

|                                                                |        | Nebula-Raines Route Alternatives <sup>a b</sup> |   |   |   | Cloud-Nebula <sup>a b</sup> |
|----------------------------------------------------------------|--------|-------------------------------------------------|---|---|---|-----------------------------|
| Locally significant resources within right-of-way and 1.0 mile | number | 3                                               | 5 | 8 | 4 | 1                           |
| NHLs between 1.0 and 1.5 miles                                 | number | 0                                               | 0 | 0 | 0 | 0                           |
| Historic districts crossed                                     | miles  | 0                                               | 0 | 0 | 0 | 0                           |
| NRHP-listed battlefields crossed                               | number | 0                                               | 0 | 0 | 0 | 0                           |
| NRHP-eligible battlefields crossed                             | number | 0                                               | 0 | 0 | 0 | 0                           |
| VDHR Easements crossed                                         | number | 0                                               | 0 | 0 | 0 | 0                           |
| Battlefields (National Park Service ABPP) Crossed              | number | 0                                               | 0 | 0 | 0 | 0                           |

#### Routing Opportunities

|                             |       |     |     |     |     |     |
|-----------------------------|-------|-----|-----|-----|-----|-----|
| Collocation—total           | miles | 0.3 | 0.8 | 0.8 | 2.9 | 0.0 |
| Existing Transmission Lines | miles | 0.0 | 0.0 | 0.0 | 0.9 | 0.0 |
| Existing Pipelines          | miles | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Existing Roads              | miles | 0.3 | 0.8 | 0.8 | 1.9 | 0.0 |
| Existing Railroad           | miles | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |

ABPP = American Battlefield Protection Program; NHL = National Historic Landmark; NRHP = National Register of Historic Places; SCU = Stream Conservation Unit; VDHR = Virginia Department of Historic Resources; VOF = Virginia Outdoors Foundation.

<sup>a</sup> The sum of the addends may not equal the totals due to rounding.

<sup>b</sup> The crossing lengths presented in this table for all feature categories are based on hypothetical centerlines within the right-of-way for each route alternative and include the Nebula Switching Station (Cloud-Nebula Route does not include the Nebula Switching Station).

<sup>c</sup> Wetland acreages are based on results of the wetland and waterbody desktop study (see Appendix D). NA indicates not applicable due to absence of a wetland type within the Project footprint; 0.0 indicates less than 0.05 acre of the wetland is present.

<sup>d</sup> Waterbody counts are based on the USGS National Hydrography Dataset (USGS 2024).



## APPENDIX D      WETLAND AND WATERBODY DESKTOP SUMMARY





222 South 9<sup>th</sup> Street  
Suite 2900  
Minneapolis, Minnesota 55402

T +0 804 253 1090  
F +0 804 253 1091

**erm.com**

Virginia Department of Environmental Quality  
Office of Environmental Impact Review  
Ms. Bettina Rayfield, Manager  
P.O. Box 1105  
Richmond, Virginia 23218

**DATE**

13 January 2025

**SUBJECT**

230 kV Nebula-Raines Line, 230 kV  
Nebula Switching Station, and 230 kV  
Cloud-Nebula Line

**REFERENCE**

0706631

Dear Ms. Rayfield:

Environmental Resources Management (ERM), on behalf of Virginia Electric and Power Company (Dominion Energy Virginia, Dominion, or the Company), conducted a desktop wetland and waterbody review of publicly available information for the proposed 230 kilovolt (kV) Nebula-Raines Line, 230 kV Nebula Switching Station, and 230 kV Cloud-Nebula Line in Mecklenburg County, Virginia. These transmission lines and the Nebula Switching Station are collectively referred to as the Project. This delineation was done using desktop resources and methodology. A field delineation is required to verify the accuracy and extent of aquatic resource boundaries. Project route alternatives are shown in Attachment 1, with wetland boundaries identified in this desktop review shown in Attachment 2.

Dominion Energy Virginia is filing an application with the State Corporation Commission (SCC) to construct and operate the following facilities:

- An approximately 14.4-mile-long overhead single circuit, 230-kV transmission line in new 100-foot-wide right-of-way supported by weathering steel double circuit monopoles with an idle conductor from the future Raines Substation<sup>1</sup>, located just south of South Hill, Virginia, to the proposed Nebula Switching Station located east of Boydton, Virginia;<sup>2</sup>
- The new 230-kV Nebula Switching Station located approximately 0.5 mile south of the existing Cloud Switching Station. The proposed Nebula Switching Station will be constructed with 14 230 kV, 4000 ampere (A) breakers with an ultimate design of six rows of breakers arranged in a breaker-and-a-half configuration. It will require the installation of an additional 24 arresters, 32 230-kV 4000A switches. The Nebula

---

<sup>1</sup> The future Raines Substation is being constructed as part of the SCC approved South Hill 230 kV Transmission Line Project and is not considered a part of this Project.

<sup>2</sup> Although the name of the Project is "Nebula to Raines," the transmission line is evaluated throughout the routing study from the future Raines Substation (starting point) to the proposed Nebula Switching Station (endpoint).

Switching Station will be designed to provide six 230-kV feeds to serve a MEC delivery point. The total area of the proposed Nebula Station is approximately 11.3 acres; and

- An approximately 0.9-mile-long overhead single circuit, 230-kV transmission line in new 100-foot-wide right-of-way supported by weathering steel double circuit monopoles with an idle conductor from the proposed Nebula Switching Station to the existing Cloud Switching Station, located just north of the proposed Nebula Switching Station.

The Project is necessary to provide service to a new delivery point pursuant to a request by Old Dominion Electric Cooperative on behalf of Mecklenburg Electric Cooperative (MEC), for Mecklenburg Electric Cooperative to provide service to one of its data center customers; maintain reliable service for the overall growth in the area; and comply with mandatory North American Electric Reliability Corporation Reliability Standards.

The purpose of this desktop analysis is to identify and evaluate potential impacts of the Project on aquatic resources (wetlands, streams, creeks, runs, and open water features) in the area. In accordance with Virginia Department of Environmental Quality (DEQ) and the SCC's Memorandum of Agreement, the evaluation was conducted using various data sets that may indicate wetland location and type. This report is being submitted to the DEQ as part of the DEQ Wetland Impacts Consultation.

This assessment did not include field investigations required for wetland delineations, as defined in the U.S. Army Corps of Engineers Wetland Delineation Manual (Environmental Laboratory, 1987) and the 2012 Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Eastern Mountains and Piedmont Region (Version 2.0).

## PROJECT STUDY AREA AND POTENTIAL ROUTES

A study area was developed encompassing an area containing the Project origin and termination points for the planned facilities (i.e., the proposed Project) as well as an area broad enough for the identification of reasonable route alternatives meeting the Project objectives. Additionally, and to the extent practicable, the limits of the study area were defined by reference to easily distinguishable landmarks, such as roads or other recognizable features.

Based on the above, ERM and Dominion defined the boundaries of the study area for the Project as follows:

- An area east of Interstate 85 (I-85) to the east;
- The unincorporated community of Gordon Corner to the north;
- The eastern extend of the Town of Boydton to the west; and
- The unincorporated communities of Norvello, Elamtown and Invermay to the south.

The study area encompasses approximately 96 square miles entirely within Mecklenburg County, Virginia. Portions of the incorporated towns of South Hill and Boydton are located respectively at the extreme eastern and western edges of the study area. The unincorporated

communities of Union Level, Gordon Corner, Callahans Corner, Busy Bee Corner, Lombardy Grove, Dockery, Smiths Crossroads, Radcliff, Big Fork, Cedar Grove, Midway, Baskerville, Gills, Antlers and Redlawn are also located within the Study Area. Land use and land cover consists of forested, agricultural, and undeveloped lands, therefore there are minimal commercial and industrial areas and buildings present throughout the study area, and forested areas along Flat Creek, Dockery Creek, Little Miles Creek, Miles Creek, Cox Creek, Allen Creek, Mines Creek, Long Branch and Reedy Branch, and Coleman Creek and associated tributaries. The largest forested/undeveloped areas are associated with riparian areas along Flat Creek, Dockery Creek, Little Miles Creek, Miles Creek, Cox Creek, Allen Creek, Mines Creek, Long Branch and Reedy Branch, and Coleman Creek waterways. Commercial and industrial buildings in the study area include warehouses and commercial signage retailers. In general, these sparse commercial businesses and buildings are located in the northeast portion of the study area near the city of South Hill. The study area is shown in Attachment 1.

## PROPOSED ROUTE ALTERNATIVES

### CLOUD-NEBULA ROUTE

Starting at the existing Cloud Switching Station, the Cloud-Nebula Route heads south for 0.5 mile adjacent to the western boundary of the Cloud Switching Station and an existing data center parcel, crossing through mostly managed timber land. The route then turns to the east for 0.3 mile across managed timber land before turning south and terminating at the proposed Nebula Substation.

The Cloud-Nebula Route measures approximately 0.9 mile long. The operational right-of-way for this alternative is 10.8 acres. Existing land uses along the route largely consist of managed timber lands with some previously cleared timber lands.

## NEBULA-RAINES ROUTE ALTERNATIVES

### NEBULA-RAINES ROUTE 1

Starting at the Raines Substation, Route 1 heads southwest for about 0.4 mile through forested areas and crossing Flat Creek before turning south for an additional 0.8 mile, crossing Rocky Branch Road at approximately milepost (MP) 0.8, just west of the South Hill WWTP. The route then turns to the southwest for 0.5 mile, crossing Turtle Road at approximately MP 1.5. The route then turns to the south for 1.1 mile, crossing through mostly forested areas (including managed timber land). At this point, the route turns to the southwest for 1.9 miles, crossing Trinity Church Road at approximately MP 3.6. This segment of the route crosses through mostly dense forested areas. The route then runs west then southwest then west for 1.2 miles, crossing Belfield Road at approximately MP 5.2. The route then turns west and continues for 3.7 miles, crossing Goodes Ferry Road at approximately MP 6.0, US 1 at MP 7.3, and Eureka Rd at MP 8.1. This segment of the route

is primarily through heavily forested land up to approximately MP 8.4, at which point the route crosses through mixed forest and agricultural land. At approximately MP 9.6, the route turns northwest and crosses Baskerville Road at approximately MP 10.0. The route then turns to the west and then southwest for 1.2 miles across forested and agricultural land before crossing Buggs Island Road at approximately MP 11.2. The route continues to the west for 1.0 mile, crossing mostly recently cleared timber lands and some agricultural grazing fields before turning southwest for 0.5 mile, and then northeast for 0.5 mile through primarily agricultural and grazing land. At this point the route turns to the west-northwest for the remaining 2.3 miles, crossing the Company's existing Lines #137 and #38 at approximately MP 13.2 and Antlers Road at approximately MP 13.5, before terminating at the proposed Nebula Station. The segment of the route west of approximate MP 13.5 is through dense managed timber land.

Route 1 measures approximately 15.4 miles in length. The operational right-of-way for this alternative (186.3 acres) and the proposed Nebula Station (11.3 acres) would encompass a combined 197.6 acres. Existing land uses along the route largely consist of a mix of agricultural and forested lands (including substantial areas of managed or replanted timber lands) with scattered rural residences and other low-intensity development at and near road crossings.

### NEBULA-RAINES ROUTE 3

Starting at the Raines Substation, Route 3 heads west for about 0.5 mile through forested areas before continuing west and collocating with the south side of US 58 for 0.8 mile across primarily agricultural lands. The route then turns to the southwest and crosses through mostly forested areas for 2.4 miles. At this point, the route turns to the west for 0.2 mile and then southwest for 0.3 mile across forested land, crossing Dockery Road at approximately MP 3.9. The route then turns south for 0.4 miles crossing through dense forested areas before turning southwest for 0.8 mile, crossing Smith Cross Road at approximately MP 5.5. After crossing Smith Cross Road, the route turns southeast for 0.1 mile and then southwest for 0.7 mile, crossing through most dense forested areas. The route then turns to the west, crossing through a mix of forested areas and cleared agricultural lands for 2.7 miles and crossing US 1 at approximately MP 6.8 and Cedar Grove Road at approximately MP 8.5. At this point the route heads southwest for 0.4 mile, crossing through open agricultural lands. At approximately MP 9.5, Route 3 crosses Baskerville Road and intersects Route 1. From this point, Route 3 follows the same alignment as Route 1 for the remaining 5.4 miles to the proposed Nebula Station.

Route 3 measures approximately 14.9 miles in length. The operational right-of-way for this alternative (180.7 acres) and the proposed Nebula Station (11.3 acres) would encompass a combined 192.0 acres. Existing land uses along the route largely consist of a mix of agricultural and forested lands (including substantial areas of managed or replanted timber

lands) with scattered rural residences and other low-intensity development at and near road crossings.

#### NEBULA-RAINES ROUTE 4

Route 4 follows the same alignment as Route 3 for the first 10.1 miles from the Raines Substation to a point 0.6 mile west of Baskerville Road. At this point, the route turns to the northwest for 0.4 mile, crossing through mostly forested lands, then turns to the west-northwest for 0.8 mile, crossing Cox Creek at approximately MP 10.5, Buggs Island Road at approximately MP 11.2. The route then turns to the west-southwest for 3.2 miles, crossing Antlers Road at approximately MP 13.0 and the Company's existing Lines #137 and #38 at approximately MP 13.1. The route then turns northwest for 0.1 mile (using the same right-of-way as Routes 1 and 3) and terminates at the proposed Nebula Station.

Route 4 measures approximately 15.0 miles in length. The operational right-of-way for this alternative (181.0 acres), and the proposed Nebula Station (11.3 acres) would encompass a combined 192.3 acres. Existing land uses along the route largely consist of a mix of agricultural and forested lands (including substantial areas of managed or replanted timber lands) with scattered rural residences and other low-intensity development at and near road crossings.

#### NEBULA-RAINES ROUTE 5

Starting at the Raines Substation, Route 5 follows the same alignment as Route 3 for the first 1.3 miles from the Raines Substation along the south side of US 58. From this point, the route continues along the south side of US 58 for another 1.1 miles before turning to the northwest for 0.1 mile, crossing US 58 and US 1 (where the two roads divide) at approximately MP 2.5, before turning west for 0.1 mile. The route then turns north-northwest for 0.6 mile, crossing Plank Road at approximately MP 3.1. The route then turns to the west for 1.3 miles and then southwest for 2.3 miles, crossing Miles Creek at approximately MP 4.5, Union Level Road at approximately MP 5.6, and Gordon Lake Road at approximately MP 6.8. At this point the route turns to the west for 2.0 miles, crossing Busy Bee Road at approximately MP 7.3. The route turns to the west/southwest for 1.7 miles, crossing Baskerville Road and Wooden Bridge Road at approximately MP 9.0 and then running through mainly forested areas. The route then heads southwest for 1.2 miles across agricultural land east of the county landfill and crossing U.S. 58 at approximately MP 11.2. At approximately MP 11.8, the route turns to the west-southwest for 0.4 mile, crossing Antlers Road at approximately MP 11.9, and then back to the southwest for 0.4 approximately mile. At approximately MP 12.5 the route turns to the west, crosses the Company's existing Lines #137 and #38, and shares right-of-way with the south side of the Company's existing Lines #1041 and #38 for 0.9 mile. The route then turns to the southwest (away from Lines #1041 and #38) for 0.6 mile across managed timber lands,

before turning west for 0.1 mile (using the same right-of-way as Routes 1 and 3) and terminating at the Nebula Station.

Route 5 measures approximately 14.4 miles in length. The operational right-of-way for this alternative (174.0 acres) and the proposed Nebula Station (11.3 acres) would encompass a combined 185.2 acres. Existing land uses along the route largely consist of a mix of agricultural and forested lands (including substantial areas of managed or replanted timber lands) with scattered rural residences and other low-intensity development at and near road crossings.

## DESKTOP EVALUATION METHODOLOGY

The area of effect considered for this study consists of the proposed rights-of-way identified above within which the electric transmission lines would be constructed and operated. Data sources used for this review include the following, each of which is described briefly below:

- USA NAIP Imagery: Color Infrared NAIP Infrared Images, Virginia, 1-meter pixel resolution (NAIP 2024)
- USA NAIP Imagery: Natural Color Images (2010-2022), Virginia, 1-meter pixel or better resolution (NAIP 2024a)
- Recent aerial imagery, taken in October of 2023 (NAIP 2023);
- Mecklenburg County Interactive Data Portal GIS datasets (Mecklenburg County 2024);
- Google Earth Aerial Imagery (Google LLC 2024);
- ESRI World Elevation Terrain 2-foot contours (ESRI et al. 2024);
- NWI maps from the USFWS online data mapping portal (USFWS 2024);
- The National Hydrography Dataset (NHD) Plus High Resolution (USGS 2024);
- Soil Survey Geographic Database soils data from the U.S. Department of Agriculture-Natural Resources Conservation Service (USDA-NRCS 2023).

## NATURAL COLOR AND INFRARED AERIAL PHOTOGRAPHY

Recent (2023) natural color aerial photography was used to provide a visual overview of the Project area and to assist in evaluating current conditions. Infrared aerial photography was used to identify the potential presence of wetlands based on signatures associated with the levels of reflectance. For example, areas that are inundated with water appear very dark (almost black) due to the low level of reflectance in the infrared spectrum. The presence of these dark colors can be used as a potential indicator of hydric or inundated soils that are likely associated with wetlands.



## TOPOGRAPHIC MAPS

Recent ESRI world topographic maps show the topography of the area as well as other important landscape features such as forest cover, development, buildings, agricultural areas, streams, lakes, and wetlands (USGS 2024; ESRI et al., 2024).

## USFWS NATIONAL WETLAND INVENTORY MAPPING

NWI maps provide the boundaries and classifications of potential wetland areas as mapped by the USFWS (USFWS 2024). NWI data is based primarily on aerial photo interpretations with limited ground-truthing and may represent incorrect boundaries or wetland cover types. NWI data can be unreliable in some areas, especially in forested landscapes, where aerial photography is used as the major data source. The classifications of the majority of the NWI polygons in the study area appear to be accurate based on a review of the cover types observed in the aerial photography. However, in areas where there was an obvious discrepancy between the NWI classification and the aerial photography, ERM modified the classification to more accurately reflect current conditions. In order to acknowledge ERM's adjustment of NWI classifications where appropriate, all the wetland types referenced in this assessment are referred to as "assigned wetland cover types" regardless of whether the cover type was modified from the NWI classification.

## USDA-NRCS SOILS DATA

Soils in the study area were identified and assessed using the SSURGO database, which is a digital version of the original county soil surveys (USDA-NRCS 2023). The attribute data within the SSURGO database provides the proportionate extent of the component soils and their properties (e.g., hydric rating) for each soil map unit. The soils in the study area were grouped into three categories based on the hydric rating of the component soils within each map unit: hydric, partially hydric, and non-hydric. Hydric soils were defined as those where the major component soils, and minor components in some cases, are designated as hydric. Hydric components in these map units account for more than 80 percent of the map unit. Partially hydric soils include map units that only contain minor component soils that are designated as hydric. The partially hydric map units in the Project area contain 10 percent or less hydric soils. The remaining map units do not contain any component soils that are designated as hydric. Areas mapped as hydric or partially hydric have a higher probability of containing wetlands than areas with no hydric soils.

## USGS NATIONAL HYDROGRAPHY DATASET

The National Hydrography Dataset (NHD) dataset contains features such as lakes, ponds, streams, rivers, and canals (USGS 2024). The waterbodies mapped by the NHD appeared generally consistent with those visible on the USGS maps and aerial photography.

## PROBABILITY ANALYSIS

ERM used a stepwise process to identify probable wetland areas along the proposed routes, as follows:

- Infrared and natural color aerial photography was used in conjunction with topographic maps and soils maps to identify potential wetland areas. Boundaries were assigned to the areas that appeared to exhibit wetland signatures based on this review and a cover type was determined based on aerial photo interpretation. For the purpose of the study, these areas are referred to as Interpreted Wetlands.
- To further determine the probability of a wetland occurring within a given location, the Interpreted Wetland polygon shape files were digitally layered with the NWI mapping and soils information from the SSURGO database.
- The probability of a wetland occurring was assigned based on the number of overlapping data layers (i.e., indicators of potential wetland presence) that occurred in a particular area.

The criteria assigned to each probability are outlined in Table 1.

**TABLE 1: CRITERIA USED TO RANK THE PROBABILITY OF WETLAND OCCURRENCE**

| Probability | Criteria                                                                                                                                                             |
|-------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| High        | Areas where layers of hydric soils, Interpreted Wetlands, and NWI data overlap                                                                                       |
| Medium/High | NWI data overlaps hydric soils; or<br>NWI data overlaps Interpreted Wetlands with or without partially hydric soils; or<br>Hydric soils overlap Interpreted Wetlands |
| Medium      | Interpreted Wetlands with or without overlap by partially hydric soils                                                                                               |
| Medium/Low  | Hydric soils only; or<br>NWI data with or without overlap by partially hydric soils                                                                                  |
| Low         | Partially hydric soils only                                                                                                                                          |
| Very Low    | Non-hydric soils only                                                                                                                                                |

## WETLAND AND WATERBODY CROSSINGS

The desktop analysis provides a probability of wetland and waterbody occurrence within each route, with wetlands classified based on the Cowardin classification system described below:

- Palustrine Emergent (PEM) wetlands – characterized by erect, rooted, herbaceous hydrophytes (i.e., aquatic plants) and woody species less than 3 feet in height, excluding mosses and lichens;



- Palustrine Scrub-Shrub (PSS) wetlands – characterized by woody vegetation, excluding woody vines, approximately 3 to 20 feet in height;
- Palustrine Forested (PFO) wetlands – characterized by woody vegetation, excluding woody vines, approximately 20 feet or more in height and 3 in. or larger diameter at breast height (DBH);
- Palustrine Unconsolidated Bottom (PUB) open waters – characterized by bottom substrate particles smaller than stones (less than 10 inches) covering greater than 25 percent of the area, with plants covering less than 30 percent of the area; and
- Riverine streams – within a channel, with two exceptions: (1) wetlands dominated by trees, shrubs, persistent emergent, emergent mosses, or lichens, and (2) habitats with water containing ocean-derived salts in excess of 0.5%. (USFWS 2013).

As stated above, field delineations were not performed and would be required to verify the accuracy and extent of aquatic resource boundaries. A range of wetland occurrence probabilities are reported by this study from very low to high. The probability of wetland occurrence increases as multiple indicators begin to overlap towards the “high” end of the spectrum. The medium, medium-high, and high probability categories are the most reliable representation of in-situ conditions, due to overlapping data sets, and these categories are reported in the summary below as a percentage of the total acreage of each route. Attachment 2 depicts the interpreted wetlands displayed on color base map images.

## RESULTS

Results of the probability analysis are presented in Table 2 below. Summaries are provided in the sections following the table. No wetlands were identified using the desktop methodology within the footprint of the proposed Nebula Switching Station.

**TABLE 2: SUMMARY OF THE PROBABILITIES OF WETLAND AND WATERBODY OCCURRENCE ALONG THE ROUTE ALTERNATIVES <sup>A,B,C</sup>**

| Probability        | Total Within Right-of-way (acres) <sup>b</sup> | Wetland and Waterbody type (acres) |                |                   |                       |                   |
|--------------------|------------------------------------------------|------------------------------------|----------------|-------------------|-----------------------|-------------------|
|                    |                                                | PEM (Emergent)                     | PFO (Forested) | PSS (Scrub-Shrub) | PUB (Freshwater pond) | Riverine (Stream) |
| Cloud-Nebula Route |                                                |                                    |                |                   |                       |                   |
| High               | NA                                             | NA                                 | NA             | NA                | NA                    | NA                |
| Medium/High        | 0.0                                            | NA                                 | 0.0            | NA                | NA                    | 0.0               |

| Probability | Total Within Right-of-way (acres) <sup>b</sup> | Wetland and Waterbody type (acres) |                |                   |                       |                   |
|-------------|------------------------------------------------|------------------------------------|----------------|-------------------|-----------------------|-------------------|
|             |                                                | PEM (Emergent)                     | PFO (Forested) | PSS (Scrub-Shrub) | PUB (Freshwater pond) | Riverine (Stream) |
| Medium      | 0.6                                            | 0.2                                | 0.4            | NA                | NA                    | 0.0               |
| Medium/Low  | NA                                             | NA                                 | NA             | NA                | NA                    | NA                |
| Low         | NA                                             | NA                                 | NA             | NA                | NA                    | NA                |
| Very Low    | NA                                             | NA                                 | NA             | NA                | NA                    | NA                |

**Nebula-Raines Lines**
*Nebula-Raines Route 1*

|             |      |     |     |    |     |     |
|-------------|------|-----|-----|----|-----|-----|
| High        | 2.9  | 0.0 | 2.5 | NA | 0.1 | 0.3 |
| Medium/High | 4.7  | 0.4 | 4.0 | NA | 0.1 | 0.2 |
| Medium      | 10.3 | NA  | 9.5 | NA | 0.0 | 0.8 |
| Medium/Low  | 0.6  | NA  | 0.3 | NA | 0.1 | 0.2 |
| Low         | NA   | NA  | NA  | NA | NA  | NA  |
| Very Low    | NA   | NA  | NA  | NA | NA  | NA  |

*Nebula-Raines Route 3*

|             |     |     |     |     |     |     |
|-------------|-----|-----|-----|-----|-----|-----|
| High        | 4.5 | 0.0 | 3.8 | NA  | 0.3 | 0.4 |
| Medium/High | 9.1 | 0.4 | 7.8 | 0.3 | 0.2 | 0.4 |
| Medium      | 5.9 | 0.0 | 5.3 | NA  | 0.3 | 0.3 |
| Medium/Low  | 2.1 | NA  | 1.8 | NA  | 0.1 | 0.2 |
| Low         | NA  | NA  | NA  | NA  | NA  | NA  |
| Very Low    | NA  | NA  | NA  | NA  | NA  | NA  |

*Nebula-Raines Route 4*

|             |     |     |     |     |     |     |
|-------------|-----|-----|-----|-----|-----|-----|
| High        | 5.7 | 0.0 | 5.1 | NA  | 0.3 | 0.4 |
| Medium/High | 8.9 | 0.4 | 7.6 | 0.3 | 0.2 | 0.4 |
| Medium      | 5.2 | 0.0 | 4.6 | NA  | 0.3 | 0.3 |
| Medium/Low  | 1.9 | NA  | 1.7 | NA  | 0.1 | 0.1 |
| Low         | NA  | NA  | NA  | NA  | NA  | NA  |

| Probability                  | Total Within Right-of-way (acres) <sup>b</sup> | Wetland and Waterbody type (acres) |                |                   |                       |                   |
|------------------------------|------------------------------------------------|------------------------------------|----------------|-------------------|-----------------------|-------------------|
|                              |                                                | PEM (Emergent)                     | PFO (Forested) | PSS (Scrub-Shrub) | PUB (Freshwater pond) | Riverine (Stream) |
| Very Low                     | NA                                             | NA                                 | NA             | NA                | NA                    | NA                |
| <i>Nebula-Raines Route 5</i> |                                                |                                    |                |                   |                       |                   |
| High                         | 3.4                                            | NA                                 | 2.7            | NA                | 0.4                   | 0.3               |
| Medium/High                  | 7.2                                            | 0.1                                | 5.8            | 0.0               | 0.9                   | 0.5               |
| Medium                       | 11.8                                           | 2.6                                | 7.4            | 0.5               | 0.9                   | 0.5               |
| Medium/Low                   | 1.8                                            | NA                                 | 0.9            | 0.3               | 0.1                   | 0.5               |
| Low                          | NA                                             | NA                                 | NA             | NA                | NA                    | NA                |
| Very Low                     | NA                                             | NA                                 | NA             | NA                | NA                    | NA                |

NA: Not applicable due to absence of wetland or waterbody type within the alternative route

a Numbers in this table have been rounded for presentation purposes; as a result, the totals may not reflect the sum of the addends.

b Total acres may not total the sum of wetland and waterbody types because some of the lower probability rankings do not overlap with NWI or interpreted wetlands, and therefore do not have a wetland/waterbody type associated with them.

c NA: Not applicable due to absence of a wetland type within the Project footprint; 0.0 indicates less than 0.05 acre of the wetland is present.

## WETLAND CROSSINGS

### CLOUD-NEBULA ROUTE

The length of the corridor for Cloud-Nebula Route is approximately 0.9 miles and encompasses a total of approximately 10.8 acres. Based on the methodology discussed above, the right-of-way footprint will encompass approximately 6.2 percent (0.7 acres) of land with a medium or higher probability of containing wetlands and waterbodies. Of these 0.7 acre of wetlands, 0.4 acre consist of PFO wetlands, 0.2 acre consist of PEM wetlands, and less than 0.1 acre consist of riverine features.

### NEBULA-RAINES ROUTE ALTERNATIVES

The Nebula-Raines Route Alternatives discussed below include the 11.3-acre proposed Nebula Switching Station Footprint. Based on the methodology discussed above, the proposed switching station footprint did not contain wetlands or waterbodies.

**Route Alternative 1**

The length of the corridor for Route Alternative 1 is approximately 15.4 miles and encompasses a total of approximately 197.6 acres (including the 11.3-acre proposed Nebula Switching Station footprint). Based on the methodology discussed above, the right-of-way footprint will encompass approximately 9.1 percent (17.9 acres) of land with a medium or higher probability of containing wetlands and waterbodies. These 17.9 acres consist of 16.1 acre of PFO wetlands, 0.4 acre of PEM wetlands, 0.2 acre of PUB open water features, and 1.3 acre of riverine features.

**Route Alternative 3**

The length of the corridor for this Nebula-Raines Route 3 is approximately 14.9 miles and encompasses a total of approximately 192.0 acres (including the 11.3-acre proposed Nebula Switching Station footprint). Based on the methodology discussed above, the right-of-way footprint will encompass approximately 10.2 percent (19.5 acres) of land with a medium or higher probability of containing wetlands and waterbodies. These 19.5 acres consist of 16.9 acres of PFO wetlands, 0.3 acre of PSS wetlands, 0.3 acre of PSS wetlands, 0.5 acre of PEM wetlands, 0.8 acre of PUB open water features, and 1.1 acre of riverine features.

**Route Alternative 4**

The length of the corridor for Nebula-Raines Route 4 is approximately 15.0 miles and encompasses a total of approximately 192.3 acres (including the 11.3-acre proposed Nebula Switching Station footprint). Based on the methodology discussed above, the right-of-way footprint will encompass approximately 10.3 percent (19.8 acres) of land with a medium or higher probability of containing wetlands and waterbodies. These 19.8 acres consist of 17.3 acres of PFO wetlands, 0.3 acre of PSS wetlands, 0.5 acre of PEM wetlands, 0.8 acre of PUB open water features, and 1.0 acre of riverine features.

**Route Alternative 5**

The length of the corridor for Nebula-Raines Route 5 is approximately 14.4 miles and encompasses a total of approximately 185.2 acres (including the 11.3-acre proposed Nebula Switching Station footprint). Based on the methodology discussed above, the right-of-way footprint will encompass approximately 12.2 percent (22.5 acres) of land with a medium or higher probability of containing wetlands and waterbodies. These 22.5 acres consist of 15.8 acres of PFO wetlands, 0.6 acre of PSS wetlands, 2.6 acres of PEM wetlands, 2.2 acres of PUB open water features, and 1.3 acres of riverine features.

**WATERBODY CROSSINGS**

ERM identified and mapped waterbodies in the study area using similar publicly available GIS databases as those used to identify and map wetlands. Waterbodies crossed by the Cloud to Raines Route and the Nebula-Raines route alternatives include the Perennial Flat Creek,

Dockery Creek, Little Miles Creek, Miles Creek, Cox Creek, Allen Creek, Mines Creek, Long Branch and Reedy Branch, Coleman Creek, several unnamed, intermittent tributaries to these waterbodies, and multiple open waterbody features (stormwater ponds and impoundments). No waterbodies were identified within the Proposed Nebula Switching Station footprint.

**TABLE 2: WATERBODIES CROSSED BY THE ROUTES AND ROUTE VARIATIONS**

| Waterbodies Crossed         | Unit   | Cloud-Nebula Route | Nebula-Raines Route 1 | Nebula-Raines Route 3 | Nebula-Raines Route 4 | Nebula-Raines Route 5 |
|-----------------------------|--------|--------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| <b>Total</b>                | Number | 1                  | 26                    | 25                    | 25                    | 31                    |
| Perennial Streams/Rivers    | Number | 0                  | 10                    | 8                     | 8                     | 8                     |
| Intermittent Streams/Rivers | Number | 1                  | 15                    | 15                    | 15                    | 20                    |
| Perennial Lakes/Ponds       | Number | 0                  | 1                     | 2                     | 2                     | 3                     |

Source: NHD (USGS 2024)

### CLOUD-NEBULA ROUTE

Based on the NHD and the methodology discussed above, the Cloud-Nebula Route crosses one NHD-mapped, unnamed, intermittent tributary to Coleman Creek that is mapped by the NHD. Based on ERM's desktop wetland and waterbody analysis, the right-of-way for Cloud-Nebula Route 1 would encompass approximately less than 0.1 acre of riverine features.

### NEBULA-RAINES ROUTE ALTERNATIVES

#### Route Alternative 1

Route Alternative 1 would have a total of 26 waterbodies that are mapped by the NHD, including 11 perennial waterbodies (Flat Creek, Dockery Creek, Allen Creek, Miles Creek, Cox Creek, five unnamed tributaries, and one lake/pond), and 15 unnamed, intermittent streams. Based on the methodology described above, the right-of-way for Route Alternative 1 would encompass approximately 0.2 acre of PUB open water features and 1.3 acres of riverine features.

#### Route Alternative 3

Route Alternative 3 would have a total of 25 waterbodies that are mapped by the NHD, including 10 perennial waterbodies (Perennial Flat Creek, Dockery Creek, Miles Creek, Cox Creek, Allen Creek, four unnamed tributaries, and two lake/ponds), and 15 unnamed, intermittent streams. Based on the methodology described above, the right-of-way for Route

Alternative 3 would encompass approximately 0.8 acre of PUB open water features and 1.1 acre of riverine features.

#### **Route Alternative 4**

Route Alternative 4 would have a total of 25 waterbodies that are mapped by the NHD, including 10 perennial waterbodies (Perennial Miles Creek, Cox Creek, Allen Creek, Flat Creek, Dockery Creek, three unnamed tributaries, and two lake/ponds), and 15 unnamed, intermittent streams. Based on the methodology described above, the right-of-way for Route 4 would encompass approximately 0.8 acre of PUB open water features and 1.0 acre of riverine features.

#### **Route Alternative 5**

Route Alternative 5 would have a total of 31 waterbodies that are mapped by the NHD, including 11 perennial waterbodies (Perennial Flat Creek, Long Branch, Dockery Creek, Reedy Branch, Miles Creek, Cox Creek, Allen Creek, one unnamed tributary, and three unnamed lake/ponds), and 20 unnamed, intermittent streams. Based on the methodology described above, the right-of-way for Route Alternative 5 would encompass approximately 2.2 acres of PUB open water features and 1.3 acres of riverine features.

### **PROJECT IMPACTS**

Avoiding or minimizing new impacts on wetlands and streams was among the criteria used in developing routes for the Project. To minimize impacts on wetland areas, the transmission lines have been designed to span or avoid wetlands and waterbodies where possible, keeping transmission structures outside of aquatic resources to the extent practicable.

The majority of potential direct impacts on wetlands due to Project construction, would be temporary in nature. Mats would be used for construction equipment to travel over wetlands, as appropriate. Due to the absence of an existing right-of-way, some new access roads may be necessary along the route. If a section of line cannot be accessed from existing roads, Dominion Energy Virginia may need to install a culvert, ford, or temporary bridge along the right-of-way to cross small streams. In such cases, some temporary fill material in wetlands adjacent to such crossings may be required. This fill would be placed on erosion control fabric and removed when work is completed, returning ground elevations to original contours. When siting transmission lines, perpendicular crossings of wetland systems are prioritized to minimize direct impacts to these sensitive areas and reduce overall impacts to the watershed.

Permanent direct impacts to wetlands would be limited to placement of structures within wetlands, if unavoidable, and, due to the necessity of removing trees and shrubby vegetation from the right-of-way, the permanent conversion of PSS/PFO wetlands to PSS or PEM type wetlands.

No change in contours of wetlands and waterbodies, or redirection of the flow of water, is anticipated and the amount of spoil from foundation and structure placement would be minimal. Excess spoil in wetlands generated through foundation construction would be controlled through construction best management practices (e.g., the implementation erosion and sediment controls).

Required tree removal adjacent to waterbodies would reduce riparian buffer functions such as stream bank stabilization and erosion control, nutrient and sediment filtration, floodwater storage and peak flow reduction, habitat diversity, and water temperature modification from shading. Where the removal of trees or shrubby vegetation occurs within wetlands, Dominion Energy Virginia would use the least intrusive method reasonably possible to clear the corridor. Within the stream buffers (100 feet), and as needed to minimize impacts to wetlands, trees and vegetation will be hand felled and stumps left in place to reduce the potential for erosion. Shrubs and trees with a diameter at breast height of less than three inches will be left in place unless it impedes temporary access where they would be clipped, leaving roots in place which will be able to naturally regenerate. Vegetation within the right-of-way would be allowed to return to maintained grasses and shrubs after construction, which would provide some filtration stabilization to help protect waterbodies from pollutants.

## SUMMARY

This Wetland and Waterbody Summary report was prepared in accordance with the Memorandum of Agreement between the DEQ and the SCC for the purpose of initiating a Wetlands Impact Consultation. Please note that a formal onsite wetland delineation was not conducted as part of this review.

In addition, there is a Project website where the SCC application will be available after filing, as well as maps and discussions about the Project. It can be accessed by going to: <https://www.dominionenergy.com/projects-and-facilities/electric-projects/power-line-projects/nebula-raines>.

If you have any questions regarding this wetland assessment, please contact me at 857-302-6502 or by email at [jake.bartha@erm.com](mailto:jake.bartha@erm.com).

Sincerely,

Jake Bartha  
Environmental Resources Management

cc: James Young, Dominion Energy Virginia

Enclosures: Attachments 1 and 2

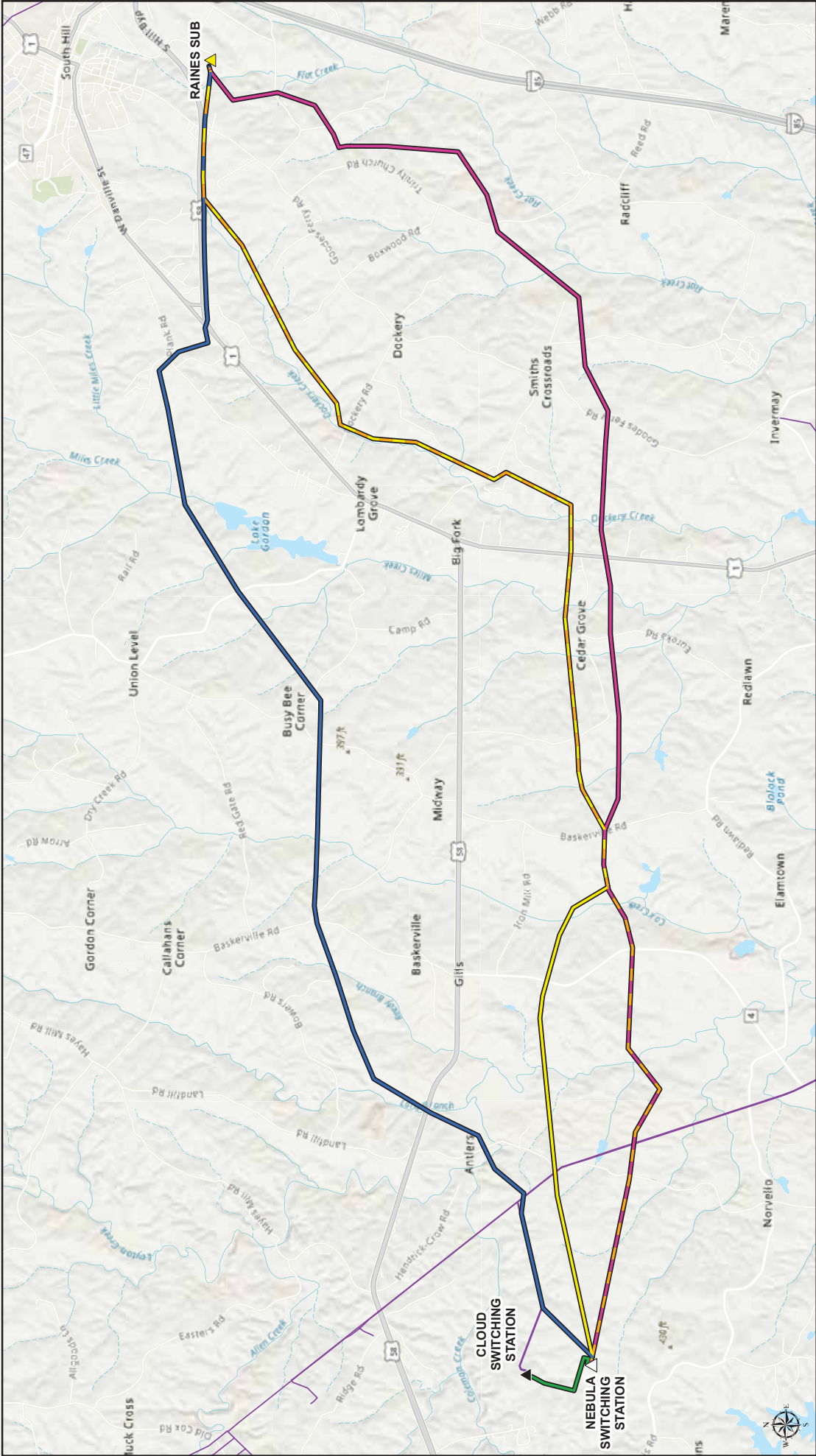
## REFERENCES

- Environmental Laboratory. 1987. Technical Report Y-87-1: Corps of Engineers Wetlands Delineation Manual US Army Corps of Engineers, Waterways Experiment Station. January 1987.
- Environmental Laboratory. 2012. Interim Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Eastern Mountains and Piedmont Region. Prepared for U.S. Army Corps of Engineers Wetlands Regulatory Assistance Program. ERDC/EL TR-12-9. Accessed October 2023.
- ESRI, Airbus, USGS, NGA, NASA, CGIAR, NLS, OS, NMA, Geodatastyrelsen, GSA, GSI and the GIS User Community. 2024. World Elevation Terrain. Available online at: <https://elevation.arcgis.com/arcgis/rest/services/WorldElevation/Terrain/ImageServer>. Accessed January 2024.
- Google Earth LLC. 2024. Google Earth Pro, Version 7.3.6.9796 (64-bit). Historic Aerial Imagery in Virginia, United States. Accessed June 2024.
- Mecklenburg County GIS. 2024. Mecklenburg County GIS Webmap. Accessed June 2024. Available online at: <https://meck.southsidegis.org/>. Accessed June 2024.
- NAIP (National Agricultural Imagery Program). 2023. Aerial imagery flown over Mecklenburg County, Virginia October 24, 2023. Available online at: <https://naip-usdaonline.hub.arcgis.com/>. Accessed June 2024.
- National Agricultural Imagery Program (NAIP). 2024. USA NAIP Imagery: Natural Color. Available online at: <https://naip-usdaonline.hub.arcgis.com/>. Accessed June 2024.
- National Agricultural Imagery Program (NAIP). 2024a. USA NAIP Imagery: Color Infrared. Available online at: <https://naip-usdaonline.hub.arcgis.com/>. Accessed June 2024.
- United States Department of Agriculture, Natural Resource Conservation (USDA-NRCS). 2023. Soil Survey Geographic Data (SSURGO). Available online at [https://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/survey/?cid=nrcs142p2\\_053627](https://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/survey/?cid=nrcs142p2_053627). Accessed August 2024.
- USFWS (U.S. Fish and Wildlife Service). 2013. *Classification of Wetlands and Deepwater Habitats of the United States*. Available online at: <https://www.fws.gov/program/national-wetlands-inventory/classification-codes>. Accessed June 2024.
- USFWS (U.S. Fish and Wildlife Service). 2023. *National Wetlands Inventory*. Available online at: <http://www.fws.gov/wetlands/>. 2024. National Wetlands Inventory. Available online at: <http://www.fws.gov/wetlands/>. Accessed August 2024.



USGS (U.S. Geological Survey). 2024. *The National Hydrography Dataset Plus High Resolution*. Accessed: August 2024. Retrieved from:  
<https://hydro.nationalmap.gov/arcgis/rest/services/nhd/MapServer>.

## ATTACHMENT 1





Project Location

Existing Switching Station

Future Substation

Proposed Switching Station

Existing Dominion Transmission Lines

Cloud-Nebula Route

Nebula-Raines Route 1

Nebula-Raines Route 3

Nebula-Raines Route 4

Nebula-Raines Route 5

Attachment 1  
Overview Map

Cloud-Nebula-Raines 230 kV Transmission Line Project

Dominion Energy Virginia  
Mecklenburg County, Virginia

ERM

0 0.5 1 Miles

1:56,000

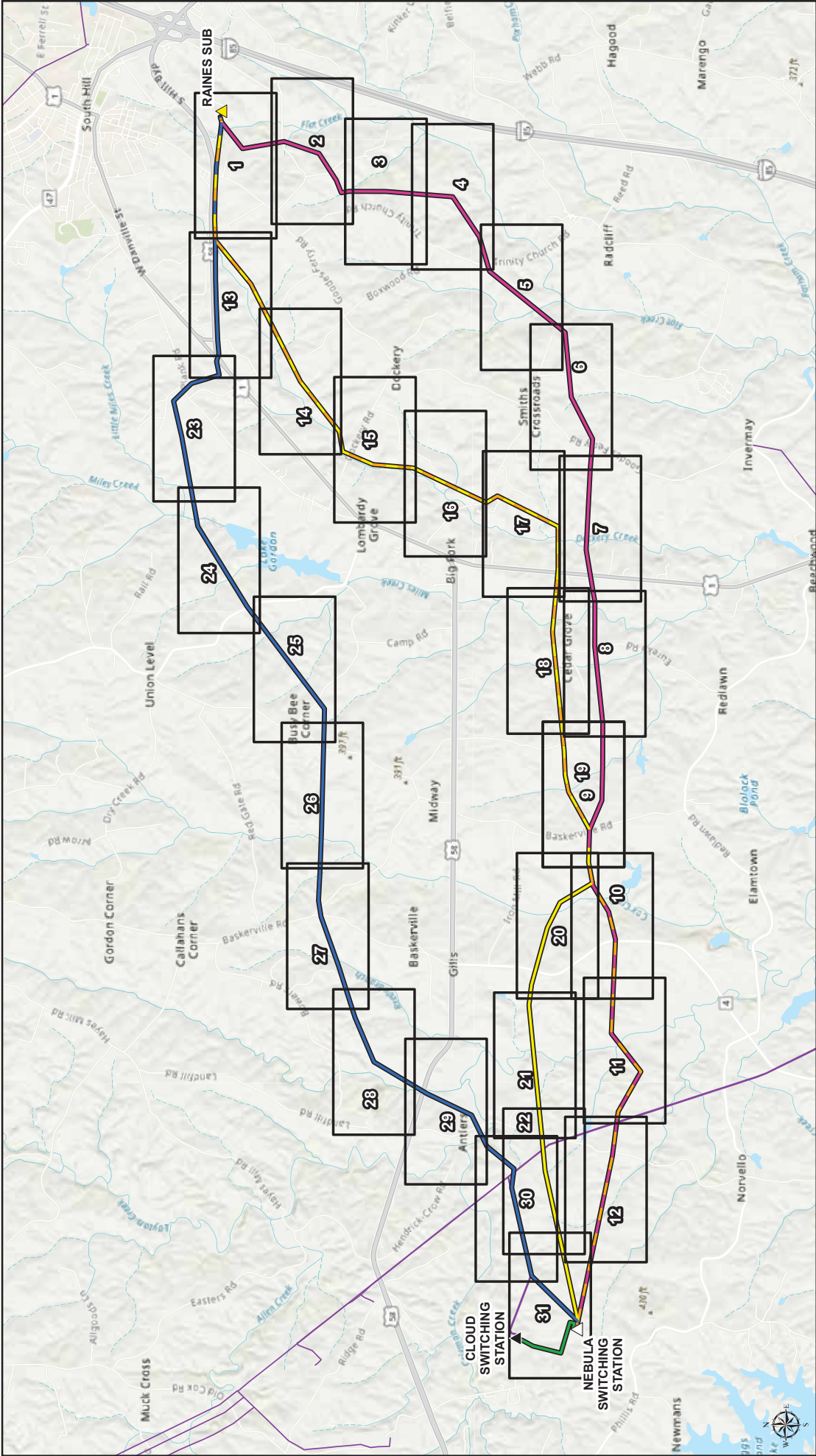


222 South 9<sup>th</sup> Street  
Suite 2900  
Minneapolis, Minnesota 55402

T +0 804 253 1090  
F +0 804 253 1091

**erm.com**

## ATTACHMENT 2



Page 0

**Attachment 2**

**Wetland Probability Map Set - Index**

**Cloud-Nebula-Raines 230 kV Transmission Line Project**

Dominion Energy Virginia  
Mecklenburg County, Virginia

**ERM**



0 0.5 1  
Miles

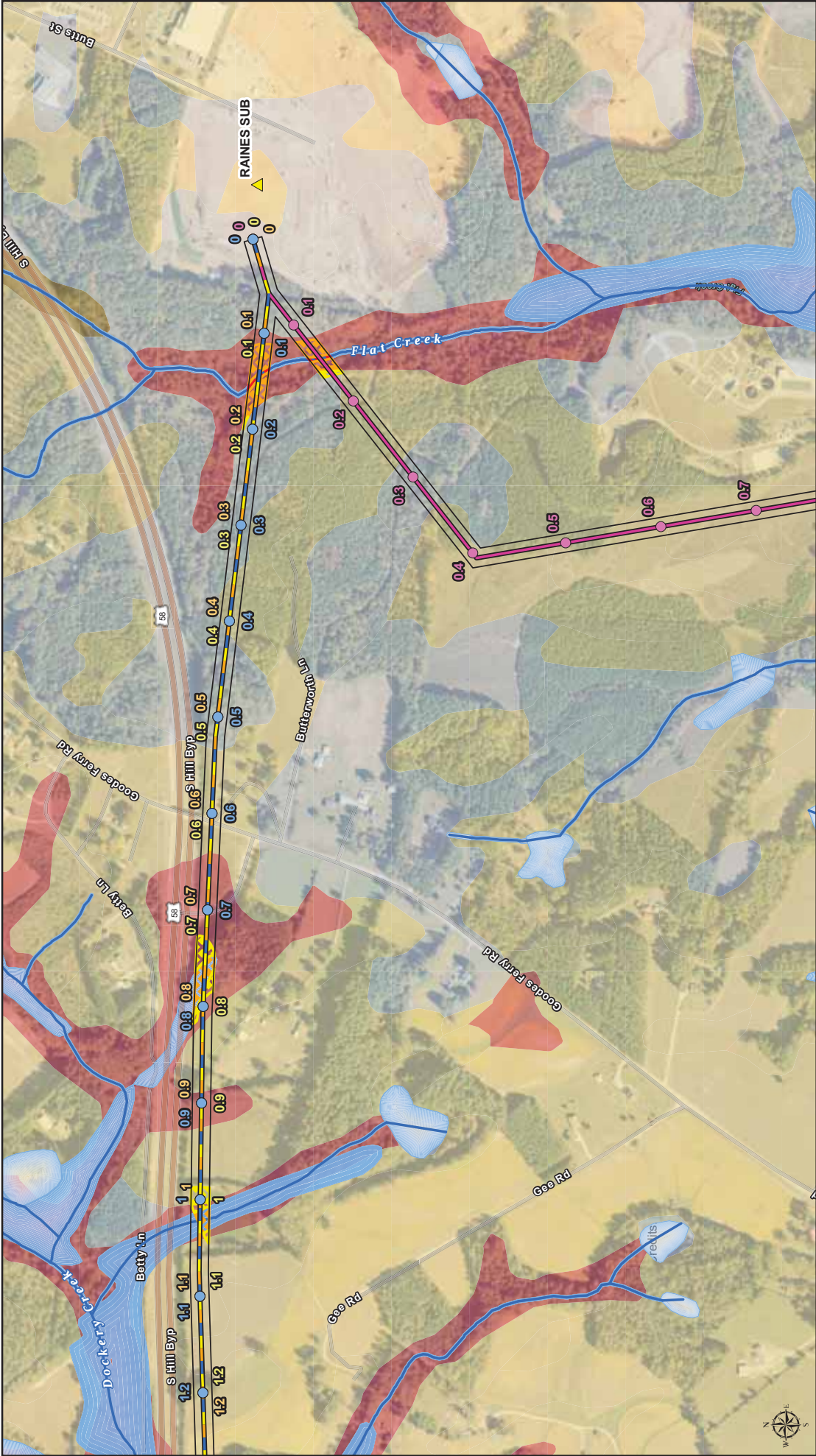
1:60,000

▲ Existing Switching Station  
▲ Future Substation  
▲ Proposed Switching Station  
— Existing Dominion Transmission Lines  
— Cloud-Nebula Route

1 Nebula-Raines Route 1  
3 Nebula-Raines Route 3  
4 Nebula-Raines Route 4  
5 Nebula-Raines Route 5  
Index Page

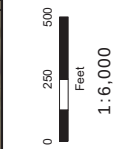






# Attachment 2 Wetland Probability Map Set - Probability Cloud-Nebula-Raines 230 kV Transmission Line Project

Dominion Energy Virginia  
Mecklenburg County, Virginia

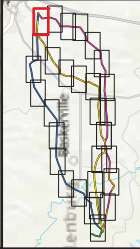


- Wetland**
- NWI Wetland
  - Nonhydryc
  - Predominantly nonhydryc
  - Partially hydryc
  - Predominantly hydryc

- Wetland Probability**
- High
  - Medium/High
  - Medium
  - NHD Stream

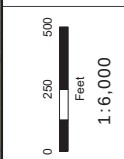
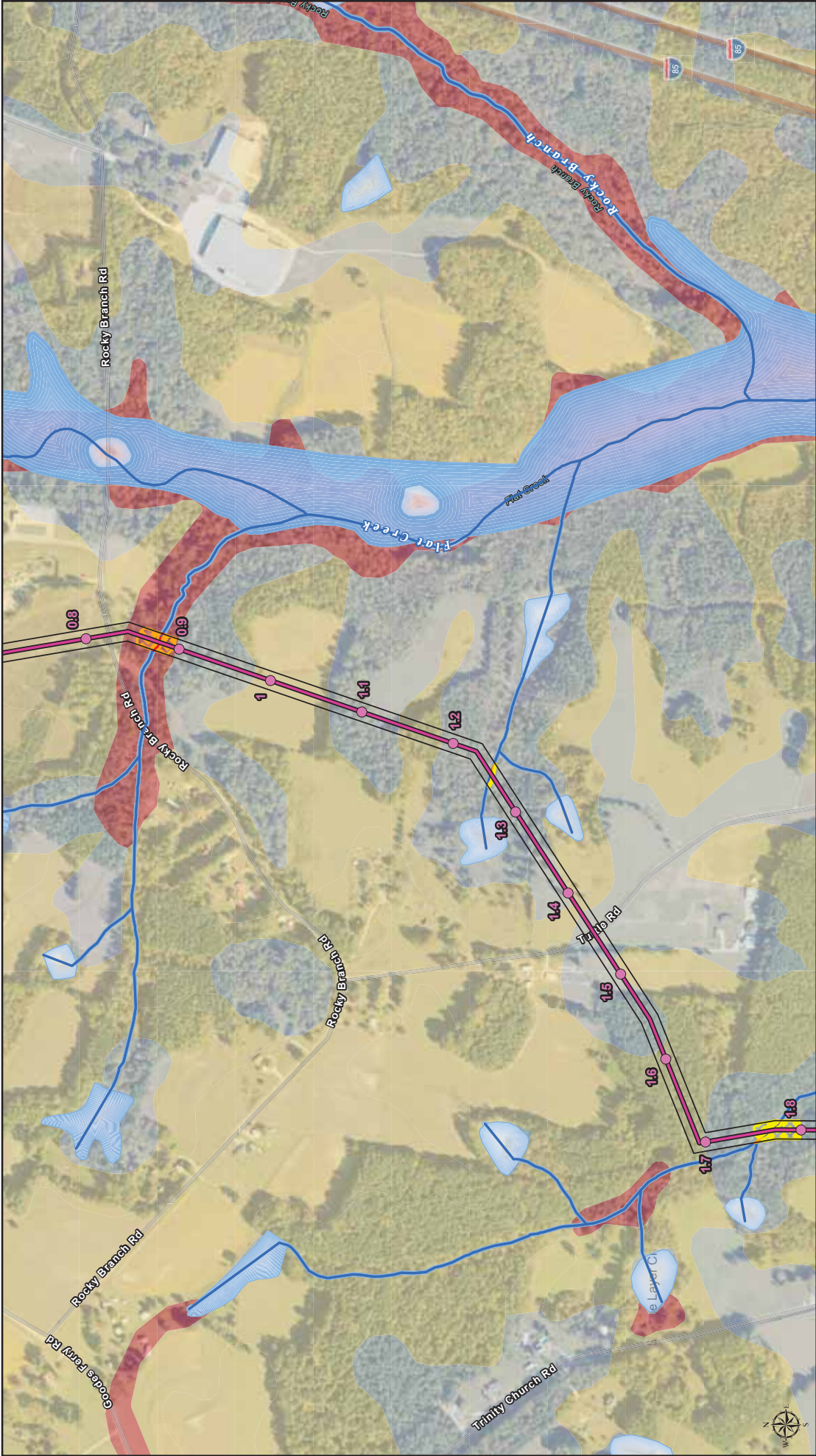
- Future Substation**
- Nebula-Raines Route 1
  - Nebula-Raines Route 3
  - Nebula-Raines Route 4
  - Nebula-Raines Route 5

- Future Substation**
- Nebula-Raines Route 1 MP
  - Nebula-Raines Route 3 MP
  - Nebula-Raines Route 4 MP
  - Nebula-Raines Route 5 MP



Note: All route Rights-of-Way are 100-foot wide

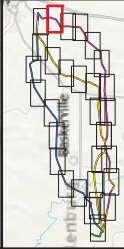




- Nonhydryc
- Predominantly nonhydryc
- Predominantly hydryc

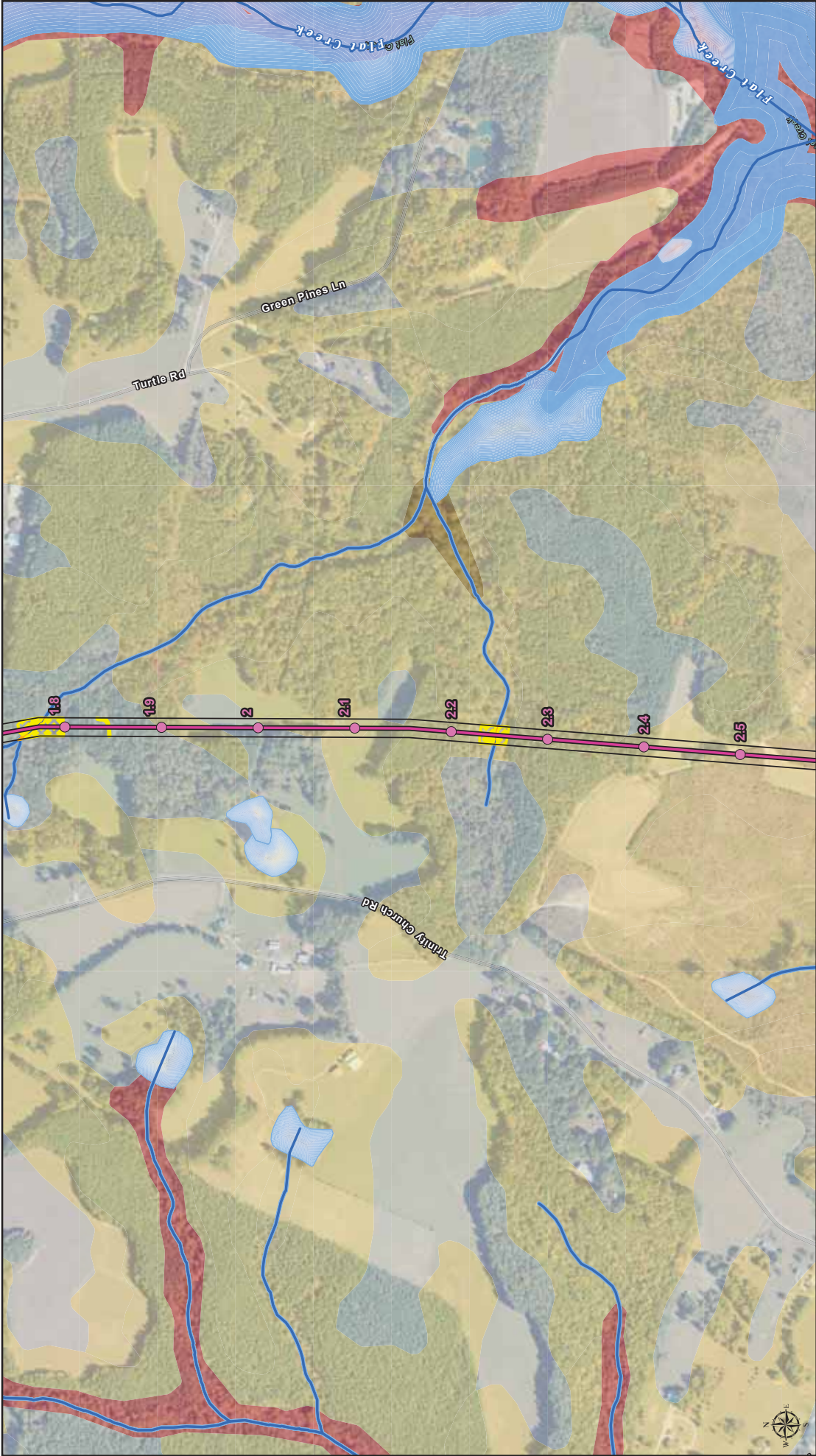
- Medium/High
- Medium
- NHD Stream
- NWI Wetland

- Nebula-Raines Route 1 MP
- Nebula-Raines Route 1
- Wetland Probability
- High

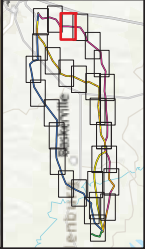
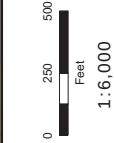


Note: All route Rights-of-Way are 100-foot wide



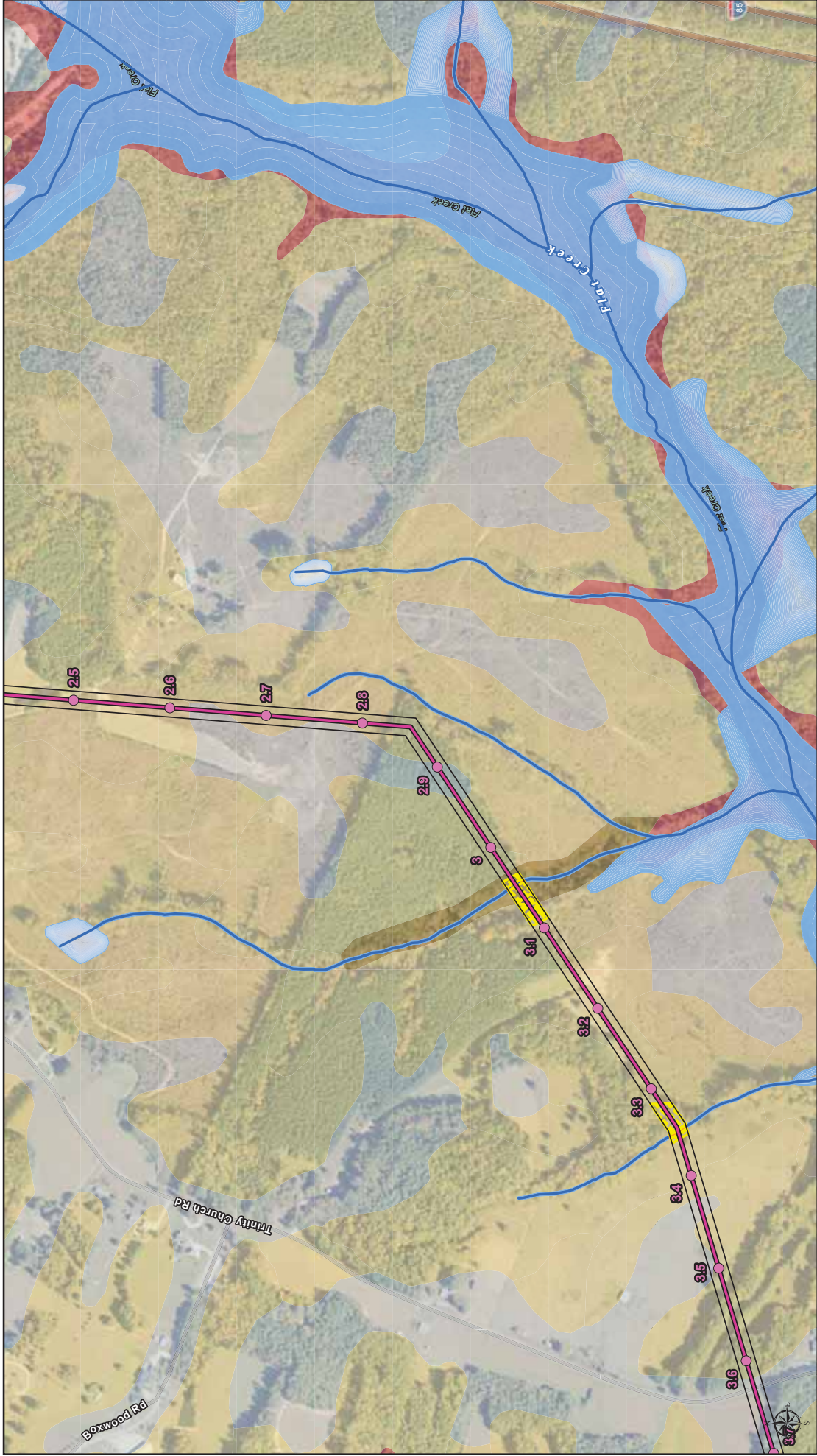


- Nebula-Raines Route 1 MP
- ▬ Nebula-Raines Route 1
- ▬ Wetland Probability
- ▬ Medium/High
- ▬ Medium
- ▬ NHD Stream
- ▬ NWI Wetland
- ▬ Nonhydryc
- ▬ Predominantly nonhydryc
- ▬ Partially hydryc
- ▬ Predominantly hydryc



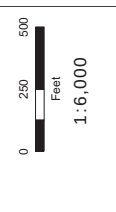
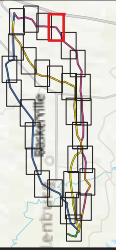
Note: All route Rights-of-Way are 100-foot wide





ERM

Attachment 2  
Wetland Probability Map Set - Probability  
Cloud-Nebula-Raines 230 kV Transmission Line Project  
Dominion Energy Virginia  
Mecklenburg County, Virginia



1:6,000

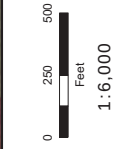
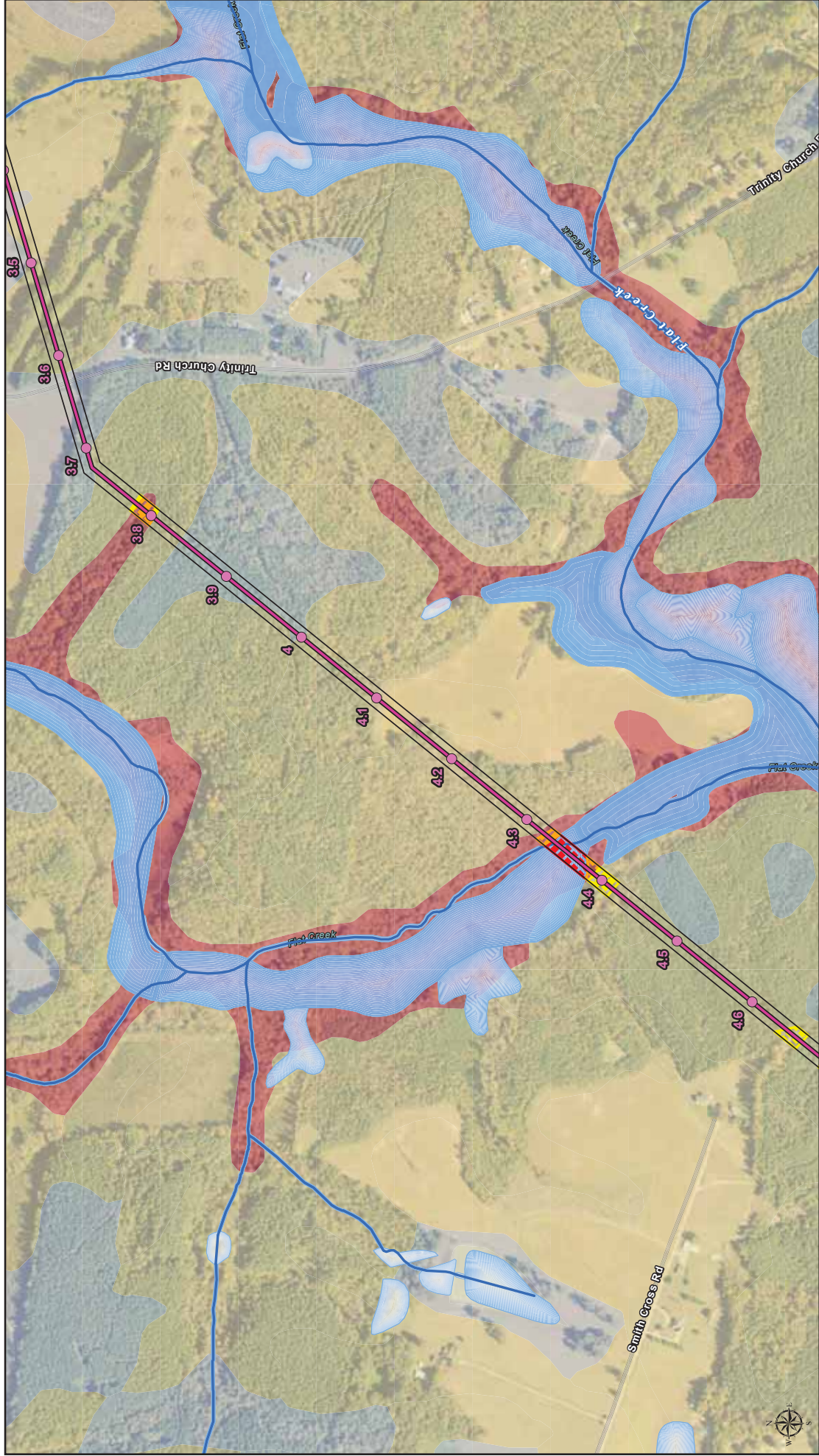
Legend:

- Nebula-Raines Route 1 MP
- ▬ Nebula-Raines Route 1
- ▬ Wetland Probability
- ▬ Medium
- ▬ NHD Stream
- ▬ NWI Wetland
- ▬ Nonhydryc
- ▬ Predominantly nonhydryc
- ▬ Partially hydryc
- ▬ Predominantly hydryc

Note: All route Rights-of-Way are 100-foot wide



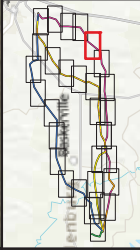




- Nonhydric
- Predominantly nonhydric
- Predominantly hydric

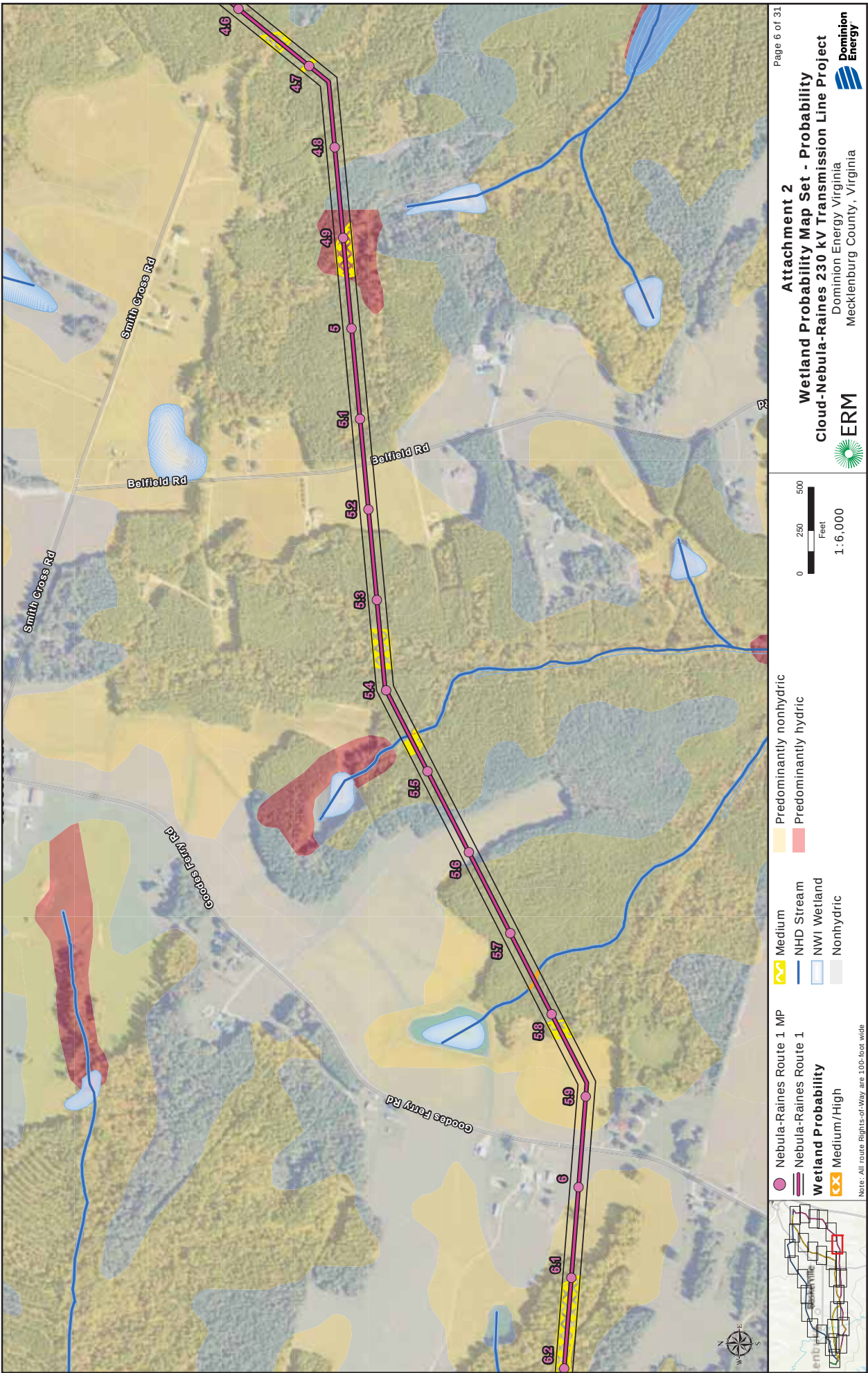
- Medium/High
- Medium
- NHD Stream
- NWI Wetland

- Nebula-Raines Route 1 MP
- Nebula-Raines Route 1
- Wetland Probability
- High

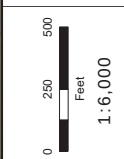
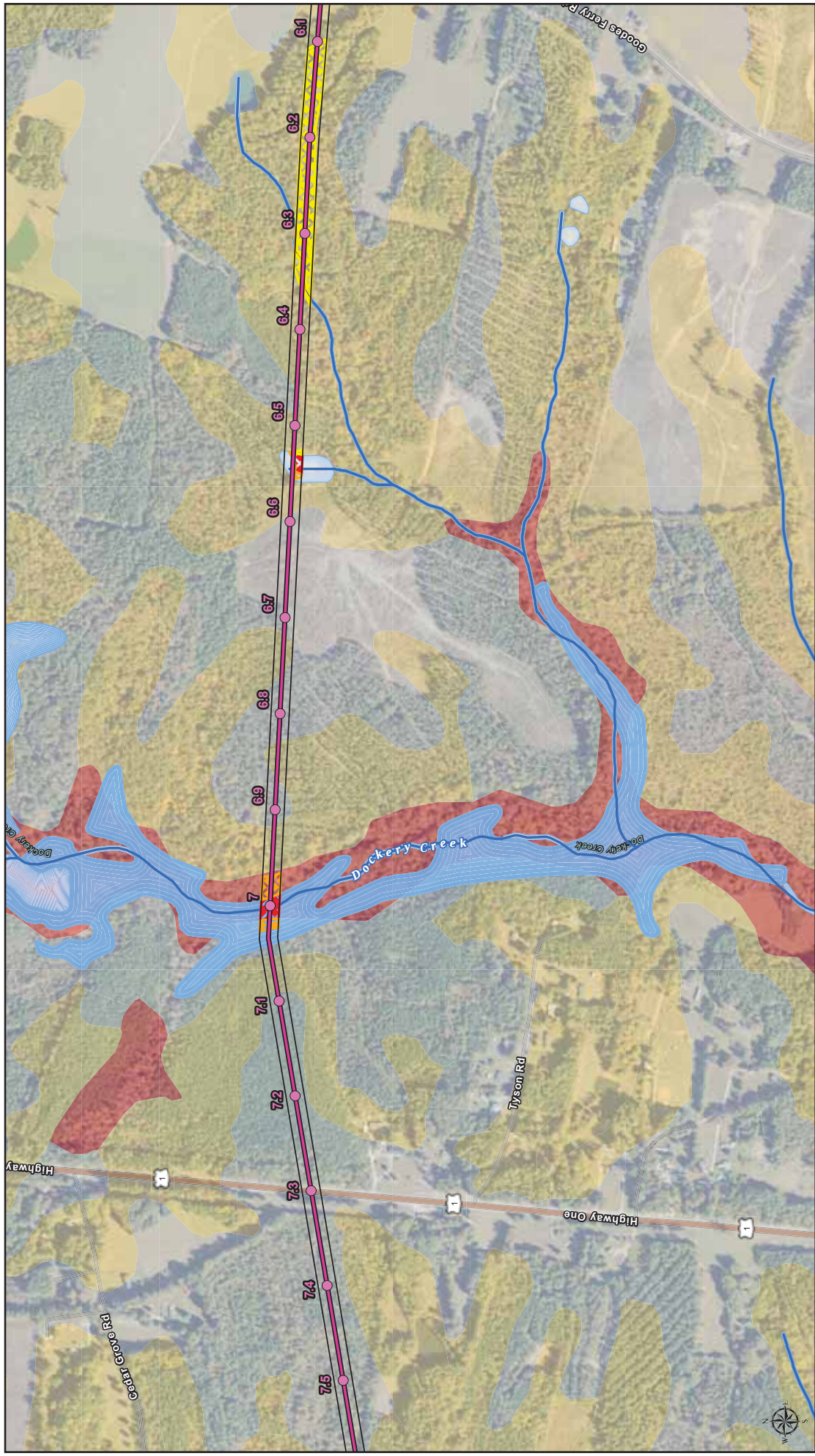


Note: All route Rights-of-Way are 100-foot wide





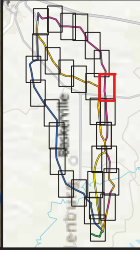




- Nonhydryc
- Predominantly nonhydryc
- Predominantly hydryc

- Medium/High
- Medium
- NHD Stream
- NWI Wetland

- Nebula-Raines Route 1 MP
- Nebula-Raines Route 1
- Wetland Probability
- High



Note: All route Rights-of-Way are 100-foot wide



