

**Dominion Energy Virginia
Glebe-Potomac River Project – Potomac Avenue Route
February 16, 2018**

City of Alexandria Working Group Questions & Responses

- 1. Would we use micro-tunneling on Potomac Avenue? Impacts? If not, what technique would be used and what's the impact?**

The Company would not install the Glebe-Potomac River underground line along the Potomac Avenue Route utilizing microtunneling. Due to its comparatively high cost, microtunneling is a trenchless construction method that is utilized primarily in areas where open trenching or horizontal directional drilling (“HDD”) cannot be used. It is the Company’s understanding that microtunneling would be required by CSX for installation of the majority of the underground line (approximately 1.6 miles) along the Railway Route. In contrast, the Company could install the underground line along the Potomac Avenue Route primarily utilizing the less expensive open trenching method, thereby making the proposed Glebe-Potomac River Project more cost competitive with the Rebuild Alternative. Installing the new underground line via microtunneling on Potomac Avenue Route would transfer much of the same additional cost associated with that construction method from the Railway Route to the Potomac Avenue Route and likely would not produce a competitive alternative to the Rebuild Alternative.

- 2. Resident concern about Potomac Yard residential impact. What is the revised option?**

The Company is currently preparing an exhibit addressing residential impacts, which will be available at the next Working Group meeting scheduled for February 21, 2018.

- 3. Request from resident about overhead lines and ask that it be removed from FAQ and clearly stated that this would not be submitted.**

The FAQ section states that Dominion Energy Virginia is pursuing an underground solution. The only remaining reference to overhead infrastructure are the original simulations presented at the October 2014 open house for historical reference.

- 4. Resident question about planning: Why was this line not planned prior to Potomac Yard build out?**

The Company does not propose transmission projects to the Virginia State Corporation Commission (“SCC”) until an actual need has been identified. The projected loads driving the need for a project represent the Company’s forecasted peaks based on actual loads and PJM’s most recent load forecast, and demonstrate the continued growth that is expected to occur, taking into account regional economic development data and current efficiency trends.

- 5. Resident question: In layperson’s terms, what does the project mean for reliability/resiliency?**

In addition to ensuring that the Company’s transmission system can maintain compliance with federally-mandated NERC Reliability Criteria, the Glebe-Potomac River Project will also increase system reliability by bringing in an additional new 230 kV source into a generation-deficient area. From a customer’s perspective, this means that the Project allows

the Company to continue to maintain the overall long-term reliability of its transmission system as our customers require more power in the future.

Resiliency offers an enhanced reliability benefit to customers that extends beyond normal reliability criteria. In the context of an electric transmission system, resilience relates to preparing for, operating through and recovering from a high-impact, low-frequency event that cannot be predicted with certainty or mitigated through ordinary investments and operational improvements. For example, there are certain NERC Reliability Criteria that will allow for the loss of a large geographic area under certain contingency conditions, whereas a resiliency benefit would allow customers to maintain service under those contingency conditions that they would not normally expect. From a customer's perspective, then, resilience benefits resulting from the Project mean that the system remains reliable even during high impact, low frequency events, whether by operating through the event or quickly recovering from the event.

6. Resident question: What is the timeline for the rebuild option? Timeline for Potomac Ave option?

See the Route Segment Comparison Chart for an overview of the Route 1 segment of the Rebuild Alternative and Potomac Avenue segment of the Glebe-Potomac River Project.

7. Resident question with requests for more information and links to information on EMF, proximity of lines to residential property and wants certainty on “no above-ground lines.”

The Company is currently preparing an exhibit addressing residential impacts, including the proximity of lines to residential properties along the Potomac Avenue Route, which will be available at the next Working Group meeting scheduled for February 21, 2018.

See the Company's response to Question No. 15 for additional information and links regarding EMF.

The Company is not proposing to construct new overhead lines for the proposed Glebe-Potomac River Project. There are segments of the Rebuild Alternative that will involve reconductoring of existing overhead lines; however, the Company is not proposing to construct new overhead lines as part of the Rebuild Alternative.

8. Resident question: Has Dominion and the City exhaustively looked at the need for the lines?

Yes, the Company has conducted this review. Power flow analyses based on PJM's 2016 Load Forecast support that the Company's transmission facilities are not projected to meet NERC Reliability Standards unless the Project is in service by June 1, 2020. While these analyses are currently being updated to reflect PJM's 2018 Load Forecast and to take into account recent cold storage announcements, the failure to address the identified deficiencies will limit the Company's ability to maintain reliable transmission service to its existing and future customers located in the identified load area. To be clear, the identified need is not going away. To address this need, the Company is proposing the Glebe-Potomac River Project, as well as the Rebuild Alternative, both of which will equally resolve the identified violations of NERC Reliability Standards. In terms of adding system resilience, the Company believes the proposed Glebe-Potomac River Project is the best solution to the

identified reliability deficiencies, and the Potomac Avenue and Railway Routes offer the minimum acquisition of new rights-of-way. Ultimately, the Virginia SCC will determine if a need exists and what project is in the public interest as part of its CPCN process in accordance with Virginia law.

9. Resident concern: Will the impact to Potomac Avenue be more pronounced than the impact to Route 1?

There will be construction impacts to both Potomac Avenue and to Route 1. The Company is preparing a traffic review that will assess these potential impacts. See the Route Segment Comparison Chart for an overview of the Route 1 segment of the Rebuild Alternative and Potomac Avenue segment of the Glebe-Potomac River Project.

10. The Working Group is concerned about the construction impacts of the rebuild option. We would like Dominion to give to the Working Group a description of such impacts, including appropriate detail and intended mitigation. What is Dominion's time table for providing that information to the Working Group?

This information is currently being developed and will be available at the next Working Group meeting scheduled for February 21, 2018.

11. Resident question (to City): Will the City consider allowing traffic to use the BRT lanes in the event the rebuild option is selected?

City Ordinance Section 10-3-17 "Dedicated Transitways" restricts the use of the Transitway facility to transit 'buses and other transit vehicles' and 'emergency vehicles'. In partnership with Arlington County, the Crystal City – Potomac Yard (CCPY) Transitway was constructed using FTA (Federal Transit Administration) and TIGER (Transportation Investment Generating Economic Recovery) funds with the express purpose of providing dedicated lanes for Bus Rapid Transit (BRT) and local transit service. Introducing private vehicles into the Transitway would be contrary to the purpose of the Transitway and would negatively impact the safe, reliable operation of service in both Alexandria and Arlington.

12. Why was the GW Parkway route not considered again?

Dominion met multiple times with the National Park Service ("NPS") about the Glebe-Potomac River Project and potential routes. NPS has indicated to the Company that it will only consider routes within or adjacent to the GW Parkway if there are no other viable options.

13. Rather than approve the lines, have the City and Dominion looked at options to manage demand and reduce need for lines?

With respect to energy efficiency, both PJM and Dominion take into account current and projected energy efficiency levels (whether naturally occurring or utility-driven) when developing their load forecasts, along with a number of other drivers such as economics and solar distributed generation. Dominion has long been committed to cost-effective energy efficiency programs and initiatives and currently offers a portfolio of residential and non-residential programs that incent customers to reduce demand or peak energy consumption. While Dominion has plans to continue its current programs as well as introduce new offerings in the coming years, such plans are subject to regulatory approval. It is highly

unlikely, however, that the load reduction achieved through such energy efficiency programs would negate or change the timing associated with the need for a new 230 kV transmission line in the Alexandria area.

14. Need more developed answers from Dominion (and City) about construction impacts from rebuild option. Can an impact study be done?

See the Route Segment Comparison Chart for an overview of the Route 1 segment of the Rebuild Alternative and Potomac Avenue segment of the Glebe-Potomac River Project.

15. Requests for additional information on EMF concerns.

International, national and state health and scientific agencies have reviewed research on EMF from all three research areas in tandem to arrive at well-formulated conclusions. None of these health agencies, including the Virginia Department of Health, the World Health Organization (WHO), and the European Commission’s European Health Risk Assessment Network on Electromagnetic Fields Exposure, have concluded that EMF affects our health. The full conclusions of the Virginia Department of Health, the WHO, and the European Health Risk Assessment Network reports can be found at:

- Virginia Department of Health – <https://www.dominionenergy.com/library/domcom/pdfs/electric-transmission/vdh-final-report-on-emf-research.pdf>
- World Health Organization – <http://www.who.int/mediacentre/factsheets/fs322/en/index.html>
- European Health Risk Assessment Network on Electromagnetic Fields Exposure – http://efhran.polimi.it/docs/EFHRAN_D2_final.pdf

See also dominionenergy.com/emf. In addition, the following slide was provided in the January 2018 Working Group meeting which references data from the National Institute of Environmental Health Sciences (NIEHS).

Proposed Underground Line
(preliminary calculated magnetic fields)

Distance from centerline of 230kV duct bank					
0 ft.	2 ft.	10ft.	25 ft.	50 ft.	
8.81 mG	15.13 mG	11.55 mG	4.42 mG	2.08 mG	

Typical Overhead Lines
(published magnetic fields)

Typical EMF Levels for Electric Transmission Lines*

	Under Structure	50 feet**	100 feet	200 feet	300 feet
115kV	29.7 mG	6.6 mG	1.7 mG	0.4 mG	0.2 mG
230kV	67.6 mG	19.6 mG	7.1 mG	1.8 mG	0.8 mG
500kV	86.7 mG	29.4 mG	12.6 mG	3.2 mG	1.4 mG

Typical EMF Levels for Distribution Lines*

	Under Main Feeder Lines	Under Smaller Lines	100 feet
	10 mG to 20 mG	Below 10 mG to under 1 mG	Similar to levels found in most homes

*SOURCE: Electric and Magnetic Fields Associated with the Use of Electric Power, National Institute of Environmental Health Sciences (NIEHS) and National Institutes of Health, June 2002
**Approximate edge of right of way

Average Magnetic Fields in the Home*
Median EMF levels in milligauss (mG) from the source of magnetic fields

	6 inches	1 foot	2 feet	4 feet
Personal Computer	14	5	2	-
Hair Dryer	300	1	-	-
Electric Shaver	100	20	-	-
Ceiling Fan	-	3	-	-
Window Air Conditioner	-	3	1	-
TV	-	7	2	-
Blender	70	10	2	-
Coffee Maker	7	-	-	-
Dishwasher	20	10	4	-
Garbage Disposal	80	10	2	-
Electric Can Opener	600	150	20	2
Electric Range	30	8	2	-
Electric Oven	9	4	-	-
Refrigerator	2	2	1	-
Toaster	10	3	-	-
Electric Clothes Dryer	3	2	-	-
Washing Machine	20	7	1	-
Iron	8	1	-	-
Vacuum Cleaner	300	60	10	1
Power Saw	200	40	5	-

NOTE: Dash (-) means that the magnetic field at this distance from the operating appliance could not be distinguished from background measurements taken before the appliance had been turned on.
*SOURCE: Electric and Magnetic Fields Associated with the Use of Electric Power, National Institute of Environmental Health Sciences (NIEHS) and National Institutes of Health, June 2002

After decades of research, there is no conclusive evidence of adverse health effects from EMF.

16. Can the line in Four Mile Run be off the bank and in channel?

Microtunnel construction method will be used to cross Four Mile Run. Microtunneling does not permit immediate changes in direction or very short, tight turns. The route of the line is a short distance between Glebe Substation and Potomac Avenue or even the CSX corridor. Because microtunneling is straight in short distances, the line will be straight from one side of Four Mile Run to the other. The microtunnel cannot turn to avoid the existing Route 1 bridge pilings in the channel or existing and abandoned railroad bridge pilings in the channel and still connect the route from the Potomac Avenue area to terminate at Glebe Substation.

17. Please clarify the process for how the removal of the substation will be handled in the rebuild alternative. In the past, we were told that it would be a separate request to the SCC.

As a component of both the proposed Glebe-Potomac River Project and the Rebuild Alternative, the Company will seek Commission approval to convert the overhead portion of Lines #248 and #2023 located between Glebe Substation and Potomac Yards North Terminal Station to underground lines and tie the converted lines into the GIS-converted Glebe Substation (“Potomac Yards Proposal”). At this time, the Company does not intend to seek separate approval through a separate application of the Potomac Yards Proposal.

18. There are many existing utilities in Potomac Avenue, such as large storm sewer pipes, a large sanitary sewer pipe, water main and other utilities. Due to the extensive existing utilities known, a detailed utility investigation will be required; and Dominion will be required, at its expense, to mitigate adverse impacts on such utilities. Provide an exhibit of the existing utility locations within Potomac Avenue that will impact the placement of the 230 kV line. What is the depth of the proposed line?

Underground utility mapping is part of any underground line design process. Typically, this begins at a high level based on GIS information, then the Company begins field surveys and mapping of all known utilities. If a utility is not clearly identified but a known object exists, non-destructive field surveys are performed to determine the utility’s facility depth and size. After all of the surveys are completed and noted on drawings, the line is engineered around these underground facilities. An underground transmission line has to be installed at a minimum depth of 42 inches from the top of the top power cable when installed under streets or land. It would be installed lower to clear existing underground utilities identified in the route. At this time, the Company has not completed underground utility mapping for the Potomac Avenue Route.

19. The Potomac Yard 20-year development program envisions more than 10 Million sq. ft. of new development. Provide a summary and describe how the proposed Potomac Avenue alignment will accommodate the long-term planned regional growth compared to the potential expansion of the line on Route 1.

By installing the new underground line within Potomac Avenue, this route of the proposed Glebe-Potomac River Project will minimize potential impacts to the planned new development on either side of Potomac Avenue. The Rebuild Alternative does not require expansion of the existing right-of-way along Route 1.

20. Dominion Letter to Mark Jinks (P. 1, Paragraph 2) “ While both options (i.e. New Line Solution and the Rebuild Solution) would resolve the need and improve reliability, the Company supported the new underground New Line Solution as the preferred option in spite of increased costs associated with that option over the Rebuild Solution. Why?”

See the Company’s response to Question No. 5, and the Route Segment Comparison Chart. While both the Glebe-Potomac River and Rebuild Alternative will resolve the projected violations of NERC Reliability Criteria, only the Glebe-Potomac River Project will increase system reliability by bringing in an additional new 230 kV source into a generation-deficient area and provide resiliency benefits.

21. Does the SCC still require two submissions, one for an underground line and one for an above ground line? If Dominion submits an underground application (presumably Potomac Ave.), what will be the overhead option? It appears to me the Rebuild option would be unacceptable since it’s a hybrid, both underground and overhead. Please clarify.

There is no strict requirement that the Company submit an overhead option for every underground alternative. For the Glebe-Potomac River Project, the Company does not have viable overhead options. The Rebuild Alternative already has overhead components which would be proposed to be replaced with corresponding overhead components.

22. Please provide comparable information on the potential disruption from having the power lines placed under Route 1 versus Potomac Avenue:

- **What are the anticipated extent and duration of closures that would be required to do the work on Route 1? Potomac Ave?**

See the Route Segment Comparison Chart for an overview of the Route 1 segment of the Rebuild Alternative and Potomac Avenue segment of the Glebe-Potomac River Project.

- **Given the volume of traffic travelling each roadway, how many private vehicle/trips would be disrupted by each option?**

See the Company’s response to Question No. 9 and the Route Segment Comparison Chart.

- **We have heard a lot of concern from residents along Potomac Avenue who are concerned about how the work would affect their quality of life. But there are also a lot of Alexandrians who live along Route 1 who would face the same problem. How many residents would be affected by the work along each roadway? How many businesses?**

It is difficult to assess how many residents and businesses would be “affected” by each option. The Company, however, is committed to minimizing the impacts to residents and businesses to the extent possible, whether along the Potomac Avenue Route associated with the Glebe-Potomac River Project or along Route 1 associated with the Rebuild Alternative. Residents who live nearby may be impacted by traffic such as detours or lane closures, regardless of which project is approved. However, construction will not take place continuously along the entire route for either project, rather, it will be segmented to minimize disruption.

Other Topics

1. No delay to Metro

Dominion does not anticipate that the installation of line along or adjacent to Potomac Avenue would delay or impact the Metro construction. The placement of the line would not impact the current planned Metro station location and Dominion will coordinate with the City and WMATA to minimize or eliminate any impacts of the nearby line installation.

2. Least impactful places in street

The Company is currently preparing an exhibit addressing placement in the northbound lanes of Potomac Avenue designed to minimize impacts, which will be available at the next Working Group meeting scheduled for February 21, 2018. The Company is committed to working with interested parties to limit impacts, where possible.

3. Proximity of construction impacts to residential property

The Company is currently preparing an exhibit addressing the proximity of the proposed underground line along Potomac Avenue to residences, which will be available at the next Working Group meeting scheduled for February 21, 2018. The Company is committed to working with interested parties to limit impacts, where possible.

4. Limit impacts to parks, trees

The Company is currently preparing an exhibit addressing the impacts to existing and future landscaping, which will be available at the next Working Group meeting scheduled for February 21, 2018. The Company is committed to working with interested parties to limit impacts, where possible.

5. Ensure no impacts to future development

The alignment of the route will take into consideration input from impacted parties in order to minimize impacts to future development, to the extent such development is known and/or certain at this time, and subject to final engineering and design.

6. Talk to Potomac Yard residents

The Company will facilitate communications with Potomac Yard residents through the Working Group meetings and any open houses hosted by the Company.

City and UTLWG Comments and Design Criteria:

The Company will take the comments and proposed design criteria into consideration, subject to final engineering and design if the Potomac Avenue Route is approved by the City of Alexandria.

1. All EVE's in Potomac Yard Park must be maintained, including access and supporting infrastructure. (RPCA)
2. Do not impact the existing stormwater utility infrastructure for Potomac Yard development and the Park located underneath the tennis courts and canal feature at the southern end of the park. (RPCA)
3. Do not impact the interactive spray fountain in Potomac Yard Park at Bluemont Ave. (RPCA)
4. Do not impact the retaining wall that supports Potomac Yard Pump station (alongside the southern sports courts in Potomac Yard Park). (RPCA)
5. Do not locate alignments that would impact footers and foundations to support park infrastructure, including lights, fencing, playground equipment, retaining walls and utilities. (RPCA)
6. Note that Potomac Yard Park is the repository for all the tree canopy coverage required for the Potomac Yard South development conditions. Any adverse impacts to the tree canopy in Potomac Yard Park must be mitigated such that the requirements in the Potomac Yard Park development condition are met or exceeded. (RPCA, UTLWG)
7. Minimize impacts to future Crescent Park and Four Mile Run Promenade. Provide a plan view that depicts the location of the proposed options for the northern portion of the Potomac Yard and Four Mile Run. (RPCA) (P&Z)
8. Dominion will replace and/or relocate, at Dominion's expense, any affected park amenities during construction, maintenance, replacement, upgrade, modifications and/or removal of the line and related infrastructure now or in the future. (RPCA, UTLWG)
9. Ensure proper horizontal and vertical clearances are maintained between the new transmission line and all existing utilities. These facilities cannot be relocated. Any proposed alignment should be at a depth that does not preclude future stormwater/sewer/ utility infrastructure to support the approved levels of development. (P&Z, TES)
10. A portion of the transmission line on the northernmost section of Potomac Ave will cross an underground infiltration BMP. The applicant must ensure adequate separation is achieved and that the construction of the utility lines does not impact the infiltration BMP. (TES)
11. Show the proposed Potomac Yard Metro Station, including the southern entry Metro pavilion, and North Potomac Yard Phase I redevelopment plan boundaries, road and block alignments on the plan. (P&Z, TES, UTLWG)
12. The alignment shall not be placed in the Potomac Avenue median. (TES, P&Z)
13. Any proposed alignment should be at a depth that does not preclude future stormwater/sewer/ utility infrastructure to support the approved levels of development. (P&Z, TES)
14. The Potomac Yard 20-year development program envisions more than 10 Million sq. ft. of new development. Provide a summary and describe how the proposed Potomac Avenue alignment will accommodate the long-term planned regional growth compared to the potential expansion of the line on Route 1. (P&Z)

15. The alignment shall take into consideration and avoid conflicts affecting the public realm (sidewalk, streetscape, bikeways/paths, hardscape, and medians), and Bus Rapid Transit lanes. (P&Z)
16. There is great concern where the alignment crosses in the area of the future school site. Dominion is required to coordinate upfront with P&Z and ACPS so that the school can still be built in the manner the recent planning has envisioned, with bus access looping the east of the school and access to the east for outdoor play areas. This cannot further constrain that site. (UTLWG)