

**PUBLIC SERVICE COMMISSION  
OF WEST VIRGINIA  
CHARLESTON**

**Case No. 07-\_\_\_\_-E-\_\_\_\_**

**TRANS-ALLEGHENY INTERSTATE LINE COMPANY**

**Application of Trans-Allegheny Interstate Line  
Company for a certificate of public convenience  
and necessity under W. Va. Code § 24-2-11a  
authorizing the construction and operation of the  
West Virginia segments of a 500 kV electric  
transmission line and related facilities in Monongalia,  
Preston, Tucker, Grant, Hardy, and Hampshire  
Counties, and for related relief**

**DIRECT TESTIMONY OF  
JACK HALPERN**

**March 30, 2007**

1 Q. PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.

2 A. My name is Jack Halpern, and my business address is 4511 South Ocean  
3 Boulevard, Suite 507, Highland Beach, Florida 33487.

4

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DUTIES AND RESPONSIBILITIES

6 Q. BY WHOM ARE YOU EMPLOYED AND IN WHAT CAPACITY?

7 A. I am employed by The Louis Berger Group, Inc. ("Berger"), a leading  
8 infrastructure engineering, environmental science and economic development firm  
9 with over 140 offices across the United States and throughout the world. Berger  
10 was retained as a consultant on behalf of Trans-Allegheny Interstate Line  
11 Company ("TrAILCo") to perform route selection for the West Virginia  
12 Segments, the Prexy Segment, the Prexy 138 kV Lines, the Pennsylvania 502  
13 Junction Segment and the Virginia state line to Meadow Brook segment of the  
14 Trans-Allegheny Interstate Line ("TrAIL"). I am the project director for Berger  
15 for this evaluation.

16

17

EXPERIENCE AND EDUCATION

18 Q. PLEASE DESCRIBE YOUR PROFESSIONAL EXPERIENCE AND  
19 EDUCATIONAL BACKGROUND.

1 A. I have a Bachelor's degree in Mining Engineering from the University of Missouri  
2 at Rolla and a Masters Degree in Geotechnical Engineering from Columbia  
3 University. I had completed the work, including a dissertation, for a Ph.D. in  
4 Geotechnical Engineering from the University of Missouri at Rolla when I was  
5 called up for military service. I later received an honorary degree from the  
6 University of Missouri at Rolla. I have had advance training at the Westinghouse  
7 International School for Environmental Management. I have consulted for the  
8 power industry on siting, permitting, geotechnical engineering and construction of  
9 generation and transmission facilities for the last forty years. I have participated or  
10 directed over one hundred siting or routing projects throughout the United States  
11 and in other countries. I have specifically worked on over 5,000 miles of  
12 transmission line projects, from route selection to permitting to foundation design  
13 to construction support. I have been chosen to represent the United States in  
14 development of the first international guideline for siting nuclear facilities. I have  
15 taught courses on siting and environmental issues from one day to eight weeks in  
16 length. I have specific experience in the PJM Interconnection, L.L.C. ("PJM") grid  
17 working on a number of transmission projects, including Atlantic City Electric's  
18 New Freedom to Cardiff Line and Jersey Central Power & Light's Seashore Loop.

19

20

1 PURPOSE OF TESTIMONY

2 Q. PLEASE DESCRIBE THE PURPOSE OF YOUR TESTIMONY.

3 A. The purpose of my testimony is to sponsor and explain the report that describes  
4 what route has been recommended for TrAIL and why that particular route has  
5 been selected.

6 Q. WILL THE USE OF VARIOUS TERMS IN YOUR TESTIMONY BE  
7 CONSISTENT WITH THE DEFINITIONS ASSIGNED TO THOSE TERMS IN  
8 THE TABLE OF NOMENCLATURE ATTACHED TO THE APPLICATION?

9 A. Yes.

10  
11 EXHIBITS

12 Q. ARE YOU SPONSORING ANY OF THE APPENDICES TO THE  
13 APPLICATION IN THIS CASE?

14 A. Yes. I am sponsoring Appendices C and D to the Application filed by TrAILCo in  
15 this proceeding. Appendix C is a narrative description of the West Virginia  
16 Segments. Appendix D is the Route Evaluation Report and Environmental Report  
17 (line route evaluation, or "LRE") for the West Virginia Segments of TrAIL  
18 prepared by the Berger Team under my direction and the supervision of TrAILCo  
19 witness Fleissner.



1 A. As set forth in the LRE, TrAILCo proposed the construction of a 500-kilovolt  
2 (kV) transmission line connecting: the proposed Prexy Substation in Washington  
3 County, Pennsylvania; the proposed 502 Junction Substation in Greene County,  
4 Pennsylvania; the existing Mt. Storm Substation in Grant County, West Virginia;  
5 and the existing Meadow Brook Substation in Frederick County, Virginia. From  
6 the Meadow Brook Substation, the line would continue in the Virginia portion of  
7 the Allegheny Power transmission zone of PJM to its boundary with the Dominion  
8 Virginia Power transmission zone where the responsibility for completing  
9 construction of the line into the Loudoun Substation in Loudoun County, Virginia  
10 would change to Dominion Virginia Power. The length of the line to be  
11 constructed by TrAILCo was initially estimated at 210 miles.

12 Q. WHAT IS THE APPROXIMATE LENGTH OF TRAIL AND ITS VARIOUS  
13 LINE COMPONENTS BASED ON THE PROPOSED ROUTE?

14 A. The preferred route for the 500-kV line as identified in the LRE is approximately  
15 180 miles in length. Three additional segments of 138-kV transmission lines in  
16 the Prexy area (the "Prexy 138 kV Lines") are also part of TrAIL. The preferred  
17 routes for these lines as identified in the LRE are for an additional combined total  
18 of 15 miles. Thus from Prexy Substation in Pennsylvania to the TrAIL End Point  
19 in Virginia, the entire TrAIL will be approximately 195 miles in length with  
20 approximately five miles for the each of the additional 138 kV lines in

1            Pennsylvania. The West Virginia Segments will be approximately 114 miles. The  
2            Prexy Segment in Pennsylvania will be approximately 37 miles, the Pennsylvania  
3            502 Junction Segment is approximately 1.2 miles and the Virginia Segments are  
4            approximately 28 miles. From 502 Junction Substation to the TrAIL End Point,  
5            the line will be approximately 143 miles.

6            Q.     WHERE IS THE ROUTE SET OUT IN THE LRE?

7            A.     As required by 150 CSR3 ("Electric Rule") 9.2.1(a), the LRE includes a detailed  
8            description of the West Virginia Segments and accompanying maps of the  
9            proposed right-of-way. The detailed text description of the line is presented in  
10           Chapter 3.2 (Description of the Preferred Route), along with maps. Chapter 4  
11           (Environmental Analysis of the Preferred Route) of the LRE also provides maps  
12           showing the locations, where information was publicly available, of incorporated  
13           communities; public or private recreational areas, parks, forests, hunting or fishing  
14           areas, or similar facilities; historic scenic areas or places; rivers, lakes, streams,  
15           reservoirs and similar bodies of water within five miles of either side of the center  
16           line of the proposed right-of-way. This information is also contained on the  
17           detailed maps provided with the Application as Appendix B in response to the  
18           requirements of Electric Rule 9.2.1.a.

19

20

1                                    EXPLANATION OF ROUTE EVALUATION PROCESS

2    Q.    DID THE BERGER TEAM ASSESS THE POTENTIAL ENVIRONMENTAL  
3           IMPACTS OF THE CONSTRUCTION OF THE WEST VIRGINIA SEGMENT  
4           ALONG THE PROPOSED ROUTE?

5    A.    Yes. As required by West Virginia Code (“Code”) 24-2-11a(b)(3) and Electric  
6           Rule 9.2.1(h), Chapter 4 of the LRE (Environmental Analysis of the Preferred  
7           Route) presents detailed information on the potential for environmental impacts  
8           associated with the construction of the West Virginia Segments. This includes  
9           analysis of potential impacts on geology and soils, surface water and aquatic  
10           species/habitats, wetlands, vegetation, wildlife and sensitive species, land use,  
11           recreation lands and designated natural scenic resources, cultural resources and  
12           aesthetics. For the 114 miles of the West Virginia Segments, about 24 miles of  
13           the proposed line route would be on steep soils (20 to 45 degree slopes), there  
14           would be ten large river and 116 small stream crossings, a small amount of  
15           wetlands (less than a mile) crossed, nine recorded sites of threatened and  
16           endangered or other sensitive species would be within 1,000 feet of the route  
17           centerline, 1,910 acres of forest would be cleared for the right-of-way, 12  
18           residences would be within 250 feet of the route centerline, 123 residences would  
19           be within 500 feet of the centerline, one historic (architectural) site within ¼ mile  
20           of the route, and one scenic byway, one tourist railroad, and nine recreation trails

1 would be crossed. Together with the information provided in the direct testimony  
2 of TrAILCo witness Bodenschatz, the information in Chapter 4 of the LRE is  
3 responsive to the requirements of Electric Rules 9.2.1(c) (right-of-way description  
4 generally), 9.2.1(d) (right-of-way vegetation control methods), 9.2.1(e) (habitat  
5 for land and aquatic life), and 9.2.1(h) (other pertinent information on potential  
6 environmental impact). As I discuss in more detail below, these impacts are less  
7 than those from the other possible routes that were examined.

8 Q. DID YOU SPECIFICALLY CONSIDER THE HABITAT AND TYPE OF  
9 WILDLIFE, BOTH LAND AND AQUATIC, THAT MAY BE IN THE RIGHT-  
10 OF-WAY OR ADJOINING AREAS, AND ANY KNOWN EFFECT THAT  
11 TRAIL MAY HAVE UPON THEM, INCLUDING FEEDING AND BREEDING  
12 HABITS?

13 A. Yes. Section 4.5 of the LRE (Wildlife and Sensitive Species) presents detailed  
14 descriptions of habitat and wildlife within or adjoining the right-of-way.  
15 Specifically, Section 4.5.2 (Impacts on Wildlife and Sensitive Species/Habitats)  
16 describes possible impacts on habitat and type of wildlife that may be in the right-  
17 of-way or adjoining areas. This section also describes any known effect the line  
18 may have upon feeding or breeding habits. This information is responsive to the  
19 requirements of Electric Rule 9.2.1(e).

1           The majority of the proposed route would require forest clearing for right-  
2           of-way construction. As a general rule, when a right-of-way would go through  
3           large relatively undisturbed tracks of forest, the right-of-way clearing would  
4           fragment the forest and create edge habitat. Although edge habitat provides  
5           habitat for a wide diversity and abundance of species, such as deer, songbirds, red-  
6           tailed hawks, and red fox, species that require forest interior habitat would lose  
7           habitat, possibly altering distribution and migration patterns and isolating habitat  
8           patches.

9           The proposed route recommended in the LRE, however, minimizes forest  
10          fragmentation by paralleling an existing 500 kV transmission line for 45.6 miles.  
11          When paralleling an existing right-of-way, no new edge is created and habitat  
12          fragmentation would not occur. The existing edge species in the area of clearing  
13          would continue to have suitable habitat following right-of-way construction. The  
14          implementation of Class III clearing within 100 feet of streams -- see section 4.4.2  
15          (Impacts on Vegetation) -- would also minimize impacts to riparian wildlife  
16          species because Class III clearing allows some shrubby/woody vegetation to  
17          remain in the right-of-way.

18    Q.    WILL THE CONSTRUCTION OF TRAIL HAVE ANY MATERIAL ADVERSE  
19           EFFECTS UPON HUMAN AND DOMESTIC ANIMAL LIFE LOCATED  
20           ALONG THE RIGHT-OF-WAY?

1 A. Domestic animal life could potentially be affected by vegetation maintenance  
2 which includes herbicide/pesticide application and mechanical methods such as  
3 cutting and mowing. Selective herbicide use is the preferred method of  
4 eliminating unwanted woody vegetation, while allowing grasses, weeds, and ferns  
5 to continue to grow. Herbicide application would abide by all applicable federal,  
6 state, and local laws and regulations, including U.S. Department of Agriculture,  
7 West Virginia Department of Agriculture, and EPA. TrAILCo would maintain  
8 herbicide-free buffer zones around: houses and barns (50 feet); ponds, lakes, and  
9 year-round flowing water (25-feet); gardens, farm crops, grape arbors, ornamental  
10 trees, flower gardens, and cultivated fruit and nut trees (100-feet), and tobacco  
11 farms (500-feet) so there would be no effect on domestic animals. Human life  
12 would primarily be affected by visual intrusion. The transmission line structures,  
13 conductors, and the cleared right-of-way will be visible in varying degrees to area  
14 residents. The visual accessibility of the line will be influenced by a multitude of  
15 factors, such as the amount of screening, the amount of natural light present, the  
16 distance from the viewpoint to the line, the amount of other human disturbance in  
17 the viewshed, background terrain and colors, the sensitivity of the viewer, and  
18 many other variables. Because the project area is extensively forested and shows  
19 significant topographic relief, an extensive amount of screening is present which  
20 should limit to a varying degree direct visual access to the proposed line. See

1 Section 4.9.2 (Impact on Visual Resources) for further details. Hence vegetation  
2 management should not materially affect domestic animals and visual intrusion  
3 should not materially affect human life. Other possible effects are discussed in  
4 the testimony of TrAILCo witnesses Bailey and Johnson.

5 Q. PLEASE DESCRIBE THE PUBLIC OUTREACH CONDUCTED WITH  
6 RESPECT TO THE ROUTE SELECTION AND THE PUBLIC INPUT  
7 RECEIVED.

8 A. Ten public open house meetings were held between November 28, 2006, and  
9 December 14, 2006, at locations throughout the TrAIL study area as listed in  
10 Section 2.5 of the LRE. These meetings were conducted to provide general  
11 information to the public about TrAIL, present preliminary results of the routing  
12 effort, and gather information from the public for use in the routing study. The  
13 public was informed about time requirements of the transmission line planning  
14 and approval process. TrAILCo specifically initiated the open house meetings to  
15 involve the public in the planning process through encouraging public comment  
16 on the project, its purpose and need, and some preliminary results. The public was  
17 informed that the open house meetings were supplementary to those that would  
18 later be mandated as part of the state utility regulatory process. Staff from  
19 TrAILCo and the Berger Team facilitated these meetings and worked together to  
20 provide information to meeting participants.

1           During and following the public open house meetings, individuals were  
2 encouraged to provide comments on the project through five methods: registration  
3 cards, questionnaires, handwritten comments on maps, letters, and emails. All of  
4 these comments were reviewed. Comments provided in handwritten notes on maps  
5 presented at the open house meetings were reviewed during additional field efforts  
6 and routing team meetings. Overall, the most common themes noted in public  
7 comments related to visual and aesthetic impacts of the proposed line, the  
8 proximity of the line to individual residences and/or property, and the impact of  
9 line construction and operation on the study area environment.

10 Q.   DID THE BERGER TEAM EXAMINE OTHER POTENTIAL ROUTES?

11 A.   Yes. The LRE shows that TrAILCo and the Berger Team applied a rigorous and  
12 systematic approach to the assessment of available alternatives and, using a  
13 number of factors (including public feedback), identified the best route for the  
14 West Virginia Segments. The description of this process, which appears  
15 generally in Chapters 2 and 3 of the LRE, responds to the requirements of Electric  
16 Rule 9.2.1(g).

17           *Potential Routes*, as defined in the LRE, were first identified and studied by  
18 the routing team. Where the routes intersected, *Links*, also as defined in the LRE,  
19 were formed as the segment of the route between intersections. The *Links* were  
20 numbered for identification. The *Link* numbers changed as the study progressed

1 and new *Links* were added or deleted. Eventually the better *Links* were  
2 assembled into the best routes for quantitative analysis. Following the open  
3 houses and review of attendee comments, a series of alternative routes were  
4 developed from the potential route network by the routing team. Section 2.10 of  
5 the LRE (Analysis of Alternate Routes) presents details of the alternatives  
6 identified as well as maps for each possible alternative.

7 Following this review, the remaining *Links* were renumbered and appear as  
8 the alternative route networks shown for 502 Junction to Mount Storm and Mt.  
9 Storm to Meadowbrook segments in Figure 2-3 and Figure 2-4, respectively.  
10 From this network, eight alternative routes (Routes A through H) were identified  
11 between 502 Junction and Mt. Storm, and 4 alternative routes (Routes A through  
12 D) were identified between Mt. Storm and Meadow Brook, as shown in Figures  
13 2-5, 2-6, and 2-7, respectively.

14 Q. WHAT ROUTE WAS SELECTED, AND WHY?

15 A. The routing team selected Alternative Route H as the Preferred Route for the  
16 proposed 502 Junction-Mt. Storm 500 kV segment of TrAIL. When compared  
17 with other alternatives, Alternate Route H had the following advantages:

- 18 ○ Route H is comparatively moderate in terms of the length of wetlands  
19 crossed and the numbers of residences within 250 and 500 feet of the route  
20 centerline;
- 21 ○ Route H would not require the removal of any known residences;
- 22

- 1
- 2           ○ Much of Route H is in undeveloped forest land;
- 3
- 4           ○ Route H permits Commission approval of the entire portion of the line
- 5           route from the West Virginia-Pennsylvania state line to the Mt. Storm
- 6           Substation;
- 7
- 8           ○ Route H minimizes the impact on sensitive species sites, cultural resources
- 9           sites, and a significant number of proposed wind farm sites identified
- 10          during the study period;
- 11
- 12          ○ Route H does not require special engineering work that would be required
- 13          for another route considered;
- 14
- 15          ○ The entrance into the Mt. Storm Substation would be simplified compared
- 16          to routes entering from the northwest; and
- 17
- 18          ○ The far western alignment west of Morgantown avoids much of the
- 19          development closer to Morgantown.
- 20

21          The routing team recommended Alternative Route A to TrAILCo as the Preferred

22          Route for the West Virginia portion of the Mt. Storm-Meadow Brook segment.

23          When compared with other alternatives, Alternate Route A had the following

24          advantages:

- 25           ○ Route A parallels Allegheny Power's existing Mt. Storm-Meadow Brook
- 26           500 kV line which would reduce impacts compared to a completely new
- 27           alignment,
- 28           ○ Route A follows the north side of the existing line, which has less of the
- 29           land use conflicts that a route on the south side would encounter,
- 30           ○ Route A has the least number of residences within 250 and 500 feet of the
- 31           route centerline of the routes analyzed, and
- 32           ○ Route A is moderate in its impacts to forests, wetlands, and other resources.
- 33
- 34

1 Q. BASED UPON YOUR EXPERIENCE AND EXPERTISE, DOES THE LRE  
2 CONSTITUTE A REASONABLE, THOROUGH STUDY CONSISTENT WITH  
3 CURRENT SITING METHODS?

4 A. Yes. Over a study period of five months, numerous potential routes were  
5 developed by the routing team and analyzed using existing aerial photography and  
6 maps, from information gained from field inspections and public meetings, from  
7 governmental agency contacts, and from numerous computerized data sources.  
8 The study conducted by Berger Team utilized the latest technologies available for  
9 data acquisition and manipulation. Ultimately, eight Alternative Routes (Routes A  
10 through H) were identified for further study between 502 Junction Substation and  
11 Mt. Storm Substation and four Alternative Routes (Routes A through D) between  
12 Mt. Storm Substation and Meadow Brook Substation. These routes were  
13 analyzed using a wide range of environmental and cultural factors to determine  
14 the best alignment for the transmission line in terms of minimizing impacts to the  
15 natural and cultural environment. The LRE represents a study consistent with  
16 current siting methods.

17 Q. IN YOUR EXPERT OPINION, IS THE ROUTE RECOMMENDED IN THE  
18 LRE THE APPROPRIATE ROUTE FOR TRAIL?

19 A. Yes. As detailed above, the routing team selected Alternative Route H as the  
20 Preferred Route for the proposed 502 Junction-Mt. Storm 500 kV segment of

1           TrAIL because comparatively this route was moderate in terms of the length of  
2           wetlands crossed and the numbers of residences near the route centerline. We do  
3           not believe that Route H would require the removal of any known residences and  
4           much of Route H is in undeveloped forest land. This route would minimize the  
5           impact on sensitive species sites, cultural resources sites, and a significant number  
6           of proposed wind farm sites identified during the study period. Hence this route is  
7           the appropriate route for TrAIL.

8    Q.    DOES THIS CONCLUDE YOUR DIRECT TESTIMONY?

9    A.    Yes, it does.