective electric service. The route selection process involved assembling a
23 project team with expertise in engineering, planning, real estate, line routing, system

1 protection, operations, construction and management. This project team, assisted by an
2 outside consultant, served as an internal committee to evaluate the Alternate Routes and
3 provided information for analysis.

4 **Q. How did the project team conduct its analysis to assist in the development of the**
5 **routes?**

6 A. The Company's route selection for this new transmission line initially began after
7 identifying the starting and stopping point for the project, and the Company hired Burns
8 & McDonnell, a consulting firm specializing in transmission line route analysis to assist
9 in evaluation of various route possibilities. Within an initial study area Burns &
10 McDonnell identified existing electric transmission corridors in the east or west sides of
11 the study area and existing non-transmission rights-of-way including I-66, a Columbia
12 gas line easement north of I-66 and a Norfolk Southern railroad corridor. Burns &
13 McDonnell's initial task was to develop route alternatives within the initial study area,
14 prepare an impact analysis, and work with the project team to recommend routes for
15 consideration by the State Corporation Commission. Mr. Cyril Welter of Burns &
16 McDonnell is a witness in this proceeding and presents a report summarizing the routing
17 factors and related analysis.

1 The Company also undertook an active program to inform the public and elected officials
2 about the project, to explain the need for the project and the routes under consideration.

3 The schedule for these various informal, informational meetings has been as follows:

4	Fauquier County information update*	Oct 10, 2006
5	Loudoun County information update	Oct 17, 2006
6	Fauquier County information update	Oct 18, 2006
7	Fauquier County information update	Oct 20, 2006
8	Loudoun County information update	Oct 25, 2006
9	Prince William County information update	Nov 21, 2006
10	Public Workshop in Loudoun County	Nov 28, 2006
11	Public Workshop in Fauquier County	Nov 29, 2006
12	Public Workshop in Prince William County	Dec 7, 2006
13	Prince William County information update	Jan 30, 2007
14	Culpeper County information update	Feb 21, 2007
15	Rappahannock County information update	Feb 21, 2007
16	Fauquier County information update	Feb 26, 2007
17	Property owner meeting in Culpeper County	April 16, 2007
18	Property owner meeting in Fauquier County	April 17, 2007

19 * These updates were for elected officials and County Planning staff

20 The Company also made presentations at two County Board meetings:

21	Prince William County Board presentation	Dec 5, 2006
22	Culpeper County Board presentation	Mar 6, 2007

23 Additional information was provided to the public through numerous interviews with the
24 local media and through an internet website dedicated to the project, which was also
25 publicized through the media and which has been periodically updated.

26 **Q. Please continue.**

27 A. Dominion Virginia Power examined the possibility of a cross-country route from
28 Allegheny Power's Meadow Brook Substation to Dominion Virginia Power's Loudoun
29 Substation, generally moving west-to-east from Meadow Brook to Loudoun. This was
30 expected to be a viable route electrically for the project, though it involved a substantial
31 amount of new right-of-way across a relatively undeveloped, scenic area. In seeking to

1 evaluate a route in this area, Burns & McDonnell found existing transmission line
2 corridors on the west and east sides of the initial study area, but no existing transmission
3 line corridors in the central section. To compound the situation, there were numerous
4 historic districts, national register eligible sites and conservation and open-space
5 easements throughout northern Fauquier and southern Loudoun Counties. Dominion
6 Virginia Power considered the importance of these easements and decided to further
7 evaluate a cross country route, but to avoid these established easements where possible.
8 The results of this routing decision effectively eliminated a number of the preliminary
9 routes identified by Burns & McDonnell, particularly in the northern portion of the study
10 area, and focused our efforts on routes in the I-66 corridor and the area to the south
11 parallel to it. A family of routes made up of segments paralleling an existing Meadow
12 Brook-Morrisville transmission line and then turning east and running generally parallel
13 to and south of I-66 and then north cross country to Loudoun Substation was developed
14 for further consideration (“Segment Overhead Route”).

15 Next we began meeting with the public (citizens, elected representatives, government
16 agencies and interested organizations) in late 2006 and early 2007 and we received
17 considerable opposition to a cross-country routing approach based upon the
18 environmental, historical and scenic resources that would be impacted by a new line. We
19 brought this information back to the project team and management and looked again at
20 the alternatives. As a team we evaluated other conceptual routes, and additional
21 information affecting the electric and routing viability of different routes was studied.

1 After discussions with members of the project team, it was determined that additional
2 options could be reviewed from both electrical and routing perspectives.

3 The results of these discussions produced three additional route possibilities to be studied
4 in addition to the Segment Overhead Route that had been identified earlier. The possible
5 routes included:

- 6 1. An overhead alternative on or immediately adjacent to existing transmission
7 line rights-of-way to the south (“Southern Route,” ultimately the Proposed
8 Route).
- 9 2. An overhead alternative on I-66 (“I-66 Route,” ultimately the Alternate
10 Route).
- 11 3. A direct current underground alternative essentially along the same alignment
12 as the Segment Overhead Route (“Segment Underground Route”).

13 Each of these alternatives had advantages and disadvantages, but Dominion Virginia
14 Power felt that they were reasonable to study as possibilities. For the I-66 alternative, the
15 Company began discussions with the Virginia Department of Transportation about the
16 feasibility of placing structures within the limited access right-of-way on I-66. For the
17 Southern Route overhead alternative along existing transmission rights-of-way corridors,
18 Dominion Virginia Power’s planning staff had to evaluate how long this circuit could
19 provide sufficient capacity as well as the suitability of the corridor as compared to a more
20 direct route. This route had been evaluated earlier as an electrical alternative, but was not
21 favored because of its relative electrical performance. However, the Company received
22 updated information from PJM in the winter of 2006/2007. Based on this updated
23 information, it became apparent that this option should be re-evaluated. For the
24 underground alternative, Dominion Virginia Power’s engineering staff had to evaluate the

1 feasibility and reliability, as well as cost, of adding this technology to the transmission
2 grid.

3 The preliminary review of these alternatives indicated that all of these routes were
4 technically feasible, so the Company announced that it would further evaluate these
5 alternatives as well as the routes presented earlier. At the Company's direction, Mr.
6 Welter undertook to assess these additional alternatives using similar impact criteria as
7 the initial route alternatives. At the same time, the Company's engineering, routing and
8 planning staff continued to evaluate these options.

9 **Q. Please summarize the advantages and disadvantages of the Proposed Route.**

10 **A.** The key advantages of this route are:

- 11 1. It utilizes existing electric transmission right-of-way for the complete route.
12 One hundred percent of the route is either in or adjacent to existing electric
13 transmission right-of-way. This route requires significantly fewer new acres of
14 right-of-way when compared to the Segment Overhead Route
- 15 2. The length through historic districts is the lowest with approximately two
16 miles as opposed to 9.3 miles for the Segment Overhead Route, 8.1 miles for
17 the I-66 Route and 8.7 miles for the Segment Underground Route.
- 18 3. This route also has fewest listed historic/archeological sites for the overhead
19 alternatives with 25 whereas the Segment Overhead, the I-66 and the Segment
20 Underground Routes have 27, 32 and 27, respectively.
- 21 4. Although the number of homes within 150' and 500' are the highest of any of
22 the alternatives, these are homes that already have an existing transmission
23 line within 500', so this impact cannot be given the same weight as a home
24 within 500' of a completely new right-of-way. Use of a corridor that already
25 has impacts is clearly preferable.
- 26 5. This route has the fewest scenic roads crossed with six crossings as opposed to
27 eight for the Segment Overhead Route, 11 for the I-66 Route and eight for the
28 Segment Underground Route.

1 The disadvantages of this route are:

- 2 1. The homes within 150' feet and 500' are 32 and 414, respectively, though
3 most are already along an existing 500 kV line, and many of the homes were
4 built-up to the right-of-way after the existing transmission facilities were in
5 place.
- 6 2. This route is the longest route with 65 miles compared to 42 miles for the
7 Segment Overhead Route, 37 miles for the I-66 Route and 41 miles for the
8 Segment Underground Route.
- 9 3. The length through wetlands is highest with 78 acres of wetlands crossed as
10 opposed to 65, 26 and 56 acres for the Segment Overhead, the I-66 and the
11 Segment Underground Routes, respectively.
- 12 4. This route has the highest number of miles of agricultural/forestal district
13 crossed with 9.4 as compared to zero miles for the I-66 Route and 2.5 miles
14 for the Segment Overhead and Underground Routes.

15 **Q. Please summarize the advantages and disadvantages for the Alternate Route.**

16 A. The key advantages of this route are:

- 17 1. This route potentially utilizes existing electric transmission line or highway
18 right-of-way for 100% of the route in Dominion Virginia Power's service
19 territory. It requires the least acres of new right-of-way with 0 acres as
20 opposed to 219, 350 and 633 for the Segment Underground, Proposed and
21 Segment Overhead Routes, respectively.
- 22 2. This route is the shortest route at 37 miles compared to 42, 65, and 41 miles
23 for the Segment Overhead, Southern and Segment Underground Routes.
- 24 3. This route has a low number of homes within 150' and the lowest number of
25 homes within 151-500 feet of the line with five and 115, respectively.
- 26 4. This route has the least acres of wetlands crossed with 26 acres compared to
27 56-78 acres for the other routes.
- 28 5. This route has the least miles of agricultural/forestal district crossed with none
29 as compared to 2.5 miles for the Segment Overhead and Underground Routes
30 and 9.4 miles for the Proposed Route.

31 The key disadvantages of this route are:

- 32 1. This route has the highest number of historic/archaeological sites within one
33 mile with 32 as compared to 27, 25, and 27 for the Segment Overhead,
34 Southern and Segment Underground routes, respectively.

- 1 2. There would be a significant added visual impact to the commuting public on
- 2 I-66.
- 3 3. The Virginia Department of Transportation has not indicated that it would be
- 4 willing to support the route within the limited access right-of-way of I-66.

5 **Q. Please summarize the advantages and disadvantages for the Segment Overhead**
6 **Route.**

7 The Segment Overhead Route is approximately 42 miles long from the Appalachian Trail
8 property to Loudoun Substation. The route parallels portions of I-66 and the Norfolk
9 Southern railroad corridors and utilizes existing #580 and #569 Line easements. This
10 route requires a section of completely new right-of-way that is not parallel to any existing
11 corridors.

12 The key advantages of this route are:

- 13 1. The number of homes within 150' feet is the lowest with 0 (same as
- 14 the Segment Underground Route) whereas the Southern and I-66
- 15 Routes have 32 and 5, respectively.
- 16 2. This route has a relatively low number of miles of agricultural/forestal
- 17 district crossed with 2.5 as compared to zero miles for the I-66 Route,
- 18 2.5 miles for the Segment Underground Route and 9.4 miles for the
- 19 Proposed Route.

20 The key disadvantages of this route are:

- 21 1. In addition to the measured criteria data described below this route
- 22 traverses an area of Virginia that is rich in cultural resources and very
- 23 scenic with the localities, government at all levels and the general
- 24 public active in efforts to preserve these resources. This route would
- 25 bisect the John Marshall's Leeds Manor Rural Historic District, the
- 26 Asheville Historic District and pass close to the "Morven"
- 27 National/State Register site. Individual citizens and private interest
- 28 groups actively promote placing land in open-space easements with the
- 29 intent to preserve the continuity of the rural setting of the area. Placing
- 30 a new transmission corridor within this open area is a significant
- 31 impact that can be avoided because an alternative exists that already
- 32 has an existing transmission line corridor.

- 1 2. The length through historic districts is the highest with 9.3 miles as
2 compared to the Southern Route with only two miles.
- 3 3. This route has a higher number of historical/archaeological sites within
4 one mile when compared to the Proposed Route with 27 as opposed to
5 25, 32 and 27 for the Southern, I-66 and Segment Underground
6 Routes.
- 7 4. This route has the greatest amount of new right-of-way with 633 acres
8 as opposed to 0, 219 and 350 acres for the I-66, Segment Underground
9 and Proposed Routes, respectively.
- 10 5. This route has relatively high acres of wetlands crossed with 65 as
11 compared to 78, 26 and 56 for the Southern, I-66 and Segment
12 Underground Routes.

13 **Q. How did the Company develop the Segment Underground Route, and what were its**
14 **advantages and disadvantages?**

15 A. The Company looked at utilizing the segments of the Segment Overhead Route on a 50'
16 wide right-of-way utilizing direct current underground technology as discussed in Mr.
17 Koonce's testimony. The Segment Underground Route deviates from the Segment
18 Overhead Route at Segment 76 just west of Manassas National Battlefield where it
19 follows Segments 77 and 79 into Loudoun Substation. As discussed in Mr. Welter's
20 testimony this route is one mile shorter than the Segment Overhead Route.

21 The Segment Underground Route is approximately 41 miles long from near the
22 Appalachian Trail property to Loudoun Substation. Two fenced converter stations, of
23 approximately 22 acres each, would be required for this line, one just east of the
24 Appalachian Trail property and one adjacent to Loudoun Substation. Each of these
25 stations would require three buildings eight stories tall to house converting equipment and
26 would resemble a small power plant and adjacent switching station.

1 The advantages of this route are:

- 2 1. With the exception of the two converter stations the underground line
3 mitigates visual impact as a routing issue.
- 4 2. The right-of-way width requirements are one third than that for an
5 equivalent overhead line because the underground line would need
6 only a 50' width instead of a 150' width.
- 7 3. The number of homes are the lowest within 150' of the line and
8 relatively low for homes between 151-500' with 0 and 261,
9 respectively. The impact to homes is generally mitigated because this
10 route is underground.
- 11 4. This route has a relatively low number of miles of agricultural/forestral
12 district crossed with 2.5 as compared to zero miles for the I-66 Route,
13 three miles for the Segment Overhead Route and 9.4 miles for the
14 Proposed Route.

15 The disadvantages of this route are:

- 16 1. The cost is significantly higher than all the other alternatives with an
17 estimated cost in excess of \$1 billion.
- 18 2. The technology has been utilized very rarely and no where at this
19 capacity and neither Dominion Virginia Power nor PJM has
20 experience with this type of technology inside their transmission grids.
- 21 3. The length through historic districts is relatively high with 8.7 miles
22 and constructing an underground trench would have more impact to
23 archaeological sites than overhead construction where foundations
24 would typically be spaces approximately 1000' apart.
- 25 4. Although wetlands crossed is not the highest with 56 acres compared
26 to 26-78 for the other routes, the trenching through wetlands would
27 create greater impact as compared to spanning wetlands which
28 overhead lines can typically do. To minimize this impact directional
29 drilling would be considered.
- 30 5. The number of historic/archaeological sites within one mile is 27
31 compared to 25-32 for the other routes.

1 **Q. Please summarize the key differences among the four routes that were considered in**
2 **the Company's final analysis.**

3 A. A summary of how the Company evaluated the four alternatives and selected the
4 Southern Route as the Proposed Route is included in Section II.A.7 of the Appendix. The
5 key differences among the four routes are:

6 The key disadvantage to the Segment Overhead Route is that it traverses an area of
7 Virginia that is rich in cultural resources and very scenic, with localities, government at
8 all levels and the general public active in efforts to preserve these resources. This route
9 would bisect the John Marshall's Leeds Manor Rural Historic District, the Asheville
10 Historic District and pass close to the National/State Register listed "Morven" site.
11 Individual citizens and private interest groups actively promote placing land in
12 open-space easements with the intent to preserve the continuity of the rural setting of the
13 area. Placing a new transmission corridor within this open area is a significant impact that
14 can be avoided because an alternative exists that already has an existing transmission line
15 corridor. The Segment Overhead Route has significant cultural resource impacts as
16 described in Mr. Welter's testimony, and a number of new open-space easements have
17 been recently created. From an ecological view any new corridor could fragment habitat
18 and ecological communities. This concern is reflected in the Virginia Department of
19 Conservation's preference for the I-66 Route, which is an existing corridor that has
20 already fragmented the habitat. This is also true for the Proposed Route with the existing
21 transmission line corridor. Additional disadvantages of the Segment Overhead Route are
22 that it creates the most completely new corridor (approximately 23 miles) with 744 acres

1 of new right-of-way required, it has the longest length through historic districts with
2 approximately 9.3 miles, it has relatively high number of cultural resources with 27
3 within one mile and it has a relatively high wetlands impact with 65 acres. A positive
4 aspect is that it has no homes within 150 feet of the route and only 262 within 151-500
5 feet.

6 The I-66 Route disadvantages are that it has the highest number of cultural sites within
7 one mile, it has the highest number of scenic road crossings, it will add a significant
8 visual impact to the commuting public and VDOT has not indicated whether it would
9 support this alternative, creating uncertainty on a critical, time-sensitive project. The
10 advantages are that it utilizes existing rights-of-way for possibly up to 100 percent of the
11 route, requires the least amount of new right-of-way, is the shortest route, has a relatively
12 low number of homes near it, has the shortest length through agricultural/forestral districts
13 and crosses the fewest acres of wetlands.

14 The Segment Underground Route disadvantages are that it has a significantly higher cost
15 (estimated at in excess of \$1 billion), utilizes a technology that is not currently in use on
16 Dominion Virginia Power's system, presents reliability concerns, would require extensive
17 trenching through rich cultural resource areas and wetlands and would require two fenced
18 converter stations at either end of the line. It has technical drawbacks described in
19 Mr. Koonce's testimony regarding the use of direct current technology in Dominion
20 Virginia Power's transmission grid and significantly different environmental impacts
21 associated with a 41-mile trench as discussed in Mr. Welter's testimony. The key
22 advantages are that, with the exception of the converter stations, the visual impacts would

1 be mitigated, the right-of-way width would be reduced to 50 feet and there are relatively
2 few homes near the route with zero within 150 feet and 261 within 151-500 feet.

3 The Proposed Route has a number of advantages and positive attributes. The key
4 advantage is that 100 percent of the route is either parallel to or completely on existing
5 electric transmission line right-of-way. This approach is favored under § 56-46.1 of the
6 Code of Virginia, which requires a utility to show why existing right-of-way is not
7 adequate for a proposed transmission line. As we have described, using and paralleling
8 existing right-of-way can satisfy the routing need in this case. This collocation of
9 facilities is completely consistent with Virginia Statute sections 56-46.1 and 56-259,
10 FERC Guideline #1, and the Appalachian Trail Conference (“ATC”) Policy on Roads and
11 Utility Developments criteria (Criteria #2), all of which encourage the use of existing
12 rights-of-way. Essentially all of the owners of the parcels on this line presently have an
13 electric transmission line easement on their property and their uses co-exist with this line,
14 whether it is farming, residential, commercial or industrial use. Dominion Virginia
15 Power believes that locating within or adjacent to the existing rights-of-way provides the
16 least overall impact. As described in Mr. Welter’s report, there is already an easement
17 placed on the land, the use as an energy transmission corridor is established and a visual
18 impact currently exists. Adding a second line to this existing corridor would not double
19 these impacts, whereas constructing a new line on a new corridor across undisturbed
20 lands would create a completely new and separate impact in northern Virginia. Additional
21 advantages of this route are that it crosses the least amount of historic district area, it has
22 the fewest cultural sites within one mile of the route and it has the fewest scenic road

1 crossings. It is important to note that these historic districts, cultural sites and scenic roads
2 that are crossed by the Proposed Route, in every case already have a transmission line
3 crossing on that parcel. The disadvantages are that it has the highest home counts, but
4 again it is important to note that these homes are already within 500 feet of an existing
5 transmission line, and many were built after the existing transmission facilities were in
6 place. It is the longest route, crosses the most agricultural/forestal district property and it
7 crosses the most wetlands, but similar to the home counts, a number of these wetland and
8 agricultural/forestal district parcels already exist within an existing transmission line
9 easement.

10 Dominion Virginia Power's review of information, which included new information on
11 electrical viability as well as the obvious benefits of using or paralleling existing
12 right-of-way, led the Company to select the Southern Route on or parallel to existing
13 transmission right-of-way as the appropriate choice for our Proposed Route. The
14 significant advantage of the Proposed Route is that existing right-of-way (much of which
15 already contains a 500 kV transmission line) is sufficient in some areas, and can be
16 expanded in other areas, to accommodate the new line, which helps make this route one
17 that clearly minimizes significant new impacts and clearly meets the statutory
18 requirements for approval. In this case, there are distinct advantages to the use of an
19 existing transmission line corridor for 100 percent of the routing of this line, including the
20 much reduced incremental impact on the public as compared to other options.

1 **Q. What were the key factors in rejecting the Segment Overhead and Underground**
2 **Routes?**

3 A. We rejected the Segment Overhead and Underground Routes due to the disadvantages
4 discussed above. In summary, the Segment Overhead and Underground Routes pass
5 through an undeveloped scenic and historic area of northern Fauquier County that has no
6 existing transmission line corridors that could be utilized to minimize impacts of a new
7 line. This community has actively employed the use of open-space easements to preserve
8 the viewsheds of the area. These routes have the highest length through historic districts
9 and a relatively high number of historical/archaeological sites and wetlands crossed. The
10 Segment Underground Route has a cost estimated in excess of \$1 billion presents
11 technical issues, it would employ a direct current technology unfamiliar to both Dominion
12 Virginia Power and PJM and could present significant impacts for wetlands and
13 archaeological resources. In addition, it would involve new right-of-way and the
14 construction of large converter stations.

15 **Q. Please explain the activities which have been and will be undertaken to reasonably**
16 **minimize the environmental impact of the proposed line along the Proposed Route.**

17 A. The Company made a number of decisions to minimize the environmental impact of this
18 project. Three key decisions include:

- 19 1. The decision to submit the Southern Route as the Proposed Route puts forth a
20 route that parallels existing right-of-way for 100 percent of the length. It
21 follows the #580 Line, the #2/#2077/#299 Line corridor, the #183 Line and
22 the #569 Line for the complete 65 mile length of the project. The section
23 parallel to the #580 line would widen the right-of-way 100' in places (no
24 widening would occur in constrained areas), the #2/#2077/#299 Line corridor
25 would be widened 100-125', the overbuild of the #183 line would widen the
26 right-of-way 50' and there would be no new right-of-way required for the

1 section parallel to the #569 Line. All this utilization of existing right-of-way is
2 a key component to minimizing the impact of the proposed line.

3 2. The Company's decision not to cross over established open-space easements
4 is part of the effort to minimize the environmental impacts. These easements
5 were set up to preserve open areas and avoiding them helps to minimize
6 impacts.

7 3. Dominion Virginia Power's Engineering staff has assisted in minimizing the
8 impact of this proposed line by developing structures that can accommodate
9 two 500 kV circuits on a narrow right-of-way. Minimizing the width of the
10 project, particularly in constrained areas, helps to minimize the overall impact
11 of the project.

12 **Q. Please describe the environmental process which is underway.**

13 A. Initial information was provided to the environmental regulatory agencies, and more
14 detailed information, including applications to the Virginia Marine Resources
15 Commission ("VMRC"), the Department of Environmental Quality ("DEQ"), and the
16 Corps of Engineers (the "Corps"), will be submitted to these agencies upon final
17 determination of the route location.

18 On July 25, 2006 and February 27, 2007, information packages with maps of the affected
19 area were sent to a number of environmental agencies describing the proposed project and
20 requesting agency comments. Agencies contacted include:

- 21 1. Virginia Marine Resources Commission
- 22 2. Virginia Game & Inland Fisheries ("VGIF")
- 23 3. Virginia Department of Historic Resources ("DHR")
- 24 4. U.S. Army Corps of Engineers
- 25 5. Environmental Protection Agency ("EPA")
- 26 6. U.S. Fish & Wildlife Service ("USFWS")
- 27 7. Virginia Department of Conservation and Recreation
- 28 8. Virginia Department of Agriculture
- 29 9. Virginia Department of Forestry
- 30 10. Virginia Department of Transportation
- 31 11. Appalachian National Scenic Trail
- 32 12. Manassas National Battlefield

1 In summary, the agency comments stated that permits from the environmental agencies
2 may be required and steps to minimize impacts to cultural resources, wetlands, streams,
3 scenic views and wildlife should be taken where appropriate. No position on specific
4 routes was taken by the agencies, except the Department of Conservation and Recreation
5 recommended that if the “no build” option was not available they recommended the
6 Alternate Route because it is already impacted and no new corridor is created. They felt
7 that both the Segment Overhead and Underground Routes created the greatest impact due
8 to the creation of a completely new corridor.

9 **Q. When will the Company apply for the required permits?**

10 A. After approval by the State Corporation Commission, the Company will survey the route
11 and then perform the necessary environmental surveys (wetlands and cultural resources).
12 After these surveys are complete, the necessary applications to the Corps, VMRC, DEQ
13 and VDOT will be submitted.

14 **Q. Does this complete your prepared direct testimony?**

15 A. Yes, it does.