Application to Alter Freshwater Wetlands Clear River Energy Center and Burrillville Interconnection Project

Burrillville, Rhode Island

PREPARED FOR:
Clear River Energy LLC
One South Wacker Drive
Suite 1800
Chicago, IL 60606

The Narragansett Electric Company d/b/a National Grid
280 Melrose Street
Providence, Rhode Island 02907

PREPARED BY:
ESS Group, Inc.
10 Hemingway Drive, 2nd Floor
East Providence, RI 02915

POWER Engineers, Inc.
100 John L. Dietsch Square
N. Attleboro, MA 02763

HDR, Inc.
8550 West Bryn Mawr Avenue
Chicago, IL 60631

ESS Project No. I108-013

March 2017

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March 2017

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Application Form

RHODE ISLAND DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
OFFICE OF WATER RESOURCES\FRESHWATER WETLANDS PROGRAM
235 Promenade Street, Providence, RI 02908
Telephone: 401-222-6820, Telecommunication Device for the Deaf: 401-222-4462

GENERAL APPLICATION FORM

Please type or print

PART A Purpose of Application

- ☐ Request to Determine Presence of Wetlands only (Rule 8.02)
- ☐ Request to Verify Delineated Edge of Wetlands (Rule 8.03)
- ☐ Request for Preliminary Determination (Rule 9.00)
- ☑ Application to Alter a Freshwater Wetland (Rule 10.00)
- ☐ Application for Renewal (Rule 11.02) **Complete Only Parts B, D & H**
- ☐ Application for Permit Modification (Rule 11.03)
- ☐ Application for Permit Transfer (Rule 11.04) **Complete Only Parts B, E & H**
- ☐ Change in Owner during review – (Rule 7.02(E)) **Complete Only Parts B, F & H**

AGENCY USE ONLY
Application No:

Application Received:

PART B Applicant Information:

First Applicant's Name (see Rules 7.02): Clear River Energy LLC

Note: The applicant must be the owner of the property or easement which is the subject of this application or must be the government agency or entity with power of condemnation over such property or easement.

Applicant's Mailing Address: 1 South Wacker Drive (Street/Road) Suite 1800 (P.O. Box)

Chicago (City/Town) IL (State) 60606 (Zip Code) (312) 224-1400 (Telephone No.)

Applicant's Email Address: (print legibly): jniland@invenergyllc.com

Second Applicant's Name (see Rules 7.02): Narragansett Electric Company d/b/a National Grid

Note: The applicant must be the owner of the property or easement which is the subject of this application or must be the government agency or entity with power of condemnation over such property or easement.

Applicant's Mailing Address: 40 Sylvan Road (Street/Road) (P.O. Box)

Waltham (City/Town) MA (State) 02451 (Zip Code) (781) 907-1000 (Telephone No.)

Applicant's Email Address: (print legibly): david.beron@nationalgrid.com

Property Location subject to this Application:

Burrillville (City/Town) See submitted narrative (Street Abutting Site) (Street address number (if applicable))

Nearest street intersection and its distance and direction from site

Nearest utility pole number(s): _____ Direction to site from abutting street: N S E W

Tax Assessor's Plat(s) and Lot No(s): See submitted plans

Recorded Plat(s) and Lot No(s) (*if Assessor's are not available*): See submitted plans

PART C General Information:

Any previous application for this site? Yes X No Provide Application No(s) 15-0239, 12-0117

Any previous enforcement action for this site? Yes _____ No X Provide File No(s)

Amount of wetland area to be altered, if any:

Palustrine wetland: 29,532 *square feet*
Riverbank or perimeter wetland: 327,043 *square feet*
Watercourse: 200 *linear feet*

☑ *Check here if any floodplain alteration is proposed.*

- Fee category per Rule 7.11 (example 7.11(D)(6) 2- lots sub. Pre-Det. - $900) 7.11(D)(5)(d) - $7500 Check No. 000060

☐ Check here if the project has a Certificate of Critical Economic Concern (CEC) and attach copy of certification.

PART D **For Application Renewal** (if applicable):

Name of Original or Subsequent Permittee: _____

Application/Permit No. _____ Permit Expiration Date: _____

Number of previous renewals issued (if applicable): _____

Applicant's Statement: I hereby state that I am requesting renewal of the original or subsequently modified permitted project under Application/Permit No._____. I fully understand the permit limitations and will comply with any and all conditions of the permit.

Applicant's name: (*print*) _____ (*signature*) _____

☐ Check here if actual site work has commenced on the project for which renewal is requested.

PART E **For Permit Transfer Application** (if applicable):

Original Permittee's Name:

Application/Permit No.: _____ Permit Expiration Date: _____

Note: A certified copy of the deed of transfer must be enclosed with application.

Applicant's Statement: I hereby certify that I have reviewed the permit letter issued under Application/Permit No. _____ and hereby agree to comply with all conditions of the permit, including any time limitations imposed.

Applicant's Name (*print*): _____ (*signature*): _____ Date: _____

PART F **For Change in Owner During Application Processing** (if applicable):

Original Applicant's Name: _____ Application No. _____

Note: A certified copy of the deed of transfer must be enclosed for Applications to Alter only.

PART G **Certification of Professional(s)** (if applicable):

Note: Any professional (e.g. engineer, biologist, landscape architect, etc.) who participated in the submission and/or preparation of this Application and supporting documentation must sign below.

I hereby certify that I have been authorized by the applicant to prepare documentation to be submitted in support of this Application; that such documentation is in accordance with the *Rules and Regulations Governing the Administration and Enforcement of the Freshwater Wetlands Act*; and that such documentation is true, accurate and complete to the best of my knowledge.

Professional's Name (*print*): Craig Wood Title: Senior Wetland Scientist

Email (print legibly): cwood@essgroup.com d/b/a: ESS Group, Inc.

Address: 10 10 Hemingway Dr, 2nd Floor, East Providence, ~~RI~~ 02915

Professional's Signature: Craig Wood Date: 03/31/2017

☐ **Check this box if the above named is the project manager or project lead for the applicant.**

☐ **I've completed and attached the Site Work Affidavit.**

If more than one professional:

Professional's Name (*print*): James Durand Title: Senior Scientist

Email (print legibly): jamie.durand@powereng.com d/b/a: POWER Engineers

Address: 100 John L Dietsch Square, North Attleborough, MA 02763

Professional's Signature: James Durand Date: 03/31/2017

☐ **I've completed and attached the Site Work Affidavit.**

Professional's Name (*print*): Chad Jacobs Title: P.E.

Email (print legibly): chad.jacobs@hdrinc.vom d/b/a: HDR, Inc.

Address: 11 Stanwix St., Suite 800, Pittsburgh, PA 15222

Professional's Signature: M Chad Jacobs Date: 3-30-17

☐ **I've completed and attached the Site Work Affidavit.**

PART H **Certification/Authorization of Applicant:**

I hereby certify that I have requested and authorized the investigation, compilation, and submission of all the information, in whatever form, contained in this Application; that I have personally examined and am familiar with the information submitted herein; and that such information is true, accurate and complete to the best of my knowledge. I hereby authorize RIDEM personnel access to the property for purposes of observing conditions pertinent to this application and assessing compliance with any permit or determination resulting from this application, including any sampling, monitoring or surveying that may be deemed appropriate, consistent with the RIDEM Administrative Inspection Guidelines. (See DEM website - Office of Compliance and Inspection for copy).
Note any special concerns for access here:

Applicant's Signature: _____ **Title** (if applicable): Vice President

See Rule 7.02 regarding Signatures

Print Name Signed Above: Richard Paglia **Date**: _____

Second Applicant's Signature: _____ **Title (if applicable): Vice President**

Print Name Signed Above: Michael Ryan **Date:** _____

Clear River Energy LLC
Operating Account
One S. Wacker Dr., Ste 1800
Chicago, IL 60606

JPMorgan Chase Bank, N.A.
Chicago, IL

2-1/710

CHECK # 000060

Check Date	Check Amount
03/30/2017	$ *******7,500.00

Seven Thousand Five Hundred and 00/100---------- Dollars

PAY TO THE ORDER OF Rhode Island General Treasurer
Providence, RI 02903

Authorized Signatures

Security features. Details on back.

⑈000060⑈ ⑆071000013⑆ 880285551⑈

Property Owner Information

PARCEL ONE DEEDS

#21004

REALTY VENTURES, LTD., a Rhode Island General Partnership,

for consideration paid, grant to ALGONQUIN GAS TRANSMISSION COMPANY, a Delaware Corporation,

of 1284 Soldiers Field Road, Boston, Massachusetts 02135,

with WARRANTY COVENANTS

Those certain parcels of land, located in the Town of Burrillville, County of Providence and State of Rhode Island, set forth on "EXHIBIT A" attached hereto and made a part hereof.

RHODE ISLAND FSM 6-1-82 $110.00 | RHODE ISLAND FSM 6-1-82 $110.00

RHODE ISLAND FSM 6-1-82 $110.00 | RHODE ISLAND FSM 6-1-82 $110.00 | RHODE ISLAND FSM 6-1-82 $110.00 | RHODE ISLAND FSM 6-1-82 $110.00 | RHODE ISLAND FSM 6-1-82 $110.00 | RHODE ISLAND FSM 6-1-82 $110.00

Witness hand this 1st day of June, 1982, said Partnership has caused these presents to be signed by its partner duly authorized.

REALTY VENTURES, LTD.

BY: [signature] Part.
RONALD A. RONCI

State of Rhode Island, Etc.
COUNTY OF Providence

In Providence on the 1st day of June, 1982, before me personally appeared RONALD A. RONCI, PARTNER of REALTY VENTURES, LTD.

to me known and known by me to be the party executing the foregoing instrument, and he acknowledged said instrument, by him executed, to be his free act and deed, in his said capacity as a Partner as aforesaid, and the free act and deed of REALTY VENTURES, LTD.

[signature]
Notary Public
FRANCIS E. MULLEN

BOOK 98 PAGE 274

Attached to and made a part of deed from Realty Ventures, Ltd. to Algonquin Gas Transmission Company dated , 1982.

EXHIBIT "A"

PARCEL I:

That certain tract or parcel of land, known as the Buck Hill Lot, so-called, located on the southerly and westerly sides of Buck Hill Road, leading northerly and northwesterly from the Village of Bridgeton in the Town of Burrillville, County of Providence and State of Rhode Island, located northerly of the Ross land, so-called, easterly of the Bates and Roberts land and bounding in part at the northwest on Round Pond, so-called, and northerly on land now or formerly of the Angell heirs, and more particularly bounded and described as follows:

Beginning at the northeasterly corner of said lot, on the southwesterly side of said Road, adjoining land now or formerly of Hannah W. and Marion F. Bates; thence running S. 54 1/4° E. with said Bates land, land now or formerly of Evelyn Angell and the devisees under the Will of William R. Angell about eighty seven (87) rods, to a stake and stones; thence S. 48 1/2° W. with land now or formerly of Herbert C. and Martha C. Blake about 18 rods, 10 links to a rock with stones on it; thence S. 18° E. with said Blake land about 52 and 3/4 rods to a stake and stones; thence S. 28 1/4° E. with land now or formerly of Louise A. Cunningham about 63 rods; thence S. 71 1/2° E. with said Cunningham land about 8 rods to said Road; thence with said Road S. 7° E. 44 rods, 9 links, S. 18 1/2° E. 15 rods, 20 links, S. 32° E. 14 rods, 15 links, S. 45° E. 14 rods, 15 links, S. 53 1/4° E. 22 rods to a bound at land now or formerly of Amy J. Gansert; thence with said Gansert land S. 64° W. 2 rods, 14 links, S. 75 1/2° W. 16 rods, 15 links, S. 62 1/2° W. 8 1/2 rods, S. 85 1/2° W. thirteen rods, 15 links, S. 83 1/2° W. 5 rods to a white pine marked, in the northwesterly corner of said Gansert land; thence continuing with said Gansert land S. 55 rods, 16 links, to a horse shoe pine, a bound of said Gansert land; thence with land now or formerly of Thomas Ryan northwesterly about 40 rods to an angle; thence westerly with said Ryan land about 71 rods to a corner; thence S. 16° W. partly with said Ryan land, partly with land of the United States of America (formerly of Seth Ross) about 96 rods to a corner; thence westerly with said last mentioned land about 176 rods to a rock with stones on it; thence about N. 14° E. with said last mentioned land 130 rods to a stone on a rock; thence N. 6° W. with land now or formerly of James Roberts about 179 rods to a rock on the shore of Round Pond; thence N. 31 1/2° E. through said Round Pond (hereby including all the right, title and interest of the grantor in said Round Pond and the land under the same) about 68 rods to a pile of stones on a rock on the other side of said Round Pond; thence with land now or formerly of Samuel A. Chase N. 72° E. 206 rods to said Road at the point of beginning. Containing about 706 1/2 acres.

EXCEPTING HEREFROM land conveyed to Albert E. and Concetta Poirier dated September 6, 1957 in Book 62 at page 69.

EXCEPTING HEREFROM land conveyed to Algonquin Gas Transmission Company dated February 1961 in Deed Book 63 at page 93.

EXCEPTING HEREFROM land conveyed to Albert J. Chrisisen and wife, Kathleen H. dated February 27, 1961 in Deed Book 63 at page 105.

EXCEPTING HEREFROM land conveyed to Algonquin Gas Transmission Company dated September 14, 1961 in Deed Book 63 at page 205.

EXCEPTING HEREFROM any portion of the above granted premises within lay out of the Wallum Lake and/or Buck Hill Road.

EXCEPTING HEREFROM a parcel of land conveyed to Jean Drans containing 22 1/2 acres, more or less.

EXCEPTING HEREFROM land conveyed to Algonquin Gas Transmission Company in 1969.

Subject to an easement to Blackstone Valley Electric Company conveyed in 1969.

TOGETHER WITH all rights accruing to the grantor herein under covenants set forth in that certain deed dated February 1, 1961, recorded in Book 63 at page 93 in the Land Evidence Records of the Town of Burrillville and any and all other rights which the said grantor acquired by virtue of all prior title deeds.

PARCEL II - See attached Page 2.

Attached to and made a part of deed from Realty Ventures, Ltd. to Algonquin Gas Transmission Company dated , 1982.

EXHIBIT "A"

Page 2

PARCEL II

That certain parcel of land with all the buildings and improvements thereon, located on the westerly side of Wallum Lake Road in the Town of Burrillville, Rhode Island, and described as follows:

Northeasterly corner of land of Anthony DeCorte and at the Southeasterly corner of the hereinafter described parcel at an iron pipe in the ground in the Westerly line of Wallum Lake Road; thence South 84° 30' West with said DeCorte land, 180' to an iron pipe; thence South 83° 30' West 536' to a piece of scrap iron in the ground in a heap of stones, a bound of one Cunningham; thence North 69° 30' West with land of Phillip Harris 326'; thence North 69° 30' East with land of William R. Cooney et ux, and with land that said Cooney et ux sold to one Hiller, 802' to a pipe in the ground in the WEsterly line of Wallum Lake Road; thence Southerly bounding Easterly on said road 498', more or less, to the first mentioned bound.

The above described property is further described as Tax Assessor's Map 3-7, Lot 30A, Block 2.

BOOK 98 PAGE 276

Received For Record JUN 1 1982 11:16 o'clock A.M.

WARRANTY DEED

EDWARD P. MANNING of Cumberland, Rhode Island, as Trustee, and JUNE PERRY of Scituate, Rhode Island, as Substitute Trustee, of that "Trust of June" dated June 13, 1969, for consideration paid, grant to REALTY VENTURES, LTD., a partnership organized and existing under the Rhode Island Uniform Partnership Act, with WARRANTY COVENANTS

That certain tract or parcel of land, known as the Buck Hill Lot, so-called, located on the southerly and westerly sides of Buck Hill Road, leading northerly and northwesterly from the Village of Bridgeton in the Town of Burrillville, County of Providence and State of Rhode Island, located northerly of the Ross land, so-called, easterly of the Bates and Roberts land and bounding in part in part at the northwest on Round Pond, so-called, and northerly on land now or formerly of the Angell heirs, and more particularly bounded and described as follows:

Beginning at the northeasterly corner of said lot, on the southwesterly side of said Road, adjoining land now or formerly of Hannah W. and Marion F. Bates; thence running S. 54 1/4° E. with said Bates land, land now or formerly of Evelyn Angell and the devisees under the Will of William R. Angell about eighty seven (87) rods, to a stake and stones; thence S. 48 1/2° W. with land now or formerly of Herbert C. and Martha C. Blake about 18 rods, 10 links to a rock with stones on it; thence S. 18° E. with said Blake land about 52 and 3/4 rods to a stake and stones; thence S. 28 1/4° E. with land now or formerly of Louise A. Cunningham about 63 rods; thence S. 71 1/2° E. with said Cunningham land about 8 rods to said Road; thence with said Road S. 7° E. 44 rods, 9 links, S. 18 1/2° E. 15 rods, 20 links, S. 32° E. 14 rods, 15 links, S. 45° E. 14 rods, 15 links, S. 53 1/4° E. 22 rods to a bound at land now or formerly of Amy J. Gansert; thence with said Gansert land S. 64° W. 2 rods, 14 links, S. 75 1/2° W. 16 rods, 15 links, S. 62 1/2° W. 8 1/2 rods, S. 85 1/2° W. thirteen rods, 15 links, S. 83 1/2° W. 5 rods to a white pine marked, in the northwesterly corner of said Gansert land; thence continuing with said Gansert land S. 55 rods, 16 links, to a horse shoe pine, a bound of said Gansert land; thence with land now or formerly of Thomas Ryan northwesterly about 40 rods to an angle; thence westerly with said Ryan land about 71 rods to a corner; thence S. 16° W. partly with said Ryan land, partly with land of the United States of America (formerly of Seth Ross) about 96 rods to a corner; thence westerly with said last mentioned land about 176 rods to a rock with stones on it; thence about N. 14° E. with said last mentioned land 130 rods to a stone on a rock; thence N. 6° W. with land now or formerly of James Roberts about 179 rods to a rock on the shore of Round Pond; thence N. 31 1/2° E. through said Round Pond (hereby including all the right, title and interest of

the grantor in said Round Pond and the land under the same) about 68 rods to a pile of stones on a rock on the other side of said Round Pond; thence with land now or formerly of Samuel A. Chase N. 72° E. 206 rods to said Road at the point of beginning. Containing about 706 1/2 acres.

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EXCEPTING HEREFROM a parcel of land conveyed Jean Drans containing 22 1/2 acres, more or less.

EXCEPTING HEREFROM land conveyed to Algonquin Gas Transmission Company in 1969.

Subject to an easement to Blackstone Valley Electric Company conveyed in 1969.

TOGETHER WITH all rights accruing to the grantor herein covenants set forth in that certain deed dated February 1, 1961 recorded in Book 63 at page 93 in the Land Evidence Records of the Town of Burrillville and any and all other rights which the said grantor acquired by virtue of all prior title deeds.

WITNESS our hands this 9th day of June, 1978.

Edward P. Manning

EDWARD P. MANNING, TRUSTEE

June Perry Substitute Trustee

JUNE PERRY, SUBSTITUTE TRUSTEE

BOOK 89 PAGE 1157

STATE OF RHODE ISLAND
COUNTY OF PROVIDENCE

In Providence on the 24th day of June, 1978, before me personally appeared EDWARD P. MANNING and JUNE PERRY to me known and known by me to be the parties executing the foregoing instrument, and they acknowledged said instrument, by them executed, to be their free act and deed, in their said capacities as Trustees as aforesaid.

Debra J. Moretti
NOTARY PUBLIC

BOOK 89 PAGE 1158

Received For Record OCT 26 1978 at 1:35 o'clock P.M.
Lorraine Mancini
Town Clerk

I, RALPH M. MERRILL, of the Town of Burrillville, County of Providence and State of Rhode Island for consideration paid, grant to myself RALPH M. MERRILL and wife, BRENDA A. MERRILL, of the aforesaid Town, County and State AS JOINT TENANTS AND NOT AS TENANTS IN COMMON with WARRANTY COVENANTS

A certain parcel of land with all the buildings and improvements thereon situated between Pine Street and Grove Street, in the Village of Pascoag, Town of Burrillville, County of Providence and State of Rhode Island, comprising the whole of lots numbered 17 (seventeen) and 24 (twenty-four) together with the northerly twenty-five (25) feet in width by the entire depth of lot numbered 25 (twenty-five) on that plat entitled, "Ara Paine Land Angell Plat Scale 50 feet to the inch Surveyed Aug. 1878 E. L. Tucker" which plat is recorded in the Registry of Deeds in said Town of Burrillville in Plat Book 1 at Page 48. Said premises are further bounded and described as follows:-

Beginning at a point in the westerly line of said Pine Street sixty-one and 3/4 (61.75) feet northerly from the corner formed by the intersection of said line of Pine Street with the northwesterly line of Centennial Street at the northeasterly corner of lot numbered 16 (sixteen) on said plat (now or formerly of Louis E. and Doris M. Genereux) and the southeasterly corner of said lot numbered 17 (seventeen); thence westerly at right angles to said Pine Street, one hundred (100) feet; thence southerly at right angles to the last described line twenty-five (25) feet to land now or formerly of Armand J. and Beatrice L. Rocheford, the last two (2) lines bounding on said lot numbered 16 (sixteen); thence westerly at right angles to the last described line, bounding southerly on said Rocheford land, one hundred (100) feet to said Grove Street; thence northerly, bounding westerly on said Grove Street, seventy-five (75) feet to the southwesterly corner of lot numbered 23 (twenty-three) on said Plat; thence easterly at right angles to said Grove Street, bounding northerly in part on said lot numbered 23 (twenty-three) and in part on lot numbered 18 (eighteen) both on said plat, in all two hundred (200) feet to said Pine Street; thence southerly, bounding easterly on said Pine Street, fifty (50) feet to the point of beginning.

3-11-9-16-106

Meaning and intending to convey and do hereby convey all and the same premises conveyed to this grantor and Dora F. Merrill (now deceased) by deed from Duane A. Bishop Jr. et ux, dated January 22nd, 1955 and recorded in the land records of the Town of Burrillville in Deed Book 58 at Page 67.

This conveyance is made subject to a mortgage of record.

The consideration in this deed is such that no Rhode Island Realty Transfer Tax Stamps are necessary

WITNESS my hand this 13th day of June 1969

Ralph M. Merrill

STATE OF RHODE ISLAND, ETC.)
COUNTY OF PROVIDENCE)

In Burrillville on the 13th day of June, 1969 before me personally appeared RALPH M. MERRILL to me known and known by me to be the party executing the foregoing instrument, and he acknowledged said instrument, by him executed, to be his free act and deed.

Editha R. Ballou

Notary Public

Received for record June 13, 1969 at 10:45 o'clock A.M.

Recorded by Editha R. Ballou, Asst. Town Clerk

BUCK HILL FOREST, INC., a Rhode Island Corporation, for consideration paid, grant to EDWARD P. MANNING and HERBERT L. PERRY, Trustees under that certain trust indenture dated June 13, 1969 with QUIT-CLAIM COVENANTS:

That certain tract or parcel of land, known as the Buck Hill Lot, so-called, located on the southerly and westerly sides of Buck Hill Road, leading northerly and northwesterly from the Village of Bridgeton in the Town of Burrillville, County of Providence and State of Rhode Island, located northerly of the Ross land, so-called, easterly of the Bates and Roberts land and bounding in part in part at the northwest on Round Pond, so-called, and northerly on land now or formerly of the Angell heirs, and more particularly bounded and described as follows:

Beginning at the northeasterly corner of said lot, on the southwesterly side of said Road, adjoining land now or formerly of Hannah W. and Marion F. Bates; thence running S. 54½° E. with said Bates land, land now or formerly of Evelyn Angell and the devisees under the Will of William R. Angell about eighty seven (87) rods, to a stake and stones; thence S. 48½° W. with land now or formerly of Herbert C. and Martha C. Blake about 18 rods, 10 links to a rock with stones on its; thence S. 18° E. with said Blake land about 52 and 3/4 rods to a stake and stones; thence S. 28½° E. with land now or formerly of Louise A. Cunningham about 63 rods; thence S. 71½° E. with said Cunningham land about 8 rods to said Road; thence with said Road S. 7° E. 44 rods, 9 links, S. 18½° E. 15 rods, 20 links, S. 32° E. 14 rods, 15 links, S. 45° E. 14 rods, 15 links, S.53½° E. 22 rods to a bound at land now or formerly of Amy J. Gansert; thence with said Gansert land S. 64° W. 2 rods, 14 links, S. 75½° W. 16 rods, 15 links, S. 62½° W. 8½ rods, S. 85½° W. thirteen rods, 15 links, S. 83½° W. 5 rods to a white pine marked, in the northwesterly corner of said Gansert land; thence continuing with said Gansert land S. 55 rods, 16 links, to a horse shoe pine, a bound of said Gansert land; thence with land now or formerly of Thomas Ryan northwesterly about 40 rods to an angle; thence westerly with said Ryan land about 71 rods to a corner; thence S. 16° W. partly with said Ryan land, partly with land of the United States of America (formerly of Seth Ross) about 96 rods to a corner; thence westerly with said last mentioned land about 176 rods to a rock with stones on it; thence about N. 14° E. with said last mentioned land 130 rods to a stone on a rock; thence N. 6° W. with land now or formerly of James Roberts about 179 rods to a rock on the shore of Round Pond; thence N. 31½° E. through said Round Pond (hereby including all the right, title and interest of the grantor in said Round Pond and the land under the same) about 68 rods to a pile of stones on a rock on the other side of said Round Pond; thence with land now or formerly of the devisees under the will of William R. Angell and with land now or formerly of Samuel A. Chase N. 72° E. 206 rods to said Road at the point of beginning. Containing about 706½ acres.

EXCEPTING HEREFROM land conveyed to Albert E. and Concetta Poirier dated September 6, 1957 in Book 62 at page 69.

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EXCEPTING HEREFROM land conveyed to Albert J. Christiaen and wife, Kathleen H. dated February 27, 1961 in Deed Book 63 at page 105.

EXCEPTING HEREFROM land conveyed to Algonquin Gas Transmission Company dated September 14, 1961 in Deed Book 63 at page 205.

EXCEPTING HEREFROM any portion of the above granted premises within lay out of the Wallum Lake and/or Buck Hill Road.

EXCEPTING HEREFROM a parcel of land conveyed Jean Drans containing 22½ acres, more or less.

EXCEPTING HEREFROM land conveyed to Algonquin Gas Transmission Company in 1969.

Subject to an easement to Blackstone Valley Electric Company conveyed in 1969.

TOGETHER WITH all rights accruing to the grantor herein under covenants set forth in that certain deed dated February 1, 1961 recorded in Book 63 at page 93 in the Land Evidence Records of the Town of Burrillville and any and all other rights which the said grantor acquired by virtue of all prior title deeds.

WITNESS this 13th day of June, 1969, said Corporation has caused these Presents to be signed and its Corporate Seal to be hereunto affixed by its Proper Officer(s), duly authorized.

BUCK HILL FOREST, INC.

R.I.R.E.C.T. Stamps $11.00
6/16/69 ERB

BY Herbert L. Perry
President

(CORP. SEAL)

STATE OF RHODE ISLAND
COUNTY OF Providence

In Providence on the 13th day of June 1969 before me personally appeared Herbert L. Perry, President to me known and known by me to be the party executing the foregoing instrument for and on behalf of said corporation and acknowledged said instrument, by him executed, to be his free act and deed, in his said capacity and the free act and deed of said corporation.

Elaine C. Doyle
Notary Public

Received for record June 16, 1969 at 9:01 o'clock A.M.

Recorded by Patricia R. Ballou, Deputy Town Clerk

ADMINISTRATRIX DEED

I, Patricia Aubin, Administratrix of the Estate of Comino Toti, late of the Town of Burrillville, County of Providence and State of Rhode Island, deceased, by the power conferred by the Probate Court of said Town of Burrillville by decree entered June 6, 1969, and by every other power me thereunto enabling for Four Thousand Five Hundred ($4,500.00) Dollars paid, grant to Dora Waterman, of said Burrillville, Rhode Island.

All the right, title and interest of said Comino Toti, deceased, in and to the following described real estate, viz:

Two certain lots or parcels of land with all the buildings and improvements thereon situated in Graniteville, so-called, in the Town of Burrillville, County of Providence and State of Rhode Island, and lying on the northerly side of the highway leading from Graniteville to Douglas, and howsoever the same may be bounded or described, it being the same premises conveyed to Albert Leclaire by Frank M. and John D. Whipple by deed dated May 9, 1916, which deed is recorded in Book 34, Page 98 Burrillville Land Records, and subject to the same conditions in regard to fences as mentioned in said deed.

Also two certain lots of land, with all the buildings and improvements thereon, situated in Graniteville, so-called, in said town, and howsoever the same may be bounded and described being all and the same premises conveyed to Louise Leclair by Harriet A. Olney and others by deed dated October 20th, 1906 which deed is recorded in Book No. 31, page 258 Burrillville Land Records and subject to the same conditions in regard to fences as mentioned in said deed.

Also one certain lot or strip of land situated on the northerly side of the highway leading from Graniteville to Douglas and joining other land of Marana Wilcox, now or formerly, and howsoever the same may be bounded and described, being all and the same premises conveyed to Louise Leclair by Henry A. Wilcox by deed dated October 5, 1907, which deed is recorded in Book No. 31, page 349 Burrillville Land Records and subject to the same conditions in regard to fences as mentioned in said deed.

I, Helen Toti, wife of Comino Toti, release to said Grantee all my right of dower and all other interest in the aforedescribed premises.

WITNESS our hands and seals this 6th day of June, 1969.

Witnessed by:

Irving I. Zimmerman

Patricia Aubin
Administratrix of the Estate of Comino Toti

Patricia Aubin
Guardian of the Estate of Helen Toti

STATE OF RHODE ISLAND
COUNTY OF PROVIDENCE

In Burrillville on the 6th day of June, 1969, before me personally appeared Patricia Aubin, Administratrix of the Estate of Comino Toti and Guardian of the Estate of Helen Toti, to me known and known by me to be the party executing the foregoing instrument, and she acknowledged said instrument, by her executed, to be her free act and deed and her free act and deed in her capacities aforesaid.

Irving I. Zimmerman
Notary Public

R.I.R.E.C.T. Stamps $4.95
6/16/69 ERB

Received for record June 16, 1969 at 10:[illegible] o'clock A.M.

Recorded by [illegible] Town Clerk

3-12-14-21 (1/5 int)

300

KNOW ALL MEN BY THESE PRESENTS

That I, ROGER M. LOVELL, of Worcester, Worcester County, Massachusetts, in consideration of One Dollar and other valuable consideration paid by THE NARRAGANSETT ELECTRIC COMPANY, a Rhode Island corporation, the receipt whereof is hereby acknowledged, do hereby remise, release and forever quitclaim unto said The Narragansett Electric Company, certain tracts or parcels of land situated in Burrillville, Providence County, Rhode Island, more particularly described as follows:

All and the same premises conveyed to Edgar G. Paine by the United Electric Railways Company by deed dated March 18, 1931, recorded with the Records of Deeds of said Town of Burrillville in Book 43, Page 12 and with the Records of Deeds of the Town of North Smithfield, Rhode Island in Book 33, Page 440 - EXCEPT so much thereof as was conveyed by the said Edgar G. Paine et ux to Irving H. Sweet et ux by deed dated December 20, 1932, duly recorded with said Burrillville Records of Deeds; and so much thereof as was conveyed by the said Edgar G. Paine et ux to Jules Senn, Jr. et ux by deed dated May 11, 1946, duly recorded with North Smithfield Records of Deeds - and SUBJECT to the rights granted by the said Edgar G. Paine et ux to the Blackstone Valley Gas and Electric Company by deed dated December 19, 1932, duly recorded with said Burrillville Records of Deeds.

Being the same premises conveyed to me by the said Edgar G. Paine et ux by deed dated January 24, 1947, recorded with the Records of Deeds of the Town of Burrillville in Book 50, Page 487.

EXCEPTING from the above described premises so much thereof as has been conveyed by me to various parties by deeds duly recorded with said Burrillville Records of Deeds.

TO HAVE AND TO HOLD the granted premises, with all the rights, privileges and appurtenances thereunto belonging, unto the said THE NARRAGANSETT ELECTRIC COMPANY and its successors and assigns forever.

And I, VIRGINIA J. LOVELL, wife of said Grantor, release to said Grantee all rights of dower and homestead and other interests therein.

WITNESS our hands and seals this 14th day of March, 1962

THE CONSIDERATION PAID FOR THE WITHIN DEED IS LESS THAN $100.

Roger M. Lovell (LS)

Virginia J. Lovell (LS)

COMMONWEALTH OF MASSACHUSETTS)
)
Suffolk, ss.) In Boston on the 14th day of March, 1962 before me personally appeared ROGER M. LOVELL and VIRGINIA J. LOVELL, to me known and known by me to be the parties executing the foregoing instrument, and they acknowledged said instrument, by them executed, to be their free act and deed.

Albert V. Colman
Notary Public.
Albert V. Colman
My commission expires Dec. 30, 1965

Received for record March 15, 1962 at 9:00 o'clock A.M.

Recorded by _____ Town Clerk

I, PHILIP O. HARRIS, of the Town of Burrillville, County of Providence and State of Rhode Island, for consideration paid, grant to BUCK HILL FOREST INC., a Rhode Island Corporation, with QUIT-CLAIM COVENANTS

No Revenue Stamps Required

That certain tract or parcel of land, with all the buildings and improvements thereon, situated in the Town of Burrillville, County of Providence and State of Rhode Island, bounded and described as follows

Beginning at the Northeasterly corner of land on the southwesterly side of said Buck Hill Road at land formerly of Hannah W. and Marion F. Bates but more recently of Samuel A. Chase; thence S 54½° E with said road and with land now or formerly of Smith Angell heirs about 87 rods to stake and stones at land formerly of Herbert C. and Martha C. Blake but more recently of William R. Cooney; thence S 48½° W with said Cooney land about 18 rods 10 links to a rock with stones on it; thence S 18° E about 52 3/4 rods to stake and stones; thence S 28½° E about 63 rods, the last two courses are with land of said Cooney, and land now or formerly of Raymond J. and Elizabeth F. King, land now or formerly of Abilio A. Dacorte, land now or formerly of Joseph Cunningham, land now or formerly of Lawrence J. and Claire Cunningham and land now or formerly of Albert J. and Kathleen H. Christiaen; thence S 71½° E with said Christiaen land about 8 rods to the Wallum Lake Road, the next five courses are with said road; S 7° E 44 rods 9 links; S 18½° E 15 rods 20 links; S 32° E 14 rods 15 links; S 45° E 14 rods 15 links; S 53½° E 22 rods to land now or formerly of Amy J. Gansert; thence with said Gansert land S 64° W 2 rods 14 links S 75½° W 16 rods 15 links; S 62½° W 8½rods; S 85½° W 13 rods; W 13 rods 15 links; S 83½° W 5 rods to a white pine tree marked at the northwesterly corner of said Gansert land; thence continuing with said Gansert land S 55 rods 16 links to the "HorseShoe Pine" so called at the southwest corner of said Gansert land; thence S 73 3/4° E with said Gansert land 55 rods to land now or formerly of Charles and Martha Letendre; thence S 40½° W with said Letendre land 40½ rods to land now or formerly of G. Bertrand Bibeault; thence N 76° W 26 rods 17 links with Bibeault land; thence N 78½° W 40 rods 8 links with Bibeault land to the "Bear Stump" at land now or formerly of Thomas Ryan; thence northwesterly with said Ryan land about 40 rods; thence westerly with said Ryan land about 71 rods; thence S 16° W with said Ryan land and with land now or formerly of the United States of America (formerly of Seth Ross) known as "Casimir Pulaski Forest" about 96 rods; thence westerly with last mentioned land about 176 rods to a rock with stones on it; thence about N 14° E with last mentioned land about 130 rods to a stone on a rock; thence N 6° W with land formerly of James Roberts but more recently of Henry Jarvis about 179 rods to a rock on the shore by Round Pond; thence N 31½° E through said Pond (hereby including all right, title and interest of the grantor in and to said Pond and the land under the same) about 68 rods to a pile of stones on a rock on the other side of said Pond; thence N 72° E with land now or formerly of devisees under the will of William R. Angell as with land now or formerly of Samuel A. Chase 206 rods to the point of beginning.

Containing 721 acres more or less.

Excepting therefrom land conveyed to Albert E. and Concetta Poirier by deed recorded September 6, 1957 in Deed Book 62 at page 69.

Excepting therefrom land conveyed to Algonquin Gas Transmission Company by deed recorded February 1961 in Deed Book 63 at page 93.

Excepting therefrom land conveyed to Albert J. Christiaen and wife Kathleen H. by deed recorded February 27, 1961 in Deed Book 63 at page 205.

Excepting therefrom land conveyed to Algonquin Gas Transmission Company by deed recorded September 14, 1961 in Deed Book 63 at page 205.

Excepting therefrom any portion of the above granted premises within layout of the Wallum Lake and/or Buck Hill Road.

Excepting therefrom a parcel of land with any and all buildings and improvements thereon, bounded and described as follows:

Beginning at the northeast corner of the above granted premises, on the southwesterly side of Buck Hill Road,, at land formerly of Hannah W. and Marion F. Bates, but more recently of Samuel A. Chase; thence S 54½° E with said road and with land now or formerly of Smith Angell heirs about 87 rods to stake and stones at land formerly of Herbert C. and Martha C. Blake, but more recently of William R. Cooney; thence S 48½° W with said Cooney land and with land conveyed by this deed 40 rods; thence N 54½° W to land now or formerly of the devisees under the will of William R. Angell; thence N 72° E with the last mentioned land and with said land now or formerly of Samuel A. Chase to the point of beginning.

Containing 22½ acres more or less.

Together with all rights accruing to the grantor herein under covenants set forth in that certain deed dated February 1961, recorded in Deed Book 63 at page 93 and at page 205 in the records of Land Evidence in said Town of Burrillville, and any and all other rights which this said grantor acquired by virtue of all prior title deeds.

Together with a right to use the so-called Wilson Trail as it now exists across the property excluded from this grant and described herein.

Reserving hereunto me, the said grantor, and my heirs and assigns, the right to use Wilson Trail as it now exists over the land herein conveyed.

This conveyance is executed subject to a lease and easements of record and to rights of others to use the existing woods road so called over the northerly portion of the above granted premises.

This conveyance is also executed subject to taxes assessed December 31, 1961.

I, the above named grantor, covenant that I am a widower.

WITNESS my hand this 3rd day of March 1962.

Philip G. Harris

STATE OF RHODE ISLAND
COUNTY OF PROVIDENCE

In BURRILLVILLE on the 3rd. day of March 1962 before me personally appeared PHILIP G. HARRIS, to me known and known by me to be the party executing the foregoing instrument, and he acknowledged said instrument, by him executed, to be his free act and deed.

Edward P. Manning
Notary Public

Received for record March 16, 1962 at 9:41 o'clock A.M.

Recorded by _____ Town Clerk

BK0324

I, RUSSELL FARRELL, of the Town of Burrillville, County of Providence and State of Rhode Island, for consideration paid, grant to DORIS E. SHER, wife of Sydney Sher, of the City of Providence, said County and State, with WARRANTY COVENANTS

A certain lot or parcel of land with all the buildings and improvements thereon situated on the easterly side of Shore Drive, on Lake Pascoag, in the Town of Burrillville, County of Providence and State of Rhode Island, bounded and described as follows:

Beginning at a point on the easterly side of said Shore Drive which point is twenty-five (25) feet measured N. 24° 45' W. from the northwesterly corner of lot numbered A26 (A twenty-six) as delineated on that certain plat entitled, "Lake Pascoag Second Section Scale 1 in. = 40 ft July 1943 Willard B. Hall Surveyor Lic 517", which plat is recorded in the Registry of Deeds in said Town of Burrillville in Plat Book 2 at Page 111, and being the southwesterly corner of the lot hereby described; thence N. 24° 45' W. seventeen and 31/100 (17.31) feet; thence N. 14° 22' E. thirty-five and 42/100 (35.42) feet to land of Russel_ E. and Rita A. Farrell, the last two lines bounding on said Shore Drive; thence N. 83° 37' E. with said last named land and passing through a drill hole about one hundred ten (110) feet to the shore of Lake Pascoag; thence southerly with said shore of Lake Pascoag about forty (40) feet; thence S. 78° 10' W. passing through an iron pin one hundred eleven and 83/100 (111.83) feet to the point of beginning. Containing 6,167 square feet, more or less.

SUBJECT TO restrictions and reservations of record.

Being the major portion of the premises conveyed to this grantor by deed from Leo F. Lawrence and Ella M. Lawrence, his wife, dated August 12, 1961 and recorded in said Registry of Deeds in Deed Book 63 at page 185.

Reference is hereby made to that unrecorded plat entitled, "Proposed Division For Leo F. Lawrence Burrillville, R.I. February, 1960 Scale: 1 inch equals 20 feet. G. Bertrand Bibeault, Civil Engineering, Woonsocket, R.I."

Grantor covenants that at time the 1962 real estate taxes become due same will be prorated between the parties.

U.S.I.R. Stamps $5.50
T.L.P. 3/26/62

I, Rita A. Farrell, wife of said Russell Farrell, release to said grantee all my right of dower and all other interest in the afore described premises.
WITNESS our hands and seals this 22nd day of March, 1962.

In presence of:

Rita A. Farrell (LS)

Russell Farrell (LS)

STATE OF RHODE ISLAND)
COUNTY OF Providence)

In Pascoag R I on the 22nd day of March, 1962 before me personally appeared Russell & Rita A. Farrell to me known and known by me to be one of the parties executing the foregoing instrument, and she acknowledged said instrument, by her executed, to be her free act and deed.

(Notarial Seal)

Louis F. Bonoyer
Notary Public

PARCEL TWO DEEDS

94

Beginning at a Rhode Island State Highway bound which is left 30 feet of Route #100 layout Base Line Station 99+05.79' thence running Southerly 420.84 feet along the Westerly side of Route #100 on a radius of 1112.11 to a point in the Westerly line of Route #100 for a point of beginning; thence turning and running S 64° 20' 06" W 100.00 feet; thence turning and running S 71° 01' 00" W 210 feet; thence turning S 75° 39' 19" W 2300 feet; thence turning and running N 16° 23' 57" W 1650.00 feet; thence turning and running N 73° 36' 03" E 2564.52 feet; thence turning and running S 25° 14' 00" E 687.79 feet said last line running for 596.62 feet as the common boundary line between Harris and others and for 91.17 feet on other lands of Harris; thence turning and running N 64° 46' 00" E 85.76 feet to the Westerly line of Route #100; thence turning and running S 3° 59' 00" E 634.37 feet to the above described Rhode Island State Highway Bound; thence Southerly 420.84 feet along the Westerly side of Route #100 on a radius of 1112.11 to the point of beginning. Containing 105.5 acres more or less excepting therefrom a parcel of one acre more or less located in the southeasterly portion of the within described parcel belonging to Albert E. Poirier and Concetta Poirier.

By accepting this deed grantee covenants that it will not locate any building within one hundred feet (100) of the westerly line of Wallum Lake Road.

Said parcel is more particularly shown on a plan entitled "Plan Showing Land to be Acquired by Algonquin Gas Trans. Co. Burrillville, R. I.," which plan is attached hereto and made a part hereof.

Grantee covenants to grant an easement for a connecting pipeline over a convenient location on the granted premises to supply a gas company to be formed by the Grantor in the event that such prospective company secures appropriate authorization from the Federal Power Commission and the Rhode Island authority/jurisdiction.

U.S.I.R. Stamps $27.50
S.W. 2/16/61

TO HAVE AND TO HOLD, the aforegranted premises, with all the rights, privileges and appurtenances thereunto belonging, unto and to the use of the said Grantee, its successors and Assigns forever.

And I the said Grantor, do hereby, for myself and for myself and for my heirs, executors, and administrators, covenant with the said Grantee and tis successors and assigns that I am lawfully seized in fee simple of the said granted premises: that the same are free from all incumbrances,

that I have good right, full power and lawful authority to sell and convey the same in manner as aforesaid, that the said Grantee and its successors heirs and assigns, shall by these presents at all times hereafter peacefully and quietly have and enjoy the said premises, and that, the said Grantor will, and my executors and administrators, shall warrant and defend the same to the said Grantee and its successors and assigns forever against the lawful claims and demands of all persons.

And for the consideration aforesaid I, Mary W. Harris, wife of said grantor do hereby release all my right of dower in and to the said granted premises unto the said Grantee and its successors and assigns, forever.

IN WITNESS WHEREOF, we have hereunto set our hands and seals this day of February in the year of our Lord one thousand nine hundred and sixty-one

Executed in the presence of

H. S. Wiley

Philip G. Harris (LS)

Mary W. Harris (LS)

STATE OF RHODE ISLAND
COUNTY OF PROVIDENCE

In Burrillville on the 15th day of February, A. D. 1961 before me personally appeared the above named grantors Philip G. Harris & Mary W. Harris to me known and known by me to be the parties executing the foregoing instrument, and acknowledged said instrument, by them executed, to be their free act and deed

H. Seymour Wiley

Notary Public

Received for record February 16, 1961 at 11:03 o'clock A.M.
Recorded by

Town Clerk

(See next page for map)

KNOW ALL MEN BY THESE PRESENTS, THAT

ALBERT E. POIRIER AND CONCETTA POIRIER, husband and wife, of Burrillville, Providence County, Rhode Island hereinafter called the Grantor in consideration of One Dollar and other valuable considerations to us paid by ALGONQUIN GAS TRANSMISSION COMPANY, a Delaware corporation, having its principal place of business at Boston, Suffolk County, Massachusetts hereinafter called the Grantee, the receipt whereof is hereby acknowledged, do hereby give, grant, bargain, sell and convey unto the said Grantee, and its successors heirs and assigns forever.

A certain lot or parcel of land, situated westerly of Wallum Lake Road, in the Township of Burrillville, in the State of Rhode Island, bounded and described, viz:

Beginning at a point 100' measured southerly 71° 01' W. from the westerly side of Wallum Lake Road, said point being located by measuring by 222.28' southerly from a Rhode Island Highway bound on the westerly side of said road at Station 99 05.79 as shown on the State of Rhode Island Highway plat numbered 922, said highway bound is also located about 622' southerly of the southeasterly corner of land of Albert J.and Kathleen H. Cristiaen; thence S 3° 59' E 210'; thence S 71° 01' W 210'; thence N 3° 59' W 210', the last three lines bounding on lands of Harris: thence N 71° 01' E, with a right of way hereinafter described 210' to the point of beginning. Containing 1.01 acres more or less.

Together with the right to pass and repass on foot and with vehicles of all kinds over a strip or parcel of land 50' in width and extending from said Wallum Lake Road westerly to the northwesterly corner of the above described lot, said right-of-way is bounded and described as follows:

Beginning at a point on the westerly side of Wallum Lake Road which point is 172.28' southerly of the Rhode Island Highway bound above mentioned; thence southerly, with said Wallum Lake Road and on a curved line having a radius of 112.11', 50'; thence S 71° 01' W, with land of Harris and the northerly line of the above described lot 310'; thence N 3° 59' W, 50'; thence N 71° 01' E about 313' to the point of beginning.

Being the same premises conveyed to us by deed of Harris et ux, dated September 6, 1957, and recorded with Burrillville Land Records in Book 62, Page 69, and shown on Block 2, Lot 32A of Assessors Plans, or however otherwise said premises may be bounded, measured or described.

Insofar as we have the power to do so we hereby cnacel and release any restrictions, agreements or covenants that do or may apply to said herein granted parcel, excepting the establishment of a one hundred foot (100) strip of land along Wallum Lake Road as a reservation.

U.S.I.R. Stamps $1.65
S.W. 2/16/61

TO HAVE AND TO HOLD, the aforegranted premises, with all the rights, privileges and appurtenances thereunto belonging, unto and to the use of the said Grantee, its successors their Heirs and Assigns forever.

And we the said Grantors, do hereby, for ourselves and for our heirs, executors, and administrators, covenant with the said Grantee and its successors heirs and assigns that we are lawfully seized in fee simple of the said granted premises: that the same are free from all incumbrances,

that we have good right, full power and lawful authority to sell and convey the same in manner as aforesaid, that the said Grantee and its successors heirs and assigns, shall by these presents at all times hereafter peacefully and quietly have and enjoy the said premises, and that, we the said Grantors will, and our heirs, executors and administrators, shall warrant and defend the same to the said Grantee and its successors heirs and assigns forever against the lawful claims and demands of all persons.

And for the consideration aforesaid we do hereby release all our right of dower and curtesy in and to the said granted premises unto the said Grantee and its successors heirs and assigns, forever.

IN WITNESS WHEREOF, We have hereunto set our hands and seals this 16th day of February in the year of our Lord one thousand nine hundred and sixty-one.

Executed in the presence of

Albert E. Poirier

Robert E. Culver

Concetta Poirier

STATE OF RHODE ISLAND
COUNTY OF PROVIDENCE

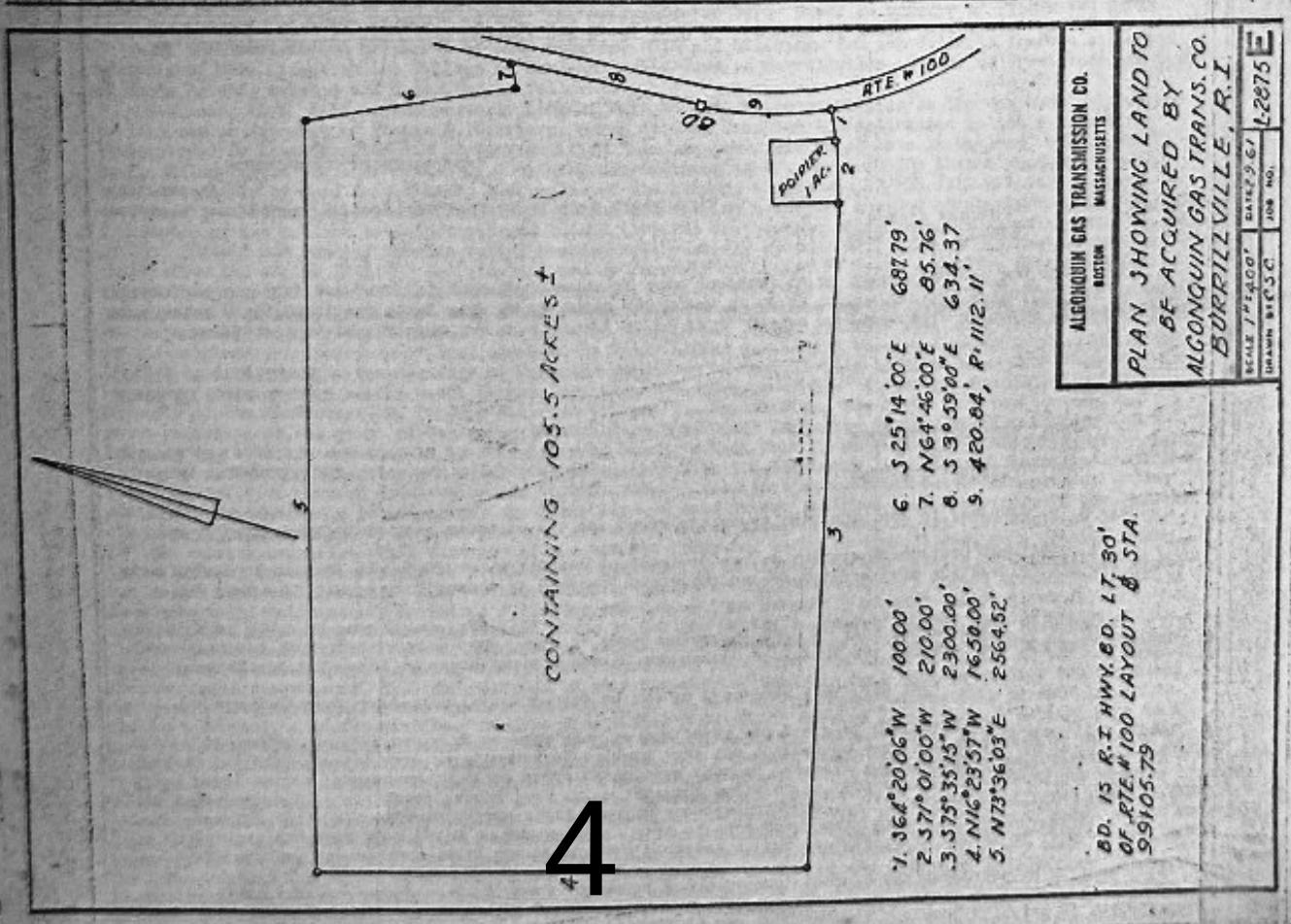
In Burrillville on the 16th day of February, A. D. 1961 before me personally appeared the above named grantors ALBERT E. POIRIER & CONCETTA POIRIER to me known and known by me to be the parties executing the foregoing instrument, and acknowledged said instrument, by them executed, to be their free act and deed

H. Seymour Wiley

Notary Public

Received for record February 16, 1961 at 11:26 o'clock A.M.
Recorded by

Town Clerk



62 Philip G. Harris, et ux, of Township of Burrillville, County of Providence, State of Rhode Island for consideration paid, grant to Albert E. Poirier and Concetta Poirier, husband and wife as joint tenants of Wallum Lake, Township of Burrillville, County of Providence, State of Rhode Island with WARRANTY COVENANTS: 69

A certain lot or parcel of land, situated westerly of the Wallum Lake Road, in the Town of Burrillville, in the State of Rhode Island, bounded and described as follows, viz;- Beginning at a point one hundred (100.00) feet measured S. 71-01'W., from the westerly side of said Wallum Lake Road, said point being located by measuring by two hundred twenty two and twenty eight one hundredths (222.28) feet southerly from a Rhode Island Highway Bound on the westerly side of said Road at station 99 05.79 as shown on the State of Rhode Highway Plat No. 922, said highway bound is also located about six hundred twenty two (622.00) feet southerly of the southeasterly corner of land of Albert J. and Kathleen H. Cristiaen; Thence S. 3 -59' E., two hundred ten (210.00) feet;- Thence S. 71 -01'W., two hundred ten (210.00) feet;- Thence N. 3 -59' W., two hundred ten (210.00) feet, the last three (3) lines bounding on other land of these grantors;- Thence N. 71 -01' E., with a right of way hereinafter described two hundred ten (210.00) feet to the point of beginning.

Containing 1.01 Acres more or less.

The grantors also convey to the grantees, their heirs and assigns the right to pass and repass on foot and with vehicles of all kinds over a strip or parcel of land fifty (50.00) feet in width and extending from said Wallum Lake Road westerly to the northwesterly corner of the above described lot, said right of way is bounded and described as follows, viz;- Beginning at a point on the westerly side of Wallum Lake Road which point is one hundred seventy two and twenty eight one hundredths (172.28) feet southerly of the Rhode Island Highway Bound above mentioned;- Thence Southerly, with said Wallum Lake Road and on a curved line having a radius of one thousand one hundred twelve and elven one hundredths (1112.11) feet, fifty (50.00) feet; - Thence S. 71 -01' W., with other land of these grantors and the northerly line of the above described lot three hundred ten (310.00) feet;- Thence N. 3 -59'W., fifty (50.00) feet;- Thence N. 71 01' E., about three hundred thirteen (313.00) feet to the point of beginning.

PROVIDED HOWEVER, and this conveyance is made upon the following expressed conditions and covenants all of which are hereby declared to run with the land hereby conveyed, and to which, each and every one of grantees for himself, his heirs and assigns, hereby consents and covenants to observe and keep, that is to say:-

That the grantee herein be an associate member of the Buck Hill Forest Association, Inc. and subject to the rules, regulations and by-laws, limitations and privileges of the said Association as respects the property of the said Association and the property of other associate members of the said Association, and the property conveyed herein.

That the grantee, his heirs and assigns will not erect any building or obstruction other than a boundary fence or wall within forty (40) feet of the boundary lines of the premises herein conveyed,- nor shall the said grantee, his heirs and assigns, dig any cesspool or locate any septic tank or other appartus or equipment for sewerage purposes within forty (40) feet of the boundary lines of the property herein conveyed; nor shall the said grantee, his heirs and assigns install or permit any installation of a trailer, temporarily or permanently, mobile or fixed on the said premises herein conveyed; nor shall the said grantee, his heirs and assigns permit or maintain poultry, cattle or other animals, on the said premises, except domesticated household pets.

That the grantee, his heirs and assigns shall not use the premises conveyed herein, together with any buildings thereon except as a private dwelling house, for residential purposes only.

That the grantee, his heirs and assigns shall not rent, lease or resell any fractional part of the premises but that lease or resale of the said premises shall include the entire premises conveyed herein.

And the said grantee, his heirs and assigns accepts this conveyance subject to the covenants restrictions and conditions above set forth and for himself, his heirs and assigns covenants to and with the grantor, his heirs and assigns that the said grantees, his heirs and assigns will forever faithfully observe and perform said several restrictions and conditions, and each of them. And if there shall at any time be a violation or attempted violation of the foregoing restrictions and conditions, it shall be lawful for any lot owner duly qualified as an associate of the Buck Hill Forest Associates, Inc. in accordance with the rules, regulations and by-laws thereof to institute and prosecute appropriate proceedings at law or in equity for the wrong done or attempted.

And as an additional covenant running with the land, the grantor, his heirs and assigns covenants with the said grantee, his heirs and assigns that for all time, the land between the premises herein conveyed and the Wallum Lake Road heretofore mentioned in the description of this property shall remain the property of the grantor, except for future conveyance to the Buck Hill Forest Associates, Inc. foruse as a reservation, park or road only.

Mary W. Harris, wife of the grantor Philip G. Harris release to said grantees all her right of dower and all other interest in the aforesaid premises.

WITNESS our hands this 6th day of September, 1957

Philip G. Harris
Mary W. Harris

STATE OF RHODE ISLAND
COUNTY OF PROVIDENCE

In Burrillville on the 6 day of Sept. 1957 before me personally appeared Philip G. Harris and Mary W. Harris to me known and known by me to the parties executing the foregoing instrument Philip G. Harris G. Harris and Mary W. Harris acknowledged said instrument, by them executed to be their free act and deed.

Thomas D. Goldrick
Notary Public (Seal)

Received for record September 6, 1957 at 2:10 o'clock P. M.

Recorded by

Town Clerk

DAA 807

1

PARCEL THREE DEEDS

150

4-15-30-23

QUIT-CLAIM DEED

I, MARJORIE R. KENYON, of the Town of Burrillville, County of Providence and State of Rhode Island, for consideration paid, grant to EDGAR R. ALGER, JR., and EVELYN R. ALGER, husband and wife, of the Town of Cumberland, County of Providence and State of Rhode Island, AS TENANTS BY THE ENTIRETY AND NOT AS JOINT TENANTS AND NOT AS TENANTS IN COMMON, with QUIT-CLAIM COVENANTS,

All my right, title and interest in and to that certain parcel of land situated in the Town of Burrillville, and near the Village of Whipple, so-called, bounded as follows:-

Beginning at the northwest corner of the premises hereby conveyed, at the center of the wall which is in the division line between land now or formerly of George A. Joslin and land formerly of Thomas H. Sweet, and at a point twenty (20) feet northerly from the center line of the Columbian Street Railroad; thence by and with the northerly line of said Railroad, S. 48½° E., two hundred seventy-eight (278) feet to a stub in the northerly line of said Railroad; thence N 80½° E., thirty-two and one quarter (32¼) feet to a stub in the line of said land formerly of Gilbert F. Whipple; thence with said Whipple line, N. 8½° W. two hundred eleven (211) feet to a point in the center of the wall in the line of land formerly of Thomas H. Sweet; thence with the line of said land formerly of Thomas H. Sweet, S. 80½° W., two hundred eleven (211) feet to the place of beginning. Containing by estimation 25,777 square feet of land. Said premises are conveyed subject to real estate taxes assessed as of December 31, 1968

The consideration of this deed is such that no documentary stamps are required.

And I, EARL R. KENYON, JR., husband of Marjorie R. Kenyon, release to said grantee all my right of curtesy and other interest in the aforedescribed premises.

WITNESS our hands this 13th day of MARCH, A. D. 1969.

In Presence of:

Eugene V. Higgins
as to both

Marjorie R. Kenyon

Earl R. Kenyon Jr.

STATE OF RHODE ISLAND)
:ss.
COUNTY OF PROVIDENCE)

In Providence, on the 13th day of MARCH, A. D. 1969, before me personally appeared MARJORIE R. KENYON and EARL R. KENYON, JR., to me known and known by me to be the parties executing the foregoing instrument, and they acknowledged said instrument, by them executed, to be their free act and deed.

Eugene V. Higgins
NOTARY PUBLIC.
Notary Public

Received for record March 18, 1969 at 10:52 o'clock A.M.

Recorded by Edith R Eddy-Wright Town Clerk

BUCK HILL FOREST, INC., a Rhode Island corporation, for consideration paid grants to ALGONQUIN GAS TRANSMISSION COMPANY, a Delaware corporation, with warranty covenants, the following described real estate:

That parcel of land, with all buildings and improvements thereon, situated in the Town of Burrillville, County of Providence and State of Rhode Island, described as follows:-

Beginning at the northerly corner of land now or lately of Amy Gansert on the westerly line of Wallum Lake Road; thence S. 64° W. forty two and 24/100 (42.24) feet; thence S. 75° 30' W. two hundred seventy three and 9/10 (273.9) feet; thence S. 62° 30' W. one hundred forty and 25/100 (140.25) feet; thence S. 85° 30'W. two hundred fourteen and 5/10 (214.5) feet; thence west two hundred twenty four and 4/10 (224.4) feet; thence S. 83°30'W. eighty two and 5/10 (82.5) feet; thence south nine hundred eighteen and 06/100 (918.06) feet to a pine stump; thence S. 73 3/4° E. nine hundred seven and 5/10 (907.5) feet to a stake and stones beside a rock, the last eight (8) lines running with said Gansert land; thence S. 40 1/2° W. six hundred sixty eight and 25/100 (668.25) feet to a hornbeam tree marked; thence N. 76° W. four hundred forty and 22/100 (440.22) feet to a stone wall; thence N. 78 1/2° W. six hundred sixty five and 28/100 (665.28) feet to a white pine stump commonly known as "The Bear Stump" at land now or lately of James J. Scarano, the last three lines running with land now or lately of the State of Rhode Island; thence northwesterly bounding southwesterly on said Scarano land six hundred sixty (660) feet to land now of this grantee; thence northerly bounding westerly and thence easterly bounding northerly on said grantee's land to said Wallum Lake Road; thence southeasterly bounding northeasterly on said Road about eight hundred fifty five (855) feet to the point of beginning.

Reserving to the grantor, its successors and assigns the right to pass and repass on foot and by vehicles over the woods road right of way, hereinafter called the "way," running generally westerly from Wallum Lake Road through land now or lately of Amy Gansert and thence through the land herein conveyed and described above and thence through land owned by the grantee to other land of the grantor lying westerly thereof, with the right to improve and construct said way over its entire length to a width not exceeding thirty (30) feet.

The grantee may, at its option, relocate said way elsewhere on its own property provided that the relocated way shall connect back to the existing way at a point on grantee's premises, and continue to provide an uninterrupted way from Wallum Lake Road to remaining lands of the grantor lying westerly of the grantee's land, and provided further that the substitute way shall be cleared, rough graded and made generally comparable to the condition of the remainder of the way as it may exist at the time of such relocation. Grantee shall be under no obligation to improve the way but covenants that it will not obstruct or interfere with the rights herein reserved by the grantor in said way.

Grantor further grants to grantee the right to use that portion of the way extending northwesterly from grantee's westerly property line to the mainline right of way for access thereto provided that such right of access shall terminate if development by grantor should obliterate the way or if such use of access should interfere with the operations of grantor or its successors.

Subject to taxes assessed December 31, 1968.

WITNESS the hand and seal of Buck Hill Forest, Inc., by its president, Herbert L. Perry, this 18th day of March, 1969.

BUCK HILL FOREST, INC.,
by Herbert L. Perry
President.
(CORP. SEAL)

87 Page 131

For Partial Release See Book 87 Page 131

25-7-2-32C

STATE OF RHODE ISLAND
COUNTY OF PROVIDENCE

In Providence on the 18th day of March, 1969, before me personally appeared Herbert L. Perry, president of Buck Hill Forest, Inc., to me known and known by me to be the person executing the foregoing instrument, and he acknowledged the same, by him executed, to be his free act and deed individually and in his said capacity, and the free act and deed of Buck Hill Forest, Inc.

R.I.R.T.T. Stamps $55.00
BHF Inc 3/19/69

Elaine C. Doyle
Notary Public.

(Notarial Seal)

CERTIFICATE

THIS IS TO CERTIFY that at a Special Meeting of the Stockholders of BUCK HILL FOREST, INC., held on March 14, 1969, whereat the holders of one hundred (100) percent of the capital stock were present and voting, the following resolutions were duly enacted, and that the same have not been amended or rescinded and still continue in force and effect:

VOTED: That the President or the Treasurer of the corporation be--and he hereby is--authorized and empowered to sell and transfer any portion of or all of the real estate owned by the corporation, from time to time, but within one (1) year, at then fair market values, said sales and transfers to be for the purpose of and pursuant to the terms of the Plan of Complete Liquidation heretofore adopted by the corporation.

VOTED: That the President or the Treasurer of the corporation be--and he hereby is--authorized and empowered to execute such agreements, stock powers, transfer documents, receipts and other instruments as may be reasonably necessary to effectuate the foregoing vote.

I do further certify that as of this 14th day of March, 1969, the duly elected and qualified officers of corporation are as follows:

Herbert L. Perry - President
Herbert L. Perry - Treasurer
Herbert L. Perry - Secretary

Herbert L. Perry
Secretary

(CORP. SEAL)

Subscribed and sworn to before me in Providence, Rhode Island, this 14th day of March, 1969.

Elaine C. Doyle
Notary Public

(Notarial Seal)

Received for record March 19, 1969 at 12:00 o'clock Noon.

Recorded by Edith R. Bailey, Dep't Y Town Clerk

EASEMENT

We, North Smithfield Development Company, a corporation organized under the laws of the State of Rhode Island, with its principal place of business being in Woonsocket, Providence County, Rhode Island, (hereinafter called the Grantor(s)) for consideration paid, grant(s) to Blackstone Valley Electric Company, a Rhode Island corporation, its successors and assigns (hereinafter called the Grantee), with Warranty covenants, the perpetual and exclusive right and easement to enter upon to survey and to construct, reconstruct, repair, replace, maintain, operate, inspect, patrol, and remove a line or lines of poles, H-Frames, towers and combinations thereof, with wires and cables above and underground, and all foundations, anchors, guys and other usual fixtures, equipment and appurtenances deemed necessary for the transmission and the distribution of electric energy for light, heat, power, telephone, telegraph, or any other purpose (which line or lines may be erected at the same or different times) over, across, under and upon a strip of land Three Hundred (300') feet in width, said strip being a part of the premises of the Grantor(s), situated in the Towns of North Smithfield & Burrillville in the County of Providence and State of Rhode Island, described as follows:

A certain parcel of land containing about 29 40/100 acres situated on the southeasterly side of the Victory Highway, in the Towns of North Smithfield and Burrillville, County of Providence and State of Rhode Island, bounded and described as follows, viz: - Beginning at a point on the southeasterly side of said Victory Highway which point is the most westerly corner of land now or formerly of Michael Bukata, said point being a Rhode Island Highway Bound set opposite station 79 + 56.33 as shown on the Rhode Island Highway Plat #203 and being the most northerly corner of the parcel hereby described; thence southeasterly on a curved line having a radius of one thousand six hundred thirty-two and 78/100 (1,632.78) feet, four hundred five and 39/100 (405.39) feet to a point of tangent; thence S. 41° 27' 34" W. three hundred and forty-five and 85/100 (345.85) feet to a Rhode Island Highway Bound; thence S. 43° 06' 58" W. six hundred sixty-nine and 65/100 (669.65) feet to a granite bound in the center line of an Old Road, the last three (3) lines bounding on said Victory Highway; thence S. 11° 21' 58" W. one hundred forty-five and 81/100 (145.81) feet to a drill hole; thence S. 37° 51' 58" W. two hundred eighty-two and 48/100 (282.48) feet to a granite bound; thence S. 55° 21' 58" W. three hundred ninety-six (396) feet; thence S. 71° 12' 58" W. three hundred seventy-nine and 2/10 (379.2) feet to a granite bound; thence S. 80° 12' 58" W. about forty (40) feet to said Victory Highway the last five (5) lines being on the center line of said Old Road; thence S. 44° 49' 48" W. with said Victory Highway about two hundred ninety-five and 55/100 (295.55) feet to a concrete bound at land of the Church of the Little Flower of Jesus; thence S. 16° 25' E. one hundred (100) feet to a drill hole in the ledge; thence easterly about fifty (50) feet to the Highwater Line of the Slatersville Upper Reservoir, so-called, the last two (2) lines bounding on said Church land; thence in a general easterly, northerly and westerly direction, bounding on the Highwater Line of said Slatersville Upper Reservoir, about three thousand one hundred (3,100) feet to a point which is three hundred twenty (320) feet from the Victory Highway measured at right angles thereto; thence northerly crossing a swamp area of said Reservoir about two hundred forty and 4/10 (240.4) feet to a point one hundred fifty (150) feet southeasterly of the Victory Highway measured at right angles thereto from a point opposite station 88 + 10 as shown on the above Highway Plat #203; thence northeasterly, bounding on the Highwater Line of said Slatersville Upper Reservoir, about four hundred fifty (450) feet to a point one hundred (100) feet southeasterly from said Victory Highway measured at right angles thereto from a point opposite station 84 + 05 as shown on said Plat; thence northeasterly one hundred (100) feet southeasterly from and parallel with said Victory Highway and crossing a small portion of said Slatersville Upper Reservoir, about four hundred [illegible]-five (465) feet to said land now or formerly of Michael Bukata, bounding on the last four (4) lines on remaining land of this grantor; thence N. 51° 27' W. with said Bukata land one hundred two and 37/100 (102.37) feet to the point of beginning.

300

KNOW ALL MEN BY THESE PRESENTS

That I, ROGER M. LOVELL, of Worcester, Worcester County, Massachusetts, in consideration of One Dollar and other valuable consideration paid by THE NARRAGANSETT ELECTRIC COMPANY, a Rhode Island corporation, the receipt whereof is hereby acknowledged, do hereby remise, release and forever quitclaim unto said The Narragansett Electric Company, certain tracts or parcels of land situated in Burrillville, Providence County, Rhode Island, more particularly described as follows:

All and the same premises conveyed to Edgar G. Paine by the United Electric Railways Company by deed dated March 18, 1931, recorded with the Records of Deeds of said Town of Burrillville in Book 43, Page 12 and with the Records of Deeds of the Town of North Smithfield, Rhode Island in Book 33, Page 440 - EXCEPT so much thereof as was conveyed by the said Edgar G. Paine et ux to Irving H. Sweet et ux by deed dated December 20, 1932, duly recorded with said Burrillville Records of Deeds; and so much thereof as was conveyed by the said Edgar G. Paine et ux to Jules Senn, Jr. et ux by deed dated May 11, 1946, duly recorded with North Smithfield Records of Deeds - and SUBJECT to the rights granted by the said Edgar G. Paine et ux to the Blackstone Valley Gas and Electric Company by deed dated December 19, 1932, duly recorded with said Burrillville Records of Deeds.

Being the same premises conveyed to me by the said Edgar G. Paine et ux by deed dated January 24, 1947, recorded with the Records of Deeds of the Town of Burrillville in Book 50, Page 487.

EXCEPTING from the above described premises so much thereof as has been conveyed by me to various parties by deeds duly recorded with said Burrillville Records of Deeds.

TO HAVE AND TO HOLD the granted premises, with all the rights, privileges and appurtenances thereunto belonging, unto the said THE NARRAGANSETT ELECTRIC COMPANY and its successors and assigns forever.

And I, VIRGINIA J. LOVELL, wife of said Grantor, release to said Grantee all rights of dower and homestead and other interests therein.

WITNESS our hands and seals this 14th day of March, 1962

THE CONSIDERATION PAID FOR THE WITHIN DEED IS LESS THAN $100.

Roger M. Lovell (LS)

Virginia J. Lovell (LS)

COMMONWEALTH OF MASSACHUSETTS)
)
Suffolk, ss.) In Boston on the 14th day of March, 1962 before me personally appeared ROGER M. LOVELL and VIRGINIA J. LOVELL, to me known and known by me to be the parties executing the foregoing instrument, and they acknowledged said instrument, by them executed, to be their free act and deed.

Albert V. Colman
Notary Public.
Albert V. Colman
My commission expires Dec. 30, 1965

Received for record March 15, 1962 at 9:00 o'clock A.M.

Recorded by _____ Town Clerk

I, PHILIP O. HARRIS, of the Town of Burrillville, County of Providence and State of Rhode Island, for consideration paid, grant to BUCK HILL FOREST INC., a Rhode Island Corporation, with QUIT-CLAIM COVENANTS

No Revenue Stamps Required

That certain tract or parcel of land, with all the buildings and improvements thereon, situated in the Town of Burrillville, County of Providence and State of Rhode Island, bounded and described as follows

Beginning at the Northeasterly corner of land on the southwesterly side of said Buck Hill Road at land formerly of Hannah W. and Marion F. Bates but more recently of Samuel A. Chase; thence S 54½° E with said road and with land now or formerly of Smith Angell heirs about 87 rods to stake and stones at land formerly of Herbert C. and Martha C. Blake but more recently of William R. Cooney; thence S 48½° W with said Cooney land about 18 rods 10 links to a rock with stones on it; thence S 18° E about 52 3/4 rods to stake and stones; thence S 28½° E about 63 rods, the last two courses are with land of said Cooney, and land now or formerly of Raymond J. and Elizabeth F. King, land now or formerly of Abilio A. Dacorte, land now or formerly of Joseph Cunningham, land now or formerly of Lawrence J. and Claire Cunningham and land now or formerly of Albert J. and Kathleen H. Christiaen; thence S 71½° E with said Christiaen land about 8 rods to the Wallum Lake Road, the next five courses are with said road; S 7° E 44 rods 9 links; S 18½° E 15 rods 20 links; S 32° E 14 rods 15 links; S 45° E 14 rods 15 links; S 53½° E 22 rods to land now or formerly of Amy J. Gansert; thence with said Gansert land S 64° W 2 rods 14 links S 75½° W 16 rods 15 links; S 62½° W 8½rods; S 85½° W 13 rods; W 13 rods 15 links; S 83½° W 5 rods to a white pine tree marked at the northwesterly corner of said Gansert land; thence continuing with said Gansert land S 55 rods 16 links to the "HorseShoe Pine" so called at the southwest corner of said Gansert land; thence S 73 3/4° E with said Gansert land 55 rods to land now or formerly of Charles and Martha Letendre; thence S 40½° W with said Letendre land 40½ rods to land now or formerly of G. Bertrand Bibeault; thence N 76° W 26 rods 17 links with Bibeault land; thence N 78½° W 40 rods 8 links with Bibeault land to the "Bear Stump" at land now or formerly of Thomas Ryan; thence northwesterly with said Ryan land about 40 rods; thence westerly with said Ryan land about 71 rods; thence S 16° W with said Ryan land and with land now or formerly of the United States of America (formerly of Seth Ross) known as "Casimir Pulaski Forest" about 96 rods; thence westerly with last mentioned land about 176 rods to a rock with stones on it; thence about N 14° E with last mentioned land about 130 rods to a stone on a rock; thence N 6° W with land formerly of James Roberts but more recently of Henry Jarvis about 179 rods to a rock on the shore by Round Pond; thence N 31½° E through said Pond (hereby including all right, title and interest of the grantor in and to said Pond and the land under the same) about 68 rods to a pile of stones on a rock on the other side of said Pond; thence N 72° E with land now or formerly of devisees under the will of William R. Angell as with land now or formerly of Samuel A. Chase 206 rods to the point of beginning.

Containing 721 acres more or less.

Excepting therefrom land conveyed to Albert E. and Concetta Poirier by deed recorded September 6, 1957 in Deed Book 62 at page 69.

Excepting therefrom land conveyed to Algonquin Gas Transmission Company by deed recorded February 1961 in Deed Book 63 at page 93.

Excepting therefrom land conveyed to Albert J. Christiaen and wife Kathleen H. by deed recorded February 27, 1961 in Deed Book 63 at page 205.

Excepting therefrom land conveyed to Algonquin Gas Transmission Company by deed recorded September 14, 1961 in Deed Book 63 at page 205.

Excepting therefrom any portion of the above granted premises within layout of the Wallum Lake and/or Buck Hill Road.

Excepting therefrom a parcel of land with any and all buildings and improvements thereon, bounded and described as follows:

Beginning at the northeast corner of the above granted premises, on the southwesterly side of Buck Hill Road,, at land formerly of Hannah W. and Marion F. Bates, but more recently of Samuel A. Chase; thence S 54½° E with said road and with land now or formerly of Smith Angell heirs about 87 rods to stake and stones at land formerly of Herbert C. and Martha C. Blake, but more recently of William R. Cooney; thence S 48½° W with said Cooney land and with land conveyed by this deed 40 rods; thence N 54½° W to land now or formerly of the devisees under the will of William R. Angell; thence N 72° E with the last mentioned land and with said land now or formerly of Samuel A. Chase to the point of beginning.

Containing 22½ acres more or less.

Together with all rights accruing to the grantor herein under covenants set forth in that certain deed dated February 1961, recorded in Deed Book 63 at page 93 and at page 205 in the records of Land Evidence in said Town of Burrillville, and any and all other rights which this said grantor acquired by virtue of all prior title deeds.

Together with a right to use the so-called Wilson Trail as it now exists across the property excluded from this grant and described herein.

Reserving hereunto me, the said grantor, and my heirs and assigns, the right to use Wilson Trail as it now exists over the land herein conveyed.

This conveyance is executed subject to a lease and easements of record and to rights of others to use the existing woods road so called over the northerly portion of the above granted premises.

This conveyance is also executed subject to taxes assessed December 31, 1961.

I, the above named grantor, covenant that I am a widower.

WITNESS my hand this 3rd day of March 1962.

Philip G. Harris

STATE OF RHODE ISLAND
COUNTY OF PROVIDENCE

In BURRILLVILLE on the 3rd. day of March 1962 before me personally appeared PHILIP G. HARRIS, to me known and known by me to be the party executing the foregoing instrument, and he acknowledged said instrument, by him executed, to be his free act and deed.

Edward P. Manning
Notary Public

Received for record March 16, 1962 at 9:41 o'clock A.M.

Recorded by _____ Town Clerk

BK0324

I, RUSSELL FARRELL, of the Town of Burrillville, County of Providence and State of Rhode Island, for consideration paid, grant to DORIS E. SHER, wife of Sydney Sher, of the City of Providence, said County and State, with WARRANTY COVENANTS

A certain lot or parcel of land with all the buildings and improvements thereon situated on the easterly side of Shore Drive, on Lake Pascoag, in the Town of Burrillville, County of Providence and State of Rhode Island, bounded and described as follows:

Beginning at a point on the easterly side of said Shore Drive which point is twenty-five (25) feet measured N. 24° 45' W. from the northwesterly corner of lot numbered A26 (A twenty-six) as delineated on that certain plat entitled, "Lake Pascoag Second Section Scale 1 in. = 40 ft July 1943 Willard B. Hall Surveyor Lic 517", which plat is recorded in the Registry of Deeds in said Town of Burrillville in Plat Book 2 at Page 111, and being the southwesterly corner of the lot hereby described; thence N. 24° 45' W. seventeen and 31/100 (17.31) feet; thence N. 14° 22' E. thirty-five and 42/100 (35.42) feet to land of Russel_ E. and Rita A. Farrell, the last two lines bounding on said Shore Drive; thence N. 83° 37' E. with said last named land and passing through a drill hole about one hundred ten (110) feet to the shore of Lake Pascoag; thence southerly with said shore of Lake Pascoag about forty (40) feet; thence S. 78° 10' W. passing through an iron pin one hundred eleven and 83/100 (111.83) feet to the point of beginning. Containing 6,167 square feet, more or less.

SUBJECT TO restrictions and reservations of record.

Being the major portion of the premises conveyed to this grantor by deed from Leo F. Lawrence and Ella M. Lawrence, his wife, dated August 12, 1961 and recorded in said Registry of Deeds in Deed Book 63 at page 185.

Reference is hereby made to that unrecorded plat entitled, "Proposed Division For Leo F. Lawrence Burrillville, R.I. February, 1960 Scale: 1 inch equals 20 feet. G. Bertrand Bibeault, Civil Engineering, Woonsocket, R.I."

Grantor covenants that at time the 1962 real estate taxes become due same will be prorated between the parties.

U.S.I.R. Stamps $5.50
T.L.P. 3/26/62

I, Rita A. Farrell, wife of said Russell Farrell, release to said grantee all my right of dower and all other interest in the afore described premises.
WITNESS our hands and seals this 22nd day of March, 1962.

In presence of:

Rita A. Farrell (LS)

Russell Farrell (LS)

STATE OF RHODE ISLAND)
COUNTY OF Providence)

In Pascoag R I on the 22nd day of March, 1962 before me personally appeared Russell & Rita A. Farrell to me known and known by me to be one of the parties executing the foregoing instrument, and she acknowledged said instrument, by her executed, to be her free act and deed.

(Notarial Seal)

Louis F. Bonoyer
Notary Public

PARCEL FOUR DEEDS

I, HENRY J. STEERE, Administrator of the Estate of Grace Emily Uttley, late of the Town of Burrillville, County of Providence and State of Rhode Island, deceased, by power conferred by the Probate Court of said Town of Burrillville by decree entered November 29, 1968 and by every other power me thereunto enabling, for EIGHT THOUSAND and 00/100 ($8000.00) DOLLARS paid, grant to RAYMOND T. STEPHENSON and D. CLAIRE STEPHENSON, his wife, both of said Town of Burrillville, as JOINT TENANTS and not as Tenants in Common

All the right, title and interest which said Grace Emily Uttley had at the time of her decease in and to the following described real estate, viz:-

A certain tract or parcel of land with all the buildings and improvements thereon lying in the Town of Burrillville and in the westerly part of the Village of Pascoag and on the west side of Church Street, in the County of Providence and State of Rhode Island, and is bounded as follows, viz:-

Beginning at the southeasterly corner of the premises at a stone set in the ground in the west line of Church Street at a bound of land formerly of William J. Sherman; thence S. 70½° W. two hundred forty-one (241) feet to the middle of a wall; thence with said wall N. 20° W. ninety (90) feet four and 1/2 (4½) inches to a stone set up in the wall; thence N. 70½° E. two hundred forty-one (241) feet to a stone set in the west line of Church Street; thence with the west line of Church Street S. 20° E. ninety (90) feet four and 1/2 (4½) inches to the first mentioned bound, containing by estimation eighty (80) square rods.

WITNESS my hand and seal this 27th day of February 1969 in my capacity as aforesaid.

R.I.R.T.T. Stamps $8.80
3-5-69 MDB

In presence of:

F. Monroe Allen

Henry J. Steere (LS)
Administrator of the Estate of
Grace Emily Uttley

STATE OF RHODE ISLAND
COUNTY OF PROVIDENCE

In Smithfield on the 27th day of February, 1969, before me personally appeared Henry J. Steere, Administrator of the Estate of Grace Emily Uttley, to me known and known by me to be the party executing the foregoing instrument and he acknowledged said instrument, by him executed, to be his free act and deed and his free act and deed in his capacity aforesaid.

F. Monroe Allen
Notary Public

Received for record March 5, 1969 at 12:30 o'clock P.M.

Recorded by Elizabeth Ballou, Dpty. Town Clerk

WARRANTY DEED

WE, HENRY B. GANSERT of the Town of North Scituate, County of Providence, State of Rhode Island, NORMAN W. GANSERT of the Town of Johnston, County of Providence, State of Rhode Island and Ellen B. McGarry of the City of Warwick, County of Kent, State of Rhode Island for consideration paid, grant to the ALGONQUIN GAS TRANSMISSION COMPANY, a Delaware Corporation, its principal place of business is 1284 Soldiers Field Road Boston Massachusetts, with WARRANTY COVENANTS, THAT PARCEL OF LAND situated on the westerly side of the Wallum Lake Road, in the Town of Burrillville, County of Providence and State of Rhode Island.

Being part of the same parcel of land conveyed by deed, dated June 14, 1928, from Richard Bacon to Amy J. Gansert and recorded in Book 39 Page 414 in the office of the Town Clerk in the Town of Burrillville State of Rhode Island, containing about fifty (50) acres more or less. This deed does not include any land on the easterly side of the Wallum Lake Road.

I, LOTTIE E. GANSERT, wife of Henry B. Gansert release to the said grantee all right of dower and all other interest in the aforedescribed premises.

I, Bernadette A. Gansert, wife of Norman W. Gansert release to the said grantee all my right of dower and all other interest in the aforesaid premises.

I, JAMES M. MCGARRY, husband of Ellen B. McGarry release to the said grantee all my right of curtesy and all other interest in the aforedescribed premises.

WITNESS our hands this 17 day of February 1969.

R.I.R.T.T. Stamps $19.80
Cancelled JMM

Henry B. Gansert
Norman W. Gansert
Ellen B. McGarry
Lottie E. Gansert
Bernadette A. Gansert
James M. McGarry

STATE OF RHODE ISLAND, ETC.
County of ~~Providence~~ Kent
Warwick
In ~~Scituate~~ on the 17 day of February, 1969, before me personally appeared Henry B. and Lottie E. Gansert to me known and known by me to be the parties executing the foregoing instrument and they acknowledged said instrument by them executed, to be their free act and deed.

James M. McGarry
Notary Public

STATE OF RHODE ISLAND, ETC.
County of Providence

In Johnston on the 17th day of February, 1969 before me personally appeared Norman W. and Bernadette Gansert to me known and known by me to be the parties executing the foregoing instrument and they acknowledged said instrument by them executed, to be their free act and deed.

James M. McCarry

Notary Public

My commission expires-June 30, 1971

STATE OF RHODE ISLAND, ETC.
County of Providence

In Warwick on the 18th day of February, 1969 before me personally appeared Ellen B. and James M. McCarry to me known and known by me to be the parties executing the foregoing instrument and they acknowledged said instrument by them executed, to be their free act and deed.

Edward R. Simcoe

Notary Public

My commission expires June 30, 1971

Received for record March 6, 1969 at 12:00 o'clock Noon.

Recorded by _____ Town Clerk

Counterpart No. 170

INDENTURE dated as of December 31, 1968, from Richard Joyce Smith and William J. Kirk, Trustees of the property of The New York, New Haven and Hartford Railroad Company, Debtor, (the "Trustees"; the Debtor being hereinafter referred to as the "New Haven"), to Penn Central Company, a Pennsylvania corporation ("Penn Central") of Six Penn Center Plaza, Philadelphia, Pennsylvania.

WHEREAS, the Trustees are the trustees duly appointed, qualified and acting, of the property of the New Haven in proceedings under Section 77 of the Bankruptcy Act pending in the United States District Court for the District of Connecticut (the "Reorganization Court") entitled "In the Matter of The New York, New Haven and Hartford Railroad Company, Debtor, No. 30226" (the "Reorganization Proceedings"); and

WHEREAS, the Trustees and Penn Central are parties to an Agreement dated April 21, 1966, as amended (the "Agreement"), providing for the transfer and sale by the Trustees of the New Haven's assets (with stated exceptions) to Penn Central; and

WHEREAS, by Order No. 559 of the Reorganization Court entered in the Reorganization Proceedings on December 24th, 1968, the Trustees were authorized and directed to execute and deliver to Penn Central on December 31, 1968, a conveyance, effective as of 11:59 P.M. on such date, of the property hereby conveyed, in order to effect the first step of the Plan of Reorganization for the New Haven;

NOW, THEREFORE, THIS INDENTURE WITNESSETH:

That the Trustees, in pursuance of Order No. 559 of the Reorganization Court, and in consideration of One Dollar and other good and valuable considerations, the receipt of which is hereby acknowledged, and of the several orders of the Interstate Commerce Commission in Finance Dockets Nos. 21989 et al., have remised, released, transferred, assigned, conveyed, quitclaimed and set over, and by these presents do remise, release, transfer, assign, convey, quitclaim and set over unto Penn Central, its successors and assigns all and singular the following described property, rights, privileges and franchises:

FIRST. All of the right, title and interest of the Trustees in and to all and singular the lines of railroad now owned or operated by the Trustees, including without limiting the generality of the foregoing, all main lines, branch lines, yard, side, industrial, switch, connecting, terminal, passing and shop tracks and turnouts, and all undivided interests and leasehold interests therein.

SECOND. All of the right, title and interest, legal and equitable, of the Trustees in and to all lands, tenements, hereditaments, easements, rights of way and other real property and interests in real property of whatever kind or description and wherever situated, and in and to all structures, improvements, and fixtures thereon, now owned or possessed by the Trustees, including specifically but not exclusively certain real property in the Commonwealth of Massachusetts registered in the Land Court for which Certificates of Registration have been issued as follows:

Registry District	Certificate Number
Barnstable County	349
Hampden County	782
Middlesex County	
Southern District	39384
	50416
	4723
Norfolk County	6403
	1566
Plymouth County	3246
Suffolk County	

THIRD. All estate, right, title, interest, terms and remainders of terms, franchises, and privileges of whatsoever name and nature in law or in equity of the Trustees in and to all trackage, terminal or operating contracts, agreements, licenses, leases, leasehold rights, joint facilities and other rights and privileges.

FOURTH. Any and all rights, powers, franchises, privileges and immunities now owned or possessed by the Trustees which may be necessary for or appurtenant to the use, operation, management, maintenance, renewal, alteration or improvement of the lines of railroad or of any other property now owned by them.

SEC PROPERTY SUMMARY CARD
© Illinois

LAKE REALTY COMPANY, a corporation organized under the laws of the State of Rhode Island and doing business principally in the Town of Burrillville, County of Providence and State of Rhode Island for consideration paid, grant to RAYMOND G. LAVERDIERE and DOROTHY B. LAVERDIERE, of the aforesaid Town, County and State AS JOINT TENANTS AND NOT AS TENANTS IN COMMON with WARRANTY COVENANTS

Those certain lots or parcels of land situated in the Town of Burrillville, County of Providence and State of Rhode Island, bounded and described as follows:

Lots A-116, A-117 and A-118, Section Two (2) on plat known as Lake Pascoag; said plat being on record in the Town Clerk-s Office, Town of Burrillville.

SUBJECT TO the following restrictions:

1. No outside toilets may be erected.
2. No business may be conducted on said lots.
3. No signs for advertising purposes may be erected or placed thereon.
4. That all buildings erected thereon shall be placed and set back not less than 15 feet from the street line, and shall conform to the Town Regulations and the State laws.
5. That there shall not be erected any buildings thereon unless the plans and specifications are approved by Lake Realty Company.
6. That there shall be no violations of the usual nuisance laws and regulations.

R.I.R.E.C.T. Stamps $0.55
DBL 6/25/69
~~REXXXX~~

(CORP. SEAL)

IN WITNESS WHEREOF the said Lake Realty Company has caused its corporate name to be hereunto affixed by its Treasurer thereunto duly authorized and its corporate seal affixed this 23rd day of June 1969.

LAKE REALTY COMPANY

By Anne M. Griffin, Treasurer

STATE OF RHODE ISLAND, ETC.)
COUNTY OF PROVIDENCE)

In Burrillville on the 23rd day of June, 1969 before me personally appeared Anne M. Griffin to me known and known by me to be the party executing the foregoing instrument, and she acknowledged said instrument, by her executed, to be her free act and deed, and the free act and deed of the said Lake Realty Company.

Editha R. Ballou

Notary Public

Received for record June 25, 1969 at 11:00 o'clock A.M.

Recorded by Editha R Ballou Deputy Town Clerk

5-11A - 6-1718

DDB081

HENRY B. GANSERT, of Scituate, Rhode Island, NORMAN W. GANSERT, of Johnston, Rhode Island and ELLEN B. McGARRY, of Warwick, Rhode Island for consideration paid, grant to ALGONQUIN GAS TRANSMISSION COMPANY, a Delaware corporation of with WARRANTY COVENANTS

That parcel of land in Burrillville, Rhode Island, being all the land we own on the westerly or southwesterly side of Wallum Lake Road, and being part of the premises described in a deed from Richard Bacon to Amy L. Gansert dated June 14, 1928, and recorded in Book 39, at Page 414, containing 50 acres more or less. This deed does not include any land on the easterly side of Wallum Lake Road.

This deed is given for the purpose of making more certain the description in a deed from these grantors to this grantee, dated February 17, 1969, and recorded in Book 71, at Page 134.

the consideration of this deed is such that no stamps are required.

We, Lottie E. Gansert(wife of Henry B. Gansert), Bernadette A. Gansert (wife of Norman W. Gansert) and James M. McGarry (husband of Ellen B. McGarry) release to said grantee all our right of curtesy and dower and all other interest in the aforedescribed premises.

WITNESS our hands this 27th day of March, 1969

Henry B. Gansert

Norman W. Gansert

Ellen B. McGarry

Lottie E. Gansert

Bernadette A. Gansert

James M. McGarry

4-7-2-25 (4 PARTIES)

STATE OF RHODE ISLAND, ETC.)
COUNTY OF PROVIDENCE)

In Scituate on the 30 day of March, 1969 before me personally appeared Henry B. Gansert and Lottie E. Gansert(wife of Henry B. Gansert) to me known and known by me to be the parties executing the foregoing instrument, and they acknowledged said instrument, by them executed, to be their free act and deed.

James M. McGarry

Notary Public

STATE OF RHODE ISLAND, ETC.
COUNTY OF Providence

In Johnston on the 28th day of March, 1969 before me personally appeared Norman W. Gansert and wife Bernadette A. Gansert to me known and known by me to be the parties executing the foregoing instrument, and they acknowledged said instrument, by them executed, to be their free act and deed.

James M. McGarry

Notary Public

STATE OF RHODE ISLAND, ETC.
COUNTY OF Kent

In Warwick on the 27th day of March, 1969 before me personally appeared Ellen B. McGarry and husband James M. McGarry to me known and known by me to be the parties executing the foregoing instrument, and they acknowledged said instrument, by them executed, to be their free act and deed.

Edward R. Simcoe

Notary Public

My commission expires June 30, 1971

Received for record June 26, 1969 at 10:09 o'clock A.M.

Recorded by Edith R. Ballou, Asst. Town Clerk

1-2-1-112

WARRANTY DEED

The WALLUM LAKE ESTATES, INC. a Rhode Island corporation with its principal place of business in the Town of Glendale, County of Providence, State of Rhode Island, for consideration paid, grants to MAURICE L. CHENARD and his wife BARBARA A. CHENARD as JOINT TENANTS BY THE ENTIRETY of 16 Mohawk Avenue, Auburn, Massachusetts with Warranty covenants subject to the restrictions hereinafter set forth, that certain lot or parcel of land with the improvements thereon situated in the Town of Burrillville, Providence County, State of Rhode Island and laid out and designated as lots numbered TWO HUNDRED TWENTY-TWO---(222) Section No. 1 on that plat of land entitled "WALLUM LAKE ESTATES" surveyed and platted by Callinan Engineering Co., Inc. Civil Engineers Oct. 1964 which said plan is on file and recorded in the Land Records Office for said Town of Burrillville, Rhode Island in Plan Book No. 4 Page 25, reference to which is hereby made for a more particular description.

This conveyance is made subject to the following restrictions which are binding upon the parties hereto, their heirs, executors, administrators, successors and assigns.

1. No building other than a single family residence shall be constructed on said lot of land excepting detached garages, garage apartments and servants' quarters.

2. No part of any structure built on said land shall be nearer to the front and rear property lines than 25 feet and no nearer to the side property lines than 10 feet.

3. There shall not be erected on any portion of said premises any dwelling having a floor area of less than 550 square feet of interior living space, and same must be completed within 12 months of the commencement of the construction thereof. All foundations must be of solid masonry, all roofing to be of asphalt shingles and all siding to be of wood shingles or clapboard. Any other form of siding must first be submitted to the grantor, its successors and/or assigns in writing for approval before being used.

4. No outside toilet shall be installed or maintained on the aforesaid premises, and all plumbing shall be connected with a sanitary sewer or septic tank constructed and installed in accordance with regulations provided by the Town of Burrillville and State of Rhode Island.

5. No tents or trailers, or temporary buildings may be placed on said Lots.

6. No business may be conducted on said land or lots, and no signs may be erected for advertising purposes thereon.

7. No noxious, offensive, unlawful or immoral use, either directly or indirectly, shall be made of said premises. No livestock animals shall be kept on or about the premises.

8. Conveyance is made subject to any and all easements and restrictions of record and to any and all applicable zoning rules and regulations in addition to the restriction pertaning to the use of the water in Wallum Lake both by the State of Rhode Island and the Town of Burrillville, R.I.

9. Invalidation of any one of these covenants or restrictions by judgment or court order shall in no wise affect any of the other provisions hereof which shall remain in full force and effect.

10. The Buyer and any and all persons claiming by through or under him in accordance with the provisions hereof shall in no event convey, rent, lease or otherwise dispose of the whole or any part of the aforesaid premises without first obtaining in writing the approval and assent of the seller or his heirs, executors, administrators and/or assigns.

11. The Grantee, on acceptance of a deed to the aforesaid premises shall be given a license to a reasonable use of the so-called Beach Area as well as a right to pass and repass on foot and with vehicles of all kinds on Shore Road and Birch Hill Road as shown on "Plan of Shore Road and Birch Hill Road, Douglas, Mass., June 1955, Scale one inch equals 200 feet, G. Bertrand Bibeault, Civil Engineering, Woonsocket, R.I." which said plan is duly recorded in the Worcester Registry of Deeds, Worcester, Massachusetts, in Plan Book 206, Plan 117. Said license shall at all times be subject to control and regulation by the Grantor, its successors and/or assigns.

12. No building shall be erected on said lots of land without the plans and specifications therefor having first been submited in writing for approval by the Wallum Lake Estates, Inc., its successors and assigns.

The consideration for this conveyance is $695.00.

IN WITNESS WHEREOF, the WALLUM LAKE ESTATES,, INC. has caused these presents to be signed by its officers hereunto duly authorized and its corporate seal to be affixed hereto, this 23rd. day of June A.D. 1969

(CORP. SEAL)

WALLUM LAKE ESTATES, INC.

By Ernest J. Lalumiere Pres.

R.I.R.E.C.T. Stamp $1.10
WLE 6-26-69

That certain tract or parcel of land situated in the westerly part of Burrillville, being the same tract of land conveyed to Amy J. Gansert by Richard Bacon in deed dated June 14, 1928, recorded in the Records of Deeds in the Town of Burrillville, Book 39, Page 414.

That certain tract or parcel of land with all the improvements appurtenant thereto situated and located in the northerly part of the Town of New Shoreham, County of Newport, State of Rhode Island, containing about ten (10) acres, more or less, with a dwelling house and out buildings thereon, being the same property conveyed to Amy J. Gansert by Almer S. Sharp by deed dated October 31, 1924 and recorded in the Recorder of Deeds Office in the Town of New Shoreham, Book 21, Page 417.

That certain parcel of land situated in the northerly part of New Shoreham, containing four (4) acres, more or less, bounded as follows: On the north by land of John M. Rose and Samuel L. Hayes, on the east by land of the aforesaid John M. Rose, on the south by land of the Block Island Land and Improvement Company and on the west by land of Samuel R. Littlefield, being the same conveyed to Amy J. Gansert by Almeda Littlefield, tax collector of the Town of New Shoreham, recorded in Book 22, Page 475 of the Land Evidence Records of New Shoreham.

That certain tract of land with all the buildings and improvements thereon situated in Johnston, County of Providence, and State of Rhode Island, bounded and described as follows: northerly on lots numbered one hundred thirty-three (133) and one hundred thirty-four (134) and Kelley Avenue as laid out on the "Lyman Park Plat near Manton Depot, Johnston, Rhode Island, belonging to Samuel Hedley and S. S. Turner, Surveyed and Platted by S. B. Cushing and Company, September 1873" easterly on lots numbered one hundred thirty-nine (139) and one hundred forty (140) on said plat, southerly on the Greenville Road, now called Greenville Avenue, and westerly on land formerly of Alexander O. Smith and said lot numbered one hundred thirty-four (134) being the same land conveyed to Henry Gansert, deceased, late of said Johnston, by Benjamin Boss, by deed dated April 20, 1906.

One certain farm or tract of land with a dwelling house, barn, and other buildings thereon, situated in the Town of Scituate in the County of Providence and State of Rhode Island, bounded and described as follows, to wit:- Beginning at the Southwest corner of said farm adjoining land of George T. Angell and Amos W. Cooke, thence N. 81 degrees E. 73 rods, thence N. 6 1/4 degrees E. 35 rods, thence N. 44 1/2 degrees E. 22 rods 10 links, thence N. 17 1/2 degrees W. 6 rods 10 links, thence N. 84 3/4 degrees E. 100 rods to the corner of the wall, thence N. 13 1/2 degrees W. 34 rods 15 links, thence N. 53 1/2 degrees E. 24 rods 18 links to corner of the wall, thence N. 1 3/4 degrees W. 13 rods 21 links to land of Barnard Arnold, thence N. 89 degrees W. 8 rods, thence S. 81 degrees W. 14 rods, thence S. 21 3/4 degrees E. 3 rods and 10 links, thence S. 75 degrees W. 39 rods 18 links, thence N. 8 1/2 degrees W. 1 1/2 rods, thence S. 81 3/4 degrees W. 22 rods 2 links, thence S. 69 3/4 degrees W. 9 rods 23 links to a stake and stones, thence S. 10 degrees E. 13 rods 2 links, to corner of the wall, thence S. 73 3/4 degrees W. 72 rods 7 links, thence N. 3 1/2 degrees W. 30 rods 10 links to land of Henry C. Arnold, thence S. 64 1/2 degrees W. 47 1/2 rods to a heap of stones, thence a straight line to the place of beginning and contains about 81 acres and 23 rods of land more or less. Excepting however from the above described tract all of that tract of land situated and lying on the Southerly side of the Saundersville Pike, so called, and Westerly side of the Chopmist Road, so called, and which borders on lands now or formerly of Amos W. Cooke and land of George A. Angell, and which is not hereby conveyed nor made a part of this deed. Reserving the Burial Ground on said premises as reserved in former deeds. Also excepting about thirty (30) acres sold to Clarence A. Edson, and also three and one-half (3 1/2) acres sold to Mr. Angell.

That certain lot or tract of land with all the buildings and improvements thereon situated in the town of Scituate, bounded and described as follows: Beginning at the corner of a wall on the Easterly side of the highway leading from the Plainfield Pike, so called, to Tunk Hill, thence Southerly and Easterly about six hundred fifteen (615) feet to land now or formerly of George R. Knight; thence northerly about three hundred fifteen (315) feet to land of Benjamin H. Shippee, now or lately, thence westerly about three hundred fifteen (315) feet on land now or lately of said Shippee to the Southeasterly corner of a burial lot, thence Northerly along land now or formerly of said Shippee to the Northeasterly corner of said Burial lot; thence westerly along said burial lot and land now or lately of said Shippee about three hundred twenty (320) feet to the first mentioned bound or place of beginning and contains four (4) acres of land be the same more or less, excepting herefrom the burial lot above mentioned which is not made a part of this conveyance.

Also that certain lot of land situated near the village of Pontiac in the City of Cranston, in the State of Rhode Island, laid out and delineated as lot numbered 142 on that plat of land entitled Pontiac Highlands, Cranston, Rhode Island, belonging to the New England Realty Company by the Frank E. Waterman Company, April 1922.

I, James McCarry, husband of the grantor, release to the grantee all my right of courtesy and all other interest in the aforesaid premises.

WITNESS our hands this 22nd day of November, A.D. 1948

Ellen B. McCarry

James M. McCarry

STATE OF RHODE ISLAND, Etc.)
COUNTY OF PROVIDENCE)

In Providence on the 22nd day of November, 1948 before me personally appeared Ellen B. McCarry and James McCarry, to me known and known by me to be the party executing the foregoing instrument, and they acknowledged said instrument by them executed, to be their free act and deed,

Joseph H. Coccio

Notary Public

Received for record June 15, 1962 at 11:16 o'clock A.M.

Recorded by _____ Town Clerk

I, Ellen B. McCarry of Johnston, Rhode Island, for consideration paid, grant to Norman W. Gansert of Johnston, Rhode Island, an undivided one-third (1/3) part of the following described property with QUIT-CLAIM COVENANTS.

All my right, title, interest, property, claim and demand which I now have or claim in and to the following described property with all the buildings and improvements thereon, situated in the City of Providence, laid out and delineated as lots numbered one, two, four, eleven and twelve on "Commissioner's Plat in Equity, H. J. Bacon et al Vs. James Bacon et al" and is recorded on Plat Card 458 in the office of the Recorder of Deeds of said Providence.

That certain lot or parcel of land with all buildings and improvements thereon situated on the northerly side of Lippitt Street in the City of Providence, State of Rhode Island, laid out and delineated as lot lettered E on that plat entitled "Commissioner's Plat in Case and Equity No. 2834, Richard Bacon et al Vs. James Bacon et al, drawn May 31, 1889, copied June 6, 1889 by C. E. Paine" and recorded in the office of the Recorder of Deeds in said City of Providence in Plat Book 18 at Page 51 and (copy) on Plat Card 607.

A certain tract or parcel of land with all the buildings and improvements thereon situated in said City of Providence, said tract being part of a lot laid out and designated as lot number one hundred and thirty-six (136) upon a certain plat entitled "Map of Weybosset Plains," lot belonging to the heirs of Hope Ives and others, surveyed and drawn by William S. Haines, April 1867, said plat being recorded in the records of said evidence in said Providence in Book of Plats number seven at page 11: said lot being one of the lots set off to Anne A. Ives (mother of said Hope B. Russell)and said Hope B. Russell in a certain deed of partition by and between said Anne A. Ives and others which said deed bears date the fourth day of June, A. D. 1867, and is recorded in said records in Book of Deeds number 179 at page 82; the part of said lot hereby conveyed being a triangular portion of said lot numbered one hundred thirty-six (136) bounded westerly on lot numbered one hundred thirty-five (135) on said plat, north-easterly by Pearl Street and southerly by Dudley Street, both said streets as at present laid out, and containing three thousand five hundred forty-nine and 36/100 (3549.36) square feet, being the same, more or less, reference to said plat and said deed being hereby had and made for a further description of said premises and said part of said lot hereby conveyed being the same premises to Henry Gansert by A. F. Charles and Mary F. Charles his wife, by deed dated November 30, 1912 and recorded in the records of the Recorder of Deeds in said Providence in Deed Book numbered 528 at page 495.

All my right, title, interest, property, claim and demand which I now have or claim in and to the following described property with all the buildings and improvements thereon located in the City of Providence on Randall Street and laid out and designated as lots numbered two hundred sixty-eight (268) and two hundred sixty-nine (269) on assessors plat number two, which plat is on record in the Assessor's Office of the City of Providence.

That certain lot or parcel of land with all the buildings and improvements thereon situated in the City of Providence on Pond Street. Being the same premises conveyed to Charles Andrews and wife Anne B. M. Andrews by deed from Josephine V. Holmes and recorded with the Records of Land Evidence for said City of Providence in Deed Book number 590 at Page 478. Being the same premises conveyed to Amy J. Gansert by Emily M. Hawkins, recorded in Book 614, Page 257, Recorder of Deeds in Providence.

That lot of land with all the buildings and improvements thereon situated in said City of Providence on Howell Street and laid out and described as follows: Lot D, delineated on that plat entitled "Commissioner's Plat in Case and Equity No. 2834, Richard Bacon et al Vs. James Bacon et al. Drawn May 31, 1889, which plat is recorded in the office of the Recorder of Deeds in said City of Providence on Plat Card 607.

That tract of land with all buildings and improvements thereon situated in the City of Providence and State of Rhode Island, at the south-easterly corner of Westminster Street and Spring Street, bounding northerly on Westminster Street thirty-six and 47/100 (36.47) feet, more or less, westerly on Spring Street one hundred and sixty and 565/1000 (160.565) feet, more or less, southerly on land now or lately of the City of Providence thirty-six and 2/10 (36.2) feet, more or less, and easterly on land now or lately of Jacob Ernstof one hundred sixty and 65/100 (160.65) feet, more or less.

That certain parcel of land with all buildings and improvements thereon situated in the City of Providence and State of Rhode Island, bounded and described as follows: Beginning at the south-westerly corner of Westminster and Spring Streets, thence south-easterly bounding north-easterly on said Spring Street one hundred fifteen and 45/100 (115.45) feet to the land of Florence B. Stevens, thence turning an interior angle of 90° 21' with the south-westerly line of Spring Street and running south-westerly bounding south-easterly on said land of Florence B. Stevens thirty-five and 93/100 (35.93) feet, more or less, to land now or formerly of Providence Institution for Savings; thence north-westerly bounding south-westerly on said Providence Institution for Savings land one hundred fifteen and 62/100 (115.62) feet to Westminster Street; thence north-easterly bounding north-westerly on said Westminster Street thirty-five and 93/100 (35.93) feet, more or less, to the place of beginning.

That certain tract or parcel of land situated in the westerly part of Burrillville, being the same tract of land conveyed to Amy J. Gansert by Richard Bacon in deed dated June 14, 1928, recorded in the Records of Deeds in the Town of Burrillville, Book 39, Page 414.

That certain tract or parcel of land with all the improvements appurtenant thereto situated and located in the northerly part of the Town of New Shoreham, County of Newport, State of Rhode Island, containing about ten (10) acres, more or less, with a dwelling house and out buildings thereon, being the same property conveyed to Amy J. Gansert by Alser S. Sharp by deed dated October 31, 1924 and recorded in the Recorder of Deeds Office in the Town of New Shorehan, Book 21, Page 417.

That certain parcel of land situated in the northerly part of New Shorehan, containing four (4) acres, more or less, bounded as follows: On the north by land of John M. Rose and Samuel L. Hayes, on the east by land of the aforesaid John M. Rose, on the south by land of the Block Island Land and Improvement Company and on the west by land of Samuel R. Littlefield, being the same conveyed to Amy J. Gansert by Almeda Littlefield, tax collector of the Town of New Shoreham, recorded in Book 22, Page 475 of the Land Evidence Records of New Shorehan.

That certain tract of land with all the buildings and improvements thereon situated in Johnston, County of Providence, and State of Rhode Island, bounded and described as follows: northerly on lots numbered one hundred thirty-three (133) and one hundred thirty-four (134) and Kelley Avenue as laid out on the "Lyman Park Plat near Manton Depot, Johnston, Rhode Island, belonging to Samuel Hedley and S. S. Turner, Surveyed and Platted by S. B. Cushing and Company, September, 1873" easterly on lots numbered one hundred thirty-nine (139) and one hundred forty (140) on said plat, southerly on the Greenville Road, now called Greenville Avenue, and westerly on land formerly of Alexander G. Smith and said lot numbered one hundred thirty-four (134) being the same land conveyed to Henry Gansert, deceased, late of Said Johnston, by Benjamin Boss, by deed dated April 20, 1906.

One certain farm or tract of land with a dwelling house, barn, and other buildings thereon, situated in the Town of Scituate in the County of Providence and State of Rhode Island, bounded and described as follows, to wit:- Beginning at the Southwest corner of said farm adjoining land of George T. Angell and Amos W. Cooke, thence N. 81 degrees E. 73 rods, thence N. 6 1/4 degrees E. 35 rods, thence N. 44 1/2 degrees E. 22 rods 10 links, thence N. 17 1/2 degrees W. 6 rods 10 links, thence N. 84 3/4 degrees E. 100 rods to the corner of the wall, thence N. 13 1/2 degrees W. 34 rods 15 links, thence N. 53 1/2 degrees E. 24 rods 18 links to corner of the wall, thence N. 1 3/4 degrees W. 13 rods 21 links to land of Barnard Arnold, thence N. 89 degrees W. 8 rods, thence S. 81 degrees W. 14 rods, thence S. 21 3/4 degrees E. 3 rods and 10 links, thence S. 75 degrees W. 39 rods 18 links, thence N. 8 1/2 degrees W. 1 1/2 rods, thence S. 81 3/4 degrees W. 22 rods 2 links, thence S. 69 3/4 degrees W. 9 rods 23 links to a stake and stones, thence S. 10 degrees E. 13 rods 2 links, to corner of the wall, thence S. 73 3/4 degrees W. 72 rods 7 links, thence N. 3 1/2 degrees W. 30 rods 10 links to land

of Henry C. Arnold, thence S. 64 1/2 degrees W. 47 1/2 rods to a heap of stones, thence in a straight line to the place of beginning and contains about 81 acres and 23 rods of land more or less. Excepting however from the above described tract all of that tract of land situated and lying on the Southerly side of the Saundersville Pike, so called, and Westerly side of the Chopmist Road, so called, and which borders on lands now or formerly of Amos W. Cooke and land of George A. Angell, and which is not hereby conveyed nor made a part of this deed. Reserving the Burial Ground on said premises as reserved in former deeds. Also excepting about thirty (30) acres sold to Clarence E. Edson, and also three and one-half (3 1/2) acres sold to Mr. Angell.

That certain lot or tract of land with all the buildings and improvements thereon situated in the town of Scituate, bounded and described as follows: Beginning at the corner of a wall on the Easterly side of the highway leading from the Plainfield Pike, so called, to Tunk Hill, thence southerly and Easterly about six hundred fifteen (615) feet to land now or formerly of George R. Knight; thence northerly about three hundred fifteen (315) feet to land of Benjamin H. Shippee, now or lately, thence westerly about three hundred fifteen (315) feet on land now or lately of said Shippee to the Southeasterly corner of a burial lot, thence Northerly along land now or formerly of said Shippee to the Northeasterly corner of said Burial lot; thence westerly along said burial lot and land now or lately of said Shippee about three hundred twenty (320) feet to the first mentioned bound or place of beginning and contains four (4) acres of land be the same more or less, excepting herefrom the burial lot above mentioned which is not made a part of this conveyance.

Also that certain lot of land situated near the village of Pontiac in the City of Cranston, in the State of Rhode Island, laid out and delineated as lot numbered 142 on that plat of land entitled Pontiac Highlands, Cranston, Rhode Island, belonging to the New England Realty Company by the Frank E. Waterman Company, April 1922.

I, James McGarry, Husband of the grantor, release to the grantee all my right of courtesy and all other interest in the aforesaid premises.

WITNESS our hands this 22nd day of November, A. D. 1948

Ellen B. McGarry

James M. McGarry

STATE OF RHODE ISLAND, Etc.)
COUNTY OF PROVIDENCE)

In Providence on the 22nd day of November, 1948 before me personally appeared Ellen B. McGarry and James McGarry, to me known and known by me to be the party executing the foregoing instrument, and they acknowledged said instrument, by them executed, to be their free act and deed.

Joseph H. Coccio

Notary Public

Received for record June 15, 1962 at 11:17 o'clock A.M.

Recorded by _____ Town Clerk

Burrillville Rod and Gun Club, a corporation duly organized under the laws of the State of Rhode Island, of Burrillville, Rhode Island, for consideration paid, grant to Donald LaPorte and Jeanne LaPorte, husband and wife, as JOINT TENANTS and not as Tenants in Common, of Burrillville, Providence County, Rhode Island with QUIT-CLAIM COVENANTS

That certain lot of land with all the buildings and improvements thereon, situated in said Town of Burrillville and bounded and described as follows:-

BEGINNING at the point of intersection of the northeasterly line of the North Road, so-called, and the westerly line of the road leading to Logee School House, said corner being sometimes known as "Thaddeus Phillips Corner"; thence running north 5 1/4° west, bounding easterly on said road leading to the Logee School House 1006 feet to a corner; thence turning and running north 83° west 955 feet to a corner; thence turning and running south 2 3/4° east 420 feet to a corner; thence turning and running south 38 3/4° west 487 feet to a corner; thence turning and running south 7 2/3° east 454 feet to a corner; and the northwesterly line of said North Road; thence turning and running in a general easterly direction following the northerly line of said North road to the point or place of beginning.

BEING the premises known as the "Thaddeus Phillips Farm" and a portion of the premises conveyed by a deed of the heirs of Thaddeus Phillips to Sumner Sherman, dated April 24, 1867 and recorded in the Records of Deeds of said Town of Burrillville in Book 17 at Page 253, and also certain premises described in a deed of Smith B. Mowry and wife to Sumner Sherman, dated February 25, 1871 and recorded in said Records of Deeds in Book No. 15 at Page 427.

U.S.I.R. Stamps $2.20
TJK 6-1-62

WITNESS its corporate name and seal hand this 1st day of June 1962 hereto signed and affixed by its proper officers hereunto duly authorized

In presence of

Thomas J. Kane

Burrillville Rod and Gun Club

David Guthrie-Pres.

John J. Lace Sec. Treas.

BURRILLVILLE ROD AND GUN CLUB ADOPTED SEAL

STATE OF RHODE ISLAND, ETC.)
COUNTY OF Providence)

In Burrillville on the 1st day of June, 1962 before me personally appeared David Gauthrie, President and John J. Lace, Secretary and Treasurer of said Burrillville Rod and Gun Club, to me known and known by me to be the parties executing the foregoing instrument and they acknowledged said instrument, by them executed, to be their free act and deed, their free act and deed in their capacities aforesaid and the free act and deed of said Burrillville Rod and Gun Club.

Thomas J. Kane

Notary Public

Received for record June 18, 1962 at 2:20 o'clock P.M.

Recorded by _____ Town Clerk

highway leading from the Plainfield Pike, so called, to Tunk Hill, thence Southerly and Easterly about six hundred fifteen (615) feet to land now or formerly of George R. Knight; thence northerly about three hundred fifteen (315) feet to land of Benjamin H. Shippee, now or lately, thence westerly about three hundred fifteen (315) feet on land now or lately of said Shippee to the Southeasterly corner of a burial lot, thence Northerly along land now or formerly of said Shippee to the northeasterly corner of said Burial lot; thence westerly along said burial lot and land now or lately of said Shippee about three hundred twenty (320) feet to the first mentioned bound or place of beginning and contains four (4) acres of land be the same more or less, excepting hereby from the burial lot above mentioned which is not made a part of this conveyance.

Also that certain lot of land situated near the village of Pontiac in the City of Cranston, in the State of Rhode Island, laid out and delineated as lot numbered 142 on that plat of land entitled Pontiac Highlands, Cranston, Rhode Island, belonging to the New England Realty Company by the Frank E. Waterman Company, April 1922.

WITNESS my hand this 22nd day of November, A.D. 1948.

Amy J. Gansert

STATE OF RHODE ISLAND, Etc.)
COUNTY OF PROVIDENCE)

In Providence on the 22nd day of November, 1948 before me personally appeared Amy J. Gansert to me known and known by me to be the party executing the foregoing instrument, and she acknowledged said instrument, by her executed, to be her free act and deed,

Joseph H. Coccio

Notary Public

Received for record June 15, 1962 at 11:15 o'clock A.M.

Recorded by _____ Town Clerk

I, Ellen B. McGarry of Johnston, Rhode Island, for consideration paid, grant to Henry B. Gansert of North Scituate, Rhode Island, an undivided one-third (1/3) part of the following described property with QUIT-CLAIM COVENANTS.

All my right, title, interest, property, claim and demand which I now have or claim in and to the following described property with all the buildings and improvements thereon, situated in the City of Providence, laid out and delineated as lots numbered one, two, four, eleven and twelve on "Commissioner's Plat in Equity, H. J. Bacon et al Vs. James Bacon et al" and is recorded on Plat Card 458 in the office of the Recorder of Deeds of said Providence.

That certain lot or parcel of land with all buildings and improvements thereon situated on the northerly side of Lippitt Street in the City of Providence, State of Rhode Island, laid out and delineated as lot lettered E on that plat entitled "Commissioner's Plat in Case and Equity No. 2834, Richard Bacon et al Vs. James Bacon et al, drawn May 31, 1889, copied June 6, 1889 by C. E. Paine" and recorded in the office of the Recorder of Deeds in said City of Providence in Plat Book 18 at Page 51 and (copy) on Plat Card 607.

A certain tract or parcel of land with all the buildings and improvements thereon situated in said City of Providence, said tract being part of a lot laid out and designated as lot number one hundred and thirty-six (136) upon a certain plat entitled "Map of Weybosset Plains," lot belonging to the heirs of Hope Ives and others, surveyed and drawn by William S. Haines, April 1867, said plat being recorded in the records of said evidence in said Providence in Book of Plats numbered seven at page 11; said lot being one of the lots set off to Anne A. Ives (mother of said Hope B. Russell) and said Hope B. Russell in a certain deed of partition by and between said Anne A. Ives and others which said deed bears date the fourth day of June, A. D. 1867, and is recorded in said records in Book of Deeds number 179 at page 82; the part of said lot hereby conveyed being a triangular portion of said lot numbered one hundred thirty-six (136) bounded westerly on lot numbered one hundred thirty-five (135) on said plat, north-easterly by Pearl Street and southerly by Dudley Street, both said streets as at present laid out, and containing three thousand five hundred forty-nine and 36/100 (3549.36) square feet, being the same, more or less, reference to said plat and said deed being hereby had and made for a further description of said premises and said part of said lot hereby conveyed being the same premises to Henry Gansert by A. F. Charles and Mary F. Charles his wife, by deed dated November 30, 1912 and recorded in the records of the Recorder of Deeds in said Providence in Deed Book number 528 at page 495.

All my right, title, interest, property, claim and demand which I now have or claim in and to the following described property with all the buildings and improvements thereon located in the City of Providence on Randall Street and laid out and designated as lots numbered two hundred sixty-eight (268) and two hundred sixty-nine (269) on assessors plat number two, which plat is on record in the Assessor's Office of the City of Providence.

That certain lot or parcel of land with all the buildings and improvements thereon situated in the City of Providence on Pond Street. Being the same premises conveyed to Charles Andrews and wife Anne B. N. Andrews by deed from Josephine V. Holmes and recorded with the Records of Land Evidence for said City of Providence in Deed Book number 590 at Page 478. Being the same premises conveyed to Amy J. Gansert by Emily M. Hawkins, recorded in Book 614, Page 257, Recorder of Deeds in Providence

That lot of land with all the buildings and improvements thereon situated in said City of Providence on Howell Street and laid out and described as follows: Lot D, delineated on that plat entitled "Commissioner's Plat in Case and Equity No. 2834 Richard Bacon et al Vs. James Bacon et al. Drawn May 31, 1889," which plat is recorded in the office of the Recorder of Deeds in said City of Providence on Plat Card 607.

That tract of land with all buildings and improvements thereon situated in the City of Providence and State of Rhode Island, at the south-easterly corner of Westminster Street and Spring Street, bounding northerly on Westminster Street thirty-six and 47/100 (36.47) feet, more or less, westerly on Spring Street one hundred and sixty and 565/1000 (160.565) feet, more or less, southerly on land now or lately of the City of Providence thirty-six and 2/10 (36.2) feet, more or less, and easterly on land now or lately of Jacob Ernst of one hundred sixty and 65/100 (160.65) feet, more or less.

That certain parcel of land with all buildings and improvements thereon situated in the City of Providence and State of Rhode Island, bounded and described as follows: Beginning at the south-westerly corner of Westminster and Spring Streets, thence south-easterly bounding north-easterly on said Spring Street one hundred fifteen and 45/100 (115.45) feet to the land of Florence B. Stevens, thence turning an interior angle of 90° 21' with the south-westerly line of Spring Street and running south-westerly bounding south-easterly on said land of Florence B. Stevens thirty-five and 93/100 (35.93) feet, more or less, to land now or formerly of Providence Institution for Savings; thence north-westerly bounding south-westerly on said Providence Institution for Savings land one hundred fifteen and 62/100 (115.62) feet to Westminster Street; thence north-easterly bounding north-westerly on said Westminster Street thirty-five and 93/100 (35.93) feet, more or less, to the place of beginning

That certain tract or parcel of land situated in the westerly part of Burrillville, being the same tract of land conveyed to Amy J. Gansert by Richard Bacon in deed dated June 14, 1928, recorded in the Records of Deeds in the Town of Burrillville, Book 39, Page 414.

That certain tract or parcel of land with all the improvements appurtenant thereto situated and located in the northerly part of the Town of New Shoreham, County of Newport, State of Rhode Island, containing about ten (10) acres, more or less, with a dwelling house and out buildings thereon, being the same property conveyed to Amy J. Gansert by Almer S. Sharp by deed dated October 31, 1924 and recorded in the Recorder of Deeds Office in the Town of New Shoreham, Book 21, Page 417.

That certain parcel of land situated in the northerly part of New Shoreham, containing four (4) acres, more or less, bounded as follows: On the north by land of John M. Rose and Samuel L. Hayes, on the east by land of the aforesaid John M. Rose, on the south by land of the Block Island Land and Improvement Company and on the west by land of Samuel R. Littlefield, being the same conveyed to Amy J. Gansert by Almeda Littlefield, tax collector of the Town of New Shoreham, recorded in Book 22, Page 475 of the Land Evidence Records of New Shoreham.

That certain tract of land with all the buildings and improvements thereon situated in Johnston, County of Providence, and State of Rhode Island, bounded and described as follows: northerly on lots numbered one hundred thirty-three (133) and one hundred thirty-four (134) and Kelley Avenue as laid out on the "Lyman Park Plat near Manton Depot, Johnston, Rhode Island, belonging to Samuel Hedley and S. S. Turner, Surveyed and Platted by S. B. Cushing and Company, September 1873" easterly on lots numbered one hundred thirty-nine (139) and one hundred forty (140) on said plat, southerly on the Greenville Road, now called Greenville Avenue, and westerly on land formerly of Alexander O. Smith and said lot numbered one hundred thirty-four (134) being the same land conveyed to Henry Gansert, deceased, late of said Johnston, by Benjamin Boss, by deed dated April 20, 1906.

One certain farm or tract of land with a dwelling house, barn, and other buildings thereon, situated in the Town of Scituate in the County of Providence and State of Rhode Island, bounded and described as follows, to wit:- Beginning at the Southwest corner of said farm adjoining land of George T. Angell and Amos W. Cooke, thence N. 81 degrees E. 73 rods, thence N. 6 1/4 degrees E. 35 rods, thence N. 44 1/2 degrees E. 22 rods 10 links, thence N. 17 1/2 degrees W. 6 rods 10 links, thence N. 84 3/4 degrees E. 100 rods to the corner of the wall, thence N. 13 1/2 degrees W. 34 rods 15 links, thence N. 53 1/2 degrees E. 24 rods 18 links to corner of the wall, thence N. 1 3/4 degrees W. 13 rods 21 links to land of Barnard Arnold, thence N. 89 degrees W. 8 rods, thence S. 81 degrees W. 14 rods, thence S. 21 3/4 degrees E. 3 rods and 10 links, thence S. 75 degrees W. 39 rods 18 links, thence N. 8 1/2 degrees W. 1 1/2 rods, thence S. 81 3/4 degrees W. 22 rods 2 links, thence S. 69 3/4 degrees W. 9 rods 23 links to a stake and stones, thence S. 10 degrees E. 13 rods 2 links, to corner of the wall, thence S. 73 3/4 degrees W. 72 rods 7 links, thence N. 3 1/2 degrees W. 30 rods 10 links to land of Henry C. Arnold, thence S. 64 1/2 degrees W. 47 1/2 rods to a heap of stones, thence a straight line to the place of beginning and contains about 81 acres and 23 rods of land more or less. Excepting however from the above described tract all of that tract of land situated and lying on the Southerly side of the Saundersville Pike, so called, and Westerly side of the Chopmist Road, so called, and which borders on lands now or formerly of Amos W. Cooke and land of George A. Angell, and which is not hereby conveyed nor made a part of this deed. Reserving the Burial Ground on said premises as reserved in former deeds. Also excepting about thirty (30) acres sold to Clarence A. Edson, and also three and one-half (3 1/2) acres sold to Mr. Angell.

That certain lot or tract of land with all the buildings and improvements thereon situated in the town of Scituate, bounded and described as follows: Beginning at the corner of a wall on the Easterly side of the highway leading from the Plainfield Pike, so called, to Tunk Hill, thence Southerly and Easterly about six hundred fifteen (615) feet to land now or formerly of George R. Knight; thence northerly about three hundred fifteen (315) feet to land of Benjamin H. Shippee, now or lately, thence westerly about three hundred fifteen (315) feet on land now or lately of said Shippee to the Southeasterly corner of a burial lot, thence Northerly along land now or formerly of said Shippee to the Northeasterly corner of said Burial lot; thence westerly along said burial lot and land now or lately of said Shippee about three hundred twenty (320) feet to the first mentioned bound or place of beginning and contains four (4) acres of land be the same more or less, excepting herefrom the burial lot above mentioned which is not made a part of this conveyance.

Also that certain lot of land situated near the village of Pontiac in the City of Cranston, in the State of Rhode Island, laid out and delineated as lot numbered 142 on that plat of land entitled Pontiac Highlands, Cranston, Rhode Island, belonging to the New England Realty Company by the Frank E. Waterman Company, April 1922.

I, James McCarry, husband of the grantor, release to the grantee all my right of courtesy and all other interest in the aforesaid premises.

WITNESS our hands this 22nd day of November, A.D. 1948

Ellen B. McCarry

James M. McCarry

STATE OF RHODE ISLAND, Etc.)
COUNTY OF PROVIDENCE)

In Providence on the 22nd day of November, 1948 before me personally appeared Ellen B. McCarry and James McCarry, to me known and known by me to be the party executing the foregoing instrument, and they acknowledged said instrument by them executed, to be their free act and deed,

Joseph H. Coccio

Notary Public

Received for record June 15, 1962 at 11:16 o'clock A.M.

Recorded by _____ Town Clerk

I, Ellen B. McCarry of Johnston, Rhode Island, for consideration paid, grant to Norman W. Gansert of Johnston, Rhode Island, an undivided one-third (1/3) part of the following described property with QUIT-CLAIM COVENANTS.

All my right, title, interest, property, claim and demand which I now have or claim in and to the following described property with all the buildings and improvements thereon, situated in the City of Providence, laid out and delineated as lots numbered one, two, four, eleven and twelve on "Commissioner's Plat in Equity, H. J. Bacon et al Vs. James Bacon et al" and is recorded on Plat Card 458 in the office of the Recorder of Deeds of said Providence.

I, Amy J. Gansert, of the Town of Johnston, State of Rhode Island, for consideration paid, grant to Ellen B. McGarry of Johnston, Rhode Island, with QUIT-CLAIM COVENANTS.

All my right, title, interest, property, claim and demand which I now have or claim in and to the following described property with all the buildings and improvements thereon, situated in the City of Providence, laid out and delineated as lots numbered one, two, four, eleven and twelve on "Commissioner's Plat in Equity, H. J. Bacon et al Vs. James Bacon et al" and is recorded on Plat Card 458 in the office of the Recorder of Deeds of said Providence.

That certain lot or parcel of land with all buildings and improvements thereon situated on the northerly side of Lippitt Street in the City of Providence, state of Rhode Island, laid out and delineated as lot lettered E on that plat entitled "Commissioner's Plat in Case and Equity No. 2834, Richard Bacon et al Vs. James Bacon et al, drawn May 31, 1889, copied June 6, 1889 by C. E. Paine" and recorded in the office of the Recorder of Deeds in said City of Providence in Plat Book 18 at Page 51 and (copy) on Plat Card 607.

A certain tract or parcel of land with all the buildings and improvements thereon situated in said City of Providence, said tract being part of a lot laid out and designated as lot number one hundred and thirty-six (136) upon a certain plat entitled "Map of Weybosset Plains", lot belonging to the heirs of Hope Ives and others surveyed and drawn by William S. Haines, April 1867, said plat being recorded in the records of said evidence in said Providence in Book of Plats number seven at page 11: said lot being one of the lots set off to Anne A. Ives (mother of said Hope B. Russell) and said Hope B. Russell in a certain deed of partition by and between said Anne A. Ives and others which said deed bears date the fourth day of June, A. D. 1867, and is recorded in said records in Book of Deeds number 179 at page 82; the part of said lot hereby conveyed being a triangular portion of said lot numbered one hundred thi-ty-six (136) bounded westerly on lot numbered one hundred thirty-five (135) on said plat, north-easterly by Pearl Street and southerly by Dudley Street, both said streets as at present laid out, and containing three thousand five hundred forty-nine and 36/100 (3549.36) square feet, being the same, more or less, reference to said plat and said deed being hereby had and made for a further description of said premises and said part of said lot hereby conveyed being the same premises to Henry Gansert by A. F. Charles and Mary F. Charles his wife, by deed dated November 30, 1912 and recorded in the records of the Recorder of Deeds in said Providence in Deed Book numbered 528 at page 495.

All my right, title, interest, property, claim and demand which I now have or claim in and to the following described property with all the buildings and improvements thereon located in the City of Providence on Randall Street and laid out and designated as lots numbered two hundred sixty-eight (268) and two hundred sixty-nine (269) on assessors plat number two, which plat is on record in the Assessor's Office in the City of Providence.

That certain lot or parcel of land with all the buildings and improvements thereon situated in the City of Providence on Pond Street. Being the same premises conveyed to Charles Andrews and wife Anne B. M. Andrews by deed from Josephine V. Holmes and recorded with the Records of Land Evidence for said City of Providence in Deed Book number 590 at Page 478. Being the same premises conveyed to me by Emily M. Hawkins, recorded in Book 614, Page 257, Recorder of Deeds in Providence.

That lot of land with all the buildings and improvements thereon situated in said City of Providence on Howell Street and laid out and described as follows: Lot D, delineated on that plat entitled "Commissioner's Plat in Case and Equity No. 2834, Richard Bacon et al Vs. James Bacon et al. Drawn May 31, 1889," which plat is recorded in the office of the Recorder of Deeds in said City of Providence on Plat Card 607.

That tract of land with all buildings and improvements thereon situated in the City of Providence and State of Rhode Island, at the south-easterly corner of Westminster Street and Spring Street, bounding northerly on Westminster Street thirty-six and 47/100 (36.47) feet, more or less, westerly on Spring Street one hundred and sixty and 565/1000 (160.565) feet, more or less, southerly on land now or lately of the City of Providence thirty-six and 2/10 (36.2) feet, more or less, and easterly on land now or lately of Jacob Ernstof one hundred sixty and 65/100 (160.65) feet, more or less.

That certain parcel of land with all buildings and improvements thereon situated in the City of Providence and State of Rhode Island, bounded and described as follows: Beginning at the south-westerly corner of Westminster and Spring Streets, thence south-easterly bounding north-easterly on said Spring Street one hundred fifteen and 45/100 (115.45) feet to the ~~xxxx~~ land of ~~xxxx xxxxxx~~ Florence B. Stevens thence turning an interior angle of 90° 21' with the south-westerly line of Spring Street and running south-westerly bounding south-easterly on said ~~xxxx~~ land of ~~xxxxxxxxxx~~ Florence B. Stevens thirty-five and 93/100 (35.93) feet, more or less, to land now or formerly of Providence Institution for Savings; thence north-westerly bounding south-westerly on said Providence Institution for Savings land one hundred fifteen and 62/100 (115.62) feet to Westminster Street: thence north-easterly bounding north westerly on said Westminster Street thirty-five and 93/100 (35.93) feet, more or less, to the place of beginning.

That certain tract or parcel of land situated in the westerly part of Burrillville, being the same tract of land conveyed to me by Richard Bacon in deed dated June 14, 1928, recorded in the Records of Deeds in the Town of Burrillville, Book 39, Page 414.

That certain tract or parcel of land with all the improvements appurtenant thereto situated and located in the northerly part of the Town of New Shoreham, County of Newport, State of Rhode Island, containing about ten (10) acres, more or less, with a dwelling house and out buildings thereon, being the same property conveyed to me by Almer S. Sharp by deed dated October 31, 1924 and recorded in the Recorder of Deeds Office in the Town of New Shoreham, Book 21, Page 417.

That certain parcel of land situated in the northerly part of New Shoreham, containing four (4) acres, more or less, bounded as follows: On the north by land of John M. Rose and Samuel L. Hayes, on the east by land of the aforesaid John M. Rose, on the south by land of the Block Island Land and Improvement Company and on the west by land of Samuel R. Littlefield, being the same conveyed to me by Almeda Littlefield, tax collector of the Town of New Shoreham, recorded in Book 22, Page 475 of the Land Evidence Records of New Shoreham.

That certain tract of land with all the buildings and improvements thereon situated in Johnston, County of Providence, and State of Rhode Island, bounded and described as follows: northerly on lots numbered one hundred thirty-three (133) and one hundred thirty-four (134) and Kelley Avenue as laid out on the "Lyman Park Plat near Manton Depot, Johnston, Rhode Island, belonging to Samuel Hedley and S. S. Turner, Surveyed and Platted by S. B. Cushing and Company, September, 1873" easterly on lots numbered one hundred thirty-nine (139) and one hundred forty (140) on said plat, southerly on the Greenville Road, now called Greenville Avenue, and westerly on land formerly of Alexander O. Smith and said lot numbered one hundred thirty-four (134) being the same land conveyed to Henry Gansert, deceased, late of Said Johnston, by Benjamin Boss, by deed dated April 20, 1906.

One certain farm or tract of land with a dwelling house, barn, and other buildings thereon, situated in the Town of Scituate in the County of Providence and State of Rhode Island, bounded and described as follows, to wit:- Beginning at the Southwest corner of said farm adjoining land of George T. Angell and Amos W. Cooke, thence N. 81 degrees E. 73 rods, thence N. 6 1/4 degrees E. 35 rods, thence N. 44 1/2 degrees E. 22 rods 10 links, thence N. 17 1/2 degrees W. 6 rods 10 links, thence N. 84 3/4 degrees E. 100 rods to the corner of the wall, thence N. 13 1/2 degrees W. 34 rods 15 links, thence N. 53 1/2 degrees E. 24 rods 18 links to corner of the wall, thence N. 1 3/4 degrees W. 13 rods 21 links to land of Barnard Arnold, thence N. 89 degrees W. 8 rods, thence S. 81 degrees W. 14 rods, thence S. 21 3/4 degrees E. 3 rods and 10 links, thence S. 75 degrees W. 39 rods 18 links, thence N. 8 1/2 degrees W. 1 1/2 rods, thence S. 81 3/4 degrees W. 22 rods 2 links, thence S. 69 3/4 degrees W. 9 rods 23 links to a stake and stones, thence S. 10 degrees E. 13 rods 2 links, to corner of the wall, thence S. 73 3/4 degrees W. 72 rods 7 links, thence N. 3 1/2 degrees W. 30 rods 10 links to land of Henry C. Arnold, thence S. 64 1/2 degrees W. 47 1/2 rods to a heap of stones, thence a straight line to the place of beginning and contains about 81 acres and 23 rods of land more or less. Excepting however from the above described tract all of that tract of land situated and lying on the Southerly side of the Saundersville Pike, so called, and Westerly side of the Chepmist Road, so called, and which borders on lands now or formerly of Amos W. Cooke and land of George A. Angell, all of which is not hereby conveyed nor made a part of this deed. Reserving the Burial Ground on said premises as reserved in former deeds. Also excepting about thirty (30) acres sold to Clarence E. Edson, and also three and one-half (3 1/2) acres sold to Mr. Angell.

That certain lot or tract of land with all the buildings and improvements thereon situated in the town of Scituate, bounded and described as follows: Beginning at the corner of a wall on the Easterly side of the

highway leading from the Plainfield Pike, so called, to Tunk Hill, thence Southerly and Easterly about six hundred fifteen (615) feet to land now or formerly of George R. Knight; thence northerly about three hundred fifteen (315) feet to land of Benjamin H. Shippee, now or lately, thence westerly about three hundred fifteen (315) feet on land now or lately of said Shippee to the Southeasterly corner of a burial lot, thence Northerly along land now or formerly of said Shippee to the northeasterly corner of said Burial lot; thence westerly along said burial lot and land now or lately of said Shippee about three hundred twenty (320) feet to the first mentioned bound or place of beginning and contains four (4) acres of land be the same more or less, excepting hereby from the burial lot above mentioned which is not made a part of this conveyance.

Also that certain lot of land situated near the village of Pontiac in the City of Cranston, in the State of Rhode Island, laid out and delineated as lot numbered 142 on that plat of land entitled Pontiac Highlands, Cranston, Rhode Island, belonging to the New England Realty Company by the Frank E. Waterman Company, April 1922.

WITNESS my hand this 22nd day of November, A.D. 1948.

Amy J. Gansert

STATE OF RHODE ISLAND, Etc.)
COUNTY OF PROVIDENCE)

In Providence on the 22nd day of November, 1948 before me personally appeared Amy J. Gansert to me known and known by me to be the party executing the foregoing instrument, and she acknowledged said instrument, by her executed, to be her free act and deed,

Joseph H. Coccio

Notary Public

Received for record June 15, 1962 at 11:15 o'clock A.M.

Recorded by _____ Town Clerk

I, Ellen B. McGarry of Johnston, Rhode Island, for consideration paid, grant to Henry B. Gansert of North Scituate, Rhode Island, an undivided one-third (1/3) part of the following described property with QUIT-CLAIM COVENANTS.

All my right, title, interest, property, claim and demand which I now have or claim in and to the following described property with all the buildings and improvements thereon, situated in the City of Providence, laid out and delineated as lots numbered one, two, four, eleven and twelve on "Commissioner's Plat in Equity, H. J. Bacon et al Vs. James Bacon et al" and is recorded on Plat Card 458 in the office of the Recorder of Deeds of said Providence.

That certain lot or parcel of land with all buildings and improvements thereon situated on the northerly side of Lippitt Street in the City of Providence, State of Rhode Island, laid out and delineated as lot lettered E on that plat entitled "Commissioner's Plat in Case and Equity No. 2834, Richard Bacon et al Vs. James Bacon et al, drawn May 31, 1889, copied June 6, 1889 by C. E. Paine" and recorded in the office of the Recorder of Deeds in said City of Providence in Plat Book 18 at Page 51 and (copy) on Plat Card 607.

A certain tract or parcel of land with all the buildings and improvements thereon situated in said City of Providence, said tract being part of a lot laid out and designated as lot number one hundred and thirty-six (136) upon a certain plat entitled "Map of Weybosset Plains," lot belonging to the heirs of Hope Ives and others, surveyed and drawn by William S. Haines, April 1867, said plat being recorded in the records of said evidence in said Providence in Book of Plats numbered seven at page 11; said lot being one of the lots set off to Anne A. Ives (mother of said Hope B. Russell) and said Hope B. Russell in a certain deed of partition by and between said Anne A. Ives and others which said deed bears date the fourth day of June, A. D. 1867, and is recorded in said records in Book of Deeds number 179 at page 82; the part of said lot hereby conveyed being a triangular portion of said lot numbered one hundred thirty-six (136) bounded westerly on lot numbered one hundred thirty-five (135) on said plat, north-easterly by Pearl Street and southerly by Dudley Street, both said streets as at present laid out, and containing three thousand five hundred forty-nine and 36/100 (3549.36) square feet, being the same, more or less, reference to said plat and said deed being hereby had and made for a further description of said premises and said part of said lot hereby conveyed being the same premises to Henry Gansert by A. F. Charles and Mary F. Charles his wife, by deed dated November 30, 1912 and recorded in the records of the Recorder of Deeds in said Providence in Deed Book number 528 at page 495.

All my right, title, interest, property, claim and demand which I now have or claim in and to the following described property with all the buildings and improvements thereon located in the City of Providence on Randall Street and laid out and designated as lots numbered two hundred sixty-eight (268) and two hundred sixty-nine (269) on assessors plat number two, which plat is on record in the Assessor's Office of the City of Providence.

That certain lot or parcel of land with all the buildings and improvements thereon situated in the City of Providence on Pond Street. Being the same premises conveyed to Charles Andrews and wife Anne B. N. Andrews by deed from Josephine V. Holmes and recorded with the Records of Land Evidence for said City of Providence in Deed Book number 590 at Page 478. Being the same premises conveyed to Amy J. Gansert by Emily M. Hawkins, recorded in Book 614, Page 257, Recorder of Deeds in Providence

That lot of land with all the buildings and improvements thereon situated in said City of Providence on Howell Street and laid out and described as follows: Lot D, delineated on that plat entitled "Commissioner's Plat in Case and Equity No. 2834 Richard Bacon et al Vs. James Bacon et al. Drawn May 31, 1889," which plat is recorded in the office of the Recorder of Deeds in said City of Providence on Plat Card 607.

That tract of land with all buildings and improvements thereon situated in the City of Providence and State of Rhode Island, at the south-easterly corner of Westminster Street and Spring Street, bounding northerly on Westminster Street thirty-six and 47/100 (36.47) feet, more or less, westerly on Spring Street one hundred and sixty and 565/1000 (160.565) feet, more or less, southerly on land now or lately of the City of Providence thirty-six and 2/10 (36.2) feet, more or less, and easterly on land now or lately of Jacob Ernst of one hundred sixty and 65/100 (160.65) feet, more or less.

That certain parcel of land with all buildings and improvements thereon situated in the City of Providence and State of Rhode Island, bounded and described as follows: Beginning at the south-westerly corner of Westminster and Spring Streets, thence south-easterly bounding north-easterly on said Spring Street one hundred fifteen and 45/100 (115.45) feet to the land of Florence B. Stevens, thence turning an interior angle of 90° 21' with the south-westerly line of Spring Street and running south-westerly bounding south-easterly on said land of Florence B. Stevens thirty-five and 93/100 (35.93) feet, more or less, to land now or formerly of Providence Institution for Savings; thence north-westerly bounding south-westerly on said Providence Institution for Savings land one hundred fifteen and 62/100 (115.62) feet to Westminster Street; thence north-easterly bounding north-westerly on said Westminster Street thirty-five and 93/100 (35.93) feet, more or less, to the place of beginning

PARCEL FIVE DEEDS

We, Russell M. Lapham and wife, Helen A. Lapham of Smithfield, Rhode Island for consideration paid, grant to Albertus Rankin and wife, Aldoa Rankin, as joint tenants and not as tenants in common of Burrillville, Rhode Island with WARRANTY COVENANTS

A certain tract or parcel of land westerly of the Log Road in the Town of Burrillville and State of Rhode Island, bounded and described as follows:

Beginning at the northwesterly corner of this lot at a corner of a wall that is also a corner of land of these grantees: thence S. 26° E. two hundred fifty-six (256) feet to a corner; thence W. 86° E. thirty seven and 5/10 (37.5) feet to a corner; thence N. 5½° W. two hundred eighty-two (282) feet, with old fence stones, to a heap of stones; all foregoing courses and distances are with land of these grantees; thence S. 64° W. one hundred thirty-eight and 5/10 (138.5) feet, with land of these grantors, to the corner of wall at the point or place of beginning.

This tract of land is at the southeasterly point of Whipple Farm, and contains 52/100 acre, more or less.

U.S.I.R. Stamp $.55
2/13/61 EWB

We, Russell M. Lapham and Helen A. Lapham husband and wife release to said grantees as joint tenants aforesaid all our rights of curtesy and dower and all other interest in the aforedescribed premises.

WITNESS our hands this 23rd day of December 1960

Edward W. Burlingame

Russell M. Lapham
Helen A. Lapham

STATE OF RHODE ISLAND, ETC.
County of Providence

In Smithfield on the 23rd day of December, 1960 before me personally appeared Russell M. Lapham and wife, Helen A. Lapham to me known and known by me to be the parties executing the foregoing instrument, and they acknowledged said instrument, by them executed, to be their free act and deed.

Edward W. Burlingame
Notary Public

Received for record February 13, 1961 at 9:08 o'clock A. M.
Recorded by
Norman Mainville
Town Clerk

We, Alfred Coulombe and wife, Mary Coulombe of the Town of Burrillville, County of Providence and State of Rhode Island, for consideration paid, grant to Lillian B. Mello of the aforesaid Town, County and State with WARRANTY COVENANTS

That certain tract or parcel of land, together with all the buildings and other improvements thereon, situated in the easterly part of the said Town of Burrillville, in said County and State, containing by estimation about ten (10) acres of land, be the same more or less, and bounded and described as follows, viz:

On the north and west by the road leading from the Douglas Turnpike, so-called, to the John White Place, so-called, formerly owned by him; on the south by land now or formerly belonging to the heirs of the said White and on the east by land formerly known as the Burlingame Farm, or however otherwise the same may be bounded and described, it is the home place where Rufus Aldrich lived at the time of his death.

EXCEPTING and RESERVING, however, from the said above described premises, a tract of land two (2) rods square for the heirs of the said Rufus Aldrich used as a burial ground where the said Rufus Aldrich is buried, and the privilege to go to and from the same at all reasonable times in the usual way and by putting up the bars after them.

Meaning and intending hereby to convey all and the same premises conveyed to me by Joseph R. Francis by that deed dated November 8, 1954 and recorded in Burrillville Land Records in Deed Book 58 at Page 26.

The consideration in this deed is such that no documentary stamps are required.

We, Alfred Coulombe and Mary Coulombe, husband & wife the grantors release to said grantee all our right of curtesy & dower and all other interest in the aforedescribed premises.

WITNESS our hands this 15th day of February 1961

Alfred Coulombe

Mary Coulombe

STATE OF RHODE ISLAND, ETC.
COUNTY OF PROVIDENCE

In Burrillville on the 15th day of February, 1961 before me personally appeared Alfred Coulombe and Mary Coulombe, both to me known and known by me to be the parties executing the foregoing instrument, and they acknowledged said instrument, by them executed, to be their free act and deed.

Norman Mainville

Notary Public

Received for record February 15, 1961 at 11:09 o'clock A. M.
Recorded by
Norman Mainville
Town Clerk

KNOW ALL MEN BY THESE PRESENTS, THAT

PHILIP G. HARRIS, of Burrillville, Providence County, Rhode Island hereinafter called the Grantor in consideration of One Dollar and other valuable consideration Dollars, to Me paid by ALGONQUIN GAS TRANSMISSION COMPANY, a Delaware corporation, having its principal place of business at Boston, Suffolk County, Massachusetts, hereinafter called the Grantee, the receipt whereof is hereby acknowledged, do hereby give, grant, bargain, sell and convey unto the said Grantee, and its successors heirs and assigns forever.

A certain parcel of land situated in the Town of Burrillville, County of Providence, and State of Rhode Island, located on the westerly side of Wallum Lake Road, also known as Route #100, bounded and described as follows:-

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Beginning at a Rhode Island State Highway bound which is left 30 feet of Route #100 layout Base Line Station 99+05.79' thence running Southerly 420.84 feet along the Westerly side of Route #100 on a radius of 1112.11 to a point in the Westerly line of Route #100 for a point of beginning; thence turning and running S 64° 20' 06" W 100.00 feet; thence turning and running S 71° 01' 00" W 210 feet; thence turning S 75° 39' 19" W 2300 feet; thence turning and running N 16° 23' 57" W 1650.00 feet; thence turning and running N 73° 36' 03" E 2564.52 feet; thence turning and running S 25° 14' 00" E 687.79 feet said last line running for 596.62 feet as the common boundary line between Harris and others and for 91.17 feet on other lands of Harris; thence turning and running N 64° 46' 00" E 85.76 feet to the Westerly line of Route #100; thence turning and running S 3° 59' 00" E 634.37 feet to the above described Rhode Island State Highway Bound; thence Southerly 420.84 feet along the Westerly side of Route #100 on a radius of 1112.11 to the point of beginning. Containing 105.5 acres more or less excepting therefrom a parcel of one acre more or less located in the southeasterly portion of the within described parcel belonging to Albert E. Poirier and Concetta Poirier.

By accepting this deed grantee covenants that it will not locate any building within one hundred feet (100) of the westerly line of Wallum Lake Road.

Said parcel is more particularly shown on a plan entitled "Plan Showing Land to be Acquired by Algonquin Gas Trans. Co. Burrillville, R. I.," which plan is attached hereto and made a part hereof.

Grantee covenants to grant an easement for a connecting pipeline over a convenient location on the granted premises to supply a gas company to be formed by the Grantor in the event that such prospective company secures appropriate authorization from the Federal Power Commission and the Rhode Island authority/jurisdiction.

U.S.I.R. Stamps $27.50
S.W. 2/16/61

TO HAVE AND TO HOLD, the aforegranted premises, with all the rights, privileges and appurtenances thereunto belonging, unto and to the use of the said Grantee, its successors and Assigns forever.

And I the said Grantor, do hereby, for myself and for myself and for my heirs, executors, and administrators, covenant with the said Grantee and tis successors and assigns that I am lawfully seized in fee simple of the said granted premises: that the same are free from all incumbrances,

that I have good right, full power and lawful authority to sell and convey the same in manner as aforesaid, that the said Grantee and its successors heirs and assigns, shall by these presents at all times hereafter peacefully and quietly have and enjoy the said premises, and that, the said Grantor will, and my executors and administrators, shall warrant and defend the same to the said Grantee and its successors and assigns forever against the lawful claims and demands of all persons.

And for the consideration aforesaid I, Mary W. Harris, wife of said grantor do hereby release all my right of dower in and to the said granted premises unto the said Grantee and its successors and assigns, forever.

IN WITNESS WHEREOF, we have hereunto set our hands and seals this day of February in the year of our Lord one thousand nine hundred and sixty-one

Executed in the presence of

H. S. Wiley

Philip G. Harris (LS)

Mary W. Harris (LS)

STATE OF RHODE ISLAND
COUNTY OF PROVIDENCE

In Burrillville on the 15th day of February, A. D. 1961 before me personally appeared the above named grantors Philip G. Harris & Mary W. Harris to me known and known by me to be the parties executing the foregoing instrument, and acknowledged said instrument, by them executed, to be their free act and deed

H. Seymour Wiley

Notary Public

Received for record February 16, 1961 at 11:03 o'clock A.M.
Recorded by

Town Clerk

(See next page for map)

KNOW ALL MEN BY THESE PRESENTS, THAT

ALBERT E. POIRIER AND CONCETTA POIRIER, husband and wife, of Burrillville, Providence County, Rhode Island hereinafter called the Grantor in consideration of One Dollar and other valuable considerations to us paid by ALGONQUIN GAS TRANSMISSION COMPANY, a Delaware corporation, having its principal place of business at Boston, Suffolk County, Massachusetts hereinafter called the Grantee, the receipt whereof is hereby acknowledged, do hereby give, grant, bargain, sell and convey unto the said Grantee, and its successors heirs and assigns forever.

A certain lot or parcel of land, situated westerly of Wallum Lake Road, in the Township of Burrillville, in the State of Rhode Island, bounded and described, viz:

Beginning at a point 100' measured southerly 71° 01' W. from the westerly side of Wallum Lake Road, said point being located by measuring by 222.28' southerly from a Rhode Island Highway bound on the westerly side of said road at Station 99 05.79 as shown on the State of Rhode Island Highway plat numbered 922, said highway bound is also located about 622' southerly of the southeasterly corner of land of Albert J.and Kathleen H. Cristiaen; thence S 3° 59' E 210'; thence S 71° 01' W 210'; thence N 3° 59' W 210', the last three lines bounding on lands of Harris: thence N 71° 01' E, with a right of way hereinafter described 210' to the point of beginning. Containing 1.01 acres more or less.

Together with the right to pass and repass on foot and with vehicles of all kinds over a strip or parcel of land 50' in width and extending from said Wallum Lake Road westerly to the northwesterly corner of the above described lot, said right-of-way is bounded and described as follows:

Beginning at a point on the westerly side of Wallum Lake Road which point is 172.28' southerly of the Rhode Island Highway bound above mentioned; thence southerly, with said Wallum Lake Road and on a curved line having a radius of 112.11', 50'; thence S 71° 01' W, with land of Harris and the northerly line of the above described lot 310'; thence N 3° 59' W, 50'; thence N 71° 01' E about 313' to the point of beginning.

Being the same premises conveyed to us by deed of Harris et ux, dated September 6, 1957, and recorded with Burrillville Land Records in Book 62, Page 69, and shown on Block 2, Lot 32A of Assessors Plans, or however otherwise said premises may be bounded, measured or described.

three hundred eighty-eight (388) feet southerly of land of George Hutnak; thence north 60° E. one hundred and fifty (150) feet with land now or formerly of George H. and Ruth E. Young, to a stake; thence S. 30° E. one hundred feet (100), with other land of George and Ruth E. Young, to a stake; thence S. 60° W. one hundred and fifty (150) feet; with land now or formerly of George H. and Ruth E. Young to a stake in the easterly line of Douglas Pike: Thence N. 30° W. one hundred (100) feet; with the easterly line of Douglas Pike to the point or place of beginning.

This being the southerly part of Lot No. II on plat and northerly part of Lot # 10. Meaning and intending to hereby convey all and the same premises conveyed to me by that deed dated November 5th, 1956 and found record- ed in the Burrillville Land Records in Deed Book 58 at Page 490.

U.S.I.R. Stamps $1.10
9/6/61 N.M.

I, Herbert Young do covenant that I am unmarried.

WITNESS my hand this 8th day of Sept. 1961

Herbert Young

STATE OF RHODE ISLAND, ETC.)
COUNTY OF Providence)

In Burrillville on the 8th day of September, 1961 before me personally appeared Herbert Young to me known and known by me to be the party executing the foregoing instrument, and he acknowledged said instrument, by him executed, to be his free act and deed.

Norman Mainville

Notary Public

Received for record Sept. 14, 1961 at 10:25 o'clock A.M.

Recorded by Norman Mainville Town Clerk

GRANT OF EASEMENT

I, JAMES J. SCARANO, of Meriden, New Haven County, Connecticut, for consideration paid, grant to PHILIP G. HARRIS, of Burrillville, Providence County, Rhode Island, his heirs and assigns, with QUITCLAIM COVENANTS, a permanent right of way and easement for passage by foot and in vehicles over the presently existing woods road located over the northerly portion of the parcel of land owned by me in said Burrillville, described in a deed from Thomas Ryan, dated May 10, 1961, recorded with Burrillville Land Records in Book 63, Page 125. Said woods road enters my above described land from land of this Grantee and after crossing my land re-enters other land of this Grantee.

In the event that this Grantee or any other party constructs a thirty foot (30') roadway over the woods road of which the herein granted premises is a segment, then the within granted right of way shall be extended to a width of thirty feet (30') to permit the construction and maintenance of a continuous thirty-foot (30') road.

I, Rose C. Scarano, wife of said grantor, release to said Grantee all rights of dower and other interests in the within granted right of way.

WITNESS our hands and seals this 31st day of July, 1961.

Signed and Sealed in the Presence of:

Robert E. Culver — James J. Scarano

State of Rhode Island)
County of Providence) ss.

August

In Burrillville on this 1st day of ~~July~~, before me personally came James J. Scarano to me known and known by me to be the party executing the foregoing grant of easement and he acknowledged the foregoing instrument by him executed to be his free act and deed,

Before me,

Elwood G. Calcutt

Notary ~~Notary-Public~~ Public
(Corp. Seal)

My Commission Expires:

June 30 - 1966
(Seal)

Received for record Sept. 14, 1961 at 3:40 o'clock P.M.

Recorded by Norman Mainville Town Clerk

KNOW ALL MEN BY THESE PRESENTS, THAT

Providence County, R.I.,

I, PHILIP G. HARRIS, of Burrillville, hereinafter called the Grantor in consideration of ONE DOLLAR and other valuable consideration Dollars, to me paid by ALGONQUIN GAS TRANSMISSION COMPANY, a Delaware corporation having its principal place of business at Boston, Suffolk County, Massachusetts hereinafter called the Grantee, the receipt whereof is hereby acknowledged, do hereby give, grant, bargain, sell and convey unto the said Grantee, and its successors and assigns forever.

A certain parcel of land situated in the Town of Burrillville, Providence County, Rhode Island, lying westerly of Wallum Lake Road and bounded and described as follows:

Beginning at the most northerly point of the granted premises, which point is also the northwesterly corner of land presently owned by the Grantee, and thence running:

S 16° 23' 57" E along said land presently owned by the Grantee for a distance of 1650.00 feet to a point which is the southeasterly corner of said land presently owned by the Grantee; thence turning and running

N 75° 35' 15" E along said land presently owned by the Grantee for a distance of 711.26 feet to a point; thence turning and running

S 16° 23' 57" E along remaining land of the Grantor for a distance of 1162.90 feet to a point; thence turning and running

N 86° 59' W along land formerly of Ryan, now of Scarano, for a distance of 1171.5 feet to a point; thence turning and running

N 16° 23' 57" W along other remaining land of this Grantor for a distance of 2448.14 feet to a point; thence turning and running

N 73° 36' 03" E along other land of this grantor for a distance of 394.01 feet to the point of beginning, and estimated to contain 20 acres more or less.

RESERVING to the Grantor, his heirs and assigns, the right to pass and repass on foot and by vehicles over the woods road running generally westerly from Wallum Lake Road which crosses a portion of the southerly part of the granted premises to lands of the Grantor westerly of same, and the right to improve and construct said road to a width not exceeding thirty (30) feet; but expressly releasing all of Grantor's rights in and to the spur road leading northerly from said woods road near the most easterly boundary of the granted premises.

TO HAVE AND TO HOLD, the aforegranted premises, with all the rights, privileges and appurtenances thereunto belonging, unto and to the use of the said Grantee, their Heirs and Assigns forever.

And I the said Grantor, do hereby, for myself and for my heirs, executors, and administrators, covenant with the said Grantee and its successors and assigns that I am lawfully seized in fee simple of the said granted premises: that the same are free from all incumbrances.

that have good right, full power and lawful authority to sell and convey the same in manner as aforesaid, that the said Grantee and heirs and assigns, shall by these presents at all times hereafter peacefully and quietly have and enjoy the said premises, and that, the said Grantor will, and heirs, executors and administrators, shall warrant and defend the same to the said Grantee and heirs and assigns forever against the lawful claims and demands of all persons.

IN WITNESS WHEREOF, I have hereunto set my hand and seal this fourteenth day of September in the year of our Lord one thousand nine hundred and Sixty-one.

Executed in the presence of

Thomas C. Leen — Philip G. Harris

Robert E. Culver

U.S.I.R. Stamp $1.10
PGH 9/14/61 REC

STATE OF RHODE ISLAND)
COUNTY OF Providence)

In Burrillville on the fourteenth day of Sept., A. D. 1961 before me personally appeared the above named grantor PHILIP G. HARRIS to me known and known by me to be the party executing the foregoing instrument, and acknowledged said instrument, by him executed, to be his free act and deed.

Norman Mainville
Notary Public
My Commission expires June 30, 1966

Received for record Sept. 14, 1961 at 3:41 o'clock P. M.

Recorded by Norman Mainville Town Clerk

We, Henry M. Ducharme, Wilfred J. Ducharme, Rita M. Kane, all of the Town of Burrillville, County of Providence and State of Rhode Island, and Theresa Kolodziejczak of Dudley, Massachusetts, being all the heirs of the late Sadie E. Ducharme, for consideration paid, grant to Charles Lindenbaum and Bessie Lindenbaum, as Joint Tenants and not as Tenants in Common, both of Providence, Rhode Island, with WARRANTY COVENANTS

A certain lot or parcel of land with all buildings and other improvements thereon, situated on the northerly side of Chapel Street, in the Village of Harrisville, in the Town of Burrillville, in the State of Rhode Island, bounded and described as follows, viz;-

Beginning at a stone bound on the northerly side of the old location of said Chapel Street which point is at land of the Stillwater Worsted Mills, Inc. and being the southeasterly corner of the lot hereby described;- Thence S. 69°-53' W., with old line of said Chapel Street one hundred forty six and four-tenths (146.40) feet to its intersection with the new line of Chapel Street as shown on State of Rhode Island Road Plat No. 748; Thence S. 74°-29' W., one hundred three and sixty-one one hundredths (103.61) feet with the new line of Chapel Street to land of Howard C. Young;- Thence N. 26°-30'W., with said Young land three hundred sixty seven and eleven one hundredths (367.11) feet to land of the aforesaid Stillwater Worsted Mills, Inc;- Thence N. 80°-30'E., fifty two (52.00) feet to a drill hole in a stone; Thence N. 81°-30' E., three hundred sixty three (363.00) feet to a split stone set in the ground;- Thence S. 01°-40' W., three hundred twelve and eighty seven one hundredths (312.87) feet to the point of beginning bounding on the last three lines on said Stillwater Worsted Mills, Inc. land

Containing 106,000 sq. ft. more or less.

Being all and the same premises conveyed to Henry J. and Sadie E. Ducharme by a deed from Mitchell and Selina Blanchard, dated October 13, 1933 and recorded in the Burrillville Registry of Deeds in Book 43 at Page 290 except a small portion thereof taken by the State of Rhode Island in the relay of said Chapel Street.

Together with all of our rights, title and interest in and to all the land lying between the said old location of Chapel Street and the new present location of said street.

The above grantors derived their title as Children and only heirs-at-law of Sadie E. Blanchard Ducharme who died in said Burrillville on February 22, 1958, intestate.

PARCEL SIX DEEDS

#21004

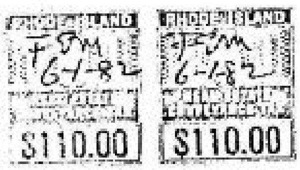
REALTY VENTURES, LTD., a Rhode Island General Partnership,

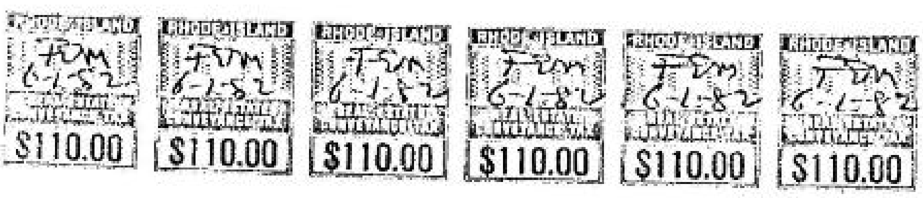
for consideration paid, grant to ALGONQUIN GAS TRANSMISSION COMPANY, a Delaware Corporation,

of 1284 Soldiers Field Road, Boston, Massachusetts 02135,

with WARRANTY COVENANTS

Those certain parcels of land, located in the Town of Burrillville, County of Providence and State of Rhode Island, set forth on "EXHIBIT A" attached hereto and made a part hereof.





~~[illegible]~~

Witness hand this 1st day of June, 1982, said Partnership has caused these presents to be signed by its partner duly authorized.

REALTY VENTURES, LTD.

BY: [signature] Part.
RONALD A. RONCI

State of Rhode Island, Etc.
COUNTY OF Providence

In Providence on the 1st day of June, 1982, before me personally appeared RONALD A. RONCI, PARTNER of REALTY VENTURES, LTD.

to me known and known by me to be the party executing the foregoing instrument, and he acknowledged said instrument, by him executed, to be his free act and deed, in his said capacity as a Partner as aforesaid, and the free act and deed of REALTY VENTURES, LTD.

[signature: Francis E. Mullen]
Notary Public
FRANCIS E. MULLEN

BOOK 98 PAGE 274

Attached to and made a part of deed from Realty Ventures, Ltd. to Algonquin Gas Transmission Company dated , 1982.

EXHIBIT "A"

PARCEL I:

That certain tract or parcel of land, known as the Buck Hill Lot, so-called, located on the southerly and westerly sides of Buck Hill Road, leading northerly and northwesterly from the Village of Bridgeton in the Town of Burrillville, County of Providence and State of Rhode Island, located northerly of the Ross land, so-called, easterly of the Bates and Roberts land and bounding in part at the northwest on Round Pond, so-called, and northerly on land now or formerly of the Angell heirs, and more particularly bounded and described as follows:

Beginning at the northeasterly corner of said lot, on the southwesterly side of said Road, adjoining land now or formerly of Hannah W. and Marion F. Bates; thence running S. 54 1/4° E. with said Bates land, land now or formerly of Evelyn Angell and the devisees under the Will of William R. Angell about eighty seven (87) rods, to a stake and stones; thence S. 48 1/2° W. with land now or formerly of Herbert C. and Martha C. Blake about 18 rods, 10 links to a rock with stones on it; thence S. 18° E. with said Blake land about 52 and 3/4 rods to a stake and stones; thence S. 28 1/4° E. with land now or formerly of Louise A. Cunningham about 63 rods; thence S. 71 1/2° E. with said Cunningham land about 8 rods to said Road; thence with said Road S. 7° E. 44 rods, 9 links, S. 18 1/2° E. 15 rods, 20 links, S. 32° E. 14 rods, 15 links, S. 45° E. 14 rods, 15 links, S. 53 1/4° E. 22 rods to a bound at land now or formerly of Amy J. Gansert; thence with said Gansert land S. 64° W. 2 rods, 14 links, S. 75 1/2° W. 16 rods, 15 links, S. 62 1/2° W. 8 1/2 rods, S. 85 1/2° W. thirteen rods, 15 links, S. 83 1/2° W. 5 rods to a white pine marked, in the northwesterly corner of said Gansert land; thence continuing with said Gansert land S. 55 rods, 16 links, to a horse shoe pine, a bound of said Gansert land; thence with land now or formerly of Thomas Ryan northwesterly about 40 rods to an angle; thence westerly with said Ryan land about 71 rods to a corner; thence S. 16° W. partly with said Ryan land, partly with land of the United States of America (formerly of Seth Ross) about 96 rods to a corner; thence westerly with said last mentioned land about 176 rods to a rock with stones on it; thence about N. 14° E. with said last mentioned land 130 rods to a stone on a rock; thence N. 6° W. with land now or formerly of James Roberts about 179 rods to a rock on the shore of Round Pond; thence N. 31 1/2° E. through said Round Pond (hereby including all the right, title and interest of the grantor in said Round Pond and the land under the same) about 68 rods to a pile of stones on a rock on the other side of said Round Pond; thence with land now or formerly of Samuel A. Chase N. 72° E. 206 rods to said Road at the point of beginning. Containing about 706 1/2 acres.

EXCEPTING HEREFROM land conveyed to Albert E. and Concetta Poirier dated September 6, 1957 in Book 62 at page 69.

EXCEPTING HEREFROM land conveyed to Algonquin Gas Transmission Company dated February 1961 in Deed Book 63 at page 93.

EXCEPTING HEREFROM land conveyed to Albert J. Chrisisen and wife, Kathleen H. dated February 27, 1961 in Deed Book 63 at page 105.

EXCEPTING HEREFROM land conveyed to Algonquin Gas Transmission Company dated September 14, 1961 in Deed Book 63 at page 205.

EXCEPTING HEREFROM any portion of the above granted premises within lay out of the Wallum Lake and/or Buck Hill Road.

EXCEPTING HEREFROM a parcel of land conveyed to Jean Drans containing 22 1/2 acres, more or less.

EXCEPTING HEREFROM land conveyed to Algonquin Gas Transmission Company in 1969.

Subject to an easement to Blackstone Valley Electric Company conveyed in 1969.

TOGETHER WITH all rights accruing to the grantor herein under covenants set forth in that certain deed dated February 1, 1961, recorded in Book 63 at page 93 in the Land Evidence Records of the Town of Burrillville and any and all other rights which the said grantor acquired by virtue of all prior title deeds.

PARCEL II - See attached Page 2.

Attached to and made a part of deed from Realty Ventures, Ltd. to Algonquin Gas Transmission Company dated , 1982.

EXHIBIT "A"

Page 2

PARCEL II

That certain parcel of land with all the buildings and improvements thereon, located on the westerly side of Wallum Lake Road in the Town of Burrillville, Rhode Island, and described as follows:

Northeasterly corner of land of Anthony DeCorte and at the Southeasterly corner of the hereinafter described parcel at an iron pipe in the ground in the Westerly line of Wallum Lake Road; thence South 84° 30' West with said DeCorte land, 180' to an iron pipe; thence South 83° 30' West 536' to a piece of scrap iron in the ground in a heap of stones, a bound of one Cunningham; thence North 69° 30' West with land of Phillip Harris 326'; thence North 69° 30' East with land of William R. Cooney et ux, and with land that said Cooney et ux sold to one Hiller, 802' to a pipe in the ground in the WEsterly line of Wallum Lake Road; thence Southerly bounding Easterly on said road 498', more or less, to the first mentioned bound.

The above described property is further described as Tax Assessor's Map 3-7, Lot 30A, Block 2.

BOOK 98 PAGE 276

Received For Record JUN 1 1982 11:16 o'clock A.M.

WARRANTY DEED

EDWARD P. MANNING of Cumberland, Rhode Island, as Trustee, and JUNE PERRY of Scituate, Rhode Island, as Substitute Trustee, of that "Trust of June" dated June 13, 1969, for consideration paid, grant to REALTY VENTURES, LTD., a partnership organized and existing under the Rhode Island Uniform Partnership Act, with WARRANTY COVENANTS

That certain tract or parcel of land, known as the Buck Hill Lot, so-called, located on the southerly and westerly sides of Buck Hill Road, leading northerly and northwesterly from the Village of Bridgeton in the Town of Burrillville, County of Providence and State of Rhode Island, located northerly of the Ross land, so-called, easterly of the Bates and Roberts land and bounding in part in part at the northwest on Round Pond, so-called, and northerly on land now or formerly of the Angell heirs, and more particularly bounded and described as follows:

Beginning at the northeasterly corner of said lot, on the southwesterly side of said Road, adjoining land now or formerly of Hannah W. and Marion F. Bates; thence running S. 54 1/4° E. with said Bates land, land now or formerly of Evelyn Angell and the devisees under the Will of William R. Angell about eighty seven (87) rods, to a stake and stones; thence S. 48 1/2° W. with land now or formerly of Herbert C. and Martha C. Blake about 18 rods, 10 links to a rock with stones on it; thence S. 18° E. with said Blake land about 52 and 3/4 rods to a stake and stones; thence S. 28 1/4° E. with land now or formerly of Louise A. Cunningham about 63 rods; thence S. 71 1/2° E. with said Cunningham land about 8 rods to said Road; thence with said Road S. 7° E. 44 rods, 9 links, S. 18 1/2° E. 15 rods, 20 links, S. 32° E. 14 rods, 15 links, S. 45° E. 14 rods, 15 links, S. 53 1/4° E. 22 rods to a bound at land now or formerly of Amy J. Gansert; thence with said Gansert land S. 64° W. 2 rods, 14 links, S. 75 1/2° W. 16 rods, 15 links, S. 62 1/2° W. 8 1/2 rods, S. 85 1/2° W. thirteen rods, 15 links, S. 83 1/2° W. 5 rods to a white pine marked, in the northwesterly corner of said Gansert land; thence continuing with said Gansert land S. 55 rods, 16 links, to a horse shoe pine, a bound of said Gansert land; thence with land now or formerly of Thomas Ryan northwesterly about 40 rods to an angle; thence westerly with said Ryan land about 71 rods to a corner; thence S. 16° W. partly with said Ryan land, partly with land of the United States of America (formerly of Seth Ross) about 96 rods to a corner; thence westerly with said last mentioned land about 176 rods to a rock with stones on it; thence about N. 14° E. with said last mentioned land 130 rods to a stone on a rock; thence N. 6° W. with land now or formerly of James Roberts about 179 rods to a rock on the shore of Round Pond; thence N. 31 1/2° E. through said Round Pond (hereby including all the right, title and interest of

the grantor in said Round Pond and the land under the same) about 68 rods to a pile of stones on a rock on the other side of said Round Pond; thence with land now or formerly of Samuel A. Chase N. 72° E. 206 rods to said Road at the point of beginning. Containing about 706 1/2 acres.

EXCEPTING HEREFROM land conveyed to Albert E. and Concetta Poirier dated September 6, 1957 in Book 62 at page 69.

EXCEPTING HEREFROM land conveyed to Algonquin Gas Transmission Company dated February 1961 in Deed Book 63 at page 93.

EXCEPTING HEREFROM land conveyed to Albert J. Chrisisen and wife, Kathleen H. dated February 27, 1961 in Deed Book 63 at page 205.

EXCEPTING HEREFROM land conveyed to Algonquin Gas Transmission Company dated September 14, 1961 in Deed Book 63 at page 205.

EXCEPTING HEREFROM any portion of the above granted premises within lay out of the Wallum Lake and/or Buck Hill Road.

EXCEPTING HEREFROM a parcel of land conveyed Jean Drans containing 22 1/2 acres, more or less.

EXCEPTING HEREFROM land conveyed to Algonquin Gas Transmission Company in 1969.

Subject to an easement to Blackstone Valley Electric Company conveyed in 1969.

TOGETHER WITH all rights accruing to the grantor herein covenants set forth in that certain deed dated February 1, 1961 recorded in Book 63 at page 93 in the Land Evidence Records of the Town of Burrillville and any and all other rights which the said grantor acquired by virtue of all prior title deeds.

WITNESS our hands this 9th day of June, 1978.

Edward P. Manning

EDWARD P. MANNING, TRUSTEE

June Perry Substitute Trustee

JUNE PERRY, SUBSTITUTE TRUSTEE

BOOK 89 PAGE 1157

STATE OF RHODE ISLAND
COUNTY OF PROVIDENCE

In Providence on the 24th day of June, 1978, before me personally appeared EDWARD P. MANNING and JUNE PERRY to me known and known by me to be the parties executing the foregoing instrument, and they acknowledged said instrument, by them executed, to be their free act and deed, in their said capacities as Trustees as aforesaid.

Debra J. Moretti
NOTARY PUBLIC

BOOK 89 PAGE 1158

Received For Record OCT 26 1978 at 1:35 o'clock P.M.
Lorraine Mancini
Town Clerk

I, RALPH M. MERRILL, of the Town of Burrillville, County of Providence and State of Rhode Island for consideration paid, grant to myself RALPH M. MERRILL and wife, BRENDA A. MERRILL, of the aforesaid Town, County and State AS JOINT TENANTS AND NOT AS TENANTS IN COMMON with WARRANTY COVENANTS

A certain parcel of land with all the buildings and improvements thereon situated between Pine Street and Grove Street, in the Village of Pascoag, Town of Burrillville, County of Providence and State of Rhode Island, comprising the whole of lots numbered 17 (seventeen) and 24 (twenty-four) together with the northerly twenty-five (25) feet in width by the entire depth of lot numbered 25 (twenty-five) on that plat entitled, "Ara Paine Land Angell Plat Scale 50 feet to the inch Surveyed Aug. 1878 E. L. Tucker" which plat is recorded in the Registry of Deeds in said Town of Burrillville in Plat Book 1 at Page 48. Said premises are further bounded and described as follows:-

Beginning at a point in the westerly line of said Pine Street sixty-one and 3/4 (61.75) feet northerly from the corner formed by the intersection of said line of Pine Street with the northwesterly line of Centennial Street at the northeasterly corner of lot numbered 16 (sixteen) on said plat (now or formerly of Louis E. and Doris M. Genereux) and the southeasterly corner of said lot numbered 17 (seventeen); thence westerly at right angles to said Pine Street, one hundred (100) feet; thence southerly at right angles to the last described line twenty-five (25) feet to land now or formerly of Armand J. and Beatrice L. Rocheford, the last two (2) lines bounding on said lot numbered 16 (sixteen); thence westerly at right angles to the last described line, bounding southerly on said Rocheford land, one hundred (100) feet to said Grove Street; thence northerly, bounding westerly on said Grove Street, seventy-five (75) feet to the southwesterly corner of lot numbered 23 (twenty-three) on said Plat; thence easterly at right angles to said Grove Street, bounding northerly in part on said lot numbered 23 (twenty-three) and in part on lot numbered 18 (eighteen) both on said plat, in all two hundred (200) feet to said Pine Street; thence southerly, bounding easterly on said Pine Street, fifty (50) feet to the point of beginning.

3-11-9-16-106

Meaning and intending to convey and do hereby convey all and the same premises conveyed to this grantor and Dora F. Merrill (now deceased) by deed from Duane A. Bishop Jr. et ux, dated January 22nd, 1955 and recorded in the land records of the Town of Burrillville in Deed Book 58 at Page 67.

This conveyance is made subject to a mortgage of record.

The consideration in this deed is such that no Rhode Island Realty Transfer Tax Stamps are necessary

WITNESS my hand this 13th day of June 1969

Ralph M. Merrill

STATE OF RHODE ISLAND, ETC.)
COUNTY OF PROVIDENCE)

In Burrillville on the 13th day of June, 1969 before me personally appeared RALPH M. MERRILL to me known and known by me to be the party executing the foregoing instrument, and he acknowledged said instrument, by him executed, to be his free act and deed.

Editha R. Ballou

Notary Public

Received for record June 13, 1969 at 10:45 o'clock A.M.

Recorded by Editha R. Ballou, Asst. Town Clerk

BUCK HILL FOREST, INC., a Rhode Island Corporation, for consideration paid, grant to EDWARD P. MANNING and HERBERT L. PERRY, Trustees under that certain trust indenture dated June 13, 1969 with QUIT-CLAIM COVENANTS:

That certain tract or parcel of land, known as the Buck Hill Lot, so-called, located on the southerly and westerly sides of Buck Hill Road, leading northerly and northwesterly from the Village of Bridgeton in the Town of Burrillville, County of Providence and State of Rhode Island, located northerly of the Ross land, so-called, easterly of the Bates and Roberts land and bounding in part in part at the northwest on Round Pond, so-called, and northerly on land now or formerly of the Angell heirs, and more particularly bounded and described as follows:

Beginning at the northeasterly corner of said lot, on the southwesterly side of said Road, adjoining land now or formerly of Hannah W. and Marion F. Bates; thence running S. 54½° E. with said Bates land, land now or formerly of Evelyn Angell and the devisees under the Will of William R. Angell about eighty seven (87) rods, to a stake and stones; thence S. 48½° W. with land now or formerly of Herbert C. and Martha C. Blake about 18 rods, 10 links to a rock with stones on its; thence S. 18° E. with said Blake land about 52 and 3/4 rods to a stake and stones; thence S. 28½° E. with land now or formerly of Louise A. Cunningham about 63 rods; thence S. 71½° E. with said Cunningham land about 8 rods to said Road; thence with said Road S. 7° E. 44 rods, 9 links, S. 18½° E. 15 rods, 20 links, S. 32° E. 14 rods, 15 links, S. 45° E. 14 rods, 15 links, S.53½° E. 22 rods to a bound at land now or formerly of Amy J. Gansert; thence with said Gansert land S. 64° W. 2 rods, 14 links, S. 75½° W. 16 rods, 15 links, S. 62½° W. 8½ rods, S. 85½° W. thirteen rods, 15 links, S. 83½° W. 5 rods to a white pine marked, in the northwesterly corner of said Gansert land; thence continuing with said Gansert land S. 55 rods, 16 links, to a horse shoe pine, a bound of said Gansert land; thence with land now or formerly of Thomas Ryan northwesterly about 40 rods to an angle; thence westerly with said Ryan land about 71 rods to a corner; thence S. 16° W. partly with said Ryan land, partly with land of the United States of America (formerly of Seth Ross) about 96 rods to a corner; thence westerly with said last mentioned land about 176 rods to a rock with stones on it; thence about N. 14° E. with said last mentioned land 130 rods to a stone on a rock; thence N. 6° W. with land now or formerly of James Roberts about 179 rods to a rock on the shore of Round Pond; thence N. 31½° E. through said Round Pond (hereby including all the right, title and interest of the grantor in said Round Pond and the land under the same) about 68 rods to a pile of stones on a rock on the other side of said Round Pond; thence with land now or formerly of the devisees under the will of William R. Angell and with land now or formerly of Samuel A. Chase N. 72° E. 206 rods to said Road at the point of beginning. Containing about 706½ acres.

EXCEPTING HEREFROM land conveyed to Albert E. and Concetta Poirier dated September 6, 1957 in Book 62 at page 69.

EXCEPTING HEREFROM land conveyed to Algonquin Gas Transmission Company dated February 1961 in Deed Book 63 at page 93.

EXCEPTING HEREFROM land conveyed to Albert J. Christiaen and wife, Kathleen H. dated February 27, 1961 in Deed Book 63 at page 105.

EXCEPTING HEREFROM land conveyed to Algonquin Gas Transmission Company dated September 14, 1961 in Deed Book 63 at page 205.

EXCEPTING HEREFROM any portion of the above granted premises within lay out of the Wallum Lake and/or Buck Hill Road.

EXCEPTING HEREFROM a parcel of land conveyed Jean Drans containing 22½ acres, more or less.

EXCEPTING HEREFROM land conveyed to Algonquin Gas Transmission Company in 1969.

Subject to an easement to Blackstone Valley Electric Company conveyed in 1969.

TOGETHER WITH all rights accruing to the grantor herein under covenants set forth in that certain deed dated February 1, 1961 recorded in Book 63 at page 93 in the Land Evidence Records of the Town of Burrillville and any and all other rights which the said grantor acquired by virtue of all prior title deeds.

WITNESS this 13th day of June, 1969, said Corporation has caused these Presents to be signed and its Corporate Seal to be hereunto affixed by its Proper Officer(s), duly authorized.

BUCK HILL FOREST, INC.

R.I.R.E.C.T. Stamps $11.00
6/16/69 ERB

BY Herbert L. Perry
President

(CORP. SEAL)

STATE OF RHODE ISLAND
COUNTY OF Providence

In Providence on the 13th day of June 1969 before me personally appeared Herbert L. Perry, President to me known and known by me to be the party executing the foregoing instrument for and on behalf of said corporation and acknowledged said instrument, by him executed, to be his free act and deed, in his said capacity and the free act and deed of said corporation.

Elaine C. Doyle
Notary Public

Received for record June 16, 1969 at 9:01 o'clock A.M.

Recorded by Patricia R. Ballou, Deputy Town Clerk

ADMINISTRATRIX DEED

I, Patricia Aubin, Administratrix of the Estate of Comino Toti, late of the Town of Burrillville, County of Providence and State of Rhode Island, deceased, by the power conferred by the Probate Court of said Town of Burrillville by decree entered June 6, 1969, and by every other power me thereunto enabling for Four Thousand Five Hundred ($4,500.00) Dollars paid, grant to Dora Waterman, of said Burrillville, Rhode Island.

All the right, title and interest of said Comino Toti, deceased, in and to the following described real estate, viz:

Two certain lots or parcels of land with all the buildings and improvements thereon situated in Graniteville, so-called, in the Town of Burrillville, County of Providence and State of Rhode Island, and lying on the northerly side of the highway leading from Graniteville to Douglas, and howsoever the same may be bounded or described, it being the same premises conveyed to Albert Leclaire by Frank M. and John D. Whipple by deed dated May 9, 1916, which deed is recorded in Book 34, Page 98 Burrillville Land Records, and subject to the same conditions in regard to fences as mentioned in said deed.

Also two certain lots of land, with all the buildings and improvements thereon, situated in Graniteville, so-called, in said town, and howsoever the same may be bounded and described being all and the same premises conveyed to Louise Leclair by Harriet A. Olney and others by deed dated October 20th, 1906 which deed is recorded in Book No. 31, page 258 Burrillville Land Records and subject to the same conditions in regard to fences as mentioned in said deed.

Also one certain lot or strip of land situated on the northerly side of the highway leading from Graniteville to Douglas and joining other land of Marana Wilcox, now or formerly, and howsoever the same may be bounded and described, being all and the same premises conveyed to Louise Leclair by Henry A. Wilcox by deed dated October 5, 1907, which deed is recorded in Book No. 31, page 349 Burrillville Land Records and subject to the same conditions in regard to fences as mentioned in said deed.

I, Helen Toti, wife of Comino Toti, release to said Grantee all my right of dower and all other interest in the aforedescribed premises.

WITNESS our hands and seals this 6th day of June, 1969.

Witnessed by:

Irving I. Zimmerman

Patricia Aubin
Administratrix of the Estate of Comino Toti

Patricia Aubin
Guardian of the Estate of Helen Toti

STATE OF RHODE ISLAND
COUNTY OF PROVIDENCE

In Burrillville on the 6th day of June, 1969, before me personally appeared Patricia Aubin, Administratrix of the Estate of Comino Toti and Guardian of the Estate of Helen Toti, to me known and known by me to be the party executing the foregoing instrument, and she acknowledged said instrument, by her executed, to be her free act and deed and her free act and deed in her capacities aforesaid.

Irving I. Zimmerman
Notary Public

R.I.R.E.C.T. Stamps $4.95
6/16/69 ERB

Received for record June 16, 1969 at 10:[illegible] o'clock A.M.

Recorded by [illegible] Town Clerk

3-12-14-21 (1/5 int)

300

KNOW ALL MEN BY THESE PRESENTS

That I, ROGER M. LOVELL, of Worcester, Worcester County, Massachusetts, in consideration of One Dollar and other valuable consideration paid by THE NARRAGANSETT ELECTRIC COMPANY, a Rhode Island corporation, the receipt whereof is hereby acknowledged, do hereby remise, release and forever quitclaim unto said The Narragansett Electric Company, certain tracts or parcels of land situated in Burrillville, Providence County, Rhode Island, more particularly described as follows:

All and the same premises conveyed to Edgar G. Paine by the United Electric Railways Company by deed dated March 18, 1931, recorded with the Records of Deeds of said Town of Burrillville in Book 43, Page 12 and with the Records of Deeds of the Town of North Smithfield, Rhode Island in Book 33, Page 440 - EXCEPT so much thereof as was conveyed by the said Edgar G. Paine et ux to Irving H. Sweet et ux by deed dated December 20, 1932, duly recorded with said Burrillville Records of Deeds; and so much thereof as was conveyed by the said Edgar G. Paine et ux to Jules Senn, Jr. et ux by deed dated May 11, 1946, duly recorded with North Smithfield Records of Deeds - and SUBJECT to the rights granted by the said Edgar G. Paine et ux to the Blackstone Valley Gas and Electric Company by deed dated December 19, 1932, duly recorded with said Burrillville Records of Deeds.

Being the same premises conveyed to me by the said Edgar G. Paine et ux by deed dated January 24, 1947, recorded with the Records of Deeds of the Town of Burrillville in Book 50, Page 487.

EXCEPTING from the above described premises so much thereof as has been conveyed by me to various parties by deeds duly recorded with said Burrillville Records of Deeds.

TO HAVE AND TO HOLD the granted premises, with all the rights, privileges and appurtenances thereunto belonging, unto the said THE NARRAGANSETT ELECTRIC COMPANY and its successors and assigns forever.

And I, VIRGINIA J. LOVELL, wife of said Grantor, release to said Grantee all rights of dower and homestead and other interests therein.

WITNESS our hands and seals this 14th day of March, 1962

THE CONSIDERATION PAID FOR THE WITHIN DEED IS LESS THAN $100.

Roger M. Lovell (LS)

Virginia J. Lovell (LS)

COMMONWEALTH OF MASSACHUSETTS)
)
Suffolk, ss.) In Boston on the 14th day of March, 1962 before me personally appeared ROGER M. LOVELL and VIRGINIA J. LOVELL, to me known and known by me to be the parties executing the foregoing instrument, and they acknowledged said instrument, by them executed, to be their free act and deed.

Albert V. Colman
Notary Public.
Albert V. Colman
My commission expires Dec. 30, 1965

Received for record March 15, 1962 at 9:00 o'clock A.M.

Recorded by _____ Town Clerk

I, PHILIP O. HARRIS, of the Town of Burrillville, County of Providence and State of Rhode Island, for consideration paid, grant to BUCK HILL FOREST INC., a Rhode Island Corporation, with QUIT-CLAIM COVENANTS

No Revenue Stamps Required

That certain tract or parcel of land, with all the buildings and improvements thereon, situated in the Town of Burrillville, County of Providence and State of Rhode Island, bounded and described as follows

Beginning at the Northeasterly corner of land on the southwesterly side of said Buck Hill Road at land formerly of Hannah W. and Marion F. Bates but more recently of Samuel A. Chase; thence S 54½° E with said road and with land now or formerly of Smith Angell heirs about 87 rods to stake and stones at land formerly of Herbert C. and Martha C. Blake but more recently of William R. Cooney; thence S 48½° W with said Cooney land about 18 rods 10 links to a rock with stones on it; thence S 18° E about 52 3/4 rods to stake and stones; thence S 28½° E about 63 rods, the last two courses are with land of said Cooney, and land now or formerly of Raymond J. and Elizabeth F. King, land now or formerly of Abilio A. Dacorte, land now or formerly of Joseph Cunningham, land now or formerly of Lawrence J. and Claire Cunningham and land now or formerly of Albert J. and Kathleen H. Christiaen; thence S 71½° E with said Christiaen land about 8 rods to the Wallum Lake Road, the next five courses are with said road; S 7° E 44 rods 9 links; S 18½° E 15 rods 20 links; S 32° E 14 rods 15 links; S 45° E 14 rods 15 links; S 53½° E 22 rods to land now or formerly of Amy J. Gansert; thence with said Gansert land S 64° W 2 rods 14 links S 75½° W 16 rods 15 links; S 62½° W 8½rods; S 85½° W 13 rods; W 13 rods 15 links; S 83½° W 5 rods to a white pine tree marked at the northwesterly corner of said Gansert land; thence continuing with said Gansert land S 55 rods 16 links to the "HorseShoe Pine" so called at the southwest corner of said Gansert land; thence S 73 3/4° E with said Gansert land 55 rods to land now or formerly of Charles and Martha Letendre; thence S 40½° W with said Letendre land 40½ rods to land now or formerly of G. Bertrand Bibeault; thence N 76° W 26 rods 17 links with Bibeault land; thence N 78½° W 40 rods 8 links with Bibeault land to the "Bear Stump" at land now or formerly of Thomas Ryan; thence northwesterly with said Ryan land about 40 rods; thence westerly with said Ryan land about 71 rods; thence S 16° W with said Ryan land and with land now or formerly of the United States of America (formerly of Seth Ross) known as "Casimir Pulaski Forest" about 96 rods; thence westerly with last mentioned land about 176 rods to a rock with stones on it; thence about N 14° E with last mentioned land about 130 rods to a stone on a rock; thence N 6° W with land formerly of James Roberts but more recently of Henry Jarvis about 179 rods to a rock on the shore by Round Pond; thence N 31½° E through said Pond (hereby including all right, title and interest of the grantor in and to said Pond and the land under the same) about 68 rods to a pile of stones on a rock on the other side of said Pond; thence N 72° E with land now or formerly of devisees under the will of William R. Angell as with land now or formerly of Samuel A. Chase 206 rods to the point of beginning.

Containing 721 acres more or less.

Excepting therefrom land conveyed to Albert E. and Concetta Poirier by deed recorded September 6, 1957 in Deed Book 62 at page 69.

Excepting therefrom land conveyed to Algonquin Gas Transmission Company by deed recorded February 1961 in Deed Book 63 at page 93.

Excepting therefrom land conveyed to Albert J. Christiaen and wife Kathleen H. by deed recorded February 27, 1961 in Deed Book 63 at page 205.

Excepting therefrom land conveyed to Algonquin Gas Transmission Company by deed recorded September 14, 1961 in Deed Book 63 at page 205.

Excepting therefrom any portion of the above granted premises within layout of the Wallum Lake and/or Buck Hill Road.

Excepting therefrom a parcel of land with any and all buildings and improvements thereon, bounded and described as follows:

Beginning at the northeast corner of the above granted premises, on the southwesterly side of Buck Hill Road,, at land formerly of Hannah W. and Marion F. Bates, but more recently of Samuel A. Chase; thence S 54½° E with said road and with land now or formerly of Smith Angell heirs about 87 rods to stake and stones at land formerly of Herbert C. and Martha C. Blake, but more recently of William R. Cooney; thence S 48½° W with said Cooney land and with land conveyed by this deed 40 rods; thence N 54½° W to land now or formerly of the devisees under the will of William R. Angell; thence N 72° E with the last mentioned land and with said land now or formerly of Samuel A. Chase to the point of beginning.

Containing 22½ acres more or less.

Together with all rights accruing to the grantor herein under covenants set forth in that certain deed dated February 1961, recorded in Deed Book 63 at page 93 and at page 205 in the records of Land Evidence in said Town of Burrillville, and any and all other rights which this said grantor acquired by virtue of all prior title deeds.

Together with a right to use the so-called Wilson Trail as it now exists across the property excluded from this grant and described herein.

Reserving hereunto me, the said grantor, and my heirs and assigns, the right to use Wilson Trail as it now exists over the land herein conveyed.

This conveyance is executed subject to a lease and easements of record and to rights of others to use the existing woods road so called over the northerly portion of the above granted premises.

This conveyance is also executed subject to taxes assessed December 31, 1961.

I, the above named grantor, covenant that I am a widower.

WITNESS my hand this 3rd day of March 1962.

Philip G. Harris

STATE OF RHODE ISLAND
COUNTY OF PROVIDENCE

In BURRILLVILLE on the 3rd. day of March 1962 before me personally appeared PHILIP G. HARRIS, to me known and known by me to be the party executing the foregoing instrument, and he acknowledged said instrument, by him executed, to be his free act and deed.

Edward P. Manning
Notary Public

Received for record March 16, 1962 at 9:41 o'clock A.M.

Recorded by _____ Town Clerk

BK0324

I, RUSSELL FARRELL, of the Town of Burrillville, County of Providence and State of Rhode Island, for consideration paid, grant to DORIS E. SHER, wife of Sydney Sher, of the City of Providence, said County and State, with WARRANTY COVENANTS

A certain lot or parcel of land with all the buildings and improvements thereon situated on the easterly side of Shore Drive, on Lake Pascoag, in the Town of Burrillville, County of Providence and State of Rhode Island, bounded and described as follows:

Beginning at a point on the easterly side of said Shore Drive which point is twenty-five (25) feet measured N. 24° 45' W. from the northwesterly corner of lot numbered A26 (A twenty-six) as delineated on that certain plat entitled, "Lake Pascoag Second Section Scale 1 in. = 40 ft July 1943 Willard B. Hall Surveyor Lic 517", which plat is recorded in the Registry of Deeds in said Town of Burrillville in Plat Book 2 at Page 111, and being the southwesterly corner of the lot hereby described; thence N. 24° 45' W. seventeen and 31/100 (17.31) feet; thence N. 14° 22' E. thirty-five and 42/100 (35.42) feet to land of Russel_ E. and Rita A. Farrell, the last two lines bounding on said Shore Drive; thence N. 83° 37' E. with said last named land and passing through a drill hole about one hundred ten (110) feet to the shore of Lake Pascoag; thence southerly with said shore of Lake Pascoag about forty (40) feet; thence S. 78° 10' W. passing through an iron pin one hundred eleven and 83/100 (111.83) feet to the point of beginning. Containing 6,167 square feet, more or less.

SUBJECT TO restrictions and reservations of record.

Being the major portion of the premises conveyed to this grantor by deed from Leo F. Lawrence and Ella M. Lawrence, his wife, dated August 12, 1961 and recorded in said Registry of Deeds in Deed Book 63 at page 185.

Reference is hereby made to that unrecorded plat entitled, "Proposed Division For Leo F. Lawrence Burrillville, R.I. February, 1960 Scale: 1 inch equals 20 feet. G. Bertrand Bibeault, Civil Engineering, Woonsocket, R.I."

Grantor covenants that at time the 1962 real estate taxes become due same will be prorated between the parties.

U.S.I.R. Stamps $5.50
T.L.P. 3/26/62

I, Rita A. Farrell, wife of said Russell Farrell, release to said grantee all my right of dower and all other interest in the afore described premises.
WITNESS our hands and seals this 22nd day of March, 1962.

In presence of:

Rita A. Farrell (LS)

Russell Farrell (LS)

STATE OF RHODE ISLAND)
COUNTY OF Providence)

In Pascoag R I on the 22nd day of March, 1962 before me personally appeared Russell & Rita A. Farrell to me known and known by me to be one of the parties executing the foregoing instrument, and she acknowledged said instrument, by her executed, to be her free act and deed.

(Notarial Seal)

Louis F. Bonoyer
Notary Public

PARCEL SEVEN DEEDS

I, James J. Scarano, of the City of Meriden, New Haven County, Connecticut for consideration paid, grant to Algonquin Gas Transmission Company, a Delaware corporation having its principal place of business at Boston, Suffolk County, Massachusetts, with WARRANTY COVENANTS

A certain tract of wood land in the Town of Burrillville, in the State of Rhode Island, located approximately two and one-half miles west of Pascoag and one-half mile south of the Buck Hill Road, bounded and described as follows:

Beginning at the northeast corner bound, a stub in the ground, a bound of John Stanfield, William Ross and James N. Wilson, now or formerly applying to all owners mentioned herein as bounding this tract; thence N 59½ degrees W, thirty-nine (39) rods, twenty-one (21) links to a stake and stones, a bound of James N. Wilson; thence N 87½ degrees W seventy (70) rods, twenty-one (21) links to a stake and stones, a bound of James N. Wilson; thence S 14 3/4 degrees W seven (7) rods, ten (10) links to a stake and stones in James N. Wilson line; thence S 69 degrees E eighty-two (82) rods, five (5) links to a stake and stones near a spring, a bound of John Stanfield and Uriah Ross; thence N 55 3/4 degrees E forty-one (41) rods, four (4) links to the first mentioned bound.

This tract contains approximately sixteen (16) acres, one hundred thirty-eight (138) rods, it being the same tract of land conveyed to Seth A. Ross by Samuel A. Ross June 28, 1878, known as Lot #1 on Plat #2 recorded in the Town of Burrillville Record Book #19 at Page 470.

Being the same premises conveyed to me by deed of Thomas Ryan, dated May 10, 1961, recorded with Burrillville Land Records in Deed Book 63, Page 125.

Subject to a right-of-way in favor of Philip G. Harris over a woods road as described in a grant of easement recorded on September 14, 1961.

Rose C. Scarano, wife of the grantor releases to said grantee all right of dower and all other interest in the aforedescribed premises.

WITNESS our hands and seals this 26th day of September, 1961.

Witness:

Thomas E. Leen — James J Scarano

R. E. Calver — Rose C Scarano

CONNECTICUT
STATE OF RHODE ISLAND, ETC.)
COUNTY OF PROVIDENCE)
NEW HAVEN

In Meriden on the 26th day of September, 1961, before me personally appeared James J. Scarano to me known and known by me to be the party executing the foregoing instrument and he acknowledged said instrument, by him executed, to be his free act and deed.

(Notorial Seal)

Donald F. Woods
Notary Public
My commission expires August 2, 1966

Received for record October 19, 1961 at 9:01 o'clock A.M.

Recorded by [signature] Town Clerk

I, ELSIE C. KANE, wife of Walter J. Kane, of the Town of North Smithfield, County of Providence and State of Rhode Island for consideration paid, grant to WILLIAM E. GONYEA and ERNESTINE R. GONYEA, his wife, both of the Town of Burrillville, said County and State, as JOINT TENANTS and not as Tenants in Common, with WARRANTY COVENANTS

A certain lot or parcel of land with any buildings and improvements thereon situated on the northwesterly side of Ross Road and on the southerly side of Wallum Lake Road, in the Village of Bridgeton, Town of Burrillville, County of Providence and State of Rhode Island, being laid out and designated as lot numbered 7 (seven) on that certain plat entitled, "Proposed Sale by David Gilman, Burrillville, R.I. December, 1956. Scale:- 1 inch Equals 60 Feet O. Bertrand Bibeault, Civil Engineering, Woonsocket, R.I.", which plat is recorded in the Registry of Deeds in said Town of Burrillville in Plat Book 3 at page 21.

Comprising a portion of the premises conveyed to this grantor by deed from David Gilman dated January 28, 1957 and recorded in said Registry of Deeds in Deed Book 58 at Page 548.

Said lot is hereby conveyed SUBJECT TO any drainage rights of either the Town of Burrillville or the State of Rhode Island, if any.

U.S.I.R. Stamps $1.65
10-20-61

I, said Walter J. Kane release to said grantees all my right of curtesy and all other interest in the afore described premises.

WITNESS our hands and seals this 20th day of October, 1961

In presence of:

Elsie C. Kane (LS)

Walter J. Kane (LS)

Dan S. Tourtellot
as to both

STATE OF RHODE ISLAND)
COUNTY OF PROVIDENCE)

In Woonsocket on the 20th day of October, 1961 before me personally appeared Walter J. Kane and Elsie C. Kane to me known and known by me to be the parties executing the foregoing instrument, and they acknowledged said instrument, by them executed, to be their free act and deed.

Dan S. Tourtellot
Notary Public

(Notorial Seal)

Received for record October 23, 1961 at 2:[illegible] o'clock P.M.

Recorded by [signature] Town Clerk

In Burrillville on the 8th day of May, 1961 before me personally appeared Albertus F. Alexander and wife Lucy M. Alexander to me known and known by me to be the parties executing the foregoing instrument, and they acknowledged said instrument, by them executed, to be their free act and deed.

Norman Mainville

Notary Public

Received for record May 9, 1961 at 10:29 o'clock A.M.

Recorded by Editha R. Ballou Asst. Town Clerk

I, Thomas Ryan of the Town of Burrillville, County of Providence, State of Rhode Island for consideration paid, grant to James J. Scarano of the City of Meriden, County of New Haven and State of Connecticut with WARRANTY COVENANTS

A certain tract of wood land in the Town of Burrillville, in the State of Rhode Island, located approximately two and one-half miles west of Pascoag and one-half mile south of the Buck Hill Road, bounded and described as follows:

Beginning at the northeast corner bound, a stub in the ground, a bound of John Stanfield, William Ross and James N. Wilson, now or formerly applying to all owners mentioned herein as bounding this tract; thence N 59½ degrees W. thirty-nine (39) rods, twenty-one (21) links to a stake and stones, a bound of James N. Wilson; thence N 87½ degrees W seventy (70) rods, twenty-one (21) links to a stake and stones, a bound of James N. Wilson; thence S 14 3/4 degrees W seven (7) rods, ten (10) links to a stake and stones in James N. Wilson line; thence S 69 degrees E eighty-two (82) rods, five (5) links to a stake and stones near a spring, a bound of John Stanfield and Uriah Ross; thence N 55 3/4 degrees E forty-one (41) rods, four (4) links to the first mentioned bound.

This tract contains approximately sixteen (16) acres, one hundred thirty-eight (138) rods, it being the same tract of land conveyed to Seth A. Ross by Samuel A. Ross June 28, 1878, known as Lot #1 on Plat #2 recorded in the Town of Burrillville Record Book #19 at Page 470.

Meaning and intending to convey and do convey all and the same premises conveyed to me by that deed recorded in Book 48 at Page 79 of Burrillville Land Records.

I, Thomas Ryan, covenant that I am unmarried.

U.S.I.R. Stamp $2.20
TR/5/10/61

WITNESS my hand this 10th day of May, 1961.

Thomas Ryan

STATE OF RHODE ISLAND, ETC.)
County of Providence)

In Burrillville on the 10th day of May, 1961 before me personally appeared Thomas Ryan to me known and known by me to be the party executing the foregoing instrument, and he acknowledged said instrument, by him executed, to be his free act and deed.

Editha R. Ballou

Notary Public

Received for record May 10, 1961 at 3:00 o'clock P.M.

Recorded by [illegible] Town Clerk

#21317

I, WILLIAM G. DOHERTY of the Town of Burrillville, County of Providence and State of Rhode Island, for consideration paid, grant to ROSAIRE W. DOHERTY and wife, THERESA A. DOHERTY, of the Town of Burrillville, County of Providence and State of Rhode Island, as Joint Tenants and not as Tenants in Common, with WARRANTY COVENANTS

A certain tract or parcel of land, on the northerly side of Joslin Road in the Town of Burrillville, County of Providence and State of Rhode Island, bounded and described as follows:

Beginning at the southeasterly corner of this lot at a stone set in the wall in the northerly line of Joslin Road or Mount Pleasant Road and said stone set in also a corner of land now or formerly of Roland A. Leduc et al; thence N. 76½° W. fifty (50) feet, with the northerly line of Joslin Road, to a turn in said Road; thence N 5° E. three hundred sixty eight (368) feet, with land of William G. Doherty and wife, to a stake in line of land now or formerly of Antone Martineau et al; thence S. 18° E. two hundred ninety five (295) feet, with land of said Martineau to a stake; thence S. 36½° W. one hundred thirty five (135) feet, more or less, with land of Roland A. Leduc et at, to a stone set in a wall in the northerly line of Joslin Road at the point or place of beginning. Containing 25,077 square feet of land, more or less.

This conveyance is executed subject to taxes assessed December 31, 1960.

The consideration in this deed is such that no documentary stamps are required.

I, ROSANNA A. DOHERTY wife of the grantor release to said grantees all my right of dower and all other interest in the aforedescribed premises.

WITNESS our hands this 8th day of May, 1961.

William G. Doherty

Rosanna: Doherty

STATE OF RHODE ISLAND, ETC.)
COUNTY OF PROVIDENCE)

In Burrillville on the 8th day of May, 1961 before me personally appeared WILLIAM G DOHERTY and wife ROSANNA A. DOHERTY to me known and known by me to be the parties executing the foregoing instrument, and they acknowledged said instrument, by them executed, to be their free act and deed.

Norman Mainville

Notary Public
Notary Public

Received for record May 11, 1961 at 1:00 o'clock P.M.

Recorded by [illegible] Town Clerk

Site Work Affidavit

RIDEM USE ONLY: Wetlands Application Number_____

RHODE ISLAND DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
Office of Water Resources / Freshwater Wetlands Program
235 Promenade Street, Providence, RI 02908-5767

SITE WORK AFFIDAVIT

This affidavit is to be used by Freshwater Wetland Professionals to attest to the completion and certification of all Site Work **at the time an application is submitted** to the RIDEM Freshwater Wetlands Program. Affidavits must be accompanied by a complete Freshwater Wetlands permit application submittal.

In accordance with Rule 7.05, an applicant must perform site work to clearly identify and label site activities and features. Incomplete site work results in the issuance of deficiency letters and the need for multiple RIDEM inspections, causing unnecessary permitting delays. Applicants are encouraged to refer to *Avoid these Common Preventable Site Work Delays!* to learn more about facilitating quicker permit reviews.

Applicant Name: Invenergy, LLC and The Narragansett Electric Company

Note: Applicant must be the owner of property or easement or a government agency or entity with power of condemnation over such property or easement that is the subject of this application.

Please initial that all applicable site work listed below have been performed and certified at the time of application submission and sign the certification statement.

CKW Wetland Flags are present on site, and are correctly and legibly labeled*;

CKW Wetland Flag numbers on site correspond to those depicted on the plans*;

CKW Wetland Flags have been accurately surveyed and depicted on the plans*;

CKW The proposed Limit of Disturbance (LOD) and other applicable proposed activities and features (See Rule 7.05) have been staked and labeled on site.*

*Work completed or underway per attached correspondence with RIDEM Office of Water Resources

CERTIFICATION OF PROFESSIONAL(S)

I certify that I have inspected the subject property and its surroundings and do hereby attest that to the best of my knowledge, all site work specified above has been accurately completed and certified at the time of application submission and prior to RIDEM inspection, in accordance with the Rules and Regulations Governing the Administration and Enforcement of the Freshwater Wetlands Act.

Professional's Name: Craig Wood

Note: The professional (e.g. engineer, biologist, landscape architect, surveyor, etc.) responsible for the submission and/or preparation of this Application, on behalf of the Applicant, must sign below.

Signature: _____ **Date:** 3/29/2017

From: Horbert, Chuck (DEM) [mailto:chuck.horbert@dem.ri.gov]
Sent: Wednesday, March 29, 2017 11:20 AM
To: Craig Wood <cwood@essgroup.com>
Subject: RE: Invenergy FWW Submission and Industrial Stormwater (MSGP NOI)

I think that all sounds about right, although I think that for the utility right of-way that follows along the existing utility it will not be necessary to stake and label the locations of all new utility pole structures. The existing adjacent structures should be labeled as to their number so that we can use them as fixed reference points.

Chuck Horbert, Program Supervisor
RIDEM Office of Water Resources
Freshwater Wetlands Program
(401) 222-4700, ext. 7402

From: Craig Wood [mailto:cwood@essgroup.com]
Sent: Wednesday, March 29, 2017 9:20 AM
To: Horbert, Chuck (DEM) <chuck.horbert@dem.ri.gov>
Subject: RE: Invenergy FWW Submission and Industrial Stormwater (MSGP NOI)

Chuck: again sorry if I was not providing clear understanding on this issue, glad we are on the same page. I am getting Waterman geared up for what is going to be an extensive staking exercise so was hoping to be clear on your expectations given the peculiarities of the project.

For CREC we plan to stake the following per 7.05:

- The boundary of the outermost limit of disturbance (e.g., filling, clearing, soil disturbance) project-wide (approximately 100 foot spacing);
- Outlines of proposed ponds and detention and retention basins;
- Corner locations of proposed septic system;
- Center lines of roadways, pipelines and utility lines, with station numbers indicated (approximately 100 foot spacing);
- Centerlines of proposed drainage channels.

I am thinking staking of existing or proposed property boundaries in or adjacent to wetlands will not be necessary given all the other staking available as reference points. Flagging of wetland edges seems to be in good shape so was not planning on a major effort to refresh given most of the lines have been edge verified. There are no proposed structures in or adjacent to wetlands.

For the TNEC and CREC ROWs we plan to stake the following per 7.05:

- The boundary of the outermost limit of disturbance (e.g., filling, clearing, soil disturbance) project-wide (approximately 100 foot spacing); NOTE I am assuming this will be the outer limit of clearing and not the limit of disturbance soil disturbance interior to the ROW as this would be an extensive exercise;
- Outlines of proposed ponds and detention and retention basins;
- Center lines of any new roadways, with station numbers indicated (approximately 100 foot spacing);
- Centerlines of proposed drainage channels;

- New utility line structure locations;

Again, I am thinking staking of existing or proposed property boundaries in or adjacent to wetlands will not be necessary given all the other staking available as reference points. All wetland edges have been previously verified, little if any previous wetland flagging is present, unless directly otherwise we are not intending to refresh flagging.

I would greatly appreciate you input on these assumptions. Regards, Craig

Craig A. Wood | **ESS Group, Inc.**
p 401.330.1208 | c 401.447.3358 | cwood@essgroup.com

List of Abutters

CLEAR RIVER ENERGY CENTER AND BURRILLVILLE INTERCONNECTION PROJECT LIST OF ABUTTERS							
PARCEL ID	**LOCATION**	**OWNER**	**MAILING ADDRESS LINE 1**	**MAILING ADDRESS LINE 2**	**CITY**	**STATE**	**ZIP**
007-002	1661 SHERMAN FARM RD	BREAU GARY C & ROSE M	1661 SHERMAN FARM RD		HARRISVILLE	RI	02830
021-005	0 ROUND TOP RD	ALLES DEBRA	98 WEST SHORE LANE		PASCOAG	RI	02859
021-010	1600 ROUND TOP RD	TASCHEREAU STEVEN R & LISA G	1600 ROUND TOP ROAD		HARRISVILLE	RI	02830
021-013	1524 ROUND TOP RD	HUSSAIN CHAUDRY	1524 ROUND TOP RD		HARRISVILLE	RI	02830
021-014	0 ROUND TOP RD	NARRAGANSETT ELECTRIC CO.	40 SYLVAN RD		WALTHAM	MA	02451
021-015	0 ROUND TOP RD	NARRAGANSETT ELECTRIC CO.	40 SYLVAN RD		WALTHAM	MA	02451
021-016	1535 ROUND TOP RD	FARLEY WILFRED J III ET UX	1535 ROUND TOP ROAD	P O BOX 454	HARRISVILLE	RI	02830
022-001	310 COLLINS TAFT RD	SAVAGE JAMES P & CHARLENE E	310 COLLINS TAFT RD		HARRISVILLE	RI	02830
022-004	375 COLLINS TAFT RD	FRENETTE KEVIN M & TAMMY A	375 COLLINS TAFT RD		HARRISVILLE	RI	02830
022-005	0 COLLINS TAFT RD	NARRAGANSETT ELECTRIC CO.	40 SYLVAN RD		WALTHAM	MA	02451
022-006	315 COLLINS TAFT RD	SHUGRUE ROBERT C & RENAY M	315 COLLINS TAFT RD		HARRISVILLE	RI	02830
022-007	275 COLLINS TAFT RD	CHRISTENSEN DAVID W & MARGARET WILSON	275 COLLINS TAFT RD		HARRISVILLE	RI	02830
024-016	0 SHERMAN FARM RD	NARRAGANSETT ELECTRIC COMPANY	40 SYLVAN RD		WALTHAM	MA	02451
034-057	0 EAST WALLUM LAKE RD	FIELDING JAMES M & FATEMEH H	65 HATFIELD ST	PAWTUCKET	PAWTUCKET	RI	02861
037-004	0 HILL RD	CHILD JOHN W ET AL	130 BAYWOOD ROAD	PO BOX 721	NORTH EASTHAM	MA	02651-0721
038-002	0 ROUND TOP RD	ALLES STEWART F & DEBRA L	98 WEST SHORE RD		PASCOAG	RI	02859
038-006	1443 ROUND TOP RD	FARLEY ALICE E	1443 ROUND TOP ROAD		HARRISVILLE	RI	02830
039-001	1265 ROUND TOP RD	STATE OF RHODE ISLAND	STATE PROPERTY COMM	1 CAPITOL HILL PLAZA	PROVIDENCE	RI	02908
040-001	0 BROOK RD	WALLUM LAKE ROD & GUN CLUB	200 BROOK ROAD		HARRISVILLE	RI	02830
040-004	200 BROOK RD	WALLUM LAKE ROD & GUN CLUB	200 BROOK RD		HARRISVILLE	RI	02830
040-005	0 SHERMAN FARM RD	WALLUM LAKE ROD & GUN CLUB	ATTN: TREASURER	200 BROOK RD	HARRISVILLE	RI	02830
054-009	1525 HILL RD	LAWTON IRENE R ESTATE OF	1525 HILL ROAD		PASCOAG	RI	02859
054-010	0 HILL RD	NARRAGANSETT ELECTRIC COMPANY	40 SYLVAN DR		WALTHAM	MA	02451
054-011	0 STONE BARN RD	CRABBE ROBERT C TRUSTEE	185 STONE BARN ROAD	P O BOX 1	PASCOAG	RI	02859
055-001	0 HILL RD	NARRAGANSETT ELECTRIC CO.	40 SYLVAN RD		WALTHAM	MA	02451
055-011	50 ANNE LN	FERRY BRENDA LYNN	50 ANNE LANE		PASCOAG	RI	02859
070-020	595 TOWN FARM RD	MURPHY MARK & LISA M TE	595 TOWN FARM ROAD		PASCOAG	RI	02859
070-021	0 TOWN FARM RD	NARRAGANSETT ELECTRIC CO.	40 SYLVAN RD		WALTHAM	MA	02451
070-022	0 TOWN FARM RD	NARRAGANSETT ELECTRIC CO.	40 SYLVAN RD		WALTHAM	MA	02451
070-023	0 TOWN FARM RD	NARRAGANSETT ELECTRIC COMPANY	40 SYLVAN RD		WALTHAM	MA	02451
071-002	0 HILL RD	NARRAGANSETT ELECTRIC CO.	40 SYLVAN RD		WALTHAM	MA	02451
071-003	1365 HILL RD	VALENTI ROBERT A JR & ROBERT A SR	1365 HILL RD		PASCOAG	RI	02859
071-012	1324 HILL RD	HOULE PETER JR & SANDRA L	1324 HILL ROAD		PASCOAG	RI	02859
071-013	0 STONE BARN RD	NARRAGANSETT ELECTRIC CO.	40 SYLVAN RD		WALTHAM	MA	02451
071-014	0 HILL RD	SWART JOHN F III & BEAUCHAMP LUCILLE	2530 DONNS WAY		OAKTON	VA	022124
071-015	0 STONE BARN RD	NARRAGANSETT ELECTRIC CO.	40 SYLVAN RD		WALTHAM	MA	02451
071-017	0 TOWN FARM RD	EXCEL MANAGEMENT INC	9 OLD JENCKES HILL ROAD		LINCOLN	RI	02865
072-030	0 ANNE LN	CRESTWOOD ESTATES HOMEOWNERS ASSOC	25 ANNE LANE		PASCOAG	RI	02859
087-003	0 WALLUM LAKE RD	NARRAGANSETT ELECTRIC COMPANY	40 SYLVAN RD		WALTHAM	MA	02451
087-005	1166 EAST WALLUM LAKE RD	HOPKINS ALLAN E & JOAN TRUSTEES	PO BOX 202		PASCOAG	RI	02859
087-005	1166 EAST WALLUM LAKE RD	HOPKINS ALLAN E & JOAN TRUSTEES	PO BOX 202		PASCOAG	RI	02859
087-006	0 EAST WALLUM LAKE RD	JENSEN ROBERT	9 OLD JENCKES HILL RD		LINCOLN	RI	02865
087-007	0 EAST WALLUM LAKE RD	NARRAGANSETT ELECTRIC CO.	40 SYLVAN RD		WALTHAM	MA	02451
087-008	0 WALLUM LAKE RD	NARRAGANSETT ELECTRIC COMPANY	40 SYLVAN RD		WALTHAM	MA	02451
101-018	0 BUCK HILL RD	AYOTTE ARTHUR R	508 BUCK HILL RD		PASCOAG	RI	02859
102-002	1485 WALLUM LAKE RD	RAMBONE JACQUELINE	1485 WALLUM LAKE ROAD		PASCOAG	RI	02859-1830
102-003	1455 WALLUM LAKE RD	LAMBERT ROLAND A & CAROL A	1455 WALLUM LAKE RD		PASCOAG	RI	02859
102-004	0 WALLUM LAKE RD	NARRAGANSETT ELECTRIC COMPANY	40 SYLVAN RD		WALTHAM	MA	02451
102-006	1335 WALLUM LAKE RD	BERTRAND THEODORE R & LINDA A TE	1335 WALLUM LAKE		PASCOAG	RI	02859
102-011	1504 WALLUM LAKE RD	NAULT JASON O & CHRISTINE A	1504 WALLUM LAKE RD		PASCOAG	RI	02859
102-012	1478 WALLUM LAKE RD	SILVA FRANK G III & KELLY A	P O BOX 42		PASCOAG	RI	02859
102-013	25 BUCK HILL RD	SONIER JULIE A	25 BUCK HILL ROAD		PASCOAG	RI	02859
102-014	35 BUCK HILL RD	NEYMAN MONICA A	35 BUCK HILL RD		PASCOAG	RI	02859

CLEAR RIVER ENERGY CENTER AND BURRILLVILLE INTERCONNECTION PROJECT LIST OF ABUTTERS							
PARCEL ID	**LOCATION**	**OWNER**	**MAILING ADDRESS LINE 1**	**MAILING ADDRESS LINE 2**	**CITY**	**STATE**	**ZIP**
102-015	63 BUCK HILL RD	MULCAHY SUSAN M &MICHAEL F TE	63 BUCK HILL RD		PASCOAG	RI	02859
102-016	105 BUCK HILL RD	LETOILE RENE & RACHEL TE	105 BUCK HILL RD		PASCOAG	RI	02859
102-017	135 BUCK HILL RD	SMITH DAVID L & JOANNE M TE	135 BUCK HILL RD		PASCOAG	RI	02859
102-019	64 BUCK HILL RD	LEPORE JOSEPH J & DEBRA A	64 BUCK HILL ROAD		PASCOAG	RI	02859
102-020	0 BUCK HILL RD	NARRAGANSETT ELECTRIC COMPANY	40 SYLVAN RD		WALTHAM	MA	02451
102-021	140 BUCK HILL RD	BONOYER CHRISTINE M	140 BUCK HILL ROAD		PASCOAG	RI	02859
103-001	0 WALLUM LAKE RD	BURRILLVILLE LAND TRUST	PO BOX 506		HARRISVILLE	RI	02830
103-002	0 EAST WALLUM LAKE RD	LAMBERT ROLAND A & CAROL & KEITH M	1455 WALLUM LAKE ROAD		PASCOAG	RI	02859
104-001	986 EAST WALLUM LAKE RD	JALBERT MARY M TRUST	986 EAST WALLUM LAKE RD		PASCOAG	RI	02859
118-002	508 BUCK HILL RD	AYOTTE ARTHUR R	508 BUCK HILL RD		PASCOAG	RI	02859
135-002	0 BUCK HILL RD	ALGONQUIN GAS TRANSMISSION C	C/O DUKE ENERGY	ATTN: ROBERT MORONEY	HOUSTON	TX	77251-1642
135-024	0 DEER RUN DR	JARVIS MICHAEL E MARY K	PO BOX 266		MELVIN VILLAGE	NH	03850
137-006	200 MANLY DR	HARRIS DAVID B	200 MANLY DR		PASCOAG	RI	02859
137-008	915 WALLUM LAKE RD	BOLDUC PAUL R & MARY L L/E	915 WALLUM LAKE RD		PASCOAG	RI	02859
137-009	935 WALLUM LAKE RD	SHALOU BETTY L L/E	935 WALLUM LAKE RD		PASCOAG	RI	02859
137-010	945 WALLUM LAKE RD	WALKER LYLE	945 WALLUM LAKE RD		PASCOAG	RI	02859
153-001	0 WALLUM LAKE RD	ALGONQUIN GAS TRANSMISSION C	C/O DUKE ENERGY	ATTN: ROBERT MORONEY	HOUSTON	TX	77251-1642

Glossary of Terms

Glossary of Terms

°C	degrees Celsius
A	amps
AALs	Acceptable Ambient Levels
ACC	Air Cooled Condenser
acfm	Actual Cubic Feet Per Minute
ACGIH	American Conference of Governmental and Industrial Hygienists
ACI	American Concrete Institute
ACSR	Aluminum Conductor Steel Reinforced
AFUDC	Allowance for Funds Used During Construction
AGT	Algonquin Gas Transmission
Ampere (Amp)	A unit of measure for the flow of electric current
ANSI	American National Standards Institute
AP&S	Adler Pollock & Sheehan, P.C.
APCR	Air Pollution control Regulation
Applicant	The Narragansett Electric Company d/b/a National Grid and Clear River Invenergy LLC
ASCE	American Society of Civil Engineers
ASF	Area Subject to Flooding
ASSF	Area Subject to Storm Flowage
ATV	All-Terrain Vehicle
BACT	Best Available Control Technology
BEA	U.S. Bureau of Economic Analysis
BFE	Base Flood Evaluation
BIP	Burrillville Interconnection Project
BMPs	Best Management Practices
BOP	Balance of Plant
Cable	A fully insulated conductor usually installed underground, but in some circumstances can be installed overhead.
CCP	Capacity Commitment Period
CEMS	Continuous Emissions Monitoring System
CFR	Code of Federal Regulations
Circuit	A system of conductors (three conductors or three bundles of conductors) through which an electric current is intended to flow and which may be supported above ground by transmission structures or placed underground.
cm/W	centimeters per watt
CO	Carbon Monoxide
Conductor	A metallic wire which serves as a path for electric current to flow.
CPP	Clean Power Plan
CPv	Channel Protection Volume
CREC	Clear River Energy Center generating plant proposed by Invenergy Thermal Development LLC. See EFSB Docket No. 2015-06
CREC ROW	The approximately 0.8 mile long 250-foot-wide easement granted to CREC located between the TNEC ROW and CREC.
CRMC	Coastal Resources Management Council
CWA	Clean Water Act

CYME	Power Engineering Software
dB	A decibel is a logarithmic unit of measurement that expresses the magnitude of a sound.
dBA	Decibel, on the A-weighted scale. A-weighting is used to emphasize the range of frequencies where human hearing is most sensitive.
Demand	The total amount of electric power required at any given time by an electric supplier's customers.
Distribution Line or System	Power lines that operate under 69 kV
Double-Circuit	Two circuits on one structure
DY	Delivery Year
EDI	Electro-Deionization
EFSB	Energy Facility Siting Board
EFSB	Rhode Island Energy Facility Siting Board
EFSB Rules	State of Rhode Island and Providence Plantations Energy Facility Siting Board Rules of Practice and Procedure, April 11, 1996.
EHS	Electromagnetic Hypersensitivity
Electric Field	A field produced as a result of voltages applied to electrical conductors and equipment; usually measured in units of kilovolts per meter.
Electric Transmission	Facilities (≥ 69 kV) that transmit electrical energy from generating plants to substations.
EMF	Electric and magnetic fields
EPA	Environmental Protection Agency
EPC	Engineering, Procurement, and Construction
ER	Environmental Report
ESS	ESS Group, Inc.
F°	Fahrenheit
FAA	Federal Aviation Administration
FAC	Facultative
Facility	The Clear River Energy Center generating plant proposed by Invenergy Thermal Development LLC.
Facility Site	The Clear River Energy Center generating plant proposed by Invenergy Thermal Development LLC.
FACW	Facultative Wetland
Fault	A failure or interruption in an electrical circuit (a.k.a. short-circuit)
FCA	Forward Capacity Auction
FCM	Forward Capacity Market
FCO	Forward Capacity Obligations
FEMA	Federal Emergency Management Agency
FERC	Federal Energy Regulatory Commission
FGR	Flue Gas Recirculation
FIP	Federal Implementation Plan
FNTP	Full Notice to Proceed
Gauss (G)	A unit of measure for magnetic fields; one G equals 1,000 milliGauss (mG)
GE	General Electric
GIS	Geographic Information System

Gneiss	Light and dark, medium to coarse-grained metamorphic rock characterized by compositional banding of light and dark minerals, typically composed of quartz, feldspar and various amounts of dark minerals.
gpd	Gallons per Day
Gray and Pape	Cultural Resource consultants retained by Invenergy
GSU	Generator Step-Up
GT	Gas Turbine
HAPs	Hazardous Air Pollutants
HDR	HDR Engineering
H-frame Structure	A wood or steel transmission line structure constructed of two upright poles with a horizontal cross-arm.
Hp	Horsepower
Hr.	Hour
HRSG	Heat Recovery Steam Generator
HRSG	Heat Recovery Steam Generators
HUC	Hydrologic Unit Code
Hz	Hertz, a measure of the frequency of alternating current; expressed in units of cycles per second.
IBAs	Important Bird Areas
ICNIRP	International Commission on Non-Ionizing Radiation Protection
ICR	Installed Capacity Requirement
IEEE	Institute of Electrical and Electronic Engineers
Invenergy	Invenergy Thermal Development, LLC
I-O	Input - Output
IPaC	Information For Planning and Conservation
IRP	Interstate Reliability Project
ISO-NE	ISO New England, Inc., the independent system operator of the New England electric transmission system
JEDI	Jobs and Economic Development Impact
K	erodibility factor
kcmil	One thousand circular mils, approximately 0.0008 square inches, a measure of conductor cross-sectional area.
kg	Kilograms
km	Kilometers
kV	Kilovolt - one kV equals 1,000 volts
kV/m	Kilovolts per meter - a measurement of electric field strength
LAER	Lowest Achievable Emissions Rate
LID	Low Impact Development
LNTP	Limited Notice to Proceed
Load	Amount of power delivered upon demand at any point or points in the electric system; load is created by the power demands of customers' equipment (residential, commercial and industrial).
LOD	Limit of Disturbance
LORs	Laws, Ordinances, Regulations and Standards
LSE	Load Serving Entities
LSR	Local Sourcing Requirements
LSZ	Landscape Similarity Zone

LUHPPL	Land Use with Higher Potential Pollutant Load
m	Meter
Max	Maximum
mG	A unit of measure for magnetic fields. One milliGauss - equals 1/1000 Gauss
mg	milligrams
mgd	Million Gallons Per Day
Michael Theriault Acoustics	MTA
MMBtu	One Million British Thermal Units
Monopole	A single pole structure supporting overhead utility wires
MVA	Megavolt Ampere - measure of electrical capacity equal to the product of the line-to-line voltage, the current and the square root of 3 for three-phase systems; electrical equipment capacities are sometimes stated in MVA.
MVAR	Megavolt Ampere Reactive - also called MegaVARS - measure of reactive power in alternating current circuits; shunt capacitor and reactor capacities are usually stated in MVARs.
MVARs	Mobile Audio/Video Recording Systems
MW	Megawatt - a megawatt equals 1.0 million watts
N-1-1	Occurrence of two separate and unrelated outages within a short period of time
NAAQS	National Ambient Air Quality Standards
NEEP	New England Economic Partnership
NEPOOL	New England Power Pool
NERC	North American Electric Reliability Corporation
NESC	National Electrical Safety Code. The NESC is an ANSI standard that covers basic provisions for safeguarding of persons from hazards arising from the installation, operation, or maintenance of 1) conductors and equipment in electrical supply stations, and 2) overhead and underground electric supply and communication lines. It also includes work rules for the construction, maintenance, and operation of electric supply and communication lines and equipment.
NEWILD	A computer program that assissts in the access and evaluation of the information presented in the Species/Habitat matrices developed by DeGraaf et. al.
NH3	Ammonia
NLCD	National Land Cover Database
NLEB	Northern Long-Eared Bat
NO2	nitrogen dioxide
NOI	Notice of Intent
NOx	Nitric Oxide/Nitrogen Oxide
NPCC	Northeast Power Coordinating Council
NPDES	National Pollutant Elimination Discharge Elimination System
NPS	National Park Service
NRCS	Natural Resource Conservation Service
NSA	Noise Sensitive Areas
NSR	New Source Review

NTMs	Neotropical Migrant Songbirds
NTP	Notice to Proceed
NWI	National Wetlands Inventory
NYISO	New York ISO
NYSDEC	New York State Department of Environmental Conservation
O3	Ozone
OBL	Obligate
OC	Oxidation Catalyst
OEM	Equipment Manufacturers
OPGW	Optical ground wire – ground wire containing optical fibers
OPGW	Optical Ground Wires
OWTS	On-Site Wastewater Treatment System
PA	PA Consulting Group
PAC	Planning Advisory Committee lead by ISO-NE
PAL	Public Archaeological Laboratory, Inc.
PAL	Public Archaeology Laboratory (a retained cultural resource management firm)
Pb	Lead
PEM	Palustrine Emergent Wetland
PFO	Palustrine Forested Wetland
Phase	Transmission and distribution AC circuits are comprised of three conductors or bundles of conductors that have voltage and angle differences between them; each of these conductors (or bundles) is referred to as a phase.
PI	Pay-For Performance Initiative
PM	Particulate Matter
PM10	Particulate matter less than 10 microns in diameter
PM2.5	Particulate matter less than 2.5 microns in diameter
POI	Points of Interest
POTWs	Publically Owned Treatment Works
POWER	POWER Engineers, Inc.
POWER	POWER Engineers, Inc.
Powerblock	The Clear River Energy Center generating facility
ppmvd	Parts Per Million By Volume, Dry Basis
Project	The construction of the Burrillville Interconnection 345 kV transmission line (3052 Line), relocation of the existing 341 and 347 Lines, improvements to the Sherman Road Switching Station yard, and relocation of the 328 Line termination at the Sherman Road Switching Station.
Project ROW	The TNEC ROW and the CREC ROW
PSD	Prevention of Significant Deterioration
PSS	Palustrine Scrub-Shrub wetland
PUD	Pascoag Utility District
PVC	Polyvinyl Chloride
PVC	Polyvinyl Chloride
QPA	Qualified Pervious Areas
R.I.G.L.	Rhode Island General Laws
Reactive Power	A component of power associated with capacitive of inductive circuit elements; its unit of measurement is the VAR

Rebuild	Replacement of an existing overhead transmission line with new structures and/or conductors, generally along the same alignment as the original line.
Reinforcement	Any of a number of approaches to increase the capacity of the transmission system, including rebuilding, reconductoring, uprating, conversion and conductor bundling methods.
RF	Radiofrequency
RGGI	Regional Greenhouse Gas Initiative
RIDEM	Rhode Island Department of Environmental Management
RIDFW	Rhode Island Division of Fish and Wildlife
RIDOT	Rhode Island Department of Transportation
RIEFSB	Rhode Island Energy Facility Siting Board
RIGIS	Rhode Island Geographic Information System
RIHPHC	Rhode Island Historic Preservation and Heritage Commission
RIHPHC	Rhode island Historical Preservation and Historical Commission
RIMS	Regional Input-Output Modeling System
RINHP	Rhode Island Natural Heritage Program
RINHS	Rhode Island Natural History Survey
RIPDES	Rhode Island Pollutant Discharge Elimination System
RISDISM	Rhode Island Stormwater Design and Installation Standards Manual
Roadway	The entrance to the Facility from Wallum Lake Road.
ROW	Right-of-Way. Corridor of land within which a utility company holds legal rights necessary to build, operate, and maintain power lines
RTO	Regional Transmission Organization
Rules	Rhode Island Fresh Water Wetlands Act and Rules
SBE	Small Business Enterprise
SCR	Selective Catalytic Reduction
SDM	Streamflow Depletion Methodology
SEMA	The Southeastern Massachusetts electrical zone
SEMA-RI	Southeastern Massachusetts and Rhode Island
SESC	Soil Erosion and Sediment Control
SESC Plan	Soil Erosion and Sediment Control Plan
SF6	Sulfur hexafluoride, a gas used as electrical insulation
Shield Wire	Wire strung at the top of transmission lines intended to prevent lightning from striking the transmission circuit. These conductors are sometimes referred to as static wire or aerial ground wire and may contain glass fibers for communication use (refer to “OPGW”).
SHLO	State Highway Layout
SIC Code	Standard Industrial Classification Code
SIP	State Implementation Plan
SO2	sulfur dioxide
Steel Pole Structure	Transmission line structure consisting of tubular steel pole(s) with arms or other components to support insulators and conductors
STP	shovel test pits
Study Area	A 5,000-foot-wide corridor measured 2,500 feet on either side of the 3052 Line. (See Figure 6-1)

Substation	A fenced-in yard containing switches, circuit breakers, power transformers, line terminal structures, and other equipment enclosures and structures; voltage changes, adjustments of voltage, monitoring of circuits and other service functions take place in the substation.
Swamp mats	Swamp mats consist of timbers that are bolted together and placed over wetland areas to distribute equipment loads and minimize impacts to the wetland and soil substrates in accordance with National Grid's ROW Access, Maintenance, and Construction Best Management Practices (EG-303).
Switching Station	Same as Substation except with no power transformers; switching of circuits and other service functions take place in a switching station.
SWPPP	Stormwater Pollution Prevention Plan
T	Tesla
tc	Time of Concentration
TGP-28	National Grid Transmission Group Procedure 28 - Transmission Planning Guide
THPO	Tribal Historic Preservation Officer
TMDL	Total Maximum Daily Load. Maximum allowed pollutant load to a water body without exceeding water quality standards.
TNC	The Nature Conservancy
TNEC	The Narragansett Electric Company d/b/a National Grid
TNEC ROW	The approximate 6.0 mile portion of the existing transmission line right of way in Burrillville located between the junction of the CREC ROW and the Sherman Road Switching Station. The ROW ranges from approximately 300 feet to 500 feet wide.
TPM	Traffic Management Plan
Transmission Line	An electric power line operating at 69,000 volts or more
Tribes	Federally-recognized tribes, e.g., The Narragansett Indian Tribe and Wampanoag Tribe of Gay Head (Aquinnah)
ULSD	Ultra-Low-Sulfur Diesel
USACE	United States Army Corps of Engineers
USDA	United States Department of Agriculture
USDOT	United States Department of Transportation
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
USGS	United Stated Geological Survey
V	volts
V/m	Volts per meter - a measure of electric field strength
VIA	Visual Impact Assessment
Visual Study Area	The area within a one mile radius of the ROW used to develop the Visual Impact Assessment
VOC	Volatile Organic Compound
Voltage	Electric potential difference between any two conductors or between a conductor and ground.
WAP	Wildlife Action Plan
Wire	Refer to "Conductor"
WPA	Wellhead Protection Areas
XLPE	Cross Linked Polyethylene. A type of underground cable.

ZLD	Zero-Liquid Discharge
µT	Microtesla

Project Narrative

1.0 INTRODUCTION

1.1 Project Summary

Clear River Energy LLC, a project company of Invenergy Thermal Development LLC ("Invenergy"), and the Narragansett Electric Company d/b/a National Grid ("TNEC"), jointly submit this Application to Alter Freshwater Wetlands to the Rhode Island Department of Environmental Management ("RIDEM") Office of Water Resources and Individual Permit application under Section 404 of the Clean Water Act to the New England District, U.S. Army Corps of Engineers ("USACE") to construct the Clear River Energy Center ("CREC" or the "Facility") and a dedicated 345 kilovolt ("kV") transmission line and associated transmission line and substation work for the purpose of interconnecting the CREC to the existing New England electric system (the "Burrillville Interconnection Project" or "BIP").

The CREC is a combined-cycle electric generating facility to be located on a 67-acre site (the "Facility Site") on Wallum Lake Road (State Route 100) in Burrillville, Rhode Island (see Figures 1-1 through 1-3). The approximate coordinates of the site are N 41.965543°, E -71.753296°. Clear River Energy LLC will construct, own, and operate the CREC.

The proposed CREC is adjacent to the existing Algonquin Compressor Station, operated by Spectra Energy, LLC. The CREC will address the need for new electric capacity that has been created by retirements of existing generators and the additional potential retirements of other generators in the New England market. The benefits associated with the Facility include:

1. Providing new highly advanced generating technology that will be one of the most efficient generators in New England, helping increase the regional electric generation efficiency which will help lower regional energy costs.

2. Reducing regional air emissions and improving air quality by displacing older, less efficient and more polluting generation and through application of best available emission control, which will also help achieve state and federal goals of reducing emissions of greenhouse gas and other air pollutants.

3. Modernizing the electric generating infrastructure by providing new, highly efficient generation that has fast start and high ramp rate (flexible) generating capability, replacing older, less flexible generation. The fast start and flexible generating capability will also help support the integration of new and existing renewable generation onto the power grid.

4. Creating new employment for skilled local workers during construction and operation, as well as direct tax revenues and economic benefits to the Town of Burrillville and to local businesses.

TNEC and Invenergy are proposing to construct the BIP, consisting primarily of a dedicated 345 kV Line (the "3052 Line") for the purpose of interconnecting the CREC to the existing electric transmission network. The 3052 Line will be built within the proposed CREC Right-Of-Way ("ROW") and the existing TNEC ROW. The TNEC ROW is currently occupied by two 345 kV transmission lines, designated as the 341 and 347 Lines. The new 3052 Line will be constructed adjacent to the existing 345kV 347 and 341 Lines located within an existing ROW held by TNEC and used for transmission purposes since the 1960s. The 341 Line was recently energized in the 4th quarter of 2015. The components of the BIP are as follows:

- Construct a new 6.8-mile 345 kV transmission line between the CREC and the Sherman Road Switching Station, which includes modifications to the 341 and 347 Lines. The BIP ROW consists of the following three segments:
    - Segment 1 – CREC ROW from the CREC to the TNEC ROW (0.8 miles in length)
    - Segment 2 – TNEC ROW from the junction of CREC ROW to a point 0.19 miles west of the Clear River (1.6 miles in length)
    - Segment 3 – TNEC ROW from 0.19 mile west of the Clear River to the Sherman Road Switching Station (4.4 miles in length)
- Improvements to the existing Sherman Road Switching Station, including the realignment of an approximate 260-foot span of the existing 345 kV 328 Line at the station.

Figure 1-1 provides an overview of the BIP location and alignment, Figure 1-2 provides a general site layout of the CREC, Figure 1-3 provides a schematic representation of the BIP, and Figures 1-4 through 1-6 provide the proposed transmission line cross sections for the BIP.

1.2 Identification of Applicant

This Application is a joint application between Clear River Energy LLC, with offices at One South Wacker Drive, Suite 1800, Chicago, Illinois 60606 for the CREC and The Narragansett Electric Company d/b/a National Grid with offices at 280 Melrose Street, Providence, Rhode Island 02907 for the Burrillville Interconnection Project (together, the "Applicant").

A letter of authorization has been provided by Algonquin Gas Transmission, LLC (the "Property Owner" of the Facility Site and CREC ROW) to the Applicant and RIDEM in order to authorize the Applicant to file for the necessary permits required for the development of the CREC and the portion of the BIP that is situated on property currently owned by Property Owner and that is the subject of the Land Option Purchase Agreement, dated December 19, 2014, between Invenergy Thermal Development LLC and Algonquin Gas Transmission, LLC. The remaining portion of the BIP is located entirely within property owned or controlled via easement by TNEC.

Invenergy

Invenergy is an independently owned company that develops, owns, and operates power generation and energy storage facilities across North America and Europe. Invenergy's expertise includes a complete range of fully integrated in-house capabilities, including project development, permitting, transmission, interconnection, energy marketing, finance, engineering, project construction, operations, and maintenance.

To date, Invenergy has developed over 13,700 MW of utility-scale renewable and natural gas-fueled power generation facilities across the United States, Canada, and Europe, including more than 9,300 MW of projects in operation and over 4,400 MW under contract or in construction.

TNEC

TNEC, a subsidiary of National Grid USA, is an electric distribution and transmission company serving approximately 465,000 customers in 38 Rhode Island communities. National Grid USA is a public utility holding company. Other subsidiaries of National Grid USA include operating companies such as New England Power Company, Massachusetts Electric Company, Nantucket Electric Company (in

Massachusetts), and Niagara Mohawk Power Corporation (in New York), as well as National Grid USA Service Company, Inc., which provides services such as engineering, facilities construction and accounting.

Project Team

This Application has been prepared by TNEC and Invenergy. Numerous employees and consultants retained by TNEC and Invenergy, including planners and engineers, contributed to the Application. The description of the affected natural resources and impact analyses were prepared by ESS Group, Inc. ("ESS") and POWER Engineers, Inc. ("POWER") for the CREC and BIP, respectively. HDR, Inc. ("HDR") is responsible for engineering and design of the CREC. POWER is responsible for engineering and design of the BIP. Gray and Pape is responsible for conducting the cultural resources assessment of both the CREC and BIP.

1.3 Project Purpose and Need

The purpose of the CREC is to help the New England Independent System Operator ("ISO-NE") meet its capacity, reliability, and operational requirements and needs for the regional electric supply and transmission network. Additionally, CREC will provide many benefits to the region including:

- Providing new highly advanced generating technology that will be one of the most efficient generators in New England, helping increase the regional electric generation efficiency which will help lower regional energy costs.
- Reducing regional air emissions and improving air quality by displacing older, less efficient and more polluting generation and through application of best available emission control technology, which will also help achieve state and federal goals of reducing emissions of greenhouse gas and other air pollutants.
- Modernizing the electric generating infrastructure by providing new, highly efficient generation that has fast start and high ramp rate (flexible) generating capability, replacing older, less flexible generation. The fast start and flexible generating capability will also help support the integration of new and existing renewable generation onto the power grid.
- Creating new employment for skilled local workers during construction and operation, as well as direct tax revenues and economic benefits to the Town of Burrillville and to local businesses.

The restructuring of New England's electric power industry in the late 1990s created an open, competitive wholesale electricity marketplace that is managed by the ISO-NE. The marketplace allows the ISO-NE to secure sufficient electricity and related services for the region at the lowest prices. The ISO-NE operates a Forward Capacity Market to ensure the reliability of the New England power supply and assign Forward Capacity Obligations ("FCO") to Generation Suppliers. The proposed Facility participated in the ISO-NE's tenth Forward Capacity Market auction ("FCA 10"). The process for the auction is to proceed in a manner that prices decline until the supply meets the required demand which establishes the clearing price and therefore the successful resources. One of the Facility's two generating units cleared in FCA 10, resulting in the award and assignment of a seven year FCO to CREC. The second unit will be bid into upcoming auctions to address need for new capacity that has been created by retirements of existing generators and the additional potential retirements of other generators in the New England market, as discussed in more detail below.

Rising costs associated with oil and coal relative to natural gas, combined with the advanced age of many of the power plants that use these oil and coal, make it difficult for these resources to safely continue operations and to compete against newer, more efficient natural gas generators. For this reason, coal and oil units are now run mainly to meet peak demand, when natural gas plants are unavailable, or during rare periods of time when natural gas price spikes surpass oil prices. The region's coal- and oil-fired generators represent about 28% of capacity in the region, but only produced about 6% of its electricity in 2014. Almost all the existing coal and oil facilities are close to or beyond their original design life. Additionally, most of these existing units are not located in an area where the existing natural gas supply infrastructure has adequate capacity to support their conversion to natural gas combined cycle technology. As a result, new units are being proposed in locations where sufficient supply of natural gas can be assured and where new generators can connect into the electric grid.

The performance of many existing fossil fuel power plants can be uncertain when called on, due to age and infrequent operation, posing risks to reliability. For example:

- Equipment issues can affect their performance when dispatched. Unexpected outages of older or poorly maintained units tend to increase during extreme cold conditions.

- They have long start-up times. In some instances, up to 24 hours are needed to reach full output, which makes it difficult for ISO-NE to rely on these resources.

Additionally, the Facility will help meet the needs of the region by being able to replace the capacity that will be lost by the recently announced retirements of units like Brayton Point and Pilgrim Nuclear Station.

Regional power markets have shifted in recent years in response to fast-changing supply and demand parameters. The ISO-NE regional transmission organization has identified issues in their capacity market designs that have led to inadequate peak generation capacity or failed to provide appropriate incentives for investment in flexible capacity. In the New England region, these problems have resulted in high-profile "narrowly missed catastrophic events" that have spurred market design changes.

The most significant of these proposals has been the new Pay-for-Performance Initiative ("PI") that alters how a generation resource's capacity payments are calculated. Approved in May 2014, the PI will influence bidding behavior in the market beginning in 2018. Capacity payments in ISO-NE will be subject to a two-settlement process, including a capacity base payment and an additional capacity performance payment that redistributes penalty payments from underperforming resources to over performing resources. These capacity performance payments will be allowed to be negative, creating a substantial financial penalty for underperformance in scarcity conditions.

In the long term, PI will result in a more efficient, flexible generation fleet with lower energy prices. Under the new regime, new, efficient units can meet this need based on their flexibility and low forced outage rates. Older units that exhibit less reliability and are more inflexible (e.g. existing coal, oil, and gas steam-fired units), that cannot respond to the market signals in a timely fashion, (and as such reduce reliability) will potentially be penalized. This new PI construct will likely result in accelerating the retirement of oil/gas steam capacity and incentivizing the construction of new, efficient units. In the long run, this dynamic should result in lower energy prices in ISO-NE, as more efficient units displace less economic generation. In the near- to medium-term though, the dynamic could result in periods of capacity shortfall and price spikes if the transition is not orderly. The CREC is well positioned to help

facilitate a smooth transition to the PI construct and enable the retirement of aging and inflexible coal and/or oil units.

The development of the CREC will have a long-term benefit on local and regional economies by increasing generation capacity throughout the ISO-NE network and reducing reliance on outdated, less efficient generation facilities and sources such as oil and coal. The Facility is projected to result in millions of dollars annually in cumulative energy savings for Rhode Island consumers. The CREC will significantly mitigate a shortfall in New England's energy grid that, according to ISO-NE, currently totals over 6,000 MW and could total 10,000 MW in the coming years. During construction, the CREC will directly create over 300 construction jobs, and will indirectly benefit the local economy as much of this income can be expected to be spent locally. In addition, the CREC will generate millions of dollars in tax revenue each year to the Town of Burrillville.

The BIP is necessary to connect the generating Facility to the New England electric system so that the electrical energy produced at the CREC can be delivered to the end user market. The CREC would be unable to operate or fulfill its purpose without the connection to the transmission grid provided by the new 345 kV transmission line and associated facilities.

2.0 PROPOSED CONSTRUCTION ACTIVITIES

2.1 Clear River Energy Center

2.1.1 Facility Description

The Clear River Energy Center is a combined-cycle electric generating Facility to be located south of the Algonquin Compressor Station site on Wallum Lake Road (State Route 100) in Burrillville, Rhode Island (see Figure 1-2 and Site Plans in Appendix A). The Facility will be configured as a two-unit, duct fired, combined cycle generation station. Each unit will consist of an advanced class General Electric model 7HA.02 gas turbine operated in a combined-cycle configuration with a heat recovery steam generator ("HRSG") equipped with natural gas fired duct burners and one steam turbine. The combustion turbine, steam turbine, and generator of each unit will be connected via a common shaft (single shaft). Each combustion turbine will fire natural gas as a primary fuel and ultra-low sulfur diesel ("ULSD") fuel as a backup fuel for limited periods when natural gas is unavailable. The ULSD will be stored in a single 2,000,000-gallon on-site storage tank. ULSD will be delivered to the Facility by truck. The natural gas supply for the Facility will be provided by pipeline from the adjacent Algonquin Compressor Station, operated by Spectra Energy.

The Facility will have a nominal power output at base load of approximately 1,080 megawatts ("MW") while firing natural gas (with supplementary HRSG duct firing) and 970 MW while firing ULSD.

Each unit will utilize air-cooled condensers ("ACC") to limit water usage and wastewater discharge. Water will be supplied from the Town of Johnston, Rhode Island under a long-term water supply agreement and delivered to the Facility via public roads by trucks owned and/or leased by the Facility.

The CREC is located in a forested, predominantly rural area. The 67 acres of land area will be purchased from Algonquin Gas Transmission, LLC and is a subset of a 730-acre site that Algonquin Gas Transmission, LLC owns that currently contains the Algonquin Compressor Station. The Facility will be constructed just south of the existing compressor station. The CREC will require a new roadway for access to the Facility which will be located south of, and parallel to, the existing

Algonquin Lane. The closest residences to the CREC Facility are approximately 1,800 feet to the northeast along Wallum Lake Road.

2.1.2 Structures

2.1.2.1 Primary Powerhouse Building

Each single-shaft combined cycle power train will be enclosed in a powerhouse building. The building will be designed to enclose the combustion turbine, steam turbine, single-shaft generator and associated ancillary equipment. The primary structure of this building will be approximately 202 feet long, 136 feet wide, and 80 feet tall and will include an overhead crane to facilitate equipment maintenance activities as well as equipment laydown areas for maintenance. A drive-through access road through this portion of the building will be available for component delivery and removal. In addition, the structure will include balance of plant equipment such as condensate pumps, air compressors, drains tanks and other equipment.

The combustion turbine exhaust will exit the north-west end of the building into a HRSG and stack, and the steam turbine exhaust will exit the southeast end of the building via an exhaust duct to each ACC.

The powerhouse building will be constructed of a steel structure with acoustically attenuated siding for noise control. The building and internal equipment components will be supported by suitable concrete foundations (mat, spread footing, etc.) bearing on existing soils or supported on deep foundations (piles, caissons, etc.).

2.1.2.2 Small, Auxiliary Buildings, Fuel Oil Equipment, & Electrical Equipment Buildings

In addition to the primary powerhouse buildings, the Facility will include the following smaller buildings:

- Administration and Controls/Warehouse Building – The administration and control portion of this building will house the plant control room, offices and meeting rooms for plant staff, locker rooms, restrooms, lunchroom, and service rooms for communications, electrical, control, and mechanical systems. The warehouse portion of the building will include an area to store spare parts, and a workshop area for performing maintenance of small equipment (such as motors and pumps).

- Auxiliary Boiler Building – This building will house the natural gas fueled auxiliary boiler to supply steam to the HRSGs during certain operating conditions (primarily during startup of the units). The auxiliary boiler building is located between the HRSGs of each unit.

- Fire Pump Building – This building will house the diesel fueled fire pump.

- Feed Water Pump Building – Boiler feed water will be supplied to the individual HRSGs by multiple large feed water pumps located in this building. This building will also include the closed cooling circulating water pumps. Each unit will include a dedicated feed water pump building.

- Water Treatment Building – Water filtration and demineralization equipment will be located in the water treatment building.

- Gas Compressor Building – The Facility gas compressor will be installed in this building. Natural gas will be compressed to satisfy the combustion turbine inlet pressure requirements.

- Fuel Oil Equipment Building – The equipment required to operate and maintain back up fuel oil operations shall be located in the fuel oil equipment building.

2.1.2.3 Storage Tanks

The Facility will include the following storage tanks:

- Fuel Oil Storage Tanks - The Facility will include one 2,000,000-gallon above ground ULSD storage tank equipped with secondary containment, as required by law. This welded steel tank will be approximately 50 feet tall and 90 feet in diameter.

- Demineralized Storage Tank – Demineralized water will be stored in a tank with a storage capacity of approximately 1,850,000 gallons. The tank will be approximately 55 feet tall and 85 feet in diameter.

- Wastewater Storage Tank – Blowdown from the HRSGs, evaporative coolers, and other wastewater from the Facility will be collected in an approximately 160,000-gallon wastewater storage tank. The tank will be approximately 30 feet tall and 30 feet in diameter.

- Fire Water / Service Water Storage Tank – Plant service water / fire water will be stored in a tank with a storage capacity of approximately 1,050,000 gallons. The tank will be approximately 49 feet tall and 68 feet in diameter.

- Ammonia Storage Tank – Part of the plant emissions control systems will include selective catalytic reduction systems for controlling NO_x emissions in the HRSGs. The SCR systems will use ammonia as a reagent. Aqueous ammonia will be stored at a concentration less than 20% in a storage tank with a storage capacity of approximately 27,000 gallons.

2.1.2.4 Switchyard

Each combined cycle unit will have a generator step-up ("GSU") transformer to increase the voltage from the generator voltage to 345 kV. The GSU transformers will be connected to the Facility switchyard located along the western edge of the site via underground cable duct banks. The Facility switchyard will occupy a footprint of approximately 370 feet by 155 feet and will be configured as a 345 kV three-breaker collector bus switchyard. The switchyard will be separately fenced and will include a separate enclosure for control equipment and auxiliary power systems. An overhead 345 kV transmission line exits the switchyard and runs along new CREC and existing TNEC ROW interconnecting at the TNEC Sherman Road Switching Station, as described in detail in Section 2.3.

2.1.2.5 Appurtenant Equipment

The following is a list of appurtenant equipment and systems:

- Standby diesel generator – The Facility will include a 2 MW standby diesel generator.
- Natural gas system - A natural gas fuel yard will be installed at the Facility that includes fuel gas filters, fuel gas dew point heaters, gas regulation trains and flow meters, and a gas compressor.
- Duct burner fuel skids – Each HRSG will be equipped with a dedicated natural gas control and regulation skid to reduce pressure and measure and modulate gas flow to the duct burners.
- Hydrogen tube trailer – The unit generators will use gaseous hydrogen for cooling and heat rejection. Truck trailer mounted hydrogen tube racks will be used for on-site hydrogen storage and makeup to the generators. Alternately, a hydrogen generator may be used for this purpose.
- Wastewater – Process wastewater generated by the Facility will be collected and recycled to the extent possible. Any remaining process wastewater will be stored and trucked for offsite disposal at a properly authorized Facility. Sanitary wastewater will be collected and will be treated on site within a permitted on-site wastewater treatment system ("OWTS").
- Balance of Plant Electrical – Balance of plant electrical systems (medium and low voltage transformers, switchgear and distribution systems) will be installed in an enclosure adjacent to each combined cycle unit. These systems will be energized by the station auxiliary transformers that will reduce voltage from the generator voltage to the appropriate medium voltage.

2.1.2.6 Cooling Systems

The CREC has been configured to use dry cooling to reduce the amount of water use and wastewater generation by more than 90% from that which would have otherwise been required if a more conventional wet cooling tower had been selected. Most power plants in New England use wet cooling and as a result consume considerably more water per MW of electricity generated. Invenergy has selected the dry cooling system for this site to minimize water use. The Facility has been configured to use dry-type heat rejection systems using an ACC. Each combined cycle unit will have a dedicated ACC and associated subsystems and piping. Steam turbine exhaust steam will be ducted through large horizontal ducts feeding several vertical risers on each ACC. Each riser will deliver steam to a distribution manifold that will run horizontally along the top of a row of finned tube air-cooled heat exchangers arranged in an A-frame configuration. Fans will be used to move ambient air over the finned tubes causing the steam to condense releasing heat to ambient air and the condensate will be drained back to the condensate collection system. Each ACC will occupy a footprint of approximately 305 feet by 130 feet and be approximately 110 feet tall.

The Facility will also include air cooled closed cycle cooling water heat exchangers (one for each combined cycle unit) to reject heat from various auxiliary systems such as lube oil and hydrogen cooling. The heat exchanger will use fans to move ambient air over the finned tubes carrying the hot closed cycle cooling water.

2.1.3 Identification of Support Facilities and Accessibility

2.1.3.1 Roads

A new roadway (approximately 2,100 feet in length) will connect the Facility to Wallum Lake Road (Route 100). This roadway is designed as a Class A road to handle equipment loads during and after plant construction. The location of the proposed roadway is shown on Figure 1-2.

2.1.3.2 Gas Line

Natural gas will be delivered to the Facility from the neighboring gas compression station north of Algonquin Lane. Gas delivery pressure varies throughout the year and its range in supply pressure is estimated to be between 450-900 psig. The Facility design includes natural gas compressors to boost and maintain gas pressure at approximately 600 psig necessary for combustion turbine operation, dew point heaters, and other associated equipment. The preliminary route of the 850-foot long 16-inch diameter natural gas pipeline from the Algonquin Compressor Station to the Facility is shown on Figure 1-2. The route of the gas pipeline is outside of jurisdictional wetland limits.

2.1.3.3 Electric Transmission and Interconnection

The Facility will connect to the TNEC electric utility system at the existing Sherman Road Switching Station via the 3052 Line (see Figure 1-1, Project Locus Map). A more detailed discussion is provided in Section 2.3.

2.2 Water Supply and Wastewater Treatment

Process water will be supplied from the Town of Johnston, Rhode Island under a long-term water supply agreement and delivered to the Facility via public roads by trucks owned and/or leased by the Facility. Back-up or contingent water will be supplied by private trucking supplier(s) who draw their water from the Town of Johnston and/or other potable water sources. See Appendix N, Water Supply Plan.

Drinking water for the Facility will be supplied by an on-site well proposed near the entrance from Wallum Lake Road (see Figure 1-2). A supply line from the well to the Facility will be contained within the roadway.

Process wastewater generated by the Facility will be collected and recycled to the extent possible. Any remaining process wastewater will be stored for off-site disposal at an authorized Facility. Sanitary wastewater will be collected and treated within the OWTS. The location of the OWTS is shown in Appendix A. The OWTS will comply with State standards, rules and regulations and will be permitted via a separate application that has been submitted to the RIDEM Office of Water Resources.

2.3 Burrillville Interconnection Project

The Applicant is proposing to construct the 3052 Line for the purpose of interconnecting the CREC to the existing electric transmission network (see Figure 1-1, Project Overview Map). The 3052 Line will be built within the CREC and TNEC ROWs. The TNEC ROW is currently occupied by two 345 kV transmission lines, designated as the 341 and 347 Lines. The 341 Line is primarily supported by steel H-frame structures, with a typical height of approximately 88 feet. The 347 Line is currently primarily supported by wooden H-frame structures, with a typical height of approximately 78 feet. The components of the BIP are as follows:

- Construct a new 6.8-mile 345 kV transmission line between the CREC and the Sherman Road Switching Station, which includes modifications to the 341 and 347 Lines. The BIP ROW consists of the following three segments:
    - Segment 1 – CREC ROW from the CREC to the TNEC ROW (0.8 miles in length)
    - Segment 2 – TNEC ROW from the junction of CREC ROW to a point 0.19 mile west of the Clear River (1.6 miles in length)
    - Segment 3 – TNEC ROW from 0.19 mile west of the Clear River to the Sherman Road Switching Station (4.4 miles in length)
- Improvements to the existing Sherman Road Switching Station, including the realignment of an approximate 260-foot span of the existing 345 kV 328 Line at the station.

The new transmission structures will be weathering steel and the new Sherman Road Switching Station termination structures will be galvanized steel. The new transmission line will be three phases of bundled 1,590 kcmil (one thousand circular mils) 54/19 “Falcon” aluminum conductor steel reinforced (“ACSR”) with two overhead shield wires.

2.3.1 Segment 1- 0.8 Miles on CREC ROW

Segment 1 of the 3052 Line is the entire length of the CREC ROW. The Applicant proposes to construct eight H-frame structures to support the new line. The CREC ROW will be 250-feet wide, of which approximately 150 feet will be cleared for the 3052 Line (refer to Figure 1-4, Typical ROW Cross-Sections). The typical height of the structures in Segment 1 will be 86 feet. The new 3052 Line will connect into the switching station located at the CREC.

An initial alignment considered for the CREC ROW connected to the existing TNEC ROW at a Point of Intersection (P.I.) or pronounced angle in the TNEC ROW, located to the southwest of the currently proposed alignment. Subsequently, the New England ISO completed their Feasibility Study, which determined that a new line was required to connect the CREC to the Sherman Road Switching Station in lieu of looping in one or both existing transmission lines. This mandate prompted further design refinements for both the CREC and TNEC ROWs. One design refinement resulted in a northerly shift in the CREC ROW to maintain average span lengths between transmission line structures. The initial alignment would have required the installation of additional structures or modifications to existing structures likely resulting in taller, more visible structures. Connecting the CREC ROW to the TNEC at the P.I. would also increase electric system reliability exposures due to the need to schedule additional outages of the existing bulk power transmission lines. In addition, installing additional structures would increase the project’s material and construction costs, increase visibility of the new structures, and increase long-term maintenance costs.

The refined alignment also avoids a Rhode Island Historical Preservation and Heritage Commission (“RIHPHC”) designated cultural resource (cellar foundation) site RI-2758 as well as one isolated wetland, both of which are located within the previous alignment. The refined alignment does cross another wetland but at a location previously disturbed by an existing woods road.

2.3.2 Segment 2 - 1.6 Miles on TNEC ROW

Segment 2 consists of 1.6 miles of the TNEC ROW running northeasterly from the CREC ROW to a point 0.19 miles west of the Clear River. The TNEC ROW is 300-feet wide in Segment 2. The existing 347 and 341 Lines will be reconfigured to provide space for the 3052 Line (refer to Figure 1-4, Typical ROW Cross-Sections). Specifically, the 341 Line will be shifted north onto new steel monopole structures that will be approximately 110-feet tall. The existing structures and wires of the 341 Line located to the north will become the 347 Line. The existing 347 Line will be removed and replaced with new steel H-frame structures, conductors, shield wire and Optical Ground Wire ("OPGW") for the 3052 Line. The new H-frame structures will be approximately 88-feet tall. A 55-foot width of trees and vegetation will be cleared along the northerly side of the TNEC ROW in Segment 2 to accommodate the new 341 Line structures; however, no new property rights will be needed.

2.3.3 Segment 3 - 4.4 Miles on TNEC ROW

Segment 3 consists of 4.4 miles of the TNEC ROW from a point 0.19-miles west of the Clear River to the existing Sherman Road Switching Station. The TNEC ROW is 500-feet wide in Segment 3. The 3052 Line will be located to the south of the existing lines within the existing TNEC ROW and will be supported by 35 new H-frame structures approximately 88 feet in height. The Applicant will clear an 85-foot wide swath of trees and vegetation along the southerly side of the ROW in Segment 3 to accommodate the new transmission line structures (see Figure 1-4, Typical ROW Cross-Sections).

2.3.4 Pipeline Access Crossing Improvements

A permanent access road crossing of the two existing Algonquin Gas Transmission ("AGT") natural gas pipelines is planned on the CREC ROW between transmission structures 3052-004 and 3052-005, where the two natural gas pipelines are located within a 75-foot wide easement. A 24-inch pipeline, which was commissioned in 1952, is located on the north side of the easement, and a 30-inch pipeline, commissioned in 1956, occupies the south side of the easement. The purpose of the improved crossing is to provide a permanent and safe means for crossing the pipelines to access the electric transmission line structures, while also to protect the integrity and safe operation of the underground pipelines from heavy equipment crossings.

Similar pipeline crossings have been installed by AGT where AGT and TNEC facilities intersect on the ROW. Improvements will include armoring of the existing pipelines in accordance with the following general procedures (Refer to Appendix A):

- The centerlines of the pipelines will be located and marked in the field.
- The work area will be flagged and appropriate soil erosion and sediment controls will be installed.
- Each pipeline will be excavated along the previously disturbed trench lines, and each pipeline will be inspected to verify the condition of the coating on the pipeline and the existing backfill surrounding the pipeline.
- The pipeline coating will be repaired as necessary, and any rocks or other unsuitable backfill discovered around the pipelines will be removed from the pipeline trench. Suitable padding material/ backfill will be placed around and on top of the pipelines.

- An interlocking row of pre-manufactured concrete slabs will be placed over each pipeline and then backfilled with compacted fill to provide the minimum depth of cover required over the pipelines, and to meet the approximate existing grade.
- Excess soils will be removed from the crossing location and either spread out in an upland area on the ROW adjacent to the crossing or hauled off-site for disposal/ re-use.
- Once the pipeline crossings are armored, above-ground markers and signage will be installed to identify the crossing.
- Disturbed areas will be lightly graded, and stabilized with seed and mulch.

Each pipeline will be armored for a length of approximately 48 feet. The full width the existing 75-foot wide pipeline easement will be improved by placing a layer of dense grade gravel at the crossing.

The armoring of the pipelines and reinforcement of the crossings on the CREC ROW are expected to result in approximately 3,600 square feet of disturbance within the perimeter wetland associated with the portion of Wetland 2 contained within the AGT ROW. The work activity on the two pipelines is to occur within the previously disturbed 75-foot wide AGT ROW. There will be an additional small, permanent disturbance in the adjacent biological wetland to accommodate the installation of a rock ford to allow for the continued flow of an intermittent watercourse that has developed within the limits of the previously disturbed pipeline ROW.

2.3.5 Upgrades to Sherman Road Switching Station

The upgrades to the Sherman Road Switching Station will occur within the existing fence line. The improvements include the construction of: (i) a new bay southeast of the existing station bays together with two additional breakers and associated disconnect switches; and (ii) a new termination structure.

Work at the Sherman Road Switching Station also involves realigning an approximate 260-foot span of the existing 328 Line. A new structure will be installed outside the station fence line. The 328 Line will be transferred onto the new structure and enter into the new bay position proposed for the station.

3.0 DESCRIPTION OF GENERAL ENVIRONMENTAL SETTING

3.1 Clear River Energy Center

3.1.1 Topography and Drainage Basins

The elevation of the proposed 67-acre generating Facility Site varies from approximately 585 to 530 feet above sea level, with the parcel generally sloping downward from northwest to southeast. The average grade on the property is 5.5% and is located within the Clear River sub-basin (HUC 12), which is part of the larger Lower Blackstone River watershed (HUC 10). The majority of the Facility Site drains in a generally northwest to southeast direction toward Iron Mine Brook. The western edge of the Facility Site drains toward a broad wetland containing Dry Arm Brook, which flows generally in a northern direction. Both watercourses ultimately drain across Wallum Lake Road and into Wilson Reservoir. Except for tributaries to the two main watercourses, no other surface water bodies exist on the Facility Site.

3.1.2 Geology and Soils

The bedrock on the Facility Site is mapped within the West Bay Area of the Esmond-Dedham Subterrane and is located approximately 1,600 feet to the east of the Hope Valley Shear Zone. The Hope Valley Shear Zone is a mapped Alleghanian strike-slip fault that marks the boundary between the Esmond-Dedham Subterrane and the Hope Valley Subterrane. A strike-slip fault is a fault on which the movement is parallel to the fault's strike. The Alleghanian orogeny or Appalachian orogeny is one of the geological mountain-forming events that formed the Appalachian Mountains. The Alleghanian orogeny occurred approximately 325 million to 260 million years ago over at least five deformation events. The underlying bedrock beneath the property is mapped as the Augen Granite Gneiss (Zeag) member of the Esmond Igneous Suite. This late Proterozoic formation consists mostly of augen granite gneiss, a pale to dark grey medium- to coarse-grained igneous unit characterized by large (>1 centimeter) lenticular feldspar porphyroclasts called augen. The formation also includes structurally conformable layers of amphibolite.

The Wisconsin glaciation period was predominantly responsible for the surficial geology of the region. This mile-thick sheet of ice reached its southernmost extent in Long Island, New York approximately 20,000 years ago.

The Facility Site is comprised of predominantly glacial till. Glacial till is material carried and directly deposited by glacial ice with little or no reworking by running water. Therefore, this material is not well-sorted and the stones are not well-rounded. Glacial till is non-stratified glacial drift consisting of clay, silt, sand, stones, and boulders transported and deposited by glacial ice. Glacial till was deposited by both the advancing and retreating ice sheet, often directly on the underlying bedrock. The surficial geology on the Facility Site is mapped predominantly as Till and Bedrock Uplands and the surficial deposits on the property are likely dominated by glacial till. Swamp and wetland deposits (typically organic peat deposits and organic silts) are associated within the mapped wetland areas.

Two major soil map units are present within the Facility Site according to the data available from NRCS. The classification follows that published in the Soil Survey of Rhode Island (Rector, 1981) and online (http://websoilsurvey.nrcs.usda.gov).

Ridgebury, Whitman, and Leicester Series

The Ridgebury, Whitman and Leicester series are commonly grouped together as one soil complex due to their similar properties. However, they are distinct series with individual classifications. The Ridgebury series is classified as coarse-loamy, mixed, mesic Aeric Fragiaquepts, the Whitman series is classified as coarse-loamy, mixed, mesic Humic Fragiaquepts and the Leicester series is classified as coarse-loamy, mixed, acid, mesic Aeric Haplaquepts. Ridgebury and Leicester soils are poorly drained and Whitman soils are very poorly drained. Whitman and Leicester have a dense till layer within one meter of the soil surface. These soils are formed in loamy glacial till derived mainly from schist, gneiss and granite. These soils are in depressions, drainage ways in glacial till uplands, and nearly level areas of glacial upland hills and drumlins.

Woodbridge Series

The Woodbridge series is classified as coarse-loamy, mixed, mesic Typic Fragiochrepts. These moderately well drained soils are formed in glacial till derived mainly from schist, gneiss, and phyllite. The soils are on lower slopes and crests of upland hills and drumlins.

Ridgebury, Whitman, and Leicester extremely stony fine sandy loams include hydric soil components as summarized in the following table. Mapped hydric soil units can be an indicator of the presence of regulated wetland resources. Portions of the roadway are located within mapped hydric soils (Figure 3-1, Property Wetlands Data).

Table 3-1: List of Soil Map Units at the Proposed Facility Site

Map Unit Symbol	Map Unit Name	Hydric Soil	Landforms
Rf	Ridgebury, Whitman, and Leicester extremely stony fine sandy loams; 0 to 3 percent slopes	Y	Depressions and drainageways
WoB	Woodbridge very stony fine sandy loam; 0 to 8 percent slopes	N	Side slopes and crests of hills

Farmland of statewide importance is land that is designated by the RIDEM Department of Administration Division of Planning used to produce food, feed, fiber, forage, and oilseed crops. Generally, farmlands of statewide importance include those lands that do not meet the requirements to be considered prime farmland, but that economically produce high crop yields when treated and managed with modern farming methods. Some may produce as high a yield as prime farmland if conditions are favorable. Neither of the soil map units within the Facility Site are designed as farmland soils of statewide importance.

3.1.3 Description of Landscape Context

The Facility Site is generally surrounded by dense forested vegetation, with the exception of the existing Algonquin Compressor Station to the north of the Site and residential development along Wallum Lake Road to the east. The Facility Site is located to the southwest of Wallum Lake Road (State Route 100), to the northeast of Jackson Schoolhouse Road, is immediately north of George Washington State Park, and is approximately 1.5 miles southeast of Buck Hill Management Area. A woods road bisects the Facility Site in both a generally north-south and east-west direction. The eastern end of the woods road is located at the intersection with Wallum Lake Road, the western end at the existing AGT ROW. The Facility Site contains a mix of forested upland and wetland habitats; according to the Rhode Island Ecological Communities Classification (Enser et al. 2011), the primary vegetative community types present at the Facility Site are: mixed deciduous/coniferous forest, oak forest, tree plantation, forested swamp, and shrub swamp.

3.1.4 Description of Wetlands and Watercourses

3.1.4.1 Wetland Delineation Methodology

Desktop Review

ESS reviewed existing desktop data sources prior to conducting the field investigation to determine the general extent of wetlands and streams in the entire AGT parcel. Desktop data sources included a review of National Wetlands Inventory (“NWI”) maps from the U.S. Fish and Wildlife Service (“USFWS”), RIDEM mapped wetlands, Natural Resources Conservation Service (“NRCS”) soils maps, and Federal Emergency Management Agency (“FEMA”) flood mapping data.

National Wetlands Inventory Maps

NWI wetlands are mapped and classified by USFWS in accordance with the Classification of Wetlands and Deepwater Habitats (Cowardin et al. 1979). Wetlands are classified by dominant plant community (hydrophytes), soils (hydric soils), and frequency of flooding. Based on the

NWI mapping, three different forested wetland types are located at the Facility Site including the following:

- PFO4E: A seasonally flooded/saturated needle-leaved evergreen palustrine forested wetland.
- PFO1E: A seasonally flooded/saturated broad-leaved deciduous palustrine forested wetland.
- PFO4/1E: A seasonally flooded/saturated mixed needle-leaved evergreen and broad-leaved deciduous palustrine forested wetland.

According to the NWI, the proposed Facility and roadway is located outside of mapped wetlands (see Figure 3-1, Property Wetlands Data).

Rhode Island Department of Environmental Management Wetland Maps

Freshwater wetlands in Rhode Island were mapped based on interpretation of aerial photographs collected in 1988. According to the RIDEM wetland maps, three RIDEM mapped wetlands are located at the proposed Facility Site. These wetlands are classified as deciduous forested wetland and coniferous-forested wetland. In general, the RIDEM mapping does not identify wetland resources at the location of the proposed Facility Site and roadway.

Field Delineation

ESS wetland scientists completed a delineation of wetlands and streams at the proposed Facility Site in the fall of 2014 and spring of 2015. Wetlands were delineated in accordance with the 1989 Federal Manual for Identifying and Delineating Jurisdictional Wetlands and the Regional Supplement. Wetland Delineation Forms are provided in Appendix C. Representative Photographs of delineated wetlands and streams have been provided in Appendix D. The majority of the delineated wetland edges at the Facility Site were officially verified by a RIDEM biologist on January 28, 2016 via RIDEM Application No. 15-0239.

Wetlands and soils mapping, along with field observations of vegetation types, soils and surface hydrology, were used to locate areas for evaluation. At each evaluation area, three parameters were considered to document whether the sample point was within a wetland: (1) a predominance of hydrophytic vegetation, (2) the presence of hydric soils, and (3) the presence of wetland hydrology. Details regarding the application of these techniques are provided below.

Hydrophytic Vegetation: The hydrophytic vegetation criterion is satisfied at a location if more than 50% of all the dominant species present within the vegetation unit have a wetland indicator status of obligate (“OBL”), facultative wetland (“FACW”), or facultative (“FAC”). An OBL indicator status refers to plants that have a 99% probability of occurring in wetlands under natural conditions. A FACW indicator status refers to plants that usually occur in wetlands (67% to 99% probability) but occasionally are found elsewhere. A FAC indicator status refers to plants that are equally likely to occur in wetlands or elsewhere (estimated probability 34% to 66% for each).

Hydric Soils: The hydric soil criterion is satisfied at a location if soils in the area can be inferred or observed to have a high groundwater table, if there is evidence of prolonged soil saturation,

or if there are any indicators suggesting a long-term reduced environment in the upper 18 inches of the soil profile. Hydric soil indicators from the Regional Supplement were used to identify whether a particular soil observed within a sample location met the hydric soil criteria.

Wetland Hydrology: The wetland hydrology criterion is satisfied at a location based on conclusions inferred from field observations that indicate that an area has a high probability of being inundated or saturated (flooded, ponded, or tidally influenced) long enough during the growing season to develop anaerobic conditions in the surface soil environment, especially within the root zone.

In addition, ESS classified each delineated wetland according to criteria outlined by Cowardin, et al, 1979, in Classification of Wetlands and Deepwater Habitats of the United States.

Wetlands were identified in the field by marking the wetland boundary with pink flagging, labeled "WETLAND DELINEATION." Each flag was labeled in consecutive order. Flags were tied so that each flag was visible from the flag tied previously.

Delineated Wetland Resource Areas

ESS delineated four jurisdictional wetlands (Wetlands 1, 2, 3, and 4) within a larger CREC Study Area, which included both the CREC Facility and the CREC ROW (see Figure 1-2). Wetland 1, 2 and 3 are greater than three acres in size, and therefore have associated 50-foot perimeter wetlands, which begin at the wetland edge per the RIDEM Wetland Regulations. The following narrative describes the wetland resource areas present at the Facility Site with respect to their geographic setting, hydrology, vegetation, habitat, soil types, and adjacent upland areas, and provides a rationale for the delineation of these wetlands in the field. Appendix E provides a list of vegetation and relative abundance. Wetlands 3 and 4 and a portion of Wetland 2, are associated with the alignment of the proposed transmission ROW. However, the descriptions of all four are provided below since they were part of the same survey effort.

3.1.4.2 Wetland 1

Wetland 1 is located to the east of Wallum Lake Road, at approximate elevation 550 to 560 feet above sea level. Wetland 1 is set in a series of topographic depressions and drainageways down-gradient to the east and southeast to the intermittent and perennial streams that flow through the wetland. Wetland 1 is located to the southwest of Wallum Lake Road and to the southeast of Algonquin Lane. The center of Wetland 1 is located approximately 1,500 feet to the southeast of the Algonquin Compressor Station.

The primary surface hydrologic feature in this wetland is Iron Mine Brook, a perennial stream that flows in a northeasterly direction through the southern portion of Wetland 1 at the Facility Site. In its reach through the Facility Site, Iron Mine Brook is a small lower perennial stream (R2) with a sandy bottom. Iron Mine Brook flows beneath Wallum Lake Road to the east of the Facility Site via twin 2.5-foot diameter RCP culverts. Where it passes through the Facility Site, Iron Mine Brook is approximately 10 to 12 feet wide; it therefore has an associated 200-foot Riverbank Wetland per the RIDEM Wetland Regulations.

Two intermittent streams (R4) are also present within Wetland 1. Both of these streams originate north of the Facility Site and flow under Algonquin Lane via small culverts. The two

streams meet in the northeastern portion of Wetland 1 and flow south, passing through an approximately 18-inch metal pipe culvert under the woods road, until ultimately reaching Iron Mine Brook. These streams average significantly less than 10-feet wide in their reach through the Facility Site; they therefore have an associated 100-foot Riverbank Wetland per the RIDEM Wetland Regulations.

Seasonal saturation to the surface is present throughout much of Wetland 1, and was observed at both wetland edge delineation data form plots. The plot located along the western edge of Wetland 1 also featured a high water table, with free water present at 4 inches below the surface. Other indicators of hydrology present throughout Wetland 1 include water-stressed trees, water-stained leaves, drainage pathways, and hummock-and-pool microtopography.

Wetland 1 is classified as a seasonally flooded/saturated palustrine broad-leaved deciduous forest (PFO1E). Wetland 1 is a mature forest with trees 18 to 24 inches diameter at breast height ("dbh") and 50 to 60 feet tall. The primary tree species present within Wetland 1 are red maple (*Acer rubrum*) and red oak (*Quercus rubra*), with white pine (*Pinus strobus*) also present to a lesser extent. The dominant shrub species within this wetland are sweet pepperbush (*Clethra alnifolia*), highbush blueberry (*Vaccinium corymbosum*), witch hazel (*Hamamelis virginiana*), and mountain laurel (*Kalmia latifolia*). Primary groundcover species are cinnamon fern (*Osumundastrum cinnamomeum*), New York fern (*Thelypteris noveboracensis*), threeleaf goldthread (*Coptis trifolia*), Canada mayflower (*Maianthemum canadense*), and peat moss (*Sphagnum* sp.). Fringed sedge (*Carex crinata*) and greenbrier (*Smilax rotundifolia*) are also common in some areas.

Wetland 1 is mapping by NRCS as primarily Ridgebury, Whitman, and Leicester extremely stony fine sandy loams and to a lesser extent Woodbridge very stony fine sandy loam. The Ridgebury, Whitman, and Leicester map unit is classified as hydric, while the Woodbridge map unit is not. Soil data was recorded at the two data points within Wetland 1.

The wetland soil core recorded at the delineation plot in the western end of Wetland 1 had a three-inch subsurface layer of organic duff. Below this organic layer, the soil core contained three inches of black fine sandy loam (2.5/N), underlain by six inches of light gray silty fine to medium sand (10YR 7/1). A matrix value of 5 or more and a chroma 1 (with or without redoximorphic features) meets the definition of a depleted matrix. At twelve inches and deeper, the soil in this location was a light yellowish brown silty medium to coarse sand (10YR 6/4). The hydric soil indicators from the Regional Supplement present at this location include A11 and F3:

- A11: Depleted below dark surface - A layer with a depleted or gleyed matrix that has 60% or more chroma of 2 or less, starting within 12 inches of the soil surface, and having a minimum thickness of 6 inches.
- F3: Depleted Matrix - A layer that has a depleted matrix with 60 percent or more chroma of 2 or less and that has a minimum thickness of either:
    - 2 inches if the 2 inches is entirely within the upper 6 inches of the soil, or
    - 6 inches starting within 10 inches of the soil surface.

The wetland soil core recorded at the delineation plot in the eastern end of Wetland 1 contained a two-inch layer of subsurface organic duff. Below this layer was a four-inch layer of dark brown medium sand (7.5YR 3/3), followed by a two-inch layer of brown fine sandy clayey loam (7.5YR 5/2). From 8 to 22 inches below the surface, the soil was a black fine sandy loam (7.5YR 2.5/1). While the delineation plot clearly supports wetland hydrology, the soil profile does not meet any hydric soil criteria. This is attributed to past disturbance, which has buried the former black fine sandy loam (7.5YR 2.5/1) surface horizon. Past disturbance along the upstream stream channel is likely responsible for this sediment accumulation.

The upland areas adjacent to Wetland 1 are characterized as mixed oak-pine woodland. The primary tree species in these areas are red oak, white oak (*Quercus alba*), white pine, and red maple. The shrub layer is similar to adjacent wetland areas, and is comprised primarily of mountain laurel, witch hazel, highbush blueberry, lowbush blueberry *(Vaccinium angustifolium*) and sweet pepperbush, with tall huckleberry (*Gaylussacia frondosa*) also present in some areas. The dominant groundcover species are lowbush blueberry, sweet pepperbush seedings, Canada mayflower, cinnamon fern, and greenbrier.

The upland soil core recorded at the delineation plot in the western edge of Wetland 1 had a three-inch layer of subsurface organic duff, followed by a 6-inch layer of dark gray fine sandy loam (10YR 4/1). Below this was a 7-inch layer of grayish brown fine sandy loam (10YR 5/2). From 16 to 30 inches below the surface, the soil was a light yellowish brown silty fine sand (10YR 6/4). This horizon also featured approximately 10% brownish yellow redoximorphic features (10YR 6/8).

The upland soil core recorded at the delineation plot in the eastern edge of Wetland 1 had a one-inch layer of subsurface organic duff, followed by a 1-inch layer of dark yellowish brown clayey loam (10YR 3/6). From 2 to 18 inches below the surface, the soil was a yellowish brown clayey loam (10YR 5/6), and from 18 to 29 inches below the surface was a yellowish brown find sandy clayey loam (10YR 5/6).

3.1.4.3 Wetland 2

Wetland 2 is located along the western boundary of the Facility Site, at approximate elevation 560 to 570 feet above sea level. Wetland 2 is set in a large topographic depression and drains down-gradient to the north. The western branch of Wetland 2 drains via the perennial stream located in that branch of the wetland. Wetland 2 is located to the southeast of the existing AGT ROW, and the center of Wetland 2 is located approximately 1,500 feet to the southwest of the Algonquin Compressor Station.

The primary surface hydrologic feature of this wetland is an unnamed perennial stream which flows through the western branch of Wetland 2 in a generally northeasterly direction toward Dry Arm Brook. In its reach through the proposed Facility Site, this stream is a small lower perennial stream with a sandy and muddy bottom (R2). Where it passes through the proposed Facility Site, this stream averages significantly less than 10-feet wide; it therefore has an associated 100-foot Riverbank Wetland per the RIDEM Wetland Regulations.

Three other small intermittent streams (R4) were identified within Wetland 2. Two of these streams meet the unnamed perennial tributary to Dry Arm Brook located in the western branch of Wetland 2. The third is a small channel that flows north across the woods road through the

eastern branch of Wetland 2. Beyond the woods road the flow becomes highly diffuse with no obvious channel present. Each of these streams average significantly less than 10 feet wide in their reaches through the Facility Site, and therefore have associated 100-foot Riverbank Wetlands per the RIDEM Wetland Regulations. The locations of these streams are given in Figure 1-2.

Surface saturation is present throughout much of Wetland 2. Soils were saturated within 8 to 12 inches of the surface at each of the three wetland edge delineation data form plots and are saturated at the surface throughout most of the interior wetland. The plot located along the eastern edge of the eastern branch of Wetland 2 also featured a high water table, with free water present at 10 inches below the ground surface. Other indicators of hydrology present throughout Wetland 2 include water-stressed trees, water-stained leaves, drainage pathways, and mound-and-pool microtopography.

Wetland 2 is classified as a seasonally flooded/saturated palustrine needle-leaved evergreen forest and a seasonally flooded/saturated palustrine broad-leaved deciduous forest (PFO4/1E). The eastern branch of Wetland 2 is a mature forest, with trees approximately 18 to 24 inches dbh and 50 to 60 feet tall. The western branch is somewhat of a younger forest, with trees approximately 10 to 14 dbh and 40-50 feet tall. The primary tree species in Wetland 2 are red maple, red oak, yellow birch (*Betula alleghaniensis*), black birch (*Betula lenta*), and white pine. The shrub layer of Wetland 2 is similar to that of Wetland 1, and is composed primarily of sweet pepperbush, highbush blueberry, witch hazel, and mountain laurel. The groundcover layer is also similar to that of Wetland 1, and is made up of sweet pepperbush seedlings, cinnamon fern, New York fern, threeleaf goldthread, and peat moss.

A stand of mature eastern hemlocks (*Tsuga canadensis*) is present in the northeastern branch of Wetland 2. This area is characterized by relatively low floral species diversity due to the dense shading of the understory; mountain laurel and peat moss are the only other primary plant species in this area.

Wetland 2 extends across the existing AGT ROW. Within the Algonquin ROW, Wetland 2 is a scrub-shrub/emergent wetland characterized by a plant community that includes highbush blueberry, sweet pepperbush, maleberry (*Lyonia ligustrina*), meadowsweet (*Spiraea tomentosa*), broom sedge (*Carex scoparia*), shallow sedge (*Carex lurida*), slender rush (*Juncus tenuis*), Canadian rush (*Juncus canadensis*), false oat-grass (*Arrhenatherum elatius*), deer-tongue (*Dichanthelium clandestinum*), and round-leaved sundew (*Drosera rotundifolia*). The ROW is subject to periodic vegetation maintenance. Groundwater discharge from fractured bedrock (blasted during the pipeline installation) is common and supports flow within a poorly defined intermittent channel.

Wetland 2 is located primarily in two soil map units, both of which are classified as hydric: Ridgebury, Whitman, and Leicester extremely stony fine sandy loams and Freetown muck. Fringe portions of Wetland 2 are also mapped by NRCS as non-hydric map units including Sutton very stony fine sand loams, Woodbridge very stony fine sandy loam, and Canton and Charlton very stony fine sandy loams. Soil data was recorded at three data points within Wetland 2.

The wetland soil core recorded at the delineation plot in east edge of the western branch of Wetland 2 contained a 2-inch layer of subsurface organic duff material. From 2 to 8 inches below the surface, the soil was a black fine sandy loam (2.5/N). From 8 to 15 inches below the surface, the soil was a light gray silty fine to medium sand (10YR 7/2) with 10% yellow redoximorphic features (10YR 7/8). From 15 to 22 inches below the surface, the soil was a light gray silty fine to medium sand (10YR 7/2) with 20% yellow redoximorphic features (10YR 7/8). The hydric soil indicators from the Regional Supplement present in this soil core include A11 and F3.

The wetland soil core recorded at the delineation plot in the west edge of the eastern branch of Wetland 2 had a 4-inch layer of organic duff material below the surface. From 4 to 10 inches below the surface, the soil was a black fine sandy loam (2.5/N). From 10 to 19 inches below the surface, the soil was a dark grayish brown fine to medium sandy loam (10YR 4/2). From 19 to 23 inches below the surface, the soil was a gray fine to medium sandy loam (10 YR 6/1) with 20% yellow redoximorphic features (10YR 7/6). The hydric soil indicators from the Regional Supplement present in this soil core include A11 and F3.

The wetland soil core recorded at the delineation plot in the east edge of the eastern branch of Wetland 2 had a 2-inch layer of subsurface organic duff. From 2 to 7 inches below the surface, the soil was a black fine sandy loam (2.5/N). From 7 to 18 inches below the surface, the soil was a gleyed, greenish gray medium to coarse sand (5/10Y). The hydric soil indicators from the Regional Supplement present in this soil core include A11 and F2:

- F2: Loamy Gleyed Matrix - A gleyed matrix that occupies 60 percent or more of a layer starting within 12 inches of the soil surface.

Primary tree species in the upland areas adjacent to Wetland 2 are red oak, white pine, black oak, red maple, yellow birch, black birch, and black gum. Similar to other portions of the Facility Site, the shrub layer is dominated by mountain laurel, witch hazel, sweet pepperbush, and highbush blueberry. Primary groundcover species are sweet pepperbush seedings, partridgeberry (*Mitchella repens*), Canada mayflower, sessile-leaved bellwort (*Uvularia sessilifolia*), and northern starflower (*Trientalis borealis*).

The upland soil core recorded at the delineation plot in east edge of the western branch of Wetland 2 contained a 1-inch layer of subsurface organic duff. From 1 to 4 inches below the surface, the soil was very dark gray fine sandy loam (10YR 3/1). From 4 to 11 inches below the surface, the soil was a dark yellowish brown silty loam (10YR 4/6). From 11 to 23 inches below the surface, the soil was a brownish yellow fine sandy silty loam (10YR 6/6) with 10% dark yellowish brown redoximorphic features (10YR 4/6).

The upland soil core recorded at the delineation plot in west edge of the eastern branch of Wetland 2 contained a 1-inch layer of subsurface organic duff. From 1 to 2 inches below the surface, the soil was a very dark gray fine sandy loam (10YR 3/1). From 2 to 6 inches below the surface, the soil was a dark brown fine sandy loam (7.5YR 3/3). From 6 to 9 inches below the surface, the soil was a yellowish brown fine to medium sandy loam (10YR 5/6). From 8 to 12 inches below the surface, the soil was a brownish yellow medium to coarse sandy loam (10YR 6/8).

The upland soil core recorded at the delineation plot in the eastern branch of Wetland 2 contained a two-inch layer of subsurface organic duff. From 2 to 4 inches below the surface, the soil was a dark yellowish brown silty loam (10YR 4/6). From 4 to 11 inches below the surface, the soil was a yellowish-brown loam with trace gravel (10YR 5/6). From 11 to 18 inches below the surface, the soil was a very pale brown fine to medium sandy loam (10YR 7/3).

3.1.4.4 Wetland 3

Wetland 3 is located along the CREC ROW, at approximate elevation of 640 to 650 feet above sea level. Wetland 3 is set in a perched hillside depression and drains down-gradient to the northeast, east, and southeast. Wetland 3 is located between the existing AGT and TNEC ROWs, approximately 3,000 feet northwest of the Algonquin Compressor Station.

Surface saturation is present at Wetland 3 and was observed at the wetland edge delineation form plot. Other indicators of hydrology present at this wetland include water-stained leaves and drainage pathways. No surface waterbodies are associated with Wetland 3. Wetland 3 featured pronounced mound-and-pool microtopography, and skidder ruts (evidence of past logging activity) were present.

Wetland 3 is classified as a seasonally flooded/saturated palustrine broad-leaved deciduous forest (PFO1E). Primary tree species located within this wetland are red maple, red oak, and gray birch (*Betula populifolia*). The dominant species in the shrub layer are sweet pepperbush, highbush blueberry, and witch hazel. The groundcover is composed primarily of sweet pepperbush and sassafras along with peat moss.

Wetland 3 is located within the soil map unit Sutton very stony fine sandy loam, which is non-hydric. The wetland appears to be an inclusion of Ridgebury soils, which was too small to be mapped by NRCS. The soil core had a five-inch layer of black fine sandy loam (2.5/N) beginning at the soil surface. From 5 to 10 inches below the surface, the soil was a gray fine to medium sandy loam (10YR 5/1). From 10 to 22 inches below the surface, the soil was a gray fine to medium sandy loam (5Y 5/1). The hydric soil indicators from the Regional Supplement present in this soil core include A11 and F3.

The upland areas adjacent to Wetland 3 are characterized by an overstory of red maple, black oak, and gray birch; a shrub layer of witch hazel, red maple, gray birch, and white pine; and a groundcover layer of lowbush blueberry, sweet pepperbush seedlings, and partridgeberry.

The upland soil core recorded at the delineation plot within Wetland 3 had an A horizon to 4 inches below the surface of black fine sandy loam (10YR 2/1). The E horizon from 4 to 7 inches below the surface was a dark gray fine sandy loam (10YR 4/1). The B horizon from 7 to 15 inches below the surface was a yellowish brown fine to medium sandy loam (10YR 5/6). The B horizon 15 inches and deeper was a light yellowish brown fine to medium sandy loam (10YR 6/4).

3.1.4.5 Wetland 4

Wetland 4 is located in the vicinity of the CREC ROW between Wetlands 2 and 3, at an approximate elevation of 600 to 610 feet above sea level. Wetland 4 is a small, isolated wetland set in a perched hillside depression. However, the wetland does not appear to have sufficient hydrology to support vernal pool dependent wildlife. Subsurface hydrology drains down-

gradient to the southeast. Wetland 4 is located between the existing AGT ROW and the existing TNEC ROW, approximately 2,250 feet southwest of the Algonquin Compressor Station.

No prolonged surface water features are present in Wetland 4. Surface saturation was observed at Wetland 4, along with other indicators of hydrology including water-stained leaves and microtopographic relief. Skidder ruts are present within Wetland 4.

Red maple and black birch are the dominant tree species within Wetland 4. The shrub and herbaceous layers are sparse and included witch hazel, highbush blueberry, and sweet pepperbush in the shrub layer and New York fern, swamp dewberry (*Rubus hispidus*), cinnamon fern, and Sphagnum sp.

Wetland 4 is located within the soil map unit Sutton very stony fine sandy loam, which is non-hydric. The wetland appears to be an extension of the adjacent Ridgebury mapping unit but was too small to be mapped by NRCS. Soils within the wetland are shallow and stony in this wetland; however, evidence of a depleted matrix was evident near the soil surface.

The primary tree species in the upland surrounding Wetland 4 are white oak, black oak, and scarlet oak (*Quercus coccinea*). The shrub layer is similar to that found within Wetland 4.

Soils in the upland areas adjacent to Wetland 4 were also shallow are very rocky. The upper layers of the soil were medium brown in color. The soil did not display any indicators of hydrology.

3.1.5 Description of Floodplain and Floodways

Digital floodplain data available from FEMA indicates that the wetland complex associated within the Dry Arm Brook watershed is located within Flood Zone A (100-year floodplain), however no base flood elevations have been determined for the Facility Site (FEMA Map Nos. 44007C0110G [Effective date: March 2, 2009] and 44007C0130G [Effective Date: March 2, 2009]) (Figure 3-2, Property Floodplain Data). The floodplain associated with the Iron Mine Brook drainage has not been mapped. As 100-year flood elevations are not available from published sources and proposed activities may involve work below the 100-year flood elevation, HDR conducted an evaluation of flooding during the 100-year flood event to establish a Base Flood Elevation (“BFE”) for both stream systems in the vicinity of the proposed project (see Appendix F).

The determination of the BFE was based on the results from a HEC-RAS model, which simulated both brooks from their headwaters to their confluence at the Wilson Reservoir. The model used the effective 100-year flood plain for Wilson Reservoir, 445 ft. (FEMA 2013), as the downstream boundary condition and the predicted 100-year flow rates from StreamStats (USGS 2015) for the upstream boundary conditions for each brook. Both Dry Arm Brook and Iron Mine Brook pass through culverts under Wallum Lake Road. The culverts were surveyed and then incorporated into the HEC-RAS model. The HEC-RAS model included ground elevations from both on-site survey and from statewide elevation data (RIGIS 2015).

The results of the analysis determined that the BFE for the main stem of Iron Mine Brook begins at 550 ft. NAVD88 at the upstream limit of Iron Mine Brook as shown in Figure 3-2 and slopes down to an elevation of 519 ft. NAVD88 at the culvert under Wallum Lake Road south of the proposed Facility. The BFE for Dry Arm Brook where it passes through the TNEC ROW is approximately 558 ft. NAVD88 and continues down to 554 ft. NAVD88 at the culvert under Wallum Lake Road. Due to

a backwatering condition within Iron Mine Brook and the presence of existing culverts under Algonquin Lane, flood waters discharge into a tributary to Iron Mine Brook. This narrow floodplain is shown on Figure 3-2 with a BFL of 554 ft. (NAVD 88) near Algonquin lane and 535 ft. (NAVD 88) near the existing woods road crossing.

3.1.6 Groundwater

The Facility Site is located entirely atop a Class GA groundwater area, meaning the underlying groundwater is known or presumed to be suitable for drinking water use with no treatment (RIDEM, 2010). The principal groundwater reservoir in the vicinity of the Facility Site is the Upper Branch River Groundwater Reservoir, located approximately 1.5 miles to the east/southeast of the property. No community or other wellhead protection areas are located on the Facility Site. Groundwater may be shallow on the property based on the presence of the wetland areas and the tributaries to Dry Arm Brook and Iron Mine Brook.

Within the bounds of the proposed Facility Site, there are no mapped groundwater reservoirs, or sole source aquifers. Potable water is provided to residences near to the Facility Site through the use of private water supply wells, typically located proximal to each residence. Glacial till and/or bedrock are the principal sources of groundwater to these wells.

3.1.7 Fish and Wildlife Habitat

This section includes a general description of the Facility Site and identifies the associated major concentrations of Core Habitats.

3.1.7.1 Ecoregions

As noted in the Rhode Island Wildlife Action Plan (“WAP”), Rhode Island and its wildlife resources fall within several ecological classifications of the Northeast. Specifically, The U.S. Forest Service (“USFS”) classification system places Rhode Island in a single Ecoregional Province (McNab 1994); (Bailey 1995); (Rudis 1999), specifically within the Lower New England Section of the Eastern Broadleaf Forest Province, which is characterized by glacially-influenced landforms descending to coastal lowlands. The forests are dominated by northern hardwoods, Appalachian oaks, and northeastern oak-pine associations with the ecosystems having been disturbed by anthropological settlement. This human induced disturbance has resulted in an ecological shift to a system that lacks large predators with an imbalance between plant resources and herbivores (Rudis 1999).

According to The Nature Conservancy (“TNC”) classification, the northwestern portion of Rhode Island falls within the Lower New England – Northern Piedmont Ecoregion, and the coastal area is within the North Atlantic Coast Ecoregion. Conservation plans for both ecoregions, describing the vegetative communities and biological resources of each (Sneddon 1998); (Beers 1999); (Barbour 2003) have been developed by the TNC.

Utilizing the United States Environmental Protection Agency (“EPA”) hierarchical classification system Rhode Island falls within the Northeastern Coastal Zone and Atlantic Coastal Pine Barrens Level III Ecoregions; only Block Island is in the latter, with the rest of the state in the former (Omemik 1995). Rhode Island is within three Level IV draft ecoregions – the Southern New England Coastal Plains and Hills (western two-thirds of the state), the Narragansett/Bristol Lowland (eastern third of the state), and Cape Cod/Long Island Ecoregion (Block Island).

The EPA defines Ecoregions as “areas of general similarity in ecosystems and in the type, quality, and quantity of environmental resources; they are designed to serve as a spatial framework for the research, assessment, management, and monitoring of ecosystems and ecosystem components” (EPA 2015) . Because they include large-scale geophysical patterns in the landscape that are linked to the faunal and floral assemblages and processes at the ecosystem scale, ecoregions provide a useful means for simplifying and reporting on more complex patterns of biodiversity.

3.1.7.2 Bird Conservation Region

As defined by the U.S. North American Bird Conservation Initiative (“NABCI”) Committee, the Facility Site is within the New England/Mid-Atlantic Coast Bird Conservation Region (“BCR”). BCRs are ecologically distinct regions in North America with similar bird communities, habitats, and resource management issues. The National Audubon Society administers the Important Bird Area (“IBA”) Program in the U.S. Audubon launched its IBA initiative in 1995, establishing programs state by state which provides conservation leaders with the ability to tailor the program to their individual state needs. There are no IBAs within the Facility Site.

3.1.7.3 Plant Communities

This section describes the plant communities within the Facility Site grouped into wetland cover types and upland cover types. These community types are based on the WAP (Terwilliger Consulting Inc 2015) the primary vegetative community types present at the site are: oak forest, mixed deciduous/coniferous forest, tree plantation, forested swamp, and shrub swamp. The cover type data was produced based on interpretation of GIS aerial mapping, as well as land use data and wetlands cover type data available from RIGIS.

3.1.7.4 Wetland Cover Types

Wetland cover types include red maple deciduous swamp, hemlock/hardwood swamp, and shrub swamp. Wetland resources in the Facility Site are described in section 3.1.4, Wetlands.

Red maple – deciduous swamp (RM)

Understory is mixed deciduous shrubs including highbush blueberry, pepperbush, spicebush, winterberry, and swamp azalea. Skunk cabbage and cinnamon fern are common ground cover plants.

Hemlock/hardwood swamp (HS)

A mixed coniferous/deciduous swamp on mineral soil in depressions receiving groundwater discharge. Characterized by a closed canopy (75-100%), sparse shrub layer, and low species diversity. The canopy is dominated by hemlock at >50% with lesser amounts of yellow birch and red maple.

Shrub swamp (SS)

Wetland communities dominated by shrubs 0.5 to 5-meters tall that occur along the margin of a pond or river, isolated in a wet depression or valley, or as a transition community between a marsh and upland communities. This type is highly variable with the dominant shrub species dictated by local conditions, including water depth, topographic position, and microclimate. At wetter sites, buttonbush or water willow may dominate with over 90% cover. Sites not permanently flooded may support a mix of shrubs with characteristic species including

highbush blueberry, sweet pepperbush, winterberry, alders, silky dogwood, maleberry, spicebush, spiraea, and swamp azalea.

Upland Cover Types

Upland cover types include black oak/scarlet oak – heath forest, and cleared areas, white oak – mountain laurel forest, mixed oak/white pine forest, and tree plantations.

Black oak/scarlet oak – heath forest (BO)

The predominant oak forest type in Rhode Island on well-drained, acidic soils. Chestnut oak and white oak may also be common constituents along with black birch, black gum, red maple, and sassafras. American chestnut was formally a common constituent. Understory is primarily ericaceous shrubs, especially huckleberry and lowbush blueberries.

White oak – mountain laurel forest (WO)

Typically found on well-drained coarse or gravelly soils such as on moraine deposits and eskers. Shrub layer is dominated by dense cover of mountain laurel with sparse herbaceous cover. Tends to occur in small patches within mixed oak and oak-pine forests.

Mixed oak/white pine forest (MO)

A forest community on well-drained soils with a canopy of mixed oak and 40-50% cover of white pine. Patches with >50% of white pine may also be found, but the overall pattern in larger stands is an even mix of oaks and pine. Shrub and ground layers are generally similar to oak-dominated forests, although understory cover is diminished in closed canopy stands of pine.

Tree plantation (TP)

Land cover is apparently modified and appears as a managed tree plantation, usually coniferous, even-aged trees planted in rows. Species may be native or non-native and include various spruces, pines, firs, and larch.

The primary vegetation species found in the Facility Site are given in Table 3-2.

Table 3-2: Primary Plant Species Found at the Facility Site

Common Name	Scientific Name	Locations
Trees		
Red maple	*Acer rubrum*	Site-wide
Red oak	*Quercus rubrum*	Site-wide
White oak	*Quercus alba*	Site-wide
Black oak	*Quercus velutina*	Site-wide
White pine	*Pinus strobus*	Site-wide
Eastern Hemlock	*Tsuga canadensis*	Wetland 2
Yellow birch	*Betula alleghaniensis*	Site-wide
Black birch	*Betula lenta*	Site-wide
Gray birch	*Betula populifolia*	Wetland 3
Black gum	*Nyssa sylvatica*	Site-wide
Shrubs		
Sweet pepperbush	*Clethra alnifolia*	Site-wide
Highbush blueberry	*Vaccinium corymbosum*	Site-wide
Lowbush blueberry	*Vaccinium angustifolium*	Site-wide (upland areas)

Common Name	Scientific Name	Locations
Witch hazel	*Hamamelis virginiana*	Site-wide
Mountain laurel	*Kalmia latifolia*	Site-wide
Tall huckleberry	*Gaylussacia frondosa*	Site-wide (upland areas)
Maleberry	*Lyonia ligustrina*	Wetland 2 shrub swamp
Ground cover		
New York fern	*Thelypteris noveboracensis*	Site-wide (wetland areas)
Cinnamon fern	*Osumundastrum cinnamomeum*	Site-wide (wetland areas)
Threeleaf goldthread	*Coptis trifolia*	Site-wide (wetland areas)
Canada mayflower	*Maianthemum canadense*	Site-wide
Partridgeberry	*Mitchella repens*	Site-wide
Northern starflower	*Trientalis borealis*	Site-wide
Dewberry	*Rubus flagellaris*	Wetland 4
Swamp dewberry	*Rubus hispidus*	Wetland 4
Meadowsweet	*Spiraea tomentosa*	Wetland 2 shrub swamp
Fringed sedge	*Carex crinata*	Wetland 1
Broom sedge	*Carex scoparia*	Wetland 2 shrub swamp
Slender rush	*Juncus tenuis*	Wetland 2 shrub swamp
Solomon's seal	*Polygonatum biflorum*	Site-wide
Greenbrier	*Smilax rotundifolia*	Site-wide
Peat moss	*Sphagnum* sp.	Site-wide (wetland areas)

3.1.7.5 Invasive Species

Invasive species (Federal Register 1999) may be defined as “alien species whose introduction does or is likely to cause economic or environmental harm”). When established, these plants may cause economic or environmental harm by developing self-sustaining populations and becoming dominant and/or disruptive to the natural pattern of plant community succession. Several invasive species are known to occur in Rhode Island, found in both wetland and upland habitats. Since the Facility Site is a largely intact, mature forest, there are currently few non-native, invasive species present at the Facility Site. A full botanical inventory of the site has not been conducted, however no significant concentrations of invasive species have been observed at or in the vicinity of the Facility Site.

3.1.7.6 Wildlife

This section provides an overview of the range of wildlife species likely to exist within the Facility Site. The analysis of vertebrate species is based on the results of a computer-generated species list and field observations at the Facility Site. The NEWILD computer model was developed by the U.S. Department of Agriculture (“USDA”) Northeastern Research Station as part of the NED project to support ecosystem management decision making. A preliminary species list was generated using this computer model by defining general habitat characteristics of the Facility Site, including dominant vegetation and successional stage. The generated species list was then reviewed by a wildlife biologist, and species whose range does not extend to Rhode Island or adjacent areas of Massachusetts or Connecticut were removed. An example of such as species was Canada Lynx (*Lynx canadensis*), which was included in the computer-generated list based on general habitat preferences, but which is not known to regularly occur within Rhode Island or adjacent areas of Massachusetts or Connecticut. The computer-generated list was then supplemented with species that were incidentally observed

at the project site but which were not included in the computer-generated list. Due to the similarities between the Facility Site and the surrounding forest, the following species lists can be considered valid both for the area contained within the limits of disturbance ("LOD") of the Facility Site as well as the adjacent forested habitats.

Birds

Table 3-3 lists bird species that may potentially occur within the Facility Site. The list includes species that may breed in the Facility Site, as well as species that may stop over on migratory flights or overwinter. The table also indicates whether species are area sensitive (require large areas of unfragmented forest), require forest interior or edge habitats, and the types of vegetation that the species utilizes. Some of the species found in the Facility Site are opportunists that can be found in a variety of habitat types, while some species are more specialized and occur in a narrower range of habitat types.

Table 3-3: Potential Bird Species Found Within the Facility Site

Common Name	Scientific Name	Upland	Wetland	Interior / Edge Forest Species[1]	State Rank/ Status[2]
Mallard	*Anas platyrhynchos*		X	-	
Hooded merganser	*Lophodytes cucullatus*		X	-	S1B/Special Concern
Turkey Vulture	*Cathartes aura*	X		-	
Bald Eagle	*Haliaeetus leucocephalus*	X	X	-	S1B, S1N/Endangered
Sharp-shinned Hawk	*Accipiter stratus*	X		-	
Cooper's hawk	*Accipiter cooperii*	X		-	
Northern Goshawk	*Accipiter gentilis*	X		-	S1B, S1N/Special Concern
Red-shouldered hawk	*Buteo lineatus*	X	X	I/E	
Broad-winged hawk	*Buteo platypterus*	X		I	
Red-tailed hawk	*Buteo jamaicensis*	X	X	E	
American Kestrel	*Falco sparverius*	X	X	-	S4B, SZN
Peregrine Falcon	*Falco peregrinus*	X	X	-	SZN/Endangered
Wild turkey	*Meleagris gallopavo*	X		I/E	
Ruffed grouse	*Bonasa umbellus*	X		I/E	S5B, S5N
Northern bobwhite	*Colinus virginianus*	X		I/E	Extirpated?
American woodcock	*Scolopax minor*		X	E	S4B, S4N
Mourning dove	*Zenaida macroura*	X		E	
Yellow-billed cuckoo	*Coccyzus americanus*	X	X	I/E	S5B, S5N
Black-billed cuckoo	*Coccyzus erythrophthalmu*	X		I/E	S5B, S5N
Eastern screech owl	*Otus asio*	X		-	
Great horned owl	*Bubo virginianus*	X	X	-	
Barred owl	*Strix varius*	X	X	I	
Long-eared Owl	*Asio otus*	X	X	-	
Northern Saw-whet Owl	*Aegolius acadicus*	X	X	-	
Common Nighthawk	*Chordeles minor*	X		-	
Eastern Whip-poor-will*	*Caprimulgis vociferus*	X		-	S4B, SZN

Common Name	Scientific Name	Upland	Wetland	Interior / Edge Forest Species[1]	State Rank/ Status[2]
Chimney swift	*Chaetura pelagica*	X		-	S5B, SZN
Ruby-throated hummingbird	*Archilochus colubris*	X	X	E	
Belted kingfisher	*Ceryle alcyon*		X	-	
Red-bellied woodpecker	*Melanerpes carolinus*	X	X	I/E	
Red-headed Woodpecker	*Melanerpes erythrocephalu*	X	X	-	
Yellow-bellied Sapsucker	*Sphyrapicus varius*	X	X	-	
Downy woodpecker	*Picoides pubescens*	X	X	I/E	
Hairy woodpecker	*Picoides villosus*	X	X	I	S4B, S4N
Northern flicker	*Colaptes auritus*	X		I/E	S5B, S5N
Pileated Woodpecker	*Hylatomus pileatus*	X	X	-	S1B, S1N/Special Concern
Eastern Wood-pewee	*Contopus virens*	X	X	I/E	
Acadian Flycatcher*	*Empidonax virescens*	X	X	-	S1B, S1N/Special Concern
Alder Flycatcher	*Empidonax alnorum*		X	-	
Willow Flycatcher	*Empidonax traillii*	X	X	-	S3B, S3N
Least Flycatcher	*Empidonax minimus*	X		-	S3B, SZN
Eastern phoebe	*Sayornis phoebe*	X	X	I/E	
Great crested flycatcher	*Myiarchus crinita*	X	X	I/E	S5B, SZN
Eastern kingbird	*Tyrannus tyrannus*	X	X	E	S5B, S5N
Tree swallow	*Iridoprocne bicolor*	X	X	E	S5B
Blue jay	*Cyanocitta cristata*	X	X	I/E	
American crow	*Corvus brachyrhynchos*	X	X	E	
Common raven	*Corvus corax*	X	X	-	
Black-capped chickadee	*Parus atricapillus*	X	X	I/E	
Tufted titmouse	*Parus bicolor*	X	X	I/E	
Red-breasted nuthatch	*Sitta canadensis*	X		I/E	
White-breasted nuthatch	*Sitta carolinensis*	X	X	I/E	
Brown creeper	*Certhia americana*	X	X	I	
House wren	*Troglodytes aedon*	X	X	E	
Winter wren	*Troglodytes hiemalis*		X	-	
Carolina wren	*Thryothorus ludovicianus*	X	X	-	
Golden-crowned kinglet	*Regulus satrapa*	X	X	-	
Ruby-crowned kinglet	*Regulus calendula*	X	X	-	
Blue-gray gnatcatcher*	*Polioptila caerulea*	X	X	I/E	
Eastern bluebird	*Sialia sialis*	X		E	S3B
Veery*	*Catharus fuscescens*		X	I	S5B
Hermit thrush	*Catharus guttatus*	X	X	I	
Wood thrush*	*Hylocichla mustelina*	X	X	I/E	S5B, SZN
American robin	*Turdus migratorius*	X	X	E	
Gray catbird	*Dumetella carolinensis*	X	X	I/E	S5B
Northern mockingbird	*Mimus polyglottus*	X		E	

Common Name	Scientific Name	Upland	Wetland	Interior / Edge Forest Species[1]	State Rank/ Status[2]
Brown thrasher	*Toxostoma rufum*	X		E	S4B, SZN
Cedar waxwing	*Bombycilla cedrorum*	X		E	
European starling	*Sturna vulgaris*	X		E	
Warbling vireo	*Vireo gilvus*	X	X	E	
Yellow-throated vireo*	*Vireo flavifrons*	X	X	E	S4B, SZN
White-eyed vireo	*Vireo griseus*		X	E	
Red-eyed vireo*	*Vireo olivaceous*	X		I/E	
Blue-headed vireo	*Vireo solitaries*	X		-	S3B, SZN
Philadelphia vireo	*Vireo philadelphicus*	X	X	-	
Blue-winged warbler	*Vermivora pinus*	X	X	E	S5B, SZN
Golden-winged warbler	*Vermivora chrysoptera*		X	E	
Tennessee warbler	*Leiothlypis peregrine*			-	
Nashville warbler	*Leiothlypis ruficapilla*			-	S3B, SZN
Black-and-white warbler*	*Mniotilta varia*			I	S5B, SZN
Black-throated green warbler*	*Dendroica virens*			I	
Prairie warbler	*Dendroica discolor*			E	S5B, SZN
Pine warbler	*Dendroica pinus*			I	
Palm warbler	*Setophaga discolor*			-	
Cerulean warbler	*Setophaga cerulea*			-	S1B, S2N/Endangered
Yellow warbler	*Dendroica petechia*		X	E	
Black-throated blue warbler*	***Setophaga caerulescens***			**-**	**S1B, S3N/Threatened**
Yellow-rumped warbler	*Setophaga coronata*			-	S2B, SZN
Canada warbler*	*Wilsonia canadensis*			I	S4B, SZN
Hooded warbler*	*Wilsonia citrina*			I/E	S3B, SZN
Worm-eating warbler*	*Helmitherus vermivorus*			I/E	
Ovenbird*	*Seiurus aurocapillus*			I	
Northern waterthrush*	*Seiurus novaboracensis*		X	I	S4B, SZN
Yellow-breasted chat	*Icteria virens*		X	I	SHB, S1N/Endangered
Common yellowthroat	*Geothlypis trichas*		X	I/E	
American redstart*	*Setophaga ruticilla*			I	S5B
Scarlet tanager*	*Piranga olivacea*			I	S5B, SZN
Eastern towhee	*Pipilo erythophthalmus*			I/E	S5B, SZN
American tree sparrow	*Spizella arborea*			-	
Chipping sparrow	*Spizella passerina*			E	
Field sparrow	*Spizella pusilla*			E	S4B, SZN
Fox sparrow	*Passerella illaca*			-	
Savannah sparrow	*Passerculus sandwichensi*			-	S2S3B, SZN
Song sparrow	*Melospiza melodia*			E	
White-throated sparrow	*Zonotrichia albicollis*			-	

Common Name	Scientific Name	Upland	Wetland	Interior / Edge Forest Species[1]	State Rank/ Status[2]
Swamp sparrow	*Melospiza georgiana*		X	E	
Rose-breasted grosbeak	*Pheucticus ludovicianus*			I/E	S4B, SZN
Northern cardinal	*Cardinalis cardinalis*			I/E	
Indigo bunting	*Passerina cyanea*			E	S4B, SZN
Dark-eyed junco	*Junco hyemalis*			E	
Red-winged blackbird	*Agelaius phoeniceus*		X	E	
Common grackle	*Quiscalus quiscula*			E	
Brown-headed cowbird	*Molothrus ater*			E	
Orchard oriole	*Icterus spurius*			E	
Baltimore oriole	*Icterus galbula*			E	
Pine grosbeak	*Pinicola enucleator*			-	
Pine siskin	*Carduelis pinus*			-	
Purple finch	*Carpodacus purpureus*			I/E	S3B, SZN
House finch	*Carpodacus mexicanus*			E	
American goldfinch	*Carduelis tristis*			E	
House sparrow	*Passer domesticus*			E	

[1] I = Interior (nest only within forest interiors, rarely near forest edge); I/E = Interior/Edge – territories located entirely within the forest but can only use edges; E = Edge – species use forest perimeters, nearby fields or large clearings during breeding season. * indicates forest interior species per G. D. Therres, Integrating Management of Forest Interior Migratory Birds with Game in the Northeast. Undated.
Gray highlight indicates species observed within the Facility Site.
Bold species are those listed as Species of Greatest Conservation Need by the Rhode Island WAP.

[2] State Rank/Status Categories

SZN	Zero Occurrences (Non-breeding)
SHB	Possibly Extirpated (Breeding)
S1B	Critically Imperiled (Breeding)
S1N	Critically Imperiled (Non-breeding)
S2B	Imperiled (Breeding)
S2N	Imperiled (Non-breeding)
S5N	Secure (Non-breeding)
S2S3B	Imperiled to Vulnerable (Breeding)
S3B	Vulnerable (Breeding)
S3N	Vulnerable (Non-breeding)
S4B	Apparently Secure (Breeding)
S4N	Apparently Secure (Non-breeding)
S5B	Secure (Breeding)

Mammals

Table 3-4 presents the list of mammal species that may find suitable feeding, breeding, and/or overwintering habitat within the Facility Site.

Table 3-4: Potential Mammalian Species Found Within the Facility Site

Common Name	Scientific Name	State Rank/Status[1]
Virginia opossum	*Didelphis virginiana*	
Masked shrew	*Sorex cinereus*	
Smoky shrew	***Sorex fumeus***	**S2/Special Concern**
Northern short-tailed shrew	*Blarina brevicauda*	
Hairy-tailed mole	*Parascalops breweri*	
Eastern mole	***Scalopus aquaticus***	**SNR**
Little brown myotis	***Myotis lucifugusp***	**S5**
Keen's myotis	*Myotis keenii*	
Northern long-eared bat	***Myotis septentrionalis***	**S2**
Silver-haired bat	***Lasionycteris noctivagans***	**SU**
Eastern pipistrelle	*Pipistrellus subflavus*	
Big brown bat	***Eptesicus fuscus***	**S5**
Red bat	***Lasiurus borealis***	**S?**
Hoary bat	***Lasiurus cinereus***	**S1**
Eastern cottontail	*Sylvilagus floridanus*	
New England cottontail	***Sylvilagus transitionalis***	**S2/Special Concern**
Snowshoe hare	*Lepus americanus*	
Eastern chipmunk	*Tamias striatus*	
Gray squirrel	*Sciurus carolinensis*	
Red squirrel	*Tamiasciurus hudsonicus*	
Southern flying squirrel	*Glaucomys Volans*	
Northern flying squirrel	*Glaucomys sabrinus*	
Beaver	*Castor canadensis*	
Woodchuck	*Marmota monax*	
White-footed mouse	*Peromyscus leucopus*	
Southern red-backed vole	*Clethrionomys gapperi*	
Meadow vole	*Microtus pennsylvanicus*	
Woodland vole	*Microtus pinetorum*	
Southern bog lemming	***Synaptomys cooperi***	**S1**
Muskrat	*Ondatra zibethicus*	
Norway rat	*Rattus norvegicus*	
House mouse	*Mus musculus*	
Meadow jumping mouse	*Zapus hudsonius*	
Woodland jumping mouse	*Napaeozapus insignis*	
Coyote	*Canis latrans*	
Red fox	*Vulpes vulpes*	
Gray fox	*Urocyon cinereoargenteus*	
Black bear	***Ursus americanus***	**SNR**
Raccoon	*Procyon lotor*	
Fisher	*Martes pennanti*	
Ermine	*Mustela erminea*	
Long-tailed weasel	*Mustela frenata*	

Common Name	Scientific Name	State Rank/Status[1]
Mink	*Mustela vison*	
Striped skunk	*Mephitis mephitis*	
River otter	*Lutra canadensis*	
Bobcat	***Felis rufus***	**SU/Threatened**
White-tailed deer	*Odocoileus virginianus*	

Gray highlight indicates species observed within the Facility Site.
Bold species are those listed as Species of Greatest Conservation Need by the Rhode Island WAP.
[1]State Rank/Status Categories
S1 Critically Imperiled
S2 Imperiled
S5 Secure
SNR Unranked
SU Unrankable
S? Uncertain

Reptiles and Amphibians

Wetland and upland habitats throughout the Facility Site provide habitat for reptiles and amphibians. Table 3-5 lists the reptiles and amphibians that are likely to be found within the Facility Site.

Table 3-5: Potential Amphibian and Reptilian Species Found Within the Facility Site

Common Name	Scientific Name	State Rank/Status[1]
Amphibians		
Spotted salamander	***Ambystoma maculatum***	**S4**
Marbled salamander	***Ambystoma opacum***	**S2**
Northern dusky salamander	***Desmognathus fuscus***	**S4**
Eastern red-backed salamander	*Plethodon cinereus*	
Four-toed salamander	***Hemidactylium scutatum***	**S3**
Northern Two-lined Salamander	*Eurycea b. bislineata*	
Red-spotted Newt	***Notophthalmus viridescens***	**S5**
American toad	*Bufo americanus*	
Fowler's toad	***Bufo fowleri***	**S3**
Eastern Spadefoot	***Scaphiopus holbrookii***	**S1/Endangered**
Bullfrog	*Lithobates catesbeianus*	
Northern Spring peeper	*Pseudacris crucifer*	
Gray treefrog	*Hyla versicolor*	
American bullfrog	*Rana catesbeiana*	
Green frog	*Rana clamitans*	
Pickerel frog	*Rana palustris*	
Northern leopard frog	***Rana pipiens***	**S2/Special Concern**
Wood frog	***Rana sylvatica***	**S5**
Spotted turtle	***Clemmys guttata***	**S5**
Wood turtle	***Clemmys insculpta***	**S2/Special Concern**
Eastern box turtle	***Terrapene carolina***	**S4**
Eastern racer	***Coluber constrictor***	**S5**
Ring-necked snake	*Diadophis punctatus*	

Common Name	Scientific Name	State Rank/Status[1]
Eastern Milk snake	*Lampropeltis triangulum*	
Smooth green snake	*Opheodrys vernalis*	
Northern brown snake	*Storeria dekayi*	
Red-bellied snake	*Storeria occipitomaculata*	
Eastern Hognose snake	***Heterodon platirhinos***	**S2/Special Concern**
Eastern Worm Snake	*Carphophis a. amoenus*	
Black Rat Snake	*Elaphe o. obsoleta*	
Eastern Ribbon Snake	***Thamnophis sauritis***	**S3/Special Concern**
Eastern Garter Snake	*Thamnophis sirtalis*	

Source: DeGraaf, R.M., and D.D. Rudis. 1983. Amphibians and Reptiles of New England. University of Massachusetts Press; Amherst, MA.
Gray highlight indicates species observed within the Facility Site.
Bold species are those listed as Species of Greatest Conservation Need by the Rhode Island WAP.
[1]State Rank/Status Categories
S1 Critically Imperiled
S2 Imperiled
S3 Vulnerable
S4 Apparently Secure
S5 Secure

Wildlife Action Plan

The WAP (Terwilliger Consulting Inc 2015) identifies 84 key habitats in Rhode Island and provides an overall ranking per habitat based on its Importance to Biodiversity (High=3 Med=2 Low=1); Current Condition (Good=3 Fair=2 Poor=1); Degree of Threat (High=3 Med=2 Low=1) and Vulnerability to Climate Change (High=3, Med=2, Low=1). Seven of these habitats are found within the Facility Site (Table 3-6).

Table 3-6: Habitats Found Within in the Facility Site and Sensitivity Ranking

Habitat	Overall Rank [1]
Red maple – deciduous swamp (RM)	9
Hemlock/hardwood swamp (HS)	10
Shrub swamp (SS)	9
Black oak/scarlet oak – heath forest (BO)	9
White oak – mountain laurel forest (WO)	9
Mixed oak/white pine forest (MO)	9
Tree Plantation (TP)	7

[1] RIWAP Habitat Sensitivity Rankings (scale of 4 [lowest] to 12 [highest])

The WAP has identified wildlife species indicative of the overall health of the state's wildlife resources. These species are the species of greatest conservation need ("SGCN") where some may be rare or declining while others may be a vital component of specific habitats. Certain SGCN may have a significant portion of their population in the state and are placed into categories based on their state or global status. Those species identified in the WAP at or near Facility Site are identified in Table 3-7.

Table 3-7: Species of Greatest Conservation Need Potentially in the Facility Site

Common Name	Distribution
Birds	
Great Crested Flycatcher	State-wide
Rose-breasted Grosbeak	State-wide
American Redstart	State-wide
Yellow-throated Vireo	*State-wide*
Northern Goshawk	*Rare state-side except Providence metro area and islands*
Pileated Woodpecker	*Rare northern and western RI*
Hairy Woodpecker	*State-wide*
Scarlet Tanager	*Abundant along southern coast and rare in northern and western RI*
Cerulean Warbler	*Rare state-wide*
Veery	*State-wide*
Acadian Flycatcher	*Rare state-side except Providence metro area and islands*
Wood Thrush	*State-wide*
Black-and-white Warbler	*State-wide*
Black-throated Blue Warbler	*Common in NW RI and along southern coast; rare elsewhere*
Hooded Warbler	*Rare statewide except Providence metro area and islands*
Least Flycatcher	*Rare statewide except Providence metro area and islands*
Purple Finch	*Abundant in NW RI, rare elsewhere*
Yellow-rumped Warbler	*Abundant along southern coast, common in NW, rare elsewhere*
Blackburnian Warbler	*Common in NW and along southern coast, rare elsewhere*
Blue-headed Vireo	*Common in NW and along southern coast, rare elsewhere*
Canada Warbler	*Rare state-wide except Providence metro area and islands*
Northern Waterthrush	*Common along southern coast, rare elsewhere, absent Providence a islands*
Hooded Merganser	*State-wide*
Northern Flicker	*Common along southern coast, rare elsewhere*
Bald Eagle	*Rare state-wide*
Peregrine Falcon	*Abundant on Block Island, common in southern RI, rare elsewhere*
Eastern Bluebird	*Rare state-wide*
Eastern Whip-poor-will	*Rare in northern and western RI and on Prudence Island.; absent elsewhere*
Ruffed Grouse	*Rare in northern and western RI*
Yellow-billed Cuckoo	*Rare state-wide*
Black-billed Cuckoo	*Rare state-wide*
Gray Catbird	*State-wide*
Indigo Bunting	*State-wide*
Mammals	
Big Brown Bat	State-wide
Eastern Red Bat	State-wide
Little Brown Myotis	State-wide
Northern Long-eared Bat	Burrillville and southeastern RI
Bobcat	*Most of state except islands and Providence metro area*
Black Bear	*Western and southern RI*

Common Name	Distribution
Amphibians and Reptiles	
Spotted Salamander	State-wide
Marbled Salamander	Western RI
Northern Dusky Salamander	Western RI
Northern Spring Salamander	Burrillville and Foster
Four-toed Salamander	State-wide
Wood Frog	State-wide
Red-spotted Newt	State-wide except Providence metro area
Spotted Turtle	State-wide
Northern Black Racer	State-wide
Wood Turtle	Western RI
Eastern Hog-nosed Snake	Western RI
Eastern Box Turtle	State-wide (not mapped in Burrillville but observed at site)

The WAP (Terwilliger Consulting Inc 2015) identifies and depicts priority areas on the landscape that offer the best opportunities and potential for SGCN conservation, designating them as "Conservation Opportunity Areas" ("COAs"). The largest of these areas is the unfragmented forest blocks of 500 acres or greater. Defined by size and using RIGIS forest classes (softwood, deciduous, and mixed forest classes), unfragmented forest blocks are not within 30 meters of developed land uses (residential, commercial) or roads. According to the WAP (Terwilliger Consulting Inc 2015), these blocks represent the best (largest and least fragmented) examples of common forest habitats as well as many rarer imbedded natural systems. Unfragmented forest blocks of between 250 and 500 acres may serve as connectors between the larger blocks (>500 acres) or may be some of the largest and therefore most resilient natural sites. Collectively, these forest blocks constitute 'core natural areas' of the WAP. The entire Facility Site has been mapped within an unfragmented forest block of 500 acres or greater (see Figure 3-3, Impacts to Forest Habitat).

In addition to the core natural areas unfragmented forest sites provide, according to the WAP (Terwilliger Consulting Inc 2015) there are many other important habitats with high ecological value and high vulnerability. Throughout the State, those sites of high ecological value and vulnerability with data sufficient for mapping include:

- Floodplain Forest
- Hemlock/Hardwood Forest
- Northern Hardwood Forest
- Pitch Pine Woodland/ Barrens
- Mud Flat
- Inland Sand Barrens
- Salt Marsh
- Wet Meadow
- Coastal Streams Freshwater Tidal Marsh
- Rocky Shore
- Sand Flat
- Sea Level Fens
- Brackish Sub-aquatic Beds
- Brackish Marsh
- Atlantic White Cedar Swamp

No habitats with high ecological value and high vulnerability have been identified within the Facility Site. An upland hemlock/hardwood forest habitat is located east of Wallum Lake Road, running parallel to the Clear River between Wallum Lake and Wilson Reservoir.

As noted in the WAP (Terwilliger Consulting Inc 2015), connectivity is an important quality of a healthy functioning landscape. Wildlife corridors connecting smaller habitats and natural core area on the landscape allow for the movement of habitat types, migrating species, populations, and gene flow among populations and locations as species shift. A network of major and minor corridors has been mapped throughout Rhode Island. These corridors were developed in conjunction with The Nature Conservancy's regional connectivity analysis done as part the Northeast Terrestrial Resilience project, and using the natural corridors provided by existing river systems analyses. A major corridor has been identified along Iron Mine Brook, extending from approximately Bowdish Reservoir south of the Facility Site, to the confluence of Iron Mine Brook and the Clear River, northeast of the Facility Site. A portion of the mapped corridor lies within the 67-acre Facility Site (Figure 3-3).

3.1.7.7 Fisheries and Benthic Invertebrates

The fisheries community within Iron Mine Brook was assessed using a backpack unit electro-fisher and the fishing effort covered a stream length of approximately 100 meters from just southwest of Wallum Lake Road to a point where the brook was considered too shallow to be expected to support a fish population. A sustained electro-fishing pass through the deeper portions of Iron Mine Brook yielded no fish. No fish were observed either; however, the electro-fishing effort did yield five common crayfish (*Cambarus bartonii bartonii*) and two green frogs (*Rana clamitans melanota*).

Iron Mine Brook was also sampled for benthic macroinvertebrates as it had not been characterized as warm or cold water. This RIDEM designation would have implications to the stormwater management design were the stream to receive a direct discharge of stormwater. Benthic macroinverterbrate sampling in Iron Mine Brook was completed in a manner consistent with the state-wide biomonitoring program established for Rhode Island. Three benthic samples from Iron Mine Brook were collected using a D-framed net with a 500-µm mesh by agitating bottom substrate in front of the net for a consistent 30-second period for each sample. Samples were processed by ESS taxonomists to reveal a relatively diverse and healthy macroinvertebrate community. Table 3-8 lists the abundance of each taxa encountered on the day of survey. The results of the benthic macroinvertebrate community analysis indicate that the community is typical of that expected in a warm-water forested stream system. Furthermore, the benthic macroinvertebrate samples were subsampled using a standard randomized subsampling routine in a 32-grid tray.

Table 3-8: Facility Site Stream Assessment: Macroinvertebrate Taxonomic Data

Taxa Group	Final Identification	Life Stage	Station ID		
			Trib 1/1	Trib 1/2	Trib 1/3
Coleoptera	*Oulimnius*	Adult		32	
	Oulimnius	Larva	96		
Collembola	*Sminthuridae*	Unidentified	32		
Crustacea	*Caecidotea communis*	Unidentified	32		
	Harpacticoida	Unidentified	64	32	
Diptera	*Chironomini*	Larva		32	64
	Corynoneura	Larva	32		96
	Cricotopus	Larva		32	224
	Hemerodromia	Larva			32
	Labrundinia pilosella	Larva		96	64

Taxa Group	Final Identification	Life Stage	Station ID		
			Trib 1/1	Trib 1/2	Trib 1/3
	Micropsectra	Larva	96	416	128
	Microtendipes	Larva		64	
	Nilotanypus	Larva	32		
	Orthocladius	Larva		32	416
	Parametriocnemus	Larva	192	256	64
	Rheotanytarsus	Larva	64		
	Stenochironomus	Larva		64	
	Tanytarsus	Larva	320	1472	1312
	Thienemanniella xena	Larva	64		
	Thienemannimyia group	Larva	288	224	192
Ephemeroptera	*Paraleptophlebia*	Larva		736	608
Megaloptera	*Nigronia*	Larva	32		
Odonata	*Boyeria*	Larva	32		32
	Calopteryx	Larva			32
	Cordulegaster	Larva	160		
Oligochaeta	*Lumbriculidae*	Unidentified	256	32	32
	Naididae	Unidentified		32	
	Pristina rupestris	Unidentified	288	32	96
	Tubificidae	Unidentified		32	32
Plecoptera	*Capniidae*	Larva	96	160	
	Leuctra	Larva	608	352	544
	Paracapnia	Larva			32
	Perlodidae	Larva	32		
Trichoptera	*Hydropsychidae*	Larva	192		
	Lepidostoma	Larva		32	32
	Polycentropus	Larva	32	128	32
	Rhyacophila	Larva	64		
Total			**3104**	**4288**	**4064**

3.1.8 Protected Species

The Applicant consulted both the USFWS and RINHS in identifying any federal or state-listed species that may have the potential to occur at the Facility Site. The Applicant completed the web-based Information for Planning and Conservation ("IPaC") Form (Appendix H) and results indicated the only threatened or endangered species in the Facility Site was the Northern long-eared bat (*Myotis septentrionalis*) (or "NLEB"). In addition, another online data form was submitted to obtain recommended conservation measures for the Facility Site. However, computer-generated results indicated there were no species in the Facility Site with conservation measure recommendations available online.

Consultation with RINHS and review of the database of Natural Heritage areas revealed that no state-listed species have been documented within the Facility Site nor do any Natural Heritage Areas occur. One state-listed species, the black-throated blue warbler (*Setophaga caerulescens*) was incidentally observed by an ESS biologist and is therefore discussed below.

3.1.8.1 Northern Long-eared Bat

Northern long-eared bats (*Myotis septentrionalis*) are known or believed to occur in Providence County according to the USFWS (USFWS-NJFO 2015); however, there are no known maternity or hibernation occurrences in the County based on communications with Charles Brown of the Rhode Island Division of Fish and Wildlife ("RIDFW") and Susi von Oettingen of the USFWS (see Appendix H). To determine the presence/absence of this species at the Facility Site an acoustic survey was conducted under the Interim 4(d) Rule in accordance with the 2015 USFWS Range-Wide Summer Survey Guidelines (Guidelines). Anabat SD2 acoustic detectors were deployed at four locations spaced across the linear and square components of the project design as prescribed in the Guidelines, which included the Facility as well as the CREC ROW. At each location, the detectors collected data for five to six days between July 31 and August 9, 2015. The results of the survey were then vetted by a USFWS qualified bat surveyor. Bats identified during the survey are included in Table 3-8. No NLEB were identified during the survey. The results of the survey were reviewed by the USFWS and the RIDFW and both agencies agreed with study results that NLEB were not present in the Facility Site.

While results of the survey found that the species was not present in the Facility Site, the Applicant is proposing to adhere to the time of year restrictions to avoid tree clearing during the June-July timeframe to avoid potential impacts to maternity roost trees.

3.1.8.2 Black-throated Blue Warbler

ESS reviewed the online natural heritage data available from RIGIS website (RIGIS 2016) with the Facility Site footprint for known occurrences of State-protected species or natural communities' data. There are no records within the Facility Site. However, multiple pairs of black-throated blue warblers, which are listed by RIDEM as a threatened species in the State, were observed displaying territorial breeding behavior in the general footprint of the Facility Site during the 2015 breeding season. Observations included multiple males singing over a period of several weeks, as well as visual observations of male-female pairs; however no specific surveys for this species were conducted.

3.1.9 Vernal Pools

During field investigations in spring 2016, two small, man-made, depressional features were discovered approximately 1,400 feet southeast of the Algonquin Compressor Station (Figure 1-2). Both depressions contained 12-18 inches of water and were found to contain a limited number of spotted salamander (*Ambystoma maculatum*) egg masses. Site conditions and historical aerial photographs indicate that this area was highly disturbed in the past both for access to a small gravel removal operation associated with the compressor station and as a yarding area for past logging operations. These two depressional features are likely the result of excavation or other earth work activities from past land disturbance. They have been designated "Special Aquatic Sites" pursuant to the Rule 4 of the Rules and Regulations Governing the Administration and Enforcement of the Freshwater Wetlands Act, which states that this type of wetland may be either natural or man-made. These isolated wetlands will also likely be considered jurisdictional by the USACE. Each of the two Special Aquatic Sites (SAS1 and SAS2) are described below (see Appendix G for data forms).

SAS 1 is an abrupt depression of approximately 850 square feet that does not exhibit natural wetland characteristics. It is located along the southern side of an existing woods road that crosses the former gravel pit area. Observations recorded during spring and summer of 2016 suggest that

SAS 1 may have a brief hydroperiod that is limited to early spring and/or large storm events. This depression is surrounded by mostly upland plant species such as oaks and mountain laurel. The bottom consists of a thin layer of leaf litter underlain by sandy soils. SAS 1 also has very few egg mass attachment sites and therefore, in combination with a brief and inconsistent hydroperiod, likely does not provide high value amphibian breeding habitat.

SAS 2 is a depressional feature that also appears to have been the result of historic land disturbance activities and occurs in two sections. The portion of SAS 2 in which standing water was observed is a linear depression approximately 150 feet long and 15 feet wide. Site conditions suggest that vehicle traffic along a pathway has compacted the soil and caused standing water to be perched during the spring and/or during storm events. SAS 2 appears to have a longer hydroperiod than SAS 1, as standing water was observed later in the spring after SAS 1 had gone dry. At its north end, SAS 2 broadens into a portion of the former gravel pit/staging area that has developed some forested wetland characteristics. This area does not have standing water, but it is dominated by a wetland plant community including red maple, sweet pepperbush, and royal fern.

3.1.10 Cultural and Historical Resources

3.1.10.1 Archaeology

Background research and a Phase I archaeological identification survey were conducted for the proposed CREC and the 0.8-mile CREC ROW. The background research and initial project testing were completed in 2015, and additional testing was completed in 2016. The project location is rural, primarily wooded, and undeveloped. No known archaeological resources were located within the property. Subsurface testing was recommended for the project area due to the presence of known nearby Native American sites and the potential for intact, unidentified Native American and historical archaeological sites. Construction areas that could potentially impact subsurface archaeological resources were tested using shovel test pits, to identify any unknown archaeological resources. In total, the areas tested were divided into 16 survey units, and included the excavation of 620 shovel tests. Six areas of archaeological interest were identified within the proposed plant and associated work areas, as well as along the initially proposed 0.8-mile interconnection line ROW. These six areas are outlined in Table 3-9 below.

Table 3-9: Archaeological Areas of Interest Identified within the CREC Facility Site

Area Type	Location	Site Information	Recommendations
Cabin foundation (RI 2758)	345kV line	19th century feature with associated artifact scatter	Possibly significant; avoid
Quartzite shatter	NE part of Power Block	Isolated Native American artifact	Not significant; no further survey
Historic period artifact scatter	SE part of Power Block	Window glass, metal	Not significant; no further survey
Iron Mine Brook Dune site (RI 2757)	SE Workspace/ Area 4	Rhyolite, quartz, quartzite Native American artifacts	Phase II completed; no further survey
Barn foundation	Frontage area	19th-20th century barn	Possibly significant; avoid
Historic period artifacts	Frontage area	Window glass and slag near road	Not significant; no further survey

Three archaeological sites were initially recommended for avoidance: the cabin foundation, the Iron Mine Dune Brook site, and the barn foundation, while the other three areas were considered not significant. Project plans were designed to avoid the cabin and barn foundations, but the location of the Iron Mine Dune Brook site made it impossible to avoid. Therefore, a Phase II site examination survey was conducted in 2016 to assess its eligibility for the National Register of Historic Places. Based on the results of the site examination, the site is considered not eligible, and no further survey was recommended. The Rhode Island Historic Preservation and Heritage Commission ("RIHPHC") concurred with all project recommendations in a letter dated June 28, 2016 (Appendix H). Should impacts become necessary to either the cabin foundation or the barn foundation, additional documentation of these sites would be required.

3.1.10.2 History

The CREC is within the John H. Chaffee Blackstone River Valley National Heritage Corridor (the "Corridor"). In 1986, Congress established the Corridor to preserve and interpret the unique and significant contributions of the valley's resources and history to the nation's heritage. The Blackstone River Valley is one of the nation's richest, best preserved repositories of landscapes, structures, and sites attesting to the rise of industry in America. Activities that occurred within the Blackstone Valley led the social revolution that transformed an agricultural society into an industrial giant. These two forces, agriculture and industry, shaped the patterns of settlement, land use, and growth in the Blackstone Valley and throughout the larger region. The Valley contains thousands of structures and entire landscapes that represent the history of the American Industrial Revolution and the complex economic and social relationships of the people who lived and worked there. The Blackstone Valley contributed to the historical context of the area in the following ways:

- The birthplace of the American Industrial Revolution;
- The first, widespread use of water power in the U.S;
- The place where the "Rhode Island System" of manufacturing was developed;
- The first ethnically and religiously diverse areas of New England, and;
- Its industrial and transportation systems were crucial to the development of Worcester and Providence, the second and third largest cities in New England, respectively.

Although all of Burrillville lies within the Corridor, the CREC is not located near any known historic elements that have been outlined as contributors to the historic nature of the Corridor. In reviewing documentation relative to the Blackstone Valley National Heritage Corridor, the National Park Service and the Blackstone Heritage Corridor Inc. point to several historical resources in Burrillville that may be considered contributing elements of the Corridor, or places to see relative to the Corridor in Burrillville. These include White Mill Park, located approximately 1.65 miles to the southeast of the CREC, the Bridgeton Car Park, located approximately 2.1 miles to the southeast of the CREC, the Burrillville Historical and Preservation Society, located approximately 1.8 miles to the southeast of the CREC, and the Black Hut Management Area, located approximately 4.25 miles to the east of the CREC. None of these resources lie within

proximity or visual line of the CREC. We therefore believe that the proposed impacts of the CREC will not affect the settings, characteristics, or feelings of these historical resources, or the Corridor.

3.2 Burrillville Interconnection

This section describes the existing natural environment that may be affected by the Burrillville Interconnection Project, both within and surrounding the BIP ROWs. This section describes the specific natural features that have been evaluated for potential impacts. Information pertaining to existing site conditions has been obtained through available published resource information, the RIGIS database, various state and local agencies, previous field investigations for TNEC's Interstate Reliability Project ("IRP"), and recent field investigations of the Burrillville Interconnection Project area.

A study area (the "Burrillville Interconnection Study Area") was established to assess the existing environment both within and immediately adjacent to the existing TNEC ROW and the proposed CREC ROW. The Burrillville Interconnection Study Area consists of a corridor measured 2,500 feet on either side of the 3052 Line. The boundaries of this corridor were determined to allow for a detailed desktop analysis of existing conditions within and adjacent to the BIP ROW (Figure 3-4).

3.2.1 Topography and Drainage Basins

3.2.1.1 Topography

The topography in the Burrillville Interconnection Study Area varies from level plains to gently rolling hills and valleys with elevations ranging from 357 to 776 feet above mean sea level. Land use is a mix of undeveloped forestland (the predominating land cover type), occasional agricultural fields, as well as rural residential areas. A relatively small area of industrial development exists in association with electric and gas transmission lines within the Burrillville Interconnection Study Area.

3.2.1.2 Waterways and Drainage Basins

The Burrillville Interconnection Study Area is drained by waterways in the Blackstone River drainage basin. The Blackstone River drainage basin is drained by waterways that generally flow to the east and southeast eventually flowing into Narragansett Bay. The western portion of the Burrillville Interconnection Study Area is drained by waterways in the Five Mile River drainage basin. A drainage basin is the area that drains water, sediment, and dissolved materials to a common outlet at some point along a stream channel (Dunne and Leopold 1978), and is synonymous with watershed.

The Burrillville Interconnection Study Area is located within the Clear River sub-basin of the Lower Blackstone River watershed. The Clear River flows in a north to south direction across the TNEC ROW east of Wallum Lake Road (Route 100). Round Top Brook and Chockalog Brook also cross the TNEC ROW and are both included in the Clear River sub-basin of the Lower Blackstone River watershed. Round Top Pond is located approximately one mile to the northwest of the Burrillville Interconnection Study Area and Wilson Reservoir is located approximately one mile to the east of the Study Area. Tributaries of Dry Arm Brook run in a north/northeast direction to the northeast and east of the Project. Western portions of the Transmission Line Study Area fall within the Upper Fivemile River Watershed.

The major surface water resources and classifications within the Burrillville Interconnection Study Area and water resources crossed by the Project are listed in Table 3-10. The waters of

the State of Rhode Island (meaning all surface water and groundwater of the State) are assigned a Use Classification which is defined by the most sensitive uses which it is intended to protect. Waters are classified according to specific physical, chemical, and biological criteria, which establish parameters of minimum water quality necessary to support the water Use Classification. The water quality classification of the major surface waters within the Burrillville Interconnection Study Area are identified in the descriptions of the water courses that follow.

Table 3-10: Major Surface Water Resources within the Burrillville Interconnection Study Area

Water Body Name	Town	Classification/ Use	Fishery Designation	Water Body Crossed
Chockalog River and tributaries	Burrillville	A	Cold	Yes
Round Top Brook and tributaries	Burrillville	A	Warm	Yes
Big Round Top Pond	Burrillville	A	NA	No
Little Round Top Pond	Burrillville	A	NA	No
Unnamed tributaries to Wakefield Pond	Burrillville	B	NA	No
Tributaries to Wilson Reservoir	Burrillville	B	NA	Yes
Card Machine Brook	Burrillville	A	NA	No
Mowry Brook and tributaries	Burrillville	B	Cold	Yes
Clear River and tributaries	Burrillville	B, B 1	Cold	Yes
Dry Arm Brook and tributaries	Burrillville	B	Warm	Yes
Round Pond	Burrillville	B	NA	No

Classification Use

A	Primary and secondary contact recreational activities and for fish and wildlife habitat. Suitable for compatible industrial processes and cooling, hydropower, aquaculture uses, navigation, and irrigation and other agricultural uses. These waters shall have excellent aesthetic value.
B	Fish and wildlife habitat and primary and secondary contact recreational activities. Suitable for compatible industrial processes and cooling, hydropower, aquaculture uses, navigation, and irrigation and other agricultural uses. These waters shall have good aesthetic value.
B1	Primary and secondary contact recreational activities and fish and wildlife habitat. Suitable for compatible industrial processes and cooling, hydropower, aquaculture uses, navigation, and irrigation and other agricultural uses. These waters shall have good aesthetic value. Primary contact recreational activities may be impacted due to pathogens from approved wastewater discharges. However, all Class B criteria must be met.
NA	no data found

Source: R.I. Department of Environmental Management. State of Rhode Island Water Quality Regulations, Amended December 2010.

Pursuant to the requirements of Section 305(b) of the Federal Clean Water Act, water bodies that are determined to be not supporting their designated uses in whole or in part are considered impaired, and placed on the Clean Water Act, Section 303(d) List of Impaired Waters where they are prioritized and scheduled for restoration. The causes of impairment are those pollutants or other

stressors that contribute to the actual chemical contaminants, physical parameters, and biological parameters. Sources of impairment are not determined until a total maximum daily load ("TMDL") assessment is conducted on a water body. There are no impaired water resources within the Burrillville Interconnection Study Area.

3.2.2 Geology and Soils

3.2.2.1 Bedrock Geology

The Burrillville Interconnection Study Area is mapped within the West Bay Area of the Esmond-Dedham Subterrane and is located approximately 1,600 feet to the east of the Hope Valley Shear Zone. The Hope Valley Shear Zone is a mapped Alleghanian strike-slip fault that marks the boundary between the Esmond-Dedham Subterrane and the Hope Valley Subterrane. A strike-slip fault is a fault on which the movement is parallel to the fault's strike. The Alleghanian orogeny or Appalachian orogeny is one of the geological mountain-forming events that formed the Appalachian Mountains. The Alleghanian orogeny occurred approximately 325 million to 260 million years ago over at least five deformation events.

The underlying bedrock beneath the Burrillville Interconnection Study Area is mapped as the Augen Granite Gneiss (Zeag) member of the Esmond Igneous Suite. This late Proterozoic formation consists mostly of augen granite gneiss, a pale to dark grey medium- to coarse-grained igneous unit characterized by large (>1 centimeter) lenticular feldspar porphyroclasts called augen. The formation also includes structurally conformable layers of amphibolite.

The Burrillville Interconnection Study Area is located within the Seaboard Lowland section of the New England physiographic province and consists of two geologic areas: The Hope Valley Subterranne and the West Bay Area of the Esmond-Dedham Subterranne. The bedrock geology of the Study Area is undifferentiated rock and augen granite gneiss from the Blackstone and Harmony period laid during the late Proterozoic period or older group (Hermes et al. 1994). Refer to Figure 3-5.

3.2.2.2 Surficial Geology

The present landscape of the Burrillville Interconnection Study Area, as with much of the Northeastern United States, was formed during the Wisconsin glacial age approximately 10,000 years ago. The dynamic land forming processes that occurred during this geologic event produced the landforms and surficial geologic deposits within the Burrillville Interconnection Study Area.

The Burrillville Interconnection Study Area is comprised of predominantly glacial till, with pockets of glaciofluvial deposits known as outwash deposits and ice contact deposits interspersed throughout. Glacial till is material carried and directly deposited by glacial ice with little or no reworking by running water. Therefore, this material is not well sorted and the stones are not well rounded. Glacial till is non-stratified glacial drift consisting of clay, silt, sand, stones, and boulders transported and deposited by glacial ice. There are two forms of glacial till: lodgement till, which was deposited directly under the glacier as it moved or melted, and ablation till, which lay on top of the ice or was incorporated into the ice, and then deposited on the ground when the ice melted. Lodgement till tends to be more compact. In contrast, glaciofluvial deposits, often referred to as glacial outwash, were deposited by the abundant meltwater which flowed from the shrinking glacier. Glaciofluvial deposits are typically

composed of well-rounded stones and sorted silt, sand and gravel deposited in recognizable layers by glacial meltwater.

Glaciofluvial deposits are common in low areas of the landscape, such as broad, level plains and valleys. Landforms associated with glaciofluvial deposits include outwash terraces, outwash fans or deltas, valley trains, eskers, kames, and kame terraces. Significant areas of glacial outwash are located in almost every town and city in the State. Some of these areas are capped with windblown deposits of silt, known as loess. The boundary between areas of till and outwash deposits is often characterized by an abrupt change in slope.

3.2.2.3 Geological Hazards

Geological hazards, such as earthquakes or fault zones, could have negative impacts on transmission line or substation facilities. Normal possible fault zones are evident to the east and south of the Burrillville Interconnection Study Area. Historically, seismic activity in the northeastern United States is the result of rebound in the earth's crust depressed by ice loading during the Pleistocene glacial event. These events are non-tectonic and do not usually result in vertical movement along fault lines. This rebound may cause moderate to very strong ground shaking locally and some horizontal movement, but this potential can be regarded as minimal for the design life of the BIP.

3.2.2.4 Sand and Gravel Mining

There are no sand and gravel mining operations within the Burrillville Interconnection Study Area corridor.

3.2.2.5 Soils

Detailed information concerning the physical properties, classification, agricultural suitability, and erodibility of soils in the vicinity of the Burrillville Interconnection Study Area are presented in this section. Descriptions of soil types identified within the Burrillville Interconnection Study Area were obtained from the Soil Survey of Rhode Island (Rector 1981) and Natural Resource Conservation Service ("NRCS"). The Soil Survey delineated map units that may consist of one or more soil series and/or miscellaneous non-soil areas that are closely and continuously associated on the landscape. In addition to the named series, map units include specific phase information that describes the texture and stoniness of the soil surface and the slope class. A total of 30 named soil series have been mapped within the Burrillville Interconnection Study Area. Table 3-11 lists the characteristics of the soil phases (lower taxonomic units than series) found within the Burrillville Interconnection Study Area and hydric soil status is depicted on Figure 3-6.

Table 3-11: Characteristics of Soil Phases within the Burrillville Interconnection Study Area

Soil Map Unit Symbol	Soil Phase	Drainage Class	Percent Slope	Depth to Bedrock (in.)
AfA	Agawam fine sandy loam	wd	0-3	>60
CaD	Canton & Charlton rock outcrop complex	wd	15-35	>60
CdB	Canton & Charlton fine sandy loam	wd	3-8	>60
CeC	Canton & Charlton fine sandy loam, very rocky	wd	3-15	>60
ChB	Canton & Charlton v. fine sandy loam	wd	3-8	>60
ChC	Canton & Charlton v. stony fine sandy loam	wd	8-15	>60
ChD	Canton & Charlton v. stony fine sandy loam	wd	15-25	>60

Soil Map Unit Symbol	Soil Phase	Drainage Class	Percent Slope	Depth to Bedrock (in.)
CkC	Canton & Charlton ex. Stony f.s. loam	wd	3-15	>60
CrC	Canton fine sandy loam, rocky	wd	3-15	>60
CrD	Canton fine sandy loam, rocky	wd	15-35	>60
CxC	Canton fine sandy loam, extremely bouldery	wd	3-15	>60
FeA	Freetown muck	vpd	0-1	>60
HkA	Hinckley gravelly sandy loam	ed	0-3	>60
HkC	Hinckley gravelly sandy loam	ed	rolling	>60
PaA	Paxton fine sandy loam	wd	0-3	>60
PaB	Paxton fine sandy loam	wd	3-8	>60
PbB	Paxton v. stony fine sandy loam	wd	0-8	>60
PbC	Paxton v. stony fine sandy loam	wd	8-15	>60
Pg	Pits, gravel	ed-swed	var.	>60
Re	Ridgebury fine sandy loam	pd	0-3	>60
Rf	Ridgebury, Whitman & Leicester ex. stony fine sandy loam	pd-vpd	NL	>60
Ss	Sudbury sandy loam	mwd	NL	>60
SuB	Sutton v. stony fine sandy loam	mwd	0-8	>60
SwA	Swansea muck	vpd	0-1	>60
UD	Udorthents- urban land complex	mwd-ed	var.	NL
Wa	Walpole sandy loam	vpd	0-3	>60
WhA	Woodbridge fine sandy loam	mwd	0-3	>60
WhB	Woodbridge fine sandy loam	mwd	3-8	>60
WoB	Woodbridge fine sandy loam, very stony	mwd	0-8	>60
WrB	Woodbridge fine sandy loam, extremely stony	mwd	0-8	>60

Notes:
in. – inches; ed – excessively drained; wd – well drained; mwd – moderately well drained; swed – somewhat excessively drained; pd – poorly drained; vpd – very poorly drained; 8-15 percent slope – highly erodible; NL – Not Listed.
Source: Rector 1981 and NRCS 2016.

3.2.2.6 Soil Series

The soil series detailed in the following subsections have been identified within the Burrillville Interconnection Study Area. The classification follows that published in the Soil Survey of Rhode Island (Rector, 1981) and online (http://websoilsurvey.nrcs.usda.gov).

Agawam Series

The Agawam series is classified as coarse-loamy over sandy-skeletal, mixed, mesic Typic Dystrochrepts. These well drained soils formed in glaciofluvial deposits derived mainly from schist, gneiss, and phyllite. The soils are on terraces and outwash plains.

Canton & Charlton Series

The Canton series is classified as coarse-loamy over sandy skeletal, mixed, mesic Typic Dystrochrepts. These well drained soils formed in glacial till derived mainly from schist and gneiss. The similar Charlton series is classified as coarse-loamy, mixed, mesic Typic Dystrochrepts. These soils were also formed in glacial till derived mainly from schist and gneiss. Charlton soils have a finer textured substratum than Canton soils. Because these series are similar, they are sometimes grouped and mapped together as an association.

Freetown Series

The Freetown series is classified as Dysic, mesic Typic Haplosaprists. These nearly level, very poorly drained soils are formed in depressions of outwash plains and glacial upland till plains.

Hinckley Series

The Hinckley series is classified as sandy-skeletal, mixed, mesic Typic Udorthents. These excessively drained soils are formed in glaciofluvial deposits derived mainly from schist and gneiss.

Paxton Series

The Paxton series is classified as well drained loamy soils formed in lodgment till. The soils are very deep to bedrock and moderately deep to a densic contact. They are nearly level to steep soils on hills, drumlins, till plains, and ground moraines.

Ridgebury, Whitman, and Leicester Series

The Ridgebury, Whitman, and Leicester series are commonly grouped together as one soil complex due to their similar properties. However, they are distinct series with individual classifications.The Ridgebury series is classified as coarse-loamy, mixed, mesic Aeric Fragiaquepts, the Whitman series is classified as coarse-loamy, mixed, mesic Humic Fragiaquepts and the Leicester series is classified as coarse-loamy, mixed, acid, mesic Aeric Haplaquepts. Ridgebury and Leicester soils are poorly drained and Whitman soils are very poorly drained. Whitman and Leicester have a dense till layer within one meter of the soil surface. These soils are formed in loamy glacial till derived mainly from schist, gneiss and granite. These soils are in depressions, drainage ways in glacial till uplands, and nearly level areas of glacial upland hills and drumlins.

Sudbury Series

The Sudbury series is classified as sandy, mixed, mesic Aquic Dystrochrepts. These moderately well drained soils are formed in glaciofluvial deposits derived mainly from schist and gneiss. These soils are on terraces and outwash plains.

Sutton Series

The Sutton series is classified as coarse-loamy, mixed, mesic Aquic Dystrochrepts. These moderately well drained soils are formed in glacial till derived mainly from schist, gneiss and granite. The soils are on side slopes and in depressions of upland hills. The soil surface ranges from non-stony to extremely stony.

Swansea Series

The Swansea series is classified as Sandy or sandy-skeletal, mixed, dysic, mesic Terric Haplosaprists. These very poorly drained organic soils are formed by organic material over sandy material. These soils are in depressions or on flat level areas on uplands and outwash plains.

Udorthents Series

The Udorthents series are moderately well drained to excessively drained soils that have been cut, filled, or eroded. The areas have had more than two feet of the upper part of the original soil removed or have more than two feet of fill on top of the original soil. Udorthents are extremely variable in texture. They are on glacial till plains and gravelly outwash terraces.

Walpole Series

The Walpole series is classified as sandy, mixed, mesic Aeric Haplaquepts. These poorly drained soils are formed in glaciofluvial deposits derived mainly from schist, gneiss, and granite. The soils are in depressions and drainage ways.

Woodbridge Series

The Woodbridge series is classified as coarse-loamy, mixed, mesic Typic Fragiochrepts. These moderately well drained soils are formed in glacial till derived mainly from schist, gneiss, and phyllite. The soils are on lower slopes and crests of upland hills and drumlins.

3.2.2.7 Prime Farmland Soils

Prime farmland, as defined by the United States Department of Agriculture ("USDA"), is the land that is best suited to producing food, feed, forage, fiber, and oilseed crops. It has the soil quality, growing season, and moisture supply needed to economically produce a sustained high yield of crops when it is treated and managed using acceptable farming methods. Rhode Island recognizes 34 prime farmland soils. The Burrillville Interconnection Study Area crosses seven prime farmland soil units as listed in Table 3-12.

Table 3-12: Farmland Soils of Statewide Importance within the Burrillville Interconnection Study Area

Soil Map Unit Symbol	Soil	Percent slope
Afa	Agawam fine sandy loam	0-3
CdB	Canton & Charlton fine sandy loam	3-8
PaA	Paxton fine sandy loam	0-3
PaB	Paxton fine sandy loam	3-8
Ss	Sudbury fine sandy loam	NL
WhA	Woodbridge fine sandy loam	0-3
WhB	Woodbridge fine sandy loam	3-8

NL – Not L
NL – Not Listed
Source: NRCS 2016

Urbanized land and water are exempt from consideration as prime farmland. Within the Burrillville Interconnection Study Area, prime farmland soils exist on land occupied by residential, agricultural, commercial, and forestland and roads.

3.2.2.8 Farmland of Statewide Importance

Farmland of statewide importance is land that is designated by the Rhode Island Department of Administration Division of Planning to be of statewide importance for the production of food, feed, fiber, forage, and oilseed crops. Generally, farmlands of statewide importance include those lands that do not meet the requirements to be considered prime farmland, but that economically produce high crop yields when treated and managed with modern farming methods. Some may produce as high a yield as prime farmland if conditions are favorable.

In order to extend the additional protection of state regulation to prime farmland, the State of Rhode Island has expanded its definition of farmland of statewide importance to include all prime farmland areas. Therefore, in Rhode Island, all USDA-designated prime farmland soils are also farmland of statewide importance.

Table 3-13 lists soil units designed as farmland soils of statewide importance that are found within the Burrillville Interconnection Study Area.

Table 3-13: Farmland Soils of Statewide Importance within the Burrillville Interconnection Study Area

Soil Map Unit Symbol	Name	Percent Slope
Afa	Agawam fine sandy loam	0-3
CdB	Canton & Charlton fine sandy loam	3-8
HkA	Hinckley gravelly sandy loam	0-3
HkC	Hinckley gravelly sandy loam, rolling	0-1
PaA	Paxton fine sandy loam	0-3
PaB	Paxton fine sandy loam	3-8
Re	Ridgebury fine sandy loam	0-1
Ss	Sudbury fine sandy loam	NL
Wa	Walpole sandy loam	0-1
WhA	Woodbridge fine sandy loam	0-3
WhB	Woodbridge fine sandy loam	3-8

NL – Not Listed

Source: NRCS 2016.

Special note: In Rhode Island, all soils that meet the "Prime Farmland" criteria are also included in the "Additional Farmland of Statewide Importance" category. The inclusion of these soils in the list of "Additional Farmland of Statewide Importance" by the USDA resulted from a May 1985 request by the RI Department of Administration's Division of Planning seeking to have the Prime Farmlands afforded the additional protection given to Farmlands of Statewide Importance.

3.2.2.9 Erosive Soils

The erodibility of soils is dependent upon the slope of the land and the texture of the soil. Soils are given an erodibility factor (K), which is a measure of the susceptibility of the soil to erosion by water. Soils having the highest K values are the most erodible. K values in Rhode Island range from 0.10 to 0.64 and vary throughout the depth of the soil profile with changes in soil texture. Very poorly drained soils and certain floodplain soils usually occupy areas with little or no slope. Therefore, these soils are not subject to erosion under normal conditions and are not given an erodibility factor. Soil map units described as strongly sloping or rolling may include areas with slopes greater than eight percent and soil map units with moderate erosion hazard are listed in Table 3-14.

Table 3-14: Burrillville Interconnection Study Area Potentially High Erodible Soil Mapping Units

Soil Map Unit Symbol	Soil Phase	Percent Slope	Surface K Values
CaD	Canton & Charlton Rock Outcrop	15-35	0.20
CdB	Canton & Charlton fine sandy loams	3-8	0.20
CeC	Canton & Charlton fine sandy loams v. rocky	3-8	0.20
ChB	Canton & Charlton v. stony fine sandy loams	3-8	0.20
ChC	Canton & Charlton v. stony fine sandy loams	3-8	0.20
ChD	Canton & Charlton v. stony fine sandy loams	8-15	0.20
CkC	Canton and Charlton extremely stony fine sandy loam	3-15	0.24
HkC	Hinckley gravelly sandy loam	rolling	0.17
PaB	Paxton fine sandy loam	3-8	0.24
PbB	Paxton v. stony fine sandy loam	0-8	0.20

Soil Map Unit Symbol	Soil Phase	Percent Slope	Surface K Values
PbC	Paxton v. stony fine sandy loam	3-15	0.20
SuB	Sutton v. stony fine sandy loam	0-8	0.20
UD	Udorthents-Urban land complex	0-15	0.24
WhB	Woodbridge fine sandy loam	3-8	0.24
WoB	Woodbridge v. stony fine sandy loam	0-8	0.20
WrB	Woodbridge extremely stony fine sandy loam	0-8	0.24

Source: Rector 1981 and NRCS 1993.

3.2.3 Description of Wetlands and Watercourses

Wetlands are resources that have ecological functions and societal values. Wetlands are characterized by three criteria: (i) the presence of undrained hydric soil, (ii) a prevalence (>50 percent) of hydrophytic vegetation, and (iii) wetland hydrology, where soils are saturated near the surface or flooded by shallow water during at least a portion of the growing season.

3.2.3.1 Burrillville Interconnection Study Area Wetlands

Federal and State-regulated freshwater wetlands and/or streams were identified and delineated within the ROWs. Wetlands and streams within the TNEC ROW were delineated in 2006 through 2008 and assessed again in 2011. A total of 78 freshwater wetlands were identified and delineated on the BIP ROW. Based on agency input from the initial pre-application meeting, both the RIDEM and USACE have approved the use of the previous wetland delineations completed for the IRP within the TNEC ROW. These wetland boundaries have again been confirmed by POWER in summer of 2016 as being accurate demarcations of the wetlands and watercourses found within the ROW. ESS conducted field delineations on the CREC ROW in the fall of 2014 and the spring of 2015.

Field methodology for the delineation of State-regulated resource areas within the ROW was based upon vegetative composition, presence of hydric soils, and evidence of wetland hydrology. The study methods included both on-site field investigations and off-site analysis to determine the wetland and watercourse resource areas proximate to the proposed BIP. A more detailed description of wetland delineation methodology is provided in Section 3.2.4.

Wetlands outside the ROW, within the overall 5,000-foot corridor Burrillville Interconnection Study Area, were identified based on a desktop review of RIGIS wetlands data (RIGIS, 1993). Figure 3-7 depicts wetland resources within the Study Area based on the results of this desktop analysis.

In accordance with the provisions of the Rules and regulations governing the administration and enforcement of the Freshwater Wetlands Act, State-regulated freshwater wetlands include swamps, marshes, bogs, forested or shrub wetlands, emergent plant communities and other areas dominated by wetland vegetation and showing wetland hydrology. Swamps are defined as wetlands dominated by woody species and are three acres in size, or greater. Marshes are at least one acre in size and contain standing or running water during the growing season. Marsh plant species include grasses (*Gramineae*), sedges (*Cyperaceae*), rushes (*Juncaceae*) and other non-woody species. Bogs are wetlands dominated by “bog” species such as blueberries and cranberries (*Vaccinium* sp.), leatherleaf (*Chamaedaphne calyculata*), and sedges (*Carex*) to name a few of the diverse plant species. Generally over fifty percent of the

ground or water surface is covered with sphagnum moss (*Sphagnum* sp.). Bogs have no minimum size criteria. Emergent wetland communities are areas similar to marshes in vegetation composition; however, they are less than one acre in size. Forested and shrub wetlands are similar to swamps, but do not meet the three-acre size criteria. The upland area within 50 feet of the edge of a swamp, marsh, or bog is regulated as the 50-foot Perimeter Wetland under the Rules. Emergent wetland communities, forested wetlands, and shrub wetlands do not merit a 50-foot Perimeter Wetland.

The Rules also regulate activities in and around streams and open water bodies that include rivers, streams, ponds, Areas Subject to Storm Flowage ("ASSF"), areas subject to flooding ("ASF") and floodplains. A river is any perennial stream indicated by a blue line on a USGS topographic map. If a stream or river is less than 10 feet wide, the area within 100 feet of each bank is regulated as a 100-foot riverbank wetland. If the stream or river is greater than 10 feet wide, the area within 200 feet of each bank is regulated as a 200-foot riverbank wetland. A pond is an area of open standing or slow moving water present for six or more months during the year and at least one quarter of an acre in size. Ponds have a 50-foot perimeter wetland associated with their boundary. An ASSF is defined as a body of flowing water as identified by a scoured channel or change in vegetative composition or density that conveys storm runoff into or out of a wetland. ASSFs include drainage swales and channels that lead into, out of, pass through, or connect other freshwater wetlands or coastal wetlands, and that carry flows resulting from storm events, but may remain relatively dry at other times. ASFs include, but are not limited to, floodplains, depressions or low lying areas flooded by rivers, streams, intermittent streams, or areas subject to storm flowage which collect, hold, or meter out storm and flood waters. ASSF and ASFs are not assigned perimeter or riverbank wetlands.

Pond

The boundary of a pond is determined by the extent of water which is delineated and surveyed. Named ponds located within the Burrillville Interconnection Study Area are Big Round Top Pond, Little Round Top Pond, and Round Pond (RIGIS, 2011). In addition to these ponds, there are 24 unnamed ponds within the Study Area (RIGIS, 2011).

Swamp

Swamps are defined as areas at least three acres in size, dominated by woody vegetation, where groundwater is at or near the surface for a significant part of the growing season. A 50-foot Perimeter Wetland is applied to both forested and shrub swamps. Shrub swamps are areas dominated by broad-leaved deciduous shrubs and often have an emergent herbaceous layer. Dominant species in shrub swamps include sweet pepperbush (*Clethra alnifolia*), highbush blueberry (*Vaccinium corymbosum*), winterberry (*Ilex verticillata*), swamp azalea (*Rhododendron viscosum*), and silky dogwood (*Cornus amomum*). Drier portions of shrub swamps are often densely overgrown with greenbrier (Smilax sp.) and blackberry (*Rubus allegheniensis*). Common species in the herbaceous layer include sensitive fern (*Onoclea sensibilis*), skunk cabbage (*Symplocarpus foetidus*) and cinnamon fern (*Osmundastrum cinnamomeum*). Shrub swamp generally occurs in areas where the wetland crosses the managed portion of the ROW.

Forested swamps mainly occur on the edges of the managed ROW where the shrub swamps are present, but where the tree cover is allowed to dominate. Vegetation in a forested swamp includes predominantly red maple (*Acer rubrum*), willow (*Salix* sp.), black gum (*Nyssa*

sylvatica), alder (*Alnus* sp.), silky dogwood, sweet pepperbush, winterberry, swamp azalea, cinnamon fern, common reed (*Phragmites* sp.), and peat moss (*Sphagnum* spp.).

There are seven shrub swamps and 31 forested swamps within the Burrillville Interconnection Study Area (RIGIS 1993).

Marsh/ Emergent Wetlands/ Wet Meadows

Marshes are wetlands at least one acre in size where water is generally above the surface of the substrate and where the vegetation is dominated by emergent herbaceous species. Marshes are the dominant cover type in several large wetlands within the ROW. Marsh vegetation is typically dominated by broad-leaved cattail (*Typha latifolia*), tussock sedge (*Carex stricta*), and reed canary grass (*Phalaris arundinaceae*), with lesser amounts of common reed (*Phragmites australis*), sensitive fern, skunk cabbage, steeplebush (*Spiraea tomentosa*), marsh fern (*Thelypteris palustris*), and soft rush (*Juncus effusus*). There are no marshes mapped in the Study Area (RIGIS 1993).

Emergent wetlands and wet meadows within the BIP ROW are characterized by cattail, bulrush (*Scirpus pungens*), woolgrass (*Scirpus cyperinus*), soft rush, sensitive fern, and reed canary grass. Within the Burrillville Interconnection Study Area there are 44 wetlands that are identified as emergent wetlands or wet meadows (less than one acre is size) (RIGIS 1993).

River / Perennial Stream

A River is typically a named body of water designated as a perennial stream by USGS (a blue line stream on a USGS topographic map). A perennial stream maintains flow year-round, and is also designated as a solid blue line on a USGS topographic map. A total of 14 perennial streams were identified on the BIP ROW. The major watercourses crossed by the Burrillville Interconnection Project include a perennial tributary to Chockalog River, Tributary to Chockalog River, Round Top Brook, Mowry Brook, Clear River and Dry Arm Brook. In this Burrillville Interconnection Study Area there are 23 mapped rivers and perennial streams (USGS 2015).

Stream / Intermittent Stream

A stream is any flowing body of water or watercourse other than a river which flows during sufficient periods of the year to develop and maintain defined channels. Such watercourses carry groundwater discharge and/or surface water runoff. Such watercourses may not have flowing water during extended dry periods but may contain isolated pools or standing water.

Based on a desktop analysis of the ROW, there are seven mapped intermittent streams within the Burrillville Interconnection Study Area (USGS 2015). Smaller unnamed streams may also be encompassed within a particular wetland. A total of 28 intermittent streams were field identified on the BIP ROW.

Shrub / Forested Wetland

Shrub wetlands in the Burrillville Interconnection Study Area are dominated by highbush blueberry, sweet pepperbush, arrowwood (*Viburnum dentatum*), maleberry (*Lyonia ligustrina*), meadowsweet (*Spiraea* sp.), steeplebush, and greenbrier with minor amounts of emergent plant community species such as skunk cabbage and cinnamon fern. There are 134 forested wetlands and 62 shrub wetlands (less than three acres in size) present within the Burrillville Interconnection Study Area (RIGIS 1993).

Area Subject to Storm Flowage

ASSF are channel areas which carry storm, surface, groundwater discharge or drainage waters out of, into, and/or connect freshwater wetlands or coastal wetlands. ASSF are recognized by evidence of scouring and/or a marked change in vegetative density and/or composition. A total of 26 ASSFs were identified within the Burrillville Interconnection Study Area.

3.2.4 Description of Floodplain and Floodways

3.2.4.1 Floodplain

A floodplain is the land area adjacent to a river, stream or other body of flowing water which is, on average, likely to be covered with flood waters resulting from a 100-year frequency storm event as mapped by Federal Emergency Management Agency ("FEMA") (RIGIS 2015). Floodplain areas within the Study Area include lands surrounding the Chockalog River, lands surrounding Big Round and Little Round Top Ponds and Round Top Brook, and lands surrounding the Clear River and the Dry Arm Brook. Other unnamed watercourses may also contain an estimated 100-year floodplain though they are not mapped.

3.2.5 Groundwater

The RIDEM classifies all of the state's groundwater resources and establishes groundwater quality standards for each class. The four classes are designated GAA, GA, GB, and GC. Groundwater classified GAA and GA is to be protected to maintain drinking water quality, whereas groundwater classified GB and GC is known or presumed to be unsuitable for drinking water use without treatment. The presence and availability of groundwater resources is a direct function of the geologic deposits in the vicinity of the BIP.

Groundwater resources within the Burrillville Interconnection Study Area are depicted on Figure 3-8. The majority of the groundwater resources in the Burrillville Interconnection Study Area, approximately 89 percent, are classified by the RIDEM as GA (RIDEM designates approximately 71 percent of groundwater Rhode Island as GA), and approximately 1.0 percent of the groundwater resources in the Burrillville Interconnection Study Area are classified as GAA. GAA groundwater resources are known or presumed to be suitable for drinking water use without treatment and are either a part of the state's major stratified drift aquifers that are capable of serving as a significant public supply source, or are a RIDEM delineated wellhead protection area. As shown on Figure 3-8, the area designated as GAA is located outside of the BIP ROW at the southern edge of the Burrillville Interconnection Study Area. The balance of groundwater resources in the Burrillville Interconnection Study Area are located in Massachusetts and were not evaluated for the purposes of this description.

A portion of the Burrillville Interconnection Study Area is located within Burrillville Zone A-80 which is an Aquifer Overlay Zone and subject to the General Ordinances for the Town of Burrillville Aquifer Zoning in §30-202(c) which states Zone A-80 permitted uses to include single-family residential, multifamily,[1] recreation/open space, farming,[2] commercial,[1] and industrial.[1]

3.2.6 Vegetation

The Burrillville Interconnection Study Area contains a variety of vegetative cover typical of Southern New England (DeGraaf and Yamasaki 2001). These include oak/pine forest, old field, and managed

[1] Must be sewered per §30-202(c) of Town of Burrillville Aquifer Zoning Ordinance.
[2] Permitted by special use permit only per §30-202(c) of Town of Burrillville Aquifer Zoning Ordinance.

lawn. This section of the report focuses on upland communities. Wetland communities are discussed in Section 3.2.3 of this report.

3.2.6.1 Oak/Pine Forest Community

Forested cover types within the Burrillville Interconnection Study Area are typically dominated by oaks (*Quercus* spp.) with or without a white pine (*Pinus strobus*) component. Although these woodlands may appear similar throughout the Burrillville Interconnection Study Area, differences in the structure and composition of species in these forests may occur between sites. Soil moisture holding capacity and slope aspect are important factors in determining the plant associations present at a particular site. Plant associations growing on hilltops and south facing slopes are likely to face moisture deficits during the summer. Sandy soils associated with glacial outwash deposits have lower moisture holding capacity in comparison with soils formed over deposits of glacial till. Forests established in these drier sites are often characterized by smaller and more widely spaced trees in comparison with more mesic sites.

Common associates of the hilltop oak/pine forests in the Burrillville Interconnection Study Area include black (*Quercus velutina*), scarlet (*Q. coccinea*), and white oaks (*Q. alba*) as well as aspen (Populus sp.) and gray birch (*Betula populifolia*). The shrub/sapling understory includes such species as black cherry (*Prunus serotina*), lowbush blueberry (*Vaccinium angustifolium*) and greenbrier (*Smilax rotundifolia*). Sheep laurel (*Kalmia angustifolia*) and sweet fern (*Comptonia peregrina*) occasionally occur in openings between oak stands with canopy openings and on rocky slopes. Herbaceous species include bracken fern *(Pteridium aquilinum*), tree clubmoss (*Lycopodium obscurum*) and hayscented fern (*Dennstaedtia punctilobula*). These hilltop communities occur where excessively drained soils predominate, and on hilltops throughout the Burrillville Interconnection Study Area.

There is an increase in the diversity within plant communities on midslopes compared with dry hilltops. The increase in soil moisture produces this greater diversity in trees, shrubs and herbs. Midslope tree species in addition to oaks include black birch (*Betula lenta*), white ash (*Fraxinus americana*), American beech (*Fagus grandifolia*) and several species of hickory (*Carya* spp.). Shrubs include witch hazel (*Hamamelis virginiana*), sassafras (*Sassafras albidum*) and ironwood (*Carpinus caroliniana*). Greenbrier and poison ivy (*Toxicodendron radicans*) are also common in this community. Common groundcover species include tree clubmoss and wintergreen (*Gaultheria procumbens*). Midslope oak/pine communities occur on mesic mid-slope and lower slope positions and adjacent to forested wetlands on the uncleared portion of BIP ROW.

3.2.6.2 Old Field Community

Upland vegetation within the cleared portions of the TNEC ROW is typically representative of an old field successional community. Old field communities are established through the process of natural succession from cleared land to mature forest. Within the cleared ROW, periodic vegetation management has favored the establishment and persistence of grasses and herbs. Over time, pioneer woody plant species including gray birch, sumac (*Rhus* sp.) and eastern red cedar (*Juniperus virginiana*) have become established.

Within the cleared portions of the ROW, vegetation varies considerably. On dry hilltops, little bluestem (*Schizachyrium scoparium*), bluets (*Houstonia caerulea*), sweet fern (*Comptonia peregrina*) and eastern red cedar are common. On the mid-slope, greenbrier and blackberry

(*Rubus* sp.) form dense, impenetrable thickets. Numerous herbs including goldenrod (Solidago sp.), sheep sorrel (*Rumex acetosella*), wild indigo (*Baptisia tinctoria*), and mullein (*Verbascum thapsus*) are also common.

3.2.6.3 Upland Low Shrub Land Community

The existing TNEC ROW has been managed to selectively remove trees so they do not interfere with the operation of the existing transmission lines. Low shrub lands dominate portions of the TNEC ROW where succession of old field has occurred and where ROW management has resulted in tree sapling removal. Sweet fern (*Comptonia peregrina*), bayberry (*Myrica pensylvanica*), and northern arrowwood (*Viburnum recognitum*) are shrub species that are commonly found within the TNEC ROW.

Forest vegetation abuts the area of managed TNEC ROW in many places along the corridor. This forested edge contains species of trees and the TNEC ROW contains saplings that require more sunlight, such as black cherry (*Prunus serotina*), grey birch (*Betula populifolia*) and eastern red cedar. Mature forest containing northern red oak and red maple (*Acer rubrum*) are also present along the corridor, and saplings of these species are occasionally found in the TNEC ROW.

3.2.6.4 Managed Lawn/Grass

Portions of the cleared TNEC ROW contain managed residential lawn. Typically these areas consist of a continuous grass cover which may include Kentucky bluegrass (*Poa pratensis*), red fescue (*Festuca rubra*), clover (*Trifolium* sp.), and plantains *(Plantago* sp.). Ornamental shrubs may also occur within these areas.

3.2.6.5 Agricultural Areas

Based on the existing land use mapping obtained from the RIGIS and field survey, the TNEC ROW crosses agricultural/pasture lands in Burrillville.

3.2.7 Fish and Wildlife Habitat

3.2.7.1 Wildlife

As previously described, Burrillville Interconnection Study Area includes a variety of aquatic and terrestrial habitats. The wildlife assemblages present within the Burrillville Interconnection Study Area vary according to habitat characteristics. An overall list of wildlife species expected to occur within the Burrillville Interconnection Study Area was compiled. This list encompasses the expected birds within the Burrillville Interconnection Study Area. It should be noted that individual species may not occur in one particular area as opposed to another, but may be found in the general area of the transmission line. A list of amphibians, reptiles, birds, and mammals expected to occur within a given habitat are provided in Table 3-15. This information is based on geographical distribution and habitat preferences as described in *New England Wildlife: Habitat, Natural History and Distribution* (DeGraaf and Yamasaki 2001).

3.2.7.2 Breeding Birds

An inventory of potential breeding birds in the Burrillville Interconnection Study Area was compiled based on a review of published data concerning breeding birds in Rhode Island and agency consultation. The *Atlas of Breeding Birds of Rhode Island* (Enser 1992) was the primary source consulted to determine which bird species are likely to breed in the Burrillville Interconnection Study Area. Bird species observed or expected to inhabit areas within the

Burrillville Interconnection Study Area are listed in Table 3-15 below and potential breeding bird species (Enser 1992) have been noted within this table.

3.2.7.3 Fisheries

There are four Designated Trout Waters, which are waters annually stocked with trout (*Oncorhynchus* spp.) by the RIDEM, located within the Study Area: Little Round Top Pond, Big Round Top Pond, Round Top Brook and Clear River (RIDEM 2016b). In addition to trout, other common gamefish species expected to exist in the vicinity of the Project include largemouth bass (*Micropterus salmoides*), northern pike (*Esox lucius*), calico bass (*Pomoxis* sp.), and yellow perch (*Perca flavescens*). Additional fish species expected to exist in the BIP vicinity include bluegill (*Lepomis macrochirus*), pumpkinseed (*Lepomis gibbosus*), white perch (*Morone americana*), chain pickerel (*Esox niger*), carp (*Cyprinus carpio*), brown bullhead (*Ameiurus nebulosus*), and a variety of minnows and other species.

Table 3-15: Expected Wildlife Species within the Burrillville Interconnection Study Area

	Terrestrial Habitats								Aquatic Habitats					
	Swamp Hardwoods	**Hemlock**	**Oak/ Pine Forest**	**Shrub/ Old Field**	**Cultivated Field**	**Grass Field**	**Managed Lawn**	**Sedge Meadow**	**Shallow Marsh**	**Shrub Swamp**	**Pond**	**Stream**	**River**	**Riparian**
Amphibians & Reptiles														
American Bullfrog									X	X	X	X	X	X
American Toad	X	X	X	X	X	X		X	X	X	X			X
Black Rat Snake	X		X	X		X								
Blue-spotted Salamander	X	X	X					X	X	X	X			X
Common Garter Snake	X	X	X	X		X		X	X	X	X	X		X
Common Musk Turtle				X		X		X	X	X	X	X	X	X
Common Snapping Turtle			X	X	X	X			X	X	X	X	X	X
Eastern Box Turtle	X		X	X		X		X	X	X				X
Eastern Hognose Snake	X		X	X	X	X			X					X
Eastern Milk Snake	X		X	X		X								
Eastern Smooth Green Snake	X		X	X		X		X	X	X				
Eastern Worm Snake		X	X	X	X									
Four-toed Salamander	X	X	X					X	X	X		X		
Fowler's Toad	X		X	X	X	X		X	X	X	X			X
Green Frog	X							X	X	X	X	X	X	X
Gray Treefrog	X		X					X	X	X	X			X
Marbled Salamander	X	X	X							X	X			X
Northern Black Racer	X		X	X		X			X	X				X
Northern Brown Snake	X	X	X	X	X	X		X	X	X				
Northern Dusky Salamander	X	X	X									X		X
Northern Redback Salamander	X	X	X						X					
Northern Redbelly Snake	X	X	X	X						X				
Northern Ringneck Snake	X	X	X											
Northern Spring Peeper	X	X	X					X	X	X	X			X
Northern Two-lined Salamander	X	X	X									X		X
Northern Water Snake								X	X	X	X	X	X	X
Pickerel Frog	X					X		X	X		X	X		X
Red-spotted Newt	X	X	X					X	X	X	X	X		X
Ribbon Snake	X		X					X	X	X	X	X		X

	Terrestrial Habitats								Aquatic Habitats					
	Swamp Hardwoods	**Hemlock**	**Oak/ Pine Forest**	**Shrub/ Old Field**	**Cultivated Field**	**Grass Field**	**Managed Lawn**	**Sedge Meadow**	**Shallow Marsh**	**Shrub Swamp**	**Pond**	**Stream**	**River**	**Riparian**
Spotted Salamander	X	X	X					X	X	X	X			X
Spotted Turtle	X	X	X	X	X	X		X	X	X	X			X
Wood Frog	X	X	X					X	X	X				X
Wood Turtle	X	X	X	X	X	X		X	X	X	X	X	X	X
Birds														
American Black Duck *	X							X	X	X	X	X	X	X
Acadian Flycatcher	X		X											X
American Crow *	X	X	X	X	X	X								
American Goldfinch *	X	X	X	X	X	X		X	X	X				X
American Kestrel	X		X	X	X	X		X	X					
American Redstart *	X	X	X											
American Robin *	X	X	X	X	X	X				X				X
American Tree Sparrow	X	X	X	X		X		X	X	X				X
American Woodcock	X		X	X	X			X		X				X
Baltimore Oriole *	X		X	X						X				X
Bank Swallow	X	X	X	X	X	X		X	X		X	X	X	
Barn Owl					X	X								
Barn Swallow *	X	X	X			X		X	X		X	X	X	X
Barred Owl *	X	X	X	X		X								
Belted Kingfisher											X	X	X	X
Black & White Warbler *	X	X	X											X
Black-billed Cuckoo *	X			X										
Black-capped Chickadee *	X	X	X	X						X				X
Black-throated Green Warbler *	X	X	X											
Blue-gray Gnatcatcher *	X		X	X						X				
Blue-headed Vireo *	X	X	X											
Blue Jay *	X	X	X	X		X								X
Blue-winged Warbler *	X		X	X		X				X				
Bobolink						X		X	X					
Broad-winged Hawk *	X	X	X			X								
Brown Creeper *	X	X	X											X
Brown Thrasher *	X		X	X										X
Brown-headed Cowbird *	X	X	X	X	X	X			X					X
Bufflehead												X	X	
Canada Goose *					X	X	X	X	X		X	X	X	X
Canada Warbler *	X	X	X							X				X

	Terrestrial Habitats								Aquatic Habitats					
	Swamp Hardwoods	**Hemlock**	**Oak/ Pine Forest**	**Shrub/ Old Field**	**Cultivated Field**	**Grass Field**	**Managed Lawn**	**Sedge Meadow**	**Shallow Marsh**	**Shrub Swamp**	**Pond**	**Stream**	**River**	**Riparian**
Carolina Wren	X		X	X										X
Cedar Waxwing *	X		X	X						X				X
Chestnut-sided Warbler *	X			X						X				
Chimney Swift *				X	X	X		X						
Chipping Sparrow *	X	X	X		X	X								
Common Nighthawk	X	X	X	X	X	X		X						X
Common Grackle *	X		X		X	X		X	X	X				X
Common Merganser	X	X	X								X	X	X	X
Common Redpoll *		X	X	X	X	X			X	X				
Common Yellowthroat *	X	X	X	X				X	X	X	X			X
Cooper's Hawk	X	X	X	X		X								
Dark-eyed Junco	X	X	X			X								
Downy Woodpecker *	X	X	X	X										X
Eastern Bluebird *	X		X	X		X				X				X
Eastern Kingbird *	X		X	X				X	X	X			X	X
Eastern Meadowlark *					X	X					X			
Eastern Phoebe *	X	X	X	X		X				X				
Eastern Screech Owl	X	X	X	X		X		X	X					X
Eastern Towhee *	X		X	X										
Eastern Wood-Pewee *	X	X	X	X						X				X
European Starling *	X	X	X	X	X	X								X
Evening Grosbeak	X	X	X											X
Field Sparrow *	X		X	X	X	X								
Fish Crow									X		X	X	X	X
Fox Sparrow	X		X	X										X
Grasshopper Sparrow					X	X								
Golden-crowned Kinglet	X	X	X							X				X
Golden-winged Warbler	X		X	X										
Gray Catbird *	X		X	X		X				X				X
Great Black-backed Gull														
Great Blue Heron *	X		X					X	X	X	X	X	X	X
Great Crested Flycatcher *	X	X	X	X										
Great Horned Owl	X	X	X	X	X	X		X	X	X				X
Green Heron	X		X					X	X	X	X	X	X	X
Hairy Woodpecker *	X	X	X											X
Hermit Thrush *	X	X	X	X						X				
Herring Gull													X	

	Terrestrial Habitats								Aquatic Habitats					
	Swamp Hardwoods	**Hemlock**	**Oak/ Pine Forest**	**Shrub/ Old Field**	**Cultivated Field**	**Grass Field**	**Managed Lawn**	**Sedge Meadow**	**Shallow Marsh**	**Shrub Swamp**	**Pond**	**Stream**	**River**	**Riparian**
Hoary Redpoll	X	X		X	X	X			X	X				
Hooded Merganser	X	X	X								X	X	X	
Hooded Warbler	X		X	X						X				
Horned Lark					X	X								
House Wren *	X		X	X		X				X				X
House Finch *			X											
House Sparrow *					X	X								
Indigo Bunting *	X		X	X		X								X
Killdeer					X			X						X
Lapland Longspur					X	X								
Least Bittern									X					
Least Flycatcher *	X		X											X
Louisiana Waterthrush	X		X									X		X
Mallard *					X	X		X	X	X	X	X	X	X
Mourning Dove *	X	X	X	X	X	X								
Mute Swan					X	X		X	X	X	X	X	X	
Nashville Warbler	X	X	X							X				X
Northern Bobwhite			X	X	X	X								
Northern Cardinal *	X		X	X						X				X
Northern Flicker *	X	X	X	X	X	X								
Northern Goshawk	X	X	X	X		X								
Northern Mockingbird *	X		X	X						X				
Northern Rough-winged Swallow	X	X	X	X	X	X		X	X		X	X		X
Northern Saw-whet Owl	X	X	X											X
Northern Shrike	X	X	X	X		X		X	X					
Northern Waterthrush *	X	X	X							X				
Orchard Oriole	X		X											X
Ovenbird *	X	X	X											
Pine Grosbeak	X	X	X		X									
Pine Siskin	X	X	X	X		X				X				X
Pine Warbler *			X											
Prairie Warbler *			X	X										X
Purple Finch *	X	X	X	X										
Purple Martin	X	X		X	X	X		X	X		X	X	X	X
Red-bellied Woodpecker	X		X											X
Red-breasted Nuthatch			X											X
Red-eyed Vireo *	X	X	X											X

	Terrestrial Habitats								Aquatic Habitats					
	Swamp Hardwoods	Hemlock	Oak/ Pine Forest	Shrub/ Old Field	Cultivated Field	Grass Field	Managed Lawn	Sedge Meadow	Shallow Marsh	Shrub Swamp	Pond	Stream	River	Riparian
Red-shouldered Hawk *	X	X	X							X				X
Red-tailed Hawk *	X	X	X	X	X	X				X				
Rose-breasted Grosbeak *	X	X	X	X						X				X
Red-winged Blackbird *	X				X	X		X	X	X	X			X
Ring-necked Pheasant				X	X	X								
Rock Dove					X									
Rough-legged Hawk				X	X	X		X	X	X				
Ruby-crowned Kinglet		X	X											
Ruby-throated Hummingbird	X	X	X	X										
Ruffed Grouse *	X	X	X	X										
Rusty Blackbird	X													X
Savannah Sparrow					X	X		X	X					
Scarlet Tanager *	X	X	X											
Sharp-shinned Hawk	X	X	X										X	
Snow Bunting					X	X		X	X					
Solitary Sandpiper									X					
Song Sparrow *	X	X	X	X	X	X		X	X	X				X
Sora Rail								X	X	X	X			
Spotted Sandpiper						X					X	X	X	X
Swamp Sparrow	X							X	X	X	X			X
Tree Swallow *	X	X	X	X	X	X		X	X	X	X	X	X	X
Tufted Titmouse *	X		X	X						X				X
Turkey Vulture	X		X	X	X	X				X	X			
Veery *	X	X	X											
Virginia Rail									X					
Warbling Vireo *			X	X										X
Whip-poor-will *	X		X	X		X								
White-breasted Nuthatch *	X		X	X										
White-eyed Vireo	X		X	X						X				X
White-throated Sparrow *	X	X	X	X		X								
Wild Turkey	X	X	X	X	X	X								
Willow Flycatcher	X	X	X	X										
Wilson's (Common) Snipe				X				X	X	X				X
Winter Wren	X	X	X							X				X

	Terrestrial Habitats								Aquatic Habitats					
	Swamp Hardwoods	**Hemlock**	**Oak/ Pine Forest**	**Shrub/ Old Field**	**Cultivated Field**	**Grass Field**	**Managed Lawn**	**Sedge Meadow**	**Shallow Marsh**	**Shrub Swamp**	**Pond**	**Stream**	**River**	**Riparian**
Wood Duck *	X		X						X	X	X	X	X	X
Wood Thrush *	X	X	X											X
Worm-eating Warbler			X											
Yellow-bellied Sapsucker	X	X	X											X
Yellow-billed Cuckoo *	X		X	X						X				
Yellow-throated Vireo *	X		X											X
Yellow Warbler *	X		X	X						X				
Mammals														
Beaver	X		X						X	X	X	X	X	X
Big Brown Bat	X	X	X	X	X	X		X	X	X	X	X	X	X
Black Bear	X	X	X	X	X	X		X	X	X	X	X	X	X
Bobcat	X	X	X	X		X		X		X				
Coyote	X	X	X	X		X		X	X	X				X
Deer Mouse	X	X	X	X										
Eastern Chipmunk	X	X	X	X		X								
Eastern Cottontail	X		X	X		X		X	X	X				X
Eastern Mole	X		X	X	X	X								
Eastern Pipistrelle	X	X	X	X	X	X		X	X	X	X	X	X	X
Ermine	X	X	X	X	X	X			X	X				X
Fisher	X	X	X	X										
Gray Fox	X		X	X				X	X	X				X
Gray Squirrel	X		X											X
Hairy-tailed Mole	X	X	X	X		X								
Hoary Bat	X	X	X	X	X	X		X	X	X	X	X	X	X
House Mouse				X	X	X								
Little Brown Myotis	X	X	X	X	X	X		X	X	X	X	X	X	X
Long-tailed Weasel	X	X	X	X	X	X		X	X	X				X
Meadow Jumping Mouse	X	X	X	X		X		X	X	X				X
Meadow Vole	X	X	X	X		X		X	X	X				X
Masked Shrew	X	X	X	X		X		X	X	X				X
Mink	X	X	X					X	X	X	X	X	X	X
Muskrat								X	X	X	X	X	X	X
New England Cottontail	X		X	X		X		X	X	X				X
Northern Flying Squirrel		X	X											
Northern Myotis	X	X	X	X	X	X		X	X	X	X	X	X	X
Northern Short-tailed Shrew	X	X	X	X		X		X	X	X				X

	Terrestrial Habitats								Aquatic Habitats					
	Swamp Hardwoods	**Hemlock**	**Oak/ Pine Forest**	**Shrub/ Old Field**	**Cultivated Field**	**Grass Field**	**Managed Lawn**	**Sedge Meadow**	**Shallow Marsh**	**Shrub Swamp**	**Pond**	**Stream**	**River**	**Riparian**
Norway Rat				X	X	X								
Porcupine	X	X	X	X	X	X		X						
Raccoon	X	X	X	X	X	X		X	X	X				X
Red Bat	X	X	X	X	X	X		X	X	X	X	X	X	X
Southern Flying Squirrel	X		X											
Red Fox	X	X	X	X	X	X		X	X	X				X
Red Squirrel	X	X	X											
River Otter	X	X	X						X	X	X	X	X	X
Silver-haired Bat	X	X	X	X	X	X		X	X	X	X	X	X	X
Smoky Shrew	X	X	X							X				X
Snowshoe Hare	X	X	X	X					X					
Southern Bog Lemming	X		X	X		X		X	X					X
Southern Red-backed Vole	X	X	X	X	X	X								X
Star-nosed Mole	X							X	X	X	X	X	X	X
Striped Skunk	X	X	X	X	X	X		X	X	X				X
Virginia Opossum	X		X	X	X	X		X	X	X				X
Water Shrew	X	X	X					X	X	X	X	X	X	X
White-footed mouse	X	X	X	X		X		X		X				X
White-tailed Deer	X	X	X	X	X	X		X	X	X				X
Woodchuck	X	X	X	X	X	X								
Woodland Vole	X		X	X		X				X				

Legend:
X = Expected
Source: DeGraaf and Yamasaki 2001.
* = Potential Breeding Birds from *The Atlas of Breeding Birds in Rhode Island* (Enser 1992).

3.2.8 Protected Species

Correspondence regarding Federal and Rhode Island state-listed species is included in Appendix H, Agency Correspondence.

Federal-listed Species: Current Correspondence for the BIP

Current review of the USFWS Endangered Species Consultation Procedure, available on the website *https://www.fws.*gov/*newengland/EndangeredSpec-Consultation_Project_Review.htm* indicates that one Federal-listed Species, the Northern long-eared bat (*Myotis septentrionalis*), documented in the Town of Burrillville, may occur in the Burrillville Interconnection Study Area due to the unfragmented forested habitat. ESS conducted an acoustic bat survey under the Interim 4(d) Rule during late July-early August 2015 at the proposed CREC Facility Site and CREC ROW. ESS's report was reviewed by the USFWS and the Rhode Island Division of Fish and Wildlife (RIDFW); both agencies agreed with study results that Northern long-eared bats (NLEB) were not present in the survey area.[3, 4]

The Applicant requested input from the USFWS on any known federally rare, threatened or endangered species or their critical habitats within the Burrillville Interconnection Study Area. In addition, the Applicant requested comments on the necessity for further consultation under Section 7 of the Endangered Species Act, including confirmation on the status of the NLEB in the Burrillville Interconnection Study Area, and the need, if any, for supplemental field surveys along the existing TNEC ROW.[5] In response, the USFWS instructed the Applicant to fill out the online Information for Planning and Conservation ("IPaC") Form (USFWS 2017) which streamlines the USFWS environmental review process.[6] The online IPaC Form was submitted and results indicated the only threatened or endangered species in the Burrillville Interconnection Study Area was the NLEB. In addition, another online data form was submitted to obtain recommended conservation measures for the Burrillville Interconnection Study Area. However, computer-generated results indicated there were no species in the Burrillville Interconnection Study Area with conservation measure recommendations available online.

The USFWS also instructed the Applicant to contact Charles Brown (RIDFW) for guidance on whether there have been updated studies on NLEBs in Burrillville through RIDFW research. The response from RIDFW (Appendix H) indicated that while no known maternity roost trees or hibernacula have been found within the Burrillville Interconnection Study Area, the RIDFW suggested that performing surveys in the areas designated for tree removal would be prudent, and if surveys were not to be performed, then to consider limiting tree clearing outside the maternity season (June-July).[7]

The Applicant is proposing to adhere to the time of year restrictions and avoid tree clearing during the June-July timeframe in order to avoid potential impacts to maternity roost trees. A summary description and habitat requirements for the NLEB are provided below.

A USFWS IPaC review was also completed for the recently federally-listed rusty patched bumble bee (*Bombus affinis*). Prior to the mid - to late 1990s, the rusty patched bumble bee was widely

[3] von Oettingen, Susi, Email to Matt Robertson. 18 December 2015.
[4] Brown, Charles. Email to Matt Robertson. 16 March 2016.
[5] Whoriskey, Erin. Letter to Susi von Oettingen. 19 July 2016.
[6] From personal communication by S. von Oettingen, August 25, 2016.
[7] Brown, Charles. Email to Meaghan Lamothe. 31 August 2016.

distributed across areas of 31 states/provinces including Rhode Island. Since 2000 the rusty patched bumble bee has been reported from 13 states/provinces. The rusty patched bumble bee has not been reported as being in Rhode Island since 2000, and Rhode Island is no longer considered the current range of the rusty patched bumble bee.

Federal-Listed Animal Species Description and Habitat Requirements

Northern long-eared bat: The NLEB is a medium-sized bat in the *Vespertilionidae* Family with distinguishing long ears (USFWS 2015). Their body lengths range from 3.0 to 3.7 inches with a wingspan of 9 to 10 inches. Fur color ranges from medium to dark brown on the back and tawny to pale-brown on the underside. The NLEB has both a winter and summer habitat. During winter, these bats hibernate in caves and mines, known as hibernacula. These habitats have high humidity, constant temperatures, and no air currents. During the summer, NLEBs prefer forests where the bats roost in colonies or singly in cavities of both live and dead trees, as well as underneath tree bark. Females give birth to a single pup each season with the estimated maximum lifespan of the NLEB being up to 18.5 years. NLEBs feed at dusk and eat a variety of insects such as flies, leafhoppers, caddisflies, beetles, and moths. The greatest threat to the NLEB is white-nose syndrome, which is spreading from the Northeast to the Midwest and Southeast United States (USFWS 2015). The NLEB is Federally-listed as a threatened species under the Endangered Species Act.

State-listed Species: Current Correspondence for the Burrillville Interconnection Project

An inquiry email was sent to the Rhode Island Natural History Survey ("RINHS") asking which member of the four-member consortium managing the natural heritage and natural communities data in Rhode Island should be contacted to review the Burrillville Interconnection Study Area for the presence of rare species.[8] The RINHS instructed the Applicant to compare online natural heritage data available from the RIGIS website (RIGIS 2016) with the BIP footprint (refer to Appendix H).[9] Dr. David Gregg, RINHS Executive Director, further advised the Applicant to contact the RIDEM Division of Planning and Development Office for additional information on the listed species if natural heritage data crossed the BIP ROW.

Because of the overlap between natural heritage data and the BIP ROW, the Applicant contacted the RIDEM to determine the presence of any known state-listed species.[10] According to the RIGIS natural heritage database, the following species occur within the BIP ROW: rock harlequin or pale corydalis (*Capnoides sempervirens* = *Corydalis sempervirens*), dewdrop (*Rubus dalibarda* = *Dalibarda repens*), Northern beech fern (*Phegopteris connectilis*), and hobblebush (*Viburnum lantanoides*). A single specimen of American yew (*Taxus canadensis*) is located on the edge of the Burrillville Interconnection Study Area outside of the TNEC ROW.

Summary descriptions and habitat requirements for each of the rare plant species mapped in the vicinity of the BIP are provided below.

State-Listed Plant Species Descriptions and Habitat Requirements

Rock Harlequin or Pale Corydalis: Rock harlequin is an annual or biennial wildflower in the Poppy Family (*Papaveraceae*) that grows in dry woods or rocky places. Blooming time for rock harlequin

[8] Lamothe, Meaghan. Email to David Gregg. 08 June 2016.
[9] Gregg, David. Email to Meaghan Lamothe. 08 June 2016.
[10] Whoriskey, Erin. Email to Paul Jordan. 19 July 2016.

is spring to fall and its flowers are in short racemes. The flowers are rose to pink-purple in color with a yellow tip. The leaves of this species are alternate and finely divided. This species grows erect, usually branched and to approximately 6 to 24 inches high. Rock harlequin is a state-listed Species of Concern.

Dewdrop: Dewdrop is a perennial wildflower in the Rose Family (*Rosaceae*) that grows in rich, wet, woods. This species blooms in the summer with white, erect five-petaled flowers that are barely taller than the leaves. The dewdrop has heart-shaped, dark green basal leaves. Dewdrop is State Endangered.

Northern Beech Fern: Northern or long beech fern is a perennial species in the Marsh Fern Family (*Thelypteridaceae*). This fern grows in rich, moist woodlands. The fronds of the long beech fern are 6 to 10 inches long and are shaped like arrowheads with the lowest pair of leaflets pointing downward at a diagonal. A distinguishing characteristic of the Northern beech fern are the wings on the rachis that connects all but the two lowest pinnae on the frond. The upper pinnae become more fused, creating a long-tapering front tip. Northern beech fern is a State Threatened species.

Hobblebush: Hobblebush, also called moosewood or witch-hobble, is a perennial shrub in the Moschatel Family (*Adoxaceae*) with pendulous branches that take root when they touch the ground. Hobblebush can grow 6 to 12 feet high. This plant grows in moist acidic woods, stream banks, and swamps. The shrub flowers in May-June with large clusters of white to pink flowers. The leaves are cardioid or heart-shaped, and serrate. The bark is gray-brown and warty and the fruit is a drupe which is red, turning to black when ripened. Hobblebush is a State-listed Species of Concern in Rhode Island.

American Yew: The American yew is a low, straggling evergreen shrub or ground cover in the Yew Family (*Taxaceae*). This shrub grows to three to six feet tall with a spreading appearance. The flat, narrow needles are dark green above and pale green below. The fruits of the American yew are bright red and berry-like. American yew is a State-listed Species of Concern.

State-listed Species: Current Studies for the Burrillville Interconnection Project

Biological surveys had previously been completed for State-listed species for the IRP in 2011. Populations of pale corydalis were found and documented on the TNEC ROW.

Biological surveys were completed for the identified State-listed plant species to document their presence and extent on the TNEC ROW. Surveys were conducted by POWER, on behalf of the Applicant, in August of 2016. Field surveys of State-listed plant species (hobblebush, northern beech fern, dewdrop, and additional populations of pale corydalis) were performed during the 2016 field season. Populations of hobblebush, and northern beech fern, were identified on the TNEC ROW. The surveys were conducted within both eastern hemlock open and closed canopy forests in both wetlands and uplands, as well as in open upland grassy meadows and shrub-dominated habitats on the TNEC ROW.

The Applicant will coordinate with the RIDEM and RINHS to report the findings of the biological surveys of listed species and to determine appropriate avoidance/protection measures that should be implemented during construction. Due to the sensitivity of locational information on rare species, information regarding the exact locations of hobblebush and northern beech fern obtained from the 2016 surveys is not released in this document.

3.2.9 Vernal Pools

A vernal pool is a type of special aquatic site that is generally defined as a contained basin that generally lacks a permanent above-ground outlet. It fills with water between late fall and spring from rising groundwater, or with the meltwater and runoff of winter and spring snow and rain (RIDEM 2016a). Many vernal pools are regulated by the RIDEM as special aquatic sites. A special aquatic site is defined in the RIDEM Freshwater Wetlands Rules and Regulations as a body of open standing water, either natural or artificial, which does not meet the definition of pond, but which is capable of supporting and providing habitat for aquatic life forms, as documented by the: 1) presence of standing water during most years, as documented on site or by aerial photographs; and 2) presence of habitat features necessary to support aquatic life forms of obligate wildlife species, or the presence of evidence of, or use by aquatic life forms of obligate wildlife species (excluding biting flies).

Most vernal pools contain water for a few months in the spring and early summer, and are dry by mid-summer. Because they lack a permanent water source and dry periodically, vernal pools lack a permanent fish population. Vernal pools provide breeding habitat for species, particularly amphibians, which depend upon pool drying and the absence of fish for breeding success and survival (obligate vernal pool species). Some wetlands and water bodies may provide breeding habitat for amphibians, but lack the specific criteria to meet the definition of a vernal pool (e.g., provide habitat to facultative vernal pool species only, or contain evidence of breeding obligate vernal pool species occurring together with fish populations); these wetlands and water bodies have been designated as “amphibian breeding habitats.”

Field investigations for potential vernal pools and amphibian breeding habitats were initially performed in conjunction with the identification and evaluation of wetlands located along the TNEC ROW during the 2008 IRP field surveys. All wetlands along the TNEC ROW with potentially suitable vernal pool/amphibian breeding habitat were again investigated during the spring of 2011 (coinciding with the amphibian breeding season) to confirm the presence/absence of such amphibian breeding activity. A total of 14 vernal pools were identified supporting obligate vernal pool species, including spotted salamanders (*Ambystoma maculatum*), wood frogs (*Rana sylvatica*), and fairy shrimp (*Eubranchipus* spp.) along the TNEC ROW. ESS conducted field delineations on the CREC ROW in the fall of 2014. No vernal pools were identified during this fieldwork on the CREC ROW.

3.2.10 Cultural and Historic Resources

3.2.10.1 Desktop Review

Gray & Pape reviewed the site files of the RIHPHC, which include reports and site forms from previous archaeological projects in the area of Burrillville, as well as the site files of the Massachusetts Historical Commission for the neighboring towns of Douglas and Uxbridge. The review included examination of mapping of all recorded Native American and historic period archaeological sites, and mapping of all recorded Native American burial locations within an approximately one-mile radius of the proposed project. Gray & Pape reviewed State and National Registers of Historic Places; conducted a literature survey of archaeological studies, historic sources, maps and photographs from the nineteenth and twentieth centuries; studied geological and USDA soil maps; reviewed nineteenth through twenty-first century topographic maps; reviewed existing conditions and proposed layout plans provided by ESS; and reviewed LiDAR data covering the proposed Burrillville Interconnection Project.

3.2.10.2 Recorded Archaeological Resources

Three previously-recorded archaeological sites were identified within or immediately adjacent to, the TNEC ROW (see Table 3-14). The Mallard site, RI-1661, was identified during a reconnaissance survey in 1987 (King et al. 1987). Site RI-1660, the Humming Bird site, lies just to the southeast of RI-1661, along the southern edge of the BIP corridor. Both sites consist of primarily quartz waste flakes from the Native American production of stone tools, although the Mallard site also contains a Small Stemmed projectile point, a hunting tool that dates usually between 4,500-3,000 years ago. The third site in the TNEC ROW is the Sherman/Arnold Barn site, RI-1684, which consists of a large three-sided stone foundation with an open side facing Collins Taft Road. The structure is a bank barn, built into the side of the slope downwards towards the road, measuring approximately 20 by 36 feet, with a back wall height of 7.5 feet. A number of nearby houses are indicated on historic maps of the nineteenth century, with which the barn remains may be associated. Public Archaeology Laboratory ("PAL") tested the site in 2012 (Leveillee et al. 2012), and recommended avoidance of impacts to the site. Table 3-16 below provides a list of archaeological sites identified within the TNEC ROW.

Table 3-16: Archaeological Sites Identified Within the TNEC ROW

Site No.	Site Name	Site Data	Site Dates	References
RI-1660	Hummingbird	8 pcs quartz	Unknown	King et al. 1987[1]
RI-1661	Mallard	Quartz Small Stemmed point, quartzite biface, quartzite flake, 13 quartz debitage	4500-3000 BP	King et al. 1987[1]
RI-1684	Sherman/Arnold Barn	Bank barn foundation	Nineteenth century	Leveillee and Lance 2008[2]
None	Possible outbuilding	Square depression	Unknown historic	Leveillee et al. 2012[3]
None	Structure 80 Findspot	Quartz flakes on ground surface and in one test pit	Unknown pre-Contact	Leveillee et al. 2012
None	Buffam/Esten/ Sherman Cellar Hole	Cellar hole, well, artifacts	Nineteenth century	Leveillee et al. 2012
None	Structure 88 Findspot	5 quartz flakes	Unknown pre-Contact	Leveillee et al. 2012
None	Quarried granite slabs	3 quarried slabs	Unknown historic	Leveillee et al. 2012
None	Structure 92 site	8 quartzite flakes and stemmed point	Late Archaic?	Leveillee et al. 2012
None	Gaswell/Phillips Foundation	Stone lined cellar hole	Nineteenth century	Leveillee et al. 2012
None	Schoolhouse Well	Stone lined square well, possibly associated with Burrillville School #8 or nearby house	Nineteenth century	Leveillee et al. 2012
None	Structure 108 Findspot	Two quartzite flakes	Unknown pre-Contact	Leveillee et al. 2012

In addition to the three recorded archaeological sites within the TNEC ROW, another nine locations were identified during previous surveys within or adjacent to the TNEC ROW, that despite including features and/or artifacts, were not recorded as archaeological sites (Table 3-14). These include four Native American sites and five historic period sites. Five of these nine sites lie along the south edge of the TNEC ROW, in proximity to the proposed 3052 Line.

Another 12 recorded sites lie within approximately one mile of the TNEC ROW, in Burrillville, Uxbridge, and Douglas, but are not close enough to the proposed 3052 Line to be of direct concern.

During the previous archaeological survey for the 341 Line (Leveillee et al. 2012), consultation in the field was conducted with Native American tribal representatives, in order to collect data on areas of interest or concern within the TNEC ROW. Areas of concern included places and landscape features that tribal representatives requested not be impacted by construction and that should be preserved in place. Areas of concern that lie near or along the proposed 3052 Line were identified in nine locations.

A large number of stone walls also cross the TNEC ROW between Sherman Road Switching Station and the 3052 Line divergence. The Applicant will follow Best Practices recommendations in avoiding impacts to stone walls as much as is practical. If impacts to stone walls are anticipated, existing conditions of stone walls will be documented.

Areas within the proposed CREC ROW were tested by Gray & Pape for archaeological resources in 2015, following investigation of an earlier alignment. The previous alignment included a nineteenth to early twentieth century cabin site (RI HPHC 2758). The CREC ROW alignment was subsequently shifted in part to avoid the resource and to comply with transmission line engineering standards. No archaeological sites were identified along the revised/ proposed CREC ROW alignment. However, at that time, specific structure locations and the proposed route of the CREC ROW access road had not yet been fully designed. Additional cultural resource surveys along the CREC and TNEC ROWs are being completed by Gray & Pape in March 2017.

The Applicant has met with the Blackstone Valley Heritage Corridor, Inc. (“BVHC”) as part of its consultation process.

3.2.10.3 Summary of Previous Studies Conducted in the Burrillville Interconnection Project Area

PAL conducted Phase I(a/b) reconnaissance and Phase I(c) archaeological testing in 2009 as part of the IRP, which was constructed in the same existing TNEC ROW. The Phase I (a/b) reconnaissance archaeological survey included archival research and a project site walkover to assess the potential for pre-contact, contact, and post-contact period cultural resources to be present within the existing ROWs. As a result of the reconnaissance, the ROWs were stratified into zones of high, moderate, and low archaeological sensitivity, relative to the probability that potentially significant cultural resources could be expected to be located within those zones. Zones of high and moderate archaeological sensitivity were identified in sections of the ROWs that have not been substantially disturbed and are situated in attractive environmental settings (elevated terrain, well-drained soils, within 500 meters of a source of water) and/or are within or proximate to identified cultural resources. Poorly drained areas (wetlands) and sections of the existing ROWs substantially disturbed due to land use activities such as sand and gravel mining were identified as zones of low sensitivity. The Phase I(c) archaeological survey consisted of testing the areas of high and moderate sensitivity.

As a permitted undertaking under USACE review, the cultural resource surveys also included consultation with the Narragansett Indian Tribal Historic Preservation Office and the Wampanoag Tribe of Gay Head Historic Preservation Office. Representatives of both Tribal

Historic Preservation Offices ("THPO") accompanied PAL during field work, and these THPO representatives identified landscape features and locations as "Areas of Interest" or "Areas of Concern."

PAL completed an identification survey of the IRP ROWs in November 2009. The Phase I(c) survey of the 341 Line ROW resulted in the identification or verification of 17 newly identified and previously recorded archaeological sites and historic features. Of these, six were pre-contact archaeological sites and find spots and 11 consisted of post-contact sites and/or structural features. The 341 Line ROW survey also resulted in the identification of 21 features or groupings of features designated Native American areas of concern and/or interest, and 41 stone walls.

Following the identification surveys of the 341 Line ROW in November 2009, PAL conducted archaeological site evaluations (Phase II) in May and June 2010. Archaeological site evaluations were conducted on six archaeological sites that were considered potentially significant. PAL also conducted an identification survey consisting of a Phase I(a/b) reconnaissance and a Phase I(c) archaeological testing at the Sherman Road Switching Station in March and April of 2012.

4.0 WETLAND FUNCTIONS AND VALUES

4.1 Clear River Energy Center

4.1.1 Evaluation Methodology and Preparer Qualifications

The US Army Corps of Engineers Highway Methodology Workbook Supplement (ACOE, 1999) specifically defines wetland functions and values, and provides a descriptive methodology for biologists to conduct their evaluations. Functions are defined as "self-sustaining properties of a wetland ecosystem that exist in the absence of society. Functions result from both living and non-living components of a specific wetland. These include all processes necessary for the self-maintenance of the wetland ecosystem such as primary production and nutrient cycling." Values to society, according to the Highway Methodology, are defined as "benefits that derive from both one or more functions and the physical characteristics associated with a wetland. The value of a particular wetland function, or combination thereof, is based on human judgment of the worth, merit, quality, or importance attributed to those functions. The proximity of development may alter wetland functions and values. Therefore, evaluation of the resource must consider not only the wetland, but also the adjacent land use and associated interrelationships."

A functional assessment of delineated wetlands was completed to identify key wetland functions and values that exist within the project limits. Wetland Functional Assessment forms are located in Appendix I.

ESS staff involved in the in the evaluation included Craig Wood, Alex Patterson, Jason Ringler, and Joshua Burgoyne.

Mr. Wood is a Professional Wetland Scientist with over 26 years of conducted and managed ecological investigations and NEPA compliance documentation, as well as other state and local environmental permitting for public and private sector clients throughout New England. He is very knowledgeable in the fields of coastal and inland wetland ecology, vernal pool ecology, wetland delineation, functional assessment, and habitat restoration design, including restoration of tidal flows, invasive species management, fish passage, and stream restoration.

Jason Ringler is a Senior Scientist with more than 17 years of experience in wildlife assessments, environmental compliance monitoring, and wetland and terrestrial ecology. Mr. Ringler is a Certified Wetland Biologist and Professional Wetland Scientist with field research experience including Atlantic flyway waterfowl and shorebird surveys, bird point counts, small mammal trapping and nighttime amphibian (pitfall) trapping. Mr. Ringler has supported a wide range of projects for federal, state, and private sector clients.

Mr. Patterson is a Wildlife Biologist with 8 years of professional experience conducting ecological field studies throughout the eastern US and abroad. His project work includes wetland delineation, wildlife surveys, surface water quality monitoring, aquatic and terrestrial plant mapping, sediment mapping and sampling, waterbody bathymetry surveys, benthic invertebrate sampling, and spatial analysis of data using GIS. He has worked on numerous environmental permitting efforts, from large regional energy developments to local water resource improvement projects.

Joshua Burgoyne is an Environmental Scientist with a background concentration in wetland science. Mr. Burgoyne has experience includes 4 years of experience in wetland delineation/identification, field botany, soil profile analysis, hydrologic/water quality assessment, environmental impact/site assessment, wildlife biology, and GIS/remote sensing. His knowledge and experience also extends to water pollution and onsite wastewater treatment programs. Resumes are found in Appendix M.

4.1.2 Fish and Shellfish Habitat

This function considers the effectiveness of seasonal or permanent watercourses associated with the wetland in question for fish and shellfish habitat. Of the wetlands evaluated, only Wetlands 1 and 2 have associated watercourses, both of which are perennial, and therefore only these two wetlands provide fish and shellfish habitat. It is a principal function of Wetland 1, because of Iron Mine Brook's size and proximity to Wilson Reservoir.

4.1.3 Wildlife Habitat

This function considers the effectiveness of the wetland to provide habitat for various types and populations of animals typically associated with wetlands and the wetland edge. Both resident and/or migrating species were considered. Wildlife habitat is considered a principal function for all wetlands within the Facility Site. The proposed CREC site is located within a contiguous forest patch greater than 500 acres (as designated in the 2015 Rhode Island Wildlife Action Plan), and therefore all wetlands onsite are generally considered to have high wildlife habitat value. In addition, Iron Mine Brook located in Wetland 1 represents the focal point of a wildlife habitat corridor.

4.1.4 Production Export (Nutrients)

This function evaluates the effectiveness of the wetland to produce food or usable products for humans or other living organisms. Wetlands 1 and 2 provide this as a principal function due primarily to their size and association with a perennial stream.

4.1.5 Groundwater Recharge/Discharge

This function considers the potential for a wetland to serve as a groundwater recharge and/or discharge area. It refers to the fundamental interaction between wetlands and aquifers, regardless of the size or importance of either. This function is provided by all wetlands within the Facility Site and is a principal function of Wetlands 1 and 2. Designated groundwater recharge areas and

aquifers exist downstream of the proposed CREC site. Wetlands 1 and 2 also each include a perennial stream.

4.1.6 Flood Alteration

This function considers the effectiveness of the wetland in reducing flood damage by water retention for prolonged periods following precipitation events and the gradual release of floodwaters. It adds to the stability of the wetland ecological system or its buffering characteristics and provides social or economic value relative to erosion and/or flood prone areas. Floodflow alteration is provided by all wetlands within the Facility Site to some degree. It is a principal function of the larger Wetlands 1 and 2, which have mapped floodplains by FEMA.

4.1.7 Sediment/Toxicant/Pathogen Retention

This function reduces or prevents degradation of water quality. It relates to the effectiveness of the wetland as a trap for sediments, toxicants, or pathogens in runoff water from surrounding uplands or upstream eroding wetland areas. This is a function of Wetlands 1 and 2. Due to the presence of longer retention times, dense vegetation and a perennial streams, this is a principal function of Wetlands 1 and 2.

4.1.8 Nutrient Removal/Retention/Transformation

This function considers the effectiveness of the wetland as a trap for nutrients in runoff water from surrounding uplands or contiguous wetlands and the ability of the wetland to process these nutrients into other forms or trophic levels. One aspect of this function is to prevent ill effects of nutrients entering aquifers or surface waters such as ponds, lakes, streams, rivers, or estuaries. This is a principal function of Wetlands 1 and 2. Wetlands 1 and 2 are relatively large and have high potential for nutrient attenuation.

4.1.9 Sediment/Shoreline Stabilization

This function considers the effectiveness of a wetland to stabilize streambanks and shorelines against erosion. Only Wetlands 1 and 2 have the potential to provide this function as other wetlands within the Facility Site do not have associated watercourses. Wetland 1 provides sediment and bank stabilization to Iron Mine Brook while Wetland 2 provides these functions to Dry Arm Brook.

4.1.10 Recreation

This value considers the suitability of the wetland and associated watercourses to provide recreational opportunities such as hiking, canoeing, boating, fishing, hunting, and other active or passive recreational activities. Consumptive opportunities consume or diminish the plants, animals, or other resources that are intrinsic to the wetland. Non-consumptive opportunities do not consume or diminish these resources of the wetland. Recreation is not a function provided by wetlands within the Facility Site as they are located on private property and do not have open water areas.

4.1.11 Educational/Scientific Value

This value considers the suitability of the wetland as a site for an “outdoor classroom” or as a location for scientific study or research. Wetlands 1-4 do not provide educational/scientific value due to their location on private property and lack of access.

4.1.12 Uniqueness/Heritage

This value considers the effectiveness of the wetland or its associated waterbodies to provide certain special values. These may include archaeological sites, critical habitat for endangered

species, its overall health and appearance, its role in the ecological system of the area, its relative importance as a typical wetland class for this geographic location. These functions are clearly valuable wetland attributes relative to aspects of public health, recreation, and habitat diversity. Wetlands within the CREC site are not considered to provide this value.

4.1.13 Visual Quality/Aesthetics

This value considers the visual and aesthetic quality or usefulness of the wetland. Factors present that could otherwise contribute the aesthetics wetlands value include the fact that the wetlands are considered to be a valuable wildlife habitat, lack of trash, debris, and signs of disturbance and the forested wetlands dominated by red maple that provides vibrant fall foliage. However, since access is not available to the CREC site, these wetlands are not considered suitable.

4.1.14 Threatened or Endangered Species Habitat

This value considers the suitability of the wetland to support threatened or endangered species. Surveys and existing data have yielded no indication that state or federally-listed species are utilizing wetlands within the Facility Site.

4.1.15 RIDEM Functions and Values

In accordance with Rule 10.02(E), RIDEM also requires a description of the following functions and values as well as a description of proposed impacts. These topics include Wildlife & Wildlife Habitat, Recreation and Aesthetics, Flood Protection, Groundwater and Surface Water Supplies, Water Quality, and Soil Erosion and Sediment Control. A detailed description is provided in Section 5.0.

4.2 Burrillville Interconnection

4.2.1 Evaluation Methodology and Preparer Qualifications

Rule 10.02 of the Freshwater Wetland Regulations lists and describes five Freshwater Wetland Functions and Values: Wildlife and Wildlife Habitat, Flood Protection, Recreation and Aesthetics, Surface Water and Groundwater, and Water Quality. These same functions and values and others are also addressed by the US Army Corps of Engineers Highway Methodology Workbook Supplement (ACOE, 1999).

During August, September and October of 2008, and again in the spring of 2011, an in-field assessment of wetland resource areas was conducted following guidelines set forth under the Highway Methodology. Through the use of the Highway Methodology analyses, each wetland evaluated is determined to provide or not provide each of the 13 (see Section 4.2.2 through 4.2.14) functions and values described under this system. Under this system, wetlands are noted to have a principal function or value “if they are an important physical component of a wetland ecosystem (functions), and/or are considered a special value to society, from a local, regional, and/or national perspective” (ACOE, 1999).

Alison Milliman is an Environmental Specialist with a background in conservation biology and wetland and watershed hydrology. Ms. Milliman has 10 years of Project experience that includes wetland and vernal pool surveys, wildlife and rare plant surveys, licensing and permitting and environmental compliance oversight.

Jamie Durand is an Environmental Project Manager/ Senior Scientist with 25 years of experience in environmental field studies and assessments. Mr. Durand is an Associate Wildlife Biologist, Professional Wetland Scientist and New England Regional Certified Soil Scientist. Mr. Durand is

responsible for natural resource field surveys, environmental feasibility and impact assessments, and environmental permitting and licensing. He was POWER Engineers, Inc. environmental project manager for the Interstate Reliability Project that was placed in-service in December of 2015.

4.2.2 Summary of Results

Of the 76 freshwater wetlands identified and evaluated on the TNEC ROW, the 72 that will be crossed by the construction of the new 345 kV transmission line have been included in this functions and values assessment. The wetlands crossed by the CREC ROW (Wetlands 2 and 3) have been assessed as part of the CREC functions and values assessment in the previous Section 4.1. The wetland functional evaluations completed for the IRP within the TNEC ROW have been previously reviewed by the RIDEM and USACE. These wetland functional evaluations have again been confirmed by POWER in summer of 2016 as being accurate assessments of the wetlands and watercourses found within the ROW. Refer to Table 4-1 below for a summary of the functions and values along the TNEC ROW.

Table 4-1: Summary of Wetland Functions and Values along the TNEC ROW

Wetland Area	Federal Wetland Type	State Wetland Type	Groundwater Recharge/ Discharge	Floodflow Alteration	Fish & Shellfish Habitat	Sediment/ Toxicant Retention	Nutrient Removal	Production Export	Sediment/ Shoreline Stabilization	Wildlife Habitat	Recreation	Educational/ Scientific Value	Uniqueness / Heritage	Visual Quality/ Aesthetics	Endangered Species Habitat	Total Functions	Total Principle Functions
w03pr164	PFO/PEM	Shrub Wetland	Yes	Yes	No	Yes	Yes, PF/V	Yes	Yes, PF/V	Yes	No	No	No	No	No	**5**	**2**
w03pr163	PFO/PEM	Shrub Wetland	Yes	Yes	No	Yes	Yes, PF/V	Yes	Yes, PF/V	Yes	No	No	No	No	No	**5**	**2**
w03pr162	PEM/PFO	Swamp	Yes	Yes	No	Yes	No	Yes	No	Yes, PF/V	No	No	No	No	No	**4**	**1**
w03pr161	PFO	Swamp	Yes	Yes	No	Yes	No	Yes	No	Yes, PF/V	No	No	No	No	No	**4**	**1**
w03pr160*	PEM	Emergent Plant Community	Yes	Yes	No	Yes	Yes	Yes	No	Yes, PF/V	No	No	No	No	No	**5**	**1**
w03pr159	PFO	Swamp	Yes, PF/V	Yes	No	Yes	Yes	Yes	No	Yes, PF/V	No	No	No	No	No	**4**	**2**
w03pr158	PEM/PFO	Swamp	Yes, PF/V	Yes	No	Yes	Yes	Yes	No	Yes, PF/V	No	No	No	No	No	**4**	**2**
w03pr157	PEM/PFO	Swamp	Yes, PF/V	Yes	No	Yes	Yes	Yes	No	Yes	No	No	No	No	No	**5**	**1**
w03pr156*	PFO	Swamp	Yes, PF/V	Yes	No	Yes	Yes	Yes	No	Yes	No	No	No	No	No	**5**	**1**
w03pr155	PFO	Swamp	Yes, PF/V	Yes	No	Yes	Yes	Yes	No	Yes	No	No	No	No	No	**5**	**1**
w03pr154	PEM	Emergent Plant Community	Yes, PF/V	Yes	No	Yes	Yes	Yes	No	Yes	No	No	No	No	No	**5**	**1**
w03pr153	PSS	Shrub Wetland	Yes, PF/V	Yes	No	Yes	Yes	Yes	No	Yes	No	No	No	No	No	**5**	**1**
w03pr152	PEM	Emergent Plant Community	Yes, PF/V	Yes	No	Yes	Yes	Yes	No	Yes	No	No	No	No	No	**5**	**1**
w03pr151	PFO/PEM	Swamp	Yes, PF/V	Yes	No	Yes	Yes	Yes	Yes, PF/V	Yes	No	No	No	No	No	**5**	**2**
w03pr150	PFO/PSS	Swamp	Yes, PF/V	Yes	No	Yes	Yes	Yes	Yes, PF/V	Yes	No	No	No	No	No	**5**	**2**
w03pr149	PFO/PEM	Swamp	Yes, PF/V	Yes	No	Yes	Yes	Yes	Yes, PF/V	Yes	No	No	No	No	No	**5**	**2**
w03pr148*	PFO/PEM	Swamp	Yes, PF/V	Yes	No	Yes	Yes	Yes	Yes, PF/V	Yes	No	No	No	No	No	**5**	**2**
w03pr147	PFO	Swamp	Yes, PF/V	Yes	No	Yes	Yes	Yes	Yes, PF/V	Yes	No	No	No	No	No	**5**	**2**
w03pr146	PFO/PEM	Swamp	Yes, PF/V	Yes	No	Yes	Yes	Yes	Yes, PF/V	Yes	No	No	No	No	No	**5**	**2**
w03pr145	PFO	Swamp	--	--	--	--	--	--	--	--	--	--	--	--	--	**--**	**0**
w03pr144	PFO	Swamp	Yes, PF/V	Yes	No	Yes	Yes	Yes	Yes, PF/V	Yes	No	No	No	No	No	**5**	**2**
w03pr143	PFO/PEM	Swamp	Yes, PF/V	Yes	No	Yes	Yes	Yes	No	Yes	No	No	No	No	No	**5**	**1**
w03pr142	PFO/PEM	Swamp	Yes, PF/V	Yes	No	Yes	Yes	Yes	No	Yes	No	No	No	No	No	**5**	**1**
w03pr141*	PEM	Swamp	Yes, PF/V	Yes	No	Yes	Yes	Yes	No	Yes	No	No	No	No	No	**5**	**1**
w03pr140	PFO	Forested Wetland	Yes, PF/V	Yes	No	Yes	Yes	Yes	No	Yes	No	No	No	No	No	**5**	**1**
w03pr139	PEM	Emergent Plant Community	Yes, PF/V	Yes	No	Yes	Yes	Yes	No	Yes	No	No	No	No	No	**5**	**1**
w03pr138	PFO	Swamp	Yes, PF/V	Yes	No	Yes	Yes	Yes	No	Yes	No	No	No	No	No	**5**	**1**
w03pr137	PEM	Emergent Plant Community	--	--	--	--	--	--	--	--	--	--	--	--	--	**--**	**0**
w03pr136	PFO/PEM	Swamp	Yes, PF/V	Yes	No	Yes	Yes	Yes	Yes	Yes, PF/V	No	No	No	No	No	**5**	**2**
w03pr135	PFO	Swamp	Yes, PF/V	Yes	No	Yes	Yes	Yes	Yes	Yes, PF/V	No	No	No	No	No	**5**	**2**
w03pr134	PFO	Forested Wetland	--	--	--	--	--	--	--	--	--	--	--	--	--	**--**	**0**
w03pr133	PFO	Swamp	Yes	Yes, PF/V	No	Yes	Yes	Yes	Yes, PF/V	Yes	No	No	No	No	No	**5**	**2**
w03pr132*	PFO/PEM	Swamp	Yes	Yes, PF/V	No	Yes	Yes	Yes	Yes, PF/V	Yes	No	No	No	No	No	**5**	**2**

Wetland Area	Federal Wetland Type	State Wetland Type	Groundwater Recharge/ Discharge	Floodflow Alteration	Fish & Shellfish Habitat	Sediment/ Toxicant Retention	Nutrient Removal	Production Export	Sediment/ Shoreline Stabilization	Wildlife Habitat	Recreation	Educational/ Scientific Value	Uniqueness / Heritage	Visual Quality/ Aesthetics	Endangered Species Habitat	Total Functions	Total Principle Functions
w03pr131	PFO/PEM	Swamp	Yes	Yes, PF/V	No	Yes	Yes	Yes	Yes, PF/V	Yes	No	No	No	No	No	**5**	**2**
w03pr130	PEM	Swamp	Yes	Yes, PF/V	No	Yes	Yes	Yes	Yes, PF/V	Yes	No	No	No	No	No	**5**	**2**
w03pr129	PFO/PEM	Swamp	Yes	Yes, PF/V	No	Yes	Yes	Yes	Yes, PF/V	Yes	No	No	No	No	No	**5**	**2**
w03pr128	PFO	Swamp	Yes	Yes, PF/V	No	Yes	Yes	Yes	Yes, PF/V	Yes	No	No	No	No	No	**5**	**2**
w03pr127	PFO/PEM	Swamp	Yes	Yes, PF/V	No	Yes	Yes	Yes	Yes, PF/V	Yes	No	No	No	No	No	**5**	**2**
w03pr126*	PSS/PFO	Shrub Wetland	Yes, PF/V	Yes	No	Yes	Yes	Yes	No	Yes	No	No	No	No	No	**5**	**1**
w03pr125	PFO	Swamp	Yes, PF/V	Yes	No	Yes	Yes	Yes	No	Yes	No	No	No	No	No	**5**	**1**
w03pr124	PFO	Swamp	Yes, PF/V	Yes	No	Yes	Yes	Yes	No	Yes	No	No	No	No	No	**5**	**1**
W05pr002*	PFO/PSS	Swamp	Yes	Yes	No	Yes	Yes	No	No	Yes VP	No	No	No	No	No	**4**	**0**
w03pr123	PFO	Swamp	Yes, PF/V	Yes	No	Yes	Yes	Yes	No	Yes	No	No	No	No	No	**5**	**1**
w03pr122*	PFO/PEM	Swamp	Yes, PF/V	Yes	No	Yes	Yes	Yes	No	Yes	No	No	No	No	No	**5**	**1**
W05pr05	PFO	Forested Wetland	Yes	Yes	No	Yes	Yes	No	No	Yes	No	No	No	No	No	**5**	**0**
w03pr121	PFO	Swamp	Yes, PF/V	Yes	No	Yes	Yes	Yes	No	Yes	No	No	No	No	No	**5**	**1**
w03pr120	PFO	Swamp	Yes, PF/V	Yes	No	Yes	Yes	Yes	No	Yes	No	No	No	No	No	**5**	**1**
w03pr119	PSS	Emergent Plant Community	Yes, PF/V	Yes	No	Yes	Yes	Yes	No	Yes	No	No	No	No	No	**5**	**1**
w03pr118*	PSS	Shrub Wetland	Yes, PF/V	Yes	No	Yes	Yes	Yes	No	Yes	No	No	No	No	No	**5**	**1**
w03pr117**	PEM	Forested Wetland	Yes, PF/V	Yes	No	Yes	Yes	Yes	No	Yes	No	No	No	No	No	**5**	**1**
w03pr116	PFO	Swamp	Yes, PF/V	Yes	No	Yes	Yes	Yes	No	Yes	No	No	No	No	No	**5**	**1**
w03pr115	PFO	Swamp	Yes, PF/V	Yes	No	Yes	Yes	Yes	No	Yes	No	No	No	No	No	**5**	**1**
w03pr114*	PFO/PEM	Swamp	Yes, PF/V	Yes	No	Yes	Yes	Yes	Yes	Yes	No	No	Yes	No	No	**7**	**1**
w03pr113	PEM	Emergent Plant Community	Yes	Yes	No	Yes, PF/V	Yes	No	No	Yes	No	No	No	No	No	**4**	**1**
w03pr112**	PSS	Shrub Wetland	Yes	Yes, PF/V	No	Yes	Yes	No	No	Yes, PF/V	No	No	No	No	No	**3**	**2**
w03pr111	PFO	Forested Wetland	--	--	--	--	--	--	--	--	--	--	--	--	--	**--**	**0**
w03pr110*	PFO/PEM	Swamp	Yes	Yes	Yes	Yes, PF/V	Yes, PF/V	Yes, PF/V	Yes	Yes, PF/V	Yes	Yes	Yes	Yes	No	**8**	**4**
w03pr109	PFO	Swamp	Yes	Yes	Yes	Yes, PF/V	Yes, PF/V	Yes, PF/V	Yes	Yes, PF/V	Yes	Yes	Yes	Yes	No	**8**	**4**
w03pr108	PFO	Forested Wetland	Yes	Yes	Yes	Yes, PF/V	Yes, PF/V	Yes, PF/V	Yes	Yes, PF/V	Yes	Yes	Yes	Yes	No	**8**	**4**
w03pr106*	PFO	Swamp	Yes	Yes	No	Yes, PF/V	Yes	No	No	Yes, PF/V	No	No	No	No	No	**3**	**2**
w03pr107	PFO	Swamp	Yes, PF/V	Yes	No	Yes	Yes	Yes	No	Yes	No	No	No	No	No	**5**	**1**
w03pr105	PSS/PEM	Shrub Wetland	Yes, PF/V	Yes	No	Yes	Yes	Yes	No	Yes	No	No	No	No	No	**5**	**1**
w03pr104	PFO/PSS	Swamp	Yes, PF/V	Yes	No	Yes	Yes	Yes	No	Yes	No	No	No	No	No	**5**	**1**
w03pr103*	PFO	Swamp	Yes, PF/V	Yes, PF/V	No	Yes	Yes	Yes	Yes	Yes	No	No	No	No	No	**5**	**2**
w03pr102*	PFO	Swamp	Yes, PF/V	Yes, PF/V	No	Yes	Yes	Yes	Yes	Yes	No	No	No	No	No	**5**	**2**
w03pr101	PEM	Emergent Plant Community	Yes	Yes	No	Yes	Yes, PF/V	No	No	Yes, PF/V	No	No	No	No	No	**3**	**2**
w03pr100	PFO/PEM	Swamp	Yes, PF/V	Yes, PF/V	No	Yes	Yes	Yes	Yes	Yes	No	No	No	No	No	**5**	**2**

Wetland Area	Federal Wetland Type	State Wetland Type	Groundwater Recharge/ Discharge	Floodflow Alteration	Fish & Shellfish Habitat	Sediment/ Toxicant Retention	Nutrient Removal	Production Export	Sediment/ Shoreline Stabilization	Wildlife Habitat	Recreation	Educational/ Scientific Value	Uniqueness / Heritage	Visual Quality/ Aesthetics	Endangered Species Habitat	Total Functions	Total Principle Functions
w03pr099	PEM/PFO	Swamp	Yes	Yes, PF/V	Yes	Yes, PF/V	Yes, PF/V	Yes	Yes	Yes, PF/V	No	No	Yes	No	No	**5**	**4**
w03pr098	PEM	Emergent Plant Community	Yes	Yes, PF/V	Yes	Yes, PF/V	Yes, PF/V	Yes	Yes	Yes, PF/V	No	No	Yes	No	No	**5**	**4**
w03pr096**	PFO/PO W/PEM	Swamp	Yes	Yes, PF/V	Yes	Yes, PF/V	Yes, PF/V	Yes	Yes	Yes, PF/V	No	No	Yes	No	No	**5**	**4**
w03pr097	PFO/PEM	Swamp	Yes	Yes, PF/V	Yes	Yes, PF/V	Yes, PF/V	Yes	Yes	Yes, PF/V	No	No	Yes	No	No	**5**	**4**
w03pr097A	PFO	Swamp	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No	No	No	**8**	**0**
W03pr099a	PFO/PSS	Shrub Wetland	Yes	Yes	No	Yes	Yes	No	No	Yes	No	No	No	No	No	**5**	**0**
W03pr098a	PFO	Forested Wetland	Yes	Yes	No	No	No	No	No	No	No	No	No	No	No	**2**	**0**
w03pr095a	PEM	Emergent Plant Community	Yes	Yes, PF/V	No	Yes, PF/V	Yes, PF/V	Yes	Yes	Yes	No	No	No	No	No	**4**	**3**
w03pr095b*	PEM	Marsh	Yes	Yes, PF/V	No	Yes, PF/V	Yes, PF/V	Yes	Yes	Yes	No	No	No	No	No	**4**	**3**
Total # of wetlands providing function			**72**	**72**	**8**	**71**	**69**	**64**	**32**	**70**	**3**	**3**	**8**	**3**	**0**		
Total % of wetlands providing function			**100.0**	**100.0**	**11.1**	**98.6**	**95.8**	**88.9**	**44.4**	**97.2**	**4.2**	**4.2**	**11.1**	**4.2**	**0.0**		
Total # of wetlands providing principal function			**42**	**18**	**0**	**12**	**12**	**3**	**15**	**17**	**0**	**0**	**0**	**0**	**0**		
Total % of wetlands providing principal function			**58.3**	**25.0**	**0.0**	**16.7**	**16.7**	**4.2**	**20.8**	**23.6**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**		

1: Wetlands were classified according to Cowardin et al. PEM = palustrine emergent, PSS = palustrine scrub-shrub, PFO = palustrine forested, and POW = palustrine open water.
PF/V = Noted as Principal Function or Value in wetland
* Vernal Pool noted within delineated wetland;
** These wetlands meet the criteria for classification as Rhode Island amphibian habitat.
***These wetland provide both vernal pool species and amphibian habitats.

4.2.3 Fish and Shellfish Habitat

This function considers the effectiveness of seasonal or permanent watercourses associated with the wetland in question for fish and shellfish habitat. Eight of the 72 wetlands assessed (11%) may provide fish habitat due to the presence of a watercourse. These wetlands are located near the Sherman Road Switching Station in a headwater section of the Chockalog River. This function was not considered principal in any wetlands.

4.2.4 Wildlife Habitat

This function considers the effectiveness of the wetland to provide habitat for various types and populations of animals typically associated with wetlands and the wetland edge. Wetland size, diversity of cover types, interspersion, and connectivity with other wildlife habitats are important factors contributing to wildlife cover, foraging, reproduction, and nursery habitat. Both resident and/or migrating species were considered. Almost all wetlands (70 of 72) within the TNEC ROW have the potential to provide habitat for different types of wildlife. This function was considered principal in 17 (or 24%) of the wetlands evaluated.

4.2.5 Production Export (Nutrients)

This function evaluates the effectiveness of the wetland to produce food or usable products for humans or other living organisms. Most of the wetlands (64 of 72) along the TNEC ROW have the potential to export nutrients and/or provide food to wildlife. This function was considered principal in 3 (or 4%) of the wetlands evaluated.

4.2.6 Groundwater Recharge/Discharge

This function considers the potential for a wetland to serve as a groundwater recharge and/or discharge area. It refers to the fundamental interaction between wetlands and aquifers, regardless of the size or importance of either. All wetlands assessed along the TNEC ROW have the potential to provide this function and more than half (58%) as a principal function. Designated groundwater recharge areas and aquifers exist downstream of the proposed TNEC ROW construction route and two Wellhead Protection Areas (“WHPA”s) exist in and around the Sherman Road Switching Station.

4.2.7 Flood Alteration

This function considers the effectiveness of the wetland in reducing flood damage by water retention for prolonged periods following precipitation events and the gradual release of floodwaters. It adds to the stability of the wetland ecological system or its buffering characteristics and provides social or economic value relative to erosion and/or flood prone areas. The wetland size, form (large level storage area with a restricted outlet), position in the watershed, and presence of a potential downstream damage area are evaluated. The potential for floodflow alteration is provided by all wetlands assessed along the TNEC ROW to some degree and it is a principal function of 25% of the TNEC ROW wetlands. Generally, wetlands with the potential to hold standing water such as permanently and intermittently flooded swamps are considered to provide flood alteration as a principal function.

4.2.8 Sediment/Toxicant/Pathogen Retention

This function reduces or prevents degradation of water quality. It relates to the effectiveness of the wetland as a trap for sediments, toxicants, or pathogens in runoff water from surrounding uplands or upstream eroding wetland areas. Potential upstream pollutant sources, the ability of the wetland

to impound water to enhance sedimentation, and the wetland size are factors that are evaluated. Nearly all of the wetlands (71 of 72) assessed along the TNEC ROW have the potential to provide this function due to the presence of longer retention times, dense vegetation and a perennial streams, this is a principal function of 12 of the 72 wetlands assessed.

4.2.9 Nutrient Removal/Retention/Transformation

This function considers the effectiveness of the wetland as a trap for nutrients in runoff water from surrounding uplands or contiguous wetlands and the ability of the wetland to process these nutrients into other forms or trophic levels. One aspect of this function is to prevent ill effects of nutrients entering aquifers or surface waters such as ponds, lakes, streams, rivers, or estuaries. This function is provided by nearly all (69 of 72) of the wetlands assessed and it is a principal function of 12 of the 72 wetlands due to their relatively large size and high potential for nutrient attenuation.

4.2.10 Sediment/Shoreline Stabilization

This function considers the effectiveness of a wetland to stabilize streambanks and shorelines against erosion. Thirty-two of the 72 wetlands assessed have the potential to provide this function due to the presence of associated watercourses or waterbodies within or immediately downstream of the wetland. Fifteen wetlands that contain significant watercourses provide sediment/shoreline stabilization as a principal function.

4.2.11 Recreation

Freshwater wetlands support active and passive recreational and aesthetic values that are important to the general public. Wetlands provide the opportunity for recreational activities, including but not limited to hunting, fishing, trapping, cross-country skiing, ice skating, boating, water-skiing, canoeing, camping, swimming, bicycling, hiking, walking, horseback riding, harvesting of natural foods or plant materials, bird watching and other animal observation, education and nature studies, and photography. Only the 3 wetlands within Round Top Management Area were considered to have recreational value. Other wetlands within and adjacent to the TNEC ROW do not have public access and do not currently provide recreational opportunities.

4.2.12 Educational/Scientific Value

This value considers the suitability of the wetland as a site for an “outdoor classroom” or as a location for scientific study or research. It combines ecological integrity, proximity of schools and ease of access to educational opportunity. With the exception of the 3 wetlands crossed by the TNEC ROW within Round Top Management Area, the wetlands along the TNEC ROW do not currently provide this value due to their location on private property and lack of access.

4.2.13 Uniqueness/Heritage

This value evaluates the potential for former use of the wetland by Native Americans, historic industry and habitations, unique plants, animals or geologic features. These may include archaeological sites, critical habitat for endangered species, its overall health and appearance, its role in the ecological system of the area, its relative importance as a typical wetland class for this geographic location. Eight of 72 wetlands assessed along the TNEC ROW have the potential to provide this function due to their location within a RINHS Natural Heritage Area and/or Round Top Management Area.

4.2.14 Visual Quality/Aesthetics

Aesthetic values include but are not limited to the visual, aural, and cultural qualities of the wetland. Without limitation, these include the wetland's prominence as a distinct feature in the local area, including its value as open space; whether it is a rare wetland type; whether it offers or provides suitable habitat for any rare animal or rare plant species; whether it has any outstanding or uncommon geomorphologic features; and whether it contains or may contain material of archaeological, historical, or cultural significance. Only the 3 wetlands within Round Top Management Area currently provide this function, since access is not available to the remainder of the TNEC ROW.

4.2.15 Threatened or Endangered Species Habitat

This value considers the suitability of the wetland to support threatened or endangered species. Surveys and existing data have yielded no indication that State or Federally-listed species are utilizing wetlands within the TNEC ROW.

5.0 DESCRIPTION OF POTENTIAL PROJECT IMPACTS

The following section discusses potential physical impacts to wetlands and watercourses and impacts to their functions and values. Also discussed in the following section are impacts to protected species and cultural resources. Several other local, state, and federal permit applications have been or will be filed that will assess environmental impacts to air quality, noise, traffic, and other issues not specifically covered in this Application. A list of permit applications for this Project that are currently under review or are in preparation is provided below:

- Rhode Island Energy Facility Siting Board Application for the Clear River Energy Center
- Rhode Island Energy Facility Siting Board Application for the Burrillville Interconnection Project
- USACE Section 404 Individual Permit Application
- RIDEM Onsite Wastewater Treatment System ("OWTS") Application
- RIDEM Major Source Permit Application
- RIDOH Potable Well Permit Application
- EPA Multi-Sector General Permit Notice of Intent ("MSGP NOI")

5.1 Clear River Energy Center

5.1.1 Wetlands and Watercourses

The CREC has been designed and sited to be located outside delineated wetland areas to the greatest extent practicable. Construction of the CREC will result in relatively small permanent wetland impacts (in comparison to the overall size of the Facility). Nearly all of the wetland impacts attributable to the CREC result from the widening and improvement of the existing woods road in order to accommodate construction vehicles and operational traffic associated with the proposed Facility. Widening of the existing woods road would entail the placement of approximately 0.48 acres of permanent fill within Wetland 1 (Table 5-1). An additional 1.04 acres of perimeter wetland and 1.21 acres of riverbank wetlands will be directly impacted. A small portion of the impact to

perimeter wetland is necessary to construct and maintain the stormwater management infrastructure.

An analysis to determine the 100-year Base Flood Elevation ("BFE") for streams potentially impacted by the CREC was conducted. Results of this analysis found that construction of the access road will impact approximately 0.13 acres of 100-year Floodplain and cause the displacement of approximately 742 cubic yards of flood storage volume within the intermittent tributary to Iron Mine Brook.

Retaining walls are proposed along the majority of the new roadway to both minimize encroachment into wetland resource areas and serve as a guiding fence to direct wildlife to a series of large natural bottom box culverts proposed under the new roadway (see Section 6.1.2 for more details). The roadway, associated retaining walls as well as a five-foot offset from the wall was considered a permanent impact. Additional disturbance beyond this five-foot offset will be restored to existing grades following construction and was therefore considered a temporary impact. To maintain a safe travelway, it may be necessary to manage vegetation within this zone to avoid new tree growth that could fall and block site access. Installation of the replacement culvert associated with the intermittent tributary to Iron Mine Brook will result in a 136 linear foot disturbance. While the new culvert will be substantially greater in length, the interior dimensions of the new natural bottom 12-foot wide by 6-foot high box culvert will allow for the restoration of a section of the stream which is currently confined to an 18-inch culvert underneath the existing woods road.

The proposed configuration of the project will result in the permanent loss of SAS 1. Permanent fill will not be placed within the limits of SAS 2; however, the upland habitats directly adjacent to the special aquatic site will be cleared for installation of the project's stormwater basin and a temporary construction staging area.

Invenergy has carefully evaluated lay-down options within the property and as a result has designed the project to avoid any additional encroachment into either biological or perimeter wetlands. Wetland impacts associated with the Facility and new roadway are summarized in the following table.

Table 5-1: Summary of Potential CREC Impacts to Wetlands, Watercourses, and Floodplain

	Biological Wetland	Intermittent Stream	Perimeter Wetland	100' Riverbank Wetland	200' Riverbank Wetland	100-Year Floodplain
Wetland ID	Acres	Linear Feet	Acres	Acres	Acres	Acres
Wetland 1	0.48	136	1.0	0.5	0.71	0.13
Wetland 2	-	-	0.04	-	NA	-
Wetland 3	-	-	-	NA	NA	-
SAS 1	0.02	-	NA	NA	NA	-
SAS 2	-	-	NA	NA	NA	-
Totals (ac)	0.50	136	1.04	0.5	0.71	0.13

5.1.2 Recreation and Aesthetics

Wetlands within the CREC Facility limits are generally not considered to provide important recreational value for such opportunities as hiking, canoeing, boating, fishing, hunting, and other active or passive recreational activities as they are located on private property without public access and do not contain open water areas. The aesthetics value considers the visual and aesthetic

quality or usefulness of the wetland. Important qualifiers absent for the majority of wetlands within the CREC limits include:

- Multiple wetland classes are visible from primary viewing locations;
- Emergent marsh and/or open water are visible from primary viewing locations;
- Wetland is easily accessed;
- Low noise level at primary viewing locations; and
- Relatively unobstructed sight line exists through wetland.

Factors present that could otherwise contribute the aesthetics wetlands value include the fact that the wetlands are considered to be a valuable wildlife habitat, lack of trash, debris, and signs of disturbance and the forested wetlands dominated by red maple that provides vibrant fall foliage. While the land use surrounding the wetlands is generally considered to be undeveloped as seen from the viewing locations along Wallum Lake Road, this condition will remain following construction of the Facility. As a result, no impacts to recreation and aesthetics wetland values are anticipated.

5.1.3 Flood Protection

This function considers the effectiveness of the wetland in reducing flood damage by water retention for prolonged periods following precipitation events and the gradual release of floodwaters. It adds to the stability of the wetland ecological system or its buffering characteristics and provides social or economic value relative to erosion and/or flood prone areas. Floodflow attenuation is provided by all wetlands within the Facility Site to some degree. It is a principal function of the larger Wetlands 1 and 2.

An analysis to determine the 100-year Base Flood Elevation ("BFE") for streams potentially impacted by the CREC was conducted. Results of this analysis found that construction of the access road will impact approximately 0.13 acres of 100-year Floodplain and cause the displacement of approximately 742 cubic yards of flood storage volume within the intermittent tributary to Iron Mine Brook. To avoid adverse impacts, the project includes the creation of an equally sized compensatory flood storage area adjacent to the access road crossing. The area will be regraded and restored to a forested condition (see Section 6.1).

Hydrologic and Hydraulic Analysis

Proposed post-construction best management practices ("BMP"s) for the CREC have been sized and designed to meet the hydrologic and hydraulic standards in *Rhode Island Stormwater Design and Installation Standards Manual* ("RISDISM") (RIDEM 2013). Additional discussion of post-construction BMP sizing and design is provided in Appendix J. The following section discusses our hydrologic and hydraulic analysis approach and general results of the analysis.

Points of Analysis

Portions of the Facility Site proposed for improvement have been analyzed in accordance with guidance presented in Appendix K of the RISDISM. Five Points of Interest ("POI"s) have been established, POI A though POI E. Each point of interest is common in pre- and post-development conditions. There are minor existing roadway culverts within the Facility Site which are proposed

for removal or replacement; there are no known existing other drainage facilities in any POI's drainage area. All cover types within all drainage areas are currently forested.

- POI A is at the proposed discharge structure from the powerblock's detention Facility. POI A drains to Iron Mine Brook, and is set in existing wetlands.
- POI B is set at the downstream end of the proposed culvert (and approximately location of a culvert for the existing wood road). POI B discharges to Iron Mine Brook.
- POI C has been established immediately south of Wallum Lake Road at the downstream end of a proposed roadway culvert. POI C discharges to Iron Mine Brook.
- POI D is an off-site point of interest, needed to determine the peak runoff reduction caused by the project at this off-site area. The proposed grading plan results in a small amount of area tributary to POI D being diverted to POIs A and B.
- POI E is at the existing road culvert for Iron Mine Brook. POI E is needed to perform the downstream analysis discussed below.

Channel Protection (1-Year, 24-Hour, Type III Storm)

The channel protection volume ("CPv") is the 24-hour extended detention of the post-development runoff volume from the 1-year, 24-hour Type III design storm event.

For Facility sizing criteria, the basis for hydrologic and hydraulic evaluation of the Facility Site are as follows:

- The NRCS TR-20 model was used to determine the CPv (in accordance with Section 3.3.4 of the RISDISM guidance).
- Conveyance systems were sized using the NRCS TR-55 (swales and storm sewers).
- Off-site areas draining to proposed facilities were modeled as "present condition" for the one-year storm event.
- The length of sheet flow used in time of concentration ("tc") calculations was limited to no more than 100 feet for post-development conditions.
- The CPv shall be released at roughly a uniform rate over a 24-hour duration.

The RISDISM guidance document requires computation of the CPv using methodology developed by Harrington in 1987. For the proposed project, the runoff volume associated with the 1-year, 24-hour Type III storm event was computed for each drainage area, and the CPv determined by multiplying the runoff volume for each area by 0.65 with the results summarized in Table 5-2 below:

Table 5-2: Summary of Channel Protection Volumes (CPv)

Summary of Channel Protection Volumes (CPv)			
Area	**Calculated CPv, cf**	**Calculated average release rate, cfs**	**Provided average release rate, cfs**
Powerblock	227,651	2.63	2.57
Roadway	36,302	0.47	N/A*

*Less than 2 fps

As presented above, the powerblock drainage area's detention pond has been designed to meet Channel Protection criteria. The roadway's detention basin has also been designed to meet these criteria.

Overbank Flood Protection (10- and 100-Year, 24-Hour, Type III Storm)

Peak flow attenuation is required for the 10-year and 100-year, 24-hour Type III design storm events. The primary purpose of this sizing criterion is to prevent an increase in the frequency and magnitude of out-of-bank flooding (i.e., flow events that exceed the bank-full capacity of the channel, and therefore, must spill over to the floodplain). One of the key objectives of an out-of-bank flooding requirement is to protect downstream structures (houses, businesses, culverts, bridge abutments, etc.) from increased flows and velocities from upstream development. The intent of this criterion is to prevent increased flood damage from infrequent but very large storm events, maintain the boundaries of the predevelopment floodplain, and protect the physical integrity of a stormwater management practice itself.

For Facility sizing criteria, the basis for hydrologic and hydraulic evaluation of the Facility Site are as follows:

- The TR-20 model was used for determining the required storage and outlet structures for attenuating the peak flows from the 10-year and 100-year, 24-hour Type III design storms.

- The standard for characterizing pre-development land use for on-site areas was woods (entire proposed drainage area is wooded).

- For purposes of computing runoff, all pervious lands prior to development were assumed to be in good condition regardless of conditions existing at the time of computation.
- Off-site areas that drain to a proposed Facility were modeled as "present condition" for peak-flow attenuation requirements.
- Off-site areas drain to the proposed stormwater management BMPs. The calculations in Appendix A of this document demonstrate safe passage of the 100-year event based on actual conditions upstream.
- The length of sheet flow used in tc calculations is limited to no more than 150 feet for pre-development conditions and 100 feet for post-development conditions.
- The proposed site design demonstrates that the 100-year event will be safely conveyed through the proposed ponds (two detention facilities—one at the powerblock drainage area and one at the proposed roadway drainage area), which have been designed to manage the 100-year event.

The detention basin at the south side of the powerblock area and detention basin serving the proposed roadway have been designed to meet these criteria and that of Minimum Standard 5. The results are summarized below:

Table 5-3: Summary of Overbank Flood Protection (Qp), cfs

Summary of Overbank Flood Protection (Qp), cfs				
POI	**10-year pre-development runoff rate, cfs**	**10-year post-development runoff rate, cfs**	**100-year pre-development runoff rate, cfs**	**100-year post-development runoff rate, cfs**
A	20.16	18.29	46.68	40.42
B	88.73	74.75	197.47	174.13
C	9.01	8.29	20.85	18.29
D	140.96	137.55	327.06	319.56
F	13.08	7.01	30.37	16.28

Downstream Analysis (10- and 100-Year, 24-Hour, Type III Storm)

A downstream analysis is required for projects meeting the project size and impervious cover characteristics specified in the RISDISM or when deemed appropriate by the approving agency when existing conditions are already causing a problem (e.g., known drainage or flooding conditions or existing channel erosion is evident), to determine whether peak flow impacts are fully attenuated by controlling the 10- and 100-year events. The criterion used for the limit of the downstream analysis is referred to as the "10% rule." Under the 10% rule, a hydrologic and hydraulic analysis is extended downstream to the point where the site represents 10% of the total drainage area. For example, a 10-acre disturbed area within the same subwatershed would be analyzed to the point downstream with a drainage area of 100 acres.

This project's disturbance area within the watershed and proposed impervious cover percentage require the preparation of a Downstream Analysis in accordance with Section 3.3.6 of the RISDISM. Such an analysis has been prepared, and the site's proposed stormwater management BMPs meet the requirements of RISDISM Section 3.3.6 related to Downstream Analysis.

5.1.4 Groundwater and Surface Water Supplies

This function considers the potential for a wetland to serve as a groundwater recharge and/or discharge area. It refers to the fundamental interaction between wetlands and aquifers, regardless of the size or importance of either. This function is provided by all wetlands within the Facility Site and is a principal function of Wetlands 1 and 2. Designated groundwater recharge areas and groundwater reservoirs exist downstream of the proposed CREC site. Wetlands 1 and 2 also each include a perennial stream which is an indicator of groundwater discharge. Stormwater management within the Facility is designed to avoid diversion of surface waters which could adversely affect wetland hydrology. Additionally, the operation of the proposed non-community water system will not have a significant impact on any water resources located on or proximal to

the Facility Site , including Dry Arm Brook and Iron Mine Brook and their associated wetland areas due to the limited amount of potable water that will be required.

5.1.5 Water Quality

The discussion below addresses general water quality at the Facility Site and appropriate post-construction water quality management BMPs to meet standards in the Freshwater Wetlands Regulations.

Appendix J, Stormwater Management Plan for Clear River Energy Center has been drafted to provide discussion of post-construction BMPs. It is our understanding that the project will be permitted by RIDEM as “new development”; therefore, post-construction water quality BMPs have been sized to manage one inch of runoff over the impervious surface. At this time, a pollutant loading analysis has not been completed, but will be completed as part of the final freshwater wetlands permit application.

The Facility Site is located in a forested, predominantly rural area. There is no existing drainage system on site. The majority of the Facility Site receives runoff from offsite areas. The hydrology of the Facility Site is described further in the sections below.

The most substantial surface hydrologic feature, Iron Mine Brook, is located east of the CREC site. Iron Mine Brook is a perennial stream that flows in a northeasterly direction through the southern portion of wetlands. Iron Mine Brook is a lower order perennial stream (R2) with a sandy bottom. Iron Mine Brook crosses under Wallum Lake Road to the east of the proposed CREC via culvert and eventually discharges to the Clear River. Iron Mine Brook is a RIDEM Category 3 river, meaning that there is insufficient or no data to identify its designated uses, and is classified as a Class B waterbody. A Class B waterbody can be considered for bathing, fish and wildlife habitat, recreational use, agricultural use, industrial supply and other legitimate uses, including navigation. Iron Mine Brook is approximately 10 to 12 feet wide; it, therefore, has an associated 200-foot riverbank wetland per the RIDEM Wetland Regulations.

Two unnamed intermittent streams are present in the eastern part of the Facility Site. Both of these streams originate north of the Facility Site, and flow under Algonquin Lane via twin 10-inch diameter pipe culverts. The two streams meet in the northeastern portion of Wetland 1 and flow south, passing through a metal pipe culvert under the woods road, until ultimately reaching Iron Mine Brook. These streams average less than 10 feet wide in their reach through the Facility Site; they therefore have an associated 100-foot Riverbank Wetland per the RIDEM Wetland Regulations.

The largest surface hydrologic feature in the western portion of the proposed Facility Site is an unnamed perennial tributary to Dry Arm Brook. This perennial stream is designated as a Class B waterbody. In its reach through the Facility Site, this stream is a lower perennial stream with a sandy and muddy bottom (R2). Where it passes through the proposed Facility Site, this stream averages less than 10 feet wide; it, therefore, has an associated 100-foot Riverbank Wetland per the RIDEM Wetland Regulations.

The majority of the Facility Site qualifies as a land use with higher potential pollutant loads (“LUHPPL”) in accordance Section 3.0 of the RISDISM. The proposed site use in the powerblock area is a power generation Facility (industrial site as defined in RIPDES Rule 31(b)(15)). The

powerblock site does not qualify for a no exposure certification for exclusion from RIPDES stormwater permitting. The character and scale of the Facility Site preclude the implementation of Qualified Pervious Areas ("QPA"s). Lined detention and water quality ponds, specifically a gravel wet vegetated treatment system ("GWVTS") designed in accordance with the RISDISM, are proposed for the powerblock.

Only the drainage area comprised of the CREC roadway is not considered a LUHPPL. Infiltration BMPs, including a dry swale and attenuation pond, will be used to the extent practicable in areas outside of the powerblock.

A design plan set and related design materials have been developed for the project. Designs are currently developed at a conceptual level sufficient to support permitting.

Operation and maintenance of stormwater BMPs at the Facility Site will be the responsibility of Clean River Energy LLC.

5.1.6 Soil Erosion and Sediment Control

The discussion below addresses general soil erosion and sediment control at the Facility Site in accordance with the *Rhode Island Soil Erosion and Sediment Control Handbook* (RIDEM 2013) and applicable Rhode Island regulatory standards.

Appendix J *Stormwater Management Plan for Clear River Energy Center*, has been drafted to provide discussion of proposed soil erosion and sediment control BMPs at the CREC.

The soil at the site consists of the following soil types (National Resource Conservation Service, Web Soil Survey):

- Canton and Charlton fine sandy loams, very rocky, 3 to 15 percent slopes (CeC)
- Canton fine sandy loam, 15 to 35 percent slopes, rocky (CrD)
- Freetown muck (FeA)
- Ridgebury, Whitman, and Leicester extremely stony fine sandy loams (Rf)
- Sutton very stony fine sandy loam, 0 to 8 percent slopes (SuB)
- Woodbridge very stony fine sandy loam, 0 to 8 percent slopes (WoB)

None of the soils on the property are listed as prime farmland soils.

The CREC site is located in a forested and predominantly rural area. There is no existing drainage system on site.

An inventory of Critical Erosion Areas includes:

- Floodplains: There are no FEMA-mapped floodplains on site or within the limits of disturbance.
- Steep slopes (>15%): According to elevation data collected in 2011 with light detection and ranging ("LiDAR") technology and obtained from the Rhode Island GIS database, the elevation of the proposed site varies from approximately 530 to 590 feet above sea level, with the parcel sloping downward from southwest to northeast. The average grade on the

property is 5.5%, but the hill in the southwestern portion of the Facility Site has steeper slopes than most of the rest of the Facility Site. This hilly area has been avoided to preclude future slope stability issues.

- Erodible soils: The preliminary geotechnical report prepared for the Facility Site did not note specific erodible soils.

Due to the existing and proposed grading of the Facility Site, two sediment basins are proposed. Each sediment basin is anticipated to control the runoff from common drainage locations serving five or more acres. Sediment basins are proposed, which will be converted to permanent stormwater management BMPs. In the proposed temporary construction laydown areas, temporary sediment basins will be provided where appropriate until final stabilization of the site is complete. Temporary sediment basins are designed in accordance with the *Rhode Island Soil Erosion and Sediment Control Handbook* (RIDEM 2013). Beyond the use of sediment basins, silt fencing will be the primary sediment barrier used at the toe of slopes and along linear aspects of the construction (roadway and gas line construction). Silt fence that is running down a slope and not along a contour will be installed using J-hook method every third foot of elevation change along the path to minimize flow velocity along the silt fence and provide areas for siltation to occur. Silt fence will be constructed along the limits of disturbance fencing with the separation from the LOD fencing being field determined by the contractor. Some areas will require the silt fence to be installed right against the LOD fencing and other areas there will be flexibility to place the silt fence 3' away from the LOD fencing.

The entrance shall be maintained in a condition that will prevent tracking or flowing of sediment onto paved surfaces. Top dressing with additional stone or additional length will be provided periodically as conditions demand. Any measures used to trap sediment will be repaired as needed. All sediment spilled, dropped, washed, or tracked onto paved surfaces will be immediately removed. Roads adjacent to a construction site shall be left clean at the end of each day.

Operation and maintenance of soil erosion and sediment control BMPs at the Facility Site will be the responsibility of Clear River Energy LLC.

5.1.7 Fish and Wildlife Habitat

5.1.7.1 Direct Permanent Impacts

Direct impacts would result from constructing the power plant and other supporting elements. Construction would include removing vegetation and grading to accommodate the Facility and roadway. Constructing the power plant infrastructure could result in different types of direct or indirect impacts. This construction could result in a loss of habitat, fragment large habitats blocks, and create barriers to animal movement, particularly where no such barriers currently exist.

The direct effects of these actions include the loss of wildlife habitat and plant communities. Actual habitat loss is a direct effect of infrastructure projects. Habitat loss occurs if an area that previously provided food, cover, water, and/or breeding resources to a species is cleared, paved, filled, or altered in such a way that it no longer provides one or more of these resources. These effects were quantified by overlaying the limit of disturbance ("LOD") onto the vegetation cover type mapping provided by RIGIS. Areas within permanent limits of disturbance that were previously altered, such as roads, were not counted as habitat loss.

Ecoregions

Although construction of the Facility will result in direct permanent impacts to habitat, including direct fill of wetlands and forested wetland conversion, the impacts associated with the CREC construction will not change the overall character or species composition of the ecoregion relative to the USFWS, TNC, or EPA classification systems.

Bird Conservation Regions

The direct permanent impacts associated with construction of the Facility will not substantially alter the character of the Bird Conservation region within which the CREC is located. There are no IBAs located within the Facility Site.

Plant Communities

Approximately 35 acres of existing forested habitat will be either permanently or temporarily altered as a result of the construction of the Facility. Some of these areas will be filled and converted to impervious surfaces, while others (e.g., construction staging areas) will be cleared during construction and restored to an earlier sessional forested habitat through planting of native species and over time will return to a similar community type. Table 5-4 provides a summary of impacts to the Rhode Island Ecological Communities as a result of the proposed project.

Table 5-4: Impacts to Rhode Island Ecological Communities from the Facility Site

Rhode Island Ecological Community	Acres within Limits of Disturbance*
Oak Forest	14.2
Mixed Deciduous/Coniferous Forests	18.3
Tree Plantation	2.5
Ruderal Grassland/Shrubland	0.07
Developed Land	0.03
TOTAL	35.1

* Approximately 8 of the 35.1 total acres are temporary staging areas that are to be reforested once construction is complete (see Section 6.2.1)

Wildlife

Direct impacts to wildlife will primarily be related to the alteration of existing habitats within the limit of disturbance of the Facility; however, other potential direct impacts may occur, including collision with the Facility or with vehicles using the Facility roadway. Approximately 35 acres of existing forested habitat at the Facility Site will be permanently or temporarily altered such that they are no longer available for use by wildlife species. Clearing and construction associated with the Facility Site will result in the loss of habitat currently used by a variety of bird, mammal, reptile, and amphibian species, including the portion of the site in which the State-threatened black-throated blue warbler had been observed displaying breeding behavior during the spring and summer of 2015.

During the construction phase, direct impacts are expected to be most significant to species with limited mobility to leave the area of active construction, and individual mortality of these

species may occur. Mobile species which are able to leave the area of active construction are expected to use adjacent areas of similar habitat. No federally-listed threatened or endangered species or hibernacula and/or maternity roost trees associated with northern long-eared bat would be impacted by construction of the CREC.

During the operational phase of the proposed project, direct impacts to wildlife may include collision with the Facility (especially the towers and storage tanks) by bird and bat species, especially during migratory periods in the spring and fall, or during inclement weather events. Vehicle collision along the Facility roadway may also result in direct mortality of individual birds, mammals, reptiles, and amphibians, however the installation of multiple wildlife crossing culverts under the roadway is expected to minimize this effect for the latter three taxa.

5.1.7.2 Direct Temporary Impacts

Description of Temporary Impacts

Construction of the proposed project could result in temporary, short-term impacts to biodiversity during the construction period. Temporary impacts include short-term disturbances during construction that would stop once construction activities are complete. These disturbances may include, but are not limited to, installing erosion controls, establishing work areas, or installing structures at stream crossings.

Without proper controls, construction related short-term impacts could occur to surface and ground water resulting from sedimentation in stormwater runoff or accidental spills. Sediment could increase turbidity, potentially clogging the gills or feeding apparatus of aquatic organisms when released in surface water. The accumulation of sediment on aquatic substrates could affect fish breeding habitat, and aquatic plants. Runoff and sediment discharges to vernal pools could affect the survival of aquatic larvae.

Temporary water quality impacts resulting from construction will be reduced or eliminated by implementing best management practices detailed in the *Rhode Island Soil Erosion and Sediment Control Handbook*. BMPs measures may include sedimentation controls (silt fence, filter berms, siltation booms), stabilization of disturbed areas, and temporary siltation basins. The proposed project will comply with the *Rhode Island Stormwater Design and Installation Standards Manual* and not have long-term adverse impact to water quality.

Temporary erosion and sedimentation controls may affect the ability of small vertebrates (amphibians, turtles, small rodents) to cross the Facility Site during construction. This barrier effect would be temporary and no longer exist when erosion controls are removed. Depending on the location within the Facility Site, disturbed areas will be permanently stabilized with pavement, or vegetation. Construction activity and associated noise could displace wildlife from areas adjacent to the Facility Site. This impact would be temporary, and wildlife is expected to return to areas adjacent to the Facility Site once construction activities conclude.

Mitigation for Construction-Period Impacts

Through the installation and management of erosion and sedimentation controls, construction impacts to jurisdictional wetlands will minimize and eliminate sedimentation of wetlands and waterways. Installed prior to construction, erosion and sediment controls would be properly maintained, and removed following stabilization of disturbed areas. A Soil Erosion Sediment

Control Plan will be implemented as required by the RIPDES Construction General Permit (see Appendix J).

Wildlife impacts may vary depending on the timing of construction. Breeding season disturbance is likely to have greater short-term or individual effects on wildlife reproductive success. However, short-term effects are not likely to have long-term affects unless the species population is not stable. Efforts will be considered to minimize impacts from construction during the breeding season and in areas where movement of rare species is a concern based upon further discussions with resources agencies and development of a more refined construction schedule. Areas disturbed from construction of the CREC will be stabilized. Vegetated areas would be seeded with an appropriate stabilization seed mix using native species. These seeded areas would be expected to revegetate within one growing season.

In addition, to mitigate for construction-related impacts, all temporary staging areas will be seeded and planted upon completion of the CREC. Please refer to section 6.2.1 for a detailed discussion of the reforestation plan for the temporary staging areas associated with the Facility Site.

5.1.7.3 Indirect Impacts

Construction of the CREC is expected to have indirect effects on natural communities and fish and wildlife habitat. This section discusses indirect effects in general, and describes the methodology used to calculate and evaluate impacts to biodiversity within the Facility Site. An evaluation of indirect environmental impacts on wildlife and their habitats including but not limited to: hydrological changes; fragmentation of habitat and populations; edge effects; noise and vibration; and restrictions to wildlife mobility, and an evaluation of impacts to migratory birds and their habitats, is included.

While generally not quantifiable, indirect impacts are defined as the consequences of an action's direct impacts. These impacts change the quality or functions of a resource and may occur over a larger area or over a longer time than the direct impacts. Short-term temporary indirect effects may be caused by disturbance from land clearing, earth moving during construction. Indirect effects may include habitat fragmentation and associated edge effect, increased competition, decreased genetic diversity, and physical or psychological changes to wildlife movements caused by some feature which wildlife are reluctant or incapable of crossing.

The WAP (2015) defines fragmentation the disruption of extensive habitats into isolated and small patches with two negative components for biota; the loss of a total habitat area; and, the creation of smaller, more isolated patches of habitat remaining. When a disturbed or developed area is created adjacent to a natural and/or forested area, the transition between types of habitats is associated with edge effects. Edge effects may contribute to a decrease in species dependent on core and/or undisturbed habitat or the spread of invasive species. Viewed as harmful to native plant and animal species population and composition, habitat fragmentation increases the amount of edge relative to the amount of interior habitat (Primack 2008). A potential indirect effect is the introduction of non-native invasive plant species along the perimeter of disturbed land.

Indirect Impact GIS Analysis

The 2015 Wildlife Action Plan was used as a supplemental method of evaluating potential indirect impacts to biodiversity from the construction and operation of the CREC. The WAP identifies and depicts priority areas on the landscape that offer the best opportunities and potential for conservation. The largest of these areas is the unfragmented forest blocks of 500 acres or greater.

An unfragmented forest impact analysis was conducted for the proposed Facility Site, as well as an additional indirect impact extending 100 feet further beyond the anticipated limits of disturbance within jurisdictional wetlands. Unfragmented forest blocks of 500 acres or more from the RIGIS data layer (available from RIDEM) was used for this analysis. The results of the analysis indicate that the limit of disturbance associated with only the CREC Facility and roadway (approximately 35 acres), is located within an unfragmented forest block of 500 acres or greater. Of these 35 acres only approximately 2.4 acres of disturbance is within State jurisdictional wetlands (biological, perimeter, and riverbank). An additional 14 acres of unfragmented forest (within State jurisdictional freshwater wetlands) within 100 feet of the limit of disturbance may be impacted indirectly due to the removal of tree canopy within the limits of disturbance (Figure 3-3).

While the WAP assesses indirect impacts 100 feet from the nearest disturbance (P. Jordan, Personal Communication, July 15, 2016), existing scientific literature suggests indirect impacts may extend beyond 100 feet. Specifically, Rosenberg et al. (1999), suggest the effects of an edge can extend from 150 to 300 feet (45 to 90 m) into the forest interior from the nearest disturbance that would cause a break in the forest canopy. Consequently, a forest interior impact analysis assuming indirect impacts extending 300 feet beyond the anticipated limit of work was also conducted. The results of this more conservative analysis indicate that, beyond the approximately 2.4 acres of direct unfragmented forest jurisdictional wetland habitat by the CREC's limit of disturbance, an additional 68 acres of unfragmented forest (within State jurisdictional freshwater wetlands) may be impacted indirectly due to the removal of tree canopy within the limits of disturbance (Figure 3-3).

A broader review and analysis of the unfragmented forest blocks of 500 acres or more in Burrillville, Gloucester, Foster, Scituate and Coventry, shows there is approximately 15,178, 17,011, 15,280, 12,376, and 15,175 acres of this habitat, respectively. The proposed CREC is situated on a privately-owned parcel in Burrillville which would result in the clearing of approximately 35 acres of existing forested habitat. This proposed impact to unfragmented forest represents 0.23% and 0.045% of the total unfragmented forest location in Burrillville and the Western Forest (Burrillville, Gloucester, Foster, Scituate and Coventry), respectively.

Impacts on Vegetation Community Composition Due to Changes in Physical Parameters of Light and Temperature

Removal of the forest canopy within the Facility Site could potentially alter the physical conditions (light, wind, temperature) in adjacent forested areas. The canopy gap would vary with the width of the limit of work and adjacent land uses. In locations where the roadway is proposed, the canopy gap would be approximately 70 feet wide. In locations where the power plant is proposed the canopy gap would vary between 850 to 1,400 feet wide.

Incident radiation (direct sunlight) within the understory is a primary factor in determining microclimate in forest ecosystems and correlates to the density of tree canopy and total leaf area. Studies have shown increases in ambient light levels have been associated with higher near-ground temperatures, higher vapor pressure deficit and drying of leaf litter. One researcher (Matlack 1993) found strong edge effects associated with increases in light intensity in south, east and west facing forest edges with no statistically significant light intensity edge effects observed in north facing forest edges. Matlack suggests the increased light zone extended from 33 feet (10 meters) in east and west facing clear-cuts and up to 115 feet (35 meters) in south facing cuts with no significant edge microclimate effects in northern facing cuts.

The proposed roadway will require the clearing of a corridor through a forested area. The narrow canopy gap would limit the potential increase in ambient light within the understory area due to the shape and orientation of the clearing. It is assumed increased light, wind, and temperature are likely to occur within 30 feet of the cleared edge of the roadway and BIP ROWs. The wider CREC footprint which occupies approximately 22 acres, would likely increase the ambient light within the understory along the CREC's northern limits. It is assumed increased light, wind and temperature are likely to occur within 115 feet of the cleared edge of the of the plant location.

Potential effects of these abiotic changes could increase drying of the litter layer which may promote seed establishment and a denser herbaceous and shrub layer. Accordingly, the existing sweet pepperbush (*Clethra alnifolia*), highbush blueberry (*Vaccinium corymbosum),* and mountain laurel (*Kalmia latifolia*) currently dominating the wetland and upland forest will increase. Matlack suggests an increase in ambient light increases adventitious limb growth and increased development of the shrub layer which my result in a "closed edge." With a closure or partial closure of edge by limbs and shrubs, quantifiable variations in light, temperature, humidity, vapor pressure density and soil moisture are no longer observed. Accordingly, it is assumed the relatively narrow canopy gap associated with the roadway only would become a closed or partially closed edge.

Impacts to Aquatic Communities Due to Discharge of Pollutants

The proposed CREC is not anticipated to produce significant discharges of pollutants to surface waters and therefore is not considered to have an adverse impact on aquatic communities.

Impacts to Community Structure or Composition Due to Changes in Hydrology

The construction of the roadway through the existing wetlands has been designed to include culverts that not only allow for unrestricted hydrologic flow, but also wildlife movement along stream and wetland corridors.

Impacts to Community Composition Due to Introduction of Invasive Species

An increase in the width of the canopy gap associated with the proposed roadway and CREC Facility would require removing existing vegetation. This linear gap of the roadway and footprint of the plant would extend through natural communities, which include red maple – deciduous swamp and shrub swamp, which may increase the potential for invasive exotic plant species, such as those given in the following list, to colonize areas adjacent to the Facility Site:

- *Typha angustifolia*; T. x glauca, narrow-leaf and hybrid cattail
- *Phalaris arundinacea*, reed canary grass
- *Phragmites australis*, common reed
- *Lythrum salicaria*, purple loosestrife
- *Frangula alnus*, glossy buckthorn
- *Berberis thunbergii*, Japanese barberry

Potential invasive upland species of the forest edges include:

- *Celastrus orbiculata*, oriental bittersweet
- *Fallopia japonica*, Japanese knotweed
- *Rosa multiflora*, multiflora rose
- *Elaeagnus umbellata*, Autumn olive

Several invasive species are known to occur within a localized area of past disturbance within the CREC Facility. Due to this limited occurrence and distribution, a substantial introduction of invasive species is not anticipated. To further minimize the spread of invasive plant species, the procedures described below would be implemented. Construction vehicles, equipment, and materials will be inspected for and cleaned of any visible soil, vegetation, insects, and debris before bringing them to the Facility Site. Cleaning methods will include, but not be limited to, brushing, scraping, and/or the use of compressed air to remove visible soils and vegetation. Contractors will be instructed to minimize ground disturbance and vegetation removal as much as possible, and to remain within designated access ways and work areas. All disturbed soils will be stabilized and seeded with a native seed mix immediately following completion of work in that area.

- All construction equipment, vehicles, and materials must be clean and free of excess soil, debris, and vegetation before being mobilized to the Facility Site.
- Construction equipment and excavated soil material will be contained within the approved limits of work areas within the Facility Site.
- Best management practices to manage specific species would be implemented on a species by species basis and depending on location.

<u>Impacts to Avian Communities Due to Fragmentation and Edge Effects</u>
Habitat fragmentation includes direct loss of habitat associated with physical clearing, grading and construction on the site, as well as and other disturbances. Noted as a cause in the decline of bird communities, particularly neotropical migrant songbirds (“NTM”s), habitat fragmentation exists at several scales, ranging from the local, landscape, and regional levels. Where differences in canopy cover are investigated to determine the effects on breeding bird, local

fragmentation includes edge effects. Landscape and regional level fragmentation incorporates variances in shape and size of forest to differences in canopy cover, respectively (Robinson 1998). Fragmentation impacts vary based on the size of opening (larger openings produce greater fragmentation effects), the type of opening (permanent openings are more detrimental), and the surrounding landscape. Rich (Rich 1994) as well as other studies define fragmenting impact as a forest separated from another forest patch by at least 300 feet of open area. Existing scientific literature suggests NTMs presence, abundance, and fecundity is linked with the size of forest block (Ambuel 1983, Askins 1987, Blake 1984, Freemark 1989, Flather 1996). The size of interior forest required varies between species; however, NTMs require a minimum of 250 acres to maintain successful reproductive population at the landscape level (Donovan et al. 1995, Robinson et al. 1995). Finch (1991) reported large forest blocks over 500 acres provide adequate contiguous forest-interior habitat to support area sensitive forest interior breeding species including overbird and Louisiana waterthrush (*Seiurus motacilla*), with multiple authors suggesting 750 to 1,200 acres are necessary, with forested tracts greater than 7,500 acres being ideal (Donovan et al. 1995, Faaborg et al. 1995, Gibbs and Faaborg 1990, Porneluzi et al. 1993).

Forest blocks 125 to 150 acres likely support some NTMs, such as; eastern peewee, red-eyed vireo (*Vireo olivaceous*), and rose-breasted grosbeak (*Pheucticus ludovicianus*), but do not support the less common area-sensitive species such as veery, hermit thrush (*Catharus guttatus*) or yellow-throated vireo (*Vireo flavifrons*) (Freemark and Collins 1989, Robbins et al. 1989). Forested blocks less than 60 acres may contain NTMs; however, diversity is low and reproductive success is limited (Donovan et al. 1995, Villard et al. 1993). Forested blocks less than 12 to 25 acres do not support forest nesting NTMs (Blake and Karr 1984, Heckert 1993, Freemark and Collins 1989).

As an indirect effect, predation may increase as opportunistic predators such as crows and raccoons use the edge adjacent to the Facility Site. In addition, if brown-headed cowbirds colonize the Facility Site and associated edge, increased brood-parasitism on songbirds may occur. Rich et al. (1994) found brown-headed cowbirds were significantly more abundant along paved secondary road forest edges compared to both powerline corridors and unpaved roads. Similarly, this research found no significant reduction in forest interior nesting species when corridors were less than 25 feet in width.

Impacts to Mammalian Communities Due to Fragmentation

Indirect impacts resulting from fragmentation may include increased predation on small mammals due to lack of cover, disturbance immediately adjacent to the Facility Site, and interruption of migration routes. Indirect impacts include changes in vegetative cover, light and temperature regimes, as well as changes to overwintering, denning and foraging habitats. There may be minor indirect impacts to small mammals; however, due to small home ranges, population stability should not be affected. The required security fencing around the CREC Facility may disrupt movement of some medium and large mammals. An at-grade ramp is proposed to allow larger mammals to cross the proposed CREC roadway. It is anticipated that displaced mammals would be able to utilize the immediately adjacent undisturbed portions of the AGT property as well as adjacent 3,000-acre George Washington Management Area.

Impacts to Reptile or Amphibian Communities Due to Fragmentation

Habitat fragmentation may create barriers to movement for reptiles and amphibians due to the presence of physical impediments and/or the increased risk of mortality due to predation or other causes due to changes in vegetative cover type or increases in impervious surfaces. This effect may be especially significant for reptiles and amphibians, which, unlike birds or medium to large-bodied mammals, face serious barriers to movement from even minor human-caused changes in the landscape, such as roads, retaining walls, fences, etc. For species that require more than one habitat type to complete their life cycle, such as vernal pool breeding amphibians, barriers to movement may represent the effective loss of habitat if it is no longer available to the species during its various life stages and reproductive periods. Habitat fragmentation may also result in increased predation risk of reptiles and amphibians, as forest-edge dwelling meso-carnivores may become more common at the Facility Site. The construction of the roadway may also pose a threat to reptiles and amphibians due to vehicle collision risk. Amphibians often cross roadways that pass through forests or wetlands, and are known to do so in especially large numbers during rainy nights in the spring when breeding is initiated for most species. During the warmer months, reptiles, including snakes and turtles, are known to bask on paved roads in order to increase their body temperature to aid in digestion and activity. These behaviors increase the risk of vehicle collision along paved roadways within woodlands. The installation of six large open bottom box culverts along the roadway retaining walls is proposed to minimize the risk of vehicle collision with reptiles and amphibians.

Impacts to Wildlife from Noise

The site of the proposed CREC facility is within an industrially zoned parcel on next to the site of a natural gas compressor station that operates continuously as required to maintain gas pressure needed to assure the natural gas supply is uninterrupted. As a result, wildlife on or near the property have been exposed to the operation of the gas compressor station both during daytime and nighttime operation for many years. The proposed noise levels for the CREC facility are lower than those of the compressor station, and as such wildlife on or near the property will be exposed to noise at similar levels to that which has been experienced by the wildlife over many years. The Town's relatively low noise level limit of 43 dBA has forced the CREC to be designed with a host of significant noise reduction measures, for both start-up and baseload operation. These measures also lower CREC noise levels in the adjacent forest, in some cases and at some frequencies to levels below that which exist today either from natural sources or the existing compressor station. Waiver of compliance with the Town's octave band requirements effects only the lower portion of the frequency spectrum, and will have little if any effect on sound levels as they pertain to impacts to wildlife.

Impacts to Wildlife from Lighting

It is known that living organisms depend on daily, monthly, and seasonal patterns of light and dark. Predictable light, such as solar and lunar patterns, dictate circadian, circannual, and circalunar rhythms of nearly all living organisms (NPS 2016[11]). When anthropogenic night lighting is introduced, natural rhythms may be disrupted. Approaches implemented to mitigate artificial night lighting vary depending on location and include avoiding use of lighting and

[11] NPS. 2016. Artificial Night Lighting and Protected Lands - Ecological Effects and Management Approaches. Natural Resources Report, Fort Collins: U.S. Department of the Interior.

keeping lighting at a minimum. The proposed project lighting design will control the lighting color spectrum to include narrow spectrum lights while avoiding ultraviolet lights and blue and shorter wavelength lights. The proposed lighting design would limit light intensity to achieve the desired function and manage the direction of light by light shielding, projecting light on only intended surfaces and preventing light from emanating above the horizontal plane. In addition, when possible the proposed design would limit the duration of light output, only lighting areas where activity is taking place and include timers and sensors.

5.1.8 Protected Species

Northern long-eared bats (Myotis septentrionalis) are known or believed to occur in Providence County according to the USFWS (USFWS-NJFO 2015); however, there are no known maternity or hibernation occurrences in the County based on communications with Charles Brown of the Rhode Island Division of Fish and Wildlife ("RIDFW") (see Appendix H). To determine the presence/absence of this species, an acoustic survey was conducted under the Interim 4(d) Rule in accordance with the 2015 USFWS Range-Wide Summer Survey Guidelines ("Guidelines"). Anabat SD2 acoustic detectors were deployed at 4 locations spaced across the linear and square components of the project design as prescribed in the Guidelines which included the Facility as well as the CREC ROW. The results of the survey were reviewed by the USFWS and the RIDFW and both agencies agreed with study results that northern long-eared bats were not present. While results of the survey found that the species was not present, the Applicant is proposing to adhere to the time of year restrictions to avoid tree clearing during the June-July timeframe to avoid potential impacts to maternity roost trees.

ESS reviewed the online natural heritage data available from RIGIS website (RIGIS 2016) with the Facility Site for known occurrences of State-protected species or natural communities' data. There are no records within the Facility Site. However, multiple pairs of black-throated blue warblers, which are listed by RIDEM as a State-threatened species, were observed displaying territorial breeding behavior in the general footprint of the Facility during the 2015 breeding season. Observations included multiple males singing over a period of several weeks, as well as visual observations of male-female pairs, however no specific surveys for this species were conducted.

Efforts will be considered to minimize impacts from construction activities during the breeding bird season and in areas where movement of state-listed rare, threatened or endangered species is a concern based upon further discussions with resources agencies and development of a more refined construction schedule.

5.1.9 Vernal Pools/Special Aquatic Sites

The construction of the CREC will result in the placement of direct permanent fill associated with the power plant site within the entirety of SAS 1. Permanent fill will not be placed within the limits of SAS 2; however, the upland habitats directly adjacent to the special aquatic site will be cleared for installation of the project's stormwater basin and a temporary construction staging area. Following completion of construction activities, the area cleared for the staging area will be re-planted. However, the ability of SAS 2 to provide suitable amphibian breeding habitat would likely be further degraded. If desired, the limited amphibian breeding habitat provided by both man-made areas could be replicated and improved within more suitable habitat elsewhere on the property.

Indirect Impacts to Vernal Pool Species

The following impacts may change the function of a vernal pool:

- Fill to vernal pools, which reduces the size of the pool;
- Impacts to vernal pool seasonal pool envelope (100-foot radius from the pool edge);
- Impacts to immediate upland seasonal pool terrestrial habitat (200-foot radius from the pool edge);
- Habitat fragmentation.

Direct fill to vernal pools/special aquatic site can have indirect impacts in addition to the direct impacts. The reduction of water volume that collects within a pool or fill may increase the likelihood that the water temperature in the pool will increase more quickly and/or dry out prior to species maturing and leaving the pool. Increase/early warming may be beneficial by speeding larval growth, but those pools which dry out early have are less likely to afford breeding habitat.

Existing scientific literature suggests some obligate species will travel several hundred feet away from pools into surrounding upland habitat which provides shelter, foraging and overwintering habitat. Undeveloped, vegetated upland buffer habitat may provide valuable habitat due to the presence of heavy leaf cover, forage, rotting logs, and treefalls. Some obligate species may live several years or more and return to the same pool or cluster of pools.

Habitat fragmentation may create indirect impacts to vernal pools through the clearing of forested wetlands and upland areas. The project may create a barrier to wildlife movement across the site due to the presence of physical impediments to movement or increase predation/mortality risk due to alterations in vegetative cover.

5.1.10 Cultural Resources

The currently proposed configuration of the CREC Facility will result in the excavation of soils in an undeveloped wooded area. Archaeological testing in this area identified several small scatters of artifacts, along with two archaeological sites. The Iron Mine Brook Dune site (RI 2757) was further investigated, and found to be not significant. A barn foundation located within the frontage area can be avoided by the proposed construction. Correspondence with the RIHPHC resulted in a determination letter stating that construction of the CREC Facility is not expected to impact cultural resources (Appendix H). Therefore, construction of the CREC Facility will have no impact on archaeological resources. Should any changes be required to the construction footprint, the Applicant will work with the RIHPHC to identify and minimize any impacts to archaeological resources. The CREC Facility will also have no effect on above ground resources.

5.2 Burrillville Interconnection Project

This section presents an analysis of the potential impacts of the BIP on the existing natural and social environments within the Burrillville Interconnection Study Area. As with any construction project, potential adverse impacts can be associated with the construction, operation, or maintenance of an electric transmission line. As detailed in Section 6.2.2, these impacts have been minimized by the

careful location of structures, facilities, and access roads, and by the adoption of numerous mitigation practices.

Potential impacts to the natural and social environments associated with the BIP can be categorized based on construction-related (temporary) impacts and siting and operational-related (permanent) impacts. Examples of potential temporary construction-related impacts include traffic impacts, temporary use of areas to stage construction equipment and supplies (such as swamp mats), and short-term construction noise associated with the operation of heavy equipment. Examples of permanent impacts include fill, new structures, vegetation removal, and facility maintenance.

The Burrillville Interconnection Project will be constructed in a manner that minimizes the potential for adverse environmental impacts to the extent practicable. A monitoring program will be conducted by the Applicant to verify that the BIP is constructed in compliance with all relevant licenses and permits and all applicable federal, state, and local laws and regulations. Design and construction mitigation measures will be implemented so that construction-related environmental impacts are minimized to the extent practicable.

5.2.1 Wetlands and Watercourses

Even after all appropriate and practicable avoidance and minimization has been undertaken, construction of the BIP will result in temporary, permanent, and secondary impacts to wetland and water resources. The following section describes the impacts associated with construction of the BIP including vegetation removal, excavation for pole structures and access road construction.

Table 5-5 below provides standard dimensions and details of the construction elements associated with the proposed 345 kV transmission line. These standards were used in the design of the new transmission line and the development of site plans. These details represent the minimum area required for each element to function properly and safely. These details are typical of transmission projects of this nature but may vary based on site-specific conditions.

Table 5-5: Wetland Impact Assumptions for the Burrillville Interconnection Project

Activity	Assumptions	Impact Type
Tree Removal[1]		
Access Routes for Tree Clearing	A 20-foot-wide temporary swamp mat road, or in limited cases, temporary corduroy road may be installed to allow vegetation crews access across and within wetlands for tree removal purposes.	Temporary
Cluster Swamp Mats for Access for Tree Clearing	A 1,200-square-foot area (60-feet by 20-feet) per installation. Temporary, short-duration placement of "portable" cluster of swamp mats.	Temporary
Transmission Line Structures: Work Pads in Wetlands		
Construction Work Pads	Require, on average, a 15,000-square foot work pad (150 feet by 100 feet). Work pads in wetlands will consist of temporary swamp mats with the use of temporary timber stringers as necessary.	Temporary
Additional Work Pads/Staging Areas	Average size of work pad/staging area is 50-feet by 50-feet however pads sizes have been customized for specific site conditions and activities. Work pads/staging areas in wetlands will consist of temporary swamp mats with the use of temporary stringers as necessary.	Temporary
328-Line Realignment	A 150-foot by 100-foot work pad will be used for removal of existing structure and installation of a new structure.	Temporary
Transmission Line Structures: Foundations and Structures/Poles		
2-Pole Structure H-frame Steel	345 kV H-Frame: 5.5-feet diameter x 2 poles = 48 sq. ft. per structure.	Permanent
3-Pole Structure	345 kV self-supporting angle and dead-end structures: 8-feet diameter x 3 poles = 150 sq. ft. per structure.	Permanent
Vertical Monopole	345 kV (Delta) monopole: 10-feet diameter x 1 pole = 79 square feet per structure.	Permanent
Access Roads		
Stabilized Construction Entrance/ Exit for Access from ROWs to Public or Private Roads	A suitable (minimum 15-foot wide by 50-foot long) construction entrance/exit installed at the intersection of the ROW access road/route with public/private paved roads, or other such locations where equipment could track mud or soil onto paved roads.	Permanent

Activity	Assumptions	Impact Type
Improve Existing Access Roads: Uplands	Existing on-ROW access roads will be improved to provide up to a 16-foot wide travel surface and a 20-foot wide base.	NA
Establish New Access Roads: Uplands	New access roads will be constructed to 20-feet wide base.	NA
Wetland Crossings for Construction	Temporary swamp mats are to be installed for wetland crossings. Swamp mats will result in a 20-foot wide disturbance. Existing roads will be expanded, as necessary, with swamp mats to provide up to a 20-foot wide travel surface width. Existing access roads will be improved with gravel and stone.	Temporary
Stream Crossings	20-feet wide swamp mat bridges will be used to span streams along access routes.	Temporary
Culverts & Rock Fords	New or replacement culverts will be installed to maintain hydraulic connection. 16 foot culverts with flared-ends will be installed, including stone riprap toe plates, as necessary. Temporary, properly-sized culverts may be installed under mat bridges. Rock Ford installed in lieu of culverts will remain in place permanently.	Maintenance, Temporary or Permanent
Other Temporary Work Sites and Facilities		
Guard Structures	30-feet by 70-feet work pad required at each location with a 20-foot wide access road.	Temporary
Temporary Guy Wires and Anchors (if necessary)	If not located within a proposed work pad, a 10-foot by 10-foot area of disturbance will be required.	Temporary
Pulling Station and Wire Stringing Pad Setup Sites	Two 150-feet by 100-feet pulling stations wiring string pads ~300 feet ahead and back of most angle and dead-end structures.	Temporary
Installation of Temporary Wood Poles (if necessary)	3.5-feet diameter x 3 poles = 29 square feet per structure.	Temporary

[1] Conversion of forested wetland to scrub-shrub or emergent wetland is a secondary impact.

The following methodology was used to calculate impacts to BIP ROW wetlands using both RIDEM and USACE wetland designations:

- GIS files containing all of the wetland data from the Rhode Island portion of the IRP were obtained. This data included both RIDEM and USACE cover type designations for each wetland.

- The data was updated to account for the change in cover types that has occurred since construction of the IRP (conversion of some forested areas within the TNEC ROW to scrub-shrub). At the federal level, Wetland areas that were designated as PFO that have since been converted were changed to PSS. At the state level, the designations were not changed due to the fact that shrub-dominated wetlands greater than 3 acres in size are still considered Swamp. Swamps along the route that are dominated by shrubs are termed “Shrub Swamps.”

- Some of the wetlands along the TNEC ROW were given multiple cover types during the IRP investigations (PFO/PSS, PSS/PEM, etc.) but no distinction was made between different cover types within these wetlands. For the purposes of calculating impacts to these wetlands, the later-successional cover type was used. For example, impacts to a wetland designated as PSS/PEM were tallied under PSS, and impacts to a wetland designated as PFO/PSS were tallied under PFO.

This methodology allows for the utilization of previously verified wetland data while accounting for changes in cover type and conservatively estimating impacts.

Table 5-6 and 5-7 summarize the potential impacts of the BIP ROWs on wetlands based on current design data. As summarized below, trees within forested wetland (PFO) and state-jurisdictional uplands (perimeter and riverbank) would be removed to clear an additional 85 feet along the 4.4 mile section of existing TNEC ROW, 55 feet on the 1.6 mile section of the existing TNEC ROW and 150 feet on the new 0.8 mile section of CREC ROW. These forested wetlands will be converted to and maintained as scrub-shrub and emergent cover types.

Table 5-6 Summary of Potential Impacts on Wetlands, Watercourses and Floodplain from the BIP (RIDEM Wetland Jurisdiction)

Impact Type		Impact Area (ft^2)										
		Swamp	Forested Wetland	Shrub Wetland	Emergent Plant Community	50' Perimeter Wetland	100-Yr Floodplain	100' Riverbank	200' Riverbank	ASSF**	Stream (lf)	Total
Proposed CREC ROW (Greenfield ROW)												
Right of Way Work Pads												0
Temporary Guard Structure Pads												0
Temporary Access Roads		3,210				27					40	3,237
Access Routes for Vegetation Removal		9,304				6,424		615			180	16,344
Permanent Work Pads						354						354
Permanent Access Roads		6,775			312	13,119		2,114			64	22,320
Permanent New Structures												0
Total Temporary Impacts		12,514			0	6,451		615			220	19,580
Total Permanent Impacts		6,775			312	13,473		2,114			64	22,675
Total Tree Removal Within ROW		67,111			119	43,917		3,875				115,022

Impact Type		Impact Area (ft^2)										
		Swamp	Forested Wetland	Shrub Wetland	Emergent Plant Community	50' Perimeter Wetland	100-Yr Floodplain	100' Riverbank	200' Riverbank	ASSF**	Stream (lf)	Total
Total Conversion*		22,633			119	16,774		2,308				41,833
Existing TNEC ROW												
Right of Way Work Pads		200,120	10,941	24,312	10,447	110,169		601				356,590
Temporary Guard Structure Pads						2,520		1,675				4,196
Temporary Access Roads		11,449	400	553		8,638		799				21,839
Access Routes for Vegetation Removal		78,483	14,483	0		51,667	703	10,903	703		320	156,943
Permanent Work Pads		197		56	60	143,482	20,701	17,918	29,859			212,271
Permanent Access Roads		228		16		20,362	605	377	900	150		22,638
Permanent New Structures		45			71	429	47	24	95			711
Total Temporary Impacts		290,051	25,824	24,866	10,447	172,994	703	13,979	703		320	539,568
Total Permanent Impacts		469		72	130	164,273	21,353	18,319	30,854	150		235,470
Total Tree Removal Within ROW		325,294	54,243	4		316,612	17,506	64,155	7,565			785,378

Impact Type		Impact Area (ft^2)										
		Swamp	Forested Wetland	Shrub Wetland	Emergent Plant Community	50' Perimeter Wetland	100-Yr Floodplain	100' Riverbank	200' Riverbank	ASSF**	Stream (lf)	Total
Total Conversion*		107,116	25,824	4		125,098	11,382	29,194	4,265			302,882
Grand Total (State Categories)												
Total Temporary Impacts	ft^2	302,565	25,824	24,866	10,447	179,446	703	14,594	703		540	559,148
	acres	6.95	0.59	0.57	0.24	4.12	0.02	0.34	0.02	0.00	0.01	12.84
Total Permanent Impacts	ft2	7,244		72	442	177,746	21,353	20,434	30,854	150	64	258,145
	acres	0.17	0.00	0.00	0.01	4.08	0.49	0.47	0.71	0.00	0.00	5.93
Total Conversion*	ft2	129,749	25,824	4	119	141,872	11,382	31,501	4,265			344,716
	acres	2.98	0.59	0.00	0.00	3.26	0.26	0.72	0.10	0.00	0.00	7.91

* This number removes the tree clearing areas that are overlapping impacts from construction features so as not to "double count" the impact area.

**ASSF = Area Subject to Storm Flowage

This is an area of trees within the limits of an emergent plant community. This number can be added to the total tree removal in PFO or Swamp if warranted.

Table 5-7 Summary of Potential Impacts on Wetlands, Watercourses, and Floodplain from the BIP (USACE Wetland Jurisdiction)

Impact Type		Impact area (ft^2)		
		PFO	PSS	PEM
Proposed CREC ROW (Greenfield ROW)				
Right of Way Work Pads				
Temporary Guard Structure Pads				
Temporary Access Roads		556		156
Access Routes for Vegetation Removal		9,295		9
Permanent Work Pads				
Permanent Access Roads		6,352		735
Permanent New Structures				
Total Temporary Impacts		9,851		165
Total Permanent Impacts		6,352		735
Total Tree Removal Within ROW		66,616		614
Total Conversion*		22,437		315
Existing TNEC ROW				
Right of Way Work Pads		55,751	148,497	41,572
Temporary Guard Structure Pads				
Temporary Access Roads		3,033	9,368	
Access Routes for Vegetation Removal		80,218	11,717	1,031
Permanent Work Pads		108	124	79
Permanent Access Roads			243	
Permanent New Structures		22	23	71
Total Temporary Impacts		139,003	169,582	42,603
Total Permanent Impacts		131	391	150
Total Tree Removal Within ROW		378,648	893	

Impact Type		Impact area (ft^2)		
		PFO	PSS	PEM
Total Conversion*		132,050	893	
Grand Total (Federal Categories)				
Total Temporary Impacts	ft^2	148,854	169,582	42,768
	acres	3.42	3.89	0.98
Total Permanent Impacts	ft2	6,483	391	885
	acres	0.15	0.01	0.02
Total Conversion*	ft2	154,487	893	315
	acres	3.55	0.02	0.01

* This number removes the tree clearing areas that are overlapping impacts from construction features so as not to "double count" the impact area.
This is an area of trees within the limits of an emergent plant community. This number can be added to the total tree removal in PFO or Swamp if warranted.

Along the TNEC ROW, the proposed transmission lines will be constructed and operated in existing ROW, where the wetlands have historically been affected by vegetation maintenance programs. Specifically, pursuant to the TNEC vegetation management practices, wetlands are maintained in scrub-shrub and emergent wetland cover types (see Appendix B). The remainder of the line will be along a new 0.8 mile section of CREC ROW.

To avoid or minimize adverse impacts to wetlands, the Applicant has attempted to locate new transmission structures in upland areas wherever practical and to limit the access roads required across wetlands if there are practical upland alternative access roads available. In general, where a new structure must be located in a wetland, a temporary work pad will be used for construction support. In some wetland areas, field conditions (such as thickness of organics, depth of water or steep slopes, etc.) may require the use of multiple layers of swamp mats placed on stringers. The temporary matting used for the work pads in wetlands will be removed and footprint restored in-situ after the completion of structure installation.

Because it is not practicable to locate all structures outside of wetlands, the transmission line will result in a minor amount of permanent wetland fill associated with the structure foundations. Such fill will displace wetland soils and vegetation and thus will constitute a long-term adverse effect. Aside from permanent stone fords through several wetlands, no new access roads in wetlands are required.

All 16 of the watercourses located within the TNEC ROW are presently spanned by existing transmission lines, and several smaller stream crossings along this ROW are also traversed by existing utility access roads. The development of the proposed transmission lines will not create an entirely new corridor across the majority of these watercourses and, for the most part, will not involve in-stream activities. However, the BIP may have limited and short-term impacts on streams and water quality.

Table 5-8: Named Watercourses Spanned by the Burrillville Interconnection Project

Watercourses	Transmission Line Span Existing or Proposed
Dry Arm Brook	Existing (TNEC ROW) and Proposed (CREC ROW)
Clear River	Existing
Mowry Brook	Existing (TNEC ROW)
Round Top Brook	Existing
Chockalog River	Existing
Tributary to Chockalog River	Existing

The Applicant proposes to avoid direct construction work in watercourses to the extent practicable and to limit the potential for impacts associated with soil erosion, sedimentation, or spills into streams and rivers from nearby upland construction activities. In general, the proposed transmission lines will span watercourses, although temporary and permanent access will be required (i.e., use of culverts or rock fords) across the smaller stream crossings along the ROW.

Vegetation Removal and Management in Wetlands

Vegetation removal will occur within state-regulated wetlands (biological, perimeter, and riverbank) in order to facilitate construction and maintenance of the proposed transmission lines. Appropriate soil erosion and sediment control measures will minimize impacts to wetlands from adjacent impacted areas.

Within the footprint of the new transmission lines, forested wetland vegetation will be have to be removed in order to construct and safely operate the new overhead transmission facilities. As a result, forested wetlands along the expanded TNEC ROW will be converted to shrub-scrub or emergent marsh wetland types. This will not create a loss of overall wetland habitat, but rather a change in habitat type, from forested wetland to shrub-scrub wetland or emergent marsh. Where possible, dead standing snags and slash piles will be left in place to provide for wildlife habitat.

Vegetation removal will be minimized along streams. Only the minimum amount of vegetation necessary for the construction and safe operation of the transmission facilities (including the provision of access) will be removed. Vegetation removal near streams will be performed selectively, to preserve desirable streamside vegetation for habitat enhancement, shading, bank stabilization, and soil erosion and sediment control.

Potential impacts on watercourses may occur from vegetation removal within riparian zones/buffers (as necessary to allow safe construction or to maintain appropriate clearance from conductors) and the movement of construction equipment across watercourses involving the use of temporary equipment bridges or permanent access roads. Access across wetland areas and streams, where upland access is not available, will be accomplished by the temporary placement of swamp mats and/or stone fords. Temporary timber mats, or other similar bridging techniques, will be installed to cross streams so not to impede or interrupt natural flow. Such temporary swamp mat access roads will be removed following completion

of construction and, if necessary, areas will be restored to re-establish pre-existing topography and hydrology.

Access Roads

Following the delineation of wetland boundaries within the TNEC and CREC ROWs, thorough constructability field reviews were conducted to determine access to pole structures which will minimize impacts to wetland areas. Access road locations have been chosen to avoid wetlands, to cross wetlands at previously impacted locations or to traverse the edge of the wetland to the extent practicable. Temporary crossings using swamp mats will be used where existing access road crossings do not exist.

Crossings of smaller streams by construction equipment will be minimized to the extent practicable. Existing access roads, which already cross these watercourses along the ROW, will be utilized whenever practicable. In general, culverted access roads have historically been installed across the smaller existing watercourses along the ROWs. Prior to construction, integrity inspections of the culverts will be conducted, and culvert structures deemed to either be in disrepair or unable to support the weights of the anticipated construction vehicles will be replaced at the same location and designed to maintain the stream flows. New culverts may be required where no culvert currently exists. These new culverted crossings will be designed and installed in accordance with USACE and RIDEM guidelines.

In certain areas where no upland alternatives are available, existing access roads through wetlands along the BIP ROW will have to be improved or new access routes through wetlands will have to be developed in order to reach structure sites. Access through wetlands will consist primarily of temporary swamp mats, which will be used only for construction and then removed from the wetlands. In some perimeter wetland or upland areas, gravel type roads (approximately 20 feet wide) will be required to provide safe access for construction and for the operation and maintenance of the transmission facilities. Permanent impacts will result where such access roads or stone fords must remain in place in wetlands to provide access for operation and maintenance activities.

Structures

Under the current design of the proposed transmission line, engineering and safety requirements necessitate the placement of five poles within state and federally-regulated wetland areas and a two-pole structure within state-regulated 100-year non-wetland floodplain. The only fill needed for structures is backfill required around the pole embedment. This will amount to approximately four cubic yards of crushed rock per structure. To mitigate this impact, the Applicant will assess the need to provide incremental floodplain compensation, in consultation with RIDEM.

The Applicant has and will continue to make design modifications, if practicable, to avoid the installation of structures in wetlands. However, in certain areas, the location of structures in wetlands will be unavoidable. The installation of structures in wetlands will result in temporary impacts associated with the creation of temporary work pads for equipment, as well as permanent impacts associated with the displacement of wetlands located at the structure footings.

5.2.2 Recreation and Aesthetics

Freshwater wetlands can support active and passive recreational and aesthetic values that are important to the general public. Wetlands provide the opportunity for recreational activities, including but not limited to hunting, fishing, trapping, cross-country skiing, ice skating, boating, water-skiing, canoeing, camping, swimming, bicycling, hiking, walking, horseback riding, harvesting of natural foods or plant materials, bird watching and other animal observation, education and nature studies, and photography. Aesthetic values include but are not limited to the visual, aural, and cultural qualities of the wetland. Without limitation, these include the wetland's prominence as a distinct feature in the local area, including its value as open space; whether it is a rare wetland type; whether it offers or provides suitable habitat for any rare animal or rare plant species; whether it has any outstanding or uncommon geomorphologic features; and whether it contains or may contain material of archaeological, historical, or cultural significance. With the exception of the 3 wetlands crossed by the TNEC ROW within Round Top Management Area, the wetlands along the TNEC ROW do not currently provide these values due to their location on private property and lack of access. Permanent impacts in the form of habitat conversion are limited to only one of these three wetlands. The work involves minor clearing of forested wetlands adjacent to existing emergent wetlands associated with Round Top Brook. As a result, construction of the BIP is not anticipated to impact these values.

5.2.3 Flood Protection

This function considers the effectiveness of the wetland in reducing flood damage by water retention for prolonged periods following precipitation events and the gradual release of floodwaters. It adds to the stability of the wetland ecological system or its buffering characteristics and provides social or economic value relative to erosion and/or flood prone areas. The potential for floodflow alteration is provided by all wetlands assessed along the TNEC ROW to some degree and it is a principal function of 25% of the TNEC ROW wetlands.

Portions of the BIP are within the 100-year floodplain, which represents the extent of flooding that may result during a storm event having a one percent chance of occurring per year. It is recognized that by definitions provided in the Rhode Island Freshwater Wetland Regulations, all rivers, streams and intermittent streams have 100-year floodplain, although they may not be mapped by FEMA.

One new structure (H-frame Structure 3052-45) will be located within the FEMA-designated floodplain associated with Round Top Brook for the construction of the 3052 Line. In this instance where the installation of the one new transmission line structure is proposed within a floodplain where no detailed FEMA study has been performed to establish a base flood elevation, it is anticipated to have *de minimis* impact on flood storage capacity and not result in an increase in flood storage in a meaningful way. The permanent impact to floodplain is estimated to be 48 square feet and 96 cubic feet of flood storage.

Any temporary fill placed within documented floodplains for temporary access roads or work pads will be removed following the completion of construction. The Contractor will be directed to over-excavate within the limits of floodplain for any new access road and/or work pad that permanently displaces floodplain. Over-excavation within the limits of floodplain will compensate for loss of flood storage volume by reestablishing the pre-existing conditions.

5.2.4 Groundwater and Surface Water Supplies

This function considers the potential for a wetland to serve as a groundwater recharge and/or discharge area. It refers to the fundamental interaction between wetlands and aquifers, regardless of the size or importance of either. All wetlands assessed along the TNEC ROW have the potential to provide this function and more than half (58%) as a principal function. Designated groundwater recharge areas and aquifers exist downstream of the proposed TNEC ROW construction route and two Wellhead Protection Areas ("WHPA"s) exist in and around the Sherman Road Switching Station.

Potential impacts to groundwater resources within the BIP ROW as a result of construction activity on the transmission line facilities will be negligible. Equipment used for the construction of the transmission lines will be properly inspected, maintained and operated to reduce the chances of spill occurrences of petroleum products. Pumps used for dewatering activities will be placed and operated within secondary containment devices. Refueling equipment will be required to carry spill containment and prevention devices (i.e., absorbent pads, clean up rags, five-gallon containers, and absorbent material) and fueling of equipment will occur in upland areas where practicable. In addition, maintenance equipment and replacement parts for construction equipment will be on hand to repair failures and stop a spill in the event of equipment malfunction. Following construction, the normal operation and maintenance of the transmission line facilities will have no impact on groundwater resources.

5.2.5 Water Quality

The primary potential impact to water quality from any major construction project is the increase in turbidity of surface waters in the vicinity of construction resulting from soil erosion and sedimentation from the impacted site. A second potential impact is the spillage of petroleum or other chemical products near waterways. Impacts to previously undisturbed areas on the ROW will be minimized through the use of existing roadways. Overhead transmission line construction requires only a minimal disturbance of soil for pole or foundation excavation. Further, equipment (with exceptions for equipment that is not readily mobile) will not be refueled or maintained near wetland or surface water resources. Therefore, it is anticipated that any adverse impacts to water resources resulting from construction of the proposed transmission lines will be negligible.

The removal of trees and limited removal of roots and stumps to facilitate improving access roads or creating construction work pads may result in an increased potential for soil erosion and sedimentation to area streams and wetlands during a heavy rainfall. However, these short-term impacts should be minor as a result of the relatively small area to be impacted, the use of selective vegetation removal within 25 feet of the streams, the implementation of soil erosion control measures and the duration of construction activities. In addition, a detailed Stormwater/Erosion and Sediment Control Plan will be designed and implemented which will confine sediment within the immediate construction area and minimize impacts to downstream areas.

The contractor will follow a Spill Response plan in accordance with state requirements in response to an inadvertent release or spill of oil or other hazardous materials.

5.2.6 Soil Erosion and Sediment Control

Construction activities which expose unprotected soils have the potential to increase natural soil erosion and sedimentation rates. Soil compaction and decreased infiltration rates may result from

equipment operations. Standard construction techniques and BMPs will be employed to minimize any short- or long- term impacts due to construction activity. These include the installation of straw bales, siltation fencing, water bars, diversion channels, the reestablishment of vegetation and dust control measures. These devices will be inspected by environmental monitors frequently during construction and repaired or replaced if necessary. The Applicant has developed and will implement a Soil Erosion and Sediment Control Plan ("SESC"), which details BMPs and inspection protocols.

Excess soil from excavation at pole structures in uplands will be spread around the poles and stabilized to prevent migration to wetland areas. Excess material and rocks excavated from pole structure locations in wetlands will be disposed of at upland sites. Any excess rock not otherwise used along the ROW would be disposed of off-site at an appropriate location, pursuant to regulatory requirements. Topsoil will then be spread over the excess excavated subsoil material to promote revegetation.

Highly erodible soils are encountered within the Project Area. On all slopes greater than eight percent which are upgradient of sensitive areas, impacted soils will be stabilized with straw or chipped brush mulch to prevent the migration of sediments. Soil erosion and sediment control measures will be selected to minimize the potential for soil erosion and sedimentation in areas where soils are impacted. The Applicant will adhere to its Rights-of-Way Access, Maintenance, and Construction Best Management Practices (Appendix L), and has prepared a Project-specific Stormwater/Soil Erosion and Sediment Control Plan (Appendix K), in compliance with the *Rhode Island Soil Erosion and Sediment Control Handbook*, the *Rhode Island Stormwater Design and Installation Standards Manual*, and the *Wetland BMP Manual: Techniques for Avoidance and Mitigation*.

Typically, temporary soil erosion controls will be installed based on the specifications in the SESC Plan. Temporary soil erosion controls may be placed in the following types of areas, in accordance with site-specific field determinations:

- Across or along portions of cleared ROW, at intervals dictated by slope, amount of vegetative cover remaining, and down-slope environmental resources;
- Across or along access ways within the transmission line ROW;
- Across areas of impacted soils on slopes leading to streams and wetlands; and
- Around portions of construction work sites that must unavoidably be located in wetlands.

The temporary soil erosion controls will be maintained, as necessary, throughout the period of active construction until restoration has been deemed successful, as determined by standard criteria for stormwater pollution control/prevention and soil erosion control. In addition to silt fence or straw bales, temporary soil erosion controls may include the use of mulch, jute netting (or equivalent), soil erosion control blankets, reseeding to establish a temporary vegetative cover, temporary or permanent diversion berms (if warranted), and/or other equivalent structural or vegetative measures. After the completion of construction activities in any area, permanent stabilization measures (e.g., seeding and/or mulching) will be performed.

During the course of periodic post-construction inspections, the Applicant will determine the appropriate time frame for removing these temporary soil erosion controls. This determination will be made based on the effectiveness of restoration measures, such as percent re-vegetative cover achieved, in accordance with applicable permit and certificate requirements.

5.2.7 Fish and Wildlife Habitat

The removal of mature trees in forested areas within the BIP ROW may affect wildlife species composition by favoring species that prefer shrub land, emergent, or open habitats to those that inhabit forested communities. The TNEC ROW will be cleared an additional approximately 55 feet in width for 1.6 miles and approximately 85 feet in width for 4.4 miles. Total tree clearing for the TNEC ROW will result in clearing approximately 51 acres of upland deciduous and coniferous forest and approximately eight acres of palustrine (mostly deciduous) forested wetland.

During construction, temporary displacement of wildlife may occur due to the presence of vegetation removal and construction equipment. However, the ability of the area to provide wildlife habitat will not be adversely affected following construction. A study conducted in the Northeast region from northern Connecticut into southern New Hampshire indicated an increase in early successional plant and wildlife usage of powerline corridors following removal of trees from ROWs (Wagner et al. 2014). Another study in western Massachusetts found transmission line corridors provided habitat for shrubland birds of high regional conservation priority (King et al. 2009). ROWs also serve as open corridors connecting non-contiguous natural areas (Temple 1996).

Wildlife currently using the forested edge of the TNEC ROW or the forest associated with the proposed clearing for the CREC ROW may be impacted by the construction of the BIP. Larger, more mobile species such as large mammals may be temporarily displaced. Some avifauna will also be temporarily displaced, possibly impacting breeding and nesting activities depending on the time of year. Some smaller and less mobile animals such as small mammals and herpetofauna may be affected during the vegetation removal and transmission line construction. Impacts will be localized to the immediate area of construction around structure locations and along access roads. Following construction, wildlife will be expected to return and re-colonize the ROW.

Within the TNEC ROW, impacts on vegetation communities and wildlife assemblages will occur within and parallel to the existing ROW, which are maintained in shrubland or other open habitat types. In order to install and operate the proposed facilities, additional vegetation will have to be removed for construction and thereafter will be maintained as low-growth shrubs or grasses. For the most part, the vegetative communities that would be affected by the BIP along and adjacent to the TNEC ROW are common to the region. In the areas where additional forested vegetation removal is required along the TNEC ROW and for the construction of the new CREC ROW, the BIP may have long-term, but incremental and localized, impacts on vegetation and associated wildlife habitats.

The creation of additional shrub land habitat along the TNEC ROW and the creation of the shrubland section of the CREC ROW will represent a long-term positive effect on disturbance and shrub-dependent avian species, as well as species from other trophic levels such as bees and butterflies. The management and maintenance of ROW creates early successional habitats dominated by shrub vegetation and open areas with dense grasses and other herbaceous vegetation. Shrubland habitats within ROWs can provide wildlife habitat such as nesting for birds,

browse for deer, and cover for small mammals (Ballard et al. 2004), and tend to offer habitats preferred by particular organisms for certain stages of their annual life-cycles (DeGraaf and Miller 1996). For example, in the northeastern United States, neotropical migrants are experiencing significant declines. Over 80% of these declining neo-tropicals use disturbance-dependent ecosystems such as shrub lands and forest edges (Confer and Pasco 2003). Studies conducted in the Northeast have shown that populations of most bird species associated with shrubland habitats have declined sharply. These shrubland species have been shown to make use of human-impacted habitats including utility ROWs (Hunter et al. 2001). These habitat types are declining and increasingly rare in the Northeast due to various factors (e.g., development, ecological succession, absence of fire) (DeGraaf and Miller 1996; King et al. 2009; Wagner et al. 2014). Additionally, most of the historic shrubland in the Northeast is irreversibly gone due to permanent human development; therefore, management for shrub habitat dependent species and for biodiversity cannot occur at these locations. Shrubland birds and other disturbance dependent species are now more dependent than ever on human activities to maintain the habitat required for their survival (King et al. 2009; Confer and Pascoe 2003; Confer et al. 2008). In this regard, transmission line ROW is considered a major source of shrubland habitat (Saucier 2003). In response to shrubland habitat loss and the decline in shrubland dependent species in the Northeast, the USFWS has recently approved the Great Thicket National Wildlife Refuge, which will be dedicated to managing shrubland wildlife habitat in the Northeast (USFWS 2016).

Site surveys have confirmed that no amphibian breeding habitats exist along the CREC ROW, and the ROW crosses one forested wetland and one swamp. In its entirety, the clearing required for the CREC ROW will be approximately 14.5 acres, including conversion of 0.5 acre of a forested wetland and 1.5 acres of a swamp to scrub-shrub and/or emergent wetland, with the remaining approximately 12.5 acres of clearing occurring in upland areas. Establishing the 0.8 mile of new CREC 150-foot-wide ROW may result in some habitat fragmentation by introducing edge effects to undisturbed forested habitat. Fragmentation effects on interior forest species could include an increase in predation by opportunistic predators due to a lack of protective cover, increased brood-parasitism on songbirds, causing interruption of migration routes and displacement of some interior forest species. Research on the effects of clearing uncleared portions of transmission line ROWs suggests that this practice improves habitat for some nesting bird species, and have shown a positive correlation between ROW width and species abundance (Confer and Pascoe 2003).

Vegetation removal will be performed using mechanized methods. Where removal of woody vegetation is required, vegetation will be cut flush with the ground surface to the extent possible. Where practical, trees will be felled parallel to the ROW to minimize the potential for off-ROW vegetation damage. Vegetation on the existing ROW is managed in accordance with the TNEC Vegetation Management Plan (Appendix B). Accordingly, trees that could interfere with the operation of the transmission lines are routinely removed from the ROW and trees along the edges are periodically pruned or removed. The operation of the new transmission facilities will require the maintenance of the ROW as low-growth shrub land and open field habitats.

5.2.8 Protected Species

The following state-listed rare plant species have been identified on or within the immediate vicinity of the ROW: rock harlequin, American yew, Northern beech fern, and hobblebush. In general, rock harlequins are adapted to the existing site conditions promoted by the on-going vegetation management practices implemented along the ROWs; and, in some cases, have shown a

preference to disturbed areas, such as those found along the regularly maintained ROW. Periodic disturbances to the vegetative community associated with management and maintenance of the ROW can create early successional habitats that could promote the further establishment of rock harlequin on the ROWs. Tree clearing could have an impact on some state-listed plant species such as Northern beech fern and hobblebush, plants which grow in the forest understory. Opening the tree canopy may affect the current populations of Northern beech fern and hobblebush. There is currently approximately 1,090 square feet of Northern beech fern (approximately 65 plants) and 2,000 square feet of hobblebush (approximately 41 plants) on the ROW.

Impacts to sensitive habitats of state-listed rare, threatened or endangered species will be minimized and where possible avoided through close coordination with the RINHP, RIDEM and the USFWS in the development of avoidance and mitigation criteria for the Federally-listed NLEB as well as the state-listed plant species discussed below. To avoid possible adverse impacts to or forced relocation of NLEBs, the Applicant will implement appropriate time of year restrictions for clearing of the TNEC and CREC ROWs to avoid the maternity nesting season during June-July.

5.2.9 Vernal Pools

Impacts to vernal pool habitat along the Project ROWs have been avoided and minimized through constructability analyses and as a result no direct impacts to vernal pools are anticipated, however; indirect impacts to vernal pools may occur. During tree and vegetation removal within the ROW, access through vernal pools will be avoided to the extent feasible. If limited access is required, low impact equipment in conjunction with swamp matting will be used. Whenever possible, tree removal will occur via mechanized feller/bunchers with a reach of 20 feet to ensure trees can be cut and removed with little to no impact to the vernal pool habitat. In some cases, individual or isolated trees can be felled by hand to avoid impacts from vehicles. Soil erosion and sediment controls will be installed and maintained along construction access roads and around work pads as necessary to protect water quality and to limit the potential for soil deposition into vernal pools. Sediment built up behind these devices will periodically be removed and placed in upland areas, in a manner that will preclude the potential for subsequent deposition into the pools. As listed below, there is proposed work along the Project ROWs in the vicinity of vernal pools. The appropriate avoidance and minimization practices will be utilized at the following locations.

- Proposed swamp mat work pad, pull pads, and structure to be removed near vernal pool associated with wetland w03pr148. If mats are to be placed during the spring or summer months, the onsite Environmental Monitor will provide a visual sweep of the area and remove all amphibians from the work area prior to the placement of swamp mats.

- Proposed swamp mat work pad and pull pads near vernal pool associated with wetland w03pr126. If mats are to be placed during the spring or summer months, the onsite Environmental Monitor will provide a visual sweep of the area and remove all amphibians from the work area prior to the placement of swamp mats.

- Proposed tree clearing near vernal pool associated with wetland w03pr123 and w03pr118. Low impact equipment in conjunction with swamp matting will be used. Whenever possible, tree removal will occur via mechanized feller/bunchers with a reach of 20 feet to ensure trees can be cut and removed with little to no impact to the vernal pool habitat. In some cases, individual or isolated trees can be felled by hand to avoid impacts from vehicles.

5.2.10 Cultural Resources

The Applicant is conducting archaeological testing of impact locations that have been determined to have a moderate to high potential to contain archaeological sites, prior to construction. The BIP could impact any as-of-yet unidentified archaeological resources, particularly in the locations proposed for the construction of electrical structures. The excavation for the structure foundations could impact subsurface artifacts and soil features that make up archaeological sites, if such sites exist. In addition, grading of access roads could also impact archaeological sites, if they exist.

6.0 AVOIDANCE AND MINIMIZATION STATEMENT

6.1 Clear River Energy Center

6.1.1 Site Selection/Alternatives Analysis

Invenergy conducted a detailed evaluation of the New England market to identify specific areas that may be in need for new generation, have available infrastructure that could support a new combined cycle plant and have sufficient land and proper zoning that would allow a combined cycle plant to be built.

As part of the Forward Capacity Market ("FCM"), ISO-NE conducts a Forward Capacity Auction ("FCA") three years in advance of each Capacity Commitment Period ("CCP") to meet the region's resource adequacy needs. Previous auctions conducted in 2013 and 2014 resulted in a shortfall of capacity supply in the Southeastern Massachusetts and Rhode Island ("SEMA/RI") zone, and given that this zone is an import capacity constrained zone (from an electrical prospective power cannot be imported into the zone from areas outside of the zone), proposed new generation resources need to be located within the SEMA/RI zone. The auction conducted on February 2, 2015, (FCA 9) resulted in capacity commitments of sufficient quantities to meet the Installed Capacity Requirement ("ICR") for the 2018/19 CCP however, the SEMA/RI capacity zone had less capacity than was needed for reliability (the zone had a deficit of approximately 250 MW).

ISO-NE issued the report "ISO New England Installed Capacity Requirement, Local Sourcing Requirements and Capacity Requirement Values for the System-Wide Capacity Demand Curve for the 2018/19 Capacity Commitment Period", in February of 2015, documenting the assumptions and simulation results of the 2018/19 CCP ICR, Local Sourcing Requirements ("LSR") and Capacity Requirement Values for the System.

For the 2018/19 CCP, ISO-NE identified three Load Zones that are import constrained and as a result, modeled as Capacity Zones in FCA 9. These Capacity Zones were Connecticut, Northeast Massachusetts/Boston (NEMA/Boston) and SEMA/RI.

LSR for import-constrained Capacity Zones involves calculating the amount of resources located within the Capacity Zone that are required to meet needs. For instances where there is insufficient generation within a zone, proxy units are required to meet the resource adequacy planning criterion specified by ISO-NE. For the FCA 9 SEMA/RI LSR analysis, an 800 MW proxy unit was needed to bring the zone and the system into compliance with the system requirements. A similar report was issued by ISO-NE in 2014 that contained similar results.

Invenergy used these reports to identify specific geographic areas where locating a new generating facility would satisfy this need. The SEMA/RI area encompasses all of Rhode Island and the southeastern portion of Massachusetts. The SEMA/RI was the primary focus for several reasons:

1. The zone is an electrically constrained import zone, which generally means that generation must be located within the zone in order to serve load within the zone.

2. The zone had insufficient generation capacity in prior Forward Capacity Auctions (FCA 8 and 9) thus leading to higher price prices in the zone.

3. These higher clearing prices are indicative of need within the zone and the Forward Capacity Market is designed to send these type of pricing signals to prospective bidders so they can properly focus on key areas of need.

Within this area there are few locations to site a new generating facility. Suitable locations must, at a minimum, have access to a large natural gas pipeline (like Algonquin), access to high voltage transmission (preferably 230 kV and higher), be properly zoned, and have a suitable buffer to any nearby residential properties. The AGT pipeline is only eight miles long within the State of Rhode Island and the only parcels that it crosses where a power plant could be permitted are the parcels owned by AGT and TransCanada's Ocean State power plant site.

Invenergy evaluated five alternative sites in addition to the selected site within the SEMA/RI zone, which includes Rhode Island and southeastern Massachusetts (Figures 6-1 through 6-6).

The viability of the alternative sites was based on the following criteria and using the information available at the time:

1. Available transmission capacity on the electric transmission lines;

    - If the line has sufficient available capacity, then new generation can be added to the line without creating the need for costly and possibly prohibitive upgrades (which would also involve additional clearing and related environmental impacts)

2. Available gas capacity on the gas pipeline;

    - If the pipeline is already fully subscribed, then additional capacity would be needed (which may require upgrades that also involve additional clearing and related environmental impacts).

    - If the pipeline is a lateral from the main line and is fully subscribed, it may require upgrades or replacement of the lateral from the main line to the point of interconnect (which may also involve additional clearing and related environmental impacts)

    - As the main pipelines get closer to Boston (NEMA/Boston) they become further constrained and the availability of gas transportation becomes more restricted, thus requiring upgrades in areas that have higher population densities.

3. Land areas (sufficient acreage) that may be suitable for a power generation facility; and

4. Zoning of any possible suitable sites.

All of the alternative sites failed to meet one or more of the above metrics. As such, none of the alternative sites were practicable. In addition, according to NWI mapping, the proposed site could

accommodate the CREC outside of mapped wetlands. Even if one of the alternative sites were practicable, none appeared to reduce wetland impacts compared to the selected site. Table 6-1 below summarizes the variables considered at each alternative site.

Table 6-1: Previous Sites Examined Within the SEMA/RI Zone

Site Number	State	Town	Gas Availability	Interconnecting Voltage (kV)	Available Transmission Capacity	Area Zoning	Power Plant Permitted Use	Located in RI Natural Heritage Area	Practicability	Remarks
1	RI	North Smithfield	Possible – 20" TGP	345	Yes	REA	No	No	No	
2	RI	North Smithfield	Possible – 20" TGP	345	Yes	REA	No	Yes	No	
3	RI	Woonsocket	Possible – 12" TGP	345	Possible	I-1	No	Yes	No	Light Industrial Park
4	RI	Cumberland	Yes – 20" TGP	345	Yes	A-1	No	No	No	
5	MA	Uxbridge	Yes – 24"/30" AGT	115/345	Yes	Res-C	No	N/A	No	Previous Developer (EMI) failed to change zoning
6	RI	Burrillville	Yes – 24"/30" AGT	345	Yes	F-5	Yes	No	Yes	

AGT's total land holding is approximately 730 acres and includes not only the AGT pipeline but also a double circuit 345 kV transmission line making it an ideal location for a power plant as no additional ROWs are needed (beyond those the CREC Facility will need from AGT). Invenergy and AGT evaluated several options for locating the CREC Facility within the 730-acre site. Figure 3-1 demonstrates site constraints within the AGT property with respect to wetlands, topography, and access. Given these constraints, Invenergy and AGT collectively determined the proposed Facility Site as being the best alternative within the 730-acre site for the following reasons:

1. Parcel will have frontage on Wallum Lake Road;
2. There will not be a need to have a new Facility roadway that would cross over the pipe line;
3. Suitable buffer to nearby residential properties and to the Algonquin compressor station; and
4. Far fewer wetland impacts and represents the least damaging practicable alternative.

6.1.2 Compliance with Avoidance and Minimization Requirements

The proposed CREC Facility and roadway have been designed to avoid and minimize impacts wherever possible. The Facility has been designed and sited to be almost entirely outside of

delineated wetland resources areas. Additional mitigation measures are designed to minimize impacts on the natural and social environments. Mitigation measures have been designed for the CREC to reduce impacts associated with each phase of construction. These measures are described in the following sections.

6.1.2.1 Design Phase

In order to reduce the impacts associated with the construction and operation of the Facility, Invenergy has incorporated design measures to avoid and minimize the impacts of the CREC. These measures, which include facility design and configuration and the use of existing woods roads where possible, have resulted in the avoidance and minimization of land use changes, wetland/water resource impacts, and soil disturbance to the greatest extent practicable. Land use impacts are minimized by locating the proposed project on private property and siting the BIP primarily within the existing TNEC ROW. The design and construction of the proposed Facility incorporates measures which minimize impacts to wetlands and water resources and other natural features within the Facility Site. To evaluate facility design and configuration, multiple versions were developed, reviewed, and refined. These reviews resulted in recommendations regarding shifting the locations of certain components of the Facility to avoid and/or reduce impacts to wetlands, watercourses, cultural resources, and other physical constraints that were observed in the field.

The proposed improvement of the existing woods road to serve as the Facility roadway will also avoid wetland impacts that would otherwise occur as a result of the development of an entirely new road crossing through wetlands. Algonquin Lane is owned by AGT, which has indicated that they will not allow Invenergy to use the road during construction or operation of the CREC due to concerns regarding conflicts with the use of the roadway to support the Algonquin Compressor Station. Accordingly, access to the proposed site is only available via Wallum Lake Road. To avoid impacts to undisturbed wetlands, the proposed roadway was designed to follow, to the extent possible, the alignment of an existing woods roads which currently includes several small culverts at existing wetland crossings.

The roadway from Wallum Lake Road into the Facility has been designed to avoid and minimize wetland impacts to the maximum extent practicable. Instead of typical 3:1 embankment slopes, the roadway will be constructed with retaining walls that will considerably reduce its overall width and impact to Wetland 1 (see Figure 6-1). This change substantially reduces the total width of the roadway infrastructure, as well as reduces permanent impacts to biological wetlands from approximately 0.9 acres to 0.5 acres.

Six natural bottom, box-type culverts will be utilized to allow unimpeded flow of water, aquatic habitat connectivity, and access for wildlife movement under the proposed roadway. The height of each culvert will have a minimum height of approximately four feet and a minimum width of nine feet. The culvert conveying the tributary to Iron Mine Brook, as well as Wildlife Crossing #5 (closest to the CREC Facility) will have a minimum height of approximately six feet and a minimum width of 12 feet. The provisions for a natural bottom culvert will accommodate a naturalized stream channel within the culvert in lieu of the existing undersized 18 inch culvert. The length of each culvert is the minimum necessary to tie to the proposed retaining walls. The retaining walls proposed along the length of the roadway will also effectively guide wildlife to the proposed natural bottom, three-sided box culverts to minimize wildlife collisions with

vehicles using the roadway. Each culvert crossing will also include two grate openings to promote light within the interior of the culvert. The grade of the roadway will be slightly elevated around the grates to avoid intercepting stormwater runoff. For large wildlife (i.e. white-tailed deer) that may be discouraged from utilizing the culvert crossings, an at-grade ramp is proposed along the midpoint of the roadway.

Invenergy sought a facility configuration that would maximize the use of upland areas that does not contain sensitive environmental features. Further, construction BMPs will be implemented during and following construction to minimize impacts associated with the CREC Facility, and a compensatory wetland mitigation plan is being developed to address mitigation requirements.

6.1.2.2 Construction Phase

Invenergy will implement several measures during construction which will minimize impacts to the environment. These include the use of the existing woods road, installation of soil erosion and sediment controls, supervision and inspection of construction activities within resource areas by an environmental monitor and minimization of impacted areas. The following section details various mitigation measures which will be implemented to minimize construction-related impacts.

Best management practices will be employed to minimize disturbances to wetlands during construction of the CREC. The boundaries of the wetlands adjacent to proposed work limits would be clearly demarcated by a qualified wetland scientist prior to the commencement of work. When working in or traversing such wetlands, Invenergy would:

- Install, inspect, and maintain soil erosion and sediment controls and other applicable construction BMPs.
- Limit grading in wetlands to the amount necessary to provide a safe workspace.
- Restore temporary impacts to wetlands, after Facility construction, to pre-construction configurations and contours to the extent practicable.
- Comply with the conditions of federal and state permit conditions related to wetlands.
- Pile cut woody wetland vegetation so as to avoid blocking surface water flows within or otherwise to adversely affect the integrity of the wetland.
- Avoid or minimize access through wetlands to the extent practical. Where access roads must be improved or developed, the roads would be designed, where practical, so as not to interfere with surface water flow or the functions of the wetland.
- Install temporary soil erosion controls around work sites in or near wetlands to minimize the potential for soil erosion and sedimentation.
- Refuel construction equipment (apart from equipment that cannot practically be moved) 100 feet or more from a wetland. If refueling must occur within a wetland, secondary containment will be used.
- Store petroleum products at least 100 feet from a wetland.

Invenergy would implement the following mitigation measures to minimize the potential impacts of construction activities in or near watercourses:

- Maintain ambient water flows (if water is present at the time of construction) and not constrain or interrupt the flow at any time during construction.
- Maintain existing riparian zone vegetation, to the extent feasible, along the banks of the watercourse.
- Install controls to prevent or minimize turbidity and sediment loading into watercourses. These controls may include the use of crushed stone approach aprons onto mat bridges, stone check dams, water bars, diversion channels, soil erosion controls, turbidity curtains and floating booms.

Invenergy has identified the following types of measures that may be implemented to minimize adverse impacts on vernal pools (special aquatic sites):

- Locate work outside of productive vernal pools and amphibian breeding habitats to the extent practical.
- Install appropriate soil erosion and sediment controls around distinct work sites and access roads to minimize the potential for sediment deposition into vernal pools, and remove such controls promptly after final site stabilization.
- During tree and vegetation removal, access through vernal pools will be avoided to the extent feasible. Minimize the removal of low-growing vegetation surrounding vernal pools.
- To the extent practicable trees to be removed will not be directly felled into vernal pool depressions. Directional felling using mechanized equipment (feller/buncher) allows complete control of trees during felling. The feller/buncher lifts the tree from the stump, allowing careful removal. Aerial cable winching and other forestry practices will be utilized as appropriate. If trees are felled within a vernal pool, whether out of necessity or inadvertently, and removal is likely to cause more harm than good (as determined by the environmental monitor), some slash may be left in place to serve as coarse woody debris.
- During the operation and maintenance of the Facility, incorporate measures to protect remaining vernal pools (e.g., maintain as much vegetative cover within and around vernal pools as possible) into the vegetation management program. The specific measures that would be implemented to protect amphibians would be defined in consultation with the involved regulatory agencies.

Best Management Practices

Soil Erosion and Sediment Control

Following vegetation removal, proper soil erosion and sediment control devices, such as straw bales, siltation fencing, or chip bales, will be installed in accordance with approved plans and permit requirements. The soil erosion and sediment control program for the Project will follow

the procedures identified in the *Rhode Island Soil Erosion and Sediment Control Handbook*, the *Rhode Island Stormwater Design and Installation Standards Manual*, the *Wetland Best Management Practice ("BMP") Manual: Techniques for Avoidance and Mitigation*.

The Town of Burrillville has adopted local soil erosion and sediment control ordinances. The Town of Burrillville code requires that a Determination of Applicability must be filed with the Building Inspector for approval (Burrillville Code Sections 12-61-73). The Code exempts certain activities including the following: excavations for an improvement that a) does not result in a total displacement of more than 50 cubic yards of material; b) has no slopes greater than 10 feet vertical in 100 feet horizontal or approximately 10 percent; and c) has all impacted surface areas promptly and effectively protected to prevent soil erosion and sedimentation. Invenergy will consult with the Burrillville Building Inspector and incorporate the town's requirements into the overall Project soil erosion and sediment control plan.

The soil erosion and sediment controls will be installed between the work area and environmentally sensitive areas such as wetlands, streams, drainage courses, roads and adjacent property when work activities will disturb soils and result in a potential for soil erosion and sedimentation. The devices will function to mitigate construction-related soil erosion and sedimentation, and will also serve as a physical boundary to delineate resource areas and to contain construction activities within approved areas.

The controls will be periodically inspected and monitored and will serve to reduce sedimentation and provide a limit of work. In addition to those described above, soil erosion and sediment control devices will be installed along the perimeter of identified wetland resource areas prior to the onset of soil disturbance activities to ensure that excess soil piles and other disturbed soil areas are confined and do not result in downslope sedimentation of wetland resources. Low growing tree species, shrubs, and grasses will be mowed only along access roads and at work envelopes.

Where dewatering is necessary during excavations for structures within or adjacent to wetland areas, water will be pumped into appropriate dewatering basins. The basin and all accumulated sediment will be removed following dewatering operations and the area will be seeded and mulched as necessary. The seed mixes to be applied will be determined based on soil properties and recommendations from the Natural Resource Conservation Service. Soil erosion and sediment controls will be used to contain excess soils, prior to removal of the excess soils from the work sites.

Soil erosion and sediment controls, and other measures will be implemented, as appropriate, in accordance with BMPs, in resource areas temporarily disturbed by construction. Herbaceous vegetation in disturbed areas will be restored using a native wetland or conservation seed mix. In areas of tree removal, enhancements are proposed as mitigation for important wildlife features lost as a result of tree removal and construction activities. Potential enhancement activities may include: seeding, planting shrub species native to the northeast, leaving snags and placing woody debris, and slash or stone piles to create wildlife cover.

The Stormwater Management Plan for Clear River Energy Center (Appendix J) provides additional details of proposed soil erosion and sediment control BMPs at the CREC.

Stream Crossings

Construction of the CREC Facility roadway requires the reconstruction of one stream crossing along the existing woods road. An existing crossing at the unnamed intermittent tributary to Iron Mine Brook will be utilized initially during construction until the proposed permanent crossing is constructed. Stream crossings will be installed and managed in accordance with RIDEM Division of Forestry's *Best Management Practices for Rhode Island Water Quality Protection and Forest Management Guidelines*.

Construction Sequencing

Due to the cut/fill nature of the CREC, which requires creating a 16+ acre flat site for the Facility, stripping and stockpiling topsoil in order to access desirable soils for fill, it is difficult to define distinct boundaries for phasing of the grading operations and construction. Cut materials will also be used to build the entrance road. Phasing of construction will be recommended to the Contractor and noted on the plans for the Contractor to develop a plan of action that will minimize exposed unstabilized earth during mass grading if possible. Proper sequencing of construction activities is essential to maximize the effectiveness of erosion, runoff, and sediment control measures. The first phase identified in the Soil Erosion and Sediment Control Plan (Appendix J) will begin with installation of the LOD fencing and silt fencing to clearly identify limits of disturbance and areas internal to the site that require protection before start of land disturbance. This work would be followed by installation of the stone construction exit and concrete washout pit. Once these features are installed, excavation and installation of temporary sediment basin "A" and its associated discharge structures will be completed in accordance with the RI SESC Handbook and/or the RI Department of Transportation Standard Specifications for Road and Bridge Construction (as amended). Diversion ditches to capture storm water runoff and divert to basin "A" will be installed prior to initiating mass grading within the CREC. All tree clearing activities will be scheduled to avoid impacts to important or sensitive habitats.

The next phase would include clearing and grubbing of the main Facility Site. Diversion ditches will divert runoff to basin "A." Topsoil will be removed and stored adjacent to the construction staging area. Topsoil stockpile will be seeded at the end of stockpiling and protected at the base with silt fence. Basin "B" will be excavated, outlet structure and outlet protection installed. Basin will be stabilized through temporary seeding. As mass grading commences, a new diversion ditch will be installed that will move with the grading operations in order to begin diverting runoff to basin "B", allowing basin "A" to shrink in size to allow fill operations. Retaining walls will be installed along the entrance road and construction of the elevated entrance road will commence.

At the completion of the mass grading, finer grading of the Facility Site will ensue and storm drainage system will be installed. Inlets will receive silt fence protection upon installation to minimize sedimentation in the storm system. These installations will effectively treat each small drainage area on the site as a sediment trap. The storm system replaces the diversion ditches and transports storm runoff to basin "B." Sediment basin "A" will no longer be used and should be removed at this time, replaced by final grading with the slope receiving final seeding and mulch for stabilization. Upon commencement of site construction activities, the contractor will initiate appropriate stabilization practices on all disturbed areas as soon as possible, but not more than 14 days after the construction activity in that area has temporarily or permanently

ceased. Gravel base will then be installed in preparation for final grading/paving. As the site is paved, the inlet protection may change from silt fence to a stone bag protection to facilitate construction. Perimeter final grading will be completed and final seeding/mulching placed to stabilize disturbed ground. Road construction will be completed, basin "B" will be converted to a water quality/detention stormwater management basin for the Facility.

During the final construction phase, temporary erosion and sediment control devices will be removed as the site becomes stabilized and removal is approved by the construction manager and governing agencies. At the end of construction, the construction staging area will be cleaned up and the soil stockpile will then be distributed over the staging areas, which will then receive final seeding and restoration plantings. Once all areas are stabilized, any remaining temporary controls will be removed.

Environmental Training and Monitoring

Throughout the entire construction process, Invenergy will retain the services of an environmental monitor. The primary responsibility of the monitor will be to oversee construction activities including the installation and maintenance of soil erosion and sediment controls, on a routine basis to ensure compliance with all federal, state, and local permit commitments. The environmental monitor will be a trained environmental scientist responsible for supervising construction activities relative to environmental issues. The environmental monitor will be experienced in soil erosion control techniques and will have an understanding of wetland resources to be protected.

During periods of prolonged precipitation, the monitor will inspect all locations to confirm that the environmental controls are functioning properly. In addition to retaining the services of an environmental monitor, Invenergy will require the Contractor to designate an individual to be responsible for the daily inspection and upkeep of environmental controls. This person will also be responsible for providing direction to the other members of the construction crew regarding matters of wetland access and appropriate work methods. Additionally, all construction personnel will be briefed on project environmental compliance issues and obligations prior to the start of construction. Regular construction progress meetings will provide the opportunity to reinforce the Contractor's awareness of these issues.

6.1.2.3 Post-Construction Phase

Following the completion of construction, Invenergy will implement the following standard and site-specific mitigation measures to minimize the impact of the CREC on the natural and social environment.

Restoration of Temporary Impacts

Restoration efforts, including final grading and installation of permanent soil erosion control devices, and restoration of temporarily impacted areas, will be completed following construction. Construction debris will be removed from the CREC Facility Site and properly disposed of. Pre-existing drainage patterns and stone walls will be restored to their former condition, where appropriate.

The restoration of temporarily impacted forested areas (reforestation) including the two construction staging areas, as well as the compensatory flood storage area, will be restored to

conditions comparable to those that existed before construction. The primary and secondary temporary staging areas are approximately 7.2 and 0.75 acres in size. The compensatory flood storage area, located just downstream of the access road stream crossing, is approximately 6,000 square feet in size. The restoration activities will include the removal of all temporary fill, construction debris, and equipment; and re-grading as necessary to re-establish previous elevations in the case of the two construction staging areas and the lower proposed elevations in the case of the compensatory flood storage area. Within both locations, topsoil will be removed and stockpiled for re-use. A minimum 8-inch depth of salvaged topsoil will be replaced within all reforestation areas.

The required plant species, quality, size, condition, and planting locations are included in the project plans (Appendix A). The planting density for saplings and shrubs is designed to equal a spacing of 20 feet-on-center and 10 feet-on-center, respectively, utilizing a triangular grid pattern. Saplings will typically be balled and burlapped or container-grown stock, a minimum of 5-feet high and ¾-inch caliper branching above 2.5 feet. Shrubs will be container-grown stock and a minimum of 2.5 to 3-feet high, full, and bushy. The proposed native plantings are based on those species currently occurring on the site and commercially available. Efforts will be made to source the plant materials locally (e.g., Rhody Natives). Plant selection was chosen to eliminate plants that deer are most likely to browse first.

Planting of the reforestation work will target September 1st to October 15th to provide best survival. Salvaged topsoil will be added as backfill in all planting pits. A 2-inch depth of dark brown pinebark mulch will be placed around planting pits. Tubex© tree guards will be provided for all saplings to prevent rodent browsing and will be removed after 2 years. Plantings within the reforestation areas will be supplemented with Allen's Conservation Mix (Allens Seed 693 South County Trail Exeter, RI 02822) to be spread after planting is complete. The seed mix will be seeded at the rate of 5 lbs/1,000 sf and includes the following species: 25% creeping red fescue (25%), annual rye (25%), tall fescue (17%), Kentucky blue (5%), colonial bentgrass (1%), red top (1%), white clover (1%). Straw mulch will be placed throughout seeded areas to aid in seed germination and initial soil stabilization.

It will be the contractor's responsibility to maintain the reforestation areas for the establishment period including watering during the first year with an approved method. The contractor will be required to replace any dead or dying plants after one year (establishment period). Any additional fertilizer in the form of a slow release fertilizer shall be used only during the establishment period of the first three years, and then only as needed.

Restoration success shall be measured based on the following criteria:

- Completion of plantings in accordance with the approved plans and specifications
- Stabilization of all disturbed soils
- Maintenance of at least an 85% survival rate of planted over two consecutive monitoring periods as documented during monitoring events, and
- Maintenance of a low occurrence of non-native, invasive species (as defined in the New England District Compensatory Mitigation Guidance)

Certain adaptive management strategies may need to be implemented at restored areas. A summary of potential issues affecting the long-term success of the restoration areas which may occur, as well as proposed responses is provided in Table 6-2 below.

Table 6-2: Planned Responses to Potential Restoration Deficiencies

Deficiency	Remedial Measures
Final elevations not as planned	Regrade as necessary
Inadequate species composition	Supplement seeding/planting
Inadequate plant density	Fertilize, supplement seeding
Significant erosion	Install erosion control blankets or similar materials
Less than 85% survival of saplings over two consecutive biannual monitoring periods (4 years)	Replant as necessary
Marginal tree/shrub vigor	Fertilize
Substantial human disturbance	Access control, legal remedies
Significant wildlife damage	Additional wildlife deterrents/replanting
Significant presence of invasive plant species	Biocontrol, manual removal, systemic herbicide control
Presence of archaeological resources	Notify SHPO and contract with an archaeological consultant to conduct investigation
Presence of hazardous waste	Notify RIDEM and contract with a hazardous waste firm to determine extent of contamination

Invenergy will restrict access to the property. Locking gates will be installed at access points to prevent unauthorized activities.

Minimization of Invasive Species

The federal government and the State of Rhode Island maintain information regarding invasive wetland plants. For example, RIDEM maintains lists of invasive wetland species. Similarly, the NRCS also maintains a list of noxious plants, by state. Based on a review of these lists and the characteristics of the existing CREC Facility Site (as determined by field investigations), the most abundant invasive species located in wetlands include multiflora rose, reed canary grass, purple loosestrife, common reed, Japanese barberry, and tartarian honeysuckle. Where there is an ample seed stock or a system of rhizomes of these invasive species, communities of these plants will tend to be the first “pioneer” species to populate and colonize areas that have been disturbed and left exposed.

During the construction of the CREC, the Applicant will implement measures to the spread of invasive plant communities during construction and as a result of the movement of construction vehicles and equipment. The main objectives will be to:

- Perform construction activities so as to minimize the spread of invasive plant species; and
- Restore landscapes affected by the CREC promptly to limit the potential for invasive species to colonize disturbed soils.

To minimize the spread of target wetland invasive plant species, the Applicant will require Contractors to implement the procedures described below, as appropriate to the phase of construction that each contract will perform:

- All construction equipment, vehicles, and materials (e.g., equipment mats) must be clean and free of excess soil, debris, and vegetation before being mobilized to the CREC Facility Site.
- If necessary, swamp mats or equivalent (e.g., corduroy roads) will be used in wetlands during clearing operations to minimize spread of invasive species within a wetland by the clearing equipment itself.
- To minimize the potential for spreading invasive plant species from wetland-to-wetland, any equipment working in or traversing a wetland containing invasive plant species will be cleaned prior to relocating to another work site. Cleaning of vehicles and other equipment (including the tracks and tires) will involve removal of visible dirt, debris and vegetation through the use of brooms, shovels, and, if needed, compressed air.
- Construction equipment and excavated soil material will be contained within the approved limits of work areas; these limits of work will be defined on project plans.
- Excavated soils containing a predominance of target invasive plants will be stockpiled separately (to the extent that there is sufficient work space) and contained within staked bales, silt fence or other approved soil erosion and sedimentation control device to minimize the potential of spreading these soils elsewhere.

6.2 Burrillville Interconnection Project

6.2.1 Summary of Alternatives Analysis Process

A number of alternatives were considered to address the need to interconnect the CREC to the existing electric transmission system. This section summarizes the environmental criteria assessed to identify and evaluate potential alternatives to the Burrillville Interconnection Project. The need for the Burrillville Interconnection Project is driven exclusively by the interconnection of the CREC to the electric system. As a result, the practicable alternatives are limited by the need for a direct 345kV line connection to Sherman Road Switching Station, as identified by the ISO-NE.

The Applicant's overriding goal has been to select the practicable alternative that best meets the purpose and need of the BIP while minimizing adverse impacts on the aquatic ecosystem and other environmental consequences.

Alternatives evaluated including the "No-Action" alternative, electrical alternatives, alternative overhead routes, overhead alternatives utilizing the existing ROW, and underground transmission line alternatives. The following sub-sections summarize the environmental and other feasibility considerations that were assessed for each alternative.

6.2.1.1 No-Action Alternatives

The No-Action alternative is not practicable, as it would not address the need to interconnect the CREC to the Sherman Road Switching Station.

6.2.1.2 Electrical Alternatives

Connection to Existing Transmission Lines

ISO-NE analyzed connecting CREC directly to the existing 345kV 341transmission line or the existing 347 Line or both. A direct connection to the existing high voltage transmission lines is not a practicable alternative. This alternative presented unacceptable reliability issues and power transfer limitations, and were rejected by ISO-NE. Ultimately, ISO-NE determined that a new dedicated 345 kV transmission line to the Sherman Road Switching Station was the required solution for connecting CREC to the transmission system.

115 kV Alternative

TNEC evaluated installing one new overhead 115 kV transmission line from the CREC to the Sherman Road Switching Station. This alternative would use a similar H-Frame structure and monopole structure configuration proposed as for the BIP. Accordingly, the transmission line would have similar environmental impacts.

However, the Sherman Road Switching Station is a 345 kV facility, therefore this alternative would require adding a 115/345 kV transformer, which would take up additional space within the fenced in area and add to the cost of the Burrillville Interconnection Project. The use of the additional space is problematic because it limits TNEC's ability to fully utilize the station in the future due to site constraints associated with neighboring wetlands and high pressure gas pipelines located near the station. As a result, this alternative was rejected because it would not have less adverse impacts on the aquatic ecosystem or other environmental receptors, but would have greater costs and could potentially have greater adverse environmental impacts if expansion of the substation is needed in the future. This alternative also presented unacceptable constraints on the existing switching station.

6.2.1.3 Overhead Route Alternatives

TNEC considered two overhead routing alternatives for the 3052 Line. These alternatives involve paralleling existing utility corridors.

Construct Overhead Transmission Line in Project Row (BIP/Preferred Option)

As discussed in greater detail in Section 2 of this Application, the Burrillville Interconnection involves (i) the construction of a new 6.8-mile 345 kV transmission line in the existing TNEC ROW and the new CREC ROW; and (ii) improvements to the existing Sherman Road Switching Station. This alternative was found to be superior to others considered for a variety of reasons discussed in this section.

Overhead Transmission Line Adjacent to Algonquin Gas Transmission Pipeline ROW

TNEC also evaluated the use of an existing Algonquin Gas Transmission ("AGT") pipeline ROW which runs from southwest to northeast from the CREC to the Sherman Road Switching Station. TNEC considered constructing an overhead 345 kV transmission line adjacent to the AGT ROW from the CREC to the Sherman Road Switching Station, utilizing H-Frame construction as an alternative to the Burrillville Interconnection Project. This alternative would require the same improvements to the Sherman Road Switching Station as the proposed alternative.

This routing alternative would parallel an existing ROW corridor and has the advantage of not having to relocate the existing 341 and 347 Lines to accommodate the new line. However, the AGT ROW is not currently wide enough to accommodate the 3052 Line and it is unlikely AGT would permit the construction of an overhead transmission line within its 75 foot wide gas pipeline ROW that is currently occupied by two high pressure natural gas pipelines. This option would require clearing of forested wetlands and upland forest for a new approximately 150-foot wide ROW and building new access roads adjacent to the AGT ROW that are located away from the existing high pressure gas pipelines.

A desktop analysis was conducted to determine potential impacts to the surrounding environmental and social resources adjacent to the AGT ROW. Resources were analyzed within a 150-foot wide buffer on either side of the existing 75-foot Algonquin Pipeline ROW, totaling a 375-foot wide ROW. Digital wetlands data (RIDEM 1993) indicates 13 wetland systems crossing the entire 375-foot ROW, with 12 additional wetland systems crossing the 150-foot northern ROW and an additional 8 wetland systems crossing the southern ROW. Nine stream crossings occur over the entire 375-foot ROW as inventoried by United USGS (1998) data, including Dry Arm Brook, Clear River, Mowry Brook, Round Top Brook, the Chockalog River, and an unnamed stream. One unnamed pond was identified by USGS (1989) and this waterbody occurred in the northern portion of the 150-foot ROW. Several groundwater protection areas are located within the 375-foot ROW from digital data provided by RIDEM, Office of Water Resources. One groundwater recharge area (RIDEM 2011) and 2 non-community wellhead protection areas (RIDEM 2014) were noted. The Rhode Island Natural Heritage data (RIDEM 2016) identified two plant species identified in the northern ROW and one plant in the southern ROW. A substantial corridor of forested wetland and upland forest would need to be cleared to accommodate the 150-foot ROW. On the northern side of the ROW, approximately 13 acres of forested wetland and approximately 70 acres of upland forest would need to be cleared. If the transmission line was developed on the southern side of the ROW, approximately 13 acres of forested wetland and approximately 73 acres of upland forest would need to be cleared to accommodate the transmission line. A review of the Town of Burrillville (2014) and current Google Earth imagery indicates that approximately eight existing residences in the northern 150-foot ROW and one existing residence in the southern ROW would be affected by the development of a new ROW parallel to the existing AGT ROW including new easement from private landowners.

Thus, this alternative would result in substantially greater impacts to wetlands and forested uplands, as well as other environmental and social environmental impacts. It would also require obtaining additional easement rights along the entire length of the AGT ROW. Accordingly, this alternative was rejected because it would have a greater adverse impact on the aquatic ecosystem and other environmental receptors and because the operational constraints, added costs and project delays (forecasted for property acquisition) _rendered the alternative impracticable.

6.2.1.4 Overhead Configuration Alternatives

The Applicant considered three alternative configurations (combinations of transmission line structure types) for constructing the BIP within the existing TNEC ROW:

- Install the 3052 Line in the BIP ROW utilizing a combination of H-frame and monopole construction (the proposed BIP configuration)
- Install the 3052 Line in the BIP ROW utilizing monopole construction
- Install the 3052 Line in the BIP ROW utilizing double-circuit monopole construction

Construction Using Combination of H-Frame Structures and Monopoles (the BIP)

As proposed, the Burrillville Interconnection will use steel H-frame structures for the 3052 Line and monopole structures for the shifted 341 Line. This option was chosen as it is the most cost-effective and reliable overhead solution. Monopoles and H-frame structures are relatively comparable in terms of their allowable span lengths, and as such, both designs would utilize approximately the same number of structures along the transmission line route. Monopoles and H-frame structures are comparable in terms of their structural reliability and their electrical reliability and performance. The narrower configuration of the monopole permits the 341 Line to be shifted north in Segment 2 without having to rebuild the 347 Line which was recently constructed as part of IRP. By using the monopoles for only 1.6 miles, the Applicant is able to minimize the visual impact of these taller structures as well as to minimize the impact of the larger reinforced concrete caisson foundations required for each monopole.

Construction Using Monopole Structures

TNEC evaluated using monopole structures both for the entire length of the 3052 Line and for the shifted 347 Line. The structures in Segments 1 and 3 would be approximately 110 feet tall, approximately 22 feet taller than the proposed H-frame structures. The typical monopole structure has a single pole that is approximately 10 feet in diameter whereas the steel H-frame structure includes two poles that are each approximately 5.5 feet in diameter. Each monopole structure would require a reinforced concrete caisson foundation, which would result in greater areas of excavation and fill for the structure installations. This alternative was rejected in part because it would result in greater impacts to the aquatic ecosystem and other environmental impacts due to the larger footprint of the reinforced concrete caisson foundations configuration, visual impact from the taller structures, and because of the additional cost over the proposed BIP.

Construction Using Double-Circuit Monopole Structures

TNEC evaluated the use of double-circuit structures to carry the 3052 Line and the existing 347 Line on a single set of structures. To achieve this configuration, the 3052 Line and the existing 347 Line would be constructed on a common single-shaft steel structure and the existing parallel 347 Line would be removed from its present location. Although the use of a double-circuit structure could reduce tree removal requirements by approximately 10 to 15 feet in width along portions of the ROW, the overall environmental impacts would likely be greater than required for the BIP. Each double-circuit structure would require a reinforced concrete caisson foundation, as opposed to the H-frame structures, which would only require concrete foundations at points of line angle and dead-end locations. The additional foundations required for the double-circuit alternative would significantly increase excavation, rock removal, soil disturbance and volume of permanent fill required for installation, and would increase the potential for impacts to environmental resources. The larger and heavier steel structures required for a double-circuit transmission line, together with the need to get concrete trucks

safely along the access spur roads to each foundation location would likely increase the level of access road and work pad improvements required for the BIP, and the impacts associated with those improvements.

A design with two 345kV transmission lines supported on the same set of double-circuit structures keapordizes the reliability of both lines by posing a common mode failure that could result in the loss of both lines simultaneously.

After considering a double-circuit structure design, TNEC concluded that utilizing single-circuit H-frame and monopole structures as proposed for the BIP offered more advantages, provided greater reliability, created fewer overall impacts, and was a more cost-effective solution.

6.2.1.5 Underground Transmission Alternatives

TNEC developed and analyzed underground alternatives to compare with the proposed overhead transmission line configuration for the Burrillville Interconnection Project. Underground transmission cables, particularly long underground cables, have very different electrical characteristics than overhead transmission lines. This can lead to operational and power flow issues, and can require additional system reinforcements to address these issues. Construction techniques for underground transmission lines create different environmental impacts than overhead transmission line construction. Reliability issues associated with underground transmission lines are different from those associated with overhead transmission lines. In developing the underground alternative, TNEC assessed these differences between overhead and underground transmission lines. These system, operational and constructability issues are further described below:

The installation of an underground route would substantially increase the costs of the Project. The cost of an in roadway underground alternative is estimated at more than a four-fold increase in costs over the overhead line alternative.

In addition, the construction of an underground line will require the following equipment installed above ground at the terminal switching station: shunt reactors, circuit breakers and associated switches, multiple cable terminations, and surge arresters. The additional equipment potentially increases the environmental impact of an underground project as additional space within the switching stations will be needed to connect the underground line to the switching station.

An outage to an underground cable can result in lengthy outage repair times. When an overhead transmission line experiences an outage, it can typically be repaired within 24 to 48 hours. In the case of a failure of an underground transmission cable, repair times can be in the range of a month or more. The extended outage times for underground cables would limit the ability of CREC to generate power during this time. Extended underground outage repair times can expose the remainder of the transmission system to emergency loadings for longer periods of time. There is also increased exposure to loss of another transmission element, with possible loss of load, during the extended underground outage.

TNEC considered the following three underground route alternatives:

- BIP ROW from the CREC to the Sherman Road Switching Station (approximately 5.4 miles).
- AGT ROW from the CREC to the Sherman Road Switching Station (approximately 6.3 miles).
- Public roadways from CREC to the Sherman Road Switching Station (approximately 7.8 miles).

TNEC ROW

An underground transmission line in the TNEC ROW was rejected because it will result in substantially greater impacts to the aquatic ecosystem and other environmental impacts. The lack of ownership rights needed for an underground line and the added costs make the project impracticable. The TNEC ROW is ill-suited for an underground transmission line for a number of reasons. The ROW traverses multiple wetlands and wetland buffer zones, and crosses multiple waterbodies, including Dry Arm Brook (twice), Clear River, Mowry Brook (twice), Round Top Brook, Chockalog River, and several smaller streams. With overhead construction, it is frequently possible to span wetlands and other sensitive resource areas. This has been demonstrated on the TNEC ROW with the existing transmission lines, and is proposed for the new overhead transmission line. By contrast, with underground construction, it is necessary either to trench the entire route, or to use trenchless techniques such as horizontal directional drilling or pipe jacking. Trenchless installation techniques create additional design, construction, and economic issues, and have their own associated environmental issues. Underground transmission construction techniques have the potential to cause an increase in short and long term impacts to wetlands and other sensitive resources along the overhead ROW. A substantial permanent access road would need to be constructed along the ROW for purposes of construction and maintenance of an underground transmission line, causing permanent impacts to the ROW, and potentially affecting wetlands, stream crossings, rare species habitat, and other sensitive resources.

Existing Algonquin Gas Pipeline ROW

An underground line adjacent to the AGT ROW was rejected for similar reasons as the TNEC ROW: the environmental impacts are greater, and the lack of property rights and added costs make the alternative impracticable. The AGT ROW crosses multiple wetlands, wetland buffer zones, and water bodies. A substantial permanent access road would be required for construction and maintenance of an underground line, potentially causing permanent impacts to wetlands, rare species, and other sensitive resources.

TNEC would need to acquire additional property rights from AGT or from individual property owners along the corridor for this alternative. Obtaining new property rights would significantly increase the timeframe and cost of this routing alternative. These constraints and considerations led TNEC to dismiss the existing AGT ROW as a potential route for an underground transmission line.

Existing Public Roadways

An underground cable route constructed within existing public roadways and/or roadway shoulders was evaluated by TNEC. Assuming an in-road route, most of the environmental

impacts would be to the manmade environment, and would primarily occur during the construction of the line. These would include temporary impacts on traffic during conduit and cable installation. The majority of the installation of an underground transmission system would be performed utilizing cut and cover techniques, where the roadway is excavated, the conduit and manhole system is installed, the trench is backfilled, and roadway is repaved. For much of the route, the roadway is only two lanes wide. Lane closures with alternating traffic patterns would be required during construction. There would also be temporary noise and construction-related impacts to the homes and businesses located along the roadway route from construction equipment and vehicles. Excavation and trenching would be required along the route. Pumping and dewatering of groundwater encountered during the trenching would be required to install the underground facilities.

The underground roadway route would cross a number of streams and small rivers, where the streams are culverted or where the roadway is in a bridge over the waterways. Wetlands and waterways would be crossed by installing the cables on bridges (if available and suitable), by cut and cover over or under culverted streams, or by trenchless techniques such as Horizontal Directional Drilling. Due to the length (~7.8 miles) of an in-road underground route, the impacts on the social/built environment, lengthy timeframe for construction, reliability concerns, and higher costs, TNEC determined that an underground cable alternative was not practicable.

6.2.1.6 Alternatives Analysis Summary Conclusion

Based on the ISO-NE review and assessment of the alternatives for the BIP, the decision was made to construct a dedicated 345kV line within the use the existing TNEC ROW and the development of the CREC ROW. ISO-NE determined that this approach was the most practicable alternative considering the environmental impact, system reliability, and cost considerations. TNEC concurs with this determination. Appendix O (attached) provides a detailed analysis of the alternatives considered for the Project.

6.2.2 Compliance with Avoidance and Minimization Requirements

The 3052 Line is aligned to avoid or minimize adverse environmental impacts to the extent practicable. Approximately six miles of the 3052 Line will be constructed within TNEC ROW and co-located with the two existing 345 kV 341 and 347 Lines. This ROW has long been dedicated as an energy corridor and also has the vegetation routinely managed by TNEC to be consistent with mandatory Federal Energy Regulatory Commission (“FERC”) vegetation standards for overhead transmission lines. Additional mitigation measures will be implemented to minimize Project impacts on the natural and social environments. Mitigation measures have been designed to reduce impacts associated with each phase of Project construction. Many of these measures are standard proven procedures that TNEC incorporates into all transmission line and substation construction projects. Others are site specific measures designed to meet the needs of this particular Project. These measures are described in the following sections.

6.2.2.1 Design Phase

In order to reduce the impacts associated with the construction and operation of the transmission line facilities, the Applicant has incorporated design measures to avoid and minimize the impacts of the Burrillville Interconnection Project. These measures, which include alignment of existing and proposed structure locations, structure design and configuration,

selection of structure locations and the use of existing access roads where possible, have resulted in the avoidance and minimization of land use, wetland/water resource impacts, and soil disturbance to the greatest extent practicable. Land use impacts are minimized by locating the approximate six miles of proposed electric transmission lines within an existing managed ROW. The design and construction of the proposed electric transmission line incorporates measures which minimize impacts to wetlands and water resources and other natural features within the ROW.

To evaluate the location of the new structures, constructability field reviews of the TNEC and CREC ROWs were conducted in August 2016 with TNEC, POWER, ESS, and Gray and Pape, Inc. These reviews were conducted to assess the constructability of the Burrillville Interconnection Project and to identify options for avoiding and/or minimizing impacts from construction. The constructability field reviews resulted in recommendations regarding shifting the locations of certain structures to avoid and/or reduce impacts to wetlands, watercourses, cultural resources, rare species habitats and other physical constraints (ledge, steep topography, existing structures, etc.) that were observed in the field. Where practicable, structure locations were adjusted and custom-shaped construction pads were designed to abut, but not permanently impact, wetlands and other resources. Forestry reviews were conducted from late August into early September 2016 to review vegetation clearing for the new transmission line along both the existing TNEC ROW and the CREC ROW. Proposed tree clearing routes were analyzed by TNEC and POWER to minimize impacts to wetlands, watercourses, rare species, cultural resources, and additional physical constraints.

Construction of the 3052 Line will result in the installation of approximately 57 new structures along the 3052 Line, one new structure in the proposed Clear River Switching Station, one new structure in the Sherman Road Switching Station, 14 new structures along the 341 Line, and one new structure and 15 relocated structures along the 347 Line. The constructability field reviews included a structure-by-structure evaluation to identify practicable options to avoid or minimize impacts on wetlands, watercourses, or vernal pools, as well as avoiding impacts to cultural features such as stone walls or stone features. These modifications are summarized as follows:

3052 Line Structure Shifts:

- 4 new structure locations were shifted to avoid wetlands
- 1 new structure location was shifted to avoid a wetland and riverbank buffer
- 1 new structure location was shifted to avoid perimeter wetland
- 1 new structure location was shifted to avoid a perimeter wetland and riverbank buffer
- 1 new structure location was shifted to avoid a cultural feature
- 3 new structure locations were shifted to avoid impacts to stone walls

341 Line Structure Shifts:

- 1 new structure location was shifted to avoid perimeter wetland

347 Line Structure Shifts:

- 2 structure locations were shifted to avoid wetlands

In all, a dozen structure locations were shifted to avoid impacts to wetlands, watercourses or vernal pools, as well as to avoid cultural features. Where possible, work pads and pull pads were reconfigured to avoid or minimize impacts to wetlands and watercourses. At these locations work areas were reduced in size or were shifted to avoid wetland and watercourse impacts.

The Applicant sought a BIP alignment that will maximize the use of upland areas that do not contain sensitive environmental features for structure locations, construction pads and access roads. Further, construction BMPs will be implemented during and following construction to minimize impacts associated with the BIP, and a compensatory wetland mitigation plan is being developed to address federal mitigation requirements.

The following sections detail the various measures implemented during the construction phase of the BIP to reduce impacts to the natural and social environment.

6.2.2.2 Construction Phase

The Applicant will implement several measures during construction, which will minimize impacts to the environment. These include the use of existing access roads and work pad locations where possible, installation of soil erosion and sediment controls, supervision and inspection of construction activities within resource areas by an environmental monitor and working within defined limits of disturbance. The following section details various mitigation measures which will be implemented to minimize construction-related impacts.

Best management practices, as detailed in Appendix L (ROW Access, Maintenance, and Construction BMPs), will be employed to minimize disturbances to wetlands during construction of the Project. The boundaries of the wetlands and watercourses along the ROW will be clearly demarcated by a qualified wetland scientist prior to the commencement of work. When working in or traversing such wetlands, the Applicant will:

- Install, inspect, and maintain soil erosion and sediment controls and other applicable construction BMPs.
- Limit grading for access roads and structure foundations in wetlands to the amount necessary to provide a safe workspace.
- Install temporary swamp matting or geotextile and stone pads for access roads across wetlands or to establish safe and stable construction work areas/ pads within wetlands, where necessary. The type of stabilization measures to be used in wetlands will depend on soil saturation and depth of organic matter.
- Restore wetlands, after transmission facility construction, to pre-construction configurations and contours to the extent practicable.
- Comply with the conditions of federal and state permit conditions related to wetlands.

- Pile cut woody wetland vegetation so as to avoid blocking surface water flows within or otherwise to adversely affect the integrity of the wetland.
- Cut forested wetland vegetation without removing stumps unless it is determined that intact stumps pose a safety concern for the installation of structures, movement of equipment, or the safety of personnel.
- Avoid or minimize access through wetlands to the extent practical. Where access roads must be improved or developed, the roads will be designed, where practical, so as not to interfere with surface water flow or the functions of the wetland.
- Install temporary soil erosion controls around work sites in or near wetlands to minimize the potential for soil erosion and sedimentation.
- Refuel construction equipment (apart from equipment that cannot practically be moved) 100 feet or more from a wetland. If refueling must occur within a wetland, secondary containment will be used.
- Store petroleum products at least 100 feet from a wetland.
- Restore structure work sites in and temporary access ways through wetlands following the completion of line installation activities.
- The Applicant will implement the following measures to minimize the potential impacts of construction activities in or near watercourses:
    - Maintain ambient water flows (if water is present at the time of construction) and not constrain or interrupt the flow at any time during construction.
    - Minimize the installation of new culverts at currently day-lighted stream reaches to the greatest extent feasible.
    - Maintain existing riparian zone vegetation, to the extent feasible, along the banks of the watercourse.
    - Install controls to prevent or minimize turbidity and sediment loading into watercourses. These controls may include the use of crushed stone approach aprons onto mat bridges, stone check dams, water bars, diversion channels, soil erosion controls, turbidity curtains and floating booms.
    - Stream fords will be installed during low flow periods. Clean, washed stone will be used at stream ford crossings.
    - Install mat bridges or other bridging techniques to span watercourses, or use other stream crossing techniques, such as temporary or permanent culvert crossings. Avoid installing temporary bridging during peak flows, or when the waterway to be crossed is above bank-full width conditions; with the exception of emergency situations or other unforeseen circumstances.

- The specific measures that will be implemented to protect amphibians will be in accordance with National Grid's Environmental Guidance (EG-303) and further defined in consultation with the applicable regulatory agencies.

Construction Sequencing

The new 345 kV 3052 Line and the reconfigured section of the 341 Line will be installed using conventional overhead electric transmission line construction techniques. Detailed constructability field reviews were conducted in the field by TNEC, its consultants, and a construction contractor, to assess structure spotting, determine access and work space requirements, and evaluate measures to avoid or minimize environmental impacts.

The transmission line will be constructed in a progression of activities that will normally proceed as described below. The typical construction equipment required for these activities is described in Table 6-3.

Table 6-3: Typical Construction Equipment

Construction Phase	Typical Equipment Required	
Vegetation Removal and ROW Mowing	• Grapple trucks • Track-mounted mowers • Chippers • Log forwarders • Brush hogs, skidders • Bucket trucks	• Motorized tree shears • Chain saws • Box trailers • Low-bed trailers, flatbed trucks • Bulldozers, excavators • Pickup trucks
Soil Erosion/Sediment Controls	• Stake body trucks • Pickup and other small trucks	• Small excavators • Trencher
Access Roads Improvement and Maintenance	• Dump trucks • Bulldozers • Excavators • Backhoes • Front end loaders • Graders	• 10-wheel trucks with grapples • Cranes • Pick-up trucks • Low-bed trailers • Stake body trucks
Removal and Disposal of Existing Transmission Line Components	• Cranes • Flatbed trucks • Pullers with take-up reels • Excavators • Vacuum trucks	• Backhoes • Trucks with welding equipment • Dump truck • Storage containers
Installation of Foundations and Structures	• Backhoes • Bulldozers • Front-end loaders • ATVs • Tracked carriers or skidders • Concrete trucks • Excavators • Rock drills mounted on excavators or tracked equipment • Cranes	• Cluster drills with truck mounted compressors • Aerial lift equipment • Tractor trailers • Bucket trucks • Large-bore foundation drill rigs • Hand-held equipment such as shovels, pumps, and vibratory tampers • Dump trucks • Generators, air compressors
Conductor and Shield Wire Installation	• Bucket trucks • Puller-tensioners • Conductor reel stands	• Cranes • Flatbed trucks • Pickup trucks • Tracked carriers or skidders

Construction Phase	Typical Equipment Required	
Restoration of the ROW	• Pickup and other small trucks • Excavators • Backhoes • Bulldozers	• Dump trucks • Tractor-mounted York rakes • Straw blowers • Hydro-seeders

Removal of Vegetation and ROW Mowing in Advance of Construction

Construction of the new 345 kV 3052 Line will require tree clearing and vegetation removal to open up a corridor for the proposed overhead electric transmission line. The 250-foot wide ROW along the CREC ROW will be cleared to a width of approximately 150 feet. The existing TNEC ROW from its intersection with the 0.8 mile ROW to 0.19 mile west of the Clear River will be cleared an additional 55 +/- feet on the north side of the existing ROW. From the Clear River to the Sherman Road Switching Station the existing TNEC ROW will be cleared an additional 85 +/- feet on the south side of the existing ROW. These tree clearing and vegetation removal activities will occur in those areas necessary to provide safe vehicular access to existing and proposed structure locations, to facilitate safe equipment passage, to provide safe work sites for personnel within the ROWs, and to maintain safe clearances between vegetation and transmission line conductors for reliable operation of the transmission facilities. In the future, the vegetation on the ROWs will be managed in accordance with TNEC's *Right-of-Way Vegetation Management Plan* (see Appendix B, Vegetation Management Plan) and subsequent updates.

Prior to vegetation removal and mowing, the boundaries of wetlands will be clearly marked to prevent unauthorized equipment encroachment into wetland areas. Appropriate forestry techniques will be implemented within wetlands to minimize ground disturbance. Other sensitive resources, such as rare species habitats and cultural resource features will be flagged and encompassed with protective fencing prior to removal of vegetation on the ROW. Existing access routes along the ROWs will be used by the tree removal personnel and equipment to the extent practicable, and road improvements will be kept to a minimum during this phase of the work. The use of temporary swamp mats will be required to gain access to and across forested wetlands, to minimize wetland disturbance, and to provide a stable platform for safe equipment operation. Swamp mats consist of timbers that are bolted together and placed over wetland areas to distribute equipment loads and minimize impacts to the wetland and soil substrates (refer to TNEC's *ROW Access, Maintenance and Construction Best Management Practices (EG-303)* in Appendix L. Temporary swamp mat roads placed in wetlands for vegetation removal will be placed, used for vegetation removal, and then removed by the clearing contractor. Temporary corduroy (log) roads may be used on a limited basis to facilitate tree removal.

Tree removal operations, where required, will include the removal of all tall growing woody species within the targeted portions of the ROWs. Tall growing trees just outside the maintained ROWs edges will be assessed for their potential to damage the transmission lines. To ensure reliability, these "danger trees" may have to be pruned or removed.

Generally, trees that are removed will be cut close to the ground, leaving the stumps and roots in place. This has the benefit of reducing soil disturbance and erosion. In locations where

grading is required for access road improvements or at structure sites, stumps will be removed. Small trees and shrubs within the ROWs will be mowed as necessary with the intent of preserving roots and low-growing vegetation to the extent practical. Brush, limbs, and cleared trees will be chipped and removed from the site, or applied to upland areas as an erosion control measure, with prior approval. Temporary "landing areas" will be established along the ROW to serve as locations to load timber, temporarily stage a wood chipper, and to park tree clearing vehicles and equipment.

In certain environmentally sensitive areas such as wetlands, it may be necessary and desirable to leave felled trees and snags and allow them to decompose in place rather than to disturb soft organic substrates. Where the ROWs cross streams and brooks, vegetation along the stream bank will be selectively cut to minimize the disturbance of bank soils and the potential for project related soil erosion. A minimum of a 25-foot wide riparian zone will be maintained along watercourses, to the extent feasible.

Installation of Soil Erosion and Sediment Controls

Following tree clearing and vegetation removal activities, proper soil erosion and sediment control devices, such as straw wattles/bales, siltation fencing, and/or chip bales will be installed in accordance with approved plans and permit requirements. The soil erosion and sediment control program for the Project will follow the procedures identified in the *Rhode Island Soil Erosion and Sediment Control Handbook*, the *Rhode Island Stormwater Design and Installation Standards Manual*, the *Rhode Island Department of Environmental Management (RIDEM) Wetland BMP Manual: Techniques for Avoidance and Mitigation*, and TNEC's *ROW Access, Maintenance and Construction Best Management Practices (EG-303)*.

The installation of these sediment control devices will be supervised by TNEC's environmental monitor. During construction, these devices will be periodically inspected and monitored by the environmental monitor, and the environmental monitor's findings will be reported regularly to TNEC's Construction Supervisor. The soil erosion and sediment controls will be installed between the work area and environmentally sensitive areas such as wetlands, streams, drainage courses, roads and adjacent property when work activities will disturb soils and result in a potential for soil erosion and sedimentation. The devices will function to mitigate construction-related soil erosion and sedimentation, and will serve as a physical boundary to delineate resource areas and to contain construction activities within approved areas.

Where dewatering is necessary during excavations for structures within or adjacent to wetland areas, water will be pumped into appropriate dewatering basins. At all times, dewatering will be performed in compliance with TNEC's *ROW Access, Maintenance and Construction Best Management Practices (EG-303)*. The basin and all accumulated sediment will be removed following dewatering operations and the area will be seeded and mulched. Soil erosion and sediment controls will be used to contain excess soils, prior to removal of the excess soils from the work sites.

Staging areas and equipment storage, where feasible, will be situated outside of watershed protection areas, 50-foot perimeter wetlands, and other environmentally sensitive areas. Equipment refueling (except for fixed equipment such as drill rigs) will occur outside of environmentally sensitive areas (such as waterways, wetlands, and drinking water sources).

Where structures requiring concrete foundations are located in or near wetlands, proper soil erosion and sediment controls will be installed to prevent impacts to these areas.

Swamp mats, soil erosion and sediment controls, and other measures will be implemented, as appropriate, in accordance with BMPs, in resource areas temporarily disturbed by construction. Herbaceous vegetation in disturbed areas will be restored using a native wetland or conservation seed mix. In areas of tree removal, enhancements are proposed as mitigation for important wildlife features lost as a result of tree removal and construction activities. Potential enhancement activities may include: seeding, planting native shrub species, leaving snags and placing woody debris and slash or stone piles to create wildlife cover.

Construction of Access Roads, Access Road Improvement, Work Pads, and Road Maintenance

Access roads are required along the ROWs to provide the ability to construct, inspect and maintain the existing and proposed transmission line facilities. For the Project, new access roads will be built for the CREC ROW to support the proposed construction activities. Along the TNEC ROW, the existing access roads will require some improvements, as it may be necessary to improve existing access roads in certain locations within the ROW to facilitate new construction. For example, clean gravel or trap rock may be necessary to stabilize and level the roads for construction vehicles; and stabilized construction entrances may need to be refreshed where the ROW crosses public roadways. New access road spurs will be constructed to access the proposed transmission line structures.

The proposed access road in the new 0.8 mile CREC ROW crosses two streams and several of the existing access roads located within TNEC's existing ROW cross and intersect streams. These stream crossings will be evaluated in order to determine if the crossings require the installation or replacement of culverts. Otherwise, temporary timber mat bridges will be installed to span over watercourses to allow for unimpeded flow.

Access across wetlands and streams, where upland access is not available, will be accomplished by the placement of temporary swamp mats. Such temporary swamp mat access roads will be removed following completion of construction and areas will be restored to re-establish pre-existing topography and hydrology. Swamp mats or similar matting may also be used to cross land in active agricultural use or in other environmentally sensitive areas.

Any access road improvements and/or maintenance will be carried out in compliance with the conditions and approvals of the appropriate federal and state regulatory agencies. Exposed soils on access roads will be wetted and stabilized as necessary to suppress dust generation during construction. Crushed stone aprons/tracking pads will be used at all access road entrances to public roadways to clean the tires of construction vehicles and minimize the migration of soils off-site.

Upland work pads will be constructed at structure locations by grading or adding gravel or crushed stone to provide a level work surface for construction equipment and crews. Once construction is complete, the work pads in uplands will remain in place, and will be stabilized with topsoil and mulched to allow vegetation to re-establish. In wetlands, these work pads will

be constructed with temporary swamp mats and will be removed after the completion of construction activities.

Typical access roads are 20 feet wide with a travel lane of approximately 16 feet wide to accommodate the vehicles and equipment needed to construct the new 345 kV transmission line facilities. TNEC is planning to use the existing network of access roads to the greatest extent practicable. New access roads will be located to avoid or minimize disturbance to water resources, to follow the existing contours of the land as closely as possible, and where practicable, avoid severe slopes. In addition, access roads will be constructed to avoid significantly altering existing drainage patterns. New access roads will be established over native soils if practicable; unstable soils may be removed and replaced with imported clean fill material.

Removal and Disposal of Existing Transmission Line Components

In order to accommodate the construction of the 3052 Line, TNEC will remove and replace approximately 14 existing wooden transmission line structures which previously supported the 347 Line between 0.19 mile west of the Clear River and the new 0.8 mile CREC ROW connecting to the Clear River Energy Center.

TNEC proposes to recycle as much of the removed material as possible. Those components not salvaged and any debris that cannot be recycled will be removed from the ROWs to an approved off-site Facility. Handling of such materials will be performed in compliance with applicable laws and regulations and in accordance with TNEC's policy and procedures.

Installation of Foundations and Structures

The proposed transmission line structures include a combination of structure types (see Figure 1-4, Typical Structure Types) including direct embedment tubular steel H-frame structures and monopole tubular steel structures. A majority of the H-frame structures do not require reinforced concrete foundations. Excavation for direct embedment structures will be performed using a soil auger or standard excavation equipment depending on field conditions. Excavations will range from approximately 10 to 20 feet in depth, with diameters typically between 3 and 5 feet. A steel casing will be placed vertically into the hole and backfilled. The poles will be field assembled and inserted by cranes into the embedded steel casings. The annular space between the pole and the steel casing will then be backfilled with crushed stone.

The monopole structures and some of the H-frame structures will require drilled concrete caisson foundations, typically 15 to 30 feet deep, with diameters of between 6 and 10 feet. These structures may include H-frames, 3-pole structures and monopoles (proposed structure configurations are depicted in Figure 1-4). Caissons will be constructed by drilling a vertical shaft, installing a steel reinforcing cage, placing steel anchor bolts, pouring concrete, and backfilling as needed. Monopole, dead-end and angle structures will be lifted by a crane and placed onto the anchor bolts.

Excavated material will be temporarily stockpiled next to the excavation; however this material will not be placed directly into resource areas. If the stockpile is in close proximity to wetlands, the excavated material will be enclosed by staked straw bales or other sediment controls. Additional controls, such as watertight mud boxes, will be used for saturated stockpile

management in work areas in wetlands (i.e., swamp mat platforms) where sediment-laden runoff would pose an issue for the surrounding wetland. Following the backfilling operations, excess soil will be spread over unregulated upland areas or removed from the site in accordance with TNEC's policies and procedures. Dewatering may be necessary during excavations or pouring concrete for foundations. At all times, dewatering will be performed in compliance with TNEC's *ROW Access, Maintenance and Construction Best Management Practices (EG-303)*. Handling and management of wetland soils will be performed in accordance with a wetland soils management plan to be prepared by the contractor and accepted by TNEC.

Rock that is encountered during foundation excavation will generally be removed by means of drilling with rock coring augers rather than a standard soil auger. This method allows the same drill rig to be used and maintains a constant diameter hole. However, in some cases, rock hammering and excavation may be used to break up the rock.

Installation of Conductor, OPGW and Shield Wire

Following the construction of transmission line structures, insulators will be installed on the structures. The insulators isolate the energized power conductors from the structure. Optical ground wire ("OPGW"), shield wire, and power conductors will then be installed using stringing blocks and wire stringing equipment. The wire stringing equipment is used to pull the conductors from a wire reel on the ground through stringing blocks attached to the structure to achieve the desired sag and tension condition. During the stringing operation, temporary guard structures or boom trucks will be placed at road and highway crossings and at crossings of existing utility lines. These guard structures are used to ensure public safety and uninterrupted operation of other utility equipment by keeping the wire away from other utility wires and clear of the traveled way at these crossing locations.

Construction of temporary wire stringing and pulling sites will be required and will involve some grading and import of gravel to provide a level work space for equipment and personnel, or to establish remote wire stringing set-up sites at angle points in the transmission line and at dead-end structures.

In instances where there is an expansive wetland, large watercourse, open water body or otherwise sensitive environmental resource, alternate means will be assessed for stringing the lead ropes and wire to avoid and/or minimize crossing of these water resources. Alternative means for stringing wire/conductor could include the following:

- Placing the wire pulling ropes during the initial tree clearing and vegetation removal phase of the BIP;
- Crossing with a one-time installation of swamp mats/mat bridge in conjunction with the use of low-pressure equipment; and
- Implementing methods for casting the lead rope/wire to pull the conductor over the resource that is to be avoided.

Helicopters may be used for line stringing or other activities. The final decision regarding helicopter use for any BIP activity will be made during the construction phase when more detailed information is known and in consultation with the selected contractor.

Environmental Training and Monitoring

Throughout the entire construction process, TNEC will retain the services of an environmental monitor. The primary responsibility of the monitor will be to oversee construction activities including the installation and maintenance of soil erosion and sediment controls on a routine basis to ensure compliance with all federal, state, and local permit commitments. The environmental monitor will be a trained environmental scientist responsible for supervising construction activities relative to environmental issues. The environmental monitor will be experienced in soil erosion control techniques described in this report and will have an understanding of wetland resources to be protected.

During periods of prolonged precipitation, the monitor will inspect all locations to confirm that the environmental controls are functioning properly. In addition to retaining the services of an environmental monitor, TNEC will require the contractor to designate an individual to be responsible for the daily inspection and upkeep of environmental controls. This person will also be responsible for providing direction to the other members of the construction crew regarding matters of wetland access and appropriate work methods. Additionally, all construction personnel will be briefed on project environmental compliance issues and obligations prior to the start of construction. Regular construction progress/environmental training meetings will provide the opportunity to reinforce the Contractor's awareness of these environmental issues.

6.2.2.3 Post-Construction Phase

Restoration of Temporary Impacts

Restoration efforts, including removal of construction debris, final grading, stabilization of disturbed soil, and installation of permanent sediment control devices (water bar/diversion channel/rock ford), will be completed following construction. All disturbed areas around structures and other graded locations will be seeded with an appropriate conservation seed mixture and/or mulched to stabilize the soils in accordance with applicable regulations. Temporary sediment control devices will be removed following the stabilization of disturbed areas. Existing walls and fences will be restored. Where authorized by property owners, permanent gates and access road blocks will be installed at key locations to restrict access onto the ROWs by unauthorized persons or vehicles. Regulated environmental resource areas that are temporarily disturbed by construction will be restored in accordance with applicable permit conditions to pre-construction conditions.

ROW Vegetation Management

Once the proposed transmission lines are energized and operational, vegetation along the ROWs will continue to be managed: 1) to provide clearance between vegetation and electrical conductors and supporting structures so that safe, reliable delivery of power to consumers is assured; and 2) to provide access for necessary inspection, repair, and maintenance of the facilities. All vegetation maintenance is carried out in strict compliance with TNEC's Right-of-Way Vegetation Management Plan (Appendix B).

Vegetation maintenance of the ROWs under and adjacent to the new transmission line will be accomplished with methods currently used in maintaining vegetation along the existing ROWs. These methods include hand and mechanical cutting and selective application of herbicides. Herbicides are applied by licensed applicators to select target species and are not applied in areas of standing water or within designated protective buffer areas associated with wells, surface waters, and agricultural areas. TNEC currently utilizes a four to five-year vegetation maintenance cycle on its transmission ROWs.

TNEC's vegetation removal and maintenance methods, as described in the management plan noted above, encourage the growth of low-growing shrubs, ferns, wildflowers and grasses, thus helping to stabilize the cleared areas against soil erosion and providing some degree of natural control of tall-growing vegetation. The vegetation management practices implemented by TNEC promote a diversity of low growth scrub-shrub and herbaceous habitats that are utilized by a variety of native wildlife species.

7.0 PROPOSED PROJECT MITIGATION PLAN

The current proposed footprint of the CREC Facility and Burrillville Interconnection Project have been designed and sited to avoid and minimize impacts to wetland resources to the extent practicable. It is anticipated that additional opportunities to further reduce project-related wetland impacts will arise as the project design advances. Despite these measures, some project activities will be located within wetlands and result in permanent, temporary and secondary impacts to state and federally-regulated wetlands. Federal jurisdiction is pursuant to Waters of the United States (i.e., those regulated under Sections 401 and 404 of the Federal Clean Water Act ("CWA") – 33 U.S.C. § 1341 and 33 U.S.C. § 1344). In addition to the CWA, the project is subject to Rhode Island Fresh Water Wetlands Act Rules and Regulations.

7.1 Wetlands and Watercourses

Throughout the planning and design process for the CREC and Burrillville Interconnection Project, where practicable wetland impacts have been minimized by siting the Facility outside of wetland areas, aligning the new transmission line primarily along the existing TNEC ROW, utilizing existing access and woods roads, and avoiding the placement and construction of structures and access roads in wetlands and watercourses to the maximum extent practicable. However, given the scale and landscape setting of the Project, certain wetland and watercourse resource impacts associated with the development of the CREC and Burrillville Interconnection Project cannot be avoided. In order to offset environmental impacts, appropriate compensatory mitigation (in collaborative consultation with local, state, and federal agencies) will be provided, as a component of the final project.

Because certain structures will unavoidably have to be located in wetlands, the CREC and Burrillville Interconnection Project will result in a permanent wetland loss. Compensatory wetland mitigation options for the CREC and Burrillville Interconnection Project may include wetland restoration and/or enhancement, wetlands preservation, and/or placement of conservation restrictions to preserve open spaces. Installation of a single transmission line structure within floodplain is anticipated to have *de minimis* impact on flood storage capacity and not result in an increase in flood stages in a meaningful way. The removal of existing structures and replacement with new structures is not expected to result in any significant displacement of flood waters. If the impact within the floodplains is substantial in comparison to the extent of the floodplains, compensatory flood storage volume will be designed to mitigate permanent impacts on 100-year floodplains. An analysis to determine the 100-year Base Flood

Elevation ("BFE") for streams potentially impacted by the CREC was conducted. Results of this analysis found that construction of the access road will result in the displacement of approximately 742 cubic yards of flood storage volume within the intermittent tributary to Iron Mine Brook. To avoid adverse impacts, the project includes the creation of an equally sized compensatory flood storage area adjacent to the access road crossing. The area will be regraded and restored to a forested condition (see Section 6.1.2).

Compensatory mitigation of unavoidable direct, indirect and secondary impacts will be required to satisfy regulatory requirements. According to USACE regulations, the fundamental objective of compensatory mitigation is to offset environmental losses resulting from unavoidable impacts to waters of the United States (33 CFR 332.3(a)). The criteria for compensatory mitigation are set forth in the USACE's mitigation regulations, the EPA's companion CWA regulations (40 CFR 230) and in the USACE's New England District ("NED") Compensatory Mitigation Guidance (September 2016). Both the USACE and the EPA have established a national goal of no overall loss of wetland functions, as detailed in the agencies' 1990 Memorandum of Understanding and respective mitigation regulations (33 CFR Parts 325 and 332; 40 CFR 230)). The NED Compensatory Mitigation Guidance incorporates these mitigation requirements, as well as those contained in the USACE's Regulatory Guidance Letter No. 08-03: Minimum Monitoring Requirements for Compensatory Mitigation Projects Involving Restoration, Establishment, and/or Enhancement of Aquatic Resources (October 10, 2008). While compensatory mitigation guidance is not included in the RI Fresh Water Wetlands Act Rules and Regulations, it is typically a component of formal applications following similar general goals and objectives

The Final Compensatory Mitigation Rule (33 CFR 332) establishes a preference hierarchy for mitigation options in order to reduce risk and uncertainty and help ensure that the required compensation is provided. The most preferred options are mitigation banks and in-lieu fee program credits. Permittee-responsible mitigation is the third and only option available in Rhode Island, with three possible circumstances (in order of preference): (1) conducted under a watershed approach, (2) on-site and in-kind, and (3) off-site/out-of-kind.

According to the 2016 NED Compensatory Mitigation Guidance, compensatory mitigation sites should be located to provide the desired water resource functions, taking into consideration factors such as watershed location, aquatic habitat diversity, connectivity, and, for wetlands and streams, a balance of wetlands and uplands. Wetland mitigation can include 1) the restoration or reestablishment of a former wetland, 2) the creation or establishment of a new wetland, 3) the enhancement or rehabilitation of a degraded wetland or 4) land preservation. The Final Compensatory Mitigation Rule (33 CFR 332) states, in part the following: Preservation may be used to provide compensatory mitigation when the resources to be preserved provide important physical, chemical, or biological functions for the watershed; contribute significantly to the ecological sustainability of the watershed; resources are under threat of destruction or adverse modifications; and when the preserved site will be permanently protected through an appropriate real estate or other legal instrument (e.g., easement, title transfer to state resource agency or land trust). Typically, where preservation is used to provide compensatory mitigation, it is done in conjunction with other forms of mitigation.

In providing compensatory mitigation, the CREC and Burrillville Interconnection Project's overall goal is to provide no net loss of existing wetland functional values and statutory interests within the affected watersheds through the preservation, restoration, enhancement, and/or creation of wetlands. As

detailed in the Compensatory Mitigation Guidance, the NED has developed standard compensatory mitigation ratios to provide a framework for all compensatory mitigation. The compensation ratios focus on direct permanent impacts, with additional mitigation required to address temporary fill impacts and secondary impacts, such as conversion of forested wetlands to scrub-shrub or emergent wetlands. While these ratios are the starting point for developing appropriate compensatory mitigation, there is flexibility on a project-by-project basis in order to achieve the most appropriate mitigation for a specific project. Tables 7-1 and 7-2 reproduce the 2016 NED guidance regarding compensatory mitigation ratios for permanent and temporary / secondary impacts, respectively.

Table 7-1: USACE NED Recommended Compensatory Mitigation Multipliers for Direct Permanent Impacts[1]

(Table C1 in the NED Compensatory Mitigation Guidance 2016)

Mitigation/ Impacts	Restoration[2] (reestablishment)	Creation (establishment)	Rehabilitation[3]	Preservation (protection/ management)
PEM	2	3	5 if hydrology 10 if vegetation 10:12	20
PSS	2	3	5 if hydrology 10 if vegetation 10:12	20
PFO	3	4	5 if hydrology 10 if vegetation 10:12	20
Upland[4]	≥10[5]	N/A	project specific	156

[1] Includes nontidal and tidal wetlands
[2] Assumes no irreversible change has occurred to the hydrology. If there has been such a change, then the corresponding creation ratio should be used.
[3] If hydrology is restored to its natural range (will generally include restoration of natural vegetation community); 10 if only the natural vegetation community is restored (hydrology is already within an acceptable range)
[4] This is when upland is used for wetland mitigation, NOT mitigation for upland impacts, which are not regulated.
[5] Only applies if existing condition is pavement or structure AND should complement aquatic functions.
[6] 100' upland buffer recommended for restoration, creation, and enhancement sites would be credited here.

Table 7-2: Recommended Compensatory Mitigation for Temporary and/or Secondary Impacts

(Excerpted from Table C2 in the NED Compensatory Mitigation Guidance 2016)

Impact	% Of Standard[1] Amount[2]
Temporary fill (e.g., swamp mats, fill over membrane) in forested wetlands; area to revegetate to forest.	15%
Temporary fill in emergent wetlands; area to revert to previous condition.	5%
Temporary fill in scrub-shrub wetlands; area to revert to previous condition.	10%
Permanent conversion of forested wetlands to emergent wetlands (with or without temporary fill)	30%

Impact	% Of Standard[1] Amount[2]
Permanent conversion of forested wetlands to scrub-shrub wetlands (with or without temporary fill)	15%
Permanent conversion of scrub-shrub to emergent	15%
Removal of forested wetland cover for new corridor.	Project specific[3]

[1]Standard" refers to amount of compensation that would be recommended under either the Corps' mitigation ratios for permanent fill (TABLE 1) or that required in in-lieu fee payments using the standard calculation.
[2]Percentages may be reduced if appropriate project-specific BMPs are incorporated into the project.
[3] This should also take into account fragmentation impacts as part of the secondary impacts.
[4]Total impact zone (feet): emergent -75, scrub-shrub – 100, forested 150
High level impact zone (feet): emergent -25, scrub-shrub – 50, forested 50

As the project design advances, the Applicant will develop a Compensatory Wetland Mitigation Plan following the NED Compensatory Mitigation Guidance in cooperation with resource agencies. The plan is anticipated to include a description of project impacts, objectives, mitigation site selection procedures, site protection information, and monitoring standards in addition to all required graphics and information. At this time, it is anticipated that the final mitigation package will primarily consist of land preservation and possibly some restoration should a viable project be identified. The total anticipated mitigation obligation in the form of preservation and restoration is summarized in Table 7-3.

The Applicant has generated an inventory of potential mitigation sites within Burrillville based primarily on a list of properties of interest to DEM for open space protection at the time of the Interstate Reliability Project. This list was refined to exclude parcels already acquired or otherwise no longer suitable and add other parcels of potential conservation interest based on a combination of desktop analysis and field reviews. This analysis considered proximity to existing conservation lands, Natural Heritage areas, wildlife corridors and unfragmented forest among others. This inventory identified over 30 parcels which will be refined based on property owner outreach and input from relevant resource agencies.

While there are no known on-site wetland restoration opportunities within the project limits, the Applicant is willing to design and construct vernal pools in biological and/or perimeter wetlands within portions of otherwise undisturbed forested habitat. Given the relative paucity of this habitat type within the CREC along with avoidable impacts to existing mad-made pools serving this function, additional vernal pools would enhance the overall wildlife habitat function. Should resource agencies agree, the Application will develop design details for agency consideration as the overall mitigation plan is refined.

Table 7-3: Anticipated Mitigation Obligation in the Form of Restoration or Preservation for the Project

	Project Impact (sq ft)	Compensatory Mitigation Multipliers			Mitigation Obligation (sq ft)	
		Restoration	Preservation	% of Standard Amount	Restoration	Preservation
Direct Permanent Impacts						
PEM	885	2	20	-	1,770	17,700
PSS	391	2	20	-	782	7,820
PFO	28,263	3	20	-	84,789	565,260
Temporary/Secondary Impacts						
Temporary fill in PFO (will revert to PFO)	148,854	0.45	3	15	66,984	446,562
Temporary fill in PEM (will revert to PEM)	42,768	0.1	1	5	16,958	169,582
Temporary fill in PSS (will revert to PSS)	169,582	0.2	2	10	33,916.40	339,164
Permanent conversion of PFO to PEM	-	0.9	6	30	-	-
Permanent conversion of PFO to PSS	154,487	0.45	3	15	69,519	463,461
Permanent conversion of PSS to PEM	-	0.3	3	15	-	-
Removal of PFO for new corridor	-				-	-
Edge effect - high level impact zone - PEM (25')	8,953	0.5	5	25	4,477	44,765
Edge effect - high level impact zone - PSS (50')	26,831	0.5	5	25	13,416	134,155
Edge effect - high level impact zone - PFO (50')	240,973	0.75	5	25	180,730	1,204,865
Edge effect - remainder of impact zone - PEM (50')	6,805	0.2	2	10	1,361	13,610
Edge effect - remainder of impact zone - PSS (50')	59,557	0.2	2	10	11,911	119,114
Edge effect - remainder of impact zone - PFO (100')	1,098,622	0.3	2	10	329,587	2,197,244
				Total PEM	24,566	245,657
				Total PSS	60,025	600,253
				Total PFO	731,609	4,877,392
				Grand Total	816,200	5,723,302
				Grand Total (ac)	18.7	131.4

7.1.1 Surface Water and Groundwater Resources

For work at the CREC and Burrillville Interconnection Project, the Applicant will require their contractors to adhere to BMPs regarding the storage and handling of oil and potentially hazardous materials during construction of the projects. Further, the Applicant will require their contractors to adhere to a standard emergency response plan or a project-specific spill prevention, containment, response, and reporting plan. Equipment refueling and equipment/material storage will not be permitted within 100 feet of any wetland or waterbody, with the exception of equipment that cannot be feasibly moved from its working location (e.g., drilling equipment, dewatering pumps). Secondary containment will be used at these refueling locations. Contractor staging areas and contractor yards typically will be located at existing developed areas (parking lots, existing yards), where the storage of construction materials and equipment, including fuels and lubricants, will not conflict with protection of public surface water supplies or wetland resources.

Dewatering will be necessary during excavations for pole structures adjacent to or within wetland areas. Dewatering discharge water will be pumped into a straw bale or silt fence settling basin which will be located in approved areas outside wetland resource areas. Other dewatering options will include pumping into a temporary storage tank. The pump intake hose will be suspended above the bottom of the excavation throughout dewatering. The basin and all accumulated sediment will be removed following dewatering operations and the area will be seeded and mulched. Additionally, mud boxes will be used to temporarily store drilling muds (used during drilling operations for installing structures) until the drilling muds can be transported to an approved disposal location or spread in an approved upland area.

7.1.2 Rare, Threatened, and Endangered Species

The following state-listed rare plant species have been identified on or within the immediate vicinity of the TNEC ROW: rock harlequin, American yew, northern beech fern, and hobblebush. In general, rock harlequins are adapted to the existing site conditions promoted by the on-going vegetation management practices implemented along the ROWs; in some cases, they have shown an affinity to disturbed areas, such as those found along the regularly maintained ROW. Periodic disturbances to the vegetative community associated with management and maintenance of the ROW can create early successional habitats that could promote the further establishment of rock harlequin on the ROWs. Tree clearing could have an impact on some state-listed plant species such as northern beech fern and hobblebush, plants which grow in the forest understory. Opening the tree canopy may affect the current populations of northern beech fern and hobblebush.

As a mitigation measure, the Applicant will conduct pre-construction reconnaissance sweeps/surveys to locate any populations of these plant species within the ROWs. Any identified plant locations will be marked for avoidance during construction. In consultation with the RIDEM and RINHS, the Applicant will determine if any other mitigative measures are recommended for rare plant communities, such as transplanting the affected plants to a protected location outside of the construction area.

Within the CREC site, only the black-throated blue warbler was incidentally identified by a biologist during routine field surveys, and NLEB were identified in a USFWS IPaC report. While results of the survey within the CREC Facility Site and ROW found that the species was not present, the Applicant is proposing to adhere to the time of year restrictions to avoid tree clearing during the June-July

timeframe to avoid potential impacts to maternity roost trees. Tree clearing will be limited to outside the NLEB nesting season which is June-July.

7.1.3 Soil Erosion and Sediment Control

Soil erosion and sediment control devices will be installed along the perimeter of identified wetland resource areas prior to the onset of soil disturbance activities to ensure that excess soil piles and other impacted soil areas are confined and do not result in downslope sedimentation of sensitive areas. Woody species with a mature height greater than 10 feet will be cleared within specified portions of the ROW. Low growing tree species, shrubs, and grasses will only be mowed along access roads and at pole locations. To avoid disturbing the root mat, tree stumps will be left in place except at structure locations and within the footprint of proposed access roads or construction work pads. Soil erosion controls will be inspected on a regular basis and maintained or replaced as necessary.

The soil erosion and sediment control measures selected will be appropriate to minimize the potential for soil erosion and sedimentation in areas where soils are impacted. The Applicant will adhere to EG-303, and will prepare a project-specific Stormwater/ Soil Erosion and Sediment Control Plan, in compliance with the Rhode Island Soil Erosion and Sediment Control Handbook, the Rhode Island Stormwater Design and Installation Standards Manual, and the Wetland BMP Manual: Techniques for Avoidance and Mitigation. Typically, temporary soil erosion controls will be installed based on the specifications in the Stormwater/ Soil Erosion and Sediment Control Plan.

8.0 COMPLIANCE WITH USACE AND RIDEM REVIEW CRITERIA

8.1 USACE Public Interest Factors

The Applicant has considered the factors set forth in 33 CFR 320.4 with respect to the USACE's Public Interest Review, and has concluded that the project is consistent with the public interest, as summarized in Table 8-1 below. The benefits of the CREC, as detailed in Section 1.3, outweigh the potential detriments based on consideration of the public interest, including the incorporation of compensatory mitigation for adverse impacts to water resources that cannot otherwise be avoided or mitigated and the use of BMPs to minimize adverse impacts on soils, vegetation, fish and wildlife values, land use, recreation historic and cultural resources and other environmental factors. Moreover, the project will be constructed, operated, and maintained in accordance with federal laws, Executive Orders, and policies and comply with the requirements of the National Historic Preservation Act regarding the protection of significant cultural resource sites. Overall, the adverse impacts of the project will be outweighed by the energy supply, environmental and local financial benefits that will result from the project.

Table 8-1: Summary of Project Consistency with Public Interest Factors

Public Interest Review Factor	Summary of Project Benefits and Impacts
Conservation	The Applicant's compensatory mitigation program will result in the preservation of habitat in the Clear River watershed. Areas temporarily affected during the construction of the project, such as any staging or workpad areas, will be restored upon completion. The adverse impacts to habitat conservation from the transmission corridor have been minimized by siting this portion of the project along an existing power line. Long term vegetation management of the BIP ROWs will conserve and expand scrub-shrub habitat, a community type that has become rare in New England and on which certain threatened and endangered species depend.
Economics	The development of the CREC will have a long-term benefit on local and regional economies by increasing generation capacity throughout the ISO-NE network and reducing reliance on outdated, less efficient generation facilities and sources such as oil and coal. The Facility is projected to result in millions of dollars annually in cumulative energy savings for Rhode Island consumers. The CREC will significantly mitigate a shortfall in New England's energy grid that, according to the ISO-NE, currently totals over 6,000 MW and could total 10,000 MW in the coming years. During construction, the CREC will directly create over 300 construction jobs, and will indirectly benefit the local economy as much of this income can be expected to be spent locally. In addition, the Project will generate millions of dollars in tax revenue each year to the Town of Burrillville.
Aesthetics	A visual assessment conducted for the CREC in May 2015 concluded the following: The CREC will have minimal visibility from most locations within the visual study area. As suggested by the vegetated viewshed analysis and the field confirmation, less than one percent of the entire five mile visual study area will have project visibility. From the locations with visibility, it will be a partial view, often with the lower portions of the project screened by vegetation. Based on the existing mitigating factors such as vegetation and structures, the CREC is not likely to have any significant visual impact during daytime viewing conditions. The construction of a new 345 kV transmission line will have a temporary negative aesthetic impact during construction. Visual impacts will be greatest in forested areas, where the ROW parallels or crosses roads in areas where vegetation provides visual screening or ornamental value. The Sherman Road Switching Station expansion will occur on currently disturbed land. In the long-term, the new 345-kV transmission line will create an incremental visual change associated with the addition of the new line of structures and the increase in the width of the vegetatively managed portion of the ROW. However, the existing managed ROW and overhead transmission line structures already present an established contrast to the visual environment. The proposed power line will minimize the incremental impacts of the new 345-kV line by locating new structures generally adjacent to existing structures, where practicable. Further, the extensive forested vegetation (coniferous and deciduous) that characterizes the surrounding area will serve to limit long views of the ROW from most locations. In addition, many locations along the ROWs are remote.

Public Interest Review Factor	Summary of Project Benefits and Impacts
General Environmental Concerns	By improving the reliability and increasing the capacity of the power generation system in Southern New England and expanding access to more efficient power generation resources, the CREC will positively impact the state of Rhode Island and the region. These positive effects will outweigh the predominantly localized negative impacts associated with the construction, operation, and maintenance of the CREC and BIP. The principal long-term adverse effect of the CREC and BIP will be the loss of forest vegetation and habitat (upland and wetland) in the areas that will be occupied by the CREC and the new 345 kV transmission line. While the construction of the CREC will inevitably result in impacts to currently forested habitat, these impacts will be cumulatively minor relative to the amount of available forested habitat in the surrounding area, which is designated in the *2015 Rhode Island Wildlife Action Plan* as unfragmented forest greater than 500 acres. The siting, design and layout of the CREC and the transmission line have been developed to achieve the highest practicable level of avoidance and minimization of wetland impacts and are also being vetted through the RIEFSB review process. The unavoidable loss of 0.6 acres of wetland will result from construction of the CREC, and this includes the loss of a small, manmade amphibian breeding pool. The construction of a new powerline primarily along an existing utility ROW will result in a conversion, but not a loss of wildlife habitat. The management of early successional and scrub-shrub habitat within the BIP ROWs will have a positive impact on a variety of species that depend on such habitat, which is otherwise relatively scarce in the region. Other temporary impacts will occur during the construction phase, such as noise emissions, which will occur during daylight hours and will be in conformance with applicable state noise requirements. Best management practices will be implemented to minimize temporary impacts from construction. The CREC will use state of the art emissions control technologies, making the Facility among the cleanest natural gas plants in the country. By burning natural gas and minimizing the number of potential oil-fired days to 15 per year, the CREC will produce emissions that are many times lower than the average ISO-NE generation facility. By displacing these outdated suppliers, the CREC will help to reduce regional carbon emissions.
Wetlands	As described in this Application, the siting, design and layout of the CREC and the Burrillville Interconnection Project have been developed to achieve the highest practicable level of avoidance and minimization of wetland impacts and are also being vetted through the RIEFSB review process. The construction of the CREC will incur an unavoidable loss of 0.6 acres of biological wetland, and this will include the loss of a small, manmade amphibian breeding pool. The construction of the transmission line will result in the conversion of approximately 10 acres of forested wetland under USACE jurisdiction to emergent and/or shrub wetland. Compensatory mitigation will be implemented to offset impacts that cannot be effectively avoided or minimized. The Applicant's preferred compensatory wetland mitigation plan for the project is acquisition of open space for land preservation.
Historic Properties	Cultural resource field investigations have been conducted at the site of the proposed CREC and additional surveys are underway for the BIP ROWs. The Applicant has coordinated with the Rhode Island State Historic Preservation Office, local tribes, and USACE. Impacts to cultural resources have been and will continue to be avoided or minimized to the extent practicable based on the findings of all cultural resource surveys. If significant cultural resource sites cannot otherwise be avoided, the Applicant will coordinate with the USACE and consulting parties to ensure conformance to the requirements of Section 106 of the National Historic Preservation Act.

Public Interest Review Factor	Summary of Project Benefits and Impacts
Fish and Wildlife Values	The CREC and Burrillville Interconnection Project have been designed to avoid and minimize impacts to fish and wildlife habitat to the greatest extent practicable. Impacts to wildlife from the construction of the CREC will differ from impacts caused by the construction of the BIP. Please see Sections 5.1.7 and 5.3.4 for detailed discussions on anticipated impacts to fish and wildlife habitat as a result of the construction of the CREC and BIP, respectively. Direct impacts to wildlife will primarily be related to the alteration of existing habitats within the limit of disturbance of the Facility; however other potential direct impacts may occur, including collision with the Facility or with vehicles using the roadway. Approximately 35 acres of existing forested habitat at the site of the proposed CREC will be permanently altered such that they are no longer available for use by wildlife species. Other clearing and construction associated with the project will result in the conversion of habitat currently used by a variety of bird, mammal, reptile, and amphibian species, including the portion of the site in which the state-threatened black-throated blue warbler had been observed displaying breeding behavior during the spring and summer of 2015. During the construction phase, direct impacts are expected to be most significant to species with limited mobility to leave the area of active construction, and individual mortality of these species may occur. Mobile species which are able to leave the area of active construction are expected to use adjacent areas of similar habitat. No federally listed threatened or endangered species or hibernacula and/or known maternity roost trees associated with Northern Long Eared Bat would be impacted by the Project. With the exception of the 0.8-mile CREC ROW, the BIP ROW will be developed along the TNEC's existing utility ROW. This developed ROW provides varied habitats for species that are not otherwise common to the region. In particular, the BIP ROWs will create substantial additional shrubland habitat, which is critical to certain species of songbirds, moths, butterflies, and bees. The forested habitat that will be affected by the BIP ROWs is the prevalent habitat in the region; thus, most species displaced from the ROWs can be expected to relocate to similar nearby forest vegetative communities. No significant adverse impacts will occur to fishery resources.
Flood Hazards	The CREC and Burrillville Interconnection Project are not anticipated to affect flood storage or increase flood hazards. Under the current design of the proposed transmission line, engineering and safety requirements necessitate the placement of a two-pole structure within state-regulated 100-year non-wetland floodplain. The only fill needed for structures is backfill required around the pole embedment. This will amount to approximately four cubic yards of crushed rock per structure. To mitigate this impact, the Applicant will assess the need to provide incremental floodplain compensation, in consultation with RIDEM. An analysis to determine the 100-year Base Flood Elevation ("BFE") for streams potentially impacted by the CREC was conducted. Results of this analysis found that construction of the access road will result in the displacement of approximately 742 cubic yards of flood storage volume within the intermittent tributary to Iron Mine Brook. To avoid adverse impacts, the project includes the creation of an equally sized compensatory flood storage area adjacent to the access road crossing. The area will be regraded and restored to a forested condition (see Section 6.1.2).
Floodplain Values	The design of the CREC and Burrillville Interconnection Project has taken floodplain values into consideration to avoid impacts to the greatest extent practicable. Minor impacts to floodplain associated with the CREC access road will require compensatory flood storage as discussed above. Portions of the BIP ROWs are within 100-year floodplain, however only a *de minimus* loss of flood storage is expected to occur as a result of the installation of single

Public Interest Review Factor	Summary of Project Benefits and Impacts
	structure within the ROW. Compensatory flood storage volume will be provided where impacts within floodplain and floodway cannot otherwise be avoided. A floodplain analysis can be found in Appendix F.
Land Use	The proposed CREC Facility Site is located in a forested, predominantly rural area. The 67 acres of land area will be purchased from AGT and is a subset of a 730-acre site that currently contains the Algonquin Compressor Station. The Facility will be constructed just south of the existing compressor station. The Algonquin Compressor Station is surrounded by dense vegetation. The CREC will require a new access road which will be located south of, and parallel to, the existing Algonquin Road. The closest residents are approximately 2,300 feet to the north of the north-northeast corner of the property line. Because the majority of the proposed transmission line is located within established ROWs, it will not require, nor will it lead to, long-term residential or business disruption. The development of the new CREC ROW is to occur on property currently owned by AGT.
Navigation	The CREC and Burrillville Interconnection Project will not affect any navigable waters of the United States.
Shore Erosion and Accretion	The CREC and Burrillville Interconnection Project is not located within the coastal zone and will not affect any beach areas.
Recreation	The CREC's and Burrillville Interconnection Project's long term adverse effect on recreational resources will be negligible. The wetlands located within the Facility Site do not currently support active or passive recreational activities to the public. The AGT property is and shall continue to be privately owned. TNEC does not allow recreational opportunities within its ROWs or facilities. The portion of the route where the BIP ROW extends across Round Top Brook State WMA will include a 55-foot increase in the width of the area that is managed in low-growth vegetation. Impacts to public recreation will be avoided since the project is located on private property, within an existing transmission line ROW, and an existing substation.
Water Supply and Conservation	The CREC has been configured to use dry cooling to reduce the amount of water and wastewater generation by more than 90% from that which would have otherwise been required if a more conventional wet cooling tower had been selected. Water usage has been reduced even further through the use of demineralizer trailers for water treatment and via treatment and reuse of wastewater. Process water will be supplied from the Town of Johnston, Rhode Island under a long-term water supply agreement and delivered to the Facility via public roads by trucks owned and/or leased by the Facility.
Water Quality	Appendix J Stormwater Management Plan for Clear River Energy Center, and Appendix K, Stormwater Management Plan for the BIP, include a discussion of post-construction BMPs. The CREC Facility will be permitted by RIDEM as "new development"; therefore, post-construction water quality BMPs have been sized to manage one inch of runoff over the impervious surface. A pollutant loading analysis is currently being completed and will be included as part of the final freshwater wetlands permit application.
Energy Needs	The development of the CREC will have a long-term benefit on the energy supply system In Southern New England by adding over 1,000 MW of generation capacity and improving electrical transmission throughout the ISO-NE network and reducing reliance on outdated, less efficient generation facilities and sources such as oil and coal. The Facility is projected to result in millions of dollars annually in cumulative energy savings for Rhode Island consumers. The Project will significantly mitigate a shortfall in New England's energy grid that, according to ISO-NE, currently totals over 6,000 MW and could total 10,000 MW in the coming years. The CREC has been extensively studied by ISO-NE over a multi-year period. These studies have repeatedly confirmed the need for the project.

Public Interest Review Factor	Summary of Project Benefits and Impacts
Safety	The CREC and Burrillville Interconnection Project will be constructed, operated, and maintained to meet or exceed all applicable safety standards established by the electric generation and transmission industries, regulators, and the Applicant.
Food and Fiber Production	The CREC and Burrillville Interconnection Project does not impact any active agricultural areas and therefore will not result in adverse impacts to the production of food or fiber resources.
Mineral Needs	The construction of the CREC and Burrillville Interconnection Project will involve the use of various local mineral resources (sand, gravel, etc.). To the Applicant's knowledge, there are no known active minerals mining or processing operations located on the subject section of the TNEC ROW or CREC ROW.
Consideration of Property Ownership	All project components associated with the proposed CREC and Burrillville Interconnection Project are sited on land controlled by one of the Applicants. All switching station improvements and modifications also will be located on land owned or leased by TNEC and historically dedicated to utility purposes. As a result, no significant impacts on property ownership are anticipated.
The needs and welfare of the people	The need for the CREC and Burrillville Interconnection Project has been well documented in this Application and through extensive studies conducted by ISO-NE. The CREC will have the capacity to produce more than 1,000 MW of energy that is needed throughout the region and will do so as one of the most efficient, low-emission generation facilities in the region and in the nation. Regionally, the CREC will result in an overall reduction in energy costs to residential, commercial and industrial consumers. By displacing older sources, the CREC will also represent a major reduction in regional greenhouse gas emissions.

8.2 RIDEM Review Criteria

The section below provides a summary of the Project's consistency with the review criteria pursuant to the *Rules and Regulations Governing the Administration of the Rhode Island Freshwater Wetlands Act.*

1) Significant reduction in the overall wildlife production or diversity of a wetland

The CREC and Burrillville Interconnection Project will include the conversion, and to a much lesser extent loss of forested wetland habitat (upland and wetland) in the areas that will be occupied by the CREC and the BIP where these impacts cannot be avoided. However, these impacts will be minor relative the amount of available forested wetland habitat in the surrounding area. The siting, design and layout of the CREC and the BIP have been developed to achieve the highest practicable level of avoidance and minimization of wetland impacts and are being vetted through the RIEFSB review process. The unavoidable loss of 0.5 acres of biological wetland will result from construction of the CREC, and this will include the loss of a small, manmade amphibian breeding pool. An additional 1.3 acres of Perimeter Wetland, and 0.5 acres of Riverbank Wetland will also be directly impacted. The construction of the BIP will result in the conversion of approximately 21 acres of forested wetland habitat (including Perimeter Wetland and Riverbank Wetland) to emergent and/or shrub wetland habitat.

As discussed in Section 5.1.7, the CREC is not expected to have a significant reduction in the overall wildlife production or diversity of on-site wetlands. An evaluation of indirect environmental impacts on wildlife and their habitats including but not limited to: hydrological changes, fragmentation of habitat and populations;

edge effects; noise and vibration; and restrictions to wildlife mobility, and an evaluation of impacts to migratory birds and their habitats, is included. As shown in Figure 3-3, these indirect impacts are anticipated to extend into portions of Wetland 1 and 2. Both the 2015 RIWAP and Rosenberg et al. (1999) are used for assessing indirect impacts to wildlife habitat. The roadway, which will incur nearly all of the proposed Facility's direct wetland impacts, will be constructed with six large natural bottom culverts, as well as an at-grade ramp on either side of the roadway that will help to maintain movement of wildlife across the site.

Forested wetland conversion that will result from the construction of the BIP is not anticipated to cause a reduction in overall wildlife production or diversity. Wetlands along the current TNEC ROW have already been exposed to forest edge effects for an extended period of time and widening of the ROW will likely not alter current wildlife production and diversity within these wetlands. Moreover, additional scrub-shrub and/or emergent wetland habitat will likely benefit species that are currently utilizing this habitat and species that may require a wider tract of earlier successional habitat. The Applicant will work in close coordination with RIDEM to mitigate for unavoidable, adverse impacts to wetland wildlife production.

2) Significant reduction in the ability of a wetland to satisfy the needs of a particular wildlife species

With the exception of SAS 1, the construction of the CREC is not anticipated to result in a significant reduction in the ability of a wetland to satisfy the needs of any particular wildlife species. The wetlands to be impacted by the proposed Facility (Wetlands 1 and 2) are wetland complexes that are large relative to the amount of impact proposed. Due to the large areas of these wetlands that will remain unaltered, a significant reduction in their ability to satisfy the needs of wildlife species is not anticipated.

As part of the constructability analysis conducted by the project team, the BIP avoids and minimizes palustrine wetland impacts, wherever possible. The new transmission line has been designed to be constructed parallel and adjacent to an existing transmission line within established ROW corridors. This greatly limits project impacts to an existing area of disturbance. A number of state-regulated freshwater wetlands will be impacted during the construction of the TNEC ROW. However, the only permanent impacts to any of these wetlands are from the installation of new poles, and improvements to existing ROW access roads. No wildlife species are expected to be wholly dependent on the small impact areas to meet all of their lifecycle requirements. Disturbances in these areas may result in temporary avoidance of a specific area by wildlife, including waterfowl.

3) Significant displacement or extirpation of any wildlife species from a wetland or surrounding areas due to the alteration of the wetland

The CREC and Burrillville Interconnection Project are not anticipated to result in significant displacement or extirpation of any wildlife species from any wetlands. Impacts to biological wetlands and their surrounding buffer zones within the Facility Site have been avoided and minimized to the maximum extent practicable.

With the exception of a small, man-made Special Aquatic Site, the only permanent wetland impacts that will result from the construction of the proposed CREC Facility are associated with the roadway. Any wildlife that may be impacted by the construction of the proposed Facility may use the remainder of multiple large wetland complexes in its vicinity, and may cross underneath the proposed roadway relatively freely via multiple culverts that have been designed to allow for unrestricted hydrologic flow and wildlife movement along stream and wetland corridors.

Temporary displacement of wildlife utilizing habitats adjacent to the proposed transmission lines is likely to occur during construction. Temporarily displaced species should recolonize the area once construction is complete. Conversion of forested wetland habitat to scrub-shrub or emergent wetland habitat will likely result in additional temporary disturbances and displacement of some wildlife utilizing these edge-habitat areas. However, extirpation is not anticipated as the wetland habitat that is currently provided by the edge of the existing transmission corridor will regenerate in a slightly different location after the ROW is widened. Furthermore, additional scrub-shrub and/or emergent wetland habitat, which are generally limited in Rhode Island that is created as a result of this portion of the project may benefit species that utilize these types of rare wetland habitat.

4) Any reduction in the ability of the wetland to ensure the long-term viability of any rare animal or rare plant species;

No permanent impacts from construction-related activities are anticipated in any wetland areas that contain rare species. As discussed in Section 5.1.8, an acoustic survey for the federally-listed NLEB was conducted within the proposed CREC Facility and CREC ROW in 2015 and yielded no positive results. As discussed in Section 5.2.8, two RIDEM-designated Natural Heritage Area polygons that are known to contain a total of four state-listed rare plant species (rock harlequin, American yew, northern beech fern, and hobblebush) have been identified on or within the vicinity of the TNEC portion of the project. Impacts to sensitive wetland habitats of state-listed rare, threatened or endangered species will be avoided through close coordination with the RINHP, RIDEM and the USFWS in the development of avoidance and mitigation criteria for the federally-listed northern long eared bat as well as the state-listed plant species discussed in the following section.

5) Any degradation in the natural characteristic(s) of any rare wetland type;

The CREC and Burrillville Interconnection Project will not result in any degradation of the natural characteristics of any rare wetland type. No rare wetland types have been identified.

6) Significant reduction in the suitability of any wetland for use by any resident, migratory, seasonal, transient, facultative, or obligate wildlife species, in either the short- or long-term as a travel corridor; feeding site; resting site; nesting site; escape cover; seasonal breeding or spawning area;

The vast majority of the wetlands in the vicinity of the CREC will retain their fully vegetated character. Impacts to wetlands associated with the construction of the proposed CREC will not reduce their ability to support the use of resident, migratory, seasonal, transient, facultative, or obligate wildlife species. The proposed wetland impacts from the CREC are not of a nature or extent that should prevent wildlife from utilizing the subject wetlands as a short- or long-term travel corridor, feeding site, resting site, nesting site, escape cover, or seasonal breeding or spawning area.

The majority of the Burrillville Interconnection Project will be constructed along an existing cleared ROW corridor of disturbance. Wildlife using adjacent wetlands are acclimated to the disturbance created by routing operation and maintenance activities associated with the transmission lines and substation. Construction activities may temporarily impact habitat utilization patterns of mammals and birds in wetland adjacent to the work area, but present use patterns should resume shortly after construction has been completed.

7) Any more than a minimal intrusion of, or increase in, less valuable, invasive or exotic plant or animal species in a wetland;

During the implementation of the Project, the Applicant will adopt the previously approved IRP *Wetland Invasive Species Control Plan* ("WISCP") to minimize the potential for the spread of invasive species along the ROWs as a result of construction activities (see Appendix P). The proposed WISCP will identify the wetlands within the Facility Site that presently contain invasive species, and assign a comparative value to each wetland ("high," "moderate", and "low") based on wetland functions and quality. The overall goal of the WISCP will be to preserve the value of wetlands along the ROWs and in the vicinity of the Facility Site that are not presently dominated with invasive plant species, and to minimize the spread of invasive plant species. The WISCP will include measures that the Applicant proposes to implement during construction to achieve this goal.

8) Significant reduction in the wildlife habitat functions and values of any wetland which could disrupt the management program for any game or non-game wildlife species carried out by state or federal fish, game, or wildlife agencies;

The CREC and Burrillville Interconnection Project will not disrupt the management program of any game on non-game wildlife species.

9) Significant reduction in overall current or potential ability of a wetland to provide active or passive recreational activities to the public;

The wetlands located within the Facility Site do not currently support active or passive recreational activities to the public. The AGT property is and shall continue to be privately owned. TNEC does not allow recreational opportunities within its ROWs or facilities. Impacts to public recreation will be avoided since the project is located on private property, within an existing transmission line ROW, and an existing substation. Impacts to recreation from the installation of the water supply and wastewater sewer pipelines will be temporary and negligible as they will be installed almost entirely within existing roadways.

10) Significant disruption of any on-going scientific studies or observations;

There are no such scientific studies or observations are known to be taking place on land owned or controlled by the Applicant.

11) Elimination of, or severe limitation to traditional human access to, along the bank of, up or down, or through any rivers, streams, ponds, or other freshwater wetlands;

Access through any rivers, streams, ponds, or other freshwater wetlands will not be eliminated or limited by construction of the CREC and Burrillville Interconnection Project. Access to these areas post-construction will not change from pre-construction. Access to wetlands on the AGT property shall be limited to employees of AGT and employees of Clear River Energy LLC. Access to the wetlands and/or streams on the CREC and TNEC ROWs or at the Sherman Road Switching Station will be limited to authorized personnel.

12) Any reduction in water quality functions and values or negative impacts to natural water quality characteristics, either in the short- or long-term, by modifying or changing: water elevations, temperature regimes, volumes, velocity of flow regimes of water; increasing turbidity; decreasing oxygen; causing any

form of pollution; or modifying the amount of flow of nutrients so as to negatively impact wetland functions and values;

The CREC and Burrillville Interconnection Project will not result in a significant reduction in water quality functions, values, or natural characteristics. Potential impacts to surface waters will be avoided and mitigated through the implementation of BMPs both during and after construction for both stormwater management and soil erosion and sediment control. Appendix J *Stormwater Management Plan for Clear River Energy Center*, includes a discussion of post-construction BMPs. The proposed CREC Facility will drain to a lined gravel wet vegetated treatment system designed in accordance with the RIDEM *Rhode Island Stormwater Design and Installation Standards Manual*, last revised March 2015. The Facility roadway will drain to a dry swale and attenuation pond.

Appendix L *Right-of-Way Access, Maintenance, and Construction Best Management Practices* has been designed for implementation along the entire transmission ROW during all phases of construction. The plan will specifically address soil erosion and control measures to be implemented for each location along the transmission ROW where the potential exists for runoff to a resource area to minimize impacts to downstream areas. All erosion control plans will be prepared in accordance with the *Rhode Island Soil Erosion and Sediment Control Handbook*.

13) Any placement of any matter or material beneath surface water elevations or erection of any barriers within any ponds or flowing bodies of water which could cause any hazards to safety;

There shall be no such placements of matter or materials beneath surface water elevations or erection of any barriers within any ponds or flowing bodies of water.

14) Significant loss of important open space or significant modification of any uncommon geologic or archaeological features;

No portions of the CREC or BIP are known to possess important open space or uncommon geologic features. The Applicant has contracted an archeological firm to conduct archaeological surveys. It is anticipated that any potentially significant archaeological features within the Facility Site and BIP ROW will be avoided.

15) Significant modification to the natural characteristics of any wetland area of unusually high visual quality;

The CREC and Burrillville Interconnection Project will not result in significant modification to the natural characteristics of any wetland area of unusually high visual quality. Wetlands within the project limits are generally not considered to provide important visual or aesthetic value. A visual assessment conducted for the CREC in May 2015 concluded the following: the CREC Facility will have minimal visibility from most locations within the visual study area. As suggested by the vegetated viewshed analysis and the field confirmation, less than one percent of the entire five-mile visual study area will have project visibility. From the locations with visibility, it will be a partial view, often with the lower portions of the project screened by vegetation. Based on the existing mitigating factors such as vegetation and structures, the CREC Facility is not likely to have any significant visual impact during daytime viewing conditions.

16) Any decrease in the flood storage capacity of any freshwater wetland which could impair the wetland's ability to protect life or property from flooding or flood flows;

A detailed floodplain analysis for the proposed CREC has been conducted and can be found in Appendix F. No activities are proposed that are anticipated to impair any wetland's ability to protect life or property from flooding or flood flows.

Under the current design of the proposed transmission line, engineering and safety requirements necessitate the placement of a two-pole structure within state-regulated 100-year non-wetland floodplain. The only fill needed for structures is backfill required around the pole embedment. This will amount to approximately four cubic yards of crushed rock per structure. To mitigate this impact, the Applicant will assess the need to provide incremental floodplain compensation, in consultation with RIDEM.

17) Significant reduction of the rate at which flood water is stored by any freshwater wetland during any flood event;

The CREC will not cause a significant reduction of the rate at which flood water is stored by any freshwater wetland during flood events. Flood protection throughout the Facility Site is discussed in detail in Section 5. A detailed floodplain analysis for the CREC has been conducted and can be found in Appendix F. Stormwater management within the CREC is designed to avoid diversion of surface waters which could adversely affect wetland hydrology. Proposed post-construction BMPs for the CREC have been sized and designed to meet the hydrologic and hydraulic standards in RISDISM. Additional discussion of post-construction BMP sizing and design is provided in Appendix J.

18) Restriction or significant modification of the path or velocities of flood flows for the 2-year, 10- year, 25-year, or 100-year frequency, 24-hour, Type III storm events so as to cause harm to life, property, or other functions and values provided by freshwater wetlands;

The CREC will not result in significant modification of the path or velocities of flood flows for the above-listed storm events. Please see Section 5.1.3 for a detailed analysis of flood protection within the Facility Site and Appendix J.

19) Placement of any structure or obstruction within a floodway so as to cause harm to life, property, or other functions and values provided by freshwater wetlands;

The CREC and Burrillville Interconnection Project does not propose the placement of any structure or obstruction within a floodway so as to cause harm to life, property, or other functions and values provided by freshwater wetland.

20) Any increase in run-off rates over pre-project levels or any increase in receiving water/wetlands peak flood elevations for the 2-year, 10-year, 25-year, or 100-year frequency, 24-hour, Type III storm events which could impair the wetland's ability to protect life or property from flooding or flood flows;

The CREC will not result in an increase in runoff rates over pre-project levels or any increase in receiving water/wetlands peak flood elevations for the above-listed storm events (see Section 5.1.3 for a detailed analysis of flood protection within the Facility Site and Appendix J *Preliminary Stormwater Management Plan for Clear River Energy Center*).

21) Any increase in run-off volumes and discharge rates which could, in any way, exacerbate flooding conditions in flood-prone areas;

It is anticipated that the CREC and Burrillville Interconnection Project will not result in an increase in runoff volumes or discharge rates which could exacerbate flooding conditions in flood prone areas.

22) Significant changes in the quantities and flow rates of surface or groundwater to or from isolated wetlands (e.g., those wetlands without inflow or outflow channels);

The flow rates of surface or groundwater to or from isolated wetlands within the Facility Site will not significantly change, with the exception of two small, man-made, seasonally flooded Special Aquatic Sites that were discovered during the course of field investigations in spring 2016 and are described in more detail in Section 3.1.9. Construction of the CREC will result in the elimination of SAS 1 and potentially alter flow rates of surface or groundwater to SAS 2. Due to the central location of these isolated wetlands within the plant layout, avoidance of direct and indirect impacts is not possible. The Applicant will consult with RIDEM to develop an appropriate mitigation strategy to compensate for the loss and alteration of these man-made wetland features.

In all other cases, the CREC and Burrillville Interconnection Project is not anticipated to significantly change surface runoff patterns to or from isolated wetlands and will not influence groundwater levels in adjacent wetlands. Culverts that need to be replaced by or near isolated wetlands will have permanent culverts installed at or above the existing wetland elevation and the finish grade of the access road over the culvert raised to accommodate the long term maintenance of the culvert and preserve the character of the neighboring resource areas.

23) Placement of any structural best management practices within wetlands, or proposal to utilize wetlands as a detention or retention facility;

Temporary BMPs consisting of compost mulch tubes, staked straw bales and/or staked straw bales with silt fence are proposed to be installed along wetlands adjacent to the proposed construction activities. Temporary swamp mats would be placed in wetlands for temporary construction access. These BMPs would be installed before any ground disturbing activities begin. Whenever possible, and where necessary, these BMPs would also be installed prior to tree clearing activities in sensitive areas. The purpose of these BMPs is to protect adjacent wetland resources from sedimentation during construction. All temporary measures installed to control soil erosion and sedimentation of wetland resource areas will be removed following construction when disturbed areas have been stabilized. There are no proposals to site BMPs within wetlands or to use wetlands as retention or detention facilities.

24) Any more than a short-term decrease in surface water and/or groundwater elevations within any wetland

The Stormwater Management Plan for the proposed CREC encourages the infiltration of stormwater. Stormwater discharging from the treatment basin will be returned to Wetland 1 via a level spreader. As a result, the CREC Facility is not anticipated to result in a decrease in surface water and/or groundwater elevations within any wetland. One exception is SAS 1, which will be eliminated as a result of the construction of the CREC. Due to its central location within the plant layout, avoidance of this small man-made depression is not possible.

25) Non-compliance with the Rhode Island Department of Environmental Management Water Quality Regulations for Water Pollution Control

The Project will be in compliance with the Rhode Island Department of Environmental Management Water Quality Regulations for Water Pollution Control.

26) Any detrimental modification of the wetlands ability to retain or remove nutrients or act as a natural pollution filter.

The CREC and Burrillville Interconnection Project is not anticipated to cause any detrimental modification of the ability of any wetlands to retain or remove nutrients or act as a natural pollution filter.

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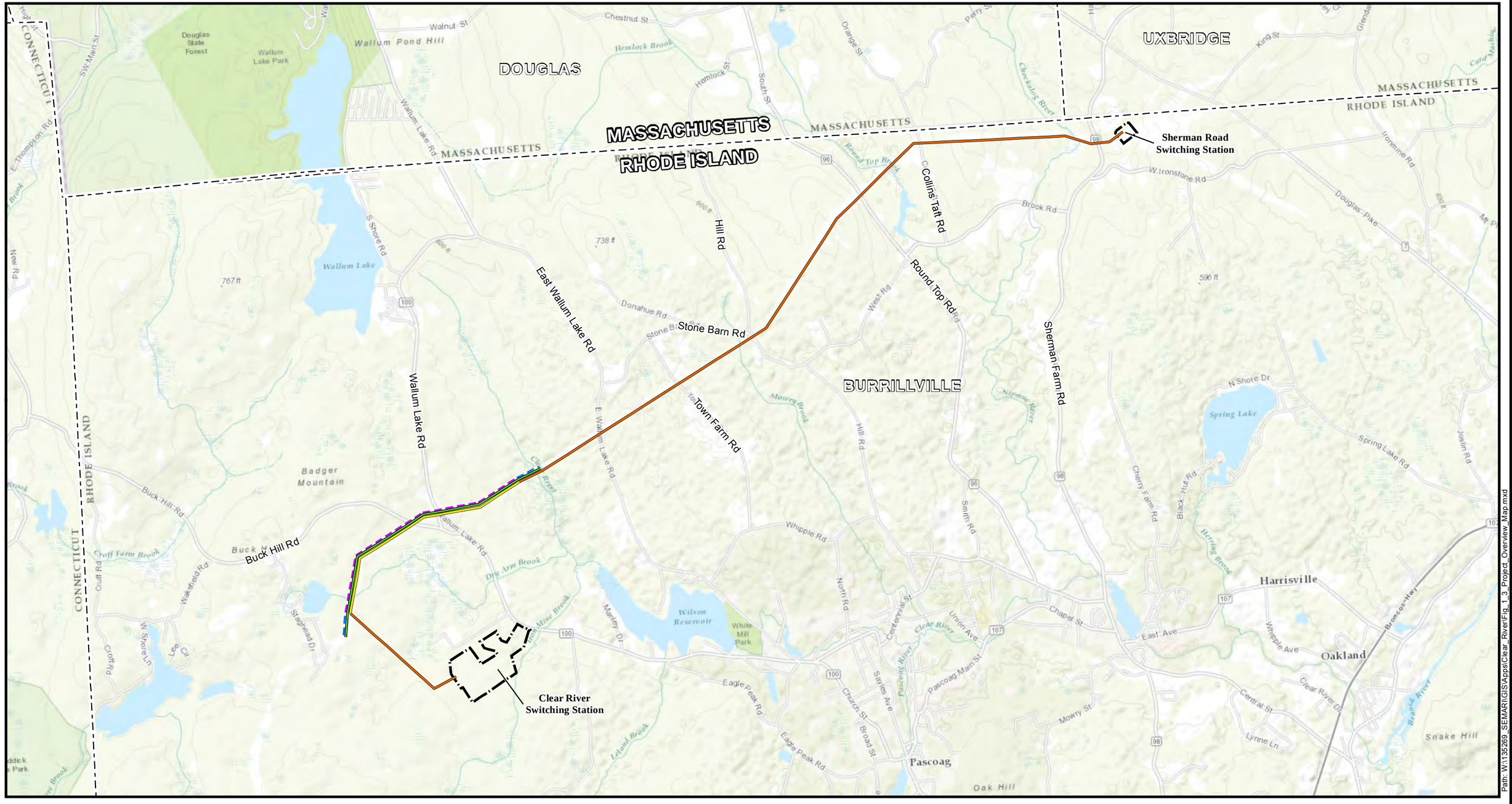
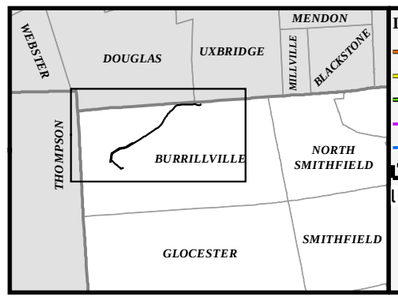
Figures





Legend

- Line 3052 - New Transmission Line
- Line 3052 - Replace Existing Line
- Line 347 - Replace Existing Line
- Line 341 - New Transmission Line
- Line 341 - Replace Existing Line
- Existing or Proposed Power Facility
- Town Boundary

Burrillville Interconnection Project

Figure 1-1:
Project Overview Map

N
W E
S

0 1,000 2,000 3,000 4,000 5,000 6,000 Feet

Date: 11/7/2016 1 " = 3,000 ' Author: TDH

The States of MA and RI

Providence and Worchester Counties:
Burrillville, Douglas,
and Uxbridge Townships

NAD 1983 UTM Zone 18N USFt
Foot US
Transverse Mercator
North American 1983

Invenergy nationalgrid

POWER ENGINEERS

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Wetland 3

Dry Arm Brook

Spectra Compressor Station

Gas Line

Potable Well

ALGONQUIN LN

WALLUM LAKE RD

Access Road

Iron Mine Brook

Wetland 4

Wetland 2

Wetland 1

345 kV Overhead Transmission Line

Generation Facility

SAS1

SAS2

N

0 200 400 800 Feet

Drawing Date: 3/6/2017

ess group
environmental consulting & engineering services

Invenergy, LLC
Clear River Energy Center

Burrillville, Rhode Island

1 inch = 400 feet

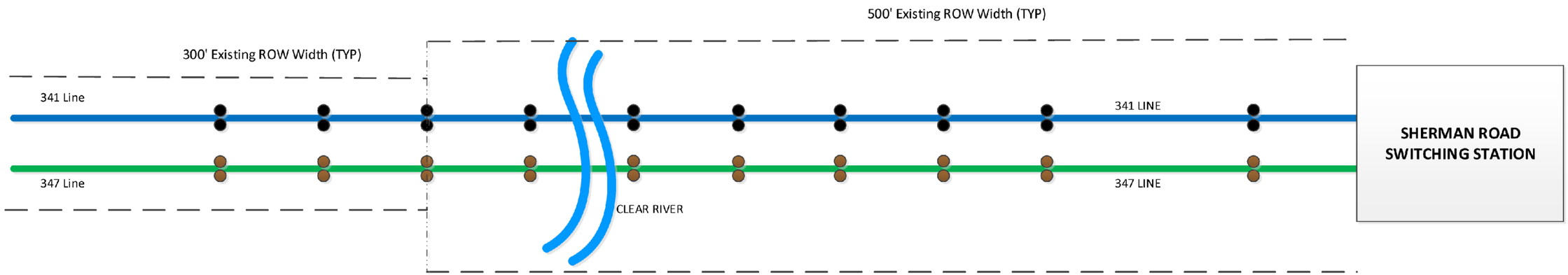
Source: 1) USGS 2011 Imagery
2) RIGIS, Roads E-911 2016
3) ESS, Delineated Wetlands 2015

- Project Limits of Disturbance
- CREC Boundaries
- Temporary Construction Staging Areas
- Perennial Stream Centerline
- Perennial Stream Bank
- 200' Riverfront Wetland
- Intermittent Stream Centerline
- 100' Riverbank Wetland
- Wetland Edge
- 50' Perimeter Wetland
- Wetland Area

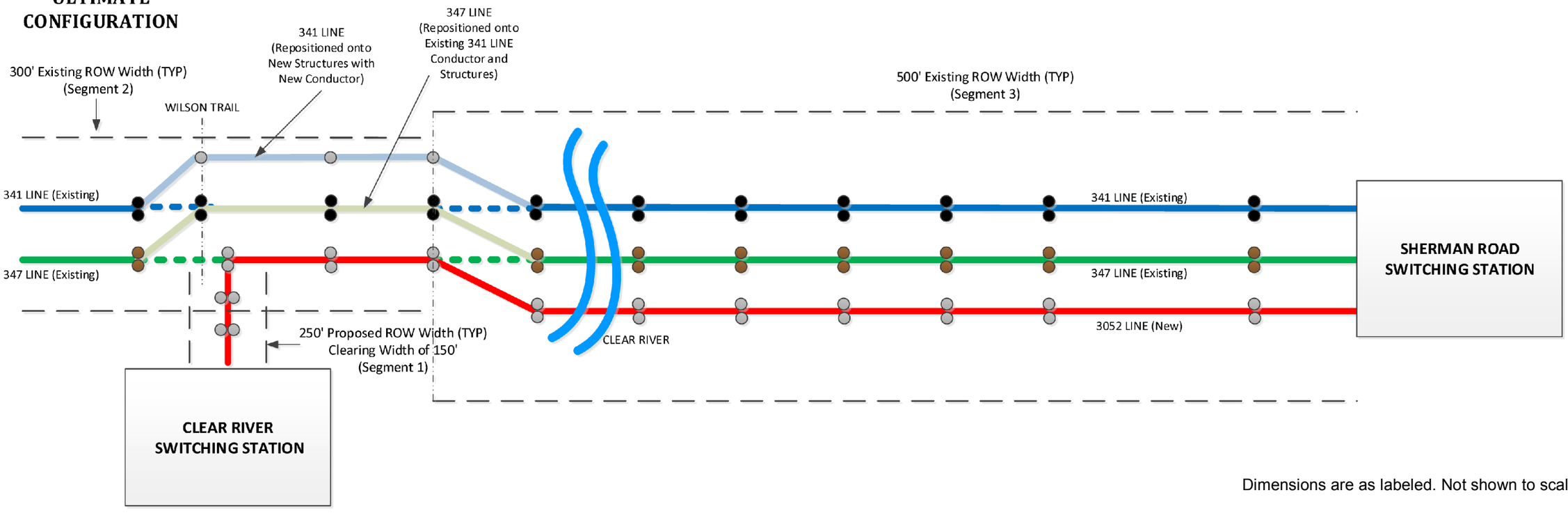
Clear River Energy Center
Proposed Layout

Figure 1-2

EXISTING CONFIGURATION



ULTIMATE CONFIGURATION



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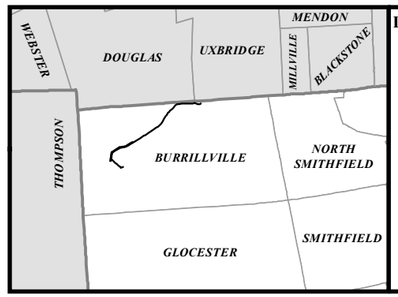

Legend

- Existing Steel H-frame Structures (TYP)
- Existing Wood H-frame Structures (TYP)
- Proposed Steel H-frame Structures (TYP)
- Proposed Steel Monopole Structures (TYP)

Burrillville Interconnection Project

Figure 1-3:
Schematic Representation of the Burrillville Interconnection Project

Date: 3/20/2017 Author: TDH

The State of Rhode Island

Providence County:
Town of Burrillville

NAD 1983 UTM Zone 18N USFt
Foot US
Transverse Mercator
North American 1983

POWER ENGINEERS

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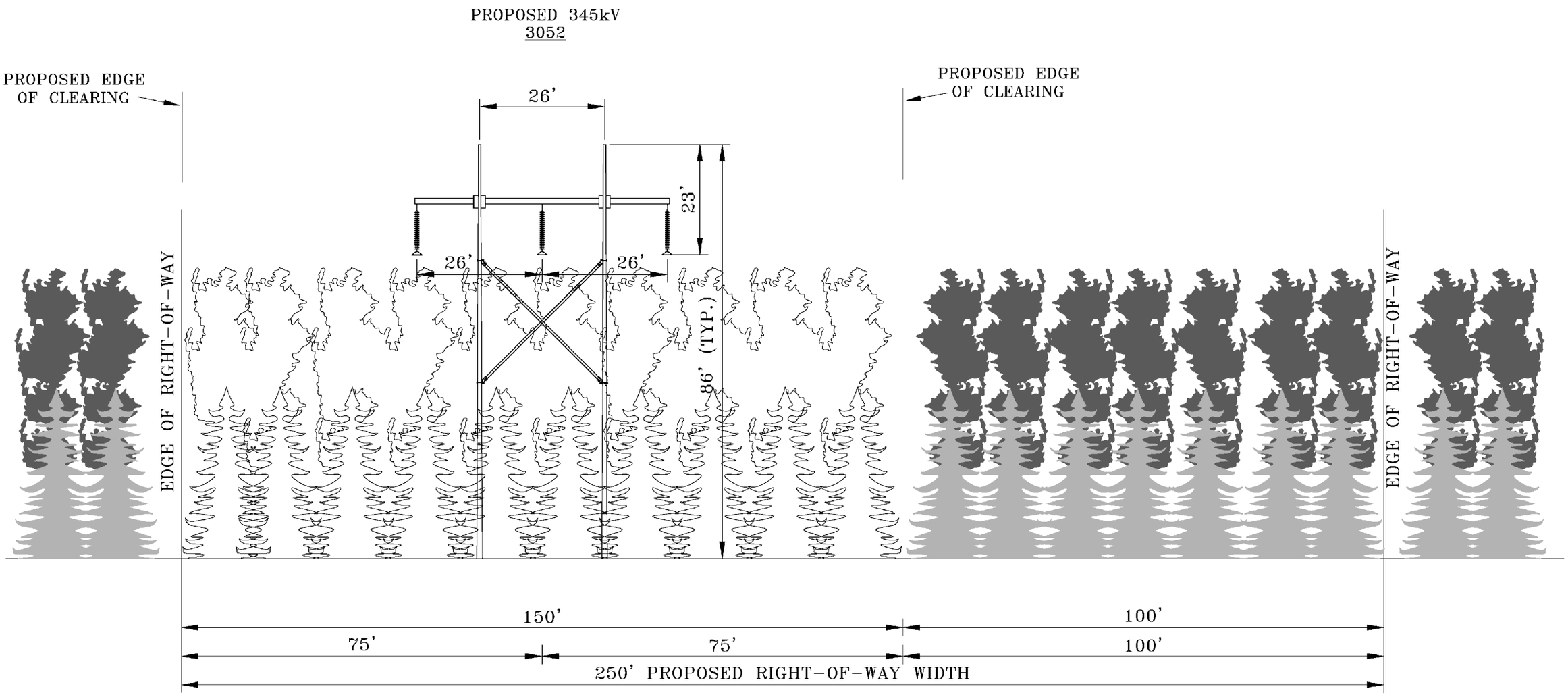
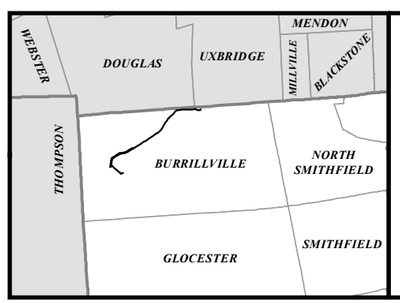


View Facing Southeast Toward CREC



Typical Right of Way Cross Section - Segment 1
CREC ROW
Approximately 0.8 Mile
Burrillville, RI

Burrillville Interconnection Project

Figure 1-4:
Typical CREC ROW
Cross Section (Segment 1)

Date: 3/20/2017 Author: TDH

The State of Rhode Island

Providence County:
Town of Burrillville

NAD 1983 UTM Zone 18N USFt
Foot US
Transverse Mercator
North American 1983

POWER ENGINEERS

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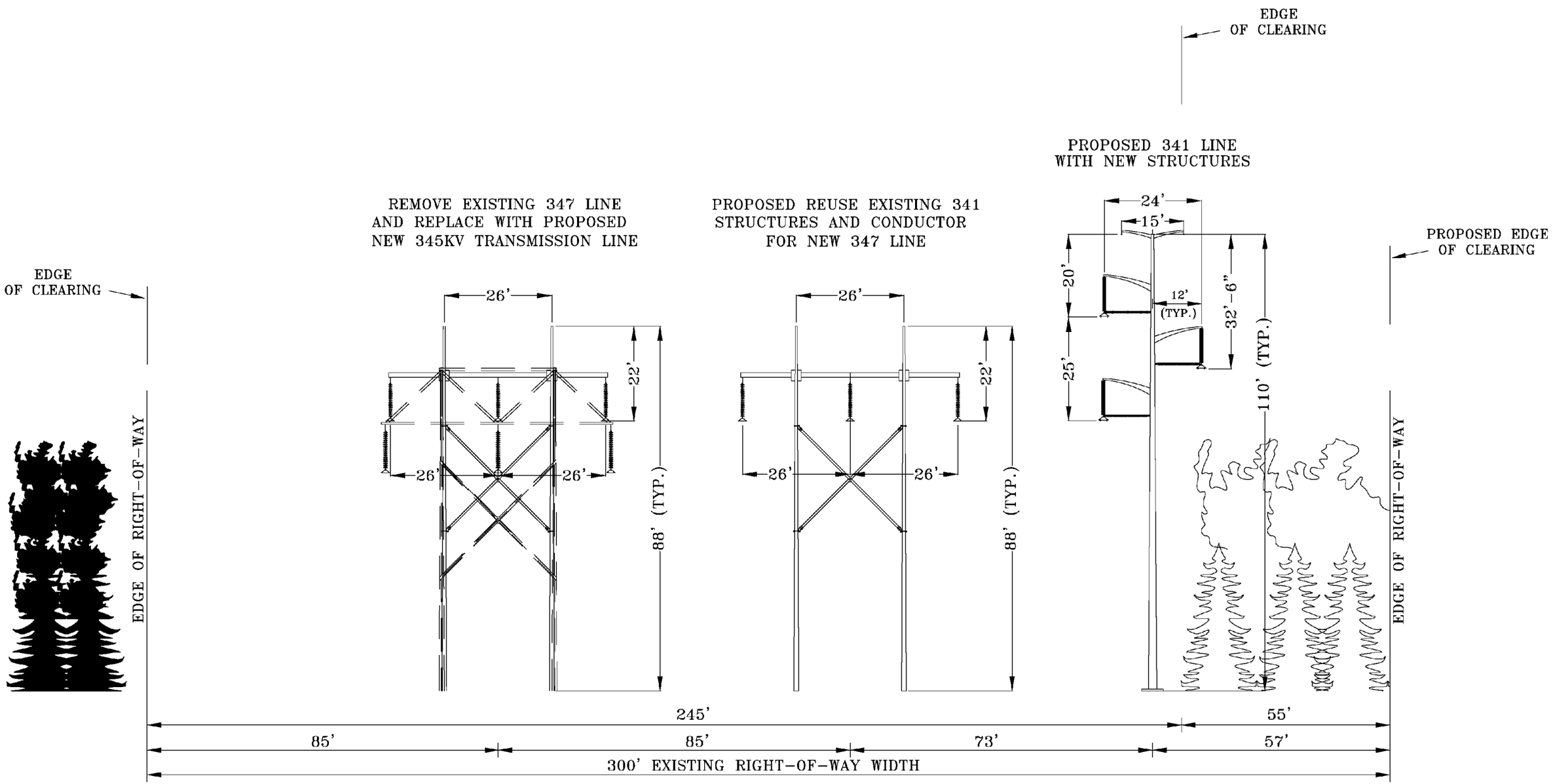
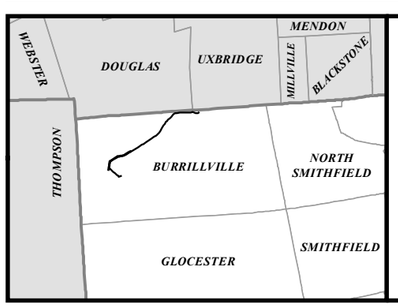


View Facing Southwest



Typical Right of Way Cross Section - Segment 2
TNEC ROW to 0.19 Mile West of the Clear River
Approximately 1.6 Miles
Burrillville, RI

Burrillville Interconnection Project

Figure 1-5:
Typical TNEC ROW
Cross Section (Segment 2)

Date: 3/20/2017 Author: TDH

The State of Rhode Island

Providence County:
Town of Burrillville

NAD 1983 UTM Zone 18N USFt
Foot US
Transverse Mercator
North American 1983

POWER ENGINEERS

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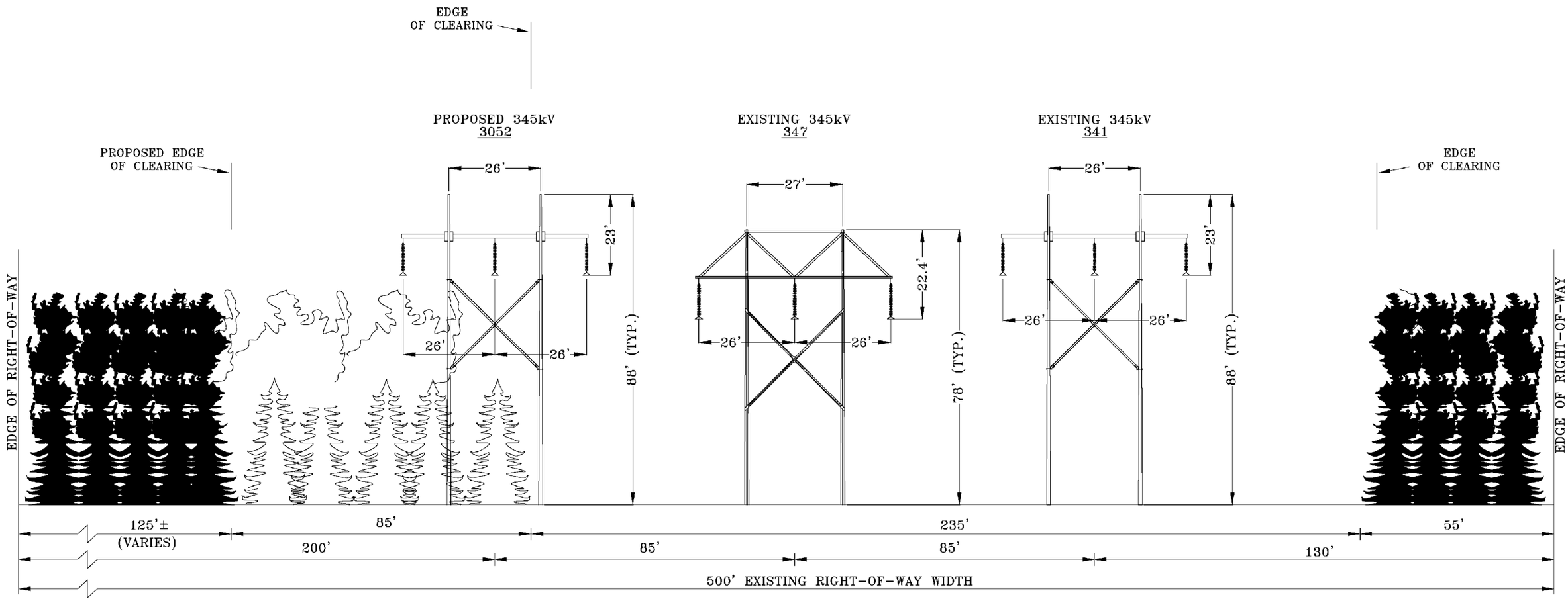
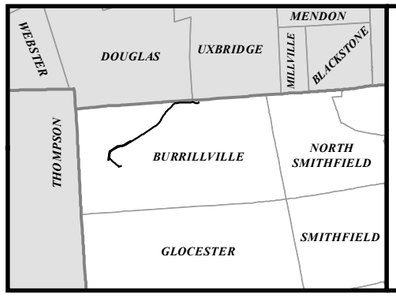


View Facing Southwest



Typical Right of Way Cross Section - Segment 3
0.19 Mile West of the Clear River to Sherman Road Switching Station
Approximately 4.4 Miles
Burrillville, RI

Burrillville Interconnection Project

Figure 1-6:
Typical TNEC ROW
Cross Section (Segment 3)

Date: 3/20/2017 Author: TDH

The State of Rhode Island

Providence County:
Town of Burrillville

NAD 1983 UTM Zone 18N USFt
Foot US
Transverse Mercator
North American 1983

POWER ENGINEERS

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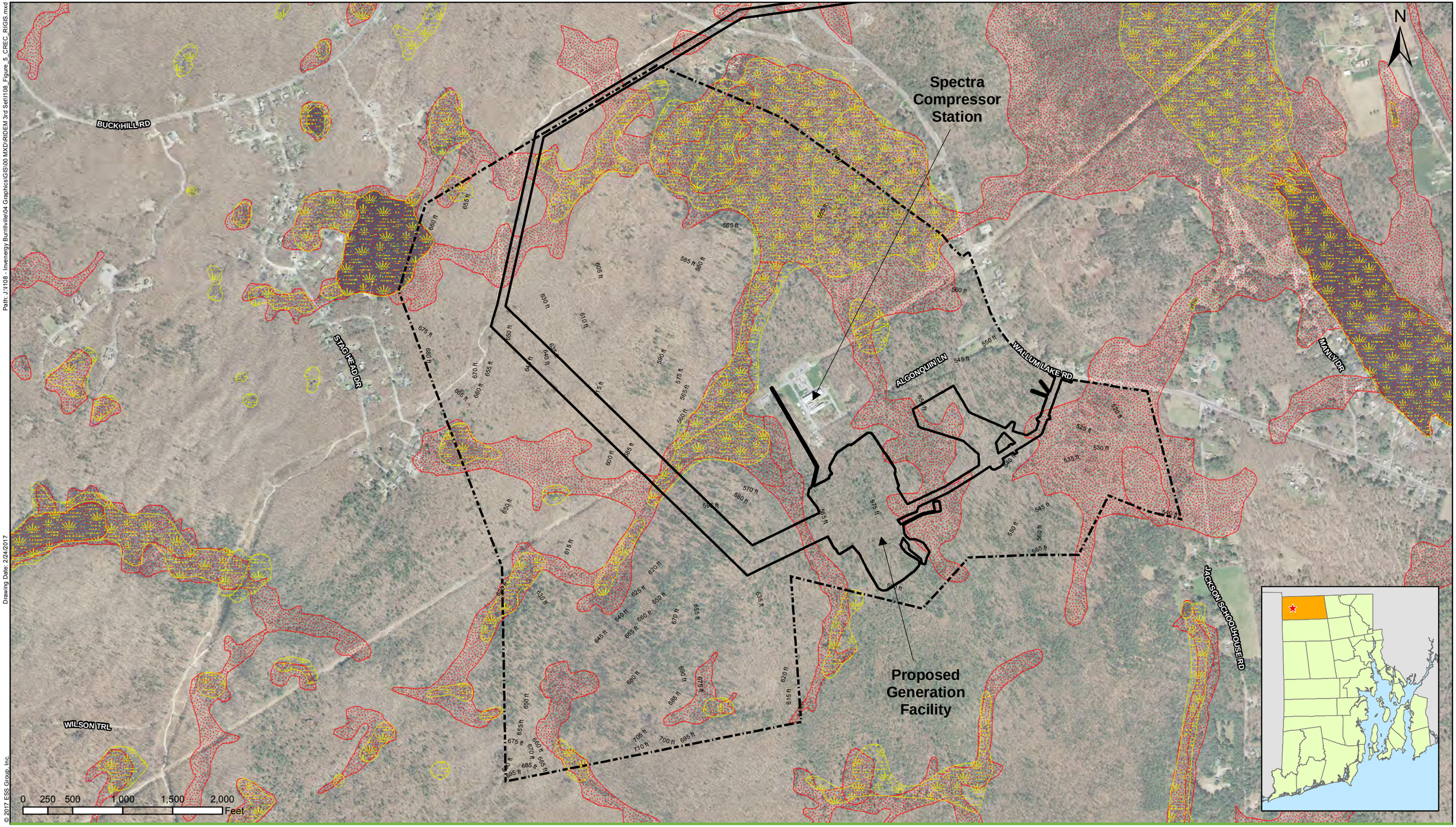
Drawing Date: 2/24/2017



Invenergy, LLC
Clear River Energy Center

Burrillville, Rhode Island

1 inch = 900 feet

Source: 1) USGS 2011 Imagery
2) RIGIS, Roads E-911 2016
3) RIGIS National Wetlands Inventory 2015
4) RIGIS NRCS Hydric Soils 2014

Legend

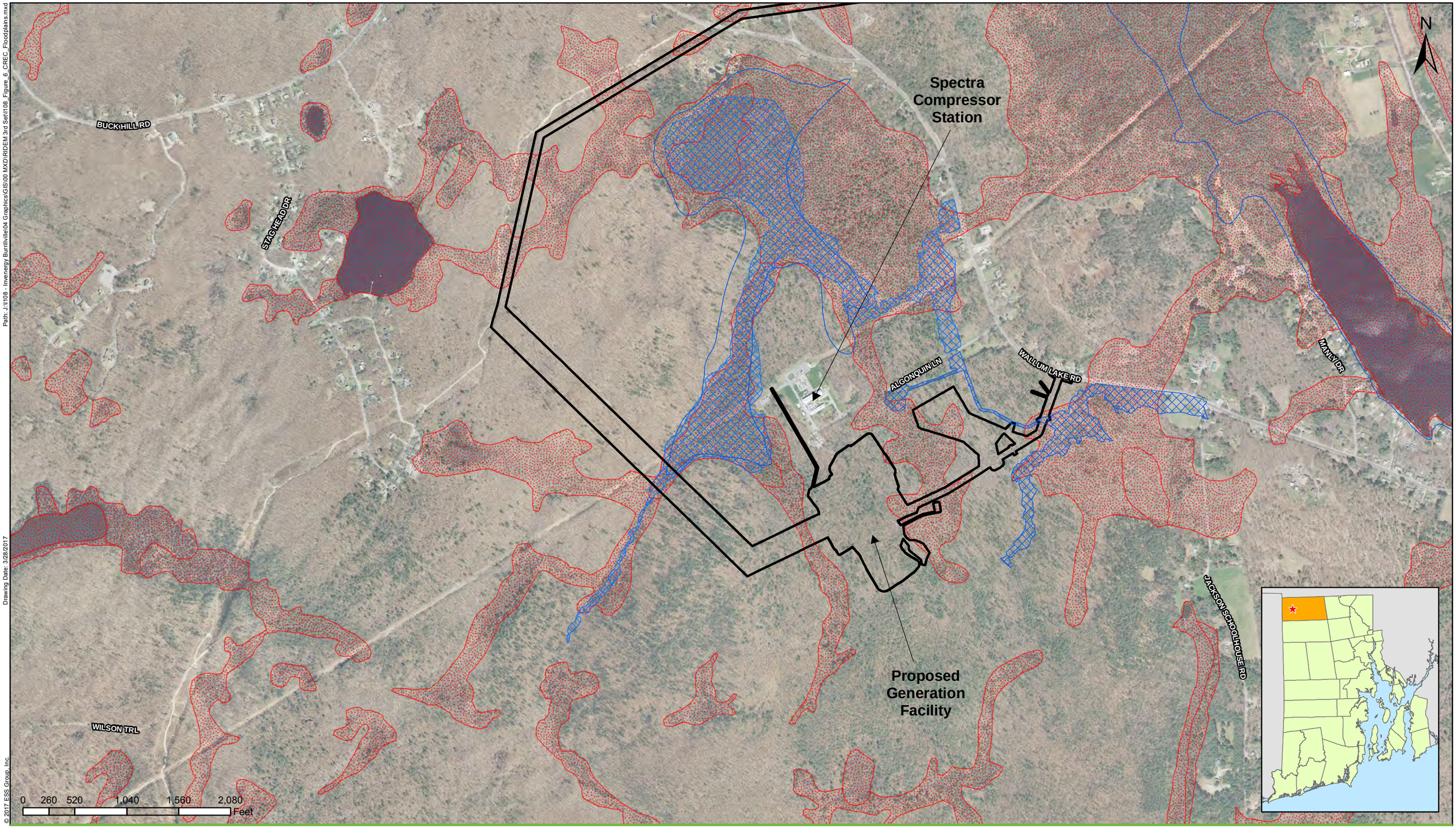
- Project Limits of Disturbance
- Spectra Property Boundary
- National Wetlands Inventory
- Hydric Soils
- 5 Foot Contour

Clear River Energy Center
Property Wetlands Data

Figure 3-1

Path: J:\1108 - Invenergy Burrillville\04 Graphics\GIS\00 MXD\RIDEM 3rd Set\1108_Figure_6_CREC_Floodplains.mxd

Drawing Date: 3/28/2017



Clear River Energy, LLC
Clear River Energy Center

Burrillville, Rhode Island

1 inch = 900 feet

Source: 1) USGS 2011 Imagery
2) RIGIS, Roads E-911 2016
3) RIGIS National Wetlands Inventory 2015
4) RIGIS NRCS Hydric Soils 2014

Legend

- Project Limits of Disturbance
- Flood Zone A - 1% Annual Chance (No BFE)
- Modeled 100 Year Floodplain
- Hydric Soils

100-Year Floodplain Mapping

Figure 3-2

Path: J:\l108 - Invenergy Burrillville\04 Graphics\GIS\00 MXD\RIDEM 3rd Set\l108_Figure_6_Forest Impacts.mxd

Drawing Date: 9/23/2016

N

0 125 250 500 750 1,000 Feet

Invenergy, LLC
Clear River Energy Center

Burrillville, Rhode Island

1 inch = 400 feet

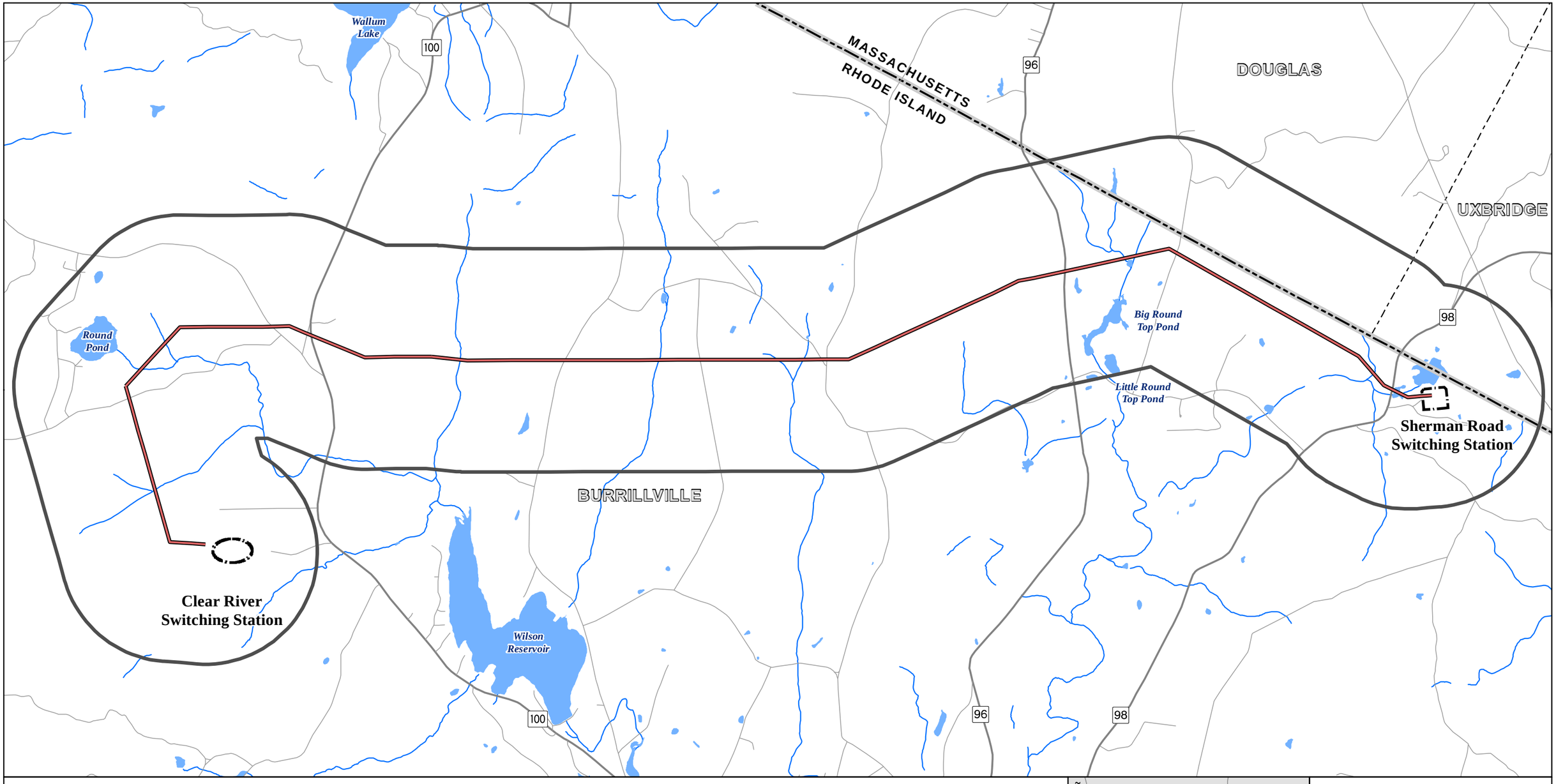
Source: 1) USGS 2011 Imagery
2) RIGIS, Roads E-911 2016
3) RIGIS National Wetlands Inventory 2015
4) RIGIS NRCS Hydric Soils 2014

Legend

- Wetland 2 100' Buffer within LOD
- Wildlife Corridor
- Wetlands
- Proposed Line of Disturbance
- Direct Impact to Jurisdictional Wetlands (2.4 Acres)
- Indirect Impact 100' Buffer of LOD (29 Acres)
- Indirect Impact 300' Buffer of LOD (68 Acres)
- Unfragmented Forest 500 Acres or More

CREC Direct and Indirect Impacts to Forest Habitat

Figure 3-3



Legend

Project Features

- Proposed Transmission Line
- 5000 Foot Study Area
- Substation Site

Transportation Features

- State Highway
- Other Road

Political Boundaries

- State Boundary
- Town Boundary

Water features

- Lake or Pond
- River or Stream

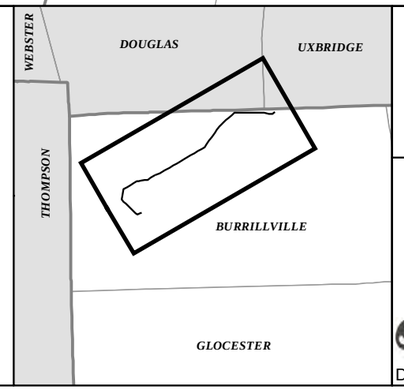


FIGURE 3-4

ROW Study Area

Burrillville Interconnection Project

0 1,000 2,000 3,000 4,000

Feet

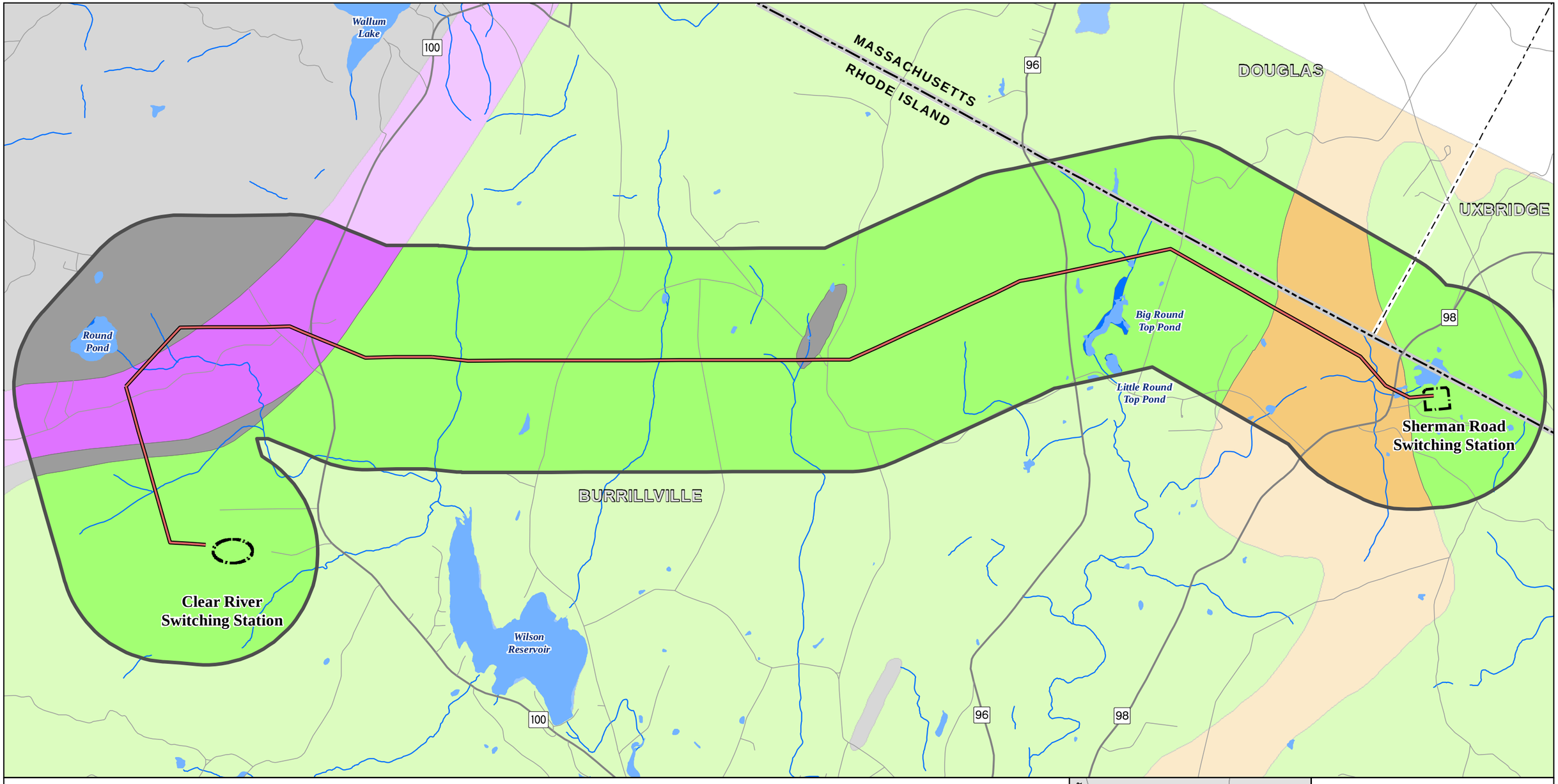
POWER ENGINEERS

Invenergy

nationalgrid

Date: 3/20/2017

Path: W:\142704_Burrillville_Interconnect_Project\DD\GIS\Apps\Fig_3_4_ROW_Study_Area.mxd



Legend

Project Features

- Proposed Transmission Line
- 5000 Foot Study Area
- Substation Site

Transportation Features

- State Highway
- Other Road

Political Boundaries

- State Boundary
- Town Boundary

Water features

- Lake or Pond
- River or Stream

Bedrock Geology

- Alaskite Gneiss
- Augen Granite Gneiss
- Granite Gneiss
- Undifferentiated Rock
- Water

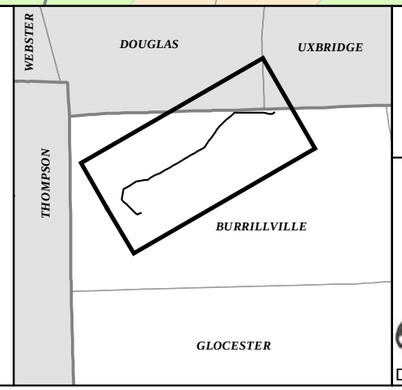


FIGURE 3-5

Bedrock Geology

Burrillville Interconnection Project

0 1,000 2,000 3,000 4,000

Feet

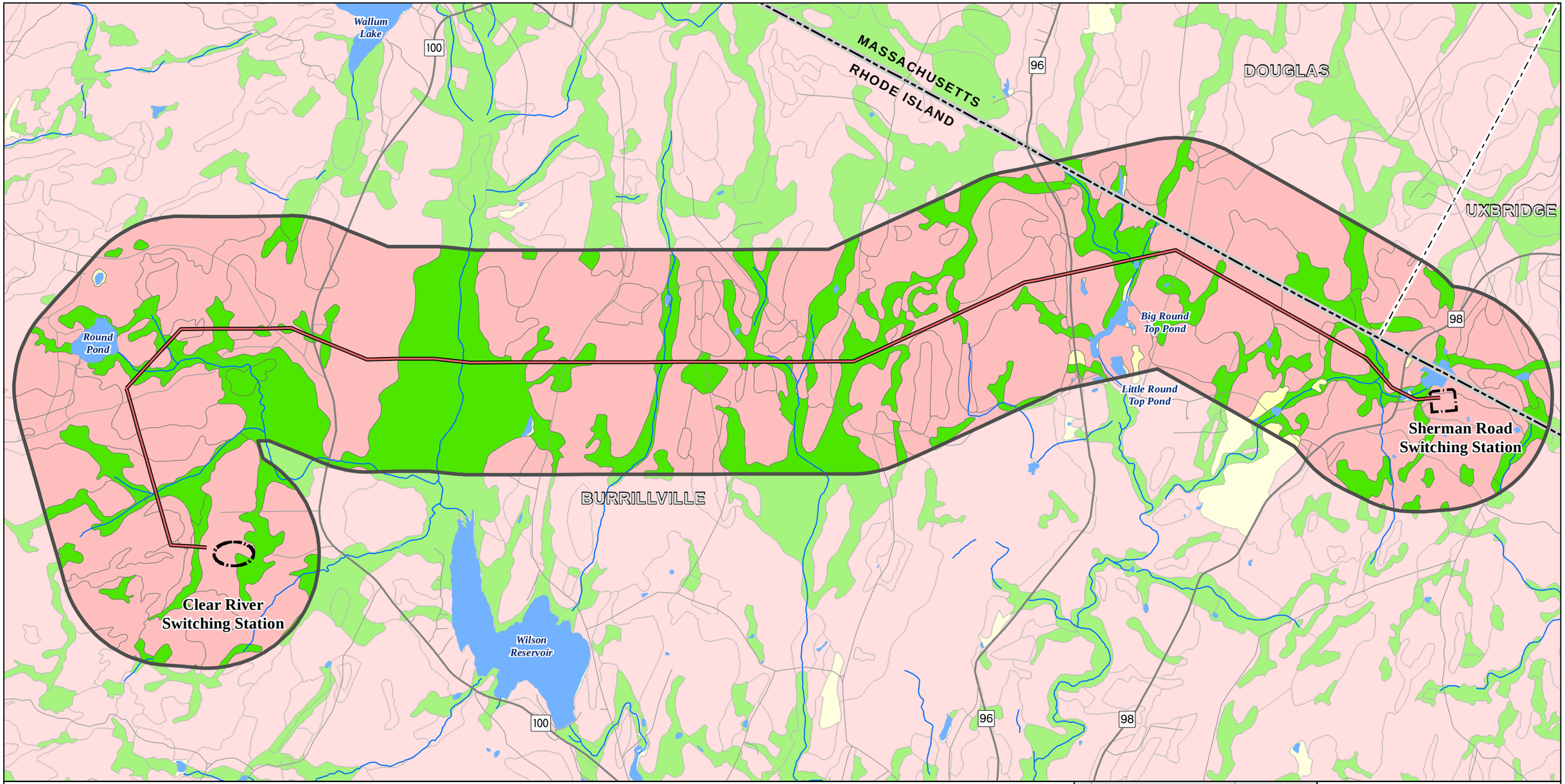
POWER ENGINEERS

Invenergy

nationalgrid

Date: 3/20/2017

Path: W:\142704_Burrillville_Interconnect_Project\DD\GIS\Apps\Fig_3_5_Bedrock_Geology.mxd



Legend

Project Features

- Proposed Transmission Line
- 5000 Foot Study Area
- Substation Site

Transportation Features

- State Highway
- Other Road

Political Boundaries

- State Boundary
- Town Boundary

Water features

- Lake or Pond
- River or Stream

Hyrdic Soil Rating

- Yes
- No
- Unknown

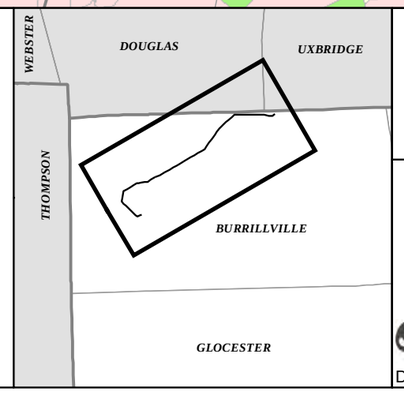


FIGURE 3-6

Soils

Burrillville Interconnection Project

0 1,000 2,000 3,000 4,000

Feet

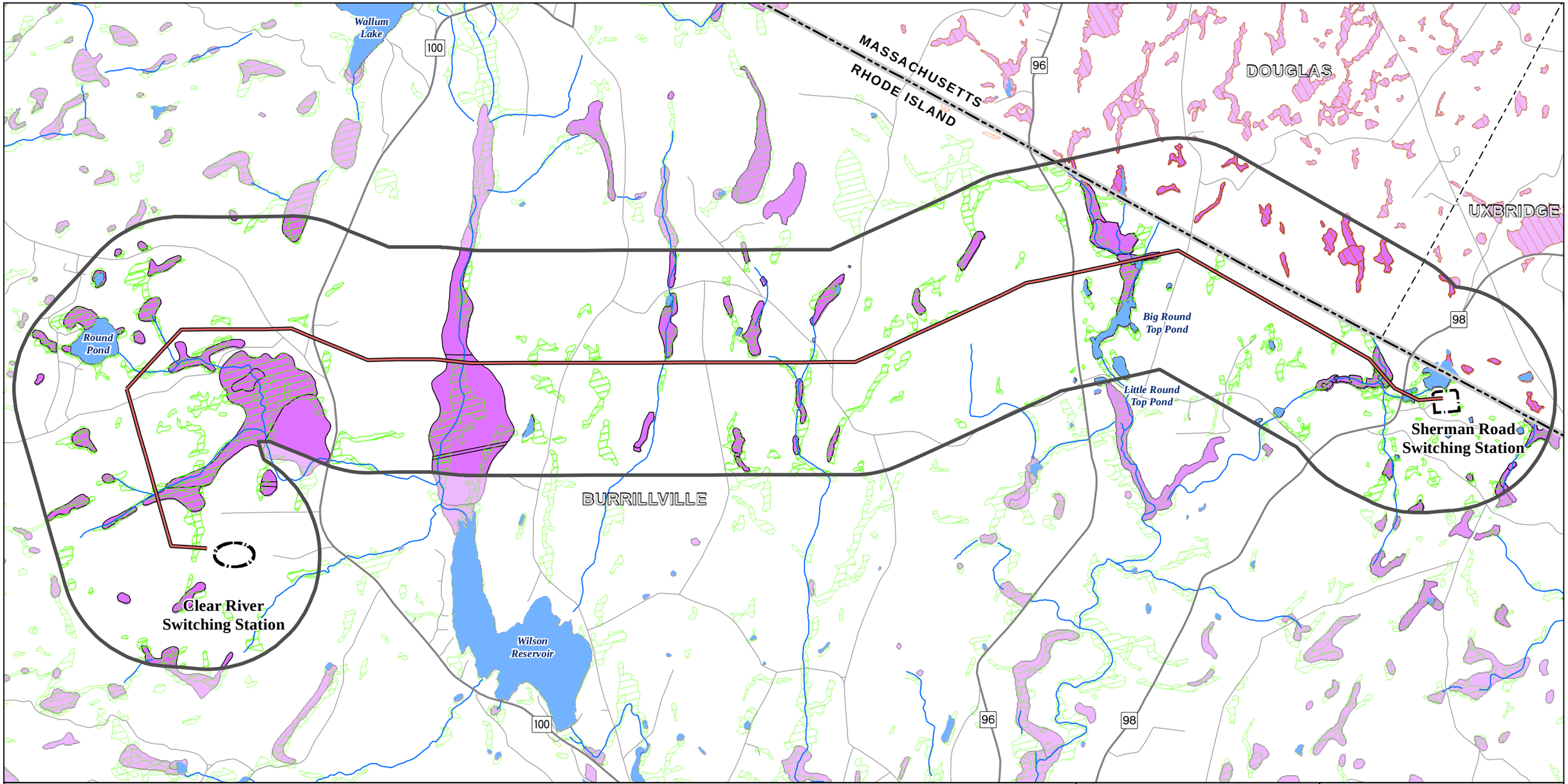
POWER ENGINEERS

Invenergy

nationalgrid

Date: 3/20/2017

Path: W:\142704_Burrillville_Interconnect_Project\DD\GIS\Apps\Fig_3_6_Soils.mxd



Legend

Project Features

- Proposed Transmission Line
- 5000 Foot Study Area
- Substation Site

Transportation Features

- State Highway
- Other Road

Political Boundaries

- State Boundary
- Town Boundary

Water features

- Lake or Pond
- River or Stream

Wetlands

- NWI Wetland Area
- RIDEM Freshwater Wetlands
- MASS DEP Wetlands

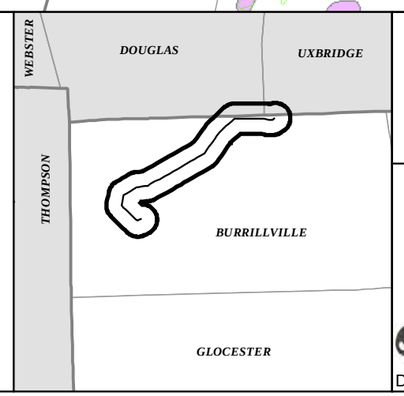


FIGURE 3-7

Wetlands Along the Transmission Line

Burrillville Interconnection Project

0 1,000 2,000 3,000 4,000

Feet

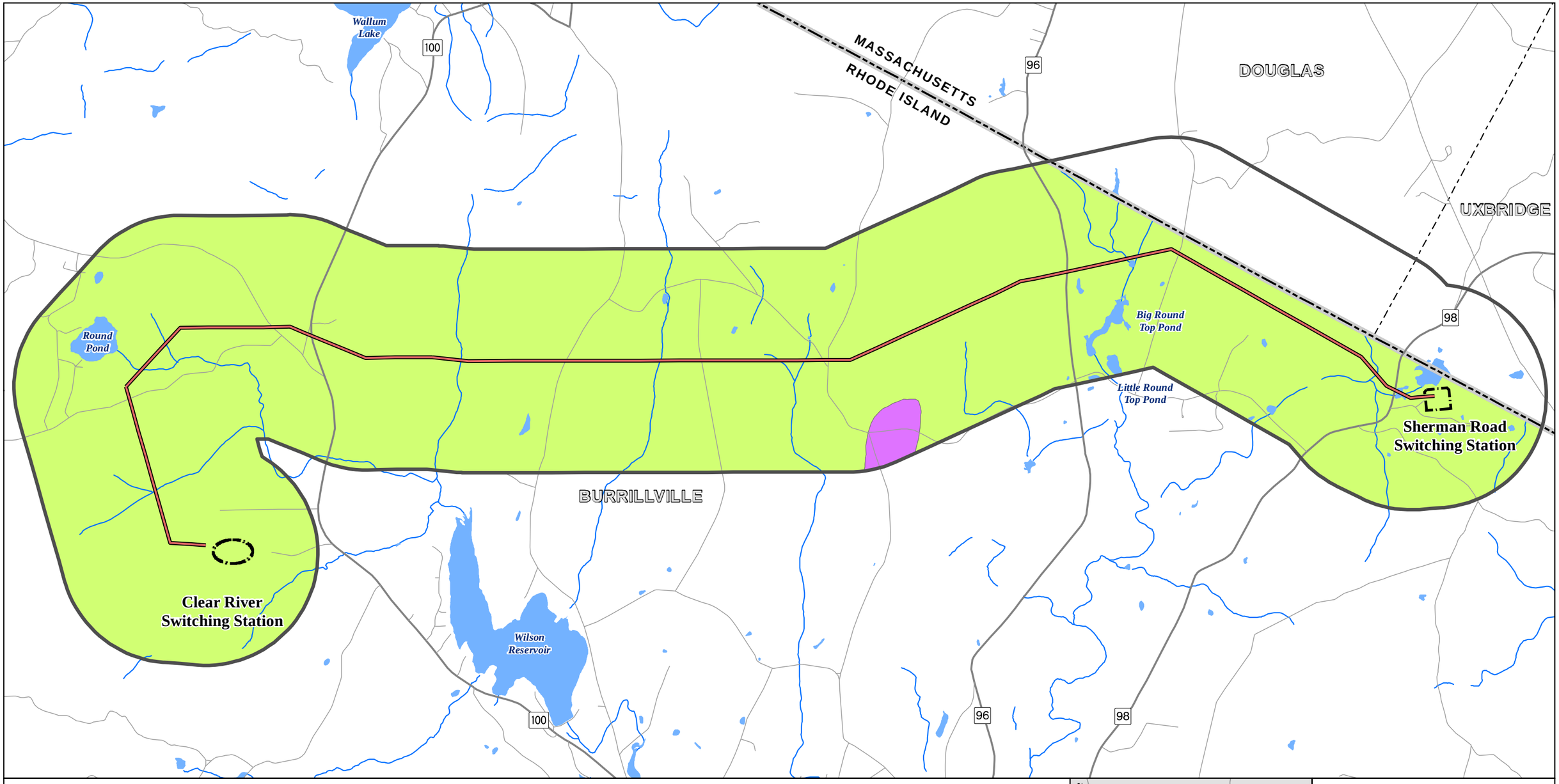
POWER ENGINEERS

Invenergy

nationalgrid

Date: 3/20/2017

Path: W:\142704_Burrillville_Interconnect_Project\DD\GIS\Apps\Fig_3_7_Wetlands_Map.mxd



Legend

Project Features

- Proposed Transmission Line
- 5000 Foot Study Area
- Substation Site

Transportation Features

- State Highway
- Other Road

Political Boundaries

- State Boundary
- Town Boundary

Water features

- Lake or Pond
- River or Stream

Groundwater Classification

- GAA
- GA

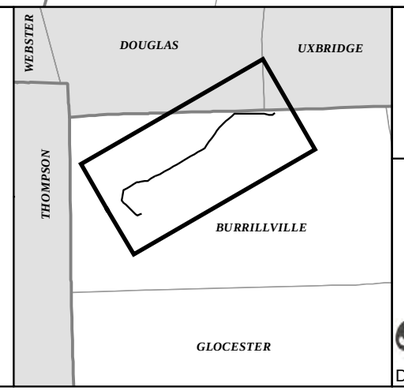


FIGURE 3-8

Groundwater Resources

Burrillville Interconnection Project

0 1,000 2,000 3,000 4,000

Feet

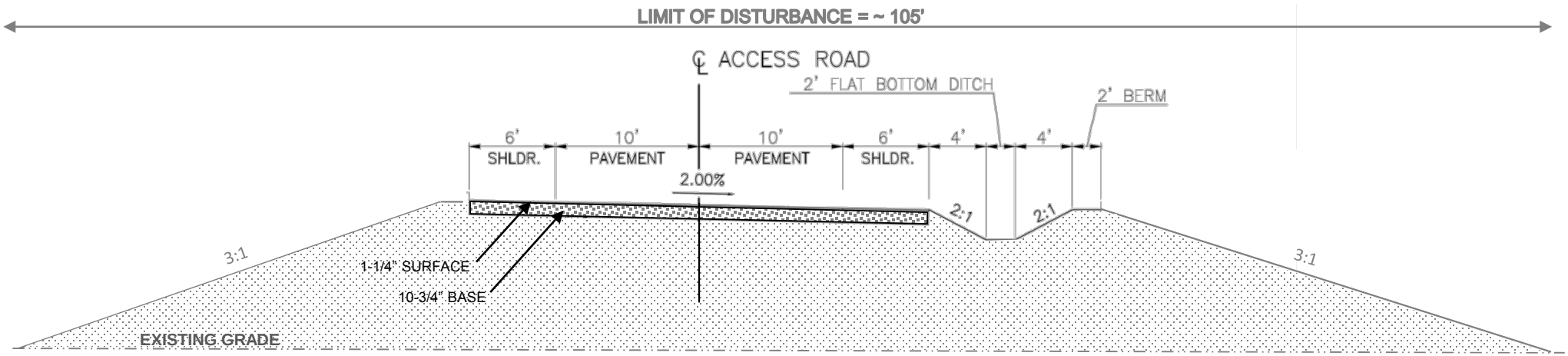
POWER ENGINEERS

Invenergy

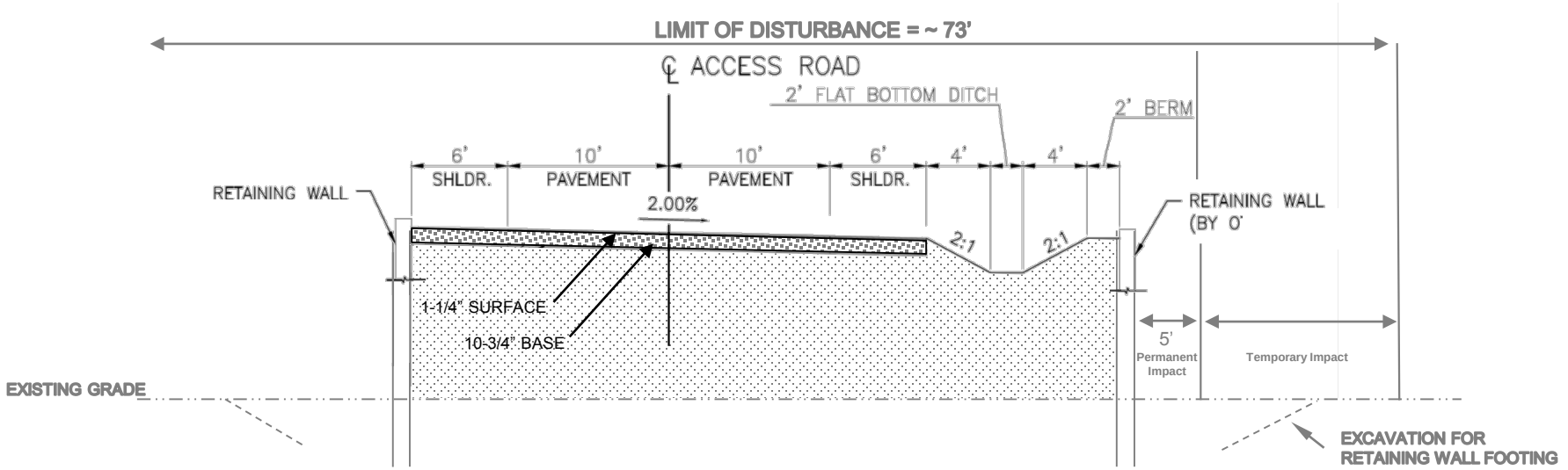
nationalgrid

Date: 3/20/2017

Path: W:\142704_Burrillville_Interconnect_Project\DD\GIS\Apps\Fig_3_8_Groundwater_Resources.mxd



ROAD WAY TYPICAL SECTION WITH 3:1 EMBANKMENT SLOPES



ROAD WAY TYPICAL SECTION WITH RETAINING WALLS

Clear River Energy Center
Town of Burriville
Providence County, Rhode Island

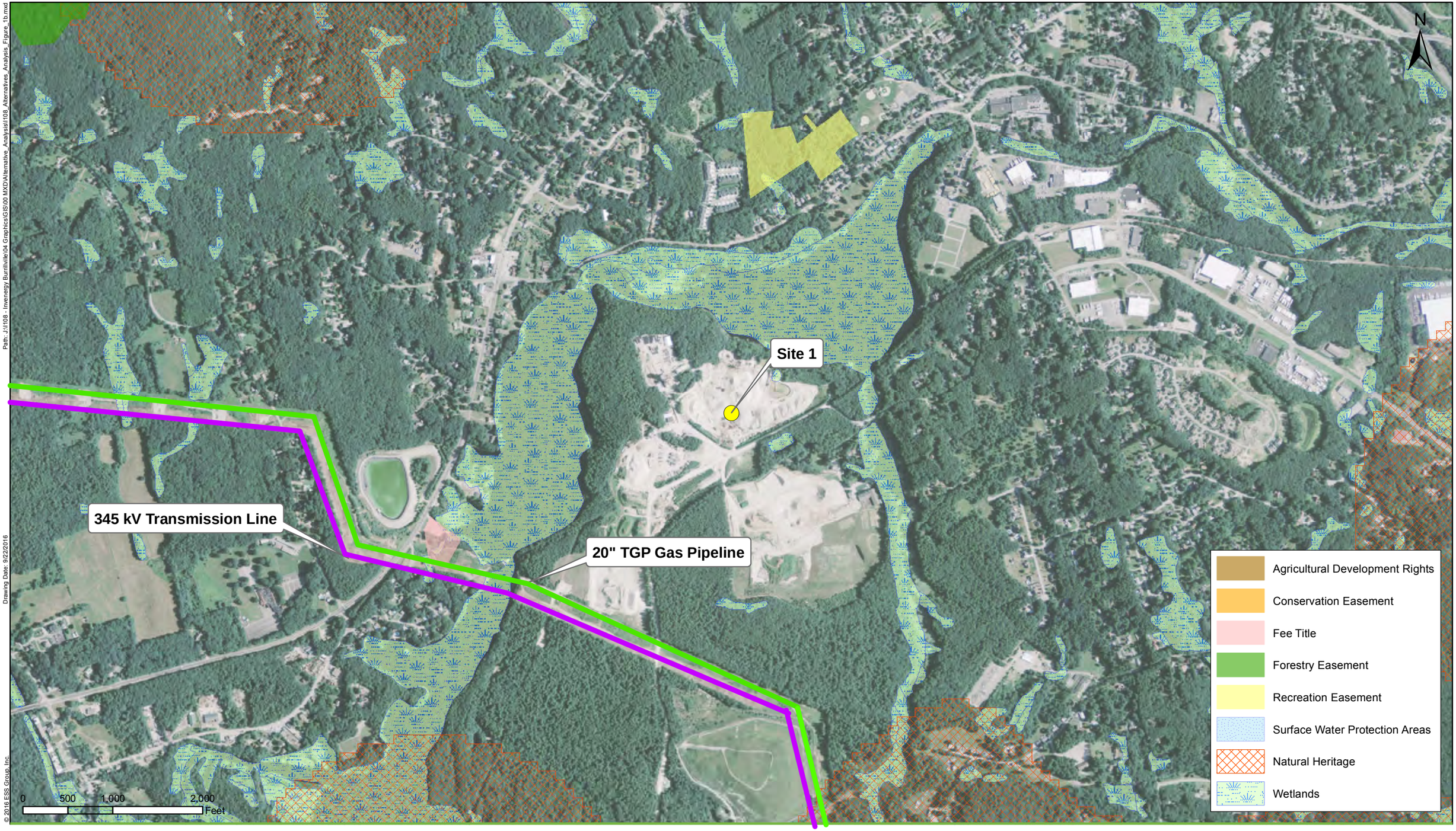
Wetland Impact Minimization Along Proposed Facility Access Roadway

Source: Adapted from HDR Stormwater Management Plan, September 2016
Approximate Scale: 1" = 10 feet (Horizontal & Vertical)

Figure 6-1

Path: J:\1108 - Invenergy Burrillville\04 Graphics\GIS\00 MXD\Alternative_Analysis\1108_Alternatives_Analysis_Figure_1b.mxd

Drawing Date: 9/22/2016



Clear River Energy, LLC
Clear River Energy Center

Burrillville, Rhode Island

1 inch = 1,000 feet

Source: 1) USGS, Ortho, 2016 2) RIGIS, Natural Heritage, 2014
3) RIGIS, Conservation Lands, 2014 4) RIGIS, Wetlands, 1993 5) RIGIS, Surface Water

Alternative Site Analysis
Site 1 - North Smithfield

Figure 6-2
Sheet 1 of 6

Path: J:\1108 - Invenergy Burrillville\04 Graphics\GIS\00 MXD\Alternative_Analysis\1108_Alternatives_Analysis_Figure_2b.mxd

345 kV Transmission Line

115kV Transmission Line

Site 2

20" TGP Gas Pipeline

BRONCOS HWY
VICTORY HWY
PROVIDENCE PKE
POUND HILL RD
TAYLOR DR
PULASKI RD
GIG RD
PINE HILL RD
OXFORD RD
OLD OXFORD RD
DOUGLAS TRNPKE
FOREST HILL DR
BLACK PLAIN RD
STONEY DR
TARKILN RD
DOUGLAS PKE
SMITH HILL RD
MATTITY RD

N

Agricultural Development Rights
Conservation Easement
Fee Title
Forestry Easement
Recreation Easement
Surface Water Protection Areas
Natural Heritage
Wetlands

0 500 1,000 2,000 Feet

Drawing Date: 9/22/2016

Clear River Energy, LLC
Clear River Energy Center

Burrillville, Rhode Island

1 inch = 1,000 feet

Source: 1) USGS, Ortho, 2016 2) RIGIS, Natural Heritage, 2014
3) RIGIS, Conservation Lands, 2014 4) RIGIS, Wetlands, 1993 5) RIGIS, Surface Water

Alternative Site Analysis
Site 2 - North Smithfield

Figure 6-2
Sheet 2 of 6

Path: J:\1108 - Invenergy Burrillville\04 Graphics\GIS\00 MXD\Alternative_Analysis\1108_Alternatives_Analysis_Figure_3b.mxd

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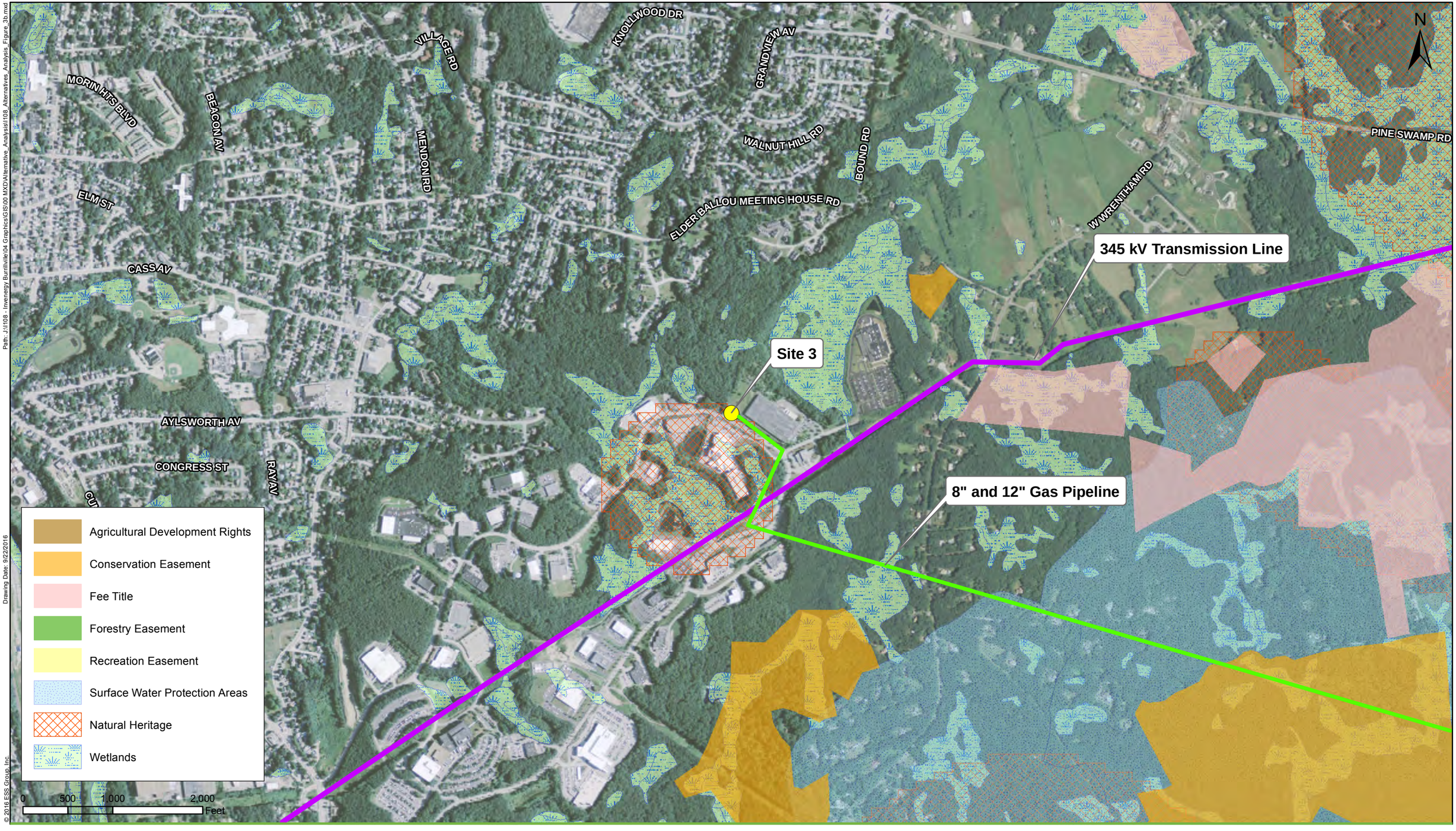


Clear River Energy, LLC
Clear River Energy Center

Burrillville, Rhode Island

1 inch = 1,000 feet

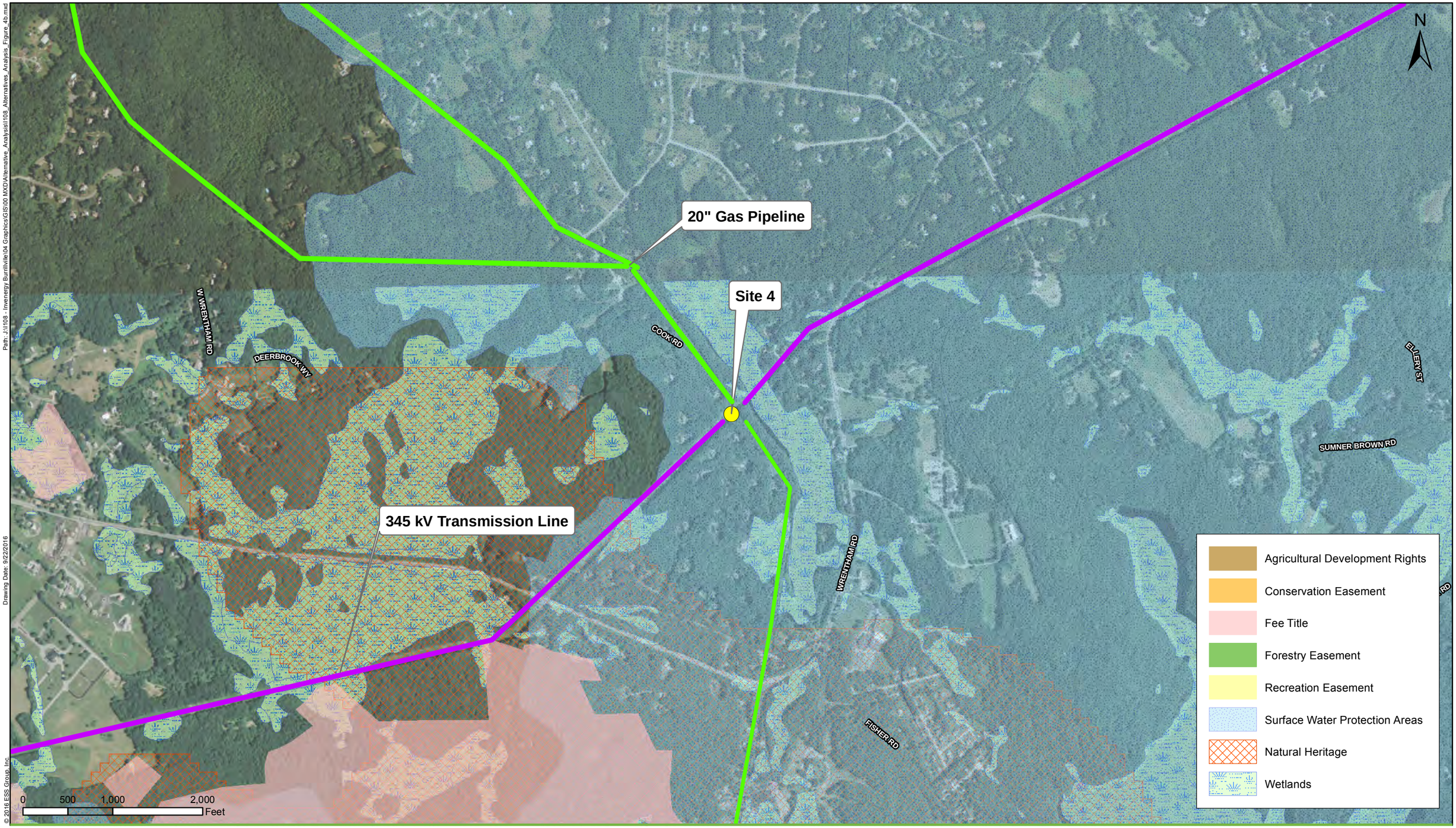
Source: 1) USGS, Ortho, 2016 2) RIGIS, Natural Heritage, 2014
3) RIGIS, Conservation Lands, 2014 4) RIGIS, Wetlands, 1993 5) RIGIS, Surface Water

Alternative Site Analysis
Site 3 - North Smithfield

Figure 6-2
Sheet 3 of 6

Path: J:\1108 - Invenergy Burrillville\04 Graphics\GIS\00 MXD\Alternative_Analysis\1108_Alternatives_Analysis_Figure_4b.mxd

Drawing Date: 9/22/2016



ess group
environmental consulting & engineering services

Clear River Energy, LLC
Clear River Energy Center

Burrillville, Rhode Island

1 inch = 1,000 feet

Source: 1) USGS, Ortho, 2016 2) RIGIS, Natural Heritage, 2014
3) RIGIS, Conservation Lands, 2014 4) RIGIS, Wetlands, 1993 5) RIGIS, Surface Water

Alternative Site Analysis
Site 4 - North Smithfield

Figure 6-2
Sheet 4 of 6

Path: J:\1108 - Invenergy Burrillville\04 Graphics\GIS\00 MXD\Alternative_Analysis\1108_Alternatives_Analysis_Figure_5b.mxd

24" and 30" Gas Pipeline

Site 5

115 kV Transmission Line

345 kV Transmission Line

N

Agricultural Preservation Restriction
Conservation Restriction
Intermediate Water Protection Area
Estimated Priority Habitat
Wetlands

0 500 1,000 2,000 Feet

Drawing Date: 9/22/2016

ess group
environmental consulting & engineering services

Clear River Energy, LLC
Clear River Energy Center

Burrillville, Rhode Island

1 inch = 1,000 feet

Source: 1) USGS, Ortho, 2016 2) MassGIS, Estimated Priority Habitats, 2014
3) MassGIS, Conservation Lands, 2016 4) MassGIS, Wetlands, 2014 5) MassDEP ,

Alternative Site Analysis
Site 5 - Uxbridge, Massachusetts

Figure 6-2
Sheet 5 of 6

Path: J:\1108 - Invenergy Burrillville\04 Graphics\GIS\00 MXD\Alternative_Analysis\1108_Alternatives_Analysis_Figure_6b.mxd

Drawing Date: 9/22/2016

ess group
environmental consulting & engineering services

Clear River Energy, LLC
Clear River Energy Center

Burrillville, Rhode Island

1 inch = 1,000 feet

Source: 1) USGS, Ortho, 2016 2) RIGIS, Natural Heritage, 2014
3) RIGIS, Conservation Lands, 2014 4) RIGIS, Wetlands, 1993 5) RIGIS, Surface Water

Alternative Site Analysis
Site 6 - Burrillville, Rhode Island

Figure 6-2
Sheet 6 of 6