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Totals, Question 1, Question 2
Wilmington NE Reliability Project

Total Number of Questionnaires/Comments	Count		
Open House Questionnaires	12		
Comments (email)	2		
Total	**14**		
Question 1			
Which of the following describes you?	**Count**	**Percentage**	
Homeowner/property owner	12	86%	
Business owner	0	0%	
Governmental agency	1	7%	
Other	1	7%	
Total	**14**		
Question 2			
How did you find out about the Project/This Meeting?	**Count**	**Percentage**	
Mailing	9	75%	
Neighbor/Friend	2	17%	
News Release	0	0%	
Internet	1	8%	
Total	**12**		
Comments:			
Comments:			

Question 3 - Factor Rating
Wilmington NE Reliability Project

The routing of a transmission line involves many considerations. From the list of routing factors below, please circle the number corresponding to the level of importance of that factor to you.

Answer Options	Not Important	---	Somewhat Important	---	Most Important	Rating Average	Response Count
Distance from homes/residences	1	1			10	4.42	9
Distance from commercial businesses/future developments	1	1	2	3	4	3.73	8
Distance from public facilities (e.g. schools, parks, churches, cemeteries, etc.)	1	1	4	4	2	3.42	9
Distance from historic/cultural sites	1		6	4	1	3.33	9
Distance from conservation areas	2		3	3	3	3.45	8
Crossing of wetlands, floodplains and streams/rivers	2		3	1	6	3.75	9
Crossing cropland/pastureland	1	1	4	2	3	3.45	8
Crossing forested land		1	2	3	5	4.09	8
Position of new line adjacent to property lines			2	3	5	4.30	7
Position of new line adjacent to roads		1	1	1	6	4.33	6
Position of new line adjacent to other utility corridors	1		3	2	4	3.80	7
Total length of the project (reducing the total cost)	2	1	2	3	2	3.20	7
						answered questions	95
						skipped questions	13

SORTED ANSWERS

Answer Options	Not Important	---	Somewhat Important	---	Most Important	Rating Average	Response Count
Distance from homes/residences	1	1			10	4.42	9
Position of new line adjacent to roads		1	1	1	6	4.33	6
Position of new line adjacent to property lines			2	3	5	4.30	7
Crossing forested land		1	2	3	5	4.09	8
Position of new line adjacent to other utility corridors	1		3	2	4	3.80	7
Crossing of wetlands, floodplains and streams/rivers	2		3	1	6	3.75	9
Distance from commercial businesses/future developments	1	1	2	3	4	3.73	8
Distance from conservation areas	2		3	3	3	3.45	8
Crossing cropland/pastureland	1	1	4	2	3	3.45	8
Distance from public facilities (e.g. schools, parks, churches, cemeteries, etc.)	1	1	4	4	2	3.42	9
Distance from historic/cultural sites	1		6	4	1	3.33	9
Total length of the project (reducing the total cost)	2	1	2	3	2	3.20	7

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Segment Concerns
Wilmington NE Reliability Project

Questionnaire	Segment(s)	Comment
1	none	none
2	6	Health (electric and magnetic fields) and visual (unsightliness)
3	31	Our house, garage, there 26 years - Neighbor has new house and barn in 2018 directly in line; another neighbor preparing to buil
4	31	Running through my house and two barns
5	12 , 17 , 18	Plan for underground
6	31	Building a house right on proposed sesgment. 4005 Ennis Acres Dr.
7	none	none
8	6 , 11 , 12	Behind our home and property, leads to our property
9	6 , 11 , 12	Six goes behind homes on Sidbury (8523) Rd. (relatives and neighbors)
10 (web)	1	Proposed corridor of new power line (shown as line #1) is cutting through my land. The address is 709 Treasure Lane, in my land title described as Ranch 347, Section X, Greenview Ranches.
11 (web)	1 . 6	Segment 1: This segment lies just to the south of a NCDOT's Plantation Road Mitigation Site which protects wetlands and rare savanna species such as the federally endangered Rough leaf loosestrife. Venus flytrap which is considered an at risk species and is currently under review for federal listing and protection also occurs at the Plantation Road Mitigation Site. The USFWS works with NCDOT to manage this property with fire in order to maintain and improve habitat for these species. Segment 6: This segment goes through some areas that are likely to contain longleaf pine savanna. A population of the federally endangered Cooley's meadowrue occurs just east of where the map shows this segment crossing Sidbury Road. While this Natural Heritage Element Occurrence area appears rather small on the biodiversity map it should be noted that there is additional habitat for this species in this area that has not yet been surveyed. Further rare species surveys may indicate that the population is actually larger than currently indicated. Likewise, the section of segment 6 between Farm Road and Sidbury Road likely contains other rare species known to occur in longleaf pine savanna habitat such as Venus flytrap.
12 (web)	2	Segment 2 - appears to cross my property (Parcel 315)

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Additional Comments
Wilmington NE Reliability Project

Questionnaire	Comment
1	none
2	Why does the route go behind the Sidbury Rd. properties when it could go straight from the bend in 6 to the bend in 12, thus not affecting the Sidbury properties at all. It's a shorter distance and would only require Route 11 to change slightly or have a bend in it.
3	Endangered woodpeckers birds and wildlife, esp. following the loss of trees, due to construction and hurricane Florence. Wetland impacted.
4	We have built a farm for a sanctuary and crops. Bees, blueberries, possible mushrooms-permanent residence of animals for our 501c3. We have owned for 2 years. I oppose segment 31. Please consider moving more east.
5	Total area has been previously approved for development.
6	At the beginning of building-the sooner we know the better.
7	none
8	none
9	none
10 (web)	would make the value of the land lesser, not to mention, less possible for me to develop it in the future.
11 (web)	General Recommendations: Several federally protected and at risk species are known from New Hanover and Pender counties including Rough leaf Loosestrife (Lysimachia asperulaefolia), Cooley's meadowrue (Thalictrum cooleyi), Venus flytrap (Dionaea muscipula), Golden sedge (Carex lutea), Red-cockaded woodpecker (Picoides borealis) and Northern long-eared bat (Myotis septentrionalis). A complete list of federally protected and at risk species is available on our office's web page at https://www.fws.gov/raleigh/species/cntylist/nc_counties.html. Click on the counties where the project occurs for a list of species. Where possible, rare species surveys should be conducted in all suitable habitat along the proposed segments. A list of optimal survey windows for listed and at risk plant species can be found at https://www.fws.gov/raleigh/pdfs/Optimal_Survey_Windows_for_listed_plants.pdf. Current Natural Heritage Program data as well as the results of any new surveys should be considered before final decisions are made about the specific locations of power lines. While rare plant species are often occur in power lines, their management is often incompatible with power line maintenance. Many savanna species require fire in order to maintain suitable habitat for the species to survive. Mowing does not provide the same benefit as fire and therefore doesn't support the same species. Vegetation management with herbicides may also destroy rare plant populations.
12 (web)	Website identifies a couple of options for compensating property owners for easement and/or right-of-ways. When will owners be notified.
Email 1	Good morning. My client, Sidbury Property Holdings, LLC (SPH), is the owner of property located at 5505 Sidbury Road. As I understand it, two of the route alternatives for the Wilmington NE Reliability Project would cross over the SPH property (routes 31 and 32). I was made aware of the open house that occurred on January 22nd but unfortunately I was unable to attend. Please allow this email to serve as my client's strenuous objection to route alternatives 31 and 32. As proposed, these two routes will cross over the central portion of his approximately 56 acre tract, causing significant harm to the value to the property and limiting its future use as residential development. In the previous decade, a former owner had proposed a develolpment on the SPH property known as "Charleston Lakes". My understanding is that the preliminary plans for Charleston Lakes were approved by New Hanover County. I also believe that those plans are still on file at the New Hanover County Planning & Development department and are still approved for future use. Although my client does not intend to develop the property at present, he does intend to either develop it himself in the next several years or sell the property to someone else for development purposes. Route alternatives 31 and 32 would substantially harm those plans and cause significant injury to the value of the property. My client is prepared to fight those alternatives if they receive any more consideration other than as "alternatives". I thank you for your time. Please contact me should you have any questions. D. Robert Williams, Jr. Price & Williams, P.A. Attorneys at Law
Email 2	Micah, per our conversation the other day-attached is a map I have "drawn" as best I could to show you the land owned by Mr. Mack aka Seagreen LLC as found in the tax records for New Hanover County. I would like to meet with you as soon as we can next week and I am providing this information to you today in this email in order for it to go on record as soon as possible during your stated comment period, which I recall you said ends February 22; and to incorporate the Seagreen property boundaries as property being impacted by Route 6 on your map. Further to the point, I want to discuss moving the Route 6 westward so as not to impact this land through which the route is currently shown. Mr. and Mrs. Mack recently bought this particular 200 acres of land to preserve it indefinitely as a natural preserve-my words if they can be so used. They have had visits from representatives from the state of North Carolina due to the existence of Venus Fly Traps throughout the property, including this latest acquisition of land now impacted by Route 6. In fact it is my understanding this biologist harvested seeds from the plants to grow them back in Raleigh. I don't have all the details but I will be getting this information to you as soon as possible. Additionally there is a pond with quite a large beaver dam that runs along the northwest portion of the property; more specifically the thin portion coming back to Sidbury Road/top left on the map. You can see the pond. Please let me know some dates/times you can meet next week. Kindest regards, Geoff King, Property manager

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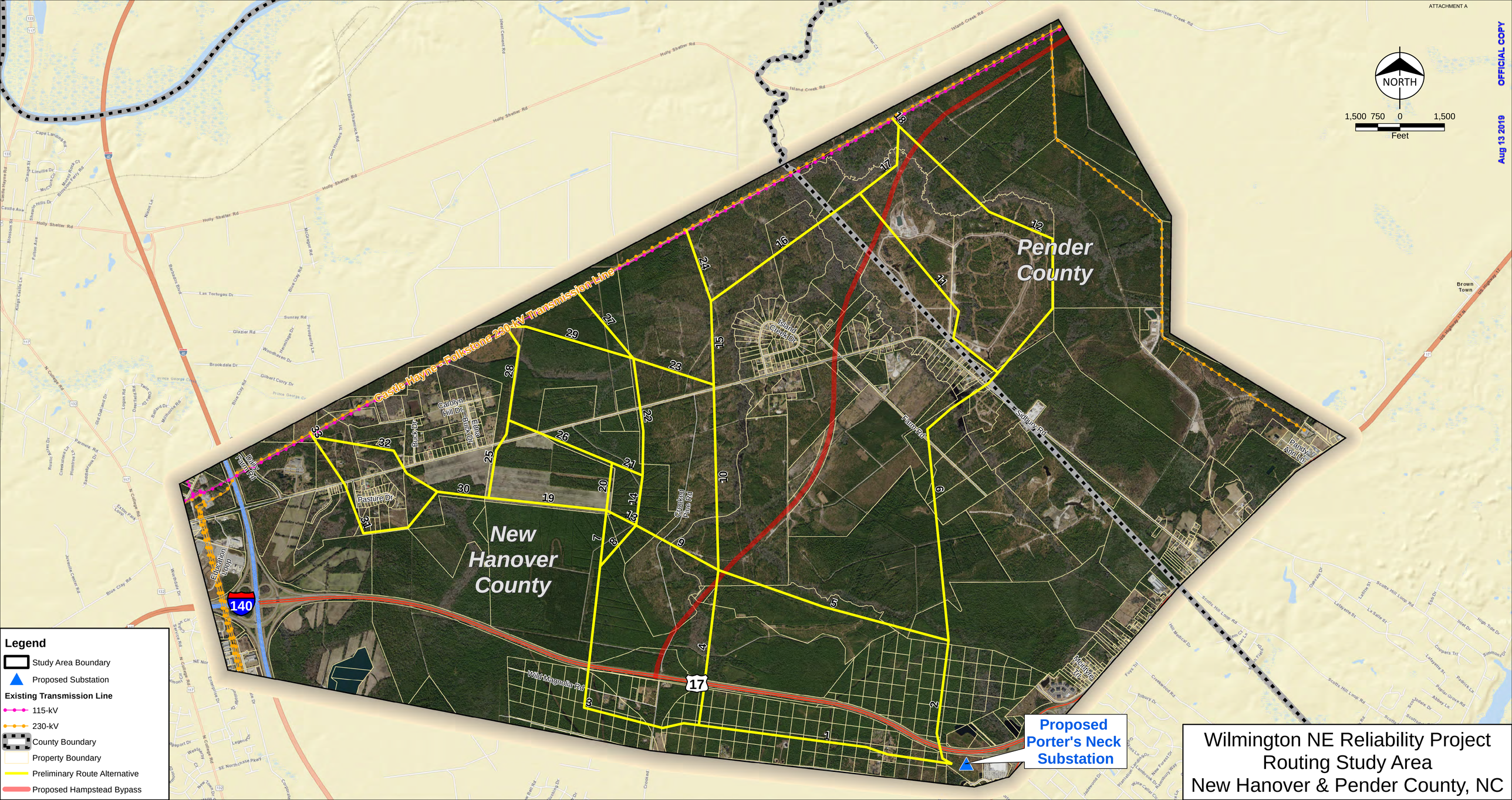
Computer Station Comments
Wilmington NE Reliability Project

Name	CommentType	Notes	StreetAddress	City	State	Zip	RecordedBy	DateCreated
Study Area Open House 1 Comments								
N/A	Development,_Planned	overpass for bypass to start approx. here.	N/A	N/A	N/A	N/A	dwerth	2018-07-26T21:21:28.945Z
BRINKLEY ESTON C KATIE B	Development,_Planned	Approved permitted residential development 42 houses	5730 MARKET ST	WILMINGTON	NC	28405	kwise	2018-07-26T20:31:04.575Z
Cheryl Blanton	Development,_Planned	LHH Holdings - developing for single family residences, including 2 parcels to the south	N/A	N/A	N/A	N/A	kwise	2018-07-26T20:08:24.089Z
Cheryl Blanton	Development,_Planned	New Hampstead Bypass - purchased some property already	N/A	N/A	N/A	N/A	kwise	2018-07-26T20:09:48.801Z
Gale Wallace	Development,_Planned	New hotel, plus retail on two parcel east of this parcel	107 Stokley Dr, Suite 100	Wilmington	NC	28403	kwise	2018-07-26T20:27:19.522Z
Jim Teachey	Development,_Planned	Plans to sell 3 properties to developers	1430 Commonwealth Drive, suite 102	Wilmington	NC	28403	kwise	2018-07-26T20:11:55.431Z
Jim Teachey	Development,_Planned	selling to developers	N/A	N/A	N/A	N/A	kwise	2018-07-26T20:14:09.580Z
Jim Teachey	Development,_Planned	plans to sell to developer	N/A	N/A	N/A	N/A	kwise	2018-07-26T20:14:37.139Z
Jim Teachey	Development,_Planned	Blake Farms Development	N/A	N/A	N/A	N/A	kwise	2018-07-26T20:21:52.804Z
NC DOT	Development,_Planned	Approximate location of hampstead bypass road to connect to 140 https://www.ncdot.gov/projects/us-17-hampstead-bypass/Documents/Overall%20Selected%20Alternative%20Map.pdf	N/A	N/A	N/A	N/A	dwerth	2018-07-26T20:10:39.111Z
PENDER 1164 LLC	Development,_Planned	Planned development with 4500 homes	1202 EASTWOOD RD	WILMINGTON	NC	28403	dwerth	2018-07-26T20:22:59.284Z
PENDER 1164 LLC	Development,_Planned	Planned development with 4500 homes. Blake Farms.	1202 EASTWOOD RD	WILMINGTON	NC	28403	dwerth	2018-07-26T20:23:37.609Z
N/A	Industrial_Use_Areas	Existing Transmission line to be added to database.	N/A	N/A	N/A	N/A	dwerth	2018-07-26T20:17:30.147Z
N/A	Industrial_Use_Areas	Water Treatment plant	N/A	N/A	N/A	N/A	dwerth	2018-07-26T20:22:08.688Z
FINN DUANE MICHAEL CARYL ANN	Residences_and_Residential_Use_Areas	House Concerned about wildlife in the area with all of the woods and the impact of the bypass and the new line. Any impacts to wildlife	8049 SIDBURY RD	WILMINGTON	NC	28411	dwerth	2018-07-26T21:20:04.369Z
Study Area Open House 2 Comments								
Jim Teacher	Development,_Planned	Plans to develop this area - does not want any of these lines here. Wanted to take company to court for initial proposed switch location along existing line.	N/A	N/A	N/A	N/A	kwise	2019-01-22T22:04:54.428Z
Jim Teacher	Development,_Planned	plans to develop this area - see other note	N/A	N/A	N/A	N/A	kwise	2019-01-22T22:06:31.923Z
RMP SIDBURY ROAD LLC	Development,_Planned	751 units planned, map provided to Siting Station; don't like any of the routes across their properties	SUITE 200 D 1401 CENTRAL AVE	CHARLOTTE	NC	28205	kwise	2019-01-22T21:32:45.016Z
LEIPELT EDWIN W PATRICIA S	General_Comment	Would prefer to not have the line behind their house at this location. Would prefer to keep the woods behind their house.	8523 SIDBURY RD	WILMINGTON	NC	28405	jdringman	2019-01-22T21:45:09.537Z
Sea Green LLC	General_Comment	formerly LEE MARITAL SHARE UDT 634 FOXLAIR DR FAYETTEVILLE, NC 28311 Now Sea Green LLC John Mack Address updated in comment	6 Club Road	Rye	NY	10580	dwerth	2019-01-22T21:21:38.265Z
Sea Green LLC	General_Comment	formerly LEE MARITAL SHARE UDT 634 FOXLAIR DR FAYETTEVILLE, NC 28311 Now Sea Green LLC John Mack Address updated in previous comment	N/A	N/A	N/A	N/A	dwerth	2019-01-22T21:24:32.842Z
Sea Green LLC	General_Comment	formerly LEE MARITAL SHARE UDT 634 FOXLAIR DR FAYETTEVILLE, NC 28311 Now Sea Green LLC John Mack Address updated in previous comment	N/A	N/A	N/A	N/A	dwerth	2019-01-22T21:24:50.883Z
Sea Green LLC	General_Comment	formerly LEE MARITAL SHARE UDT 634 FOXLAIR DR FAYETTEVILLE, NC 28311 Now Sea Green LLC John Mack Address updated in previous comment Bobby Pittman Ph 910-470-2649 Mr. Mack's agent (local manger of the land)	N/A	N/A	N/A	N/A	dwerth	2019-01-22T21:25:08.686Z
DEAN LINDSAY	None	Horse Paddock and barn located on the north side of the parcel in this general area.	1408 BROOKSIDE GARDENS DR	WILMINGTON	NC	28411	jdringman	2019-01-22T21:21:10.504Z
DEAN LINDSAY	None	Gravel road installed at this location	1408 BROOKSIDE GARDENS DR	WILMINGTON	NC	28411	jdringman	2019-01-22T21:22:11.834Z
GODSEY JAMES G SANDRA	None	New Property Line located here.	119 SCOTTSDALE DR	WILMINGTON	NC	28411	jdringman	2019-01-22T21:24:03.863Z
Sea Green LLC	None	formerly LEE MARITAL SHARE UDT 634 FOXLAIR DR FAYETTEVILLE, NC 28311 Now Sea Green LLC John Mack Address updated in previous comment	N/A	N/A	N/A	N/A	dwerth	2019-01-22T21:26:01.832Z
N/A	Residences_and_Residential_Use_Areas	New House Located here.	N/A	N/A	N/A	N/A	jdringman	2019-01-22T21:24:28.944Z
DAVIS JEFFREY DEBORAH A	Residences_and_Residential_Use_Areas	Property address is the new correct mailing address. 4001 ENNIS ACRES DR Castle Hayne, NC 28429 "We are very opposed to this route. Would prefer a route to the East that doesn't affect currently standing houses." Didn't hear about the project until Dean to the north let them know.	208 INLET DR	WILMINGTON	NC	28411	jdringman	2019-01-22T22:11:09.076Z
DAVIS JEFFREY DEBORAH A	Residences_and_Residential_Use_Areas	Property is currently being marketed for development.	208 INLET DR	WILMINGTON	NC	28411	jdringman	2019-01-22T22:11:59.357Z
DEAN LINDSAY	Residences_and_Residential_Use_Areas	Septic system has to go in the center of the property here. Have the documents for the land survey.	1408 BROOKSIDE GARDENS DR	WILMINGTON	NC	28411	jdringman	2019-01-22T21:17:49.408Z

Computer Station Comments
Wilmington NE Reliability Project

DEAN LINDSAY	Residences_and_Residential_Use_Areas	Plans for a house located on the east side of the property. The area to the south side of the parcel is full of wetlands.	1408 BROOKSIDE GARDENS DR	WILMINGTON	NC	28411	jdringman	2019-01-22T21:20:16.964Z
ENGLEHART DONALD D DOROTHY S	Residences_and_Residential_Use_Areas	New Mailing Address191 Timber TrailsRocky Point, NC 28457	4115 EDNA BUCK DR	CASTLE HAYN	NC	28429	jdringman	2019-01-22T23:14:59.439Z
GODSEY JAMES G SANDRA	Residences_and_Residential_Use_Areas	New House located here.	119 SCOTTSDALE DR	WILMINGTON	NC	28411	jdringman	2019-01-22T21:22:45.620Z
SIEMERING EDWARD WM JR SANDRA	Residences_and_Residential_Use_Areas	Also confirmed the house to the south.	4000 ENNIS ACRES DR	CASTLE HAYN	NC	28429	jdringman	2019-01-22T22:08:06.328Z
Jim Teacher	Development,_Planned	Plans to develop this area - does not want any of these lines here. Wanted to take company to court for initial proposed switch location along existing line.	N/A	N/A	N/A	N/A	kwise	2019-01-22T22:04:54.428Z
Jim Teacher	Development,_Planned	plans to develop this area - see other note	N/A	N/A	N/A	N/A	kwise	2019-01-22T22:06:31.923Z
RMP SIDBURY ROAD LLC	Development,_Planned	751 units planned, map provided to Siting Station; don't like any of the routes across their properties	SUITE 200 D 1401 CENTRAL AVE	CHARLOTTE	NC	28205	kwise	2019-01-22T21:32:45.016Z
LEIPELT EDWIN W PATRICIA S	General_Comment	Would prefer to not have the line behind their house at this location. Would prefer to keep the woods behind their house.	8523 SIDBURY RD	WILMINGTON	NC	28405	jdringman	2019-01-22T21:45:09.537Z
Sea Green LLC	General_Comment	formerly LEE MARITAL SHARE UDT 634 FOXLAIR DR FAYETTEVILLE, NC 28311 Now Sea Green LLC John Mack Address updated in comment	6 Club Road	Rye	NY	10580	dwerth	2019-01-22T21:21:38.265Z
Sea Green LLC	General_Comment	formerly LEE MARITAL SHARE UDT 634 FOXLAIR DR FAYETTEVILLE, NC 28311 Now Sea Green LLC John Mack Address updated in previous comment	N/A	N/A	N/A	N/A	dwerth	2019-01-22T21:24:32.842Z
Sea Green LLC	General_Comment	formerly LEE MARITAL SHARE UDT 634 FOXLAIR DR FAYETTEVILLE, NC 28311 Now Sea Green LLC John Mack Address updated in previous comment	N/A	N/A	N/A	N/A	dwerth	2019-01-22T21:24:50.883Z
Sea Green LLC	General_Comment	formerly LEE MARITAL SHARE UDT 634 FOXLAIR DR FAYETTEVILLE, NC 28311 Now Sea Green LLC John Mack Address updated in previous comment Bobby Pittman Ph 910-470-2649 Mr. Mack's agent (local manger of the land)	N/A	N/A	N/A	N/A	dwerth	2019-01-22T21:25:08.686Z
Sea Green LLC	None	formerly LEE MARITAL SHARE UDT 634 FOXLAIR DR FAYETTEVILLE, NC 28311 Now Sea Green LLC John Mack Address updated in previous comment	N/A	N/A	N/A	N/A	dwerth	2019-01-22T21:26:01.832Z
N/A	Residences_and_Residential_Use_Areas	New House Located here.	N/A	N/A	N/A	N/A	jdringman	2019-01-22T21:24:28.944Z
DAVIS JEFFREY DEBORAH A	Residences_and_Residential_Use_Areas	Property address is the new correct mailing address. 4001 ENNIS ACRES DR Castle Hayne, NC 28429 "We are very opposed to this route. Would prefer a route to the East that doesn't affect currently standing houses." Didn't hear about the project until Dean to the north let them know.	208 INLET DR	WILMINGTON	NC	28411	jdringman	2019-01-22T22:11:09.076Z
DAVIS JEFFREY DEBORAH A	Residences_and_Residential_Use_Areas	Property is currently being marketed for development.	208 INLET DR	WILMINGTON	NC	28411	jdringman	2019-01-22T22:11:59.357Z
DEAN LINDSAY	Residences_and_Residential_Use_Areas	Septic system has to go in the center of the property here. Have the documents for the land survey.	1408 BROOKSIDE GARDENS DR	WILMINGTON	NC	28411	jdringman	2019-01-22T21:17:49.408Z
DEAN LINDSAY	Residences_and_Residential_Use_Areas	Plans for a house located on the east side of the property. The area to the south side of the parcel is full of wetlands.	1408 BROOKSIDE GARDENS DR	WILMINGTON	NC	28411	jdringman	2019-01-22T21:20:16.964Z
ENGLEHART DONALD D DOROTHY S	Residences_and_Residential_Use_Areas	New Mailing Address191 Timber TrailsRocky Point, NC 28457	4115 EDNA BUCK DR	CASTLE HAYN	NC	28429	jdringman	2019-01-22T23:14:59.439Z
GODSEY JAMES G SANDRA	Residences_and_Residential_Use_Areas	New House located here.	119 SCOTTSDALE DR	WILMINGTON	NC	28411	jdringman	2019-01-22T21:22:45.620Z
SIEMERING EDWARD WM JR SANDRA	Residences_and_Residential_Use_Areas	Also confirmed the house to the south.	4000 ENNIS ACRES DR	CASTLE HAYN	NC	28429	jdringman	2019-01-22T22:08:06.328Z


ATTACHMENT A
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NORTH
1,500 750 0 1,500
Feet
Castle Hayne - Folkstone 230-kV Transmission Line
Pender County
New Hanover County
Proposed Porter's Neck Substation
Legend
Study Area Boundary
Proposed Substation
Existing Transmission Line
115-kV
230-kV
County Boundary
Property Boundary
Preliminary Route Alternative
Proposed Hampstead Bypass
Wilmington NE Reliability Project
Routing Study Area
New Hanover & Pender County, NC

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APPENDIX D – PROJECT COST ESTIMATES

Porter's Neck Tap Line Route Analysis Estimate

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General Scope

The following estimates are for the six alternatives for the Porter's Neck Tap Line from the Substation to the existing Castle Hayne – Folkstone 230kV circuit. To accommodate the tap line, two existing structures on the Castle Hayne – Folkstone 230kV circuit will need to be raised to provide clearance for the tap span and an existing 115kV circuit running parallel with the Castle Hayne – Folkstone 230kV line.

Burdened Project Costs

	Route 34	Route 35	Route 37	Route 42	Route 46	Route 47
	Segments (2,5,10,15,24)	Segments (2,5,10,23,27)	Segments (2,5,9,13,19,25,28)	Segments (2,5,9,13,20,26,28)	Segments (2,5,9,14,22,27)	Segments (2,5,9,14,22,29)
Siting & Land Acquisition	$ 6,406,000	$ 6,535,000	$ 7,084,000	$ 6,740,000	$ 6,463,000	$ 6,814,000
Matting & Environmental	$ 3,926,000	$ 4,058,000	$ 4,008,000	$ 4,188,000	$ 4,233,000	$ 4,227,000
Engineering & Materials	$ 2,335,000	$ 2,360,000	$ 2,473,000	$ 2,415,000	$ 2,353,000	$ 2,417,000
Construction	$ 3,148,000	$ 3,220,000	$ 4,193,000	$ 4,140,000	$ 3,853,000	$ 4,140,000
Total	**$ 15,815,000**	**$ 16,173,000**	**$ 17,758,000**	**$ 17,483,000**	**$ 16,902,000**	**$ 17,598,000**

Estimate Assumptions

Siting & Land Acquisition
New ROW at $52k/ac.
- 125' ROW

Danger Tree Rights at $36.4k/ac.
- 62.5' each side

Matting & Environmental
7' x 14 Composite mats
daily rental
28' wide roads
Structure Work Pads 30' x 50'
Pull Pads 50' x 100'
mat flipping during construction
Hand Clearing
E&S Control = wattles

Engineering & Materials
450' ruling span
3 new Remote Control Switches
Sub. Eng. and mat'l not included

Construction
4 day work week
Mob./Demob. included
Continuous construction
Sub. Constr. costs not included
Labor burden = 50%
Material burden = 16.5%
Class 4 Estimate

ATTACHMENT A

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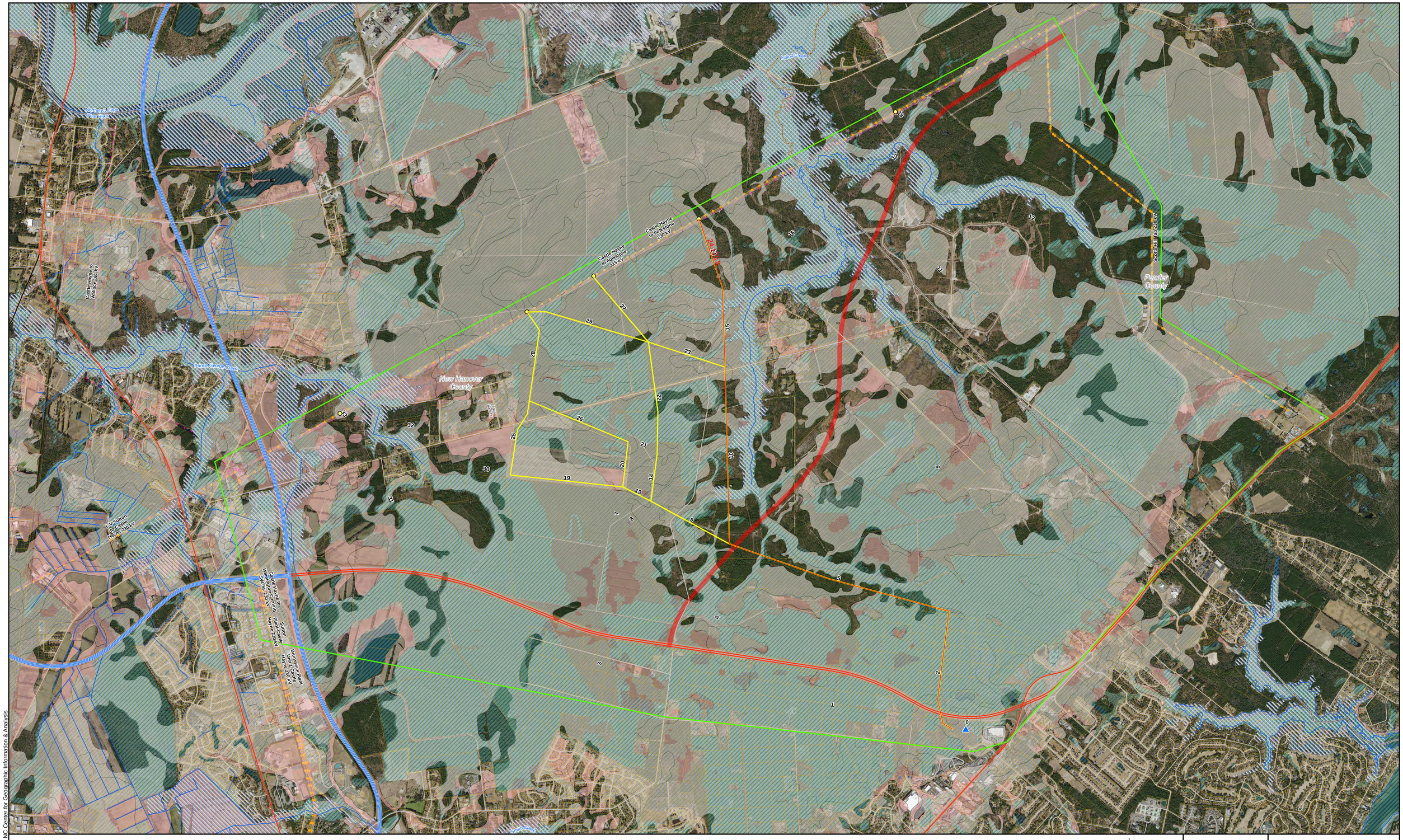

Legend

- Top 6 Routes
- Duke-Provided Tap Location
- Study Area
- Proposed Hampstead Bypass
- Parcel Boundary
- CREWS Wetlands
- 100-yr Floodzone
- 230 kV Transmission Line
- 161 kV Transmission Line
- Hydric Soils >50 Percent
- NWI Wetland
- Proposed Substation Location

NORTH

1,400 700 0 1,400

Scale in Feet

BURNS McDONNELL

Wilmington NE 230kV
Top 6 Route Alternatives
Route PN34

Issued: 6/3/2019

Path: Z:\Clients\ENS\DukeEnrgyPro1050777_PortersNeck230\Studies\GeospatialDataFiles\ArcDocs\TopRoutesForCostEstimate_JWD.mxd jdunham Date: 6/3/2019

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Legend

- Top 6 Routes
- Duke-Provided Tap Location
- Study Area
- Proposed Hampstead Bypass
- Parcel Boundary
- CREWS Wetlands
- 100-yr Floodzone
- 230 kV Transmission Line
- 161 kV Transmission Line
- Hydric Soils >50 Percent
- NWI Wetland
- Proposed Substation Location

NORTH

1,400 700 0 1,400

Scale in Feet

BURNS McDONNELL

Wilmington NE 230kV
Top 6 Route Alternatives
Route PN34

Issued: 6/3/2019

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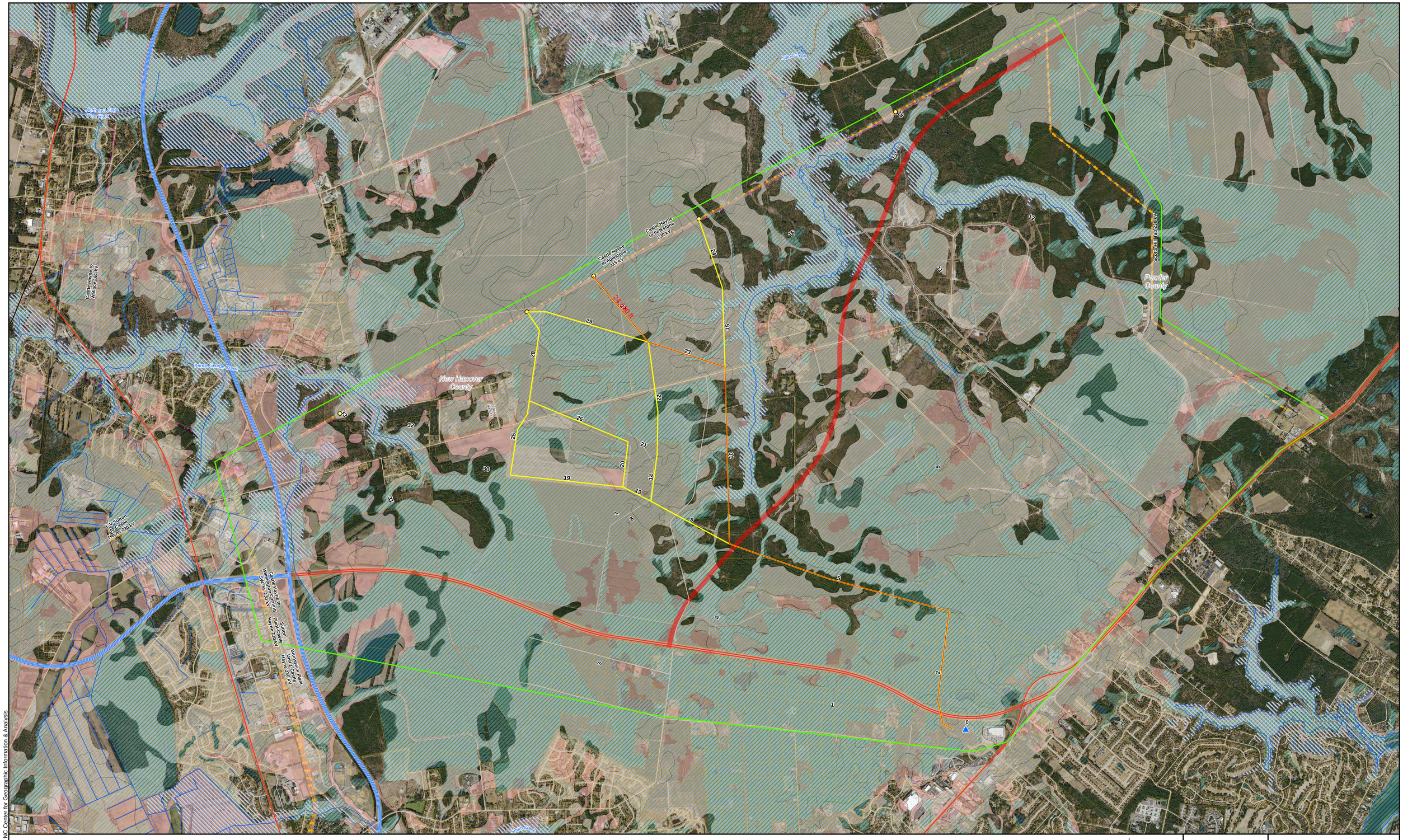

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Legend

— Top 6 Routes
● Duke-Provided Tap Location
▭ Study Area
▬ Proposed Hampstead Bypass
▭ Parcel Boundary
▨ CREWS Wetlands
▨ 100-yr Floodzone
230 kV Transmission Line
161 kV Transmission Line
▭ Hydric Soils >50 Percent
▨ NWI Wetland
▲ Proposed Substation Location

NORTH

1,400 700 0 1,400
Scale in Feet

BURNS McDONNELL

Wilmington NE 230kV
Top 6 Route Alternatives
Route PN35

Issued: 6/3/2019

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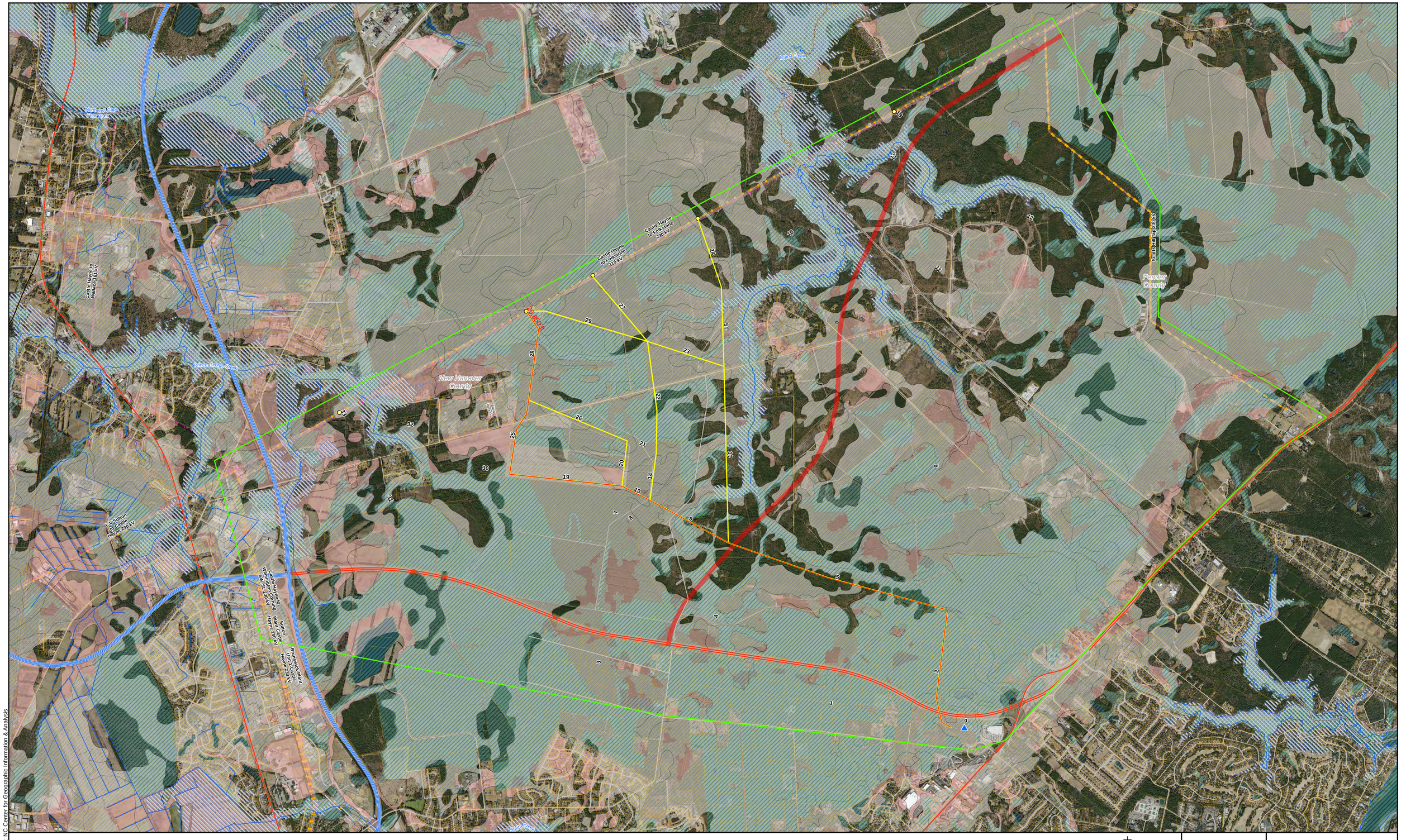

Legend

- Top 6 Routes
- Duke-Provided Tap Location
- Study Area
- Proposed Hampstead Bypass
- Parcel Boundary
- CREWS Wetlands
- 100-yr Floodzone
- 230 kV Transmission Line
- 161 kV Transmission Line
- Hydric Soils >50 Percent
- NWI Wetland
- Proposed Substation Location

NORTH

1,400 700 0 1,400

Scale in Feet

BURNS McDONNELL

Wilmington NE 230kV
Top 6 Route Alternatives
Route PN37

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Legend

- Top 6 Routes
- Duke-Provided Tap Location
- Study Area
- Proposed Hampstead Bypass
- Parcel Boundary
- CREWS Wetlands
- 100-yr Floodzone
- 230 kV Transmission Line
- 161 kV Transmission Line
- Hydric Soils >50 Percent
- NWI Wetland
- Proposed Substation Location

NORTH

1,400 700 0 1,400

Scale in Feet

BURNS McDONNELL

Wilmington NE 230kV
Top 6 Route Alternatives
Route PN37

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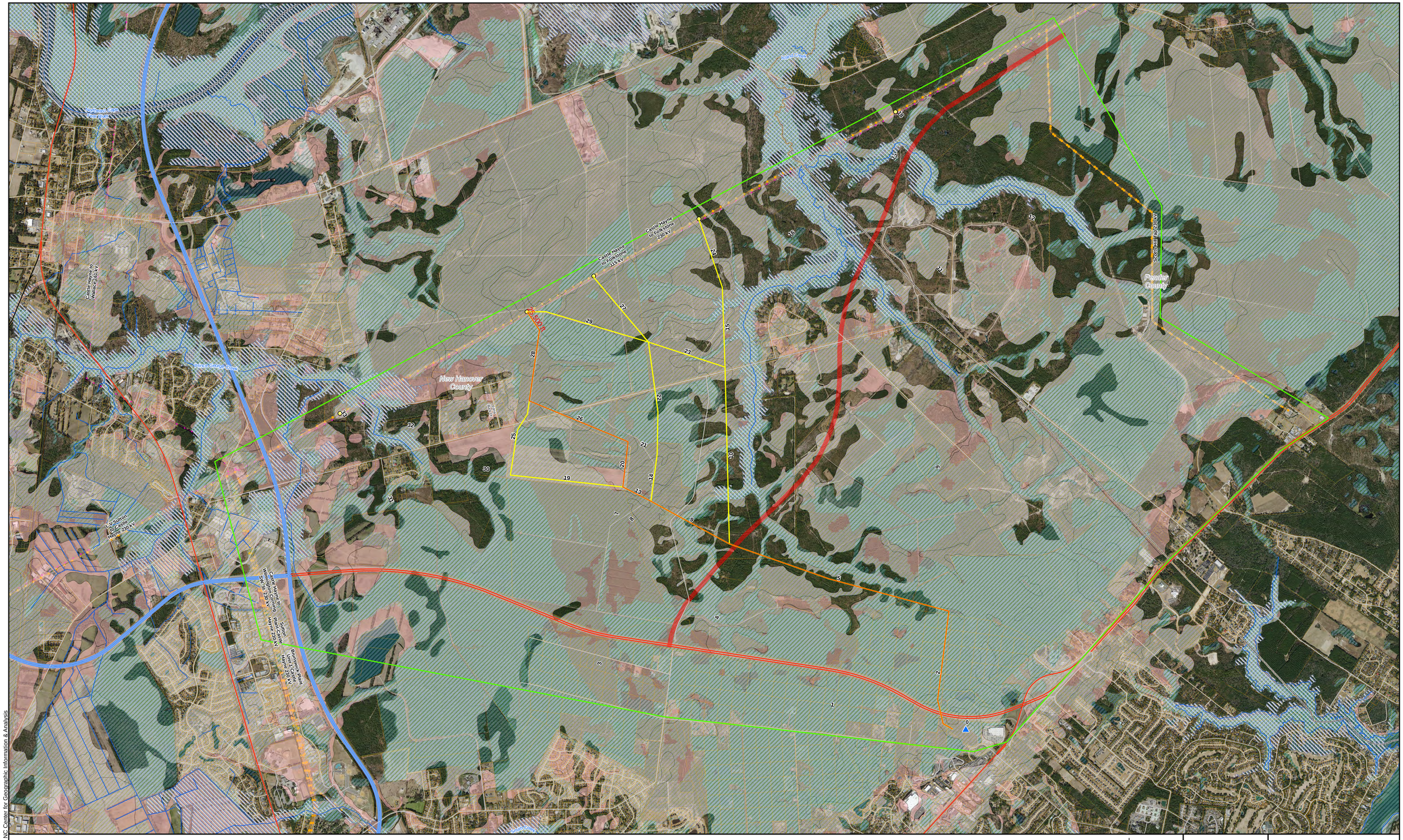

Legend

- Top 6 Routes
- Duke-Provided Tap Location
- Study Area
- Proposed Hampstead Bypass
- Parcel Boundary
- CREWS Wetlands
- 100-yr Floodzone
- 230 kV Transmission Line
- 161 kV Transmission Line
- Hydric Soils >50 Percent
- NWI Wetland
- Proposed Substation Location

NORTH

1,400 700 0 1,400

Scale in Feet

BURNS McDONNELL

Wilmington NE 230kV
Top 6 Route Alternatives
Route PN42

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ATTACHMENT A

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Legend

- Top 6 Routes
- ○ Duke-Provided Tap Location
- 🟩 Study Area
- Proposed Hampstead Bypass
- ▨ Parcel Boundary
- ▨ CREWS Wetlands
- ▨ 100-yr Floodzone
- 230 kV Transmission Line
- 161 kV Transmission Line
- ▨ Hydric Soils >50 Percent
- ▨ NWI Wetland
- ▲ Proposed Substation Location

NORTH

1,400 700 0 1,400

Scale in Feet

BURNS McDONNELL

Wilmington NE 230kV
Top 6 Route Alternatives
Route PN42

Issued: 6/3/2019

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- Study Area
- Proposed Hampstead Bypass
- Parcel Boundary
- CREWS Wetlands
- 100-yr Floodzone
- 230 kV Transmission Line
- 161 kV Transmission Line
- Hydric Soils >50 Percent
- NWI Wetland
- Proposed Substation Location

NORTH

1,400 700 0 1,400

Scale in Feet

BURNS McDONNELL

Wilmington NE 230kV
Top 6 Route Alternatives
Route PN46

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Legend

- Top 6 Routes
- Duke-Provided Tap Location
- Study Area
- Proposed Hampstead Bypass
- Parcel Boundary
- CREWS Wetlands
- 100-yr Floodzone
- 230 kV Transmission Line
- 161 kV Transmission Line
- Hydric Soils >50 Percent
- NWI Wetland
- Proposed Substation Location

NORTH

1,400 700 0 1,400

Scale in Feet

BURNS McDONNELL

Wilmington NE 230kV
Top 6 Route Alternatives
Route PN46

Issued: 6/3/2019

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Source:

Legend

- Top 6 Routes
- Duke-Provided Tap Location
- Study Area
- Proposed Hampstead Bypass
- Parcel Boundary
- CREWS Wetlands
- 100-yr Floodzone
- 230 kV Transmission Line
- 161 kV Transmission Line
- Hydric Soils >50 Percent
- NWI Wetland
- Proposed Substation Location

NORTH

1,400 700 0 1,400

Scale in Feet

BURNS McDONNELL

Wilmington NE 230kV
Top 6 Route Alternatives
Route PN47

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Legend

- Top 6 Routes
- ● Duke-Provided Tap Location
- 🟩 Study Area
- Proposed Hampstead Bypass
- Parcel Boundary
- ▨ CREWS Wetlands
- ▨ 100-yr Floodzone
- 230 kV Transmission Line
- 161 kV Transmission Line
- Hydric Soils >50 Percent
- ▨ NWI Wetland
- ▲ Proposed Substation Location

NORTH

1,400 700 0 1,400

Scale in Feet

BURNS McDONNELL

Wilmington NE 230kV
Top 6 Route Alternatives
Route PN47

Issued: 6/3/2019

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9400 Ward Parkway
Kansas City, MO 64114
O 816-333-9400
F 816-333-3690
www.burnsmcd.com

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BEFORE THE NORTH CAROLINA UTILITIES COMMISSION

DOCKET NO. E-2, SUB 1215

In the Matter of:	)	
	)	
Application of Duke Energy Progress, LLC for	)	
a Certificate of Environmental Compatibility	)	
and Public Convenience and Necessity	)	**PUBLIC**
Pursuant to N.C. Gen. Stat. §§ 62-100 et. seq.	)	**NOTICE**
to Construct Approximately 4.6 Miles of New	)	
230 kV Transmission Line in the northeast	)	
area of Wilmington, New Hanover County,	)	
North Carolina	)	

NOTICE IS HEREBY GIVEN that on August 13, 2019, Duke Energy Progress, LLC ("DEP" or "Applicant") filed with the North Carolina Utilities Commission ("Commission") an application to obtain a certificate of environmental compatibility and public convenience and necessity to construct approximately 4.6 miles of new 230 kV transmission line in New Hanover County, North Carolina.

The preferred route originates at the site of the proposed Porters Neck Substation, located between U.S. Highway 17 and Porters Neck Road in New Hanover County, North Carolina. The route exits the substation site to the northwest and extends for approximately 380 feet before turning north-northwest for approximately 875 feet while crossing U.S. Highway 17. The route then continues north for approximately 3,170 feet before turning west-northwest. From this point, the preferred route extends approximately 8,105 feet and crosses the alignment for the proposed Hampstead Bypass. The route then extends north for approximately 6,105 feet, crosses Sidbury Road, and then continues to the north for another 2,980 feet. The preferred route alignment then continues to the northwest for approximately 2,555 feet before terminating at a selected tap location along the existing Castle Hayne – Folkstone 230 kV transmission line.

Anyone wishing to view Duke Energy Progress' certificate application report and/or the detailed maps concerning this project may do so at either the Office of the Chief Clerk of the Commission, Dobbs Building, 430 North Salisbury Street, Raleigh, North Carolina 27603 or at the following Duke Energy Progress location: 1451 Military Cutoff Road, Wilmington, North Carolina 28403. Please contact Brian R. West at 1-910-256-7223 prior to the visit. The filing is also available on the Commission's web site, www.ncuc.net. (Search for Docket No. E-2 Sub 1215)

The Commission has scheduled the application for public hearing at ___ p.m., on _____, 2019 in _____, North Carolina. This hearing may be canceled if no significant protests are received subsequent to public notice.

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Persons desiring to intervene as formal parties of record should file a verified petition under Commission Rules Rl-5 and Rl-64 no later than _____ ____, 2019. Such a petition should be filed with the Chief Clerk, North Carolina Utilities Commission, 4325 Mail Service Center, Raleigh, North Carolina 27699-4300. Intervenors shall also file the direct testimony and exhibits of expert witnesses with the Commission on or before _____ ____, 2019. Persons desiring to send written statements to inform the Commission of their position in the matter should address their statements to the North Carolina Utilities Commission, 4325 Mail Service Center, Raleigh, North Carolina 27699-4300 and reference Docket No. E-2, Sub 1215. Such written statements will be included in the Commission's official files. If the public hearing is not canceled, however, such written statements cannot be considered competent evidence unless those persons appear at the hearing and testify concerning the information contained in their written statements. The Public Staff of the Utilities Commission, through its Executive Director, is required by statute to represent the using and consuming public in proceedings before the Commission. Statements to the Executive Director should be addressed to Mr. Chris Ayers, Executive Director, Public Staff-North Carolina Utilities Commission, 4326 Mail Service Center, Raleigh, North Carolina 27699-4300. The Attorney General is also authorized to represent the using and consuming public in proceedings before the Commission. Statements to the Attorney General should be addressed to: The Honorable Josh Stein, Attorney General of North Carolina, 9001 Mail Service Center, Raleigh, North Carolina 27699-9001.

ISSUED BY ORDER OF THE COMMISSION.
This the ___ day of _____, 2019.

NORTH CAROLINA UTILITIES COMMISSION
M. Lynn Jarvis, Chief Clerk

(In accordance with N.C. Gen. Stat.§ 62-102(c), Duke Energy Progress, LLC will publish this Public Notice, upon approval and instruction from the North Carolina Utilities Commission, in the newspapers of general circulation in the area of the proposed project.)

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Aug 13 2019

BEFORE THE NORTH CAROLINA UTILITIES COMMISSION

DOCKET NO. E-2, SUB 1215

In the Matter of	)	
	)	
Application of Duke Energy Progress, LLC	)	
For A Certificate of Environmental	)	**DIRECT TESTIMONY OF**
Compatibility and Public Convenience and	)	**JAMES UMBDENSTOCK FOR**
Necessity Pursuant to N.C. Gen. Stat. § 62-	)	**DUKE ENERGY PROGRESS, LLC**
100 et seq. to Construct Approximately 4.6	)	
Miles of New 230kV Transmission Line in	)	
the northeast area of Wilmington, New	)	
Hanover County, North Carolina	)	

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Q. PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.

A. My name is James Umbdenstock, and my business address is 1020 W. Chatham Street, Cary, North Carolina 27511.

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

A. I am employed as a Lead Engineer in Reliability Engineering in Carolinas East, by Duke Energy Progress, LLC ("DEP"). DEP is a wholly owned, indirect subsidiary of Duke Energy Corporation ("Duke Energy").

Q. WHAT ARE YOUR RESPONSIBILITIES AS LEAD ENGINEER?

A. I am responsible for helping plan the electrical distribution infrastructure necessary to serve new growth and development in the DEP territory of North and South Carolina. This includes coordinating the design and construction of all transmission-to-distribution substations and their associated transmission line connections with the Transmission Department.

Q. PLEASE DESCRIBE YOUR EDUCATIONAL AND PROFESSIONAL BACKGROUND.

A. I graduated from North Carolina State University in Raleigh with a Bachelor of Science degree in Electrical Engineering in 1979. I have worked for DEP for almost 40 years, all in the area of Distribution. I have also held various engineering and supervisory roles during my work career. I am a licensed Professional Engineer in the State of North Carolina.

Q. HAVE YOU PREVIOUSLY TESTIFIED BEFORE THE NORTH CAROLINA UTILITIES COMMISSION?

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A. Yes, I testified during the construction of the Cary Trenton Road 230kV Substation and its associated transmission tap line, in Docket No. E-2, Sub 855. I have also previously submitted pre-filed direct testimony before this Commission in Docket No. E-2, Sub 1150.

Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY?

A. The purpose of my testimony in this proceeding is to describe the need and necessity for the construction of the proposed Porters Neck 230kV Substation and thus the 4.6 miles of new 230kV transmission line necessary to energize the substation in the Porters Neck area that is northeast of Wilmington in New Hanover County, North Carolina.

Q. WERE YOU INVOLVED IN PREPARING DEP'S APPLICATION IN THIS DOCKET?

A. Yes.

Q. WHY IS DEP REQUESTING THIS COMMISSION TO GRANT THE CERTIFICATE OF PUBLIC CONVENIENCE AND NECESSITY?

A. DEP's assessment of electric energy requirements for its customers has identified the need to build a new 230kV/23kV transmission-to-distribution substation and a new 230kV transmission line to provide power to the substation in the Porters Neck area that is in the northeast area of Wilmington, New Hanover County, North Carolina. This new substation site was purchased in 2016 based on the projected load center in the vicinity of the intersection of Interstate 140 and Market Street.

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This area is currently served by two existing substations, Wilmington Ogden 230kV to the south and Scotts Hill 230kV to the north. The proposed Porters Neck Substation is the approximate load center for the circuits emanating from the Scotts Hill 230kV and the Wilmington Ogden 230kV Substations as it is located almost exactly halfway between those two substations.

Two feeders—the Edgewater Club 24kV and Scotts Hill Loop Road 24kV out of Scotts Hill 230kV Substation in Pender County—were previously overloaded and were relieved with the addition of a new circuit breaker, Kirkland 24kV in 2017. This new feeder became the third distribution circuit serving the customers and load in the Porters Neck area more than three miles away. Likewise, there are three feeders out of the Wilmington Ogden 230kV Substation that feed 3 miles north towards the same Porters Neck/Market Street area. All three of those circuits are projected to be above 95% of capacity by January 2020. In addition, both transformer banks at Wilmington Ogden 230kV Substation are projected to be loaded above their nameplate rating by January 2022.

The new substation and its associated transmission line are required to provide needed capacity and enhanced service reliability to support our existing customers, plus allow for future residential and commercial growth.

Q. DOES THIS CONCLUDE YOUR PRE-FILED DIRECT TESTIMONY?

A. Yes.

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BEFORE THE NORTH CAROLINA UTILITIES COMMISSION

DOCKET NO. E-2, SUB 1215

In the Matter of	)	
	)	
Application of Duke Energy Progress, LLC	)	
For A Certificate of Environmental	)	**DIRECT TESTIMONY OF**
Compatibility and Public Convenience and	)	**MICAH E. RETZLAFF**
Necessity Pursuant to N.C. Gen. Stat. § 62-	)	**FOR**
100 et seq. to Construct Approximately 4.6	)	**DUKE ENERGY PROGRESS,**
Miles of New 230kV Transmission Line in	)	**LLC**
northeast area of Wilmington, New Hanover	)	
County, North Carolina	)	

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Q. PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.

A. My name is Micah E. Retzlaff, and my business address is 410 S. Wilmington Street, Raleigh, North Carolina 27601.

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

A. I am employed as Lead Siting Specialist, Transmission Siting, Permitting, and Engagement by Duke Energy Progress, LLC ("DEP" or the "Company").

Q. WHAT ARE YOUR RESPONSIBILITIES AS LEAD TRANSMISSION SITING SPECIALIST?

A. As Lead Transmission Siting Specialist, Transmission Siting and Permitting, I am responsible for both the siting/due diligence of substation sites to be purchased in fee, as well as the selection of preferred/least impactful routes for transmission lines which require easement and/or right of way ("ROW") acquisition for DEP territories.

Q. PLEASE DESCRIBE YOUR EDUCATIONAL AND PROFESSIONAL BACKGROUND.

A. I have a Bachelor of Science in Environmental Health from East Carolina University. I have over 20 years of experience developing public infrastructure, in the telecommunication and utilities industries. I began my career in the wireless telecommunication as a Senior Real Estate Specialist with American Tower Corporation, the largest owner and operator of multi-use tower sites in the United States, then as a Project Manager with SpectraSite Communications, an owner and developer of over 8,000 tower facilities. Starting in 2006, I was a Senior Program Manager with Excell Communications, a turn-key site

development consultant firm, managing wireless and wireline/fiber optic deployment projects for clients from Texas to Florida and the Carolinas. After 18 years in the wireless telecommunication industry and having developed more than 350 greenfield tower facilities, I joined DEP in my current role as Lead Siting Specialist, Transmission in 2017. I hold a Project Management Professional ("PMP") certificate from the Project Management Institute and have Real Estate Brokers (or equivalent) licenses in North Carolina, South Carolina and Virginia.

Q. HAVE YOU PREVIOUSLY TESTIFIED BEFORE THE NORTH CAROLINA UTILITIES COMMISSION ("COMMISSION")?

A. No.

Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY?

A. The purpose of my testimony in this proceeding is to support DEP's Application for a Certificate of Public Convenience and Necessity to construct 4.6 miles of new 230kV transmission line in the north Wilmington area of New Hanover County, North Carolina, which I will refer to as the "Porters Neck line" or the "Project."

Q. WERE YOU INVOLVED IN PREPARING DEP'S APPLICATION IN THIS DOCKET?

A. Yes.

Q. TO YOUR KNOWLEDGE, WILL DEP FILE AND PROVIDE ALL INFORMATION, BEGIN PUBLIC NOTICE REQUIRED BY THIS COMMISSION, AND OBTAIN ALL FEDERAL AND STATE

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LICENSES, PERMITS, AND EXEMPTIONS REQUIRED UNDER APPLICABLE LAW FOR CONSTRUCTION AND OPERATION OF THIS TRANSMISSION LINE?

A. Yes.

Q. WAS THE PROCESS UTILIZED TO SITE THE PORTERS NECK LINE SUBSTANTIALLY SIMILAR TO THE PROCESS USED IN THE CASE OF THE MOST RECENT TRANSMISSION LINE CERTIFICATE APPROVED BY THE COMMISSION?

A. Yes, DEP's processes and methodologies for siting the Project—which are described in the remainder of my testimony and in more detail in the Routing Study (as hereinafter defined)—were substantially similar to that which was used by DEP in the case of the Cleveland Matthews project for which the Commission recently issued a certificate in Docket No. E-2, Sub 1150.

Q. PLEASE DESCRIBE THE PROCESS UTILIZED TO SITE THE PORTERS NECK LINE.

DEP retained Burns & McDonnell Engineering Company, Inc. ("Burns & McDonnell"), a full service international engineering and construction firm with substantial utility and infrastructure siting experience, to assist the Company with the line routing and public input for the Project. Burns & McDonnell conducted a comprehensive routing study and prepared a Routing Study and Environmental Report (the "Routing Study"), which is attached as Exhibit A to the Application. My role was to oversee Burns & McDonnell's

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performance of the routing study from preliminary route alternative identification through the selection of the preferred route.

The following is an overview of the steps involved in the identification of the route alternatives and the selection of the proposed route for the Project:

The limits of the study area were established based on the proposed location of the Porters Neck Substation southwest of the intersection of U.S. Highway 17/Market Street and I-140 in New Hanover County, the locations of the Brunswick Plant Unit 1 – Castle Hayne 230kV, Castle Hayne – Wilmington Corning Sw. Sta. 230kV, Sutton Plant – Castle Hayne 230kV, Castle Hayne – Folkstone 230kV and Scotts Hill Tap 230kV transmission lines, and a preliminary review of potential routing opportunities and constraints in the area. The study area, which encompasses approximately 21 square miles, is shown in Figure 3-1 of the Routing Study. The study area was defined to incorporate potential Project tap points, while offering an area large enough to provide a set of reasonable and geographically distinct route alternatives.

After establishing the study area, data was collected from publicly available sources—including Federal, State, county, and local agencies—to identify constraints and environmental concerns that could result in challenges for the siting of a transmission line. The collected data was used to create a raster-based suitability surface within a GIS framework. The purpose of the suitability surface and subsequent analysis was to aid in the identification of areas more likely suitable for the placement of a transmission line route. DEP

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also held two community workshops and received input from residents and local public officials in the study area.

Collected data were grouped into one of four categories: Engineering, Land Use, Social, and Environmental. Each category was further divided into individual criteria and assigned a weight from 1 to 10 according to each criterion's potential sensitivity to a transmission line, as determined by members of DEP's Project team and feedback obtained from public comments. The weight scale of 10 represents the highest consideration during the evaluation. For example, Residential Proximity Score has a weight scale of 10.

The suitability surface was created using the weighted criteria. Using GIS, criteria were combined through a process called overlay analysis, which results in a cumulative suitability rating by adding the weighted criteria together for each cell within the suitability raster. This results in a single suitability surface that can be reviewed by the siting team as a means of identifying preferred siting areas. GIS can then use color-coding to help visually display areas of lesser potential impact (see Figure 4-1 of the Routing Study).

After completion of a suitability analysis, potential routes were identified. The objective was to identify economically feasible routes that connected the proposed Porters Neck Substation to the Castle Hayne – Folkstone 230kV transmission line, while avoiding or minimizing impacts to both community and natural resources. All other existing transmission lines within or near the study area were analyzed by the DEP Transmission Planning team and found to be unsuitable. Local, State, and Federal government agencies

were contacted by DEP to obtain information on resources of particular concern that were relevant to the routing process. The potential route alternatives were shared with the public and local officials throughout the route identification process to obtain input for evaluation of the alternatives. The study team then quantified the engineering, land use, social, and environmental resources that would be impacted by each feasible route. Quantitative data and public input were used to evaluate the alternatives and to select a preferred route for the proposed transmission line.

Q. HOW DID DEP DEVELOP FORTY-NINE (49) ALTERNATE ROUTES FOR THE PORTERS NECK 230kV LINE?

A. The objective of the routing analysis was to identify an economically feasible route that offered the most benefits in terms of providing reliable electric service, but also limited adverse impacts to the social and natural environment within the study area. This effort included leveraging four main sources of data:

- Field reconnaissance of the study area from publicly accessible roadways;
- Review of USGS topographic maps and recent aerial photography;
- Review of local planning and zoning documents and available GIS data; and
- Contacts with local, State, and Federal agencies.

Based on the information gathered, a set of feasible routes were identified that connect the proposed Porters Neck Substation to available transmission lines. The primary goals regarding routing were to:

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- Minimize overall impacts by paralleling existing ROWs, including transmission lines, highways, and roads, where possible;
- Maximize the distance of the line from existing residences; and
- Minimize the overall length of the route.

The route alternatives consist of individual segments that can be combined in different arrangements to form a continuous path from the proposed substation site to a transmission line. Each segment begins and ends at intersections with other segments. The set of route alternatives for this Project consisted of 33 individual segments. The alternatives were identified to avoid and/or minimize, to the extent practicable, impacts to environmentally sensitive features and residential areas, while providing a direct route alignment. Ultimately, 49 distinct routes were developed using a combination of the 33 segments.

Q. DID DEP SEEK PUBLIC INPUT AS PART OF THE PORTERS NECK LINE ROUTING PROCESS?

A. Yes. To solicit study area data and determine community values relative to the proposed Project, the route selection process included several forms of public input. These included an agency scoping meeting and other communications with Federal, State, and local agencies, as well as public information workshops held by DEP to provide and receive information from the public about the study area. All input was used to identify environmental and land use sensitivities located in the study area and assess the values and attitudes of the residents and public officials regarding the Project, which enabled the Project team to identify

the most appropriate factors to evaluate the routes and to develop routes that limited impacts to resources of primary concern to the environmental agencies and to residents.

State and Federal agencies were contacted by DEP or Burns & McDonnell to provide input on threatened and endangered species, wetlands, wildlife resources, stream sensitivity, hydric soils, and other potential permitting issues. The following agencies were contacted: the U.S. Army Corps of Engineers ("USACE"), U.S. Fish and Wildlife Service ("USFWS"), NC Wildlife Resources Commission ("NCWRC"), N.C. Natural Heritage Program ("NHP"), and N.C. Department of Environmental Quality ("NCDEQ"), including the N.C. Division of Water Resources and N.C. Division of Land Quality. On April 4, 2018, DEP held an agency scoping meeting that included attendees from all of the agencies that were contacted above.

The primary concerns discussed during the agency scoping meeting were related to several N.C. Department of Transportation ("NCDOT") mitigation properties within the study area, the presence of Federally protected species and other species of concern, and wetlands located throughout the study area. The USFWS and NHP provided DEP with information developed from recent State projects in the area which identified areas with potential to support species of concern as well as occurrences of Federally endangered species. Additionally, the NCDOT provided information related to the restricted activities listed in the USACE permit conditions for the mitigation of properties

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located in the study area. This information was incorporated into the route evaluation factors.

The intent of the public information workshops was to both request data on sensitive features located in the study area and on private properties and provide potentially affected landowners near the alternative routes an understanding of the need for the Project, the decision-making process used to select a preferred route, and a forum to voice concerns about the proposed Project. As directed by the Commission, the Company incorporated several new activities into the routing process meant to improve public awareness of the project and engage earlier with customers in the study area which included: (1) addition of a study area workshop (described in more detail below), (2) the use of U.S. Postal Service certified mail to ensure delivery of the invitations to the workshops, and (3) adding a conspicuous stamp on the workshop invitation envelopes to differentiate it from other notices from the Company and emphasize its importance. The use of certified delivery and special stamps on correspondence envelopes will also be used when notifying stakeholders of Project updates as well. Invitations to a study area community workshop—held at the Scotts Hill Baptist Church on July 26, 2018—were sent to all owners of property in the Project study area. The purpose of the workshop was to notify the general public of the Project, present the preliminary data collected and solicit information known by the attendees about area sensitivities that could help the Company identify constraints and opportunities for the line routes considered. This workshop is a recent addition to the Company's line routing

process as a direct result of recommendations from the Commission. Information about the Project and various maps of the study area were also available on the DEP website throughout the duration of the Project. The Project website went live at the same time as the first workshop and will be updated as the development and construction of the Project progresses.

Information gathered at the study area workshop was combined with data collected during the initial phase of the Project to identify the 33 potential line segments previously noted. To gather public input on the route alternatives, DEP held a route alternatives public workshop on January 22, 2019 also at the Scotts Hill Baptist Church. A total of 146 invitations were sent to owners with properties within 500 feet of any alternative route, and 25 attendees registered at the event.

Each public workshop included displays with information on Project need, engineering, route alternatives, environmental management, and ROW requirements. Representatives from DEP and Burns & McDonnell were present to address the public's questions and receive comments. Potential routes for the proposed transmission line, shown at the route alternatives workshop, were depicted on aerial photographs. No preferred route had been selected at the time of the workshops. Photographs and drawings showing the types of structures proposed for the Project were displayed. DEP staff was also present to discuss ROW acquisition and maintenance, and electric and magnetic fields associated with transmission lines.

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Participants at the workshops received a written questionnaire to communicate their opinions on the routing criteria, the segment locations, and issues of concern regarding the Project. The public was asked to return questionnaires at the workshops, by mail, or online within four weeks after the workshops. Individuals could also have their comments recorded on GIS computer workstations available at each workshop. In addition, the Project website also included an interactive web map that allowed visitors to the site to submit an electronic response to the questionnaire. A total of 14 questionnaires (12 hard copies and two emails) were submitted by landowners. 55 specific comments from landowners were recorded at the GIS computer workstations during the public workshops.

Q. AFTER COMPILING DATA FROM COMMUNITY WORKSHOPS, PROPERTY OWNERS IN THE AREA AND DATA FROM OTHER SOURCES, HOW DID DEP EVALUATE THE FORTY-NINE ALTERNATE ROUTES?

A. The analysis of alternatives was based on engineering, land use, social, and environmental factors. Data for each factor were quantified for each segment and summed for each route.

The evaluation of the proposed routes included a systematic comparison of the alternatives based on the social, environmental, land use, and engineering factors that represent the potential adverse effects on resources in the study area. The routing factors include the following:

Engineering:

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- Total length (Feet)
- Road crossings (Number)
- Heavy angles (>20 degrees) (Number)

Land Use:

- Conservation Lands Score (Score)
- Length through planned residential zones/land use (Feet)

Social:

- Residences within 50 feet of centerline (Number)
- Residences within 51-100 feet of centerline (Number)
- Residences within 101-300 feet of centerline (Number)
- Residential proximity score (Score)
- Businesses within 300 feet (Number)
- Public facilities within 300 feet (Number)
- Length not along parcel edges (Feet)

Environmental:

- Forested areas within ROW (Acres)
- NWI/Crews/Hydric soils >50% wetlands within ROW (Acres)
- Stream crossings with buffers (50’ each side) (Acres)
- RCW buffers crossed (Acres)
- NHEO polygons crossed (Acres)
- Floodplain crossed (Acres)

The primary source of the data used in this analysis was 2016 aerial imagery supplemented with field reconnaissance of the overall study area and along each of the alternative routes. Digital data, such as roads, parcels, protected lands, and wetland information, were acquired from various agencies. Some of the criteria were quantified using GIS software; others were calculated by measuring information directly from the aerial photography.

Engineering factors were considered for the route analysis. Total Length is a general indicator of the overall magnitude of the Project. Length is also an indicator of construction costs. The longer the proposed route, the more expensive it would be if all other factors were equal. The number of Road Crossings gives an indicator of potential permitting and/or line crossing issues. Heavy Angles (>20 degrees) were considered because these angles typically require larger structures and more space. Consequently, these structures tend to be more visible and more expensive.

Social and land use criteria were also evaluated, including proximity to residences, businesses, and public facilities. Proximity to businesses and public facilities was reviewed but not included in the evaluation process since none of these occurred within 300 feet of any potential route alternatives. Residences within 50 Feet, between 51-100 Feet, and between 101-300 Feet were counted for each proposed segment using aerial photography supplemented with field verification. The impact to residences varied depending on the distance from the route. The three measurements for the distance to residences was converted to a Residential Proximity Score to reflect the public concern that residences

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closer to a transmission line would be more affected than those further away. To determine the residential proximity score, the number of residences within 50 feet of the edge of ROW were multiplied by three; the number of residences between 51-100 feet were multiplied by two; and the number of residences between 101-300 feet were multiplied by one. Then, all three results were added together. Parcels Crossed were quantified for each segment as a relative measure of the overall impact on private property. Routes that cross significantly more parcels tend to cost more as a result of additional landowners from which to acquire easements. Length Not Along Parcel Edges was quantified as well, as it is generally accepted that a transmission line that extends parallel and adjacent to existing property lines is considered to be generally less impactful to a given parcel than a transmission line that traverses through the middle of a parcel.

Other social and land use impact evaluation criteria were also considered. The Conservation Lands Score was developed using these measurements to address potential impacts to these areas, calculated by multiplying the length through or adjacent to conservation lands by two and the length through or adjacent to proposed conservation lands by one. Then, both results were added together to result in the conservation lands score for that route alternative. Length Through Planned Residential Zones/Land Use was measured for each route alternative to evaluate the potential for impacts to the planned developments in the area that either have approval or are in the process of approval for residential development.

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Environmental evaluation criteria included forests, wetlands, protected species and their habitat, and water resources. To calculate many of these in acres, new ROW was used as mentioned earlier. Forested Areas within ROW was determined using digital National Land Cover Database ("NLCD") data and supplemented with aerial photography interpretation. This criterion measured the forested areas within the ROW that would be cleared along each route. Wetlands within ROW were measured using a combination of National Wetlands Inventory ("NWI") data produced by the USFWS, North Carolina Coastal Region Evaluation of Wetland Significance ("NC-CREWS") data and hydric soils >50% obtained from soil survey data (SSURGO, soil database of the U.S. Department of Agriculture). Floodplain Crossed was measured using Federal Emergency Management Agency digital floodplain data. Stream Crossings with 50-foot Buffer were measured in acres and were used to determine areas where the ROW might impact both streams and a 50-foot-wide buffer to represent their associated sensitive riparian areas. RCW Buffers Crossed provided a measurement of potential impact to the red-cockaded woodpecker, a Federally endangered species. Data showing potential clusters and their center points that were identified for the RCW was obtained from the USFWS for the study area. This criterion measured how much of a particular route alternative would pass through a 0.5-mile buffer of each red-cockaded woodpecker centroid, which is a documented area of current or historical habitat or sighting for the RCW. Rather than use the proposed ROW of 125 feet, the ROW was expanded to 250 feet in these areas to better reflect the

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potential from both the ROW clearing and danger tree clearing. NHEO Polygons Crossed measured potential impacts to designated polygons containing current or historic natural heritage element occurrences, according to the North Carolina NHP. NHEO polygons typically consist of areas of habitat or known occurrences of sensitive plant and animal species. An additional 20-foot buffer was applied to these areas to better evaluate the potential for impacts from the proposed routes.

The categories described above were considered to represent the potential impact of construction and operation of the new transmission line. The Project team then assigned weights to the factors based on input from the public, agencies, DEP engineers, and experience with similar transmission line projects across the country. A weight scale from 1 to 10 was used for this process, with 1 representing the lowest level of concern and 10 representing the highest level of concern during the evaluation. The weights associated with each routing factor are presented in Table 4-2 of the Routing Study.

Q. WHAT WERE THE RESULTS OF THE COMPREHENSIVE EVALUATION?

A. We determined that Route 34 was the best overall (least impactful) route.

Q. WHY WAS ROUTE 34 SELECTED AS THE BEST ROUTE?

A. Route 34 was selected as the best route for the following reasons:

- Tied for the lowest Residential Proximity Score among all routes, an indication of minimal potential impacts to residences and property owners;

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- The total length is shortest amongst all routes;
- Minimal input from concerned landowners as opposed to greater input along other lower scoring routes, indicating less chance of construction or access issues and a more positive public perception of the Project;
- Least amount of length through planned residential zones/land use;
- Least number of residences within 300 feet of centerline;
- No stream crossings;
- Proposed ROW crosses the least amount of wetland and hydric soils (given that more of the proposed ROW is to be located in upland zones); and
- Lowest estimated total cost alternative route.

The preferred route was the least overall impacting route in the numerical evaluation performed for the proposed Project. For this and the above reasons, and by using standard construction procedures and mitigation techniques when coordinating the Project with State and Federal agencies to comply with necessary regulations, the construction, operation, and maintenance of the proposed Project will have limited effects on the natural and social resources within the study area. DEP will continue to work with environmental stakeholders and landowners to reduce impacts of this proposed Project.

Q. PLEASE DESCRIBE THE PROPOSED ROUTE OF THE PROPOSED TRANSMISSION LINE.

A. The proposed route originates at the site of the proposed Porters Neck Substation, located southwest of the intersection of U.S. Hwy. 17/Market Street

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and I-140 in New Hanover County, North Carolina. The route exits the substation site to the northwest and extends for approximately 380 feet before turning north-northwest for approximately 875 feet, crossing I-140. The route then continues generally northward for approximately 3,170 feet before turning west-northwest. From here, the preferred route extends approximately 8,105 feet and crosses the alignment for the proposed Hampstead Bypass. The route then extends to the north for approximately 6,105 feet, crosses Sidbury Road, and then continues to the north for another 2,980 feet. The preferred route then extends to the northwest for approximately 2,555 feet before terminating at the selected tap location on the existing Castle Hayne – Folkstone 230kV transmission line.

Q. HOW MANY LANDOWNERS WILL BE DIRECTLY AFFECTED BY THE PROPOSED TRANSMISSION LINE, AND HAS DEP CONTACTED THOSE LANDOWNERS?

A. There are 11 landowners that will be directly affected by having at least some portion of the proposed 125-foot wide right-of-way on their property. On June 22, 2019, DEP sent letters to the 11 property owners of the total 14 land parcels that are within the proposed 125-foot right of way. All notifications were mailed certified U.S. Postal Service and included the appropriate reference to N.C. Gen. Stat. § 40A-11 providing the necessary 30-day notice to enter the properties for the purpose of surveying, soil borings, appraisals, and assessments.

Q. DOES THIS CONCLUDE YOUR PRE-FILED DIRECT TESTIMONY?

A. Yes.

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CERTIFICATE OF SERVICE

I certify that a copy of Duke Energy Progress, LLC's Application for a Certificate of Environmental Compatibility and Public Convenience and Necessity to Construct 4.6 Miles of Transmission Line in New Hanover County, North Carolina, in Docket No. E-2, Sub 1215, has been served by electronic mail, hand delivery or by depositing a copy in the United States mail, postage prepaid to the following parties:

David Drooz, Chief Counsel
Public Staff
North Carolina Utilities Commission
4326 Mail Service Center
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This the 13th day of August, 2019

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