ATLANTIC CITY ELECTRIC
QUINTON - WIND PORT 69 KV
TRANSMISSION LINE PROJECT

APPLICATION FOR

FRESHWATER WETLAND INDIVIDUAL PERMIT, COASTAL WETLAND INDIVIDUAL PERMIT, WATERFRONT DEVELOPMENT IN-WATER PERMIT AND WATER QUALITY CERTIFICATE

ENVIRONMENTAL REPORT
APPENDICES

Submitted to:

New Jersey Department of Environmental Protection
Division of Land Use Regulation

Submitted by:

atlantic city electric℠
AN EXELON COMPANY

Prepared By:

WSP

May 2023

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APPENDICES

Appendix A

Tax Maps of the Project Area

TAX MAP
LOWER ALLOWAYS CREEK TOWNSHIP

SCALE 1" = 400' SALEM CO., N.J.

SKINNER & COMPTON, ENGINEERS

JUNE 8, 1962 REVISED: DEC. 1, 1972, MAR. 7, 1978, JULY 1, 1980, MAY 16, 1988

SHEET 8

MATCH LINE

(1) EXEMPTED UNITED STATES GOVERNMENT 516 Ac. TOTAL

(2) EXEMPTED UNITED STATES GOVERNMENT 355 ACRES TOTAL

(3) EXEMPTED UNITED STATES GOVERNMENT 557.8 Ac. TOTAL

(3.01) EXEMPTED STATE OF N.J. D.E.P. 869.74 Ac. TOTAL

(3.02) EXEMPTED STATE OF N.J. D.E.P. 394.46 Ac. TOTAL

4.01 33.33 Ac.

4.02 58.69 AC

4 114.88 AC.

5.01 10.72 Ac.

5.02 51.88 AC.

5.03 55.09 AC.

5 414.36 AC.

26

50' WIDE PIPELINE EASEMENT TO U.S.A.

ELECTRIC TRANSMISSION EASEMENT

50' ACCESS EASEMENT

EASEMENT PUBLIC SERVICE ELECTRIC AND GAS COMPANY

ACCESS ROAD TO NUCLEAR STATION (PRIVATE)

ARTIFICIAL ISLAND

DELAWARE RIVER

HALFWAY CREEK

HOPE CREEK

HOPE CREEK

HOPE CREEK

SHEET 15

MATCH LINE

MATCH LINE

SHEET 21

NEW JERSEY DEPARTMENT OF THE TREASURY
DIVISION OF TAXATION
ENGINEERING & RAILROAD TAX BUREAU
APPROVED AS A TAX MAP PURSUANT TO THE PROVISIONS OF CHAPTER 175, LAWS OF 1913, ETC. FOR THE DIRECTOR, DIVISION OF TAXATION
BY C. Adams STATE SUPERVISOR
DATE JUN 29 1962 SERIAL NO. 360

Block 26, Lot 5.01 "Subdivision Public Service Electric & Gas Co" Filed in S.C.C.O. Nº 339 A&B

SHEET 14

MATCH LINE A

26

3.02
EXEMPTED
STATE OF N.J.
D.E.P.
394.46 Ac. TOTAL

6
RIPARIAN GRANT
PUBLIC SERVICE ELEC.
& GAS Co
0.66 Ac.

3
RIPARIAN GRANT
PUBLIC SERVICE ELEC. & GAS Co
0.46 Ac.

SHEET 15

BLOCK LIMIT
5841'

312.18

730' (R)

PUBLIC SERVICE ELECTRIC AND GAS COMPANY EASEMENT

ACCESS ROAD TO NUCLEAR STATION (PRIVATE)

485'

1550' (R)

ALLOWAY CREEK NECK ROAD

SHEET 18

49.50'

550' (R)

BLOCK LIMIT

6900's TOTAL

4000' TOTAL

HOPE CREEK

49

1
757.12 Ac.
EXEMPTED
THE STATE OF NEW JERSEY

FISHING CREEK

23,500 (±)

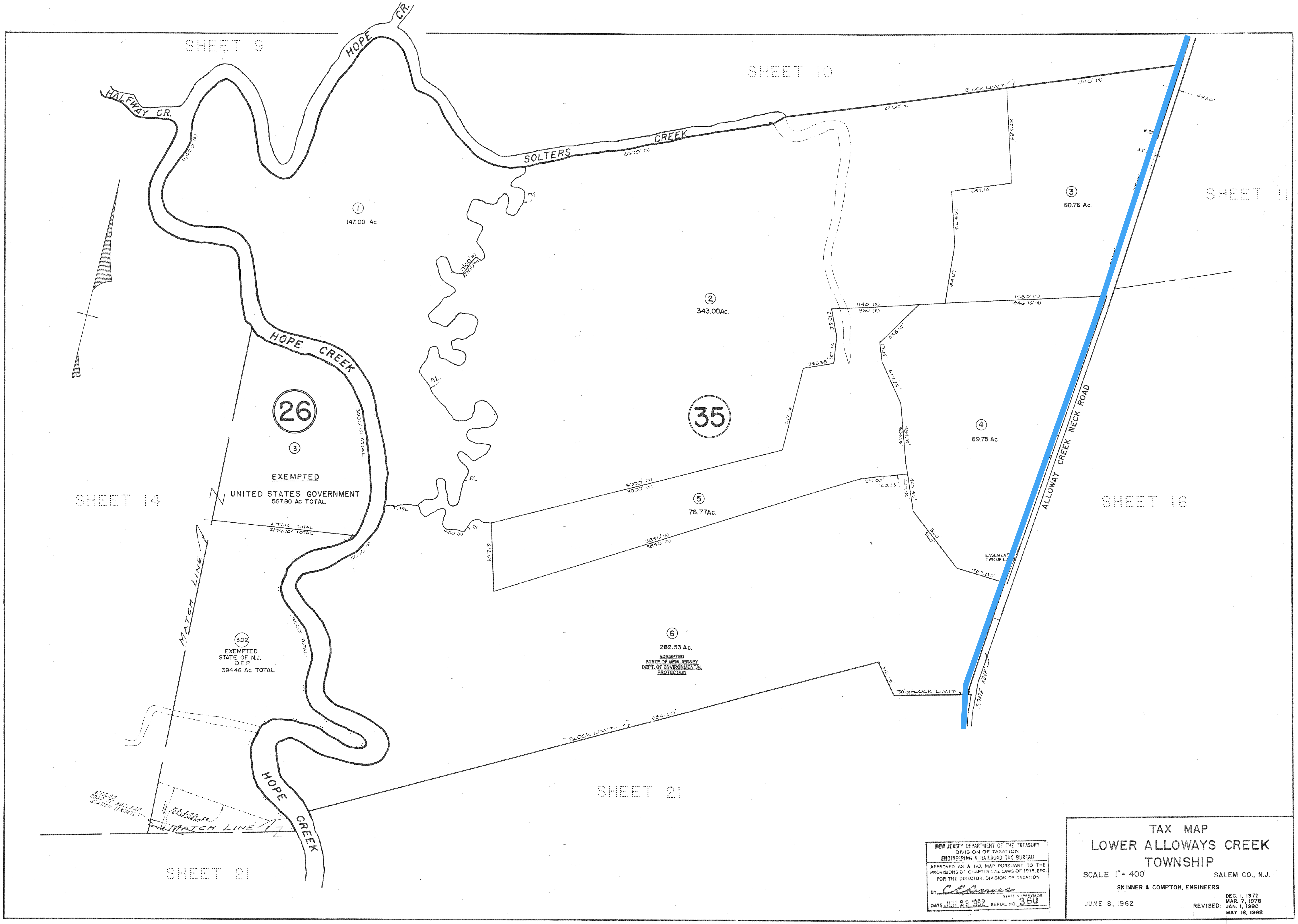
D E L A W A R E B A Y

SHEET 22

LOT 2, BLOCK 49 UNASSIGNED.

NEW JERSEY DEPARTMENT OF THE TREASURY
DIVISION OF TAXATION
ENGINEERING & RAILROAD TAX BUREAU
APPROVED AS A TAX MAP PURSUANT TO THE PROVISIONS OF CHAPTER 175, LAWS OF 1913, ETC.
FOR THE DIRECTOR, DIVISION OF TAXATION
BY C.C. Bonnet STATE SUPERVISOR
DATE JUN 29 1962 SERIAL NO. 260

TAX MAP
LOWER ALLOWAYS CREEK
TOWNSHIP
SCALE 1" = 400' SALEM CO., N.J.
SKINNER & COMPTON, ENGINEERS
JUNE 8, 1962
REVISED : DEC. 1, 1972
MAR. 7, 1978
JAN 1 1980
MAY 16, 1988


SHEET 9
SHEET 10
SHEET 11
SHEET 14
SHEET 16
SHEET 21
SHEET 21
HOPE CR.
HALFWAY CR.
SOLTERS CREEK
HOPE CREEK
HOPE CREEK
ALLOWAY CREEK NECK ROAD
PRIVATE ROAD
MATCH LINE
MATCH LINE
BLOCK LIMIT
26
35
1
147.00 Ac.
2
343.00Ac.
3
80.76 Ac.
4
89.75 Ac.
5
76.77Ac.
6
282.53 Ac.
EXEMPTED
STATE OF NEW JERSEY
DEPT. OF ENVIRONMENTAL PROTECTION
3
EXEMPTED
UNITED STATES GOVERNMENT
557.80 Ac TOTAL
3.02
EXEMPTED
STATE OF N.J.
D.E.P.
394.46 Ac TOTAL
EASEMENT TWP. OF L.A.C.
NEW JERSEY DEPARTMENT OF THE TREASURY
DIVISION OF TAXATION
ENGINEERING & RAILROAD TAX BUREAU
APPROVED AS A TAX MAP PURSUANT TO THE PROVISIONS OF CHAPTER 175, LAWS OF 1913, ETC.
FOR THE DIRECTOR, DIVISION OF TAXATION
STATE SUPERVISOR
DATE JUN 29 1962 SERIAL NO. 360
TAX MAP
LOWER ALLOWAYS CREEK
TOWNSHIP
SCALE 1" = 400'
SALEM CO., N.J.
SKINNER & COMPTON, ENGINEERS
JUNE 8, 1962
REVISED: DEC. 1, 1972
MAR. 7, 1978
JAN. 1, 1980
MAY 16, 1988

SHEET 2

SHEET 9

PRIVATE R/W

BLOCK LIMIT

VACATED BY TOWNSHIP ORDINANCE 4/2/16

VILLAGE OF HANCOCKS BRIDGE

POPLAR STREET

TOWNSHIP OF L.A.C. EXEMPTED

(7.01) 3.21Ac.

BLOCK LIMIT

POWELL ST.

SLUTS CREEK

BLOCK LIMIT

(1) 8.60Ac.

(2) 129.92 Ac.

(3) 7.14Ac.

(4) 19.89Ac.

(5) 53.52 Ac.

(6) 62.30Ac.

(7) 2.64Ac.

(8) 9.97Ac.

(9) 9.81Ac.

(10) 8.37Ac.

(11) 6.50Ac.

(12) 7.50Ac.

(13) 213.44AC.

(14) 69.84Ac.

(15) 26.89Ac.

(16) 0.20Ac.

(17) 138.20Ac.

(18)

(19)

28

(20) 70.31 AC

(20.01) 13.09 AC

PUBLIC SERVICE ELECTRIC & GAS COMPANY EASEMENT

EASEMENT TWP OF L.A.C.

PANCOAST ROAD

ALLOWAY CREEK NECK ROAD

GROSSCUP ROAD

HOPE CREEK

HOPE CREEK

(22) 209.35Ac.

(21.01) 52.91 Ac.

(21.02) 16.02 Ac.

(21.03) 10.54 Ac.

(24) 4.70Ac.

SEE DETAIL 'A'

DETAIL 'A' NO SCALE

SOLTERS CREEK

STATE OF NEW JERSEY

(23) EXEMPTED

175.88AC.

BLOCK LIMIT

SHEET 11

SHEET 15

SHEET 15

LOT 21, BLOCK 28 UNASSIGNED.

NEW JERSEY DEPARTMENT OF THE TREASURY
DIVISION OF TAXATION
ENGINEERING & RAILROAD TAX BUREAU

APPROVED AS A TAX MAP PURSUANT TO THE PROVISIONS OF CHAPTER 175, LAWS OF 1913, ETC FOR THE DIRECTOR, DIVISION OF TAXATION

BY C.C. Bowne STATE SUPERVISOR

DATE JUN 28 1962 SERIAL NO. 360

TAX MAP
LOWER ALLOWAYS CREEK TOWNSHIP

SCALE 1" = 400' SALEM CO., N.J.

SKINNER & COMPTON, ENGINEERS

JUNE 8, 1962

REVISED: DEC. 1, 1982
MAR. 7, 1978
JAN. 1, 1980
MAY 16, 1988

5-17-05

SHEET 6

HANCOCKS BRIDGE

LOCUST ISLAND ROAD

ALLOWAYS CREEK

FRONT STREET

NEW STREET

SECOND STREET

MAPLE AVENUE

MAIN STREET

POWELL STREET

BUTTONWOOD AVENUE

ALLOWAY CREEK NECK ROAD

DITCH

BLOCK LIMIT

MAINTANCE R.O.W. EASEMENT

SIGHT TRIANGLE COUNTY OF SALEM

EXEMPTED STATE OF NEW JERSEY DEPT. OF ENVIRONMENTAL PROTECTION

EXEMPTED STATE OF N. J. 1.30Ac.

EXEMPTED FIRE CO. 0.73Ac.

EXEMPTED FIRE CO. 0.73Ac.

EXEMPTED M. E. CHURCH 0.73Ac.

EXEMPTED M. E. CHURCH 0.20A.

EXEMPTED L.A.C. TWP. 1.31Ac.

EXEMPTED L.A.C. TWP. 0.06Ac.

EXEMPTED L.A.C. TWP.

EXEMPTED TWP. OF L.A.C. 2.61AC.

EXEMPTED TWP. OF L.A.C. 1.85AC.

EXEMPTED TOWNSHIP OF LOWER ALLOWAYS CREEK 17.40Ac.

EXEMPTED TOWNSHIP OF LOWER ALLOWAYS CREEK 12.80 AC.

EXEMPTED FRIEND'S MEETING HOUSE 0.52Ac.

VACATED BY ORDINANCE 83-7

APPROXIMATE DITCH LOCATION

SHEET 2

SHEET 10

SHEET 11

NOTE: BLOCK 16, LOT 7 IS UNASSIGNED

BLOCK 17, UNASSIGNED, ADDED TO LOT 11
BLOCK 11, UNASSIGNED, ADDED TO LOT 10 AND POPLAR STREET
BLOCK 11, LOT 12 UNASSIGNED, NEW LOT 19, BLOCK 17

NEW JERSEY DEPARTMENT OF THE TREASURY
DIVISION OF TAXATION
ENGINEERING & RAILROAD TAX BUREAU
APPROVED AS A TAX MAP PURSUANT TO THE PROVISIONS OF CHAPTER 175, LAWS OF 1913 ETC.
FOR THE DIRECTOR, DIVISION OF TAXATION
BY C. E. Bowers
STATE SUPERVISOR
DATE JUN 29 1962 SERIAL NO. 960

TAX MAP
LOWER ALLOWAYS CREEK TOWNSHIP

SCALE 1" = 100' SALEM CO., N.J.

SKINNER & COMPTON, ENGINEERS

JUNE 8, 1962

REVISED: DEC. 7, 1972
MAR. 7, 1978
JAN. 1, 1980
MAY 16, 1988

SHEET 3

SHEET 2

SHEET 5

SHEET 7

SHEET 11

COOPERS BRANCH

ALLOWAYS CREEK

NEW BRIDGE ROAD

ILOCUST ISLAND ROAD

HANCOCKS BRIDGE

HARMERSVILLE ROAD

CUFF ROAD

VILLAGE OF HANCOCKS BRIDGE

HARMERSVILLE

20

21

1 5.42 Ac.
6.17 Ac.

2 40.73 Ac.

2.01 14.96 Ac.

3 8.74 Ac.

3 10.80 Ac.

4 14.90 Ac.

3.64 Ac.

5 72.94 AC.

5.01 6 AC.

1.99 AC.
1.77 AC.

5.02 1.32 Ac.

6 13.90 Ac.

7 104.31 Ac.

8 68.68 Ac.

1.01 5.18 AC.

1.02 4.08 AC.
EXEMPTED CEMETERY

24.72 AC.

SEE INSET

INSET
SCALE 1" = 100'

6 EXEMPTED SOCIETY OF FRIENDS 0.98 Ac.

7 0.54 Ac.

14 1.21 Ac.

PRIVATE EASEMENT

NEW JERSEY DEPARTMENT OF THE TREASURY
DIVISION OF TAXATION
ENGINEERING & RAILROAD TAX BUREAU
APPROVED AS A TAX MAP PURSUANT TO THE PROVISIONS OF CHAPTER 175, LAWS OF 1913, ETC.
FOR THE DIRECTOR, DIVISION OF TAXATION
BY C. C. Evans STATE SUPERVISOR
DATE JUN 20 1980 SERIAL NO. 360

TAX MAP
LOWER ALLOWAYS CREEK TOWNSHIP

SCALE 1" = 400' SALEM CO., N.J.

SKINNER & COMPTON, ENGINEERS

JUNE 8, 1962

REVISED DEC. 1, 1972
MAR. 7, 1978
JAN. 1, 1980

MAY 16, 1988

6-16-08

SHEET 4

SHEET 3

SHEET 6

SHEET 13

SHEET 12

SHEET 11

QUINTON TOWNSHIP

HOGATE BOULEVARD

COOPERS BRANCH

COOPERS BRANCH BRIDGE

ROBINSON ROAD

NEW BRIDGE ROAD

HARMERSVILLE - PECKS CORNER ROAD

HARMERSVILLE

HARMERSVILLE - PECKS CORNER RD.

HALSTA ROAD

CROSS ROAD

BLACK DIVISION ROAD

DEADMAN CREEK

SIGHT TRIANGLE EASEMENT

COUNTY OF SALEM

EXEMPTED TWP. OF L.A.C.

FARMLAND PRESERVATION EASEMENT
73.84 AC (LOTS 10 & 10.01 & EXCEPTIONS)

FARMLAND PRESERVATION EASEMENT
23.78 AC (TOTAL)
21.78 AC (W. O. EXC)
EXCEPTION 2.00 AC

EXCEPTION 1.50 AC

EXCEPTION 1.5 AC

PRIVATE R/W EASEMENT TWP. OF L.A.C.

20' WIDE ACCESS EASEMENT

DRAINAGE EASEMENT TWP. OF L.A.C.

Lot No 6, Block 23 unassigned 3/12/76
Lot No 7, Block 23 unassigned 3/12/76

NEW JERSEY DEPARTMENT OF THE TREASURY
DIVISION OF TAXATION
ENGINEERING & RAILROAD TAX BUREAU
APPROVED AS A TAX MAP PURSUANT TO THE PROVISIONS OF CHARTER 175, LAWS OF 1913, ETC. FOR THE DIRECTOR, DIVISION OF TAXATION
BY C. R. Bauers STATE SUPERVISOR
DATE JUN 20 1962 SERIAL NO. 360

TAX MAP
LOWER ALLOWAYS CREEK TOWNSHIP

SCALE 1" = 400' SALEM CO., N. J.

SKINNER & COMPTON; ENGINEERS

JUNE 8, 1962

DEC. 1, 1972
REVISED : MAR. 7, 1975
JAN. 1, 1980
MAY 16, 1988

62-06

SHEET 1

HANCOCKS BRIDGE – QUINTON ROAD

QUINTON TOWNSHIP

NEW BRIDGE

ALLOWAYS CREEK

TOWNSHIP LINE

SALEM – HANCOCKS BRIDGE ROAD

NEW BRIDGE ROAD

COOPERS BRANCH

EXEMPTED CEMETERY SOCIETY OF FRIENDS

EXEMPTED L.A.C. TWP.

STATE OF NEW JERSEY EXEMPTED

AGRICULTURAL EASEMENT AREA

DRAINAGE EASEMENT COUNTY OF SALEM

R/W

4 62.24 AC.

7 158.73 Ac.

3 54.32 Ac.

9 1.50Ac.

2.30Ac.

3.52Ac.

3.01 5.75Ac.

3.02

2.01 1.23Ac.

2.02 1.16 Ac.

6 12.10Ac.

3 0.31Ac.

3.80Ac.

5 9.85AC.

2 75.34Ac.

4 45.30Ac.

4.43Ac.

6.01 0.67 Ac.

5 .86AC. 0.58 Ac.

4.01 3.01AC.

9 10.39Ac.

8.01 3.60Ac.

8 44.43 Ac.

10 65.29Ac.

11 7.68AC. AEASMT.

11.01 6.0AC.

7 6.16 Ac.

9 AGRICULTURAL EASEMENT AREA

6 27.00Ac.

5.02 6.18AC.

4 7.26 Ac.

4.02

5.01

4.01 1.95 Ac.

4.03 1.22 Ac.

1.57Ac.

2.47Ac.

SHEET 2

53.72 Ac.

8 155.00Ac.

1 18.55Ac.

1 11.28Ac.

1 56.82 AC

HANCOCKS BRIDGE

VILLAGE OF HANCOCKS BRIDGE

SHEET 4

SHEET 6

SHEET 7

COOPERS BRANCH BRIDGE

Lot 8, Block 7 unassigned.

NEW JERSEY DEPARTMENT OF THE TREASURY
DIVISION OF TAXATION
ENGINEERING & RAILROAD TAX BUREAU
APPROVED AS A TAX MAP PURSUANT TO THE PROVISIONS OF CHAPTER 175, LAWS OF 1913, ETC.
FOR THE DIRECTOR, DIVISION OF TAXATION
BY C. R. Francis
DATE JUN 29 1982 STATE SURVEYOR
SERIAL NO. S 30

TAX MAP
LOWER ALLOWAYS CREEK TOWNSHIP

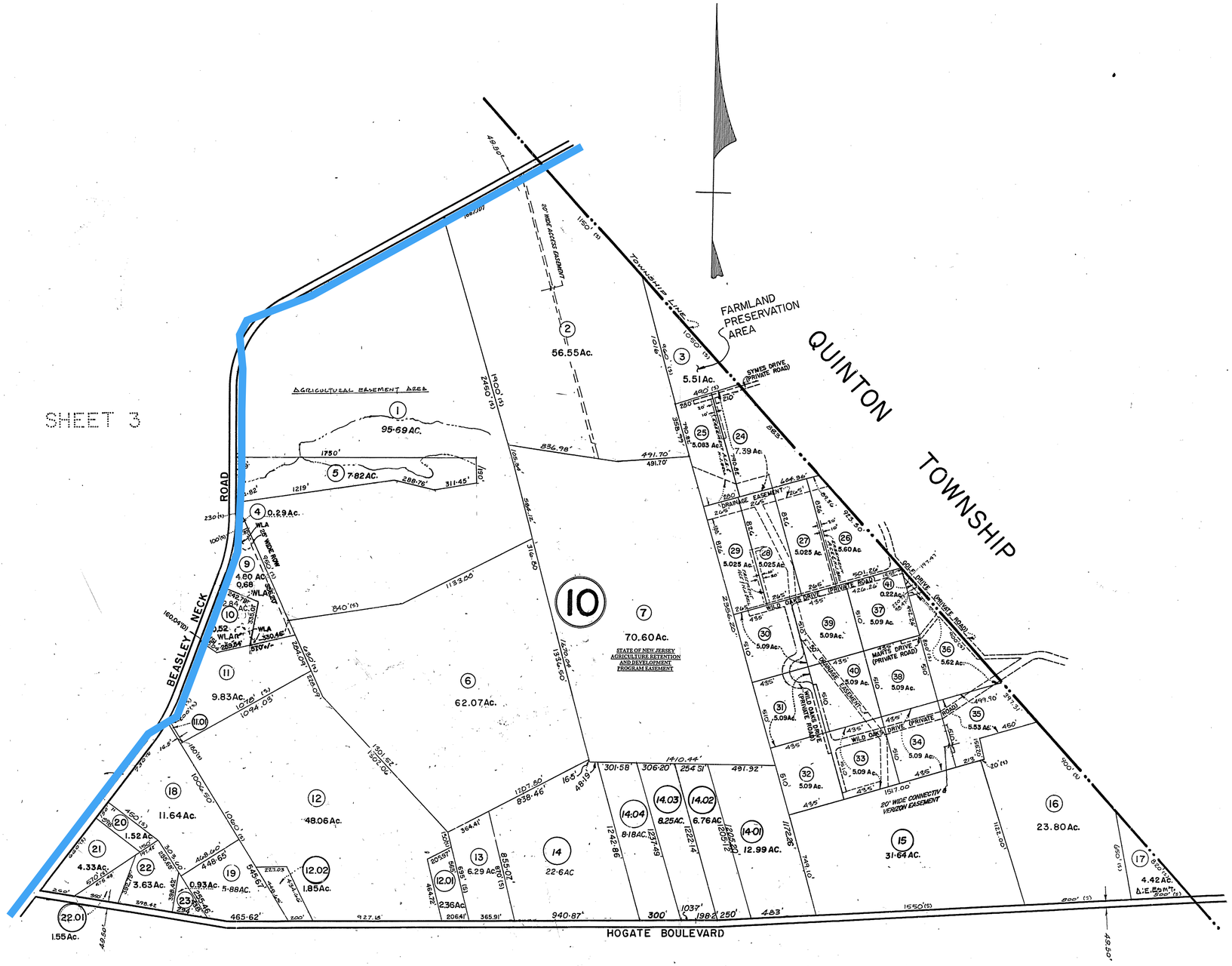
SCALE 1" = 400' SALEM CO., N.J.

SKINNER & COMPTON, ENGINEERS

JUNE 8, 1962

REVISED DEC. 1, 1972
MAR. 7, 1978
JAN. 1, 1980
MAY 16, 1988

SHEET 3



SHEET 7

NEW JERSEY DEPARTMENT OF THE TREASURY
DIVISION OF TAXATION
ENGINEERING & RAILROAD TAX BUREAU
APPROVED AS A TAX MAP PURSUANT TO THE PROVISIONS OF CHAPTER 175, LAWS OF 1913, ETC.
FOR THE DIRECTOR, DIVISION OF TAXATION
BY _____ STATE SUPERVISOR
DATE JUN 29 1982 SERIAL NO. 360

TAX MAP
LOWER ALLOWAYS CREEK TOWNSHIP

SCALE 1" = 400' SALEM CO., N. J.

SKINNER & COMPTON, ENGINEERS

JUNE 8, 1982

REVISED DEC. 1, 1972
MAR. 7, 1978
JAN. 1, 1980
MAY 16, 1988

8-12-06


7
SHEET 6
VILLAGE
OF
QUINTON
SHEET 8
MAIN STREET
SMITHFIELD ST.
ROBINSON ST.
EXEMPTED
TOWNSHIP OF QUINTON
14.84A.
9.17AC.
8.75AC.
10.45 A.
6.20A.
28.70A.
7.50 A.
14.03A.
12.01 Ac.
92.45A.
Lot 23, Block 26 Unassigned
Lot 8, Block 26 Unassigned
Lot 10, Block 26 Unassigned
SHEET 9
JERICHO ROAD
6.92A.
188.62 Acs.
STATE OF NEW JERSEY AGRICULTURE RETENTION AND DEVLOPMENT EASEMENT
28
50' WIDE DRAINAGE EASEMENT COUNTY OF SALEM
SHEET 5
CROSS ROAD
51.94A.
BLOCK DIVISION
WILD OAKS DRIVE (PRIVATE ROAD)
(PRIVATE ROAD & UTILITY EASEMENT)
6.91 A.
4.25A.
60' Wide Right-of-Way Easement
2.00 Acs.
19.71A.
62.79 AC.
6.61 Ac.
86.26 A.
BEASLEY NECK ROAD
29
29.01
66.69 AC.
134.89 Acs.
11.24A.
HOGATE ROAD
SHEET 11
29.02
BLOCK DIVISION
SYMES DRIVE (PRIVATE ROAD)
WILD OAKS DRIVE (PRIVATE ROAD)
4.98A.
STATE OF NEW JERSEY AGRICULTURE RETENTION AND DEVLOPMENT EASEMENT
18.86 Acs.
GOLF (PRIVATE ROAD) DRIVE
Township Line
EXEMPTED QUINTON TOWNSHIP
21.62 AC.
3.58A.
30
LOWER ALLOWAYS CREEK TOWNSHIP
Lot Numbers 8 thru 15 and numbers shown thus 5, 6 and 7 in Block 29 refer to 'Subdivision Map for Wild Oaks Country Club'
Lot Numbers 1 thru 15 and 17 thru 22, Block 29.1 refer to 'Subdivision Map for Wild Oaks Country Club'
Lot Number 1, Block 29.2 refer to Subdivision Map for Wild Oaks Country Club'
Lot 5, Block 29 Unassigned
Lot 5A, Block 29 Unassigned
Lot 6, Block 29 Unassigned
Lot 7, Block 29 Unassigned
Lot 12, Block 28 Unassigned
Lot 38, Block 28 Unassigned
NEW JERSEY DEPARTMENT OF THE TREASURY
DIVISION OF TAXATION
ENGINEERING & RAILROAD TAX BUREAU
APPROVED AS A TAX MAP PURSUANT TO THE PROVISIONS OF CHAPTER 175, LAWS OF 1913, ETC. FOR THE DIRECTOR, DIVISION OF TAXATION
DATE APR 26 1962
SERIAL NO. 351
TAX MAP
QUINTON TOWNSHIP
SCALE: 1"=400'
SALEM CO. N.J.
SKINNER & COMPTON ENGINEERS
MARCH 26, 1962
7

SHEET 5 | SHEET 4 | SHEET 4 | SHEET 8 | SHEET 5 | SHEET 7 | SHEET 7 | SHEET 8

ALLOWAYS CREEK

BLOCK DIVISION

QUINTON – ALLOWAY ROAD

MAIN STREET

NEW STREET

COTTAGE AVENUE

SICKLER STREET

EAST AVENUE

BULLET LANE

HIGH STREET

LAKE AVENUE

SMITHFIELD STREET

ROBINSON STREET

WATERWORKS ROAD

LAUREL LAKE

NORTH UNION

BELL ATLANTIC EASEMENT

12' WIDE RIGHT-OF-WAY EASEMENT

12' WIDE PRIVATE R/W OVER ENTIRE LOT

VARIABLE WIDTH WATER MAIN EASEMENT

19 — 4.33A. | 1.86A.

23 — 1 0.72 Acs. EXEMPT QUINTON TWP

17 0.70 A. | 19 0.33A. | 19.01 0.27A. | 18 0.40A. | 20 0.38A.

3 EXEMPTED DAUGHTERS AMERICAN REVOLUTION (MONUMENT LOT 12 W 12') | 4 1.19A.

1 EXEMPTED TOWNSHIP OF QUINTON 0.40 Acs. | 2 | 3 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 0.30 Ac.

20 — 14 0.83 Acs. EXEMPTED TOWNSHIP OF QUINTON

1 EXEMPTED TOWNSHIP OF QUINTON | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18.01 | 19 | 20 | 21 | 22 | 23 | 24

0.15 A. 1.02 | 0.50A. 1.03 | 1.01 0.14 A.

1 | 2 | 3.01 | 9 0.05AC. EXEMPT QUINTON TWP

21 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8

22 — 11 1.29 Acs. EXEMPTED QUINTON M.E. CHURCH

1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 12 | 13 | 14 EXEMPT QUINTON UNITED METHODIST CHURCH | 14.01 | 15 | 16 | 17 | 18

24 — 15 1.92A. | 21 1.24A. | 8.01 0.22 A. | 8 0.23 A. | 24 5.75AC.

1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 14 | 22 | 23

25 — 1 | 2 | 3 | 4 | 5.01 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 35 | 36 | 37 | 38 | 39 | 40 | 41

EXEMPTED QUINTON TOWNSHIP 25 0.95A.

26 — 0.78A. | 27 0.32 A. | 28 2.21 Ac. EXEMPT QUINTON TWP | 30 3.24A. | 31 0.77A.

1 0.77 Acs. EXEMPTED QUINTON TOWNSHIP | 2 | 3 | 5 | 6 0.60± Acs. | 7 0.28 Acs. | 7.01 0.29 Acs. | 8 | 10 | 11 | 12 0.91 Acs. | 12.01

14 5.25± Acs. EXEMPTED QUINTON BAPTIST CHURCH

16 | 17 | 18 1.33 Acs.

27 — 1 | 2 0.38 AC. | 3 | 4

NOTE:–Lot 16, Block 24 Unassigned
Lot 9, Block 24 Unassigned
Lot 13, Block 24 Unassigned, added to Lot 12 – 1/31/96
Lot 4, BLock 26 Unassigned

NEW JERSEY DEPARTMENT OF THE TREASURY
DIVISION OF TAXATION
ENGINEERING & RAILROAD TAX BUREAU
APPROVED AS A TAX MAP PURSUANT TO THE PROVISIONS OF CHAPTER 175, LAWS OF 1911 R.S.
FOR THE DIRECTOR, DIVISION OF TAXATION
BY C.C. Barnes STATE SURVEYOR
DATE APR 26 1962 SERIAL NO. 351

TAX MAP
QUINTON TOWNSHIP

SCALE: 1"=100' SALEM CO. N.J.
SKINNER & COMPTON ENGINEERS
MARCH 26, 1962

TAX MAP
QUINTON TOWNSHIP

SCALE: 1"=400'

SALEM CO. N.J.

SKINNER & COMPTON ENGINEERS

MARCH 26, 1962

MANNINGTON TOWNSHIP

ALLOWAY TOWNSHIP

VILLAGE OF PENTON

QUAKER NECK RD.

MATCH LINE — CLANCY ROAD

SEE INSET ON RIGHT

INSET
SCALE: 1"=400'

ALLOWAY CREEK

10' WIDE UNDERGROUND PIPELINE EASEMENT

QUINTON – ALLOWAY ROAD (49.50' WIDE)

INSET B
SCALE: 1"=200'

CREAM RIDGE ROAD

ACTON STATION ROAD

SALEM – QUINTON ROAD

BURDEN HILL ROAD

ALLOWAYS CREEK

BLOCK LIMIT

20' WIDE WATER LINE EASEMENTS

DRAINAGE EASEMENT TOWNSHIP OF QUINTON

33' WIDE RIGHT OF WAY ACCESS EASEMENT

40' RIGHT OF WAY

COUNTY DRAINAGE EASEMENT

WELDON CRT.

COURT

WELDON

Note:– Lot 1, BLock 14 Unassigned
Lot 24A, Block 14 Unassigned

SEE INSET B

SHEET 2

SHEET 5

SHEET 6

SHEET 8

LOTS 24.01, 24.02, 24.03, BLOCK 14, 'LAHN SUBDIVISION' FILED IN SALEM COUNTY CLERKS OFFICE

NEW JERSEY DEPARTMENT OF THE TREASURY
DIVISION OF TAXATION
ENGINEERING & R.R.ROAD TAX BUREAU
APPROVED AS A TAX MAP PURSUANT TO THE PROVISIONS OF CHAPTER 175, LAWS OF 1913, ETC.
FOR THE DIRECTOR, DIVISION OF TAXATION
BY _____
STATE SURVEYOR
DATE APR 26 1962 SERIAL NO. 351

TAX MAP 8

QUINTON TOWNSHIP

SCALE: 1"=400' SALEM CO. N.J.

SKINNER & COMPTON ENGINEERS

MARCH 26, 1962

NEW JERSEY DEPARTMENT OF THE TREASURY
DIVISION OF TAXATION
ENGINEERING & RAILROAD TAX BUREAU
APPROVED AS A TAX MAP PURSUANT TO THE PROVISIONS OF CHAPTER 175, LAWS OF 1913, ETC.
FOR THE DIRECTOR, DIVISION OF TAXATION
BY _____ STATE SUPERVISOR
DATE APR 26 1962 SERIAL NO. 351

Lot 39, Block 33 Unassigned 8/29/75
Lot 40, Block 33 Unassigned 8/29/75
Lot 41, Block 33 Unassigned 10/19/98

ALLOWAY TOWNSHIP

TOWNSHIP LINE

SIGHT TRIANGLE EASEMENT TO SALEM COUNTY

BURDEN HILL ROAD

QUINTON - ALLOWAY ROAD

WATERWORKS ROAD

INSET 'A'
SCALE: 1"=200'

SEE INSET 'A'

SHEET 4

SHEET 6

VILLAGE OF QUINTON

SALEM - QUINTON ROAD

LAKE AVENUE

LAUREL LAKE

MAIN STREET

SHEET 7

QUINTON - MARLBORO ROAD

SHEET 9

SHEET 10

BURDEN HILL

20' WIDE COMMON DRIVEWAY EASEMENT

50' WIDE PRIVATE ACCESS EASEMENT

40' WIDE R/W

15' R/W

20' WIDE ☩ OF CITY OF SALEM WATER LINE EASEMENT

8

SEE SHEET 33

TIDE MILL ROAD

SEE SHEET 32

NEWELL ROAD

SEE SHEET 26

N

66'

ROUTE 45

66'

2 0.31 AC. | 3 0.23 AC. | 4 0.15 AC. | 5 0.23 AC. | 7 0.23 AC. | 8 0.23 AC. | 9 0.23 AC. | 10 0.31 AC. | 11 0.23 AC. | 12 0.16 AC. | 13 0.16 AC. | 14 0.16 AC.

17 0.77 AC. | 18 0.38 AC. | 19 0.77 AC. | 20 0.58 AC. | 21 0.38 AC. | 22 0.29 AC.

Approximate Approved Laydown Area

EXEMPTED
N. J. ASSOCIATION FOR RETARDED CITIZENS, INC. SALEM UNIT
I
6.00 AC.

6
14.18 AC.

15
8.12 AC.

61

16
3.81 AC.

23
15.09 AC.

ROBERT STREET E.

SEE SHEET 30

BLOCK LIMIT

SEE SHEET 27

BLOCK LIMIT

BLOCK LIMIT

BLOCK LIMIT

B/L

BLOCK LIMIT

SEE SHEET 30

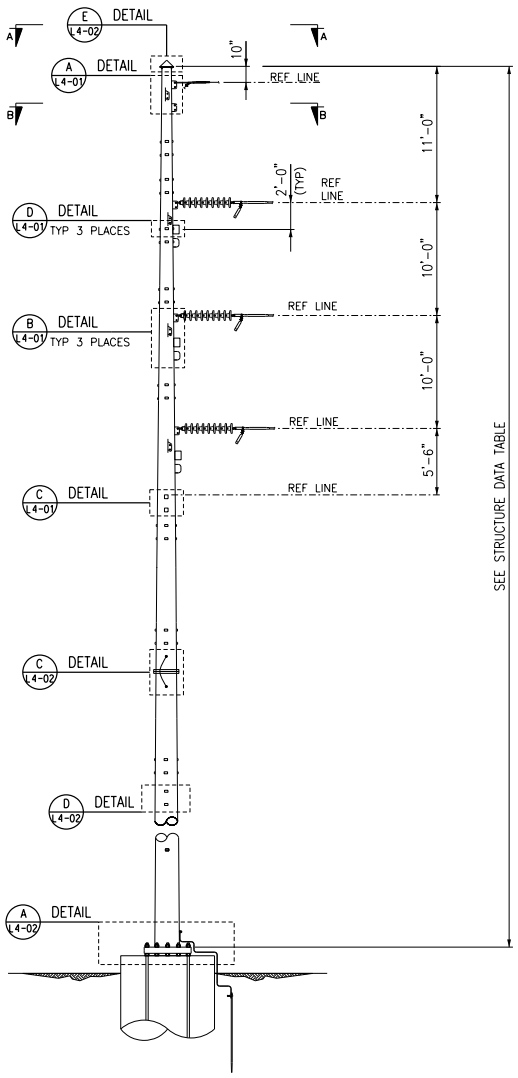
SEE SHEET 27

NEW JERSEY DEPARTMENT OF THE TREASURY
DIVISION OF TAXATION
LOCAL PROPERTY AND PUBLIC UTILITY BRANCH
APPROVED AS A TAX MAP PURSUANT TO THE PROVISIONS OF CHAPTER 175, LAWS OF 1918, ETC. FOR THE DIRECTOR, DIVISION OF TAXATION
J. H. Dittmar
BY _____ P.E. & L.S.
Lic. #5009 SUPERINTENDENT
DATE JAN 6 1982 SERIAL NO. 601

TAX ASSESSMENT MAP
MANNINGTON TOWNSHIP
SALEM COUNTY, NEW JERSEY
SCALE: 1" = 100' *SEPTEMBER, 1981*
ALBERT A. FRALINGER, JR., TOWNSHIP ENGINEER
115 FIFTH STREET SALEM, NEW JERSEY 08079

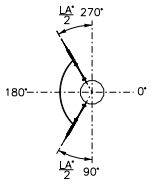
Appendix B

Typical Cross-Section Drawings of Proposed Structures



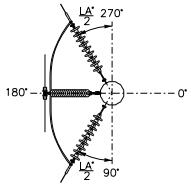
TYPE SC-69-DE-MS (60)

DRILLED PIER FOUNDATION



SECTION A-A

STATIC WIRE PLAN



SECTION B-B

CONDUCTOR PLAN

STRUCTURE DATA				
STRUCTURE TYPE	HEIGHT (FT)	IA (DEG)	STRUCTURE NUMBER	QTY
SC-69-DE-MS (60)	70	31.65	QR-1	1

NOTES:

1. ALL STATED LOADS ARE ULTIMATE VALUES AND INCLUDE OVERLOAD FACTORS AND INSULATOR WEIGHTS.
2. STRUCTURE AND ATTACHMENTS SHALL BE DESIGNED FOR THE SIMULTANEOUS APPLICATION OF WIND ON THE STRUCTURE AND WIRE LOADS FOR EACH LOAD CASE. WIND SHALL BE APPLIED IN THE DIRECTION WHICH RESULTS IN THE MOST SEVERE EFFECT.
3. WIND PRESSURE SHOWN ON LOADING SCHEDULE IS BASED ON A SHAPE FACTOR OF 1.0.
4. POLE TIP DEFLECTION SHALL NOT EXCEED 1.0% OF THE ABOVE GROUND HEIGHT FOR THE DEFLECTION LOAD CASE AND SHALL NOT EXCEED 6% OF THE ABOVE GROUND HEIGHT UNDER THE MAXIMUM INTACT LOADING CONDITION.
5. DESIGN AND FABRICATION SHALL BE IN ACCORDANCE WITH ASCE MANUAL NO. 48.
6. FOR THE CONSTRUCTION AND TENSION STRINGING LOAD CASES, FABRICATOR SHALL APPLY A POINT LOAD OF 5,000 POUNDS AT ANY POINT WHERE A CONSTRUCTION OR MAINTENANCE PERSON COULD STAND OR OTHERWISE BE SUPPORTED. THIS LOAD HAS NOT BEEN CONSIDERED IN THE WIRE LOAD TABLES.
7. THE VERTICAL LOADS IN THE LOADING SCHEDULE DO NOT INCLUDE STRUCTURE DEAD WEIGHT. THE FABRICATOR SHALL INCLUDE THE STRUCTURE DEAD WEIGHT LOAD IN ALL CALCULATIONS. THE VERTICAL OVERLOAD FACTOR APPLIED TO THIS LOAD SHALL BE AS LISTED IN THE LOAD WORKSHEET FOR EACH LOAD CASE.
8. ALL POLES SHALL BE GALVANIZED STEEL.
9. SEE DRAWINGS L4-01 & L4-02 FOR DETAILS.

THIS DRAWING WAS CREATED USING COMPUTER AIDED DRAFTING. DO NOT MAKE MANUAL CHANGES WITHOUT UPDATING ELECTRONIC FILE.

No.	DATE	REVISION DESCRIPTION	DRAWN BY	ENGR BY	CHECKED BY	APVD BY
A	09/30/22	ISSUED FOR 60% REVIEW	DM	SGN	GY	PG

No.	DATE	REVISION DESCRIPTION	DRAWN BY	ENGR BY	CHECKED BY	APVD BY
					DRAWN BY	DM 09/30/22
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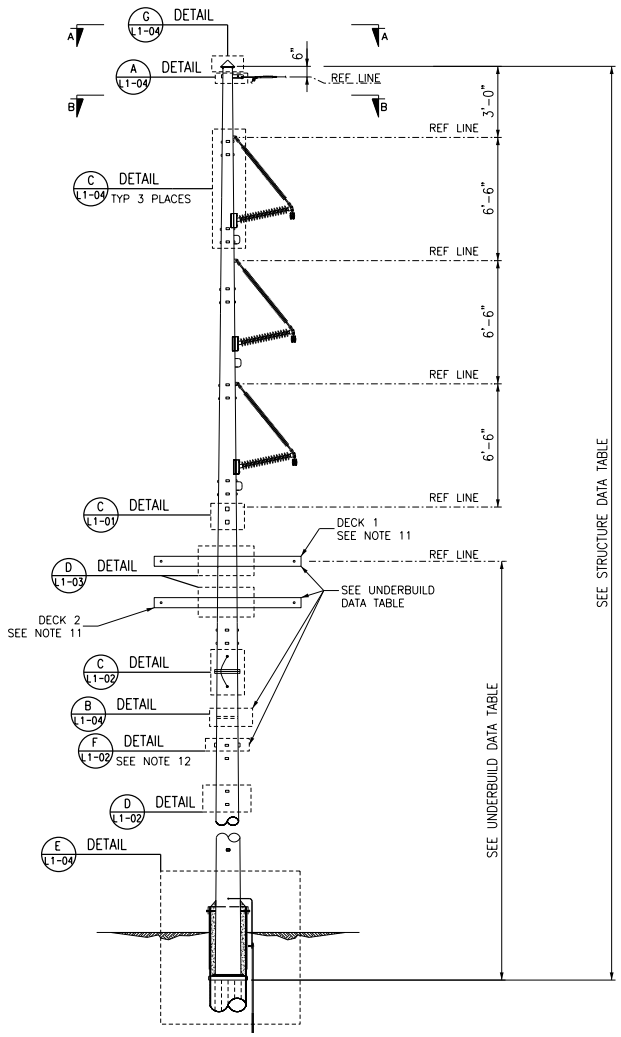
SCALE N.T.S.

TITLE

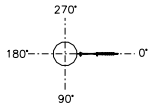
QUINTON - ROADSTOWN
69kV TRANSMISSION LINE
PERFORMANCE DRAWING
TYPE SC-69-DE-MS (60)

DRAWING No.	SHEET OF SHEET		REV
L3-01	1	2	A



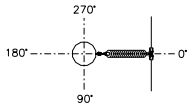
TYPE SC-69-LRA-SS

SOCKETED VIBRATORY CAISSON FOUNDATION



SECTION A-A

STATIC WIRE PLAN



SECTION B-B

CONDUCTOR PLAN

STRUCTURE DATA					
STRUCTURE TYPE	HEIGHT (FT)	EMBEDMENT DEPTH (FT)	LA (DEG)	STRUCTURE NUMBER	QTY
SC-69-LRA-SS	95	6	11.34	78	1
	85	2	-9.67	103	1
	85	2	-9.99	104	1

UNDERBUILD DATA				
STRUCTURE NUMBER	HEIGHT ON POLE FROM BASE (FT)			
	DECK 1	DECK 2	NEUTRAL	COMM WIRE
78	52.0	47.0	33.5	N/A
103	50.0	45.0	31.5	24.0
104	50.0	45.0	31.5	24.0

NOTES:

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2. STRUCTURE AND ATTACHMENTS SHALL BE DESIGNED FOR THE SIMULTANEOUS APPLICATION OF WIND ON THE STRUCTURE AND WIRE LOADS FOR EACH LOAD CASE. WIND SHALL BE APPLIED IN THE DIRECTION WHICH RESULTS IN THE MOST SEVERE EFFECT.
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4. POLE TIP DEFLECTION SHALL NOT EXCEED 1.5% OF THE ABOVE GROUND HEIGHT FOR THE DEFLECTION LOAD CASE AND SHALL NOT EXCEED 10% OF THE ABOVE GROUND HEIGHT UNDER THE MAXIMUM INTACT LOADING CONDITION.
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6. FOR THE CONSTRUCTION AND TENSION STRINGING LOAD CASES, FABRICATOR SHALL APPLY A POINT LOAD OF 5,000 POUNDS AT ANY POINT WHERE A CONSTRUCTION OR MAINTENANCE PERSON COULD STAND OR OTHERWISE BE SUPPORTED. THIS LOAD HAS NOT BEEN CONSIDERED IN THE WIRE LOAD TABLES.
7. THE VERTICAL LOADS IN THE LOADING SCHEDULE DO NOT INCLUDE STRUCTURE DEAD WEIGHT. THE FABRICATOR SHALL INCLUDE THE STRUCTURE DEAD WEIGHT LOAD IN ALL CALCULATIONS. THE VERTICAL OVERLOAD FACTOR APPLIED TO THIS LOAD SHALL BE AS LISTED IN THE LOAD WORKSHEET FOR EACH LOAD CASE.
8. ALL POLES SHALL BE GALVANIZED STEEL.
9. SEE DRAWINGS L1-01, L1-02, L1-03, AND L1-04 FOR DETAILS.
10. STRUCTURES WITH UNDERBUILD SHALL BE DESIGNED TO NOT EXCEED 90% OF THE POLE UTILIZATION.
11. CROSSARMS TO BE PROVIDED BY OTHERS. CROSSARM DIMENSIONS ARE ASSUMED.
12. COMMUNICATION BRACKET DETAIL F OF L1-02 SHALL SUPPORT A 3 KIP VERTICAL, LONGITUDINAL, AND TRANSVERSE LOAD FOR ALL WEATHER CONDITIONS.

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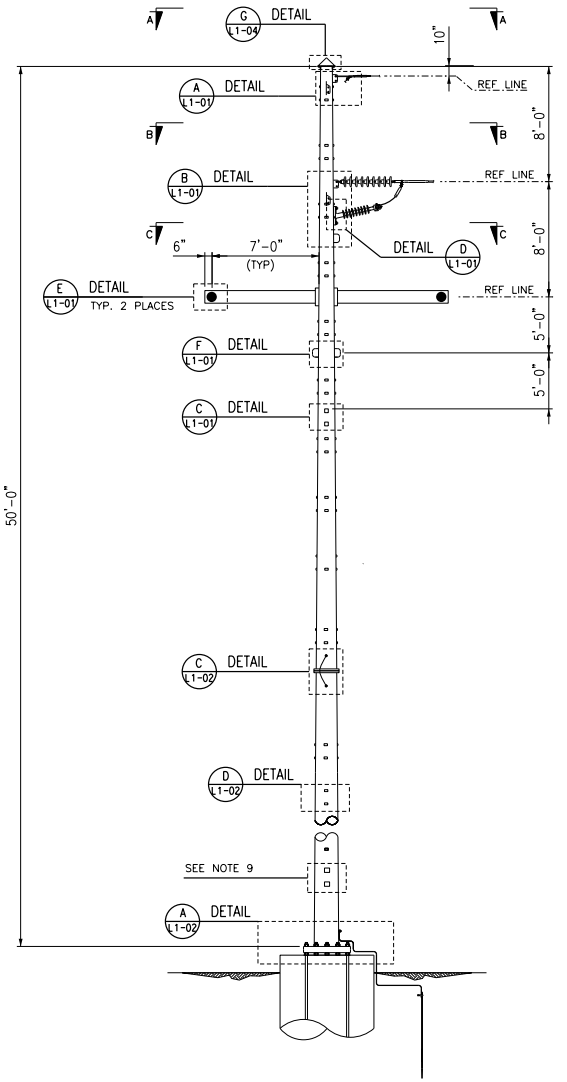
SCALE N.T.S.

ATLANTIC CITY ELECTRIC

TITLE

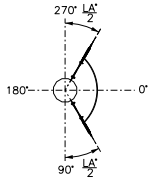
QUINTON - WINDPORT
69kV TRANSMISSION LINE
PERFORMANCE DRAWING
TYPE SC-69-LRA-SS

DRAWING No.	SHEET OF SHEET		REV
L0-03	1	2	A



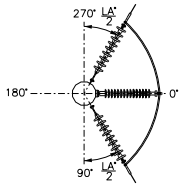
TYPE SC-69-CUSTOM DE

DRILLED PIER FOUNDATION



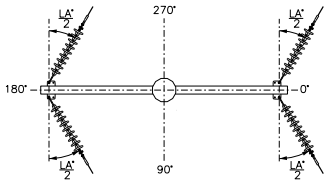
SECTION A-A

STATIC WIRE PLAN



SECTION B-B

TOP CONDUCTOR PLAN



SECTION C-C

BOTTOM CONDUCTOR PLAN

STRUCTURE DATA				
STRUCTURE TYPE	HEIGHT (FT)	LA (DEG)	STRUCTURE NUMBER	QTY
SC-69-CUSTOM DE	50	-16.28	205	1
	50	38.46	206	1

NOTES:

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2. STRUCTURE AND ATTACHMENTS SHALL BE DESIGNED FOR THE SIMULTANEOUS APPLICATION OF WIND ON THE STRUCTURE AND WIRE LOADS FOR EACH LOAD CASE. WIND SHALL BE APPLIED IN THE DIRECTION WHICH RESULTS IN THE MOST SEVERE EFFECT.
3. WIND PRESSURE SHOWN ON LOADING SCHEDULE IS BASED ON A SHAPE FACTOR OF 1.0.
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6. FOR THE CONSTRUCTION AND TENSION STRINGING LOAD CASES, FABRICATOR SHALL APPLY A POINT LOAD OF 5,000 POUNDS AT ANY POINT WHERE A CONSTRUCTION OR MAINTENANCE PERSON COULD STAND OR OTHERWISE BE SUPPORTED. THIS LOAD HAS NOT BEEN CONSIDERED IN THE WIRE LOAD TABLES.
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8. ALL POLES SHALL BE GALVANIZED STEEL.
9. SEE TABLE ON DRAWING L1-03 FOR LIST OF STRUCTURES WHICH SHALL HAVE OPGW DOWNLEAD AND SPLICE BOX BRACKETS.
10. SEE DRAWINGS L1-01, L1-02, L1-03, AND L1-04 FOR DETAILS.
11. JUMPER POST BRACKETS ONLY REQUIRED FOR LINE ANGLES LESS THAN 65 DEGREES.

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CHECKED BY	GY 09/30/22
APVD BY	PG 09/30/22

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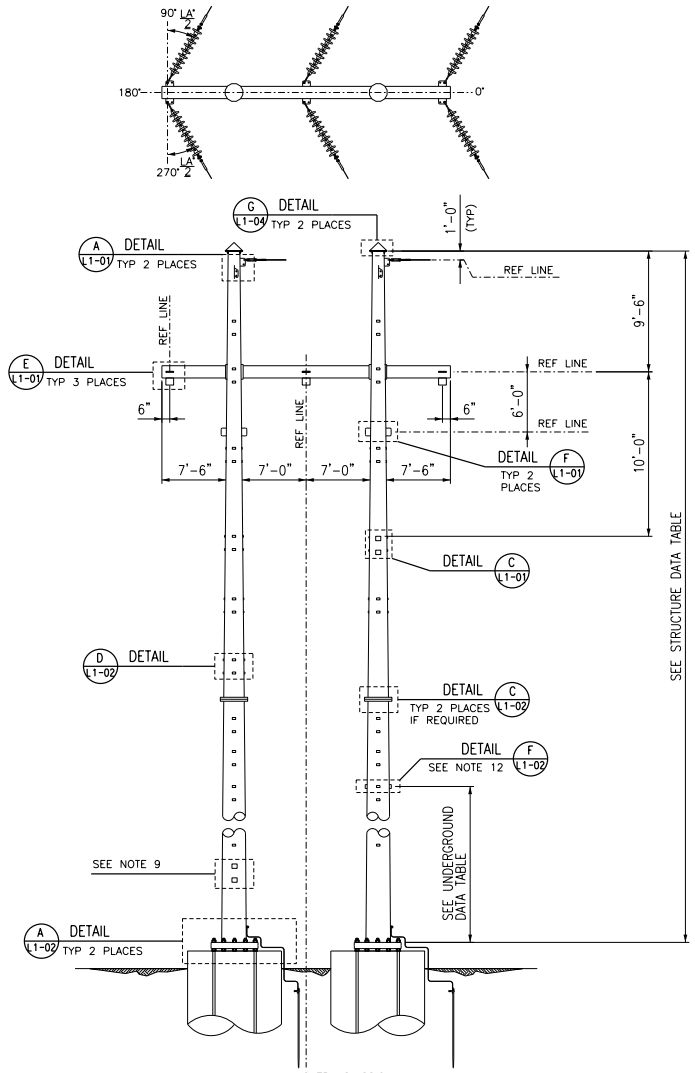
ATLANTIC CITY ELECTRIC

TITLE

QUINTON - WINDPORT
69kV TRANSMISSION LINE
PERFORMANCE DRAWING
TYPE SC-69-CUSTOM DE

DRAWING No.	SHEET OF SHEET		REV
L0-05	1	2	A



TYPE SC-69-DE-H-FRAME
& SC-69-DE-H-FRAME(45)

DRILLED PIER FOUNDATION

STRUCTURE DATA				
STRUCTURE TYPE	HEIGHT (FT)	IA (DEG)	STRUCTURE NUMBER	QTY
SC-69-DE-H-FRAME	47	0.00	291A	2
	47	0.00	291B	2
	47	0.00	291C	2
SC-69-DE-H-FRAME (45)	47	-40.81	292	2

UNDERBUILD DATA				
STRUCTURE NUMBER	HEIGHT ON POLE FROM BASE (FT)			
	DECK 1	DECK 2	NEUTRAL	COMM WIRE
291A	N/A	N/A	N/A	19.5
291B	N/A	N/A	N/A	19.5
291C	N/A	N/A	N/A	19.5
292	N/A	N/A	N/A	19.5

NOTES:

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10. SEE DRAWINGS L1-01, L1-02, L1-03, AND L1-04 FOR DETAILS.
11. STRUCTURES WITH UNDERBUILD SHALL BE DESIGNED TO NOT EXCEED 90% OF THE POLE UTILIZATION.
12. COMMUNICATION BRACKET DETAIL F OF L1-02 SHALL SUPPORT A 3 KIP VERTICAL, LONGITUDINAL, AND TRANSVERSE LOAD FOR ALL WEATHER CONDITIONS.

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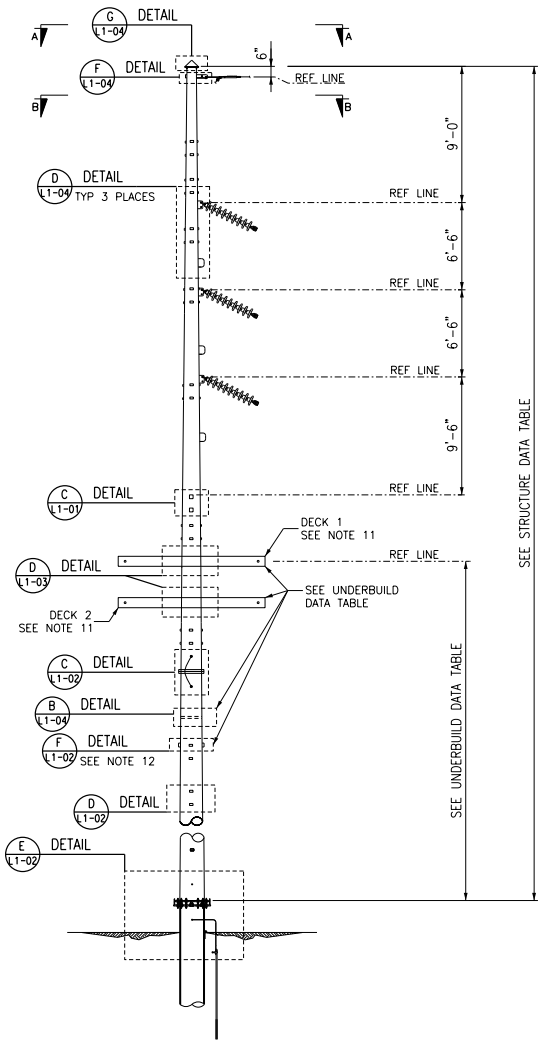
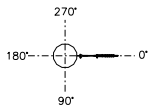
SCALE N.T.S.

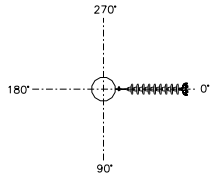
TITLE
QUINTON - WINDPORT
69kV TRANSMISSION LINE
PERFORMANCE DRAWING
TYPE SC-69-DE-H-FRAME & SC-69-DE-H-FRAME(45)

DRAWING No.	SHEET	OF SHEET	REV
L0-06	1	3	A





SECTION A–A
STATIC WIRE PLAN



SECTION B–B
CONDUCTOR PLAN

STRUCTURE DATA				
STRUCTURE TYPE	HEIGHT (FT)	IA (DEG)	STRUCTURE NUMBER	QTY
SC-69-HRA-SS (30)	90	16.95	85	1
	85	15.23	209	1
	85	13.06	243	1
	85	11.93	244	1
	85	-25.31	71	1
	80	-25.76	162	1
SC-69-HRA-SS (30) DIST TAP 1	85	19.61	127	1
	85	16.03	133	1
SC-69-HRA-SS (30) DIST TAP 2	80	-16.86	147	1
SC-69-HRA-SS (40)	65	-37.34	288	1

STRUCTURE TAP DATA	
STRUCTURE NUMBER	TAP ATTACHMENT ABOVE POLE BASE (FT)
71	26.5
	40.0
85	26.5
	40.0
127	18.0
	26.5
	40.0

UNDERBUILD DATA				
STRUCTURE NUMBER	HEIGHT ON POLE FROM BASE (FT)			
	DECK 1	DECK 2	NEUTRAL	COMM WIRE
71	46.0	41.0	27.5	N/A
85	46.0	41.0	27.5	N/A
127	46.0	41.0	27.5	20.0
133	46.0	41.0	27.5	20.0
147	41.0	N/A	27.5	20.0
162	39.0	N/A	25.5	18.0
209	39.0	N/A	25.5	19.0
243	39.0	N/A	25.5	19.0
244	44.0	N/A	27.5	20.0
288	N/A	N/A	N/A	19.5

NOTES:

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2. STRUCTURE AND ATTACHMENTS SHALL BE DESIGNED FOR THE SIMULTANEOUS APPLICATION OF WIND ON THE STRUCTURE AND WIRE LOADS FOR EACH LOAD CASE. WIND SHALL BE APPLIED IN THE DIRECTION WHICH RESULTS IN THE MOST SEVERE EFFECT.
3. WIND PRESSURE SHOWN ON LOADING SCHEDULE IS BASED ON A SHAPE FACTOR OF 1.0.
4. FOR STRUCTURES WITH LINE ANGLES LESS THAN 15°, POLE TIP DEFLECTION SHALL NOT EXCEED 1.5% OF THE ABOVE GROUND HEIGHT FOR THE DEFLECTION LOAD CASE AND SHALL NOT EXCEED 10% OF THE ABOVE GROUND HEIGHT UNDER THE MAXIMUM LOADING CONDITION. FOR STURCTURES WITH LINE ANGLES GREATER THAN 15°, POLE TIP DEFLECTION SHALL NOT EXCEED 1% OF THE ABOVE GROUND HEIGHT FOR THE DEFLECTION LOAD CASE AND SHALL NOT EXCEED 6% OF THE ABOVE GROUND HEIGHT UNDER THE MAXIMUM LOADING CONDITION.
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10. STRUCTURES WITH UNDERBUILD SHALL BE DESIGNED TO NOT EXCEED 90% OF THE POLE UTILIZATION.
11. CROSSARMS TO BE PROVIDED BY OTHERS. CROSSARM DIMENSIONS ARE ASSUMED.
12. COMMUNICATION BRACKET DETAIL F OF L1-02 SHALL SUPPORT A 3 KIP VERTICAL, LONGITUDINAL, AND TRANSVERSE LOAD FOR ALL WEATHER CONDITIONS.
13. STRUCTURES 71, 85, AND 127 SHALL SUPPORT A 3 KIP VERTICAL, LONGITUDINAL, AND TRANSVERSE LOAD FOR ALL WEATHER CONDITIONS AT TAP LOCATIONS. THE TAPS WILL BE FIELD INSTALLED. SEE STRUCTURE TAP DATA TABLE FOR TAP LOCATIONS.

TYPE SC-69-HRA-SS (30) , SC-69-HRA-SS (30) DIST TAP 1,
SC-69-HRA-SS (30) DIST TAP 2, & SC-69-HRA-SS (40)

FLANGED VIBRATORY CAISSON FOUNDATION

No.	DATE	REVISION DESCRIPTION	DRAWN BY	ENGR BY	CHECKED BY	APVD BY
A	09/30/22	ISSUED FOR 60% REVIEW	DM	SGN	GY	PG

DRAWN BY	DM 09/30/22
ENGR BY	SGN 09/30/22
CHECKED BY	GY 09/30/22
APVD BY	PG 09/30/22

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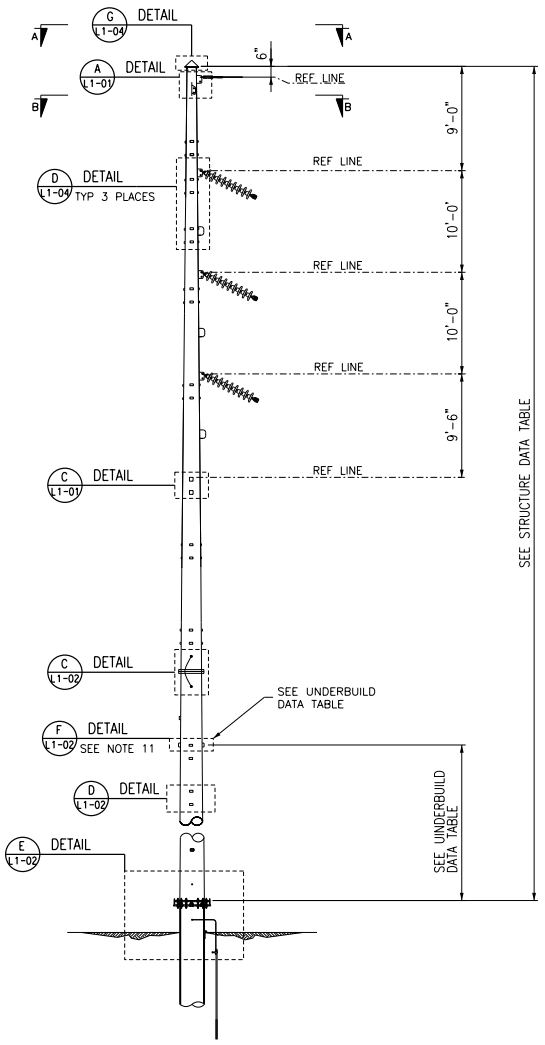
- ☐ AS INSTALLED

SCALE N.T.S.

ATLANTIC CITY ELECTRIC

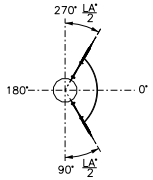
TITLE
QUINTON - WINDPORT
69kV TRANSMISSION LINE
PERFORMANCE DRAWING
TYPE SC-69-HRA-SS (30) , SC-69-HRA-SS (30) DIST TAP 1,
SC-69-HRA-SS (30) DIST TAP 2, & SC-69-HRA-SS (40)

DRAWING No.	SHEET	OF SHEET	REV
L0-07	1	5	A



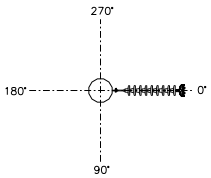
TYPE SC-69-HRA-MS (60)

FLANGED VIBRATORY CAISSON FOUNDATION



SECTION A–A

STATIC WIRE PLAN



SECTION B–B

CONDUCTOR PLAN

STRUCTURE DATA				
STRUCTURE TYPE	HEIGHT (FT)	IA (DEG)	STRUCTURE NUMBER	QTY
SC-69-HRA-MS (60)	70	49.64	280	1
	70	-43.77	287	1

UNDERBUILD DATA				
STRUCTURE NUMBER	HEIGHT ON POLE FROM BASE (FT)			
	DECK 1	DECK 2	NEUTRAL	COMM WIRE
280	N/A	N/A	N/A	21.5
287	N/A	N/A	N/A	20.5

NOTES:

1. ALL STATED LOADS ARE ULTIMATE VALUES AND INCLUDE OVERLOAD FACTORS AND INSULATOR WEIGHTS.
2. STRUCTURE AND ATTACHMENTS SHALL BE DESIGNED FOR THE SIMULTANEOUS APPLICATION OF WIND ON THE STRUCTURE AND WIRE LOADS FOR EACH LOAD CASE. WIND SHALL BE APPLIED IN THE DIRECTION WHICH RESULTS IN THE MOST SEVERE EFFECT.
3. WIND PRESSURE SHOWN ON LOADING SCHEDULE IS BASED ON A SHAPE FACTOR OF 1.0.
4. POLE TIP DEFLECTION SHALL NOT EXCEED 1% OF THE ABOVE GROUND HEIGHT FOR THE DEFLECTION LOAD CASE AND SHALL NOT EXCEED 6% OF THE ABOVE GROUND HEIGHT UNDER THE MAXIMUM LOADING CONDITION.
5. DESIGN AND FABRICATION SHALL BE IN ACCORDANCE WITH ASCE MANUAL NO. 48.
6. FOR THE CONSTRUCTION AND TENSION STRINGING LOAD CASES, FABRICATOR SHALL APPLY A POINT LOAD OF 5,000 POUNDS AT ANY POINT WHERE A CONSTRUCTION OR MAINTENANCE PERSON COULD STAND OR OTHERWISE BE SUPPORTED. THIS LOAD HAS NOT BEEN CONSIDERED IN THE WIRE LOAD TABLES.
7. THE VERTICAL LOADS IN THE LOADING SCHEDULE DO NOT INCLUDE STRUCTURE DEAD WEIGHT. THE FABRICATOR SHALL INCLUDE THE STRUCTURE DEAD WEIGHT LOAD IN ALL CALCULATIONS. THE VERTICAL OVERLOAD FACTOR APPLIED TO THIS LOAD SHALL BE AS LISTED IN THE LOAD WORKSHEET FOR EACH LOAD CASE.
8. ALL POLES SHALL BE GALVANIZED STEEL.
9. SEE DRAWINGS L1–01, L1–02, L1–03, AND L1–04 FOR DETAILS.
10. STRUCTURES WITH UNDERBUILD SHALL BE DESIGNED TO NOT EXCEED 90% OF THE POLE UTILIZATION.
11. COMMUNICATION BRACKET DETAIL F OF L1–02 SHALL SUPPORT A 3 KIP VERTICAL, LONGITUDINAL, AND TRANSVERSE LOAD FOR ALL WEATHER CONDITIONS.

THIS DRAWING WAS CREATED USING COMPUTER AIDED DRAFTING. DO NOT MAKE MANUAL CHANGES WITHOUT UPDATING ELECTRONIC FILE.

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A	09/30/22	ISSUED FOR 60% REVIEW	DM	SGN	GY	PG

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SCALE N.T.S.

TITLE

QUINTON - WINDPORT
69kV TRANSMISSION LINE
PERFORMANCE DRAWING
TYPE SC-69-HRA-MS (60)

DRAWING No.	SHEET	OF SHEET	REV
L0-09	1	2	A

Appendix C

Alternative Route Analysis Report

QUINTON-ARTIFICIAL ISLAND WINDPORT 69 KV TRANSMISSION LINE

SEGMENT AND ALTERNATIVE ROUTE ANALYSIS

Salem County, New Jersey

Atlantic City Electric

August 18, 2021

Prepared for:

Atlantic City Electric
5100 Harding Highway
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Prepared by:

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Executive Summary

This Segment and Alternative Route Analysis (Study) was prepared by AECOM on behalf of Atlantic City Electric (ACE), an Exelon Company. The purpose of the Study was to identify and evaluate potential routing segments that would be used as the foundation for developing alternative routes for a new 69 kilovolt (kV) transmission line alignment that would connect the existing Quinton 69 kV Substation (Quinton Substation) located in Quinton Township, Salem County, to the proposed customer-owned Artificial Island Windport 69 kV Substation (Windport Substation) located adjacent to the Hope Creek Nuclear Generating Station in Lower Alloways Creek Township, Salem County, New Jersey (project). Quinton Substation is approximately 8.5 miles straight-line distance from the proposed Windport Substation site. The new Windport Substation and connecting 69 kV transmission line are needed to address the needs of a new manufacturing plant to be developed on Artificial Island.

The Study analysis identified potential transmission line alignments (segments) within the Study Area, quantified metrics for each segment, combined those into Alternative Routes, and quantitatively compared the resulting Alternative Routes to each other. Factoring in qualitative metrics leads to the identification of the Preferred Route, which is the route with the least potential for impacts to the built and natural environment and is feasible for engineering and construction. To evaluate for potential viable segments, the Study Area for the project encompasses 55 square miles in Salem County (Figure 1-1).

A total of 46 segments were identified that included distribution underbuild options along many of the local roadways or crossed over agricultural lands or marsh areas where possible. Several of the segments mirrored the alignment of the inactive Quinton-Hancock 69 kV transmission line that parallels the roadways from the Quinton Substation to the former Hancock Substation that was located on Artificial Island. This alignment currently consists of de-energized 69 kV transmission lines and energized 12 kV distribution lines located on wood poles. Assumptions built into the analysis include the existence of a 60-foot wide right-of-way (ROW) along the Quinton-Hancock 69 kV transmission line corridor. The 46 segments were assessed quantitatively and combined to form 64 Alternative Routes. Examples of the quantitative factors evaluated include the number of parcels crossed requiring new easements, number of stream crossings, and length of distribution underbuild. Of the 64 Alternative Routes, six of the best ranking (lower scores) Alternative Routes were further evaluated using qualitative criteria. Qualitative aspects reviewed included community/visual issues, special permit issues, and constructability.

In consideration of the quantitative and qualitative analyses completed for the Study, ACE concluded that Alternative Route 1 is the Preferred Route with Alternative Route 3 as a potential backup. Alternative Route 1 is preferred based on providing a viable route around the town of Quinton while minimizing the need for new easement rights, predominantly using the inactive Quinton-Hancock 69 kV transmission line corridor for most of the new alignment, and reducing environmental impacts compared to other alternatives. Alternative Route 3 also provides a viable route around the town of Quinton but would potentially involve more environmental impacts.

1 INTRODUCTION

AECOM is assisting ACE in the identification of preferential alignments for the proposed Quinton-Artificial Island Windport 69 kilovolt (kV) transmission line (Quinton-Windport transmission line) from the existing Quinton Substation to the proposed Windport Substation. The purpose of the Study was to identify and evaluate potential routing segments that could be used as the foundation for developing alternative routes for a new 69 kV transmission line that will connect the two substations. The new, proposed Windport Substation will be a customer-owned substation and will be located adjacent to the Hope Creek Nuclear Generating Station, which is located on Artificial Island.

The Study provides an overview of the environmental setting of the Study Area in Section 2.0 that describes the built and natural conditions through which the project would extend. Development and assessment of the segments is reviewed in Section 3.0 and analysis of the Alternative Routes is provided in Section 4.0. The Preferred Route identification criteria is summarized in Section 5.0.

2 ENVIRONMENTAL SETTING

The Study Area developed for the project spans a geographic area of 55 square miles in Salem County (Figure 1-1). The eastern and northern boundaries were set between 1 to 2 miles beyond the Quinton Substation site to provide opportunities for the transmission line to bypass around the constraints of downtown Quinton. The eastern boundary parallels a series of local roads beyond which substantial impacts to existing forest would be encountered. The northern boundary also parallels several local roads but is situated in sections to avoid the built constraints around the town of Salem. The Delaware River is the western boundary and the southern boundary extends east from the mouth of Hope Creek near Artificial Island along an alignment beyond which route options would not be reasonable.

This section focuses on the existing built and natural environment of the Study Area and provides a summary of engineering considerations pertinent to identifying potential transmission line segments and routes. Information contained in this Section is based on review of Federal, State, and local Geographic Information Systems (GIS) databases, published reports and maps, a reconnaissance driving "windshield" survey of the Study Area conducted on May 27, 2021, and team discussions with ACE representatives, held on May 14, July 9, and July 23, 2021.

2.1 Built Environment

Transmission line routing evaluates the existing land uses that may need to be crossed by the proposed ROW. Identifying specific built environment constraints such as residential developments, commercial/industrial buildings, preserved farms, or park lands narrows the routing options to areas that may be more conducive for a new ROW. This section provides a summary of the main built constraints within the Study Area, with a focus on the residential areas, commercial development, conserved lands, historic and cultural resources, and other sensitive features including churches, cemeteries, and schools (Figure 2-1).

Residential development is a noted across the Study Area in highly variable densities, with the highest concentration in the towns of Quinton and Hancocks Bridge. Other moderately dense villages include Hagerville, Harmersville, and Canton (PHOTO 1). Most of the roadways connecting

these towns and villages are bordered by residential properties, and in some areas, they are clustered in tight communities. Sections of agricultural lands with low density farmsteads are located across the Study Area.

PHOTO 1: View east of the residential development in the village of Harmersville

Commercial development is also a variable built environment component with the highest concentration in the town of Quinton, which has a lumber yard, grocery stores, restaurants, and gas stations (PHOTO 2). A few commercial properties are also located in the villages and at locations sporadically along the roadways such as the Wild Oaks Golf Course, Holladays Used Auto Parts, and other local shops

PHOTO 2: View north of the lumber yard located in Quinton with existing 69 kV line in the background

Conserved lands located within the Study Area include portions of the 9,000 acre Mad Horse Creek Wildlife Management Area and the 1,600 acre Abbots Meadow Wildlife Management Area, which are managed by the New Jersey Department of Environmental Protection (NJDEP) and are both situated within the tidal marsh area that dominates the western portion of the Study Area. Portions of this marsh are also composed of the 3,000 acre Alloway Creek Watershed Wetland

Restoration Site managed by Public Service Enterprise Group (PSEG), a local electrical utility. Specific sections of these conserved lands are currently spanned by existing PSEG 500 kV transmission lines that extend into the Hope Creek Nuclear Generating Station. The 1,100 acre Maskells Mills Pond Wildlife Management Area preserves a freshwater pond and deciduous oak-pine forest complex located in the southeastern corner of the Study Area. Additionally, conserved lands include the local farms that have placed their lands under agricultural conservation easements through the New Jersey Farmland Preservation Program, which limits the type of development that can occur on the lands. Most of the farms range between 50 and 150 acres and are primarily located in the northern and central portions of the Study Area. Sections of ACE's inactive Quinton-Hancock 69 kV transmission line currently cross several preserved farms along the roadway edge. Segment options that would span these preserved lands may require approval from the county and state agencies overseeing the preservation efforts.

The Study Area does not contain any National Registers of Historical Places (NRHP) designated historic districts but does contain seven NRHP-listed or NHRP-eligible sites including the Hancock Bridge (eligible) and the Hancock House (listed) in the town of Hancocks Bridge (PHOTO 3). Numerous other structures and properties deemed historic by the New Jersey Historic Preservation Office are also located in Hancocks Bridge and in the rural areas north and south of this town.

PHOTO 3: View south of the NRHP-listed Hancock House located in Hancocks Bridge

Several churches, cemeteries, and schools are located in the Study Area. Churches include the Quinton United Methodist Church and the Quinton Baptist Church in Quinton and the Lower Alloways Creek Friends Meetinghouse in Hancock Bridge. The Canton Baptist Church and cemetery are located in Canton and Hancocks Bridge United Methodist Cemetery and Cedar Hill Friends Cemetery are located in Harmersville. The only school in the Study Area is the Quinton Township Elementary School located in Quinton.

In general, it is preferred to build transmission lines parallel to or co-located with existing distribution or transmission ROWs to minimize potential impacts to the built environment. Property owner coordination will be required in instances where the ROW may need to be expanded or new easements obtained on properties which have no current ROW easements. Properties that require coordination for acquiring new easements are considered during routing analysis and are reflected in the quantitative and qualitative evaluations.

2.2 Natural Environment

This section provides a general description of the main environmental constraints within the Study Area, including surface waters, wetlands, and wildlife habitat (Figure 2-2).

The major surface water features in the Study Area are Alloways Creek and Hope Creek. Alloways Creek mainstem flows near the town of Quinton and Hancocks Bridge and other tributaries are located throughout the Study Area (PHOTO 4). The system extends west through the large freshwater tidal marsh located in the western portion of the Study Area and eventually into the Delaware Bay. A smaller marsh area located in the southcentral section of the Study Area also provides hydrology to this system. Hope Creek initiates within the large tidal marsh area and flows south near the Hope Creek Nuclear Generating Station and into the Delaware Bay. The freshwater tidal marshes and other wetland types located within the tidally influenced areas of Alloways Creek and Hope Creek are regulated by NJDEP, as mapped coastal wetlands (Wetlands Act of 1970). Many of the tributaries flowing to these streams are bordered by riparian areas.

PHOTO 4: View west of Alloways Creek near Quinton and the bordering tidal marsh and riparian habitat

Approximately half of the Study Area is located within Federal Emergency Management Agency (FEMA) and NJDEP mapped floodplains and flood hazard areas. The streams within the Study Area are regulated and require authorization by the NJ Flood Hazard Area Control Act Rules (N.J.A.C. 7:13), which regulates riparian zones and flood hazard areas delineated by the state and/or FEMA. Non-tidal freshwater wetlands occur throughout the Study Area and are classified as palustrine emergent, scrub/shrub, and forested (PEM, PSS, PFO, respectively). Modified agricultural wetlands are common within farmlands.

Rare, threatened and endangered (RTE) species habitat potentially present in the Study Area include species mapped by New Jersey's Landscape Project as Federally listed (Rank 5), State-endangered (Rank 4), and State-threatened (Rank 3). Federally listed (Rank 5) Atlantic green turtle (*Chelonia mydas*) and loggerhead turtle (*Caretta caretta*) habitat is located in the tidal mud flats along the Delaware Bay. Rank 4 habitat for the State-endangered bald eagle (*Haliaeetus leucocephalus*) is located throughout the tidal marsh area and upstream along Alloways Creek beyond Quinton. This habitat area is also used by the State-threatened horned lark (*Eremophila alpestris*) and American kestrel (*Falco sparverius*). Agricultural fields and meadows located north of Alloways Creek may also support these and other threatened bird species.

2.3 Engineering

The engineering considerations focus on opportunity corridors for the route to follow or constraints that impede design and construction. Potential opportunities to follow existing corridors in the Study Area include two active ACE 69 kV lines extending from the Quinton Substation and four PSEG 500 kV transmission lines that extend from the Hope Creek Nuclear Generating Station as well as the inactive ACE Quinton-Hancock 69 kV transmission line. Other linear features such as major highways or railroads are not located in the Study Area. Engineering constraints such as airports or quarries were not identified in the Study Area (Figure 2-3).

PHOTO 5: View west of ACE's inactive 69 kV transmission line along Lake Avenue in Quinton

Due to the direction of their alignments and engineering considerations, ACE's single-circuit Churchtown-Quinton 69 kV transmission line and an additional double-circuit 69 kV tap line extending east from the Quinton Substation were not considered opportunities for double-circuiting or paralleling. ACE's inactive Quinton-Hancock 69 kV line traverses west through the center of Quinton and then north along State Route (SR) 49 (PHOTO 5). Based on information provided by ACE, this inactive line turns west off of SR 49 at Sickler Road (County Road (CR) 651) and parallels a series of county roads for approximately 11 miles in a southwest direction to Artificial Island (PHOTO 6).

PHOTO 6: View east of the inactive Quinton-Hancock 69 kV transmission along CR 651

The four PSEG 500 kV transmission lines were considered linear features that could be paralleled but options to co-locate on the towers or build within the PSEG ROW were not considered. The Hope Creek-Keeney 500 kV transmission line extends north parallel to the Delaware Bay across the tidal marsh area associated with the Alloway Creek Watershed Wetland Restoration Site and the Abbots Meadow Wildlife Management Area (PHOTO 7). Two of the lines that parallel each other to the east include the Hope Creek-New Freedom and the Salem-Orchard 500 kV transmission lines, which span over portions of the Mad Horse Creek Wildlife Management Area. A second Hope Creek-New Freedom 500 kV transmission line extends south then east from the Hope Creek Nuclear Generating Station and also span sections of the Mad Horse Creek Wildlife Management Area, as well as sections of the Maskell Mills Pond Wildlife Management Area.

PHOTO 7: View south of the Hope Creek-Keeney 500 kV transmission line and surrounding tidal marsh

Paralleling the existing roadway network with a transmission line is also considered an option. In most places, there are existing ACE distribution lines that provide opportunities for underbuilding with the new transmission line. Portions of roadways are bordered by single family or clustered residential housing, as well as other obstructions that may require additional planning and engineering if there is necessity to work within narrower ROWs (PHOTO 8). Such constraints may also require more structures than cross-country options.

PHOTO 8: View east of a farm structure located close to the roadway edge with distribution lines overhead

3 METHODOLOGY - SEGMENT ANALYSIS

The methodology used for this Study involves a two-step process: segment analysis and alternative route analysis. The first step focuses on identifying potential transmission line alignments (segments) across the Study Area that are then evaluated based on a series of quantitative metrics to recognize various groupings of segments that collectively define potential alternative routes between the substation end points. The metric analysis uses publicly available data such as parcel lines, stream networks, and existing transmission line routes that was screened and verified to confirm relevance and accuracy. A list of the data used in the Study is provided in the References (Appendix A). The metric analysis also incorporates the use of weights as a means to elevate the relative importance of some metrics over others based on input from ACE and expert judgement. Through this quantitative analysis process the resulting Alternative Routes are scored and ranked, with the lowest scoring (least impactful) routes having the highest (best) ranking. To focus the analysis process, six of the best ranking Alternative Routes (Top Six) were identified and forwarded for further review.

As explained in Section 4, the second step of the process evaluates the quantitative scores and provides a qualitative discussion of the Top Six Alternative Routes to determine a Preferred Route.

The following sections provide a summary of the segment identification process (Section 3.1), the evaluation process (Section 3.2), the results of the segment analysis, (Section 3.3), and description of the top six Alternative Routes identified in the Study Area (Section 3.4).

3.1 Segment Identification

Segments are partial alignments through the landscape of the Study Area that identify an opportunity to develop a transmission line corridor between two specific points of interest. Several segments can be identified across the landscape that provides opportunities to connect the same two points. These segments may use different combinations of roads, cross through undeveloped lands, or parallel existing utility corridors as a means to connect the two points. The goal is to identify all of the potential segments between two points so that comparative analysis between the segments can determine which ones provide the least impacts and thereby the favorable options. Through this process, a series of segments are identified that crisscrosses the landscape between the two substation sites. These segments are ultimately narrowed down to a series of preferential segments that when combined define Alternative Routes.

The segment identification process focused on the potential use of existing linear corridors within the Study Area such as transmission lines, distribution lines, and roadways to provide connectivity between the two substation endpoints. Through this process, segments were identified that mirrored the alignment of ACE's inactive Quinton-Hancock 69 kV line as a rebuild option and others that paralleled the PSEG 500 kV lines as cross-country options.

As part of the evaluation process to be reviewed below, ACE assumed that the easement rights of the inactive Quinton-Hancock 69 kV consisted of an existing 60-foot wide ROW and that new easements from the landowners crossed would not be required. Similarly, this alignment crosses properties that are protected by agricultural conservation easements where ACE assumed that the state and county agency coordination process for constructing the new line on these lands would be more favorable due to the development of the ROW prior to the lands being placed under a conservation easement.

Most of the other segments were identified along the county and local roadway network. These segments follow existing distribution alignments that have potential for the development of a new 69 kV line as an overbuild option. The potential need to secure easement rights from landowners of parcels crossed was considered a substantial social constraint to potential segments along roadways. Alternatively, a few segments were also identified to span undeveloped agricultural fields that provided opportunities to bypass around built or environmental constraints in the Study Area. Where feasible, these segments were aligned to parallel property lines or adjacent to existing farm lands to minimize impacts to the farming operations. Segment alignments were also modified to minimize impacts to the forested areas that border these agricultural areas.

Due to the interconnecting aspect of these roadway and cross-country alignments, 46 segments were identified within the Study Area (Figure 3-1).

3.2 Segment Evaluation Process

The segment evaluation process involves determining the quantitative metrics to be reviewed, calculating the specific metric values for each segment, tabulating those values for each combination of segments that define an alternative route between the substations, and comparing the data as normalized and weighted outputs. The following provides additional detail regarding the evaluation process and how alternative routes are subsequently developed.

To evaluate and compare the segments, quantitative metrics were developed that focused on the potential impacts of the project to the human/built environment, natural environment, and engineering considerations (Table 3-1). The evaluation process also addressed several opportunity scenarios such as paralleling roadways or utility corridors. Construction along these corridors concentrates the impacts into an already affected area and has the potential to reduce environmental impacts by overlapping ROWs where feasible and using existing access roads in undeveloped areas and hard top roads in developed areas. The relative ease of accessibility and probable lower level of permitting involved makes these conditions favorable, thus these metric values are inverted during the evaluation process such that longer lengths are considered to be less impactful and more beneficial to the construction and long-term maintenance of the project than shorter lengths.

Each segment was evaluated using the metrics listed in Table 3-1 and the findings were recorded in a comprehensive database that was used as the foundation for the segment analysis (APPENDIX B). These quantitative feature metrics were normalized and assigned relative weights within their specific perspective. The metrics were normalized to provide a means to compare the data. Using a normalized 0-100 scale allows the different data values to be mathematically combined and compared without being distorted by differences in measurement scale. Establishing these quantitative values allowed overall scoring and ranking for each Alternative Route identified. Lower scores are preferred as they indicate potentially less impact along that route (e.g., combination of segments). The numerical score calculated through this process provides an objective reference for quantitatively comparing each of the Alternative Routes identified.

3.3 Segment Evaluation Results

Through the use of a repetitive algorithm process, approximately 64 different segment combinations (Alternative Routes) were identified and evaluated in the Study Area. Assessment of the lowest scoring (least impactful) alignments noted that the first three Alternative Routes

(Ranks 1-3) were variations of the inactive Quinton-Hancock 69 kV alignment with the difference being the segment combinations extending around or through the town of Quinton. Similarly, the next three Alternative Routes (Ranks 4-6) have the same three alignment variations around Quinton but extend off of the inactive Quinton-Hancock 69 kV route past the town of Hancocks Bridge and extend across the tidal marsh parallel to the PSEG 500 kV lines. Spatial diversity in the alignments across the Study Area is noted for the next four Alternative Routes (Ranks 7-10) relative to the first six discussed above. These alternative routes extend north and south of the inactive Quinton-Hancock 69 kV alignment and use a series of roadways and cross-country segments to reach Alloways Creek Neck Road, which may provide the least environmentally impactful means for crossing the tidal marsh required to reach the proposed substation site.

To focus the evaluation process to identify a potential Preferred Route, six of the lowest scoring Alternative Routes (Rank 1, Rank 2, Rank 3, Rank 4, Rank 8, and Rank 9) were comparatively organized to show the metric and normalized values (Table 3-2) and the cumulative weighted scores (Table 3-3) for each of these top six Alternative Routes.

For reporting purposes, the six alternatives reviewed have been designated as follows: Alternative Route 1 (Rank 1), Alternative Route 2 (Rank 2); Alternative Route 3 (Rank 3); Alternative Route 4 (Rank 4), Alternative Route 5 (Rank 8), and Alternative Route 6 (Rank 9).

The network of segments that constitute these top six Alternative Routes are illustrated in Figure 3-2. The output of the analytical review (ranked lowest to highest) is provided in APPENDIX C and a visual display of the top six Alternative Routes evaluated is provided in APPENDIX D.

TABLE 3-1: Quantitative Routing Metrics

Built Environment
NRHP (Listed & Eligible) Properties and Districts within 1,000 feet of the ROW: National Register of Historic Places (NRHP) Listed or Eligible Historic Properties and Districts adjacent to a ROW
Churches, Cemeteries, or Schools within 1,000 feet of the ROW: Number of these sensitive land uses adjacent to the ROW
Properties Requiring New Easements: Parcels crossed on which ACE would need to obtain a new or additional easement
Residential Structures on Parcels Crossed by or Adjacent to an Existing Transmission Line ROW: Residences located on parcels currently crossed or located adjacent (within 100 feet) to an existing ROW
Residential Structures on Parcels Crossed by or Adjacent to a New Transmission Line ROW: Residences located on parcels that would be crossed or adjacent (within 100 feet) to a new ROW or an existing distribution line that may be overbuilt with transmission lines
Commercial/Industrial Buildings on Parcels Crossed by or Adjacent to an Existing Transmission Line ROW: Structures located on parcels currently crossed or located adjacent to (within 100 feet) to an existing ROW
Commercial/Industrial Buildings on Parcels Crossed by or Adjacent to a New Transmission Line ROW: Structures located on parcels that would be crossed or located adjacent (within 100 feet) to a new ROW or to an existing distribution line that may be overbuilt with transmission lines
Conserved Lands Crossed by an Existing Transmission Line ROW: Acres of conserved lands that are crossed by an existing ROW. Conserved lands include Open Space, Recreational, Preserves, and other lands with local, State, and Federal administration such as Green Acres Program lands, National Wildlife Refuges, State Wildlife Management Areas, agricultural conservation easements, and others.
Conserved Lands Crossed by a New ROW: Acres of conserved lands that would be crossed by a new ROW or by an existing distribution line that may be overbuilt with transmission lines
Natural Environment
Riparian Zone (forested/shrub) Requiring Clearing: Acres of riparian zone requiring clearing within the ROW
Stream Crossings: Number of NJDEP and/or USACE jurisdictional waterways or waterbodies crossed by the ROW
Flood Hazard Area Crossed: Acres of flood hazard area (NJDEP/FEMA mapped flood hazard floodplain and floodway) crossed by the ROW that would require structures and/or other fill within floodplains and/or avoidance of structures in floodways
PFO/PSS Wetlands Requiring Clearing: Acres of PFO or PSS wetland conversion to PEM required within the ROW (NJDEP 2012 LULC Wetlands)
PEM Wetlands Requiring Disturbance: Acres of PEM wetlands disturbed temporarily for construction and/or permanently for structures required within the defined or assumed ROW and subject to NJDEP and/or USACE authorizations
Coastal Zone Areas Crossed: Acres of coastal wetlands, Tidelands licensing area, and waterfront development areas crossed by the ROW
Threatened and Endangered Species Habitat Crossed: Acres of threatened and endangered species habitat crossed by the ROW. Includes NJDEP Landscape Project Version 3.3 data of State and Federal Threatened and/or Endangered species.
Engineering
Length Within or Parallel to an Existing Utility Corridor (Inverted): Length (miles) of the Alternative Route located within an existing transmission line ROW (rebuild) or parallel to the ROW of an existing pipeline or transmission/distribution line. These areas may have fewer impacts compared to developing completely new right-of-way, but require additional coordination and may involve more engineering analysis to ensure safe co-location with the other utility.
Length Parallel to a Roadway (Inverted): Length (miles) adjacent to roadways. Paralleling these features typically reduces potential new impacts and improve access for construction and maintenance.
Centerline Road Crossings: Number of crossings of public road alignment. These areas would have engineering constraints due to height and other requirements.
Number of Turns Greater Than 60 Degrees: Number of times the Alternative Route would need to make a turn greater than 60 degrees. Turns place tension on the tower structures, which may require additional support or engineering to support the stress.
Transmission Line Crossings: Number of crossings of an existing transmission line.
Length of Underground: Length (miles) of underground transmission line that would involve trench or horizontal directional drilling (HDD).
Length of Distribution Underbuild and/or Third Party Attachments: Length (miles) of existing distribution underbuild and/or underbuilt attachments by third parties such as telecommunications companies.
Estimated Total Project Costs: Values estimated based on typical project-specific cost per mile. Estimates do not include ROW Acquisition, Licensing and Permitting, and other miscellaneous costs.

3.4 Description of Alternative Routes

The top six Alternative Routes evaluated include a diversity of alignment combinations that use roadways, cross-country, and transmission corridor options identified in the Study Area. The following provides a description of the alignment of these six Alternative Routes and an introduction to some of the positive and negative factors that will be part of the Preferred Route decision making process.

Alternative Route 1 (Rank 1):

- Alternative Route 1 is 11.60 miles in length.
- From the Quinton Substation, this route extends 0.11 miles northwest parallel to Waterworks Road to the north side of Quinton-Alloways Road (CR 581) as a single-circuit transmission line system.
- On the north side of CR 581, the new transmission lines would be added onto ACE's existing distribution network as an overbuild to the distribution lines. The route turns west and parallels this road for 0.12 mile to the west side of SR 49 as a distribution underbuild configuration.
- At this point, the route turns south for 0.04 miles parallel to SR 49 and adjacent to an active lumber yard and then turns west for 0.10 mile along the north side of Cottage Ave, which is where the entrance of the lumber yard is located.
- Alternative Route 1 then turns south for 0.14 mile along the west side of New Street to Sickler Street (CR 651). New Street is bordered by a storage section of the lumber yard as well as several residential homes.
- At the juncture with Sickler Street (CR 651), the route intersects with the ROW of ACE's inactive Quinton-Hancock 69 kV line, which currently consists of de-energized 69 kV transmission lines and energized 12 kV distribution lines located on wood poles. The route would follow the alignment of this existing ROW to the southwest for 11.09 miles predominantly as a distribution underbuild configuration.
- Turning to the southwest, the route parallels the north side of Sickler Street for 0.49 miles past a dense residential cluster and over a tributary to the Alloways Creek to Beasely Neck Road (CR 651).
- Continuing in a southwest direction parallel with Beasely Neck Road, the route extends for 2.45 miles to New Bridge Road (CR 623). This alignment crosses several preserved farms, spans two tributaries to Alloways Creek that are bordered by coastal wetlands, and crosses areas mapped as agriculturally modified wetlands. Land use along this section is mostly agricultural but several residential parcels are crossed. Due to a few residential structures being located close to the roadway, the alignment does shift from one side of the road to the other.
- Turning south, Alternative Route 1 parallels the west side of New Bridge Road for 0.50 mile to Cuff Road. The route spans Lower Alloways Creek and another tributary that are bordered by coastal wetlands. This section is mostly bordered by undeveloped forest but does cross one preserved farm property.

- At this point, the route turns southwest for 0.50 mile parallel to the south side of Cuff Road to Hancocks Bridge-Harmersville Road (CR 658). Cuff Road is a local road that is bordered by agricultural lands and areas mapped as agriculturally modified wetlands. Past this intersection, the route continues west along CR 658 for 0.30 mile to where this county road turns north toward the town of Hancocks Bridge. This section is also bordered mostly by agricultural lands but does span a tributary to Alloways Creek with adjacent coastal wetlands and other areas mapped as deciduous wooded wetlands.
- From this intersection, the roadway becomes Alloways Creek Neck Road, which Alternative Route 1 parallels for 5.70 miles in southwesterly direction to the Hope Creek Nuclear Generating Station. Alloways Creek Neck Road is a local road bordered predominantly by undeveloped agricultural and forested lands but also by a cluster of residential parcels near Hancocks Bridge and fewer homes as the road extends south. This section does span under the three of the PSEG 500 kV lines, cross lands preserved as part of the Mad Horse Creek Wildlife Management Area, several properties deemed historic by the New Jersey Historic Preservation Office, as well as near the Nathaniel Chambless House, a NRHP-eligible resource. Northern portions of the line cross areas mapped as agriculturally modified wetlands, whereas the southern portion that crosses the tidal marsh area involves areas mapped as deciduous wooded wetlands and coastal wetlands, as well as a span of Hope Creek. Most of this section will be constructed as distribution underbuild but the portion extending over the tidal marsh may be constructed without the underbuild elements.
- The final 1.15 mile wraps around the eastern perimeter of the Hope Creek Nuclear Generating Station and into the proposed Windport Substation site. Land use in this area is dominated by *Phragmites* based tidal wetlands that are not considered to be within the coastal wetland boundary. This section crosses under the four PSEG 500 kV lines that extend from the generating station. Engineering constraints with these lines may result in the new 69 kV line being installed underground through the marsh area.

<u>Alternative Route 2 (Rank 2):</u>

- Alternative Route 2 is 11.84 miles in length and mirrors the alignment of the inactive Quinton-Hancock 69 kV line.
- From the Quinton Substation, this route extends for 0.25 mile east along the south side of Waterworks Road to Lake Avenue as distribution underbuild. The route passes a dense residential cluster and over an area mapped as deciduous wooded wetlands and coastal wetlands.
- Turning to the southwest, the route parallels Lake Avenue for 0.35 mile to SR 49 as distribution underbuild. This route spans a tributary to Alloways Creek and then pass a dense area of residential development located within the town of Quinton.
- At SR 49, the route turns north for 0.05 mile to Sickler Street (CR 651) and then turns west along Sickler Street for 0.10 mile to New Street, where it intersects with the alignment of Alternative Route 1, which it follows for the next 11.09 miles to the proposed Windport Substation site. This section would be built as distribution underbuild and passes through dense residential development.

<u>Alternative Route 3 (Rank 3):</u>

- Alternative Route 3 is 12.11 miles in length.
- From the Quinton Substation, this route extends for 0.25 mile east along the south side of Waterworks Road to Lake Avenue as distribution underbuild. The route passes a dense residential cluster and over an area mapped as deciduous wooded wetlands and coastal wetlands.
- Turning to the southwest, the route parallels Lake Avenue for 0.06 mile to a point where the route turns south for 0.08 mile through a forested area that transitions to agricultural lands. This section spans a tributary to Alloways Creek and passes between residential structures located within the forested area. Distribution underbuild would not be involved with this section.
- At this point, Alternative Route 3 parallels the parcel line of the agricultural field to the south west for 0.35 mile to SR 49 without distribution underbuild. This section passes through a narrow area mapped as deciduous wooded wetlands.
- After spanning SR 49 in an area with several commercial buildings, the route extends west for 0.67 mile to Quinton-Maskells Mill Road without distribution underbuild. This section crosses mostly agricultural lands as well as spans two forest lined tributaries to Alloways Creek and the bordering coastal wetlands.
- At Quinton-Maskells Mill Road, the route turns north for 0.10 mile to Beasely Neck Road, where it intersects with the alignment of Alternative Route 1, which it follows for the next 10.60 miles to the proposed Windport Substation site. This section would be built as distribution underbuild and passes over agricultural lands that are part of a preserved farm and has a section mapped as agriculturally modified wetlands.

<u>Alternative Route 4 (Rank 4):</u>

- Alternative Route 4 is 9.67miles in length.
- From the Quinton Substation, this route mirrors the alignment of Alternative Route 1 around the west side of Quinton and along ACE's inactive Quinton-Hancock 69 kV route for 5.41 miles to its intersection with the double PSEG 500 kV lines along Alloways Creek Neck Road. This section is engineered as distribution underbuild.
- At this point, the route turns west for 4.20 miles to the Windport Substation site without distribution underbuild. This section parallels the north side of the PSEG 500 kV lines, that initially cross agricultural and forested lands but predominantly crosses a large tidal marsh. Portions of this upland and marsh area are part of the Mad Horse Creek Wildlife Management Area.

<u>Alternative Route 5 (Rank 8):</u>

- Alternative Route 5 is 13.89 miles in length.
- From the Quinton Substation, this route mirrors the configuration of Alternative Route 3 for 0.39 miles to the east side of Quinton. It extends across the agricultural field for 0.34 mile to SR 49 on an angle to the south to be across from Jericho Road.
- After crossing SR 49 near several commercial properties, the route extends to the south along Jericho Road for 2.45 miles to Harmersville-Pecks Corner Road (CR 667) as distribution underbuild. The route initially parallels the eastern side of the roadway where

it passes through a dense residential cluster and over preserved farm lands. Due to structural constraints noted along the roadway, the route crosses to the west side and back to the east as it spans the mixed residential and agricultural land uses. Three streams and agriculturally modified and deciduous wooded wetland are crossed in this area.

- At the intersection with Harmersville-Pecks Corner Road (CR 667), Alternative Route 5 turns west and parallels the roadway for 2.60 miles as distribution underbuild to the intersection with Hancocks Bridge-Harmersville Road (CR 658) in the village of Harmersville. The route initially parallels the southern side of the roadway but due to structural constraints noted along the roadway it crosses to the north side and back to the south as it spans the mixed residential and agricultural land uses. One stream and agriculturally modified and mixed wooded and scrub/shrub wetlands are crossed in this section. One preserved farm is also crossed.
- Turning to the northwest, the route parallels Hancocks Bridge-Harmersville Road (CR 658) for 0.96 mile to its intersection with Cuff Road, where it meets with the alignment of the inactive Quinton-Hancock 69 kV line. This section extends through the dense residential area in the village of Harmersville and spans from one side of the road to the other at locations to avoid structural constraints.
- From the Cuff Road intersection, Alternative Route 5 would extend for 7.15 miles parallel to Alloways Creek Neck Road to the proposed Windport Substation site.

<u>Alternative Route 6 (Rank 9):</u>

- Alternative Route 6 is 13.52 miles in length.
- From the Quinton Substation, this route would mirror the alignment of Alternative Route 5 for 4.78 mile as distribution underbuild along Jericho Road and portions of Harmersville-Pecks Corner Road (CR 667), At a point west of Cross Road (CR 654), the route turns southwest for 0.95 mile to Maskells Mill Road (CR 658) without underbuild. This section extends across agricultural and forested lands and under the dual PSEG 500 kV lines. One stream and agriculturally modified and mixed wooded and scrub/shrub wetlands are crossed in this section.
- Continuing in a southwest direction, the route extends for 0.55 mile to Canton-Harmersville Road (CR 623) without underbuild. Land uses include agricultural and forested areas but also several residential structures. Agriculturally modified and mixed wooded and scrub/shrub wetlands are crossed in this section.
- After crossing Canton-Harmersville Road (CR 623), Alternative Route 6 extends 3.16 miles to Alloways Creek Neck Road without underbuild. This section parallels the north side of the PSEG 500 kV line and predominantly crosses agricultural and forested lands. The route spans the NRHP-eligible Cuff-Dubois House property and the Meadow View Sporting Dog Club and Preserve parcel, which is deemed historic by the New Jersey Historic Preservation Office. A section of the Mad Horse Creek Wildlife Management Area is also crossed. A large tidal marsh that consists of coastal wetland areas, as well as several streams and wetland areas are also crossed.
- From the intersection with Alloways Creek Neck Road, the route extends for 4.08 miles to the proposed Windport Substation site without underbuild.

TABLE 3-2: Tabular Summary of the Top Six Alternative Routes

	MATRIX/CORRIDOR	Alternative Route 1	Alternative Route 2	Alternative Route 3	Alternative Route 4	Alternative Route 5	Alternative Route 6
BUILT ENVIRONMENT	NRHP (Listed & Eligible) Properties/Districts Adjacent to ROW (#)	26	26	25	20	25	4
	Normalized	27.80	27.80	26.60	20.20	26.60	0.00
	Churches, Cemeteries, Schools within 1,000 ft of the ROW (#)	5	5	3	5	7	3
	Normalized	62.40	62.40	37.60	62.40	87.60	37.60
	Properties Requiring New Easements (#)	9	0	6	20	55	61
	Normalized	10.47	0.00	7.00	23.27	63.93	70.93
	Residential Structures on Parcels Crossed by or Adjacent to an Existing Transmission Line ROW (#)	68	111	57	64	29	14
	Normalized	59.40	100.00	49.10	55.70	22.60	8.50
	Residential Structures on Parcels Crossed by or Adjacent to a New Transmission Line ROW (#)	13	0	3	13	93	72
	Normalized	11.10	0.00	2.55	11.10	79.50	61.55
	Commercial/Industrial Buildings on Parcels Crossed by or Adjacent to an Existing Transmission Line ROW (#)	5	7	6	6	5	6
	Normalized	40.00	80.00	60.00	60.00	40.00	60.00
	Commercial/Industrial Buildings on Parcels Crossed by or Adjacent to a New Transmission Line ROW (#)	5	1	3	5	15	15
	Normalized	21.10	0.00	10.50	21.10	73.70	73.70
	Conserved Lands Crossed by an Existing Transmission Line ROW (acres)	0	0	0	13.90	0	5.60
	Normalized	0.00	0.00	0.00	72.40	0.00	29.20
	Conserved Lands Crossed by a New Transmission Line ROW (acres)	0	0	0.60	0.50	4.50	4.50
	Normalized	0.00	0.00	2.50	2.10	18.75	18.75
NATURAL ENVIRONMENT	Riparian Zone Requiring Clearing (acres)	0.20	0.20	0.30	0.20	0.11	0.00
	Normalized	33.10	33.10	48.75	33.10	17.45	0.00
	Stream Crossings (#)	19	19	20	55	17	19
	Normalized	10.93	10.93	13.07	89.07	6.53	10.93
	Flood Hazard Area Crossed (acres)	33.87	33.72	33.97	39.43	29.32	31.57
	Normalized	24.13	23.33	24.67	52.13	1.33	12.67
	PFO/PSS Wetlands Requiring Clearing (acres)	1.08	1.18	1.28	0.98	2.77	10.24
	Normalized	2.70	3.30	4.00	2.10	13.25	59.85
	PEM Wetlands Requiring Disturbance (acres)	11.56	11.56	11.77	6.61	14.52	25.19
	Normalized	40.50	40.50	41.50	19.10	53.40	99.50
	Coastal Zone Areas Crossed (acres)	4.19	4.21	4.45	21.62	3.90	3.26
	Normalized	4.15	4.30	5.30	80.25	2.90	0.10
	Threatened/Endangered Habitat Crossed (acres)	53.54	55.48	58.87	43.70	50.44	54.72
	Normalized	37.80	43.47	53.40	9.07	28.73	41.27
ENGINEERING	Length Within or Parallel to an Existing Utility Corridor (Inverted) (miles)	0.07	0.60	0.26	3.37	0.26	3.44
	Normalized	100.00	89.35	96.30	33.90	96.30	32.35
	Length Parallel to a Roadway (inverted) (miles)	10.72	10.95	10.12	5.41	12.53	7.47
	Normalized	39.87	37.47	46.00	93.93	21.47	73.00
	Centerline Road Crossings (#)	18	23	18	15	26	18
	Normalized	35.00	60.00	35.00	20.00	75.00	35.00
	Turns Greater Than 60 Degrees (#)	0	0	0	0	0	0
	Normalized	0.00	0.00	0.00	0.00	0.00	0.00
	Transmission Line Crossings (#)	7	8	8	1	8	8
	Normalized	85.70	100.00	100.00	0.00	100.00	100.00
	Length of Underground (miles)	0.0	0.0	0.0	0.0	0.0	0.0
	Normalized	0.00	0.00	0.00	0.00	0.00	0.00
	Length of Distribution Underbuild and Third Party Attachments (miles)	10.10	10.57	9.74	4.76	11.77	6.98
	Normalized	60.20	65.13	56.40	3.80	77.80	27.27
	Route Length (miles)	11.60	11.84	12.11	9.67	13.89	13.52
	Normalized	29.20	33.00	37.00	0.00	64.00	58.40

TABLE 3-3: Weighted Metrics and Totals for the Top Six Alternative Routes

MATRIX/CORRIDOR		Alternative Route 1	Alternative Route 2	Alternative Route 3	Alternative Route 4	Alternative Route 5	Alternative Route 6
BUILT ENVIRONMENT	40%						
NRHP (Listed & Eligible) Properties/Districts Adjacent to ROW (#)	5%	27.80	27.80	26.60	20.20	26.60	0.00
Weighted		1.39	1.39	1.33	1.01	1.33	0.00
Churches, Cemeteries, Schools within 1,000 ft of the ROW (#)	5%	62.40	62.40	37.60	62.40	87.60	37.60
Weighted		3.12	3.12	1.88	3.12	4.38	1.88
Properties Requiring New Easements (#)	15%	10.47	0.00	7.00	23.27	63.93	70.93
Weighted		1.57	0.00	1.05	3.49	9.59	10.64
Residential Structures on Parcels Crossed by or Adjacent to an Existing Transmission Line ROW (#)	10%	59.40	100.00	49.10	55.70	22.60	8.50
Weighted		5.94	10.00	4.91	5.57	2.26	0.85
Residential Structures on Parcels Crossed by or Adjacent to a New Transmission Line ROW (#)	20%	11.10	0.00	2.55	11.10	79.50	61.55
Weighted		2.22	0.00	0.51	2.22	15.90	12.31
Commercial/Industrial Buildings on Parcels Crossed by or Adjacent to an Existing Transmission Line ROW (#)	5%	40.00	80.00	60.00	60.00	40.00	60.00
Weighted		2.00	4.00	3.00	3.00	2.00	3.00
Commercial/Industrial Buildings on Parcels Crossed by or Adjacent to a New Transmission Line ROW (#)	10%	21.10	0.0	10.50	21.10	73.70	73.70
Weighted		2.11	0.0	1.05	2.11	7.37	7.37
Conserved Lands Crossed by an Existing Transmission Line ROW (acres)	10%	0.0	0.0	0.0	72.40	0.00	29.20
Weighted		0.0	0.0	0.0	7.24	0.00	2.92
Conserved Lands Crossed by a New Transmission Line ROW (acres)	20%	0.0	0.0	2.50	2.10	18.75	18.75
Weighted		0.0	0.0	0.50	0.42	3.75	3.75
TOTAL	**100%**	**18.35**	**18.51**	**14.23**	**28.18**	**46.58**	**42.72**
WEIGHTED TOTAL		**7.34**	**7.40**	**5.69**	**11.27**	**18.63**	**17.09**
NATURAL ENVIRONMENT	40%						
Riparian Zone Requiring Clearing (acres)	20%	33.10	33.10	48.75	33.10	17.45	0.00
Weighted		6.62	6.62	9.75	6.62	3.49	0.00
Stream Crossings (#)	7.5%	10.93	10.93	13.07	89.07	6.53	10.93
Weighted		0.82	0.82	0.98	6.68	0.49	0.82
Flood Hazard Area Crossed (acres)	7.5%	24.13	23.33	24.67	52.13	1.33	12.67
Weighted		1.81	1.75	1.85	3.91	0.10	0.95
PFO/PSS Wetlands Requiring Clearing (acres)	20%	2.70	3.30	4.00	2.10	13.25	59.85
Weighted		0.54	0.66	0.80	0.42	2.65	11.97
PEM Wetlands Requiring Disturbance (acres)	10%	40.50	40.50	41.50	19.10	53.40	99.50
Weighted		4.05	4.05	4.15	1.91	5.34	9.95
Coastal Zone Areas Crossed (acres)	20%	4.15	4.30	5.30	80.25	2.90	0.10
Weighted		0.83	0.86	1.06	16.05	0.58	0.02
Threatened/Endangered Habitat Crossed (acres)	15%	37.80	43.47	53.40	9.07	28.73	41.27
Weighted		5.67	6.52	8.01	1.36	4.31	6.19
TOTAL	**100%**	**20.34**	**21.28**	**26.60**	**36.95**	**16.96**	**29.90**
WEIGHTED TOTAL		**8.14**	**8.51**	**10.64**	**14.78**	**6.78**	**11.96**
ENGINEERING	20%						
Length Within or Parallel to an Existing Utility Corridor (Inverted) (miles)	20%	100.00	89.35	96.30	33.90	96.30	32.35
Weighted		20.00	17.87	19.26	6.78	19.26	6.47
Length Parallel to a Roadway (inverted) (miles)	15%	39.87	37.47	46.00	93.93	21.47	73.00
Weighted		5.98	5.62	6.90	14.09	3.22	10.95
Centerline Road Crossings (#)	10%	35.00	60.00	35.00	20.00	75.00	35.00
Weighted		3.50	6.00	3.50	2.00	7.50	3.50
Turns Greater Than 60 Degrees (#)	5%	0.0	0.0	0.0	0.0	0.0	0.0
Weighted		0.0	0.0	0.0	0.0	0.0	0.0
Transmission Line Crossings (#)	10%	85.70	100.00	100.00	0.0	100.00	100.00
Weighted		8.57	10.00	10.00	0.0	10.00	10.00
Length of Underground (miles)	20%	0.0	0.0	0.0	0.0	0.0	0.0
Weighted		0.0	0.0	0.0	0.0	0.0	0.0
Length of Distribution Underbuild and Third Party Attachments (miles)	15%	60.20	65.13	56.40	3.80	77.80	27.27
Weighted		9.03	9.77	8.46	0.57	11.67	4.09
Route Length (miles)	5%	29.20	33.00	37.00	0.00	64.00	58.40
Weighted		1.46	1.65	1.85	0.00	3.20	2.92
TOTAL	**100%**	**48.54**	**50.91**	**49.97**	**23.44**	**54.85**	**37.93**
WEIGHTED TOTAL		**9.71**	**10.18**	**9.99**	**4.69**	**10.97**	**7.59**
SUM OF WEIGHTED TOTAL		**25.19**	**26.10**	**26.32**	**30.74**	**36.39**	**36.63**

4 METHODOLOGY - ALTERNATIVE ROUTE ANALYSIS

The second step of the methodology involves reviewing the results of the quantitative analysis to identify the factors that were most relevant in defining the scores calculated for the Top Six Alternative Routes. This information was further incorporated into a qualitative evaluation process that reviewed and scored the routes based on intangible factors such as community issues, permitting, ROW acquisition, and constructability. The reviews were collectively used by ACE and AECOM to identify the Preferred Route.

The following sections provide a summary of the quantitative review results (Section 4.1) and a summary of the qualitative evaluation discussion and findings (Section 4.2).

4.1 Quantitative Evaluation Results

The cumulative Sum of Weighted Scores value for the three metric perspectives (built environment, natural environment, and engineering considerations) for each of the Alternative Routes are provided in Table 3-3. The first three Alternative Routes reviewed, which significantly overlap in their alignments along the inactive Quinton-Hancock 69 kV route, have a very limited margin of difference between the Sum of Weighted Scores value (range is 25.19 to 26.32). The other three Alternative Routes have higher but comparative scores that range between 30.74 and 36.63. A summary of the Weighted Total perspective scores is provided below to explain the drivers behind these differences. Although the focus of this review is between six higher ranked routes, the scores for these routes are reflective of the overall analysis that identified 64 alternative routes and that the normalized and weighted scores are reflective of the range of metric values calculated during this analysis.

Built Environment Summary

Review of the Weighted Total scores for the built environment analysis notes that Alternative Route 3 scored the lowest (best) (5.69) and Alternative Routes 1 and 2 scored relatively higher (7.34 and 7.40 respectively). Alternative Routes 5 and 6 scored the highest (worst) (18.36 and 17.09 respectively) and Alternative Route 4's score was relatively better (11.37).

Alternative Route 3, which avoids the concentrated residential area in Quinton, had the lowest score because it would be in close proximity to the fewest residential structures (cumulatively 60) and require new easements from relatively few landowners (6). The alignment would pass the fewest churches and schools (3) and involve one farm where coordination for a new ROW easement on conserved lands would be required. Alternative Route 1, which extends around the western side of Quinton) had a higher score due to being in close proximity to a moderately high number of residential structures (81 cumulatively), more churches and schools (5), and requiring new easements from nine landowners. Alternative Route 2, which extends through the center of Quinton, had a slightly higher score due to being in close proximity to one of the highest number of residential structures (111).

Alternative Route 5, which is the longest option (13.89 miles), scored the worst due to being in close proximity to the most residential structures (122 cumulatively with the most near a new ROW

(93)) and the most churches and schools (7). The alignment would also require one the highest number of new easements (55) and a moderately high acreage of new easements across conserved farm lands (4.50). Alternative Route 6 is a slightly shorter route (13.52 miles) but would require the most new easements (61) and one the highest acreage of new easements across conserved lands (10.10), which includes conserved farm lands and state wildlife management lands. This route scored slightly better due to being in close proximity to fewer residential structures (86 cumulatively with 72 near a new ROW), near the fewest historic properties (4), and near fewer churches and schools (3).

Alternative Route 4, which mirrors the alignment of Alternative Route 1 around the western side of Quinton but deviates from the inactive Quinton-Hancock 69 kV alignment by extending across the tidal marsh to the Windport Substation, is the shortest route (9.67 miles). This option would be in close proximity to a moderate number of residential structures (77) and require a moderate number of new easements (20), but had a relatively high score due to the extent of conserved lands crossed (14.40), which would all be located on state wildlife management lands.

Natural Environment Summary

Review of the Weighted Total scores for the natural environment analysis notes that Alternative Route 5 scored the lowest (6.78) and Alternative Routes 1 and 2 scored relatively higher (8.14 and 8.51 respectively). Alternative Route 4 scored the highest (14.78) and Alternative Routes 3 and 6 were relatively better (10.64 and 11.96 respectively).

Alternative Route 5 bypasses around the east side of Quinton as a cross-county route and then extends to the Windport Substation parallel to a series of county and local roads. It had the lowest score due to involving the fewest stream crossings (17), having a low riparian impact (0.11), and crossing the least flood hazard area (29.32). The route would also involve one of the lowest area of coastal zone crossing (3.90) but would involve a moderate forested wetland clearing area (2.77) and emergent wetland crossing area (14.52). Although Alternative Routes 1 and 2 would involve less forested clearing and emergent wetland crossing areas, these options scored higher due to having slightly more stream crossings (19), riparian impacts (0.20), flood hazard area crossing, and coastal zone crossings.

Alternative Route 4 scored the worst due to crossing the most streams (55 – this is reflective of the dense pattern of channels located across the tidal marsh), most flood hazard area (39.43), and coastal zone area (21.62) as it parallels the PSEG 500 kV lines into the Windport Substation site. It would, conversely, involve the least threatened and endangered species area, forested wetland clearing, and emergent wetland crossing. Alternative Route 6 parallels Alloways Creek Neck Road across the large tidal marsh area to minimize impacts in this area, but does cross a separate tidal marsh area east of Alloways Creek Neck Road. The route scored relatively better by involving less stream crossings, riparian impacts, flood hazard area crossing, and coastal zone crossings, but would involve the most forested wetland clearing (10.24), and emergent wetland crossing (25.19). Alternative Route 3 would involve the most riparian impact (0.30) and threatened and endangered species area crossing (58.87), but had a relatively lower score by having less impacts on forested and emergent wetlands.

Engineering Summary

Review of the Weighted Total scores for the engineering analysis notes that Alternative Route 4 scored the lowest (4.69) and Alternative Route 6 has the next lowest score (7.59). Alternative Route

5 scored the highest (10.97) and Alternative Routes 1, 2, and 3 were relatively better (10.18, 9.71, and 9.99 respectively).

Alternative Route 4 scored the best due to requiring the shortest length of distribution underbuild (4.76), fewest road crossings (15), fewest transmission line crossings (1), and longest length parallel to an existing utility corridor (3.37). Note that the one transmission line crossing would be under a 500 kV line in close proximity to the Hope Creek Nuclear Generating Station, which may necessitate underground engineering. Comparatively, this route would potentially require less underground than the other alternative routes, which would need to go under all four 500 kV lines near the Hope Creek Nuclear Generating Station. Alternative Route 6 scored relatively low due to having a long length parallel to an existing utility corridor (3.44). but was higher than Alterative Route 4 due to having more road crossings (18), a longer length of distribution underbuild (6.98), and more transmission line crossings (8).

Although Alternative Route 5 has the longest length parallel to a roadway (12.53), it scored the worst due to having the longest length of distribution underbuild (11.77), the most roadway crossings (26), the shortest length parallel to an existing utility corridor (0.26), and having the longest overall length. Alternative Routes 1, 2, and 3 each scored relatively better due to being shorter routes that would involve less distribution underbuild and less road crossings. These three routes having identical alignments from the west side of Quinton to the proposed Windport Substation, with the differences being focused on their alignment around the town of Quinton. Comparatively, Alternative Route 3 has the higher score due to involving more road crossings (23) and a longer length of distribution underbuild.

Quantitative Summary

The Sum of Weighted Scores value provided in **Table 3-3** is the sum of the Weighted Total scores calculated for the three perspectives reviewed above. The following is a summary of the quantitative review results:

- Alternative Routes 1 and 2 did not score the best in any of the perspectives reviewed, but each scored relatively low in each of the perspectives so that cumulatively, they had the lowest (best) scores of the analysis.
- Alternative Route 3 scored the best in the build environment review, but had a higher overall score due to the increased environmental effects involved in its cross-country section.
- Alternative Route 4 scored the best in the engineering review but the worst in the natural environment review and moderately high in the built environment review, which are both associated with crossing of the tidal marsh area.
- Alternative Route 5 scored the best in the natural environment review, but the worst in the built environment and engineering review, which is reflective of this option being the longest route and its alignment adjacent to residential-lined roadways.
- Alternative Route 6 had high scores in the built environment and natural environment reviews due to its long alignment, some of which would be cross-country and over marsh areas. Its moderate engineering score was based on minimizing road crossings and the need for distribution underbuild.

4.2 Qualitative Evaluation Discussions

The final step in the analysis for the Quinton-Artificial Island Windport 69 kV transmission line involved a qualitative evaluation of the six Alternative Routes. The five qualitative criteria described below were assessed:

- Visual And Community Issues:
    - Potential visual concerns with a transmission line will vary due to the diversity of landscapes in the Study Area, the means of line development, the number of people potentially viewing the alignment, and if the alignment parallels or is co-located with an existing line or is the development of a new transmission line corridor. In addition, community concerns may be raised due to the traffic and noise that will occur during construction of the project, as well as the potential to affect contiguous groups of private properties during the construction process, such as needing to access the project through private lands or working in the constrained environments of residential yards.
- ROW Acquisition:
    - Acquisition of new ROW easements will be required for most of the alternative routes but is assumed to not be required for route options located along the inactive Quinton-Hancock 69 kV alignment. In many cases the alternative routes are located along public roadways where use of the existing public ROW is assumed. Engineering constraints may alter that assumption since public ROWs adjacent to roadways are often constrained by the presence of other utilities (i.e., gas lines, water lines) and may be limited in width. Qualitative results reflect the potential difficulty that may be involved with acquiring ROW easements from adjoining private, public, or commercial properties. The presence of agricultural conservation easements on some of the farm parcels crossed will increase the complexity of the easement acquisition. It is assumed that the inactive Quinton-Hancock 69 kV transmission line ROW was in place prior to the agricultural easement coordination on the preserved farm lands crossed along the alignment. If no additional easement area is required, route options located along this alignment may not require as much coordination with state and county agencies.
- Special Permit Issues:
    - Federal, state, and local permits may be required for permanent and temporary impacts associated with developing new transmission lines and ROWs, as well as for transmission line modifications within existing ROWs. Wetlands and waters under federal jurisdiction would potentially require authorization from the U.S. Army Corps of Engineers (USACE) for compliance with Sections 404 of the Clean Water Act (CWA) and Section 10 of the Rivers and Harbors Act. In New Jersey, areas including freshwater wetlands, open waters, flood hazard areas, coastal wetlands, Waterfront Development Areas, and tidelands are regulated by the NJDEP. Additionally, agency coordination or consultation required in support of permitting in some conserved areas (e.g., Wildlife Management Areas) may affect permitting efforts and timelines. Local permitting requirements vary within municipalities but

potentially could include authorizations for excavating, tree removal, traffic, and work in floodplains depending on local ordinances. Other special permit processes that may be relevant to the project include coordinating with the New Jersey Department of Transportation (NJDOT) for route options along and over SR 49.

- Construction:
    - Variables identified under this category involve constructing the transmission lines (structures and lines). Initial phases of transmission line construction require the use of various types of heavy machinery (bulldozers, cranes, and concrete mixers) that need to traverse the landscape to the proposed structure positions. Construction activities outside of existing ROWs include clearing trees, leveling out access roads and footer/pad areas, digging the footer or creating the concrete foundations, and erecting the structures. Typically, wire is installed by hand with construction personnel carrying lighter leader lines between poles and using small power equipment to pull the line taut and haul the heavier line into place. This process often allows the lines to be strung over wetlands or waters, thereby decreasing potential impacts to these resources. Construction activities along roadways involve re-routing traffic using various traffic control devises, impacting sidewalks and lawn areas, digging new footers, and erecting new structures. Third party line attachments and distribution line underbuilds are also considerations that are taken into account particularly along roadways where these types of issues are more numerous. Overbuilding existing distribution lines is further complicated by the limited span lengths required between the distribution structures, which increases the number of structures to be installed, the duration of the construction, and the impact of these new structures on the landscape. Potential scenarios for this project also include constructing structures within tidal marsh areas that may involve extensive use of timber matting and the possible use of helicopters to carry materials into isolated sections of the marsh.
- Maintenance and Long Term Accessibility:
    - Variables identified under this category involve conducting routine maintenance of the facilities and providing appropriate access to all the required areas. Typical maintenance tasks along transmission line corridors include inspections and repairs to structures and conductor hardware and vegetation management processes to clear ROWs for potential safety concerns. Some of the inspections are conducted annually whereas the vegetation management processes may be on a longer cycle (i.e., every 3-5 year). The goal of these maintenance activities is to maintain the safe operations of the transmission line. Long-term accessibility to all sections of the transmission line is required to facilitate these routine maintenance operations but also to assure access to the transmission line corridor in case of emergencies. Weather-related outages caused by falling trees can affect thousands of customers, and prompt response by the utility company can only be accomplished if access to these sites is securely negotiated when the ROW corridor is being defined.

Each of these qualitative criteria was assigned a weight based on its significance within the scope of the project as illustrated in **Table 4-1**. Per project team input, ROW acquisition was assigned a

relatively higher weight (25%) to account for the potential difficulty in obtaining new ROW agreements across the Study Area. Since most of the potential alignments would parallel existing roadways, construction was deemed to be potentially less problematic and was assigned a relatively lower weight (15%). The remaining variables were assigned a moderate 20% weight. Each Alternative Route was assessed based on these criteria and ranked on a 1-5 scale with one (1) indicating a low impact and five (5) indicating a high impact. A discussion of the considerations related to the rankings for each of the qualitative criteria is provided below.

TABLE 4-1: Qualitative Evaluation of Alternative Routes

Criteria	Weights	Alternative Route 1	Alternative Route 2	Alternative Route 3	Alternative Route 4	Alternative Route 5	Alternative Route 6
VISUAL/COMMUNITY ISSUES	20%	2	5	1	2	4	3
Weighted		0.4	1.0	0.2	0.4	0.8	0.6
ROW ACQUISITION	25%	2	1	2	4	4	5
Weighted		0.5	0.3	0.5	1.0	1.0	1.3
SPECIAL PERMIT ISSUES	20%	2	3	3	5	2	4
Weighted		0.4	0.6	0.6	1.0	0.4	0.8
CONSTRUCTION	15%	1	2	3	5	2	4
Weighted		0.2	0.3	0.5	0.8	0.3	0.6
MAINTENANCE & LONG TERM ACCESSIBILITY	20%	1	1	2	4	1	3
Weighted		0.2	0.2	0.4	0.8	0.2	0.6
TOTALS	**100%**	**1.7**	**2.4**	**2.2**	**4.0**	**2.7**	**3.9**

4.2.1 Visual and Community Evaluation

Alternative Route 2 mirrors the inactive Quinton-Hancock 69 kV alignment from Quinton to the proposed Windport Substation site and it has been assumed through this Study that ACE has the required 60-foot ROW to construct the new 69 kV line. The alignment of this route extends through the center of Quinton where community concerns are anticipated since the landowners crossed will not be able to defend against the use of the existing ROW and the new structures and lines would be located in close proximity to their homes, some of which are considered locally historic. Transmission line structures to be installed are projected to be larger and taller and may result in additional community concerns regarding the visual impact. Construction of this line would also involve extensive traffic control measures and generate high noise levels that would be disruptive to the surrounding community. Due to these factors, Alternative Route 2 was assigned the highest visual and community issue value (5).

Alternative Route 5 is the longest route of the options reviewed and would be located in close proximity to the most residential homes. This route bypasses to the east around the town of Quinton, but extends along a series of roadways that are bordered by clusters of homes as well as passes through the village of Harmersville. The new line would be constructed as an overbuild to the existing distribution system, which is located in the front yards of many homes along the route. The new line will require the installation of larger and taller structures, which is anticipated to be considered a visual impact in these communities. Due to these factors, Alternative Route 5 was assigned a moderately high visual and community issue value (4).

Alternative Route 6 is the second longest route and would be located in close proximity to relatively less residential homes compared to Alternative Route 5. Alternative Route 6 mirrors the alignment of Alternative Route 5 around Quinton but avoids traversing through Harmersville by crossing over agricultural fields south of the village. Portions of the line constructed adjacent to the roadways will involve distribution underbuild whereas the portion crossing the agricultural lands would not and therefore be constructed with optimize pole spans, which would have relatively less visual

impact. Due to these factors, Alternative Route 6 was assigned a moderate visual and community issue value (3).

Alternative Routes 1 and 4 have similar alignments that bypass around the west side of Quinton that would require new structures and lines along New Street, a short residentially-lined road located on the edge of town. The visual and community concern associated with the new distribution underbuild features, as well as the traffic and noise concerns, would be focused on this less populated and traveled section of town. These routes differ further along their alignments where Alternative Route 1 parallels rural roadways and Alternative Route 4 traverses a tidal marsh area as they extend into the proposed Windport Substation site. Due the limited community and visual concerns anticipated for these two route options, each was assigned a moderately low value (2).

Alternative Route 3 uses a cross-country alignment to bypass around Quinton and to extend to an intersection point with the inactive Quinton-Hancock 69 kV alignment west of Quinton. This route would span SR 49 south of Quinton in an agricultural and commercially developed area and be in close proximity to the fewest residential homes. Due to these factors, Alternative Route 3 was assigned a low visual and community issue value (1).

4.2.2 Right-of-Way Acquisition

Alternative Route 6 is the second longest route and would require the need to acquire the most new ROW easements (61). Some of the parcels crossed are preserved farm lands, state wildlife management areas, and NRHP-eligible and state-identified historic sites, which would increase the complexity of acquiring new easements. Several of the parcels crossed are active agricultural lands where the new route may be considered an impact to their farming practices. Due to these factors, Alternative Route 6 was assigned the highest ROW acquisition value (5).

Alternative Route 5 is the longest route and would require the need to acquire the second highest number of new easements (55). This route crosses several preserved farms but avoids the state wildlife management areas and historic sites. Acquisition of new ROW easements in the village of Harmersville was considered to be potentially problematic due to the community and visual concerns that the route may generate. Due to these factors, Alternative Route 5 was assigned a moderately high ROW acquisition value (4).

Nearly half of the Alternative Route 4 alignment would be along the inactive Quinton -Hancock 69 kV corridor where ACE has assumed that no new ROW easements would be required. This route does however extend around the west side of Quinton where several new ROW easements will be required from several residential and commercial landowners. The route also extends across the tidal marsh area near the proposed Windport Substation site where additional easements will be required for crossing state wildlife management areas. Due to these factors, Alternative Route 4 was assigned a moderately high ROW acquisition value (4).

Most of the alignments of Alternative Routes 1 and 3 would be along the inactive Quinton-Hancock 69 kV corridor where no new ROW easements would be required. These two alternatives however do extend west and east respectively around the perimeter of Quinton where new ROW easements would be required. Alternative Route 1 would need to obtain 9 new easements from the residential and commercial landowners located along the roadway network paralleled by the route, whereas Alternative Route 3 would need to obtain 6 new easements for crossing predominantly agricultural lands but across a longer length relative to Alternative Route 1. These

two route options were considered to have potentially similar easement acquisition concerns and were each assigned a moderately low value (2).

Alternative Route 2 mirrors the inactive Quinton-Hancock 69 kV alignment from Quinton to the proposed Windport Substation site and is assumed to not require any new ROW easements. Due to this assumption, Alternative Route 2 was assigned the lowest ROW acquisition value (1).

4.2.3 Special Permit Considerations

The information in Table 4-2 was coordinated to provide an overview of the potential permitting requirements associated with each of the Alternative Routes that may be triggered by potential impacts to specific resource areas regulated by NJDEP. The summary is explained in detail below.

The primary permitting drivers for all routes currently under consideration are the new permanent and temporary disturbances in regulated areas associated with the construction of transmission line structures and creation of new or expanded ROW areas. Along with the potential disturbances in regulated areas, the permit options for authorizing electric utility projects are dependent upon the permit options promulgated by each regulatory program specifically for or otherwise applicable to electric utility lines.

Each Alternative Route will require NJDEP Division of Land Resource Protection authorizations from the Freshwater Wetlands, Flood Hazard Area, and Coastal Zone Management programs, as well as licensing from the Bureau of Tidelands Management. As indicated in the notes on Table 4-2, where a General Permit has not been promulgated for electric utility lines and no other General Permit applies, Individual Permits will be required (e.g., Flood Hazard Area and Waterfront Development Individual Permits).

Applicability of Statewide Blanket Authorizations

ACE's *Statewide Blanket Permit for Vegetative and Structural Maintenance within Power Line Rights-of-Way* contains multiple authorizations including Flood Hazard Area Individual Permit, Waterfront Development Individual Permit, Freshwater Wetlands General Permit #1 (Maintenance), Freshwater Wetlands General Permit #21 (Above-Ground Utility Lines), and CAFRA General Permit #19 (Modification of Existing Substations). These authorizations are for structural and vegetative work within existing ROWs and limited work in existing substations within the CAFRA Zone. Two of these authorizations; the Coastal Wetlands Individual and the Freshwater Wetlands General Permit #21; were modified by request of NJDEP to only be used for projects with minimal impacts rather than lengthy transmission line rebuilds between substations. Because the routes between substations represent complete projects, the Statewide Blanket Permit may be limited in its applicability to routes that are not entirely contained within existing, maintained ROWs.

Geotechnical investigative activities would also be required to assess subsurface geotechnical conditions for engineering and final design but are assumed to be similarly necessary for all routes and authorized by ACE's Statewide Blanket Permit for Geotechnical Investigative Activities.

TABLE 4-2: Environmental Permitting Summary of the Top Six Alternative Routes

Po+A1:G19tential Permits	Alternative Route 1	Alternative Route 2	Alternative Route 3	Alternative Route 4	Alternative Route 5	Alternative Route 6
USACE (CWA Section 404 and Rivers and Harbors Act Section 10)	NWP#57[1]	NWP#57[1]	NWP#57[1]	NWP#57[1]	NWP#57[1]	NWP#57[1]
USACE Section 408 Request for Permission to Alter a USACE Project[2]	C	C	C	C	C	C
NJDEP Freshwater Wetlands Protection Act Rules (N.J.A.C. 7:7A)	GP#21 or IP[3]	GP#21 or IP[3]	GP#21 or IP[3]	GP#21 or IP[3]	GP#21 or IP[3]	GP#21 or IP[3]
NJDEP Flood Hazard Area Control Act Rules (N.J.A.C. 7:13)	SP or IP[4,5]	SP or IP[4,5]	SP or IP[4,5]	SP or IP[4,5]	SP or IP[4,5]	SP or IP[4,5]
NJDEP Coastal Zone Management Rules (N.J.A.C. 7:7)						
Coastal Area Facilities Review Act (CAFRA)	NA[6]	NA[6]	NA[6]	NA[6]	NA[6]	NA[6]
Waterfront Development Area	SP or IP[7]	SP or IP[7]	SP or IP[7]	SP or IP[7]	SP or IP[7]	SP or IP[7]
Coastal Wetlands	IP[7]	IP[7]	IP[7]	IP[7]	IP[7]	IP[7]
Bureau of Tidelands - Tidelands Utility License	TUL	TUL	TUL	TUL	TUL	TUL
NJDEP Linear Construction Project	LP[8]	LP[8]	LP[8]	LP[8]	LP[8]	LP[8]
Agency Coordination/Consultation[9, 10]	X	X	X	X	X	X
Soil Erosion and Sediment Control	X	X	X	X	X	X

Acronyms:

GP=General Permit	NA=Not Applicable	SP=Statewide Blanket Permit
C=Consultation	NWP=Nationwide Permit	TUL=Tidelands Utility License
IP=Individual Permit	X=Applies	WFD=Waterfront Development
LP=Low Potential	PBR=Permit-by-Rule	

Notes:

1 USACE NWP #57 (Utility Lines) is a new permit effective March 15, 2021, for electric utilities and telecommunications activities formerly covered by Nationwide Permit #12. A PCN is required and a 1/2 acre permanent disturbance limit applies. A USACE NWP #12 (Maintenance) may apply in some areas for previously authorized structures but permitting a single and complete project will likely require NWP #57.

2 As per 33 USC 408, alteration of a Civil Works project or property requires pre-coordination with the Section 408 Coordinator and submittal of an application package. CWA Section 404 and Rivers and Harbors Act Section 10 permit verifications cannot be issued without a Section 408 permit decision. Consultation may be required if proposed work intersects Block 26, Lot 3 (owned by USACE).

3 GP#21 for overhead lines can only be used for 20 feet width or less and/or 1/2 acre or less permanent disturbance. Therefore, an IP is likely for all routes but may be downgraded to a GP by greater avoidance of freshwater wetlands and use of existing ROW.

4 There are no applicable GPs promulgated for NJDEP Flood Hazard Area Control Act permits. PBRs do not apply to projects with riparian zone clearing. Therefore, a Flood Hazard Area IP applies if not covered under the Statewide Blanket Permit.

5 Hardship exceptions or waivers are required if riparian zone allowances are exceeded for new transmission lines and access as per the NJDEP Flood Hazard Area Control Act Rules N.J.A.C. 7:13, Table 11.2 (Maximum Allowable Area of Riparian Zone Vegetation that can be Temporarily or Permanently Cleared, Cut, or Removed without Additional Justification and/or a Hardship Exception Request.

6 Transmission and distribution lines are exempt from CAFRA as per N.J.A.C. 7:7-2.2 (b)(2)(ix). CAFRA applies to existing substation expansions (outside of fenceline) and new substations which are not included in this Routing Study.

7 The construction or rebuild of transmission line does not qualify for any PBRs or GPs contained in the Coastal Zone Management Rules (N.J.A.C. 7:7). Therefore, an IP for coastal wetlands would apply. A WFD IP would be required if not authorized under the Statewide Blanket Permit.

8 Linear Construction Projects are linear projects crossing known contaminated sites and generating 200 cubic yards or greater of contaminated soil. Construction in these areas is subject to the requirements of NJDEP Linear Construction Guidance.

9 Agency coordination/consultation includes threatened and endangered species, cultural, and conserved lands and will be required for all routes. Other coordination will likely include United States Coast Guard and USACE for Section 408 determination.

10 Threatened and endangered species requiring significant time of year restrictions (TOYRs) are documented for all routes (e.g., Bald Eagle and Osprey Nests).

USACE permitting would be required for all Alternative Routes for the crossings of jurisdictional waters (tidal waters and navigable waters) and disturbances in associated wetlands. Verification of the use of Nationwide Permits (NWPs) would be the likely permitting option assuming permanent disturbances to be less than 0.50 acre. An individual or standard permit would be required for exceedances of that disturbance limit. In addition, potential coordination/permitting

for a Section 408 (33 USC 408) (alteration of civil works or property) determination could be required for all alternative options, except Alternative Route 4, if construction of transmission line occurs on Block 26, Lot 3 (owned by the United States of America).

All Alternative Routes cross parcels that are owned by PSEG and contiguous with the Salem Nuclear Generating Station, a known contaminated site listed in the New Jersey Contaminated Sites List. If found to be within the perimeter of the area delineated as contaminated, the transmission line work would require compliance with the NJDEP Linear Construction Projects Guidance. This is considered low potential, subject to confirmation by due diligence efforts, as the route crossings are outside of the substation proper and likely not within the known contaminated site boundary.

Agency consultation/coordination would be required for each Alternative Route with some differences in effort noted for specific routes according to their respective constraints (e.g., threatened and endangered species).

Mitigation

Mitigation requirements for each of the permit types differs according to regulated resource and program and will be dependent upon the disturbances associated with final design. Mitigation may be required by the Freshwater Wetlands Program, Flood Hazard Area Control Act Program, Coastal Zone Management Program, and USACE if mitigation limits or thresholds are exceeded. Mitigation options vary by resource and program but may include on-site and/or off-site creation/enhancement, purchase of banking credits, in-lieu fees or combinations thereof.

The potential permitting requirements associated with each Alternative Route is summarized in Table 4-2 and the main permitting differences among routes is explained in detail below:

Alternative Routes 1, 2, and 3:

Alternative Routes 1, 2, and 3 are combined in this summary as their alignments are relatively the same and only diverge in the vicinity of the existing Quinton Substation. The land use permitting options for these routes is anticipated to be similar since the potential disturbances in regulated areas will be at a similar level. Permitting of any of these three routes would require the permits described above and in Table 4-2 depending on final design. However, these three routes have potential for reducing potential impacts to regulated resources in terms of acreages of disturbance and therefore may have advantages including agency acceptance, reduced mitigation, and reduced permit fees for those permits requiring payment by the acres of disturbance (e.g., Coastal Wetlands Individual Permit).

Alternative Route 4:

Alternative Route 4, due to its crossing of a large extent of mapped coastal wetlands would incur a greater level of disturbance within mapped coastal wetlands in comparison to the other routes. Although all routes will require a Coastal Wetlands Individual Permit, the costs for permitting the acres of disturbance and mitigation of these disturbances would be considerably higher than the other routes. Agency acceptance would also be challenging as authorization of such impacts is conditioned on the requirement that disturbances in coastal wetlands will be avoided and minimized and less impactful than other alternative routes. In addition, this crossing has a greater number of documented osprey and bald eagle nests present in structures within the PSEG ROW

than the other routes. The time of year restrictions (TOYRs) within nest buffers for these two species combined would require a long TOYR on temporary construction activities as well as require increased consultation with the NJDEP Threatened and Endangered Species Unit.

Alternative Routes 5 and 6:

Alternative Routes 5 and 6 are combined in this summary as their alignments are the same except for a middle section where they diverge; Alternative Route 5 continuing along roadways through Harmersville and Alternative Route 6 using cross-country routes that parallel the existing PSEG ROW before converging on Alloways Creek Neck Road near the large tidal marsh crossing area. These two routes would involve a similar level of coastal wetlands disturbance overall as well as similarly low potential for riparian zone clearing. Permanent freshwater wetlands disturbance (conversion) would be greater for Route 6 than Route 5 and thus require increased permit fees and mitigation costs. However, both would also likely not meet the 0.50 acre threshold and 20 foot ROW width permanent disturbance limit for use of the General Permit #21 (Above-Ground Utility Lines) and would require an Individual Permit. Mapped threatened and endangered species are prevalent along both routes, including areas outside of mapped coastal wetlands, and would likely result in 150-foot transition area widths for many wetlands.

The Alternative Routes were assigned special permit issues value based on this environmental permitting summary and other potential permitting requirements as follows:

- Alternative Route 4 was assigned the highest special permit issues value (5) due to the level of environmental permitting anticipated for crossing the large mapped coastal wetlands area.
- Alternative Route 6 was assigned a moderately high special permit issues value (4) due to the extent of mapped coastal wetlands crossed and the having the most forested and emergent freshwater wetland impacts.
- Alternative Route 3 was assigned a moderate special permit issues value (3) due to the extent of regulated features crossed while paralleling the section of Alloways Creek Neck Road that extends to the proposed Windport Substation site and additional riparian and stream impacts anticipated for the cross-country section used to avoid Quinton.
- Alternative Route 2 was also assigned a moderate special permit issues value (3) due to the extent of regulated features crossed while paralleling the section of Alloways Creek Neck Road that extends to the proposed Windport Substation site and the anticipated permitting coordination required with NJDOT for paralleling a portion of SR 49 in the town of Quinton.
- Alternative Routes 1 and 5 were assigned moderately low special permit issues values (2) due to the extent of regulated features crossed while paralleling the section of Alloways Creek Neck Road that extends to the proposed Windport Substation site.

4.2.4 Construction Considerations

Review of the construction aspect of the project noted the potential need for underground alignments that may need to extend under the four PSEG 500 kV lines that radiate out from the Hope Creek Nuclear Generating Station. This measure would be required for each of the

Alternative Routes except Alternative Route 4, which would only need to cross under one of the 500 kV lines further out in the tidal marsh area where underground may not be required. The complexity of the underground section was not considered a factor for this analysis as it would be an issue for each of the alternative routes except Alternative Route 4, which would involve its own construction complexity crossing under the 500 kV lines.

As noted earlier, most of the Alternative Routes parallel roadway edges where construction was deemed to be potentially less problematic, however each of the alternative routes will involve special nuances that will result in some construction complexity as follows:

- Alternative Route 4 was considered to involve the most complex construction process due the section that crosses the large tidal marsh. Options to conduct work in these conditions would involve either extensive use of temporary matting and bridges or the use of helicopters to carry the material and workers into specific areas where new structures are needed. This process can be further complicated by the time of year restrictions placed on the project due to the presence of bald eagles or ospreys. Due to these factors, Alternative Route 4 was assigned the highest constructability value (5).
- Alternative Route 6 would also involve an area of tidal marsh that may require the same construction approach as Alternative Route 4 but on a smaller scale. This route option would also be subject to time of year restrictions placed on the project due to the presence of bald eagles or ospreys. Sections of this route would also be located in agricultural fields and isolated forested areas where construction activities may be problematic. Due to these factors, Alternative Route 6 was assigned a moderately high constructability value (4).
- Alternative Route 3 is located predominantly along roadways but would involve a short section of alignment that would be located in agricultural fields and isolated forested areas where construction activities may be problematic. Due to this factor, Alternative Route 3 was assigned a moderate constructability value (3).
- Alternative Route 5 would also involve a short section of construction within an agricultural field but in an area that is relatively more accessible. Due to this factor, Alternative Route 5 was assigned a moderately low constructability value (2).
- Alternative Route 2 would extend through the center of Quinton where construction activities may be complicated due to the close proximity of existing buildings and the need for extensive traffic control measures. Due to these factors, Alternative Route 2 was assigned a moderately low constructability value (2).
- Alternative Route 1 would be built entirely adjacent to roadways and less complicated by existing buildings and traffic control measures. Due to these factors, Alternative Route 1 was assigned the lowest constructability value (1).

4.2.5 Maintenance and Long-Term Accessibility

ACE noted that the alignments constructed along roadways would be the easiest to access and maintain. Maintenance and long-term access was considered by ACE to be most problematic in the tidal marsh areas and agriculturally active fields. Similar to the construction process, accessing the marsh areas may involve the need for helicopters or extensive matting and

accessing the agricultural fields may require matting. Access to the fields was considered additionally challenging due to the landowner coordination required and the potential impact to crops or farming operation processes that could occur in these fields.

Based on this summary, the Alternative Routes were assigned maintenance and long-term accessibility values as follows:

- Alternative Route 4 was assigned a moderately high value (4) due to the anticipated difficulty involved in maintaining and accessing structures located in the large tidal marsh area near the Hope Creek Nuclear Generating Station.
- Alternative Route 6 was assigned a moderate value (3) due to the anticipated difficulty involved in maintaining and accessing structures located in the smaller tidal marsh area located east of Alloways Creek Neck Road. Portions of this alignment are also located in agricultural fields where access coordination and processes may be difficult.
- Alternative Route 3 was assigned a moderately low value (2) due to the anticipated access coordination and processes difficulty involved with working in agricultural fields.
- Alternative Routes 1, 2, and 5 were assigned the lowest value (1) due to these alignments being located predominantly adjacent to roadways. Alternative Route 5 would involve a short section that is located in an agricultural field, but this area would involve coordination with only one landowner and the field is situated adjacent to SR 49 where access was not considered problematic.

5 PREFERRED ROUTE AND CONCLUSIONS

The results of the *quantitative and qualitative evaluation* discussed in Section 4 and illustrated in Table 3-3 and Table 4-1 document that Alternative Route 1 (Rank 1) has the lowest overall quantitative weighted total value and the lowest qualitative score.

Based on review of the quantitative metrics and the qualitative review discussions, ACE determined that Alternative Route 1 was the Preferred Route for the Quinton-Windport 69 kV Transmission Line. This decision is based on the following factors:

- The route would follow the 60-foot ROW of ACE's inactive Quinton-Hancock 69 kV alignment for most of the alignment between Quinton and the proposed Windport Substation site;
- The route will involve a limited area in Quinton where new ROW would be required;
- The route would involve limited visual and community concerns;
- The route would involve similar environmental impacts as most of the other options reviewed, with most of the impacts focused along a common corridor (Alloways Creek Neck Road); and
- The route would be located adjacent to the local roadway network where construction and long-term access was not considered problematic.

The Preferred Route is illustrated in Figure 5-1.

The quantitative and qualitative scores for Alternative Route 1 (Rank 1) are very similar to the scores for Alternative Route 2 (Rank 2) and Alternative Route 3 (Rank 3). These three route options follow identical alignments for most of their length with the differences being their route around Quinton. Alternative Route 2 (Rank 2) would use the ROW of ACE's inactive Quinton-Hancock 69 kV line to extend through the center of Quinton, however this option was considered to potentially result in more visual and community issues as well as construction concerns based on the density of the housing and proximity of the homes to the roadway edge where the new transmission line would be constructed. Due to these factors, use of the existing ROW was considered to be the most problematic option through Quinton. Alternative Route 3 (Rank 3) would use a section of the ROW along Waterworks Road and Lake Avenue but then divert to the southeast as a cross-country option that uses a series of agricultural and forested lands to bypass around the east and south side of Quinton. This option would involve somewhat more environmental impacts and be relatively harder to construct and maintain but was considered by ACE to be a viable alternative to the Preferred Route if issues arise during the easement acquisition, permitting, or engineering aspects of this route.

This outcome concludes the Alternative Route Analysis.

Figures

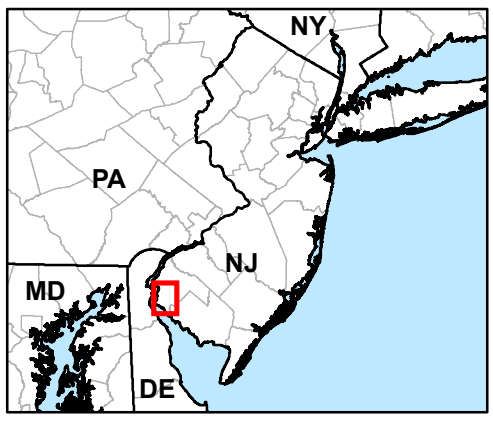
Legend

- Substations
- 69 kV Transmission Line
- 230 kV Transmission Line
- 500 kV Transmission Line
- Quinton - Windport Study Area

NAD 1983 State Plane
New Jersey FIPS 2900
Projection: Tranverse Mercator
Linear Unit: US Foot

References:
World Imagery Basemap (ESRI)
Transmission Lines (PowerMap/ACE)

0 2,750 5,500 11,000
Feet
1 inch = 5,500 feet

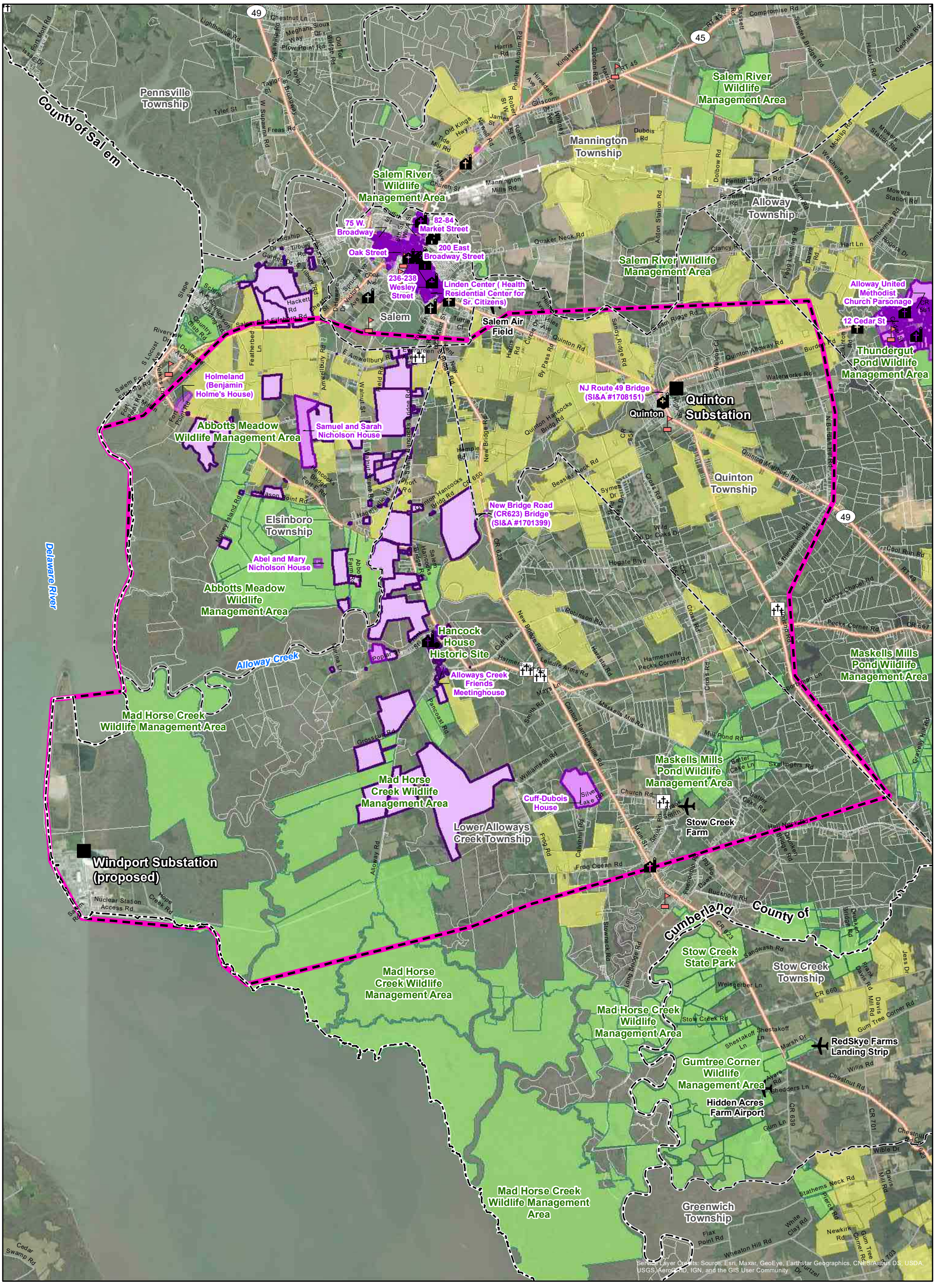


AECOM

Figure 1-1
Study Area
Quinton - Windport 69 kV
Routing Analysis

Salem County
New Jersey
Atlantic City Electric
Mays Landing, New Jersey

Prepared By: FCM	Checked By: BAB
Job: 60657167	Date: 8/5/2021



Legend

- Substations
- Quinton - Windport Study
- County Boundaries
- Municipal Boundaries
- Airports
- Churches
- Cemeteries
- Schools
- NRLP Historic Properties
- NJSHPO Historic Properties
- Open Space
- Preserved Farms
- County Parcels
- Railroad

NAD 1983 State Plane
New Jersey FIPS 2900
Projection: Tranverse Mercator
Linear Unit: US Foot

References:
World Imagery Basemap (ESRI)
Airports (ESRI)
Preserved Land (D&R Greenway Land Trust)
Open Space (NJDEP)
Historic Properties (NJSHPO/NLRP)

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Feet
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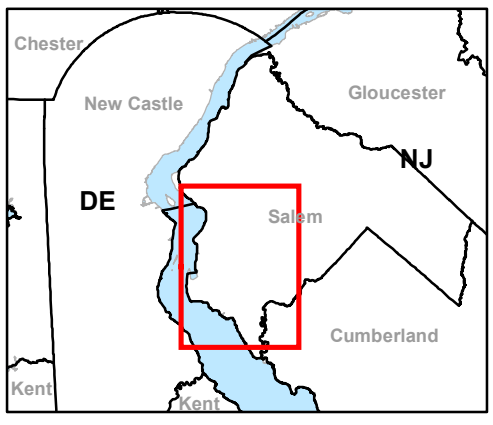
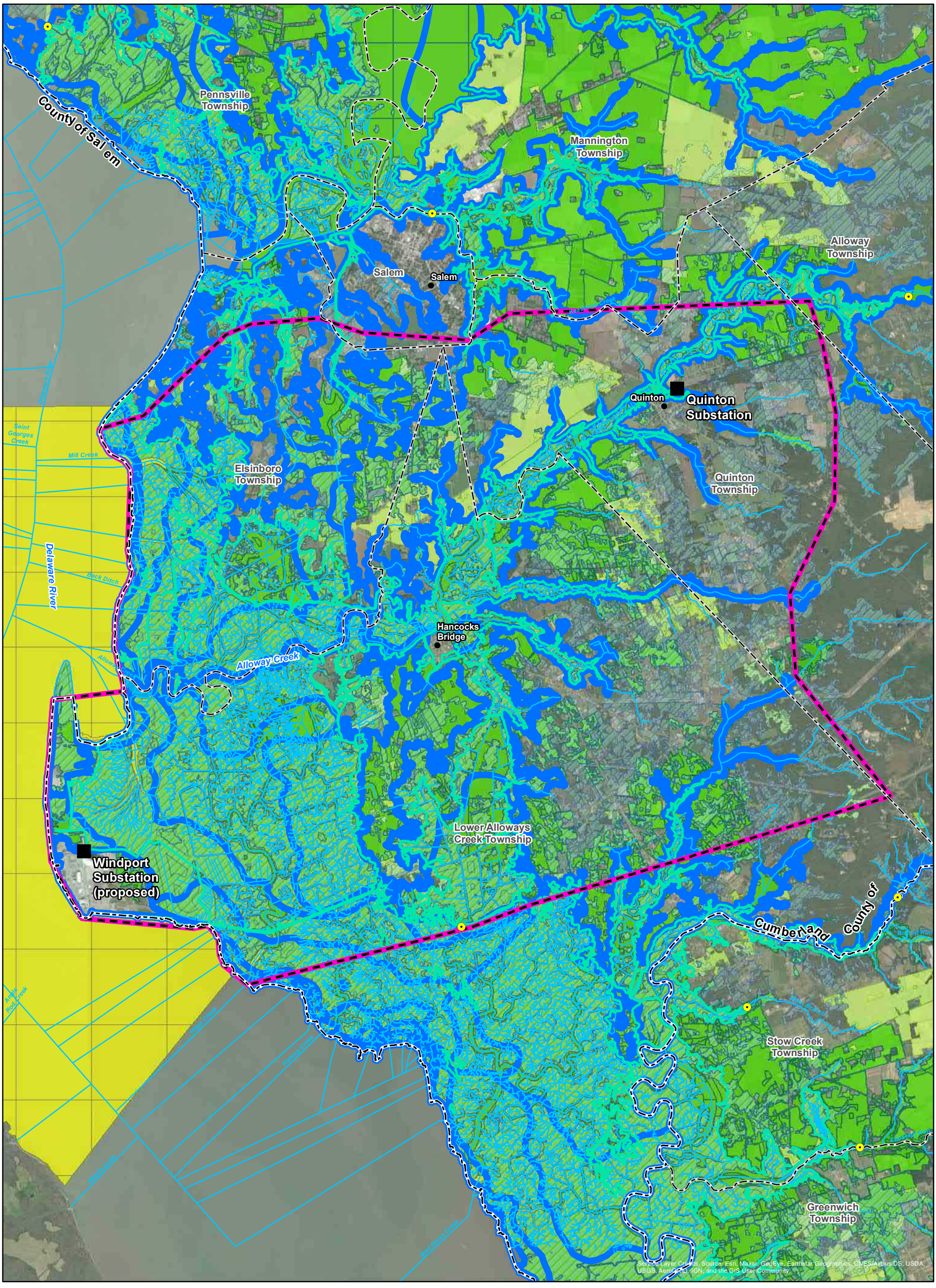


AECOM

Figure 2-1
Built Environment
Quinton - Windport 69 kV
Routing Analysis

Salem County
New Jersey
Atlantic City Electric
Mays Landing, New Jersey

Prepared By: FCM	Checked By: BAB
Job: 60657167	Date: 8/7/2021



Legend

- Substations
- Quinton - Windport Study Area
- County Boundaries
- Municipal Boundaries
- Head of Tide
- Upper Wetlands Boundary
- NHD Streams
- NJDEP Wetlands

100-Year Floodplain

- 100-Year Floodplain
- 100-Year Floodplain Floodway

Landscape Project 3.3

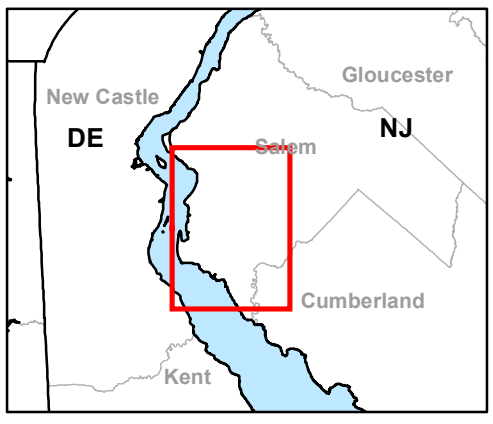
- Rank 3 - State Threatened Species
- Rank 4 - State Endangered Species
- Rank 5 - Federal Listed Species

NAD 1983 State Plane
New Jersey FIPS 2900
Projection: Tranverse Mercator
Linear Unit: US Foot

References:
World Imagery Basemap (ESRI)
100-Year Floodplain (FEMA)
Streams (NHD)
Wetlands (NJDEP)
Landscape Project (NJDEP)
Head of Tide (NJDEP)

0 2,750 5,500 11,000
Feet

1 inch = 5,500 feet

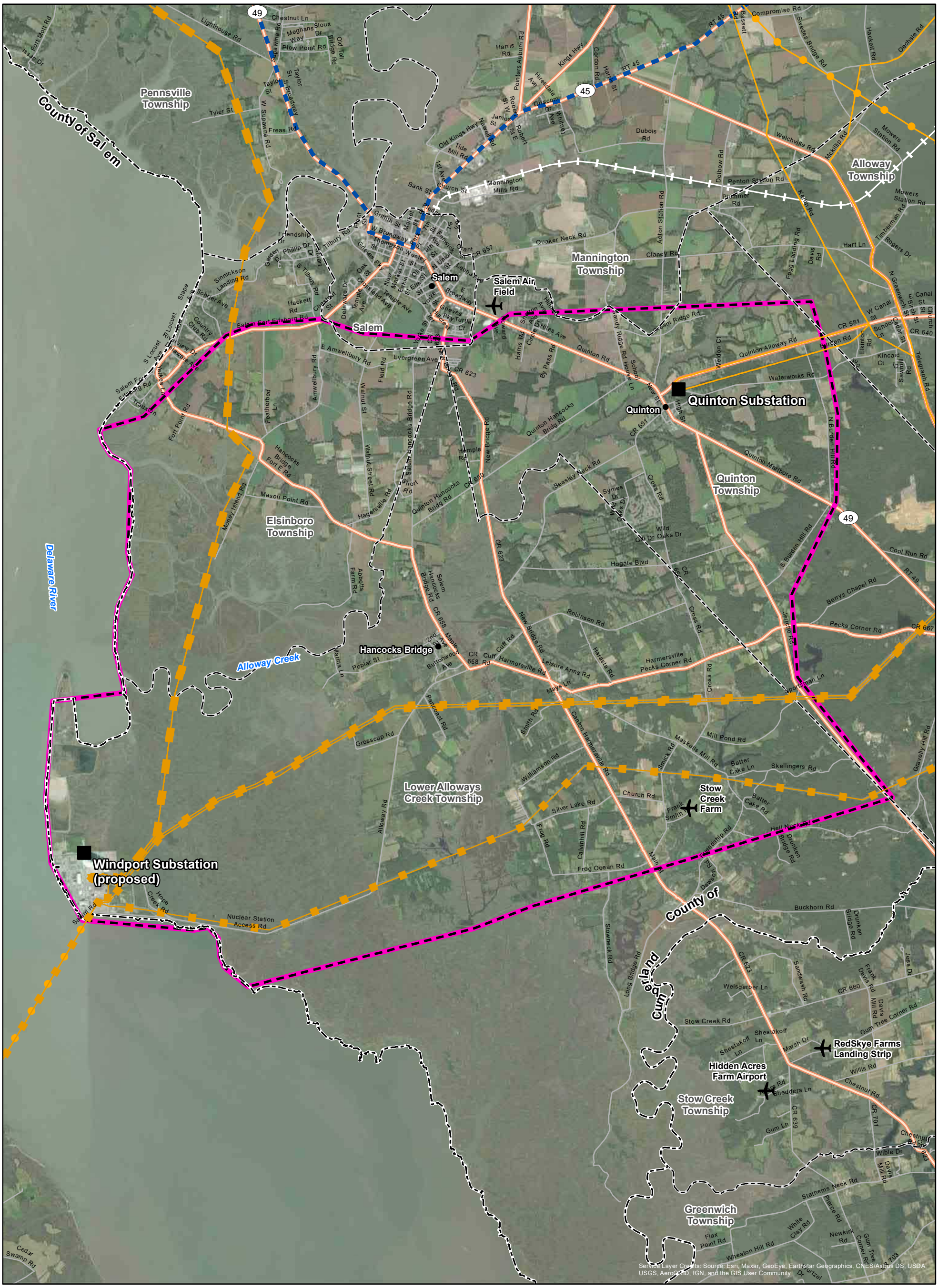


AECOM

Figure 2-2
Natural Environment
Quinton - Windport 69 kV
Routing Analysis

Salem County
New Jersey
Atlantic City Electric
Mays Landing, New Jersey

Prepared By: FCM	Checked By: BAB
Job: 60657167	Date: 8/7/2021



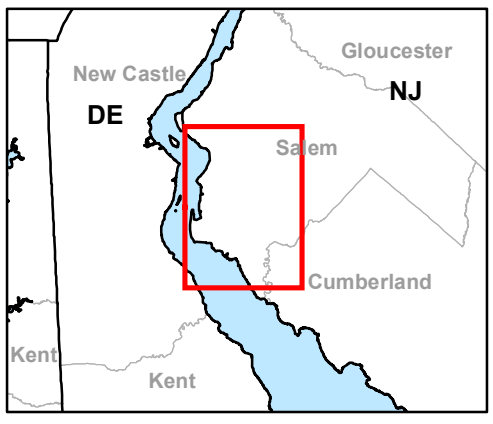
Legend

- Substations
- Quinton - Windport Study Area
- County Boundaries
- Municipal Boundaries
- Airport
- 69 kV Transmission Line
- 230 kV Transmission Line
- 500 kV Transmission Line
- Pipeline
- Railroad

NAD 1983 State Plane
New Jersey FIPS 2900
Projection: Tranverse Mercator
Linear Unit: US Foot

References:
World Imagery Basemap (ESRI)
Transmission Lines (PowerMAP/ACE)
Airports (ESRI)
Pipelines (digitized from NPMS)

0 2,750 5,500 11,000
Feet
1 inch = 5,500 feet

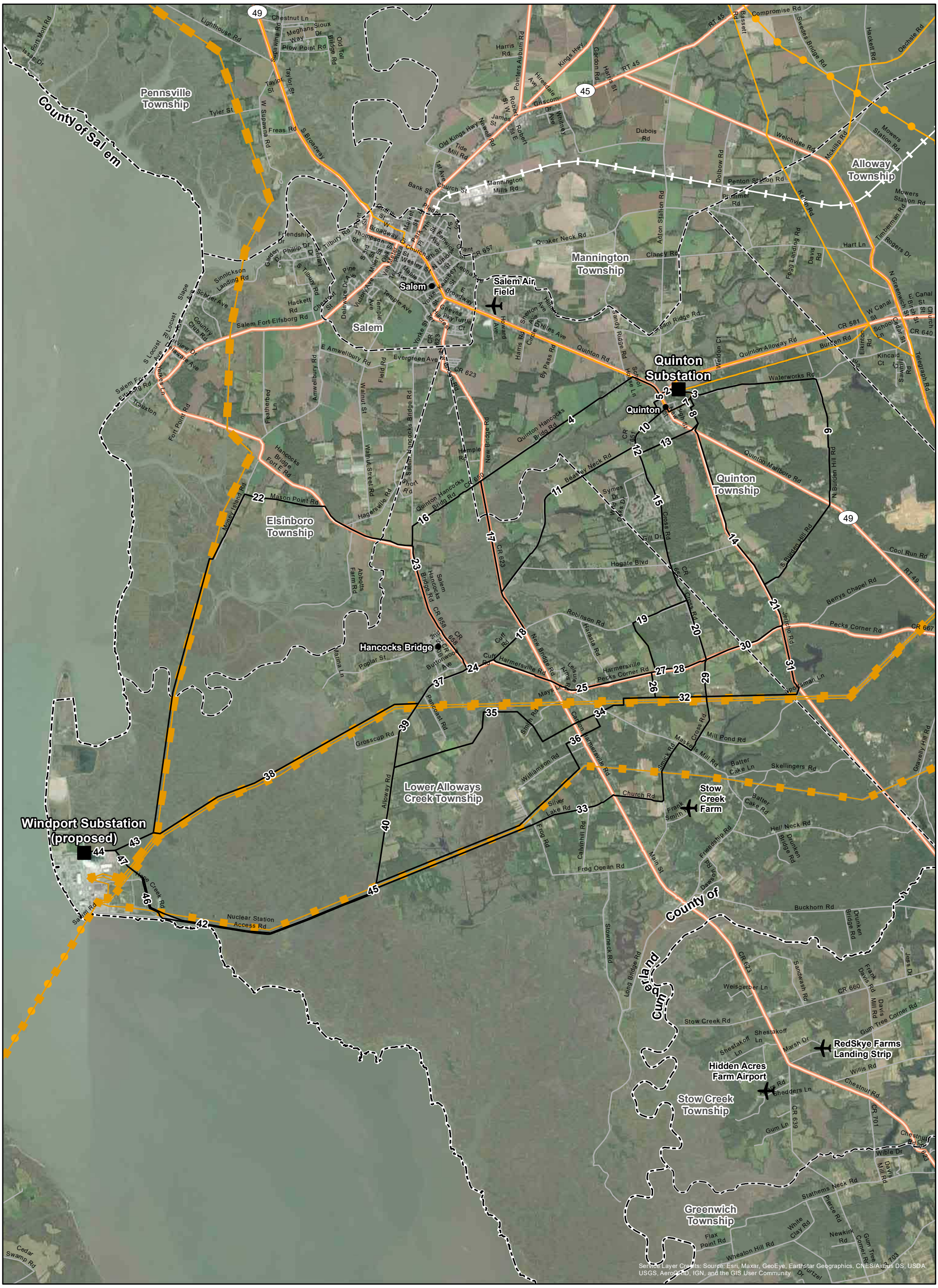


AECOM

Figure 2-3
Engineering Opportunities
Quinton - Windport 69 kV
Routing Analysis

Salem County
New Jersey
Atlantic City Electric
Mays Landing, New Jersey

Prepared By: FCM	Checked By: BAB
Job: 60657167	Date: 8/7/2021

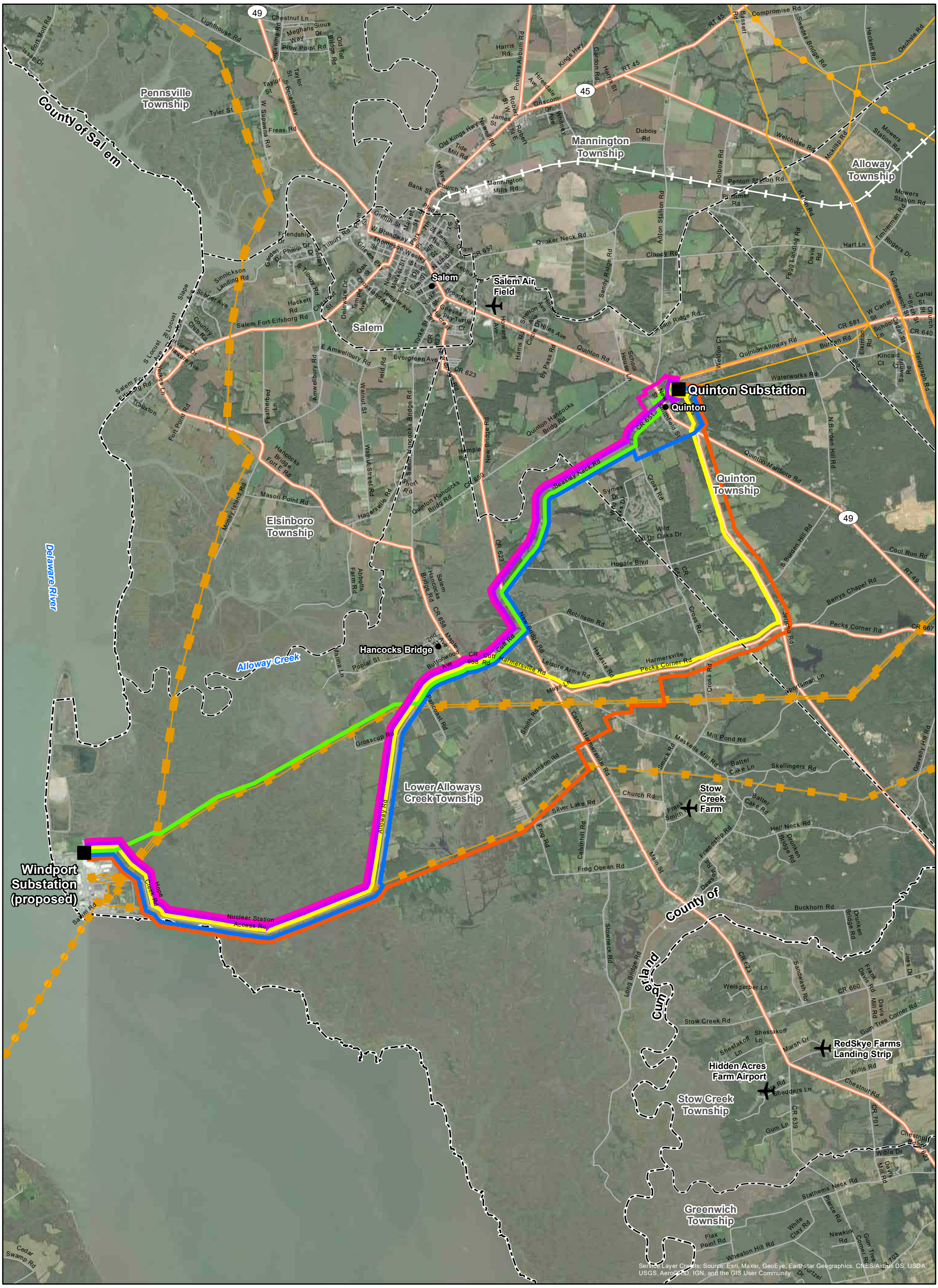


AECOM

Figure 3-1
Segments Identified in the Study Area
Quinton - Windport 69 kV
Routing Analysis

Salem County
New Jersey
Atlantic City Electric
Mays Landing, New Jersey

Prepared By: FCM	Checked By: BAB
Job: ACE Quinton - Windport	Date: 8/7/2021



Legend

- Substations
- Airport
- County Boundaries
- Municipal Boundaries

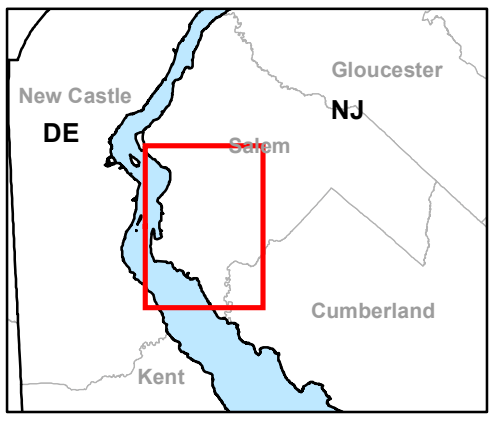
Top 6 Routes

- Route 1
- Route 2
- Route 3
- Route 4
- Route 5
- Route 6

NAD 1983 State Plane
New Jersey FIPS 2900
Projection: Tranverse Mercator
Linear Unit: US Foot

References:
World Imagery Basemap (ESRI)
Transmission Lines (PowerMap/ACE)
Airports (ESRI)

0 2,750 5,500 11,000
Feet
1 inch = 5,500 feet

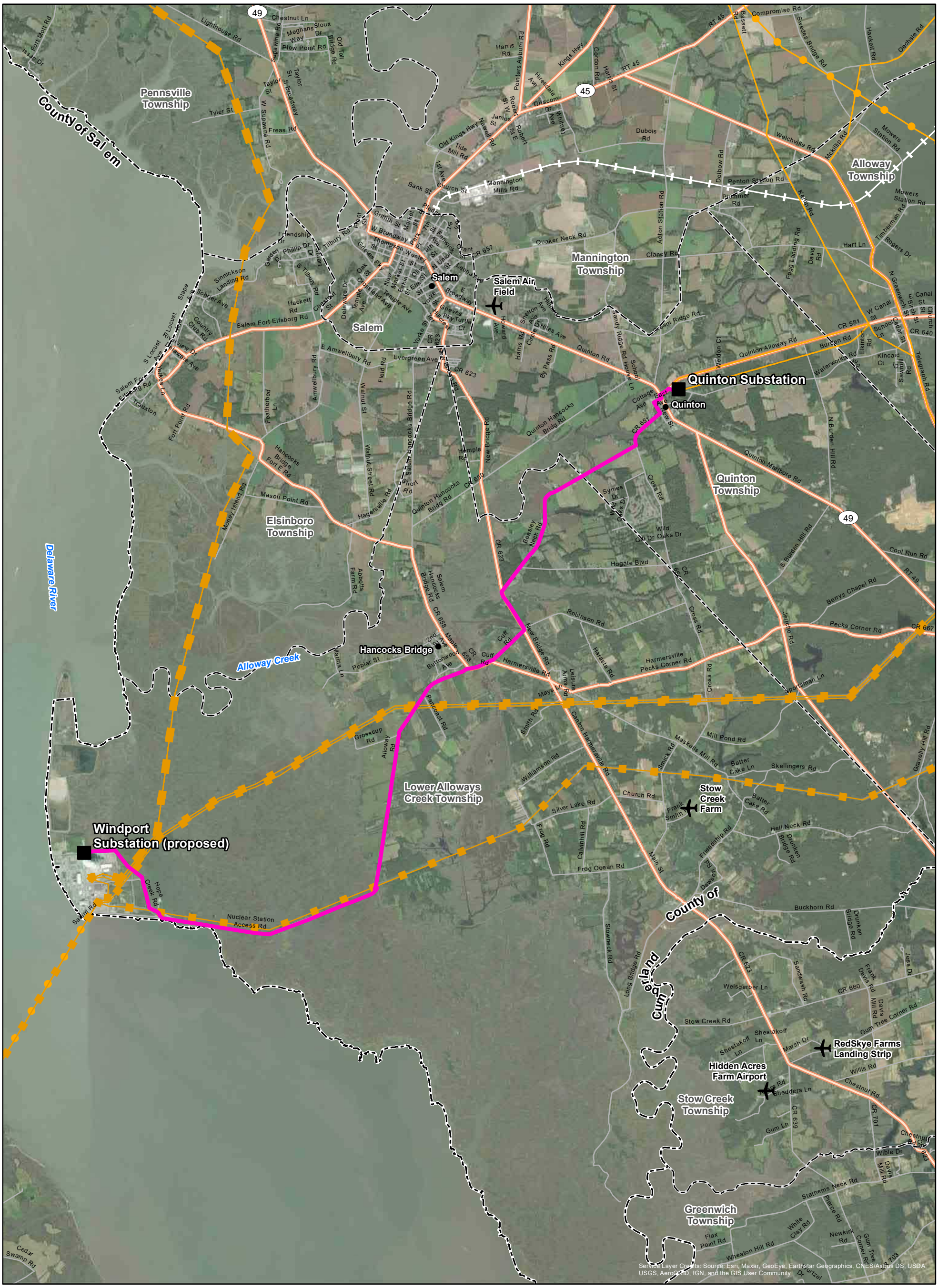


AECOM

Figure 3-2
Top Six Alternative Routes
Quinton - Windport 69 kV
Routing Analysis

Salem County
New Jersey
Atlantic City Electric
Mays Landing, New Jersey

Prepared By: FCM	Checked By: BAB
Job: 60657167	Date: 8/7/2021



Legend

- Substations
- Airport

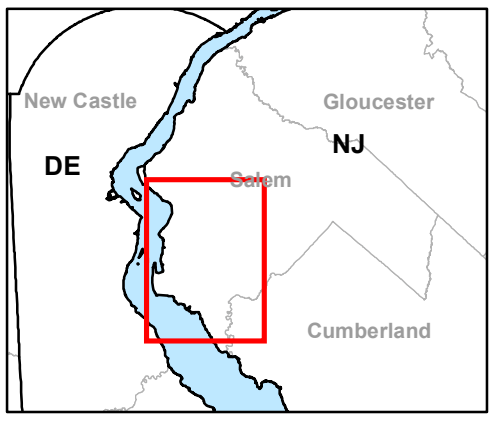
Preferred Route

- Route 1

NAD 1983 State Plane
New Jersey FIPS 2900
Projection: Tranverse Mercator
Linear Unit: US Foot

References:
World Imagery Basemap (ESRI)
Transmission Lines (PowerMAP/ACE)
Airports (ESRI)

0 2,750 5,500 11,000
Feet
1 inch = 5,500 feet



AECOM

Figure 5-1
Preferred Route
Quinton - Windport 69 kV
Routing Analysis

Salem County
New Jersey
Atlantic City Electric
Mays Landing, New Jersey

Prepared By: FCM	Checked By: BAB
Job: 60657167	Date: 8/7/2021

Appendix A References

Federal Emergency Management Agency (FEMA), Published 06/27/2016. Preliminary Digital Flood Insurance Rate Map Database, Salem County, New Jersey (All Jurisdictions).

New Jersey Department of Agriculture. Published 07/29/2020. New Jersey Farmland Preservation Program (NJFPP), New Jersey State Plane NAD83. Accessed 05/20/2021.

New Jersey Department of Environmental Protection (NJDEP), Division of Fish Wildlife (DFW), Endangered Nongame Species Program (ENSP). 2017. NJDEP Species Based Habitat, Piedmont Region (Version 3.3, 20170509)

NJDEP, State, Local and Nonprofit Open Space of New Jersey. Published 07/29/2020. NJDEP State Owned, Protected Open Space and Recreation Areas in New Jersey (Version 20200729).

NJDEP, Historic Preservation Office (HPO). Identification of Historic Resources. 07/21/2015. New Jersey and National Registers of Historic Places. http://www.nj.gov/dep/hpo/1identify/nrsr_lists.htm. Accessed September 2015.

NJDEP, Natural and Historic Resources (NHR), Historic Preservation Office (HPO). Published 10/31/2017. NJDEP Historic Properties of New Jersey (Edition 20171031).

NJDEP, Natural and Historic Resources (NHR), Historic Preservation Office (HPO). Published 10/31/2017. NJDEP Historic Districts of New Jersey (Edition 20171031).

NJDEP, Office of Information Resources Management (OIRM), Bureau of Geographic Information Systems (BGIS). 02/17/2015. Land Use/Land Cover 2012 Update, Edition 20150217.

NJDEP, Office of Information Resources Management (OIRM), Bureau of Geographic Information Systems (BGIS). 2002. NJDEP Upper Wetlands Boundary/Upper Wetland Limit for New Jersey.

New Jersey Department of Transportation (NJDOT), Bureau of Transportation Data Development (BTDD). 02/01/2016. NJ_Roadway_Network.

Salem County Agricultural Development Board. *https://www.salemcountynj.gov/departments/agriculture-development-board.* Accessed 08/20/2020.

Salem County Department of Planning. Accessed 05/20/2021. Parcels of Salem County, New Jersey State Plane NAD83.

United States Geological Survey (USGS). National Hydrography Dataset. http://nhd.usgs.gov/. Accessed January 2016.

Appendix B Raw Segment Metric Data

APPENDIX B
RAW SEGMENT METRIC DATA
BUILT ENVIRONMENT

Segments	Segments Length (mi)	NRHP (Listed & Eligible) Properties/Districts within 1,000 ft of ROW (#)	Churches, Cemeteries, Schools within 1,000 ft (#)	Properties Requiring New Easements (#)	Residential Structures on Parcels Crossed by or Adjacent to an Existing Transmission Line ROW (#)	Residential Structures on Parcels Crossed by or Adjacent to a New Transmission Line ROW (#)	Commercial/Industrial Buildings on Parcels Crossed by or Adjacent to an Existing Transmission Line ROW (#)	Commercial/Industrial Buildings on Parcels Crossed by or Adjacent to an Existing Transmission Line ROW (#)	Conserved Lands Crossed by an Existing Transmission Line ROW (acres)	Conserved Lands Crossed by a New Transmission Line ROW (acres)
1	0.04	1	0	0	2	0	2	0	0	0
2	0.2	1	0	3	0	2	0	3	0	0
3	0.21	1	0	0	8	0	2	0	0	0
4	2.48	2	0	17	3	26	1	1	0.5	5.4
5	0.28	1	4	6	2	11	1	1	0	0
6	0.07	0	0	0	2	0	1	0	0	0
7	0.44	1	4	0	35	0	0	0	0	0
8	0.34	0	2	1	0	0	0	1	0	0
9	4.08	0	0	42	0	61	0	8	0	0
10	0.49	0	0	0	19	0	1	0	0	0
11	2.42	0	0	0	22	0	1	0	0	0
12	0.1	0	0	1	0	1	0	0	0	0.6
13	0.76	0	0	4	0	2	0	1	0	0
14	2.04	0	0	22	0	38	0	3	0	3.8
15	1.78	0	0	18	0	20	0	4	0	0.6
16	1.16	9	0	7	0	12	0	0	0	3.9
17	1.29	2	0	4	0	0	0	0	0	0.7
18	0.99	0	0	0	6	0	0	0	0	0
19	1.29	0	0	8	0	10	0	1	0	1.2
20	0.71	0	0	10	0	16	0	0	0	1.1
21	0.52	0	1	4	0	6	0	5	0	0
22	6.12	11	0	11	0	16	0	1	18.7	14.2
23	1.57	48	1	15	0	17	0	2	0	0.1
24	0.32	1	0	0	0	0	0	0	0	0
25	1.89	0	3	18	0	31	0	2	0	0
26	0.29	0	0	1	0	2	0	0	0	0
27	0.05	0	0	0	0	3	0	1	0	0
28	0.6	0	0	4	0	4	0	0	0	0
29	0.43	0	0	6	0	6	0	1	0	0
30	0.95	0	0	6	0	11	0	2	0	0.7
31	1.85	0	0	12	1	8	1	1	5.6	0
32	0.58	0	0	2	2	0	0	0	0	0
33	5.04	2	1	28	0	33	1	1	6.4	4
34	0.8	0	0	8	1	6	0	1	0	0
35	2.83	4	0	12	0	1	1	2	0	0
36	3.6	2	0	15	1	2	1	1	5.6	0
37	0.71	15	1	0	12	0	0	0	0	0
38	3.4	1	0	11	1	0	1	0	13.9	0
39	0.8	4	0	0	3	0	0	0	0	0
40	1.34	3	0	0	2	0	0	0	0	0
41	0.07	0	0	0	0	0	0	0	0	0
42	3.06	0	0	0	0	0	0	0	0	0
43	0.48	0	0	0	0	0	0	0	0	0.5
44	0.34	0	0	0	0	0	0	1	0	0
45	0.03	0	0	0	0	0	0	0	0	0
46	3.13	0	0	0	0	0	0	0	0	0
47	0.44	0	0	0	0	0	0	0	0	0

APPENDIX B
RAW SEGMENT METRIC DATA
NATURAL ENVIRONMENT

Segments	Segments Length (mi)	Riparian Zone Requiring Clearing (acres)	Stream Crossings (#)	Flood Hazard Area Crossed (acres)	PFO/PSS Wetlands Requiring Clearing (acres)	PEM Wetlands Requiring Disturbance (acres)	Coastal Zone Areas Crossed (acres)	Threatened/ Endangered Habitat Crossed (acres)
1	0.04	0	0	0	0	0	0	0
2	0.2	0	1	0.469	0	0	0	0.057
3	0.21	0	0	0.013	0.099	0	0.028	0.395
4	2.48	0.355	4	2.811	0.032	0.339	0.378	5.369
5	0.28	0	0	0	0	0	0	0
6	0.07	0	1	0.299	0	0	0	0.113
7	0.44	0	0	0	0	0	0	1.486
8	0.34	0	0	0	0.109	0	0	2.449
9	4.08	0.249	0	0.023	0.627	1.697	0	9.56
10	0.49	0	1	0.603	0	0.023	0	0.446
11	2.42	0.028	3	1.207	0.263	1.175	0.168	6.322
12	0.1	0	0	0	0	0.219	0	0.357
13	0.76	0.095	2	0.86	0	0.013	0.237	2.517
14	2.04	0	2	0	0.622	1.587	0	1.552
15	1.78	0.406	2	0.242	0.466	0.252	0	8.721
16	1.16	0.068	3	1.858	0	0.203	0.101	3.819
17	1.29	0.061	5	8.558	0.002	0.899	1.46	3.548
18	0.99	0.067	2	3.801	0	0.513	0.147	4.133
19	1.29	0	1	0	0.727	3.205	0	4.487
20	0.71	0	0	0	0	0.096	0	0.532
21	0.52	0	1	0.157	0.367	0.146	0	0
22	6.12	0	45	34.164	2.187	1.617	20.475	31.257
23	1.57	0	2	9.792	0.079	0.627	0.751	1.889
24	0.32	0	1	2.334	0.181	0.007	0.239	0.814
25	1.89	0	1	1.064	0.544	0.858	0	2.538
26	0.29	0	0	0	0.137	1.765	0	0.204
27	0.05	0	0	0	0	0.044	0	0
28	0.6	0	0	0	0.186	1.181	0	0.809
29	0.43	0	0	0	0	0.036	0	0.303
30	0.95	0	0	0	0.03	0.857	0	0
31	1.85	0.005	3	1.059	3.056	0.714	0	4.24
32	0.58	0	0	0	2.765	0.991	0	4.203
33	5.04	0	6	10.083	5.427	7.084	0.253	29.281
34	0.8	0	1	0	2.28	2.24	0	3.852
35	2.83	0.1	9	11.466	6.883	6.471	1.67	18.553
36	3.6	0	5	9.692	6.211	10.043	0.015	21.805
37	0.71	0.106	1	2.449	0.131	0.051	0	2.835
38	3.4	0	43	22.868	0.403	4.811	15.873	23.871
39	0.8	0	0	0.538	0	0.916	0	5.749
40	1.34	0	1	1.057	0.3	1.55	0.416	9.644
41	0.07	0	0	0.479	0	0.196	0.109	0.479
42	3.06	0	9	19.003	0	7.168	8.911	18.072
43	0.48	0	3	3.481	0	0	3.48	3.481
44	0.34	0	0	2.222	0	0.032	1.712	1.744
45	0.03	0	0	0.215	0	0.027	0.009	0.215
46	3.13	0	9	18.404	0.202	5.238	1.314	18.261
47	0.44	0	0	0.094	0	1.833	0.072	2.841

APPENDIX B
RAW SEGMENT METRIC DATA
ENGINEERING

Segments	Segments Length (mi)	Length Within or Parallel to an Existing Utility Corridor (Inverted) (miles)	Length of Parallel to a Roadway (Inverted) (miles)	Centerline Road Crossings (#)	Number of Turns Greater Than 60 Degrees (#)	Transmission Line Crossings (#)	Length of Underground (miles)	Length of Distribution Underbuild and Third Party Attachments (miles)
1	0.04	0	0	0	0	0	0	0
2	0.2	0	0.197	2	0	0	0	0.2
3	0.21	0.162	0.204	2	0	1	0	0.2
4	2.48	0.381	2.482	2	0	0	0	2.36
5	0.28	0.043	0.282	0	0	0	0	0.04
6	0.07	0.066	0.066	0	0	0	0	0.07
7	0.44	0.346	0.442	5	0	0	0	0.44
8	0.34	0	0	0	0	0	0	0
9	4.08	0	4.079	10	0	0	0	4.08
10	0.49	0	0.49	2	0	0	0	0.49
11	2.42	0	2.42	4	0	0	0	2.28
12	0.1	0	0.1	0	0	0	0	0.1
13	0.76	0	0	2	0	0	0	0
14	2.04	0	1.905	5	0	0	0	1.91
15	1.78	0	1.779	4	0	0	0	1.78
16	1.16	0	1.161	5	0	0	0	0.71
17	1.29	0	1.287	0	0	0	0	1.29
18	0.99	0	0.994	1	0	0	0	0.99
19	1.29	0	0.665	2	0	0	0	0.31
20	0.71	0	0.711	1	0	0	0	0.71
21	0.52	0	0.522	3	0	0	0	0
22	6.12	3.191	2.887	3	0	1	0	2.89
23	1.57	0	1.57	5	0	0	0	1.38
24	0.32	0	0.321	5	0	0	0	0.3
25	1.89	0	1.892	5	0	0	0	1.89
26	0.29	0	0	1	0	0	0	0
27	0.05	0	0.055	0	0	0	0	0.05
28	0.6	0	0.596	2	0	0	0	0.6
29	0.43	0	0.426	1	0	0	0	0.39
30	0.95	0	0.95	0	0	0	0	0.95
31	1.85	1.034	0.819	1	0	0	0	0.75
32	0.58	0.578	0	0	0	0	0	0
33	5.04	1.794	3.094	9	0	3	0	2.51
34	0.8	0.485	0	1	0	2	0	0
35	2.83	0	0	3	0	0	0	0
36	3.6	2.702	0	2	0	0	0	0
37	0.71	0	0.71	1	0	0	0	0.46
38	3.4	3.325	0	0	0	1	0	0
39	0.8	0	0.799	1	0	2	0	0.8
40	1.34	0	1.336	0	0	0	0	1.34
41	0.07	0	0.066	0	0	1	0	0.07
42	3.06	2.361	3.042	0	0	1	0	0.05
43	0.48	0	0	0	0	0	0	0
44	0.34	0	0	0	0	0	0	0
45	0.03	0.03	0	1	0	0	0	0
46	3.13	0	3.105	1	0	1	0	3.13
47	0.44	0	0	0	0	3	0	0

Appendix C Evaluation Output

APPENDIX C
EVALUATION OUTPUT

Rank	NRHP Properties	Normalized NRHP Properties	Residential Structures - Existing	Normalized Residential Structures - Existing	Residential Structures - New	Normalized Residential Structures - New	Commercial/ Industrial Buildings - Existing	Normalized Commercial/ Industrial Buildings - Existing	Commercial/ Industrial Buildings - New	Normalized Commercial/ Industrial Buildings - New	Conserved Lands Crossed - Existing	Normalized Conserved Lands Crossed - Existing	Conserved Lands Crossed - New	Normalized Conserved Lands Crossed - New	Properties Requiring New Easements	Normalized Properties Requiring New Easements	Churches, Cemeteries, Schools within 1,000 ft	Normalized Churches, Cemeteries, Schools within 1,000 ft	Riparian Zone Requiring Clearing	Normalized Riparian Zone Requiring Clearing	Stream Crossings	Normalized Stream Crossings
1	26	1.392405063	68	5.943396226	13	2.222222222	5	2	5	2.105263158	0	0	0	0	9	1.569767442	5	3.125	0.201	6.622734761	19	0.815217391
2	26	1.392405063	111	10	0	0	7	4	1	0	0	0	0	0	0	0	5	3.125	0.201	6.622734761	19	0.815217391
3	25	1.329113924	57	4.905660377	3	0.512820513	6	3	3	1.052631579	0	0	0.6	0.5	6	1.046511628	3	1.875	0.296	9.752883031	20	0.97826087
4	20	1.012658228	64	5.566037736	13	2.222222222	6	3	5	2.105263158	13.9	7.239583333	0.5	0.416666667	20	3.488372093	5	3.125	0.201	6.622734761	55	6.684782609
5	20	1.012658228	107	9.622641509	0	0	8	5	1	0	13.9	7.239583333	0.5	0.416666667	11	1.918604651	5	3.125	0.201	6.622734761	55	6.684782609
6	19	0.949367089	53	4.528301887	3	0.512820513	7	4	3	1.052631579	13.9	7.239583333	1.1	0.916666667	17	2.965116279	3	1.875	0.296	9.752883031	56	6.847826087
7	29	1.582278481	28	2.169811321	28	4.786324786	3	0	5	2.105263158	0.5	0.260416667	6.1	5.083333333	24	4.186046512	1	0.625	0.589	19.40691928	24	1.630434783
8	25	1.329113924	29	2.264150943	93	15.8974359	5	2	15	7.368421053	0	0	4.5	3.75	55	9.593023256	7	4.375	0.106	3.492586491	17	0.489130435
9	4	0	14	0.849056604	72	12.30769231	6	3	15	7.368421053	5.6	2.916666667	4.5	3.75	61	10.63953488	3	1.875	0	0	19	0.815217391
10	83	5	22	1.603773585	57	9.743589744	3	0	7	3.157894737	0.5	0.260416667	9.4	7.833333333	42	7.325581395	2	1.25	0.529	17.42998353	21	1.141304348
11	4	0	16	1.037735849	69	11.79487179	6	3	15	7.368421053	5.6	2.916666667	4.5	3.75	64	11.1627907	3	1.875	0	0	19	0.815217391
12	4	0	12	0.660377358	94	16.06837607	6	3	14	6.842105263	6.4	3.333333333	8.5	7.083333333	67	11.68604651	4	2.5	0	0	19	0.815217391
13	23	1.202531646	24	1.79245283	28	4.786324786	4	1	5	2.105263158	14.4	7.5	6.6	5.5	35	6.104651163	1	0.625	0.589	19.40691928	60	7.5
14	4	0	17	1.132075472	60	10.25641026	7	4	13	6.315789474	11.2	5.833333333	3.8	3.166666667	64	11.1627907	3	1.875	0.005	0.164744646	22	1.304347826
15	4	0	13	0.754716981	85	14.52991453	7	4	12	5.789473684	12	6.25	7.8	6.5	67	11.68604651	4	2.5	0.005	0.164744646	22	1.304347826
16	26	1.392405063	40	3.301886792	88	15.04273504	4	1	12	5.789473684	0	0	2.3	1.916666667	60	10.46511628	8	5	0.512	16.86985173	17	0.489130435
17	26	1.392405063	40	3.301886792	78	13.33333333	4	1	13	6.315789474	0	0	2.4	2	54	9.418604651	8	5	0.512	16.86985173	18	0.652173913
18	25	1.329113924	29	2.264150943	76	12.99145299	5	2	10	4.736842105	0	0	1.7	1.416666667	55	9.593023256	6	3.75	0.607	20	18	0.652173913
19	5	0.063291139	25	1.886792453	67	11.45299145	5	2	12	5.789473684	5.6	2.916666667	2.3	1.916666667	66	11.51162791	4	2.5	0.406	13.37726524	19	0.815217391
20	25	1.329113924	29	2.264150943	66	11.28205128	5	2	11	5.263157895	0	0	1.8	1.5	49	8.546511628	6	3.75	0.607	20	19	0.815217391
21	5	0.063291139	25	1.886792453	57	9.743589744	5	2	13	6.315789474	5.6	2.916666667	2.4	2	60	10.46511628	4	2.5	0.406	13.37726524	20	0.97826087
22	4	0	14	0.849056604	55	9.401709402	6	3	10	4.736842105	5.6	2.916666667	1.7	1.416666667	61	10.63953488	2	1.25	0.501	16.50741351	20	0.97826087
23	4	0	14	0.849056604	45	7.692307692	6	3	11	5.263157895	5.6	2.916666667	1.8	1.5	55	9.593023256	2	1.25	0.501	16.50741351	21	1.141304348
24	26	1.392405063	83	7.358490566	75	12.82051282	6	3	8	3.684210526	0	0	2.3	1.916666667	51	8.895348837	8	5	0.512	16.86985173	17	0.489130435
25	26	1.392405063	83	7.358490566	65	11.11111111	6	3	9	4.210526316	0	0	2.4	2	45	7.848837209	8	5	0.512	16.86985173	18	0.652173913
26	19	0.949367089	25	1.886792453	93	15.8974359	6	3	15	7.368421053	13.9	7.239583333	5	4.166666667	66	11.51162791	7	4.375	0.106	3.492586491	53	6.358695652
27	5	0.063291139	27	2.075471698	64	10.94017094	5	2	12	5.789473684	5.6	2.916666667	2.3	1.916666667	69	12.03488372	4	2.5	0.406	13.37726524	19	0.815217391
28	5	0.063291139	68	5.943396226	54	9.230769231	7	4	8	3.684210526	5.6	2.916666667	2.3	1.916666667	57	9.941860465	4	2.5	0.406	13.37726524	19	0.815217391
29	9	0.316455696	15	0.943396226	71	12.13675214	6	3	16	7.894736842	0	0	4.5	3.75	58	10.11627907	3	1.875	0.1	3.294892916	24	1.630434783
30	5	0.063291139	68	5.943396226	44	7.521367521	7	4	9	4.210526316	5.6	2.916666667	2.4	2	51	8.895348837	4	2.5	0.406	13.37726524	20	0.97826087
31	4	0	16	1.037735849	52	8.888888889	6	3	10	4.736842105	5.6	2.916666667	1.7	1.416666667	64	11.1627907	2	1.25	0.501	16.50741351	20	0.97826087
32	25	1.329113924	27	2.075471698	116	19.82905983	4	1	19	9.473684211	0	0	0.7	0.583333333	74	12.90697674	5	3.125	0.355	11.69686985	14	0
33	5	0.063291139	70	6.132075472	51	8.717948718	7	4	8	3.684210526	5.6	2.916666667	2.3	1.916666667	60	10.46511628	4	2.5	0.406	13.37726524	19	0.815217391
34	9	0.316455696	17	1.132075472	68	11.62393162	6	3	16	7.894736842	0	0	4.5	3.75	61	10.63953488	3	1.875	0.1	3.294892916	24	1.630434783
35	77	4.620253165	18	1.226415094	57	9.743589744	4	1	7	3.157894737	14.4	7.5	9.9	8.25	53	9.244186047	2	1.25	0.529	17.42998353	57	7.010869565
36	4	0	12	0.660377358	95	16.23931624	5	2	19	9.473684211	5.6	2.916666667	0.7	0.583333333	80	13.95348837	1	0.625	0.249	8.204283361	16	0.326086957
37	5	0.063291139	23	1.698113208	89	15.21367521	5	2	11	5.263157895	6.4	3.333333333	6.3	5.25	72	12.55813953	5	3.125	0.406	13.37726524	19	0.815217391
38	4	0	12	0.660377358	77	13.16239316	6	3	9	4.210526316	6.4	3.333333333	5.7	4.75	67	11.68604651	3	1.875	0.501	16.50741351	20	0.97826087
39	4	0	14	0.849056604	92	15.72649573	5	2	19	9.473684211	5.6	2.916666667	0.7	0.583333333	83	14.47674419	1	0.625	0.249	8.204283361	16	0.326086957
40	5	0.063291139	66	5.754716981	76	12.99145299	7	4	7	3.157894737	6.4	3.333333333	6.3	5.25	63	10.98837209	5	3.125	0.406	13.37726524	19	0.815217391
41	4	0	10	0.471698113	117	20	5	2	18	8.947368421	6.4	3.333333333	4.7	3.916666667	86	15	2	1.25	0.249	8.204283361	16	0.326086957
42	24	1.265822785	5	0	56	9.572649573	3	0	6	2.631578947	19.2	10	24	20	38	6.627906977	0	0	0.423	13.93739703	56	6.847826087
43	9	0.316455696	18	1.226415094	59	10.08547009	7	4	14	6.842105263	5.6	2.916666667	3.8	3.166666667	61	10.63953488	3	1.875	0.105	3.459637562	27	2.119565217
44	4	0	15	0.943396226	83	14.18803419	6	3	17	8.421052632	11.2	5.833333333	0	0	83	14.47674419	1	0.625	0.254	8.369028007	19	0.815217391
45	20	1.012658228	36	2.924528302	88	15.04273504	5	2	12	5.789473684	13.9	7.239583333	2.8	2.333333333	71	12.38372093	8	5	0.512	16.86985173	53	6.358695652
46	10	0.379746835	26	1.981132075	66	11.28205128	5	2	13	6.315789474	0	0	2.3	1.916666667	63	10.98837209	4	2.5	0.506	16.67215815	24	1.630434783
47	20	1.012658228	36	2.924528302	78	13.33333333	5	2	13	6.315789474	13.9	7.239583333	2.9	2.416666667	65	11.3372093	8	5	0.512	16.86985173	54	6.52173913
48	10	0.379746835	26	1.981132075	56	9.572649573	5	2	14	6.842105263	0	0	2.4	2	57	9.941860465	4	2.5	0.506	16.67215815	25	1.793478261
49	19	0.949367089	25	1.886792453	76	12.99145299	6	3	10	4.736842105	13.9	7.239583333	2.2	1.833333333	66	11.51162791	6	3.75	0.607	20	54	6.52173913
50	9	0.316455696	15	0.943396226	54	9.230769231	6	3	11	5.263157895	0	0	1.7	1.416666667	58	10.11627907	2	1.25	0.601	19.80230643	25	1.793478261
51	19	0.949367089	25	1.886792453	66	11.28205128	6	3	11	5.263157895	13.9	7.239583333	2.3	1.916666667	60	10.46511628	6	3.75	0.607	20	55	6.684782609
52	9	0.316455696	15	0.943396226	44	7.521367521	6	3	12	5.789473684	0	0	1.8	1.5	52	9.069767442	2	1.25	0.601	19.80230643	26	1.956521739
53	4	0	11	0.566037736	108	18.46153846	6	3	16	7.894736842	12	6.25	4	3.333333333	86	15	2	1.25	0.254	8.369028007	19	0.815217391
54	20	1.012658228	79	6.981132075	75	12.82051282	7	4	8	3.684210526	13.9	7.239583333	2.8	2.333333333	62	10.81395349	8	5	0.512	16.86985173	53	6.358695652
55	10	0.379746835	28	2.169811321	63	10.76923077	5	2	13	6.315789474	0	0	2.3	1.916666667	66	11.51162791	4	2.5	0.506	16.67215815	24	1.630434783
56	10	0.379746835	69	6.037735849	53	9.05982906	7	4	9	4.210526316	0	0	2.3	1.916666667	54	9.418604651	4	2.5	0.506	16.67215815	24	1.630434783
57	20	1.012658228	79	6.981132075	65	11.11111111	7	4	9	4.210526316	13.9	7.239583333	2.9	2.416666667	56	9.76744186	8	5	0.512	16.86985173	54	6.52173913
58	10	0.379746835	69	6.037735849	43	7.35042735	7	4	10	4.736842105	0	0	2.4	2	48	8.372093023	4	2.5	0.506	16.67215815	25	1.793478261
59	9	0.316455696	17	1.132075472	51	8.717948718	6	3	11	5.263157895	0	0	1.7	1.416666667	61	10.63953488	2	1.25	0.601	19.80230643	25	1.793478261
60	10	0.379746835	71	6.226415094	50	8.547008547	7	4	9	4.210526316	0	0	2.3	1.916666667	57	9.941860465	4	2.5	0.506	16.67215815	24	1.630434783
61	19	0.949367089	23	1.698113208	116	19.82905983	5	2	19	9.473684211	13.9	7.239583333	1.2	1	85	14.8255814	5	3.125	0.355	11.69686985	50	5.869565217
62	9	0.316455696	13	0.754716981	94	16.06837607	5	2	20	10	0	0	0.7	0.583333333	77	13.43023256	1	0.625	0.349	11.49917628	21	1.141304348
63	9	0.316455696	15	0.943396226	91	15.55555556	5	2	20	10	0	0	0.7	0.583333333	80	13.95348837	1	0.625	0.349	11.49917628	21	1.141304348
64	9	0.316455696	16	1.037735849	82	14.01709402	6	3	18	8.947368421	5.6	2.916666667	0	0	80	13.95348837	1	0.625	0.354	11.66392092	24	1.630434783

APPENDIX C
EVALUATION OUTPUT

Flood Hazard Area	Normalized Flood Hazard Area	PFO/PSS Wetlands Requiring Clearing	Normalized PFO/PSS Wetlands Requiring Clearing	PEM Wetlands Requiring Disturbance	Normalized PEM Wetlands Requiring Disturbance	Coastal Zone Areas Crossed	Normalized Coastal Zone Areas Crossed	Threatened/ Endangered Habitat Crossed	Normalized Threatened/ Endangered Habitat Crossed	Length Parallel to an Existing Utility Corridor (Inverted)	Normalized Length Parallel to an Existing Utility Corridor (Inverted)	Length Parallel to a Road (Inverted)	Normalized Length Parallel to a Road (Inverted)	Centerline Road Crossings	Normalized Centerline Road Crossings	Turns Greater Than 60 Degrees	Normalized Turns Greater Than 60 Degrees	Transmission Line Crossings	Normalized Transmission Line Crossings	Length of Underground	Normalized Length of Underground
33.872	1.813703369	1.077	0.538720539	11.561	4.054872771	4.186	0.833515165	53.54	5.671517489	0.073	20	10.72	5.980142566	18	3.5	0	0	7	8.571428571	0	0
33.715	1.754663057	1.176	0.662177329	11.561	4.054872771	4.214	0.857953306	55.477	6.520557552	0.604	17.86918138	10.953	5.624236253	23	6	0	0	8	10	0	0
33.972	1.851308664	1.285	0.798104502	11.77	4.145317639	4.451	1.064804713	58.868	8.006925572	0.258	19.2576244	10.121	6.895112016	18	3.5	0	0	8	10	0	0
39.434	3.905309868	0.978	0.415263749	6.612	1.913190237	21.619	16.04887628	43.703	1.359691418	3.368	6.777688604	5.414	14.08503055	15	2	0	0	1	0	0	0
39.277	3.846269555	1.077	0.538720539	6.612	1.913190237	21.647	16.07331442	45.64	2.208731481	3.899	4.646869984	5.647	13.72912424	20	4.5	0	0	2	1.428571429	0	0
39.534	3.942915162	1.186	0.674647712	6.821	2.003635105	21.884	16.28016583	49.031	3.6950995	3.553	6.035313002	4.815	15	15	2	0	0	2	1.428571429	0	0
43.431	5.408393502	0.848	0.253148772	11.601	4.072182794	5.856	2.291075715	55.689	6.613482949	0.411	18.64365971	11.297	5.098778004	14	1.5	0	0	7	8.571428571	0	0
29.325	0.103790614	2.771	2.651203392	14.523	5.336679938	3.899	0.58302422	50.438	4.311826072	0.258	19.2576244	12.527	3.219959267	26	7.5	0	0	8	10	0	0
31.575	0.949909747	10.243	11.96907345	25.189	9.952397438	3.259	0.024438141	54.719	6.188305426	3.445	6.468699839	7.469	10.94602851	18	3.5	0	0	8	10	0	0
40.388	4.26406438	0.744	0.12345679	11.012	3.817292712	4.862	1.423521711	52.902	5.391864645	0.411	18.64365971	11.426	4.901731161	18	3.5	0	0	7	8.571428571	0	0
31.575	0.949909747	12.685	15.01434094	23.226	9.102908084	3.259	0.024438141	58.212	7.719382835	4.023	4.149277689	7.244	11.28971487	16	2.5	0	0	8	10	0	0
31.272	0.835965704	6.856	7.745354782	16.813	6.327678726	3.379	0.129173031	56.939	7.161392128	2.022	12.17897271	10.272	6.664460285	21	5	0	0	8	10	0	0
48.993	7.5	0.749	0.129691982	6.652	1.93050026	23.289	17.50643683	45.852	2.301656877	3.706	5.421348315	5.991	13.20366599	11	0	0	0	1	0	0	0
32.634	1.348149819	15.711	18.78787879	23.047	9.025445733	3.259	0.024438141	62.149	9.445077584	5.057	0	6.687	12.14052953	16	2.5	0	0	8	10	0	0
32.331	1.234205776	9.882	11.51889263	16.634	6.250216375	3.379	0.129173031	60.876	8.887086876	3.056	8.029695024	9.715	7.515274949	21	5	0	0	8	10	0	0
30.17	0.421555355	2.01	1.702207258	12.523	4.471178813	3.871	0.558586079	56.042	6.768212501	0.073	20	12.439	3.354378819	25	7	0	0	7	8.571428571	0	0
30.17	0.421555355	2.551	2.376854969	14.451	5.305521897	3.871	0.558586079	59.188	8.147190322	0.073	20	11.797	4.33503055	24	6.5	0	0	7	8.571428571	0	0
30.27	0.45916065	2.218	1.961591221	12.294	4.372078934	4.136	0.789875627	60.656	8.790654861	0.258	19.2576244	11.64	4.574847251	25	7	0	0	8	10	0	0
32.42	1.267674489	9.482	11.02007732	23.189	9.086896313	3.231	0	60.323	8.644691856	3.26	7.211075441	7.381	11.08044807	17	3	0	0	7	8.571428571	0	0
30.27	0.45916065	2.759	2.636238933	14.222	5.206422018	4.136	0.789875627	63.802	10.16963268	0.258	19.2576244	10.998	5.555498982	24	6.5	0	0	8	10	0	0
32.42	1.267674489	10.023	11.69472503	25.117	9.921239398	3.231	0	63.469	10.02366968	3.26	7.211075441	6.739	12.0610998	16	2.5	0	0	7	8.571428571	0	0
32.52	1.305279783	9.69	11.27946128	22.96	8.987796434	3.496	0.231289548	64.937	10.66713422	3.445	6.468699839	6.582	12.3009165	17	3	0	0	8	10	0	0
32.52	1.305279783	10.231	11.95410899	24.888	9.822139519	3.496	0.231289548	68.083	12.04611204	3.445	6.468699839	5.94	13.28156823	16	2.5	0	0	8	10	0	0
30.013	0.362515042	2.109	1.825664048	12.523	4.471178813	3.899	0.58302422	57.979	7.617252564	0.604	17.86918138	12.672	2.998472505	30	9.5	0	0	8	10	0	0
30.013	0.362515042	2.65	2.50031176	14.451	5.305521897	3.899	0.58302422	61.125	8.996230385	0.604	17.86918138	12.03	3.979124236	29	9	0	0	8	10	0	0
34.887	2.195397112	2.672	2.527746602	9.574	3.194997403	21.332	15.79838534	40.601	0	3.553	6.035313002	7.221	11.32484725	23	6	0	0	2	1.428571429	0	0
32.42	1.267674489	11.924	14.06534481	21.226	8.237406959	3.231	0	63.816	10.17576926	3.838	4.891653291	7.156	11.42413442	15	2	0	0	7	8.571428571	0	0
32.263	1.208634176	9.581	11.14353411	23.189	9.086896313	3.259	0.024438141	62.26	9.493731919	3.791	5.080256822	7.614	10.72454175	22	5.5	0	0	8	10	0	0
34.406	2.014515644	11.215	13.18119466	23.167	9.077375801	5.33	1.831987781	61.111	8.990093802	0.743	17.31139647	8.805	8.905295316	19	4	0	0	8	10	0	0
32.263	1.208634176	10.122	11.81818182	25.117	9.921239398	3.259	0.024438141	65.406	10.87270974	3.791	5.080256822	6.972	11.70519348	21	5	0	0	8	10	0	0
32.52	1.305279783	12.132	14.32472877	20.997	8.13830708	3.496	0.231289548	68.43	12.19821162	4.023	4.149277689	6.357	12.64460285	15	2	0	0	8	10	0	0
29.049	0	2.667	2.52151141	14.633	5.3842825	3.899	0.58302422	55.884	6.698956781	0.192	19.52247191	14.635	0	31	10	0	0	8	10	0	0
32.263	1.208634176	12.023	14.1888016	21.226	8.237406959	3.259	0.024438141	65.753	11.02480933	4.369	2.760834671	7.389	11.06822811	20	4.5	0	0	8	10	0	0
34.406	2.014515644	13.657	16.22646215	21.204	8.227886446	5.33	1.831987781	64.604	10.52117121	1.321	14.99197432	8.58	9.24898167	17	3	0	0	8	10	0	0
45.95	6.355670878	0.645	0	6.063	1.675610178	22.295	16.63888283	43.065	1.080038573	3.706	5.421348315	6.12	13.00661914	15	2	0	0	1	0	0	0
31.299	0.846119134	10.139	11.83938147	25.299	10	3.259	0.024438141	60.165	8.575436136	3.379	6.733547352	9.577	7.726069246	23	6	0	0	8	10	0	0
32.117	1.153730445	6.095	6.796358648	14.813	5.462177601	3.351	0.10473489	62.543	9.617778557	1.837	12.92134831	10.184	6.798879837	20	4.5	0	0	7	8.571428571	0	0
32.217	1.19133574	6.303	7.055742611	14.584	5.363077722	3.616	0.336024438	67.157	11.64022092	2.022	12.17897271	9.385	8.019348269	20	4.5	0	0	8	10	0	0
31.299	0.846119134	12.581	14.88464896	23.336	9.150510646	3.259	0.024438141	63.658	10.10651354	3.957	4.414125201	9.352	8.069755601	21	5	0	0	8	10	0	0
31.96	1.094690132	6.194	6.919815438	14.813	5.462177601	3.379	0.129173031	64.48	10.46681862	2.368	10.7905297	10.417	6.442973523	25	7	0	0	8	10	0	0
30.996	0.73217509	6.752	7.615662801	16.923	6.375281288	3.379	0.129173031	62.385	9.548522837	1.956	12.44382022	12.38	3.444501018	26	7.5	0	0	8	10	0	0
45.005	6.000300842	2.219	1.962838259	2.191	0	26.146	20	45.727	2.246865959	3.572	5.959069021	6.727	12.07942974	12	0.5	0	0	1	0	0	0
35.465	2.412755716	16.683	20	21.025	8.150424096	5.33	1.831987781	68.541	12.24686596	2.355	10.84269663	8.023	10.09979633	17	3	0	0	8	10	0	0
32.358	1.244359206	15.607	18.65818681	23.157	9.073048295	3.259	0.024438141	67.595	11.83220829	4.991	0.264847512	8.795	8.920570265	21	5	0	0	8	10	0	0
35.732	2.513161853	1.911	1.578750468	7.574	2.329496278	21.304	15.7739472	46.205	2.456386429	3.368	6.777688604	7.133	11.4592668	22	5.5	0	0	1	0	0	0
35.251	2.332280385	10.454	12.23219853	21.167	8.211874675	5.302	1.80754964	66.715	11.44648023	0.558	18.05377207	8.717	9.039714868	18	3.5	0	0	7	8.571428571	0	0
35.732	2.513161853	2.452	2.253398179	9.502	3.163839363	21.304	15.7739472	49.351	3.83536425	3.368	6.777688604	6.491	12.43991853	21	5	0	0	1	0	0	0
35.251	2.332280385	10.995	12.90684624	23.095	9.04621776	5.302	1.80754964	69.861	12.82545805	0.558	18.05377207	8.075	10.0203666	17	3	0	0	7	8.571428571	0	0
35.832	2.550767148	2.119	1.838134431	7.345	2.2303964	21.569	16.00523674	50.819	4.478828789	3.553	6.035313002	6.334	12.67973523	22	5.5	0	0	2	1.428571429	0	0
35.351	2.36988568	10.662	12.49158249	20.938	8.112774797	5.567	2.038839188	71.329	13.46892259	0.743	17.31139647	7.918	10.2601833	18	3.5	0	0	8	10	0	0
35.832	2.550767148	2.66	2.512782142	9.273	3.064739484	21.569	16.00523674	53.965	5.85780661	3.553	6.035313002	5.692	13.66038697	21	5	0	0	2	1.428571429	0	0
35.351	2.36988568	11.203	13.1662302	22.866	8.947117881	5.567	2.038839188	74.475	14.84790041	0.743	17.31139647	7.276	11.24083503	17	3	0	0	8	10	0	0
32.055	1.130415162	9.778	11.38920065	16.744	6.297818937	3.379	0.129173031	66.322	11.27421759	2.99	8.294542536	11.823	4.295315682	26	7.5	0	0	8	10	0	0
35.575	2.45412154	2.01	1.702207258	7.574	2.329496278	21.332	15.79838534	48.142	3.305426493	3.899	4.646869984	7.366	11.10336049	27	8	0	0	2	1.428571429	0	0
35.251	2.332280385	12.896	15.27746602	19.204	7.362385321	5.302	1.80754964	70.208	12.97755764	1.136	15.73434992	8.492	9.383401222	16	2.5	0	0	7	8.571428571	0	0
35.094	2.273240072	10.553	12.35565532	21.167	8.211874675	5.33	1.831987781	68.652	12.29552029	1.089	15.92295345	8.95	8.683808554	23	6	0	0	8	10	0	0
35.575	2.45412154	2.551	2.376854969	9.502	3.163839363	21.332	15.79838534	51.288	4.684404313	3.899	4.646869984	6.724	12.08401222	26	7.5	0	0	2	1.428571429	0	0
35.094	2.273240072	11.094	13.03030303	23.095	9.04621776	5.33	1.831987781	71.798	13.67449812	1.089	15.92295345	8.308	9.664460285	22	5.5	0	0	8	10	0	0
35.351	2.36988568	13.104	15.53684998	18.975	7.263285442	5.567	2.038839188	74.822	15	1.321	14.99197432	7.693	10.60386965	16	2.5	0	0	8	10	0	0
35.094	2.273240072	12.995	15.40092281	19.204	7.362385321	5.33	1.831987781	72.145	13.8265977	1.667	13.6035313	8.725	9.027494908	21	5	0	0	8	10	0	0
34.611	2.091606498	2.568	2.39805462	9.684	3.242599965	21.332	15.79838534	46.047	2.387130709	3.487	6.300160514	9.329	8.104887984	28	8.5	0	0	2	1.428571429	0	0
34.13	1.91072503	11.111	13.05150268	23.277	9.124978362	5.33	1.831987781	66.557	11.37722451	0.677	17.57624398	10.913	5.685336049	24	6.5	0	0	8	10	0	0
34.13	1.91072503	13.553	16.09677017	21.314	8.275489008	5.33	1.831987781	70.05	12.90830192	1.255	15.25682183	10.688	6.029022403	22	5.5	0	0	8	10	0	0
35.189	2.308965102	16.579	19.87030802	21.135	8.198026657	5.33	1.831987781	73.987	14.63399667	2.289	11.10754414	10.131	6.879837067	22	5.5	0	0	8	10	0	0

APPENDIX C
EVALUATION OUTPUT

Length of Distribution Underbuild	Normalized Length of Distribution Underbuild	Segments Length (mi)	Normalized Segments Length (mi)	Total Built	Total Environment	Total Engineering	Grand Total	Route Name
10.1	9.028511088	11.6	1.464339909	18.35805411	20.35028149	48.54442213	25.19221867	A44,A47,A46,A45,A41,A40,A39,A37,A24,A18,A11,A10,A5,A2,A1
10.57	9.772967265	11.84	1.646433991	18.51740506	21.28817617	50.91281889	26.10479627	A44,A47,A46,A45,A41,A40,A39,A37,A24,A18,A11,A10,A7,A6,A3,A1
9.74	8.458289335	12.11	1.851289833	14.22173802	26.59760499	49.96231558	26.32020032	A44,A47,A46,A45,A41,A40,A39,A37,A24,A18,A11,A12,A13,A8,A6,A3,A1
4.76	0.570221753	9.67	0	28.17580344	36.94984892	23.43294091	30.73684913	A44,A43,A38,A37,A24,A18,A11,A10,A5,A2,A1
5.23	1.31467793	9.91	0.182094082	28.33515439	37.8877436	25.80133766	31.64942673	A44,A43,A38,A37,A24,A18,A11,A10,A7,A6,A3,A1
4.4	0	10.18	0.386949924	24.03948735	43.19717243	24.85083435	31.86483078	A44,A43,A38,A37,A24,A18,A11,A12,A13,A8,A6,A3,A1
10.94	10.35902851	12.18	1.904400607	20.79847426	39.67563779	46.0772954	33.4051039	A44,A47,A46,A45,A41,A40,A39,A37,A24,A18,A17,A4,A2,A1
11.77	11.67370644	13.89	3.201820941	46.57714507	16.96824116	54.85311105	36.3887767	A44,A47,A46,A45,A41,A40,A39,A37,A24,A25,A27,A28,A30,A21,A14,A8,A6,A3,A1
6.98	4.086589229	13.52	2.921092564	42.70637151	29.89934159	37.92241015	36.62676727	A44,A47,A46,A45,A41,A36,A34,A26,A27,A28,A30,A21,A14,A8,A6,A3,A1
10.45	9.582893347	12.31	2.003034901	36.17458946	33.59148811	47.20274769	37.34698057	A44,A47,A46,A45,A41,A40,A39,A37,A23,A16,A4,A2,A1
6.72	3.674762408	13.59	2.974203338	42.90548606	33.62619714	34.5879583	37.53026494	A44,A47,A46,A45,A41,A36,A34,A32,A29,A30,A21,A14,A8,A6,A3,A1
9.16	7.539598733	13.55	2.943854325	51.17357187	23.01478176	44.32688606	38.54071866	A44,A47,A46,A33,A29,A30,A21,A14,A8,A6,A3,A1
5.6	1.900739176	10.25	0.440060698	30.61622358	56.27520523	20.96581418	38.94973436	A44,A43,A38,A37,A24,A18,A17,A4,A2,A1
6.13	2.740232313	14.06	3.330804249	43.7420659	40.10008254	30.71156609	39.67917259	A44,A47,A46,A45,A41,A36,A34,A32,A31,A21,A14,A8,A6,A3,A1
8.57	6.605068638	14.02	3.300455235	52.01015171	29.48866716	40.45049385	40.68962632	A44,A47,A46,A33,A31,A21,A14,A8,A6,A3,A1
11.96	11.97465681	13.32	2.769347496	43.90828353	31.28072217	53.6698117	40.80956462	A44,A47,A46,A45,A41,A40,A39,A37,A24,A25,A27,A28,A20,A15,A12,A10,A5,A2,A1
10.96	10.3907075	13.3	2.754172989	41.76201931	34.33173427	52.55133961	40.94776935	A44,A47,A46,A45,A41,A40,A39,A37,A24,A25,A27,A19,A15,A12,A10,A5,A2,A1
11.4	11.0876452	13.63	3.004552352	38.08124989	37.02553521	54.9246692	41.02764788	A44,A47,A46,A45,A41,A40,A39,A37,A24,A25,A27,A28,A20,A15,A13,A8,A6,A3,A1
7.17	4.387539599	12.95	2.48861912	40.03750997	44.2118226	36.7391108	41.04755519	A44,A47,A46,A45,A41,A36,A34,A26,A27,A28,A20,A15,A12,A10,A5,A2,A1
10.4	9.503695882	13.61	2.989377845	35.93498567	40.0765473	53.80619711	41.16585261	A44,A47,A46,A45,A41,A40,A39,A37,A24,A25,A27,A19,A15,A13,A8,A6,A3,A1
6.17	2.803590285	12.93	2.473444613	37.89124576	47.2628347	35.62063871	41.18575992	A44,A47,A46,A45,A41,A36,A34,A26,A27,A19,A15,A12,A10,A5,A2,A1
6.61	3.500527983	13.26	2.723823976	34.21047633	49.95663564	37.9939683	41.26563845	A44,A47,A46,A45,A41,A36,A34,A26,A27,A28,A20,A15,A13,A8,A6,A3,A1
5.61	1.916578669	13.24	2.708649469	32.06421211	53.00764774	36.87549621	41.40384318	A44,A47,A46,A45,A41,A36,A34,A26,A27,A19,A15,A13,A8,A6,A3,A1
12.43	12.71911299	13.56	2.951441578	44.06763448	32.21861685	56.03820845	41.72214222	A44,A47,A46,A45,A41,A40,A39,A37,A24,A25,A27,A28,A20,A15,A12,A10,A7,A6,A3,A1
11.43	11.13516367	13.54	2.936267071	41.92137027	35.26962895	54.91973636	41.86034696	A44,A47,A46,A45,A41,A40,A39,A37,A24,A25,A27,A19,A15,A12,A10,A7,A6,A3,A1
6.43	3.215417107	11.96	1.737481032	56.3948944	33.5678086	29.74162982	41.93340716	A44,A43,A38,A37,A24,A25,A27,A28,A30,A21,A14,A8,A6,A3,A1
6.91	3.975712777	13.02	2.541729894	40.23662452	47.93867815	33.40465895	41.95105286	A44,A47,A46,A45,A41,A36,A34,A32,A29,A20,A15,A12,A10,A5,A2,A1
7.64	5.131995776	13.19	2.670713202	40.19686092	45.14971729	39.10750755	41.96013279	A44,A47,A46,A45,A41,A36,A34,A26,A27,A28,A20,A15,A12,A10,A7,A6,A3,A1
8.32	6.209081309	14.09	3.353566009	40.03261997	40.02049539	49.7793391	41.97711396	A44,A47,A46,A45,A41,A40,A35,A34,A26,A27,A28,A30,A21,A14,A8,A6,A3,A1
6.64	3.548046463	13.17	2.655538695	38.05059671	48.20072938	37.98903546	42.09833753	A44,A47,A46,A45,A41,A36,A34,A26,A27,A19,A15,A12,A10,A7,A6,A3,A1
6.35	3.088701162	13.33	2.77693475	34.40959087	53.68349118	34.65951645	42.16913611	A44,A47,A46,A45,A41,A36,A34,A32,A29,A20,A15,A13,A8,A6,A3,A1
13.87	15	15.52	4.438543247	50.32263974	26.88464476	58.96101516	42.67511683	A44,A47,A46,A45,A41,A40,A39,A37,A24,A25,A27,A28,A30,A21,A9,A3,A1
7.38	4.720168955	13.26	2.723823976	40.39597547	48.87657283	35.77305571	42.86363046	A44,A47,A46,A45,A41,A36,A34,A32,A29,A20,A15,A12,A10,A7,A6,A3,A1
8.06	5.797254488	14.16	3.406676783	40.23173452	43.74735093	46.44488726	42.88061163	A44,A47,A46,A45,A41,A40,A35,A34,A32,A29,A30,A21,A14,A8,A6,A3,A1
5.11	1.124604013	10.38	0.538694992	45.99233879	50.19105555	22.09126646	42.89161103	A44,A43,A38,A37,A23,A16,A4,A2,A1
9.08	7.412882788	15.15	4.157814871	46.45186618	39.8157452	42.03031426	42.9131074	A44,A47,A46,A45,A41,A36,A34,A26,A27,A28,A30,A21,A9,A3,A1
9.35	7.840549102	12.98	2.51138088	48.50471032	37.32726277	43.14358671	42.96150658	A44,A47,A46,A33,A29,A20,A15,A12,A10,A5,A2,A1
8.79	6.953537487	13.29	2.746585736	42.67767668	43.07207581	44.3984442	43.17958984	A44,A47,A46,A33,A29,A20,A15,A13,A8,A6,A3,A1
8.82	7.001055966	15.22	4.210925645	46.65098073	43.54260074	38.69586241	43.81660507	A44,A47,A46,A45,A41,A36,A34,A32,A29,A30,A21,A9,A3,A1
9.82	8.58500528	13.22	2.693474962	48.66406128	38.26515745	45.51198346	43.87408418	A44,A47,A46,A33,A29,A20,A15,A12,A10,A7,A6,A3,A1
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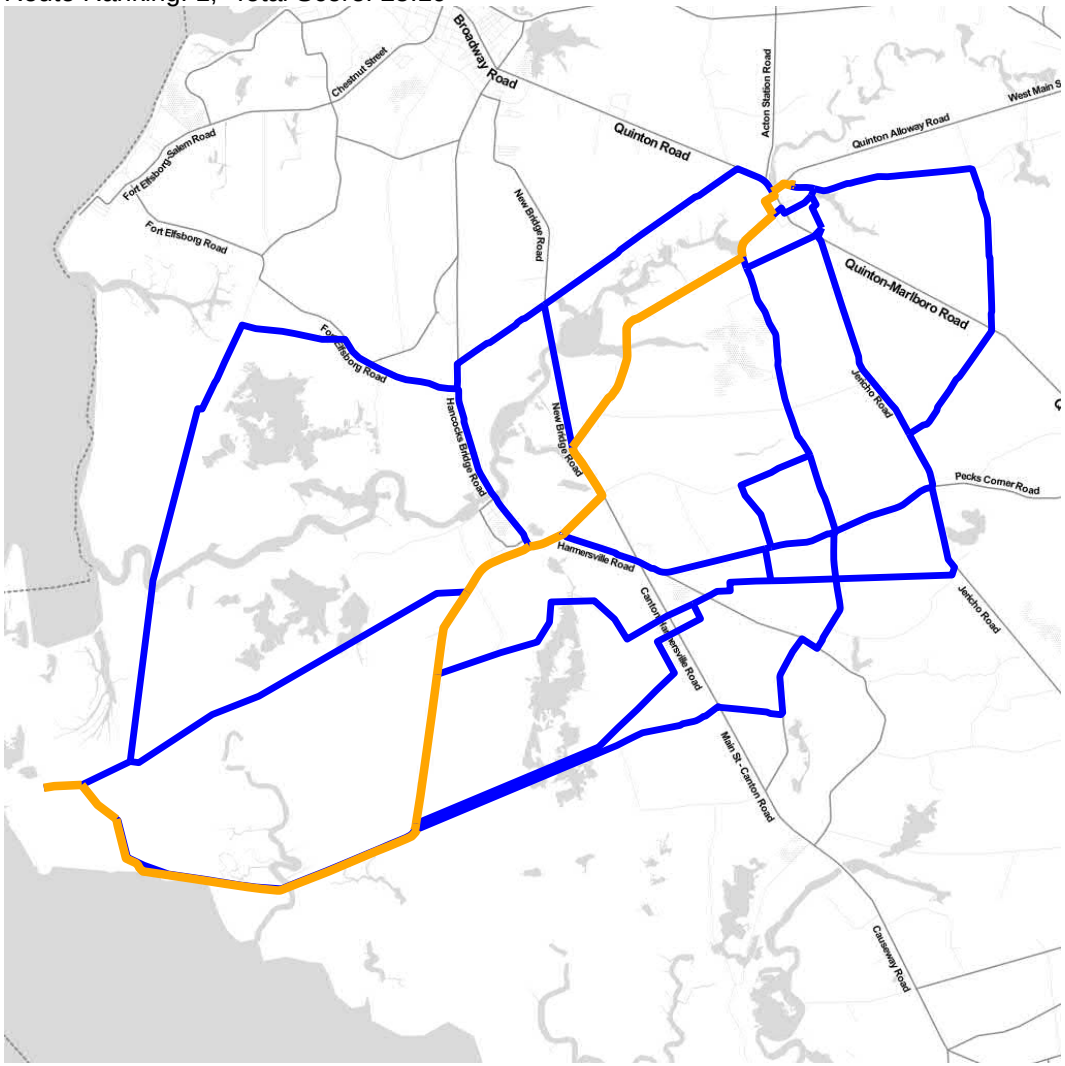
6.16	2.787750792	10.82	0.872534143	50.09795828	50.99522818	22.19878369	44.87703132	A44,A43,A22,A16,A4,A2,A1
7.47	4.862724393	14.63	3.763277693	41.06831436	50.22123633	42.56849505	45.02951928	A44,A47,A46,A45,A41,A40,A35,A34,A32,A31,A21,A14,A8,A6,A3,A1
8.23	6.066525871	15.69	4.567526555	47.48756057	50.01648614	34.8194702	45.96551272	A44,A47,A46,A45,A41,A36,A34,A32,A31,A21,A9,A3,A1
6.62	3.516367476	11.39	1.305007587	53.72603285	47.88028961	28.55833047	46.35419508	A44,A43,A38,A37,A24,A25,A27,A28,A20,A15,A12,A10,A5,A2,A1
8.51	6.510031679	13.52	2.921092564	37.36375843	54.3329764	48.59603975	46.39790188	A44,A47,A46,A45,A41,A40,A35,A34,A26,A27,A28,A20,A15,A12,A10,A5,A2,A1
5.62	1.932418163	11.37	1.28983308	51.57976864	50.9313017	27.43985838	46.49239981	A44,A43,A38,A37,A24,A25,A27,A19,A15,A12,A10,A5,A2,A1
7.51	4.926082365	13.5	2.905918058	35.21749421	57.38398849	47.47756766	46.53610661	A44,A47,A46,A45,A41,A40,A35,A34,A26,A27,A19,A15,A12,A10,A5,A2,A1
6.06	2.629355861	11.7	1.540212443	47.89899921	53.62510264	29.81318797	46.57227834	A44,A43,A38,A37,A24,A25,A27,A28,A20,A15,A13,A8,A6,A3,A1
7.95	5.623020063	13.83	3.15629742	31.53672478	60.07778943	49.85089725	46.61598514	A44,A47,A46,A45,A41,A40,A35,A34,A26,A27,A28,A20,A15,A13,A8,A6,A3,A1
5.06	1.045406547	11.68	1.525037936	45.752735	56.67611474	28.69471588	46.71048307	A44,A43,A38,A37,A24,A25,A27,A19,A15,A13,A8,A6,A3,A1
6.95	4.03907075	13.81	3.141122914	29.39046057	63.12880153	48.73242516	46.75418987	A44,A47,A46,A45,A41,A40,A35,A34,A26,A27,A19,A15,A13,A8,A6,A3,A1
10.67	9.931362196	15.65	4.537177542	55.75564637	39.40507076	44.55839796	46.97596645	A44,A47,A46,A33,A31,A21,A9,A3,A1
7.09	4.260823654	11.63	1.487101669	53.88538381	48.81818429	30.92672722	47.26677268	A44,A43,A38,A37,A24,A25,A27,A28,A20,A15,A12,A10,A7,A6,A3,A1
8.25	6.098204857	13.59	2.974203338	37.56287297	58.05983194	45.26158791	47.30139955	A44,A47,A46,A45,A41,A40,A35,A34,A32,A29,A20,A15,A12,A10,A5,A2,A1
8.98	7.254487856	13.76	3.103186646	37.52310938	55.27087108	50.96443651	47.31047948	A44,A47,A46,A45,A41,A40,A35,A34,A26,A27,A28,A20,A15,A12,A10,A7,A6,A3,A1
6.09	2.67687434	11.61	1.471927162	51.73911959	51.86919638	29.80825513	47.40497742	A44,A43,A38,A37,A24,A25,A27,A19,A15,A12,A10,A7,A6,A3,A1
7.98	5.670538543	13.74	3.08801214	35.37684516	58.32188317	49.84596442	47.44868422	A44,A47,A46,A45,A41,A40,A35,A34,A26,A27,A19,A15,A12,A10,A7,A6,A3,A1
7.69	5.211193242	13.9	3.209408194	31.73583933	63.80464498	46.51644541	47.5194828	A44,A47,A46,A45,A41,A40,A35,A34,A32,A29,A20,A15,A13,A8,A6,A3,A1
8.72	6.842661035	13.83	3.15629742	37.72222392	58.99772662	47.62998466	48.21397715	A44,A47,A46,A45,A41,A40,A35,A34,A32,A29,A20,A15,A12,A10,A7,A6,A3,A1
8.53	6.541710665	13.59	2.974203338	60.14038906	43.4842122	33.84953393	48.21974729	A44,A43,A38,A37,A24,A25,A27,A28,A30,A21,A9,A3,A1
10.42	9.535374868	15.72	4.590288316	43.77811464	49.93689899	53.88724321	48.26345409	A44,A47,A46,A45,A41,A40,A35,A34,A26,A27,A28,A30,A21,A9,A3,A1
10.16	9.123548046	15.79	4.64339909	43.97722918	53.66375453	50.55279137	49.16695176	A44,A47,A46,A45,A41,A40,A35,A34,A32,A29,A30,A21,A9,A3,A1
9.57	8.189017951	16.26	5	44.81380902	60.13763993	46.67639916	51.31585941	A44,A47,A46,A45,A41,A40,A35,A34,A32,A31,A21,A9,A3,A1

Appendix D Illustrated Summary of Top Six Alternative Routes

Quinton − Windport 69 kV Routing Study

Route Name: A44,A47,A46,A45,A41,A40,A39,A37,A24,A18,A11,A10,A5,A2,A1
Route Ranking: 1, Total Score: 25.19



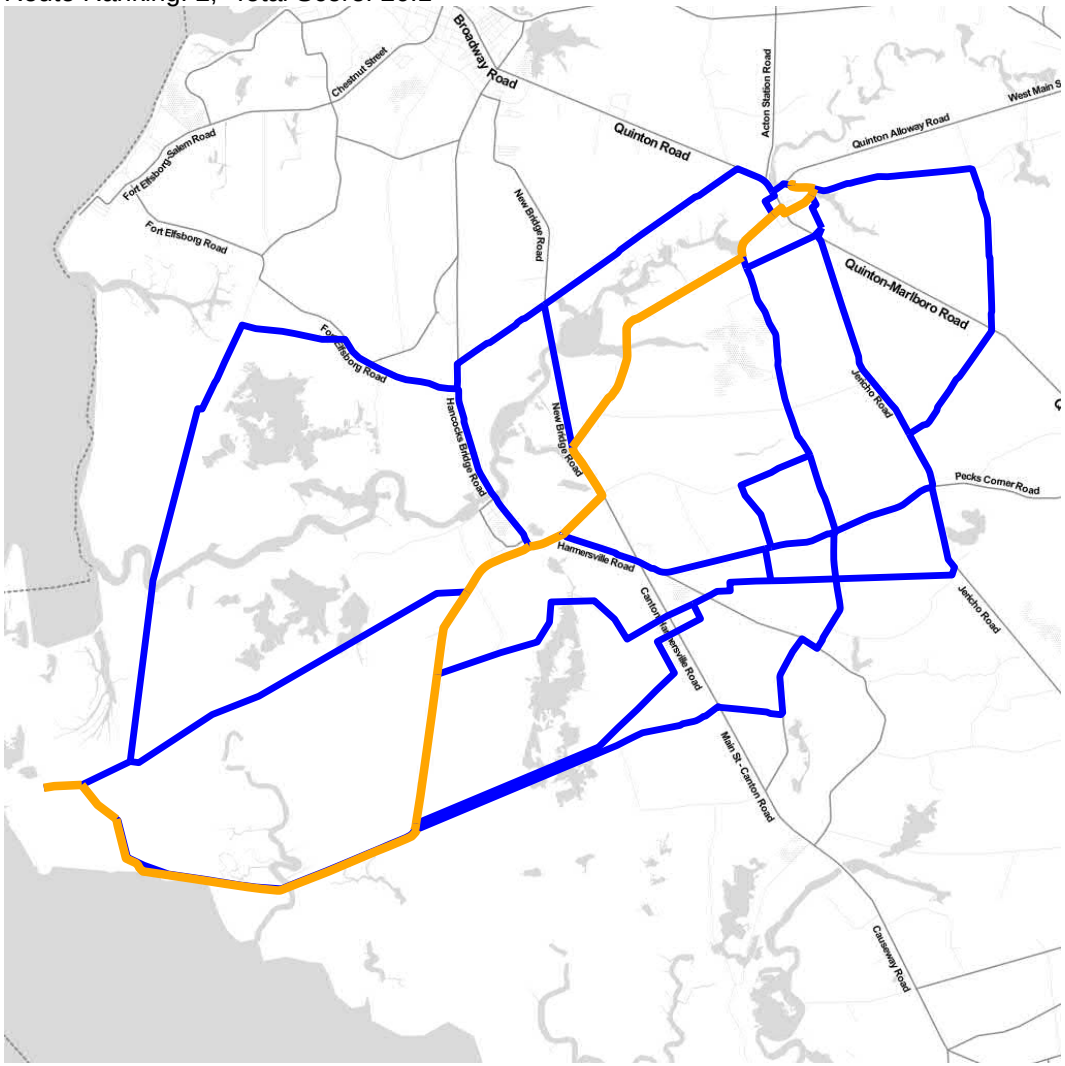
Built Criteria	Value	Scores
NRHP Properties	26.00	1.39
Residential Structures − Existing	68.00	5.94
Residential Structures − New	13.00	2.22
Commercial/Industrial Buildings − Existing	5.00	2.00
Commercial/Industrial Buildings − New	5.00	2.11
Conserved Lands Crossed − Existing	0.00	0.00
Conserved Lands Crossed − New	0.00	0.00
Properties Requiring New Easements	9.00	1.57
Churches, Cemeteries, Schools within 1,000 ft	5.00	3.12
Total Built	NA	18.36

Env. Criteria	Value	Scores
Riparian Zone Requiring Clearing	0.20	6.62
Stream Crossings	19.00	0.82
Flood Hazard Area	33.87	1.81
PFO/PSS Wetlands Requiring Clearing	1.08	0.54
PEM Wetlands Requiring Disturbance	11.56	4.05
Coastal Zone Areas Crossed	4.19	0.83
Threatened/Endangered Habitat Crossed	53.54	5.67
Total Environment	NA	20.35

Eng. Criteria	Value	Scores
Length Parallel to an Existing Utility Corridor (Inverted)	0.07	20.00
Length Parallel to a Road (Inverted)	10.72	5.98
Centerline Road Crossings	18.00	3.50
Turns Greater Than 60 Degrees	0.00	0.00
Transmission Line Crossings	7.00	8.57
Length of Underground	0.00	0.00
Length of Distribution Underbuild	10.10	9.03
Segments Length (mi)	11.60	1.46
Total Engineering	NA	48.54

Quinton − Windport 69 kV Routing Study

Route Name: A44,A47,A46,A45,A41,A40,A39,A37,A24,A18,A11,A10,A7,A6,A3,A1
Route Ranking: 2, Total Score: 26.1



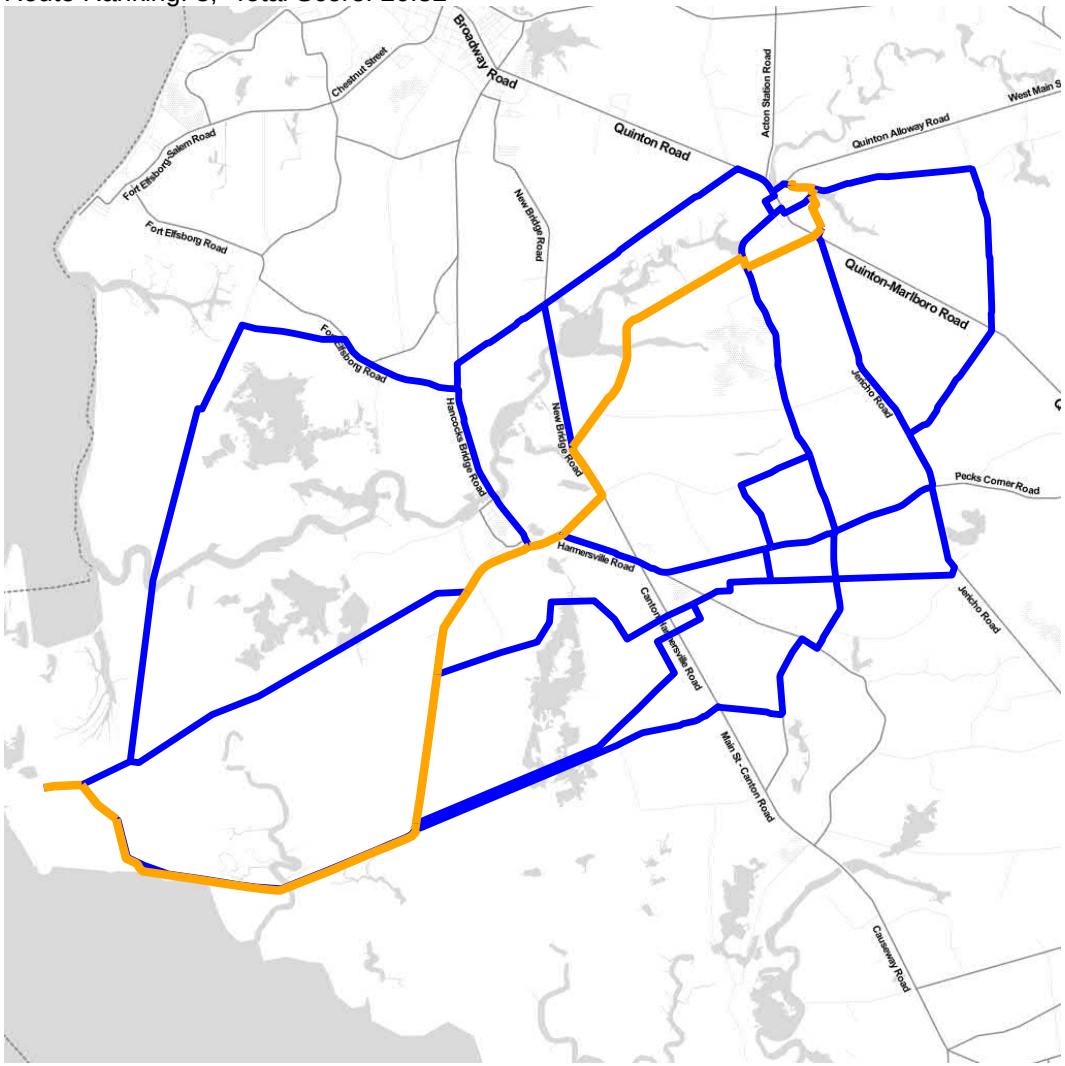
Built Criteria	Value	Scores
NRHP Properties	26.00	1.39
Residential Structures − Existing	111.00	10.00
Residential Structures − New	0.00	0.00
Commercial/Industrial Buildings − Existing	7.00	4.00
Commercial/Industrial Buildings − New	1.00	0.00
Conserved Lands Crossed − Existing	0.00	0.00
Conserved Lands Crossed − New	0.00	0.00
Properties Requiring New Easements	0.00	0.00
Churches, Cemeteries, Schools within 1,000 ft	5.00	3.12
Total Built	NA	18.52

Env. Criteria	Value	Scores
Riparian Zone Requiring Clearing	0.20	6.62
Stream Crossings	19.00	0.82
Flood Hazard Area	33.72	1.75
PFO/PSS Wetlands Requiring Clearing	1.18	0.66
PEM Wetlands Requiring Disturbance	11.56	4.05
Coastal Zone Areas Crossed	4.21	0.86
Threatened/Endangered Habitat Crossed	55.48	6.52
Total Environment	NA	21.29

Eng. Criteria	Value	Scores
Length Parallel to an Existing Utility Corridor (Inverted)	0.60	17.87
Length Parallel to a Road (Inverted)	10.95	5.62
Centerline Road Crossings	23.00	6.00
Turns Greater Than 60 Degrees	0.00	0.00
Transmission Line Crossings	8.00	10.00
Length of Underground	0.00	0.00
Length of Distribution Underbuild	10.57	9.77
Segments Length (mi)	11.84	1.65
Total Engineering	NA	50.91

Quinton − Windport 69 kV Routing Study

Route Name: A44,A47,A46,A45,A41,A40,A39,A37,A24,A18,A11,A12,A13,A8,A6,A3,A1
Route Ranking: 3, Total Score: 26.32



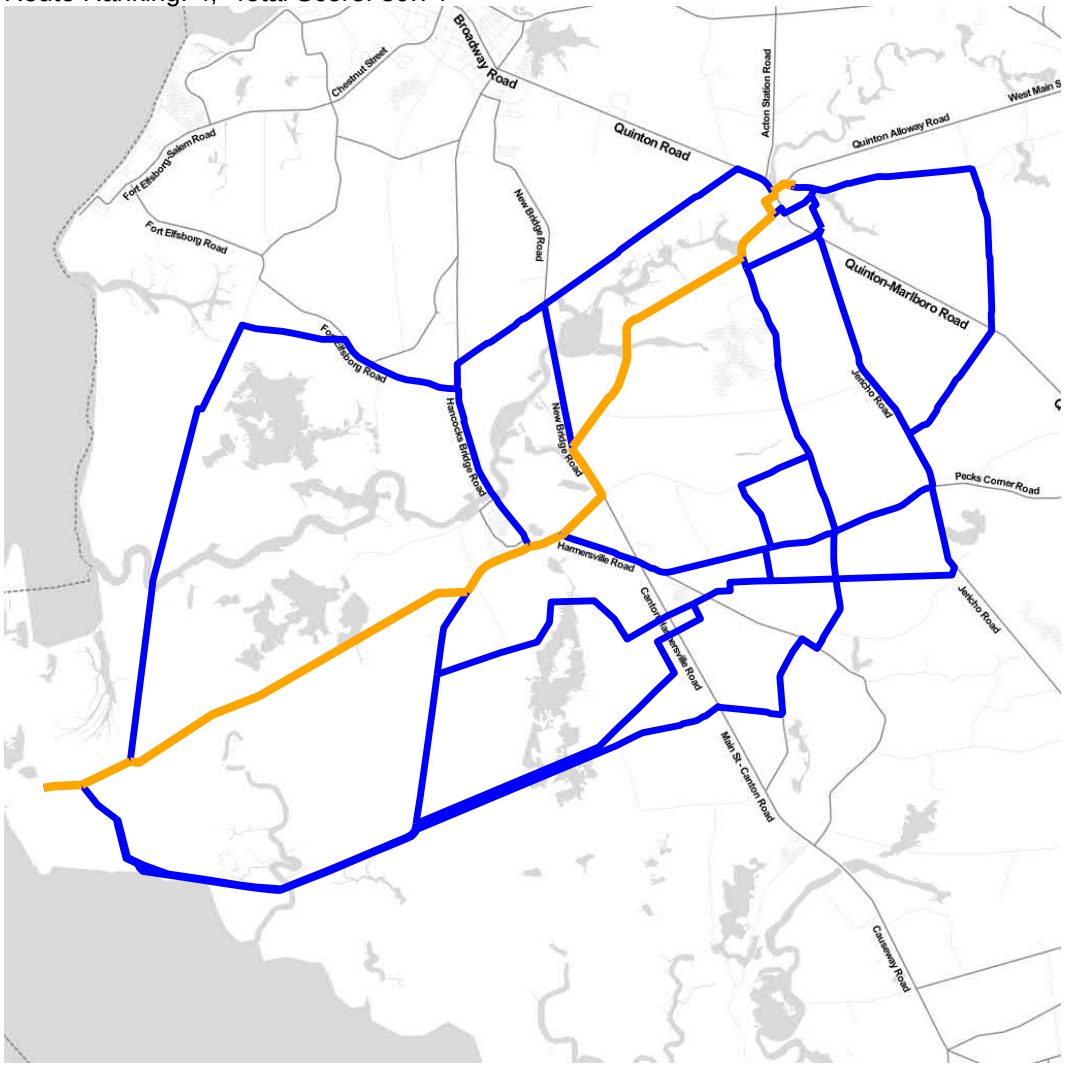
Built Criteria	Value	Scores
NRHP Properties	25.00	1.33
Residential Structures − Existing	57.00	4.91
Residential Structures − New	3.00	0.51
Commercial/Industrial Buildings − Existing	6.00	3.00
Commercial/Industrial Buildings − New	3.00	1.05
Conserved Lands Crossed − Existing	0.00	0.00
Conserved Lands Crossed − New	0.60	0.50
Properties Requiring New Easements	6.00	1.05
Churches, Cemeteries, Schools within 1,000 ft	3.00	1.88
Total Built	NA	14.22

Env. Criteria	Value	Scores
Riparian Zone Requiring Clearing	0.30	9.75
Stream Crossings	20.00	0.98
Flood Hazard Area	33.97	1.85
PFO/PSS Wetlands Requiring Clearing	1.28	0.80
PEM Wetlands Requiring Disturbance	11.77	4.15
Coastal Zone Areas Crossed	4.45	1.06
Threatened/Endangered Habitat Crossed	58.87	8.01
Total Environment	NA	26.60

Eng. Criteria	Value	Scores
Length Parallel to an Existing Utility Corridor (Inverted)	0.26	19.26
Length Parallel to a Road (Inverted)	10.12	6.90
Centerline Road Crossings	18.00	3.50
Turns Greater Than 60 Degrees	0.00	0.00
Transmission Line Crossings	8.00	10.00
Length of Underground	0.00	0.00
Length of Distribution Underbuild	9.74	8.46
Segments Length (mi)	12.11	1.85
Total Engineering	NA	49.96

Quinton − Windport 69 kV Routing Study

Route Name: A44,A43,A38,A37,A24,A18,A11,A10,A5,A2,A1
Route Ranking: 4, Total Score: 30.74



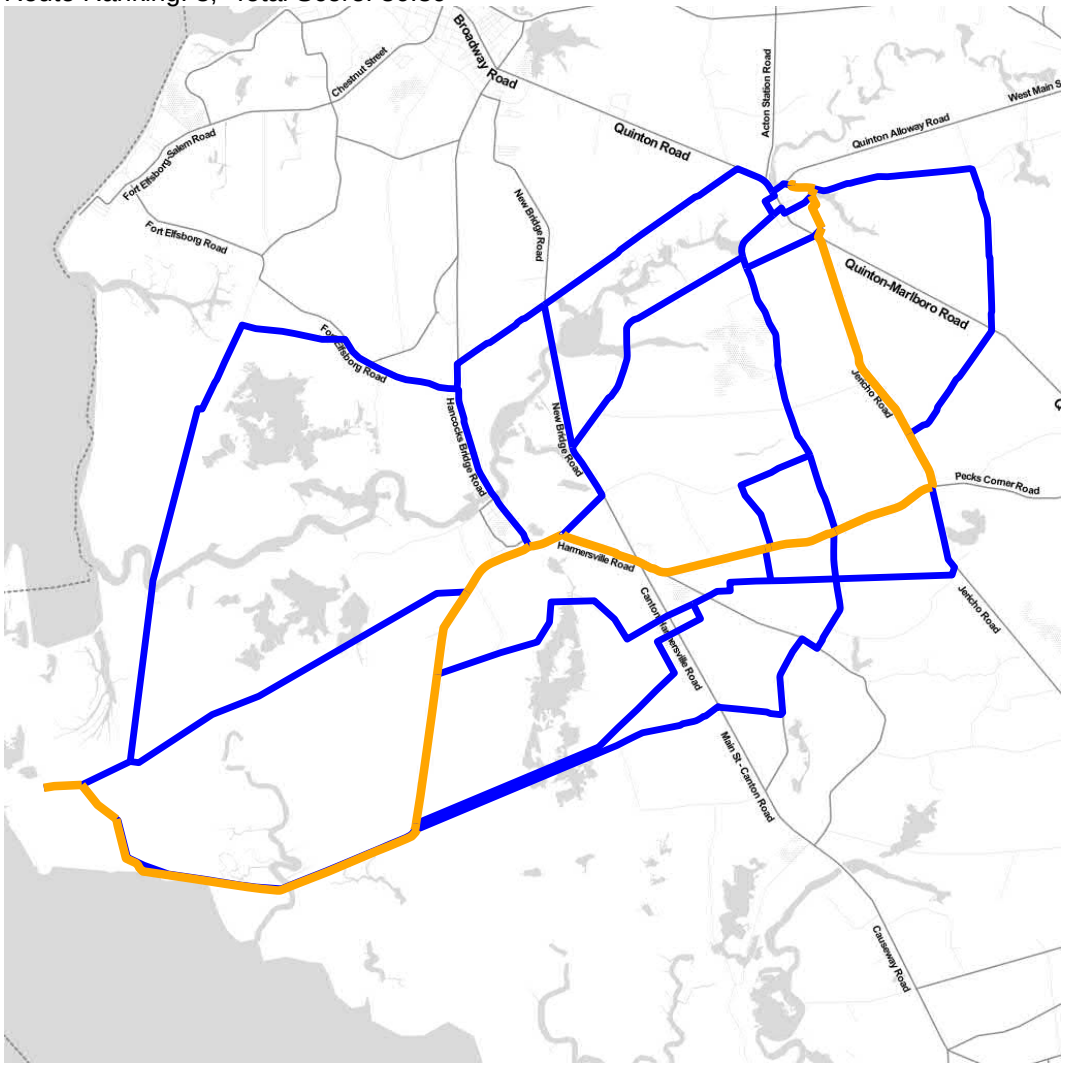
Built Criteria	Value	Scores
NRHP Properties	20.00	1.01
Residential Structures − Existing	64.00	5.57
Residential Structures − New	13.00	2.22
Commercial/Industrial Buildings − Existing	6.00	3.00
Commercial/Industrial Buildings − New	5.00	2.11
Conserved Lands Crossed − Existing	13.90	7.24
Conserved Lands Crossed − New	0.50	0.42
Properties Requiring New Easements	20.00	3.49
Churches, Cemeteries, Schools within 1,000 ft	5.00	3.12
Total Built	NA	28.18

Env. Criteria	Value	Scores
Riparian Zone Requiring Clearing	0.20	6.62
Stream Crossings	55.00	6.68
Flood Hazard Area	39.43	3.91
PFO/PSS Wetlands Requiring Clearing	0.98	0.42
PEM Wetlands Requiring Disturbance	6.61	1.91
Coastal Zone Areas Crossed	21.62	16.05
Threatened/Endangered Habitat Crossed	43.70	1.36
Total Environment	NA	36.95

Eng. Criteria	Value	Scores
Length Parallel to an Existing Utility Corridor (Inverted)	3.37	6.78
Length Parallel to a Road (Inverted)	5.41	14.09
Centerline Road Crossings	15.00	2.00
Turns Greater Than 60 Degrees	0.00	0.00
Transmission Line Crossings	1.00	0.00
Length of Underground	0.00	0.00
Length of Distribution Underbuild	4.76	0.57
Segments Length (mi)	9.67	0.00
Total Engineering	NA	23.43

Quinton − Windport 69 kV Routing Study

Route Name: A44,A47,A46,A45,A41,A40,A39,A37,A24,A25,A27,A28,A30,A21,A14,A8,A6,A3,A1
Route Ranking: 8, Total Score: 36.39



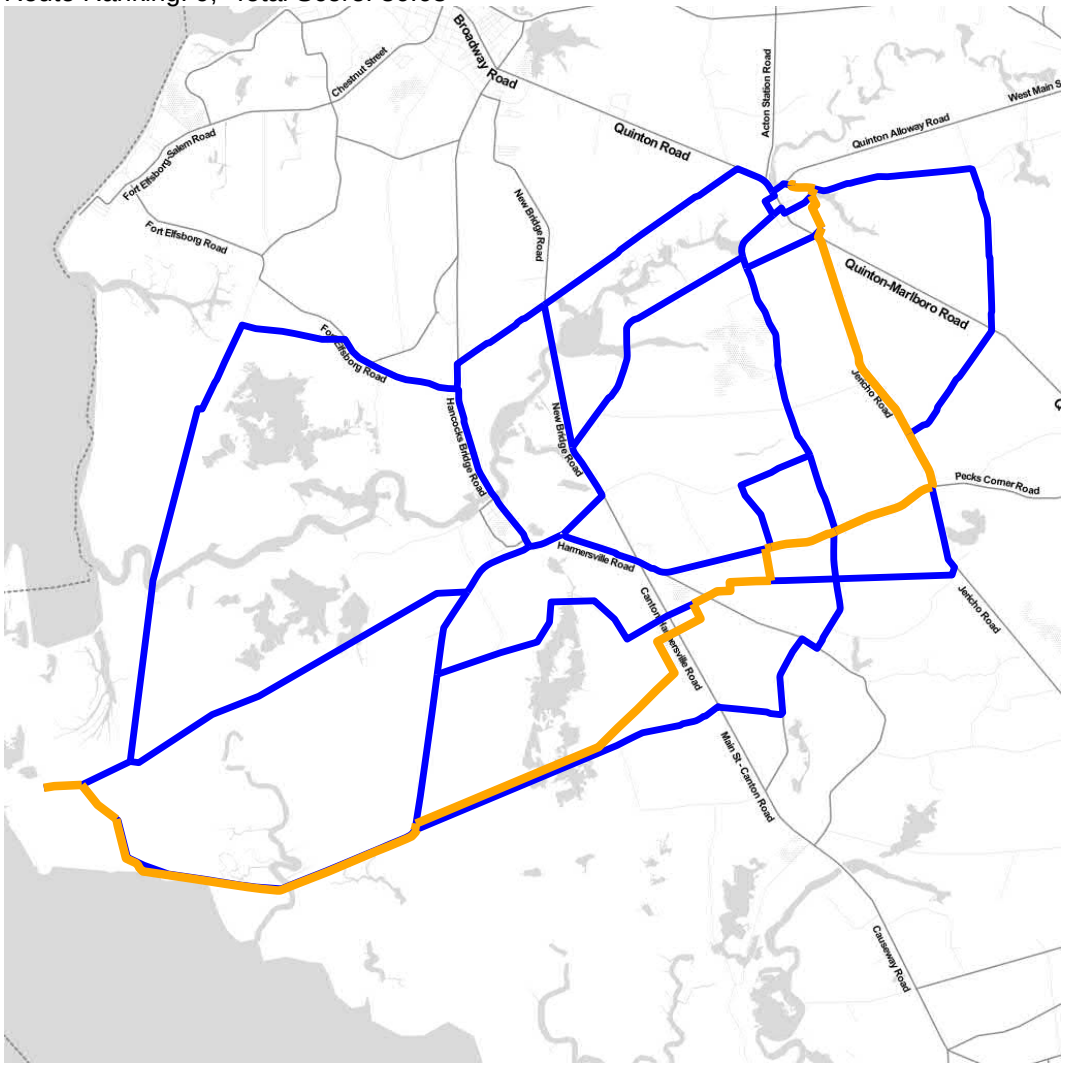
Built Criteria	Value	Scores
NRHP Properties	25.00	1.33
Residential Structures − Existing	29.00	2.26
Residential Structures − New	93.00	15.90
Commercial/Industrial Buildings − Existing	5.00	2.00
Commercial/Industrial Buildings − New	15.00	7.37
Conserved Lands Crossed − Existing	0.00	0.00
Conserved Lands Crossed − New	4.50	3.75
Properties Requiring New Easements	55.00	9.59
Churches, Cemeteries, Schools within 1,000 ft	7.00	4.38
Total Built	NA	46.58

Env. Criteria	Value	Scores
Riparian Zone Requiring Clearing	0.11	3.49
Stream Crossings	17.00	0.49
Flood Hazard Area	29.32	0.10
PFO/PSS Wetlands Requiring Clearing	2.77	2.65
PEM Wetlands Requiring Disturbance	14.52	5.34
Coastal Zone Areas Crossed	3.90	0.58
Threatened/Endangered Habitat Crossed	50.44	4.31
Total Environment	NA	16.97

Eng. Criteria	Value	Scores
Length Parallel to an Existing Utility Corridor (Inverted)	0.26	19.26
Length Parallel to a Road (Inverted)	12.53	3.22
Centerline Road Crossings	26.00	7.50
Turns Greater Than 60 Degrees	0.00	0.00
Transmission Line Crossings	8.00	10.00
Length of Underground	0.00	0.00
Length of Distribution Underbuild	11.77	11.67
Segments Length (mi)	13.89	3.20
Total Engineering	NA	54.85

Quinton − Windport 69 kV Routing Study

Route Name: A44,A47,A46,A45,A41,A36,A34,A26,A27,A28,A30,A21,A14,A8,A6,A3,A1
Route Ranking: 9, Total Score: 36.63



Built Criteria	Value	Scores
NRHP Properties	4.00	0.00
Residential Structures − Existing	14.00	0.85
Residential Structures − New	72.00	12.31
Commercial/Industrial Buildings − Existing	6.00	3.00
Commercial/Industrial Buildings − New	15.00	7.37
Conserved Lands Crossed − Existing	5.60	2.92
Conserved Lands Crossed − New	4.50	3.75
Properties Requiring New Easements	61.00	10.64
Churches, Cemeteries, Schools within 1,000 ft	3.00	1.88
Total Built	NA	42.71

Env. Criteria	Value	Scores
Riparian Zone Requiring Clearing	0.00	0.00
Stream Crossings	19.00	0.82
Flood Hazard Area	31.57	0.95
PFO/PSS Wetlands Requiring Clearing	10.24	11.97
PEM Wetlands Requiring Disturbance	25.19	9.95
Coastal Zone Areas Crossed	3.26	0.02
Threatened/Endangered Habitat Crossed	54.72	6.19
Total Environment	NA	29.90

Eng. Criteria	Value	Scores
Length Parallel to an Existing Utility Corridor (Inverted)	3.44	6.47
Length Parallel to a Road (Inverted)	7.47	10.95
Centerline Road Crossings	18.00	3.50
Turns Greater Than 60 Degrees	0.00	0.00
Transmission Line Crossings	8.00	10.00
Length of Underground	0.00	0.00
Length of Distribution Underbuild	6.98	4.09
Segments Length (mi)	13.52	2.92
Total Engineering	NA	37.92

Appendix D

Site Photographs

Photo 01: View of *Phragmites* estuarine marsh along project ROW

Photo 02: View of *Phragmites* estuarine marsh along project ROW

Photo 03: View of *Phragmites* estuarine marsh along project ROW

Photo 04: View of estuarine open water adjacent to project ROW

Photo 05: View of estuarine open water and *Phragmites* marsh adjacent to project ROW

Photo 06: View of isolated *Phragmites* PEM wetland on Artificial Island property

Photo 07: View of disturbed, modified wetland on Artificial Island property

Photo 08: View of riverine creek and *Phragmites* marsh along project ROW

Photo 09: View of PEM *Phragmites* ditch along project ROW

Photo 10: View of modified agricultural wetland ditch along project ROW

Photo 11: View of PEM wetland ditch along project ROW

Photo 12: View of mowed PEM wetland ditch along project ROW

Photo 13: View of mowed PEM wetland ditch along project ROW

Photo 14: View of modified agricultural wetlands along project ROW

Photo 15: View of modified agricultural wetlands and wetland ditch along project ROW

Photo 16: View of PEM wetlands adjacent to project ROW

Photo 17: View of PEM wetlands adjacent to project ROW

Photo 18: View of PFO wetlands adjacent to project ROW

Photo 19: View of PFO wetlands adjacent to project ROW

Photo 20: Representative view of non-hydric soils associated with project ROW

Photo 21: Representative view of hydric soils associated with project ROW

Appendix E

Wetland Delineation Report

D1067.080
February 23, 2023

WATER RESOURCE DELINEATION REPORT

ATLANTIC CITY ELECTRIC COMPANY

QUINTON – WINDPORT TRANSMISSION LINE PROJECT

QUINTON & LOWER ALLOWAYS CREEK TOWNSHIP,
SALEM COUNTY, NEW JERSEY

PREPARED FOR:

LOUIS BERGER U.S., INC.,
A WSP COMPANY
412 MOUNT KEMBLE AVENUE
PO BOX 1946
MORRISTOWN, NJ 07962

PREPARED BY:

DuBois & ASSOCIATES

190 NORTH MAIN STREET
MANAHAWKIN, NJ 08050

ANTHONY SILVA, PWS
SR. BIOLOGIST/PROJECT MANAGER

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FIGURES

1.0 INTRODUCTION

A Water Resource Delineation Report has been prepared for land within and proximal to the Atlantic City Electric Company (ACE) Quinton – Windport Transmission Line Project (the Project) located within Middle Township, Cape May County, New Jersey. The delineation of wetlands and/or state open waters was the focus of field work performed by DuBois & Associates, LLC (DuBois) in December of 2021 and September of 2022. "Wetland" means an area that is inundated or saturated by surface water or groundwater at a frequency and duration sufficient to support, and that under normal circumstances does support, a prevalence of vegetation typically adapted for life in saturated soil conditions (33 CFR § 328.3). "State open waters" means all waters of the State as defined in N.J.A.C. 7:7A-1.3.

The Project area and immediate vicinity were investigated for the presence or absence of freshwater wetlands, coastal wetlands and/or state open waters, and a subsequent delineation of wetland/water boundaries was conducted. DuBois was retained by WSP to flag and GPS locate wetland/water points among the Project area in support of a new 69kV transmission line upgrade project. The wetland/water points were recorded with a Trimble GeoXt GPS unit and the data was post-processed using ArcPad and GPS Pathfinder Office software. The wetland data was then transferred to ArcMap software, discrete wetland polygons containing attribute data were created, and wetland locations were depicted on aerial imagery in support of upcoming Project activities. Refer to *Figures 4 - 33: Water Resource Delineation Maps* enclosed herewith for an aerial depiction of the location of wetlands that are present along the Project area.

Refer to *Appendix A: Survey Area Photographs* for representative photographs of wetlands located among the Project area, and *Appendix B: Wetland Data Sheets* for representative data collected for the wetlands/uplands located along the Project. The qualifications of the environmental staff responsible for conducting the wetland and water delineation are presented in *Appendix C*.

2.0 PROJECT LOCATION & LAND COVERAGE

The project is located in the southwest portion of New Jersey in the Lower Delaware water region. The linear project is approximately 11.0-miles in length with a northern terminus at the Quinton Substation in Quinton Township and a southern terminus at Artificial Island in Lower Alloways Creek, Salem County (refer to *Figure 1: New Jersey Road Map*). The project is located on the Salem, Canton and Taylors Bridge United States Geological Survey (USGS) Quadrangle with state plane coordinates (NAD83 feet) of E(x) 235,503 and N(y) of 261,961 located at the Quinton Substation and E(x) 199,764 and N(y) of 234,229 located at the proposed Windport Substation (refer to *Figure 2: Salem, Canton & Taylors Bridge U.S.G.S Quadrangle Map*). The project is located in the Maurice, Salem, and Cohansey Watershed Management Area (WMA 17), the Alloway Creek / Hope Creek watershed, and six (6) subwatersheds of the Alloways Creek. The Delaware River lies to the west and southwest of the project route. Portions of the project route in the southern half of the alignment are located among the Mad Horse Creek Wildlife Management Area.

The project follows an existing ROW that is largely roadside. The route lies along Sickler Street, Beasley Neck Road (Rt. 651), New Bridge Road (Rt. 623), Cuff Road, Alloway Creek Neck Road and Buttonwood Avenue for the majority of its length. Farmland, old-field, *Phragmites*-dominant brackish marsh with tidal channels, salt marsh with tidal channels, and fringe maritime brushland defines the majority of the land-cover along the project route. An urban landscape is present near the northern terminus at the town of Quinton, and an industrial-disturbed/successional-vegetated landscape is present at the southern terminus at Artificial Island. Refer to *Figure 3: Aerial Map* for an orthophotographic depiction of the project route and surrounding landscape.

3.0 WATER RESOURCE DELINEATION METHODOLOGY

3.1 Desktop Assessment

Desktop resources including the 2012 NJDEP wetland mapping, U.S. Fish and Wildlife Service (USFWS) National Wetland Inventory (NWI) mapping, topographic mapping, and the Salem County Soil Survey were reviewed and utilized prior to the field investigations to obtain a baseline indication of where potential wetlands and waters may be present along the ROW. According to digital resources, NJDEP and USFWS-mapped freshwater can coastal wetlands are present from the Project area; NJDEP-mapped streams are also present from the project area. According to the USFWS NWI, the mapped wetlands and waterways have the following wetland or deepwater classifications (Cowardin et al. 1979):

Code	System	Sub System	Class	Sub Class	Water Regime	Water Chemistry	Special Modifier
E1UBL	Estuarine	Subtidal	Unconsolidated Bottom		Subtidal		
E1UBLh6	Estuarine	Subtidal	Unconsolidated Bottom		Subtidal	Oligohaline	Diked / Impounded
E2EM1P6	Estuarine	Intertidal	Emergent	Persistent	Irregularly Flooded	Oligohaline	
E2EM1Pd6	Estuarine	Intertidal	Emergent	Persistent	Irregularly Flooded	Oligohaline	Partially Drained / Ditched
E2EM5Ps	Estuarine	Intertidal	Emergent	Phragmites australis	Irregularly Flooded		Spoils
PEM1/SS1R	Palustrine		Emergent / Scrub-shrub	Persistent / Broad-leaved Deciduous	Seasonally Flooded - Tidal		
PEM1Dd	Palustrine		Emergent	Persistent	Continuously Saturated		Partially Drained / Ditched
PEM5Rh	Palustrine		Emergent	Phragmites australis	Seasonally Flooded - Tidal		Diked / Impounded
PFO1R	Palustrine		Forested	Broad-leaved Deciduous	Seasonally Flooded - Tidal		
PUS1/ EM5Rs	Palustrine		Unconsolidated Shore / Emergent	Cobble-Gravel / Phragmites australis	Seasonally Flooded - Tidal		Spoils
R4SBCx	Riverine	Intermittent	Streambed		Seasonally Flooded		Excavated

The Salem County Soil Survey indicates eleven (11) soil map units present from the Project area, four (4) of which are classified as hydric. The following soil map units are mapped among the project area:

- Woodstown sandy loam, 0 to 2 percent slopes
- Sassafras sandy loam, 2 to 5 percent slopes
- Othello, Fallsington, and Trussum soils, 0 to 2 percent slopes
- Mattapex silt loam, 0 to 2 percent slopes
- Matapeake silt loam, 2 to 5 percent slopes
- Downer loamy sand, 0 to 5 percent slopes
- Mannington-Nanticoke complex, 0 to 1 percent slopes, very frequently flooded
- Transquaking mucky peat, 0 to 1 percent slopes, very frequently flooded
- Udorthents, dredged fine material, 0 to 8 percent slopes
- Urban Land
- Water

3.2 Field Wetland Delineation

The Project area was investigated in December of 2021 and September of 2022 to identify and delineate wetlands and state open waters that may be subject to regulatory jurisdiction under the New Jersey Department of Environmental Protection (NJDEP) Freshwater Wetlands Protection Act Rules (N.J.A.C.7:7A), the Coastal Zone Management Rules (N.J.A.C. 7:7) and Section 404 of the federal Clean Water Act. The water resource delineation study area included a 60-foot-wide existing electric transmission ROW corridor extending from Quintion Substation to the proposed Windport Substation. Wetland points were numerated and demarcated in the field with pink visual ribbon. The wetland points were recorded with a Trimble GeoXt GPS unit and the data was post-processed using ArcPad and GPS Pathfinder Office software. The point data was transferred to ArcMap software and discrete wetland and polygons containing attribute data were created.

The methodology utilized to determine the presence and extent of wetlands within and along the Project area was the three Parameter Approach set forth in the 1989 *Federal Manual* (Federal Interagency Committee for Wetlands Delineation 1989). According to the *Federal Manual*, identification of wetlands is based on a three-factor approach involving indicators of hydrophytic vegetation, hydric soil, and wetland hydrology. The Army Corp. of Engineers *Atlantic and Gulf Coastal Plain Regional Wetland Supplement* (ACOE 2010) and the U.S. Department of Agriculture (USDA) Natural Resource Conservation Service (NRCS) Field Indicators of Hydric Soil manual (USDA 2018) were also utilized.

3.2.1 Hydrophytic Vegetation

A hydrophyte is macrophytic plant life growing in water, soil, or on a substrate that is at least periodically deficient in oxygen as a result of excessive water content. As per the *Federal Manual* and *Pinelands Supplement*, hydrophytic vegetation is defined as "macrophytic plant life growing in water, soil or on a substrate that is at least periodically deficient in oxygen as a result of excessive water content." Indicator statuses are used to designate a plant species' preference for occurrence in a wetland or upland. The vegetation in the ROW was identified and classified in accordance with the 2018 National Wetland Plant List, which is a list compiled as an interagency effort between the U.S. Army Corp. of Engineers, the U.S. Environmental Protection Agency (USEPA), the USFWS and the USDA NRCS to be utilized for all jurisdictional wetland determinations. Plants are assigned an indicator, and classifications listed are as follows:

Hydrophytic vegetation in the Atlantic Gulf Coastal Plain region is identified by using the indicators with the interagency 2020 National Wetland Plant List, which is the list that is currently utilized for all jurisdictional wetland determinations. Plants are assigned an indicator based on the associated physiographic region and plant classifications listed are as follows:

Table 1: Hydrophytic Vegetation Indictors

Obligatory (OBL)	Almost always is a hydrophyte, rarely in uplands
Facultative Wetland (FACW)	Usually is a hydrophyte but occasionally found in uplands
Facultative (FAC)	Commonly occurs as either a hydrophyte or non-hydrophyte
Facultative Upland (FACU)	Occasionally is a hydrophyte but usually occurs in uplands
Upland (UPL)	Rarely is a hydrophyte, almost always in uplands

An inventory of vegetation was taken along upland/wetland boundaries among the Project area. A community was considered hydrophytic vegetation if it either passed the rapid field test for hydrophytic vegetation, or the Dominance Test where more than 50 percent of the dominant plant species across all strata were rated OBL, FACW, or FAC.

3.2.2 Hydric Soil

The National Technical Committee for Hydric Soils (NTCHS) defines a hydric soil as a soil that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part (USDA Soil Conservation Service 1994). Most hydric soils exhibit characteristic morphologies that result from repeated periods of saturation or inundation that last more than a few days. Saturation or inundation, when combined with microbial activity in the soil, causes the depletion of oxygen. This anaerobiosis promotes certain biogeochemical processes, such as the accumulation of organic matter and the reduction, translocation, or accumulation of iron and other reducible elements. These processes result in distinctive characteristics that persist in the soil during both wet and dry periods, making them particularly useful for identifying hydric soils in the field (USDA NRCS 2018).

Soils among the Project area were investigated for the presence of hydric soils by inspecting subsurface samples with a hand-held soil auger. A determination of hydric soil presence or absence was made based on comparison to the *Field Indicators of Hydric Soils in the United States* (USDA NRCS 2018).

3.2.3 Hydrology

Wetland hydrology indicators are used in combination with indicators of hydric soil and hydrophytic vegetation to determine whether an area is a wetland under the *Federal Manual*. Indicators of hydrophytic vegetation and hydric soil generally reflect a site's medium- to long-term wetness history. They provide readily observable evidence that episodes of inundation or soil saturation lasting more than a few days during the growing season have occurred repeatedly over a period of years and that the timing, duration, and frequency of wet conditions have been sufficient to produce a characteristic wetland plant community and hydric soil morphology. Wetland hydrology indicators provide evidence that the site has a continuing wetland hydrologic regime and that hydric soils and hydrophytic vegetation are not relicts of a past hydrologic regime. Wetland hydrology indicators confirm that an episode of inundation or soil saturation occurred recently, but may provide little additional information about the timing, duration, or frequency of such events (National Research Council 1995).

Wetland hydrology among the Project area was determined by the visual presence of drift lines, watermarks, sediment deposition, standing water, saturated soils, and stained leaves, among others. Hydrology indicators are often the most transitory of wetland indicators. Some hydrology indicators are naturally temporary or seasonal, and many are affected by recent or long-term meteorological conditions. Hydrology varies with the season and amount of recent precipitation. Therefore, the hydrology criteria cannot always be a major determining factor, but it assists in the final verification of a wetland limit. Where appropriate, soil description and/or historical data were utilized to supplement field observations.

4.0 WATER RESOURCE DELINEATION RESULTS

The field survey revealed the presence of freshwater wetlands, coastal wetlands and state open waters (i.e., streams, rivers) within the Project area. The following table summarizes the wetland and water naming conventions and conditions present among the Project area. The delineation areas are listed sequentially from north to south along the Project area. Refer to *Figures 4 - 33: Water Resource Delineation Maps* for a depiction of the delineated wetlands and waters. Refer to *Appendix A* for representative photographs of the wetland and water delineation areas. Refer to *Appendix B: Wetland Data Sheets* for representative data collected for wetlands and uplands among the Project area.

Table 2: Water Resource Delineation Table

Wetland Code	Point Designations	Wetland/Water Classification Code	Wetland/Water Classification	Notes
SA	SA 1-9	E1UBL	Estuarine Subtidal	0.0027 ac.
WB	WB 1-18	PEM, E2EM	Palustrine Emergent, Estuarine Emergent	Points 11-17 = roadside ditch. 0.172 ac.
SB	SB 1-10	E1UBL	Estuarine Subtidal	0.118 ac.
WC	WC 1-4	MOD	Modified	Roadside Ditch. 0.022 ac.
WD	WD 1-4	MOD	Modified	Roadside Ditch. 0.006 ac.
WE	WE 0-7	PEM, PFO	Palustrine Emergent, Forested	Phragmites-dominant PEM. 0.068 ac.
SE	SE 1-4	E1UBL	Estuarine Subtidal	0.008 ac.
WF	WF 1-8	PEM, E2EM	Palustrine Emergent, Estuarine Emergent	Phragmites-dominant PEM. 0.15 ac.
SF	SF 1-5	E1UBL	Estuarine Subtidal	0.064 ac.
WG	WG 1-5	PFO, PEM	Palustrine Forested, Emergent	0.054 ac.
SG	SG 1-5	R4	Intermittent Stream	0.75 ac.
WH	WH 1-8	MODAG	Modified Agricultural	0.20 ac.
WI	WI 1-7	MODAG	Modified Agricultural	0.168 ac.
WJ	WJ 1-4	PFO	Palustrine Forested	Ditch. 0.004 ac.
WL	WL 1-14	MOD	Modified	Roadside Ditch. 0.049 ac.
WKK	WKK 1-7	PEM	Palustrine Emergent	Phragmites-dominant. 0.169 ac.
SKK	SKK 1-6	E1UBL	Estuarine Subtidal	0.024 ac.
WJJ	WJJ 1-10	E2EM	Estuarine Emergent	Phragmites-dominant. 0.207 ac.
SJJ	SJJ 1-4	E1UBL	Estuarine Subtidal	0.09 ac.
WII	WII 0-10	PEM	Palustrine Emergent	0.290ac.
SII	SII 0-4	R1	Riverine	0.032 ac.
WVV	WVV 1-8	MODAG	Modified Agricultural	Roadside Ditch. MODAG seep. 0.010 ac.
WUU	WUU 1-7	MOD	Modified	Roadside Ditch. 0.050 ac.
WTT	WTT 1-9	MODAG	Modified Agricultural	Roadside Ditch and MODAG. 0.167 ac.
WSS	WSS 1-7	MOD	Modified	Roadside Ditch. 0.053 ac.
WWW	WWW 1-21	MODAG	Modified Agricultural	Roadside Ditch and MODAG. 0.529 ac.
WXX	WXX 1-10	MODAG	Modified Agricultural	Roadside Ditch and MODAG. 0.050 ac.
WYY	WYY 1-9	PEM, MOD	Palustrine Emergent, Modified	Phragmites-dominant PEM and managed lawn. 0.235 ac.
SRR	SRR 1-5	E1UBL	Estuarine Subtidal	0.026 ac.
WRR	WRR 1-18	PEM, PFO	Palustrine Emergent, Forested	Phragmites-dominant PEM. 0.137 ac.
WQQ	WQQ 1-5	PFO	Palustrine Forested	0.015 ac.
SY	SY 1-11	R1	Riverine	0.035 ac.
WOO	WOO 1-9	MODAG	Modified Agricultural	Roadside and MODAG ditches. 0.043 ac.
WNN	WNN 1-13	MODAG	Modified	Roadside and MODAG ditches.

Wetland Code	Point Designations	Wetland/Water Classification Code	Wetland/Water Classification	Notes
			Agricultural	0.173 ac.
WMM	WMM 1.6	MODAG	Modified Agricultural	Roadside Ditch. 0.011 ac.
WM	WM 1-18	PEM	Palustrine Emergent	Roadside Ditch. 0.202
WN	WN 1-9	PEM	Palustrine Emergent	Roadside Ditch and Brushland. 0.182 ac.
WO	WO 1-11	PEM	Palustrine Emergent	Roadside Ditch and Brushland. 0.130 ac.
WP	WP 1-10	PEM	Palustrine Emergent	Roadside Ditch. 0.050 ac.
WQ	WQ 1-8	PEM	Palustrine Emergent	Roadside Ditch. 0.025 ac.
WR	WR 1-9	PEM, PSS	Palustrine Emergent, Scrub/shrub	Roadside Ditch and Shrubland. 0.154 ac.
WS	WS 1-16	PEM	Palustrine Emergent	Roadside Ditch and Brushland. 0.258 ac.
WT	WT 1-15	PEM	Palustrine Emergent	Roadside Ditch. 0.178 ac.
WW	WW 1-11	PEM	Palustrine Emergent	Roadside Ditch. 0.081 ac.
WX	WX 1-4	PEM	Palustrine Emergent	Roadside Ditch. 0.006 ac.
WY	WY 1-7	MODAG	Modified Agricultural	0.029 ac.
WZ	WZ 1-23	E2EM, PFO	Estuarine Emergent, Palustrine Forested	Phragmites-dominant. 0.535 ac.
SZ	SZ 1-6	E1	Estuarine Subtidal	0.001 ac.
WEE	WEE 1-112	E2EM	Estuarine Emergent	Phragmites & Sporobulus-dominant coastal marsh. 9.734 ac.
SEE	multiple	E1UBL	Estuarine Subtidal	1.182 ac.
WDD	WDD 1-28	MOD, PEM	Modified, Palustrine Emergent	Disturbed & Phragmites-dominant. 0.414 ac.
WCC	WCC 1-48	MOD, PEM	Modified, Palustrine Emergent	Disturbed/managed; Phragmites-dominant; Roadside ditch. 1.389 ac.
WBB	WBB 1-11	MOD	Modified	Roadside Ditch. 0.075 ac.
WAA	WAA 1-4	PEM	Palustrine Emergent	Phragmites-dominant. Isolated. 0.015 ac.

Palustrine Emergent Wetlands (PEM)

The majority of wetland delineation areas characterized as PEM are dominated by the exotic common reed (*Phragmites australis*), which outcompetes most other vegetation. Other PEM wetlands include managed roadside ditches. During the field delineations, the ditches were mown; however, identifiable hydrophytes include soft rush (*Juncus effusus*, OBL), wool grass (*Scirpus cyperinus*, OBL), reed canaarygrass (*Phalaris arundinacea*, FACW), flatsedges (*Cyperus* spp.), spikerushes (*Eleocharis* spp.) and sedges (*Carex* spp.). In areas of PEM wetlands, positive hydrologic indicators included surface water, a high-water table, drift deposits, water-borne drift deposits, and oxidized rhizospheres. Positive hydric soil indicators observed in PEM wetlands primarily included F3 – Depleted Matrix and S5 – Sandy Redox.

Palustrine Forested Wetlands (PFO)

PFO wetlands are minimal among the Project area and primarily existing at the edge of existing ROW in several locations. Wetland trees included pin oak (*Quercus palustris*, FACW), red maple (*Acer rubrum*, FAC), sweet gum (*Liquidambar styraciflua*, FAC), river birch (*Betula nigra*, FACW), box elder (*Acer negundo*, FACW) and silver maple (*Acer saccharinum*, FACW). Understories were observed to be composed largely of invasive species, however observed hydrophytes include silky dogwood (*Cornus amomum*, FACW) and highbush blueberry (*Vaccinium corymbosum*, FACW). Herbaceous hydrophytes include common reed, reed canary grass, soft rush, Japanese stilt grass (*Microstegium vimineum*, FAC), sedges, and skunk cabbage (*Symplocarpus foetidus*, OBL). Water regimes varied from seasonally saturated to tidally-flooded. Several locations exhibited wet mucky conditions. Positive hydric soil indicators observed in PFO wetlands primarily included A3 – Black Histic, A11 – Depleted Below Dark Surface, and F3 – Depleted Matrix.

Modified and Modified Agricultural Wetlands (MOD & MODAG)

Modified wetlands along the Project area primarily include anthropogenic roadside ditches and other altered land. Culverts convey intermittent surface waters beneath bisecting roadways and driveways. During the delineations, roadside ditches were actively mown. Modified agricultural wetlands are in active cropland production. During the delineation, land was cultivated and absent of native hydrophytes. In these area, hydric soils and hydrologic indicators were used to determine the presence of jurisdictional wetlands in the State. Positive wetland hydrology indicators in farmland included surface water, a high-water table, algal crusts and iron deposits. Positive hydric soil indicators in the modified wetland areas primarily included F3 – Depleted Matrix and S5 – Sandy Redox.

Estuarine Emergent Wetlands (E2EM)

These wetlands among the Project area are tidally influenced with higher salinity levels. As with the PEM wetlands, the majority of E2EM wetlands along the Project area are also dominated by common reed (*Phragmites australis*), which forms dense monocultures. In the southern extent of the Project area, however, along Alloway Neck Road, native low salt marsh becomes dominant. Regular and irregularly-flooded smooth cordgrass (*Sporobolus alterniflorus* = *Spartina alterniflora*, OBL) marsh is representative. Patches of high marsh containing salt hay (*Sporobolus pumilus* = *Spartina patens*, OBL) and salt grass (*Distichlis spicata*, OBL) are admixed. Hydrogen sulfide odor is a positive hydrology and hydric soil indicator from this area.

Estuarine Subtidal Waters (E1UBL)

Estuarine waters are present from the Project area. This system is differentiated from the estuarine wetlands by the absence of vegetation and persistence of tidal waters with substrate below mean high water.

Riverine Waters (R)

Riverine waters are present from the Project area. This system is differentiated from the palustrine wetlands by the absence of vegetation and presence of perennial or intermitted freshwaters within a defined bed and bank.

5.0 CONCLUSION

The ACE Quinton - Windport Transmission Project has been investigated for the presence of wetlands and state open waters and a water resource area delineation was performed in support of upcoming transmission line improvements. The results of our delineation conclude that freshwater wetlands, coastal wetlands and open waters are present from the Project area and vicinity. Depending on the nature and extent of the Project, the wetlands and waters have the potential to be regulated pursuant to the New Jersey Coastal Zone Management Rules, the New Jersey Freshwater Wetland Protection Act Rules and the Federal Clean Water Act.

This information may be used by WSP and ACE to implement wetland protection and/or permitting strategies in support of the upcoming transmission line upgrade project.

6.0 REFERENCES

Federal Interagency Committee for Wetland Delineation, 1989. Federal Manual for Identifying and Delineating Jurisdictional Wetlands. U.S. Army Corps of Engineers, U.S. Environmental Protection Agency, U.S. Fish and Wildlife Services, and U.S.D.A. Soil Conservation Service, Washington, D.C. Cooperative Technical Publication.

Gardiner, Duane T. and Miller, Raymond W. Soils In Our Environment, 10th Edition. Pearson Education, Inc. Upper Saddle River, NJ, 2004.

New Jersey Department of Environmental Protection, Bureau of Geographical Information Systems. Maps and Map Data. Accessed February 2022. http://www.nj.gov/dep/gis/

New Jersey Department of Environmental Protection, Division of Fish and Wildlife. 2017. New Jersey Landscape Project, Version 3.3. New Jersey Department of Environmental Protection, Division of Fish and Wildlife, Endangered and Nongame Species Program.

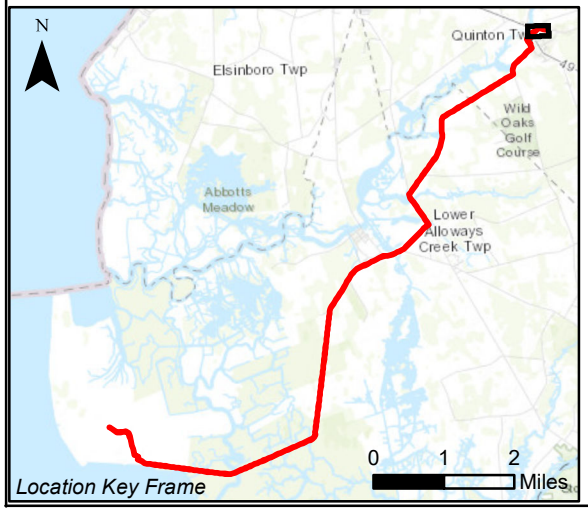
U.S. Army Corps of Engineers. 2010. Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Atlantic and Gulf Coastal Plain Region Version 2.0, ed. J. F. Berkowitz, J. S. Wakeley, R. W. Lichvar, C. V. Noble. ERDC/EL TR-12-9. Vicksburg, MS: U.S. Army Engineer Research and Development Center.

U.S. Department of Agriculture, Natural Resource Conservation Service. 2022. Web Soil Survey. Soil mapping and data. Available online at https://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm

United States Department of Agriculture, Natural Resources Conservation Service. 2018. Field Indicators of Hydric Soils in the United States, Version 8.2. L.M. Vasilas, G.W. Hurt, and C.V. Noble (eds.). USDA, NRCS, in cooperation with the National Technical Committee for Hydric Soils.

United States Fish and Wildlife Service, United States Environmental Protection Agency, United States Army Corp. of Engineers, United States Department of Agriculture Natural Resources Conservation Service. 2020. National Wetland Plant List. Available Online at http://plants.usda.gov/wetland.html.

Figures



Legend

- Project Right-of-Way
- Delineation Point
- Wetland Delineation
- Watercourse Delineation

Water Resource Delineation Map

ACE Quinton - Winsport Transmission Project
Quinton & Lower Alloways Creek Township,
Salem County, New Jersey

Date: 2/21/2023	
Drawn By: AS	
Figure 4	

DuBois & ASSOCIATES

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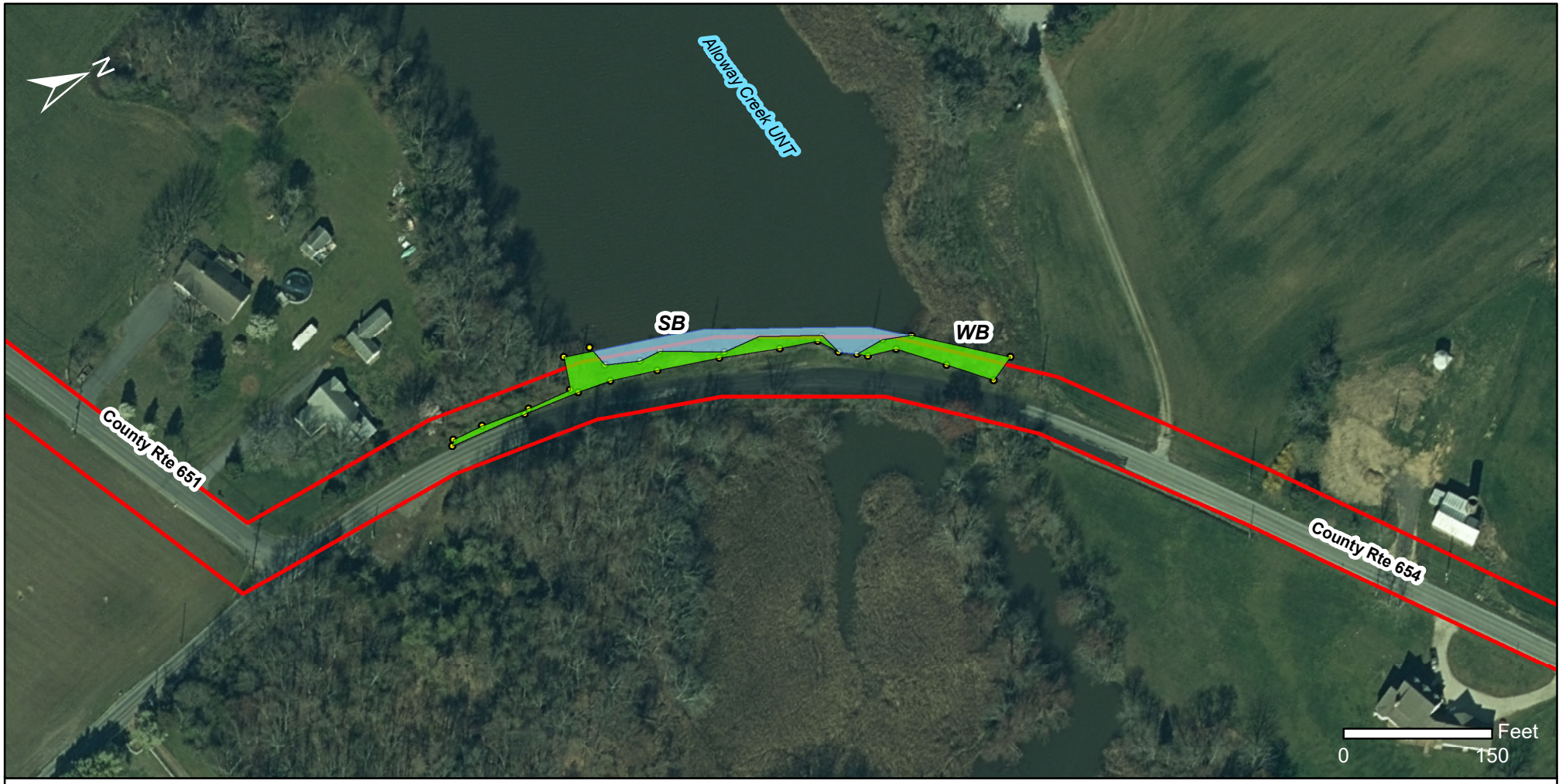

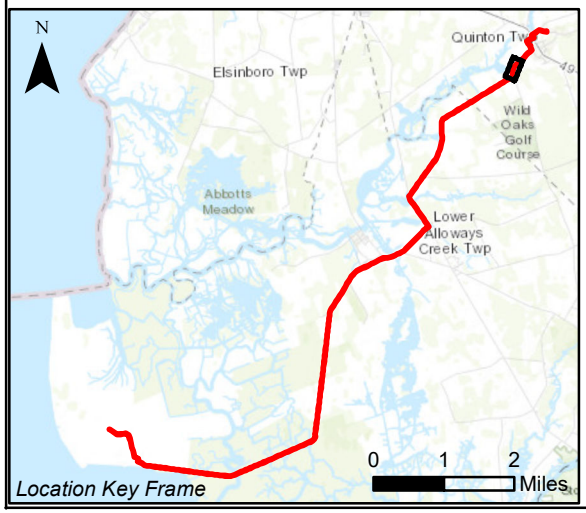

Legend

- Project Right-of-Way
- Delineation Point
- Wetland Delineation
- Watercourse Delineation

Water Resource Delineation Map

ACE Quinton - Winsport Transmission Project
Quinton & Lower Alloways Creek Township,
Salem County, New Jersey

Date: 2/21/2023	
Drawn By: AS	
Figure 5	

DuBois & ASSOCIATES

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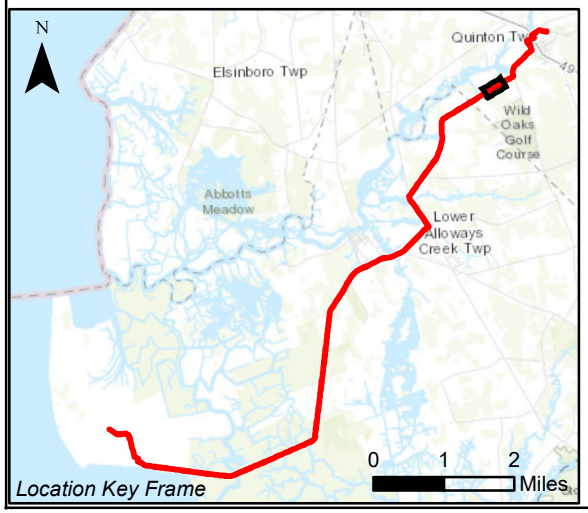

Legend

- Project Right-of-Way
- Delineation Point
- Wetland Delineation
- Watercourse Delineation

Water Resource Delineation Map

ACE Quinton - Winsport Transmission Project
Quinton & Lower Alloways Creek Township,
Salem County, New Jersey

Date: 2/21/2023	
Drawn By: AS	
Figure 6	

DuBois & ASSOCIATES

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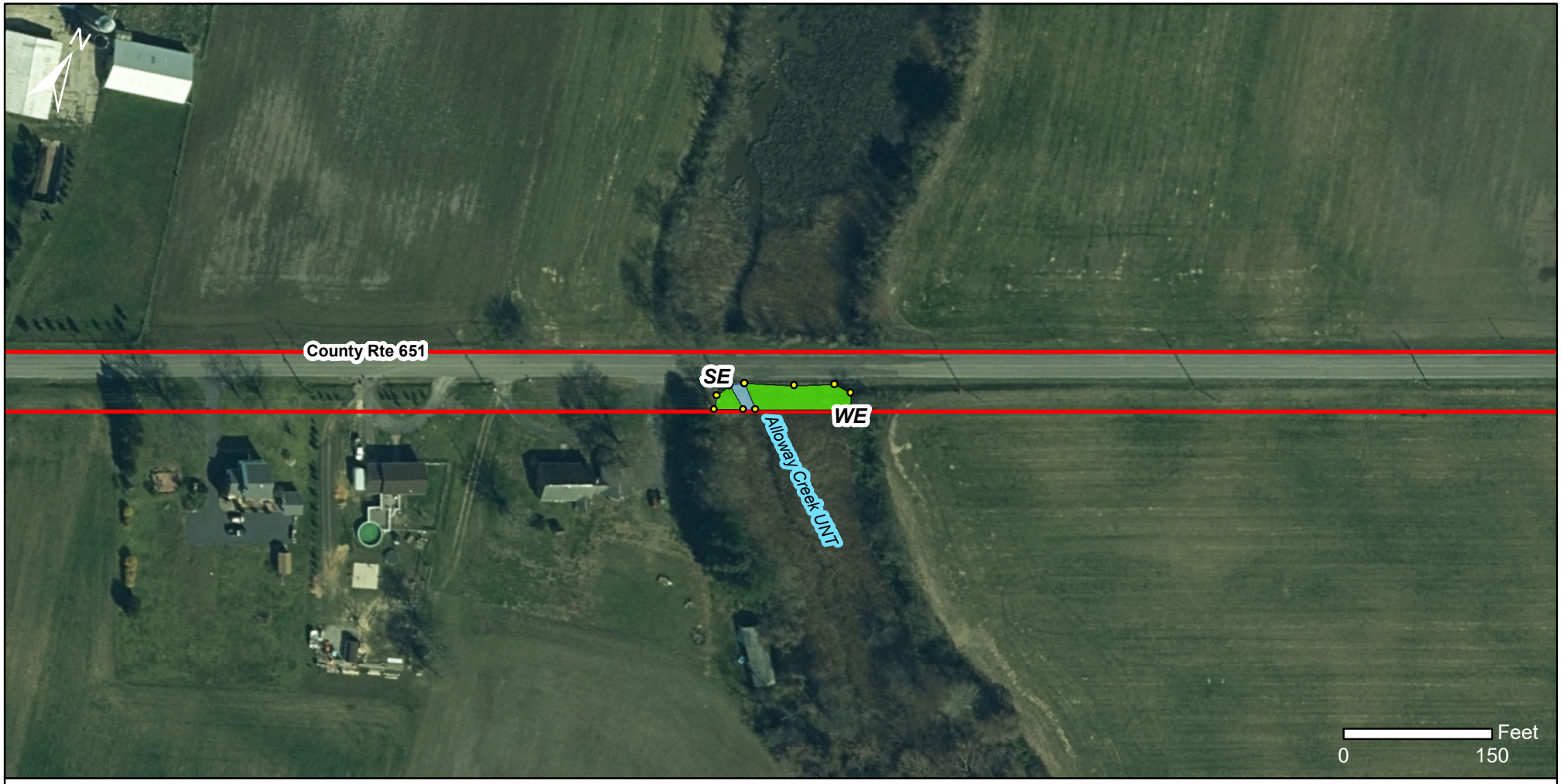

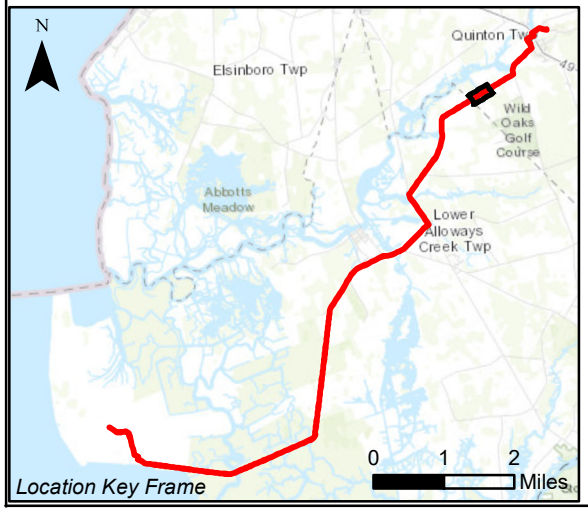

Legend

- Project Right-of-Way
- Delineation Point
- Wetland Delineation
- Watercourse Delineation

Water Resource Delineation Map

ACE Quinton - Winsport Transmission Project
Quinton & Lower Alloways Creek Township,
Salem County, New Jersey

Date: 2/22/2023	DuBois & ASSOCIATES
Drawn By: AS	
Figure 7	

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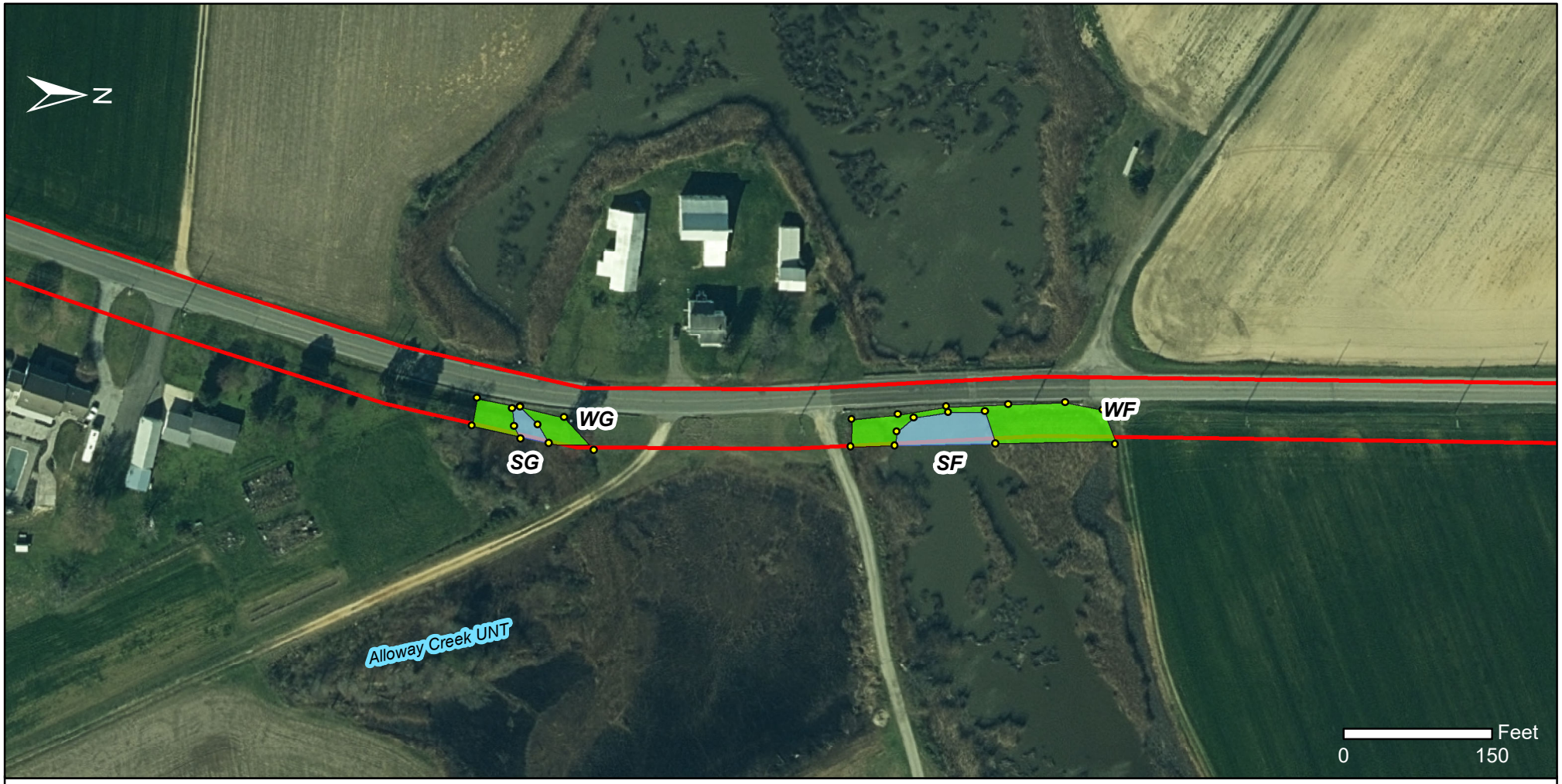

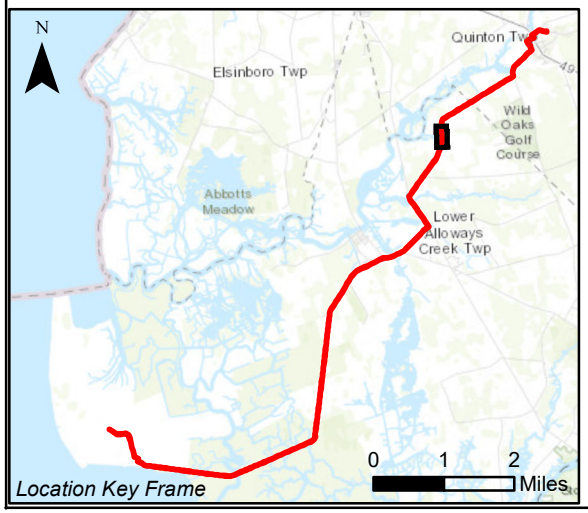

Legend

- Project Right-of-Way
- Delineation Point
- Wetland Delineation
- Watercourse Delineation

Water Resource Delineation Map

ACE Quinton - Winsport Transmission Project
Quinton & Lower Alloways Creek Township,
Salem County, New Jersey

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Figure 8	

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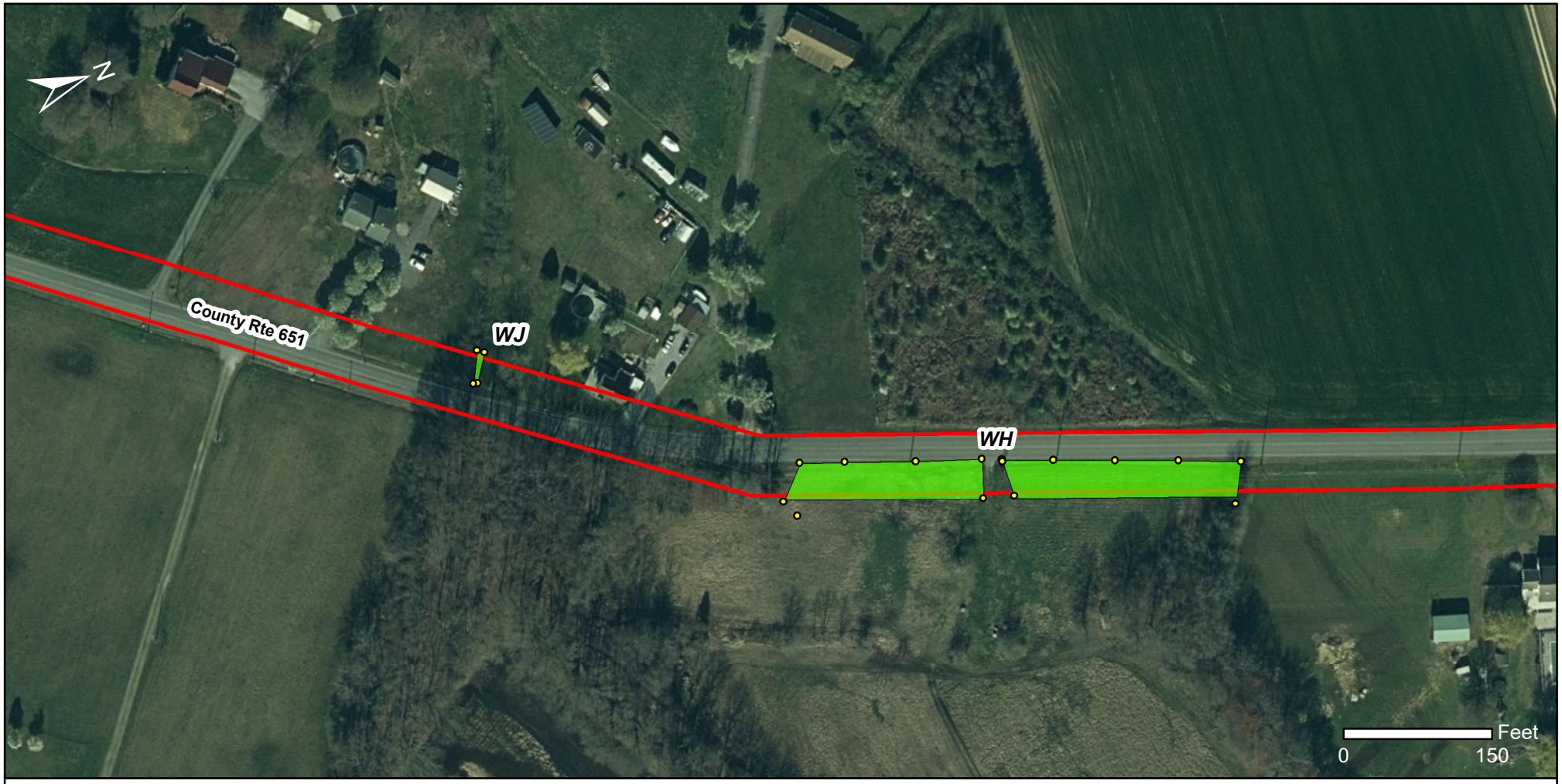
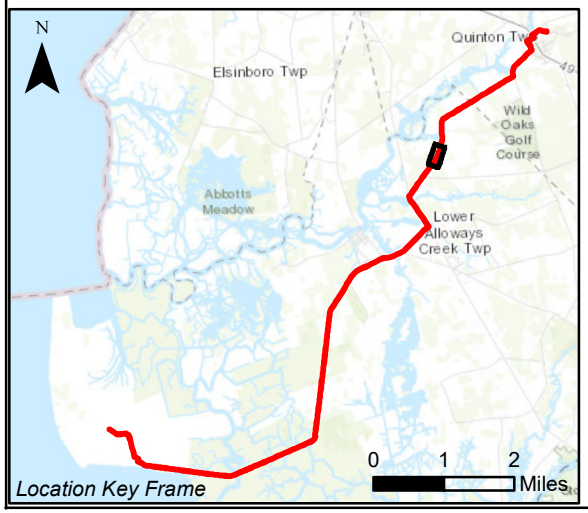
Document Path: S:\JOBS NUMBERS\D1067.080\Wetland Delineation\Wet_8.mxd

This map was developed using Geographic Information Systems Digital Data. This map is for visual display purposes only and all locations are approximate.





Legend

- Project Right-of-Way
- Delineation Point
- Wetland Delineation
- Watercourse Delineation

Water Resource Delineation Map

ACE Quinton - Winsport Transmission Project
Quinton & Lower Alloways Creek Township,
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Figure 9	

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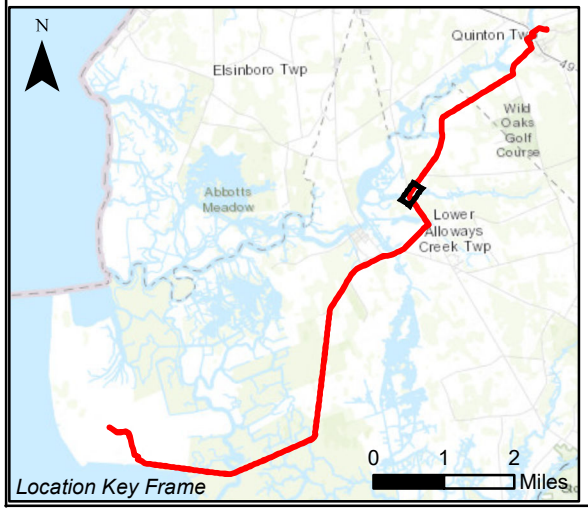
Document Path: S:\JOBS NUMBERS\D1067.080\Wetland Delineation\Wet_9.mxd

This map was developed using Geographic Information Systems Digital Data. This map is for visual display purposes only and all locations are approximate.



Legend

- Project Right-of-Way
- Delineation Point
- Wetland Delineation
- Watercourse Delineation

Water Resource Delineation Map

ACE Quinton - Winsport Transmission Project
Quinton & Lower Alloways Creek Township,
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Drawn By: AS	
Figure 10	

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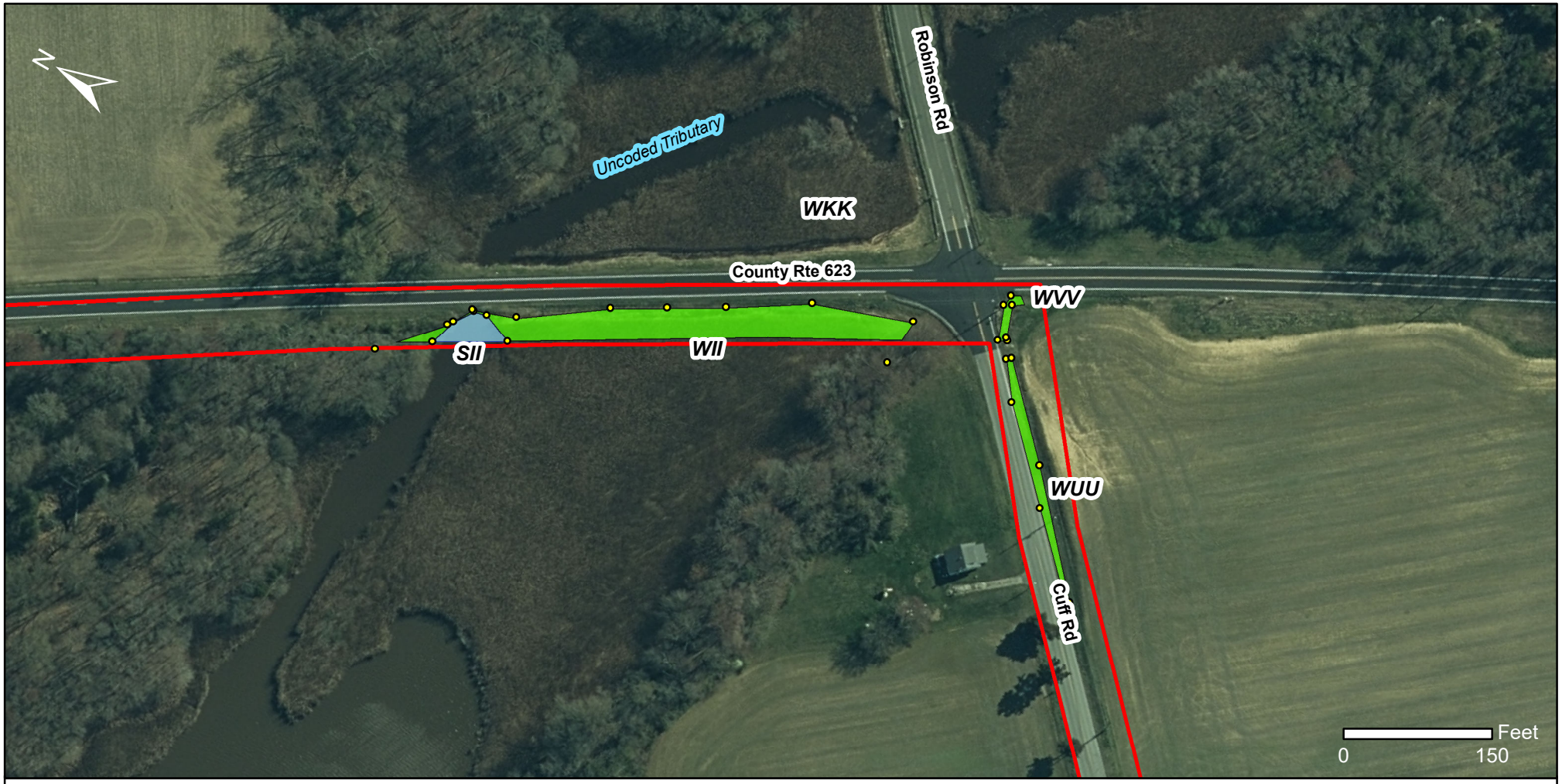
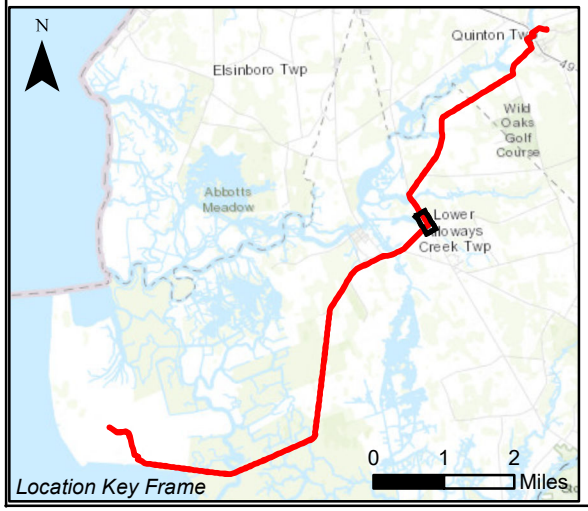
Document Path: S:\JOBS NUMBERS\D1067.080\Wetland Delineation\Wet_10.mxd

This map was developed using Geographic Information Systems Digital Data. This map is for visual display purposes only and all locations are approximate.





Legend

- Project Right-of-Way
- Delineation Point
- Wetland Delineation
- Watercourse Delineation

Water Resource Delineation Map

ACE Quinton - Winsport Transmission Project
Quinton & Lower Alloways Creek Township,
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Drawn By: AS	
Figure 11	

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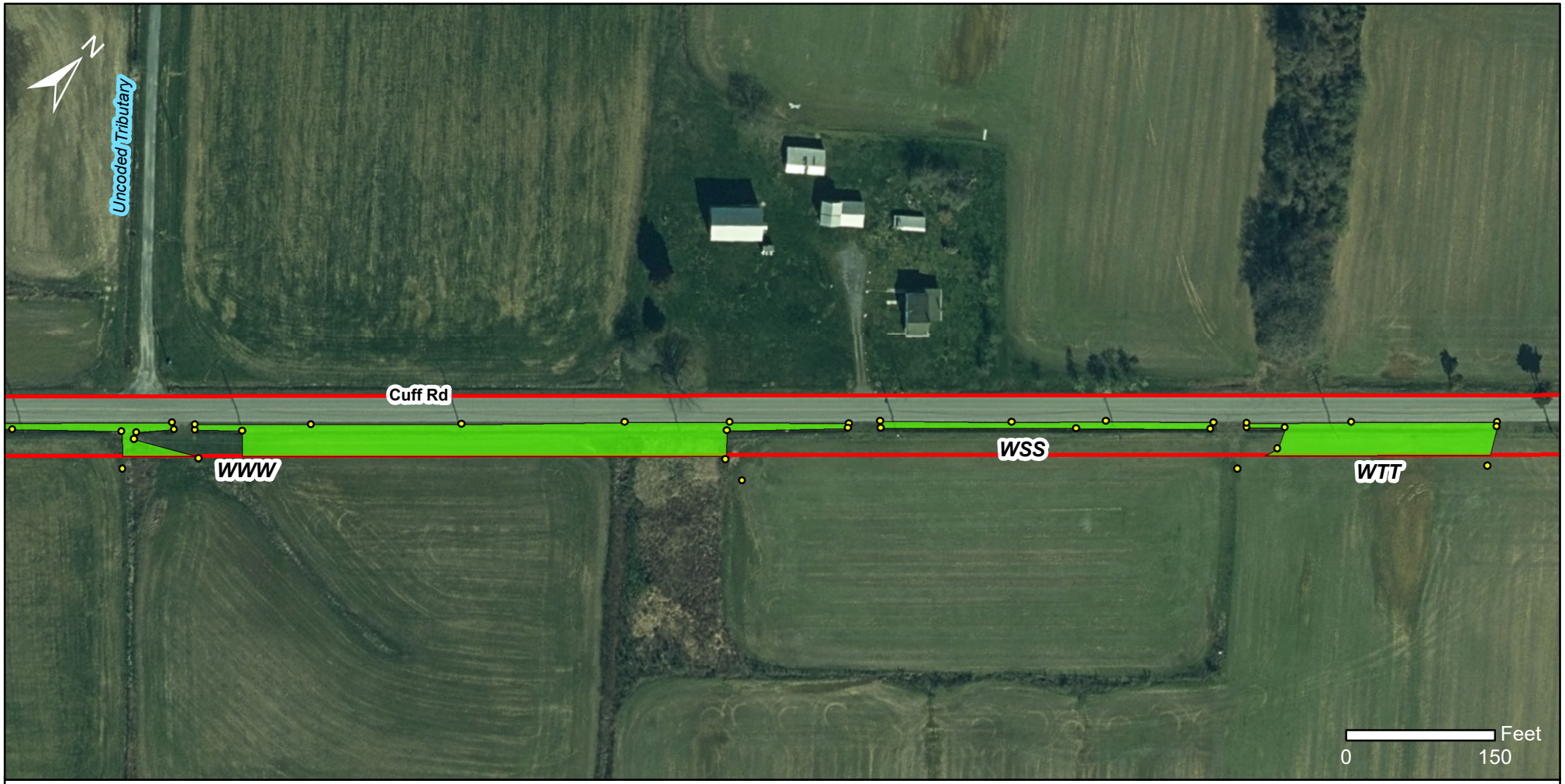
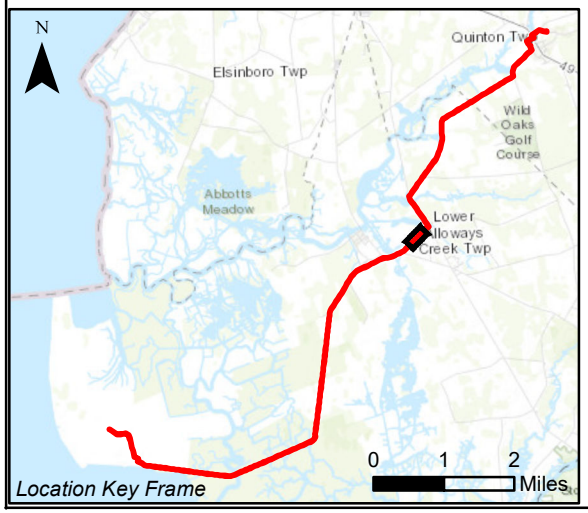
Document Path: S:\JOBS NUMBERS\D1067.080\Wetland Delineation\Wet_11.mxd





Legend

- Project Right-of-Way
- Delineation Point
- Wetland Delineation
- Watercourse Delineation

Water Resource Delineation Map

ACE Quinton - Winsport Transmission Project
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Figure 12	

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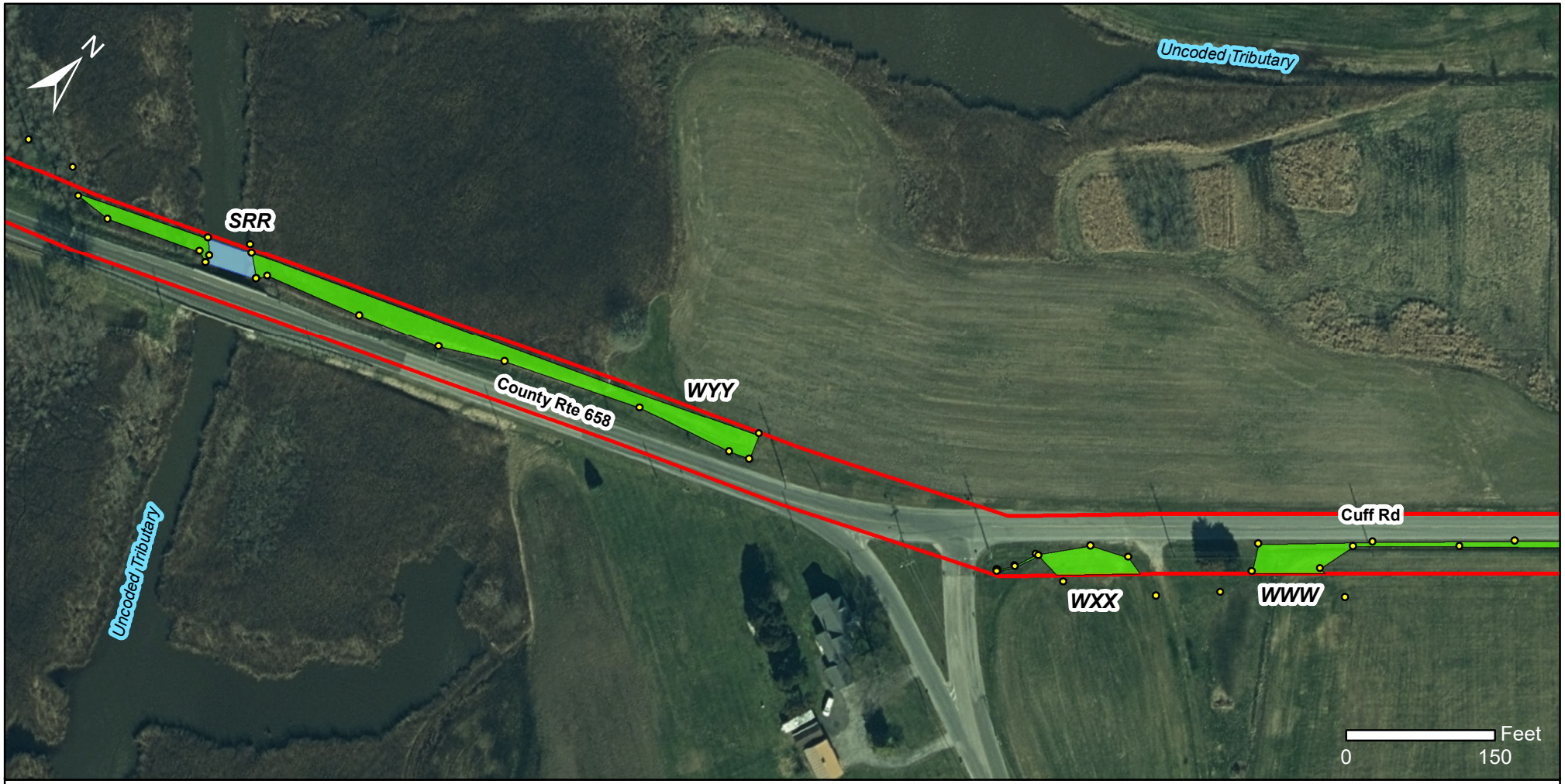
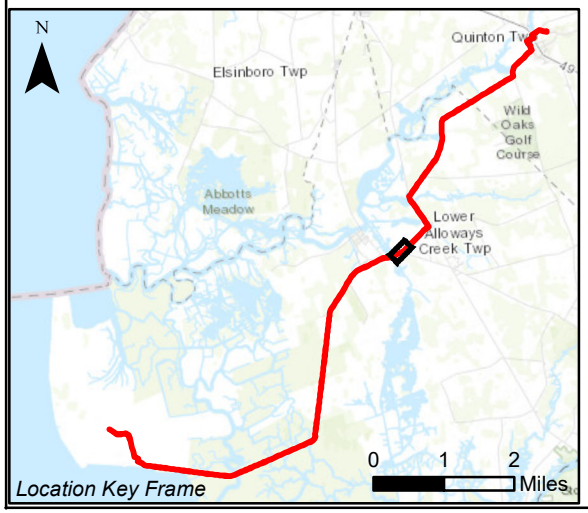
This map was developed using Geographic Information Systems Digital Data. This map is for visual display purposes only and all locations are approximate.





Legend

- Project Right-of-Way
- Delineation Point
- Wetland Delineation
- Watercourse Delineation

Water Resource Delineation Map

ACE Quinton - Winsport Transmission Project
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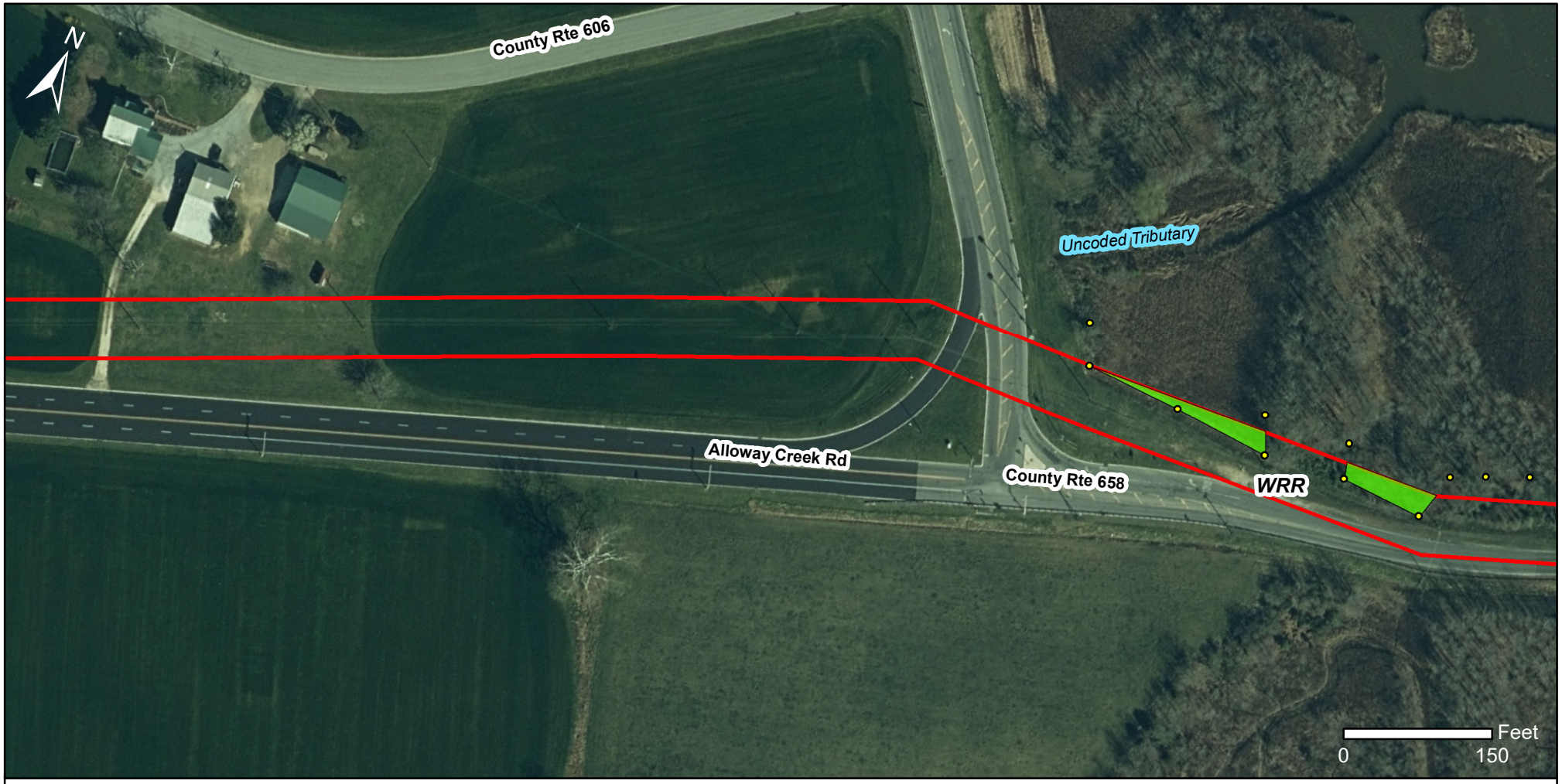
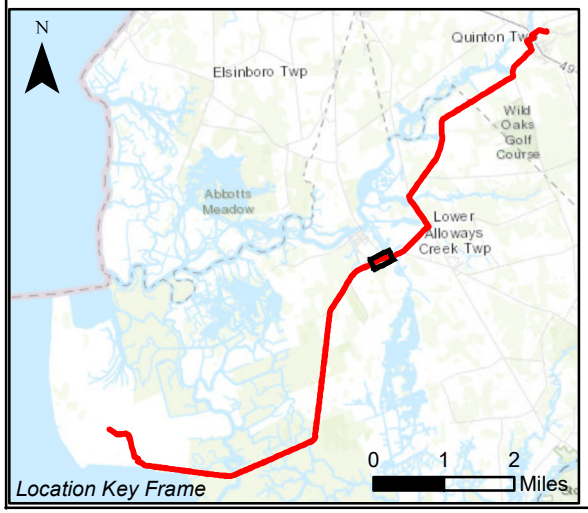
Document Path: S:\JOBS NUMBERS\D1067.080\Wetland Delineation\Wet_13.mxd

This map was developed using Geographic Information Systems Digital Data. This map is for visual display purposes only and all locations are approximate.





Legend

- Project Right-of-Way
- Delineation Point
- Wetland Delineation
- Watercourse Delineation

Water Resource Delineation Map

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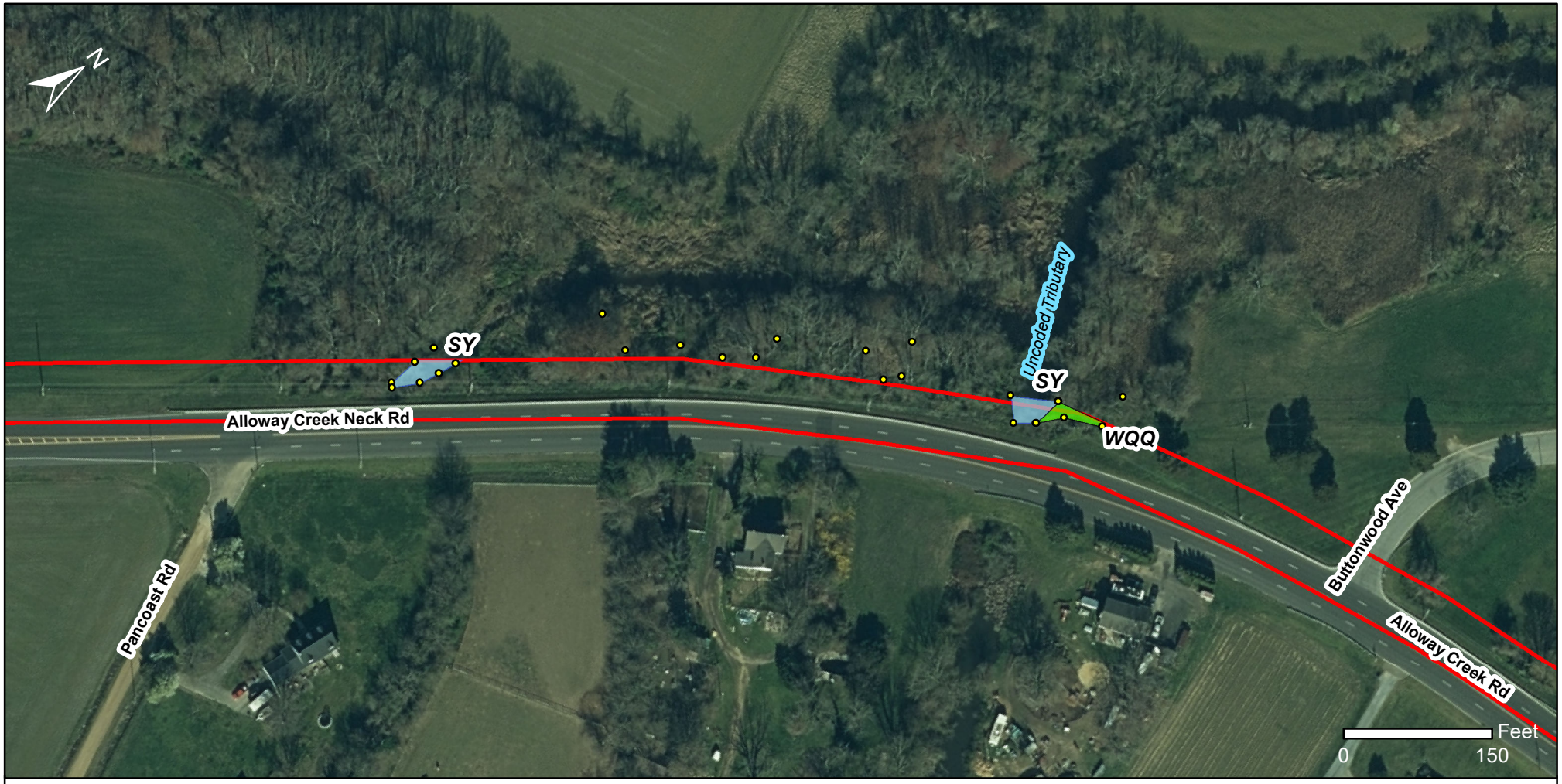
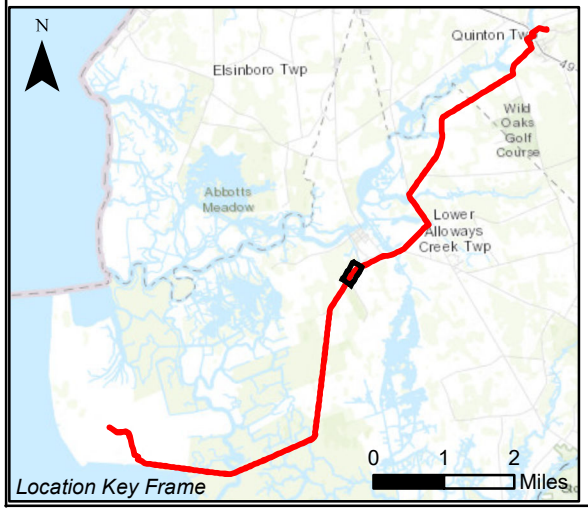
Document Path: S:\JOBS NUMBERS\D1067.080\Wetland Delineation\Wet_14.mxd

This map was developed using Geographic Information Systems Digital Data. This map is for visual display purposes only and all locations are approximate.





Legend

- Project Right-of-Way
- Delineation Point
- Wetland Delineation
- Watercourse Delineation

Water Resource Delineation Map

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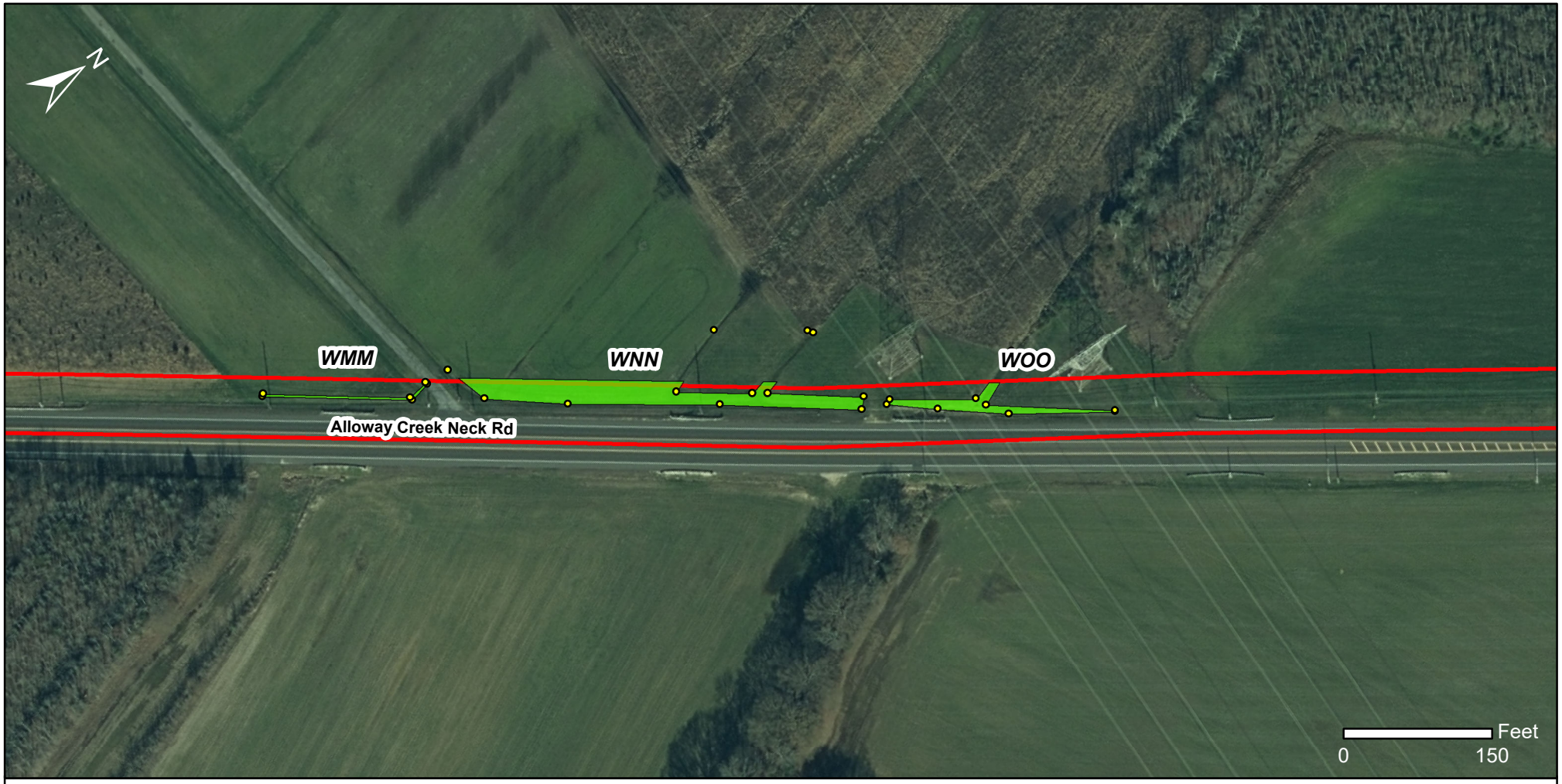
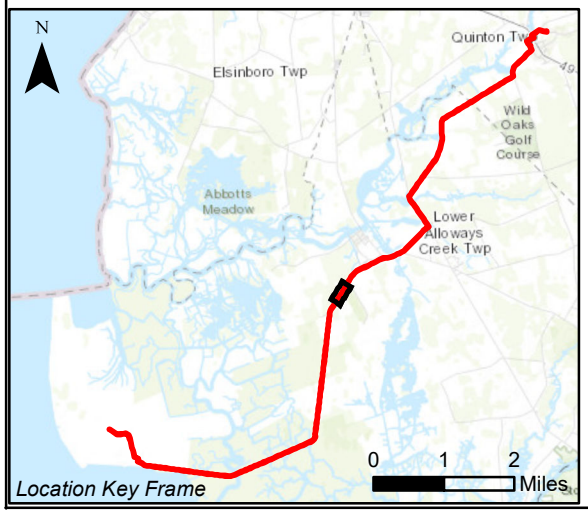
Document Path: S:\JOBS NUMBERS\D1067.080\Wetland Delineation\Wet_15.mxd

This map was developed using Geographic Information Systems Digital Data. This map is for visual display purposes only and all locations are approximate.





Legend

- Project Right-of-Way
- Delineation Point
- Wetland Delineation
- Watercourse Delineation

Water Resource Delineation Map

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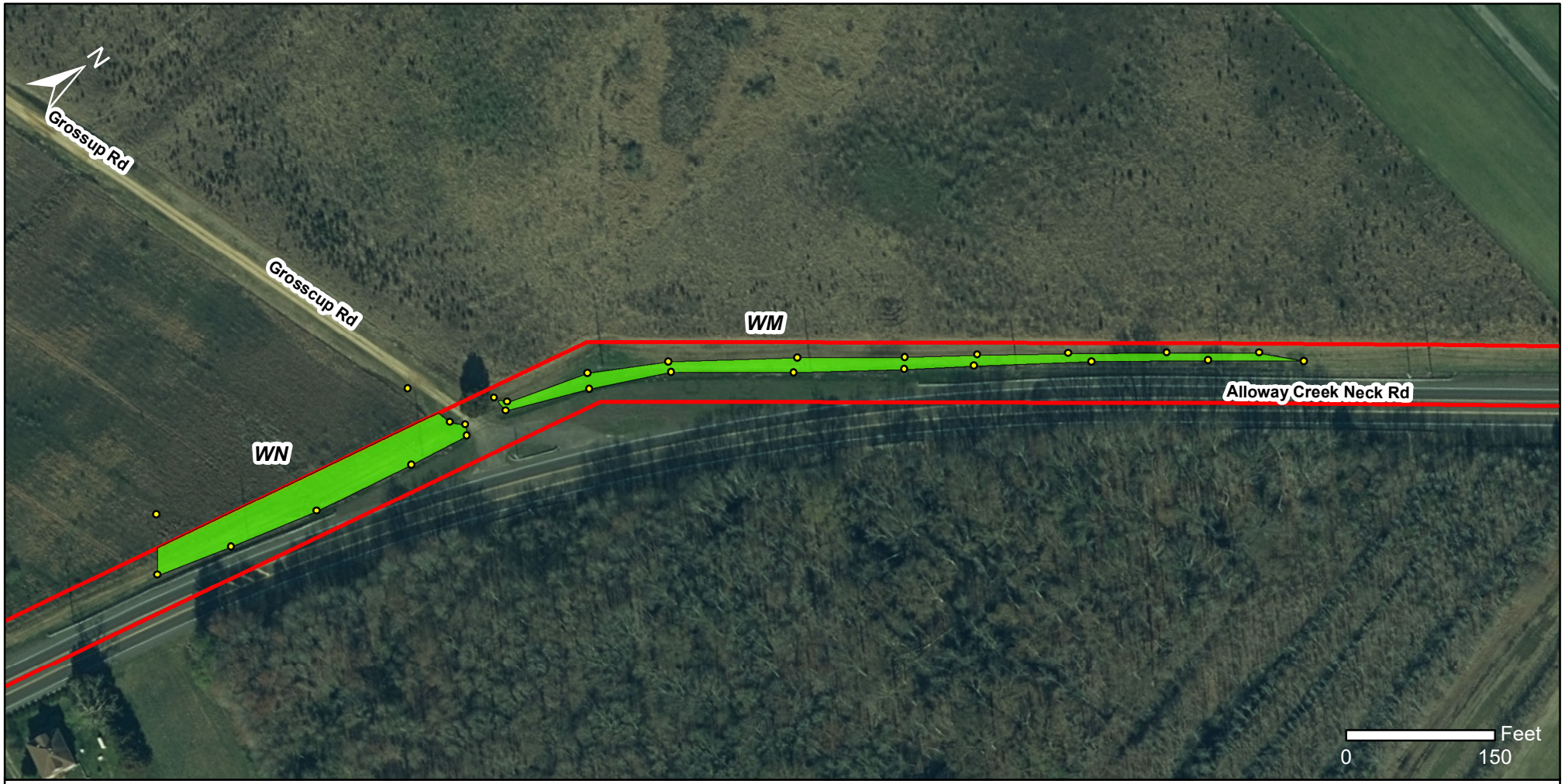
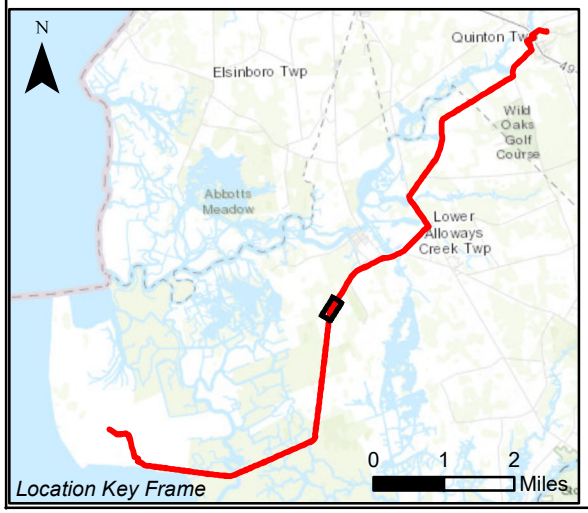
This map was developed using Geographic Information Systems Digital Data. This map is for visual display purposes only and all locations are approximate.





Legend

- Project Right-of-Way
- Delineation Point
- Wetland Delineation
- Watercourse Delineation

Water Resource Delineation Map

ACE Quinton - Winsport Transmission Project
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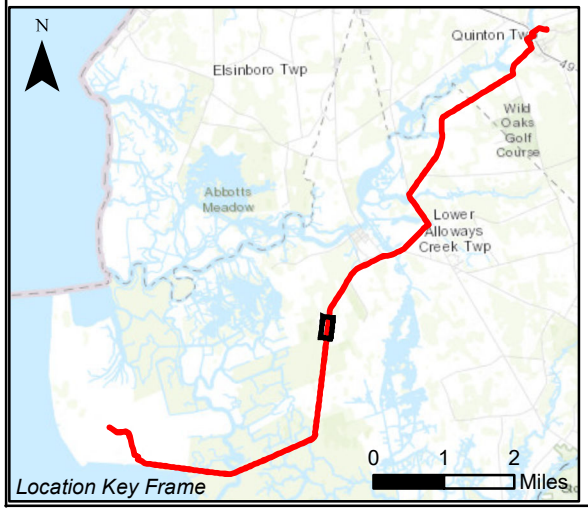
Document Path: S:\JOBS NUMBERS\D1067.080\Wetland Delineation\Wet_17.mxd

This map was developed using Geographic Information Systems Digital Data. This map is for visual display purposes only and all locations are approximate.



Legend

- Project Right-of-Way
- Delineation Point
- Wetland Delineation
- Watercourse Delineation

Water Resource Delineation Map

ACE Quinton - Winsport Transmission Project
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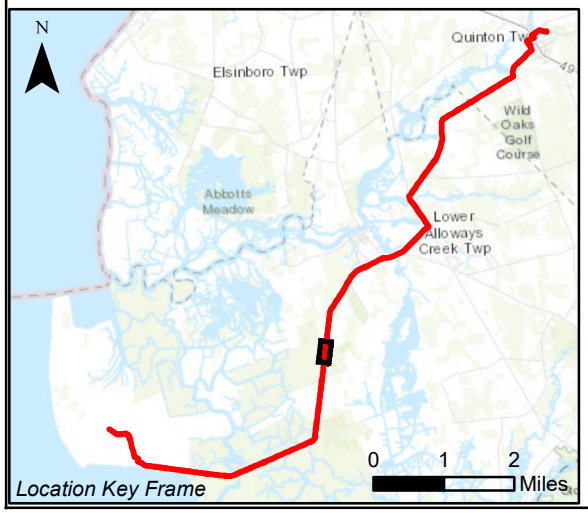
Document Path: S:\JOBS NUMBERS\D1067.080\Wetland Delineation\Wet_18.mxd

This map was developed using Geographic Information Systems Digital Data. This map is for visual display purposes only and all locations are approximate.



Legend

- Project Right-of-Way
- Delineation Point
- Wetland Delineation
- Watercourse Delineation

Water Resource Delineation Map

ACE Quinton - Winsport Transmission Project
Quinton & Lower Alloways Creek Township,
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Document Path: S:\JOBS NUMBERS\D1067.080\Wetland Delineation\Wet_19.mxd

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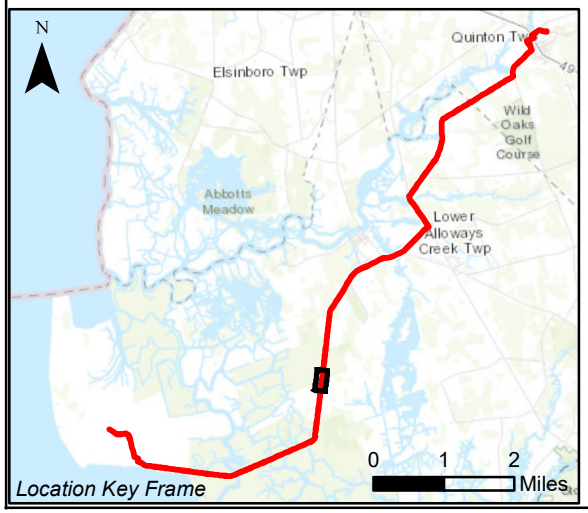

Legend

- Project Right-of-Way
- Delineation Point
- Wetland Delineation
- Watercourse Delineation

Water Resource Delineation Map

ACE Quinton - Winsport Transmission Project
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Figure 20	

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Document Path: S:\JOBS NUMBERS\D1067.080\Wetland Delineation\Wet_20.mxd

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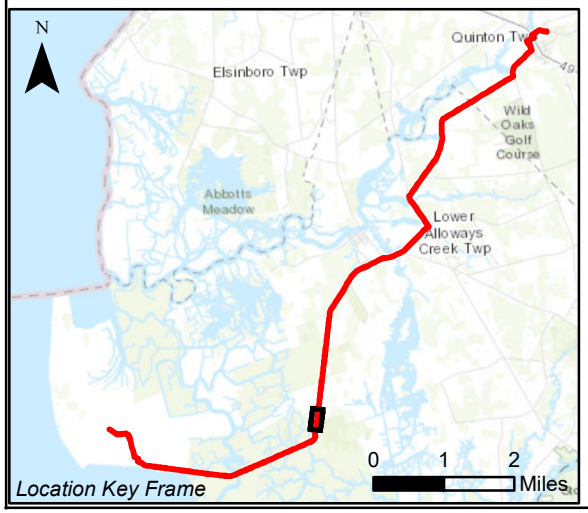

Legend

- Project Right-of-Way
- Delineation Point
- Wetland Delineation
- Watercourse Delineation CenterLine

Water Resource Delineation Map

ACE Quinton - Winsport Transmission Project
Quinton & Lower Alloways Creek Township,
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Document Path: S:\JOBS NUMBERS\D1067.080\Wetland Delineation\Wet_21.mxd

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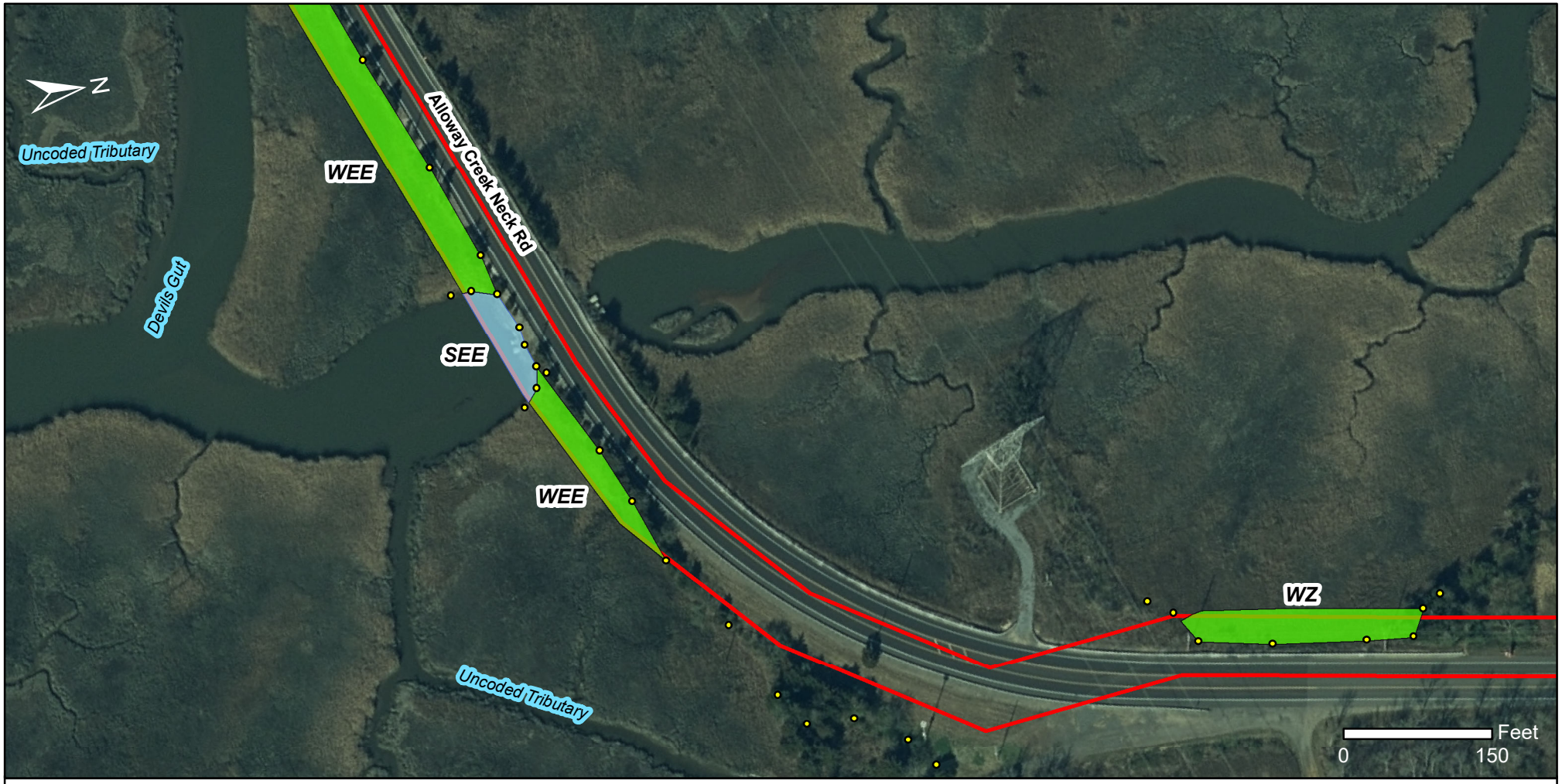

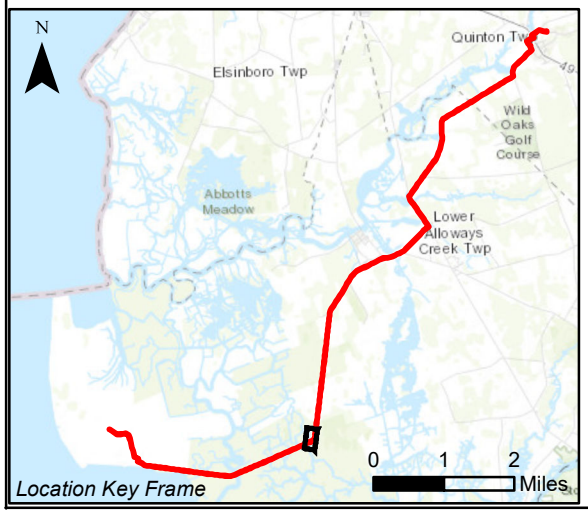

Legend

- Project Right-of-Way
- Delineation Point
- Wetland Delineation
- Watercourse Delineation

Water Resource Delineation Map

ACE Quinton - Winsport Transmission Project
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Figure 22	

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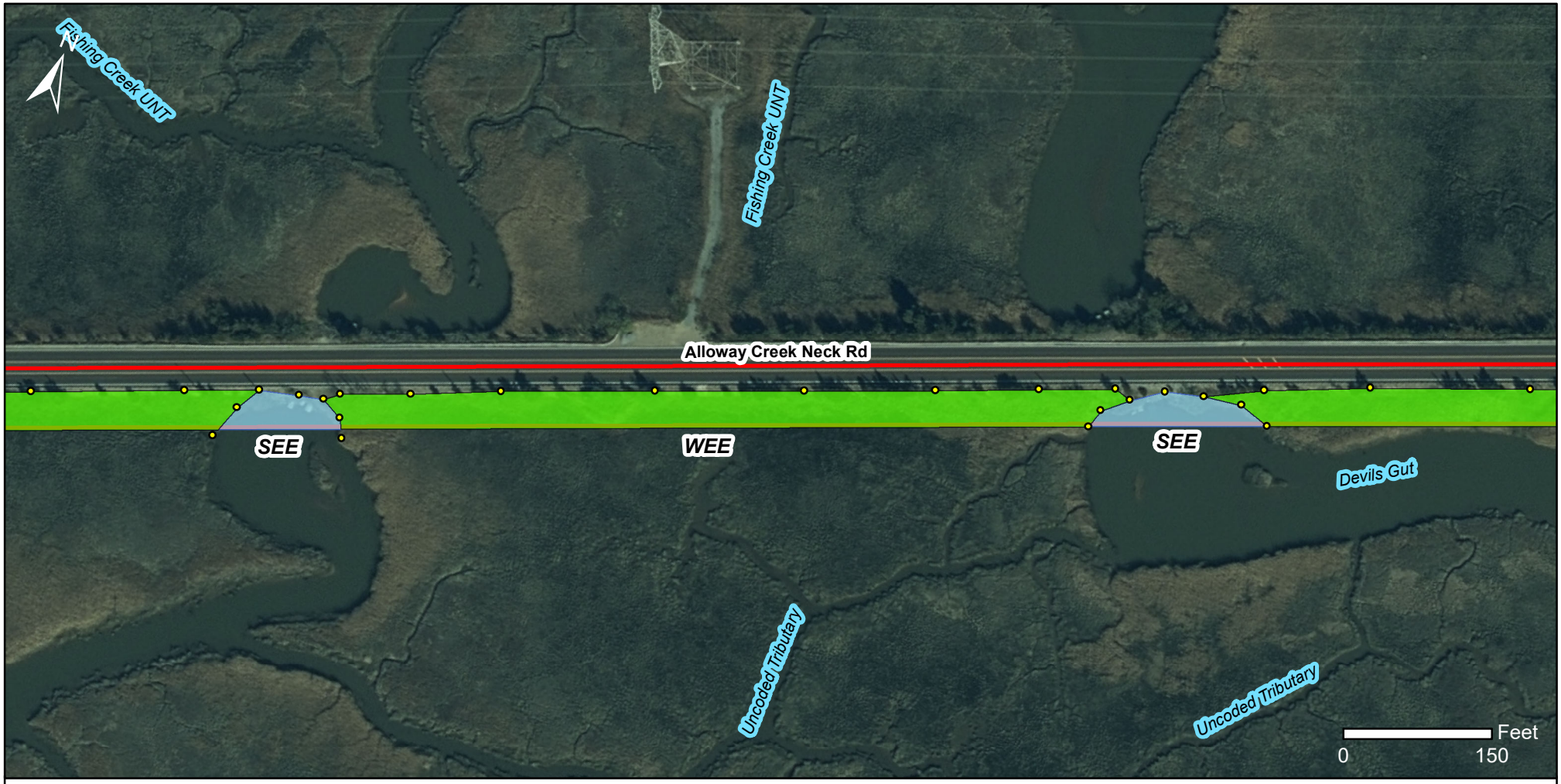
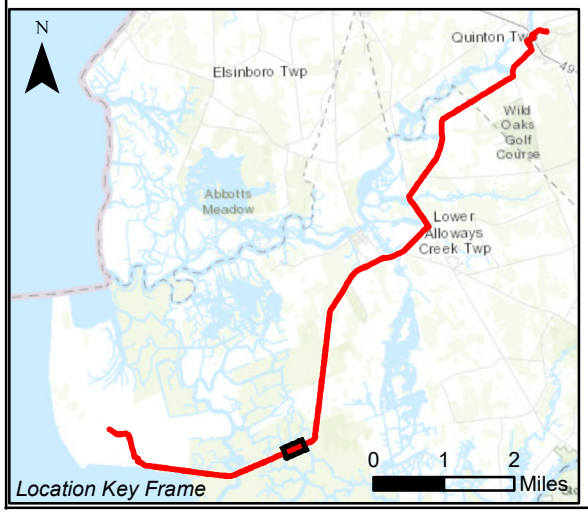
Document Path: S:\JOBS NUMBERS\D1067.080\Wetland Delineation\Wet_22.mxd





Legend

- Project Right-of-Way
- Delineation Point
- Wetland Delineation
- Watercourse Delineation

Water Resource Delineation Map

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Quinton & Lower Alloways Creek Township,
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Figure 23	

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Document Path: S:\JOBS NUMBERS\D1067.080\Wetland Delineation\Wet_23.mxd

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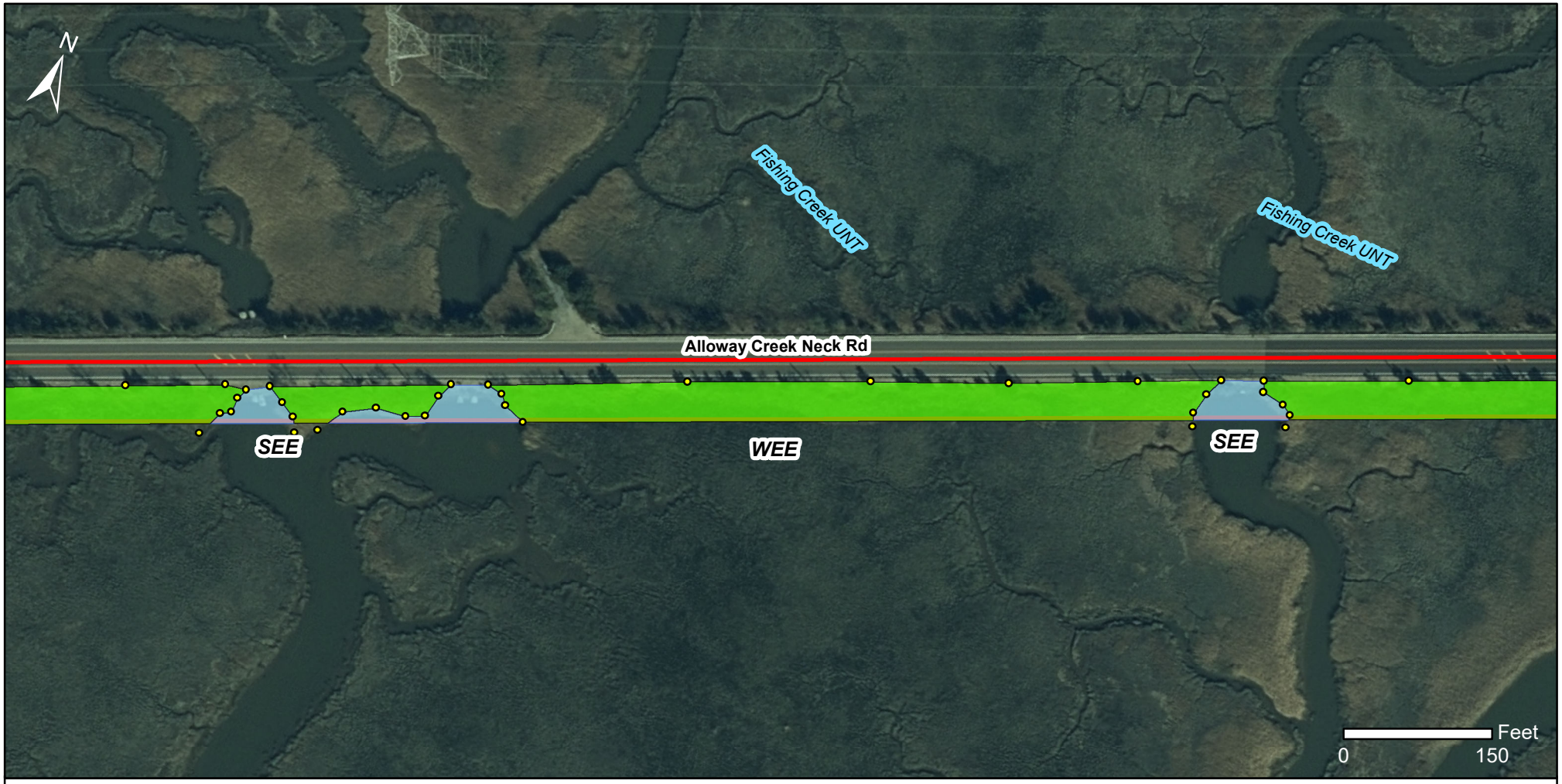

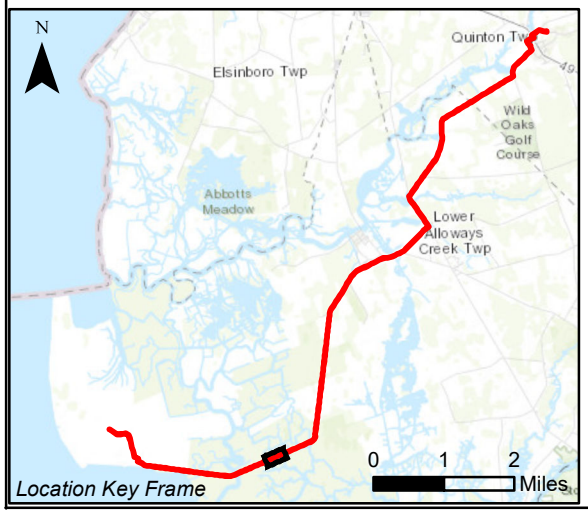

Legend

- Project Right-of-Way
- Delineation Point
- Wetland Delineation
- Watercourse Delineation

Water Resource Delineation Map

ACE Quinton - Winsport Transmission Project
Quinton & Lower Alloways Creek Township,
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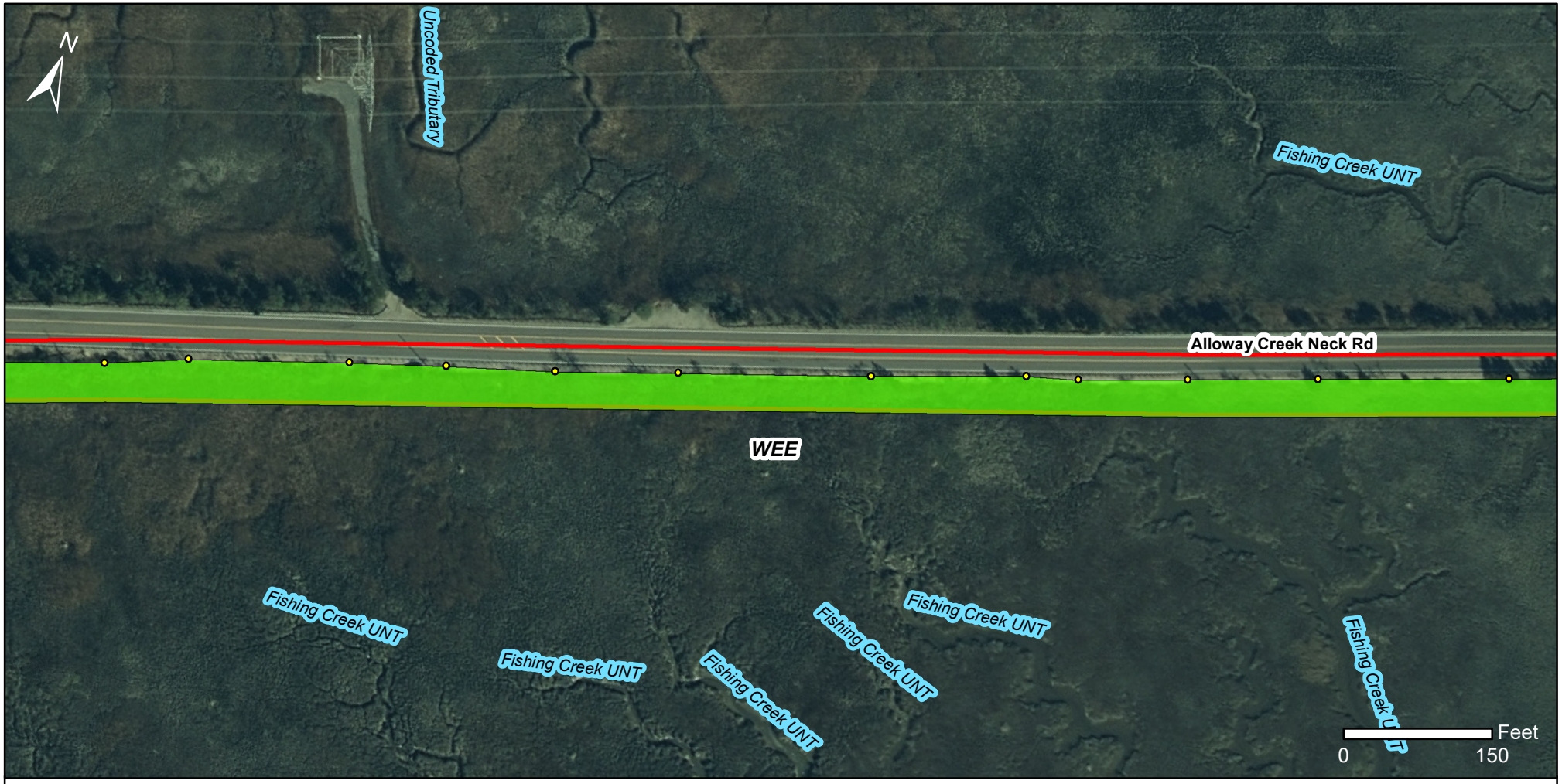
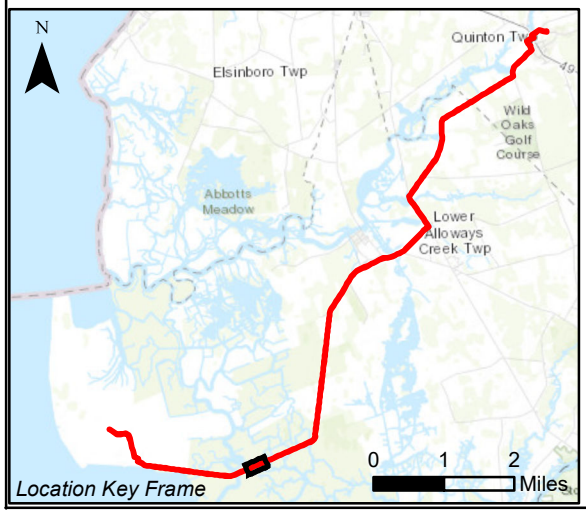
Document Path: S:\JOBS NUMBERS\D1067.080\Wetland Delineation\Wet_24.mxd

This map was developed using Geographic Information Systems Digital Data. This map is for visual display purposes only and all locations are approximate.





Legend

- Project Right-of-Way
- Delineation Point
- Wetland Delineation
- Watercourse Delineation

Water Resource Delineation Map

ACE Quinton - Winsport Transmission Project
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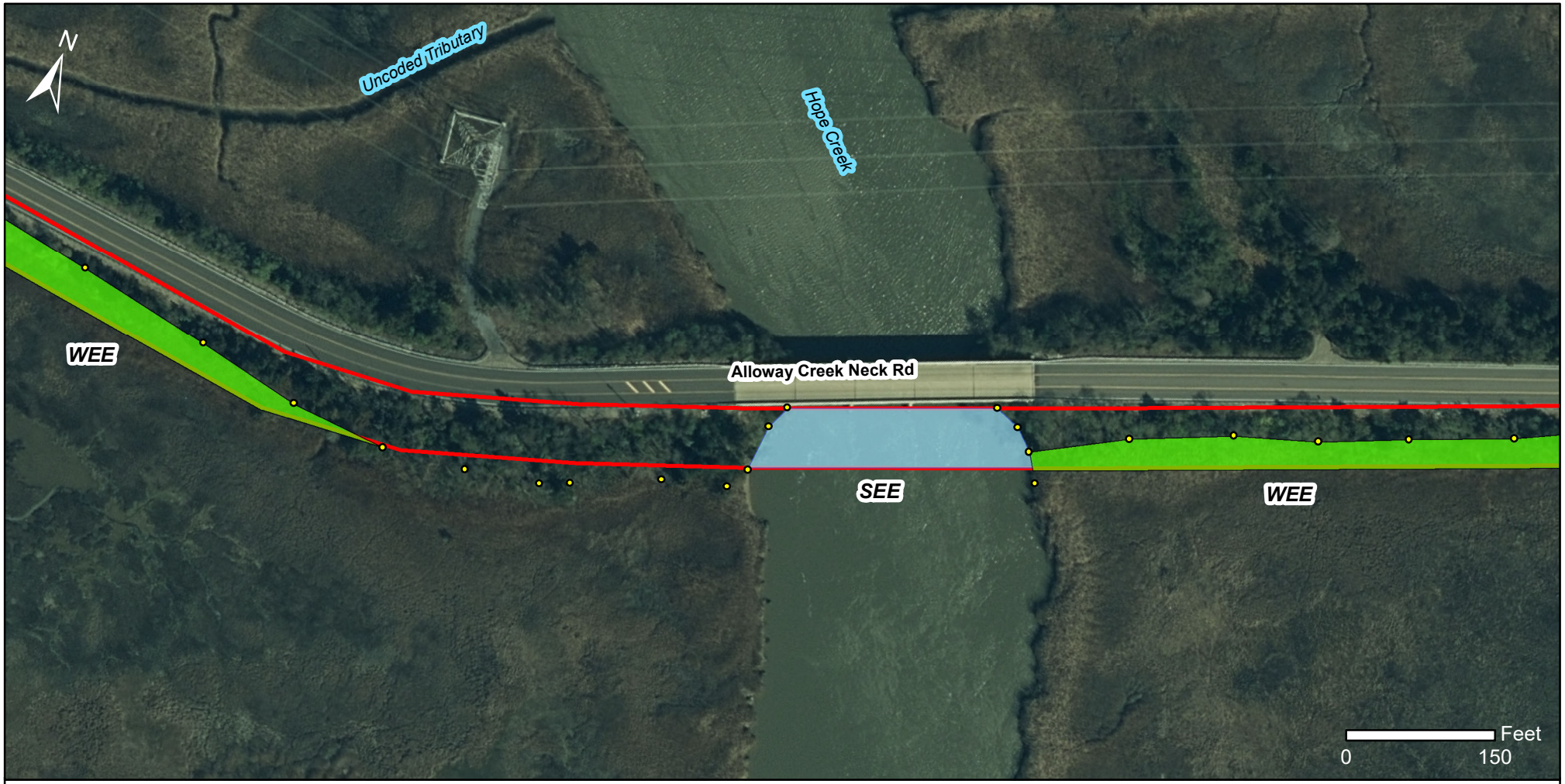
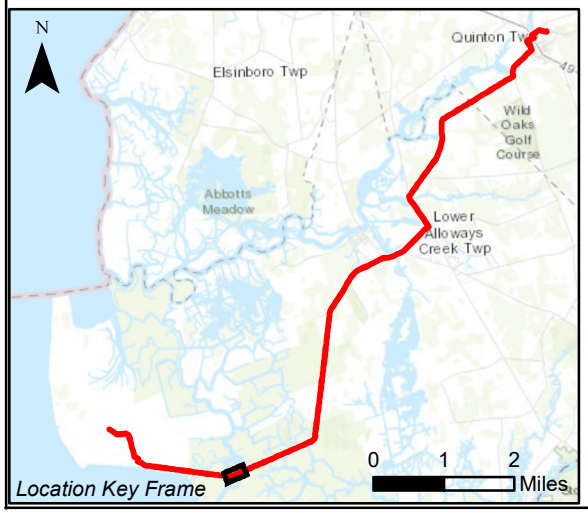
Document Path: S:\JOBS NUMBERS\D1067.080\Wetland Delineation\Wet_25.mxd

This map was developed using Geographic Information Systems Digital Data. This map is for visual display purposes only and all locations are approximate.





Legend

- Project Right-of-Way
- Delineation Point
- Wetland Delineation
- Watercourse Delineation

Water Resource Delineation Map

ACE Quinton - Winsport Transmission Project
Quinton & Lower Alloways Creek Township,
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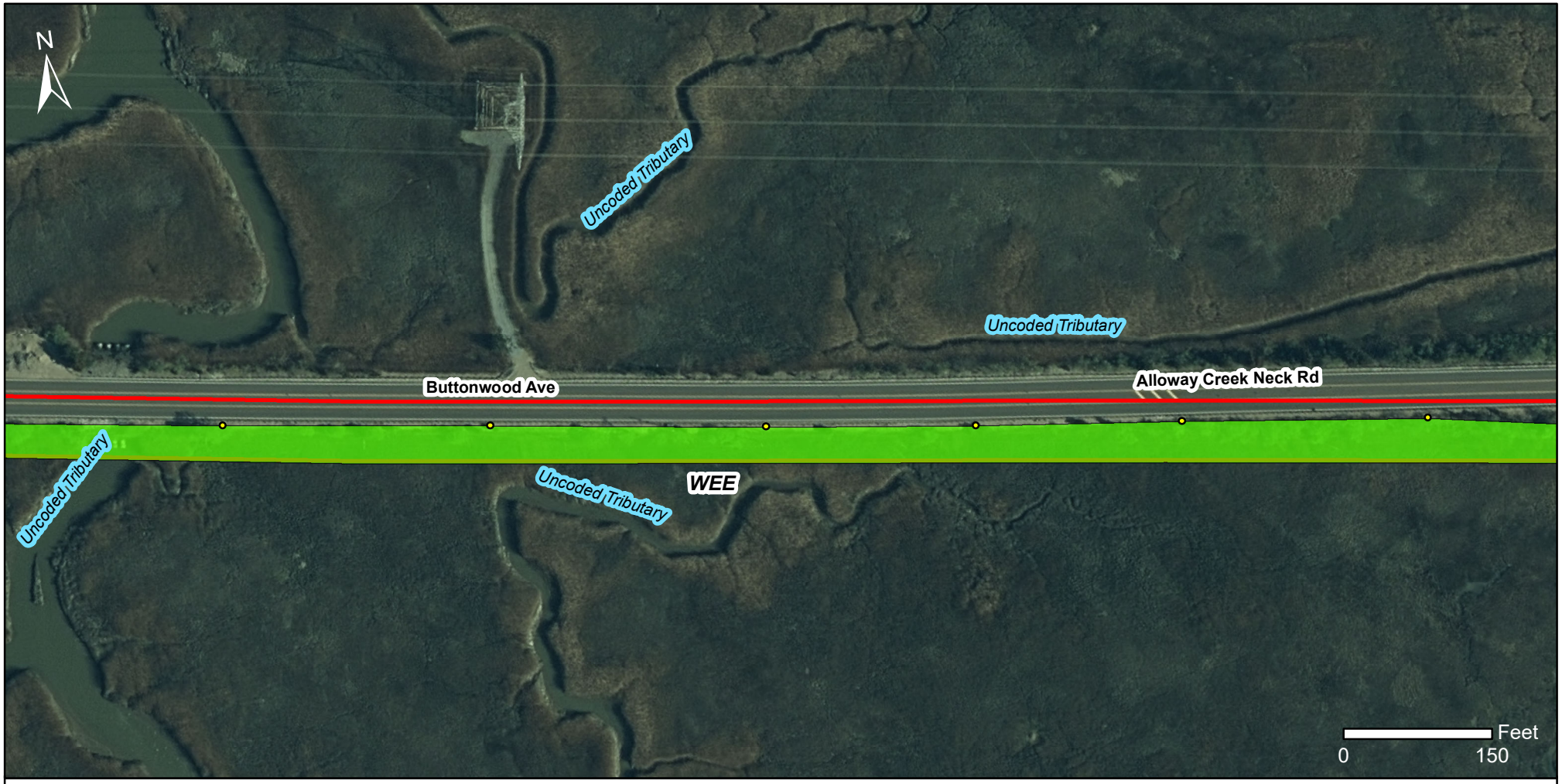
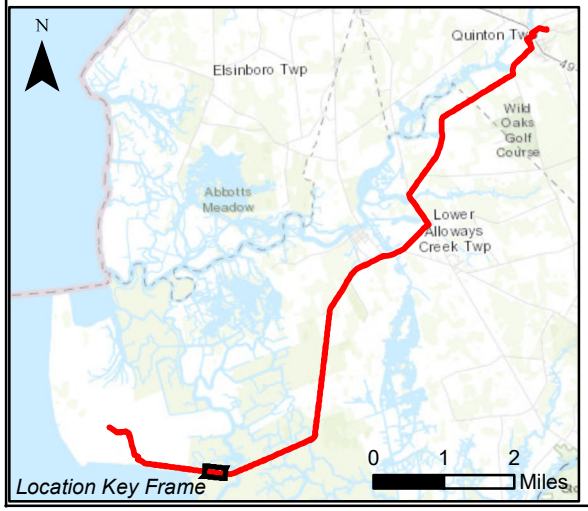
Document Path: S:\JOBS NUMBERS\D1067.080\Wetland Delineation\Wet_26.mxd

This map was developed using Geographic Information Systems Digital Data. This map is for visual display purposes only and all locations are approximate.





Legend

- Project Right-of-Way
- Delineation Point
- Wetland Delineation
- Watercourse Delineation

Water Resource Delineation Map

ACE Quinton - Winsport Transmission Project
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Figure 27	

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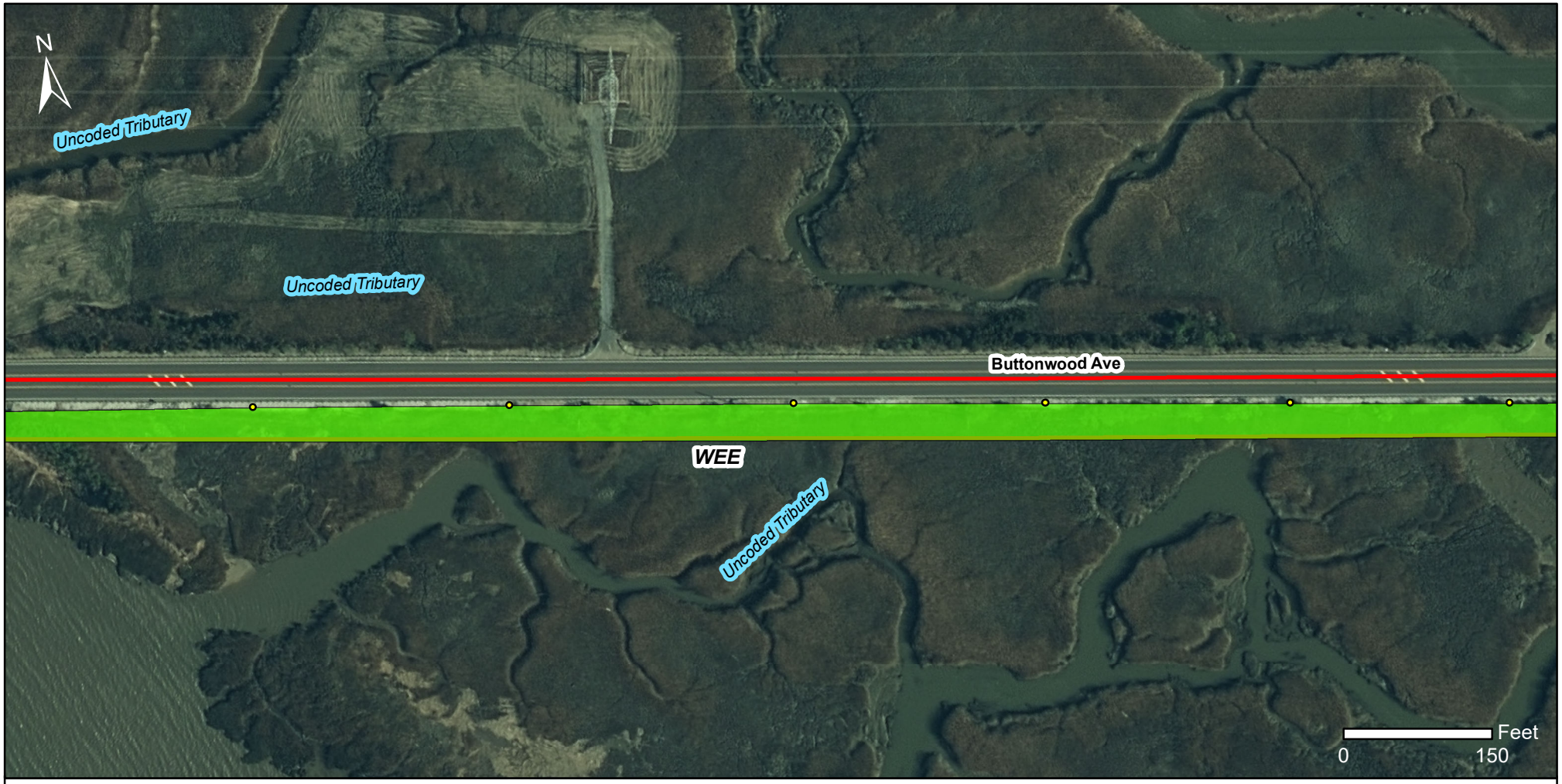
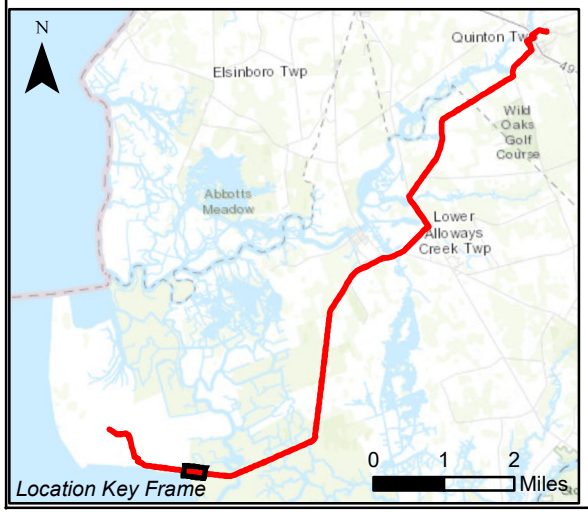
Document Path: S:\JOBS NUMBERS\D1067.080\Wetland Delineation\Wet_27.mxd

This map was developed using Geographic Information Systems Digital Data. This map is for visual display purposes only and all locations are approximate.





Legend

- Project Right-of-Way
- Delineation Point
- Wetland Delineation
- Watercourse Delineation

Water Resource Delineation Map

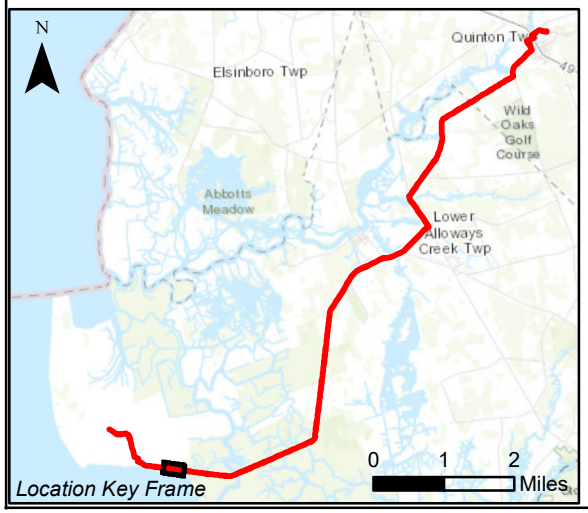
ACE Quinton - Winsport Transmission Project
Quinton & Lower Alloways Creek Township,
Salem County, New Jersey

Date: 2/22/2023	
Drawn By: AS	
Figure 28	

DuBois & ASSOCIATES

Document Path: S:\JOBS NUMBERS\D1067.080\Wetland Delineation\Wet_28.mxd

This map was developed using Geographic Information Systems Digital Data. This map is for visual display purposes only and all locations are approximate.



Legend

- Project Right-of-Way
- Delineation Point
- Wetland Delineation
- Watercourse Delineation

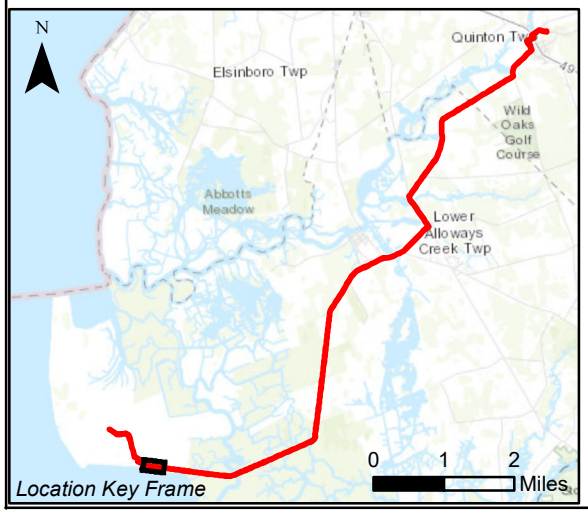
Water Resource Delineation Map

ACE Quinton - Winsport Transmission Project
Quinton & Lower Alloways Creek Township,
Salem County, New Jersey

Date: 2/22/2023	
Drawn By: AS	
Figure 29	

DuBois & ASSOCIATES

Document Path: S:\JOBS NUMBERS\D1067.080\Wetland Delineation\Wet_28.mxd



Legend

- Project Right-of-Way
- Delineation Point
- Wetland Delineation
- Watercourse Delineation

Water Resource Delineation Map

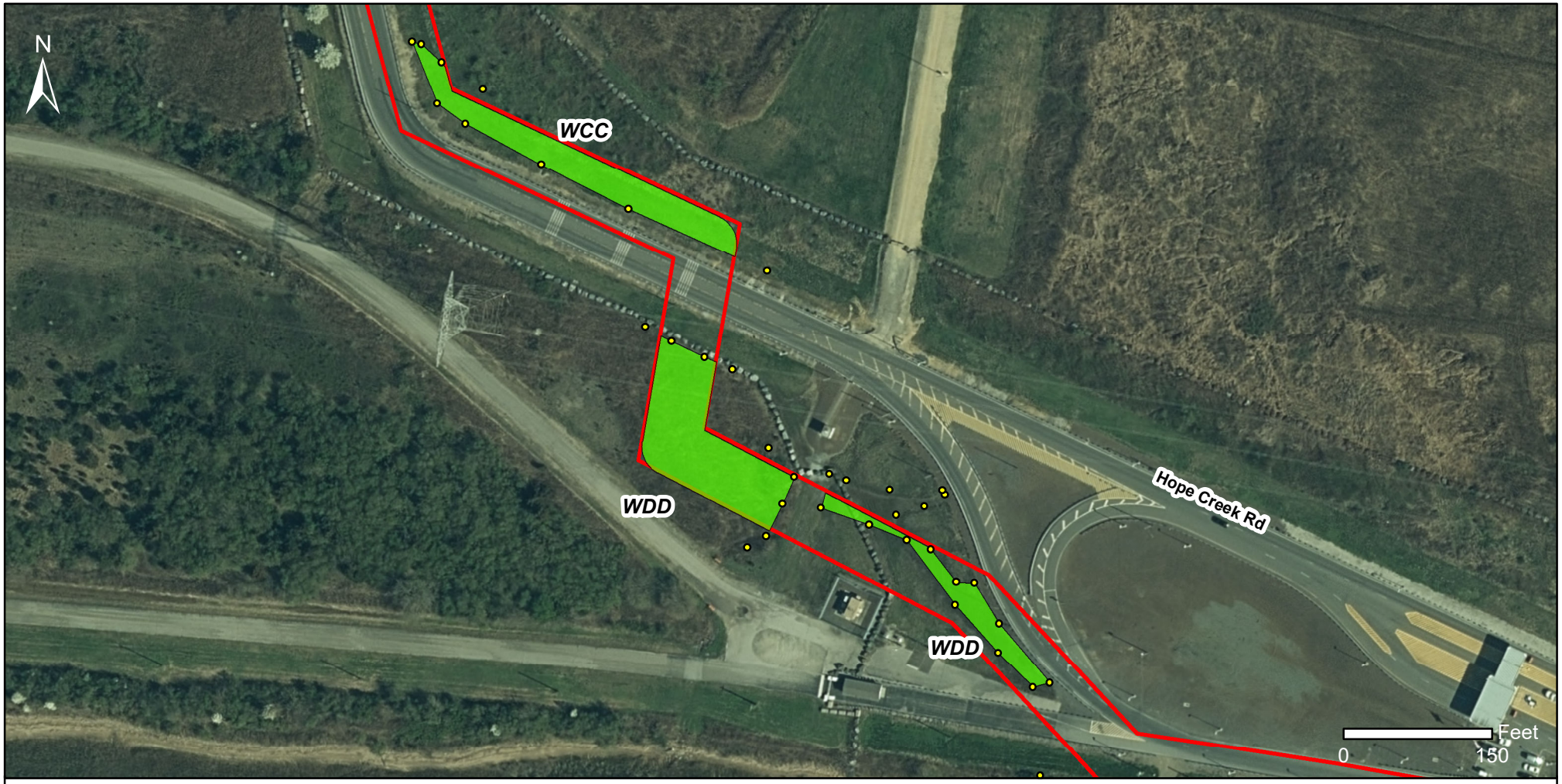
ACE Quinton - Winsport Transmission Project
Quinton & Lower Alloways Creek Township,
Salem County, New Jersey

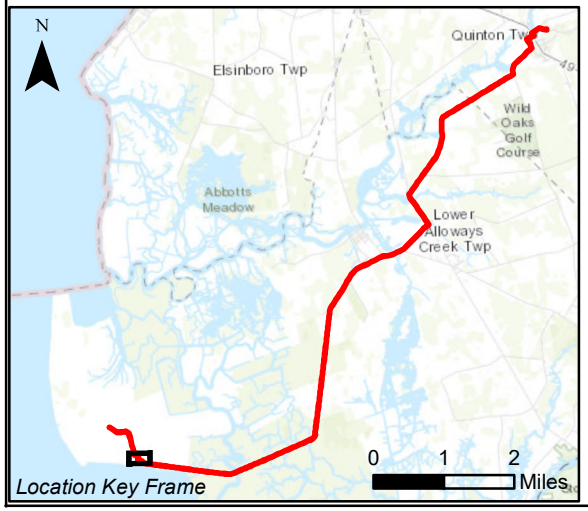
Date: 2/22/2023	
Drawn By: AS	
Figure 30	

DuBois & ASSOCIATES

Document Path: S:\JOBS NUMBERS\D1067.080\Wetland Delineation\Wet_30.mxd

This map was developed using Geographic Information Systems Digital Data. This map is for visual display purposes only and all locations are approximate.





Legend

- Project Right-of-Way
- Delineation Point
- Wetland Delineation
- Watercourse Delineation

Water Resource Delineation Map

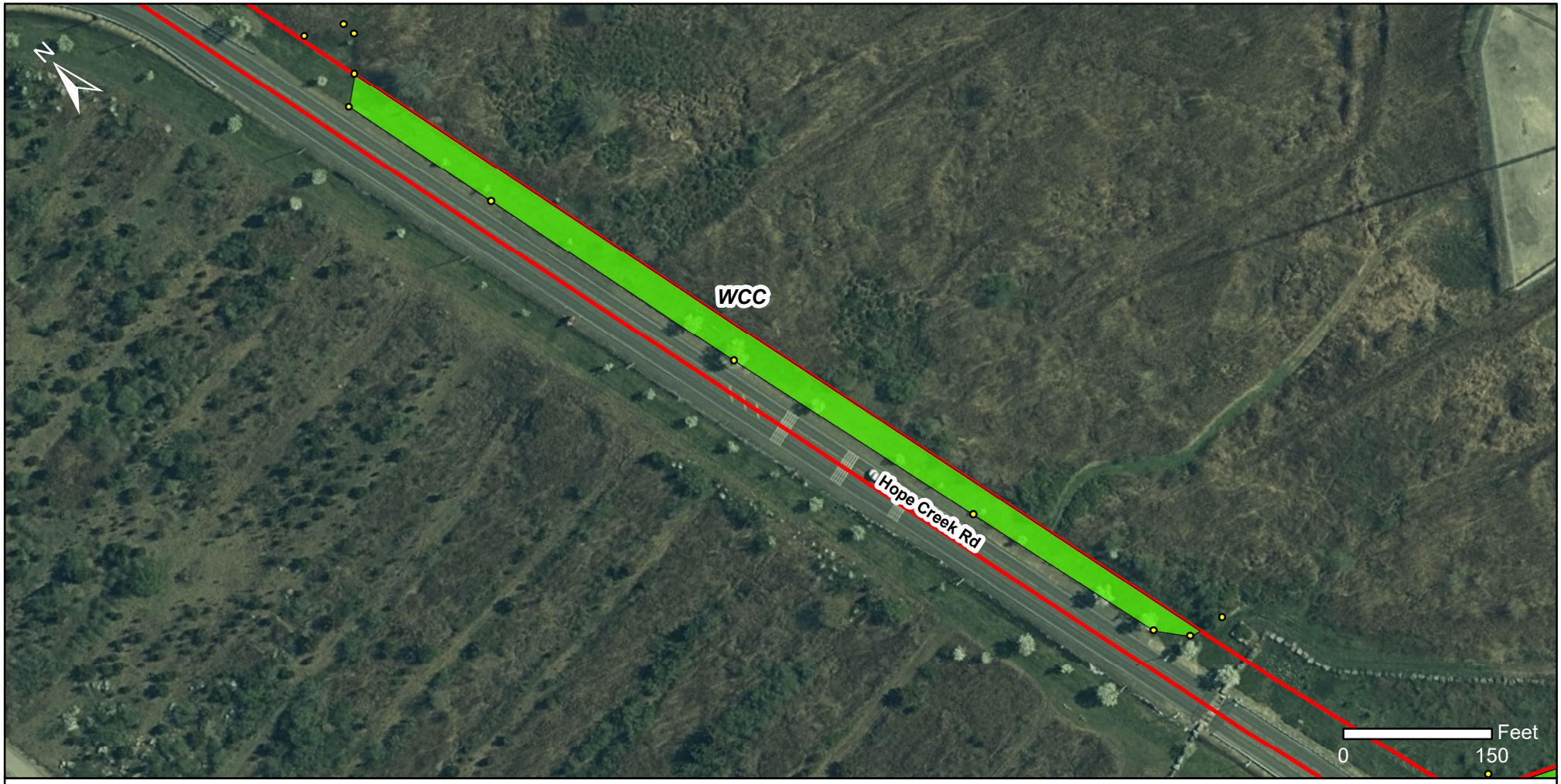
ACE Quinton - Winsport Transmission Project
Quinton & Lower Alloways Creek Township,
Salem County, New Jersey

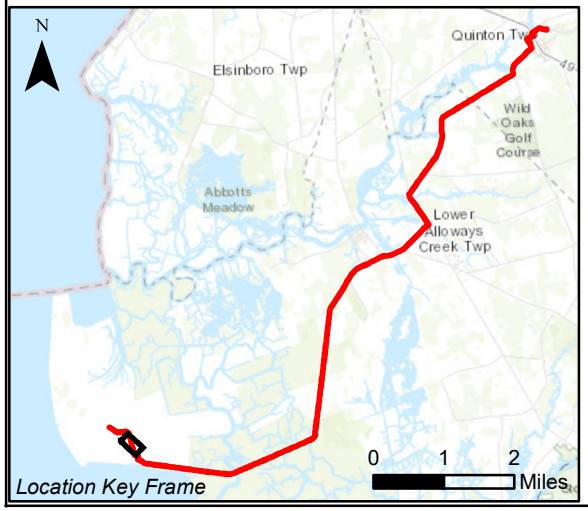
Date: 2/22/2023	
Drawn By: AS	
Figure 31	

DuBois & ASSOCIATES

Document Path: S:\JOBS NUMBERS\D1067.080\Wetland Delineation\Wet_31.mxd

This map was developed using Geographic Information Systems Digital Data. This map is for visual display purposes only and all locations are approximate.





Legend

- Project Right-of-Way
- Delineation Point
- Wetland Delineation
- Watercourse Delineation

Water Resource Delineation Map

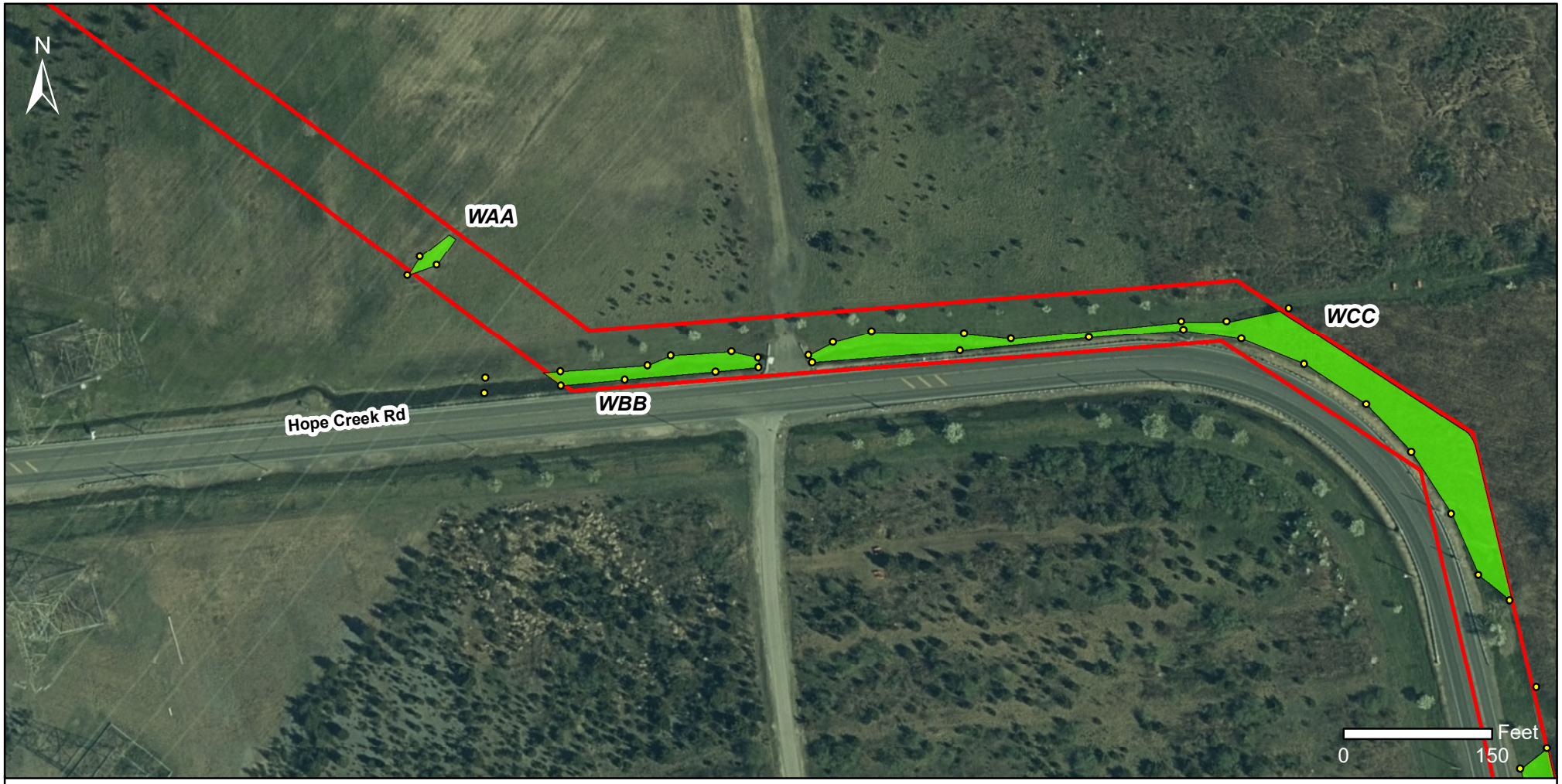
ACE Quinton - Winsport Transmission Project
Quinton & Lower Alloways Creek Township,
Salem County, New Jersey

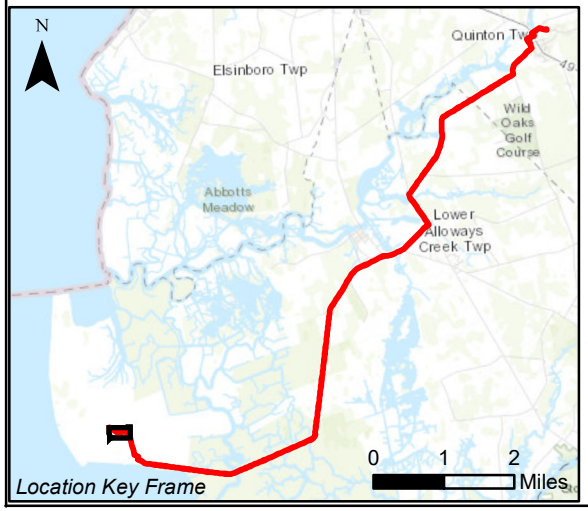
Date: 2/22/2023	
Drawn By: AS	
Figure 32	

DuBois & ASSOCIATES

Document Path: S:\JOBS NUMBERS\D1067.080\Wetland Delineation\Wet_32.mxd

This map was developed using Geographic Information Systems Digital Data. This map is for visual display purposes only and all locations are approximate.





Legend

- Project Right-of-Way
- Delineation Point
- Wetland Delineation
- Watercourse Delineation

Water Resource Delineation Map

ACE Quinton - Winsport Transmission Project
Quinton & Lower Alloways Creek Township,
Salem County, New Jersey

Date: 2/22/2023	
Drawn By: AS	
Figure 33	

DuBois & ASSOCIATES

Document Path: S:\JOBS NUMBERS\D1067.080\Wetland Delineation\Wet_33.mxd

This map was developed using Geographic Information Systems Digital Data. This map is for visual display purposes only and all locations are approximate.

Appendix A

Survey Area Photographs

Appendix B

Field Data Logs

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: ACE Quinton - Windport City/County: Quinton & LAC, Salem Sampling Date: 12/8/2021

Applicant/Owner: Atlantic City Electric State: NJ Sampling Point: WB-3

Investigator(s): Wildman, K. & Berrios, I. Section, Township, Range:

Landform (hillslope, terrace, etc.): floodplain Local relief (concave, convex, none): Slope (%): 2

Subregion (LRR or MLRA): LRRS Lat: 39.541678 Long: -75.418780 Datum: NAD83

Soil Map Unit Name: Woodstown sandy loam, 0 to 2 percent slopes NWI classification: UPL

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No _____	**Is the Sampled Area within a Wetland?** Yes X No _____
Hydric Soil Present?	Yes X	No _____	
Wetland Hydrology Present?	Yes X	No _____	

Remarks:

Estuarine Phragmites marsh along Alloway Creek tributary, toeslope of C.R. 654.

No upland data sheet. Upland = mown road shoulder sloping to Phragmites marsh.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ☑ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☑ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15) **(LRR U)**
- ☐ Hydrogen Sulfide Odor (C1)
- ☑ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present?	Yes X	No _____	Depth (inches): 0
Water Table Present?	Yes _____	No _____	Depth (inches): _____
Saturation Present? (includes capillary fringe)	Yes _____	No _____	Depth (inches): _____

Wetland Hydrology Present? Yes X No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

irregularly flooded Phragmites marsh along tributary

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: WB-3

Tree Stratum (Plot size: 30'x30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Acer rubrum	10	Y	FAC
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		

50% of total cover: _____ 20% of total cover: _____

Sapling/Shrub Stratum (Plot size: _____)			
1. N/A			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		

50% of total cover: _____ 20% of total cover: _____

Herb Stratum (Plot size: _____)			
1. Phragmites australis	95	Y	FACW
2. Lonicera japonica	5	N	FACU
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	= Total Cover		

50% of total cover: _____ 20% of total cover: _____

Woody Vine Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		

50% of total cover: _____ 20% of total cover: _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species		x 3 =	
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:	(A)		(B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

- [x] 1 - Rapid Test for Hydrophytic Vegetation
- [ ] 2 - Dominance Test is >50%
- [ ] 3 - Prevalence Index is ≤3.0[1]
- [ ] Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** X **No** _____

Remarks: (If observed, list morphological adaptations below).

SOIL

Sampling Point: WB-3

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-8	10YR 2/1						muck	
8-14+	10YR 3/1		5 YR 5/4	10	C	M, PL	silt	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☑ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☑ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ☐ Thin Dark Surface (S9) **(LRR S, T, U)**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR O)**
- ☐ 2 cm Muck (A10) **(LRR S)**
- ☐ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ☐ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** _____

Remarks:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: ACE Quinton - Windport City/County: Quinton & LAC, Salem Sampling Date: 12/8/2021

Applicant/Owner: Atlantic City Electric State: NJ Sampling Point: WE-3

Investigator(s): Wildman, K. & Berrios, I. Section, Township, Range:

Landform (hillslope, terrace, etc.): floodplain Local relief (concave, convex, none): Slope (%): 2

Subregion (LRR or MLRA): LRRS Lat: 39.535720 Long: -75.427842 Datum: NAD83

Soil Map Unit Name: Othello, Fallsington, and Trussum soils, 0 to 2 percent slopes NWI classification: E2EM1Ph6

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No _____	**Is the Sampled Area within a Wetland?** Yes X No _____
Hydric Soil Present?	Yes X	No _____	
Wetland Hydrology Present?	Yes X	No _____	

Remarks:

Estuarine Phragmites marsh along Alloway Creek tributary, toeslope of C.R. 651.

No upland data sheet. Upland = mown road shoulder sloping to Phragmites marsh.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ☑ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☑ Sediment Deposits (B2)
- ☑ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15) **(LRR U)**
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☑ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present?	Yes X	No _____	Depth (inches): 0
Water Table Present?	Yes _____	No _____	Depth (inches): _____
Saturation Present? (includes capillary fringe)	Yes _____	No _____	Depth (inches): _____

Wetland Hydrology Present? Yes X No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

irregularly flooded Phragmites marsh along channelized tributary

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: WE-3

Tree Stratum (Plot size: 30'x30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Acer negundo	15	Y	FACW
2.			
3.			
4.			
5.			
6.			
7.			
8.			
= Total Cover			

50% of total cover: _____ 20% of total cover: _____

Sapling/Shrub Stratum (Plot size: _____)			
1. Rhus copallinum	5	Y	UPL
2.			
3.			
4.			
5.			
6.			
7.			
8.			
= Total Cover			

50% of total cover: _____ 20% of total cover: _____

Herb Stratum (Plot size: _____)			
1. Phragmites australis	95	Y	FACW
2. Lonicera japonica	5	N	FACU
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
= Total Cover			

50% of total cover: _____ 20% of total cover: _____

Woody Vine Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
= Total Cover			

50% of total cover: _____ 20% of total cover: _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 66 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

- [x] 1 - Rapid Test for Hydrophytic Vegetation
- [x] 2 - Dominance Test is >50%
- [ ] 3 - Prevalence Index is ≤3.0[1]
- [ ] Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** X **No** _____

Remarks: (If observed, list morphological adaptations below).

Phragmites marsh

SOIL

Sampling Point: WE-3

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-12	10YR 2/1						muck	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☑ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ☐ Thin Dark Surface (S9) **(LRR S, T, U)**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR O)**
- ☐ 2 cm Muck (A10) **(LRR S)**
- ☐ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ☐ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** _____

Remarks:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: ACE Quinton - Windport City/County: Quinton & LAC, Salem Sampling Date: 12/8/2021

Applicant/Owner: Atlantic City Electric State: NJ Sampling Point: WH-4

Investigator(s): Wildman, K. & Berrios, I. Section, Township, Range:

Landform (hillslope, terrace, etc.): agricultural Local relief (concave, convex, none): flat Slope (%): 2

Subregion (LRR or MLRA): LRRS Lat: 39.524358 Long: -75.439271 Datum: NAD83

Soil Map Unit Name: Othello, Fallsington, and Trussum soils, 0 to 2 percent slopes NWI classification: UPL

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology X significantly disturbed? Are "Normal Circumstances" present? Yes _____ No X

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No _____	**Is the Sampled Area within a Wetland?** Yes X No _____
Hydric Soil Present?	Yes X	No _____	
Wetland Hydrology Present?	Yes X	No _____	

Remarks:

Fallow agricultural wetlands with roadside ditch.

No upland data sheet. Upland = mown road shoulder

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ☐ Surface Water (A1)
- ☑ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15) **(LRR U)**
- ☐ Hydrogen Sulfide Odor (C1)
- ☑ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present?	Yes _____	No X	Depth (inches): _____
Water Table Present?	Yes X	No _____	Depth (inches): 10
Saturation Present? (includes capillary fringe)	Yes _____	No _____	Depth (inches): _____

Wetland Hydrology Present? Yes X No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Roadside ditch present

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: WH-4

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1. Salix nigra	10	Y	OBL
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
50% of total cover:	20% of total cover:		
Sapling/Shrub Stratum (Plot size:)			
1. N/A			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
50% of total cover:	20% of total cover:		
Herb Stratum (Plot size:)			
1. Andropogon virginicus	25	Y	FAC
2. Panicum virgatum	25	Y	FAC
3. Solidago rugosa	25	Y	FAC
4. Juncus effusus	5	N	OBL
5. Scirpus cyperinus	5	N	OBL
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	85 = Total Cover		
50% of total cover:	20% of total cover: 17		
Woody Vine Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
50% of total cover:	20% of total cover:		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☑ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is ≤3.0[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** X **No**

Remarks: (If observed, list morphological adaptations below).

SOIL

Sampling Point: WH-4

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-8	10YR 4/1		5YR 5/4	2	C	M	sandy loam	
8-15+	10YR 5/2		5YR 5/4	5	C	M, PL	sand	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☑ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ☐ Thin Dark Surface (S9) **(LRR S, T, U)**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR O)**
- ☐ 2 cm Muck (A10) **(LRR S)**
- ☐ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ☐ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** _____

Remarks:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: ACE Quinton - Windport City/County: Quinton & LAC, Salem Sampling Date: 12/8/2021

Applicant/Owner: Atlantic City Electric State: NJ Sampling Point: WJJ-5

Investigator(s): Silva, A. & DuBois, E. Section, Township, Range:

Landform (hillslope, terrace, etc.): Floodplain Local relief (concave, convex, none): Slope (%): 0

Subregion (LRR or MLRA): LRRS Lat: 39.514792 Long: -75.447236 Datum: NAD83

Soil Map Unit Name: Mannington-Nanticoke complex, 0 to 1 percent slopes, very frequently f NWI classification: UPL

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No _____	**Is the Sampled Area within a Wetland?** Yes X No _____
Hydric Soil Present?	Yes X	No _____	
Wetland Hydrology Present?	Yes X	No _____	

Remarks:

Estuarine Phragmites marsh.

No upland data sheet. Uplands = sloped, mown road shoulder.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ☐ Surface Water (A1)
- ☑ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☑ Sediment Deposits (B2)
- ☑ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15) **(LRR U)**
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present?	Yes _____	No X	Depth (inches): _____
Water Table Present?	Yes X	No _____	Depth (inches): 5
Saturation Present? (includes capillary fringe)	Yes X	No _____	Depth (inches): 2

Wetland Hydrology Present? Yes X No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: WJJ-5

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1. N/A			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		

50% of total cover: _____ 20% of total cover: _____

Sapling/Shrub Stratum (Plot size:)			
1. N/A			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		

50% of total cover: _____ 20% of total cover: _____

Herb Stratum (Plot size:)			
1. Phragmites australis	100	Y	FAC
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	= Total Cover		

50% of total cover: _____ 20% of total cover: 17

Woody Vine Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		

50% of total cover: _____ 20% of total cover: _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species		x 3 =	
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:	(A)		(B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

- ☑ 1 - Rapid Test for Hydrophytic Vegetation
- ☐ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is ≤3.0[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** X **No** _____

Remarks: (If observed, list morphological adaptations below).

Phragmites marsh

SOIL

Sampling Point: WJJ-5

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-12	10YR 2/1						Muck	
12-15+	10YR 5/2		10YR 5/2	2	C	M	Silt	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☑ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☑ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ☐ Thin Dark Surface (S9) **(LRR S, T, U)**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR O)**
- ☐ 2 cm Muck (A10) **(LRR S)**
- ☐ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ☐ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** _____

Remarks:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: ACE Quinton - Windport City/County: Quinton & LAC, Salem Sampling Date: 12/8/2021

Applicant/Owner: Atlantic City Electric State: NJ Sampling Point: WQQ-14

Investigator(s): Silva, A. & DuBois, E. Section, Township, Range:

Landform (hillslope, terrace, etc.): Flat Local relief (concave, convex, none): Flat Slope (%): 0

Subregion (LRR or MLRA): LRRS Lat: 39.506110 Long: -75.446315 Datum: NAD83

Soil Map Unit Name: Othello, Fallsington, and Trussum soils, 0 to 2 percent slopes NWI classification: UPL

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation X, Soil _____, or Hydrology X significantly disturbed? Are "Normal Circumstances" present? Yes _____ No X

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No X	**Is the Sampled Area within a Wetland?** Yes X No _____
Hydric Soil Present?	Yes X	No _____	
Wetland Hydrology Present?	Yes X	No _____	

Remarks:

Modified agricultural wetlands with roadside ditch.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☑ Sediment Deposits (B2)
- ☑ Drift Deposits (B3)
- ☑ Algal Mat or Crust (B4)
- ☑ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15) **(LRR U)**
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present?	Yes _____	No X	Depth (inches): _____
Water Table Present?	Yes _____	No X	Depth (inches): _____
Saturation Present? (includes capillary fringe)	Yes _____	No X	Depth (inches): _____

Wetland Hydrology Present? Yes X No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: WQQ-14

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
= Total Cover			

50% of total cover: _____ 20% of total cover: _____

Sapling/Shrub Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
= Total Cover			

50% of total cover: _____ 20% of total cover: _____

Herb Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
= Total Cover			

50% of total cover: _____ 20% of total cover: 17

Woody Vine Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
= Total Cover			

50% of total cover: _____ 20% of total cover: _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: _____ (A)

Total Number of Dominant Species Across All Strata: _____ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: _____ (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species		x 3 =	
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:	(A)		(B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☐ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is ≤3.0[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** _____ **No** X

Remarks: (If observed, list morphological adaptations below).

Modified agricultural wetlands - cultivated. No natural vegetation present.

SOIL

Sampling Point: WQQ-14

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-3	10YR 4/4						sand	
3-10	10YR 4/2		5YR 6/3	5	C	M	silt loam	
10-15+	10YR 6/2		5YR 6/3	5	C	M	silt loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ☐ Thin Dark Surface (S9) **(LRR S, T, U)**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☑ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR O)**
- ☐ 2 cm Muck (A10) **(LRR S)**
- ☐ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ☐ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No _____

Remarks:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: ACE Quinton - Windport City/County: Quinton & LAC, Salem Sampling Date: 12/8/2021

Applicant/Owner: Atlantic City Electric State: NJ Sampling Point: WYY-7

Investigator(s): Silva, A. & DuBois, E. Section, Township, Range:

Landform (hillslope, terrace, etc.): Local relief (concave, convex, none): Slope (%):

Subregion (LRR or MLRA): LRRS Lat: 39.503323 Long: -75.451129 Datum: NAD83

Soil Map Unit Name: Mannington-Nanticoke complex, 0 to 1 percent slopes, very frequently f NWI classification: PEM5Rh

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)

Are Vegetation X, Soil , or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes No X

Are Vegetation , Soil , or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No	**Is the Sampled Area within a Wetland?** Yes X No
Hydric Soil Present?	Yes X	No	
Wetland Hydrology Present?	Yes X	No	

Remarks:

Phragmites marsh - partially mowed

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ☑ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☑ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15) **(LRR U)**
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☑ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present?	Yes X	No	Depth (inches): 0
Water Table Present?	Yes	No	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes	No	Depth (inches):

Wetland Hydrology Present? Yes X No

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: WYY-7

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1. N/A			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
= Total Cover			
50% of total cover:	20% of total cover:		
Sapling/Shrub Stratum (Plot size:)			
1. N/A			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
= Total Cover			
50% of total cover:	20% of total cover:		
Herb Stratum (Plot size:)			
1. Phragmites australis	100	Y	FACW
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
= Total Cover			
50% of total cover:	20% of total cover: 17		
Woody Vine Stratum (Plot size:)			
1. N/A			
2.			
3.			
4.			
5.			
= Total Cover			
50% of total cover:	20% of total cover:		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species		x 3 =	
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:	(A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ☑ 1 - Rapid Test for Hydrophytic Vegetation
- ☑ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is ≤3.0[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** X **No**

Remarks: (If observed, list morphological adaptations below).

SOIL

Sampling Point: WYY-7

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-12	10YR 2/1						muck	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☑ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ☐ Thin Dark Surface (S9) **(LRR S, T, U)**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR O)**
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- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** _____

Remarks:

Appendix C

Statements of Qualifications

Anthony Silva
Senior Biologist/Environmental Scientist
asilva@denviro.com

190 N. Main Street
Manahawkin, NJ 08050
609-488-2857

Education:

B.S. Environmental Studies
The Richard Stockton College of New Jersey – 2006

Graduated Magna Cum Laude with Program Distinction

Certifications:

Professional Wetland Scientist – Society of Wetland Scientists

USFWS Qualified Bog Turtle Surveyor (QBTS) – NJ, DE, MD, PA

USFWS Qualified Bat Surveyor (QBS) – NJ & PA

PA DCNR Wild Plant Management Permittee

NJDEP ENSP Recognized Qualified Venomous Snake Monitor

Continuing Education:

Western Bat Working Group: Bats and Wind Energy.

Northeast Bat Working Group: Annual Conferences

Bat Acoustic Software Training Workshop

Advanced Bat Acoustics: A Master Class

Bats and Bridges Survey Training hosted by USFWS and NJDEP

N.J. Conservation Foundation & P.P.A: Fundamentals of Pinelands Botany; Pinelands Botany: Practical Applications

Identification of Tidal Wetland Plants. Rutgers

Poaceae: Field Identification of Grasses. Eagle Hill Institute Natural History Seminar

Fields of Competence:

Mr. Silva has over 17 years of experience in the fields of biology, ecology, wetland science, soil science and land use regulatory compliance. He conducts various environmental site assessments; rare species habitat evaluations, surveys, and management plans; ecological sampling investigations; mitigation design, permitting, and vegetation monitoring; and environmental/biological construction monitoring.

Professional Experience:

Mr. Silva is a senior biologist and environmental scientist with the firm of DuBois Environmental Consultants. He is responsible for conducting faunal and floral sampling investigations, natural resource inventories, threatened/endangered species habitat assessments and directed surveys. Mr. Silva is well versed as to the survey and sampling protocols required under the jurisdiction of the USFWS, NJDEP and Pinelands Commission for Threatened and Endangered Species Surveys. He has tracked several northern pine snakes using radio telemetry, providing data pertinent to home range statistics, core-use areas and critical habitat delineation. He is responsible for the maintenance and operation of a variety of ecological trapping arrays, including drift fence-box funnel trap arrays designed to capture threatened and endangered snake species. He also performs numerous raptor nest investigations and breeding vocalization broadcast surveys, conducts amphibian community evaluations and critical wildlife habitat assessments. To date, Mr. Silva has studied for rare faunal and floral species in 5 states, including New Jersey, New York, Pennsylvania, Delaware and Maryland.

Mr. Silva has conducted numerous Phase I habitat assessments, Phase II visual surveys and Phase III trapping surveys for the Federally-threatened bog turtle. He has also assisted in habitat restoration and enhancement projects for the bog turtle through removal and control of invasive vegetation, and is currently recognized by the USFWS as a Qualified Bog Turtle Surveyor in the states of N.J., D.E., M.D. and P.A. Mr. Silva is also responsible for the operation of mist nets designed to capture various bat species, including the Federally-endangered Indiana bat and Federally-threatened Northern long-eared bat. He measures and records pertinent biological data of all collected specimens. Mr. Silva also deploys acoustic hardware and performs subsequent acoustic analysis of bat echolocation calls captured in the field.

In addition to the above responsibilities, Mr. Silva conducts plant surveys within various vegetation communities, which have included numerous species considered rare or listed as protected in various states. Mr. Silva has conducted numerous botanical investigations for rare plant species within the jurisdiction of the New Jersey Pinelands Commission, the New Jersey Department of Environmental Protection, the Pennsylvania Department of Conservation of Natural Resources, and the Maryland Department of Natural Resources. Many projects include botanical surveys along existing transmission line right-of-ways; investigations have led to the delineation and protection of rare plant occurrences while permitting utilities to perform upgrades and maintenance operations within their easements.

Mr. Silva performs environmental and biological construction monitoring associated with linear project improvements. Environmental oversight ensures the project is conducted in an environmentally responsible manner and in accordance with all applicable SESC standards and best management practices. Biological oversight in and around sensitive habitats ensures that the project does not have any adverse impacts to sensitive habitats or rare faunal and floral species.

Mr. Silva is a certified professional wetland scientist responsible for performing wetland delineations under the jurisdiction of multiple agencies. He follows

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Senior Biologist/Environmental Scientist
asilva@denviro.com

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Identification of Common Carex Using Field Features. Eagle Hill Institute Natural History Seminar

Ecological Risk Assessment: Practice and Protocols. Rutgers

Restoration Ecology. Rutgers

Mid-Atlantic Professional Soil Scientists Hydric Soils Workshops

Pinelands Groundwater Supply & Ecosystem Needs; Pinelands Annual Short Courses

Professional Affiliations:

Member: Philadelphia Botanical Club

Member: NJ Chapter of The Wildlife Society

Member: New Jersey Division of Fish, Game and Wildlife Conservation Corps.

Member: Northeast Partners in Amphibian and Reptile Conservation

Member: Northeast Bat Working Group

Member: Flora of New Jersey Project

Member: National Association of Wetland Managers

Career Positions:

Trident Environmental Consultants, Toms River, NJ – Biologist/Environmental Scientist 2005 – 2014

DuBois & Associates, LLC, Manahawkin, NJ – Sr. Biologist/Environmental Scientist 2014 – Present

interagency evaluation procedures and is well versed in analyzing the technical indicators of wetland vegetation, hydrology and soils. He authors Freshwater Wetland Delineation Reports and prepares Freshwater Wetland Letter of Interpretation applications for submittal to the NJDEP. In addition, he prepares various NJDEP Division of Land Use permitting applications and Environmental Impact Statements for Township approval.

Mr. Silva performs annual wetland mitigation monitoring to document the performance of vegetation and other variables at wetland restoration, creation and enhancement sites. He performs wetland mitigation site location searches and mitigation site design which provides clients with a variety of potential mitigation site options.

Mr. Silva is very proficient in ESRI ArcMap Geographic Information Systems (GIS) software and GPS technology. Maps are created to present clients with a visual representation of site-specific environmental characteristics in relation to various projects.

Projects of Relevance:

Public utility MAPP Project – Delmarva Peninsula & Chesapeake Western Shore
Ecological and environmental work was completed to assist the land acquisition process for the Mid-Atlantic Power Pathway (MAPP) Project. Mr. Silva was a lead biologist responsible for documenting the presence or absence of the Federally-endangered Delmarva fox squirrel within forested landscapes within Dorchester County, Maryland. County-wide photomonitoring surveys provided pertinent information regarding distribution trends and mitigation locations. Rare, threatened and endangered (RTE) species habitat evaluations and directed RTE plant species surveys were performed from Calvert County, Maryland east to the Maryland/Delaware border.

Cape May Refuge Migratory Landbird Research
Mr. Silva has conducted fall-migrating landbird research on lands located within the Cape May National Wildlife Refuge in Cape May County, New Jersey. The objective of the on-going study is to determine the use of stop-over habitats by neotropical migrants within the Refuge. Surveys were performed within management units that receive different treatments to enhance shrub habitat quality for migrating birds. Survey methodologies performed include bird abundance area searches, behavioral response reaction via mobbing audiotapes, activity budgets to determine utilized habitat and foraging substrates, vegetation density and fruiting analysis within management plots.

Resource Extraction Indiana Bat Habitat Mitigation Plan
Mr. Silva authored and developed an Indiana Bat Habitat Mitigation Plan for a mineral quarry in Luzerne County, Pennsylvania. The quarry is located within the area of a known Indiana bat hibernaculum and the Plan was developed to ensure protection of this endangered species pursuant to the Endangered Species Act of 1973. The measures within the Plan satisfied USFWS concerns regarding expansion of quarry operations and Indiana bat protection.

Kristin Wildman
Sr. Environmental Consultant/Project Manager
kwildman@denviro.com

190 North Main Street
Manahawkin, NJ 08050
609-488-2857

Education:

B.S. Environmental Science
Concentration: Atmospheric Science
University of Delaware – 2002

Certifications:

Professional Wetland Scientist-
Society of Wetland Scientists

Continuing Education:

Rutgers University
Methodology for Delineating Wetland, Hydric Soils & Wetland Vegetation Identification

The Role of the Environmental Consultant in Litigation

NJDEP Coastal Project Review

NJDEP Flood Hazard Area Control Act Rules

Environmental Audits & Site Assessments

Environmental Data Resources
Vapor Intrusion Risk & Due Diligence Challenges in the Real World

MAPPS Training Workshop
Hydric Soils

Professional Affiliations:

The Society of Wetland Scientists
- Member

Environmental Assessment Association
-Certified Environmental Inspector
2007 – present

Career Positions:

The Lomax Consulting Group, LLC
Cape May Court House, NJ-
Environmental Analyst 2004-2007

Fields of Competence:

Kristin Wildman has over 19 years of experience in the fields of land use regulatory compliance, wetland science, soil science, biology and ecology. She has extensive experience in managing a variety of projects from the initial field study stage through various regulatory application and approval processes, including coordination with regulatory personnel. Mrs. Wildman has the knowledge and experience to identify applicable regulations, develop appropriate permitting strategies, prepare required permit applications and oversee NJDEP, NJPC and USACE application review. Mrs. Wildman has a respected professional relationship with various municipal and county agencies, NJDEP, NJPC, USFWS and USACE personnel. She conducts various environmental site assessments, development feasibility studies, dune delineations, wetland delineations, rare species habitat evaluations and population surveys.

Professional Experience:

Mrs. Wildman is a senior environmental consultant and project manager with the firm of DuBois and Associates. She manages all aspects of a project and coordinates specifically with a variety of clients to organize projects and proposals. Mrs. Wildman manages each individual project to ensure all appropriate and applicable regulations and tasks are implemented to facilitate successful completion/approval of the project.

Mrs. Wildman coordinates directly with professional engineers, attorneys, clients, and regulatory agencies to evaluate compliance and design of projects pursuant to various environmental regulations, inclusive of the Coastal Zone Management Rules, Freshwater Wetlands Protection Act Rules, Flood Hazard Area Control Act Rules, Pinelands Comprehensive Management Plan, Section 10 of the River and Harbors Act and Section 404 of the Clean Water Act. Mrs. Wildman works diligently on behalf of our clients, to obtain regulatory approvals and permits related to activities and projects involving the CAFRA Area, Waterfront Area, wetlands and waterways and their regulated buffer zones and other environmentally sensitive areas. Based on the permit analyses and project designs, she prepares compliance statements and provides all logistical and technical support to obtain environmental permits pursuant to the NJDEP and USACE regulations. She also prepares and oversees applications for NJDEP Bureau of Tidelands Management conveyance instruments. Mrs. Wildman continuously stays up to date with changing environmental regulations.

Mrs. Wildman is responsible for performing wetland delineations under the jurisdiction of multiple agencies, which are conducted pursuant to the interagency evaluation procedures. This includes expertise in analyzing the vegetation and technical indicators of hydrology and soils. She authors Freshwater Wetland Delineation Reports and prepares Freshwater Wetland Letter of Interpretation applications for submittal to the NJDEP for verification of the delineated wetland limits. Mrs. Wildman is also responsible for conducting subaquatic vegetation inventories and shellfish habitat evaluations and surveys.

Mrs. Wildman is responsible for conducting development feasibilities, wetland delineations, natural resource inventories, threatened/endangered species habitat assessments and directed surveys, and monitoring activities. Mrs. Wildman has experience with the survey and sampling protocols required under the jurisdiction of the USFWS, NJDEP, and Pinelands Commission for threatened and endangered species surveys. Mrs. Wildman also conducts vegetation inventories within a variety

Environmental Consultant 2007-2010 Senior Consultant / Director of Technical Services 2010-2016 DuBois and Associates, LLC Manahawkin, NJ – Sr. Environmental Scientist / Project Manager 2017 – Present	of biotic communities throughout New Jersey. These have included species specific surveys for numerous target plants considered rare State and/or Federally listed. Mrs. Wildman has prepared lectures and presented to numerous local and state agencies. These presentations include *Amphibian/Reptiles of the New Jersey Coastal Plains* to local schools, *New Jersey Department of Environmental Protection Division of Land Use Regulation Regulatory Reform* to the New Jersey Department of State Red Tape Review Commission and *Environmental Constraints at the Cape May and Millville Airports* to the Delaware River & Bay Authority. Mrs. Wildman has also conducted numerous volunteer survey efforts in coordination with the USFWS. These survey efforts include federally directed amphibian / reptile surveys and swamp pink population surveys. **Representative Projects of Relevance:** *Atlantic Capes, Lund's Fisheries and Cold Spring Fish & Supply Co. Ports Rehabilitation* Ecological and environmental work was completed to assist commercial fisheries clients in conducting environmental constraints evaluations and permit analyses for improvements to their commercial facilities. Mrs. Wildman works directly with the engineers in assisting with design of the project to ensure compliance of proposed improvements pursuant to State waterfront development, CAFRA, freshwater wetlands, and flood hazard regulations. Mrs. Wildman also coordinates with the NJDEP and USACOE with regard to permit requirements and to ensure no adverse impacts to documented state and federal threatened and endangered species habitat. Mrs. Wildman prepared all necessary permit applications and ensured continued cooperative coordination with the regulatory agencies to ensure receipt of the applicable permit approvals for the port projects. *Nichomus Run Solar and Sheep Farm* Provided environmental and ecological support to a major development firm to assist in the state and local approvals of a large scale solar energy project. Mrs. Wildman prepared an Environmental Impact Report upon land proposed for the construction of a 150 Megawatts photovoltaic (PV) facility. She supervised site investigations of the entire site to observe and inventory hydrology, freshwater wetlands, soils, vegetation communities, wildlife, ecotone areas, and existing and surrounding land uses. Mrs. Wildman was also responsible for the delineation of on-site wetlands, testimony at the municipal zoning board use variance hearing, preparation of an application report and environmental report pursuant to N.J.A.C. 7:13 for a Flood Hazard Verification and N.J.A.C. 7:7A for a Freshwater Wetland Letter of Interpretation Line Verification application to New Jersey Department of Environmental Protection. *Logan Generating Station Dredging* Conducted sediment sampling and analysis of subaqueous material, and submitted permit applications and received approval from the NJDEP, USACE and DNREC to authorize dredging of berthing areas at the Logan Generating Plant's coal unloading pier in the Delaware River in Logan Township, Gloucester County. The activities required a NJDEP Waterfront Development Individual Permit, USACE Nationwide Permit and DNREC Subaqueous Lands Permit. This project included multi-jurisdictional coordination and project management, that also involved collaboration with USACE regarding the Federal dredging project of the Delaware River channel.

Israel Berrios
Environmental Scientist
iberrios@denviro.com

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Education:

B.S. Biology with a Concentration in Ecology
West Chester University – 2014

Certifications:

USFWS Qualified Bog Turtle Surveyor – NJ

PA DCNR Wild Plant Management Permittee - #22-842

Delaware DNREC Sediment & Stormwater Program Blue Card Certification B 2018/12/13 004

State of Maryland Erosion & Sediment Control Certification No. RPC015013

Continuing Education:

N.J. Conservation Foundation & P.P.A: Fundamentals of Pinelands Botany

N.J. Department of Agriculture – State Soil Conservation Committee: N.J. Soil Erosion & Sediment Control Standards Training Course

Swamp School LLC
USACOE Hydric Soils Indicators Online Training Course

Rutgers N.J. Agricultural Experiment Station Office of Continuing Professional Education – Vegetation Identification for South N.J.

Bats & Bridges Survey Training Hosted by USFWS & NJDEP

Vespor Bats – Acoustic ID of Eastern Bats

Fields of Competence:

Mr. Berrios has 7 years of experience in the fields of regulatory land use, radio telemetry, wetland science, soil science, biology and ecology.

Professional Experience:

Mr. Berrios is a biologist and environmental scientist with the firm of DuBois & Associates. He is responsible for assisting with faunal and floral sampling investigations, site assessments, monitoring, and threatened/endangered species habitat assessments. He is also technical support for the maintenance of a variety of ecological trapping arrays and herptile surveys. Furthermore, Mr. Berrios has participated in conducting studies on various species throughout New Jersey, the Pinelands of New Jersey, and Pennsylvania including Cope's gray treefrog, Pine Barrens treefrog, barred owl, red-shouldered hawk, wood turtle, bog turtle, northern red-bellied cooter, red-headed woodpecker, northern pine snake, among others.

Mr. Berrios has assisted in habitat and visual surveys for Bog Turtles in New Jersey, Delaware, and Pennsylvania. These activities include helping with directed visual surveys, implementation of data collection and habitat analysis. Mr. Berrios is also a USFWS Recognized Qualified Bog Turtle Surveyor in the State of New Jersey.

Mr. Berrios is also responsible for the organization and execution of various environmental reports including Letters of Interpretation (LOIs), feasibility studies, site assessments, field and lab analysis of soils, and permitting for a wide variety of projects.

In conjunction with performing surveys for a variety of environmental/ecological assessments, Mr. Berrios has gained experience using ESRI Arc Map Geographic Information Systems (GIS) software and global positioning systems (GPS). Maps are created to depict a visual representation for clients of site-specific characteristics in relation to various projects. These tools are also used in mapping species movements such as turtles, bats and snakes.

In addition to the above responsibilities, Mr. Berrios has assisted in/ conducted plant surveys within various vegetation communities, which have included numerous species considered rare or listed as protected in various states. Mr. Berrios has assisted in/conducted numerous botanical investigations for rare plant species within the jurisdiction of the New Jersey Pinelands Commission, the New Jersey Department of Environmental Protection, and the Pennsylvania Department of Conservation of Natural Resources. Many projects include botanical surveys along existing transmission line rights-of-ways; investigations have led to the delineation and protection of rare plant occurrences while permitting utilities to perform upgrades and maintenance operations within their easements.

Mr. Berrios also performs biological/environmental construction monitoring associated with utility projects throughout New Jersey. Environmental oversight ensures the project is conducted in an environmentally responsible manner and in accordance with all applicable SESC standards, best management practices, and any local, state or federal permit conditions. Biological oversight in and around environmentally sensitive and regulated areas ensures that the project does not

Israel Berrios
Environmental Scientist
iberrios@denviro.com

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609-488-2857

Career Positions:

DuBois & Associates, Manahawkin, NJ – Environmental Scientist 2015 – Present

have any adverse impacts to critical habitats, rare faunal and floral species, or environmentally regulated areas.

Education:

Mr. Berrios received a Bachelor of Science degree in Biology with a concentration in Ecology in December of 2014. While attending West Chester University, Mr. Berrios selected upper-level classes including Freshwater Ecology, Vertebrate Ecology, Plant Physiology, and Population Biology/Invasive Ecology. All classes were supplemented with hands-on laboratory experience using professional techniques, as well as site-specific trips for fieldwork.

Ethan DuBois
Staff Biologist
edubois@denviro.com

190 North Main Street
Manahawkin, NJ 08050
609-488-2857

Education:

B.S. Environmental Science
Elizabethtown College - 2020

M.S. Wildlife & Fisheries Resources
Clemson University - 2021

Certifications:

Certified Associate Ecologist - Ecological Society of America

USFWS Qualified Bog Turtle Surveyor - NJ

Delaware DNREC Sediment & Stormwater Program Blue Card

Continuing Education:

Rutgers N.J. Agricultural Experiment Station Office of Continuing Professional Education -Identification of Wetland Plants in Winter Form

Rutgers N.J. Agricultural Experiment Station Office of Continuing Professional Education - Hydric Soils

Bats and Bridges Survey Training hosted by USFWS and NJDEP

Vespor Bats - Acoustic ID of Eastern Bats

Career Positions:

DuBois & Associates, Manahawkin, NJ – Staff Biologist, 2014 – Present

Qualifications:

Mr. Ethan DuBois is a Staff Biologist with the firm of DuBois & Associates. He is responsible for performing and assisting with faunal and floral sampling investigations, environmental site assessments and on-site soil analysis. Mr. E DuBois has conducted various rare, threatened and endangered species studies. Since starting at DuBois & Associates, Mr. DuBois has participated in numerous studies on various species such as Bog Turtles, Northern Pine Snakes, Timber Rattlesnakes, Pine Barrens Treefrogs, Red-Bellied Turtles, Red-headed Woodpeckers, Barred Owl and Eastern Tiger Salamanders.

Mr. E. DuBois has performed and assisted in habitat and visual surveys for Bog Turtles in New Jersey, Pennsylvania, and Maryland. These activities include directed visual surveys, implementation of data collection, population and habitat management, identification of nesting locations, along with habitat analysis. He has also been responsible for the maintenance and operation of multiple ecological trapping arrays, including drift fence-box funnel trap arrays designed to capture threatened and endangered snake species, as well as bog turtle trapping arrays in Pennsylvania.

In conjunction with performing surveys for a variety of environmental/ecological assessments, Mr. E. DuBois has gained extensive experience using ESRI Arc Map Geographic Information Systems (GIS) software and global positioning systems (GPS). Mr. E DuBois is a critical piece of a team which create and maintain geodatabases and physical maps associated with threatened and endangered species restrictions. These tools assist vegetation maintenance crews across the state of New Jersey on best management practices, time-of-year restrictions along with additional information that may be pertinent.

Mr. E. DuBois also performs biological/environmental construction monitoring associated with utility right-of-way's throughout New Jersey, Pennsylvania, Delaware and Maryland. Environmental oversight ensures the project is conducted in an environmentally responsible manner and in accordance with all applicable soil erosion and sediment control (SESC) standards and best management practices. Biological oversight in and around sensitive habitats ensures that the project does not have any adverse impacts to sensitive habitats or rare faunal and floral species.

Projects of Relevance:

Phase 1 and Phase 2 Bog Turtle Surveys along Several Transmission Line Upgrade Projects and Vegetation Maintenance Cycles within Lancaster, Northampton, Lebanon, Adams and Berks Counties, PA Gloucester, Salem, Sussex, Monmouth and Warren Counties, NJ, and Harford County, MD: Performed Phase 1 surveys throughout the State of New Jersey on numerous Utility Lines. These surveys were coordinated with the USFWS, the PA Fish and Boat Commission, and the NJDEP.

Large trapping projects associated with major development and restoration in 2022. Including but not limited to multi season snake surveys for the Northern Pine Snake, in Ocean County, NJ, Phase III trapping surveys for the bog turtle in Berks County, PA, as well as habitat assessment, trapping survey and construction monitoring for the Northern red-bellied Cooter at Marsh Creek Lake in Chester County, PA.

Ethan DuBois
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Education:

Mr. E. DuBois received a Bachelor of Science degree in Environmental Science with a Business Administration Minor in May of 2020. Following graduation, Mr. E. DuBois enrolled in an M.S Program in Wildlife and Fisheries Resources at Clemson University which he completed in December 2021. While at Clemson, Mr. E. DuBois selected graduate level classes including Wildlife Habitat Management, Restoration Ecology, Plant Biology, Global Change Ecology, Fisheries Management and Conservation, as well as Conservation Issues.

Appendix F

Threatened & Endangered Wildlife Species Survey Report (DuBois)

D1000.215
February 1, 2023

State-Listed Endangered or Threatened Species Habitat Evaluation

Atlantic City Electric Company
Quinton – Windport Transmission Line Project
Quinton & Lower Alloways Creek Township, Salem County, New Jersey

Prepared for:

Atlantic City Electric Company
5100 Harding Highway
Mays Landing, NJ 08330

Prepared by:

DuBois & ASSOCIATES

190 North Main Street
Manahawkin, NJ 08050

Anthony Silva, PWS
Senior Biologist

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1.0 INTRODUCTION

DuBois & Associates, L.L.C. (DuBois) has conducted a *State-Listed Endangered or Threatened Species Habitat Evaluation* upon and in the vicinity of land associated with the Atlantic City Electric Company (ACE) Quinton – Windport Transmission Line Project (the project). The project proposes a 69kV electric transmission line from the existing ACE Quinton Substation in Quinton Township to a proposed Substation (to be owned by others) at Artificial Island in Lower Alloways Creek Township, Salem County. The project includes both overhead and underground components, along with work within the existing fence line of Quinton Substation. From Quinton Substation the proposed transmission line is overhead following existing poles to the Artificial Island property, where there is an underground segment for two 500kV line crossings. The proposed line will then be overhead to a proposed Substation to be permitted, constructed, and owned by others.

Threatened and Endangered Species-Specific Conditions of ACE's NJDEP's Division of Land Use Regulation blanket permit No.: 0000-14-0010.1 (blanket permit) specifies threatened and endangered wildlife or plant species protection standards. DuBois, an ecological consulting firm that specializes in threatened and endangered species evaluations and surveys, was retained by ACE to determine whether potentially critical habitat is present along the ROW for state-listed threatened or endangered fauna or flora. DuBois performed desktop assessments and a field habitat evaluation along the project ROW and vicinity on several dates in 2021 and 2022 to identify any potentially suitable habitat for state-listed threatened or endangered species of plants or wildlife. Information on the potential occurrence of endangered or threatened wildlife or plant species' habitat from the project area was obtained through consultation with the New Jersey Department of Environmental Protection (NJDEP) Natural Heritage Program, as well as through review of NJDEP Landscape Maps of Habitat for Endangered, Threatened and Other Priority Wildlife Species. Where applicable, the habitat evaluation incorporated the assessment of hydrology, freshwater and coastal wetlands, vegetation assemblages, ecotone areas and surrounding land uses in relation to the habitat requirements of addressed species and the results of such were used to evaluate whether or not the project area provides all the components necessary to potentially support the listed threatened and endangered wildlife or plant species.

This evaluation has been conducted in accordance with the regional standards set forth at N.J.A.C. 7:7-11 – *Standards for Conducting and Reporting the Results of an Endangered or Threatened Wildlife or Plant Species Habitat Impact Assessment and/or Endangered or Threatened Wildlife Species Habitat Evaluation*.

2.0 PROJECT LOCATION

The project is located in the southwest portion of New Jersey in the Lower Delaware water region. The linear project is approximately 11.0-miles in length with a northern terminus at the Quinton Substation in Quinton Township and a southern terminus at Artificial Island in Lower Alloways Creek, Salem County (refer to *Figure 1: New Jersey Road Map*). The project is located on the Salem, Canton and Taylors Bridge United States Geological Survey (USGS) Quadrangle with state plane coordinates (NAD83 feet) of E(x) 235,503 and N(y) of 261,961 located at the Quinton Substation and E(x) 199,764 and N(y) of 234,229 located at the proposed Windport Substation (refer to *Figure 2: Salem, Canton & Taylors Bridge U.S.G.S Quadrangle Map*). The project is located in the Maurice, Salem, and Cohansey Watershed Management Area (WMA 17), the Alloway Creek / Hope Creek watershed, and six (6) subwatersheds of the Alloways Creek. The Delaware River lies to the west and southwest of the project route. Portions of the project route in the southern half of the alignment are located among the Mad Horse Creek Wildlife Management Area.

3.0 PROJECT AREA ECOLOGICAL CHARACTERISTICS

3.1 Existing Land-Use/Land-Cover

The project follows an existing ROW that is largely roadside. The route lies along Sickler Street, Beasley Neck Road (Rt. 651), New Bridge Road (Rt. 623), Cuff Road, Alloway Creek Neck Road and Buttonwood Avenue for the majority of its length. Farmland, old-field, Phragmites-dominant brackish marsh with tidal channels, salt marsh with tidal channels, and fringe maritime brushland defines the majority of the land-cover along the project route. An urban landscape is present near the northern terminus at the town of Quinton, and an industrial-disturbed/successional-vegetated landscape is present at the southern terminus at Artificial Island. Refer to *Figure 3: Aerial Map* for an orthophotographic depiction of the project route and surrounding landscape.

3.2 Vegetation Communities

Natural vegetation community types encountered in the field were identified and classified in accordance with the U.S. National Vegetation Classification (USNVC), which is a central organizing framework for documentation, inventory, monitoring, and study of vegetation in the United States (USNVC, 2021). Based on the field investigation, the following natural vegetation community types are associated with the project area.

3.2.1 Ruderal Tidal Common Reed Marsh

This community is a dense tall grassland indicative of disturbance. It occurs in a range of tidal wetland habitats from fresh to brackish in salinity. It is characterized by dense stands of common reed (*Phragmites australis ssp. australis*), an exotic taxon which tends to grow in colonies of tall, stout, leafy plants often to the exclusion of all other vascular plant species. Associated species are highly variable, depending on the community that has been invaded. Spreading in large colonies, *Phragmites* eventually dominates disturbed areas at coverage up to 100%. More typically, though, scattered individuals of other species may occur. This community has a broad geographic range, including coastal areas of the eastern and southeastern United States and Canada. Where present in the ROW, *Phragmites* is present as a monocultural stand with an observed absence of associate marsh species.

3.2.2 Smooth Cordgrass Low Salt Marsh Alliance

This alliance includes low, regularly flooded tidal marshes of the eastern U.S. and Gulf Coast dominated by *Spartina alterniflora* (smooth cordgrass). This alliance is commonly known as "low salt marsh," occurring as a tall grassland strongly dominated by *S. alterniflora*. There is little variation in vascular plant species composition across the range. It occurs in nearly pure stands, with occasional low-growing species such as *Spergularia salina* (salt sandspurry), *Salicornia* spp. (glasswort), *Suaeda maritima* (seepweed), and seaweeds such as *Ulva lactuca* (sea lettuce) and other algae such as *Fucus vesiculosus* (bladder wrack) and *Ascophyllum nodosum* (knotted wrack), which grow at the bases of the *Spartina* plants. Herbs of *Salicornia depressa* and *Salicornia bigelovii* can be quite common mixed in with the *Spartina*, often becoming more apparent later in the growing season. *Limonium carolinianum* is another characteristic herb, but only as scattered individuals. In the northern part of its range, this alliance is generally limited to the zone between mean sea level and the mean high-water level. The habitat occurs in protected inlets behind barrier beaches, drowned river valleys, and along the margin of large bays.

S. alterniflora grows in both a tall form and a short form (Valiela et al. 1978). The tall form (generally over 1 m in height) is common along tidal creeks and at marsh edges; the short form (10-40 cm tall) is typically found in more extensive flats landward of the tall form.

3.2.3 Saltmeadow Cordgrass - Jesuit's-bark High Salt Marsh Group

This group encompasses vegetation in the regularly flooded, upper herbaceous or herb-shrub zones of salt marshes of the Atlantic Coast of temperate North America subject to polyhaline tidal waters. Dominance is most often by graminoids, with *Spartina patens* usually present and often dominant. Other characteristic species include *Distichlis spicata* and *Salicornia* spp. A fringe of shrub-herb vegetation, or sometimes more extensive areas of salt-tolerant shrubs, is common at the upper edges of the high marsh zone. High marsh vegetation generally develops between the levels of an area's mean daily high tides and spring tides. Wind tides may be important in marshes associated with barrier island systems. Associated species vary across the north-to-south expanse of this group. Towards the north, common associates include *Juncus gerardii*, *Solidago sempervirens*, *Symphyotrichum novi-belgii*, and *Limonium carolinianum*.

3.2.4 Black Cherry - Serviceberry species - Eastern Red Cedar Maritime Scrub Forest Alliance

This alliance includes temperate deciduous forests and scrub forests in Atlantic maritime environments from southern Maine to northern Virginia. These associations are characterized by early-successional species, reflecting the disclimax maintained in this state by the maritime climate and disturbance regime. The physiognomy of this vegetation is highly variable and may range from open woodland to stunted forest to dense nearly impenetrable thicket, and individual trees tend to be wind-pruned and multi-stemmed. The canopy may contain *Acer rubrum* (red maple), *Amelanchier canadensis* (serviceberry), *Nyssa sylvatica* (black gum), *Aronia arbutifolia* (red chokeberry), *Prunus serotina var. serotina* (black cherry), and *Sassafras albidum* (sassafras) in varying proportions. *Pinus taeda* loblolly pine), *Diospyros virginiana* (persimmon), and *Ilex opaca var. opaca* (American holly) may occur locally on the Coastal Plain. *Morella pensylvanica* (northern bayberry) is diagnostic of this alliance and differentiates it from more inland early-successional and ruderal forests resulting from anthropogenic changes. Some examples support vines in great abundance, such as *Smilax rotundifolia* (roundleaf greenbriar), *Smilax glauca* (catbriar), *Parthenocissus quinquefolia* (Virginia creeper), and *Toxicodendron radicans* (poison ivy). Herbs are of variable cover, depending on the degree of sunlight penetrating the canopy. Herbaceous composition is widely variable and may include both native and exotic species. The substrate varies from pure sand to loamy sands.

Agriculturally-modified old-field communities and maintained roadside early successional brushland communities, composed of a variety of grasses, herbs and low shrubs, are also present along the project route. Herbaceous roadside vegetation characteristic of the project area is a mix of native and exotic species.

3.3 Soils

According to the U.S. Department of Agriculture (USDA), Natural Resources Conservation Service (NRCS), web soil survey, the project area is underlain by the following 11 soil map units:

- Woodstown sandy loam, 0 to 2 percent slopes
- Sassafras sandy loam, 2 to 5 percent slopes
- Othello, Fallsington, and Trussum soils, 0 to 2 percent slopes
- Mattapex silt loam, 0 to 2 percent slopes

- Matapeake silt loam, 2 to 5 percent slopes
- Downer loamy sand, 0 to 5 percent slopes
- Mannington-Nanticoke complex, 0 to 1 percent slopes, very frequently flooded
- Transquaking mucky peat, 0 to 1 percent slopes, very frequently flooded
- Udorthents, dredged fine material, 0 to 8 percent slopes
- Urban Land
- Water

3.4 Wetlands & Hydrology

NJDEP Geographic Information Systems (GIS) wetland and surface water mappings depict freshwater wetlands, coastal wetlands and waterways lying among the project area (refer to *Figure 4: NJDEP Wetlands Map*). According to the U.S. Fish & Wildlife Service (USFWS) National Wetland Inventory (NWI), the mapped wetlands and waterways have the following wetland or deepwater classifications (Cowardin et al. 1979):

Code	System	Sub System	Class	Sub Class	Water Regime	Water Chemistry	Special Modifier
E1UBL	Estuarine	Subtidal	Unconsolidated Bottom		Subtidal		
E1UBLh6	Estuarine	Subtidal	Unconsolidated Bottom		Subtidal	Oligohaline	Diked / Impounded
E2EM1P6	Estuarine	Intertidal	Emergent	Persistent	Irregularly Flooded	Oligohaline	
E2EM1Pd6	Estuarine	Intertidal	Emergent	Persistent	Irregularly Flooded	Oligohaline	Partially Drained / Ditched
E2EM5Ps	Estuarine	Intertidal	Emergent	Phragmites australis	Irregularly Flooded		Spoils
PEM1/SS1R	Palustrine		Emergent / Scrub-shrub	Persistent / Broad-leaved Deciduous	Seasonally Flooded - Tidal		
PEM1Dd	Palustrine		Emergent	Persistent	Continuously Saturated		Partially Drained / Ditched
PEM5Rh	Palustrine		Emergent	Phragmites australis	Seasonally Flooded - Tidal		Diked / Impounded
PFO1R	Palustrine		Forested	Broad-leaved Deciduous	Seasonally Flooded - Tidal		
PUS1/ EM5Rs	Palustrine		Unconsolidated Shore / Emergent	Cobble-Gravel / Phragmites australis	Seasonally Flooded - Tidal		Spoils
R4SBCx	Riverine	Intermittent	Streambed		Seasonally Flooded		Excavated

Waterways among the project route largely include tributaries to the Alloway Creek, but also Hope Creek in the south, which are classified by the New Jersey Water Quality Standards (N.J.A.C. 7:9B) as SE1 waterways. "SE" means the general surface water classification applied to saline waters of estuaries. Also in the southern portion of the project route, saline waterways that are tributary to the Fishing Creek are classified as Category One (C1) waters. "C1" waters are classified as such by the NJDEP due to their exceptional ecological significance, exceptional recreational significance, exceptional water supply significance or exceptional fisheries resource(s). All waterways among the project route ultimately drain to the Delaware River.

4.0 THREATENED & ENDANGERED SPECIES DATABASE REVIEW

An endangered species is a species or subspecies of wildlife whose prospects for survival or recruitment are in jeopardy or are likely within the foreseeable future to become so due to any of the following factors: (1) the destruction, drastic modification, or severe curtailment of its habitat, or (2) its over-utilization for scientific, commercial or sporting purposes, or (3) the effect on it of disease, pollution, or predation, or (4) other natural or manmade factors affecting its prospects of survival or recruitment within the State, or (5) any combination of the foregoing factors. Threatened species are generally defined to be species that may become endangered if conditions surrounding them begin or continue to deteriorate (N.J. Division of Fish and Wildlife 2012).

Threatened and endangered wildlife or plant species habitats are terrestrial or aquatic areas known to be inhabited on a seasonal or permanent basis by, or be critical at any stage in the life cycle of, any wildlife or plant identified as an endangered or threatened species (N.J.A.C. 7:7). This evaluation addresses state-listed species only as derived from the following database reviews. A federal U.S. Fish & Wildlife Service (USFWS) Information, Planning and Conservation System (IPaC) Database review and effects analysis is being performed for the project and provided to ACE under separate cover.

4.1 Landscape Project Version 3.3 Data

To determine whether any potential threatened or endangered wildlife species habitat exists on the site, DuBois reviewed the NJDEP Landscape Maps of Habitat for Endangered, Threatened and Other Priority Wildlife (*version 3.3*). The Landscape Project was developed by the NJDEP, Division of Fish and Wildlife, Endangered and Non-Game Species Program (DFW ENSP) as a wildlife-habitat mapping program that is used to identify and map critical habitats for endangered, threatened, and special-concern wildlife. The Landscape Project uses documented sightings of listed wildlife and, based on a species-specific model, designates areas of suitable habitat contiguous to the sighting as critical habitat. The NJDEP notes that the Landscape Project maps represent an approximation of the location and extent of documented endangered or threatened species habitat; the maps are rooted in the NJDEP's aerial photography-based land-use/land-cover data, and therefore, they do not replace the need for an individual site assessment of any particular property in question.

The Landscape wildlife habitat patches are ranked based on the status of a species record, if present, within or near a polygon. The ranking system applied is as follows:

> Rank 3: assigned to species-specific habitat patches with one or more occurrences of State threatened species.
>
> Rank 4: assigned to species-specific patches containing one or more occurrences of State endangered species.
>
> Rank 5: assigned to species-specific habitat patches containing one or more occurrences of wildlife listed as endangered and threatened pursuant to the Federal Endangered Species Act of 1973.

The project is located among the Piedmont and Delaware Bay Landscape Regions. Review of NJDEP Landscape Project maps depict the majority of the project route lying among potential threatened or endangered wildlife species' habitats. The following wildlife species' habitat occurrences are mapped among the project route (refer to *Figure 5: NJDEP Landscape Project Version 3.3 Map*).

- Bald Eagle Foraging & Nest (Endangered)
- Osprey Foraging & Nest (Threatened)
- American Kestrel Breeding Sighting (Threatened)
- Grasshopper Sparrow Breeding Sighting (Threatened)
- Savannah Sparrow Breeding Sighting (Threatened)
- Horned Lark Breeding Sighting (Threatened)

Estuarine waters outside of the project area, but nearby the southern portion of the project route near Artificial Island, are mapped as containing habitat occurrences for federally-listed marine species.

4.2 NJDEP Natural Heritage Database Review

DuBois requested a Natural Heritage Database Review from the NJDEP Natural Heritage Program (NHP). The October 20, 2021 NHP database letter lists the aforementioned Landscape Project wildlife species' habitat occurrences along the project route. The NHP letter also lists the following federal-listed marine species along the project route (refer to *Appendix B* for a copy of the NHP database letter).

- Atlantic Sturgeon Migration Corridor – Adult & Juvenile Sighting (Federally Endangered)
- Shortnose Sturgeon Migration Corridor – Adult Sighting (Federally Endangered)
- Atlantic Green Turtle Occupied Habitat (Federally Threatened)
- Atlantic Loggerhead Occupied Habitat (Federally Threatened)
- Kemp's or Atlantic Ridley Occupied Habitat (Federally Threatened)

The NHP database review letter does not list any potential endangered plant species, rare ecological communities or Natural Heritage Priority Sites associated with the project route.

5.0 THREATENED & ENDANGERED SPECIES HABITAT EVALUATION

A field evaluation to determine whether suitable habitat to support the state-listed threatened or endangered species of wildlife was performed by the biological staff of DuBois along the majority of the project route on October 6, 2021, as well as the southern section along Alloway Creek Neck Road/Buttonwood Road to Windport Substation on September 15, 2022.

The habitat evaluation methodology included evaluating characteristics of the project ROW in relation to species-specific habitat requirements, which were derived from the life history of each particular species, review of scientific literature and experience of DuBois biologists. As applicable, the habitat evaluation incorporated the assessment of hydrology, freshwater and coastal wetlands, soil composition, vegetation assemblages, ecotone areas and surrounding land uses in relation to the habitat requirements of each species. The results of such were used to evaluate whether or not the project ROW provides all the components necessary to support the referenced species. No documentation of state-endangered plant species has been identified as associated with the project area based on NHP database review.

Federally-listed marine wildlife identified within the NJDEP NHP database letter are not included in this habitat evaluation as the project route does not intersect with Landscape-mapped marine waters associated with these species. ACE is encouraged to employ all necessary soil erosion and sediment control measures into project planning to avoid potential water quality impacts to nearby waters containing habitat occurrences for federally-listed marine species. A federal USFWS IPaC Database review and effects analysis is being performed for the project and provided to ACE under separate cover.

The following state-listed wildlife species have been identified as possibly associated with the project ROW or vicinity. Descriptions of suitable habitats required by these species are presented followed by species-specific habitat evaluations.

5.1 Bald Eagle (*Haliaeetus leucocephalus*), State-endangered (breeding population) and state-threatened (non-breeding population)

5.1.1 Species Narrative

Bald eagles are found primarily along coastlines, large rivers, and lakes where they feed mainly on fish. Waterfowl, small mammals, and carrion may also be taken by bald eagles. Given these feeding habits, preferred foraging habitat for bald eagles are rivers, lakes, and estuaries (DeGraaf et al. 1980). Foraging habitat for bald eagles consists of large perch trees near a body of water (Paturzo and Clark 2003). Nesting habitat generally consists of large nest trees in discontinuous forest stands. Throughout the state, these large birds require a nesting location that is safe from the threat of human disturbance, and they usually choose their nest tree accordingly. Typically, the tree they choose for building their large nests is a 'supercanopy' tree that is taller than the trees immediately surrounding it (Paturzo and Clark 2003). Roost sites are more likely to be taller than the surrounding canopy and feature hardwoods, high canopies, and snags than just random sites. Habitat is usually chosen due to the amount of the availability of prey, perch sites and roosting areas.

5.1.2 Habitat Evaluation

Prior to the field survey, DuBois performed a desktop review of the annual NJDEP Bald Eagle Project Reports (Smith and Clark, 2021 & 2022) to determine whether there is any local documentation of active bald eagle nests. According to the publications, there appears to be two (2) potential bald eagle nests located in close proximity to the project ROW (known as Nest Sites "Quinton B" and "Alloway Creek C"). The field surveys included a raptor nest survey to determine the presence or absence of bald eagle or osprey nests from within 1,000-feet of the project. The results of the raptor nest surveys conclude that three (3) active bald eagle nests are located within 1,000-feet of the project ROW. DuBois observed one bald eagle stick nest in a maple tree adjacent to marsh associated with Alloway Creek, located 946-feet north of Quinton Substation. Also in the Quinton area, DuBois observed one adult bald eagle perched atop a nest on a nearby communication tower that overlooks marsh associated with Alloway Creek. This tower is located 384-feet west of the project ROW and is documented by "Osprey Watch" as an osprey nest with no recorded breeding activity; however, due to size of nest, location and presence of adult eagle, it is believed to be currently occupied by bald eagle. A third bald eagle nest is located proximal to the Alloway Creek Neck Road portion of the ROW in the south. On September 25, 2022 (during the non-breeding season), DuBois observed one adult bald eagle perched atop an adjacent PSE&G lattice transmission tower within coastal marsh. The tower contains a wide, flat stick nest atop the upper tower cage. This nest appears to be the "Devil's Gut" nest location published in the NJDEP 2022 Bald Eagle Project Report. Osprey Watch has a nest reported at this tower, first added in 2013. In the middle cage of this tower, a very poor stick nest is present. It is dilapidated and presumed to be an inactive, former osprey nest.

Below table documents the location and status of observed bald eagle nests.

Nest ID	Structure	Species	Latitude	Longitude	Active	Distance to Project	Status
Quinton B	Tree	Bald Eagle	39.551661	-75.412187	Yes	946’	Active 2020
Alloway Creek C	Communication Tower	Bald Eagle	39.542411	-75.419950	Yes	384’	Active 2020
Devil’s Gut	Transmission Tower	Bald Eagle	39.464423	-75.479705	Yes	320’	Active 2022

The network of tidal waterways, brackish marsh and salt marsh associated with the project area represents suitable foraging habitat for bald eagle. The coastal landscape is an attractive area for bald eagle, and our field survey concludes that the project ROW lies along critical habitat area for three (3) pairs of breeding bald eagle. Refer to *Figures 6 & 7* for a depiction of the bald eagle nests located within 1,000-feet of the project ROW.

5.2 Osprey (*Pandion haliaetus*), State-threatened (breeding population)

5.2.1 Species Narrative

Ospreys are entirely fish-eating birds therefore they are associated with bodies of water that support adequate fish populations. Ospreys inhabit coastal rivers, marshes, bays and inlets as well as inland rivers, lakes and reservoirs. Ospreys nest on trees, cliffs, telephone poles and artificial structures within close proximity to fishing areas and have an unobstructed view of the surrounding landscape. Man-made platforms, however, are the preferred nesting structure for Osprey in southern New Jersey. The nests are constructed from sticks and breeding pairs will continue to return to the same nest each season. Territories typically contain poles, snags or other structures near the nest on which the ospreys perch (Liguori 2003).

5.2.2 Habitat Evaluation

Prior to the field survey, DuBois performed a desktop review of “Osprey Watch” (Center for Conservation Biology 2021) to determine whether there is any local documentation of osprey nests. According to this public data source, four (4) osprey nests appear to be historically documented within 1,000-feet of the project ROW. The field survey included a raptor nest survey to determine the presence or absence of bald eagle or osprey nests from within 1,000-feet of the project. The results of the raptor nest survey conclude that one (1) osprey nest is located near Alloway Creek Neck Road on an adjacent lattice transmission tower 180-feet west of the project ROW. This stick nest was observed to be in good condition during our field survey which was performed outside the breeding season. Osprey Watch has a nest reported at the same tower that shares the “Devil’s Gut” bald eagle nest, which was first added in 2013 (Nickname = 5024 3/3 S-NFso Access R). In the middle cage of this tower, below the upper cage bald eagle nest, a very poor dilapidated stick nest is present. It is dilapidated and presumed to be the inactive, former osprey nest; however, our survey was performed outside the breeding season and activity/occupancy could not be confirmed. Osprey Watch depicts two other nests on nearby lattice transmission towers that, based on our field observations, are not currently present. Below table documents the location and status of observed osprey nests.

Nest ID	Structure	Species	Latitude	Longitude	Active	Distance to Project	Status
Alloway Neck 1	Transmission Tower	Osprey	39.466245	-75.474143	Unknown	180’	Unknown
Alloway Neck 2	Transmission Tower	Osprey	39.464423	-75.479705	Unknown	320’	Unknown/ Unlikely

The network of tidal waterways, brackish marsh and salt marsh associated with the project area represents suitable foraging habitat for osprey. The coastal landscape is an attractive area for osprey, and our field survey concludes that the project ROW potentially lies along critical breeding habitat for osprey. Refer to *Figure 7* for a depiction of the osprey nest located within 1,000-feet of the project ROW.

5.3 Grassland Birds

Grassland birds is a collective term that refers to bird species that rely on grasslands. In this evaluation, the term grassland birds refers to American kestrel, grasshopper sparrow, savannah sparrow and horned lark. These four (4) grassland birds are discussed together as they have similar and overlapping habitat requirements.

5.3.1 Species Narrative: American Kestrel (*Falco sparverius*), State-threatened (breeding population)

The kestrel is the smallest species of falcon found within North America. Kestrels are found in open, grassy habitats – especially ones that have cavities for nesting and perches for hunting. They are characterized as “secondary” cavity nesters that will utilize cavities in trees that are either naturally occurring or excavated by woodpeckers (NatureServe 2012; Hawk Mountain 1997; Korth, undated). Preferred nest cavities are identified as being surrounded by suitable open hunting grounds, and face open areas with no obstructions (Korth, undated). Removal of trees and snags with suitable cavities, and competition for nest cavities by competitors such as starlings, squirrels and woodpeckers have contributed to the decline of the species (Winkler and Mason, 2012). Kestrels will also nest in the eaves of buildings barns, and constructed nest boxes (ibid.). Large open areas with short vegetation, such as farmland, parkland and livestock pastures are occupied and utilized as foraging habitat. When hunting, kestrels can be seen perching on roadway utility lines and tree branches, as well as hovering stationary above the ground. Kestrel’s hunt and feed on a variety of small prey including grasshoppers, lizards, mice, snakes and small birds (Korth, undated).

5.3.2 Species Narrative: Grasshopper Sparrow (*Ammodramus savannarum*), State-threatened (breeding population)

The grasshopper sparrow can be found throughout the entire state during the breeding season and arrive in mid-April to early May. It is a ground nesting bird that tends to favor well drained sites. It prefers short bunch grasses with minimal litter and patches of bare ground (Munafo et al. 2012). Grasshopper sparrows breed in grassland, upland meadow, pasture, hay field, and old field habitats. Nesting grasshopper sparrows may occur on agricultural lands and airports where such habitats occur. Although grasshopper sparrows may use small grasslands, open areas over 40 hectares (99 acres) are favored, and males establish territories averaging 2-4 acres. Optimal habitat for these sparrows contains short-to medium-height bunch grasses interspersed with patches of bare ground, a shallow litter layer, scattered forbs, and few shrubs. Clumped grasses, such as poverty grass and broom-sedge, provide cover and foraging areas and are consequently favored over sod or matting grasses. Shrubs, fence posts, and tall forbs are used as song perches (Liguori 2003).

The diet of the grasshopper sparrow includes both animal and plant matter. During the spring and summer, they consume spiders, snails, and other invertebrates. Adult grasshopper sparrows feed caterpillars to their young. Grains, weed seeds, and grass seeds supplement the diet throughout the year.

5.3.3 Species Narrative: Savannah Sparrow (*Passerculus sandwichensis*), State-threatened (breeding population)

Savannah sparrows breed in the Ridge and Valley and Highlands regions of northern New Jersey and in the inner coastal plain of southwestern New Jersey. Indigenous to open habitats, the savannah sparrow nests in hay and alfalfa fields, fallow fields, grasslands, upland meadows, airports, pastures, and vegetated landfills. The female constructs a cup nest, concealed by vegetation, in a slight depression on the ground. Located within clumps of grass or at the base of a shrub, the nest is woven of thick grasses and lined with thinner grasses. Suitable tracts must provide a mix of short and tall grasses, a thick litter layer, dense ground vegetation, and scattered shrubs, saplings or forbs. This species is relatively tolerant of vegetative succession and may occupy fields that also contain early woody growth.

Savannah sparrows require large grasslands of approximately 20-40 acres, within which males establish territories of 1-2 acres. Most individuals arrive at the breeding territory by mid-April and leave by early fall. They are commonly observed during spring migration from late March into April and fall migration during September/October.

Savannah sparrows rely on seasonally abundant food sources. They feed mainly on insects in the summer and grass and weed seeds during the winter. In the nesting season, they feed on invertebrates such as insects, larvae, and caterpillars. Young sparrows are fed invertebrates along with fruit and berries (Liguori 2003).

5.3.4 Species Narrative: Horned Lark (*Eremophila alpestris*), State-threatened (breeding population)

Horned larks prefer open habitats with short, sparse grasses and wildflowers, bare ground, and few shrubs. They are quick to abandon sites as vegetation grows thicker. Their minimum habitat patch size needs are poorly understood, but habitat character probably matters more than the expanse. Mowed areas around airstrips support populations where suitable agricultural and non-forested habitats are scarce (Hall 2011).

Adult horned larks eat mostly weed seeds, grass seeds, and waste grains. They feed insects to their young, though, and also consume some insects (like grasshoppers, caterpillars, ants, and wasps) themselves (Hall 2011).

5.3.5 Grassland Bird Habitat Evaluation

Grassland birds inhabit open, agricultural habitats in New Jersey. The field evaluation confirmed the presence of active farmland and old-field habitats along and in the vicinity of the project ROW at two concentrated areas (refer to *Figures 8 & 9: Grassland Bird Suitable Habitat Map*), the southern of which includes lands contained within the Mad Horse Creek Wildlife Management Area. Active farmland includes fields of soybean and row crops of corn; however, crop assemblage may vary year-by-year. Old-fields include agricultural tracts that were not farmed, and contained early successional grasses, herbs and few shrubs. Both these farmed and non-farmed areas represent suitable habitat for grassland birds, however, old-field habitats represent more optimal habitat as active farming practices often occur during the grassland bird breeding season and interrupts critical life stage processes. As ground nesters, potential grassland birds and their eggs and young among the project vicinity could be vulnerable to predation by

birds, mammals and farming practices. Considering annual crop rotation, the suitability of any particular agricultural patch may vary from year to year for the subject grassland birds.

American kestrels favor open areas with short ground vegetation and sparse trees. When breeding, kestrels need access to at least a few trees or structures that provide appropriate nesting cavities (Cornell University 2019). As part of the field survey, a visual survey for snags and/or live trees containing suitable cavities for American kestrel were sought among the agricultural portion of the project ROW, however, none were found. Where farmland is present, the project ROW is roadside and absent of potential snags or suitable cavity trees.

Niles et al. (2008) consider all grassland patches greater than 18 ha (44.5 ac) as the minimum size requirement suitable for grassland dependent species. The two (2) concentrated areas of farmland collectively meet minimum patch size criteria to support the breeding requirements of grassland birds; however, grassland birds will typically nest in core grasslands, that is, in areas away from edges. Predator densities may be higher near field edges than at interior locations which results in higher predation rates near edges (Gates and Gysel 1978; Johnson and Temple 1990). Given the project ROW's location along managed roadside edge, the project area is an unlikely and unviable location to support nesting grassland birds.

6.0 DISCUSSION

Based on the results of the habitat evaluation, the following are our findings regarding potential regulatory implications and/or project constraints regarding the protection of state-listed threatened or endangered species' habitats pursuant to ACE's blanket permit.

6.1 Osprey & Bald Eagle

Three (3) active bald eagle nests are located proximal to the project ROW (*Figures 6 & 7*). Two (2) osprey nests of unknown activity are located proximal to the project ROW (*Figure 7*). Construction work which generates disturbance (e.g., sound levels, visual interruption) that is out of character with what currently exists at or surrounding the project area can negatively impact breeding eagles and osprey. Depending on the nature of construction, DuBois recommends avoiding construction activities within 1,000-feet from the identified bald eagle nests from January 1 to July 31, and 1,000-feet from the identified osprey nests from April 1 to August 31, which are timing restrictions that are protective of the breeding seasons for both eagle and osprey, respectively, as recommended within the *Recommended Rights-of-way Management Guidelines for Minimizing Prohibited Take in New Jersey* (NJDEP, 2020). If these timing restrictions cannot be upheld, or project activities are likely not to disturb the raptors within these distances, it is recommended to consult with the NJDEP Division of Land Resource Protection and/or ACE environmental planning.

6.2 Grassland Birds

Suitable tracts of farmland, albeit their quality dependent on intensity of farming practices, are present among the project ROW at two (2) concentrated areas, the southernmost of which is located among the Mad Horse Creek Wildlife Management Area. Despite being located among suitable agricultural patches, the project ROW is located along managed roadside/field edge – this edge location does not represent effective "core" breeding habitat for grassland birds. Since grassland birds are unlikely to nest along the project ROW, it is our conclusion the transmission build is unlikely to adversely impact breeding grassland birds.

DuBois recommends avoiding staging any equipment within the interior of the suitable grassland bird habitat farmland tracts from April 1 - August 31, a seasonal timing restriction as recommended within the *Recommended Rights-of-way Management Guidelines for Minimizing Prohibited Take in New Jersey* (NJDEP, 2020). If material must be staged beyond 100-feet of existing roadside edge, DuBois recommends a pre-construction survey of the staging area to determine if the area is inhabited by nesting grassland birds. Alternatively, ACE may wish to perform grassland bird surveys of the project area to determine residency status of grassland birds.

7.0 SUMMARY & CONCLUSION

The project ROW was evaluated to determine whether suitable habitats for state-listed threatened or endangered species may be present and to determine any regulatory implications or project constraints that may be present. Maintenance projects may proceed under ACE's blanket permit only if a regulated activity will not destroy, jeopardize, or adversely modify a present or documented habitat for threatened or endangered species, and shall not jeopardize the continued existence of any local population of a threatened or endangered species. Based on review of NJDEP records, and a field assessment to determine location and extent of any suitable habitats, it is our determination that abiding by the osprey, bald eagle and grassland bird habitat recommendations cited in Chapter 6.0, the Quinton – Windport Transmission Line Project shall be in conformance with the threatened and endangered species protection standards of ACE's blanket permit.

This report and conclusions stated herewith should be provided to the NJDEP Division of Land Resource Protection for consideration of project area habitat conditions and concurrence of the determinations made herewith.

8.0 REFERENCES

Cornell University. 2019. American Kestrel and Horned Lark. All About Birds. The Cornell Lab. Available online at https://www.birds.cornell.edu/home

DeGraaf, R.M., G.M. Witman, J.M. Lancier, B.J. Hill and J.M. Keniston. 1980. Forest habitat for birds of the Northeast. U.S. For. Serv., Northeast For. Exp. Stn. Broomall, PA. 589 pp.

Gates, J. E., and L. W. Gysel. 1978. Avian nest dispersion and fledging success in field-forest ecotones. Ecology 59:871-883.

Hall, MacKenzie. 2011. Horned Lark. New Jersey Endangered and Threatened Species Field Guide. Conserve Wildlife Foundation of New Jersey. Available online at http://www.conservewildlifenj.org/species/fieldguide/view/Eremophila%20alpestris/

Hawk Mountain Sanctuary Association. 1997. Nestboxes for kestrels. Kempton, PA: Hawk Mountain Sanctuary Association. Available online at http://www.hawkmountain.org. Accessed October 4, 2012.

Haywood, D.D. and R.D. Ohmart. 1986. Utilization of benthic-feeding fish by inland breeding bald eagles. The Condor 88:35-42

Johnson, R. G., and S. A. Temple. 1990. Nest predation and brood parasitism of tallgrass prairie birds. J. Wildl. Manage. 54:106-111.

Korth, Kim. undated. Species Spotlight: American Kestrel. The Conserve Wildlife Foundation of New Jersey and NJ Division of Fish and Wildlife, Endangered and Nongame Species Program. Available online at http://www.conservewildlifenj.org/species/spotlight/kestrel. Accessed October 4, 2012.

Munafo, K., N. Tsipoura and L. Stern. 2012. 2012 Grassland Bird Survey Citizen Science Protocol. The New Jersey Audubon Society. Bernardsville, NJ.

NatureServe. 2012. NatureServe Expolorer: An online encyclopedia of life. Version 7.1. NatureServe, Arlington, Virginia. Available online at http://www.natureserve.org/explorer. Accessed October 4, 2012.

NatureServe 2021: NatureServe Explorer Version 2.0: An online encyclopedia of life [web application]. NatureServe, Arlington, Virginia. Available http://explorer.natureserve.org. (Accessed: April 8, 2021).

New Jersey Department of Environmental Protection, Division of Fish and Wildlife, Endangered and Nongame Species Program. 2019. Recommended Rights-of-way Management Guidelines for Minimizing Prohibited Take in New Jersey (revised Sept 2019). Trenton, NJ.

New Jersey Department of Environmental Protection, Division of Land Use Regulation, Office of Natural Lands Management Division of Parks and Forestry and Endangered and Nongame Species Program Division of Fish and Wildlife. 2013. *Protocols for the Establishment of Exceptional Resource Value Wetlands Pursuant to the Freshwater Wetland Protection Act (N.J.S.A. 13:9B-1 Et Seq.)*. Updated January 2013.

New Jersey Department of Environmental Protection, Bureau of Geographical Information Systems. http://www.nj.gov/dep/gis/.

New Jersey Division of Fish and Wildlife. 2012. New Jersey Landscape Project, Version 3.1. New Jersey Department of Environmental Protection, Division of Fish and Wildlife, Endangered and Nongame Species Program. pp. 36.

Niles, L.J., M. Valent, P. Winkler and P. Woerner. 2008. New Jersey's Landscape Project, Version 2.1. New Jersey Department of Environmental Protection, Division of Fish and Wildlife, Endangered and Nongame Species Program. pp. 150.

Paturzo, Steve and Kathleen Clark. 2003. Bald Eagle. In Endangered and Threatened Wildlife of New Jersey, eds. Beans, B. and Niles, L. Rutgers University Press, New Brunswick, NJ.

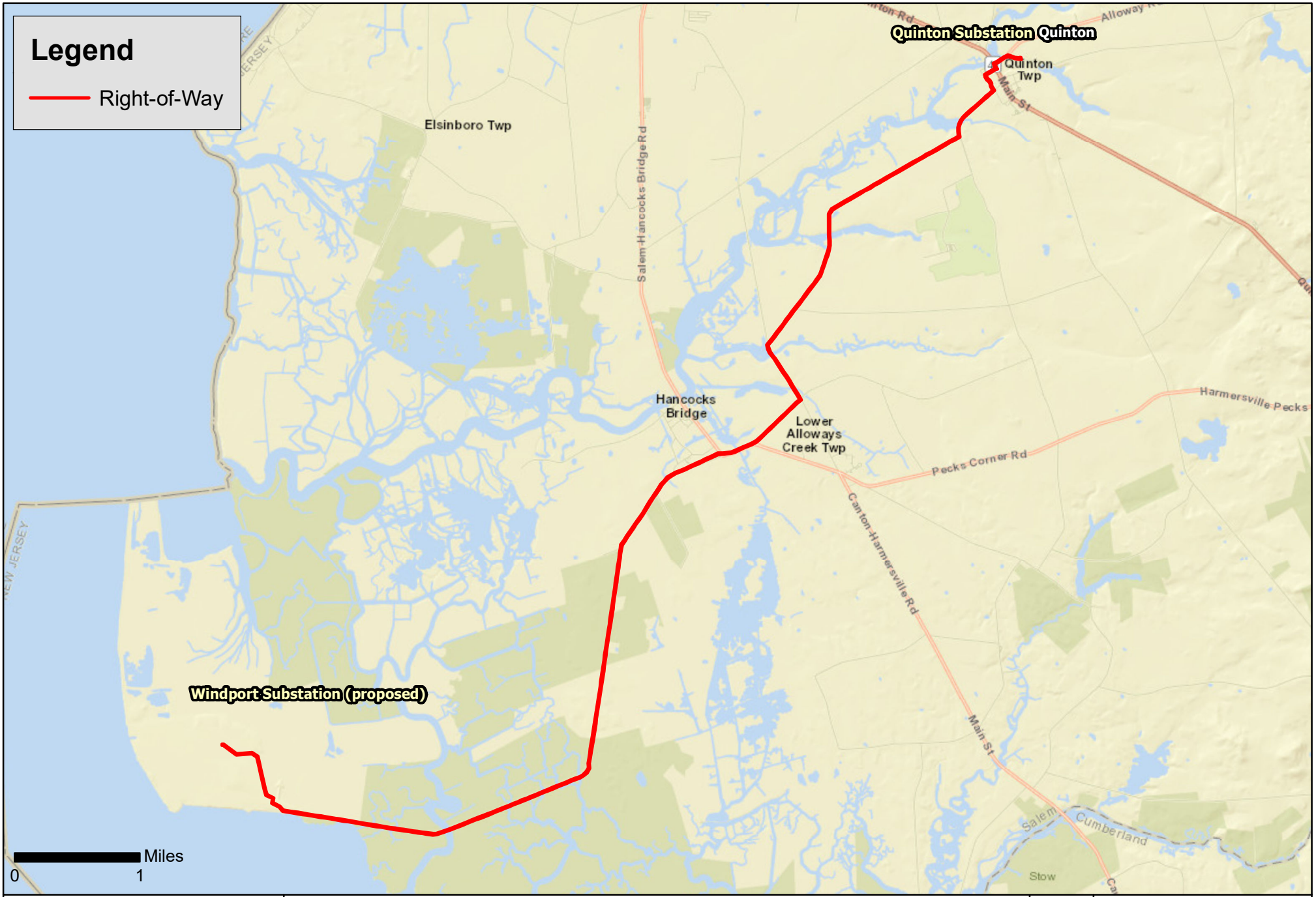
Smith, L. and K. Clark. 2021. New Jersey Bald Eagle Project, 2020. New Jersey Department of Environmental Protection, Division of Fish and Wildlife, Endangered and Nongame Species Program & New Jersey Conservation Foundation. 23pp. Trenton, NJ.

United States Department of Agriculture, Natural Resource Conservation Service. 2021. Web Soil Survey. Available online at https://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm

United States National Vegetation Classification. 2021. Guide to Inventorying Natural and Cultural Vegetation Communities. USGS GAP, ESA, USFS, NatureServe. Available online at http://usnvc.org/

Winkler, P. & M. Mason. 2012. New Jersey American Kestrel Nest Box Project 2006 – 2012. New Jersey Department of Environmental Protection, Division of Fish and Wildlife. Available online: https://www.state.nj.us/dep/fgw/ensp/pdf/kestrel_project_summary06-12.pdf

Figures



New Jersey Roads Map

Quinton - Windport Transmission Line Project
Quinton & Lower Alloway Creek Townships, Salem County, NJ

DuBois & ASSOCIATES

NORTH

Figure 1

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Date: 2/1/2023
Drawn By: HJ

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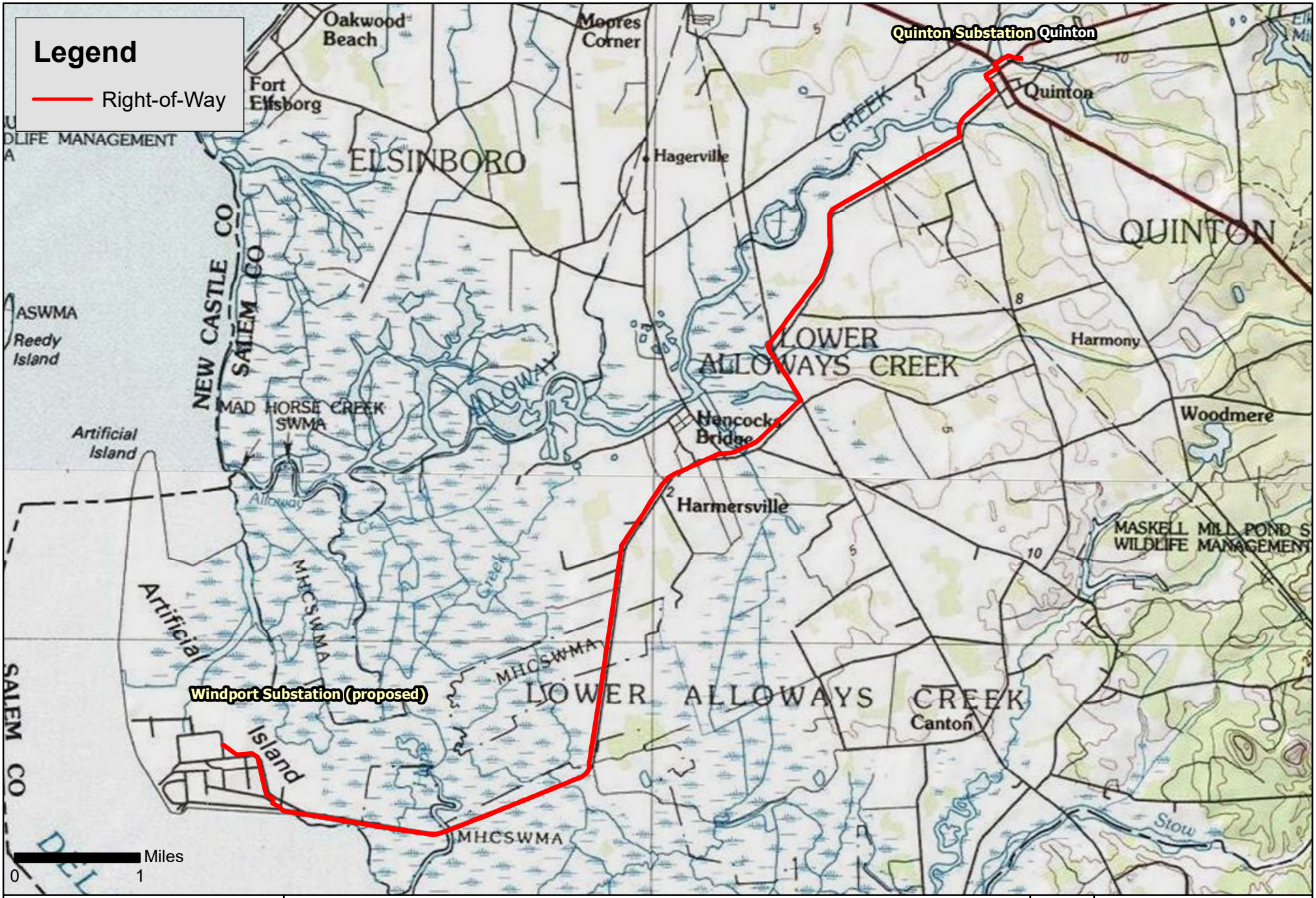

DuBois & ASSOCIATES

Salem, Canton & Taylors Bridge USGS Quadrangle Map

Quinton - Windport Transmission Line Project
Quinton & Lower Alloway Creek Townships, Salem County, NJ

NORTH

Figure 2	Job No.: D1000.215
	Scale: 1 in = 5,280 ft
	Date: 2/1/2023
	Drawn By: HJ

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This map was developed using Geographic Information Systems Digital Data. This map is for visual display purposes only and all locations are approximate.

Aerial Map

Quinton - Windport Transmission Line Project
Quinton & Lower Alloway Creek Townships, Salem County, NJ

DuBois & ASSOCIATES

NORTH

Figure 3

Job No.: D1000.215
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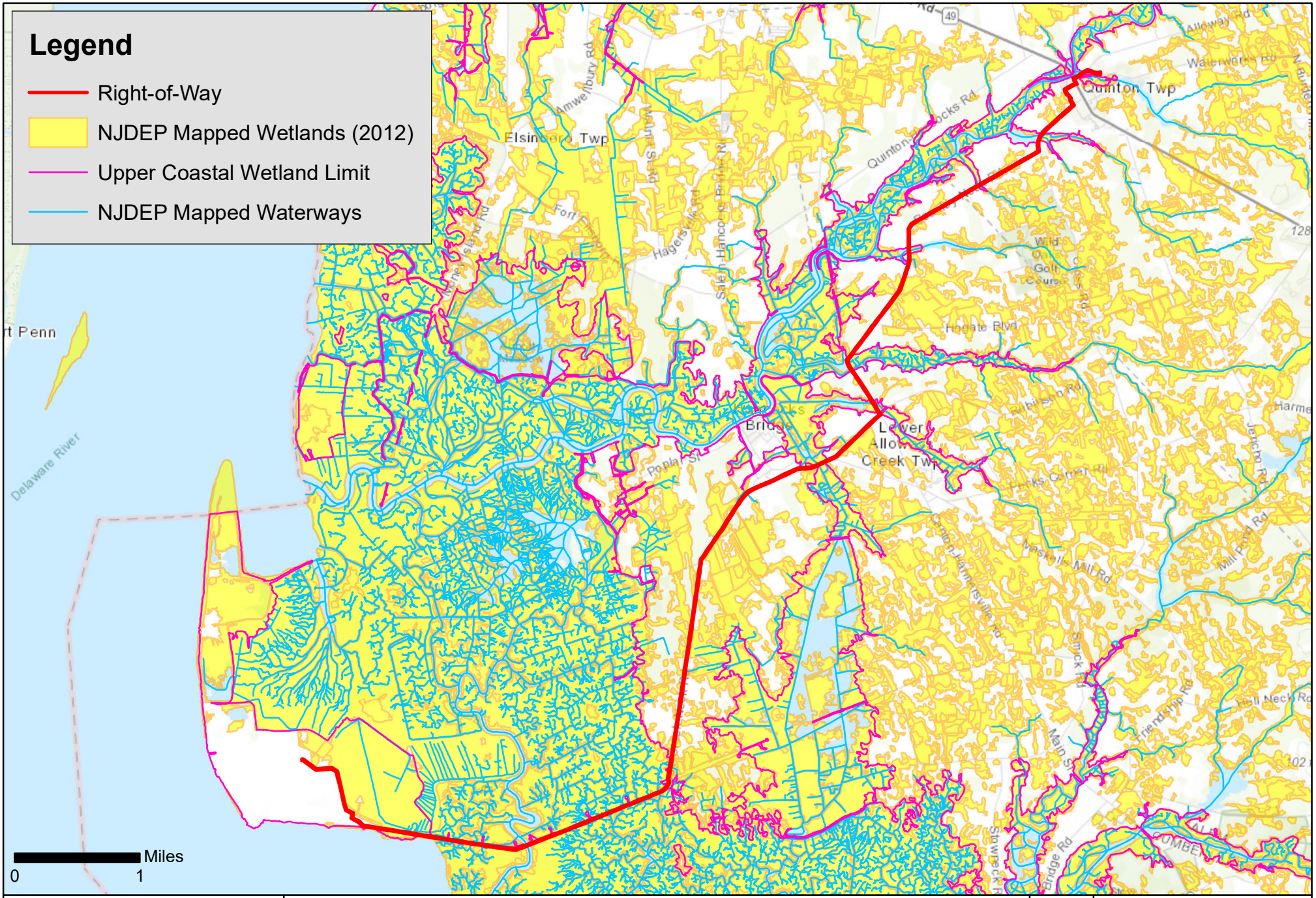

NJDEP Wetlands Map

Quinton - Windport Transmission Line Project
Quinton & Lower Alloway Creek Townships, Salem County, NJ

DuBois & ASSOCIATES

NORTH

Figure 4

Job No.: D1000.215
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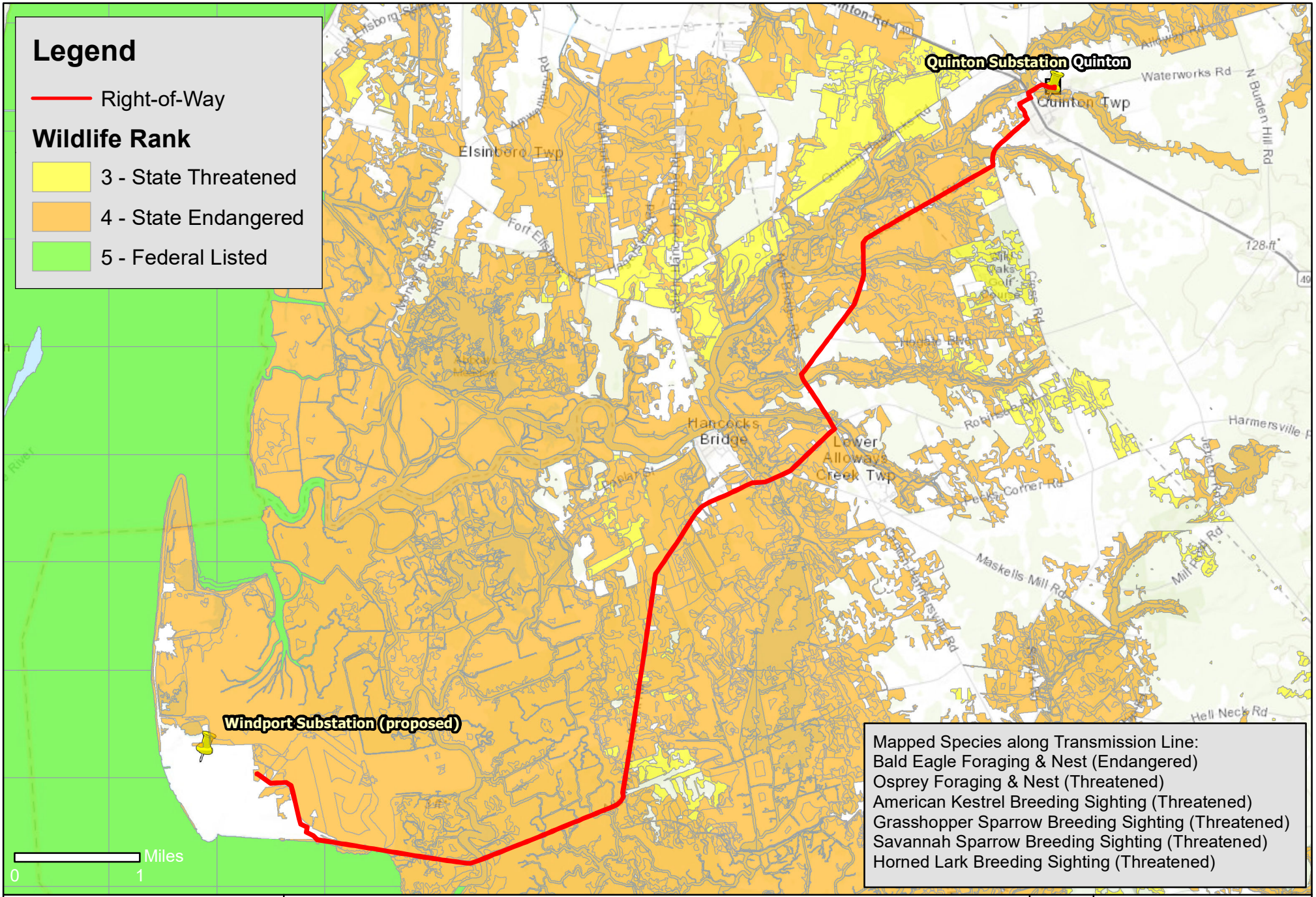

Mapped Species along Transmission Line:
Bald Eagle Foraging & Nest (Endangered)
Osprey Foraging & Nest (Threatened)
American Kestrel Breeding Sighting (Threatened)
Grasshopper Sparrow Breeding Sighting (Threatened)
Savannah Sparrow Breeding Sighting (Threatened)
Horned Lark Breeding Sighting (Threatened)

DuBois & ASSOCIATES

NJDEP Landscape Project Map (ver. 3.3)

Quinton - Windport Transmission Line Project
Quinton & Lower Alloways CreekTownship, Salem County, NJ

NORTH

Figure 5

Job No.: D1000.215
Scale: 1 in = 5,280 ft
Date: 2/1/2023
Drawn By: HJ

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Bald Eagle Nest Location Map

Quinton - Windport Transmission Line Project
Quinton & Lower Alloways Creek Township, Salem County, NJ

DuBois & ASSOCIATES

NORTH

Figure 6

Job No.: D1000.215	
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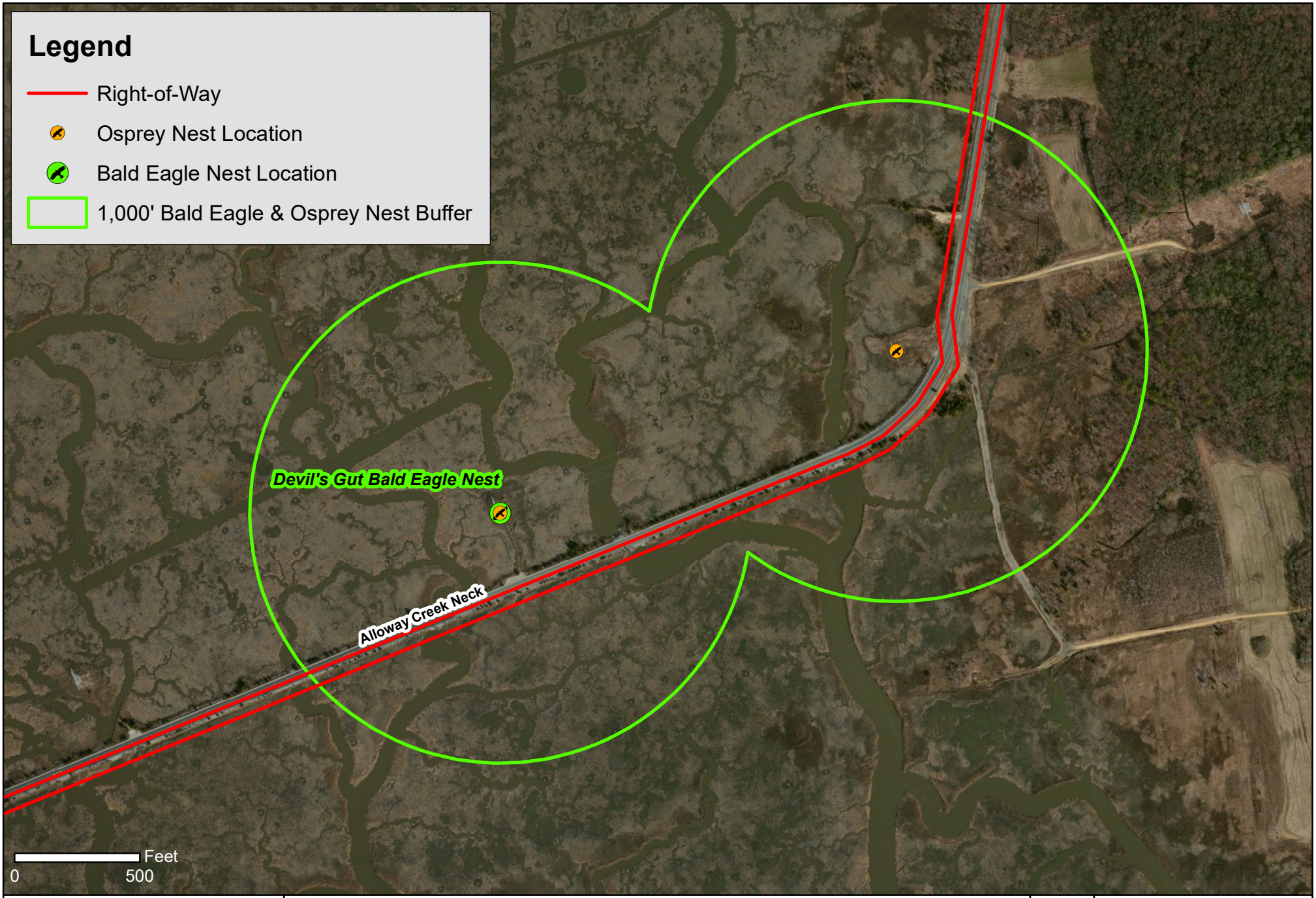

DuBois & ASSOCIATES

Bald Eagle & Osprey Nest Location Map

Quinton - Windport Transmission Line Project
Quinton & Lower Alloways Creek Township, Salem County, NJ

NORTH

Figure 7

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Date: 2/1/2023
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Grassland Bird Suitable Habitat Map

Quinton - Windport Transmission Line Project
Quinton & Lower Alloways CreekTownship, Salem County, NJ

NORTH

Figure 8

Job No.: D1000.215
Scale: 1 in = 1,000 ft
Date: 2/1/2023
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This map was developed using Geographic Information Systems Digital Data. This map is for visual display purposes only and all locations are approximate.

Grassland Bird Suitable Habitat Map

Quinton - Windport Transmission Line Project
Quinton & Lower Alloways CreekTownship, Salem County, NJ

DuBois & ASSOCIATES

NORTH

Figure 9

Job No.: D1000.215	
Scale: 1 in = 1,000 ft	
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Drawn By: HJ	

Document Path: S:\JOBS NUMBERS\D1000.215\Grassland bird habitat_2.mxd

This map was developed using Geographic Information Systems Digital Data. This map is for visual display purposes only and all locations are approximate.

Appendix A

Site Photographs

Photo 01: View of the project ROW along roadside edge of suitable grassland bird habitat

Photo 02: View of a lower quality soybean crop/grassland bird habitat adjacent to project ROW

Photo 03: Representative view of ROW in a rural residential landscape in Quinton

Photo 04: View of *Phragmites* tidal marsh and Alloway Creek adjacent to the project ROW.

Photo 05: View of Mad Horse Creek WMA entrance facing north from Alloway Creek Neck Road.

Photo 06: Representative view of old-field suitable grassland bird habitat within WMA along the ROW.

Photo 07: View of a lower quality cornfield/grassland bird habitat adjacent to project ROW

Photo 08: View of bald eagle nest “Quinton B” located in maple tree north of Quinton Substation

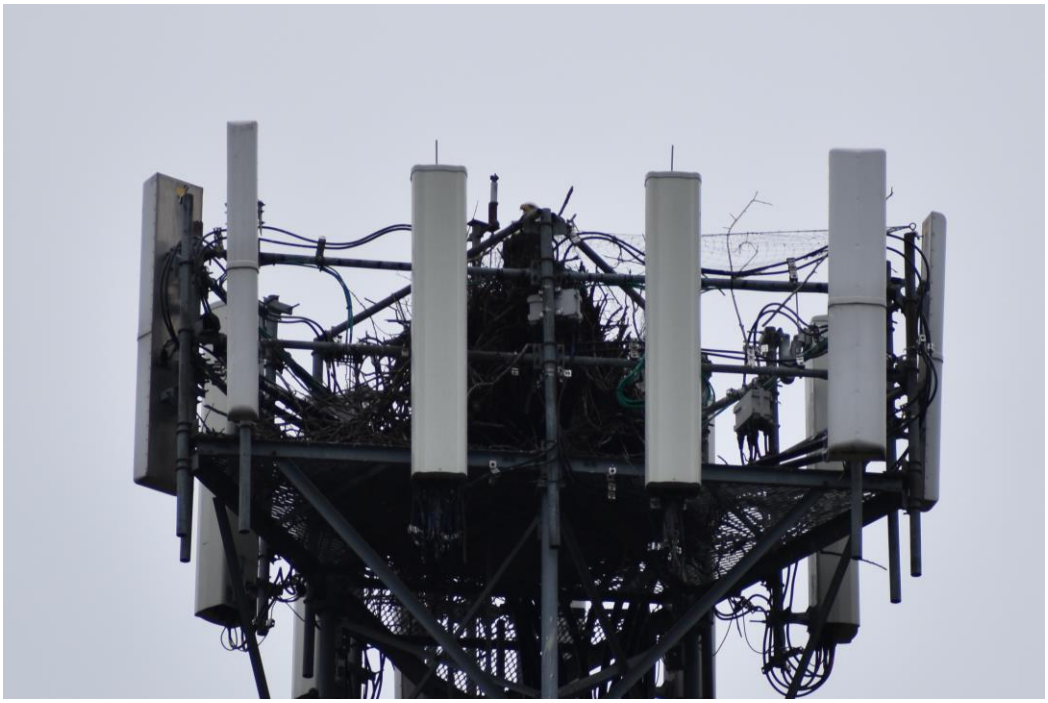

Photo 09: View of bald eagle nest "Alloway Creek C" located on communication tower NW of ROW

Photo 10: View of bald eagle and nest ("Devil's Gut") atop PSEG tower near Alloway Creek Neck Road

Photo 11: View of dilapidated osprey nest "Alloway Neck 2" below "Devil's Gut" bald eagle nest within PSEG tower near Alloway Creek Neck Road

Photo 12: View of osprey nest "Alloway Neck 1" within PSEG tower near Alloway Creek Neck Road

Photo 13: View of coastal conditions adjacent to Alloway Creek Neck Road

Photo 14: View of coastal conditions along project ROW adjacent to Alloway Creek Neck Road

Photo 15: View of disturbed wetland conditions along project ROW at Artificial Island

Photo 16: View of disturbed wetland conditions near project ROW at Artificial Island

Appendix B

Natural Heritage Program Correspondence

State of New Jersey
MAIL CODE 501-04
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF PARKS & FORESTRY
NEW JERSEY FOREST SERVICE
OFFICE OF NATURAL LANDS MANAGEMENT
P.O. BOX 420
TRENTON, NJ 08625-0420
Tel. (609) 984-1339 Fax (609) 984-0427

PHILIP D. MURPHY
Governor

SHEILA Y. OLIVER
Lt. Governor

SHAWN M. LATOURETTE
Commissioner

October 20, 2021

Anthony Silva
DuBois Environmental Consultants, LLC
190 North Main Street
Manahawkin, NJ 08050

Re: Quinton to Windport
Quinton and Lower Alloways Creek Townships, Salem County
Along Quinton Roads: Beasley Neck Rd., Sickler St., Smithfield St., and Cottage Ave.
Along Lower Alloways Creek Roads: Hope Creek Rd., Buttonwood Ave., Alloway Creek Neck Rd., Cuff Rd., and Beasley Neck Rd.

Dear Mr. Silva:

Thank you for your data request regarding rare species information for the above referenced project site.

Searches of the Natural Heritage Database and the Landscape Project (Version 3.3) are based on a representation of the boundaries of your project site in our Geographic Information System (GIS). We make every effort to accurately transfer your project bounds from the map(s) submitted with the Natural Heritage Data Request Form into our GIS. We do not typically verify that your project bounds are accurate, or check them against other sources.

We have checked the Landscape Project habitat mapping and the Biotics Database for occurrences of any rare wildlife species or wildlife habitat on the referenced site. The Natural Heritage Database was searched for occurrences of rare plant species or ecological communities that may be on the project site. Please refer to Table 1 (attached) to determine if any rare plant species, ecological communities, or rare wildlife species or wildlife habitat are documented on site. A detailed report is provided for each category coded as 'Yes' in Table 1.

We have also checked the Landscape Project habitat mapping and Biotics Database for occurrences of rare wildlife species or wildlife habitat in the immediate vicinity (within ¼ mile) of the referenced site. Additionally, the Natural Heritage Database was checked for occurrences of rare plant species or ecological communities within ¼ mile of the site. Please refer to Table 2 (attached) to determine if any rare plant species, ecological communities, or rare wildlife species or wildlife habitat are documented within the immediate vicinity of the site. Detailed reports are provided for all categories coded as 'Yes' in Table 2. These reports may include species that have also been documented on the project site.

The Natural Heritage Program reviews its data periodically to identify priority sites for natural diversity in the State. Included as priority sites are some of the State's best habitats for rare and endangered species and ecological communities. Please refer to Tables 1 and 2 (attached) to determine if any priority sites are located on or in the immediate vicinity of the site.

A list of rare plant species and ecological communities that have been documented from the county (or counties), referenced above, can be downloaded from http://www.state.nj.us/dep/parksandforests/natural/heritage/countylist.html. If suitable habitat is present at the project site, the species in that list have potential to be present.

Status and rank codes used in the tables and lists are defined in EXPLANATION OF CODES USED IN NATURAL HERITAGE REPORTS, which can be downloaded from http://www.state.nj.us/dep/parksandforests/natural/heritage/nhpcodes_2010.pdf.

NHP File No. 21-3907554-23125

Beginning May 9, 2017, the Natural Heritage Program reports for wildlife species will utilize data from Landscape Project Version 3.3. If you have questions concerning the wildlife records or wildlife species mentioned in this response, we recommend that you visit the interactive web application at the following URL, https://njdep.maps.arcgis.com/apps/webappviewer/index.html?id=0e6a44098c524ed99bf739953cb4d4c7, or contact the Division of Fish and Wildlife, Endangered and Nongame Species Program at (609) 292-9400.

For additional information regarding any Federally listed plant or animal species, please contact the U.S. Fish & Wildlife Service, New Jersey Field Office at http://www.fws.gov/northeast/njfieldoffice/endangered/consultation.html.

PLEASE SEE 'CAUTIONS AND RESTRICTIONS ON NHP DATA', which can be downloaded from http://www.state.nj.us/dep/parksandforests/natural/heritage/newcaution2008.pdf.

Thank you for consulting the Natural Heritage Program. The attached invoice details the payment due for processing this data request. Feel free to contact us again regarding any future data requests.

Sincerely,

Robert J. Cartica
Administrator

c: NHP File No. 21-3907554-23125

Table 1: On Site Data Request Search Results (6 Possible Reports)

Report Name	Included	Number of Pages
1. Possibly on Project Site Based on Search of Natural Heritage Database: Rare Plant Species and Ecological Communities Currently Recorded in the New Jersey Natural Heritage Database	Yes	1 page(s) included
2. Natural Heritage Priority Sites On Site	No	0 pages included
3. Rare Wildlife Species or Wildlife Habitat on the Project Site Based on Search of Landscape Project 3.3 Species Based Patches	Yes	2 page(s) included
4. Vernal Pool Habitat on the Project Site Based on Search of Landscape Project 3.3	Yes	1 page(s) included
5. Rare Wildlife Species or Wildlife Habitat on the Project Site Based on Search of Landscape Project 3.3 Stream Habitat File	No	0 pages included
6. Other Animal Species On the Project Site Based on Additional Species Tracked by Endangered and Nongame Species Program	No	0 pages included

Possibly on Project Site Based on Search of Natural Heritage Database: Rare Plant Species and Ecological Communities Currently Recorded in the New Jersey Natural Heritage Database

Scientific Name	Common Name	Federal Protection Status	State Protection Status	Regional Status	Grank	Srank	Identified	Last Observed	Location
Vascular Plants									
Sagittaria calycina var. spongiosa	Tidal Arrowhead			HL	G5T4	S3	Y	2011-09-19	2011: Located 0.25 mile north-northwest of center of Quinton, bordering the northeast corner of the intersection of State Highway 49 and Action Station Road (Quinton Washington Road), on the north/west bank of Alloway Creek, in Quinton Township, Salem County.
Schoenoplectus novae-angliae	New England Bulrush			HL	G5	S2	Y	1972-10-16	ALONG SMALL TIDAL TRIBUTARY OF ALLOWAY CREEK ON SOUTHEAST SIDE OF QUINTON-REMSTERVILLE ROAD, QUINTON.

Total number of records: 2

Rare Wildlife Species or Wildlife Habitat on the Project Site Based on Search of Landscape Project 3.3 Species Based Patches

Class	Common Name	Scientific Name	Feature Type	Rank	Federal Protection Status	State Protection Status	Grank	Srank
Aves								
	American Kestrel	Falco sparverius	Breeding Sighting	3	NA	State Threatened	G5	S2B,S2N
	Bald Eagle	Haliaeetus leucocephalus	Foraging	4	NA	State Endangered	G5	S1B,S2N
	Bald Eagle	Haliaeetus leucocephalus	Nest	4	NA	State Endangered	G5	S1B,S2N
	Bald Eagle	Haliaeetus leucocephalus	Wintering	3	NA	State Threatened	G5	S1B,S2N
	Brown Thrasher	Toxostoma rufum	Breeding Sighting	2	NA	Special Concern	G5	S3B,S4N
	Eastern Meadowlark	Sturnella magna	Breeding Sighting	2	NA	Special Concern	G5	S3B,S3N
	Grasshopper Sparrow	Ammodramus savannarum	Breeding Sighting	3	NA	State Threatened	G5	S2B,S3N
	Great Blue Heron	Ardea herodias	Foraging	2	NA	Special Concern	G5	S3B,S4N
	Hooded Warbler	Wilsonia citrina	Breeding Sighting	2	NA	Special Concern	G5	S3B,S4N
	Horned Lark	Eremophila alpestris	Breeding Sighting	3	NA	State Threatened	G5	S2B,S3N
	Osprey	Pandion haliaetus	Foraging	3	NA	State Threatened	G5	S2B,S4N
	Osprey	Pandion haliaetus	Nest	3	NA	State Threatened	G5	S2B,S4N

Rare Wildlife Species or Wildlife Habitat on the Project Site Based on Search of Landscape Project 3.3 Species Based Patches

Class	Common Name	Scientific Name	Feature Type	Rank	Federal Protection Status	State Protection Status	Grank	Srank
	Savannah Sparrow	Passerculus sandwichensis	Breeding Sighting	3	NA	State Threatened	G5	S2B,S4N
	Wood Thrush	Hylocichla mustelina	Breeding Sighting	2	NA	Special Concern	G4	S3B,S4N
Osteichthyes								
	Atlantic Sturgeon	Acipenser oxyrinchus	Migration Corridor - Adult Sighting	5	Federally Listed Endangered	State Endangered	G3	S1
	Atlantic Sturgeon	Acipenser oxyrinchus	Migration Corridor - Juvenile Sighting	5	Federally Listed Endangered	State Endangered	G3	S1
	Shortnose Sturgeon	Acipenser brevirostrum	Migration Corridor - Adult Sighting	5	Federally Listed Endangered	State Endangered	G3	S1
Reptilia								
	Atlantic Green Turtle	Chelonia mydas	Occupied Habitat	5	Federally Listed Threatened	State Threatened	G3	S1
	Atlantic Loggerhead	Caretta caretta	Occupied Habitat	5	Federally Listed Threatened	State Endangered	G3	S1
	Eastern Box Turtle	Terrapene carolina carolina	Occupied Habitat	2	NA	Special Concern	G5T5	S3
	Kemp's or Atlantic Ridley	Lepidochelys kempii	Occupied Habitat	5	Federally Listed Endangered	State Endangered	G1	S1
	Spotted Turtle	Clemmys guttata	Occupied Habitat	2	NA	Special Concern	G5	S3

Vernal Pool Habitat on the Project Site Based on Search of Landscape Project 3.3

Vernal Pool Habitat Type	Vernal Pool Habitat ID
Potential vernal habitat area	376
Potential vernal habitat area	489

Total number of records: 2

Table 2: Vicinity Data Request Search Results (6 possible reports)

Report Name	Included	Number of Pages
1. Immediate Vicinity of the Project Site Based on Search of Natural Heritage Database: Rare Plant Species and Ecological Communities Currently Recorded in the New Jersey Natural Heritage Database	Yes	1 page(s) included
2. Natural Heritage Priority Sites within the Immediate Vicinity	No	0 pages included
3. Rare Wildlife Species or Wildlife Habitat Within the Immediate Vicinity of the Project Site Based on Search of Landscape Project 3.3 Species Based Patches	Yes	2 page(s) included
4. Vernal Pool Habitat In the Immediate Vicinity of Project Site Based on Search of Landscape Project 3.3	Yes	1 page(s) included
5. Rare Wildlife Species or Wildlife Habitat In the Immediate Vicinity of the Project Site Based on Search of Landscape Project 3.3 Stream Habitat File	No	0 pages included
6. Other Animal Species In the Immediate Vicinity of the Project Site Based on Additional Species Tracked by Endangered and Nongame Species Program	No	0 pages included

Immediate Vicinity of the Project Site
Based on Search of Natural Heritage Database
Rare Plant Species and Ecological Communities Currently Recorded in the New Jersey Natural Heritage Database

Scientific Name	Common Name	Federal Protection Status	State Protection Status	Regional Status	Grank	Srank	Identified	Last Observed	Location
Vascular Plants									
Sagittaria calycina var. spongiosa	Tidal Arrowhead			HL	G5T4	S3	Y	2011-09-19	2011: Located 0.25 mile north-northwest of center of Quinton, bordering the northeast corner of the intersection of State Highway 49 and Action Station Road (Quinton Washington Road), on the north/west bank of Alloway Creek, in Quinton Township, Salem County.
Schoenoplectus novae-angliae	New England Bulrush			HL	G5	S2	Y	1972-10-16	ALONG SMALL TIDAL TRIBUTARY OF ALLOWAY CREEK ON SOUTHEAST SIDE OF QUINTON-REMSTERVILLE ROAD, QUINTON.

Total number of records: 2

Rare Wildlife Species or Wildlife Habitat Within the Immediate Vicinity of the Project Site Based on Search of Landscape Project 3.3 Species Based Patches

Class	Common Name	Scientific Name	Feature Type	Rank	Federal Protection Status	State Protection Status	Grank	Srank
Aves								
	American Kestrel	Falco sparverius	Breeding Sighting	3	NA	State Threatened	G5	S2B,S2N
	Bald Eagle	Haliaeetus leucocephalus	Foraging	4	NA	State Endangered	G5	S1B,S2N
	Bald Eagle	Haliaeetus leucocephalus	Nest	4	NA	State Endangered	G5	S1B,S2N
	Bald Eagle	Haliaeetus leucocephalus	Wintering	3	NA	State Threatened	G5	S1B,S2N
	Brown Thrasher	Toxostoma rufum	Breeding Sighting	2	NA	Special Concern	G5	S3B,S4N
	Eastern Meadowlark	Sturnella magna	Breeding Sighting	2	NA	Special Concern	G5	S3B,S3N
	Grasshopper Sparrow	Ammodramus savannarum	Breeding Sighting	3	NA	State Threatened	G5	S2B,S3N
	Great Blue Heron	Ardea herodias	Foraging	2	NA	Special Concern	G5	S3B,S4N
	Hooded Warbler	Wilsonia citrina	Breeding Sighting	2	NA	Special Concern	G5	S3B,S4N
	Horned Lark	Eremophila alpestris	Breeding Sighting	3	NA	State Threatened	G5	S2B,S3N
	Osprey	Pandion haliaetus	Foraging	3	NA	State Threatened	G5	S2B,S4N
	Osprey	Pandion haliaetus	Nest	3	NA	State Threatened	G5	S2B,S4N
	Savannah Sparrow	Passerculus sandwichensis	Breeding Sighting	3	NA	State Threatened	G5	S2B,S4N
	Wood Thrush	Hylocichla mustelina	Breeding Sighting	2	NA	Special Concern	G4	S3B,S4N
Osteichthyes								

Rare Wildlife Species or Wildlife Habitat Within the Immediate Vicinity of the Project Site Based on Search of Landscape Project 3.3 Species Based Patches

Class	Common Name	Scientific Name	Feature Type	Rank	Federal Protection Status	State Protection Status	Grank	Srank
	Atlantic Sturgeon	Acipenser oxyrinchus	Migration Corridor - Adult Sighting	5	Federally Listed Endangered	State Endangered	G3	S1
	Atlantic Sturgeon	Acipenser oxyrinchus	Migration Corridor - Juvenile Sighting	5	Federally Listed Endangered	State Endangered	G3	S1
	Shortnose Sturgeon	Acipenser brevirostrum	Migration Corridor - Adult Sighting	5	Federally Listed Endangered	State Endangered	G3	S1
Reptilia								
	Atlantic Green Turtle	Chelonia mydas	Occupied Habitat	5	Federally Listed Threatened	State Threatened	G3	S1
	Atlantic Loggerhead	Caretta caretta	Occupied Habitat	5	Federally Listed Threatened	State Endangered	G3	S1
	Eastern Box Turtle	Terrapene carolina carolina	Occupied Habitat	2	NA	Special Concern	G5T5	S3
	Kemp's or Atlantic Ridley	Lepidochelys kempii	Occupied Habitat	5	Federally Listed Endangered	State Endangered	G1	S1
	Spotted Turtle	Clemmys guttata	Occupied Habitat	2	NA	Special Concern	G5	S3

Vernal Pool Habitat
In the Immediate Vicinity of
Project Site Based on Search of
Landscape Project 3.3

Vernal Pool Habitat Type	Vernal Pool Habitat ID
Potential vernal habitat area	376
Potential vernal habitat area	398
Potential vernal habitat area	489
Potential vernal habitat area	511

Total number of records: 4

Wednesday, October 20, 2021

NHP File No.: 21-3907554-23125

Appendix C

Statements of Qualifications

Anthony Silva
Senior Biologist/Environmental Scientist
asilva@denviro.com

190 N. Main Street
Manahawkin, NJ 08050
609-488-2857

Education:

B.S. Environmental Studies
The Richard Stockton College of New Jersey – 2006

Graduated Magna Cum Laude with Program Distinction

Certifications:

Professional Wetland Scientist – Society of Wetland Scientists

USFWS Qualified Bog Turtle Surveyor (QBTS) – NJ, DE, MD, PA

USFWS Qualified Bat Surveyor (QBS) – NJ & PA

PA DCNR Wild Plant Management Permittee

NJDEP ENSP Recognized Qualified Venomous Snake Monitor

Continuing Education:

Western Bat Working Group: Bats and Wind Energy.

Northeast Bat Working Group: Annual Conferences

Bat Acoustic Software Training Workshop

Advanced Bat Acoustics: A Master Class

Bats and Bridges Survey Training hosted by USFWS and NJDEP

N.J. Conservation Foundation & P.P.A: Fundamentals of Pinelands Botany; Pinelands Botany: Practical Applications

Identification of Tidal Wetland Plants. Rutgers

Poaceae: Field Identification of Grasses. Eagle Hill Institute Natural History Seminar

Fields of Competence:

Mr. Silva has over 17 years of experience in the fields of biology, ecology, wetland science, soil science and land use regulatory compliance. He conducts various environmental site assessments; rare species habitat evaluations, surveys, and management plans; ecological sampling investigations; mitigation design, permitting, and vegetation monitoring; and environmental/biological construction monitoring.

Professional Experience:

Mr. Silva is a senior biologist and environmental scientist with the firm of DuBois Environmental Consultants. He is responsible for conducting faunal and floral sampling investigations, natural resource inventories, threatened/endangered species habitat assessments and directed surveys. Mr. Silva is well versed as to the survey and sampling protocols required under the jurisdiction of the USFWS, NJDEP and Pinelands Commission for Threatened and Endangered Species Surveys. He has tracked several northern pine snakes using radio telemetry, providing data pertinent to home range statistics, core-use areas and critical habitat delineation. He is responsible for the maintenance and operation of a variety of ecological trapping arrays, including drift fence-box funnel trap arrays designed to capture threatened and endangered snake species. He also performs numerous raptor nest investigations and breeding vocalization broadcast surveys, conducts amphibian community evaluations and critical wildlife habitat assessments. To date, Mr. Silva has studied for rare faunal and floral species in 5 states, including New Jersey, New York, Pennsylvania, Delaware and Maryland.

Mr. Silva has conducted numerous Phase I habitat assessments, Phase II visual surveys and Phase III trapping surveys for the Federally-threatened bog turtle. He has also assisted in habitat restoration and enhancement projects for the bog turtle through removal and control of invasive vegetation, and is currently recognized by the USFWS as a Qualified Bog Turtle Surveyor in the states of N.J., D.E., M.D. and P.A. Mr. Silva is also responsible for the operation of mist nets designed to capture various bat species, including the Federally-endangered Indiana bat and Federally-threatened Northern long-eared bat. He measures and records pertinent biological data of all collected specimens. Mr. Silva also deploys acoustic hardware and performs subsequent acoustic analysis of bat echolocation calls captured in the field.

In addition to the above responsibilities, Mr. Silva conducts plant surveys within various vegetation communities, which have included numerous species considered rare or listed as protected in various states. Mr. Silva has conducted numerous botanical investigations for rare plant species within the jurisdiction of the New Jersey Pinelands Commission, the New Jersey Department of Environmental Protection, the Pennsylvania Department of Conservation of Natural Resources, and the Maryland Department of Natural Resources. Many projects include botanical surveys along existing transmission line right-of-ways; investigations have led to the delineation and protection of rare plant occurrences while permitting utilities to perform upgrades and maintenance operations within their easements.

Mr. Silva performs environmental and biological construction monitoring associated with linear project improvements. Environmental oversight ensures the project is conducted in an environmentally responsible manner and in accordance with all applicable SESC standards and best management practices. Biological oversight in and around sensitive habitats ensures that the project does not have any adverse impacts to sensitive habitats or rare faunal and floral species.

Mr. Silva is a certified professional wetland scientist responsible for performing wetland delineations under the jurisdiction of multiple agencies. He follows

Anthony Silva
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Identification of Common Carex Using Field Features. Eagle Hill Institute Natural History Seminar

Ecological Risk Assessment: Practice and Protocols. Rutgers

Restoration Ecology. Rutgers

Mid-Atlantic Professional Soil Scientists Hydric Soils Workshops

Pinelands Groundwater Supply & Ecosystem Needs; Pinelands Annual Short Courses

Professional Affiliations:

Member: Philadelphia Botanical Club

Member: NJ Chapter of The Wildlife Society

Member: New Jersey Division of Fish, Game and Wildlife Conservation Corps.

Member: Northeast Partners in Amphibian and Reptile Conservation

Member: Northeast Bat Working Group

Member: Flora of New Jersey Project

Member: National Association of Wetland Managers

Career Positions:

Trident Environmental Consultants, Toms River, NJ – Biologist/Environmental Scientist 2005 – 2014

DuBois & Associates, LLC, Manahawkin, NJ – Sr. Biologist/Environmental Scientist 2014 – Present

interagency evaluation procedures and is well versed in analyzing the technical indicators of wetland vegetation, hydrology and soils. He authors Freshwater Wetland Delineation Reports and prepares Freshwater Wetland Letter of Interpretation applications for submittal to the NJDEP. In addition, he prepares various NJDEP Division of Land Use permitting applications and Environmental Impact Statements for Township approval.

Mr. Silva performs annual wetland mitigation monitoring to document the performance of vegetation and other variables at wetland restoration, creation and enhancement sites. He performs wetland mitigation site location searches and mitigation site design which provides clients with a variety of potential mitigation site options.

Mr. Silva is very proficient in ESRI ArcMap Geographic Information Systems (GIS) software and GPS technology. Maps are created to present clients with a visual representation of site-specific environmental characteristics in relation to various projects.

Projects of Relevance:

Public utility MAPP Project – Delmarva Peninsula & Chesapeake Western Shore
Ecological and environmental work was completed to assist the land acquisition process for the Mid-Atlantic Power Pathway (MAPP) Project. Mr. Silva was a lead biologist responsible for documenting the presence or absence of the Federally-endangered Delmarva fox squirrel within forested landscapes within Dorchester County, Maryland. County-wide photomonitoring surveys provided pertinent information regarding distribution trends and mitigation locations. Rare, threatened and endangered (RTE) species habitat evaluations and directed RTE plant species surveys were performed from Calvert County, Maryland east to the Maryland/Delaware border.

Cape May Refuge Migratory Landbird Research
Mr. Silva has conducted fall-migrating landbird research on lands located within the Cape May National Wildlife Refuge in Cape May County, New Jersey. The objective of the on-going study is to determine the use of stop-over habitats by neotropical migrants within the Refuge. Surveys were performed within management units that receive different treatments to enhance shrub habitat quality for migrating birds. Survey methodologies performed include bird abundance area searches, behavioral response reaction via mobbing audiotapes, activity budgets to determine utilized habitat and foraging substrates, vegetation density and fruiting analysis within management plots.

Resource Extraction Indiana Bat Habitat Mitigation Plan
Mr. Silva authored and developed an Indiana Bat Habitat Mitigation Plan for a mineral quarry in Luzerne County, Pennsylvania. The quarry is located within the area of a known Indiana bat hibernaculum and the Plan was developed to ensure protection of this endangered species pursuant to the Endangered Species Act of 1973. The measures within the Plan satisfied USFWS concerns regarding expansion of quarry operations and Indiana bat protection.