7.0 COMMUNITY RESOURCES

This section includes a discussion of community resources in the Town of Killingly and the area surrounding KEC. Topics discussed include land use, zoning, and planning; traffic and transportation; visual resources and aesthetics; noise; electric and magnetic fields; cultural resources; and socioeconomics.

7.1 LAND USE, ZONING, AND PLANNING

The KEC Site is located in the Town of Killingly, Windham County, Connecticut. The Town of Killingly covers 48.3 square miles and borders the State of Rhode Island to the east; the Towns of Plainfield and Sterling to the south; the Town of Brooklyn to the west; the Town of Pomfret to the northwest; and the Town of Putnam to the north. The Towns of Pomfret and Putnam are located within 2,500 feet of the KEC Site. The following sections provide a: description of existing KEC Site land uses; a discussion of the land use character of its immediate surroundings; identification of recreational resources proximate to the KEC Site; a description of existing planning and zoning characteristics of the KEC Site and surroundings; and a discussion of consistency with local land use requirements.

7.1.1 KEC Site Existing Land Use

The approximately 73-acre KEC Site is largely undeveloped. One two-story house is located in the southeast corner of the Generating Facility Site. The balance of the Generating Facility Site consists of undeveloped woodland, a man-made pond, wetlands, and bedrock outcrops near the center of the parcel. Lake Road, a road that serves both industries to the east and residences to the west, runs between the Generating Facility Site and the Switchyard Site. The Switchyard Site is also predominantly wooded. In the northerly portion of the Switchyard Site is an open field, a dilapidated barn and several outbuildings and stone walls, a remnant foundation, and a small family cemetery.

7.1.2 Existing Land Use Surrounding the KEC Site

The KEC Site is located within an area of the Town of Killingly characterized by a mix of industrial development in the Killingly Industrial Park, as well as rural residential and lakefront residential uses. Figure 7-1 illustrates land uses within 1 mile of the KEC Site. Land uses bordering the Generating Facility Site are the Eversource electric transmission ROW to the east; the Quinebaug River to the north and west; woodlands and large lot residences to the southwest; and Lake Road to the southeast. The nearest residence is located approximately 260 feet to the west of KEC's proposed operating equipment (set back off of Lake Road).

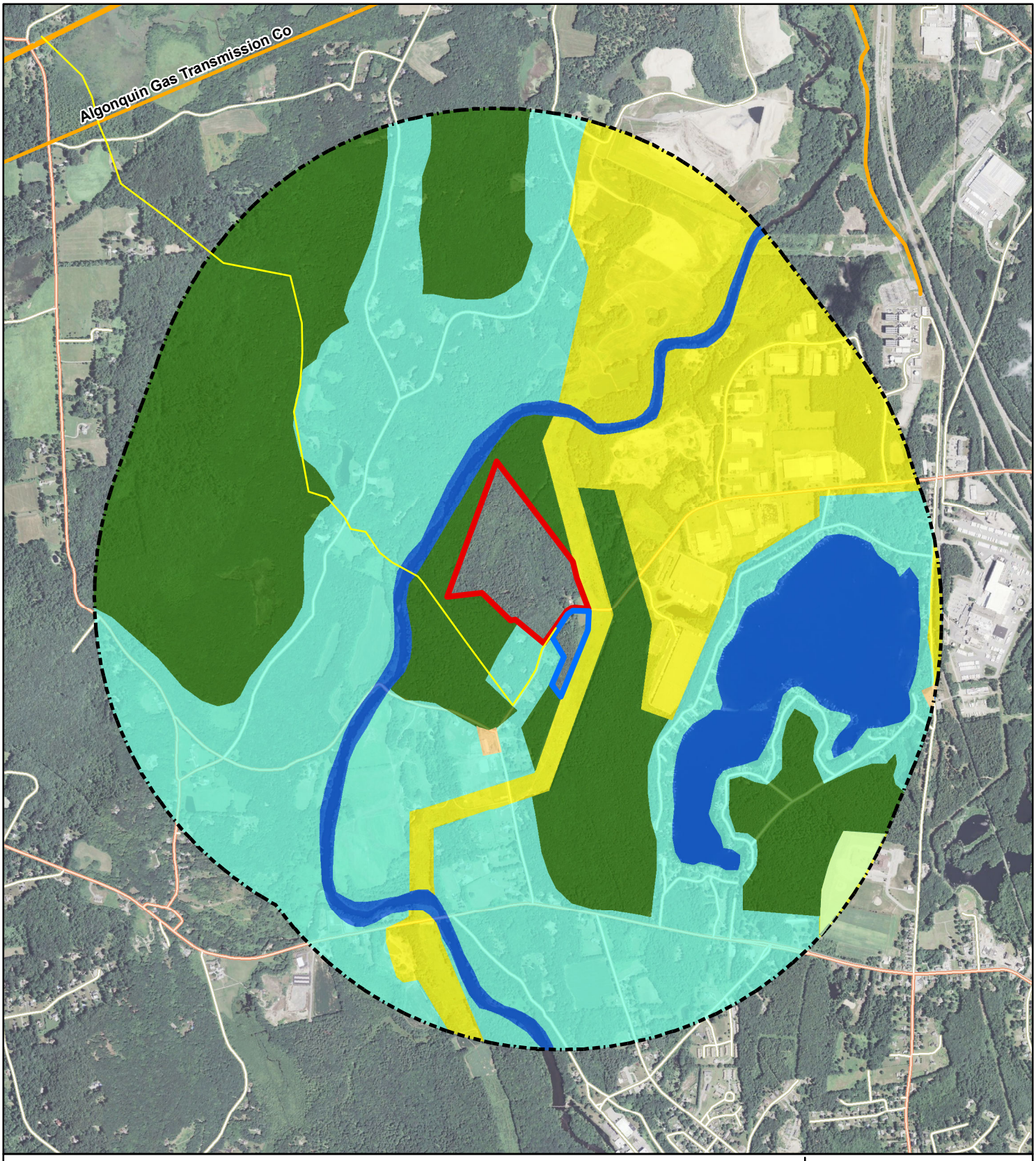

Figure 7-1
Land Use within 1 Mile

Killingly Energy Center
an NTE Energy Project

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Lake Road extends from the intersection of State Route 101 to the south of the KEC Site generally in a northeasterly direction through the Killingly Industrial Park. At its intersection with Upper Maple Street, Lake Road becomes Attawaugan Crossing Road and continues for approximately 0.14 mile to its intersection with the I-395 southbound ramps. Significant industrial development in the Killingly Industrial Park exists north and south of Lake Road and along the northerly portion of Upper Maple Street. Industries within the Killingly Industrial Park and in other areas proximate to the KEC Site include (Figure 2-3):

- The Lake Road Generating Facility, an approximately 800-MW combined cycle electric generating facility with three units located on 56 acres at 56 Alexander Parkway, approximately 1 mile northeast of the KEC Site;
- Frito-Lay, a 460,000 square foot manufacturing facility on 79 acres at 1886 Upper Maple Street;
- United Natural Foods (UNFI and Ryder Integrated Logistics), a 442,000 square foot manufacturing and warehouse facility on 31 acres at 260 and 300 Lake Road;
- Rite Aid Distribution Center, a 460,000 square foot distribution warehouse facility on 32 acres at 30 Forbes Road;
- Symbol Mattress of New England, a 73,600 square foot manufacturing facility on 7.8 acres at 312 Lake Road;
- US Cosmetics Corporation, a 118,000 square foot manufacturing and warehouse facility on 11 acres off Lake Road and Louisa Viens Drive;
- Northeast Foods (Automatic Rolls of New England), a 75,000 square foot manufacturing facility on 8 acres at 328 Lake Road;
- DAC ONE/DAC TWO Real Estate, a 20,000 square foot manufacturing and warehouse facility on 2.3 acres at 329 Lake Road;
- Lake Road Holdings (Superwinch), a 220,000 square foot manufacturing and warehouse facility on 21 acres at 349 Lake Road;
- Jayball Inc., a 6,500 square foot multi-use storage facility on 6 acres at 394 Lake Road;
- Spirol International, a 11,000 square foot manufacturing and warehouse facility on 5 acres at 429 Lake Road;
- Ferron Realty (Web Industries), a 10,000 square foot manufacturing and warehouse facility on 2 acres at 154 Louisa Viens Drive;

- MSI Realty, a 35,000 square foot warehouse facility on 3 acres at 140 Louisa Viens Drive;
- Pepsi-Cola, a 25,000 square foot warehouse facility on 5 acres at 135 Louisa Viens Drive;
- Dandeneau Properties, a 40,000 square foot manufacturing facility on 3.5 acres at 130 Louisa Viens Drive;
- P&R Holdings, a 11,000 square foot warehouse facility on 3 acres at 61 Louisa Viens Drive;
- Bollore Inc., a 75,000 square foot manufacturing facility on 7 acres at 60 Louisa Viens Drive;
- Dandeneau Properties (Putnam Plastics), a 94,000 square foot manufacturing facility on 9 acres at 40 Louisa Viens Drive; and
- Robert Fulton & Carl Rubin (Web Industries), a 41,000 square foot manufacturing facility on 4 acres at 20 Louisa Viens Drive.

In total, the northwest Killingly industrial area maintains more than 2.2 million square feet of industrial, manufacturing and warehouse development.

Outside of this industrial area, the area immediately surrounding the KEC Site is less developed and more rural in character. A considerable amount of forested land exists within the KEC Site's surroundings, with a dense mixture of evergreen and deciduous trees.

Alexander Lake, is located 0.5 mile east of the KEC Site (beyond the United Natural Food Warehouse facility and Rite Aid Distribution Center). The Alexander Lake shore-front is developed with both seasonal and year-round residences. The Quinebaug River is located north and west of the KEC Site. The Dunn Preserve, a 32-acre forested parcel of conservation land owned by the Wyndham Land Trust (Wyndham Land Trust 2016) lies along the eastern bank of the Quinebaug River, to the northwest of the Generating Facility Site. Access to the Dunn Preserve is via a 0.4-mile unpaved road that extends from Lake Road along the western boundary of the Generating Facility Site.

Portions of three municipalities are encompassed within the 1-mile radius; the KEC Site lies within the Town of Killingly, which is located south and east of the Quinebaug River, the Town of Pomfret is located north and west of the Quinebaug River, northwest of the KEC Site; and the Town of Putnam is located east of the Quinebaug River, northeast of the KEC Site. As previously noted, land use in the Town of Killingly transitions from the industrial development in the northwest corner, near the KEC Site, to a more open landscape in the south and east. Commercial and residential development increases along the major roadways, with the majority of the town characterized by dense forest and scattered residences. In the Town of Pomfret, residential density decreases, with a greater percentage of open fields and woodlands.

The Town of Putnam is also characterized by scattered residences and woodlands, although portions to the east have industries associated with existing and former mining and other industrial operations.

7.1.3 Recreational Resources

Adjacent to and northwest of the Generating Facility Site is the 32-acre Dunn Preserve owned and maintained by the Wyndham Land Trust. The Dunn Preserve extends for approximately 2,000 feet along the eastern bank of the Quinebaug River. Pedestrian access to the preserve extends from Lake Road, along the southwestern boundary of the Generating Facility Site. The Dunn Preserve is open to the public, although no formal trails extend through this area and limited parking is available.

The Quinebaug River, a 69-mile long river that originates from East Brimfield Lake in Massachusetts, flows south into the Shetucket River in northeast of Norwich, Connecticut. Portions of the Quinebaug River are designated as a National Recreational Trail by the National Park Service. This designation requires suitable boating access points, as well as places ashore for camping and picnicking. No such boating access points or campgrounds are proximate to the KEC Site. In the vicinity of KEC, the Quinebaug River is approximately 170 feet wide and lined with tall, dense vegetation.

The entire KEC Site and surrounding area is located within the Quinebaug and Shetucket Rivers Valley National Heritage Corridor, also called the Last Green Valley. This National Heritage Corridor was established by the National Park Service, under Public Act 09-221, in 1994, and encompasses 35 municipalities (26 in Connecticut, including the Town of Killingly) and approximately 595,000 acres of land in northeastern Connecticut and south-central Massachusetts. The Last Green Valley was designated to preserve the region's cultural, historical, and natural heritage. State parks associated with the Last Green Valley located in the Town of Killingly are the Killingly Pond State Park Preserve, the Old Furnance State Park, and the Quinebaug Lake State Park Scenic Reserve; however, all are located more than 5 miles from the KEC Site.

The Airline North State Park Trail, located approximately 1.3 miles north of the KEC Site, is a recreational component of the Last Green Valley. This 50-mile, multi-use rail-trail and linear state park is located on the historic Airline Railroad. This trail was declared a national recreational trail in 2001.

The Natchaug State Forest is located in the Town of Pomfret (approximately 0.4 mile west of the KEC Site) and in the Town of Putnam (approximately 1.4 miles northeast of the KEC Site). Several other public and private recreational resources located within 5 miles of the proposed KEC Site include:

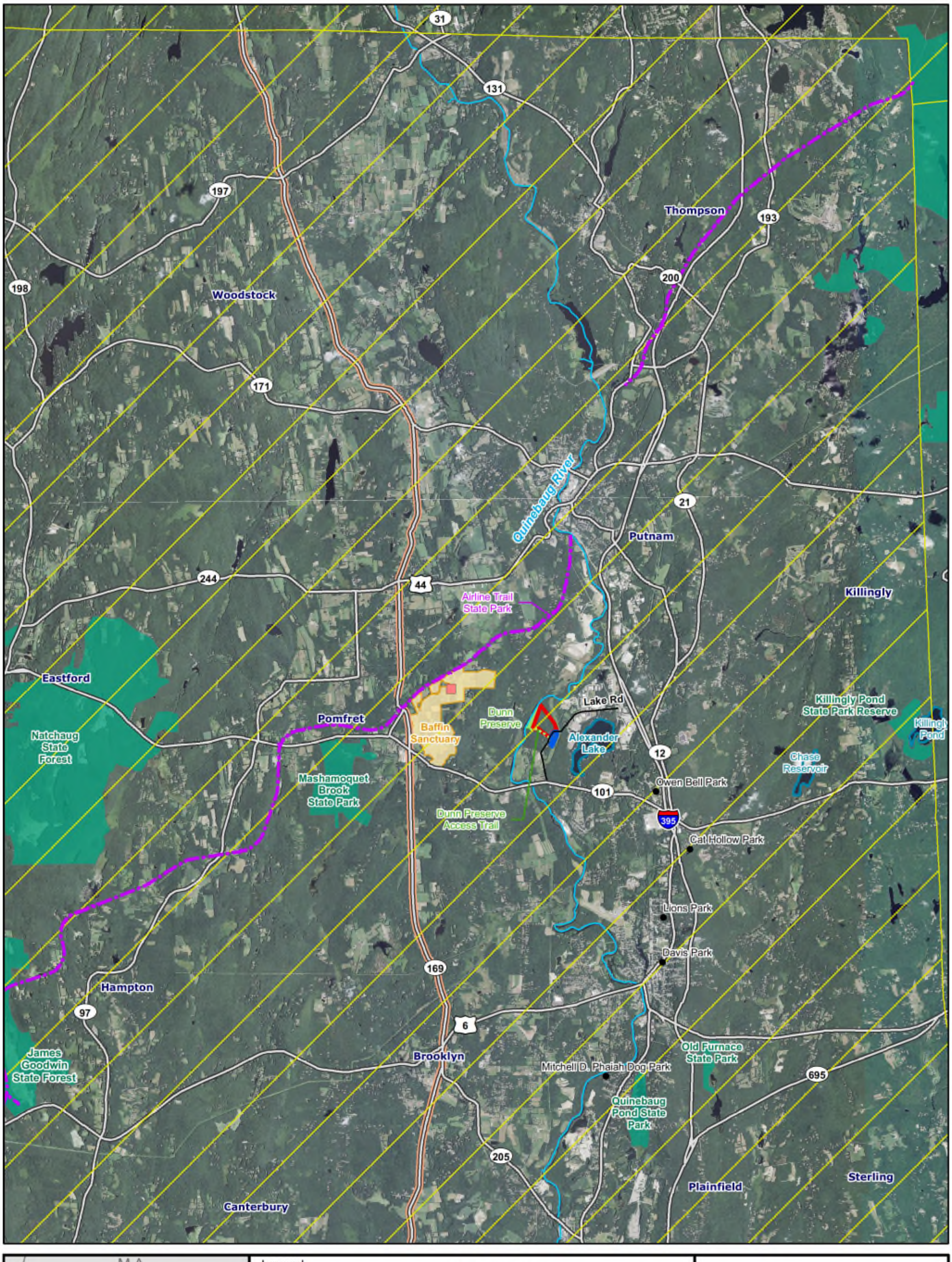
- Alexander Lake, an approximately 190-acre private lake located in the northwestern corner of Killingly, Connecticut, is utilized by private residents for swimming, boating and fishing. Residential development exists along the vast majority of the shoreline, with a private beach on the lake's

eastern shore. The use of kayaks, canoes, sail boats, restricted motor boats, and jet skis are permitted. No public access is available.

- The 702-acre Bafflin Sanctuary, located in Pomfret, Connecticut approximately 1 mile northwest of the KEC Site, was historically a working dairy farm, and is now designated an Important Bird Area, and contains beaver ponds, grasslands, a hemlock ravine, and walking trails. The Bafflin Sanctuary is also the location of the Connecticut Audubon Society Center at Pomfret, which offers year-round events and activities for all ages.
- Chase Reservoir is a 365-acre nature preserve located in East Killingly, approximately 4 miles east of the KEC Site. The preserve is open to the public for hiking, fishing (from non-motorized boats), kayaking, and canoeing; however, hunting and swimming are prohibited.
- Mashamoquet Brook State Park is a 900-acre, publicly owned recreational area located in the Town of Pomfret, approximately 2.6 miles west of the KEC Site. The park offers facilities for camping, swimming, fishing, and picnicking. Notable features include the Wolf Den national historic site, the Brayton Grist Mill, and the Table Rock and Indian Chair natural stone formations.
- Approximately 32 miles (from Rocky Hollow Road in Lisbon to the Massachusetts border in Woodstock) of State Route 169 have been designated as a Scenic Byway primarily for its scenic qualities as a winding country road, lined with stone walls and vistas of farmland and quintessential New England villages. This roadway, which generally runs north-south, is located 2 miles west of the KEC Site.

Additional Town of Killingly parks include: Owen Bell Park; Davis Park; Danielson Lions Park; Cat Hollow; and Mitchell D. Phaiah Dog Park. The closest of these to the KEC Site is the Owen Bell Park, located approximately 1.8 miles to the southeast. This park includes a track and trails for running and walking, playground equipment, basketball and tennis courts, a skateboard park, ball fields, and picnic areas.

Locations of these recreational areas are shown on Figure 7-2. Due to intervening distance and the characteristics of KEC, no impact from KEC is anticipated on any of these recreational resources.



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7.1.4 Planning and Zoning

KEC, an electric generating facility, is proposed on property intended for future industrial economic development within the Town of Killingly, although the KEC Site is currently zoned within a Rural Development District (Figure 7-3). The following sections describe existing zoning on the KEC Site and immediate surroundings, as well as the community's plan for economic development in this area.

7.1.4.1 Killingly Plan of Conservation and Development

The Killingly Plan of Conservation and Development (the Plan) was adopted in 2010 as a guide to the Town's decisions regarding land use planning and growth management over the following decade. The Plan outlines goals and objectives for future land use, the provision of public facilities and services, environmental protection, economic development and land conservation to provide a healthy environment, thriving economy, and high quality of life for residents.

The Plan acknowledges the important role the Killingly Industrial Park has played in creating jobs and revenues for the Town. The Future Land Use map (Figure 7-4) indicates the town's intent to expand this industrial area to encompass the land on which KEC is proposed. This expressed intention to designate the Generating Facility Site for industrial development, was one of several factors that lead to selection of this location for KEC.

7.1.4.2 Existing Zoning Classifications

Existing zoning classifications within one mile of the KEC Site are shown on Figure 7-3. The KEC Site is located in a Rural Development district, in which permitted uses include low-density residential development, agriculture, and specified non-intensive uses.

North of the KEC Site, on the other side of the Quinebaug River in the Town of Pomfret, is the Rural Residential District. Industrial zones are located approximately 0.1 mile east and 0.5 mile northeast of the KEC Site. A Residential zone exists along the perimeter of Alexander Lake, approximately 0.5 miles east of the KEC Site.

Special permits allow for broader uses in the Rural Development zone. A number of dimensional requirements are established in this zone, as well as the requirement for plan review of activities on slopes of 15% or greater and for review by the Killingly Inland Wetlands & Watercourses Commission if activities are proposed within 200 feet of a designated wetland or watercourse. Dimensional requirements for the Rural Development zone are shown in Table 7-1, with dimensional requirement for the Industrial zone shown in Table 7-2.

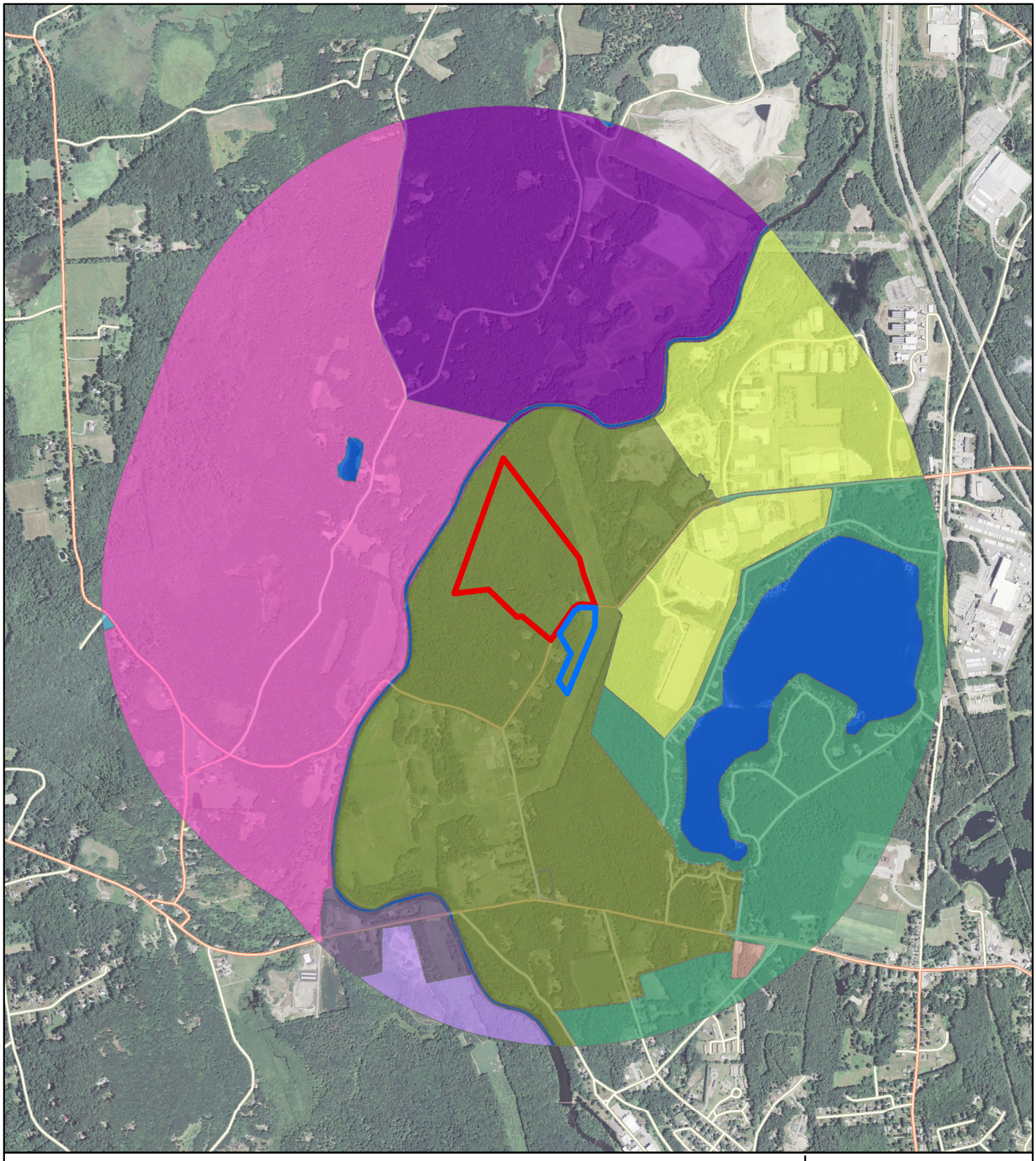

Figure 7-3
Zoning Classifications within 1 Mile

Killingly Energy Center
an NTE Energy Project

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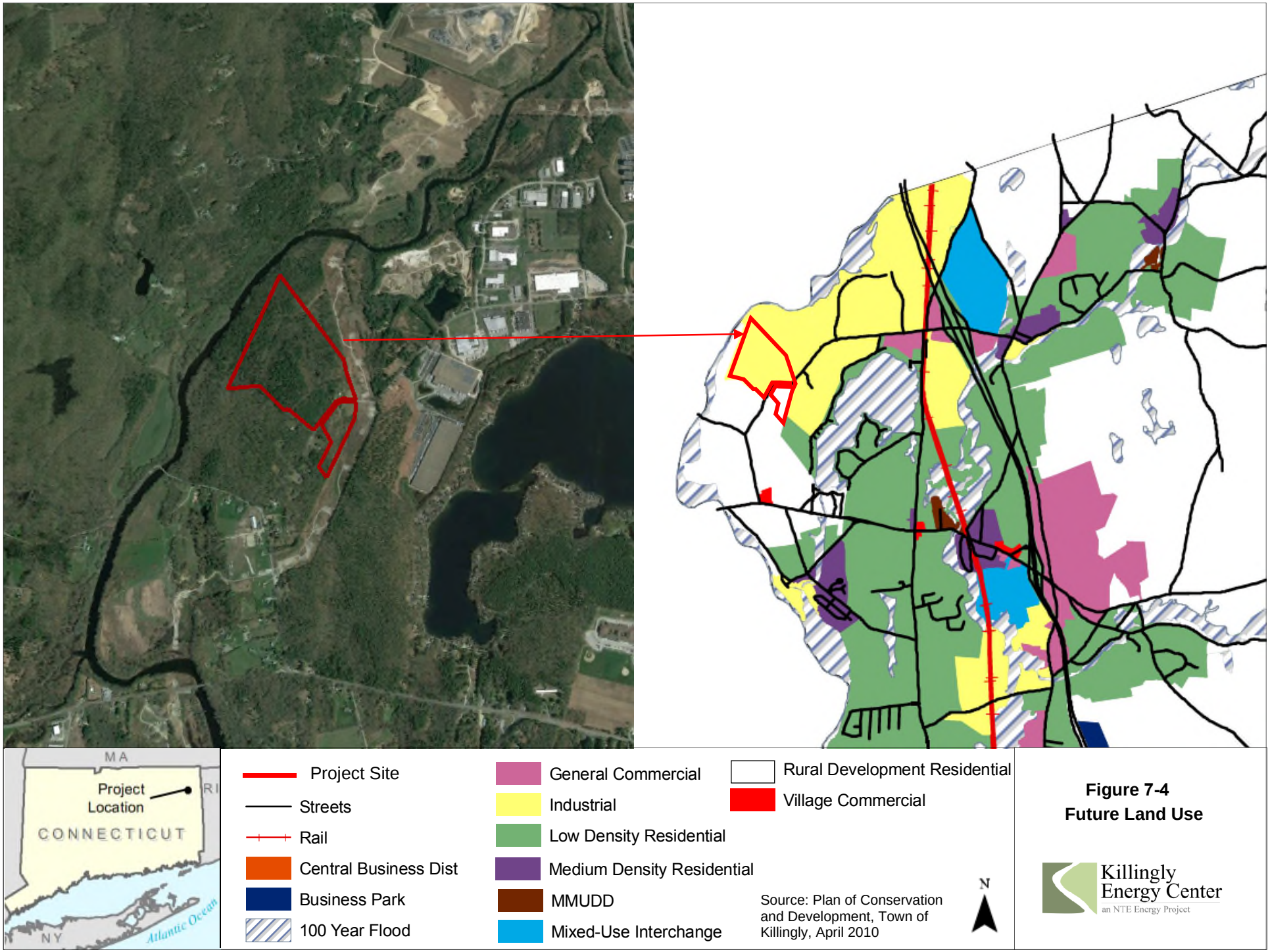


Figure 7-4
Future Land Use

Killingly Energy Center
an NTE Energy Project

Source: Killingly Future Land Use map 4/26/10

Table 7-1: Dimensional Requirements in Killingly's Rural Development Zone

Dimension	Required Distance or Size	KEC Consistency
Minimum Lot Area	80,000 square feet (160,000 square feet for interior lots)	Yes
Minimum Lot Frontage	250 feet	Yes
Minimum Setback from Street Line	75 feet	Yes
Minimum Setback from Side Line	25 feet	Yes
Minimum Setback from Rear Line	30 feet	Yes
Maximum Height of Structure	35 feet	No
Maximum Height of Accessory Structure	65 feet	No
Maximum Lot Coverage	15%	Yes

Table 7-2: Dimensional Requirements in Killingly's Industrial Zone

Dimension	Required Distance or Size	KEC Consistency
Minimum Lot Area	50,000 square feet	Yes
Minimum Lot Frontage	150 feet	Yes
Minimum Setback from Street Line	50 feet	Yes
Minimum Setback from Side Line	25 feet	Yes
Minimum Setback from Rear Line	30 feet	Yes
Maximum Height of Structure	50 feet	No
Maximum Height of Accessory Structure	Taller heights allowed by Special Permit	NA
Maximum Lot Coverage	70%	Yes

Zoning within the Town of Putnam is classified as Agricultural District (AG2) most immediately proximate to the KEC Site, with industrially zoned property within the 1-mile radius, proximate to I-395. In the Town

of Putnam, AG2 designations are primarily rural areas not served by public water and sewer that are characterized by low-density residential development, agricultural, and certain low intensity non-residential activities. In the vicinity of the KEC Site, this area is wooded, but also includes landfill and mining areas. Putnam's Industrial District is intended to provide for orderly development of manufacturing, assembling, warehousing, and other industrial facilities in accordance with the town's Plan of Conservation and Development.

Where the Town of Pomfret is within 2,500 feet of the KEC Site, its zoning classification is predominantly Rural Residential. A small area of Commercial Village/Commercial Business is located on the town border further south.

7.1.5 Consistency with Existing Land Use and Local Requirements

7.1.5.1 Land Use Compatibility

KEC is proposed to be located along Lake Road, immediately west of the Killingly Industrial Park and other industrial development in the area. Although other non-industrial land uses exist in the area, KEC is a land use consistent with planned and existing industrial uses immediately proximate. By maintaining an adequate buffer around the KEC Site and meeting all federal and state standards associated with environmental controls, KEC will be compatible with surrounding land uses.

7.1.5.2 Zoning and Planning Consistency

KEC is not consistent with the current zoning designation, but aligns with the future land use planning goals and objectives of the Town of Killingly. The Plan identifies economic viability as critical to protecting the character of the community and the quality of life throughout the town. The Killingly Industrial Park has successfully provided jobs (Killingly's website notes that more than 3,200 employees work in the Killingly Industrial Park) and significant tax revenue for the town. The Plan states that the Town is actively exploring expansion of the Killingly Industrial Park to encourage similar industrial development in the future. KEC is pleased to be in a position to help the Town of Killingly meet this goal.

7.1.5.3 Consistency with Local Requirements

As shown in Tables 7-1 and 7-2, all dimensional requirements associated with the Rural Development and Industrial zones can be met by KEC, with the exception of those relating to structure height. Within the existing Rural Development zone, structure heights are restricted to 35 feet (65 feet allowed for accessory uses), and within the Industrial zone planned for the KEC Site, maximum specified height is 50 feet, with special permit authorization allowed for heights necessary for the efficient operation of the proposed industry as long as it does not significantly interfere with present or reasonably anticipated uses of other

property. The heights required for KEC structures taller than 50 feet relate to its functional design and requirements, and would be expected to be allowed under special permit.

7.1.5.4 Consistency with Municipal Regulate and Restrict Orders

NTE has shared information about KEC with the local community and officials throughout the early stages of development, and supplied a formal Technical Report to the municipalities of Killingly, Putnam, and Pomfret on May 4, 2016. NTE and others representing KEC participated in a joint special meeting of the Killingly Planning & Zoning Commission and Inland Wetlands & Watercourses Commission on July 19, 2016 to provide information on KEC and discuss various technical analyses prepared for the CSC Application. Information-sharing with the Commissions will continue throughout the 65-day project review period and beyond, as necessary, following submission of the Application to further assist with the town's development of its comments and recommendations.

7.2 TRAFFIC AND TRANSPORTATION

This section addresses transportation issues. Vehicular traffic is discussed, including KEC's effect on roadway operation, potential evacuation routes, traffic safety, and a fuel spill risk assessment. In addition, airport proximity (including FAA affirmation that the tallest structure will not require marking or lighting) and railroad infrastructure proximate to the KEC Site are addressed.

7.2.1 Traffic Assessment

7.2.1.1 Operational Impact to Local Roadways

A traffic impact study was conducted to estimate the amount of traffic that will be generated by KEC and determine its impact on the adjacent roadway network (Appendix I).

The KEC Site is located on the north and south side of Lake Road, approximately 1.25 miles west of I-395 and approximately 0.85 mile north of Hartford Turnpike (Route 101). Lake Road originates south of the KEC Site at an unsignalized intersection with Route 101 and extends in a generally northeasterly direction for approximately 2 miles before taking on the name of Attawaugan Crossing Road. An "S" curve occurs in Lake Road just east of the KEC Site. Lake Road passes through the Killingly Industrial Park, with uses that accommodate a high volume of tractor trailer traffic, including the Rite Aid Distribution Center, located adjacent to the east of the KEC Site, and the United Natural Food Inc. Warehouse, immediately north of the Rite Aid facility, the Northeast Food Inc. facility, and others described in Section 7.1.2. Lake Road/Attawaugan Crossing Road has a northbound and southbound interchange with I-395. There is a

sign that currently restricts "through truck traffic" along Lake Road south and west of the Rite Aid Distribution facility.

The Connecticut Department of Transportation (ConnDOT) maintains a continuous count program of traffic volumes on state highways and many local roadways. A count on Lake Road, north of Route 101, conducted in October 2013, indicated an average daily traffic of 1,700 vehicles with a morning peak hour volume of 150 vehicles (7:00 a.m.) and an afternoon peak hour volume of 174 vehicles (4:00 p.m.). An automated traffic volume counter, installed on Lake Road at the location of the proposed KEC driveway for a 48-hour period in May 2016, indicated an average daily traffic of 2,048 vehicles with a morning peak of 199 vehicles (6:00 a.m.) and an afternoon peak hour volume of 209 vehicles (3:00 p.m.). Existing traffic level of service operations were evaluated at the following intersections:

- Attawaugan Crossing Road at the I-395 Northbound Ramps
- Attawaugan Crossing Road at the I-395 Southbound Ramps
- Attawaugan Crossing Road/Lake Road at Upper Maple Street
- Attawaugan Crossing Road/Lake Road at Tracy Road/Old Trolley Road and the Frito Lay Driveway
- Lake Road at North Shore Road
- Route 101 (Hartford Turnpike) at Lake Road
- Lake Road at the proposed Generating Facility Site driveway

As shown in Table 7-3, existing levels of service range from A (defined as low traffic density with minimal delays) to C (defined as intermittent delays with occasional backups). These reflect acceptable traffic operations in terms of wait times and queue length.

Table 7-3: Existing and Peak Construction Levels of Service

Intersection Evaluated	Direction	Background Level of Service (2019)		Peak Construction Level of Service (2019)	
		AM	PM	AM	PM
Attawaugan Crossing Road at the I-395 Northbound Ramps	NB	B	B	B	B
	EB (left/through)	A/A	A/A	A/A	A/A
	WB	B	B	C	B
	Overall	B	B	B	B
Attawaugan Crossing Road at the I-395 Southbound Ramps	SB	C	B	E	C
	EB	A	A	A	A
	WB	A	A	A	A
Attawaugan Crossing Road / Lake Road at Tracy Road / Frito Lay Driveway	NB	B	B	B	B
	SB	C	C	B	C
	EB (left/through)	A/A	A/A	A/A	A/B
	WB	C	B	C	C
	Overall	B	B	B	B
	NB (left/through)	C/A	C/A	C/A	C/A

Intersection Evaluated	Direction	Background Level of Service (2019)		Peak Construction Level of Service (2019)	
		AM	PM	AM	PM
Attawaugan Crossing Road / Lake Road at Upper Maple Street	EB	B	C	B	C
	WB (left/through)	A/A	A/A	A/A	A/B
	Overall	A	B	A	B
Lake Road at North Shore Road	NB	B	B	B	B
	EB	A	A	A	A
	WB	A	A	A	A
Route 101 (Hartford Turnpike) at Lake Road	SB	B	C	C	C
	EB	A	A	A	A
	WB	A	A	A	A
Lake Road at proposed KEC Driveway	NB	-	-	A	A
	SB	-	-	A	A
	EB	-	-	B	C

When KEC begins commercial operation in 2020, the staff is anticipated to include 25 to 30 employees working over three shifts; conservatively assuming 30 employees, this represents a total of 32 vehicle trips during the morning peak hour and 30 vehicle trips during the afternoon peak hour. This is an insignificant number of trips that will not impact the existing level of service at the nearby intersections. In the rare circumstances when KEC will operate using ULSD, the ULSD tank can be replenished by two fuel delivery trucks per hour. The additional truck traffic anticipated for fuel delivery will not add significantly to the level of truck traffic currently using the segment of Lake Road from I-395 to the KEC Site and will not have a significant impact on the local roadway network. The operation of KEC did not, therefore, warrant additional analysis or mitigation. Note that the sign that currently restricts “through truck traffic” along Lake Road will need to be relocated approximately 1,500 feet, to a location just west of the KEC entrance driveway. All truck traffic from the KEC Site will be directed east towards I-395.

During construction, a more significant potential for traffic impacts to the area will occur. Construction traffic to the KEC Site will generally consist of construction personnel, heavy construction equipment and material and equipment deliveries. In order to evaluate the potential effect on existing traffic operations, an analysis was completed that evaluated the number of workers expected during the peak (3-month) period of construction. At all other times during construction, lower levels of traffic are anticipated. With an assumption of 350 construction workers on-site during this peak construction period, 385 trips are expected to occur during the morning and afternoon peak hours. Up to 30 truck deliveries of material and equipment will be distributed throughout the day. Because truck deliveries will not significantly add to the morning and afternoon peak hour traffic volumes, they are not included in the analysis. However, background traffic levels were increased to account for other future growth that could occur in the Killingly Industrial Park area other than that associated with KEC. Trips associated with KEC are expected to predominantly travel between the KEC Site and I-395. Therefore, 75% of those trips were assigned in that northeasterly direction.

An analysis was completed for the intersections identified in Table 7-3. During the peak period of construction, acceptable levels of service will be maintained at all intersections within the study area. As shown in Table 7-3, most of the existing service levels remain the same, with the following exceptions:

- The level of service at the intersection of Attawaugan Crossing and the I-395 southbound ramps going southbound is anticipated to drop from LOS B to LOS C during the evening rush hour; during the morning peak hour, this intersection is anticipated to drop from LOS C to LOS E.
- During the morning rush hour, the level of service at the intersection of Attawaugan Crossing Road and the I-395 Northbound ramps going westbound is anticipated to drop from LOS B to LOS C;
- During the evening rush hour, the level of service at the intersection of Attawaugan Crossing Road/Lake Road and Tracy Road/Frito Lay Driveway is anticipated to drop from LOS A to LOS B going eastbound (through) and LOS B to LOS C going westbound;
- During the evening peak, the level of service at the intersection of Attawaugan Crossing Road/Lake Road and Upper Maple Street going westbound (through) is anticipated to drop from LOS A to LOS B; and
- During the morning peak, the level of service at the intersection of Route 101 (Hartford Turnpike) and Lake Road going southbound is anticipated to drop from LOS B to LOS C.

Therefore, even for the highest level of traffic expected to be experienced only during a short, 3-month duration of the construction period, KEC-related traffic will not significantly affect intersection performance or area roadways.

The “S” turn in Lake Road just east of the KEC Site will require widening in order to accommodate trucks that will travel to and from KEC throughout construction and operation. NTE will work closely with the Town of Killingly to determine appropriate design and implementation of these roadway improvements. Note that truck traffic associated with KEC will be routed towards I-395 in order to maintain the “no through truck” usage along less industrial segments of Lake Road.

7.2.1.2 Traffic Safety and Evacuation Routes

Traffic safety, including line-of-sight, adequate turning radii, and roadway width, have been considered as a part of the above assessment. KEC is well-sited in an area of the Town of Killingly that is only 1.25 miles from a major interstate highway and proximate to an industrial area that currently supports truck and other traffic. Once KEC is operational, very little traffic will be associated with the facility.

The emergency management plan to be developed for both construction and operation will specify various unanticipated emergency conditions for which actions and contingencies will be planned. Among those will include scenarios that could involve evacuation from the KEC Site. Should this be necessary, the planned evacuation route would be to travel east along Lake Road for 1.25 miles towards I-395.

7.2.1.3 Risk Associated with ULSD Delivery

ULSD deliveries are anticipated to occur infrequently because KEC has contracted for a firm supply of natural gas, and the potential operating hours on ULSD will be specifically restricted by the DEEP air permit. It is anticipated that ULSD use will occur on the order of only several hours once every two to three years. The specific company from which ULSD will be purchased will not be identified until just prior to its first use for testing purposes at the end of the construction period. However, it is anticipated that delivery will be via standard oil tanker trucks and that access to the KEC Site will be via I-395 and then west along Lake Road. As noted above, contracts with such vendors will specify that through trucks will not be allowed to travel westbound along Lake Road from the KEC Site.

Tanker trucks that deliver ULSD are equipped with appropriate containment and are regularly inspected. Contingency plans for spill prevention are typically developed by the delivery company that includes carrying basic supplies for use in containing and treatment of minor leaks or spills, and information about appropriate notification to the Connecticut Emergency Response and Spill Prevention Program. KEC's SPCC plan will also include information about fuel delivery. The risk of ULSD delivery fuel spills is anticipated to be very low. The amount of ULSD required for KEC's use is low relative to the number of similar fuel delivery vehicles traveling to supply homes and other businesses throughout the state and region on a regular basis. Although unanticipated spills can occasionally occur, proper planning for spill control will limit the potential for impact. Because KEC has direct access approximately 1.25 miles from I-395, the use of local roads and potential for local exposure is further limited.

7.2.2 Airports

A review of the surrounding area identified Danielson Airport as the closest air navigation facility to the proposed KEC Site. Located approximately 2.5 miles south of the KEC Site, Danielson Airport has two asphalt-paved, 2,700-foot long runways that are open to the public. Both Runway 13 and 31 have a left-handed traffic pattern with medium intensity edge lighting. The airport is publicly owned by the Connecticut Airport Authority and has 29 single engine aircraft, one multi-engine aircraft, and five gliders operating from that location. The airport offers glider service, pilot instruction, parachute jump activities, and aircraft rentals (SkyVector 2016). Other nearby air navigation facilities include: Woodstock Airport, a private airport located approximately 4 miles north of the KEC Site; Yankee Airstrip, a private landing strip located approximately 5 miles east of the KEC Site; and Toutant Airport, a public airport located approximately 9 miles northwest of the KEC Site.

On July 18, 2016, the FAA issued a Determination of No Hazard to Air Navigation for the proposed 150-foot tall KEC stack (Appendix J); the 150-foot stack is KEC's tallest structure. Based on the FAA's evaluation, no navigation marking or lighting of the stack was deemed necessary.

7.2.3 Railroads

The Providence-Worcester Railroad extends in a north-south direction through Killingly's industrial area, approximately 1 mile east of the KEC Site. The rail line runs parallel to and to the east of Upper Maple Street. The Providence-Worcester Railroad is a regional freight railroad operating in Massachusetts, Rhode Island, and Connecticut. The Providence and Worcester Railroad Company transports a wide variety of commodities, including automobiles, construction aggregates, iron and steel products, chemicals and plastics, lumber, scrap metals, plastic resins, cement, limestone, construction and demolition debris, and processed food and edible foodstuffs.

The proximity of nearby rail infrastructure provides KEC with an opportunity to consider an alternative means for delivery of certain construction material and equipment. To do so, however, KEC would need to coordinate with other industries where sidings exist to support material off-loading. This option may be further explored, but would not significantly alter traffic on local roadways, since delivery from the railroad to the KEC Site is not substantially different from delivery from I-395 in terms of impact to local roads.

7.3 VISUAL RESOURCES AND AESTHETICS

A detailed Visual Impact Assessment is provided in Appendix K for a 5-mile radius around the proposed KEC Site. This assessment identified locations with potential views of the KEC facility, including the tallest structure – the 150-foot tall stack, using a digital elevation model viewshed analysis, and then generated photographic simulations to assess the potential impact of KEC to the visual landscape. The analysis focuses on the anticipated change in observer views toward the 73-acre property within which KEC is proposed, including whether there would be a change in the character or quality of the view, and considers the viewer context as it relates to the manner in which a change would be experienced. A wide range of factors, including the types of land uses, duration of the view, degree of discernable detail, number of viewers, degree of natural buffering, and the scenic value of a location, were considered when assessing visual impact. Modeling did not indicate a potential change in view from identified federal, state or local areas of visual importance, such as designated recreational areas for which visual character has particular importance. Given the rural character of Windham County and its surrounding communities, views were considered from vantage points surrounding KEC in order to determine to what degree those existing views would potentially change.

Based on this analysis, KEC will not alter the visual environment for the majority of the area within a 5-mile radius. For the majority of vantage points within the 5-mile radius, potential views of KEC will be screened by intervening distance, topography, vegetation, and/or existing structures. At certain locations, however, elements of KEC will be visible, most particularly the top of the stack. Simulations have been prepared to illustrate the limited vantage points from which KEC may be visible. In those locations, the view will typically

be fleeting (as for travelers along Lake Road) or visible within a context comprised of similar landscape features, as KEC will be located within an industrial area and relatively proximate to a similar facility, the Lake Road Generating facility, which has three slightly taller stacks.

7.4 NOISE

A detailed noise assessment has been prepared (provided in Appendix L) that examines the noise levels generated by the KEC site to the surrounding community. State of Connecticut and Town of Killingly regulations require that KEC meet stringent sound limits at its boundaries, with levels not to exceed 51 dBA required during nighttime hours, which is similar to a quiet office space or the sound generated from the water flow of a medium sized creek (Noise Navigator Sound Level Database 2015). Typical sound level comparisons are shown in Table 7-4.

Table 7-4: Typical Noise Sources and Acoustic Environments

Noise Source or Activity	Sound Level (dBA)	Subjective Impression
Lawnmower (at operator)	85 – 90	Significant
Jet Ski (50 feet)	80	
Vacuum cleaner (10 feet)	70	Moderate
Passenger car at 65 mph (25 feet)	65	
Large store air-conditioning unit (20 feet)	60	
Light auto traffic (100 feet) Medium size creek (50 feet) Quiet Office Space	50	Quiet
Quiet rural residential area with no activity	45	
Bedroom or quiet living room; Bird calls	40	Faint
Typical wilderness area	35	
Quiet library, soft whisper (15 feet)	30	Very quiet
Wilderness with no wind or animal activity	25	Extremely quiet
High-quality recording studio	20	
Acoustic test chamber	10	Just audible
	0	Threshold of hearing
Adapted from: Kurze and Beranek (1988), USEPA (1971), and Noise Navigator Sound Level Database (2015).		

As a frame of reference, ambient measurements (as described in Appendix L) were conducted indicating that sound levels surrounding the proposed Generating Facility Site are at relatively low levels. As expected, measurements closer to Lake Road generally experienced louder ambient noise levels associated with vehicle traffic, particularly during the daytime period. Short-term L_{eq} sound levels ranged from 38 dBA to

47 dBA (with L_{90} sound levels for the same period ranging from 32 dBA to 36 dBA)[8] during the daytime period. Nighttime short-term sound levels ranged from 32 dBA to 47 dBA (with L_{90} sound levels ranging from 30 dBA to 40 dBA). The hourly data collected during the long-term 24-hour sound monitoring study showed consistency with the short-term measurements. The long-term hourly L_{eq} sound levels ranged from 38 to 42 dBA during the daytime period (L_{90} ranging from 32 dBA to 38 dBA) during the daytime period and 30 to 40 dBA (L_{90} ranging from 26 dBA to 35 dBA) during the nighttime period.

Anticipated construction sound and schedule is discussed in Appendix L, along with mitigation measures to be employed in order to minimize disruption associated with this temporary condition.

KEC has integrated low-noise features into its layout and design in order to meet the stringent state and local requirements. These features include: positioning louder equipment (such as the air-cooled condenser fans) towards the middle of the site; the use of sound attenuation enclosures around major equipment (for example, the combustion turbine and steam turbine); the placement of noise-generating equipment inside buildings; and the incorporation of mitigation measures (such as acoustic silencers, sound walls or barriers, and specifying low-noise equipment). Although the specific noise control measures will be refined as KEC moves towards final design and construction, this analysis demonstrates that measures can and will be incorporated into KEC's design that will enable KEC to comply with all applicable noise requirements.

Results of the acoustical modeling are shown in Figure 7-5. The adjacent residential property line will experience KEC sound levels of 45 to 49 dBA, meeting the 51 dBA requirement. All other residential property lines will experience KEC sound levels of 44 dBA or lower. In fact, the majority of the more densely populated residential areas (around Alexander Lake and southwest of the KEC Site closer to Route 101) will experience KEC sound levels that are less than 30 dBA (see Figure 7-5). Note that these reflect outdoor sound levels. Typical residential construction also provides approximately 15 to 20 decibels of additional noise reduction with windows closed and approximately 10 dB of additional noise reduction with windows in an open position (Harris 1998).

Nighttime sound associated with KEC will not only comply with the required 51 dBA at the property boundary but, due to noise attenuation of residential construction, will result in an interior noise level at the nearest residence ranging from 31 dBA to 36 dBA. This is well within the range of typical interior noise levels in bedrooms where people are sleeping, which is 30 dBA to 40 dBA (Harris 1998).

[8] An L_{eq} sound level is the equivalent continuous sound reflecting variability over time, and is commonly used to represent community sound levels, while an L_{90} sound level reflects the sound level that was exceeding 90% of the time, rather than a representation of average sound.

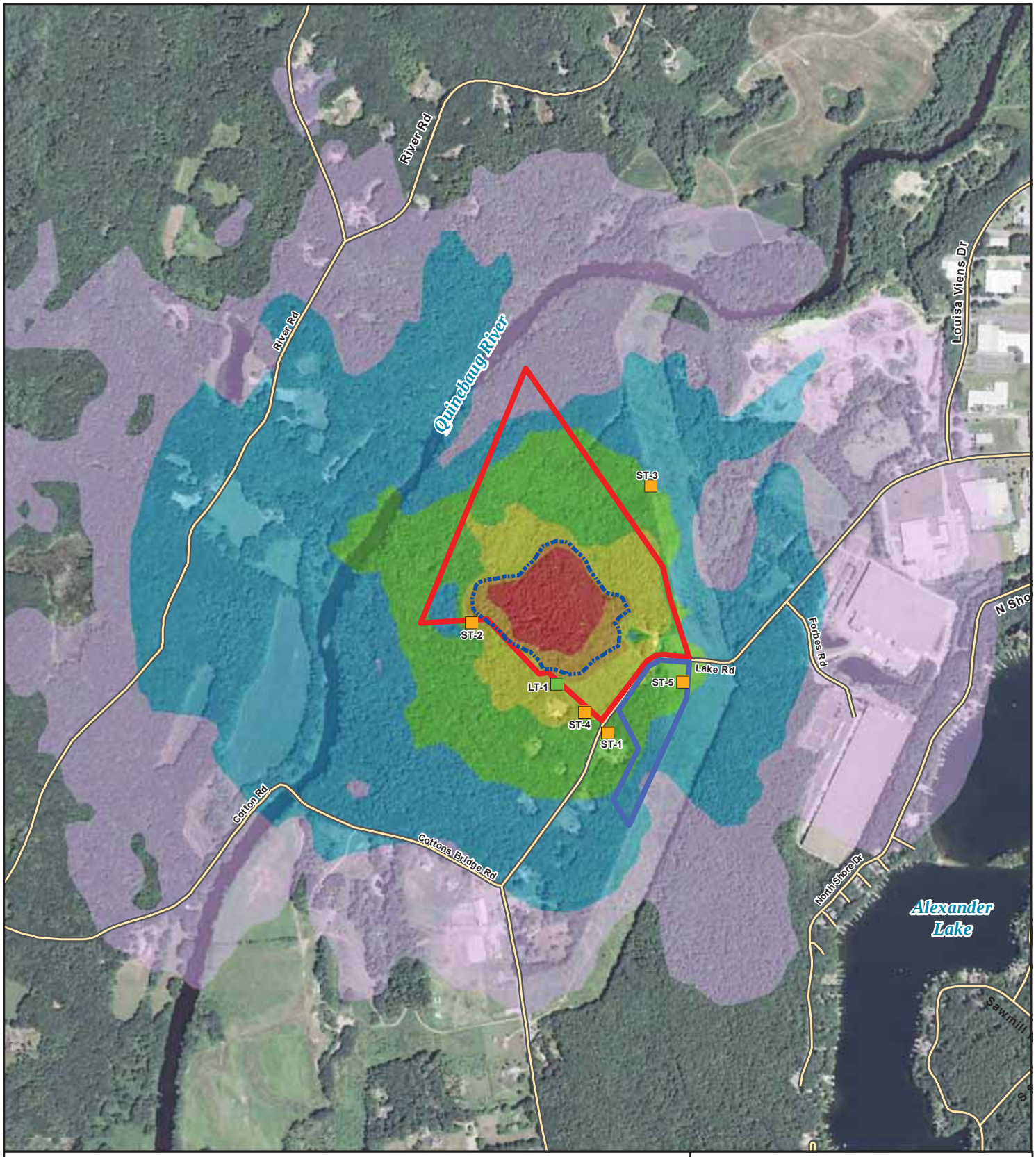


Figure 7-5
Results of Acoustical Modeling

Killingly Energy Center
an NTE Energy Project

7.5 ELECTRIC AND MAGNETIC FIELDS

The short interconnection between KEC and the Utility Switchyard will be a source of EMF, AN, and RN around the electric transmission line as it crosses over Lake Road. The electricity generated by KEC also will increase the magnetic field on the existing ROW. An analysis of these potential effects is detailed in Appendix M, and summarized in this section.

7.5.1 Modeling Results

Modeling was performed for three configurations surrounding KEC: an interconnection from KEC that extends across Lake Road; and cross-sections of the existing ROW to the north and south of KEC's POI. Analysis was not conducted for the Utility Switchyard itself, as it immediately abuts the existing ROW and, therefore, all changes to the electrical environment will be confined to an area inaccessible to the public (on KEC-owned property); associated changes to EMF, AN, and RN levels beyond the ROW or property boundary are expected to be minimal. Results of the analysis indicate the following:

- **Magnetic Fields** – The new interconnection transmission line crossing Lake Road will locally increase the magnetic field level. This interconnection has been conservatively modeled with a mid-span conductor height of 26 feet; if a greater conductor height is ultimately constructed (as is typical for road crossings), the magnetic field level would be less than calculated. Assuming that the interconnection will be carrying the full KEC load of 550 MW, the maximum magnetic field calculated at a distance of 75 feet from the transmission line centerline is 58 milliGauss (mG). The magnetic field level on the existing ROW to the north and south of the interconnection increases somewhat for all loading conditions. The highest magnetic field levels (7.9 mG) were modeled both north and south of the KEC POI; under the KEC operating conditions modeled, this maximum edge-of-ROW level would increase to 15 mG at both locations. These levels are similar to those encountered beneath typical distribution lines, and continue to decrease with distance from the ROW. Under all loading scenarios and across all modeled cross sections, magnetic-field levels are a small fraction of International Commission on Non-Ionizing Radiation Protection (ICNIRP) and International Committee on Electromagnetic Safety (ICES) exposure limits.
- **Electric Fields** – The electric field level associated with the Lake Road interconnection crossing has been calculated to be approximately 1.4 kilovolts per meter (kV/m) at a distance of 75 feet, far below either ICNIRP or ICES exposure limits. Directly beneath the transmission line the electric field is approximately 7.8 kV/m (although, as with the magnetic field levels, this will decrease if constructed conductor heights are greater), but remain below ICNIRP or ICES basic restriction limits. Electric field levels for the existing ROW will not change from existing conditions, as the physical configuration of the existing transmission lines is not expected to change.

- **Audible Noise** – No change will occur along the existing transmission line ROW, as the physical configuration will not change. At 75 feet from the centerline of the Lake Road interconnection, the fair weather AN level is calculated to be 22 dBA, well below ambient sound levels; in foul weather, AN levels are calculated to be 25 dB higher, but additional noise sources that typically accompany foul weather (e.g., wind and rain) are themselves likely to generate approximately 41-63 dBA of AN and would likely mask the noise from the transmission lines during these conditions (Miller 1978). In either fair or foul weather, the AN from the transmission lines will be below state and local noise standards (51 dBA).
- **Radio Noise** – No change in RN levels will occur along the existing transmission line ROW, as the physical configuration will not change. RN levels are typically evaluated at a distance of 50 feet from the outermost transmission line conductor. Fair weather RN levels associated with the Lake Road interconnection are calculated to be approximately 44 decibels above 1 volt per meter (dBμV/m), far below the Institute of Electrical and Electronics Engineering (IEEE) Radio Noise Design Guide RN level of 61 dBμV/m for fair weather. In foul weather RN levels are calculated to be 17 dB higher but will still meet the IEEE guideline level.

7.5.2 Consistency with Connecticut Siting Council BMP

The calculations of EMF levels and the KEC design were evaluated for consistency with the CSC's EMF BMP for the permitting of new electric transmission lines. Additional consideration has been given to EMF topics addressed in the CSC's *Application Guide for an Electric and Fuel Transmission Line Facility* (2010) as well as to the CSC's *Application Guide for Electric Substation Facilities* (2010).

Calculations of EMF from the new interconnection between the KEC plant switchyard and proposed Utility Switchyard as well as for existing lines on the adjacent ROW have been provided (see Appendix M for additional detail) compared calculated EMF levels under existing and proposed conditions. Measurements of existing EMF levels have also been performed. Further consistency with the EMF BMP is demonstrated by:

- The new KEC interconnection is sited such that there are no adjacent statutory facilities[9] where children might congregate located in the vicinity of KEC.
- NTE has followed the EMF BMP in designing an interconnection to incorporate low cost/no cost measures to reduce magnetic fields by using applicable "no-cost/low-cost designs that do not compromise system reliability or worker safety, or environmental and aesthetic project goals" (CSC

[9] Statutory facilities are "residential areas, public or private schools, licensed child day-care facilities, licensed youth camps, or public playgrounds" adjacent to a proposed facility (Public Act No. 04-246).

2014). The principal design features that minimize potential exposure to EMF are: KEC's location immediately adjacent to an existing utility ROW and near industrial uses; the associated need for minimal off-site electrical interconnection; and an interconnection voltage of 345 kV that will reduce magnetic field levels from the line relative to other interconnection options.

7.5.3 Conclusions

KEC's location immediately adjacent to an existing ROW limits the need for lengthy new off-site transmission lines; KEC will also interconnect at the existing 345-kV transmission line. Therefore, electric field, AN, and RN levels on or near the ROW will not change as a result of KEC. The additional power flow on the transmission line will increase magnetic field levels on the ROW, but because the POI is near the center of the ROW, the small change in magnetic field level at the ROW edge and beyond is minimized.

In summary, KEC incorporates a design which applies practices consistent with the CSC's BMP and Application Guides for substations and transmission lines applying "no-cost/low-cost designs that do not compromise system reliability or worker safety, or environmental and aesthetic project goals" and complies with international standards for EMF, AN and RN.

7.6 CULTURAL RESOURCES

Historical and archaeological background research has been conducted; detailed archaeological surveys have been conducted; and an evaluation has been completed of structures currently located on the KEC Site. These investigations have concluded that no significant cultural resources exist that will be adversely affected by construction or operation of KEC. NTE has submitted complete documentation to the Connecticut State Historic Preservation Office (SHPO), as well as to the Tribal Historic Preservation Offices (THPO) of the Mashantucket Pequot Tribal Nation and the Mohegan Tribe (Connecticut's two federally recognized tribes). Following SHPO and THPO review, those entities will determine whether sensitive information relative to the cultural resources exists in the archaeological report and then determine the extent to which it can be made generally publicly available; the structure evaluation is provided in Appendix N. This section provides a summary of: cultural resources background; archaeological investigations and results; historical architectural review of the on-site structures and results; and information regarding an unanticipated discoveries plan that will be implemented during KEC's construction.

7.6.1 Cultural Resources Background

7.6.1.1 Cultural Prehistory

The prehistory of Connecticut is characterized by three major chronological stages that presumably corresponded to broad adaptive shifts of changing natural and cultural conditions (Ritchie 1969; Reeve and Forgacs 1999; Lavin 2013). These are the Paleo-Indian Stage (12,000 to 9,500 BP), Archaic Stage (9,500 to 2,700 BP), and Woodland Stage (2,700 to 500 BP). The Archaic and Woodland stages are further subdivided into Early, Middle, and Late periods, based on differences among chronologically diagnostic artifacts such as projectile points, ground and chipped-stone technologies, and/or ceramic styles during the Woodland Stage.

Throughout most of the prehistoric cultural period, Native Americans subsisted by hunting, gathering plants, and fishing. It is assumed that Native Americans both lived and worked in close proximity to highly productive food resources. Most mammals, birds, plants, fish, and other resources became available at various times from spring through autumn, probably prompting relocations of residential sites. Many archaeological sites contain artifacts from several cultural periods, indicating reoccupation of highly productive environments over thousands of years. Surplus harvests of many resources were required to prevent starvation over cold New England winters.

Paleo-Indian fluted and lanceolate points (13,000 to 9,500 BP) have rarely been recovered in northeastern Connecticut (Lavin 2013). Paleo-Indians are often associated with hunting large, now-extinct, herbivores, such as mammoths and mastodons (Lavin 2013). No Paleo-Indian or Early Archaic sites or artifacts have been reported or observed in the vicinity of the KEC Site.

The Middle Archaic period (8,000 to 5,000 BP) marked major increases in archaeological sites along rivers and streams across New England, probably coincident with the development of anadromous fish runs in major river systems (Dincauze 1976; Jones 1999; Forrest 1999; Lavin and Banks 2008). Fish spawning runs of Atlantic salmon, shad and alewife probably extended along the Quinebaug River to the Great Falls in the Town of Putnam, Connecticut, approximately 3 miles north of the KEC Site. The LeBeau Site (a state archaeological preserve located 5 miles from the KEC Site) has shown evidence of Middle Archaic, Late Archaic (5,000 to 2,700 BP), and Early Woodland (2,700 to 2,000 BP) use, suggesting repeated Native American occupations at that particular fishing location for more than 6,000 years (Lavin and Banks 2008). Two other limited finds were identified approximately 2 miles from the KEC Site (Ruggiero and Millis 1998a; McBride and Soulsby 1990).

Across Connecticut, the number of archaeological sites increased dramatically during the Late Archaic period, suggesting increasing Native American populations between 5,000 and 2,700 BP (Reeve and Forgacs 1999). Two finds along the Quinebaug River less than 2 miles from KEC (McBride 1992; McBride

and Soulsby 1992), suggest the importance of the Quinebaug River for subsistence and travel during that period.

The Woodland Stage is marked by the technological innovations of ceramics, the introduction of new projectile point styles, and apparent new settlement patterns. In the Town of Pomfret, within 2 miles of the KEC Site, a site was identified associated with Early Woodland use (McBride 1992; McBride and Soulsby 1992). Algonquin-speaking populations, ancestral to historic tribes, migrated eastward through Connecticut during the Middle Woodland period (2,000 to 1,000 BP), associated with Point Peninsula pottery and Fox Creek points (Fiedel 1990). A Fox Creek point was recovered approximately 1 mile from the KEC Site (Ruggiero and Millis 1998b).

The Late Woodland (1,000 BP to AD 1,614) was a period of major cultural change across Connecticut. Tropical cultigens (maize, beans, and squash) provided new subsistence resources before 1,000 BP (Bendremer et al. 1991; Reeve and Forgacs 1999; Little 2002). In addition, the bow and arrow may have replaced atlatl-spear-hunting technologies during the Middle or Late Woodland periods in association with the appearances of Jack's Reef and triangular Levanna points (Blitz 1988). Increased hunting efficiency and overkill of local deer populations might have increased the need for agricultural surpluses and increasingly complex tribal social organization, warfare, and village settlements. No Late Woodland sites or artifacts have been observed or reported within 2 miles of the KEC Site.

Based upon a review of prior investigations, most prehistoric period sites recorded within 2 miles of the KEC Site were camps, while one site was a lithic scatter and one site was an unknown site type. These Prehistoric sites were associated with a diversity of lithic types used for stone tools, including quartzite, quartz, chert, jasper, rhyolite, argillite, gneiss, and other stone materials, possibly reflecting broad territorial ranges or trade among Native peoples. Pottery, bone, and botanical remains have also been reported at nearby prehistoric sites. Inspection of SHPO site files indicated that the locations of most nearby prehistoric sites were near rivers, streams, or wetlands, and were on relatively level ground surfaces. This was one factor in the determination that detailed archaeological investigation should be undertaken at the KEC Site.

7.6.1.2 Historic Cultural Context

Sustained European contacts with Native peoples in the area began in 1614 when Dutch traders mapped the coast of Long Island Sound and traded European goods for furs along the Connecticut River (Cici 1990). European trade introduced diseases and caused increasing conflicts among Algonquin-speaking groups. The area of Killingly was the southern frontier of the Nipmuc Tribe, whose territory extended farther north into Massachusetts (Griswold 1930). The Mohican Tribe controlled territories west of the Quinebaug River. The Pequot were to the south near the confluence of the Quinebaug River with the Thames River. The Narragansett Tribe resided to the east of Killingly in Rhode Island.

The earliest English settlements in Killingly occurred north of Alexander Lake (Mashipaug Lake), including areas now in the Town of Putnam (Larned 1874). In 1695, 1,700 acres east of the Quinebaug River were granted to James Fitch, Rev. Thomas Buckingham, and others, possibly including portions of the Project property. In 1703, Rev. Buckingham sold his portion to Captain John Sabin, who built a farm for his daughter and son-in-law Joseph Leavens. Leavens' brothers James and Peter also bought land in the area. The Sabin farm, north and south of Lake Road, probably remained in the family through the 18th century, and may have included the KEC Site.

In 1703, Lieutenant Peter Aspinwall purchased a 200-acre grant from surveyor Caleb Stanley, bounded southeast on Alexander Lake and extending westward to the Buckingham tract, possibly also including portions of the KEC Site. In 1704, Aspinwall sold Stanley's tract to John Allen of Marlborough, Massachusetts, who built "a tenement of housing and other accommodations." The Allen farm at 92 Lake Road, south of the KEC Site, may have remained in the family until 1798, when it was sold to John Day (Larned 1874; Killingly Land Records). John Day became a leading industrialist during the early 19th century.

By 1708, about 30 families resided east of the Quinebaug River. That year, the Connecticut General Court established the Town of Killingly. In 1709, the town first sought improvements to highways connecting to Providence Rhode Island, Boston Massachusetts, and Norwich Connecticut, including earlier versions of State Routes 12 and 6 (Larned 1874). In 1710, the town hired Reverend John Fisk of Braintree, Massachusetts as their first minister. The first meeting house was south of the modern Killingly-Putnam line, east of State Route 21. Lake Road, circling the west shore of Alexander Lake, was probably among the earliest highways in Killingly, directing people and goods from the Quinebaug River and local farms to the Killingly meeting house and more distant markets.

In 1721, Nell Ellick Saunders (later called Alexander), a Scottish trader, purchased 3,500 acres east of what became known as Alexander Lake. Nell Alexander I died in 1738, but seven generations of his family continued purchasing land around the lake, including land at 180 Lake Road (a portion of the KEC Site) (Aleman no date; Killingly Land Records). By 1771, grandson Nell Alexander III was producing bricks along the east side of the lake, enhancing the family's fortunes (Coolidge 2005).

In 1799, a new road and bridge were laid out from Captain John Day's farm "through lands of Carpenter, Alexander, Kelly, Leavens, Howe, Whipple, and Warren" (Larned 1874). The bridge and road were improved following creation of the Connecticut and Rhode Island Turnpike, chartered in 1802, now State Route 101 (Wood 1919).

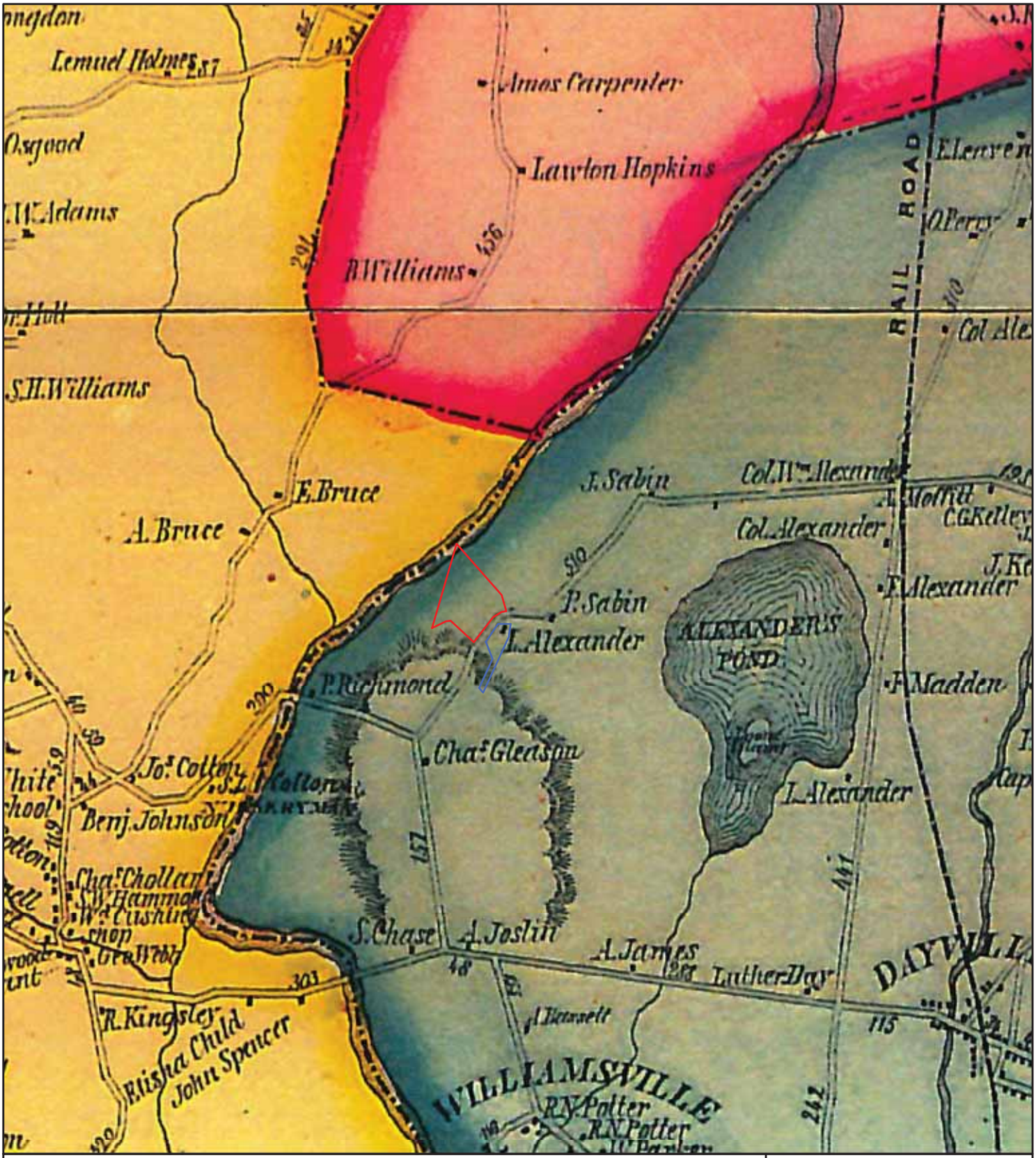
Improved transportation led to new commercial undertakings, primarily in textile manufacturing. The Stone Chapel Manufacturing Company was built around 1810 along the Five Mile River at Attawaugan, partly owned by the Alexander family. About that same time period, the Daniels Factory was built on the lower

Five Mile River, now Danielson (Larned 1874; Dowd and Ward 1989). The Daniels Village mill and surrounding buildings were destroyed by fire in the 1860s, but the ruins and archaeological remains have been listed on the National Register of Historic Places (NRHP). In the 1830s, wealthy landowner John Day constructed a dam and canal from Alexander Lake, and storage ponds along the Five Mile River to drive a woolen mill, cotton mill, sawmill, and blacksmith shop. The village of Dayville developed around the factory and along the Connecticut and Rhode Island Turnpike. The Dayville Historic District is approximately 1.5 miles southeast of the KEC Site (Clouette and Johnson 1988). Day's mills and other local industries were aided during the 1830s by the construction of the Norwich and Worcester Railroad (Clouette and Johnson 1988). The Dayville station became a central shipping point for the importation of cotton for mills in surrounding villages, and the export of local manufactured goods. The Alexander brick factory also expanded, with a railroad siding along the main line north of Dayville (Coolidge 2005). Most of Killingly's numerous mills and factories were forced to close or retool during the Great Depression; many were destroyed by fires, floods, or abandonment.

Among the new Killingly residents was Moses Lippitt from Cranston, Rhode Island, a member of one of that state's early textile manufacturing families (Arnold 1890). In 1801, Moses Lippitt bought 127 acres from Caleb and Chloe Sheldon of Killingly, probably comprising much of the KEC Site, including all lands Sheldon had formerly purchased from John Day, Prudence Alexander, Phillip Richmond, Susannah Seaver and Simon Cotton (Killingly Land Records; Weaver 2016). Moses Lippitt probably built a new house at 180 Lake Road, and soon established the family burying ground. His wife Anstis (Holden) Lippitt and daughter Phebe died in 1804, and daughter Betsey died in 1808 (Combs 2000). Moses died in 1844, and probably was also buried in the family cemetery. In 1847, son Nathaniel Lippitt sold the property to Luther D. Alexander, mentioning "the family burying Ground south of the house which same is to and remain unmolested either by cultivation or otherwise by said Lippitts erecting and maintaining a suitable and proper enclosure around the same" (Killingly Land Records).

The 1856 Woodford map (Figure 7-6) provides the earliest detailed view of the KEC Site, and dwellings along Lake Road. Charles Gleason owned the 18th-century Allen-Day farm at 92 Lake Road. A dwelling owned by L. (Luther) Alexander, probably a tenant house on the former Lippitt farm, was shown at 180 Lake Road within the KEC Site, now no longer standing. Luther Alexander resided in a mansion in Dayville that was destroyed by fire in 1939 (Coolidge 2009). No structure was shown on the map at the 189 Lake Road location. A dwelling owned by P. Sabin probably was located at 220 Lake Road, now demolished, within the Eversource ROW. A dwelling owned by A J. Sabin was located at 293 Lake Road; it is now demolished.

The 1869 Gray map (Figure 7-7) provides additional details of the KEC Site and vicinity. The Charles Gleason dwelling was shown at 92 Lake Road. A dwelling owned by Luther Alexander was shown either at 180 or 220 Lake Road, and is now demolished. The Gray map did not show a structure at the 189 Lake



Legend

Generating Facility Site

Switchyard Site

Source:
E.M. Woodford, 1856. Map of Windham County, Connecticut.
Online at www.pld-maps.com.

N

0 1,000 2,000 Feet

Figure 7-6
1856 Woodford Map

Killingly Energy Center
an NTE Energy Project

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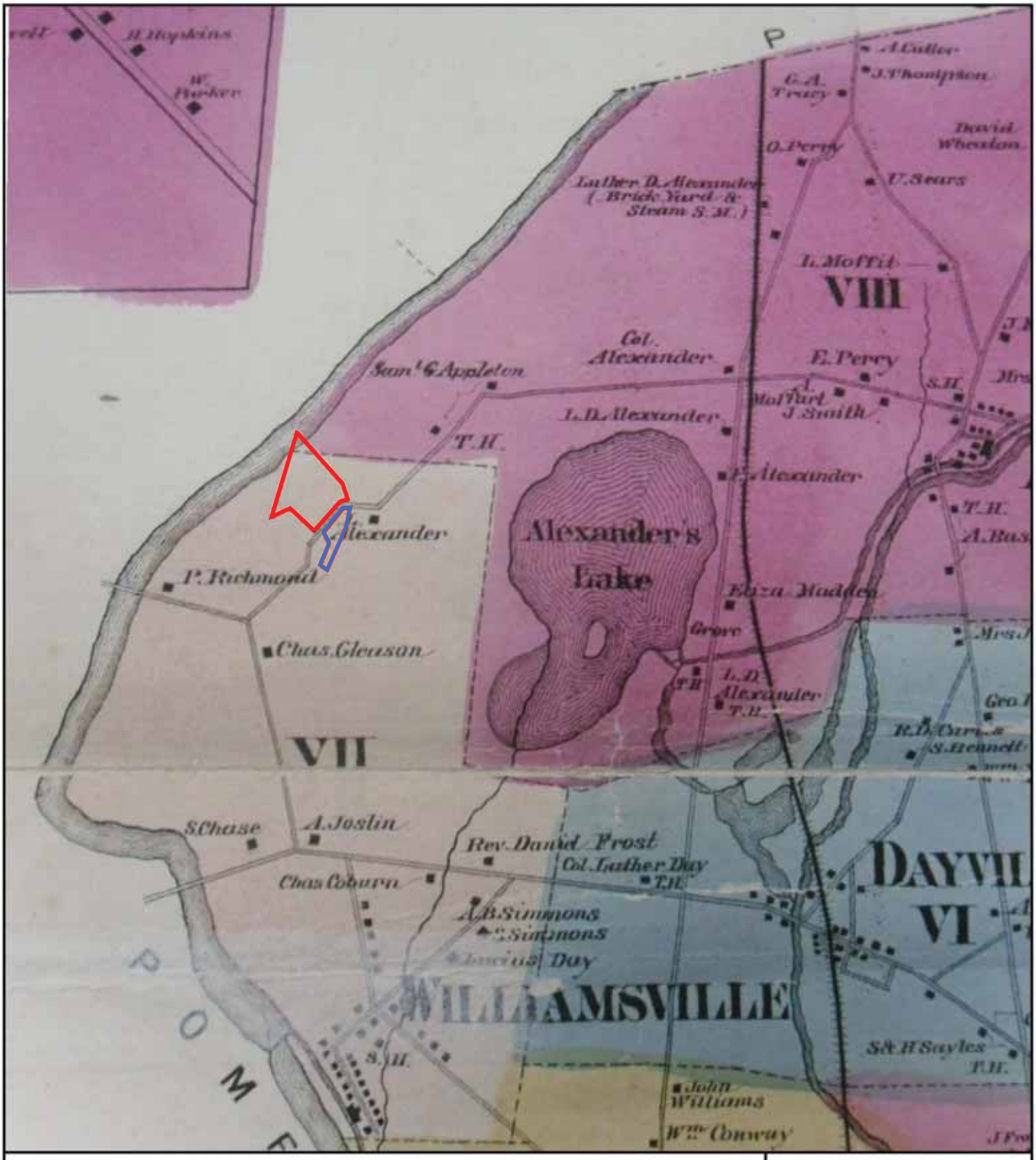

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Generating Facility Site

Switchyard Site

Source:
O.W. Gray, 1869. Atlas of Windham and Tolland Counties.
Keeney, Hartford, CT.

N

0 1,000 2,000 Feet

Figure 7-7
1869 Gray Map

Killingly Energy Center
an NTE Energy Project

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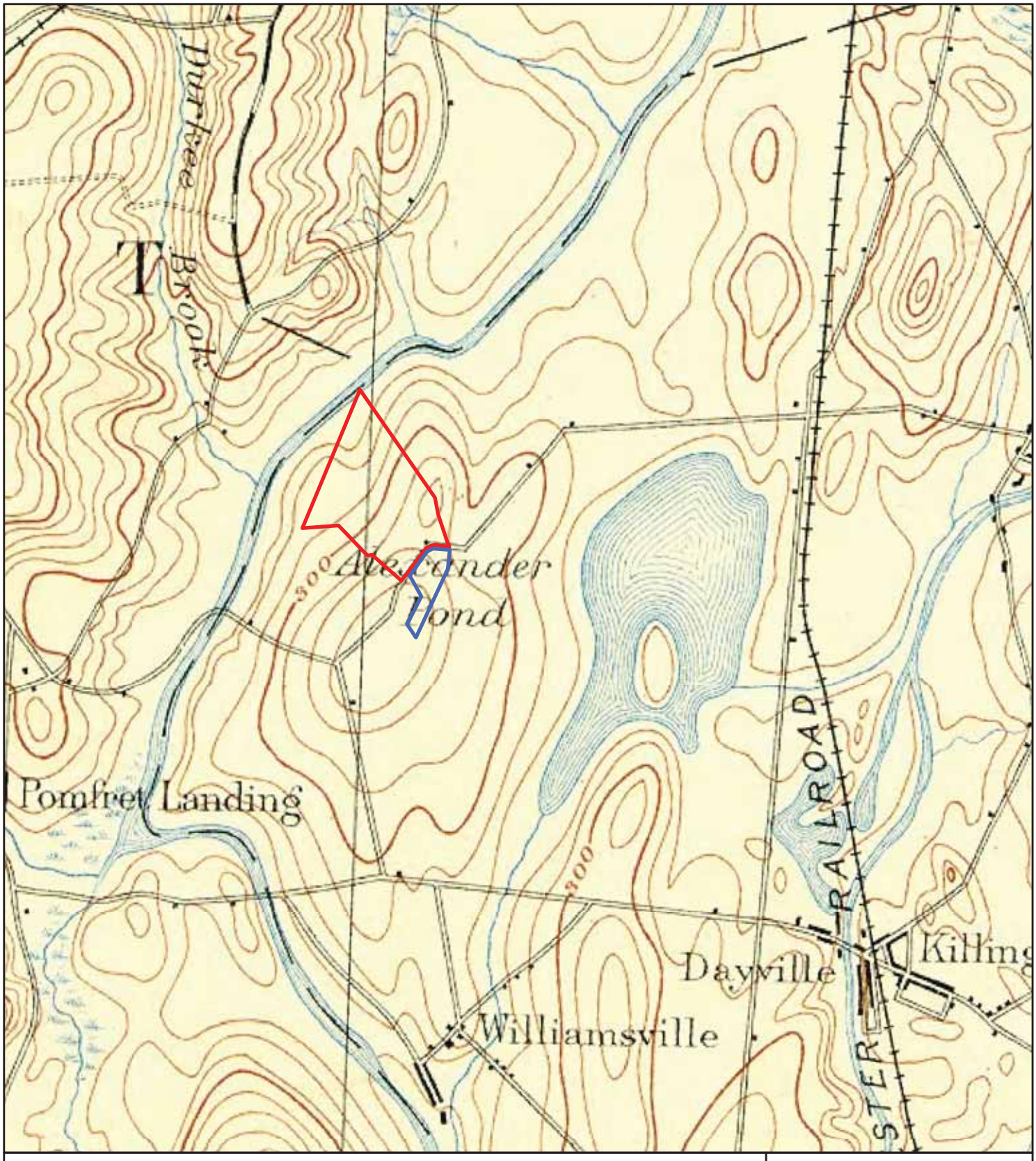
Road location. The former Sabin farm contained a tenant house, possibly at 251 Lake Road, and the dwelling of Samuel G. Appleton at 293 Lake Road, which is now demolished.

The 1893 USGS Putnam quadrangle first showed a structure at the 189 Lake Road location within the proposed Project (Figure 7-8); interestingly, the 1889 USGS Putnam quadrangle map showed no buildings along Lake Road, although dwellings are shown in other parts of the map. Earlier dwellings at 180 and 220 Lake Road were not shown, probably indicating demolition or abandonment of the structures. Based on evidence from historic maps, the extant dwelling at 189 Lake Road was probably built between 1869 and 1893. This date is somewhat different from the 1908 construction date listed by the Killingly Assessor, or the 1865 date reported on the Historic Resource Inventory (HRI) form submitted to the SHPO (McCahon 1990: HRI structure 143). The HRI form for the dwelling at 189 Lake Road also provided information about architectural style and the succession of owners, based on land titles in the Killingly Land Records:

> *Stylistically similar to the house built in 1866 at 56 Attawaugan Crossing Road, this Italianate dwelling is built on property historically known as the Sabin Farm, and if the house is from this same period as the Perry House, it was constructed for Dwight Sabin. He sold it and 55 acres to Samuel G. Appleton in 1868 (45:409). An earlier house that stood on the farm is shown as the dwelling of J. Sabin on the 1856 atlas map. The property passed to the Chase family, and in 1900 Crowell Chase sold it to Thomas Dunn, father of John Dunn (60:259). After Thomas Dunn's death about 1921, the house passed to his widow, Eliza, and then to son John. Mr. Dunn raised wards of the state. The house is one of the few examples of the Italianate mode in the rural portions of town. It succeeded the Greek Revival mode in popularity, but it was never that common in Killingly which hung onto the Greek Revival style well after it passes from fashion nationally (McCahon 1990: HRI structure 143).*

During 1934, the Fairchild Aerial Survey was conducted across Connecticut. These aerial photographs have been posted online in the Connecticut State Library digital collections (CSL 1934). The section including the KEC Site shows the location of the Lippitt cemetery and two possible agricultural outbuildings at 180 Lake Road (Figure 7-9). The dwelling at 189 Lake Road, stone walls, and agricultural landscape features were also visible.

During the early 1890s, the Alexander family began developing Alexander Lake as a resort destination, including Wildwood Park to the east of the Project area. Trolley service by Peoples Tramway opened in 1900, with a stop at Alexander Lake. The Connecticut Electric Railway was established in 1902, linking with other lines to bring visitors from as far as Providence Rhode Island and Norwich Connecticut (Weaver, et al. 1976). The *Cultural Resource Plan, Killingly, Connecticut* identified instances of shore communities around Alexander Lake, less than 0.5 mile from the KEC Site, that include areas identified as containing significant cultural resources (Andrews and Will 1993). However, Lake Road and the KEC Site were not



Legend

Generating Facility Site

Switchyard Site

Source:
USGS, 1893. Connecticut-Rhode Island, Putnam Sheet.
USGS 15-minute quadrangle. Washington, D.C.

N

0 1,000 2,000 Feet

Figure 7-8
1893 USGS Putnam Quadrangle Map

Killingly Energy Center
an NTE Energy Project

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Legend

Generating Facility Site

Switchyard Site

Source:
Connecticut State Library, 1934. Fairchild Aerial Survey, Photograph 1125. Digital Collections, Online at http://cslib.contentdm.oclc.org/cdm/singleitem/collection/p4005coll10/id/2954

N

0 250 500 Feet

Figure 7-9
1934 Fairchild Aerial Survey Map

Killingly Energy Center
an NTE Energy Project

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identified as areas of historical or scenic priorities by the plan (Andrews and Will 1993; Killingly Planning and Zoning Commission 2010).

Recent residential and manufacturing/commercial development in vicinity of the KEC Site can be summarized from information provided by the Killingly Assessor (2016). Based upon Assessor's dates of construction for 40 buildings on 48 lots (totaling 671.8 acres) with addresses along Lake Road, only two buildings predate 1900 (residences located at 92 and 251 Lake Road). Between 1900 and 1949, four buildings were built, including residences located at 86, 110, 189, and 293 Lake Road. Substantial development occurred between 1950 and 1999, with construction of 17 residences, three outbuildings, and eight manufacturing/commercial buildings. From 2000 to 2016, four residences, one outbuilding, and one office building were constructed on Lake Road. In addition, eight lots remain as undeveloped land, totaling 133.1 acres. These include 30 acres of designated permanent open space owned by the Windham Land Trust along the Quinebaug River near 161 Lake Road and adjacent to the KEC Site (Killingly Assessor 2016).

7.6.2 Archaeological Investigations

Due to the potential for archaeological resources in a location proximate to the Quinebaug River, archaeological investigations were undertaken. An evaluation was first undertaken to identify portions of the KEC Site with low archaeological sensitivity (e.g., wetlands, steep slopes). Within the remainder of the KEC Site – designated into 13 distinct survey areas based on distinctive topographic, hydrographic and historic landscape features that potentially influenced past land uses and possible artifact distributions – a total of 245 shovel tests were excavated as part of a Phase I archaeological investigation. No prehistoric chipped stone or ceramic artifacts were recovered within the KEC Site.

The Lippitt family cemetery is located on the Switchyard Site. NTE will avoid impact to the cemetery, and it will be retained in place. Therefore, no shovel test pits were excavated within the cemetery.

Approximately 30% of the shovel tests, mostly located near existing or former structures or dump piles within the KEC Site, contained historic artifacts. These included such items as nails, tile fragments, glass fragments, coal fragments, tractor parts, a leather glove fragment, auto headlight fragments, and a Bakelite pipe stem. These reflected a mixture of materials from the 1800s and 1900s, probably reflecting historic field dumping and more recent trash disposal. Eleven more recent dump piles were mapped, as well as an approximately 1-acre household dump. None of the historic artifacts found were determined to indicate a significant cultural resource that warranted further investigation, although the recommendation was made to evaluate the standing structures for potential NRHP eligibility. No additional investigation was recommended; results are currently pending concurrence by the SHPO and THPOs.

7.6.3 Historic Architectural Investigations

Based upon recommendations of the archaeological investigation, the aboveground resources on the KEC Site were evaluated by an architectural historian whose qualifications meet the Secretary of the Interior's standards for that discipline in order to assess the intact buildings and structures on it for potential eligibility to the NRHP. The investigation (Appendix N) specifically focused on the relatively intact buildings and structures remaining on the property – the residence and three sheds on the Generating Facility Site, the barn on the Switchyard Site, and the stone walls located within the KEC Site. The small family cemetery was not specifically investigated, as it will not be altered by construction or operation of KEC. While the KEC Site and its individual elements retain some integrity, they are not eligible for NRHP listing, either as a group or individually. Because the KEC Site is recommended as not being eligible for NRHP listing, KEC will, therefore, not adversely affect cultural resources that qualify as significant historic properties.

- **Residence:** The Sorrow House is a two-story, two-bay, Italianate-style house with a fieldstone foundation, wooden clapboards, and an asphalt-covered pyramidal roof that faces south, toward Lake Road. The building has an irregular footprint, with a roughly cubic main block, one-story, full-width front porch with hipped roof; a one-story, hip-roofed entry at the rear of the east wall; and two extensions off of the rear (north). A one-story, hip-roofed section is located at the eastern end of the north wall. Double doors suggest that it is either an attached shed or cellar entrance. To the west of this section is a more complex extension: closest to the main block is a two-story section with a hipped roof; abutting its north wall is a one-story section with a pitched roof. The ridge of the roof runs north-south. The building has a centrally located brick chimney. The windows are predominantly 2/1 sliding sash. The 1990 HRI form refers to "turned posts" and "lacey corner brackets" on the front porch. The porch was obscured by translucent plastic sheeting; no evidence of the turned post or corner brackets could be seen through the plastic. The cladding has some areas of visible rot; it is in fair condition.

- **Sheds:** Three utilitarian sheds sit on the property. One is located just to the northeast of the residence, while the other two are to the northwest of the house. All three are small, gable roofed buildings that range from good condition to ruinous.

- **Barn:** The barn on the property is a relatively recent building constructed on, and within, a pre-existing foundation. According to the current property owner, an earlier barn existed on the site. It had been converted to a large chicken house by the 1950s and was demolished after falling into disrepair by the early 1970s. A new building was constructed on the foundation ca. 1975. While the current building is not historic, its foundation is more than 50 years old. Based on the fact that the dry-laid wall was constructed to raise the main body of the earlier barn, creating a "bank barn," it seems likely that this barn was constructed no earlier than the 1820s, the period when this style

of barn first became popular in New England (Visser 1997). It is thought that the Lippett house, which is now represented by the remains of a foundation, was likely constructed not long after Moses Lippett purchased the property in 1801; as the barn was likely not constructed until at least two decades later, it was likely not the first barn associated with the Lippett house.

- **Stone Walls:** Stone walls are located throughout the property. They are generally dry-laid fieldstones, often with large cap stones and are in generally good condition.

The property was assessed for NRHP eligibility based on the National Register Criteria for Evaluation and seven aspects of integrity. To be eligible for listing in the NRHP, a building, structure, site, district or object must meet at least one of the following National Register Criteria for Evaluation (National Park Service [NPS], 1997):

A. Associated with events that have made a significant contribution to the broad patterns of our history;
B. Associated with the lives of persons significant in our past;
C. Embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or
D. Yielded, or may be likely to yield, information important in prehistory or history.

In addition, resources must retain integrity to convey their significance. There are seven aspects of integrity defined by the NPS (NPS 1997): location; design; setting; materials; workmanship; feeling; and association.

Based on these standards, neither the property as a whole nor the buildings and structures individually are considered NRHP eligible.

- **Criterion A:** None of the buildings or structures on the KEC Site, either individually or as a group, are associated with significant historical events. The KEC Site and its elements individually are not NRHP eligible under Criterion A.
- **Criterion B:** None of the buildings or structures on the KEC Site, either individually or as a group, are closely associated with figures significant in American History. The KEC Site and its elements individually are not NRHP eligible under Criterion B.
- **Criterion C:** The KEC Site does not contain an illustrative example or examples of the distinctive characteristics of a type, period, or method of construction, does not represent the work of a master, and does not possess high artistic values. The KEC Site and its elements individually are not NRHP eligible under Criterion C.
- **Criterion D:** This criterion generally relates to archaeological sites. As noted in Section 7.6.2, the KEC Site was not determined to have artifacts that would be important to history or pre-history.

An assessment of integrity was also conducted:

- **Location:** The individual elements on the KEC Site are all in their original locations. The KEC Site and its elements, therefore, retain integrity of location.
- **Setting:** The KEC Site and its individual elements are now located in a wooded area. Aerial photographs show that from 1934 to as recently as 1991 the KEC Site was in a more open, rural setting. Over the last 30 years, many open fields in the vicinity have been allowed to revert to woodlands, changing the immediate surroundings of the KEC Site. In addition, several industrial properties have been added to Lake Road in the vicinity of the KEC Site, further changing its locale. The area no longer has the original feeling that once characterized the surroundings of the KEC Site. The KEC Site and its elements, therefore, no longer retain integrity of setting.
- **Design:** The KEC Site as a whole was designed as a farmstead. As it has lost several key components of this design, including the important historic barn, the property as a whole no longer retains its integrity of design. The house, shed, and walls all retain their original size, general shape, and specific design features such as the deeply overhanging roof on the Italianate-style house or the dry-laying technique of the walls. These three elements individually retain their integrity of design.
- **Materials:** The structures on the KEC Site as a whole remain, with the exception of the rebuilt barn, composed of elements that retain their original materials. Individually, the house, shed, and walls all retain their original materials. The KEC Site and its elements retain their integrity of materials.
- **Workmanship:** The individual elements on the KEC Site are simply adorned. Nevertheless, the property as a whole and the individual elements do demonstrate elements of vernacular workmanship, such as the simple trim on the house or the dry laid walls with large capstones. The KEC Site as a whole and its individual elements retain their integrity of workmanship.
- **Feeling:** Farmsteads achieve their “feeling” by creating a sense of the work that once took place there. The combination of a farmhouse, barn, and ancillary outbuildings, all set among stone walls and open fields, present a clear sense of how and why a farmstead was created. They demonstrate the historic character of the property. At the farmstead on the KEC Site, the loss of significant elements such as the historic barn and much of the open space means that the KEC Site no longer presents a clear representation of its historic use and character. The KEC Site as a whole no longer retains its integrity of feeling. Similarly, when viewed in isolation (i.e., without the context of the whole farmstead) none of the individual elements retains integrity of feeling.
- **Association:** As there is no direct link between the KEC Site and a significant historic event, and because the resources on the KEC Site no longer visually relate to their past, there is no integrity of association.

To summarize, although the KEC Site and its individual elements retain some integrity, they are not eligible for NRHP listing, either as a group or individually, under any criteria, therefore, the KEC Site is

recommended as not eligible for NRHP listing. KEC will not adversely affect cultural resources that qualify as significant historic properties.

7.6.4 Unanticipated Discoveries Plan

Although no significant historic or archaeological resources have been identified on the KEC Site, it is prudent to have plans in place in the event of an unanticipated discovery of archaeological resources during the course of construction. In the unexpected event that resources of cultural, historic or archaeological importance are encountered in the excavation process, procedures outlined in an Unanticipated Discovery Plan (UDP) will be implemented.

The UDP will require that construction related work in the vicinity of any discovery cease upon encountering possible archaeological or human remains. The SHPO and Connecticut State Police, if appropriate, will be notified. Discoveries will be assessed using the most current methodologies in use by the SHPO. Such an assessment will be conducted by a professional archaeologist meeting appropriate qualifications standards.

In the event that significant cultural resources are identified, NTE would implement potential measures to avoid or minimize adverse effects to those resources. The SHPO coordinator will be consulted throughout the investigation, as outlined in the UDP and the Town of Killingly will be informed of the status and results of the investigations.

7.7 SOCIOECONOMICS

This section provides information about the local community as a context for discussing the direct and indirect socioeconomic impacts associated with KEC's construction and operation. As discussed below, KEC is projected to have substantial positive economic impacts, with minimal demand for local services.

7.7.1 Existing Conditions

The KEC Site is located in the Town of Killingly, which covers 48.3 square miles of Windham County (512.9 square miles), and is within the Willimantic-Danielson Labor Market Area (Danielson-NE LMA), the Northeast Economic Development Region, and the Northeastern Connecticut Planning Area (U.S. Census Bureau 2010). Additional details are provided in the following sections for: population and population density; housing, employment, and income; and community resources and services.

7.7.1.1 Population and Population Density

Historic and projected population of the Town of Killingly, Windham County, and the State of Connecticut are shown in Table 7-5, which indicates the expectation of modest future growth in population. Currently, the State of Connecticut has approximately 3.5 million people with a gross state product of approximately $260 billion and a per capita income of $65,000 (Appendix B). The Town of Killingly spans 48.3 square miles and has a population of 17,370 and a population density of 360 people per square mile (U.S. Census Bureau 2010, Appendix B). The Town of Killingly has an estimated per capita income of approximately $27,000 (Appendix B).

Table 7-5: Historic and Projected Population Information

	Town of Killingly	Windham County	Danielson-NE LMA	State of Connecticut
Historic Populations				
2000	16,472	109,091	73,638	3,405,565
2010	17,370	118,428	79,680	3,574,097
Projected Population				
2020	17,974	126,432	84,736	3,702,469

Source: U.S. Census Bureau 2010 and Connecticut Data Collaborative 2016

Killingly represents about 15% of Windham County's population, and 22% of the Danielson-NE LMA's population. Although the population of the Town of Killingly is projected to grow to nearly 18,000 by 2020, this will represent a slightly smaller percentage of the projected populations of Windham County and Danielson-NE LMA (14% and 21%, respectively).

Table 7-6 provides a comparison of population densities between the Town of Killingly, Windham County, and the State of Connecticut. As shown in Table 7-6, the Town of Killingly is more densely populated than Windham County, but has a significantly lower population density than the State of Connecticut.

Table 7-6: Population Density

Area	Persons Per Square Miles
Town of Killingly	359.6
Windham County	230.9
State of Connecticut	738.1

Source: U.S. Census Bureau 2010

7.7.1.2 Housing, Employment and Income

The American Community Survey (ACS) provides periodic population, demographic and housing unit estimates for larger geographies. Table 7-7 presents general housing information reported in the 2010 and 2014 ACS for the Town of Killingly, Windham County and the State of Connecticut. In 2014, there were estimated 6,959; 44,487; and 1,356,206 households in the Town of Killingly, Windham County, and the State of Connecticut, respectively (U.S. Census Bureau 2010-2014). Windham County had 4,675 vacant units and a vacancy rate of 1.5% for homeowners and 6.6% for rentals (U.S. Census Bureau 2010-2014).

Table 7-7: Housing in 2010 and 2014

Area	Housing Units	Vacant Units	Vacancy Rate	
			Homeowner	Rental
2010				
Town of Killingly	7,652	794	1.6	2.1
Windham County	48,518	4,197	1.7	4.2
State of Connecticut	1,475,657	116,439	1.4	7.0
2014				
Town of Killingly	7,817	858	0.5	1.5
Windham County	49,162	4,675	1.5	6.6
State of Connecticut	1,490,381	134,175	1.7	6.9

Source: U.S. Census Bureau 2010-2014

Table 7-8 presents the estimated number of housing units in the Town of Killingly and Windham County by the number of housing units within the structure. The total number of housing units in the Town of Killingly increased by about 2% between 2010 and 2014. During 2014, in the Town of Killingly, approximately 11% of the all housing units were vacant, with a homeowner vacancy rate[10] of 0.5% and a rental vacancy rate of 1.5%. In Windham County, vacant housing units represent 9.5% of the all housing units, with a homeowner vacancy rate of 1.5% and a rental vacancy rate of 6.6%. In 2014, the average household size in the Town of Killingly was 2.53 persons in owner-occupied units and 2.19 in renter-occupied units (U.S. Census Bureau 2010-2014). Similarly, the average household size in Windham County was 2.62 persons in owner-occupied units and 2.33 in renter-occupied units (U.S. Census Bureau 2010-2014).

[10]The homeowner vacancy rate is the proportion of the homeowner housing inventory that is vacant for sale. It is computed by dividing the number of vacant units for sale only by the sum of owner-occupied units and vacant units that are for sale only, and then multiplying by 100.

Table 7-8: Housing Units by Type of Structure

Housing Type	Town of Killingly		Windham County	
	2010	2014	2010	2014
Single Unit Detached	4,921	5,104	31,716	32,679
Single Unit Attached	217	238	1,270	2,097
In 2-Unit Structures	632	590	4,069	3,621
In 3- to 4-Unit Structures	706	542	3,595	3,934
In 5- to 9-Unit Structures	506	613	3,117	2,987
In 10- to 19-Unit Structures	161	249	1,323	1,149
In 20 or More Unit Structures	121	214	1,216	1,122
Mobile Homes	388	267	2,212	1,573
Boat, RV, Van, etc.	0	0	0	0
Total	**7,652**	**7,817**	**48,518**	**49,162**

Source: U.S. Census Bureau 2010-2014

Table 7-9 presents the labor force, employment, and unemployment information for the Town of Killingly, Windham County, the Danielson-NE LMA, and the State of Connecticut. In 2015, the reported civilian labor force in the Town of Killingly was 9,572, representing about 15% of the 63,011-worker labor force in Windham County.

Table 7-9: Labor Force, Employment, and Unemployment Information

	2013	2014	2015
Town of Killingly			
Labor Force	9,492	9,545	9,572
Employed	8,592	8,788	8,917
Unemployed	900	757	655
Unemployment Rate	9.5	7.9	6.8
Windham County			
Labor Force	62,463	62,839	63,011
Employed	57,053	58,248	59,100
Unemployed	5,410	4,591	3,911
Unemployment Rate	8.7	7.3	6.2
Danielson-NE LMA			
Labor Force	42,505	42,799	42,946
Employed	38,854	39,720	40,310

	2013	2014	2015
Unemployed	3,651	3,079	2,636
Unemployment Rate	8.6	7.2	6.1
State of Connecticut			
Labor Force	1,872,031	1,886,398	1,888,001
Employed	1,726,875	1,761,610	1,781,517
Unemployed	145,156	124,788	106,484
Unemployment Rate	7.8	6.6	5.6

Source: Connecticut Department of Labor 2016

The top employment industries include education services, healthcare and social assistance, manufacturing, and retail trade. Based on employee levels, the largest employers in the Town of Killingly include manufacturing, wholesale trading, and warehousing employers, such as Frito-Lay Inc., Rogers Corp, Spirol International Corp, Staples Distribution Center, and UNFI. The largest employers in Windham County include Day Kimball Healthcare, Frito-Lay Inc., Lowe's Distribution Center, Windham Hospital, and Windham Public Schools (Connecticut Department of Labor 2016).

Similarly, based on annual average employment information supplied by the Connecticut Department of Labor in 2014, the largest industries in the Danielson-NE LMA included manufacturing; retail trade; health care and social assistance; accommodation and food services; and government employment.

As shown in Table 7-9, annual unemployment in the Town of Killingly ranged from 9.5 to 6.8% during the recent period from 2013 to 2015. According to the Connecticut Department of Labor, Killingly's unemployment rate as of June 2016 was 6.5%. The unemployment rate in the Town of Killingly remains consistently higher than Windham County's, the Danielson-NE LMA's, and the State of Connecticut's unemployment rates.

Table 7-10 presents estimated per capita income levels for the Town of Killingly, Windham County and the State of Connecticut. The Town's average per capita income is slightly lower than that of Windham County, and significantly lower than that of the State of Connecticut. In 2009, average per capita income in the Town of Killingly was 4.6% lower than Windham County and 39.5% lower than the State of Connecticut. In 2014, the average per capita income in in Town of Killingly was 1.6% lower than Windham County and 33.1% lower than the State of Connecticut. The average per capita income in Killingly, Windham County and Connecticut increased from 2009 to 2014 by 12.7, 9.5, and 5.5%, respectively. The Town of Killingly's current estimated per capita income, according to the U.S. Census Bureau, is approximately $27,000.

Table 7-10: Per Capita Income Levels

	Town of Killingly	Windham County	State of Connecticut
2009	24,451	25,603	36,468
2010	25,215	26,457	36,775
2011	26,023	27,634	37,627
2012	26,585	27,456	37,807
2013	26,977	27,893	37,892
2014	27,549	28,044	38,480

Source: U.S. Census Bureau 2005-2009, 2010, 2014

7.7.1.3 Town Government, Schools and Services

The Town of Killingly practices a council-manager form of government, in which the Town Council is the legislative governing body. The Town Council consists of nine elected council members, headed by the Chairperson Councilor at Large, who serves two-year terms. The Town Manager, selected by the Town Council, is the Chief Executive responsible for implementing the policies and ordinances established by the Town Council.

As reported in the Town's 2013-2014 Annual Financial Report, Table 7-11 provides the Town's revenues by source for the period that ended on June 30, 2014. Property taxes represent the largest portion, 53.6%, of the Town's total revenues. The Town's reported actual mill rate and equalized mill rate in 2014 were 20.70 and 19.03, respectively. The Town's current mill rate is 27.31.

Table 7-11: Sources of Town Revenue

Source	Annual Revenue for Period Ending June 30, 2014 (Dollars)	% of Total Revenues
Property Taxes	30,568,731	53.6
Intergovernmental	22,203,161	39.0
Licenses, Permits and Fees	380,608	0.7
Charges for Services	3,096,103	5.4
Investment Earnings	99,699	0.2
Miscellaneous	654,707	1.1
Total Revenues	57,003,009	100.0

Source: Town of Killingly Finance Department

The Town of Killingly has five public schools in the Killingly Public Schools District, with a 2014-2015 school year enrollment of approximately 2,500 from Pre-Kindergarten through grade 12. Killingly Public Schools consist of one high school, one intermediate school, two elementary schools, and a preschool. The high school also offers an Alternative Learning Program, co-located in a building with the District Central Offices and a private Special Education School. The Town of Killingly also has the H.H. Ellis Technical High School part of the Connecticut Technical High School System, and the Quinebaug Middle College part of the Eastern Connecticut Regional Educational Service Center (EASTCONN). The town has one private school, St. James School, serving Pre-Kindergarten through Grade 8 and one community college, the Quinebaug Valley Community College. Table 7-12 lists the state-regulated schools, and enrollment for the 2014-2015 school year. The locations, including known daycare centers, are shown in Figure 7-10.

Table 7-12: Town of Killingly Connecticut Schools

School	Grades	Address	Enrollment (2014-2015)
Killingly High School	9 – 12	226 Putnam Pike Killingly, CT 06241	792
Killingly Alternative Learning Program	9 – 12	79 Westfield Avenue Killingly, CT 0239	21
H.H. Ellis Technical High School	9 – 12	613 Upper Maple Street Killingly, CT 06239	619
Quinebaug Middle College	High school/community college program	742 Upper Maple Street Killingly, CT 06239	160
Killingly Intermediate School	5 – 8	1599 Upper Maple Street Killingly, CT 06241	715
Killingly Memorial School	2 – 4	339 Main Street Killingly, CT 06239	483
Killingly Central School	Pre-Kindergarten – 1	60 Soap Street Killingly, CT 06241	382
Goodyear Early Childhood Center	Early care and education for children 2 years and 9 months through Kindergarten	22 Williamsville Road Killingly, CT 06263	111
Sunrise Community School	Kindergarten – 12	79 Westfield Avenue Killingly, CT 06239	11

Source: Connecticut State Department of Education

Figure 7-10 presents the location of the hospitals and emergency services in the Town of Killingly and Windham County. There are two acute care general hospitals located in Windham County with a total of 234 beds (Connecticut Department of Health 2014). There are no hospitals in the Town of Killingly. The closest hospital, Day Kimball Hospital, is approximately 3 miles from the Generating Facility Site in the neighboring Town of Putnam.

Windham Community Memorial Hospital and Hatch Hospital, located in the Town of Windham, are approximately 19 miles from the Generating Facility Site.

K-B Ambulance Corps, Inc. provides coverage in Killingly 24 hours per day, seven days per week. A paid staff, consisting of six full-time and one part-time emergency medical technicians, are available Monday through Friday 12 a.m. to 6 p.m., and 24 hours per day on Saturday and Sunday with a paid crew. A force of 26 volunteer emergency medical technicians and 24 emergency medical responders supplement the remaining schedule.

As shown in Figure 7-10, the Town of Killingly has six fire stations:

- Attawaugan Fire Station;
- Danielson Fire Station;
- Dayville Fire Station;
- East Killingly Fire Department;
- South Killingly Fire Station; and
- Williamsville Fire Engine Co.

The Williamsville Fire Engine Co., Attawaugan Fire Station, and Dayville Fire Station are all located proximate to the KEC Site, with a travel response time of 5 minutes or less.

Quinebaug Valley Emergency Communications, Inc. (QVEC), also located in the Town of Killingly, receives and dispatches emergency calls. QVEC is comprised of five full-time and 14 part-time dispatchers. The QVEC dispatch area, about 519 square miles, consists of 34 fire departments, 14 ambulance agencies, two municipal police departments, and two state police agencies.

The Killingly Police Department and the State Police are located approximately 4 miles south of the Generating Facility Site in the borough of Danielson, Killingly. The Town of Killingly is served by four resident troopers of Trooper First Class ranking. In addition, the Putnam Police Department and the Plainfield Police Department are approximately 3 miles north and 10.5 miles south of the Generating Facility Site, respectively.

7.7.2 Construction-Related Impacts and Benefits

The estimated annual average construction workforce for KEC is 150 individuals, with a peak construction workforce of 350 annual individuals. Construction will require a workforce of several disciplines including civil, mechanical and electrical craft workers. Civil crafts will include carpenters, laborers, masons, equipment operators and painters. Mechanical crafts include boilermakers, millwrights, pipefitters and welders. The duties of electrical craft workers will include cable tray installation, conduit installation, cable pulling, welding, electrical terminating, and high voltage cable splicing. The total construction payroll, excluding benefits, is estimated to be approximately $116 million.

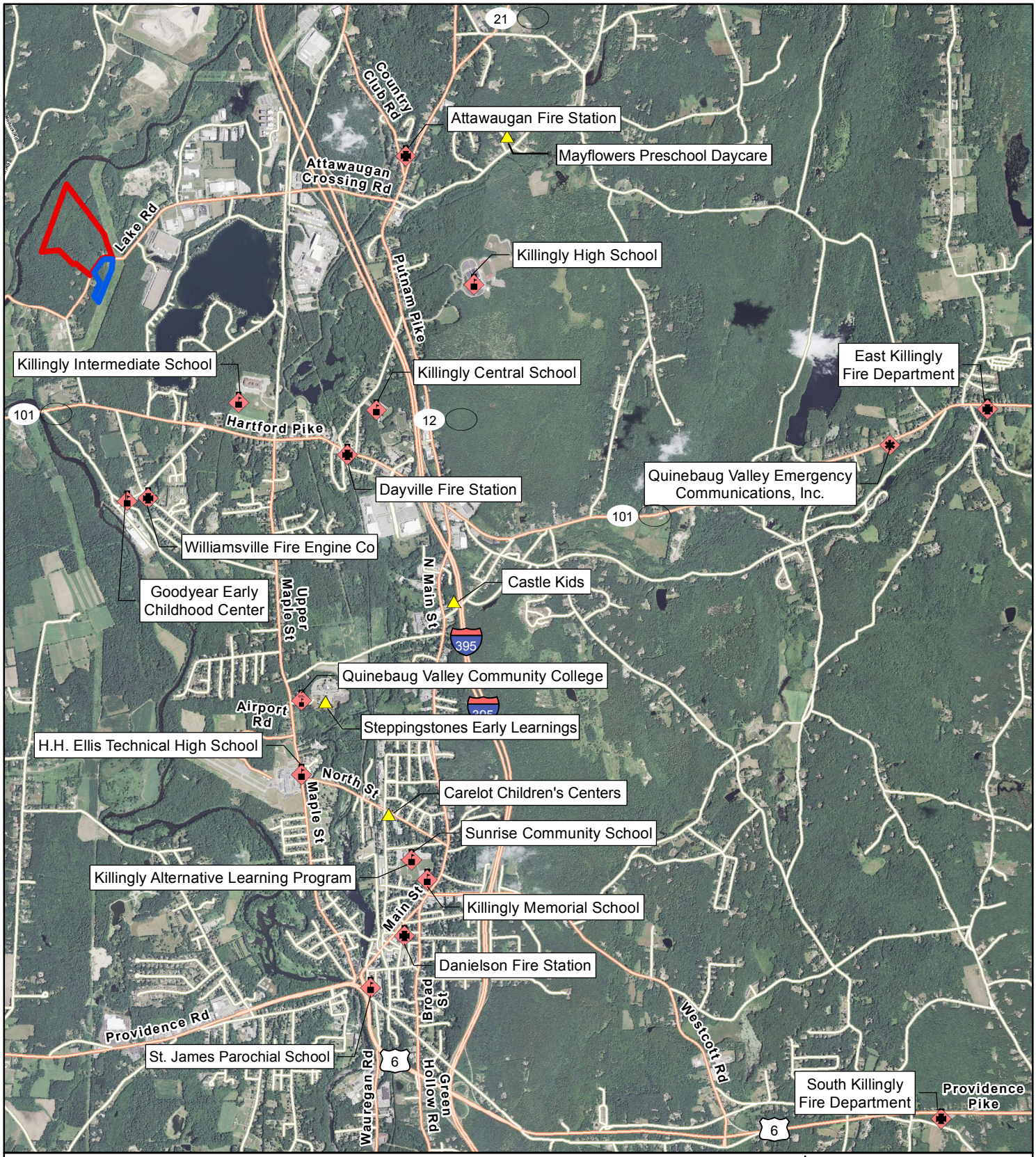

Figure 7-10
Community Resources

Killingly Energy Center
an NTE Energy Project

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The following sections provide information on the economic effect associated with the construction period, as well the demand on municipal services through KEC's commercial operation date in 2020.

7.7.2.1 Economic Effects

Construction of KEC will provide direct benefits to the local and regional economies. Construction-related businesses will likely experience an influx of dollars as equipment and construction materials may be provided by local or regional businesses. Ancillary expenditures, such as local service-related and rental businesses, will likely experience an increase in revenue during the construction phase due to the construction workers in the area. Non-payroll direct expenditures, such as services and rentals, made locally during the construction period, are anticipated to include services such as transportation, security, catering, and clearing. Additionally, indirect and induced economic activity in industries including food services, investigation and security systems, real estate services (i.e., lodging/leasing and rentals), and retail stores are anticipated. In total, the construction of KEC will have significant economic benefits for the state of Connecticut and the Town of Killingly. Table 7-13 illustrates the total (i.e., direct, indirect, and induced) job creation, employee earnings (i.e., wages), and economic output, attributable to KEC's construction on the State of Connecticut. In total, the economic output from KEC during construction is projected to be $236 million ($36 million in 2017, $106 million in 2018, $82 million in 2019, and $11 million in 2020).

Table 7-13: Total Economic Impacts on the State of Connecticut – Construction

	2017	2018	2019	2020	Total[a]
Employment Impact (full-time equivalents [FTEs] per year)	180	515	386	51	283
Earnings Impact ($ - millions)	25	73	56	8	162
Economic Output ($ - millions)	36	106	82	11	236

[a] Employment impacts represent the average annual jobs across the construction period.

Table 7-14 (which includes the values already presented in Table 7-13, above) highlights the direct employment and earnings impacts from KEC's construction and operations, impacts that are expected to originate in the Town of Killingly. These impacts will be driven by the direct onsite jobs created during construction and operations, illustrated in the upper portion of Table 7-14 under the "Direct Employment Impact (FTEs per year)" heading. Construction jobs are projected to average 240 during the height of construction (2018-19). These direct employment impacts result in associated wage creation and impacts, labeled as "Direct Earnings Impact ($ - millions)" in Table 7-14, of $116 million from 2017 through 2020,

with those impacts projected to be realized in and around the Town of Killingly, and $162 million once indirect and induced impacts are included.

Table 7-14: Construction Period: Breakout of Jobs and Earnings Impacts – Direct, Indirect, and Induced

	2017	2018	2019	2020	Total[a]
Direct Employment Impact (FTEs per year)	95	273	204	27	150
Indirect & Induced Employment Impact (FTEs per year)	85	242	181	24	133
Total Employment Impact	***180***	***515***	***386***	***24***	***283***
Direct Earnings Impact ($ - millions)	18	53	40	5	116
Indirect & Induced Earnings Impact ($ - millions)	7	21	16	2	46
Total Earnings Impact	***26***	***73***	***56***	***8***	***162***
[a]Employment impacts represent the average annual jobs across the construction period.					

To summarize, KEC is projected to result in the following total economic benefits to the state of Connecticut during construction.

- **Jobs:** During the peak of KEC's construction (2018-2019), 515 jobs will be created in 2018 (including 273 onsite) and 386 jobs will be created in 2019 (including 204 onsite).
- **Salaries and wages:** KEC's total wage creation during construction is projected to be $162 million (an average of $41 million per year). Of this $162 million, $116 million will be attributed to direct wage creation (an average of $29 million per year).
- **Economic output:** From 2017-2020, the total economic output from KEC is projected to be $236 million (an average of $59 million per year).

A more detailed discussion the analysis related to KEC's economic impacts, input assumptions and findings is provided in Appendix B (Appendix B-1 and Sections 2.2 and 2.3 of Appendix B-2).

7.7.2.2 Demand on Local Services

Adequate construction workers are anticipated to be available locally within the region, and as such, significant relocations are not anticipated. If relocations to the region are required, the resulting regional population increase would be small. Construction of KEC is not expected to significantly affect population,

labor, or housing trends in the area. Similarly, adverse impacts to local schools, hospitals, or emergency services are not anticipated.

Construction of KEC is not anticipated to significantly impact local educational services in the Town of Killingly. Although the KEC Site is located within the Killingly Public Schools District, the construction labor force is anticipated to already live locally in the surrounding towns and counties. Temporary workers traveling from other regions will stay for relatively short durations that would not likely contribute to burden on schools. Because KEC does not involve the construction of new residences or require significant relocations of the labor force, construction of KEC is not expected to generate additional households or schoolchildren in the district.

The need for fire, police, and other emergency services during construction will be minimized by planning for and implementing appropriate security, training, fire suppression, and safety measures at the KEC Site. Coordination with local authorities will occur to ensure appropriate protocols are in place prior to construction of KEC, including updates regarding construction scheduling. During the construction phase, the fire protection systems will comply with all applicable state and local codes. With a comprehensive, on-site fire protection system and proper safety training and procedures, it is not anticipated that construction of KEC will result in significant fire or safety demands that would require acquisition of new equipment or significant operating or infrastructure costs.

KEC will employ private security and coordinate traffic control and KEC Site access with the local police department. During construction of KEC, compensation will be provided, as required, for the provision of traffic control by police officers. No additional operating or infrastructure costs are expected to be incurred by the public police services.

Construction of KEC will, therefore, provide substantial economic and jobs benefits to the Town of Killingly and the region, without the need for significant reliance on community services.

7.7.3 Operational Impacts and Benefits

Operation of KEC is expected to require approximately 25 to 30 full-time employees, anticipated to work in three 8-hour shifts per day. The expectation is that many of these onsite jobs will be filled by residents of the Town of Killingly and the neighboring towns. The annual wages associated with these jobs is projected be $3 million, with a cumulative $13 million in wages over the first five years of operations. Additionally, KEC's operations will result in a significant increase in the Town of Killingly's tax revenue.

The following sections provide information on the economic effect associated with the operations period, as well the demand on municipal services past KEC's commercial operation date in 2020.

7.7.3.1 Economic Effects

Similar to the construction phase, the operation of KEC will have significant economic benefits for the state of the Connecticut and Town of Killingly. Table 7-15 illustrates the total (i.e., direct, indirect, and induced) job creation, employee earnings (i.e., wages), and economic output, attributable to KEC's operations on the State of Connecticut. In total, the economic output from KEC's operations is projected to be $991 million during the first five years of operations.

KEC's total economic benefits can be bifurcated into: benefits derived from KEC's direct operations (labeled as "Facility Operations" in Table 7-15); and benefits derived from the impact of KEC's operations on electricity costs and, specifically, lower wholesale capacity and energy costs (labeled as "Cost Savings to Customer" in Table 7-15). KEC's direct operations are projected to result in an increase in economic output of $82 million over the first five years of operations. Wholesale electricity cost savings are projected to result in an increase in economic output of $910 million over this same time.

Table 7-15: Direct, Indirect, and Induced Economic Impacts on the State of Connecticut – Operations

	2020	2021	2022	2023	2024	Total[a]
Employment Impact (FTEs per year)						
Facility Operations	62	74	74	74	74	71
Cost Savings to Customer	291	956	1,200	1,319	1,300	1,013
Total Employment Impact	***353***	***1,030***	***1,274***	***1,393***	***1,374***	***1,085***
Earning Impact ($ - millions)						
Facility Operations	6	7	8	8	8	37
Cost Savings to Customer	18	62	79	89	90	338
Total Earnings Impact	***24***	***69***	***87***	***97***	***98***	***375***
Economic Output ($ - millions)						
Facility Operations	13	17	17	17	18	82
Cost Savings to Customer	50	166	213	240	241	910
Total Economic Output	***63***	***183***	***230***	***257***	***259***	***991***

[a]Employment impacts represent the average annual jobs across the operations period.

KEC's operations are projected to result in an annual average decrease of approximately 10% in wholesale electricity costs, all else equal, during the initial five years of KEC's operations. This equates to an average of approximately $215 million per year in wholesale electricity cost savings to Connecticut ratepayers. The $215 million per year in electricity cost savings to Connecticut ratepayers is projected to result in an average of $180 million per year in increased economic output during KEC's first five years of operations.[11] The average of $180 million per year is based on annual economic output (as shown in the "Cost Savings to Customer" line item) of $50 million in 2020 through and including $241 million in 2024.

To summarize, KEC is projected to result in the following total economic benefits to the state of Connecticut during operations.

- **Jobs:** KEC's operations will create 1,374 jobs in 2024.
- **Salaries and wages:** The associated wage creation with these jobs will be $98 million in 2024, and total wage creation from 2020 through 2024 is projected to be $375 million.
- **Economic output:** Total economic output from 2020 through 2024 will be $991 million, with $259 million in 2024.

A more detailed discussion the analysis related to KEC's economic impacts, input assumptions and findings is provided in Appendix B (Appendix B-1 and Sections 2.2 and 2.3 of Appendix B-2).

7.7.3.2 Demand on Local Services

The relatively small number of employees required for operations (25 to 30) is not expected to significantly affect population, labor, or housing trends in the area, nor represent a burden to local schools, hospitals, or emergency services. The demand for fire, police, and other emergency services during operation will be minimized through appropriate security, training, fire suppression, and safety measures at the KEC Site. Coordination with local authorities will be provided to ensure appropriate protocols are in place prior to operation of KEC.

7.7.4 Environmental Justice

DEEP identifies EJ Communities to protect public health and welfare in vulnerable communities. The EJ Program outlines protective procedures for proposed industrial projects, to prevent disproportionate environmental burden on low-income or minority populations, and appropriate equal distribution of

[11] The analysis in Appendix B assumes that electricity cost savings represent an increase in household income, and that for every $1.00 increase in household income, Connecticut electricity ratepayers will spend approximately $0.85. This is why $215 million in electricity cost savings results in a slightly lower economic output of $180 million.

environmental benefits throughout the state. Protected EJ Communities in Connecticut include municipalities recognized by the state's Department of Economic and Community Development on its List of Distressed Municipalities, such as the Town of Killingly, which has been on the list since 1999.

In compliance with the EJ Program, NTE has developed and is implementing an EJ Plan that assures all members of the community the opportunity to be aware of KEC and its proposal. Meetings have been held, notifications posted, and materials broadly distributed to allow all members of the community to be aware of KEC and its permitting processes. KEC will bring additional economic development to a community that has identified the need for such economic growth, and will be sited in an area of the Town of Killingly specifically intended for this purpose. KEC will also be designed, constructed, and operated in a manner that complies with applicable standards and minimizes levels of environmental and community impact to the greatest extent possible. The economic contribution to the Town of Killingly through taxes and other community agreements will also provide substantial benefits. Therefore, KEC reflects a positive socioeconomic contribution to the local community that has been appropriately reviewed under DEEP's EJ program.

8.0 PROJECT-RELATED INTERCONNECTIONS

There are four interconnections associated with KEC that are anticipated to be permitted, constructed, owned, and operated by others. In order to provide an understanding of the breadth of impacts associated with KEC, this section provides currently available details for: the natural gas pipeline interconnection; the electric transmission interconnection; the water piping; and the wastewater piping.

8.1 NATURAL GAS PIPELINE INTERCONNECTION

KEC will be served by an upgraded natural gas pipeline lateral to be constructed and owned by Eversource (formerly Yankee Gas). Eversource currently owns and operates an approximately 50 year old distribution level natural gas pipeline that extends from the AGT mainline, approximately 2 miles northwest of the KEC Site in the Town of Pomfret, to Lake Road in the Town of Killingly, at which point the pipeline turns eastward along Lake Road, continuing past the KEC site approaching the Killingly Industrial Park.

To meet KEC's natural gas requirements (3.9 MMcf per hour), the pipeline lateral will be upgraded to an expected diameter of at least 14 inches with a pressure of 700 psi. Replacement of the existing pipeline lateral within an established Eversource ROW will minimize the environmental impacts commonly associated with development a new ROW for new pipeline infrastructure. Impacts resulting from the pipeline upgrade will be limited to activities associated with excavating the previously disturbed trench. The replacement pipeline may require additional temporary workspace alongside the pipeline trench during construction, but there will be no permanent aboveground infrastructure associated with the new pipeline, except for the necessary meter facilities that will be located on the KEC Site.

The following section provides a description of the existing pipeline ROW, the planned upgrade, and anticipated environmental and community impacts.

8.1.1 Existing Pipeline

The existing Eversource pipeline intersects a 24-inch AGT pipeline, the northernmost pipeline of the two parallel AGT pipelines within the AGT mainline, near Wrights Crossing Road in the Town of Pomfret. From the POI with the AGT pipeline, the existing pipeline heads southeast beneath a wetland area for approximately 2,000 feet, then continues southeast for approximately 600 feet abutting an open field before crossing Holmes Road and the Airline North State Park Trail. The pipeline continues southeast for approximately 3,000 feet through forested and protected open space, then heads south, paralleling Durkee Brook for approximately 3,000 feet. The pipeline continues southeast for approximately 2,500 feet, passing west of Bruce's Pond and crossing River Road. The pipeline continues in a southeasterly direction, crossing the Quinebaug River into the Town of Killingly. South of the Quinebaug River, the pipeline continues

approximately 2,400 feet through forested lands until it enters the southern edge of Lake Road. At Lake Road, the pipeline travels northeast to the KEC Site for approximately 1,200 feet and then extends past the KEC site to the Killingly Industrial Park. The approximate length of the existing pipeline is 2.8 miles, as shown on Figure 2-8.

8.1.2 Proposed Pipeline Replacement

Replacement of the existing Eversource pipeline with a larger diameter pipeline will not require an increase in the width of the existing ROW, based on preliminary information provided by Eversource. As the pipeline will be located below ground, any temporarily disturbed areas will be properly restored after construction. There will be no permanent, visible changes to the area as a result of the pipeline replacement.

8.1.3 Community and Environmental Considerations

As this upgrade consists of the removal and replacement of an existing pipeline into the same location, impacts to the community and environment are anticipated to be minimal. The following section provides a general review of: earth resource; natural resource; air resource; water resource; and community resource issues relating to this interconnection. Community and environmental characteristics are shown on Figure 8-1.

8.1.4 Earth Resources

Terrain along the pipeline route has moderate elevation changes, beginning at approximately 350 feet amsl at the northern end of the pipeline, rising to over 400 feet amsl south of Holmes Road, lowering near the Quinebaug River to about 210 feet amsl, before rising to approximately 360 feet amsl at Lake Road near the KEC Site at the southern end of the pipeline. Because the updated pipeline will be installed in essentially the same trench from which the existing pipe will be removed, it is not anticipated that blasting or significant earthwork issues will be required. As is the case for the existing pipeline, seismic design issues will be integrated into the design and construction practices.

Soils along the pipeline corridor are typical of this area and include the following based on soil classifications from the United States Department of Agriculture Natural Resources Conservation Service:

- Calden and Freetown soils (0 to 2% slopes)
- Charlton-Chatfield complex (3 to 15% slopes, very rocky)
- Canton and Charlton soils (3 to 15% slopes, extremely stony)
- Scarborough Muck (0 to 3% slopes)
- Hinckley loamy sand (3 to 15% slopes)

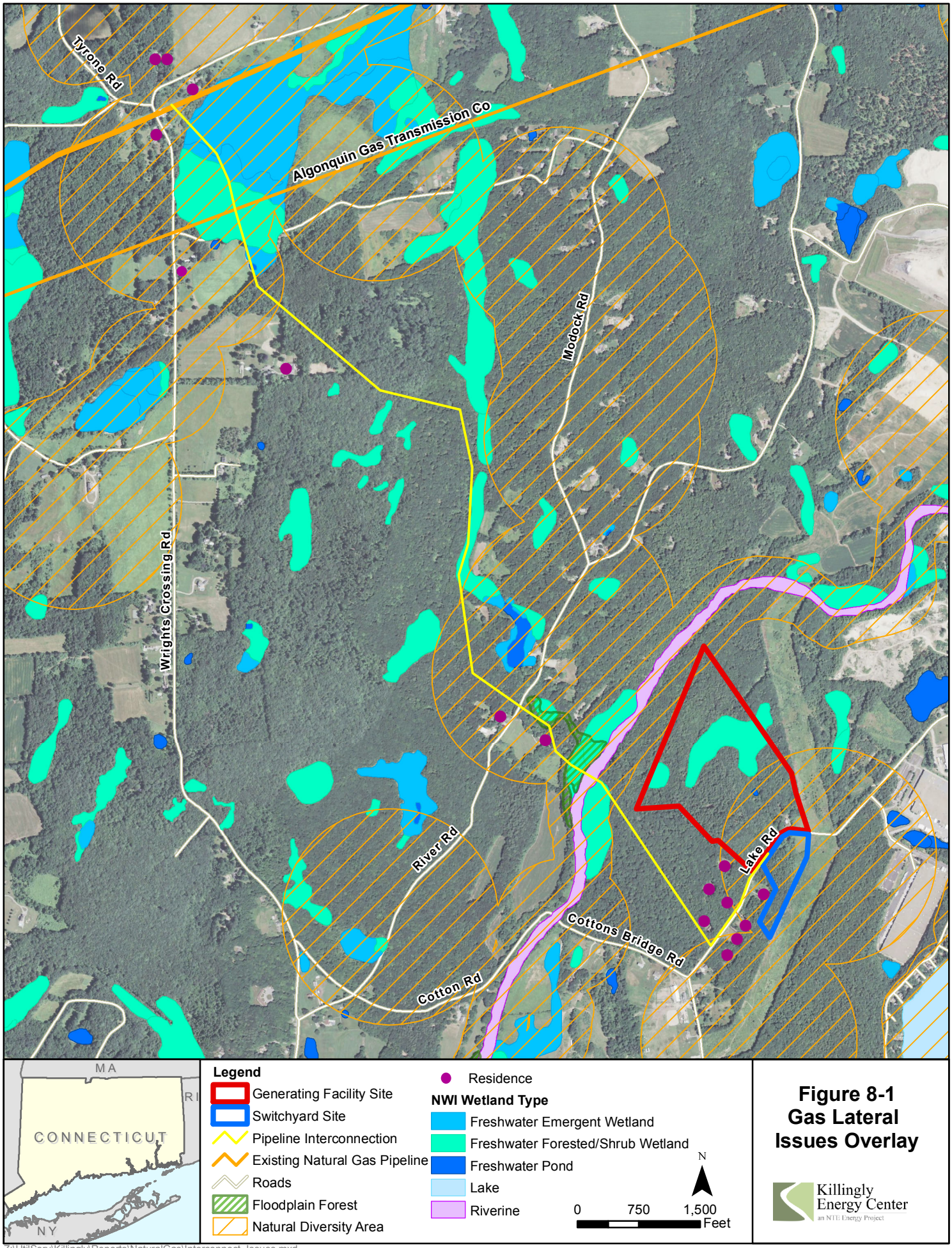

Figure 8-1
Gas Lateral Issues Overlay

Killingly Energy Center
an NTE Energy Project

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- Suncook loamy fine sand (0 to 3% slopes)
- Charlton-Chatfield complex (15 to 45% slopes, very rocky)
- Canton and Charlton soils (3 to 8% slopes, very stony)

During pipeline construction, as the existing pipeline is excavated and removed, soils will be removed and stockpiled nearby. Soils will be managed by the construction contractor in accordance with an approved pipeline-specific Erosion and Sedimentation Plan. Upon installation of the replacement pipeline, soils will be recycled as backfill into the trench, and the areas will be re-graded to their original contours to the extent feasible. Stormwater management, including the erosion and sediment control measures outlined in the Erosion and Sedimentation Plan, will be employed in accordance with BMPs.

If determined necessary, some clearing will be required to allow for sufficient temporary workspace. Once construction is complete, it is anticipated that the area will be re-graded and returned to its original contours.

During operations, the pipeline ROW will be maintained in accordance with Eversource's vegetation management and routine maintenance procedures. The ROW will be inspected periodically in accordance with Eversource's pipeline safety management practices.

8.1.5 Natural Resources

The majority of the area through which the proposed pipeline traverses is undeveloped. Based on land use mapping from the United States Department of Agriculture Natural Resources Conservation Service, land cover classifications for the area consist of emergent wetlands, forested/shrub wetlands, deciduous and mixed forested areas, and a portion of developed open space, along Lake Road (Figure 8-1). Some clearing may be necessary to accommodate the replacement lateral and to provide sufficient workspace for construction. The width of the permanent ROW will not increase as a result of the upgrade. The amount of temporary workspace required will be determined by Eversource.

The existing pipeline traverses several wetland areas (Figure 8-1). At the northern end, just after the interconnection with the AGT pipeline, the pipeline extends beneath approximately 2,000 feet of mapped freshwater emergent and freshwater forested/shrub wetland, west of Bark Meadow Brook. As the pipeline extends south and southwest, a portion of the pipeline parallels Durkee Brook to the west, and appears to be located within or proximate to forested /shrub wetland. Farther to the south, the pipeline crosses beneath the Quinebaug River. There are no additional mapped wetlands or waterways south of the Quinebaug River crossing as the pipeline approaches Lake Road and heads east to the KEC Site. The Quinebaug River and adjacent area southeast of the Quinebaug River is within the 100-year flood zone.

It is anticipated that the replacement pipeline will cross the same resource areas crossed by the existing pipeline. Eversource will work with local and state agencies to determine the appropriate method for

conducting work in wetland areas and for crossing the Quinebaug River to minimize environmental impacts. Current plans are to leave the existing pipe in place at the Quinebaug River crossing, and utilize boring techniques to install the upgraded piping. Detailed resource area mapping will be conducted by Eversource prior to the start of the pipeline work, and work will be performed only after applicable regulatory approvals:

The existing pipeline crosses several areas that have been mapped in the NDDB for State and Federal Listed Species and Significant Natural Communities by the DEEP Bureau of Natural Resources, Wildlife Division (Figure 8-1). Prior to submitting an application for construction of the replacement pipeline, Eversource will consult with the DEEP to obtain additional information regarding the presence or absence of rare or threatened endangered species along the pipeline route and will take any necessary measures to avoid impacts where possible. Given this is replacing an existing use in the same location, any potential impacts are expected to be limited to temporary construction disturbance. Depending upon the species anticipated to have the potential to be present, appropriate construction BMPs will be implemented to minimize impact potential.

8.1.6 Air Resources

Temporary impacts during construction including fugitive dust and temporary emissions associated with construction vehicles may occur; however, use of BMPs will control fugitive dust and all construction vehicles will comply with state and federal requirements for emissions. No new equipment is proposed that would be a source of air emissions.

8.1.7 Water Resources

The existing pipeline crosses the Quinebaug River. For the replacement lateral, Eversource will work with state and local agencies to determine the appropriate method for the crossing of the Quinebaug River while minimizing environmental impacts. Crossing methods may include the use of horizontal directional drilling, leaving the existing pipe in place, which would minimize impacts to the river.

The existing pipeline is located within the Quinebaug River watershed (Sub-basin No. 3700), within which the pipeline crosses three local watersheds (Sub-basin No. 3700-18, Sub-basin No. 3700-17, and Sub-basin No. 3700-00). Groundwater resources and surface water resources in this watershed ultimately discharge to the Quinebaug River. The groundwater resources underlying the existing pipeline are currently classified by DEEP as Class GA. DEEP presumes that groundwater in such areas is suitable for drinking and other domestic uses without treatment and base flow for hydraulically connected surface water bodies. The existing pipeline does not cross any Aquifer Protection Areas. Construction of the replacement pipeline is not anticipated to adversely affect the existing groundwater resources or regional water supply.

8.1.8 Community Resources

Property along the pipeline route consists primarily of undeveloped land. There are several parcels of protected open space that are crossed by the existing pipeline: a portion of the Bafflin Sanctuary, owned by the Connecticut Audubon Society; Wyndham Land Trust; the Airline North State Park Trail; and a large undeveloped parcel owned by the Pomfret Rod and Gun Club, north of River Road, which includes Bruce Pond. There are scattered private residences in proximity of the existing pipeline. North of the Quinebaug River, residences generally occur along local roadways. At the POI with the AGT pipeline, Wrights Crossing Road has several residences in proximity; the closest is approximately 350 feet from the POI. Several other residences, located farther south along Wrights Crossing Road occur relatively proximate to the interconnection. At its crossing with River Road, the interconnection passes near two residences. Following the Quinebaug River crossing, no residences are in proximity until the interconnection approaches Lake Road. Although the pipeline upgrade would involve some temporary disruption, following installation impact to these land uses would be no different than existing conditions.

Given that most of the proposed work area has previously been disturbed by the existing pipeline, it is not anticipated that significant cultural resources exist or will be impacted; consultation will occur with the SHPO for confirmation.

Construction of the replacement pipeline lateral will result in temporary construction-related traffic. Eversource will address traffic management during construction in its application. During operations, the replacement pipeline is not anticipated to generate any material traffic, other than periodic safety inspections conducted by Eversource.

The existing pipeline has little, if any, discernable noise associated with operation. Temporary noise impacts will occur during construction of the replacement pipeline, but this temporary disruption will cease following pipe installation.

As with the existing pipeline, the replacement pipeline will be constructed and operated by Eversource in accordance with all federal, state and local safety requirements. The pipeline itself will be consistent with surrounding land uses as it will be below ground, and not discernibly different to the existing pipeline that it will replace. The pipeline replacement is a benefit to the surrounding area by providing more reliable and updated transportation of natural gas along this existing ROW.

8.2 ELECTRIC TRANSMISSION INTERCONNECTION

Studies were completed for the Switchyard Site. The Application includes specific information regarding the Utility Switchyard in the following sections:

- Section 1.1.1 – Statutory Authority and Purpose
- Section 1.5 – Transmission Interconnection and Power Delivery
- Section 2.1 – Site Location and Access
- Section 2.2 – Proposed Facility Layout
- Section 2.3.6 – Electrical Generators and Interconnections
- Section 2.13.1 – Lighting Plan
- Section 2.13.5.2 – Contingencies for Resource or Equipment Failure
- Section 3.0 – Earth Resources
- Section 4.0 – Natural Resources
- Section 6.2.2 – Stormwater Management
- Section 7. 5 – Electric and Magnetic Fields
- Section 9.1.3 – Final Site Selection Process

The Utility Switchyard will be immediately adjacent to the existing Eversource electric transmission ROW, and will not require an off-site interconnection.

8.3 WATER PIPE INTERCONNECTION

As discussed in Section 6.1.3, KEC will be supplied water by CWC from its existing permitted wellfields and treatment systems. Figure 2-10 illustrates the water pipe that will be required to be extended to reach the KEC Site. As can be seen, the existing water main, adequate to meet KEC's limited water needs, currently exists at the intersection of Lake Road and Louisa Viens Drive. This water main will be extended along Lake Road approximately 3,100 feet to the KEC access drive.

Additional piping extensions between the Plainfield and Brooklyn Wellfields are also proposed. It is anticipated that all piping work will occur within the road, and that no natural resource impacts will result. Details will be determined as design of the piping systems are more fully developed.

8.4 WASTEWATER PIPE INTERCONNECTION

As discussed in Section 6.3.2, KEC will discharge its wastewater into the existing municipal wastewater treatment system. Figure 2-12 illustrates the sewer main that will be required to be extended to reach the KEC Site. As can be seen, the sewer main manhole, adequate to meet KEC's discharge volumes, currently

exists just west of the intersection of Lake Road and Louisa Viens Drive. This sewer main will be extended along Lake Road approximately 3,100 feet to the KEC access drive. It is anticipated that all piping work will occur within the road, and that no natural resource impacts will result. Details will be determined as design of the piping systems are more fully developed.

9.0 ALTERNATIVES

This section considers alternatives to KEC as currently proposed, including a discussion of alternative sites and the site selection process, alternative technologies considered, and alternative designs of the KEC facility. Based upon this analysis, NTE has confirmed that KEC is an appropriately sized and designed facility located in a suitable location that is consistent with planned land uses in the area, where KEC will have minimal environmental and community impacts and provide significant economic benefits.

9.1 ALTERNATIVE SITES

9.1.1 Site Study Area Selection

Due to the growing need for flexible, reliable baseload power generation in ISO-NE, NTE evaluated potential development sites throughout New England. Early on in the siting process, Connecticut was selected as a focus area for site selection; Connecticut was identified as having a need to supplement and replace existing aging power generating assets. Also, locations in Connecticut are closer to load centers, south of transmission and natural gas constraint points in the New England region where much of the existing generation is north of those constraints.

Given current supply and demand conditions in this region of the ISO-NE system, as well as future supply/demand projections, Connecticut and ISO-NE were identified as a suitable target location needing a flexible, reliable baseload facility. In addition, Connecticut's Renewable Portfolio Standard (RPS) is among the most aggressive in the region; as a result, Connecticut is projected to be the location of growing solar electric facilities in New England (ISO-NE forecasts an average of 50 MW of solar added each year from 2014 through 2023 [ISO-NE 2014]). As the amount of intermittent renewable energy generation increases, grid stability becomes more crucial, resulting in the need for reliable, flexible, baseload power generation that can be quickly called upon to meet peak demands and provide integral grid support functions such as frequency and voltage response. Suitable locations within Connecticut were, therefore, sought to meet these needs.

9.1.2 Screening Criteria and Process

To identify a site most suitable for power generation, NTE developed general screening criteria to evaluate and compare alternate sites for a new power generating facility. These criteria included:

- Proximity to natural gas and electric transmission line infrastructure;
- Consistency with existing and planned development in the area;

- Sizable acreage;
- Potential site redevelopment options;
- Host community interest;
- Property owner interest; and
- Environmental considerations and constraints.

NTE's initial site search included an extensive desktop analysis, through which locations were identified and prioritized focusing first on the site screening criteria referenced above.

As various locations were investigated, a number of potential development sites were considered, including brownfield locations like retired coal-fired power facilities. Retired power generation sites like coal-fired power generation facilities are assumed to have certain infrastructure in place, such as electric transmission.

After researching brownfield sites across Connecticut, such locations were determined not to be suitable for NTE's proposed facility, either because natural gas pipeline infrastructure and capability were typically not within close proximity to these sites, or because current owners were not interested in relinquishing the sites. Due to lack of additionally required infrastructure and/or disinterest from site owners, redevelopment sites were not considered any further in the alternative sites analysis.

Over the course of several months, NTE researched and evaluated numerous prospective sites for the development of a new power generating facility in Connecticut, including site locations in: Wallingford; Danbury; Milford; East Granby; Berlin; Waterbury; Killingly; Pomfret; and Putnam.

In addition to a thorough desktop analysis utilizing GIS mapping software that illustrates the location of infrastructure, wetlands, parcel boundaries, and other siting criteria, NTE conducted numerous site visits, spoke with property owners and met with town officials to discuss the general interest level in a natural gas-fired power generation facility, the towns' long-term development plans, prospective site locations within each town, and the necessary infrastructure capabilities.

In Wallingford and Danbury, for example, NTE did not identify available parcels of adequate size in or near the Town's industrial areas, suitable and in close proximity to required infrastructure for the development of a power generating facility. In Milford, Putnam, and at an alternative location in Killingly, identified parcel owners were not interested in selling the parcel. A site investigated in Waterbury was located more than 7 miles from the nearest electric transmission line, which would require extensive development of transmission infrastructure. Lastly, locations investigated in Berlin, Pomfret, and East Granby lacked adequate industrial areas to support a power generating facility. In each instance, these alternative sites/locations were rejected.

Many of the locations identified and rejected would require the development of extensive new infrastructure (electric transmission and natural gas lines) to accommodate a new power generation facility or lacked adequate land area or dimensions needed for the use. In some cases, where adequate land area might have been available, the parcels were identified as "unavailable" by the owners. Other parcels maintained environmental and engineering constraints associated with former uses; for instance, a few identified parcels showed large wetland footprints that would have required significant disturbance to wetland areas.

Ultimately, the industrial park area in northwest Killingly became the focus of NTE's site search efforts. This area maintains robust electric and gas transmission infrastructure and is surrounded by a number of significant industrial uses, including the existing Lake Road Generating Facility. A number of the sites investigated in Killingly were adequately sized, located in the existing industrial park, or in an area identified by the Town for future expansion the industrial park, and the Town was open to the idea of additional industrial development in the industrial area of to the Town, especially one that would have a strong economic benefits.

9.1.3 Final Site Selection Process

Once Killingly was chosen as the primary candidate town, NTE narrowed its site search to three potential locations within the Town which possessed the most favorable attributes. A more detailed engineering and environmental evaluation was conducted of each of the three Killingly site locations in order to further consider viability and support selection of a specific location. Table 9-1 summarizes the results of the assessment that led to the selection of the current location for KEC.

Table 9-1: Site Comparison

Category	Site 1	Site 2	Site 3 (Generating Facility Site)
Site Size	Sufficient acreage available	Sufficient acreage available	Sufficient acreage available
Owner Interest	Potential for option	No interest in option	Potential for option
Engineering Suitability	Site constrained due to parcel configuration and location of existing infrastructure corridors; unlikely to support facility layout	Sloping site; given location of mapped wetland/floodplain constraints may prove challenging to avoid impacts	Sloping site; location of mapped constraints appears to retain sufficient area for a layout that would avoid impacts
Air Quality	No material difference between the sites		

Category	Site 1	Site 2	Site 3 (Generating Facility Site)
Wetlands	Mapped wetland hydric soils within Quinebaug River floodplain area	Mapped wetlands, hydric soils, and potential streams	Mapped wetlands, stream, and hydric soils; considerable non-mapped area remaining
Floodplain	Significant area of floodplain mapped adjacent to Quinebaug	Floodplain pocket in center of site	Floodplain pocket; considerable non-mapped area remaining
Protected Species	Entire site in state-mapped habitat area	Southern portion of site in state-mapped habitat area	Southern portion of site in state-mapped habitat area (northern tip in mapped area along the Quinebaug River)
Land Use and Zoning	Zoned Industrial	Zoned Rural Development, within future Industrial area	Zoned Rural Development, within future Industrial area
Noise	Residential standards not required to be met at property lines	Residential standards required to be met at property lines	Residential standards required to be met at property lines
Visibility	Closest to Quinebaug River and I-395	Generally wooded setting	Wooded setting
Cultural Resources	Closest to Quinebaug River, although existing infrastructure disturbance reduces potential sensitivity	Minimal prior disturbance	Minimal prior disturbance
Water supply	No material difference between the sites		
Wastewater	No material difference between the sites		

Based upon this assessment, NTE selected Site 3, which is the Generating Facility Site. All of the sites met the basic requirements of site size, location within an area currently zoned or planned for future industrial use, and proximate to important infrastructure (natural gas, electrical, and water/wastewater). Sites 1 and 2 were, however, determined to be less favorable. Site 1, located north of the Lake Road Generating facility off Alexander Parkway is substantially encumbered by wetlands and floodplain areas making it difficult to develop and access. Site 1 contains hydric soils, a mapped species habitat, and is also constrained by the position of existing infrastructure corridor (Eversource transmission line) that bisects the parcel. Site 2 had similar attributes to Site 1, including mapped natural resources including flood plain

areas and wetlands. More importantly, as the site selection process progressed, it was determined that the landowner had no further interest in selling this property.

The combination of adequate parcel size, surrounding robust infrastructure, site buffering capabilities, ability to avoid major wetland disturbance, the site owner's interest in selling the property, and the Town's future land use plan to expand is industrial park made Site 3 the top candidate for KEC. Based on NTE's alternative site analysis, the following conclusions were made regarding Site 3:

- The site, its location, existing infrastructure, and topography contain characteristics that are conducive to KEC's development, with minimal impacts to the public and the environment.
- The Town is receptive to consideration of KEC since its meets several of the Town's objectives for its future industrial development of the area.
- The site requires minimal new construction of a new natural gas lateral pipeline and no new construction to access electric transmission lines. (It was later determined that additional property – approximately 10 acres with the same ownership as the 63-acre parcel, would be added across Lake Road to allow for the Utility Switchyard.)
- The site has access to an adequate supply of both water from CWC without the need for any new water diversions; and municipal sewer capacities.

Due to its favorable attributes to the alternate sites considered, the KEC Site is clearly superior to any other reasonable alternatives.

9.2 ALTERNATIVE TECHNOLOGIES

9.2.1 Generation Technologies

NTE considered a range of potential generation technologies, and affirmed that a combined cycle combustion turbine utilizing natural gas as its primary fuel not only presented proven economic and efficiency advantages but also was a favorable option from the perspective of reliability, environmental considerations, and acceptability relative to the purpose and need for the project.

9.2.1.1 Renewable Energy Technologies

Renewable resources, such as wind and solar, are an important component of the electrical grid. However, they require the support of KEC's three primary attributes (flexible, reliable, baseload power), which are important for meeting energy needs in Connecticut. Solar and wind facilities generate energy only intermittently, depending upon the availability of the resource. Energy storage solutions do not yet allow for reliable power generation across the potential demand spectrum. Given this, efficient and flexible

baseload generating sources are needed across the region, to meet system baseload demand, while supporting the growing number of renewables in the energy mix.

In addition to the factors discussed above, land requirements for solar and wind projects are highly dependent on the "resource" available at a given site, as well as topographic and other factors. NREL identifies solar energy production in its June 2013 report Land-Use Requirements for Solar Power Plants in the United States of approximately 5.9 acres per MW at maximum solar output (i.e., mid-day with clear skies [Ong et al. 2013]). Assuming the entire KEC Site was usable, 73 acres would result in solar generation of approximately 12 MW under ideal conditions only. In reality, significant portions of the KEC Site would not be used due to wetlands or other constraints, and due to the highly variable weather conditions at the KEC and the region as a whole, the energy yield would be significantly less than 12 MW continuously (as a baseload facility, such as KEC, would provide). Therefore, a solar powered energy generation facility at the KEC Site would yield energy less than 12 MW. Similarly, wind generation facilities vary in the amount of land area required. Using NREL's August 2009 Land-Use Requirements of Modern Wind Power Plants in the United States, wind energy facilities can require from approximately 22 acres per MW to as much as 250 acres per MW (Denholm et al. 2009). Even assuming the more productive end of the NREL range, the KEC Site could yield just over 3 MW of generation from wind at maximum wind output conditions. In general, New England is not among the areas with strong on-shore wind resources, due to variable wind direction and lower overall wind speeds (except along certain ridgelines). The solar or wind alternatives located on the KEC Site, therefore, would result in considerably lower energy production than the technology proposed by KEC.

9.2.1.2 Simple Cycle Combustion Technology

Simple cycle combustion turbine technology is not as efficient as combined cycle units in terms of energy and emissions produced. The EIA publication entitled Updated Capital Cost Estimates for Utility Scale Electricity Generating Plants (U.S. Department of Energy 2013) provides a comparison of heat rates for various electric utility scale generating technologies and determined that simple cycle combustion turbines have a heat rate of 9,750 to 10,850 Btu/kWh. Combined cycle combustion technology produces heat rates between 6,430 and 7,050 Btu/kWh.

Additionally, simple cycle combustion turbine technology is quick-starting and well-suited to meeting peak electric demand as opposed to baseload demand. KEC is being developed to provide baseload power to the region to meet a baseload electrical demand. As such, simple cycle technology would not provide the power to meet KEC's objectives and the needs of the region.

9.2.1.3 Combined Cycle Combustion Technology

Advanced combined cycle combustion turbine technology with natural gas firing is much more efficient than other types of technology utilized in current non-renewable electric power generation projects. KEC has a new and clean net heat rate (excluding supplemental firing) at full load under ISO conditions of 6,529 Btu/kWh (higher heating value, net).

Natural gas-fired combined cycle technology, as proposed, also facilitates flexible operation. This will allow ISO-NE to select the most appropriate generating source to meet the varying levels of energy demand. Combined cycle technology utilizing natural gas as its primary fuel remains the most favorable option today from a market point of view. This was recently demonstrated by ISO-NE's choice of a gas-fired combined cycle facility as the forward capacity market's proxy unit. This technology also maximizes operating efficiency while minimizing air emissions.

9.2.2 Fuels

Natural gas, the preferred fuel source for KEC, is the cleanest burning fossil fuel. Burning alternative fossil fuels, such as coal and fuel oil in traditional steam generating units, results in greater pollutant emissions. NTE identified the following three fuel options to assure the lowest emitting scenario was selected that would best meet KEC's purpose and need:

- Natural gas as the sole fuel;
- Natural gas as primary fuel with LNG as backup; and
- Natural gas as the primary fuel with ULSD as backup.

Natural gas, delivered via the AGT pipeline, located approximately 2 miles north of the KEC Site, and the Eversource lateral connection eliminates the need for road or rail delivery, and provides efficient combustion in combined cycle mode resulting in the lowest emissions for all fossil fuels. Natural gas will be fired in the combustion turbine generator at all times when it is available. KEC has contracted for firm natural gas fuel supply. Under this contract structure, NTE will enter into a natural gas fuel supply agreement with a single fuel supplier that will provide interstate pipeline transportation, natural gas commodity, and balancing service bundled into one firm delivered natural gas fuel supply. The supplier holds a firm obligation to deliver natural gas regardless of market conditions; however, there could be circumstances where even firm natural gas pipeline transportation is curtailed due to operational flow orders or other operation events on the interstate pipeline even though a firm obligation exists. In this circumstance, KEC continues to have a delivery obligation to ISO-NE and thus must generate as required to maintain system integrity on the electric grid. Therefore, backup fuel is required in order to meet the capacity and delivery obligations of ISO-NE, as these delivery obligations are not excused even in the event of curtailment of firm natural gas fuel supply.

Natural gas as the primary fuel with the installation of LNG storage to supply backup fuel was a considered option; however, securing the necessary approvals and constructing LNG storage at the KEC Site was considered infeasible. There is not sufficient space on the site to build an LNG storage terminal due to the size of the terminal and the additional space requirements associated with the need for an exclusion zone around LNG storage tanks. This fuel alternative was, therefore, eliminated from further consideration.

The use of ULSD was considered. Due to its ease of transport, compact storage requirements, lowest emitting characteristics of liquid fuels available, and ability to be utilized by the same combustion process and equipment, ULSD was selected as the backup fuel. Because the emissions are higher for certain parameters than natural gas and the water demand is increased when firing ULSD, KEC's use of ULSD will be restricted to instances when natural gas is unavailable and in no case for more than 720 hours per year. This will be sufficient support for KEC reliability, and allow for appropriate fuel flexibility without the need for substantial additional infrastructure or equipment.

The selection of natural gas as the primary fuel, with ULSD for limited use as backup, was determined to be the appropriate fuel scenario for KEC.

9.2.3 Electric Power Transmission

The KEC Site is immediately adjacent to an existing Eversource transmission ROW that includes 115-kV and 345-kV electrical systems. Electrical interconnection and transmission into the regional electric grid will be possible without the need for an additional electrical transmission corridor. An overhead 345-kV transmission line will extend from KEC's collection switchyard located on the Generating Facility Site across Lake Road to the Switchyard Site. Because the interconnection will occur adjacent to the existing ROW, no alternative transmission routes were considered for KEC's electrical interconnection.

9.3 ALTERNATIVE DESIGNS

9.3.1 Emission Controls

KEC has selected advanced pollution control technologies and add-on controls to achieve low levels of emissions when operating both with its primary fuel (natural gas) and its backup source (ULSD). KEC's emission controls are subject to BACT and LAER analysis, as further discussed in Section 5.4.

KEC considered various alternative NO_x emission control technologies, and proposes to install DLN combustors and SCR technology to control NO_x emissions during natural gas firing. Water injection will be used with SCR to minimize NO_x emissions during ULSD firing. As discussed in Section 5.4, this represents LAER, which is equivalent to the lowest emission rates achieved in practice. NTE evaluated alternative

technologies, including selective non-catalytic reduction (SNCR) and EM_x^{TM} technology. SNCR requires exhaust temperatures much higher than produced by a combustion turbine to be effective and typically achieves NO_x reductions of 50% or less. For these reasons, SNCR was eliminated as technically infeasible. EM_x^{TM} has never been installed on a CTG larger than 43 MW and has not demonstrated NO_x control levels greater than SCR. For these reasons, EM_x^{TM} was eliminated as technically infeasible.

Good combustion controls and an oxidation catalyst will be used to control CO and VOC emissions; this represents BACT for these two pollutants. No other emission control technologies are available to achieve further reductions for these two pollutants.

Emissions of SO_2, H_2SO_4 and $PM/PM_{2.5}/PM_{10}$ will be controlled by good combustion practices and use of low sulfur fuels. KEC will fire natural gas as the primary fuel, with a maximum sulfur content of 0.5 gr/100 scf. ULSD, with a maximum sulfur content of 15 ppmw, will be the backup fuel, limited to times when natural gas is not available and in no case for more than 720 hours per year. Post-combustion emissions controls such as fabric filters, electrostatic precipitators, and scrubbers, which are commonly used on solid-fuel boilers, are not technically feasible for CTGs, given the low emission rates. There are no known combined cycle CTGs with post-combustion controls for SO_2, H_2SO_4 or $PM/PM_{2.5}/PM_{10}$.

Emissions of GHGs, primarily CO_2, are related to carbon content of the fuel and heat rate of the technology. Due to relatively low carbon content of natural gas on a heat content basis, and the low heat rate of the combined cycle technology, KEC will have less than half of the CO_2 emissions of existing coal-fired boiler plants with steam turbines. Post-combustion controls, while theoretically feasible, are not commercially available and cost prohibitive. BACT for GHGs was determined to be use of natural gas as the primary fuel with limited use of ULSD as the backup fuel in a highly efficient combustion turbine.

9.3.2 Cooling Systems

A natural gas-fired combined cycle electric generating facility requires cooling, particularly for the condensing of turbine exhaust steam in the steam turbine condenser. A range of cooling technologies was evaluated, including once-through cooling, conventional “wet” cooling towers, and air cooling. The technology that is most appropriate for a given project is dependent on a site-specific balancing of a number of technical, economic, and environmental factors. Air cooling has been selected as the most appropriate cooling technology for KEC.

9.3.2.1 Once-Through Cooling

Many larger electric generating facilities located near surface water bodies have historically utilized once-through cooling technology. Once-through cooling systems circulate water from a nearby surface waterbody through the steam surface condenser. Heat from the steam condenser is transferred to the

cooler circulating water. The same quantity of water is then returned directly to the surface water body after exiting the condenser, although at a warmer temperature. The warmer temperature is the result of the water having absorbed the latent heat of vaporization associated with condensing the turbine exhaust steam back to a liquid state. The name of this system is derived from the fact that cooling water is passed through the condenser just one time before being returned to the water source. With the issuance of USEPA's 2014 §316(b) Final Rule covering cooling water intake structures, presumptive Best Technology Available has been defined as a withdrawal rate equivalent to mechanical draft wet cooling towers. For this reason, once-through cooling was rejected.

9.3.2.2 Mechanical Draft (Wet) Cooling

In a mechanical draft or wet cooling tower system, water is circulated in a loop through the steam surface condenser and the cooling tower. The circulating water serves as the intermediary heat transfer medium between the steam surface condenser and ambient air. Cooling is achieved by evaporation of the water circulating through the system and through direct contact with the air as the water cascades down through the cooling tower. Air is moved through the cooling tower through the use of fans. A supply of water is required to make up for evaporation losses. In addition, a smaller quantity of water, known as blowdown, is discharged from the system to limit the build-up of dissolved solids that are concentrated in the remaining circulating water during the evaporation process. The blowdown water must also be replaced with makeup water. Particulate air emissions must be permitted for a mechanical draft cooling tower.

Although water cooling is more efficient than air cooling, local concerns regarding water and water use were a key factor for this site. Although the Quinebaug River reflects a potential surface water source, and groundwater resources are also available, it was determined that technology should be selected for KEC that required the least possible water demand.

9.3.2.3 Air-Cooled Condenser Cooling

An air-cooled condenser relies only on ambient air as a direct steam-cycle heat sink, without the use of any water or other intermediary heat transfer medium. Steam is routed from the turbine exhaust through ducts to a series of finned tube heat exchangers. The steam flows through, and condenses inside the tubes while air flows over the outer, finned tube surface. Condensate is discharged from the air-cooled condenser and supplied back to the HRSG after the latent heat of vaporization is transferred from the turbine steam directly to the air stream. Air is moved through the air-cooled condensers by a series of fans, with the warmer air discharged from the tops of the condenser. Air has a lower heat adsorption/exchange rate than water that affects the size of the cooling system.

Selection of air cooling reduces KEC's water requirements by over 95% as compared to wet cooling, and was thus determined to be most appropriate for KEC, given its location.

9.3.3 Water Supply

KEC has been designed to have a reduced water demand for a facility of its size and magnitude. As previously discussed, KEC will utilize air-cooled condenser technology, which will limit its water use to approximately 50,000 to 100,000 gpd when firing natural gas, with demands of up to 400,000 gpd during the limited times ULSD would be utilized. As presented in Section 6.3.1, the CWC system has the capacity to meet KEC's water needs without the need for permitting additional capacity/volume or impacting the community or environment, including Alexander Lake.

NTE considered the potential availability and suitability of several water sources to supplement water received from CWC (Appendix H). These sources included the potential use of recycled wastewater from nearby dischargers, as well as development of surface water or groundwater sources, as outlined below.

9.3.3.1 Potential Use of Treated Effluent

Treated effluent from nearby publicly owned treatment works or other large industrial uses, has been considered for water use at KEC where sufficient flow is consistently available and water quality can support a reasonable water treatment system (because KEC's water must be cleaner than potable water quality for most of its uses). Three facilities were identified in the vicinity of the KEC site that were considered as potential sources of treated effluent: the Killingly wastewater treatment facility; the Putnam wastewater treatment facility; and the Frito-Lay facility. Each is addressed below.

Killingly Wastewater Treatment Facility

The Killingly wastewater treatment facility discharges into the Quinebaug River south of KEC. This facility, operated by Suez, has a design capacity of 8 MGD, with an average daily flow into the treatment plant of 3 MGD. With flows of this volume, it was determined that this facility could be considered as a potential source of treated effluent.

Based upon an evaluation of preliminary water quality data provided by the facility, the wastewater treatment facility appears to remove both conventional pollutants (biochemical oxygen demand and total suspended solids) as well as nutrients (phosphorus and nitrogen species) to very low concentrations in the treated effluent. However, the conductivity of the Killingly wastewater treatment facility's discharge is estimated to be four to six times higher than that in the CWC supply.

Unlike the CWC supply, treated effluent from Killingly would require further treatment at KEC to make it suitable for the intended water uses. The water would require pretreatment (e.g., microfiltration) and supplemental disinfection such that it could be used as service water, evaporative cooler makeup, and supply water to the makeup demineralizer system. The elevated conductivity of the treated effluent does

not meet the requirements established for evaporative coolers. Thus, a portion would have to be demineralized and blended with treated water that is not demineralized in order to meet makeup water quality guidelines. Such a blending arrangement increases operational complexity as well as the size of the membrane (reverse osmosis-based) demineralizer system. Since reverse osmosis systems typically operate at approximately 75% recovery when treating water with the expected salinity in the Killingly effluent, this additional demineralized water demand results in an associated increased demand for supply water and wastewater. The high conductivity also results in increased chemical usage, power requirements and operator attention for the makeup demineralizer system.

The requirement for a pretreatment process (e.g., microfiltration) reduces the overall recovery of the treatment system, results in the increased production of wastewater (e.g., microfiltration backwash) and increases chemical usage, operator attention and maintenance requirements. Even with suitable pretreatment, it is expected that the reverse osmosis membranes would require more frequent cleaning, which results in increased wastewater production and operator attention.

Significant infrastructure modifications would be necessary, including construction of a water supply pump station and chlorination facilities at the Killingly wastewater treatment plant site, an approximately 6.5-mile treated effluent supply pipeline (including the procurement of all necessary rights-of-way) and a separate filtered/service water tank and pumping system at KEC.

In addition to these basic water treatment issues, the Killingly wastewater treatment facilityt currently experiences infiltration and inflow that would result in variable water volume and quality under certain rainfall conditions. Consistent influent water quality is necessary in order to design an effective water treatment system.

It is also important to consider the potential that low flow concerns could exist associated with removing this discharge from the Quinebaug River. Although KEC's demand is not likely to be sufficient to result in significant concern, considerable evaluation and demonstration of no effect would be anticipated to be required.

Due to these issues, the use of Killingly treated effluent was eliminated from further consideration as the source of water supply for KEC.

Putnam Wastewater Treatment Plant

The Town of Putnam has a wastewater treatment plant that discharges to the Quinebaug River north of KEC and is also operated by Suez. According to the Town of Putnam Water Pollution Control Authority, the wastewater treatment plant has a design capacity of 2.9 MGD; if flows approximate this volume, this facility could be considered as a potential source of treated effluent.

While representatives of the Putnam wastewater treatment plant were initially willing to consider potential use of its treated effluent for this purpose, subsequent communications have indicated that treated effluent from this facility may be reserved for other purposes. No further consideration of this source has, therefore, been undertaken.

Frito-Lay Facility

The Frito-Lay facility is located on the eastern shore of Alexander Lake, just over 1 mile from the KEC Site. The manufacturing processes for each snack food Frito-Lay produces have different procedures and varying wastewater composition, depending upon the characteristics of the core ingredients. Because most of the products are fried, specific controls are designed into its discharge, including an oil/water separator, clarification and neutralization, prior to discharging its wastewater to the Killingly wastewater treatment facility. Discharge is on the order of 600,000 to 900,000 gpd, but varies by work schedule as well as product. Its current permit allows for discharge of up to 1.6 MGD. According to Frito-Lay, its discharges typically comprise approximately 30% of the flows being discharged to the Killingly wastewater treatment facility.

Although sufficient volumes appear to be available from this potential source, concerns included the variability of the discharge quality and the potential for oily waste even at low levels. Frito-Lay's discharge would require extensive treatment to render it suitable to use as supply water to KEC's makeup demineralizer system and evaporative cooler. The conductivity (a measure of salinity or other potentially dissolved solids) of Frito-Lay's discharge is an order of magnitude higher than that in the CWC supply, making it considerably more difficult to demineralize. In addition, the discharge from Frito-Lay has a significant biochemical oxygen demand loading that would require treatment utilizing biological processes. This type of treatment imposes complex and cumbersome operational requirements not typically encountered in facilities like KEC and results in increased maintenance requirements. This water source was, therefore, not selected for further consideration.

9.3.3.2 New Surface or Groundwater Supply

Given the proximity to the Quinebaug River, the possibility of surface water withdrawal or groundwater well development (as demonstrated by other nearby well users) was briefly considered.

The Quinebaug River was considered to be the most robust and appropriate potential source of surface water in the vicinity of KEC, with average daily flows at the USGS gauging station in Putnam measured at 547 cfs, or over 350 MGD. The 7Q10[12] at that gauge was identified as 49 cfs (31.7 MGD). Although the

[12] The definition of 7Q10 is the lowest average discharge over a period of one week with a recurrence interval of 10 years.

Quinebaug River was identified as a potentially feasible water source, it was noted that the most recent Diversion Permit granted (in 2008 to Plainfield Renewable Energy, LLC for a maximum use of 893,000 gpd and annual average day withdrawal limit of 0.656 MGD) was extremely controversial. Given the low typical water needs of an air-cooled facility such KEC, as well as the cost and potential concerns associated with permitting and construction of an intake structure in the Quinebaug River, this alternative was not selected for further consideration.

The KEC site is not specifically located in an aquifer protection area as determined by DEEP. While surficial aquifer potential is mapped as low, water could be determined to be available from sandy/silt deposits more proximate to the Quinebaug River or from bedrock. However, this type of potential water supply may be limited or not available without intensive water supply exploration. In addition, given the proximity of Alexander Lake and the presence of other groundwater users in the vicinity, an on-site or near-site groundwater well was not selected for further consideration.

9.3.4 Layout Alternatives

KEC's layout has been designed to avoid and minimize impacts to sensitive on-site natural resources and impacts to the surrounding community. The layout design goals were to:

- Avoid direct wetland impact, and if unavoidable, minimize to the degree practicable;
- Avoid indirect wetland impacts through appropriate mitigation strategies and generous setbacks;
- Retain significant undeveloped forested areas on the KEC Site;
- Minimize tree clearing to the greatest extent possible;
- Maximize visual screening and separation of sound-producing elements to residences;
- Avoid substantial earth movement where possible; and
- Maintain practical technical equipment orientation to facilitate construction and operations in an efficient, safe, and least-impactful manner.

As described in Section 4.0, several wetland areas exist in the northeastern and northwestern portions of the Generating Facility Site, as well as along the eastern boundary of the Switchyard Site. The original layout was positioned more centrally on the Generating Facility Site, and included direct impacts to wetland resources. To avoid direct impact to these resources, the KEC layout has been shifted towards Lake Road, positioned in the upland area between the two lobes of Wetland A, and in the southwestern upland area of the property. NTE considered several alternate layout configurations. The chosen configuration

allows direct wetland impact to be completely avoided on the Generating Facility Site, and a substantial portion of the KEC Site, closest to the Quinebaug River, to remain in its current wooded condition.

Additional considerations associated with KEC's layout have been designed to minimize impact of potential visibility and noise. Although positioned to avoid wetlands, the KEC layout has been set back as far as possible in the center of the KEC Site. Existing trees surrounding the perimeter of the KEC Site will be retained, where practical, to further provide a visual buffer from surrounding land uses. Low-profile equipment has been selected as another means to minimize the potential for visibility. For example, the air-cooled condenser (which more typically has a design height of greater than 100 feet) will be 80 feet tall. In fact, selection of air cooling for KEC, eliminates the need for a substantial water vapor plume, as would be visible from a water-cooled facility. Also, the HRSG exhaust stack, the tallest feature associated with KEC, has been reduced in height to 150 feet in order to minimize potential visibility while still providing for adequate dispersion that will result in air quality protection and compliance with applicable standards.

KEC's layout was evaluated through an iterative process that has positioned equipment with noise-producing attributes (for example, the ACC, which is a series of elevated fans that must be outdoors in order to function) as far as possible from the KEC Site boundaries. Other louder equipment has been enclosed and/or placed within buildings to minimize its effect to the greatest extent possible. By selecting low-noise equipment, enclosures, and positioning equipment to maximize distance and shielding, the stringent noise requirements will be met at the KEC Site boundaries.

Other alternatives considered in optimizing the layout of the Generating Facility Site include:

- Maximizing use of previously cleared portions of the site, such as abandoned agricultural fields and pasture – The Generating Facility Site portion of KEC is primarily undeveloped woodland, with a small cleared portion surrounding and to the east of the existing residence, adjacent to the transmission line ROW. The current site arrangement takes advantage of this cleared area, which is where the fuel gas metering station is proposed to be located.

- Considering integration of the Utility Switchyard on the Generating Facility Site – The placement of the Generating Facility Site equipment is constrained by several factors and considerations; including wetlands, noise, visibility, air, required civil works, and ultimately space. NTE considered locating the Utility Switchyard on the Generating Facility Site, closest to Lake Road, but only after mitigation of the listed constraints were addressed. Several drawbacks to eastern portion of the Generating Facility Site as a possible location for the Utility Switchyard were identified.

    - This area includes very steep terrain at significantly higher elevations relative to other portions of the Generating Facility Site. Placement of the Utility Switchyard in this area

would have required significant amounts of impactful civil works in order to provide a level area large enough to accommodate the Utility Switchyard.

- Placement of the Switchyard on the Generating Facility Site, closer to Lake Road, would have constrained space further and required the power block equipment to shift closer to the wetlands areas, where the avoidance of impact to the higher-value wetlands located on the Generating Facility Site was prioritized over the impact to the wetlands on the Switchyard Site.

- The placement the Utility Switchyard on the Generating Facility Site would have displaced areas that are currently proposed for construction laydown and parking, which would have had to have been relocated to the Switchyard Site in order to accommodate this location. Establishing construction laydown and parking across Lake Road from the Generating Facility Site would have resulted in several negative community impacts, including traffic implications for the significant amount of construction workers having to cross Lake Road, and the need to transport heavy equipment across Lake Road. In addition, the construction parking and laydown areas on the Generating Facility Site, closest to Lake Road, will be re-vegetated following completion of construction, adding a significant visible buffer.

- The proposed placement of the Utility Switchyard on the Switchyard Site is also set back from Lake Road, which will serve to reduce visible impact. Placement of the Utility Switchyard on the southeastern portion of the Generating Facility Site would have resulted in significant visible impact from this area being positioned directly adjacent to Lake Road.

- In addition, Eversource will be transferred ownership of the Utility Switchyard following completion of construction, and locating their equipment separately from the Generating Facility Site will simplify any potential confusion from an access, safety and maintenance perspective.

- Grading features to minimize development footprint – Significant civil works will be required for placement of the Generating Facility Site equipment in its proposed location, which avoids any direct impact to the wetlands, reduces effects on noise, and minimizes visible impact. Initially, the equipment was more centrally located on the parcel, which would have minimized noise and visible impact to a further extent, as well as reduced the amount of site grading work required. Once wetland delineation was finalized, the decision was made to prioritize the avoidance of wetlands entirely on the Generating Facility Site, while maintaining the stringent noise and visible impact requirements that were previously achieved. The result is that placement of the Generating Facility Site will require significant grading in order to achieve the current proposed location which minimizes impacts to the community from all critical standpoints. Extensive design steps were

taken from all standpoints, including a large retaining wall bordering the eastern wetlands, buildings and enclosures for equipment, and specification of low-noise equipment and sound attenuation features.

- Selection of temporary work areas to minimize environmental and community effect – Temporary construction facilities are located on-site, including parking, equipment laydown areas, and work and fabrication areas, in order to minimize off-site traffic, noise and disturbance of other areas. These areas will be re-vegetated after construction, which will add a significant visible buffer.

- Minimizing impervious surfaces – Of the total 13-acre footprint of KEC on the Generating Facility Site, which is a 63-acre parcel, only 2.1 acres of paved surfaces and additional 4.3 acres of buildings and other impervious surfaces, including the fuel containment area, are proposed; a total of 6.4 acres. The 2.1 acres of paved surfaces are required for daily operations and maintenance of the facility. The turbine buildings are required for noise mitigation in order to meet the stringent noise requirements of the Town of Killingly and State of Connecticut. The fuel containment berm, which includes an impervious liner, as well as other containment areas, are required to protect the environment from the unlikely event of a spill. Clean stormwater will be released from these areas following a visual inspection after a rain event. All other areas of the Generating Facility Site will be designed using pervious surfaces.

Once it was determined that the Utility Switchyard could not be accommodated on the Generating Facility Site, alternative layouts were examined for the switchyard itself. The design goals of the alternatives considered are addressed below.

- Consistency with Eversource design requirements for the type of Utility Switchyard required – NTE had extensive discussions with Eversource, including a site visit, about the feasibility and layout of the Utility Switchyard. Eversource confirmed that the proposed location of the Utility Switchyard and feasibility of the overhead tie-in are suitable. Eversource advised that for a 345 kV three-breaker-ring bus, which will be used in this application, a 220 foot by 400-foot parcel of land would be required. NTE's proposed layout conforms to this general requirement. NTE is currently awaiting completion of interconnection studies performed jointly by Eversource and ISO-NE that will further define the details of the layout of the Utility Switchyard.

- Adjacency to the existing Eversource ROW – The proposed location of the Utility Switchyard is ideal in that it eliminates the need for any new transmission lines or additional ROW's for interconnection. There will be one transmission line crossing between the Generating Facility Site and the Switchyard Site. Given the proximity to the existing road crossing of the Eversource ROW, visible impact will be minimal from this additional single crossing.

- Avoid direct wetland impact wherever possible – The proposed positioning of the Utility Switchyard on the Switchyard Site is primarily constrained by two factors: avoidance of cultural resources and positioning of the electrical equipment to facilitate the interconnection. Regarding the former, there is a small family cemetery located on the site in a location that limits placement of the Utility Switchyard. Because of this, and because of the fact that the Utility Switchyard needed to be positioned and aligned with the existing 345-kV transmission tower, 0.3-acre of wetlands impact could not be avoided. To offset the proposed direct impact to wetlands, NTE proposes both wetland replication and enhancement. Wetland replication would take place at the northern portion of the Switchyard Site, within an open field. Approximately 17,000 square feet of emergent and scrub shrub wetland would be created and be permanently protected within a roughly 0.77-acre conservation easement. This created wetland will be more diverse and be higher functioning than the wetland to be impacted. Additionally, wetland enhancement is proposed, in the form of invasive plant removal, within roughly 1.22 acres of wetlands and adjacent uplands, both at the Switchyard and Generating Facility Sites.

- Avoid impact to sensitive cultural resources – As noted above, the small family cemetery located on the site in a location that limits placement of the Utility Switchyard. A retaining wall is proposed at the southwest corner of the Utility Switchyard to avoid impact to the family cemetery.

- Retain significant undeveloped area on the site – As mentioned above, per Eversource, the required area of the switchyard is 220 feet by 400 feet, or approximately 2 acres. Construction of the switchyard and other grading and use will require approximately 2 acres of additional disturbance. The majority of the Switchyard Site (the remaining 6 acres) will remain undeveloped, with a significant setback maintained from Lake Road, minimizing visual impact. The 2-acre of temporary disturbance will be revegetated following the completion of construction of the switchyard.

- Minimize tree clearing to the greatest extent possible – The approximately 10-acre Switchyard Site is wooded within its southern half, while the balance is post-agricultural, early successional woods, and an open field at its northern extent adjacent to the existing transmission line ROW. The switchyard will mostly avoid steeper slopes and the taking of maturing forestland and be located on gently sloping land in the area that was previously farmed and abandoned just over a decade ago. The proposed location of the switchyard is primarily driven by the location of the existing 345-kV transmission tower to which the switchyard will physically interconnect. The alignment of the switchyard with the existing 345-kV tower reduces visible impact and the need for tall dead-end structures (as the location of this tower coincides with the lowest point of the adjacent 115-kV transmission lines).

- Avoid substantial earth movement where possible – Elevations increase toward the southwest of the Switchyard Site. Even as the existing location extends farther south, earthwork requirements are evidenced by the tight grading contours necessary. Shifting farther back on the parcel would have resulted in considerable additional earthwork within a narrower portion of the Switchyard Site. The Utility Switchyard and associated grading would have been difficult to fit within those narrower boundary constraints; this would also have eliminated the rear buffer to other land impacts.

Temporary work space is incorporated in the Switchyard Site, which can be used for construction of the Utility Switchyard as well as KEC. Once use of this area is completed, it will be restored. A portion of this area will be utilized for wetland replication to compensate for the unavoidable wetland fill; creation of a higher quality wetland and restoration of wetland characteristics in other wetland areas throughout the KEC Site will provide offsetting benefits in terms of wetland function and value.

10.0 REQUIRED PERMITS AND APPROVALS

KEC will be designed, constructed, and operated in accordance with applicable federal and state regulations, approvals, codes, and ordinances. Table 10-1 provides a summary of key state and federal permits and approvals, and the status or schedule for each permit and approval.

Table 10-1: List of Key Construction Permits and Approvals

Agency	Permit/Approval	Status
State Permits, Reviews and Approvals		
CSC	Certification of Environmental Compatibility and Public Need	Local submittal filed on 5/4/16; filed with CSC on or about 8/17/16.
DEEP	Permit to Construct; PSD; NNSR	Application submitted 4/15/16; ambient air quality analysis submitted 5/27/16; sufficiency notice issued by DEEP 5/31/16.
	Title IV Acid Rain Permit	Application for Acid Rain Permit required no later than 24 months prior to operation; not yet filed.
	Clean Water Act, Section 401 Water Quality Certification	Review concurrent with other DEEP water discharge approvals, as necessary.
	Wastewater – Discharge Permit for discharge to sanitary sewer	Permit issuance required prior to discharge; not yet filed.
	National Pollutant Discharge Elimination System (NPDES) General Permit for Stormwater – construction	Required prior to construction; preliminary SWPPP provided in Appendix D; Notice of Intent not yet filed.
	NDDB – endangered species program	Initial consultation completed 3/8/16; recommended studies completed (see Appendix F) and under review.
Connecticut Commission on Culture and Tourism – History Division	Historic and archaeological resource review	Archaeological and historic architecture studies submitted to SHPO and THPOs on 8/5/16; agency review pending.
Federal Permits, Reviews and Approvals		
USACE	Clean Water Act Section 404 Permit	Not required for Generating Facility Site. Application for General Permit to be filed for Switchyard Site following renewal of General Permit Program; summer 2016.
USFWS	Endangered Species Act Section 7 Consultation	IPac report refreshed 5/10/16; USFWS approval of bat monitoring work plan and confirmation no other studies required on 5/11/16; monitoring completed and under review by USFWS.
FAA	Notice of Proposed Construction	Determination of No Hazard issued 7/18/16; no lighting or marking required.

11.0 CONCLUSION

Based on the facts and evidence presented in this Application, NTE submits that the establishment of the KEC facility is needed, will have a substantial public and economic benefit, and will not have a substantial adverse effect on the environment of the KEC Site or the surrounding areas.

NTE Connecticut LLC

Mark Mirabito, Vice President

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