Appendix AB

Visual Impact Assessment, Merrimack Valley Reliability Project, Towns of Pelham, Windham, Hudson, and Londonderry, NH, May 2015

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Visual Impact Assessment

Merrimack Valley Reliability Project

Towns of Pelham, Windham, Hudson and Londonderry, New Hampshire

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May 2015

Visual Impact Assessment

Merrimack Valley Reliability Project

Towns of Pelham, Windham, Hudson and Londonderry, New Hampshire

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Executive Summary

The New England Power Company d/b/a National Grid (NEP) and Public Service Company of New Hampshire d/b/a Eversource Energy (PSNH) are proposing to construct the New Hampshire portion of Merrimack Valley Reliability Project (the Project) in the Towns of Pelham, Windham, Hudson and Londonderry, New Hampshire. The Project involves construction of a new 345 kV transmission line (and some associated relocation of existing lines) along an existing 17.9-mile long transmission corridor. Proposed transmission structures will be self-weathering steel H-frame and single pole davit arm structures, ranging in height from 40 to 130 feet above ground level. The proposed line will be built within, or directly adjacent, to a cleared corridor that already hosts multiple transmission lines.

NEP and PSNH retained Environmental Design & Research, Landscape Architecture, Engineering & Environmental Services, D.P.C. (EDR) to prepare this Visual Impact Assessment (VIA) for the Project. The VIA for the Project was prepared in accordance with standard visual impact assessment methodologies, while being mindful of the draft regulations being prepared in New Hampshire ("draft SEC Rules"). A two-mile radius around the center line of the proposed transmission line was defined as the visual study area. The study area totals approximately 77 square miles, and includes portions of the Towns of Pelham, Windham, Hudson, Londonderry, Litchfield and Derry. Within this area EDR described existing landscape character, viewer groups, and scenic resources. Potential Project visibility and visual impact were evaluated through viewshed analysis, field review, preparation of visual simulations, and evaluation of visual contrast by a panel of experienced visual impact assessors.

The proposed Project occurs entirely within an existing, well-established transmission corridor. Land use adjacent to the transmission corridor, and within the 2-mile radius visual study area, is dominated by suburban residential development and remnant forest land. Farms and agricultural land within the study area occur primarily in the western portion of Londonderry, with two smaller agricultural areas occurring in the northern and southern portions of Pelham. Higher density residential and commercial development is concentrated in the village/downtown areas of Derry, Londonderry, and Pelham. Review of existing data bases revealed that there are no National or State Parks, National Forests, National Heritage Areas, National Wildlife Refuges or State Wildlife Management Areas, National Natural Landmarks, or National/State Designated Wild, Scenic or Recreational Rivers, or other sites that would be typically considered scenic resources of statewide or national significance within the 2-mile radius study area. An inventory of potentially scenic public resources within the study area identified one state forest, four scenic byways/drives, 18 town-designated scenic areas, four recreational trails, numerous local parks and conservation areas, four golf courses, and a number of surface water resources. A full listing of inventoried resources within the visual study area is included in Appendix A. It should be noted that while compiling the inventory, resources were identified as "potentially scenic"

rather than "scenic," because they may or may not actually meet the definition of a scenic resource included in the draft SEC Rules (i.e., they may lack scenic qualities or public access).

Viewshed analyses were conducted to identify those areas within the study area where an unobstructed line of sight is potentially available between a viewer and any portion of one or more of the proposed transmission structures. Topographic viewshed maps for the Project were prepared using United States Geological Survey (USGS) digital elevation model (DEM) data (7.5-minute series), the location and above-ground height of existing and proposed transmission structures, an assumed viewer height of 5.5 feet, and ESRI ArcGIS® software with the Spatial Analyst extension. To supplement the topographic viewshed analysis, a vegetation viewshed was also prepared to illustrate the potential screening provided by forest vegetation. A base vegetation layer was created using the USGS 2011 National Land Cover Dataset, and the mapped locations of forest land were assigned a conservative assumed height of 40 feet and added to the DEM. The viewshed analysis was then re-run, and the areas covered by the forest vegetation layer were designated as "not visible" on the resulting data layer.

Topographic viewshed analysis indicates that approximately 10.1% of the 2-mile radius study area will be screened from view of the Project by topography alone. However, since the visual study area includes a significant amount of forest land, areas with potential views of the proposed Project will be much more limited. When also considering the screening provided by mapped forest vegetation, viewshed analysis indicates that no new structures should be visible in 70.5% of the study area, and views of the Project are likely to be fully screened from 13 of the identified potential scenic resources. When compared to the viewshed of the existing transmission structures, it was determined that areas of potential Project visibility cover the same general areas and have the same pattern as the viewshed of the existing lines. The "newly visible" areas associated with the proposed line (i.e., areas where the proposed structures are potentially visible but the existing structures are not) only total 2.3 square miles, or 3% of the study area. These newly visible areas are generally quite small in size and tend to occur in valleys and low lying areas. The Project's viewshed is largely restricted to areas within or directly adjacent to the cleared transmission line ROW and other clearings such as roadways and open water/wetland areas that provide the opportunity for unscreened views. The viewshed analysis also indicates potential Project visibility in some more heavily developed areas, but it is important to note that the screening effect of built structures, and trees along streets and in yards, is not taken into consideration in this analysis.

Field review revealed that actual Project visibility is likely to be much more limited than suggested by viewshed mapping. This is due to the fact that screening provided by buildings is significant in village/town center areas, residential neighborhoods, and other areas of intensive land use. Trees within and adjacent to residential

neighborhoods and in undeveloped portions of the study area are also generally more extensive and/or taller than assumed in the viewshed analysis, and typically limit long distance views. Field review confirmed that visibility of the Project is very limited within the study area and generally restricted to sites located within or immediately adjacent to the existing transmission ROW. Consequently, open views of the Project site, in all cases, included views of the existing transmission lines. In village and neighborhood areas, where population is concentrated, views of the Project site are generally well-screened by buildings, street trees, yard trees, and/or adjacent areas of the forest. Open views were documented from the more heavily traveled highways that traverse the study area (e.g. State Routes 28, 38 and 102), but generally only at, and immediately adjacent to, the point where the lines cross the road. In general, views of the existing transmission lines, and therefore the proposed Project, were not documented from locations beyond 0.5 mile from the ROW.

Based on the lack of Project visibility from beyond 0.5 mile, potential scenic resources within this distance of the proposed line were evaluated to determine if they 1) actually met the definition of a scenic resource, and 2) could have potential views of the Project. This evaluation determined that there are 13 scenic resources within the visual study area that could have views of the proposed line. These included the Granite State Rail Trail, (a.k.a. Londonderry Rail Trail in this location) Apple Way State Scenic Byway, and Musquash Conservation Area.

From the 13 scenic resources with potential views of the Project, photos from eight key observation points (KOPs) with foreground views of the Project were selected for the development of visual simulations to illustrate “worst case” visibility and visual impact of the proposed Project. Simulations of the proposed Project were prepared by creating three dimension models of the landscape and the proposed Project using DEM data, transmission line clearing limits and structure design, dimensions, and coordinates provided by the Applicants. The models were incorporated into photographs obtained during field review using AutoCAD® and 3D Studio Max® software to create realistic photographic simulations of the Project.

A panel of three experienced visual impact assessors (all registered landscape architects) evaluated the visual impact of the Project by reviewing photos of the existing view and simulations of the proposed Project from each of the eight selected KOPs. The simulations indicate that, in most cases where open views are available, the Project will be viewed at foreground distances, on a cleared ROW, in association with several existing transmission lines. The occurrence of the new line within an existing transmission corridor limits the Project’s impact on perceived land use, scenic quality, and the aesthetic expectations of viewers. However, in those instances where the Project resulted in a notable increase in the number of visible structures (both existing and proposed) and/or the width of the cleared ROW, more substantial impact on scenic quality and potential viewer activity/expectations could occur.

Visual contrast was evaluated for each viewpoint using an evaluation form developed by EDR, based on the U.S. Department of the Interior Bureau of Land Management (BLM) contrast rating methodology. This form, which has been used for the evaluation of the visual impacts of numerous energy generation and transmission projects in New York and New England, provides for a description of existing scenic quality, viewer type, and view duration, in addition to the actual rating of contrast between the proposed Project and the existing view. The procedure involves using a numerical contrast rating system to quantify visual impact at each of the selected KOPs. Results of the contrast evaluation conducted by the rating panel indicated that the Project's overall contrast with the visual/aesthetic character of the area will be in the range of minimal to moderate. Composite contrast ratings for individual viewpoints ranged from 0.2 to 3.2 on the scale of 0 (insignificant) to 4 (strong), and averaged 1.5 (minimal-moderate). Appreciable contrast (scores between 2.5 and 3.5) was noted for two of the eight KOPs where the proposed Project increased the perceived intensity/extent of utility development in the view. This effect was primarily associated with vegetation clearing that resulted in the addition of multiple transmission structures to the view or the creation of a substantially wider cleared ROW. For those viewpoints with the highest contrast rating, rating panel comments indicated that the Project presented appreciable to strong contrast with multiple components of the landscape, primarily the existing vegetation and sky, and was likely to result in reduced scenic quality and viewer enjoyment of the view. However, low contrast ratings and rating panel comments for the majority of the viewpoints, indicate that this effect is tempered by the presence of the existing transmission infrastructure, which already compromises visual quality and the aesthetic expectations of viewers at these locations. In addition, the type and extent of adverse visual effects noted for these views will diminish rapidly with increasing distance from the line and even partial screening of the proposed Project.

While the contrast presented by the proposed Project may have an impact on scenic quality at a small number of scenic resources within the study area, this impact is not considered to be unreasonably adverse. This conclusion is based on the fact that 1) the Project will have very limited visibility from most locations within the 2-mile radius study area (including the majority of scenic resources), 2) scenic resources located beyond 0.5 mile from the proposed center line will generally not have views of the proposed Project, 3) open views from scenic resources will generally present limited contrast with the existing landscape and will have minimal impact on scenic quality and viewer expectations, due to the location of the Project within an existing transmission corridor, 4) even where presenting appreciable visual contrast, the Project would not be a dominant feature of a landscape in which existing human development is not already a prominent feature, 5) the Project would not offend the sensibilities of a reasonable person or violate a clear written community standard intended to preserve scenic resources, and 6) the Applicants have committed to feasible and appropriate impact avoidance, minimization and mitigation measures in the design of the facility that improve the harmony of the proposed Project with its surroundings. Based on these findings, and in consideration of the

requirements of the draft SEC Rules, it is EDR's conclusion that the Project will not have an unreasonably adverse effect on aesthetics.

1.0 Introduction

Environmental Design & Research, Landscape Architecture, Engineering & Environmental Services, D.P.C. (EDR) was retained by the New England Power Company d/b/a National Grid (NEP) and Public Service Company of New Hampshire d/b/a Eversource Energy (PSNH) (together, the Applicants) to prepare a Visual Impact Assessment (VIA) for the New Hampshire portion of the proposed Merrimack Valley Reliability Project (the Project) located in the Towns of Pelham, Windham, Hudson and Londonderry, New Hampshire. The purpose of this VIA is to:

- Describe the appearance of the visible components of the proposed Project.
- Describe landscape character and viewer groups within the Project study area.
- Inventory potential scenic resources within the study area.
- Evaluate potential Project visibility within the study area.
- Identify key observation points (KOPs) from scenic resources where the Project will be visible.
- Prepare visual simulations of the Project from these KOPs.
- Assess the visual impacts of the proposed Project on representative scenic resources within the study area.

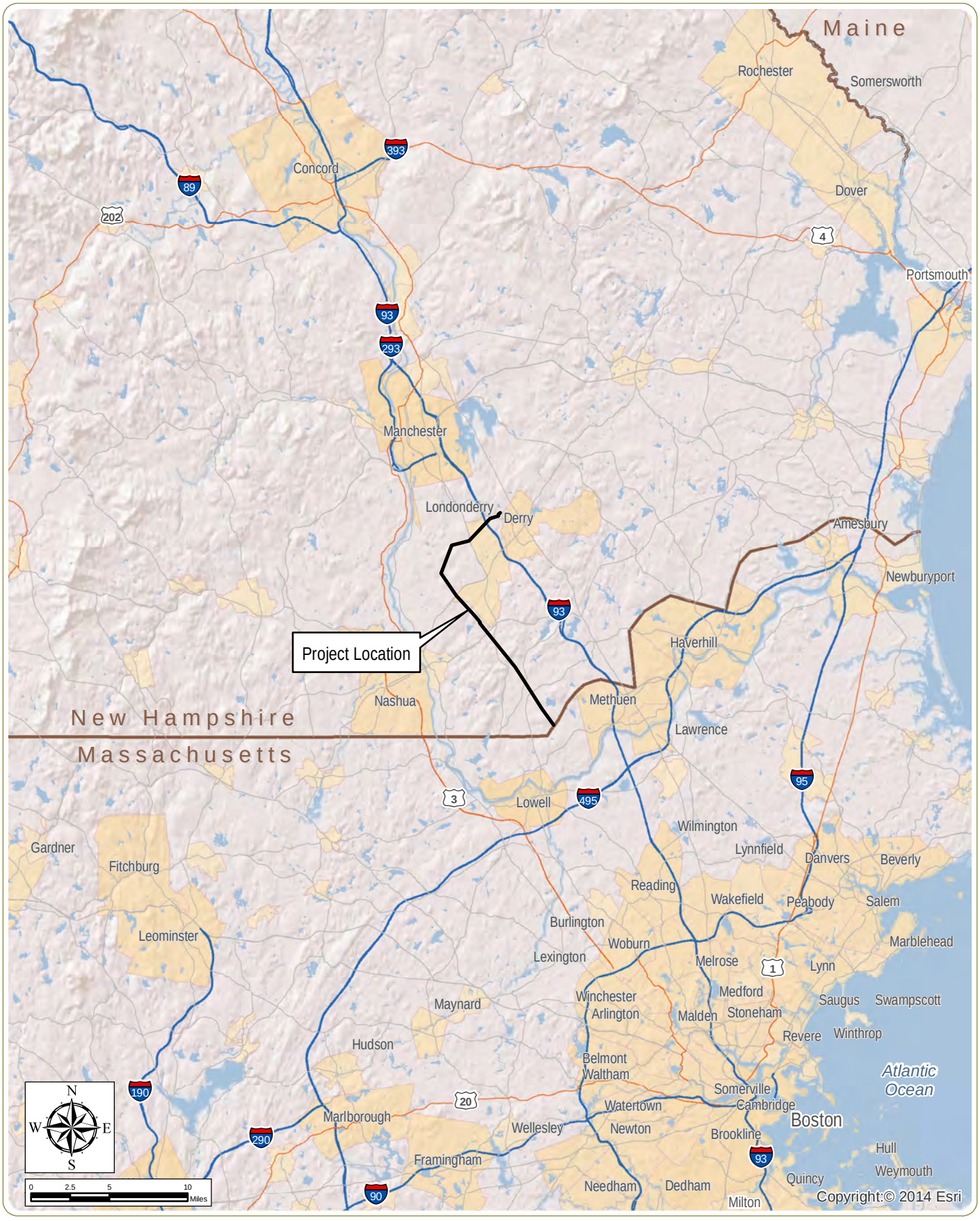
This VIA was prepared with input and oversight provided by registered landscape architects experienced in the preparation of visual impact assessments. It is also consistent with the policies, procedures, and guidelines contained in established visual impact assessment methodologies (see Literature Cited/References section).

2.0 Project Description

The proposed Project involves construction of a new 345 kV transmission line, known as 3124 Line, that will connect NEP's Tewksbury Substation in Tewksbury, Massachusetts to PSNH's Scobie Pond Substation in Londonderry, New Hampshire.

2.1 Proposed Project Site

The Project site addressed in this VIA begins at the Massachusetts/New Hampshire border in the Town of Pelham, and continues to the Scobie Pond Substation in the Town of Londonderry (Figure 1). The proposed 3124 Line will be located entirely on existing transmission line right-of-way (ROW) in the Towns of Pelham, Windham, Hudson, and Londonderry (Figure 2). Cleared portions of the existing ROW are characterized by a corridor (or corridors) of successional old field and shrub vegetation interspersed in places with emergent and scrub-shrub wetlands. The cleared corridors range in width from 130 to over 500 feet, and accommodate multiple overhead transmission lines. The existing lines are carried on a mix of structure types, including wood pole H-frame, steel H-frame, steel lattice and wood pole davit arm structures, that range in height from 50 to 130 feet above ground level. Uncleared portions of the ROW are generally characterized by mixed coniferous and deciduous forest interspersed with wetlands. Areas immediately adjacent to the ROW are characterized predominantly by areas of suburban residential development and remnants of undeveloped forest land.



Merrimack Valley Reliability Project

Towns of Pelham, Windham, Hudson and Londonderry, New Hampshire

Figure 1: Regional Project Location

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Notes: 1. Basemap: ESRI ArcGIS Online "Shaded Relief" Map Service and ESRI StreetMap North America, 2008
2. This is a color graphic. Reproduction in grayscale may misrepresent the data.

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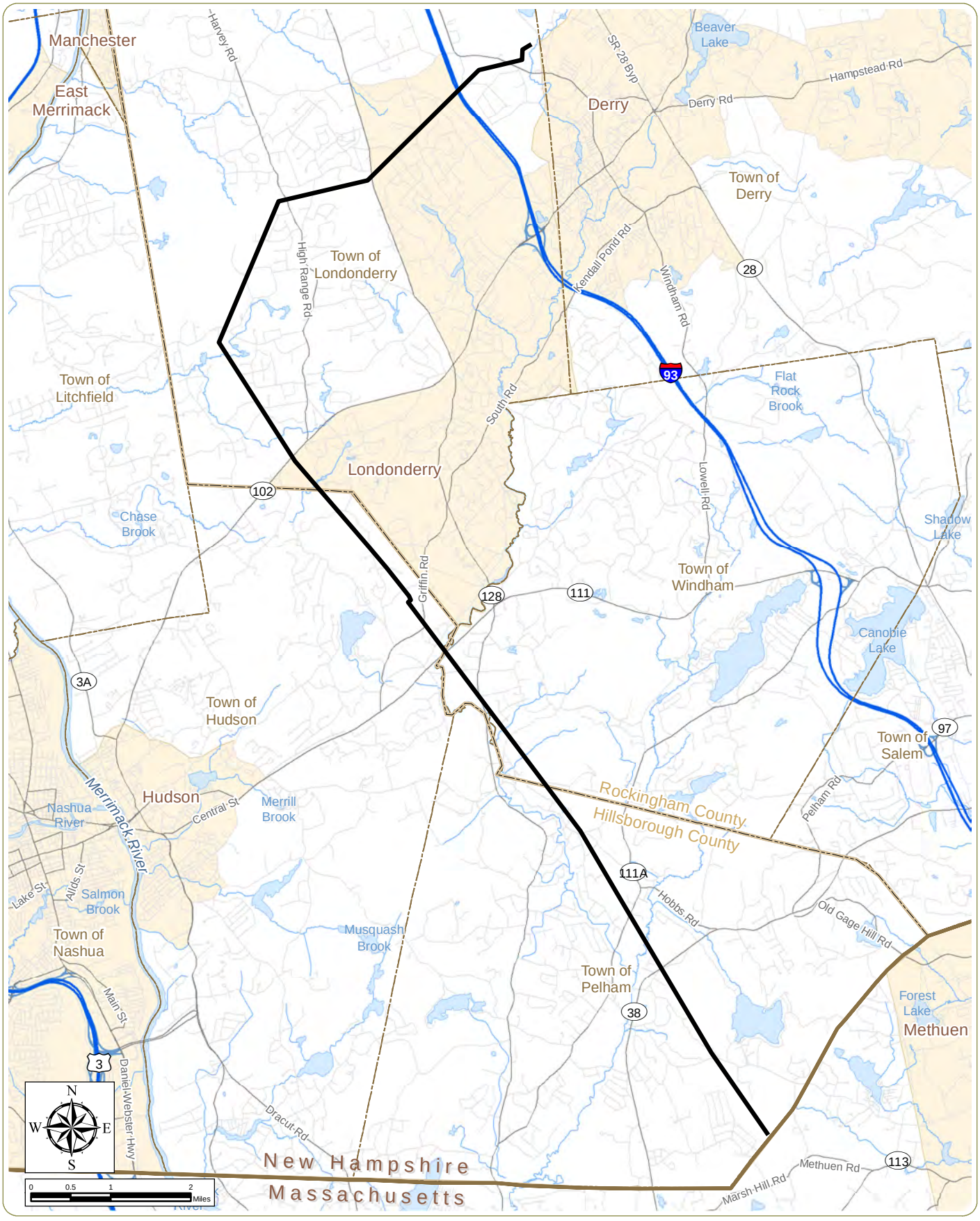

Merrimack Valley Reliability Project

Towns of Pelham, Windham, Hudson and Londonderry, New Hampshire

Figure 2: Proposed Project Center Line

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Project Center Line

Notes: 1. Basemap: ESRI StreetMap North America, 2008.
2. This is a color graphic. Reproduction in grayscale may misrepresent the data.

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2.2 Proposed Project

The proposed Project has been divided into four segments differentiated by state, ownership, and line alignment. Segment 1 is the portion of the Project located in Massachusetts, and is not addressed in this report. The remaining segments of the Project that are located in New Hampshire are described below.

Segment 2 (NEP)

Segment 2 of the Project follows existing ROW for 8.1 miles, from the Massachusetts/New Hampshire border to a location in the Town of Hudson where the Project transitions from NEP to PSNH ownership. Currently, 7.5 miles of this segment contains three existing overhead transmission lines designated O-215, Y-151 and N-214, respectively from west to east. The proposed new configuration for this section of Segment 2 from west to east is: Y-151, O-215, 3124, and N-214. To incorporate the new 3124 Line, a series of 115 kV delta davit arm structures will be erected approximately 28.5 feet from the western edge of the ROW. Once completed, the Y-151 line will be relocated onto these new structures. The existing Y-151 structures will then be removed from their current location, creating space for a series of new 345 kV steel H-Frame structures intended to support the new 3124 Line. The new 3124 Line will be located on the center line of the existing ROW, approximately 91.5 feet to the east of the existing O-215 line and approximately 91.5 feet to the west of the existing N-214 line. At a point north of Bockes Road in Hudson, the Y-151 line diverges from the main ROW. The new 3124 Line will maintain its alignment within the center of the ROW, between the O-215 and N-214 lines, for the remaining 0.6 miles of Segment 2 until the Project transitions to PSNH ownership. A total of 175 new structures are proposed in this Segment. Depending on the structure type, structures will be direct embedded or constructed on a caisson foundation, and will range in height from 40 feet to 100 feet.

Segment 3 (PSNH)

Segment 3 of the Project is 3.9 miles long and runs from the point of ownership transition in Hudson to a point in Londonderry where the new 3124 Line will change direction. The 3124 Line will be installed within the east edge of the existing PSNH ROW in an area that has not previously been cleared. There is one existing overhead 345 kV transmission line that currently occupies the ROW along this entire segment. The new 3124 Line will run parallel to the existing transmission line. In some locations along this segment, the adjacent NEP ROW will be utilized to gain construction access to the PSNH ROW. The proposed Project design for this segment will include 39 new steel H-frame structures. Structures will be direct embedded or constructed on a caisson foundation, and will range in height from 65.5 feet to 101.5 feet tall.

Segment 4 (PSNH)

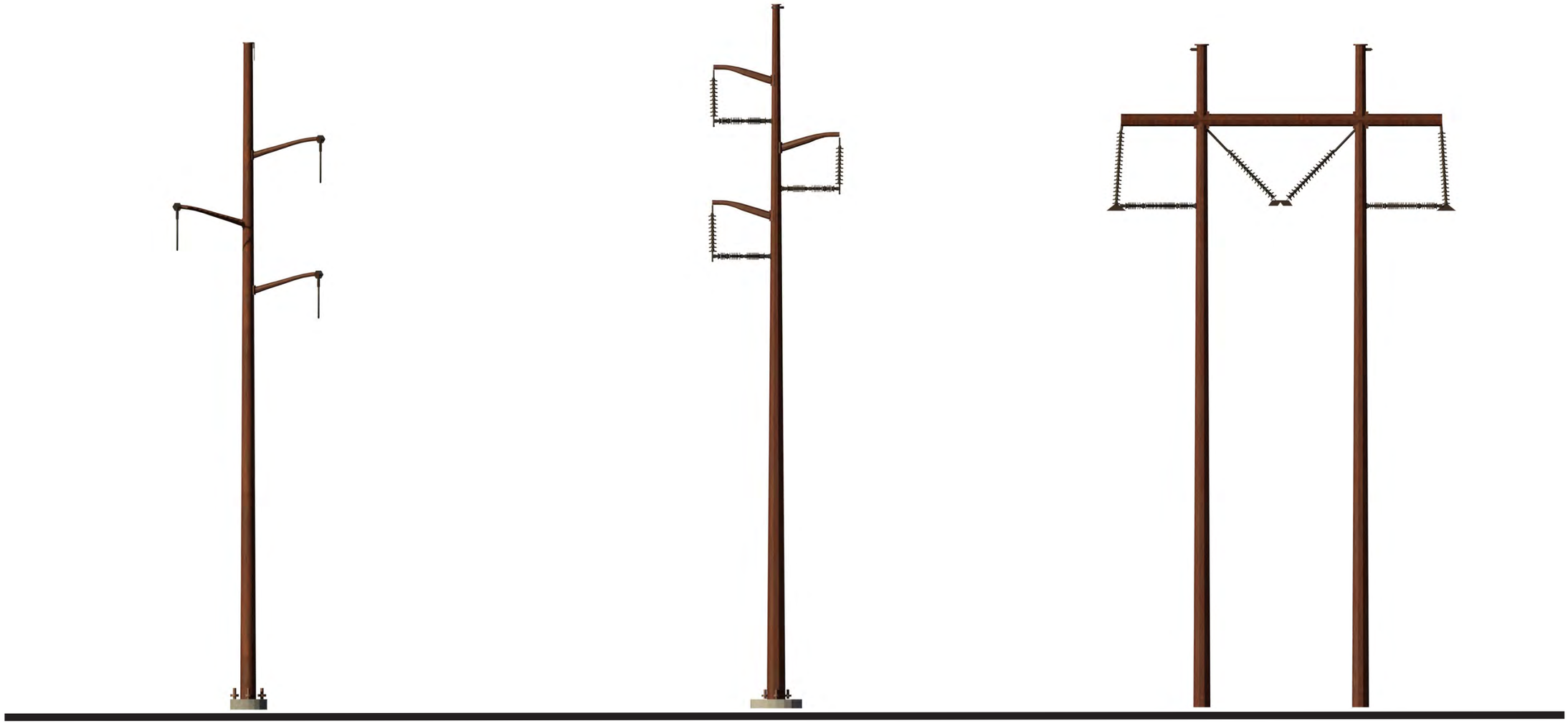
Segment 4 of the Project begins at the point where the PSNH ROW diverges from running parallel with the NEP ROW and continues to the Scobie Pond Substation. This segment of the Project is 5.9 miles long and located entirely within the Town of Londonderry. In this segment, the new 3124 Line will be installed in the center of the existing ROW in an area that has not been previously cleared. The ROW within this segment contains several existing overhead transmission lines and, in some locations, additional overhead distribution circuits. No reconfiguration of the existing transmission or distribution lines is required in this segment. The proposed Project design for this segment includes 52 new steel H-frame structures. Structures will be direct embedded or constructed on a caisson foundation, and will range in height from 70 feet to 130 feet tall.

Computer models of the transmission structure types that will be installed along the line, and whose visual impact will be evaluated in this study, are illustrated in Figure 3.

115 kV Davit Arm Dead End Structure

115 kV Delta Davit Arm Suspension Structure

345 kV H-Frame Suspension Structure



Merrimack Valley Reliability Project

Towns of Pelham, Windham, Hudson and Londonderry New Hampshire

Figure 3 - Computer Model of Proposed Project (Structures Visible from Key Observation Points - National Grid)

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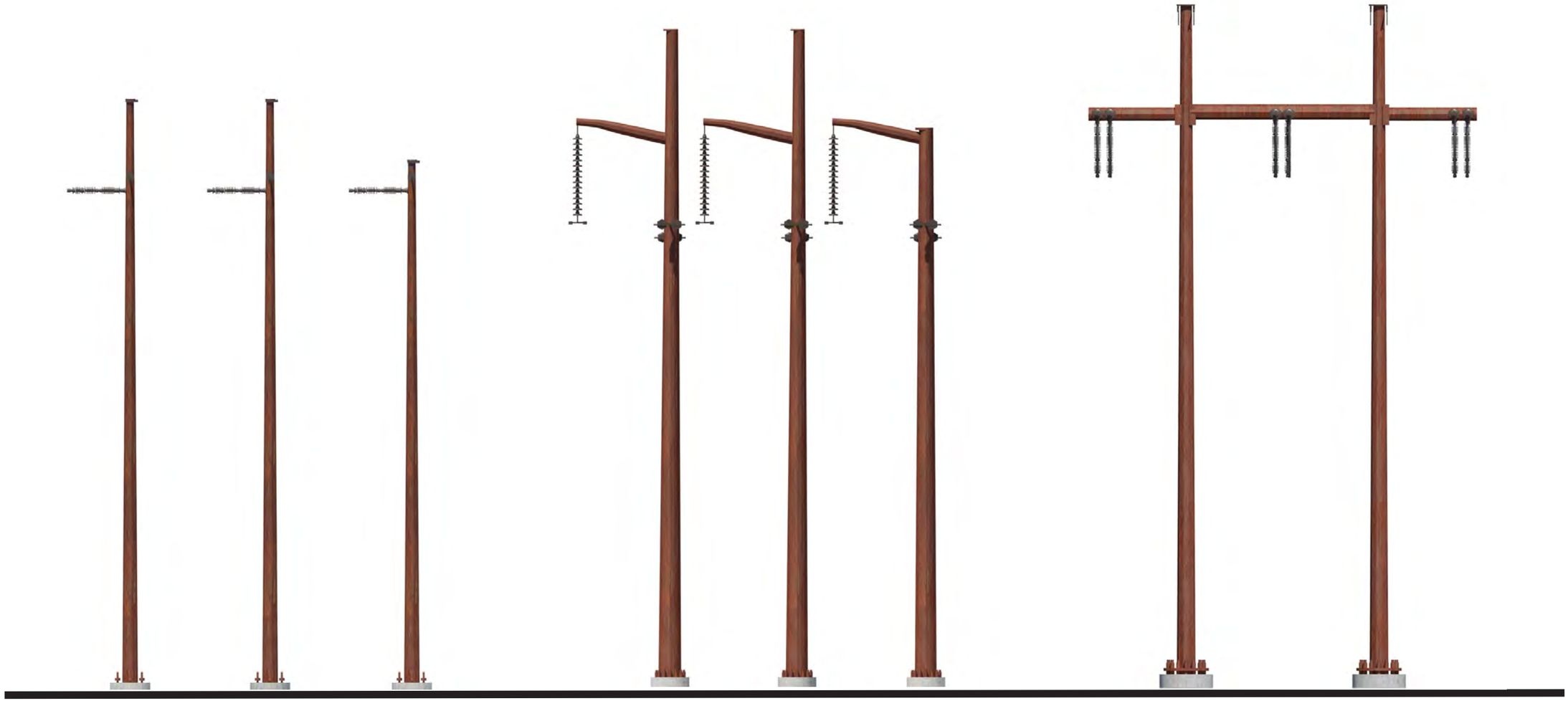
115 kV Three-Pole Dead End Structure

345 kV Three-Pole Dead End Structure

345 kV H-Frame Dead End Structure



Merrimack Valley Reliability Project

Towns of Pelham, Windham, Hudson and Londonderry New Hampshire

Figure 3 - Computer Model of Proposed Project (Structures Visible from Key Observation Points - National Grid)

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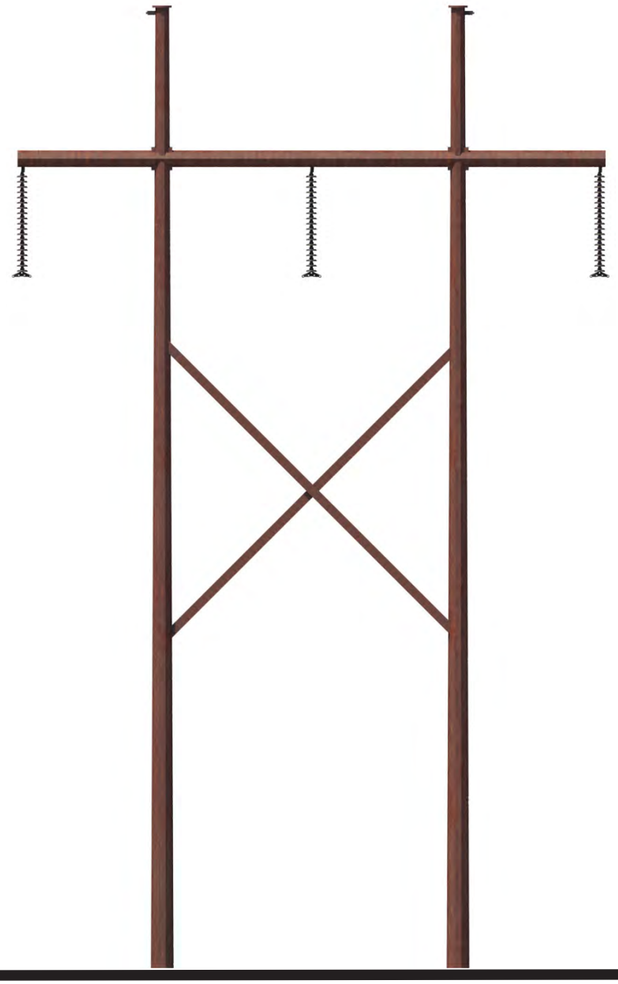
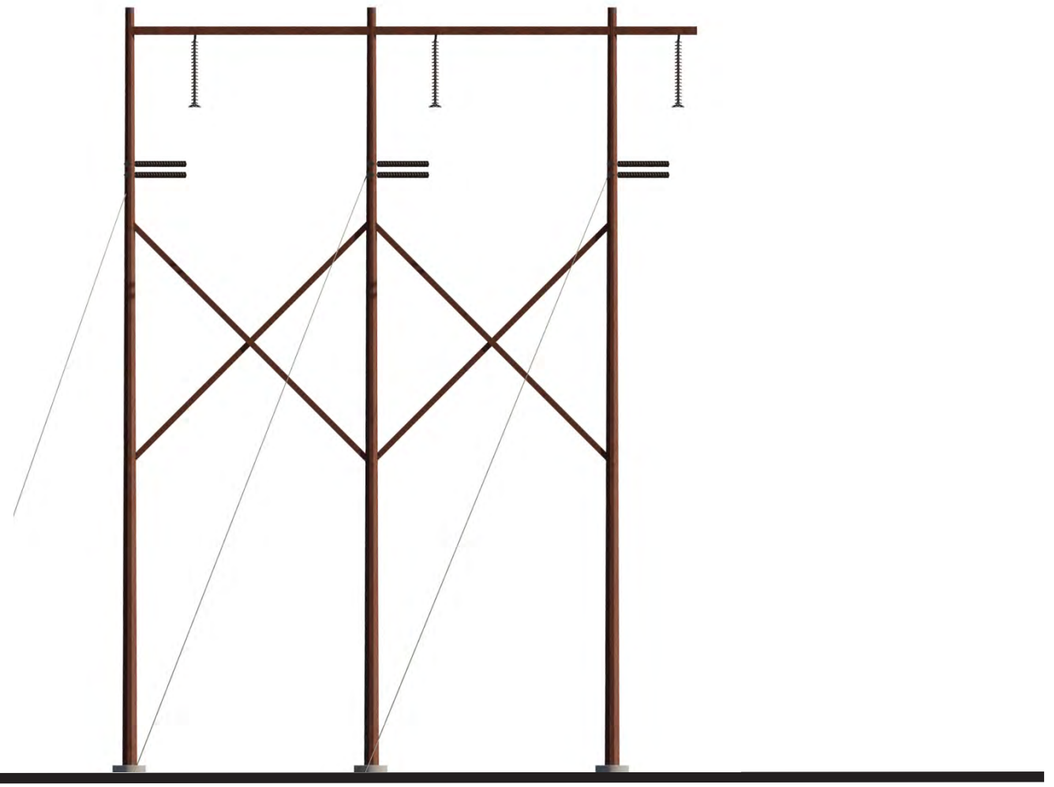
345 kV Single Circuit Tangent
H-Frame Structure



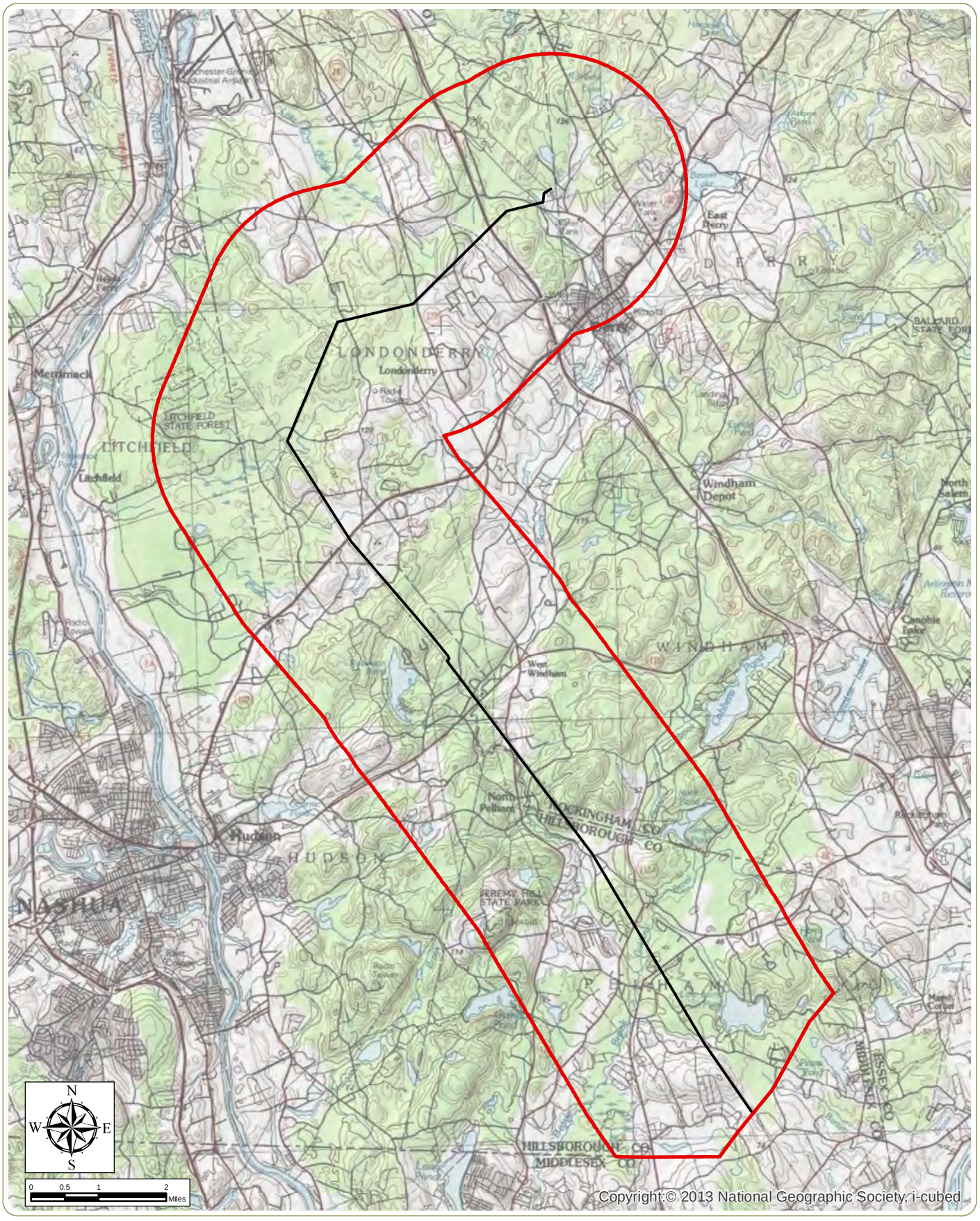
345 kV Single Circuit Three-Pole
Dead EndStructure



Merrimack Valley Reliability Project
Towns of Pelham, Windham, Hudson and Londonderry New Hampshire
Figure 3 - Computer Model of Proposed Project (Structures Visible from Key Observation Points - PSNH)
May 2015

3.0 Existing Visual Character

The visual study area for the proposed Project includes a 2-mile radius around the center line of the proposed transmission corridor (Figure 4). This is larger than the visual study areas typically defined for transmission line projects, and totals approximately 77 square miles in Hillsborough and Rockingham Counties, including portions of the Towns of Pelham, Windham, Hudson, Londonderry, Litchfield and Derry, New Hampshire.



Merrimack Valley Reliability Project

Towns of Pelham, Windham, Hudson and Londonderry, New Hampshire

Figure 4: Visual Study Area

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Project Center Line

2-Mile Study Area

Notes: 1. Basemap: ESRI ArcGIS Online "USA Topo Maps" Map Service.
2. This is a color graphic. Reproduction in grayscale may misrepresent the data.

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3.1 Physiographic/Visual Setting

3.1.1 Landform and Vegetation

The visual study area lies within the Seaboard Lowland Section of the New England Province of the Appalachian Highlands Physiographic Region. The Seaboard Lowland Section covers a portion of southeastern New Hampshire, and is characterized as mostly level with some gently rolling areas. Elevations generally range between 100 and 400 feet above mean sea level (amsl), increasing toward the north and west, with some isolated hills rising even higher. The relatively limited topographic relief in most areas allows for views of short to intermediate distance, although more expansive views can be gained from some hill tops.

Vegetation in the study area is characterized by relatively small blocks of second growth forest dominated by white pine and northern hardwoods (primarily sugar maple, red oak, American beech, and white ash). The majority of the forest fragments in the study area are found along the edge of the existing transmission ROW, or are interspersed with residential developments. These forested areas are characterized by a fairly dense overstory tree canopy that restricts outward views. Additionally, the dominance of white pine in many of the areas maintains overstory screening throughout the winter months. The study area also includes relatively small areas of active and reverting agricultural fields and wetlands. Although minor components of the study area, these more open vegetative communities offer increased opportunities for longer-distance views of the surrounding landscape.

3.1.2 Land Use

Land use within the 2-mile radius visual study area is dominated by suburban residential development and remnant forest land. Farms and agricultural land within the study area occur primarily in the western portion of Londonderry, with two smaller agricultural areas occurring in the northern and southern portions of Pelham. These agricultural areas include several small farms, and represent a very small portion of the total study area. Higher density residential and commercial development is concentrated in the village/downtown areas of Derry, Londonderry, and Pelham. The downtown areas of Derry and Londonderry are characterized by a sprawling business district, mostly along State Routes 102 and 28. The downtown areas are surrounded by suburban residential developments. The Village of Pelham is characterized by a main street business district surrounded by suburban neighborhoods, with some commercial frontage development along the outskirts. The remainder of the study area is composed primarily of suburban residential developments, interspersed with blocks of remnant forest.

3.1.3 Water Features

The study area includes several lakes and an abundance of smaller ponds and streams. Major water features within a 2-mile radius of the Project center line include Beaver Lake, Scobie Pond, Hoods Pond, Rainbow Lake, Darrah Pond, Robinson Pond, Rock Pond, Moeckel Pond, and Little Island Pond. These lakes and ponds are characterized by expanses of open water that provide open views to the opposite shoreline and landscape features immediately adjacent to the waterbodies. All of these water features are relatively small, and range in size from 5 to 160 acres. Shorelines of most water bodies within the study area are typically wooded, but in many places are interspersed with seasonal and year-round residences. Many of these water bodies receive recreational use in the form of swimming, boating, and/or fishing. The Merrimack River occurs entirely outside of the visual study area to the west. Smaller tributary streams within the study area are typically narrow and bordered by trees. As such, they are not major visual components of the landscape.

3.2 Distance Zones

Three distinct distance zones are typically defined in visual studies. Consistent with well-established agency protocols (e.g., Jones and Jones 1977; USDA Forest Service, 1995), EDR generally defines these zones as follows:

- *Foreground*: 0 to 0.5 mile. At these distances, a viewer is able to perceive details of an object with clarity. Surface textures, small features, and the full intensity and value of color can be seen on foreground objects.

- *Mid-ground*: 0.5 to 3.5 miles. The mid-ground is usually the predominant distance at which landscapes are seen. At these distances a viewer can perceive individual structures and trees but not in great detail. This is the zone where the parts of the landscape start to join together; individual hills become a range, individual trees merge into a forest, and buildings appear as simple geometric forms. Colors will be clearly distinguishable, but will have a bluish cast and a softer tone than those in the foreground. Contrast in color and texture among landscape elements will also be reduced.

- *Background*: Over 3.5 miles. The background defines the broader regional landscape within which a view occurs. Within this distance zone, the landscape has been simplified; only broad landforms are discernible, and atmospheric conditions often render the landscape an overall bluish color. Texture has generally disappeared and color has flattened, but large patterns of vegetation are discernible. Silhouettes of one land mass set against another and/or the skyline are often the dominant visual characteristics in the background.

The background can contribute to scenic quality by providing a backdrop for foreground and mid-ground features, an attractive vista, or a distant focal point.

Given the 2.0 mile radius of the visual study area, all views of the proposed Project within this area will be within the foreground and mid-ground distance zones.

3.3 Viewer/User Groups

Three categories of viewer/user groups were identified within the visual study area. These include the following:

3.3.1 Local Residents

Local residents include those who live, work, and travel for their daily business within the area. They generally view the landscape from their yards, homes, local roads and places of employment. Residents are concentrated in and around the various village/town center areas and residential subdivisions, but occur throughout the visual study area. Except when involved in local travel, residents are likely to be stationary, and have frequent or prolonged views of the landscape. Local residents may view the landscape from ground level or elevated viewpoints (typically upper floors/stories of homes). Residents' sensitivity to visual quality is variable, and may be tempered by the aesthetic character/setting of their neighborhood or work place. Those living in densely settled areas with views focused on their neighborhood street or adjacent commercial development may be less sensitive to landscape changes than those with a view of undeveloped forest and farm fields. It is generally assumed, however, that all residents are familiar with the surrounding landscape and may be very sensitive to changes in their views.

3.3.2 Commuters/Through Travelers

Travelers passing through the area view the landscape from motor vehicles on their way to other destinations. Commuters and other through travelers are typically moving, have a relatively narrow field of view oriented along the axis of the roadway, and are destination oriented. Drivers on major roads in the area (e.g., State Routes 28, 102 and 111, and Interstate Route 93) will generally be focused on the road and traffic conditions, but do have the opportunity to observe roadside scenery. Passengers in moving vehicles will have greater opportunities for prolonged off-road views than will drivers, and therefore may be more aware of the quality of surrounding scenery. However, through travelers who are not residents of the area are unlikely to be particularly sensitive to visual change.

3.3.3 Recreational Users

This group generally includes local residents and tourists involved in outdoor recreational activities at local parks, recreational facilities, and natural areas. This group includes athletic teams, bicyclists, children, joggers, and those involved in more passive recreational activities (picnicking, walking, nature observation, etc.). For some recreational users, scenery may be a very important part of their recreational experience, and their activities may afford continuous views of landscape features over relatively long periods of time. Such viewers are likely to have a high appreciation for visual quality and high sensitivity to visual change. Other recreational users engaged in sporting events or other more active/athletic pursuits are likely to be less sensitive to scenic quality. In either case, it is worth noting that recreational users within the study area that could have views of the proposed Project presently have clear views of portions of the existing transmission lines where the existing ROW crosses or runs adjacent to conservation lands, trails, ball fields and other recreational areas. Proximity of the existing lines may temper their expectations of visual quality and sensitivity to visual change.

3.4 Scenic Resources

An important component of a visual impact assessment is compiling an inventory of potentially scenic public resources from which impacts are subsequently evaluated. Such inventories typically consider aesthetic resources of both statewide and local significance. Potentially scenic resources of statewide significance generally include State and National Parks, Forests, Wildlife Refuges/Management Areas, Historic Sites, and Heritage Areas; National Natural Landmarks, and Scenic Roads, Trails, and Rivers designated at the State or National level. Potentially scenic resources of local significance tend to be more variable based on project location, but often include resources such as local parks and recreational facilities, waterbodies, nature preserves, campgrounds, golf courses, schools, cemeteries, areas of concentrated human settlement, and heavily traveled highways.

Consistent with the draft SEC Rules, scenic resources are defined as including:

> "*resources designated by national, state, or municipal authorities for their scenic quality and to which the public has a legal right of access; conservation lands or easement areas that possess a scenic quality and to which the public has a legal right of access; lakes, ponds, rivers, parks, and other tourism destinations recognized by the New Hampshire Division of Travel and Tourism as having scenic quality and to which the public has a legal right of access; recreational trails, parks, or areas established, protected or maintained in whole or in part with public funds; and town and village centers that possess a scenic quality.*"

On-line data bases and local planning documents were consulted to determine if any potential scenic resources of state or national significance are present within the Project visual study area, and to help identify locally-designated aesthetic resources. The towns and counties located within the visual study area clearly value the preservation of undeveloped open space and conservation areas, as evidenced by their local master plans and open space plans (Hudson Open Space Committee, 2012; Londonderry Open Space Task Force, 2011; Nashua Regional Planning Commission, 2009 and 2010; Rockingham Planning Commission; Southern New Hampshire Planning Commission, 2010; Town Planning & Urban Design Collaborative, 2013; Windham Conservation Commission, 1998; Taintor & Associates, 2005). Resources identified within these documents as having scenic qualities and being publicly accessible are included in the inventory of potential scenic resources included in this report.

Review of existing data bases revealed that there are no National or State Parks, National Forests, National Heritage Areas, National Wildlife Refuges or State Wildlife Management Areas, National Natural Landmarks, or National/State Designated Wild, Scenic or Recreational Rivers within the 2-mile radius study area. The inventory of potentially scenic resources identified one state forest, four scenic byways/drives, 18 town-designated scenic areas, four recreational trails, numerous local parks and conservation areas, four golf courses, and a number of surface water resources within the study area. It should be noted that while compiling the inventory, resources were identified as "potentially scenic" rather than "scenic," because they may or may not actually possess scenic qualities or provisions for public access. For example, State Forests are often managed for timber resources and some forestry practices are not considered scenic, or a golf course might be open to members only, with no public right of access.

All inventoried potentially scenic resources that occur with visual study area are listed in Table A in Appendix A. Distance measurements referenced in Table A and the discussion below represent the minimum distance between the identified resource and the nearest point on the proposed 3124 Line. The mapped location of these resources within the study area is illustrated in Figure 5, and on the large-scale viewshed map included in Appendix A. Brief descriptions of the potentially scenic resources identified within the study area are presented below.

State Forests

New Hampshire is the second most forested state in the nation (NHDFL, 2015a). The Forest Management Bureau within the Division of Forests and Lands is responsible for forest management activities on woodlands under state jurisdiction. This includes more than 167,000 acres of state-owned reservations (NHDFL, 2015b). According to the conservation/public lands database maintained by the Complex Systems Research Center at the University of New Hampshire (CSRC, 2013), Litchfield State Forest is the only state forest located within the visual study area. Located

within the Town of Litchfield, approximately 1.3 miles west of the proposed transmission line, this 340-acre state forest is largely undeveloped forestland, but includes a road and several small clearings, as well as a large wetland area. New Hampshire State Forests serve as demonstrations of sound forestry principles, and are generally managed for timber production and appropriate public uses such as hunting, hiking, and nature study.

Scenic Areas

The only state-designated scenic area within the visual study area is the Apple Way Scenic Byway in the Town of Londonderry. This 10 mile route explores the scenic beauty and interesting agricultural history of the area, including five orchards and the town's first maple syrup producer (NHDOT, 2009). The Apple Way Scenic Byway also passes the Town Common and a number of historic buildings including school houses, churches, and the town museum.

Additional designated scenic resources within the visual study area include the Route 28 scenic drive, Pelham and Derry Town Designated Scenic Roads, and 18 scenic views identified within the Town of Londonderry. Route 28, from the Route 28 Bypass in Derry to Manchester, is considered a "scenic drive" by the New Hampshire Department of Resources and Economic Development (NHDRED, 2015). Although "scenic drives" are not clearly defined, they appear to include roads of notable scenic quality that have not been formally designated as scenic byways. Old Bridge Road has been designated a scenic road by the Town of Pelham due to the historic Abbott Bridge (South Bridge), which spans Beaver Brook along this stretch of road. Abbott Bridge was "built in 1837, without mortar and sustained solely by expert shaping of its arched stones. It is the oldest double-arched stone bridge to survive in New Hampshire" (Pelham Historical Society, 2014). English Range Road has been designated a scenic road by the Town of Derry because it "still exhibits the strong agricultural characteristics of Derry prior to the housing boom" and the town Conservation Commission obtained land and easements along this road that preserve an old apple orchard known as the Corneliusen property (Southern New Hampshire Planning Commission, 2010). Additionally, the Town of Londonderry has formally identified a number of scenic views within its borders, including views toward apple orchards, active farms and ridges/hilltops; which represent the most attractive areas of Londonderry (Londonderry Open Space Task Force, 2011). Eighteen of these identified scenic areas occur within the visual study area.

Trails

A portion of the Granite State Recreational Rail Trail runs through the northern portion of the visual study area, in the Towns of Londonderry and Derry. The rail trail through this area is currently under construction, with phase 2 of 3 to be completed in the spring of 2015 (Londonderry Trailways, 2015). The Granite State Rail Trail (a.k.a. Londonderry Rail Trail in this location) crosses the transmission line ROW near the Scobie Pond Substation. Other mapped trails within the visual study area include the Trolley Car Path, Dragonfly Way, and Kelly Path, all in the Town of Londonderry.

Trolley Car Path is a right-of-way associated with an old trolley line that formerly ran from Manchester to Londonderry but presently consists of a 2-mile path extending northwest from the terminus of Trolley Car Lane, crossing the proposed transmission line ROW, and terminating at Stonehenge Road. The path is reportedly well used by hikers and mountain bikers, however, at the time of field review the trailhead was blocked by a closed gate and a "No Trespassing" sign indicating that the trail is not publicly accessible (Arnett Development Group, LLC, 2014; Appendix B, Viewpoint 91). Dragonfly Way also begins at the terminus of Trolley Car Lane but extends to the southwest, ending at Kitt Lane. It is an abandoned road right-of-way that has not been maintained for many years but may be developed into a walking/biking trail that would connect several neighborhoods (Arnett Development Group, LLC, 2014). Kelley Path is a 1.6-mile trail that extends north from the Londonderry schools, crosses under the proposed transmission line ROW, and terminates at Kelley Road. Although digital mapping was unavailable, the documents reviewed as part of this study indicate that recreational trails also exist within many of the conservation areas and public parks described below.

It is worth noting that the New Hampshire Department of Transportation website indicates that numerous roads in the study area are designated as bicycle routes (NHDOT, 2015). Designated bicycle routes that cross the Project ROW include Tallant Road, Bridge Street/Route 38, and Route 111A in the Town of Pelham, Route 128 in the Town of Windham, Bockes Road in the Town of Hudson, and Mammoth Road and Pillsbury Road in the Town of Londonderry. However, none of these roads are designated as scenic or possess notable scenic qualities in the vicinity of the proposed Project. Therefore, they are not considered scenic resource's in this study.

Local Parks, Conservation Areas, and Golf Courses

Over 50 local parks and conservation areas have been mapped within the visual study area. These range from undeveloped open space set-asides and town forests, to golf courses, playgrounds and athletic fields. A number of these resources include rudimentary to a well-developed trail systems. The Musquash Conservation Area in the Town of Londonderry is the largest of these resources. Over 900 acres in size, the Musquash Conservation Area provides habitat for area wildlife, has an extensive well-developed trail system, and is open to hunters and snowmobiles but closed to other motorized vehicles. Other sizeable conservation/open space areas (over 100 acres) within the visual study area include Adams Pond/Moose Hill Orchards, Leslie C. Bockes Memorial Forest, Robinson Pond/Robinson Pond Park, London Bridge Road Forest, and Elmer G. Raymond Park.

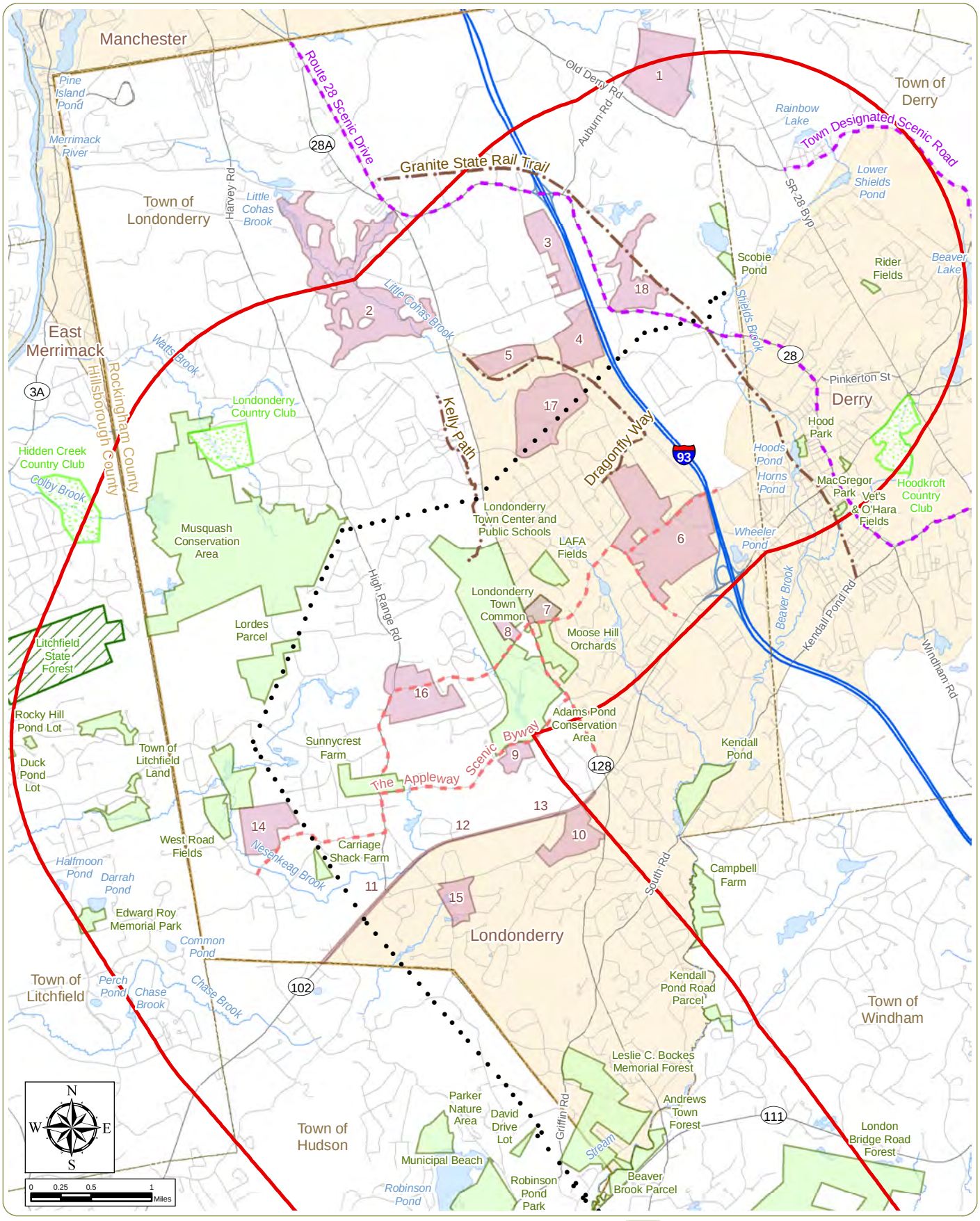
Major Water Bodies

Lakes, ponds, and rivers recognized as having scenic quality, and to which the public has a right of access, are identified as scenic resources by the draft SEC Rules. Twenty-seven named surface waters occur within the visual

study area, the majority of which are small brooks and ponds. Larger water features (over 100 acres in size) include Beaver Lake, Little Island Pond, and Robinson Pond. These water bodies may provide recreational and scenic value to local residents and visitors to the area, but are not officially recognized as having scenic quality and therefore are not considered scenic resources in this study.

Village/Town Centers

Areas of concentrated human settlement (such as cities, villages, and hamlets) are often considered visually sensitive resources, due to the number of potential viewers concentrated in these areas, and because the people who live there may be concerned about changes to their views. Town and village centers that possess a scenic quality are often identified as a scenic resource. The Pelham and Londonderry Town Commons appear to meet this definition of a scenic resource.



Merrimack Valley Reliability Project

Towns of Pelham, Windham, Hudson and Londonderry, NH

Figure 5: Potential Scenic Resources
Sheet 1 of 2

May 2015

Notes: 1. Basemap: ESRI StreetMap North America, 2008.
2. This is a color graphic. Reproduction in grayscale may misrepresent the data.

- Pole Location
- Trail
- Scenic Drive/Road
- State Scenic Byway
- State Forest
- Golf Course
- Local Parks & Recreation
- Town Designated Scenic View
- City/Village
- Town Boundary
- County Boundary
- 2-Mile Study Area

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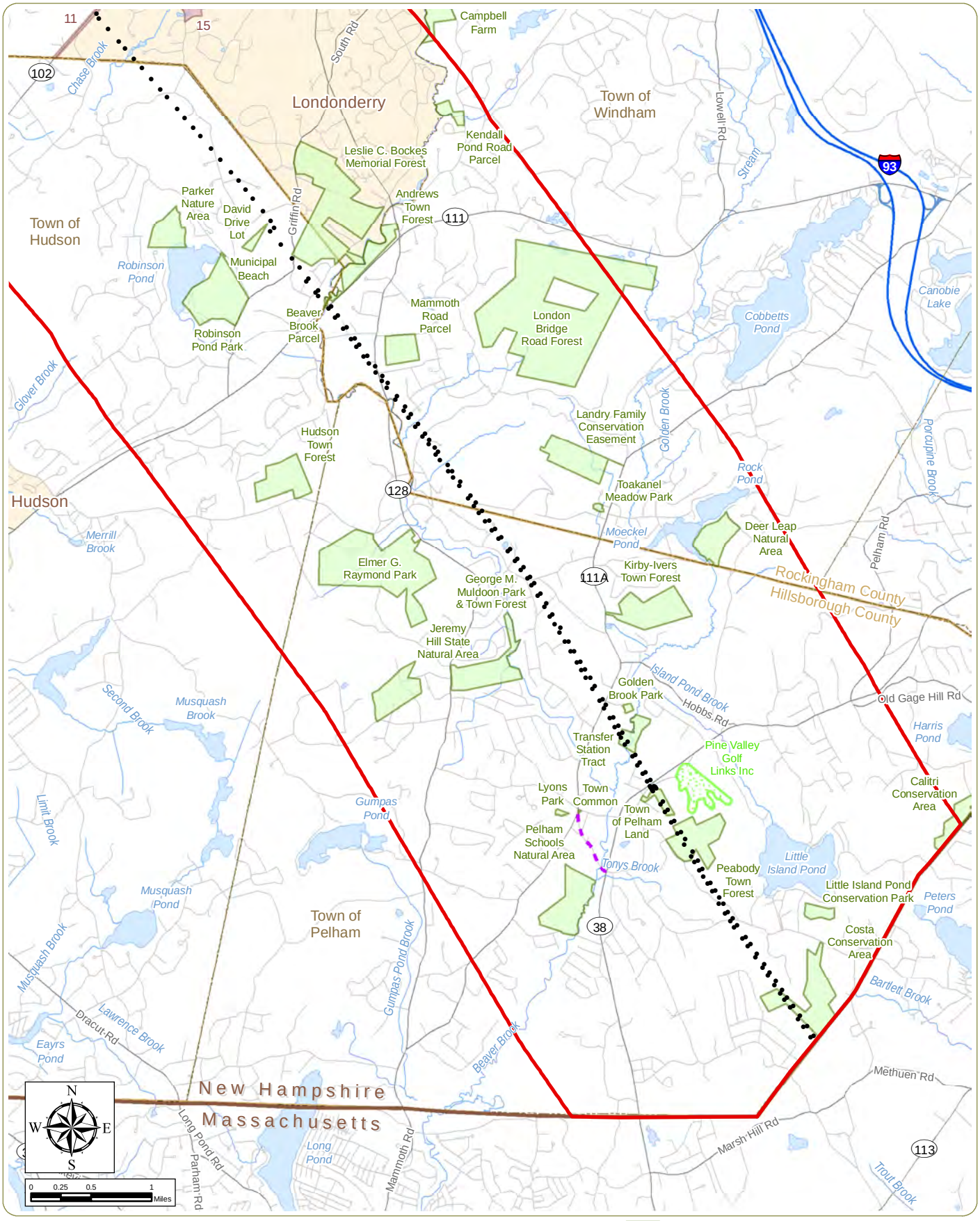

Merrimack Valley Reliability Project

Towns of Pelham, Windham, Hudson and Londonderry, NH

Figure 5: Potential Scenic Resources

Sheet 2 of 2

May 2015

Notes: 1. Basemap: ESRI StreetMap North America, 2008.
2. This is a color graphic. Reproduction in grayscale may misrepresent the data.

- Pole Location
- Trail
- Scenic Drive/Road
- State Scenic Byway
- State Forest
- Golf Course
- Local Parks & Recreation
- Town Designated Scenic View
- City/Village
- Town Boundary
- County Boundary
- 2-Mile Study Area

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4.0 Visual Impact Assessment Methodology

The VIA procedures used for this study are consistent with methodologies developed by various state and federal agencies, including the U.S. Department of the Interior, Bureau of Land Management (1980), U.S. Department of Agriculture, National Forest Service (1974), the State of Vermont (2012), and the New York State Department of Environmental Conservation (not dated). The specific techniques used to assess potential Project visibility and visual impacts are essentially the same as those used on the Groton Wind Project which was reviewed and approved by the New Hampshire SEC in 2011. Methodologies utilized by EDR on the VIA for the Project include viewshed analysis, field verification of potential visibility, identification of key viewpoints from scenic resources, preparation of computer-assisted visual simulations from those viewpoints, and evaluation of the Project's visual contrast by a panel of landscape architects. Each of these techniques are described in the following section.

4.1 Potential Project Visibility

An analysis of potential Project visibility was undertaken to identify those locations within the visual study area where it may be possible to view the proposed transmission structures from ground-level vantage points. This analysis included identifying potentially visible areas on viewshed maps and verifying line of sight conditions in the field. The methodology employed for each of these assessment techniques is described below.

4.1.1 Viewshed Analysis

Viewshed maps define areas of potential Project visibility by identifying those portions of the study area that could have an unobstructed line of sight from the viewer to any portion of one or more of the proposed transmission structures (NYSDEC, not dated). To evaluate potential Project visibility, EDR performed viewshed analyses of the existing and proposed transmission line structures. The viewshed analyses were based on the location and height of all proposed structures along the transmission line corridor as well as the location and height of the tallest existing transmission line structures. Heights of existing structures evaluated in this analysis ranged from 50 feet to 130 feet, while height of the proposed transmission structures ranged from 40 feet to 130 feet. Topographic viewshed maps for the Project were prepared using United States Geological Survey (USGS) digital elevation model (DEM) data (7.5-minute series), the location and above-ground height of existing and proposed transmission structures provided by the Applicants, an assumed viewer height of 5.5 feet, and ESRI ArcGIS® software with the Spatial Analyst extension. To cover the unusually large study area defined for his Project, two 2-mile radius topographic viewsheds were mapped, one to

illustrate potential visibility of the proposed structures, and the other to illustrate potential visibility of the existing transmission structure already on the ROW.

The ArcGIS program defines the viewshed (using topography only) by reading every cell of the DEM data and assigning a value based upon the existence of a direct, unobstructed line of sight to transmission structure location/elevation coordinates from observation points throughout the 2-mile study area. The resulting topographic viewshed maps define the maximum area from which any portion of any existing or proposed structure could potentially be seen within the study area based on the existence of a direct line of sight, and ignoring the screening effects of existing vegetation and structures. The accuracy of these maps is directly related to the accuracy of the USGS DEM data used in the analysis. The resulting viewshed map for the existing transmission line structures and the viewshed map for the new transmission line structures were then overlaid and compared to show the areas of potential increased visibility resulting from construction of the proposed Project.

Because the screening provided by vegetation and structures is not considered in this specific analysis, the topographic viewshed represents a "worst case" assessment of potential Project visibility. Topographic viewshed maps assume that no trees exist, and therefore are very accurate in predicting where visibility will not occur due to topographic interference. However, they are less accurate in identifying areas from which the Project would actually be visible. Trees and buildings can limit or eliminate visibility in areas indicated as having potential Project visibility in the topographic viewshed analysis.

To supplement the topographic viewshed analysis, a vegetation viewshed was also prepared to illustrate the potential screening provided by forest vegetation. A base vegetation layer was created using the USGS 2011 National Land Cover Dataset (NLCD) to identify the mapped location of forest land (including the Deciduous Forest, Evergreen Forest and Mixed Forest NLCD classifications). Based on standard visual assessment practice, the mapped locations of the forest land was assigned a conservative assumed height of 40 feet (even though most forest vegetation within the study area exceeds this height), and added to the DEM. The viewshed analysis was then re-run, as described above. As with the topographic viewshed analysis, the potential visibility of both the existing and proposed structures was evaluated. Once the viewshed analysis was completed, the areas covered by the forest vegetation layer were designated as “not visible” on the resulting data layer. Although there are certainly areas of mapped forest that have natural or man-made clearings that provide open outward views, these openings are typically narrow/enclosed and would include little of the proposed Project. In most forested areas, outward views will be well screened by tree trunks, branches and/or the overhead tree canopy. During the growing season the forest canopy will generally fully block

views of the proposed structures, and such views will typically be almost completely obscured, or at least significantly screened, even under "leaf-off" conditions.

Because it accounts for the screening provided by mapped forest stands, the vegetation viewshed is a much more accurate representation of potential Project visibility. However, it is important to note that screening provided by buildings and street/yard trees, as well as characteristics of the proposed transmission structures that influence visibility (color, narrow profile, distance from viewer, etc.), are not taken consideration in the viewshed analyses. These factors can limit or eliminate Project visibility. Consequently, being within the vegetation viewshed does not necessarily equate to actual Project visibility.

4.1.2 Field Verification

Potential visibility of the proposed Project was also evaluated in the field on October 9th and 10th, 2014 and November 19th, 2014. The purpose of these visits was to verify the existence of direct lines of sight to the Project as indicated by viewshed analysis, and to obtain photographs for subsequent use in the development of visual simulations. A mix of clear and partly cloudy skies provided good visibility and a representative variety of sky/lighting conditions throughout the field review.

During the field verification, EDR staff members drove public roads and visited potential scenic resources and other public vantage points within the 2-mile radius study area to document locations from which the proposed transmission structures would likely be visible, partially screened, or fully screened under both "leaf-on" and "leaf-off" conditions. This determination was made based on the visibility of existing transmission structures and/or the cleared ROW. Photos were taken from a total of 122 representative viewpoints within the study area. All photos were obtained using a Canon EOS Rebel T3i digital SLR camera with a focal length between 28 and 35 mm (equivalent to between 45 and 55 mm on a standard 35 mm film camera). This focal length is the standard used in visual impact assessment because it most closely approximates normal human perception of spatial relationships and scale in the landscape. Viewpoint locations were determined using hand-held global positioning system (GPS) units and high-resolution aerial photographs (digital ortho quarter quadrangles). The time and location of each photo were documented on all electronic equipment (camera, GPS unit, etc.) and noted on field maps and data sheets (see Appendix B). Viewpoints photographed during field review generally represented the most open, unobstructed available views toward the Project site (see representative photos from each viewpoint in the Photolog included in Appendix B).

4.2 Project Visual Impact

Beyond evaluating potential Project visibility, the VIA also examined the potential visual impact of the proposed transmission line on scenic resources and users of these resources within the visual study area. This assessment involved identifying scenic resources with open views of the Project, selecting representative key observation points (KOPs) from the selected scenic resources, creating computer models of the proposed transmission line, and preparing computer-assisted visual simulations of the Project from the selected KOPs. These simulations were then used to characterize the type and extent of visual impact resulting from Project construction. Details of the visual impact assessment procedures are described below.

4.2.1 Viewpoint Selection

From the 122 viewpoints documented during fieldwork, EDR selected a total of eight viewpoints for development of visual simulations. The selected viewpoints provide open views toward the Project site (as determined through field verification) from areas that could be considered scenic resources within the visual study area. Individual photos from each of these viewpoints were selected as KOPs, if they offered "worst case" visibility of the proposed Project (i.e., represented a location where the greatest number of proposed facility structures or components are potentially visible, where the greatest amount of public use is anticipated, and/or at which access to the scenic resource is most easily or likely achieved). A summary of the viewpoints selected as KOPs for evaluation in this study is presented in Section 5.1.4.

4.2.2 Visual Simulations

To show anticipated visual changes associated with the proposed Project, high-resolution computer-enhanced image processing was used to create realistic photographic simulations of the proposed Project from each of the eight selected KOPs. The photographic simulations were developed by using Autodesk 3ds Max Design 2015® to create a simulated perspective (camera view) to match the location, bearing, and focal length of each existing conditions photograph. Existing elements in the view (e.g., buildings, existing transmission structures, roads) were modeled based on aerial photographs and DEM data in AutoCAD Civil 3D 2014®. A three dimensional ("3-D") topographic mesh of the landform (based on DEM data) was then brought into the 3-D model space. At this point minor adjustments were made to camera and target location, focal length, and camera roll to align all modeled elements with the corresponding elements in the photograph. This assures that any elements introduced to the model space (i.e., the proposed transmission structures) will be shown in proportion, perspective, and proper relation to the existing

landscape elements in the view. Consequently, the alignment, elevations, dimensions and locations of the proposed Project structures will be accurate and true in their relationship to other landscape elements in the photograph.

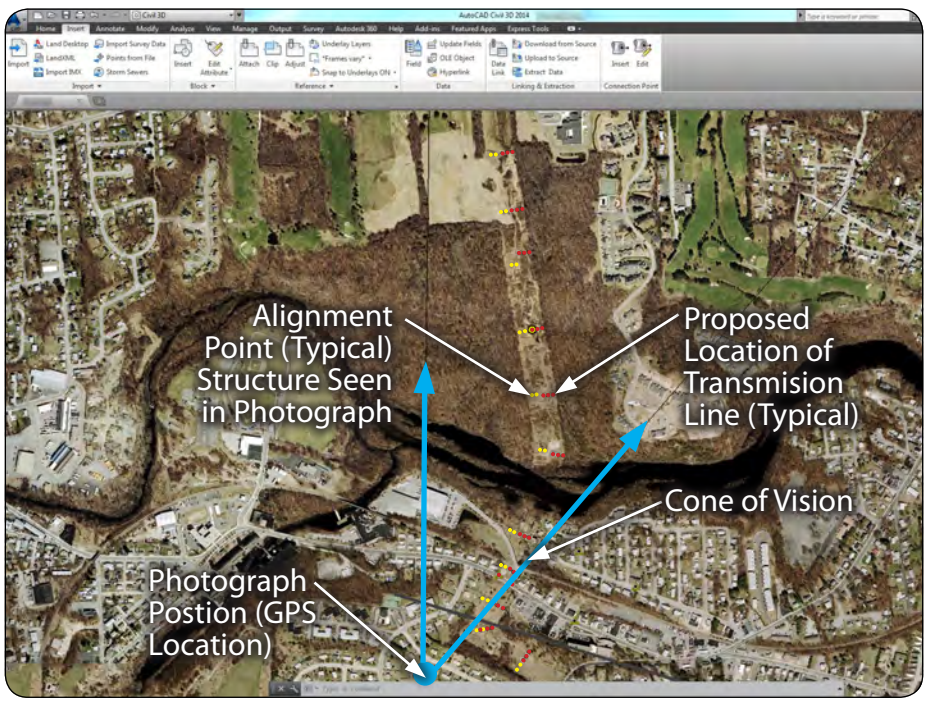
Computer models of the proposed transmission structures were prepared based on specifications and data provided by the Applicants (see representations of 3-D models in Figure 3). Using the camera view as guidance, the visible portions of these modeled Project components were imported to the landscape model space described above, and set at the proper coordinates. Coordinates for proposed transmission structures, were provided to EDR by NEP and PSNH. For the purposes of this visual impact assessment, all new transmission structures were assumed to be self-weathering steel with brown insulators.

Once the proposed Project was accurately aligned within the camera view, a lighting system was created based on the actual time, date, and location of the photograph. Using the Mental Ray Rendering System® with Final Gather and Mental Ray Daylight System® within the Autodesk 3ds Max Design 2015® software, light reflection, highlights, color casting, and shadows were accurately rendered on the modeled Project based on actual environmental conditions represented in the photograph.

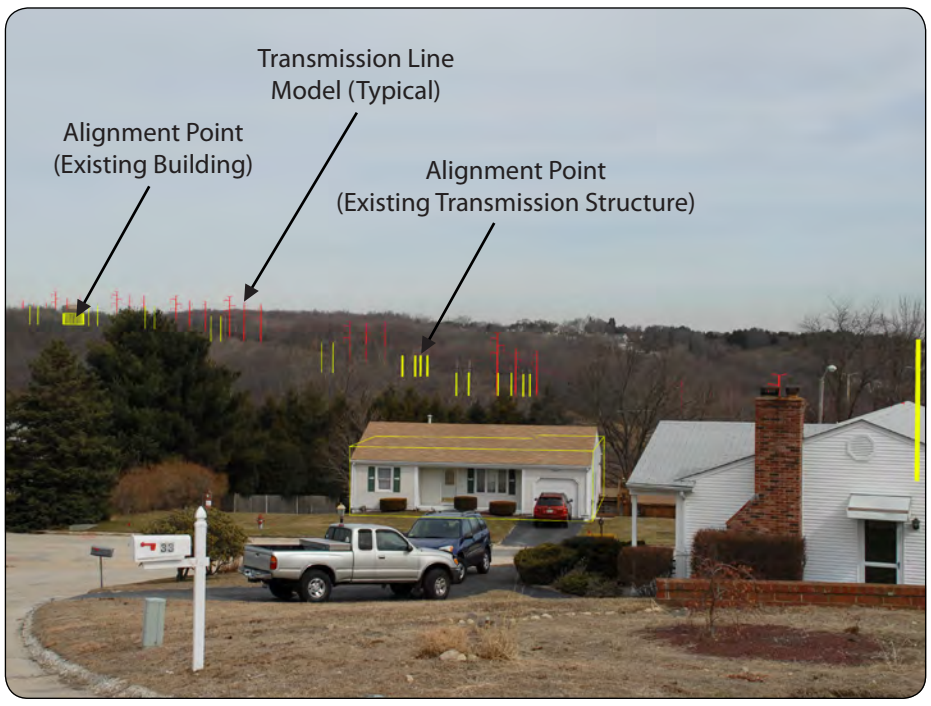
The rendered Project was then superimposed over the photograph in Adobe Photoshop CS5® and portions of the Project that fall behind vegetation, structures or topography were masked out. Photoshop was also used to take out any existing structures or vegetation proposed to be removed as part of the Project. Once the new Project components were added to the photo, any shadows cast on the ground by the proposed structures were also included by rendering a separate “shadow pass” over the DEM model in Autodesk 3ds Max Design 2015® and then overlaying the shadows on the simulated view with the proper fall-off and transparency using Adobe Photoshop CS5®. A graphic illustration of the simulation process is included in Figure 6.

Photos are selected to illustrate typical views of the proposed project that will be available to representative viewer/user groups from the major landscape similarity zones and/or sensitive sites within the study area.

A three-dimensional computer model of the project is built based on proposed structure specifications and structure site coordinates.



Aerial photographs and GPS data collected in the field are used to locate existing features that can serve as alignment points and create an AutoCAD Civil 3D® drawing.



These data are superimposed over photographs from each of the viewpoints, and minor camera changes are made to align all known alignment points within the view.

A digital terrain model representing the existing topography is also overlayed on the existing photograph to refine camera alignment, and target elevation.

The proposed exterior color/finish of the structures is then added to the model and the appropriate sun angle is simulated based on the specific date, time and location (latitude and longitude) at which each photo was taken.

Merrimack Valley Reliability Project

Towns of Pelham, Windham, Hudson and Londonderry, New Hampshire

Figure 6: Visual Simulation Methodology

May 2015

Note: Images in this figure are not from the Merrimack Valley Reliability Project

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4.2.3 Visual Impact Evaluation

Visual impact of the proposed Project was evaluated by a panel of three experienced visual impact assessors (two in-house landscape architects and one independent landscape architect) using a standardized rating form. Use of a panel of experienced landscape professionals and an evaluation form provides for a more balanced and objective assessment and is consistent with guidance provided in agency developed methodologies (e.g., Smardon et. al 1988). The methodology utilized in this evaluation is a modified version of the U.S. Department of the Interior, Bureau of Land Management (BLM) contrast rating methodology (USDI BLM, 1980). The rating form was developed by EDR, and has been used for visual impact evaluation on numerous electric transmission and generation projects in New York and New England, including the Groton Wind Project in Groton, New Hampshire. Along with having proven to be accurate in predicting public reaction to these projects, this methodology 1) documents the basis for conclusions regarding visual impact, 2) allows for independent review and replication of the evaluation, and 3) allows a large number of viewpoints to be evaluated in a reasonable amount of time without "burn-out" of the evaluator.

Prior to conducting the evaluation, a meeting was held with the rating panel to describe the proposed Project and visual study area, and to review the evaluation process and each KOP being evaluated. Background information reviewed with the panel included general land use and visual character of the study area, results of scenic resources research and field review conducted for the Project, a map of potential scenic resources, and a viewpoint location map. The viewer type(s) and scenic resources represented by each KOP were also reviewed with the panel, along with the rating forms to be used for the visual impact assessment (see Appendix C). The visual simulations for the eight KOPs were provided as digital files and 11 x 17 inch color prints. Digital files containing additional context photos taken at each viewpoint were also made available to the panel.

Rating form instructions were also provided to the panel to ensure consistency among the panel members in their use of terms and understanding of what information was being requested in the rating forms. The instructions provided: background concerning the landscape setting, viewer types, and scenic resources in the study area; guidance regarding how best to describe landscape components depicted in each viewpoint (e.g., in terms of landscape composition, form, line, color, texture, focal point, order, atmospheric conditions, lighting direction, and visual clutter); guidance regarding evaluation of viewpoint sensitivity (in terms of both scenic quality and viewer exposure); and guidance regarding terms and concepts used in contrast rating. The instructions also included the following guidance to improve consistency and reliability in the panel's understanding of each of the factors under consideration:

Landform:	Please consider the effect of the project relative to the appearance of the landform or topography, including the strength and range of color, the density of relief, the space as defined by the landform, and the extent of its scale.
Vegetation:	Please consider the effect of the project relative to the appearance of the form(s) and variety of vegetation, including the extent of clearing, the range of color, the density of texture, space as defined by the vegetation, and its hierarchy/diversity of scale.
Land Use:	Please consider the effect of the project relative to the appearance of identifiable land use(s) in the view, and evaluate the degree to which the project is compatible/consistent with the appearance of existing land use(s) in the view.
Water:	Please consider the effect of the project relative to the appearance of water features in terms of the form of the water body(ies), its (their) shorelines, color, and texture (which refers here to movement), reflection, degree of enclosure, and the scale (or extent) of the presence of water in the view. Waterbodies typically attract viewer attention, provide a focal point in the view, and are generally associated with higher scenic quality.
Sky:	Please consider the effect of the project relative to the appearance of the sky in terms of form (including the appearance of clouds), the edges of its lines (perhaps in terms of the horizon), clarity of color, texture (which here could refer to cloudiness or other atmospheric conditions), the degree of openness or enclosure, and the scale (or extent) of the sky in the view.
Viewer Activity:	Please consider the effect of the project on the viewer's perception of the scenic quality and potential enjoyment of the view, taking into account the viewpoint location and context, viewer type, and duration of the view.

Comments from the panel member were also solicited to obtain input on the following considerations:

1. The expectations of the typical viewer;
2. The Project's effect on viewer enjoyment of the scenic resource;
3. The extent of Project visibility from the scenic resource;
4. The scale of the proposed facility relative to surrounding topography and existing structures;
5. The duration and direction of the typical view of the elements of the proposed facility; and
6. The effect of intervening screening between the scenic resource and the proposed Project.

Additional guidance and details can be found on the instruction form included in Appendix C.

The rating panel members then evaluated the before and after views from each KOP, and assigned each view quantitative contrast ratings on a scale of 0 (insignificant) to 4 (strong). The ratings were based on consideration of five landscape components (landform, water resources, vegetation, land use, and sky), along with viewer activity. Following the panel's evaluation, each panel member's contrast ratings were compiled as an individual average for each KOP. The three individual ratings were then averaged to generate a composite contrast rating for each KOP.

Comments provided by the raters were reviewed to identify consistent observations and the range of varying perception regarding baseline scenic quality and the effect of the Project at each KOP. These were then used to generate narrative descriptions of the existing view and the overall visual effect of the Project on the scenic resources and viewers represented by each of the selected KOPs.

5.0 Visual Impact Assessment Results

5.1 Project Visibility

5.1.1 Viewshed Analysis

Potential Project visibility within the study area, as indicated by the viewshed analyses, is illustrated in Figure 7 and summarized in Table 1. Results of the topographic viewshed analysis indicate that a direct line of sight between a viewer and one or more of the proposed transmission structures (i.e., unobstructed by topography) could potentially be available from approximately 89.9% of the 2-mile study area. This "worst case" assessment of potential visibility indicates the area where *any* portion of *any* structure could possibly be seen without considering the screening effect of existing vegetation and structures. Areas where no direct line of sight toward the Project exists due to topographic screening comprise approximately 10.1% of the overall study area. These areas are most common at distances of 1 to 2 miles from the Project center line and are more heavily concentrated in the northern portion of the visual study area.

The topographic viewshed maps for both the existing and proposed structures show a very similar pattern and extent of potential visibility. Overlaying the two viewshed maps confirms that there is very little change in potential transmission line visibility with the proposed Project in place (Figure 7a). Areas of potential Project visibility cover the same general areas and have the same pattern as the viewshed of the existing lines. The “newly visible” area associated with the proposed 3124 Line (areas where the proposed structures are potentially visible but the existing structures are not) only totals 0.5 square mile, or 0.7% of the study area. As indicated in Figure 7a, newly visible areas are generally quite small in size, but increase in size somewhat with distance from the line and tend to occur more in valleys and low lying areas. Intervening vegetation and the diminishing effects of distance are likely to limit any increase in actual Project visibility or visual impact in these more sizeable areas.

Although it does not account for all potential sources of visual screening (e.g., man-made structures and small groups of trees), factoring mapped forest vegetation into the viewshed analysis significantly reduces the area where direct lines of sight toward the Project could potentially be available, and is a more accurate reflection of what the actual extent of Project visibility is likely to be (Figure 7b). Within a 2-mile radius, the vegetation viewshed analysis indicates that only approximately 29.5% of the study area could have potential views of some portion of the Project based on the availability of an unobstructed line of sight. Visibility will be eliminated in large portions of the study area where forest vegetation occurs. Mapped forest land covers roughly 40% of the visual study area and occurs in small fragments as well as more sizeable blocks throughout the study area. Taking this into consideration significantly reduces potential

Project visibility throughout the area, except in more heavily developed areas such as Londonderry, Derry and some residential neighborhoods; open areas such as agricultural fields, wetlands and water bodies; and along existing road and transmission corridors.

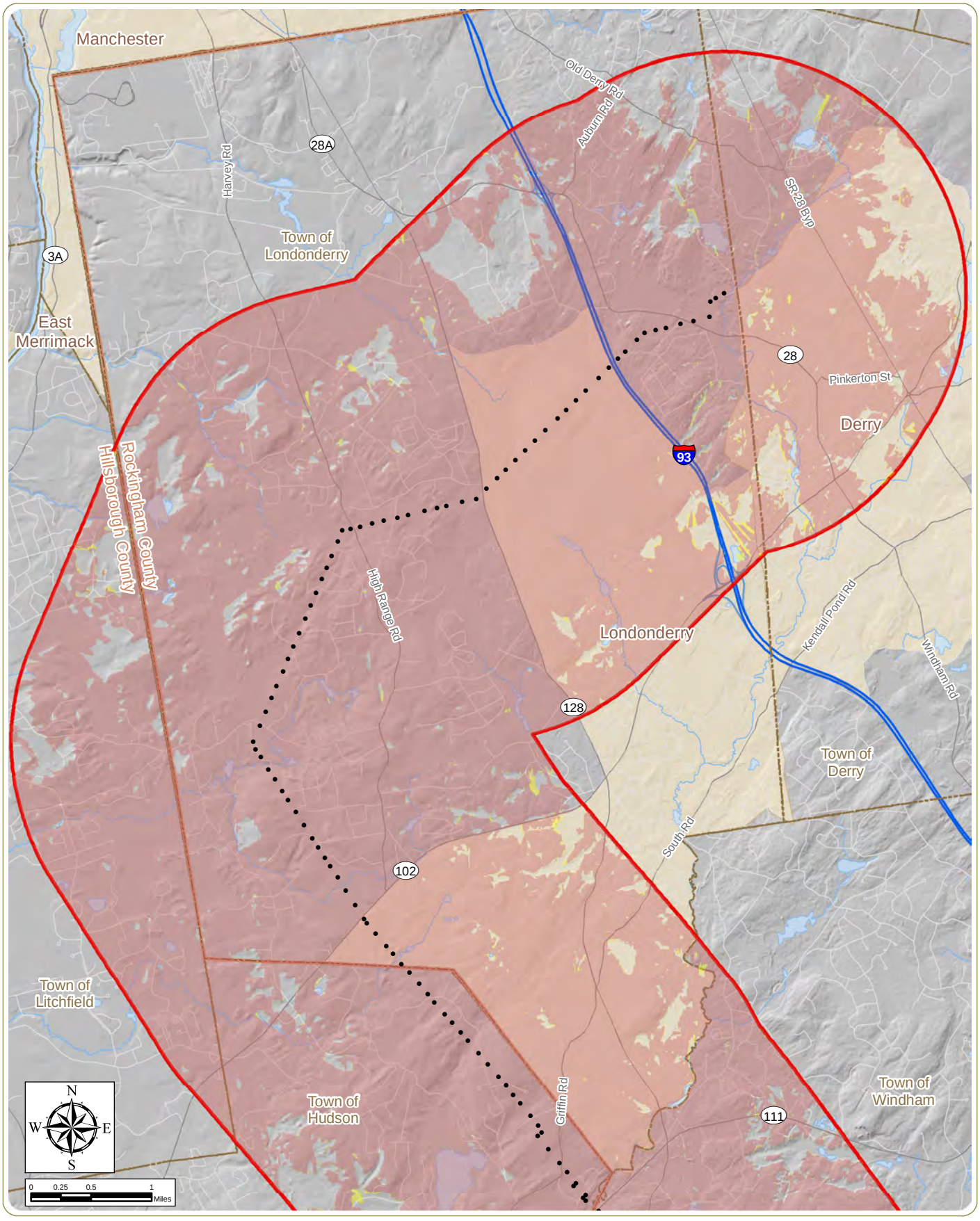
When compared with the vegetation viewshed of the existing structures, the viewshed of the proposed structures again shows a very similar pattern and extent of potential visibility. Throughout the study area, newly visible area covers 2.3 square miles (3.0%), with the largest newly visible areas occurring along the ROW within the area proposed to be cleared to accommodate the new line (Figure 7b).

Table 1. Viewshed Analysis Summary

Viewshed Analysis	Total Area of Potential Project Visibility within Study Area[1]	Percent of Study Area with Potential Project Visibility[1]
Proposed Structures Topography Only	69.0 square miles	89.9%
Existing Structures Topography Only	68.9 square miles	89.7%
Proposed Structures Vegetation and Topography	22.6 square miles	29.5%
Existing Structures Vegetation and Topography	22.1 square miles	28.8%

[1]The viewshed results indicate some areas where the existing structures are potentially visible but the proposed structures are not visible. Therefore, the difference between the area of potential visibility of the existing and proposed structures is not equal to the "newly visible" areas (areas where the proposed structures are visible but the existing structures are not). The topographic viewshed results indicate 0.5 square miles of newly visible area (0.7% of the study area) and the topographic/vegetation viewshed results indicate 2.3 square miles of newly visible area (3.0% of the study area).

As mentioned previously, being within the Project viewshed does not equate to Project visibility, which needs to be verified in the field (see Section 5.1.2). Areas of actual visibility are typically more limited than indicated by the vegetation viewshed analysis, due to the slender profile of the transmission structures, the effects of distance, and screening provided by yard trees, street trees and buildings in the study area, all of which are not considered in the viewshed analysis. In addition, the viewshed analysis assumed 40 foot trees, when in fact there are large areas where mature trees are over 60 feet in height.



Merrimack Valley Reliability Project

Towns of Pelham, Windham, Hudson and Londonderry, NH

Figure 7a: Topographic Viewshed Analysis

Sheet 1 of 2

May 2015

- Pole Location
- City/Village
- Town Boundary
- 2-Mile Study

Potential Visibility of Proposed Transmission Line Structures

- Existing Visibility (Area that already has a View of Existing Transmission Structures)
- Newly Visible Area (Area without View of Existing Transmission Structures)

Notes: 1. Basemap: ESRI StreetMap North America, 2008; Hillshade derived from USGS DEM data.
2. Potential visibility based on topography only. Screening effects of buildings, trees or other factors not accounted for. 3. This is a color graphic. Reproduction in grayscale may misrepresent the data.

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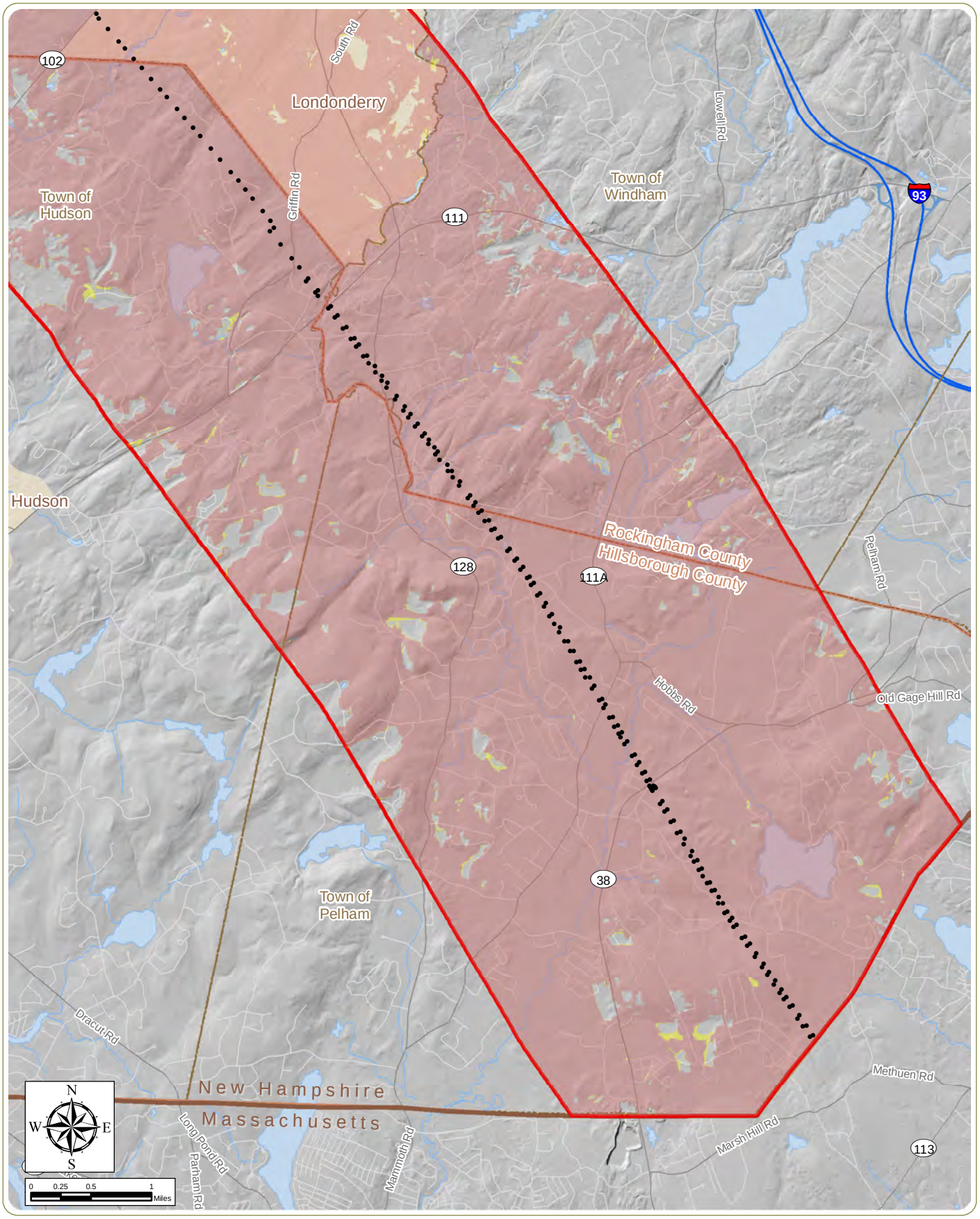

Merrimack Valley Reliability Project

Towns of Pelham, Windham, Hudson and Londonderry, NH

Figure 7a: Topographic Viewshed Analysis

Sheet 2 of 2

May 2015

- Pole Location
- City/Village
- Town Boundary
- 2-Mile Study

Potential Visibility of Proposed Transmission Line Structures

- Existing Visibility (Area that already has a View of Existing Transmission Structures)
- Newly Visible Area (Area without View of Existing Transmission Structures)

Notes: 1. Basemap: ESRI StreetMap North America, 2008; Hillshade derived from USGS DEM data.
2. Potential visibility based on topography only. Screening effects of buildings, trees or other factors not accounted for. 3. This is a color graphic. Reproduction in grayscale may misrepresent the data.

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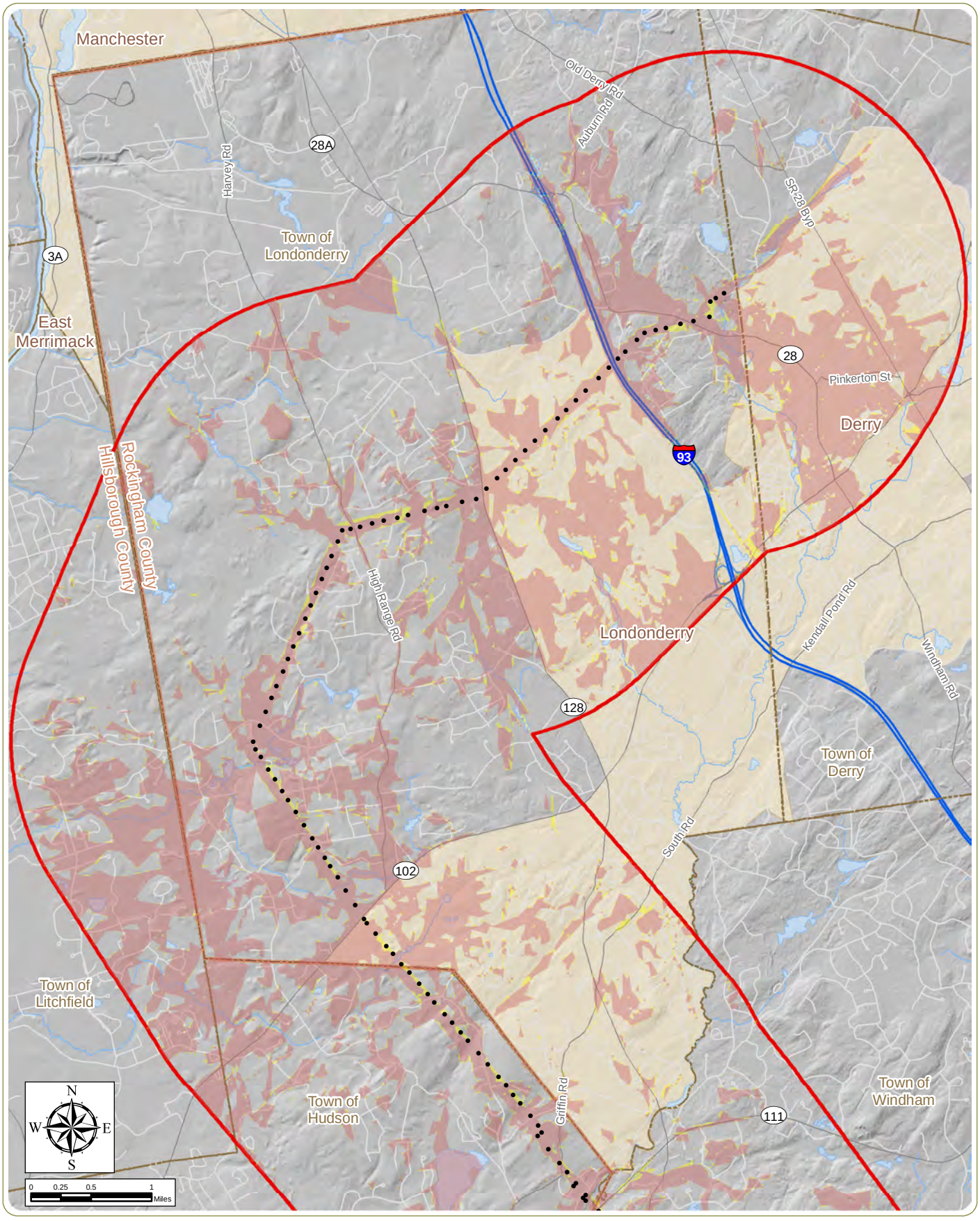

Merrimack Valley Reliability Project

Towns of Pelham, Windham, Hudson and Londonderry, NH

Figure 7b: Topographic and Vegetation Viewshed Analysis

Sheet 1 of 2

May 2015

- Pole Location
- City/Village
- Town Boundary
- 2-Mile Study

Potential Visibility of Proposed Transmission Line Structures

- Existing Visibility (Area that already has a View of Existing Transmission Structures)
- Newly Visible Area (Area without View of Existing Transmission Structures)

Notes: 1. Basemap: ESRI StreetMap North America, 2008; Hillshade derived from USGS DEM data.
2. Potential Project visibility based on topography and potential screening by mapped forest vegetation (with an assumed height of 40 feet). 3. This is a color graphic. Reproduction in grayscale may misrepresent the data.

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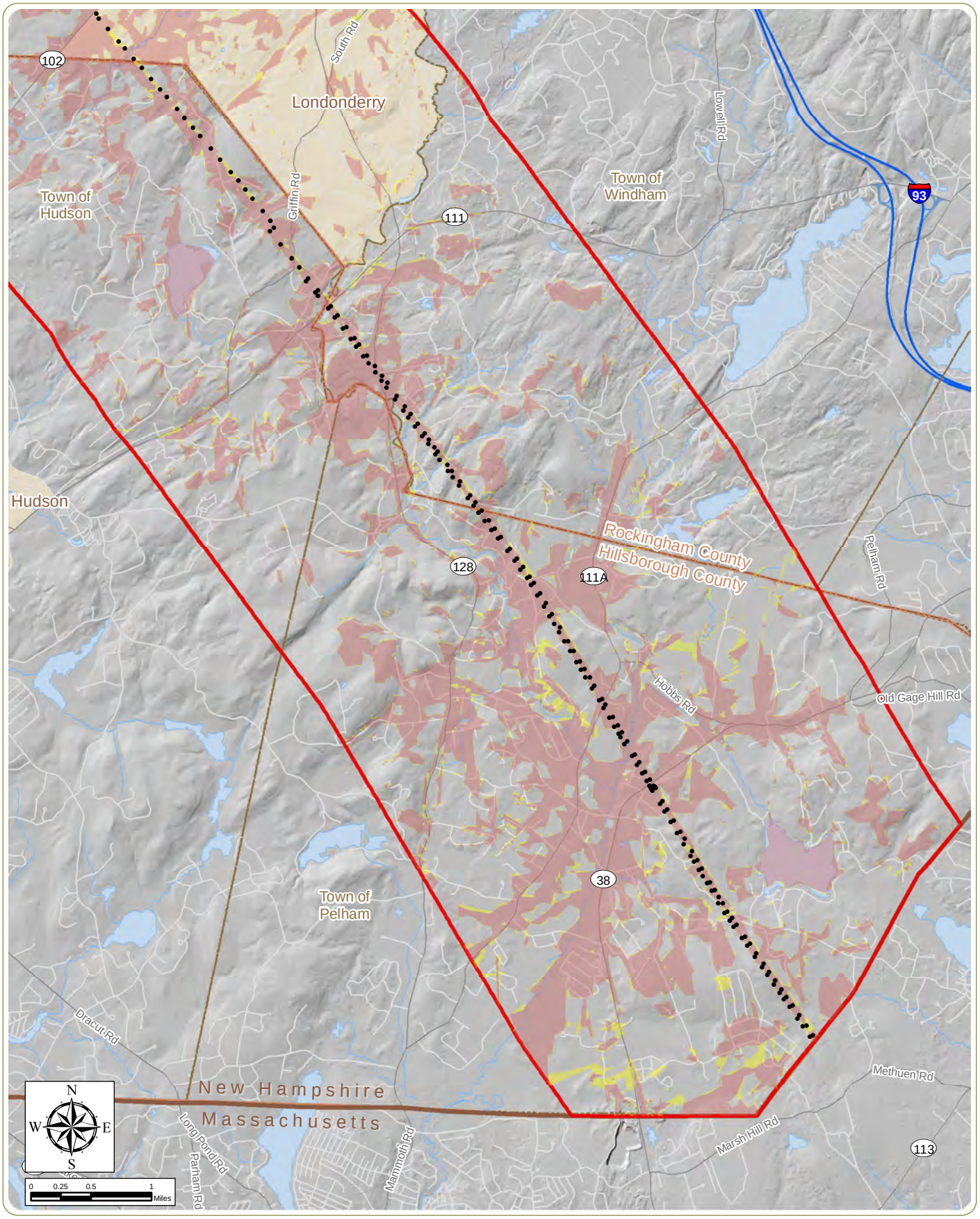

Merrimack Valley Reliability Project

Towns of Pelham, Windham, Hudson and Londonderry, NH

Figure 7b: Topographic and Vegetation Viewshed Analysis

Sheet 2 of 2

May 2015

- Pole Location
- City/Village
- Town Boundary
- 2-Mile Study

Potential Visibility of Proposed Transmission Line Structures

- Existing Visibility (Area that already has a View of Existing Transmission Structures)
- Newly Visible Area (Area without View of Existing Transmission Structures)

Notes: 1. Basemap: ESRI StreetMap North America, 2008; Hillshade derived from USGS DEM data.
2. Potential Project visibility based on topography and potential screening by mapped forest vegetation (with an assumed height of 40 feet). 3. This is a color graphic. Reproduction in grayscale may misrepresent the data.

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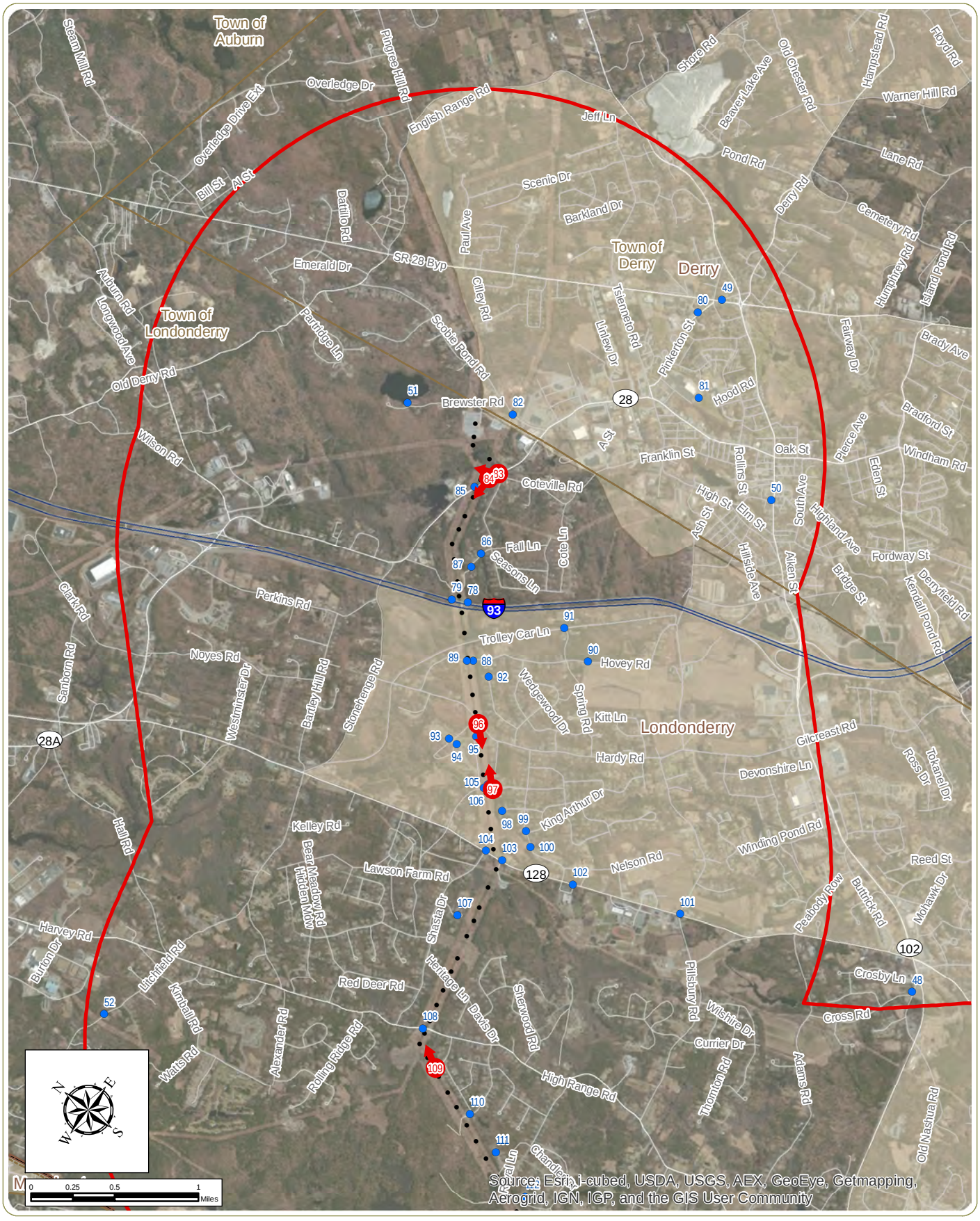
5.1.2 Field Verification

Potential visibility of the proposed Project was evaluated in the field on October 9th and 10th, 2014 and November 19th, 2014. Photos were taken from a total of 122 representative viewpoints within the study area. Viewpoint locations are indicated on Figure 8 and Appendix A. Representative photographs illustrating views of the Project site from throughout the study area, and factors affecting the visibility of the Project, are provided in the Photo Log included in Appendix B.

Field review revealed that actual Project visibility is likely to be much more limited than suggested by viewshed mapping. This is due to the fact that screening provided by buildings is significant in village/town center areas and other areas of intensive land use, and trees within and adjacent to residential neighborhoods and in undeveloped portions of the study area typically limit long distance views. Field review confirmed that visibility of the Project is very limited within the study area. Open, unobscured views of the Project will generally be available only at sites within, or immediately adjacent to, the existing transmission ROW. These open views are typically restricted to road crossings and open yards/fields that abut the ROW. At locations over 500 feet from the ROW views of the existing transmission lines are generally fully screened from view by intervening trees/forest vegetation. Due to a general lack of topographic variability and the abundance of trees within the study area, no long-distance views of the existing transmission lines or cleared ROW were documented during field review. In village and neighborhood areas, where population is concentrated, views of the Project site are generally well-screened by buildings, street trees, yard trees, and/or adjacent areas of the forest. Open views were documented from the more heavily traveled highways that traverse the study area (e.g. State Routes 28, 38 and 102), but generally only at, and immediately adjacent to, the point where the lines cross the road.

Although field review focused on the identification of sites with potential views of the proposed Project, it is worth reiterating that field review confirmed that views toward the Project site are screened throughout the vast majority of the visual study area. As indicated in the field notes and photos included in Appendix B, views of the existing transmission lines were not documented at any locations beyond 0.5 mile from the line. Consequently, the proposed Project is not anticipated to be visible from the portion of the study area beyond 0.5 mile from the Project center line (i.e., approximately 75% of the 2-mile radius study area).



Merrimack Valley Reliability Project

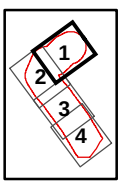
Towns of Pelham, Windham, Hudson and Londonderry, NH

Figure 8: Viewpoint Location Map

May 2015

Notes: 1. Basemap: ESRI ArcGIS Online "World Imagery" Map Service and ESRI StreetMap North America, 2008.
2. This is a color graphic. Reproduction in grayscale may misrepresent the data.

- Simulation KOP
- Viewpoint
- Pole Location
- City/Village
- Town Boundary
- 2-Mile Study Area



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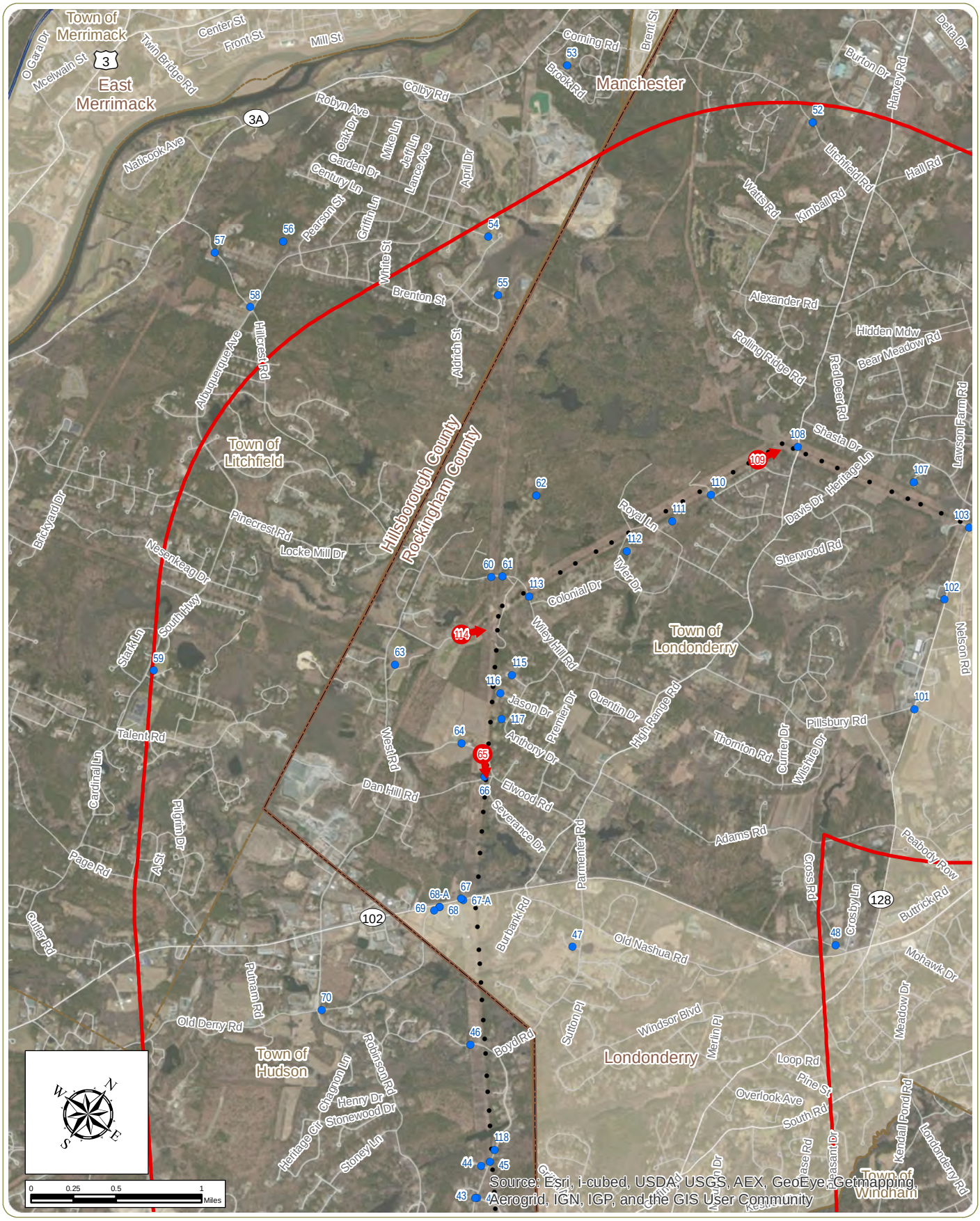


Merrimack Valley Reliability Project

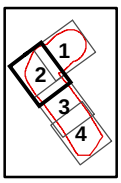
Towns of Pelham, Windham, Hudson and Londonderry, NH

Figure 8: Viewpoint Location Map

May 2015

Notes: 1. Basemap: ESRI ArcGIS Online "World Imagery" Map Service and ESRI StreetMap North America, 2008.
2. This is a color graphic. Reproduction in grayscale may misrepresent the data.

- Simulation KOP
- Viewpoint
- Pole Location
- City/Village
- Town Boundary
- 2-Mile Study Area



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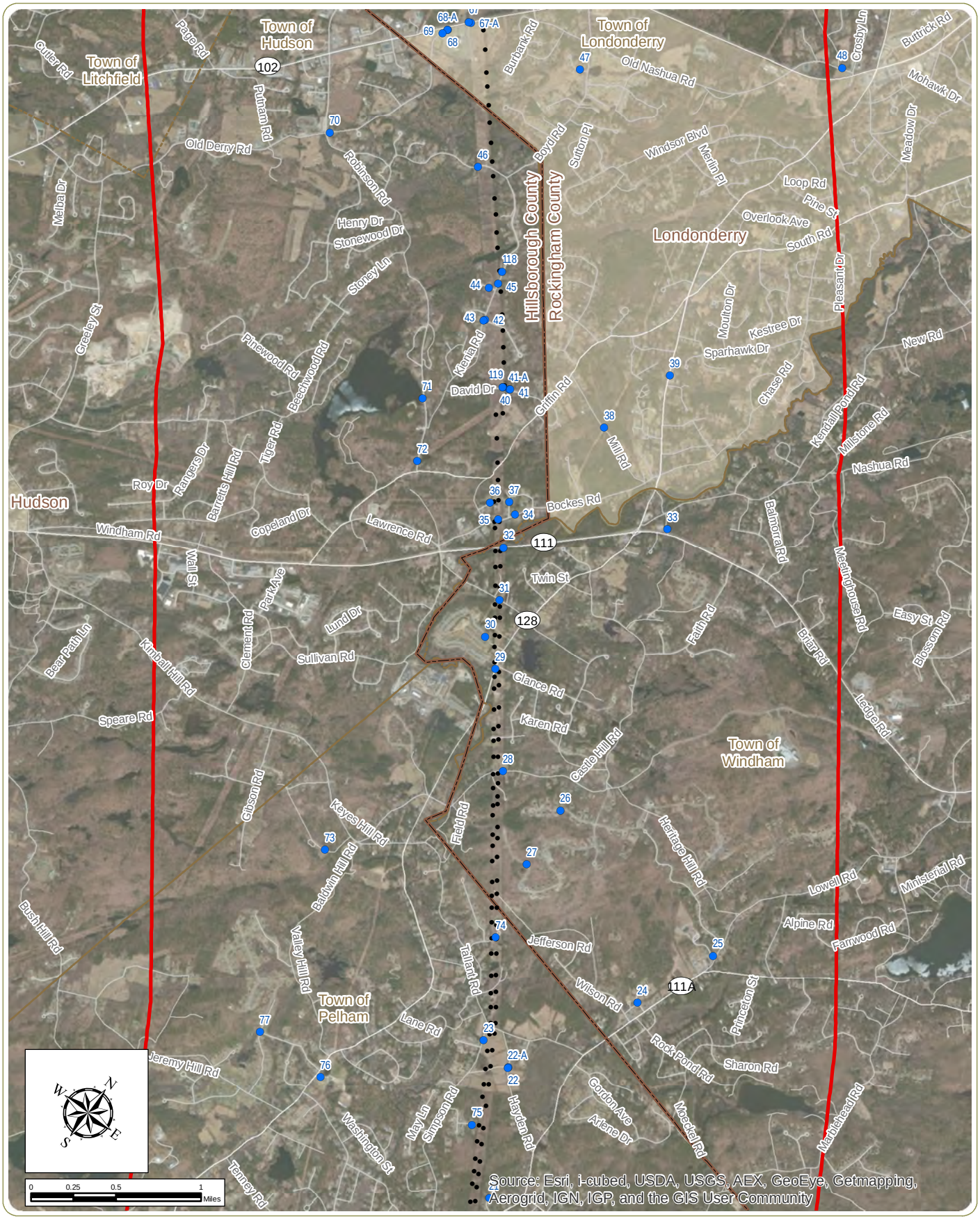


Merrimack Valley Reliability Project

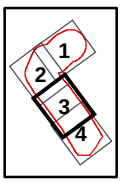
Towns of Pelham, Windham, Hudson and Londonderry, NH

Figure 8: Viewpoint Location Map

May 2015

Notes: 1. Basemap: ESRI ArcGIS Online "World Imagery" Map Service and ESRI StreetMap North America, 2008.
2. This is a color graphic. Reproduction in grayscale may misrepresent the data.

- Simulation KOP
- Viewpoint
- Pole Location
- City/Village
- Town Boundary
- 2-Mile Study Area



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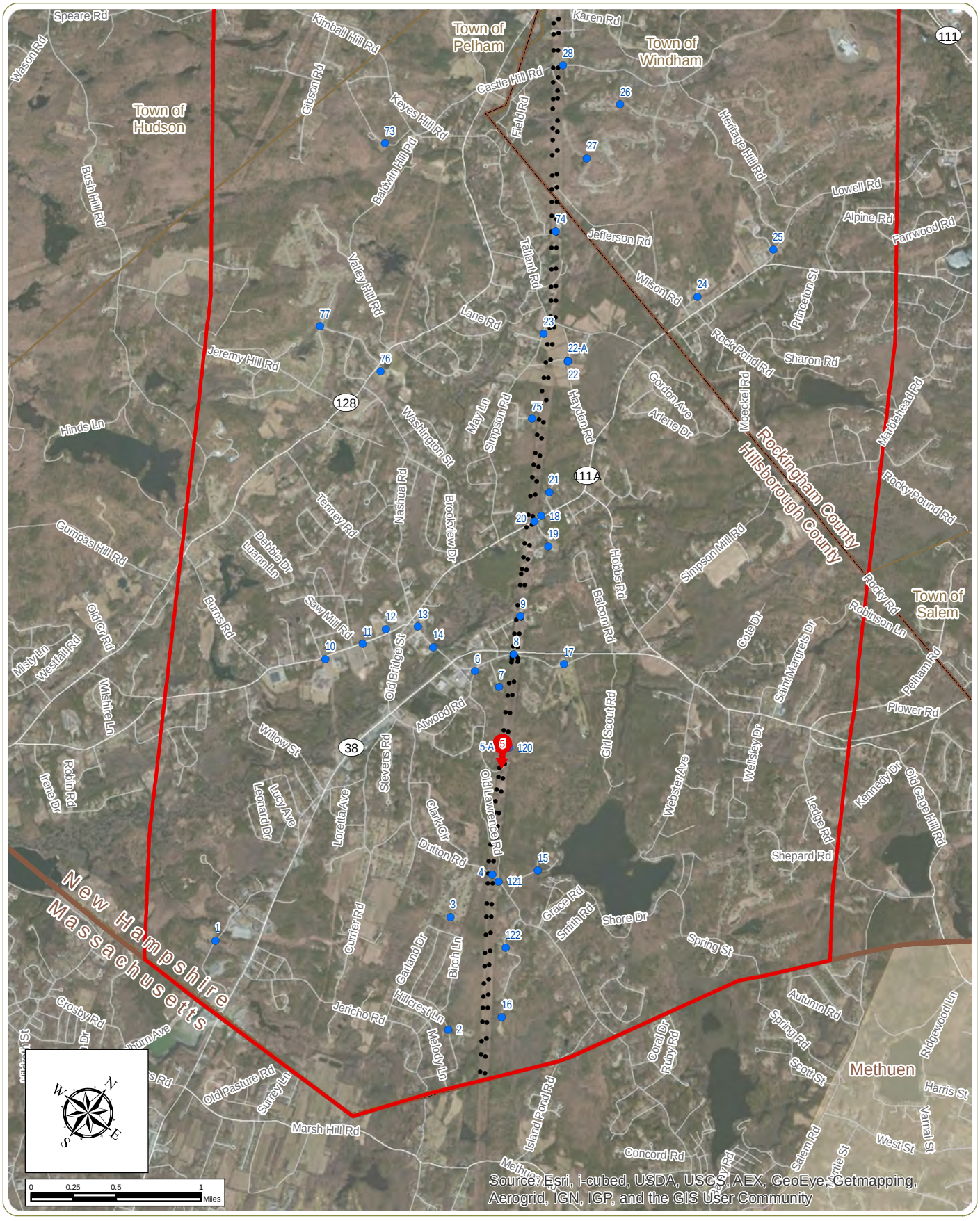


Merrimack Valley Reliability Project

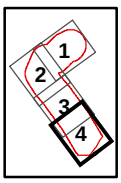
Towns of Pelham, Windham, Hudson and Londonderry, NH

Figure 8: Viewpoint Location Map

May 2015

Notes: 1. Basemap: ESRI ArcGIS Online "World Imagery" Map Service and ESRI StreetMap North America, 2008.
2. This is a color graphic. Reproduction in grayscale may misrepresent the data.

- Simulation KOP
- Viewpoint
- Pole Location
- City/Village
- Town Boundary
- 2-Mile Study Area



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5.1.3 Visibility from Scenic Resources

Project visibility from all potential scenic resources inventoried within the study area, based on both viewshed analysis and field verification, is summarized in Appendix A. Viewshed analysis indicates that the majority of potential scenic resources within the 2-mile radius study area are located within the viewshed of the proposed Project. However, this same analysis indicates that the resources that occur within the viewshed of the proposed Project are, in almost all cases, already within the viewshed of the existing transmission lines. Consequently, there should be few instances where views of the proposed Project would be available from potential scenic resources that do not already include views of existing transmission facilities.

When considering the screening effect of both topography and mapped forest vegetation, the viewshed analysis indicates that the Project should be fully screened from 13 of the 108 potential scenic resources identified within the study area. Additionally, potential visibility will be partially screened (but not eliminated) from an additional 93 of these resources. Sites where viewshed analysis indicates some level of Project visibility considering the screening effects of topography and vegetation include Litchfield State Forest, each of the identified scenic roads/byways, each identified trail, 16 of the 18 Town of Londonderry scenic views, each of the four golf courses, and 85% of the identified local parks, conservation areas and water resources. Two potential scenic resources (Half Moon Pond in the Town of Litchfield and the Town of Pelham Town Common) are indicated as having a direct line of sight toward the Project from all locations within their mapped boundaries.

Field review served to further document the availability of views toward the Project site from the inventoried potential scenic resources described in Section 3.4. As discussed in Section 5.1.2, field review revealed that actual Project visibility throughout the study area will be much more limited than suggested by the viewshed analysis. Field review at potential scenic resources indicated that Project visibility will be highly variable, and largely dependent on proximity to the proposed Project. Views from potential scenic resources located beyond 0.5 mile from the Project were in almost all cases totally screened. These resources beyond 0.5 mile from the Project included one state forest, one identified trail, two of the designated scenic roads and byways, 10 of the Town of Londonderry-identified scenic views, 26 of the local parks and conservation areas, three golf courses, and 14 of the identified surface waters. The only potential scenic resources located beyond 0.5 mile from the Project that could have views of the proposed transmission line from certain areas within their boundaries were the Dragonfly Way (a trail which does not display scenic quality, and therefore is not considered a scenic resource), and possibly certain high points within the Jeremy Hill State Natural Area, if there are breaks in the forest canopy that allow outward views (this was not confirmed during field review).

As stated previously, open views of the proposed Project are not anticipated to be available from sites beyond 0.5 mile from the ROW. Consequently, identified potential scenic resources located within 0.5 mile of the Project center line were reviewed to determine 1) if the resource could actually be considered a scenic resource, based on existing scenic quality and/or the availability of public access, and 2) whether the proposed Project was likely to be visible from some portion of the resource based on the results of field review and (if necessary) follow-up desktop analysis. Results of this review indicate that, of the 51 potential scenic resources located within 0.5 mile of the Project center line, 23 (45%) would actually not be considered scenic resources due to a lack of formal scenic designation, low scenic quality, and/or lack of public access. These include 12 waterbodies (none of which are designated as scenic), six local parks or conservation areas (most of which are open space set-asides associated with adjacent residential subdivisions), two trails: Kelly Path and Trolley Car Path (which have low scenic quality and unclear public access), one farm/petting zoo (Carriage Shack Farm), and one golf course (the Pine Valley Gold Links).

Of the remaining 28 sites that could be considered scenic resources, it was determined that the Project would not be visible from 15 (54%) of these sites. These include five locally designated scenic views, and 11 town parks, open space parcels and forests, such as Little Island Pond Park, Elmer G. Raymond Park, Kirby-Ivers Town Forest, and Golden Brook Park. Scenic resources within 0.5 mile of the Project with the potential for views of the proposed transmission line include the following:

- Apple Way Scenic Byway
- Route 28 Scenic Drive
- Granite State Rail Trail
- Londonderry Scenic View #11
- Londonderry Scenic View #14
- Londonderry Scenic View #17
- Peabody Town Forest
- Leslie C. Bockes Memorial Forest
- Musquash Conservation Area
- Centennial Park/West Road Fields
- Londonderry Town Center and Public Schools
- George M. Muldoon Park and Town Forest
- Robinson Pond Park

Descriptions of these resources, and the type and likely extent of Project visibility at each of them, are presented below (with the exception of Londonderry Scenic View #14, which was not visited during field review).

5.1.3.1 The Apple Way Scenic Byway (Viewpoints 64 and 65)

The Apple Way is an approximately 10-mile, state-designated Scenic Byway located in the Town of Londonderry. The Apple Way extends from West Road on the south to Interstate 93 on the north, and includes portions of several local roads. The Apple Way connects five orchards in Londonderry, and additional historic, cultural, and agricultural resources and open spaces are located along its route. The Apple Way is primarily intended as an automotive byway and not specifically intended for use by pedestrians, though the scenic quality of adjacent resources could be enjoyed from a car, bicycle, or on foot (Arnett Development Group, 2014).

Field evaluation indicated that unobstructed views of the existing transmission lines (and therefore, the Project) are available along Elwood Road at Elwood Orchards where the transmission ROW crosses the scenic byway (Photo Inset 1). The orchards are used for apple-picking, walking, and other activities enhanced by scenic quality. Unobstructed views to the north and south are available within the orchard. Views of the Project from the rest of the Apple Way are well screened by topography, vegetation and/or buildings, as distance from the existing ROW increases.

Photo Inset 1. Viewpoint 65, The Apple Way, view northwest from Elwood Road (Elwood Orchards) and existing ROW.

5.1.3.2 Route 28 Scenic Drive (Viewpoint 84)

The Route 28 Scenic Drive extends along Route 28 from the Town of Derry on the southeast to the Route 28 bypass in Manchester on the northwest (NHDRED, 2015). Approximately 5.3 miles of the scenic drive occur within the study area. This portion of the scenic drive is lined with deciduous and coniferous trees, and scattered houses and commercial operations. A heavier concentration of commercial activity is found on the southeastern end in Derry, as well as immediately adjacent to Interstate 93. The portion of the Route 28 Scenic Drive that passes under the existing transmission lines is lined by low successional vegetation atop roadside berms. The scenic drive is most likely intended for automobiles due to the narrow shoulder of the road that is not suitable for bicyclists or pedestrians.

Field evaluation indicated that portions of the Route 28 Scenic Drive located directly beneath the existing transmission line will have an unobstructed view of the Project to the northeast and southwest (Photo Inset 2). Views of the Project from the edges of the ROW will include some partial screening. More distant views of the Project along the drive are partially-to-completely screened due to topography, vegetation, and the contours of the road. Views of the Project along this route will be brief in duration, due to being experienced from a moving automobile.

Photo Inset 2. Viewpoint 84, Route 28 Scenic Drive, view to the west-southwest toward existing ROW.

5.1.3.3 Granite State Rail Trail (Viewpoint 83)

A portion of the Granite State Rail Trail (a.k.a. Londonderry Rail Trail in this location) is located in the northeastern portion of the visual study area. The rail trail is part of a statewide initiative to connect various New Hampshire communities along an abandoned railroad ROW. When completed, the trail will extend from the Massachusetts border on the south to the Connecticut River in the Town of Lebanon to the north (Arnett Development Group, 2014). The approximately 5-mile portion of the rail trail located within the study area extends from the Town of Derry on the southeast into the Town of Londonderry on the northwest, and passes under the existing transmission ROW northeast of State Route 28. The land immediately surrounding the trail where it intersects the ROW includes low, successional upland and wetland vegetation, with coniferous trees located along the edges of the ROW. The trail is intended to be used for walking, bicycling and other outdoor activities.

Field evaluation indicated that portions of the rail trail located within and immediately adjacent to the existing transmission line will have an unobstructed view of the Project to the northeast and southwest. Views of the Project from the edge of the ROW (Photo Inset 3) will include some partial screening. More distant views of the Project along the trail are likely to be partially-to-completely screened due to topography, vegetation, and curvature of the trail.

Photo Inset 3. Viewpoint 83, Granite State Rail Trail, view to the northwest from NH Route 28 toward existing ROW.

5.1.3.4 Town of Londonderry Scenic View #11 (Viewpoints 67 and 68)

The Town of Londonderry portion of State Route 102 (Nashua Road) located within the study area has been identified as an area having a scenic view that is "attractive and representative of Londonderry" (LOSTF, 2011). This portion of Route 102 is lined with deciduous and coniferous trees, and several houses and scattered businesses (including the Londonderry Flea Market) are located along the road. The existing transmission ROW crosses Route 102 immediately adjacent to the Londonderry Flea Market. The flea market is located on 30 acres of former farm land immediately adjacent to Route 102, and is open weekends from April through October (Visit Londonderry, 2015). It is unlikely that the flea market and the existing transmission structures were contributing factors to the designation of Route 102 as a scenic view.

Field evaluation indicated unobstructed views of the existing transmission lines (and therefore, the Project) were available where the ROW crosses Route 102 (Photo Inset 4). Open views of the Project are available to the north and south from immediately under the line, where existing scenic quality is low. Only partial views of the Project are available within approximately 500 feet of the road crossing, and would be limited to structures immediately adjacent to the road. More distant views of the Project are likely to be completely screened due to topography, vegetation, and curvature of the road.

Photo Inset 4. Viewpoint 67, Town of Londonderry scenic area along NH Route 102, view to the south toward existing ROW and Londonderry Flea Market from Route 102.

5.1.3.5 Town of Londonderry Scenic View #17 (Viewpoints 93-97 and 105-106)

An approximately 170-acre parcel of land located between Hardy Road and King Henry Drive in the Town of Londonderry has been identified as an area having a scenic view that is the "attractive and representative of Londonderry" (LOSTF, 2011). A significant portion of this designated scenic area includes a private residential development along Parrish Drive and Meetinghouse Drive. The existing transmission ROW runs along the eastern portion of this residential development through the designated scenic view area (Photo Inset 5). The ROW includes two parallel transmission lines separated by a narrow band of primarily deciduous trees, with low successional vegetation present within much of the ROW. No provisions for public access or recreation are apparent. Scenic views in this area are likely experienced primarily by motorists and nearby residents.

Field evaluation indicated unobstructed views of the existing transmission ROW (and therefore, the Project) were available where the ROW passes through the designated scenic area east of the Parrish Drive subdivision (Photo Inset 5). Open views of the Project will be available to the north and south from immediately under the line, while partial views of the Project will be available within the subdivision (generally limited to the tops of transmission structures visible above the roof lines). Existing vegetation partially screens views of the line from Parrish Drive.

Photo Inset 5. Viewpoint 97, Town of Londonderry Parcel, view to the north from King Henry Drive of existing ROW.

5.1.3.6 Arthur Peabody Town Forest (Viewpoints 5 and 120)

Arthur Peabody Town Forest is a publicly accessible forest totaling over 100 acres in the Town of Pelham. Although not officially designated or described as scenic, the forest is used for walking, biking, hunting, and other outdoor activities. A system of marked trails can be accessed from a parking area along Old Lawrence Road on the west side of the forest. The trail extending west from the parking area crosses the existing transmission ROW before continuing into a densely-wooded area to the east. A branch of the trail parallels the eastern side of the ROW before turning east at the northern boundary of the forest (Town of Pelham, 2015). The portion of the trail that crosses the transmission ROW (Photo Inset 6) is located amid low volunteer vegetation and scrub brush with some rock outcroppings evident.

Field evaluation indicated that unobstructed views of the existing transmission lines (and therefore, the Project) are available along the portion of the trail that crosses the ROW, and along portions of the trail immediately east and west of the ROW. Forest vegetation provides considerable screening of views toward the transmission lines from within the wooded portions of the forest. Although not verified during field review, once off the ROW, views of the Project should be fully or substantially screened by trees in most of the Peabody Town Forest.

Photo Inset 6. Viewpoint 120, Arthur Peabody Town Forest, view from trail toward existing transmission line ROW looking northwest.

5.1.3.7 Leslie C. Bockes Memorial Forest (Viewpoint 38)

The Leslie C. Bockes Memorial Forest (also known as Bockes-Ingersoll Memorial Forest) is comprised of approximately 226 acres in the Town of Londonderry, northeast of the proposed Project. The southwestern portion of the forest is located immediately adjacent to the existing transmission ROW, while the eastern boundary of the forest is approximately 0.8-mile from the ROW. The forest is comprised of multiple parcels managed by the Society for the Protection of New Hampshire Forests. Although no developed recreational facilities are located within the forest, it is used for hiking, cross-country skiing, snowshoeing, and other outdoor activities by the public. The forest is part of the approximately 300-acre Tri-Town Forest that spans portions of the Towns of Hudson, Londonderry and Windham (SPNHF, 2015). Parking is available along Mill Road, and points of public access are available from adjoining roads.

Field evaluation indicated that no views of the existing transmission line (and therefore, the Project) would be available from much of Leslie C. Bockes Memorial Forest, primarily due to distance from the lines and screening provided by forest vegetation (Photo Inset 7). A gas pipeline ROW provides the potential for views of the Project to the southwest from the middle of the forest. Although not verified in the field, views are assumed to be available from the western portion of the forest that borders the existing ROW.

Photo Inset 7. Viewpoint 38, Leslie C. Bockes Memorial Forest, view to the west from Mill Road.

5.1.3.8 Musquash Conservation Area (Viewpoint 109)

Musquash Conservation Area is the largest conservation area in the Town of Londonderry, including over 1,000 acres of land. The conservation area was established in 1979 by the Londonderry Conservation Commission for the purposes of wildlife habitat preservation, forest management and developing outdoor recreational opportunities. The area contains 10.5 miles of managed trails, and is used for hiking, snowmobiling, hunting and other outdoor activities that are enhanced by scenic quality. Four trailheads provide public access to different parts of the conservation area (MRWHT, 2015). The conservation area is heavily wooded, with a mix of deciduous and coniferous trees spread over varying topography. A large swamp is located in the northwest corner of the conservation area. Existing transmission line ROWs are located on all sides of the conservation area.

Field evaluation indicated that views of the existing transmission line (and therefore, the Project) are available within the eastern portion of the Musquash Conservation Area that is crossed by the Project ROW (Photo Inset 8). Open, unobstructed views of the Project would be available within this portion of the conservation area. Partially screened views of the Project would be available on the portions of the trails located immediately west of the ROW. Although not verified through field evaluation, more distant views within the conservation area are likely to be substantially-to-completely screened by intervening forest vegetation.

Photo Inset 8. Viewpoint 109, Musquash Conservation Area, view to the northeast from Landing Trail toward existing ROW.

5.1.3.9 Continental Park and West Road Fields (Viewpoint 114)

Continental Park and West Road Fields include several athletic fields spread over approximately 99 acres in the Town of Londonderry. The fields were constructed atop a reclaimed borrow pit, and include approximately 18 acres of conservation land, as well as a series of trails in addition to the numerous athletic fields. The park is surrounded by primarily undeveloped land, and existing transmission ROWs border the east and west portions of the property. Although not designated as scenic, the park has been identified as a significant outdoor open space in the Town of Londonderry, includes recreational facilities maintained with public funds, and is used for soccer, hiking, and other outdoor recreational activities (Arnett Development Group, 2014).

Field evaluation indicated that views of the existing transmission line (and therefore, the Project) are limited to partially screened views from the area immediately adjacent to the ROW at the northern end of the West Road Fields (Photo Inset 9). Views in this area are largely screened by vegetation and limited to partial views of overhead conductors and transmission poles through coniferous trees. The Project will be substantially-to-completely screened throughout the remainder of the park by vegetation and topography.

Photo Inset 9. Viewpoint 114, Continental Park, view to the northeast toward the existing transmission ROW.

5.1.3.10 Londonderry Town Center and Public Schools (Viewpoint 102)

The Londonderry Town Center and Public Schools are an approximately 245-acre area of land located west of Mammoth Road and north of Pillsbury Road, approximately 0.2 mile from the proposed Project. The area includes four schools with over a dozen associated sports fields, as well as approximately ten paved and unpaved trails, three small ponds, and a multi-use pathway located along State Route 128 (Mammoth Road). Although not designated as scenic, the trail system within this area is a publicly accessible local resource that is used for walking, bicycling, and other outdoor activities.

Field evaluation indicated that views of the existing transmission line (and therefore, the Project) are limited to distant views along the multi-use pathway located along Mammoth Road (Photo Inset 10). The ROW crosses Mammoth Road to the north of this parcel, and views of the Project would be limited to the tops of transmission poles visible above the tree line. The Project is unlikely to be visible from much of the Londonderry Town Center and Public Schools land due to screening provided by vegetation, topography and buildings.

Photo Inset 10. Viewpoint 102, view northwest from State Route 128 along Londonderry Town Center and Public Schools multi-use pathway.

5.1.3.11 George M. Muldoon Park and Town Forest (Viewpoint 76)

George M. Muldoon Park is an approximately 58-acre park located on Mammoth Road in the Town of Pelham, approximately 0.3-mile southwest of the proposed Project. The park land was donated to the town in the late 1970s for recreation. It includes a skating pond and disc golf course, as well fields for baseball, softball, soccer, and lacrosse, and hosts several youth sports teams and events. (NRPC, 2010; Town of Pelham, 2015). Although not officially designated as scenic, the park includes recreational facilities maintained with public funds, and is used for some outdoor activities. A nature trail extends from the parking area in the west side of the park into a fairly dense forest comprised of primarily deciduous trees.

Field evaluation indicated that no views of the existing transmission line (and therefore, the Project) would be available from the western portion of Muldoon Park, primarily due to vegetation, but also due to considerable screening provided by topography and buildings (Photo Inset 11). Although not verified in the field, potential views of the Project could be available within the forested (eastern) portion of the park located closer to the ROW, though such views are likely to be at least partially screened by vegetation that exists between the park and the ROW.

Photo Inset 11. Viewpoint 76, George M. Muldoon Park, view to the east.

5.1.3.12 Robinson Pond Park (Viewpoint 72)

Robinson Pond Park is an approximately 47-acre park located along Robinson Road in the Town of Hudson. The park is located approximately 0.4-mile southwest of the proposed Project. It is located southeast of and immediately adjacent to Robinson Pond, and is comprised of dense forest that includes a mix of deciduous and coniferous trees. The park is bordered by Robinson Road on the east, Robinson Pond to the north and west, and private land to the south. Although not designated as a scenic resource, the park is used for hiking, picnicking, geocaching, and other outdoor activities.

Field evaluation indicated that views of the existing transmission lines (and therefore, the Project) were not available from the majority of the park, or from Robinson Pond, due to distance and screening provided by intervening forest vegetation. The only possible view of the proposed Project would be a distant view down an intersecting transmission ROW located at the southeastern corner of the park, along Robinson Road (Photo Inset 12). The existing structures on the Project ROW are barely perceptible from this location, and scenic quality in this view is low.

Photo Inset 14. Viewpoint 72, view along intersecting ROW from Griffin Road along edge of Robinson Pond Park (arrow indicates location of proposed Project).

5.1.4 Viewpoint Selection

Of the sites described above, views of the proposed Project are likely to be distant and/or substantially obscured from the Londonderry Town Center and Public Schools, George M. Muldoon Park and Town Forest, and Robinson Pond Park. From the 10 remaining scenic resources with open foreground views of the proposed Project, eight KOPs (including two from the Town of Londonderry Scenic View #17) were selected for the development of visual simulations. The selected KOPs are listed in Table 2, below.

Table 2. Key Observation Points Selected for Simulation and Evaluation

KOP Number	Town	Scenic Resource	Viewer Group Represented	Viewing Distance[1]	View Orientation[2]
Viewpoint 5	Pelham	Peabody Memorial Forest	Recreational Users	<0.1 mi.	SE
Viewpoint 65	Londonderry	Apple Way Scenic Byway	Recreational Users/Residents	<0.1 mi.	SE
Viewpoint 83	Londonderry	Granite State Rail Trail	Recreational Users/Residents	0.1 mi.	NNW
Viewpoint 84	Londonderry	Route 28 Scenic Drive	Residents/Through Travelers	<0.1 mi.	W
Viewpoint 96	Londonderry	Town-Designated Scenic View #17	Residents	<0.1 mi.	SW
Viewpoint 97	Londonderry	Town-Designated Scenic View #17	Residents	0.1 mi.	NE
Viewpoint 109	Londonderry	Musquash Conservation Area	Recreational Users	0.1 mi.	NE
Viewpoint 114	Londonderry	Continental Park/West Road Fields	Recreational Users	0.2 mi.	NE

[1]Distance to nearest transmission structure that would be visible in the selected view
[2]N = North, S = South, E = East, W = West

Although clear views of the Project would also be available from the Town of Londonderry Scenic View #11, the lack of scenic quality at the location of the transmission line crossing suggested that the view from the Route 28 scenic drive and the Apple Way Scenic Byway would be a better representation of the Project's potential effect on scenic quality and viewers along a designated scenic road. Similarly, the view from the Apple Way was determined to be representative of potential views from the Town of Londonderry Scenic View #14. In addition, foreground views from the Peabody Town Forest and Musquash Conservation Area were determined to adequately represent potential views from Bockes Memorial Forest.

5.2 Project Visual Impact

5.2.1 Analysis of Existing and Proposed Views

Photographic simulations of the completed Project from each of the eight selected KOPs were used to evaluate the Project's appearance and visual impact on seven identified scenic resources within the study area. As indicated in Section 5.1.3, these KOPs are representative of the most open, unobstructed views toward the Project site that are

available from inventoried scenic resources within 2 miles of the Project. Consequently, simulations developed from these locations are representative of "worst case" Project visibility from scenic resources within the visual study area. Review of these images, along with photos of the existing view, allowed for comparison of the scenic quality of each view, with and without the proposed Project in place. Results of this evaluation were reviewed to identify common perceptions and the variety of opinions expressed by the rating panel. These narrative summaries are presented in the following section. Numerical scores resulting from the VIA evaluation are summarized in Section 5.2.2, and the significance of the identified visual effect is discussed in Section 5.2.3.

Viewpoint 5 (Figure 9)

Existing View

This viewpoint is located on the existing transmission ROW as it passes through the Arthur Peabody Town Forest in the Town of Pelham. The view is oriented to the south, and was selected as a KOP because it is representative of the most open views of the proposed Project that will be available to users of the forest where it is crossed by the existing ROW. The existing view is dominated by the cleared ROW, which is characterized by low brush and herbaceous vegetation, and includes three existing transmission lines. The existing lines are carried on self-weathering steel pole and galvanized steel lattice structures. The ROW is bordered by forest vegetation on both sides and extends away from the viewer to a small rise in the background. Other than the transmission lines, no other developed features are preset in the view. The ROW is a well-defined linear corridor through the forest, and the relatively straight edges of the cleared ROW are clearly visible against the sky as it crosses the rise in the background. Forest vegetation along the edge of the ROW and the hill on the ROW limits views of more distant landscape features, and forms the visible horizon in this view. Rating panel members had varying opinions on the scenic quality of this view (ranging from low to moderate).

Proposed Project

With the proposed Project in place, the existing steel H-frame structures have been replaced with larger self-weathering steel H-frame structures in the middle of the ROW, and a new line of single pole davit arm structures have been added along the right side of the ROW. The H-frame structures are similar to the structures they have replaced in line, color and form. However, they are somewhat taller, which makes the upper portions of the foreground structures and the overhead conductors they are carrying more visible against the sky. The new davit arm structures on the right side of the ROW result in some widening of the existing cleared ROW, but not enough to change the character of the view. The new lines and wider cleared ROW reinforce the dominance of utility infrastructure in this view, as additional structures and overhead conductors are visible in the foreground against the sky. However, the new poles blend well with the forested backdrop in the mid-ground, and are a barely perceptible addition to the cleared ROW as they crest the background hill. The result is a modest increase in visual clutter, and an insignificant to minimal change in scenic quality or perceived land use. Although the visual effect of the proposed Project will be noticeable to users of the forest, its effect on viewer activity and aesthetic expectations should be minimal due to the presence of the existing ROW.

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Figure 9: Viewpoint 5 (Arthur Peabody Town Forest, Town of Pelham - View to the southeast)

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Figure 9: Viewpoint 5 (Arthur Peabody Town Forest, Town of Pelham - View to the southeast)

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Viewpoint 65 (Figure 10)

Existing View

This viewpoint is located where the existing ROW crosses Elwood Road in the Town of Londonderry. Elwood Road is part of the state-designated Apple Way Scenic Byway. This KOP offers the closest, most unobstructed view of the proposed Project from the Scenic Byway. The view to the southeast is looking directly down the cleared ROW, and is dominated by three separate transmission lines carried on a mix of steel pole and lattice H-frame structures. An open field and apple trees in the immediate foreground, as well as a small sign and wooden storage box, indicate the presence of an orchard, which extends across the existing ROW. Mature forest can be seen lining the edges of the ROW, and in the distance where the ROW turns to the east. This forest vegetation, along with the gently rolling topography, restricts long-distance views to the cleared ROW and blocks views of more distant landscape features. The view has a strong rural character, but despite being within an apple orchard, land use in this view is defined by the presence of the existing transmission lines. Scenic quality in this view, as perceived by the rating panel, varied from low to moderate-high.

Proposed Project

With the proposed Project in place, an additional transmission line has been added to the left side of the ROW. The new structures are self-weathering steel H-frame structures similar in line, scale and form with the adjacent existing line. Their darker color presents increased contrast with the sky in the foreground, but blends well with the forest vegetation that provides a backdrop for the more distant structures. Apple trees on the ROW provide partial screening of several of the new structures. Although the effect of additional ROW clearing can be seen, the loss of vegetation along the left side of the ROW does not make the cleared area appear substantially larger. The proposed Project adds some visual clutter to the view, but the duration of the view for users of the scenic byway will be brief and peripheral to the alignment of the road. Due to the presence of the existing lines, the proposed Project does not alter the perceived land use, and will have an insignificant to minimal impact on scenic quality and viewer activity.

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Figure 10: Viewpoint 65 (The Appleway, Elwood Road, Town of Londonderry - View to the southeast)

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Figure 10: Viewpoint 65 (The Appleway, Elwood Road, Town of Londonderry - View to the southeast)

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Viewpoint 83 (Figure 11)

Existing View

Viewpoint 83 is located off of State Route 28 where it intersects with the Granite State Rail Trail in the Town of Londonderry. The view from this location is oriented to the north-northwest and was selected as a KOP because it includes an area that will be cleared to accommodate the proposed transmission line where it turns off the existing ROW and heads toward the Scobie Pond Substation. The existing view features a pole gate (the entrance to the Rail Trail) and young trees in the immediate foreground, backed by a cleared ROW dominated by low herbaceous and shrubby wetland vegetation. Although not obvious in this view, a block of white pines on the opposite side of the cleared transmission corridor separates this corridor from a second cleared corridor angling away from the viewer. Overhead conductors indicate the presence of existing transmission lines along both these corridors, but the poles carrying these lines are screened and/or outside the field of view in this photo. The stand of pines and a band of forest vegetation on the far side of the second transmission corridor screen views of more distant landscape features. The lack of topographic and vegetative diversity, and the lack of available long distance views, result in a view with low to moderate scenic quality.

Proposed Project

With the proposed Project in place, the stand of pines on the far side of the nearest transmission corridor has been removed, and two new self-weathering steel transmission structures have been installed in its place. The new structures angle away from the viewer toward the Scobie Pond Substation, a corner of which can now be seen in the open view. Removal of the pines has also opened views to several wood pole transmission structures on the second cleared corridor that were previously screened from view. The additional visible structures, and the wider area of clearing results in a more expansive view that is dominated by utility infrastructure. The Project presents moderate to strong contrast with the existing vegetation and sky, and makes the perceived land use more developed/industrial. By removing additional vegetation and accentuating the utilitarian character of the ROW, the Project could have an appreciable impact on scenic quality and viewer enjoyment of the portion of the Granite State Rail Trail that crosses under the ROW. However, the aesthetic expectations of trail users at this location are likely already compromised due to the presence of the existing transmission lines.

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Figure 11: Viewpoint 83 (Granite State Rail Trail, Town of Londonderry - View to the north-northwest)

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Figure 11: Viewpoint 83 (Granite State Rail Trail, Town of Londonderry - View to the north-northwest)

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Viewpoint 84 (Figure 12)

Existing View

This viewpoint is located on Route 28 in the Town of Londonderry, at the crossing of the existing transmission line corridor. The view to the west from this location was selected as a KOP because it will offer the most direct and unobscured view of the visual effects of the proposed Project from this designated scenic drive. The existing view features the road surface and the cleared ROW in the immediate foreground. Other foreground features associated with the road include a speed limit sign and a roadside utility line which add visual clutter to the view. The cleared transmission line ROW descends out of view to the south but single wood pole davit arm structures carrying three separate transmission lines are dominant foreground features of the view, and project well into the sky from this vantage point. A thin band of trees separates this cleared corridor from an adjacent cleared transmission corridor that accommodates two additional transmission lines. These lines are carried on wood H-frame structures which are partially screened by the band of trees between the two cleared corridors. Route 28 angles out of view to the right in this view, and offers the only opportunity for views of more distant landscape features, which include only forest vegetation and roadside utility poles. For drivers on this road, this view down the road would be there primary focus, but the open utility corridor would offer opportunities for brief peripheral views. Although located on a designated scenic drive, the lack of scenic focal points or long distance views, along with the presence of numerous existing transmission lines, results in relatively low scenic quality at this viewpoint.

Proposed Project

With the proposed Project in place, the thin band of trees that separated the two cleared corridors has been removed and a new transmission line carried on self-weathering steel H-frame structures has been added in its place. Although somewhat darker in color, the new structures appear compatible with the existing structures in line, form, and scale, and are consistent with the existing land use, which is dominated by transmission infrastructure. However, clearing of trees to accommodate the new line removes vegetation that previously screened views of portions of the existing lines, and results in a noticeably wider open corridor. The addition of the new line, in association with the increased visibility of the existing lines, adds visual clutter and accentuates the utilitarian character of the view. The proposed Project alters the perceived scale and focus of the road corridor, and draws the viewer's attention to the wider, open transmission corridor. The overall effect is a reduction in scenic quality and a moderate effect on viewer activity and the aesthetic expectations of drivers along this section of the scenic drive. However, the relatively low scenic quality of the existing view and the brief exposure of viewers driving along this road, limits the Project's adverse visual impact.

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Figure 12: Viewpoint 84 (Route 28 Scenic Drive, Town of Londonderry - View to the west)

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Towns of Pelham, Windham, Hudson and Londonderry, New Hampshire

Figure 12: Viewpoint 84 (Route 28 Scenic Drive, Town of Londonderry - View to the west)

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Viewpoint 96 (Figure 13)

Existing View

Viewpoint 96 is located within the area designated as Scenic View #17 off of Hardy Road in the Town of Londonderry. This location was selected as a KOP because it offers the most extensive long-distance view from this locally-designated scenic area that will include the proposed Project. The existing view to the southwest features two cleared transmission corridors separated by a central band of remnant forest vegetation. The transmission corridor on the left features three lines carried on single wood pole davit arm structures. The corridor on the right includes two additional lines (only one of which is visible in this photo) carried on wood pole H-frame structures. The immediate foreground is characterized by successional old field vegetation on the ROW and large trees in the remnant band of forest vegetation. These trees are flanked by the existing cleared corridors and transmission lines. The elevated nature of this vantage point and the presence of the cleared ROW offers the opportunity for more distant views of gently rolling forested hills in the mid-ground and mountainous topography in the background. Perception of scenic quality at this location by the rating panel varied from low to high.

Proposed Project

With the proposed Project in place, the central band of trees has been replaced by a new transmission line carried on self-weathering steel H-frame structures. The closest of these structures is now a prominent foreground feature of the view, while portions of two additional new structures can be seen descending out of the view. Due to its proximity to the viewer, the nearest new structure presents appreciable contrast with the sky, and appears substantially larger than the existing transmission line structures on the ROW. Clearing associated with the new line has also exposed the second transmission line on the corridor to the right, and created a substantially wider open view. This wider corridor provides additional views of the forested hills in the background but makes the foreground appear more utilitarian in character. The removal of screening and addition of the new line adds visual clutter and makes the transmission structures the focal points in this view. Even though the existing transmission lines are dominant features of the current view, the overall effect of the proposed Project will be a reduction in scenic quality and enjoyment of the view by local residents. However, this effect is likely to be mitigated by the limited aesthetic expectations of viewers on an existing transmission line ROW.

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Figure 13: Viewpoint 96 (Town of Londonderry Scenic View 17, Hardy Road, Town of Londonderry - View to the southwest)

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Figure 13: Viewpoint 96 (Town of Londonderry Scenic View 17, Hardy Road, Town of Londonderry - View to the southwest)

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Viewpoint 97 (Figure 14)

Existing View

This viewpoint is located at the end of King Henry Drive in the Town of Londonderry. It is located at the south end of a large town-designated scenic area (Scenic View #17) that includes a mix of relatively new residential development and open space. This location was selected as a KOP because it will provide open foreground views of the proposed Project in a setting representative of the larger designated scenic view area. The existing view to the northeast features two cleared transmission line corridors on either side of a narrow band of forest vegetation that angles up and over a gentle hill in the center of the view. The corridor on the right includes three transmission lines, each carried on wood pole davit arm structures, and a smaller distribution line on the far right side. Views of nearby poles on all these lines are unobscured down the cleared ROW. However, the land falls away from the viewer and more distant structures on these lines are screened from view at this location. The transmission corridor on the left side of the view includes wood H-frame structures that are partially screened by the trees that separate the two cleared ROWs. Houses in a nearby residential neighborhood can be seen on the left side of the view beyond the second transmission corridor. These houses are partially screened from view by trees both on, and along the edge of, the ROW. The foreground trees and descending topography limit views of more distant landscape features. The presence of the transmission lines, and the lack of long distance views, result in relatively low scenic quality at this viewpoint.

Proposed Project

With the proposed Project in place, the corridor of trees that separated the two cleared transmission corridors has been removed and a new transmission line added in its place. Clearing associated with the new line has exposed additional wood H-frame structures on the existing line, as well as some more houses in the adjacent neighborhood. Although somewhat darker in color, the new structures appear consistent with the existing structures in line, form and scale. They are also consistent with the utility land use that characterizes the existing view. However, as with several of the previous views, the utilitarian character of the view now appears to be even more dominant with the creation of a much wider cleared ROW and the addition of numerous new transmission structures to the view. The increased visual clutter and utilitarian character present appreciable to strong contrast with the more rural/residential character of the existing view. Although baseline scenic quality in this view is relatively low, the Project results in a dominance of utility infrastructure, which further reduces the aesthetic quality and could have an appreciable effect on viewer activity.

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Towns of Pelham, Windham, Hudson and Londonderry, New Hampshire

Figure 14: Viewpoint 97 (Town of Londonderry Scenic View 17, King Henry Drive, Town of Londonderry - View to the northeast)

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Figure 14: Viewpoint 97 (Town of Londonderry Scenic View 17, King Henry Drive, Town of Londonderry - View to the northeast)

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Viewpoint 109 (Figure 15)

Existing View

This viewpoint is located on the Musquash Conservation Area in the Town of Londonderry. This KOP is on conservation area land immediately west of a trailhead located at the end of Hickory Hill Drive. It is located on a foot trail that crosses the existing transmission line ROW before entering a large forested track to the west. As such, it is representative of the most open, unobscured views of the Project that will be available from the Musquash Conservation Area. The existing view to the northeast features multiple transmission lines on wood pole H-frame structures within a cleared ROW. The immediate foreground includes the open ROW, which is dominated by successional herbaceous wetland and upland vegetation. The ROW is bordered and enclosed by a mix of coniferous and deciduous trees on all sides, and includes a band of uncleared vegetation between two cleared transmission corridors. The ROW descends slightly to an angel point before taking a turn to the right. Multiple transmission structures can be seen angling away from the viewer and behind trees in the central and right hand portions of the view. Other than a screened house amidst the mid-ground trees, the transmission lines are the only man-made features in the view. The existing structures are generally at or below the height of the adjacent trees, which limits their visibility against the sky. However, the lines present significant visual clutter due to the abundance of overhead conductors, poles, guy wires and cross bracing which create numerous crisscrossing lines in the view. Tall trees and level topography limit available views to the foreground and near mid-ground. The abundance of transmission lines, along with the lack of vegetative and topographic variability result in relatively low scenic quality in this view.

Proposed Project

With the proposed Project in place, a new transmission line has been added to the ROW between two of the existing lines. The new line results in new structures being added to the view, and clearing of additional vegetation, which also makes several of the existing structures more visible. The line, scale, and form of the new structures are compatible with the existing structures and land use represented in this view. However, some of the new structures extend above the tree line into the sky, and the additional clearing results in a much wider open ROW. What was an interspersion of open meadow and trees on the ROW is now an expansive open area. This reinforces the utilitarian character of the view but does not substantially alter perceived scenic quality. Users of the conservation area will likely notice the addition of the new line and associated wider cleared ROW. The perceived overall effect of the Project was variable amongst the rating panel members, with two members noting very little additional impact, while the third noted an appreciable adverse effect. However, the fact that the Project is occurring on an existing, well established ROW with already compromised scenic quality will minimize its impact on viewer activities, perceived land use or aesthetic expectations at this location.

ORIGINAL

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Towns of Pelham, Windham, Hudson and Londonderry, New Hampshire

Figure 15: Viewpoint 109 (Musquash Conservation Area, Town of Londonderry - View to the northeast)

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Figure 15: Viewpoint 109 (Musquash Conservation Area, Town of Londonderry - View to the northeast)

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Viewpoint 114 (Figure 16)

Existing View

Viewpoint 114 is located in Continental Park (within the West Road Fields) in the Town of Londonderry. This viewpoint was selected as a KOP because it is representative of the most open view of the existing transmission corridor from public recreational facilities within the park. The existing view to the northeast features an athletic field in the immediate foreground, along with associated man-made objects, including a chain link fence, soccer goals, and large light poles. A line of trees (predominately white pines) occurs behind the field. A break in the trees offers a view of the adjacent cleared ROW, as indicated by the presence of overhead conductors. No structures on the ROW are visible in this view. Beyond the ROW, the land descends and then rises to a mid-ground ridge that defines the visual horizon. This area is uniformly forested, and includes no visible development. Although not a dynamic visual setting, the mix of maintained recreational fields framed by forest vegetation results in moderate scenic quality.

Proposed Project

With the proposed Project in place, very little has changed from this viewpoint. Some additional clearing of low coniferous vegetation on the far side of the ROW can be seen, along with some new conductors visible against the backdrop of trees that will remain. However, these changes are very subtle, with the new conductors being lost amidst the existing lines, and the cleared corridor appearing essentially the same. In addition, the new structures associated with the proposed line are almost completely screened by the band of forest vegetation behind the fields that will remain following Project construction. Consequently, there is essentially no visual change with the Project in place, and the overall effect on scenic quality and viewer activity will be insignificant at this location.

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Figure 16: Viewpoint 114 (Continental Park, Town of Londonderry - View to the northeast)

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Figure 16: Viewpoint 114 (Continental Park, Town of Londonderry - View to the northeast)

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5.2.2 Impact Evaluation

The simulations described in the previous section are representative of the closest, most open views of the Project that will be available to the public from representatives scenic resources within the visual study area. As indicated previously, such views are available almost exclusively from locations where the existing transmission lines are already visible in the immediate foreground (i.e., on or adjacent to the existing cleared ROW). The simulations evaluated by the rating panel thus represent focused views of the Project from a very small portion of the study area. Evaluation of the Project's effect from these viewpoints therefore represents a "worst case" assessment of potential visual impact within the larger study area.

As described in Section 4.2.3, a panel of three experienced visual impact assessors evaluated the visual impact of the Project by reviewing photos of the existing view and simulations of the proposed Project from each of the eight selected KOPs. Visual contrast was evaluated for each viewpoint using an evaluation form designed to provide a consistent and objective means of evaluating the Project's contrast with the existing landscape (see Appendix C). Results of the contrast evaluation conducted by the rating panel are summarized in Table 3 below.

Table 3. Visual Contrast Rating Summary Table

KOP	Distance to Project[1]	Viewers	Scenic Resource	Rating Panel Contrast Scores[2]			
				#1	#2	#3	Average
5	<0.1 mi.	Recreational Users	Peabody Memorial Forest	0.7	0.6	0.8	0.7
65	<0.1 mi.	Recreational Users/Residents	Apple Way Scenic Byway	0.4	0.4	0.7	0.5
83	0.1 mi.	Recreational Users/Residents	Granite State Rail Trail	2.5	3.1	2.1	2.6
84	<0.1 mi.	Residents/Through Travelers	Route 28 Scenic Drive	2.2	1.2	2.0	1.8
96	<0.1 mi.	Residents	Londonderry Scenic View #17	1.9	2.6	2.8	1.5
97	0.1 mi.	Residents	Londonderry Scenic View #17	2.8	4.0	2.8	3.2
109	0.1 mi.	Recreational Users	Musquash Conservation Area	0.3	2.9	0.7	1.3
114	0.2 mi.	Recreational Users	Continental Park/West Road Fields	0.1	0.4	0	0.2
Average				1.4	1.8	1.5	1.5

[1]As measured to the nearest visible transmission line structure.
[2]Scores: 0 = Insignificant, 1 = Minimal, 2 = Moderate, 3 = Appreciable, 4 = Strong

As indicated in Table 3, contrast ratings varied both by viewpoint and individual rating panel member. Individual scores for specific KOPs ranged from 4.0 (indicating a strong contrast) to 0 (indicating an insignificant contrast). Composite scores for each KOP (i.e., the average score of all three rating panel members) ranged from 0.2 to 3.2, and averaged 1.5. In general, the highest contrast sores were received by views where clearing of trees to accommodate the new transmission line resulted in the exposure of additional visible structures and the creation of a substantially wider cleared corridor.

Two of the eight KOPs, Viewpoints 83 and 97, received composite scores indicating appreciable visual contrast (scores of 2.6 and 3.2, respectively). In these cases, clearing of forest vegetation between two cleared transmission corridors created appreciable to strong contrast with multiple landscape features, primarily vegetation, sky and viewer activity. Even though the Project is occurring within an existing transmission corridor, the utilitarian land use is accentuated in these views with the proposed Project in place. This, along with the proximity of the proposed Project to adjacent residences, resulted in Viewpoint 97 (within the area delineated as Londonderry View #17) receiving the highest individual and composite contrast ratings. The next highest composite contrast rating (2.6) was received by the simulation from the Granite State Rail Trail (Viewpoint 83), and one panel member's individual contrast rating for Viewpoint 109 also indicated appreciable contrast (2.9) for this second KOP within Londonderry View #17. The basis for these ratings was largely the same as cited in the evaluation of Viewpoint 97. However, as mentioned previously, the impacts described for these viewpoints will be limited to locations where the viewer is at, or directly adjacent to, the proposed ROW. They thus affect only a small portion of the scenic resource in question, and/or an area that is already characterized by reduced scenic quality. Visibility and visual impact drop off dramatically as one moves away from the cleared ROW.

On the other end of the scale, three of the eight KOPs received a score of less than 1.0, indicating insignificant to minimal contrast. The lowest composite contrast score (0.2) was received by Viewpoint 114 at Continental Park/West Road Fields. This is attributable to the fact that the built components of Project are largely screened, and the effects of vegetation clearing are difficult to perceive at this viewpoint. However, even in views where the Project was fully visible (e.g., Viewpoints 5 and 65), contrast ratings were generally low if vegetation clearing was limited and the ROW did not appear to substantially increase in width. This is largely attributable to the location of the Project on an existing cleared ROW with numerous other transmission structures already present in the view.

Use of a panel and a standardized rating form for the evaluation of visual impact allows definition of shared perceptions, as well as differing opinions, regarding the type and extent of anticipated Project-related visual impacts. This is more

likely to reflect the range of public reaction to the Project than the opinion of a single individual. Areas of general agreement among the panel members included the following:

1. Existing scenic quality and the aesthetic expectations of viewers are relatively low at the selected KOPs due largely to the proximity of the existing transmission lines.

2. The proposed Project is generally compatible with the existing transmission lines in terms of its line, form, color and scale.

3. The proposed location of the Project, on a well-established ROW that already accommodates multiple existing transmission lines, limits perceived changes to existing land use.

4. The most substantial impact occurs in those areas where additional vegetation clearing results in a substantially wider cleared ROW with more visible transmission structures.

5. Project impact on scenic quality and viewer activity are reduced due to the presence of the existing transmission lines.

Variability amongst the panel members was noted to some extent in their evaluation of baseline scenic quality, but to a larger extent in their assessment of visual impact. Rating panel member #2 generally evaluated the Project as having greater impact than the other two panel members. The average score assigned by Rater #2 was 1.8, indicating moderate contrast for the selected KOPs. The overall contrast scores for the other two rating panel members were 1.4 and 1.5, indicating a minimal to moderate overall visual contrast. Although the average scores of all the rating panel members are fairly similar, more notable differences of opinion were noted for individual KOPs, especially Viewpoint 109, where Rater #2 indicated appreciable to strong visual contrast, while the other raters indicated minimal contrast. This difference in perceived impact appears to be related primarily to the width of the cleared ROW and more numerous visible transmission structures, which Rater #2 believed was unexpected in a conservation area, while the other rating panel members considered it in only an incremental impact to a site already impacted by transmission infrastrucutre.

Considering the results of Project visibility assessment (viewshed analysis and field verification), as well as the evaluation of visual impact conducted by the rating panel, EDR's conclusion is that the Project will impact a small number of scenic resources within the 2-mile radius study area. In most cases, the impact is limited to that portion of the resource crossed by, or directly adjacent to, the existing ROW. Consequently, the geographic extent and/or temporal duration of the impact will generally be small. This, along with the relatively low scenic quality and

compromised aesthetic expectations of viewers at those locations where the Project will be visible, suggest that overall visual impact will be minimal. However, in those relatively few locations where construction of the Project will result in a substantially wider cleared ROW and increased visibility of both existing and proposed transmission lines in the foreground of the view, it is likely that scenic quality and viewer enjoyment of the view will be diminished to some extent.

5.2.3 Impact Significance

Recognizing that under certain circumstances the Project will have an effect on scenic resources and users of those resources, the remaining question is whether the effect is "unreasonably" adverse. As indicated below, the New Hampshire Code of Administrative Rules provides guidance on how the SEC shall determine whether a proposed project will have an unreasonable effect on aesthetics.

New Hampshire Code of Administrative Rules

Site 301.08 Criteria Relative to Findings of Unreasonable Adverse Effects

(a) In determining whether a proposed energy facility will have an unreasonable adverse effect on aesthetics, the committee shall consider:

(1) The existing character of the area of potential effect in the host community and communities abutting or in the vicinity of the proposed facility

(2) The significance of affected scenic resources and their distance from the proposed facility;

(3) The extent, nature, and duration of public uses of affected scenic resources;

(4) The scope and scale of the change in the landscape visible from affected scenic resources;

(5) The evaluation of the overall visual impacts of the facility as described in the visual impact assessment submitted by the applicant and other relevant evidence submitted pursuant to Site 202.24;

(6) Whether the proposed facility would be a dominant feature of a landscape in which existing human development is not already a prominent feature as viewed from affected scenic resources;

(7) Whether the visibility of the proposed facility would offend the sensibilities of a reasonable person during daytime or nighttime periods; and

(8) The effectiveness of the best practical measures planned by the applicant to avoid, minimize, or mitigate unreasonable adverse effects on aesthetics.

Several of the criteria listed above have already been addressed in previous sections of the VIA. Criterion 1 is addressed in Section 3.0 (and subsections), while Criteria 2 and 3 are addressed in Sections 3.4 and 5.1.3. Criterion

4 is described in Section 5.0 (and subsections) and Criterion 5 is addressed in Sections 4.0 and 5.0 (and subsections). Criterion 8 will be addressed in Section 6.0 of the VIA.

Only Criteria 6 and 7 have not yet been addressed in other sections of this report. In regard to Criterion 6, because the Project will be located within an existing ROW amongst similar transmission facilities, the proposed transmission line will not be a dominant feature in an undeveloped landscape.

There is no specific New Hampshire precedent indicating how to apply Criterion 7. New Hampshire law, however, provides some insight into how to conduct such as assessment, by suggesting that visual effects like the ones being examined here, to be considered unreasonable, must be found to be "in excess of the customary interference a land user suffers in an organized society"[1]. Applying Criterion 7 using this concept, the Project would not offend the sensibilities of a reasonable person because it is co-located with other existing transmission lines within a well-established existing ROW, and it is not out of character with its surroundings.[2] Consequently, it is consistent with the effects land users typically experience within the visual study area.

An unreasonable effect could also occur if a project violated written community standards designed to protect aesthetic resources or scenic quality. As part of this VIA, EDR reviewed a number of community and regional plans for the area surrounding the proposed Project, including the New Hampshire Division of Parks and Recreation Ten-Year Strategic Development and Capital Improvement Plan (NH Division of Parks and Recreation, 2010), the New Hampshire Statewide Comprehensive Outdoor Recreation Plan, 2013-2018 (NHOEP and DRED, 2013), the Final Report of the Londonderry Open Space Task Force (2011), the Londonderry Master Plan (Town Planning & Urban Design Collaborative, 2013), the Town of Windham Open Space Report (Rockingham Planning Commission, 2010), the Town of Windham Master Plan (Taintor & Associates, Inc., 2005), the Town of Hudson Open Space Report (Hudson Open Space Committee, 2012), the Town of Litchfield Open Space Plan (Nashua Regional Planning Commission [NRPC], 2009), the Town of Pelham Open Space Plan (NRPC, 2010), and the Town of Derry Master Plan (Southern New Hampshire Planning Commission, 2010).

Although aesthetic resources are generally recognized in these plans, no specific standards or protection measures for these resources are proposed. The plans encourage the protection of natural and historic resources in general, in part because of their contribution to scenic quality, but visual/aesthetic resources are not a focus of these reports.

[1] Citing the 1972 Robie Case from the New Hampshire Supreme Court.
[2] The analysis also produces a result consistent with the Quechee Test, which is used in Vermont to determine whether a project would offend the sensibilities of an average person. The Act 250 Training Manual for the Vermont process indicates that a project might appear offensive or shocking if it is out of character with its surroundings or significantly diminishes the scenic qualities of the area (State of Vermont, 2012).

Where protection of scenic views is specially recommended, as in the Final Report of the Londonderry Open Space Task Force (2011), this recommendation/goal is specific to “natural views” “scenic vistas” or “cultural landscapes”, which would likely exclude locations where existing transmission lines dominate the view. Thus, based on the data reviewed by EDR, the Project does not violate a clear written community standard intended to preserve the aesthetics or scenic beauty of the area.

Based on the criteria established by the State of New Hampshire, and similar standards applied in other states, the Project will not have an undue or unreasonably adverse visual impact.

6.0 Impact Avoidance, Minimization and Mitigation

The Applicants have designed the proposed Project to avoid and minimize visual impacts on aesthetic resources to the extent practicable. Although options for limiting the visibility and visual effect of a new transmission line are limited, given the nature of the Project and its siting, structural and electrical requirements, the following impact avoidance, minimization and mitigation measures have been incorporated into the Project:

A. *Design and Siting.* Siting the Project on an existing transmission line ROW that is well screened from the majority of scenic resources within the study area minimizes its visual impact. Utilizing structure spacing, design and color that are consistent with the existing transmission structures on the ROW also increases Project compatibility with the existing facilities.

B. *Relocation*. Relocation of the proposed line to a new corridor would increase contrast with the existing landscape and result in a more substantial visual impact. However, possible relocation of several individual structures has been examined by the Applicants as a means of minimizing visual impacts on adjacent residences. The feasibility and benefit of these relocations will be evaluated as the design of the transmission line is finalized.

C. *Camouflage*. The dark brown color of the self-weathering steel proposed for the new structures generally minimizes contrast with surrounding vegetation under most conditions. Use of alternate materials, such as galvanized steel rather than wood, could reduce color contrast and visual weight when the structures are viewed against the sky. However, this material would increase color contrast when the structures are viewed against a vegetated backdrop, and would contrast with the color of the wood pole transmission structures already on the ROW. Because most of the proposed structures do not extend substantially above the adjacent tree tops, and since self-weathering steel poles minimize color contrast with existing background vegetation, this is considered the best material for reducing visual impact in most situations.

D. *Low Profile Structures*. Single circuit H-frame structures are being proposed for the 3124 Line to minimize the height of the new structures. Additional reduction in structure height is not feasible given the line clearance/safety requirements of the Project. The only way to accommodate lower structures would be to shorten span length and install additional structures or widen the existing ROW to accommodate shorter but wider H-frame structures where single poles (on relocated existing lines) are proposed. Either of these approaches (i.e., more numerous shorter structures and/or a wider cleared ROW) would likely increase visual impact.

E. *Maintenance*. Use of self-weathering steel prevents the need for repainting of towers as part of transmission line maintenance. Maintenance of the ROW will be conducted on a regular basis to assure the electrical security of the line and remove any debris that is illegally disposed in the area.

Although not proposed to date, in selected locations where removal of vegetation to accommodate the new line increases the visibility of the proposed and/or existing lines, screen plantings could reduce the Project's visual impact. Screen plantings have the greatest mitigation value in off-ROW situations, where the line is proximate to scenic resources or recreational viewers, opportunities for plantings exist, landowners approve of the proposed plantings, and these plantings have the potential to grow tall enough to substantially screen the transmission line or enclose the viewer's area of spatial reference. Results of the visual impact evaluation suggest that such plantings might be appropriate between the proposed transmission line and adjacent residential neighborhoods within the area identified as Londonderry Scenic View #17 (see Viewpoint 97). Selected plantings along the Granite State Rail Trail (Viewpoint 83) and the trail on the Musquash Conservation Area where they cross the cleared ROW could also have a visual benefit by breaking up the perceived expanse of the cleared ROW. However, plantings on the ROW would have to be evaluated in terms of their compatibility with ROW maintenance/line clearance requirements.

7.0 Conclusions

The VIA for the New Hampshire portion of the Merrimack Valley Reliability Project allows the following conclusions to be drawn:

1. Viewshed analysis indicates that approximately 10.1% of the visual study area will be screened from view of the Project by topography alone. When considering the screening of both topography and mapped forest vegetation, viewshed analysis indicates that approximately 70.5% of the study area will not have views of the proposed transmission structures. In addition, viewshed analysis suggests that views of the Project are likely to be fully screened from 13 of the identified potential scenic resources that occur within this 2-mile radius study area. When compared to the viewshed of existing transmission structures on the ROW, it was determined that areas of potential Project visibility cover the same general areas, and have the same pattern, as the viewshed of the existing lines. Thus, few locations within the study area will have views of the proposed Project, that do not already have views of the existing transmission lines.

2. Field review indicated that the Project will either not be visible, or will be significantly screened by foreground vegetation and structures in most locations within the visual study area. In general, open views of the Project will be restricted to sites on, or directly adjacent to, the cleared ROW. Based on visibility of the existing transmission lines, open views of the Project are not anticipated to be available from sites over 0.5 mile from the ROW.

3. Of the 108 potential scenic resources identified within the visual study area, field evaluation suggests that the 57 resources that occur beyond 0.5 mile from the line will not have open views of the Project. Of the remaining 51 resources located within 0.5 mile of the Project center line, 28 appear to actually meet the definition of a scenic resource. Of these, it was determined that only 13 scenic resources would have potential views of the Project.

4. Simulations of the proposed Project from eight KOPs, representing the most open unobstructed foreground views of the Project from scenic resources within the visual study area, indicate that the visibility and visual contrast of the Project will be variable, based on the extent of screening, the character of the surrounding landscape, and the amount of clearing that will be required to accommodate the new line. In all cases where open views are available, the Project will be viewed as part of an existing transmission line ROW. However, vegetation clearing within the ROW will increase the perceived size and utilitarian character of the ROW in some views.

5. Evaluation by a panel of experienced visual impact assessors indicates that the Project's overall contrast with the visual character and impact on scenic quality at inventoried scenic resources will generally be in the range of

minimal to moderate. Composite contrast ratings for individual KOPs ranged from 0.2 to 3.2 on a scale of 0 (insignificant) to 4 (strong), and averaged 1.5 (minimal-moderate). The highest contrast scores were received by views where the new transmission structures were relatively close to the viewer, were completely or substantially unscreened, and where vegetation clearing exposed additional existing structures and created a substantially wider open ROW. In these instances, the proposed Project has the potential to present appreciable contrast with various landscape features or viewer activities occurring at the site. However, this impact will occur almost exclusively in locations that are on, or immediately adjacent to, the ROW where scenic quality and the aesthetic expectations of viewers have already been compromised to some extent by the presence of the existing transmission lines. In addition, any effects on scenic quality and user activities will diminish quickly with increasing distance from the line and even partial foreground screening.

6. Taking into consideration the limited visibility of the proposed Project, the small number of scenic resources affected, and the relatively low scenic quality and diminished aesthetic expectations of viewers in locations where the Project would be visible (i.e., on or directly adjacent to an existing transmission line ROW), the Project's overall visual impact will generally be small. However, in a few locations, the proposed Project is likely to reduce scenic quality and viewer enjoyment of the view to some extent.

7. Recognizing that under certain circumstances the Project could have an effect on scenic resources, and users of those resources, EDR examined whether the effect would be "unreasonably adverse". Because the Project will be located within an existing ROW amongst similar facilities, the proposed transmission line will not be a dominant feature in an undeveloped landscape. For this same reason, the Project is unlikely to offend the sensibilities of a reasonable person. In addition, review of local, regional and statewide planning documents, indicate that the Project will not violate a clear written community standard to preserve aesthetics, scenic resources or natural beauty. Consequently, the Project should not have an unreasonably adverse visual impact.

8. Given electrical transmission requirements of the Project, and the associated electrical and safety standards with which it must comply, mitigation options are limited, and some level of visual impact is unavoidable. However, several measures that help mitigate visual impact have been incorporated into the design of the Project. These include 1) siting the line within an existing transmission corridor to minimize vegetation clearing and perceived change in land use, 2) utilizing self-weathering steel to minimize color contrast with surrounding vegetation, 3) utilizing transmission structure designs that are consistent with existing structures on the ROW, and 4) utilizing single circuit H-frame structures to minimize the height of the new 3124 line.

9. Although opportunities and potential effectiveness may be limited, the feasibility of selective screen plantings on and adjacent to the ROW should be explored in those instances where clearing of a remnant band of forest vegetation between two existing cleared transmission corridors will result in a substantial increase in the number of visible structures and/or the perception of a substantially wider cleared ROW. Specific locations where impact evaluation suggest this might be of value include 1) between the ROW and adjacent residences in the area designed as Londonderry Scenic View #17 and 2) along the edge of the Granite State Rail Trail and a trail on the Musquash Conservation Area where these trails cross the cleared ROW. Given the effect of the existing narrow band of remnant vegetation, this may be achievable with relatively small clumps of vegetation that selectively screen views and break up the perceived width of the cleared ROW. Such plantings would need to consider line clearance/ROW management requirements, and would be contingent on landowner approval.

In summary, based on the results of this VIA, it can be concluded that: 1) the Project will have very limited visibility from most locations within the 2-mile radius study area (including the majority of scenic resources), 2) scenic resources located beyond 0.5 mile, from the proposed center line will generally not have views of the proposed Project, 3) open views from scenic resources will generally present limited contrast with the existing landscape and will have minimal impact on scenic quality, due to the location of the Project within an existing transmission corridor and the already compromised scenic quality and aesthetic expectations of viewers at these sites, 4) even where presenting appreciable visual contrast, the Project would not be a dominant feature of a landscape in which existing human development is not already a prominent feature, 5) the Project would not offend the sensibilities of a reasonable person or violate a clear written community standard intended to preserve scenic resources, and 6) the Applicants have committed to feasible and appropriate mitigation measures that improve the harmony of the proposed Project with its surroundings. Based on these findings, it is EDR's conclusion that the Project will not have an unreasonably adverse effect on aesthetics.

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Appendix A

Potential Scenic Resource Inventory and Mapping

Table A. Potential Scenic Resources

Resource	Location	VP Number[1]	Distance[2] Miles from Transmission Line	Distance Zone ● Foreground ● Midground • Background	Project Visibility +Visible - Not Visible +/- Partially Visible[3] Topographic Viewshed	Topographic & Vegetation Viewshed	Field Review[4]
National or State Parks							
None in Study Area							
National or State Forests							
Litchfield State Forest	Town of Litchfield, Hillsborough County, NH	58	1.3	●	+/-	+/-	-
National Heritage Areas							
None in Study Area							
National Wildlife Refuges and State Wildlife Management Areas							
None in Study Area							
National Park System, Recreation Areas, Seashores, Forests							
None in Study Area							
National or State Designated Wild, Scenic, or Recreational Rivers							
None in Study Area							
Designated Scenic Roads and Byways							
The Apply Way State Scenic Byway	Town of Londonderry, Rockingham County, NH	64, 65, 101	0.0	●	+/-	+/-	+/-
Route 28 Scenic Drive	Towns of Londerry and Derry, Rockingham County, NH	83-85	0.0	●	+/-	+/-	+/-
Old Bridge Road - Pelham Town Designated Scenic Road	Town of Pelham, Hillsborough County, NH		0.6	●	+	+/-	-
English Range Road - Derry Town Designated Scenic Road	Town of Derry, Rockingham County, NH		1.1	●	+/-	+/-	-
Trails							
Granite State Rail Trail (a.k.a Londonderry Rail Trail)	Town of Londonderry, Rockingham County, NH	83	0.0	●	+/-	+/-	+
Kelly Path	Town of Londonderry, Rockingham County, NH	103	0.0	●	+	+/-	+
Trolley Car Path	Town of Londonderry, Rockingham County, NH	88-89, 91	0.0	●	+	+/-	+
Dragonfly Way	Town of Londonderry, Rockingham County, NH	91	0.6	●	+	+/-	+/-
Town Designated Scenic Resources							
Londonderry Identified Scenic View 17	Town of Londonderry, Rockingham County, NH	89, 93-97, 105-106	0.0	●	+	+/-	+
Londonderry Identified Scenic View 11	Town of Londonderry, Rockingham County, NH	67, 67-A	0.0	●	+	+/-	+
Londonderry Identified Scenic View 14	Town of Londonderry, Rockingham County, NH		0.0	●	+/-	+/-	+/-
Londonderry Identified Scenic View 4	Town of Londonderry, Rockingham County, NH		0.1	●	+/-	+/-	-

Table A. Potential Scenic Resources

Resource	Location	VP Number[1]	Distance[2] Miles from Transmission Line	Distance Zone ● Foreground ● Midground • Background	Project Visibility +Visible - Not Visible +/- Partially Visible[3] Topographic Viewshed	Topographic & Vegetation Viewshed	Field Review[4]
Londonderry Identified Scenic View 18	Town of Londonderry, Rockingham County, NH		0.2	●	+/-	+/-	-
Londonderry Identified Scenic View 12	Town of Londonderry, Rockingham County, NH		0.3	●	+/-	+/-	-
Londonderry Identified Scenic View 5	Town of Londonderry, Rockingham County, NH		0.5	●	+	+/-	-
Londonderry Identified Scenic View 15	Town of Londonderry, Rockingham County, NH		0.5	●	+/-	+/-	-
Londonderry Identified Scenic View 6	Town of Londonderry, Rockingham County, NH		0.6	●	+/-	+/-	-
Londonderry Identified Scenic View 3	Town of Londonderry, Rockingham County, NH		0.6	●	+/-	+/-	-
Londonderry Identified Scenic View 16	Town of Londonderry, Rockingham County, NH		0.8	●	+/-	+/-	-
Londonderry Identified Scenic View 7	Town of Londonderry, Rockingham County, NH	101	1.0	●	+/-	+/-	-
Londonderry Identified Scenic View 8	Town of Londonderry, Rockingham County, NH		1.0	●	+	+/-	-
Londonderry Identified Scenic View 13	Town of Londonderry, Rockingham County, NH		1.3	●	+/-	+/-	-
Londonderry Identified Scenic View 2	Town of Londonderry, Rockingham County, NH		1.3	●	+/-	+/-	-
Londonderry Identified Scenic View 10	Town of Londonderry, Rockingham County, NH		1.4	●	+/-	-	-
Londonderry Identified Scenic View 1	Town of Londonderry, Rockingham County, NH		1.5	●	+/-	-	-
Londonderry Identified Scenic View 9	Town of Londonderry, Rockingham County, NH		1.6	●	+/-	+/-	-
Local Parks and Conservation Areas							
Peabody Town Forest	Town of Pelham, Hillsborough County, NH	5, 5-A, 120	0.0	●	+/-	+/-	+
Lordes Parcel	Town of Londonderry, Rockingham County, NH	62, 112	0.0	●	+/-	+/-	+/-
Costa Conservation Area	Town of Pelham, Hillsborough County, NH	16	0.0	●	+	+/-	+/-
Town of Pelham Land	Town of Pelham, Hillsborough County, NH	8	0.0	●	+	+/-	+
Transfer Station Tract	Town of Pelham, Hillsborough County, NH	9	0.0	●	+	+/-	+
Leslie C. Bockes Memorial Forest	Town of Londonderry, Rockingham County, NH	38	0.0	●	+/-	+/-	+/-
Carriage Shack Farm	Town of Londonderry, Rockingham County, NH	66	0.0	●	+	+/-	+/-
Beaver Brook Parcel	Town of Windham, Rockingham County, NH	32	0.0	●	+	+/-	+
David Drive Lot	Town of Hudson, Hillsborough County, NH		0.0	●	+	+/-	+/-
Musquash Conservation Area	Town of Windham, Rockingham County, NH	109	0.0	●	+/-	+/-	+
Mammoth Road Parcel	Town of Windham, Rockingham County, NH		0.1	●	+	+/-	-
West Road Fields	Town of Londonderry, Rockingham County, NH	63, 114	0.1	●	+/-	+/-	+/-
Golden Brook Park	Town of Pelham, Hillsborough County, NH	18	0.1	●	+	+/-	-

Table A. Potential Scenic Resources

Resource	Location	VP Number[1]	Distance[2] Miles from Transmission Line	Distance Zone ● Foreground ● Midground • Background	Project Visibility +Visible - Not Visible +/- Partially Visible[3] Topographic Viewshed	Topographic & Vegetation Viewshed	Field Review[4]
Scobie Pond	Town of Londonderry, Rockingham County, NH	51	0.2	●	+/-	+/-	-
Andrews Town Forest	Town of Windham, Rockingham County, NH		0.2	●	+/-	+/-	-
Londonderry Town Center and Public Schools	Town of Londonderry, Rockingham County, NH	102	0.2	●	+/-	+/-	+/-
George M. Muldoon Park & Town Forest	Town of Pelham, Hillsborough County, NH	76	0.3	●	+	+/-	+/-
Kirby-Ivers Town Forest	Town of Pelham, Hillsborough County, NH		0.4	●	+/-	+/-	-
Sunnycrest Farm	Town of Londonderry, Rockingham County, NH		0.4	●	+/-	+/-	-
Municipal Beach	Town of Hudson, Hillsborough County, NH	71	0.4	●	+	-	-
Robinson Pond Park	Town of Hudson, Hillsborough County, NH	72	0.4	●	+/-	+/-	+/-
Little Island Pond Conservation Park	Town of Pelham, Hillsborough County, NH		0.5	●	+	+/-	-
Elmer G. Raymond Park	Town of Pelham, Hillsborough County, NH	73	0.5	●	+/-	+/-	-
Parker Nature Area	Town of Hudson, Hillsborough County, NH		0.5	●	+	+/-	-
Town Common	Town of Pelham, Hillsborough County, NH	13	0.6	•	+	+	-
Landry Family Conservation Easement	Town of Windham, Rockingham County, NH		0.7	•	+/-	+/-	-
Lyons Park	Town of Pelham, Hillsborough County, NH		0.7	•	+	+/-	-
LAFA Fields	Town of Londonderry, Rockingham County, NH		0.7	•	+	+/-	-
Toakanel Meadow Park	Town of Windham, Rockingham County, NH	24	0.8	•	+	+/-	-
Pelham Schools Natural Area	Town of Pelham, Hillsborough County, NH		0.8	•	+	+/-	-
London Bridge Road Forest	Town of Windham, Rockingham County, NH		0.8	•	+/-	+/-	-
Hudson Town Forest	Town of Hudson, Hillsborough County, NH		0.9	•	+/-	-	-
Moose Hill Orchards	Town of Londonderry, Rockingham County, NH		1.0	•	+/-	+/-	-
Town of Litchfield Land	Town of Litchfield, Hillsborough County, NH		1.0	•	+/-	+/-	-
Town of Litchfield Land	Town of Litchfield, Hillsborough County, NH		1.0	•	+/-	-	-
Town of Litchfield Land	Town of Litchfield, Hillsborough County, NH		1.0	•	+	+/-	-
Londonderry Town Common	Town of Londonderry, Rockingham County, NH	101	1.1	•	+	+/-	-
Rider Fields	Town of Derry, Rockingham County, NH		1.1	•	+/-	+/-	-
Jeremy Hill State Natural Area	Town of Pelham, Hillsborough County, NH	77	1.1	•	+/-	+/-	-
Adams Pond Conservation Area	Town of Londonderry, Rockingham County, NH		1.2	•	+/-	+/-	-

Table A. Potential Scenic Resources

Resource	Location	VP Number[1]	Distance[2] Miles from Transmission Line	Distance Zone ● Foreground ● Midground • Background	Project Visibility +Visible - Not Visible +/- Partially Visible[3] Topographic Viewshed	Topographic & Vegetation Viewshed	Field Review[4]
Hood Park	Town of Derry, Rockingham County, NH		1.2	●	+/-	+/-	-
Deer Leap Natural Area	Town of Windham, Rockingham County, NH		1.3	●	+/-	+/-	-
Kendall Pond Road Parcel	Town of Windham, Rockingham County, NH		1.6	●	+	-	-
MacGregor Park	Town of Derry, Rockingham County, NH		1.6	●	+/-	+/-	-
Calitri Conservation Area	Town of Pelham, Hillsborough County, NH		1.7	●	+/-	+/-	-
Edward Roy Memorial Park	Town of Litchfield, Hillsborough County, NH	59	1.8	●	+	+/-	-
Rocky Hill Pond Lot	Town of Litchfield, Hillsborough County, NH		1.8	●	+/-	-	-
Vet's & O'Hara Fields	Town of Derry, Rockingham County, NH		1.9	●	+	+/-	-
Campbell Farm	Town of Windham, Rockingham County, NH		1.9	●	+/-	-	-
Duck Pond Lot	Town of Litchfield, Hillsborough County, NH		2.0	●	-	-	-
Golf Courses							
Pine Valley Golf Links Inc	Town of Pelham, Hillsborough County, NH	17	0.1	●	+	+/-	-
Londonderry Country Club	Town of Londonderry, Rockingham County, NH		0.9	●	+/-	+/-	-
Hoodkroft Country Club	Town of Derry, Rockingham County, NH		1.7	●	+/-	+/-	-
Hidden Creek Country Club	Town of Litchfield, Hillsborough County, NH	54	1.8	●	+/-	+/-	-
Surface Waters							
Golden Brook	Town of Windham, Rockingham County and Town of Pelham, Hillsborough County, NH	9, 18	0.0	●	+/-	+/-	+/-
Beaver Brook	Derry, Londonderry & Windham, Rockingham County & Hudson and Pelham, HIllsborough County, NH	32	0.0	●	+/-	+/-	+/-
Nesenkeag Brook	Town of Litchfield, Hillsborough County and Town of Londonderry, Rockingham County, NH		0.0	●	+/-	+/-	-
Chase Brook	Towns of Litchfield and Hudson, Hillsborough County, and Town of Londonderry, Rockingham County, NH		0.0	●	+/-	+/-	-
Shields Brook	Towns of Londonderry and Derry, Rockingham County, NH		0.1	●	+/-	+/-	-
Tonys Brook	Town of Pelham, Hillsborough County, NH		0.1	●	+/-	+/-	-
Little Cohas Brook	Town of Londonderry, Rockingham County, NH		0.2	●	+/-	+/-	-
Little Island Pond	Town of Pelham, Hillsborough County, NH		0.3	●	+	+/-	-
Island Pond Brook	Town of Pelham, Hillsborough County, NH		0.3	●	+	+/-	-
Scobie Pond	Town of Londonderry, Rockingham County, NH	51	0.3	●	+/-	+/-	-

Table A. Potential Scenic Resources

Resource	Location	VP Number[1]	Distance[2] Miles from Transmission Line	Distance Zone ● Foreground ● Midground • Background	Project Visibility +Visible - Not Visible +/- Partially Visible[3] Topographic Viewshed	Topographic & Vegetation Viewshed	Field Review[4]
Bartlett Brook	Pelham, HIllsborough Cnty, NH		0.4	●	+	+/-	-
Robinson Pond	Town of Hudson, Hillsborough County, NH	71	0.4	●	+/-	+/-	-
Watts Brook	Town of Manchester and Litchfield, Hillsborough County & Town of Londonderry, Rockingham County, NH		0.5	●	+/-	+/-	-
Lower Shields Pond	Town of Derry, Rockingham County, NH		1.0	●	+/-	+/-	-
Moeckel Pond	Town of Windham, Rockingham County, NH		1.0	●	+/-	+/-	-
Simpson Pond	Town of Windham, Rockingham County, NH		1.2	●	+/-	+/-	-
Hoods Pond	Town of Derry, Rockingham County, NH		1.3	●	+/-	+/-	-
Rainbow Lake	Town of Derry, Rockingham County, NH		1.4	●	+/-	-	-
Common Pond	Town of Litchfield, Hillsborough County, NH		1.4	●	+	+/-	-
Horns Pond	Town of Derry, Rockingham County, NH		1.4	●	+/-	+/-	-
Rock Pond	Town of Windham, Rockingham County, NH		1.5	●	+	+/-	-
Darrah Pond	Town of Litchfield, Hillsborough County, NH		1.7	●	+	+/-	-
Colby Brook	Town of Litchfield, Hillsborough County, NH		1.8	●	+/-	-	-
Rocky Hill Pond	Town of Litchfield, Hillsborough County, NH		1.9	●	+/-	-	-
Beaver Lake	Town of Derry, Rockingham County, NH		1.9	●	+/-	+/-	-
Half Moon Pond	Town of Litchfield, Hillsborough County, NH		1.9	●	+	+	-
Duck Pond	Town of Litchfield, Hillsborough County, NH		2.0	●	-	-	-

[1] If no viewpoint (VP) number is indicated, no photo was obtained during fieldwork.

[2] For large areas and linear sites, approximate distance to the transmission line was measured from the respective area's closest point.

[3] Indicates potential Project visbility from some portion of the identified resource

[4] Based on only those areas of the resource visited by EDR field crews. Visibility not necessarily confirmed for the full geographic extent of the resource.

Merrimack Valley Reliability Project

Towns of Pelham, Windham, Hudson and Londonderry, New Hampshire

Appendix A: Viewshed Overlaid on Potential Scenic Resource Mapping

May 2015

Notes: 1. Basemap: ESRI StreetMap North America,2008.
2. Potential Project visibility based on topography and potential screening by mapped forest vegetation (with an assumed height of 40 feet).
3. This is a color graphic. Reproduction in grayscale may misrepresent the data.

Project Visibility Based on Topography and Vegetation

- Existing Visibility (Area that already has a View of Existing Transmission Structures)
- Newly Visible Area (Area without View of Existing Transmission Structures)

- Simulation KOP
- Viewpoint
- Pole Location
- Trail
- Scenic Drive/Road
- State Scenic Byway
- State Forest
- Golf Course
- Town Designated Scenic View
- Local Parks & Recreation
- City/Village
- Town Boundary
- State Boundary
- 2-Mile Study

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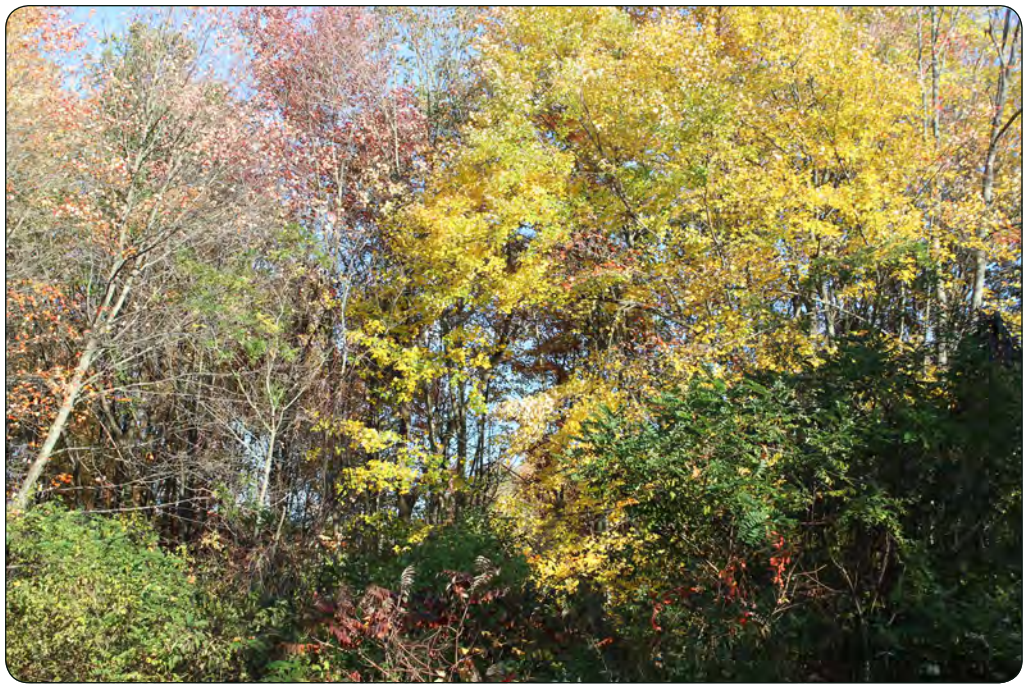
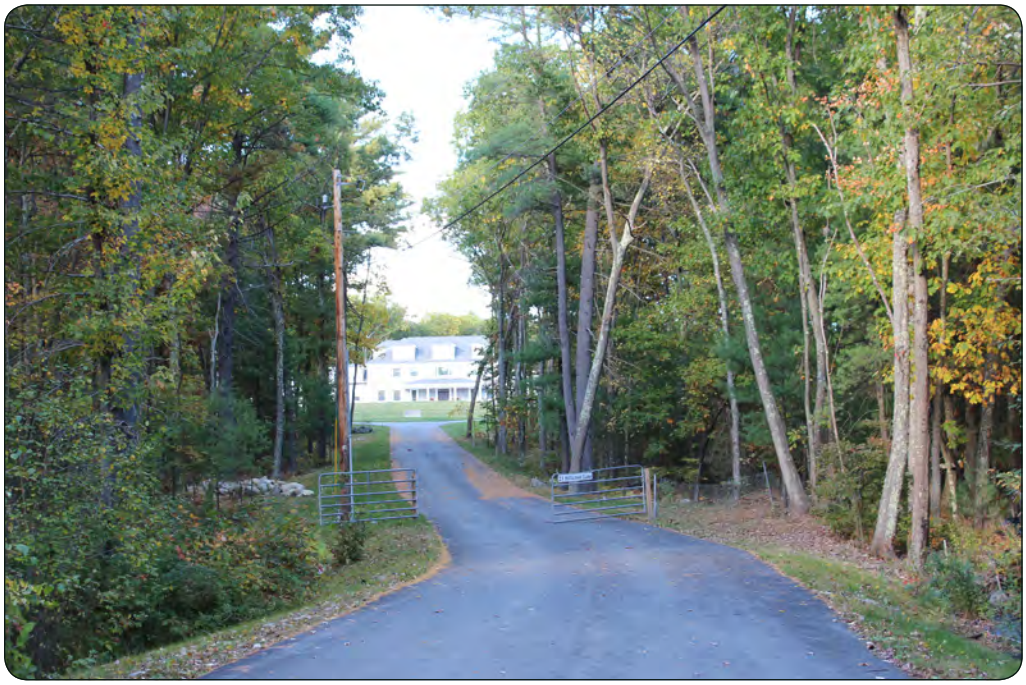
Appendix B

Photo Log and Field Notes



Viewpoint - 01



Viewpoint - 02

Viewpoint - 03

Viewpoint - 04

Viewpoint - 05

Leaf-on

Viewpoint - 05-A

Leaf-off

Viewpoint - 06

Viewpoint - 07

Viewpoint - 08

Viewpoint - 09

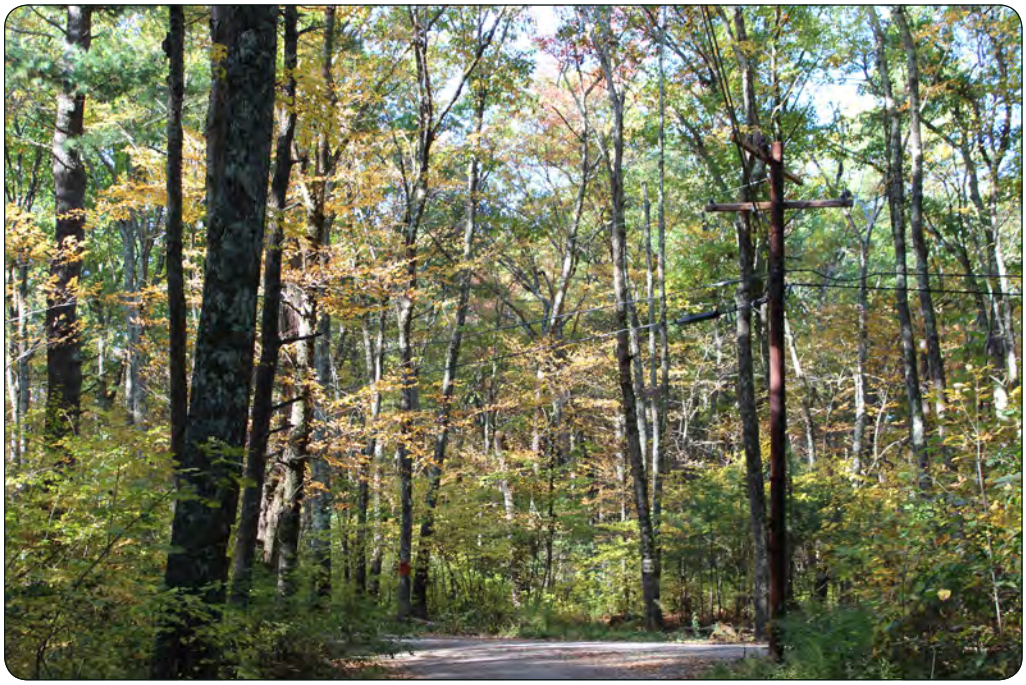
Viewpoint - 10

Viewpoint - 11

Viewpoint - 12

Viewpoint - 13

Viewpoint - 14



Viewpoint - 15

Viewpoint - 16

Viewpoint - 17

Viewpoint - 18

Viewpoint - 19

Viewpoint - 20

Viewpoint - 21

Viewpoint - 22

Leaf-on

Viewpoint - 22-A

Leaf-off

Viewpoint - 23

Viewpoint - 24

Viewpoint - 25

Viewpoint - 26

Viewpoint - 27

Viewpoint - 28

Viewpoint - 29

Viewpoint - 30

Viewpoint - 31

Viewpoint - 32

Viewpoint - 33

Viewpoint - 34

Viewpoint - 35

Viewpoint - 36

Viewpoint - 37

Viewpoint - 38

Viewpoint - 39

Viewpoint - 40

Viewpoint - 41

Leaf-on

Viewpoint - 41-A

Leaf-off

Viewpoint - 42

Viewpoint - 43

Viewpoint - 44

Viewpoint - 45

Viewpoint - 46

Viewpoint - 47

Viewpoint - 48

Viewpoint - 49

Viewpoint - 50

Viewpoint - 51

Viewpoint - 52

Viewpoint - 53

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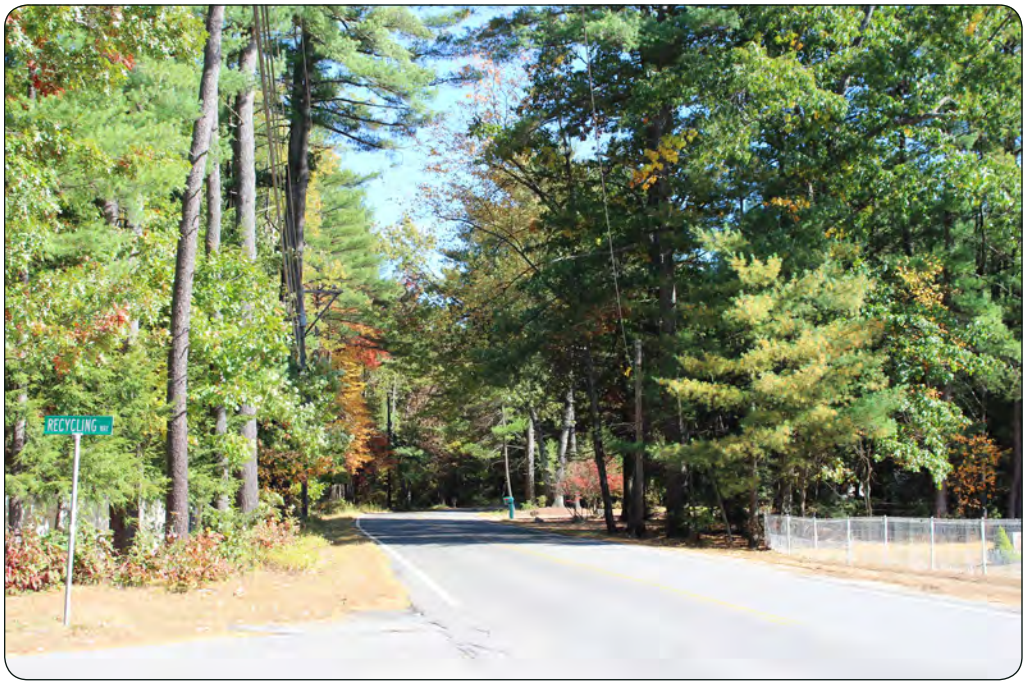
Viewpoint - 56



Viewpoint - 57

Viewpoint - 58

Viewpoint - 59

Viewpoint - 60

Viewpoint - 61

Viewpoint - 62

Viewpoint - 63

Viewpoint - 64

Viewpoint - 65

Viewpoint - 66

Viewpoint - 67

Leaf-on

Viewpoint - 67-A

Leaf-off

Viewpoint - 68

Viewpoint - 68-A

Viewpoint - 69

Viewpoint - 70

Viewpoint - 71

Viewpoint - 72

Viewpoint - 73

Viewpoint - 74

Viewpoint - 75

Viewpoint - 76

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Viewpoint - 121

Viewpoint - 122

EDR Project: NH Scobie to Tewksbury (14111)

Date: 10-9-14 Weather: clear sunny, 60s° partial clouds Winds: 0-5 mph Sheet: 1 of ___ Initials: EJ/SB

GPS #: Garmin etrex Camera: Canon Rebel T3i

VP #	GPS #	Photo Reference	Time	Project Visible?	Location / Sensitive Resource / Comments	Direction of View
	057	1617 - 1620	3:42	N	St. Casimirs Cemetery - forested - no views	E/W
	058	1621 - 1622	3:57	N	Hillcrest Ln - Deadend - view of private lee - forested	E
	059	1623 - 1627	3:58	N	Deer Hill Cir. - no view - veg. - high open distance views of forest context	E + pan
*	060	1628 - 1630	4:02	Y	Dutton Rd. under line 2 open views both directions	N+S
***	061	1631 - 1634	4:15	Y	Arthur Peabody Memorial Forest - Under line - trail ★	N+S
	062	1646 - 1647	4:25	N	Atwood Cemetery - screened by veg - no views	E
	063	1648 - [redacted]	4:28	YN	Gaudet Ln - Fireside Estates - Limbs barely visible - heavily screened	E
***	064	1649 - 1655	4:32	Y	Old "__" Hill Rd under line parallel to 38 - open views of poles	NW/SE
***	065	1656 - 1660	4:37	Y	Tina Ave. dead end near trucking co. - under line - good view NW	NW/SE
	066	1661 - 1666	4:47	N	Pelham Middle + Elem. Schools - no views - veg/distance	E
	067	1667 - 1669	4:51	N	Gibson Cemetery - Pelham - no views	E
	068	1670 - 1676	4:54	N	Pelham Village Green, Library, Town Hall, roundabout - character, no views	Various/E
	069	1677 - 1682	5:00	N	Pelham Hist Society, church, character - no views	E/NE
	070	1683 - 1685	5:04pm	N	Saint Patrick School - no views - veg./distance	E
10/10						
	071	1686 - 1688	9:03am	N	West Shore Dr. near Little Island Pond - heavily screened veg	WSW
***	072	1689 - 1693	9:09	Y	Frontier Dr - visible behind houses on W. side of road - good for kaf off?	WSW
	073	1694 - 1697	9:27	N	Pine Valley Golf Links - screened by veg.	WSW
****	074	1698 - 1700	9:32	Y	Rt. 111 - ★ near line - good shot with road/house context	WSW
***	075	1701 - 1706	9:35	Y	Golden Brook Park - view past recycling center of line + view of field	W
***	076	1707 - 1710	9:38	Y	Newcomb Field/GB Park entrance - good view of line	SW
	077	1711 - 1713	9:41	Y	Lenmore Dr. - visible behind trees - partially screened	WSW
***	078	1714 - 1718	9:46	Y	open view of line across field - Hayden Rd.	W
***	079	1719 - 1723	9:49	Y	Simpson Rd - open view under line	E-NE
	080	1724 - 1726	9:58	N	Foxboro Meadow Park - no views - tops/veg. -	SW
	081	1727 - 1731	10:02	N	Golden Brook Elem/Windham Middle driveway - no views - distance/veg.	W-SW pan
	082	1732 - 1734	10:09	N	Heritage Hill Rd. - rise near mile side - sac - no views - heavily screened	SW
**	083	1735 - 1736	10:14	Y	Ryan Farm Rd. - view at end of road near construction	SW
***	084	1737 - 1740	10:20	Y	Castle Hill Rd. - next to line - open views W/ house - good view NW	NW
***	085	1741 - 1744	10:30	Y	Mammoth Rd. @ Glance Rd. - good open views at Town of Windham Line	NW
	086	1745 - 1747	10:36	Y	Brookview Rd. - view between trees.	SE
**	087	1748 - 1751	10:42	Y	Bridle Bridge Rd. - open view under lines	NW
	088	1752 - 1757	10:46	Y	Rt. 111 under line - open view NW	NW
	089	1758 - 1761	10:54	N	Alleged "Rockingham Recreational Trail" trailhead - no trail? No views	SW
	090	1762 - 1765	10:59	Y	Burtes Rd - view down rd. (uphill) to road crossing	SW

EDR Project: NH Scobie to Tewksbury (14111)

Date: 10-10-14 Weather: Clear, sunny, 60s Winds: 0-5 mph Sheet: 2 of ___ Initials: GS/SB

GPS #: Garmin etrex Camera: Canon Rebel T3i

VP #	GPS #	Photo Reference	Time	Project Visible?	Location / Sensitive Resource / Comments	Direction of View
**	091	1766 - 1773	11:01	Y	Bodies Rd. underline – open view adjacent to horses (DON'T USE FIRST PHOTO)	NW
*	092	1774 - 1780	11:05	Y	McCrady Dr. Dead End – view of line past houses	E NE
**	093	1781 - 1784	11:09	Y	Hopkins Dr. – view of line / poles behind houses	SW
	094	1785 - 1789	11:15	N	Bodies Memorial Forest – Mill Rd. – no views – top o/veg	W/SW
	095	1790 - 1793	11:24	N	Victory Christian School – 128/Mammoth Rd. – no views	SW
**	096	1794 - 1799	11:29	Y	David Dr. Under line – open view uphill	NW
****	097	1800 - 1805	11:30	Y	David Dr. – trees + houses East of line – poles above houses – BOTH WAYS	NW/SE
****	098	1806 - 1808	11:34	Y	Lenny Ln – good view now / house – good view	SE
****	099	1809 - 1810	11:38	Y	Kienia (?) Ln. – view along rd. – good view	NW
**	100	1811 - 1814	11:42	Y	Marie Ln. – under line adj. to houses	NW
***	101	1815 - 1817	11:44	Y	Kienia Rd. – open view along road – good view	NW
**	102	1818 - 1821	11:49	Y	Breakneck Rd. under line – open views	NW/SE
.	103	1822 - 1827	11:58	N	Boyd Rd – Boyd Cemetery – no views – dist./veg.	W/SW
	104	1828 - 1835	12:08	N	Moses J. Young house – no views – dist./veg.	SW
	105	1836 - 1845	12:38	N	Matthew Thornton House – Derry – no views – dont use	NW
	106	1846 - 1853	12:50	N	Adams Memorial Bldg. – Derry – context shots – no views	NNW
	107	1854 - 1857	1:05	N	Scobie Pond Boat Launch – NO VIEWS	SW
	108	1858 - 1862	1:27	N	Sunnyside Cemetery – Litchfield Rd. – No views	SW
	109	1863 - 1866	1:35	N	County Road Park – No views – dist./veg.	SE
****	110	1867 - 1871	1:43	Y	Courtney Ln + Brenton St. – view over houses (LOOK @ LATER PHOTOS)	ESE
	111	1872 - 1873	1:49	Y	Lund St. cul-de-sac – visible above trees – better vis loaf off	E
	112	1874 - 1876	1:58	N	Litchfield Park – SCREened (not mapped) – Bike trail along Road	E
	113	1877 - 1880	2:01	N	Hillcrest cemetery – Hillcrest Rd. – screened – dist./veg.	ESE
	114	1881 - 1883	2:03	N	Litchfield State Forest – Alby. + Litchfield Rds – no views	E
	115	1884 - 1887	2:13	N	Edward Roy Mem. Park – no views – Dist/veg.	ENE
**	116	1888 - 1890	2:20	Y	Wiley Hill Rd. Under line – good view SE	SE
**	117	1891 - 1894	2:21	Y	Wiley Hill Rd E of line, pt of fib of N end of line @ crossing	NW
	118	1895 - 1897	2:24	N	Preserve Rd cul-de-sac – "Musquash Conservation Area" ??? – no views	W
	119	1898 - 1901	2:30	Y/N?	Courtney Rail Park – View of intersecting line from large roc. park	NE
****	120	1902 - 1911	2:36	Y	Elwood Orchards – good views, both directions	NW-SE
***	121	1912 - 1916	2:39	Y	Elwood Rd East of J – open view SE	SE-NW
***	122	1917 - 1921	2:45	Y	Dan Hill Rd under line – open views – both directions	NW-SE
***	123	1922 - 1929	2:49	Y	SR 102 under line @ Londonderry Flea Mkt. – good view SE	SE-NW
☆ ****	124	1930 - 1933	2:51	Y	Avery Rd – GREAT VIEW over Londonderry Flea Mkt.	ESE
☆ **	128	1934 - 1943	2:53	Y	PAN SE → NW of Flea Mkt – 1939 - 1943	SE → NW

EDR Project: NH Scobie to Tewksbury (14111)

Date: 10/10/14 Weather: Mostly sunny 62° Winds: 5-10 mph Sheet: 3 of 3 Initials: GJ + SB

GPS #: Garmin Camera: Canon Rebel T3i

VP #	GPS #	Photo Reference	Time	Project Visible?	Location / Sensitive Resource / Comments	Direction of View
	126	1944-1950	3:00	N	Center Cemetery / Burial Ground - downhill - no views	NE
	127	1951-1955	3:06	N	Municipal Beach @ Robinson Pond + changing stalls - no views	ENE
	128	1956-1957	3:13	N?	Robinson Pond Park @ Griffin Rd. - intersecting R-O-W	NE
	129	1958-1961	3:25	N	Raymond "Park" - inactive - screened - veg. - no views	E
	130	1962-1965	3:31	Y	Shelley Drive underline - open views - both directions	NW/SE
	131	1966-1971	3:37	N?	Carriage Dr. cul-de-sac - line obscured by trees	ENE
	132	1972-1975	3:46	N	George M. Muldoon Park - no views - screened - veg.	E
	133	1976-1978	3:48	N	Serenity Hill "State Natural Area" - res. dev. - no views - topo./veg.	ENE

EDR Project: NH Scobie to Tewksbury (14111)

Date: 11-19-14 Weather: clear, 28°-30° Winds: 0 mph Sheet: 1 of ___ Initials: GJ

GPS #: Garmin Camera: Canon EOS T3i

VP #	GPS #	Photo Reference	Time	Project Visible?	Location / Sensitive Resource / Comments	Direction of View
78	1	2096-2124	8:35	Y	I-93 N, east side of line, views in both directions	N/S
79	2	2125-2146	8:40	Y	I-93 N, west side of line, views in both directions	N/S
80	3	2147-2148	8:58	N	Pinkerton Academy, Derry — No views + rep. shot	SW
81	4	2149-2150	9:04	N	MacGregor Park near Hood Middle School — No views	SW
82	5	2151-2156	9:12	Y	Substation - Scobie Pond Rd. - view of end of line	S
83	6	2157-2168	9:16	Y	Rt. 28 - profile view of line	W
84	7	2169-2174	9:18	Y?	Rt. 28 under line - open views both directions	NE/SW
85	8	2175-2182	9:22	Y?	Rt. 28 " different line — WHICH ONE???	NE/SW
86	9	2183-2186	9:32	Y	Snowflake Ln. - subdivision - poles vis - over trees	W/SW
87	10	2187-2194	9:36	Y	Snowflake Ln. cul-de-sac - trail?	SW
88	11	2195-2208	9:48	Y	Hovey Ln. - E. side of line - good views N to Rt. 93	N *
89	12	2209-2222	9:50	Y	Hovey Ln. - W. side of line - " " " " "	N/S **
90	13	2223-2226	9:58	N	Old Hill Cemetery / Pillsbury Cemetery - no views	W
91	14	2227-2228	10:06	Y/N	Trolley Car Ln. & Private trail - distant view	W
92	15	2229-2238	10:15	Y	Judy Dr. cul-de-sac - line visible behind houses - screened in leaf-on	W
93	16	2239-2246	10:22	Y	[illegible] house Dr.?) - new cul-de-sac views of line over houses - bad light	NE
94	17	2247-2258	10:24	Y	Parrish Ln - pvt road - view of line over houses - bad light	ENE
95	18	2259-2268	10:28	Y	Parrish Ln - rise good view Lawhill - Mtns. in distance	SSE/NNW *
96	19	2269-2280	10:[illegible]	Y	Hardy Rd./Parrish Ln. Int. - views of both lines - good open (2279")	SE/NW ***
97	20	2281-2298	10:38	Y	King Henry Dr. cul-de-sac - open views of line [illegible] houses - good	NE/SW
98	21	2299-2300	10:44	Y	Barrow Way - cul-de-sac - screened view through trees	W
99	22	2301-2304	10:48	Y/N	Otterson Rd near rotary - view behind houses - partially screened	W
100	23	2305-2308	10:50	Y	Otterson Rd - views over wetland - screened but visible	NW
101	24	2309-2316	10:58	N	Int. of 128 + Pillsbury Rd - "Hodgdon way" - rep. shots of churches, etc.	- All
102	25	2317-2320	11:34	Y?	Rt. 128 near Londonderry Middle school - might be visible?	WNW
103	26	2321-2330	11:36	Y	Rt. 128 - E side of line - open views both directions	N/S
104	27	2331-2340	11:40	Y	Rt. 128 - W side of line - " " " " - good views S	N/S
105	28	2341-2354	11:46	Y	Bancroft Ln under line - Great View of Parrish Ln. houses - east side	N/S
106	29	2355 2362	11:48	Y	Bancroft Ln " " - west side	N/S
107	30	2363-2368	11:59	Y	Wheelwright cul-de-sac - largely screened	ESE
108	31	2369-2386	12:11	Y	High Range Rd under lines - both sets. both directions open Vs	N/S
109	32	2387-2410	12:21	Y	Trailhead for Musquash C.A. - right under line - open V both dir.	NW/SE
110	33	2411-2422	12:30	Y	Mayflower Dr. near line crossing - views west to houses	NW/SE
111	34	2423-2426	12:42	Y	Royal Ln. cul-de-sac - visible through trees - screened in leaf	W NW
112	35	2427-2430	12:45	Y?/N	Hancock Circle cul-de-sac - heavily screened - not sure if visible	WNW

EDR Project: NH Scobie to Tewksbury (14111)

Date: 11-19-14 Weather: 35°, clear + sunny Winds: 0-5 mph Sheet: 2 of ___ Initials: GJ

GPS #: Garmin Camera: Canon EOS T3i

VP #	GPS #	Photo Reference	Time	Project Visible?	Location / Sensitive Resource / Comments	Direction of View
113	36	2431 – 2440	12:52	Y	Wiley Hill Rd under line – open views, both directions	N/S
114	37	2441 – 2446	1:04	Y?	Continental Park – interesting trees – possible views?	NE
115	38	2447 – 2450	1:20	Y	Shadow Ridge Rd. cul-de-sac visible over trees	NW
116	39	2451 – 2456	1:25	N	Fraser Drive cul-de-sac – heavily screened by evergreens	SW-W
117	40	2457 – 2460	1:29	Y	Cedar Ln cul-de-sac – line visible behind house – just top – not great	SW
68A	**41	2461 – 2474	1:36	Y	Londonderry Flea Market – open views of all lines – PSNH house	E + pan N to S
118	**42	2475 – 2488	1:40	Y	Rt 102 – under line by PSNH house – "The Tracks"	SE
119	**43	2489 – 2512	1:52	Y	Breakneck Rd – PSNH tower near old VP 45 – clearing	SW
41A	**44	2513 – 2524	2:04	Y	David Dr. – PSNH tower 25 – clearing – old VP 41 – view NW	NW / E
120	**45	2525 – 2544	2:08	Y	David Dr.	SW
22A	46	2545 – 2554	2:20	Y	Hayden Rd. – reshoot of old VP 22	NW
5A	47	2555 – 2561	2:40	Y	Arthur Peabody Memorial Forest – reshoot of old VP 5	N + S
121	48	2562 – 2568	2:44	Y	" " " " – new point / VP-2567*	N + S
122	49	2569 – 2574	3:10	Y	Dutton Rd – under line – alt VP of old VP 4	NW
123	50	2575 – 2578	3:20	Y	Brandy Ln – new VP near old VP 16 – visible over houses	NW

Appendix C

Sample Rating Form and Instructions

Visual Impact Rating Form

Merrimack Valley Reliability Project (EDR Project #14111)

Viewpoint #:	Your Name:	Date:
Viewpoint Location:	Designated Aesthetic Resource (Identify/Describe):	
Viewer Type *check as many as apply* ☐Resident ☐Traveler ☐Recreational ☐Other:		

VIEWPOINT DESCRIPTION: *Please describe this view in your own words.*

VIEWPOINT SENSITIVITY: *Rate the scenic quality and viewer exposure for this view.*

SCENIC QUALITY: *please rate existing scenic quality*	VIEWER EXPOSURE: *frequency and duration of view*
☐Low ☐Moderate ☐High	☐ Continuous ☐Repeated/Regular ☐Occasional/Brief ☐Rare

CONTRAST RATING: *Rate the level of contrast between the proposed structures and the existing view.*

COMPONENT	*SCORE*	*DESCRIPTION OF CONTRAST*
Landform		
Vegetation		
Land Use		
*Water **		
Sky		
Viewer Activity		
TOTAL		*Total all scores above.*
AVERAGE		*Average all scores above.*

** If no water is visible in the view, please enter "N/A" in the 'Score".*

Variable factors that may have influenced rating (atmospheric conditions, season, etc.):

Perceived effect on scenic quality / viewer enjoyment:

Contrast Rating Score Chart

0	Insignificant
0.5	
1	Minimal
1.5	
2	Moderate
2.5	
3	Appreciable
3.5	
4	Strong

Visual Impact Rating Form Instructions

Project Name:	Merrimack Valley Reliability Project	EDR Project No:	14111
Date:	February 12, 2015		
Reference:	Visual Impact Rating Form - Instructions		

These instructions are intended to guide personnel conducting visual impact assessment contrast ratings through EDR's Visual Impact Rating Form.

Viewpoint #/Viewpoint Location:

Please fill this in based on the information in the title block for each photograph/viewpoint that is provided.

Your Name/Date:

Please complete.

Designated Aesthetic Resource:

Please refer to the Viewpoint Location Map and title block for photographs to identify the designated aesthetic resource for each viewpoint.

Viewer Type:

Please infer who the mostly likely viewer(s) is/are based on the location and context of the view. Please also refer to the Viewpoint Location Map and title block for photographs. For instance:

- If the photo shows a residential or concentrated settlement, check *resident*.
- If the viewpoint is a roadway location, check *traveler*.
- If the viewpoint is from a recreational area or the view suggests recreational activities, check *recreational*.

Viewpoint Description:

Please describe the view in your own words, focusing on the landscape components described below.

- *Landscape Composition:* The arrangement of objects and voids in the landscape that can be categorized by their spatial arrangement. Basic landscape components include vegetation, landform, water and sky.
- *Form, Line, Color, and Texture*: These are the four major compositional elements that define the perceived visual character of a landscape. Form refers to the shape of an object that appears unified; often defined by edge, outline, and surrounding space. Line refers to the path the eye follows when perceiving abrupt changes

in form, color, or texture; usually evident as the edges of shapes or masses in the landscape. Texture in this context refers to the visual surface characteristics of an object.

- *Focal Point*: Certain natural or man-made landscape features stand out and are particularly noticeable as a result of their physical characteristics. Focal points often contrast with their surroundings in color, form, scale or texture, and therefore tend to draw a viewer's attention. Examples include prominent trees, mountains and water features. Cultural features, such as a distinctive barn or steeple can also be focal points.

- *Order*: Natural landscapes have an underlying order determined by natural processes. Cultural landscapes exhibit order by displaying traditional or logical patterns of land use/development. Elements in the landscape that are inconsistent with this natural order may detract from scenic quality.

- *Atmospheric Conditions*: Clouds, precipitation, haze, and other ambient air related conditions affect the visibility of an object or objects and can greatly impact the design elements of form, line, color, texture, and scale.

- *Lighting Direction*: Backlighting refers to a viewing situation in which sunlight is coming toward the observer from behind a feature or elements in a scene. Front lighting refers to a situation where the light source is coming from behind the observer and falling directly upon the area being viewed. Side lighting refers to a viewing situation in which sunlight is coming from the side of the observer to a feature or elements in a scene.

- *Visual Clutter*: Numerous unrelated built elements occurring within a view can create visual clutter, which adversely impacts scenic quality. Note that because the project is a transmission line rebuild, the extent of existing electrical infrastructure in the view may contribute to a sense of visual clutter.

Viewpoint Sensitivity:

Please rate the sensitivity of each viewpoint as determined by scenic quality and viewer exposure, as follows:

Scenic Quality:

Please rate the scenic quality of the existing view according to your opinion about the quality of the existing landscape, without the project in place, for the general public. Please consider the following:

- An undeveloped landscape, or one containing aesthetically important structures, might be at the high end of the scale, while a landscape already impacted by infrastructure or industrial facilities might be at the low end. Most residential areas will fall into the moderate category, unless they are either historic neighborhoods, or degraded/abandoned.

- Because the proposed project is the construction of a new transmission line within an existing transmission line corridor, all of the views under consideration include existing electrical transmission infrastructure. Please factor this into your assessment of existing scenic quality for each viewpoint.

- Note that designation as a scenic or recreational resource is an indication that there is broad public consensus on the value of that particular resource. The particular characteristics of the resource that contribute to its scenic or recreational value provide guidance in evaluating a project's visual impact on that resource. However, the scenic quality rating you assign depends on your individual judgment.

View Exposure:

Please infer the frequency and duration of views based on the Viewer Type, LSZ, viewpoint context, and viewpoint location map. Please consider the following:

- Some views are seen as quick glimpses while driving along a roadway or hiking a trail, while others are seen for a more prolonged period of time. Longer duration views of a project, especially from significant aesthetic resources, have the greatest potential for visual impact.

- Please indicate whether there is potential for continuous or repeated exposure (such as residences, village intersections, and principal transportation routes with an open view towards the project), brief or occasional exposure (such as openings in otherwise screened areas or secondary roads that most people will not use on a daily basis), or rare exposure (such as viewpoints that are clearly off the beaten track and/or represent small areas of narrow visibility in otherwise completely screened areas).

Contrast Rating:

The New Hampshire Site Evaluation Committee (SEC) Draft Code of Administrative Rules (or, the Draft SEC Rules) advise that assessment of potential visual impact include the following considerations:

1. The expectations of the typical viewer;
2. The effect on future use and enjoyment of the scenic resource;
3. The extent of the proposed facility, including all structures and disturbed areas, visible from the scenic resource;
4. The distance of the proposed facility from the scenic resource;
5. The horizontal breadth (visual arc) of the visible elements of the proposed facility;
6. The scale of the proposed facility relative to surrounding topography and existing structures;
7. The duration and direction of the typical view of the elements of the proposed facility; and
8. The presence of intervening topography between the scenic resource and elements of the proposed facility.

Please rate the level of contrast that you perceive between the existing landscape components (as they appear in each in photo) and the effect that the proposed project has on those components. Please provide a numerical rating between 0 and 4 for each landscape component, where:

0 = Insignificant Contrast
1 = Minimal Contrast
2 = Moderate Contrast
3 = Appreciable Contrast
4 = Strong Contrast
* (please make use of .5 to allow for refinement or ambivalence between any of these ratings, e.g., 2.5 = Moderate to Appreciable Contrast).

Please then also describe in your own words the factors in the appearance of the photo that contribute to or affect the degree of contrast for each landscape component.

Please consider the following for each landscape component:

Landform: Please consider the effect of the project relative to the appearance of the landform or topography, including the strength and range of color, the density of relief, the space as defined by the landform, and the extent of its scale.

Because this project is the construction of a new transmission line within an existing transmission line corridor, key considerations relative to landform may include:

- The vertical scale relationship and spatial presence/prominence of the proposed structures relative to existing topography and other landscape elements, including existing utility structures. The effect of scale is often a function of the viewing distance relative to the proposed structures.

- Relevant considerations include the form, size, and spacing of the proposed structures relative to landscape elements in the view.

Vegetation: Please consider the effect of the project relative to the appearance of the form(s) and variety of vegetation, including the extent of clearing, the range of color, the density of texture, space as defined by the vegetation, and its hierarchy/diversity of scale.

Key considerations for this project relative to vegetation include:

- Change in vertical scale of the proposed structures relative to vegetation in the view.

- Proposed vegetation clearing associated with new right-of-way (ROW) and/or expansion of the existing ROW.

- The color of the proposed transmission structures relative to their visual setting. Structures that are consistent in color or tone with their backdrop, such as brown structures against a forested backdrop, are less likely to attract viewer attention.

- The introduction of transmission structures into an otherwise “natural” setting that does not include visible utility infrastructure is likely to be perceived as generally less compatible (or greater contrast).

- In areas with existing electrical infrastructure, the replacement, alteration, or addition of transmission structures is generally less likely to attract attention or be perceived as incompatible with the existing setting.

Land Use: Please consider the effect of the project relative to the appearance of identifiable land use(s) in the view, and evaluate the degree to which the project is compatible/consistent with the appearance of existing land use(s) in the view.

The key considerations for this project relative to land use are:

- The natural and man-made features of the landscape that define its dominant character. The type and extent of existing development and the compatibility of the

proposed changes to the utility infrastructure with their setting – including whether similar structures are present in the existing view – should be considered.

- In instances where similar infrastructure or other man-made features are not apparent in the existing view, the proposed project is more likely to attract viewer attention and may be perceived as less compatible with existing land use.

- In areas with existing electrical infrastructure, the replacement, alteration, or addition of transmission structures is generally less likely to attract attention or be perceived as incompatible with the existing setting.

Water: Please consider the effect of the project relative to the appearance of water features in terms of the form of the water body(ies), its (their) shorelines, color, and texture (which refers here to movement), reflection, degree of enclosure, and the scale (or extent) of the presence of water in the view. Waterbodies typically attract viewer attention, provide a focal point in the view, and are generally associated with higher scenic quality.

Key considerations for this project relative to waterbodies include:

- The degree to which the changes to the view resulting from the project obstruct, compete with, or distract from the viewer's attention and/or enjoyment of the waterbody as a focal point or scenic element in the view. This effect is often a function of project's proximity to the water and/or the viewer's distance relative to the project.

Sky: Please consider the effect of the project relative to the appearance of the sky in terms of form (including the appearance of clouds), the edges of its lines (perhaps in terms of the horizon), clarity of color, texture (which here could refer to cloudiness or other atmospheric conditions), the degree of openness or enclosure, and the scale (or extent) of the sky in the view.

Key considerations for this project relative to sky include:

- Potential changes in height of the proposed structures relative to existing structures. Visual contrast is generally increased if the proposed structures appear significantly taller and/or appear significantly more prominent relative to existing structures and the horizon in the view. Structures that are "skylined" or silhouetted on the horizon typically result in greater visual contrast.

- The color of the proposed structures can also affect the degree of contrast, with lighter poles often appearing less prominent against the backdrop of the sky.

Viewer Activity: Please consider the effect of the project on the viewer's perception of the scenic quality and potential enjoyment of the view, taking into account the viewpoint location and context, viewer type, and duration of the view.

Key considerations for this project relative to viewer activity include:

- The degree to which the proposed project would compete for viewer attention and/or decrease the viewer's enjoyment of whatever activity in which they are engaged. For instance, viewers engaged in activities such as outdoor recreation and sightseeing would generally be more sensitive to visual impact than those commuting or participating in athletic events.

- In instances where similar or comparable infrastructure is not apparent in the existing view, the proposed project is more likely to attract viewer attention and may be perceived as less compatible with existing viewer activities.

- In areas with existing electrical infrastructure, the replacement, alteration, or addition of transmission structures is generally less likely to attract attention or be perceived as incompatible with the viewer activities.

Variable factors that may have influenced rating:

Please note any conditions, based on what is visible in the photographs that may influence the degree of contrast perceived between the project and the existing conditions (e.g., atmospheric condition, season, etc.).

Perceived effect on scenic quality/viewer enjoyment:

Please summarize your evaluation of the project's overall effect on the appearance of the view, taking into account the viewpoint location and context, sensitivity of that location, scenic quality of the existing view, viewer type, and viewer exposure.