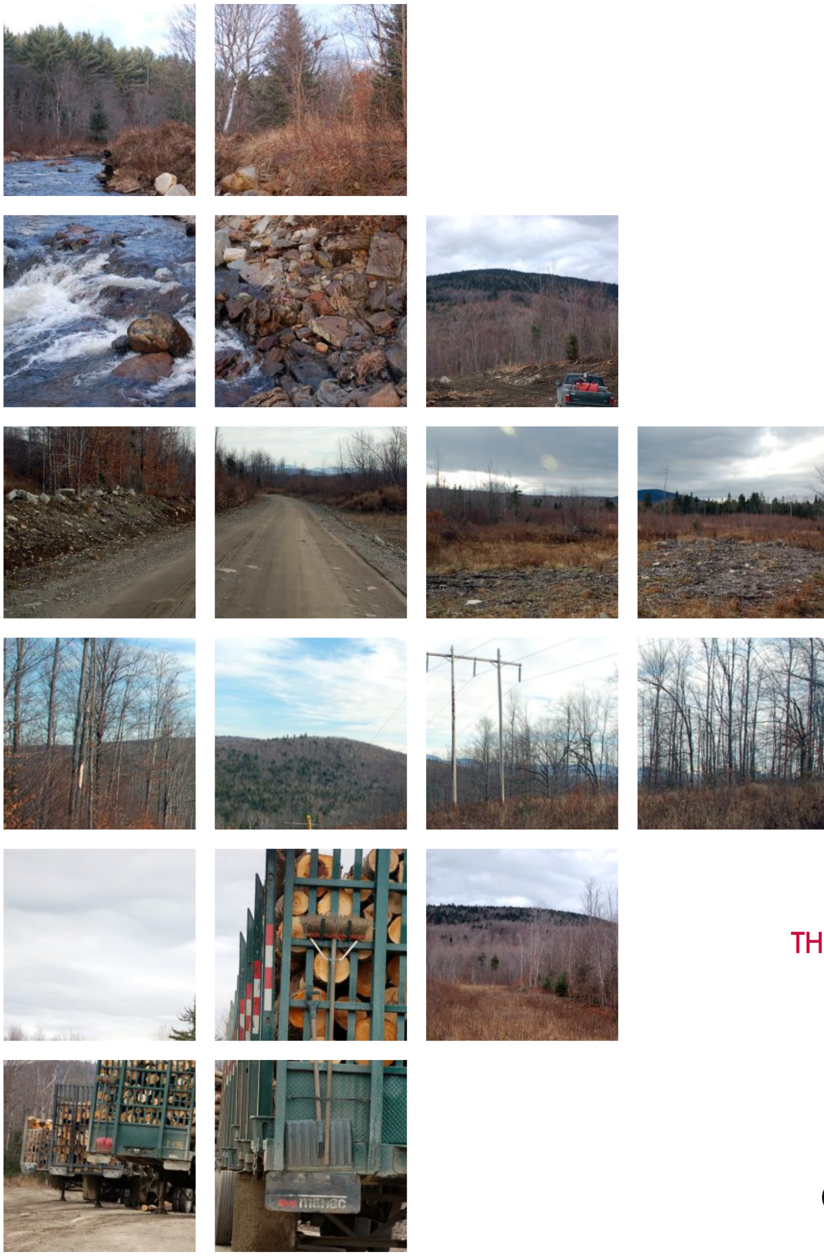
Phase IA Archaeological Survey

Granite Reliable Power, LLC
Proposed Windpark

Coos County
New Hampshire



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Abstract

On behalf of Granite Reliable Power, LLC, a subsidiary of Noble Environmental Power, LLC, of Essex, Connecticut, The Louis Berger Group, Inc. (Berger), has completed a Phase IA archaeological investigation for the proposed Granite Reliable Power Windpark (Windpark), Coos County, New Hampshire. The purpose of the survey was to identify and assess areas of archaeological sensitivity (or potential) and identify any archaeological sites within the area of potential effects (APE), which for this survey includes all parts of the proposed Windpark that will be subject to ground disturbance, including turbine construction, access road improvements and construction, collection line installation, and switchyard and substation construction. This investigation was designed in accordance with guidelines issued by the New Hampshire Department of Historical Resources (NHDHR).

The Windpark is proposed for installation on private land in the central portion of Coos County, encompassing a total area of approximately 80,000 acres, of which the APE is a subset. The Windpark is located in a current logging area in the White Mountains region of north-central New Hampshire. The northern extent of the wind turbine locations within the APE includes the upper reaches of Dixville Peak. Moving south, the wind turbine area includes the named summits of Mt. Kelsey and Owlhead Mountain, in addition to locally named Fishbrook Mountain. Project components, including 33 wind turbines, access roads, and electrical interconnection facilities, will be located in the unincorporated places of Dixville, Ervings Location, Millsfield, and Odell, and the incorporated Town of Dummer. The Windpark is primarily a linear project with wind turbines installed along the north-south oriented ridgelines in the region. To connect these turbines to the grid, a switchyard will be constructed near the southern part of the project area and a new transmission line will be built to connect the switchyard to the existing 115kV transmission line. A new substation, consisting of a maintenance building and laydown area, will be constructed within the APE as part of the Windpark just north of Dummer Ponds. In its longest dimension the project components will span approximately 21 miles from the northernmost part of the Windpark to the existing transmission line in the south.

This Phase IA archaeological investigation consisted of background research and fieldwork, to gain an understanding of previous construction and cultural resources management projects in the area, identify and assess areas of archaeological sensitivity (or potential), and identify any extant archaeological sites within the APE. No archaeological resources or sites were identified within a 3-mile (4.8-kilometer) radius of the APE; however, particular areas within the APE were identified as possessing a potential for containing precontact or historical archaeological resources. Judging from preliminary results of this survey, it is Berger's opinion that a Phase IB archaeological survey is recommended for the Granite Reliable Power Windpark.

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I. Introduction

On behalf of Granite Reliable Power, LLC, a subsidiary of Noble Environmental Power, LLC, of Essex, Connecticut, The Louis Berger Group, Inc. (Berger), has completed a Phase IA archaeological investigation for the proposed Granite Reliable Power Windpark (Windpark), Coos County, New Hampshire (Figures 1-3). The purpose of the survey was to identify and assess areas of archaeological sensitivity (or potential) and identify any archaeological sites within the area of potential effects (APE), which for this survey includes all parts of the proposed Windpark that will be subject to ground disturbance, including turbine construction, access road improvements and construction, collection line installation, and switchyard and substation construction. This investigation was designed in accordance with guidelines issued by the New Hampshire Department of Historical Resources (NHDHR).

A 300-foot (91-meter) radius will be allocated for ground disturbance around each wind turbine, and the summit roads constructed to connect the turbines will have a 75-foot (22.9-meter) right-of-way (ROW). The 35kV Underground Collection Line used to connect the turbines will be buried within the 75-foot (22.9-meter) ROW of the summit access roads. Existing logging roads will have a 50-foot (15.2-meter) ROW. The Electrical Interconnection Line (EIL) will follow the existing road (Dummer Pond Road) between the switchyard and the substation. In areas where the EIL extends to the west and outside the 50-foot (15.2-meter) ROW, the APE will be expanded. The 35kV Overhead Collection Line (OCL) follows the primary access road north from the substation and is encompassed by the ROW for the primary access roads. The substation, including a maintenance building and laydown yard, will be situated on a 14.35-acre parcel of land adjacent to Dummer Pond Road, and the switchyard will be on a 2.53-acre parcel of land (including the access road to the switchyard) at the southern extreme of the project area, thus defining the APE (see Figures 1-3).

A. Project Area Location

The Windpark is proposed for installation on private land in the central portion of Coos County. Project components, including wind turbines, access roads, and electrical interconnection facilities, will be located in the unincorporated places of Dixville, Ervings Location, Millsfield, and Odell, and the incorporated Town of Dummer. The Windpark is primarily a linear project, accessed via Dummer Pond Road off New Hampshire Route 16, with wind turbines situated along the north-south oriented ridges in the region. In its longest dimension the project components will span approximately 21 miles (33.8 kilometers) from the northernmost part of the APE to the existing transmission line in the south.

The Windpark is located in a current logging area, largely in the Phillips Brook Forest, in the White Mountains region. The northern extent of the wind turbine locations includes the upper reaches of Dixville Peak, which is separated from the higher mountains coursing northward by the Dixville Notch, in the vicinity of Dixville Notch State Park and the Balsams Grand Hotel and Resort. Extending south from Dixville Peak, the wind turbine area includes the named summits of Mt. Kelsey and Owlhead Mountain, in addition to locally named Fishbrook Mountain.[1]

Set between two ridgelines, the Windpark lies in a rural, unpopulated setting and consists of variable terrain. Along the ridgelines where the proposed turbines are to be erected, the terrain is rugged with primarily moderate to steep slopes and thin, typically very stony, poorly drained soils, as well as outcrops of exposed bedrock. Along particular sections of access roads, however, terrain is less rugged, with gentle

[1] The elevations of the three project ridges are as follows: Fishbrook, 2,889 feet (880.6 meters); Owlhead Mountain/Mt. Kelsey, 3,472 feet (1,058.3 meters); Dixville Peak, 3,460 feet (1,054.6 meters).

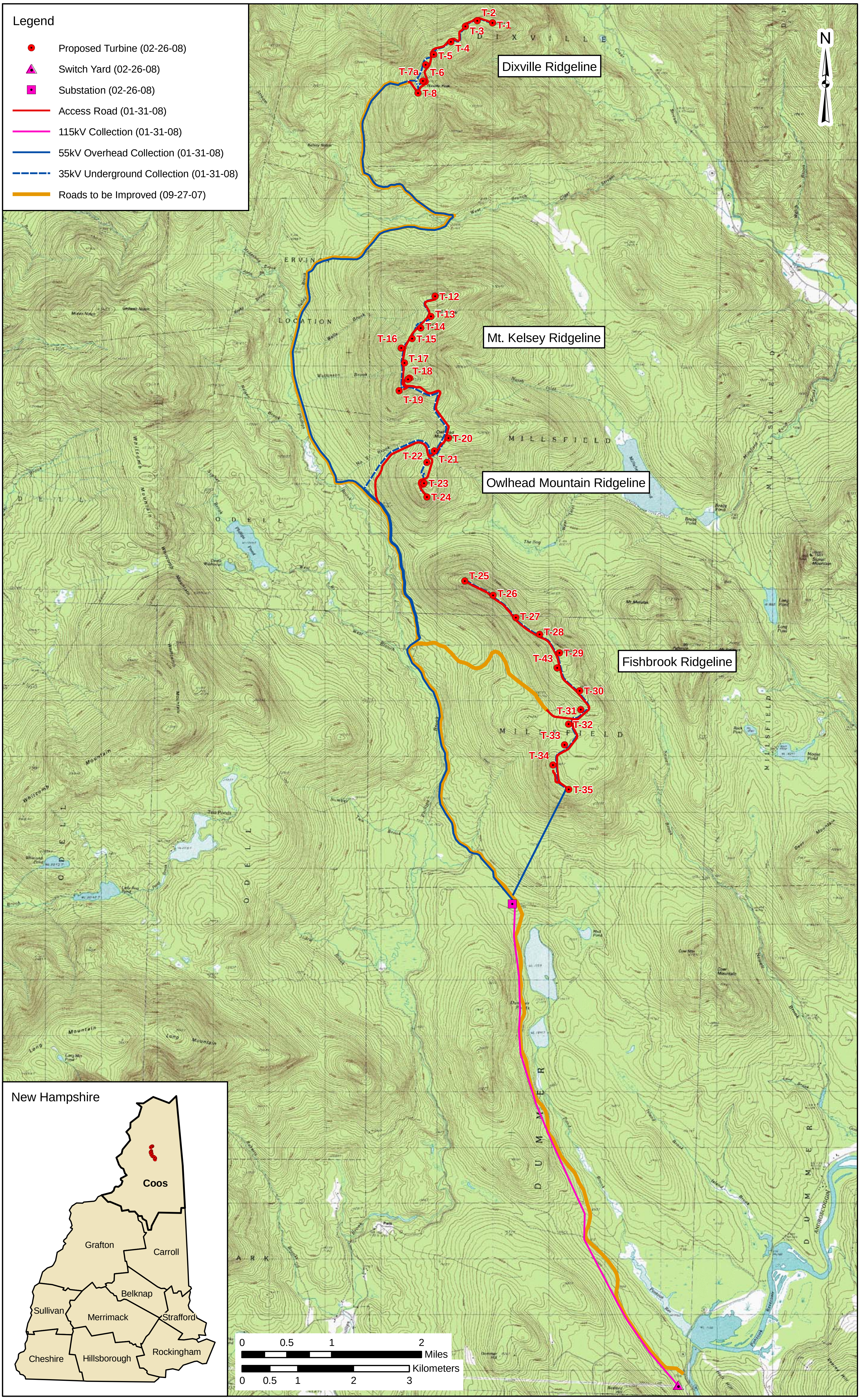

FIGURE 1: Location of Project Area

SOURCE: GRANIT 2007; Granite Reliable Power 2008

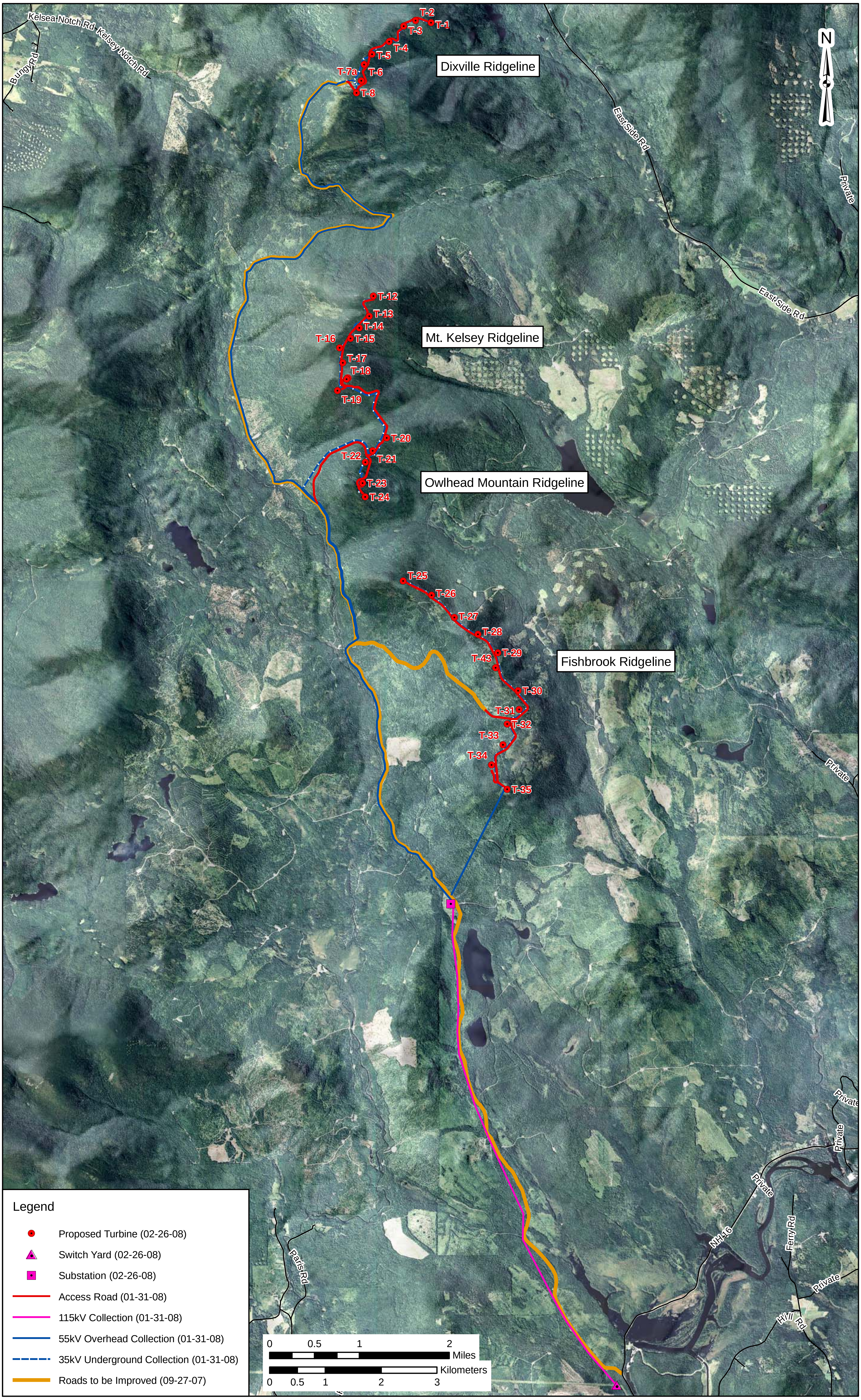

FIGURE 2: Aerial View of Project Area

SOURCE: Granite Reliable Power 2007; Granite Reliable Power 2008; GRANIT 2007

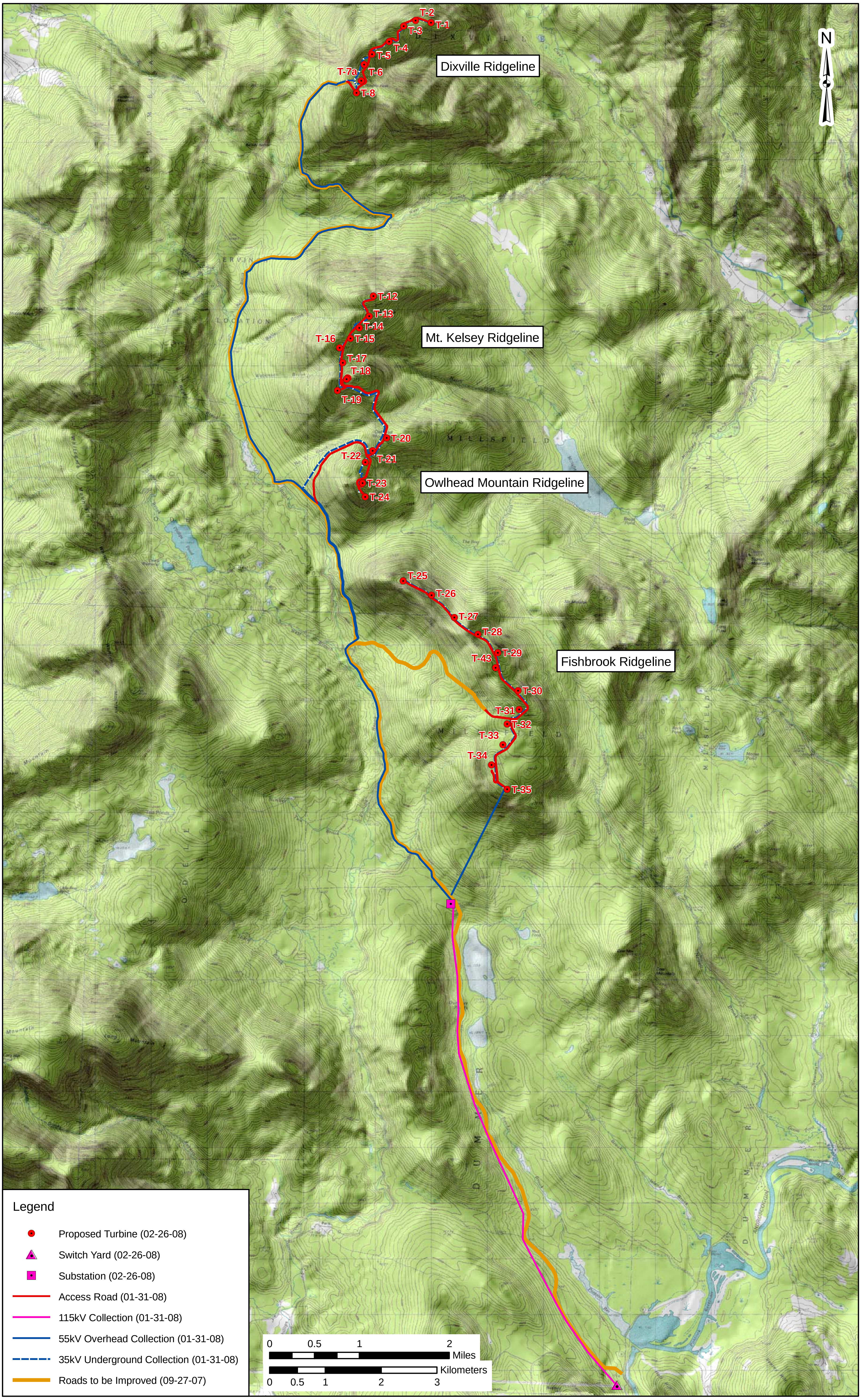

FIGURE 3: Topographic Relief View of Project Area

SOURCE: GRANIT 2007; Granite Reliable Power 2008 to moderate slopes and some moderate to well drained soils, and some areas are relatively close to bodies of water, such as brooks, ponds, and forest wetlands.

B. Scope of Services

The objective of the survey was to identify and assess areas of archaeological sensitivity (or potential) and identify any extant archaeological sites within areas to be impacted by the construction of wind-powered generating facilities, service/access roads, connection utilities, and switchyard/substation construction within the project area. The survey included background research and fieldwork.

Berger conducted its Phase IA investigation research in November and December 2007. The first part of the Phase IA research consisted of a site visit, with the goal of completing a pedestrian survey of the entire APE. On December 14, 2007, a windshield survey of the primary access roads and a walkover of the proposed switchyard and substation locations were conducted; however, owing to inclement weather on both November 15, 2007 (heavy rain and flood warning) and November 16, 2007 (heavy snowfall) Berger was prevented from conducting a complete walkover of the summit access roads or turbine locations in the project area before snow cover. An intense pedestrian survey of the entire APE is therefore recommended before a Phase IB investigation is implemented.

The goal of the background research was to assess the potential for cultural resources within the project area. This research included a review of archaeological site files at NHDHR in Concord, New Hampshire (November 14, 2007) and of cultural resource management projects conducted within Coos County. Additional research was conducted on the environmental and cultural context of the region, in particular as it relates to the project area.

All cultural resource services were performed using the professional guidelines and standards set forth in the Procedures for the Protection of Historic and Cultural Properties (36 CFR 800) and the Procedures for Determining Site Eligibility for the National Register of Historic Places (36 CFR 60 and 63). This investigation also conformed to the Secretary of the Interior’s Standards for Archaeology and Historic Preservation (48 *Federal Register* 44716) (U.S. Department of the Interior 1983) and *Archaeological Standards and Guidelines* (New Hampshire Division of Historic Resources [NHDHR] 2007). The cultural resource specialists who performed this work satisfy the Secretary of the Interior’s Professional Qualifications standards as specified in 36 CFR 66.3(6) (2).

This report has been organized into five chapters. After the introduction, Chapter II summarizes the results of the background research conducted for this project. Chapter III describes the methods and results of the archaeological investigations. Chapter IV provides a summary and recommendations. Chapter V contains a list of the references cited.

Berger Assistant Director for Cultural Resources and Senior Archaeologist Hope E. Luhman, Ph.D., directed this survey. Dr. Luhman also completed background research at the NHDHR in Concord, New Hampshire, and met with Karl Roenke, Heritage Resource Program leader at the White Mountains National Forest. Berger Archaeologist Mark Penney and Berger Architectural Historian Roger Ciuffo completed the additional background research. Mr. Penney was Principal Investigator and authored the report with contributions from Dr. Luhman and Mr. Ciuffo. Senior Editor Anne Moiseev edited and produced the report, and Principal Draftsperson Jacqueline L. Horsford completed the graphics.

II. Background Research

A. Introduction

The background research for the Phase IA survey of the Windpark included general environmental, cultural and historical research and examination of the New Hampshire site files, cultural resource management report files, and published archaeological articles from the region. Archaeological site files at the NHDHR in Concord were reviewed for information on earlier archaeological surveys and previously recorded archaeological sites in the project area vicinity. The types and locations of previously recorded archaeological sites were used as a guide for determining site sensitivity and expected site types in the Windpark project. The prehistory and history of the region were reviewed in order to understand the project area's historical background and provide a context on which to base the sensitivity assessment.

B. Environmental Context

1. General Project Area Setting

The proposed Windpark project lies within the New England physiographic province, part of the Appalachian Highlands. This province is divided into five major sections: the New England Uplands, the Seaboard Lowlands, the White Mountains section, the Green Mountains section, and the Taconic section. The project area is located in the White Mountains[2] section of the New England physiographic province, which represents the northern one third of New Hampshire. Stream valleys in the region can be deeper and narrower with faster rates of flow as compared to stream valleys in other parts of the state. Average elevation within the White Mountains section ranges from 1,000 feet (305 meters) above mean sea level (amsl) to 2,000 feet (609 meters) amsl. Many areas are above 2,000 feet (609 meters) amsl, and 46 peaks rise over 4,000 feet (1,219 meters) amsl. Mt. Washington, at 6,288 feet (1917 meters) amsl, is the highest elevation in the Northeast (Potter 1994:9). This section has three major subdivisions: the Presidential Range in the east, the Franconia Mountains in the west, and the hilly country of northern New Hampshire (Van Driver 1987:18).

The undeveloped expanse of commercial forests in the Phillips Brook Valley is situated west of the mountain range that forms the wind turbine section of the project area. About 2 to 3 miles west of the wind turbine area, the terrain rises up to form the large expanses of uplands and higher peaks in the Nash Stream Forest. Southwest, and straddling the border of the Phillips Brook tract and the Nash Stream Forest, are the Trio Ponds and Long Mountain. South of the Windpark, Phillips Brook empties into the Upper Ammonoosuc River. Further beyond, the northern flanks of the Killkenny Mountains in the White Mountain National Forest rise above the river valley. To the east the project area is bounded by the lower slopes and hills associated with the majority of the Bayroot lands in the unincorporated township of Millsfield and the town of Dummer. Mt. Patience and Signal Mountain are two named summits several miles to the east that lie at generally lower elevations than the ridgeline that forms the wind turbine area.

Soils in the APE are diverse, and there are stark differences in the soil composition between the ridgelines and the remainder of the APE at lower elevations. For instance, along the ridgelines of Mt. Kelsey and Owlhead Mountain, soils are predominantly of the Glebe-Saddleback-Sisk association—very stony, ranging from gently sloping to very steep. Along the Dixville Peak ridgeline, soils are of the Saddleback-Glebe-Ricker association and are moderately steep and very stony. On the Fishbrook ridgeline the soils

[2] The project area is not located within the White Mountain National Park, which is also contained within the White Mountains section of the New England physiographic province.

consist mainly of Peru-Pillsbury soils, very stony with gentle to moderate slopes. The soils along the ridgelines all possess surface characteristics that include steep slopes, erosive textures, bedrock outcrops, surface boulders and extreme rockiness (United States Department of Agriculture- National Resource Conservation Service [USDA-NRCS] 2007).

The remainder of the APE away from the ridgelines consists of the primary and secondary access roads, collection lines, and the switchyard and substation. In these areas the soil characteristics are different. Beginning with the access roads, the soil composition changes from south to north. In the southern portion of the APE along Dummer Pond Road, soils are predominantly gently to moderately sloping and very stony Beckett-Skerry soils, supplemented by moderately sloped, very stony Skerry-Peru soils. Along Phillips Brook Road soils are predominantly very stony, gentle sloping Peru-Pillsbury soils, supplemented by moderately sloped and stony Skerry-Peru soils, undulating Monadnock-Hermon stony soils, and gentle sloping Cabot-Howland association soils. Further north in the APE along the forest access road from Phillips Brook Road to the West Branch of Clear Stream, soils are dominated by undulating and very stony Dixmont-Bangor association soils. There are, however, some small sections of Grange Silt Loam and Sheepscot cobbly, fine sandy loam near the stream. From the West Branch of Clear Stream to Dixville Peak, the soils consist mainly of moderately sloped and very stony Peru-Pillsbury soils, in addition to very steep rocky outcrops and sloped and stony Saddleback-Glebe-Ricker association soils. Lastly are the soils of the switchyard and the substation. Soils at the switchyard location are predominantly Skerry fine sandy loam, very stony with 3 to 8 percent slopes, supplemented by Beckett-Skerry association, which are gently sloping, stony soils. At the location of the proposed substation, the soils consist of Peru-Pillsbury, gently sloping, very stony soils (USDA-NRCS 2007).

TABLE 1

SOILS IN PROJECT AREA

NAME	RELATIVE DEPTH	SOIL FORMATION	TEXTURE, INCLUSIONS	SLOPE (%)	DRAINAGE
Beckett-Skerry	Very deep	Loamy mantle overlying dense, sandy till on glaciated uplands	Very stony	0-60	Moderately well drained
Cabot-Howland	Very deep	Dense loamy till on glaciated uplands	Very stony	0-25	Poor to moderately well drained
Dixmont-Bangor	Very deep	Glaciated till	Very stony	0-25	Poor to moderately well drained
Glebe-Saddleback-Sisk	Shallow to moderately deep	Loamy till on glaciated uplands	Very stony	3-80	Well drained
Marlow-Peru	Very deep	Loamy till on glaciated uplands	Extremely Bouldery	15-60	Well drained
Monadnock-Hermon	Very deep	Loamy mantle overlying sandy glacial till on uplands and mountain side slopes	Very stony	0-60	Well to excessively drained
Peru-Pillsbury	Very deep	Dense loamy, glacial till on glaciated uplands	Very stony	3-35	Poor to moderately well drained
Saddleback-Glebe-Ricker	Very shallow-shallow	Glacial till	Very stony	3-80	Well drained on mountains
Skerry Fine Sandy Loam	Very deep	Loamy mantle overlying dense, sandy till on glaciated uplands	Very stony	3-8	Moderately well drained
Skerry-Peru	Very deep	Loamy mantle overlying dense, sandy till on glaciated uplands	Very stony	0-35	Moderately well drained

Source: USDA-NRCS (2007)

Modern disturbance in the APE is minimal. The Windpark lies in an active logging area that has been in use since it became an International Paper Company active forestry area in 1896 (Doscher 2006). The project area contains a matrix of existing named (e.g., Dummer Pond Road and Phillips Brook Road) and unnamed logging or forest access roads. The APE for the Windpark project lies along the ridgelines of Fishbrook, Owlhead Mountain, Mt. Kelsey, and Dixville Peak and in the low-lying areas of the Phillips Brook watershed.

2. Environmental History

Paleoecologists have constructed the environmental history of New Hampshire and New England from a variety of sources, including pollen cores, sedimentation histories, and faunal collections. New Hampshire was largely deglaciated by 13,000 years before present (BP), although the mountain valleys were probably not free of ice for another 1,000 years (Potter 1994). Glacial Lake Hitchcock had drained probably by 13,000 BP, revealing today's Connecticut River valley. As the glaciers retreated north, they continued to affect climate for thousands of years, producing a wet and cold climate during which frigid arctic conditions prevailed, leaving the ground frozen for most of the year. Vegetation in the wake of the glaciers consisted of moss, lichens, and stunted shrubs. Fauna during this period likely included wooly mammoths, mastodons, moose, elk, herds of caribou, musk ox, and smaller arctic animals, such as ptarmigan, arctic shrews, and lemmings.

By 10,000 BP and the beginning of the Holocene, the climate was warming, and tree populations of pine, spruce, and birch expanded, changing the landscape from open woodland to closed forest (Potter 1994). Between 9000 and 4000 BP, the climate in general became warmer and dryer, and the modern forest of hemlock, beech, and yellow birch developed, although with much local variation (Potter 1994). These changes led to growth in the populations of many animals that today live in the Northeast, including moose, beaver, lynx, porcupine, snowshoe rabbit, spruce grouse, mice, voles, and other animals that likely came in from the south.

Different strands of evidence from the Upper Midwest and the wider Northeast reveal that between 7500 and 5300 BP, precipitation was higher than today, and the climate was fairly warm. Along the Missisquoi River to the northwest in Vermont, evidence of rapid sedimentation and increased channel migration between 6500 and 5400 BP indicates a higher level of rainfall. Other evidence of a wetter environment includes high rates of hemlock and beech pollen deposition, as well as beech, cedar, maple, and hemlock logs found along the Missisquoi floodplain that date to this time period (COHMAP Members 1988; Thomas and Dillon 1983).

In general, rivers in New England between 10,000 and 7000 BP meandered widely and did not reach their present channels until after isostatic rebound from the receding glaciers (Potter 1994). Evidence of drier conditions after the sixth millennium BP includes the entrenchment and infrequent flooding of rivers in the upper Midwest (Thompson and Bettis 1982); the climate was probably between two and four degrees centigrade warmer than today (Dincauze 1989). After 5000 BP the quantity of hemlock went into steep decline and the amount of oak and hickory increased (Whitehead and Bentley 1963), also indicating drier conditions.

Temperatures likely became cooler after about 2800 BP, and precipitation probably increased to about AD 270. These changes led to greater quantities of spruce and fir at higher elevations and a general increase in pine in the lowlands (Bernabo and Webb 1977; Whitehead and Bentley 1963). Warmer temperatures then returned during the first millennium AD, with a rise in precipitation after about AD 750 (Swain 1978). Most of the state is now reforested; original timber stands over much of the state were cut in the nineteenth century.

C. Cultural Context

Archaeologists in New Hampshire have identified four major periods covering the more than 10 millennia of Native American occupation and settlement of the region before European settlement (Bunker 1994:20-21): Paleoindian, Archaic, Woodland, and Contact. Further subdivisions exist for each of these periods.

1. Paleoindian Period (11,000 to 9000 BP)

The earliest known human occupations of New Hampshire date to the Paleoindian period. These occupations are marked by the widespread use of narrow, unnotched spearpoints, the faces of which were typically marked by the removal of a single long flake, or flute. Projectile points of this period broadly resemble the Clovis point type, which was a key diagnostic element of the first Paleoindian tradition defined in the western United States. In the past two decades archaeologists in northern New England have begun to recognize that a later manifestation of Paleoindian culture also occurs in the region, characterized by an unfluted lanceolate projectile point. This point is somewhat analogous to those from the Plano tradition of the later Paleoindian period in the western United States. The recognition of fluted point and unfluted lanceolate point assemblages in northern New England has led archaeologists recently to divide the Paleoindian period into early and late subperiods (Curran 1994). In addition to fluted points, the stone technologies of these groups consisted of a flake-based toolkit with general categories of wide- and narrow-bit unifacial tools, unifacial gravers, utilized flakes, bipolar artifacts, and large bifaces.

There are eight recorded Paleoindian sites at five locations in or near the White Mountains, just south of the project area (Boisvert 1998, 1999). One site in particular, the Mt. Jasper Lithic Source near the confluence of the Androscoggin and Dead rivers in the city of Berlin, New Hampshire, has been recognized for some time, and Mt. Jasper rhyolite has been documented at Paleoindian sites in nearby Jefferson, New Hampshire. One additional Paleoindian site near the Windpark, approximately 5 miles to the west, is the Colebrook Site. Unlike the Paleoindian components at the sites in Jefferson and at Mt. Jasper, lithics at Colebrook were primarily high-quality exotic raw materials (Boisvert 1999).

People during the Paleoindian period in the Northeast probably preferred bedrock lithic sources as opposed to secondary cobble, and this lithic procurement strategy may have been driven, in part, by the design requirements of their highly transportable stone toolkits. Locations of raw material sources for Paleoindian stone toolkits are often many kilometers distant from the sites where these tools are recovered. These distances indicate that people in the Northeast traveled far to collect stone for tool making either during their seasonal movements or as part of trips made specifically to gather new supplies of lithic materials (Seeman 1994).

Disagreement exists over whether people at the end of the Pleistocene in the Northeast were specialists following herds of caribou, or generalists living off a diverse environment, collecting and hunting a wide range of resources (Dincauze and Curran 1983; Pelletier and Robinson 2005). More than likely the reality varied over time and across space, and was a question not of specialist versus generalist but rather of degree and scale. As specialists people likely gathered together in larger, multifamily settlements at key times of the year along strategic intercept points to hunt caribou. These larger aggregations then split up into smaller groups and moved widely across the landscape. As generalists the people of the Paleoindian period may have moved in small family-sized groups, mapping their movements to the availability of resources.

2. Archaic Period (9000 to 3000 BP)

Archaeologists call the period beginning 9,000 years ago following the end of the Pleistocene and the beginning of the Holocene the Archaic period. They further subdivide the Archaic into at least three subperiods, Early (9000 to 7500 BP), Middle (7500 to 6000 BP), and Late (6000 to 3000 BP), largely based on changes in projectile point styles.

In the past archaeologists generalized the environment of the early Holocene (Early and Middle Archaic) in the Northeast as closed woodlands dominated by conifers (Dincauze and Mulholland 1977; Fitting 1968, Ritchie 1980). Since a low carrying capacity characterizes such an environment, they hypothesized there was a low population until about 6,000 years ago that resulted in low site density. More recently archaeologists have questioned this understanding. George Nicholas (1991a, 1991b, 1998) cites evidence that the landscape in the early Holocene was far more diverse, supporting a broader resource base than that characterized by a closed conifer forest environment. According to Nicholas's "glacial lake basin mosaic model" (Nicholas 1991a, 1991b, 1998), people took advantage of a highly productive ecosystem that contained a complex system of lakes, ponds, and wetlands.

Robinson and Petersen (1993) cite the problems encountered with trying to attach changing demographics to known frequencies of temporally diagnostic projectile points. Since earlier archaeologists did not find many sites with temporally diagnostic points in early Holocene contexts, they assumed that this meant that there were few people and that the region was fairly uninhabited. Robinson and Petersen (1993) further observe that the lithic technology recovered from known early Holocene components was typically very expedient, resulting in the production of few temporally diagnostic formal artifacts, such as projectile points. Assemblages from these sites consist mostly of flakes and as a result, many of the components dating to this time period have likely gone unrecognized. Furthermore, it is possible that many sites from the Early and Middle Archaic lie deep beneath river floodplains (Vermont Division for Historic Preservation [VTDHP] 1991:5-1).

The combination of environmental and technological changes during the transition to the Early Archaic may indicate an increase in the importance of plant foods and shifts in the exploitation of certain terrestrial fauna, such as the hunting of deer rather than caribou. As opposed to the Paleoindian use of high-quality cherts brought long distances before discard, evidence from early Holocene sites indicates a change to the use of local chert, quartzite, and quartz during the Early Archaic. The change is likely the result of people living in far more restricted areas than their Paleoindian period ancestors, as well as a lack of widespread external contacts (VTDHP 1991:5-6). Archaeologists have long thought that people remained within these more restricted territories, spending significant portions of the year in larger base camps while also using smaller, more task-specific camps in the surrounding area (Snow 1980:171).

The number of known sites as well as diagnostic artifact types and projectile points dating to the Late Archaic (6000 to 3000 BP) is far greater throughout the Northeast than for any of the preceding periods. There is also greater evidence of the use of mortuary ceremonialism. Archaeologists have traditionally characterized the Late Archaic in the Northeast into three basic traditions based on these numerous changing artifact types. The first of these, the Laurentian tradition, is thought to date between about 5600 to 4400 BP and is known from sites throughout the Northeast, including New York, southern Ontario, southern Quebec, and northern New England. The Narrow Point tradition follows the Laurentian and dates roughly between 4400 and 3600 BP. Archaeologists have found artifacts associated with this tradition along the East Coast from as far south as North Carolina and as far north as the Upper St. Lawrence River. The Susquehanna tradition is later, dating from about 3800 to 1800 BP. Traits associated with this tradition are thought to have moved north from the Southeastern Piedmont to as far north as Maine and the Upper St. Lawrence.

These traditions differ from each other based largely on changing artifact traits; however, Dean Snow (1980) and others (e.g., Braun and Braun 1994) geographically split the Northeast during the Late Archaic into three very general sections, based on broad generalizations about adaptations to major regional environments. The Maritime Archaic lay in the coastal regions of northern New England and the Canadian Maritimes and is defined as an adaptation based on the resources of the ocean. The Lake Forest Archaic stretched from the Eastern Great Lakes across northern New England. Snow (1980) believes that the people of the Lake Forest Archaic lived around the many lakes and rivers found in the region. The Mast Forest Archaic ran from the coastal plains of southern New England into the oak forests of the interior. Here people are thought to have made use of the abundant nut-bearing deciduous trees in the region. Although these models are useful in a very general sense, they are also problematic because they mask much of the potential for variation across the Northeast.

Our understanding of the lives people led in the Northeast is largely shaped by where the vast majority of archaeologists have worked along the great rivers of the region, including the Connecticut, the Hudson, and the Merrimack. Thousands of years ago, people migrated to these rivers each spring to take advantage of the abundant annual migrations of anadromous fish. Each spring around April, these fish swam far up the rivers and their tributaries to spawn until stopped by falls. They created a plentiful food resource for people at the leanest time of year, when the winter stocks were empty. These large groups of people likely stayed together throughout much of the warm-weather months, splintering off periodically to hunt, gather different food, and collect other needed resources. There is ample archaeological evidence along the floodplains of large rivers in much of the Northeast of these large gatherings at so-called “base camps.” With the onset of the cold weather, people are thought to have splintered into smaller groups, likely extended families, and moved inland away from the river. Ritchie and Funk (1973:340) define this pattern of small groups of hunter-gatherers aggregating during the spring and then splintering in the fall as the “central-based wandering” pattern.

3. Woodland Period (3000 BP to AD 1600)

As with the Archaic period, the Woodland period is also subdivided into three periods, Early (3000 to 2000 BP), Middle (2000 to 1000 BP), and Late (1000 BP to AD 1600), largely based on the presence or absence of different projectile point types. The Woodland period, however, is distinctive from the Archaic because of the introduction of ceramic technology. Changes in ceramic types provide an additional means for separating the Woodland period into subperiods.

Evidence of the use of ceramics in the Northeast dates to the Early Woodland about 3,000 years ago, with the earliest dates in New Hampshire coming from the Beaver Meadow Brook and Eddy sites in the Merrimack Valley (Bunker 1994:23). With ceramic technology people created highly durable containers that provided waterproof storage and could withstand the rigors of cooking with direct heat. These changes in cooking may have affected the nutrition and population dynamics of Woodland groups, and ceramics also enhanced their capability to store food. The ability to store food likely helped offset seasonal changes in the availability of different foods and made it possible for people to become more sedentary. Despite the possibilities presented by this new technology, there is little evidence of any profound changes in life across New Hampshire after 3000 BP, and the Archaic period use of riverine environments remained the overall focus of the Early Woodland period (Bunker 1994).

Victoria Kenyon (1982) interprets the variability in ceramic decoration within sites and the similarities in decorative patterns between sites as evidence of increased regionalism during the Middle Woodland in the Amoskeag area of New Hampshire. Many sites dating to this period are large sites on large waterways; fewer Middle Woodland sites are known on smaller streams. These changes may indicate less of the “central-based wandering” patterns that were common for millennia in the past, perhaps further indicating increased regionalism. Middle Woodland sites in the Merrimack River valley of New Hampshire include the Neville, Smyth, Garvins Falls, Beaver Meadow Brook, and Smolt (Kenyon 1983) sites.

Throughout the Northeast the Late Woodland period is associated with the introduction of horticulture, particularly the importation of domesticated maize, but it is more than likely that maize did not appear in New England until after about AD 1300 (Chilton 2006), several centuries after the Iroquois to the west had adopted it and made it a key component in their development of large permanent villages. Although maize was adopted in New Hampshire and elsewhere in New England, there is little evidence of development of large sedentary villages based on maize horticulture as in New York (c.f., Petersen and Cowie 2002). Rather, archaeological evidence indicates that people remained mobile hunter-gatherers, using maize only as a dietary supplement, therefore becoming what Elizabeth Chilton (2002) has called mobile farmers because although they planted, they did not become sedentary farmers like the Iroquois.

4. Contact Period (AD 1600 to 1750)

The Contact period began with the colonization of New England by Europeans. Native American sites associated with this period are characterized by the presence of materials that are European in origin, often reworked to fit traditional Native American needs. Increasing pressure from European settlers, wars, and diseases forced Native Americans to move into more isolated but less advantageous locations, such as hilltops. Because Native American settlements of the Late Woodland and early Contact periods were generally situated in the choicest locations along the rivers, such as falls, these locations became prime sites for European settlement.

The lack of documented Contact period sites is primarily the result of expanding European settlement in the area. Beginning in the early 1600s, European exploration and immigration in New England resulted in the spread of disease and war throughout the region. Population estimates suggest that, prior to an epidemic spread of European diseases in the 1670s, approximately 25,000 to 30,000 Native Americans may have been living in the major drainage areas of New Hampshire (Stewart-Smith 1994). While large numbers of Native Americans died during these epidemics, European immigrants continued moving into the valley and establishing settlements.

In the late seventeenth and early eighteenth centuries, hostilities and armed conflicts between natives and European settlers continued in northern New England. After repeated attacks on native communities in the region during the 1720s by militia groups from southern New England, these settlements tended to become small and dispersed into more remote areas of the White Mountains and upper Connecticut Valley regions (Bunker et al. 1995b:9).

Because intact Contact period sites are rare in the White Mountains region, the discovery of such sites would provide valuable information on settlement patterns of Native American peoples in the region and on the movement of Native American peoples out of the region. Background research for this project included review of the map titled *Historic Indian Trails of New Hampshire* (Price 1967), and although no trails cross the APE, they do follow major waterways nearby (Figure 4). There is, however, a low probability that intact Contact period sites are located within the Windpark.

D. Historic Context

1. Coos County

The name *Coos* is derived from the word *Cohos* or *Coo-ash*, which comes from the Abenaki dialect (Merrill 1888). During the eighteenth century the Upper Androscoggin valley was controlled by the

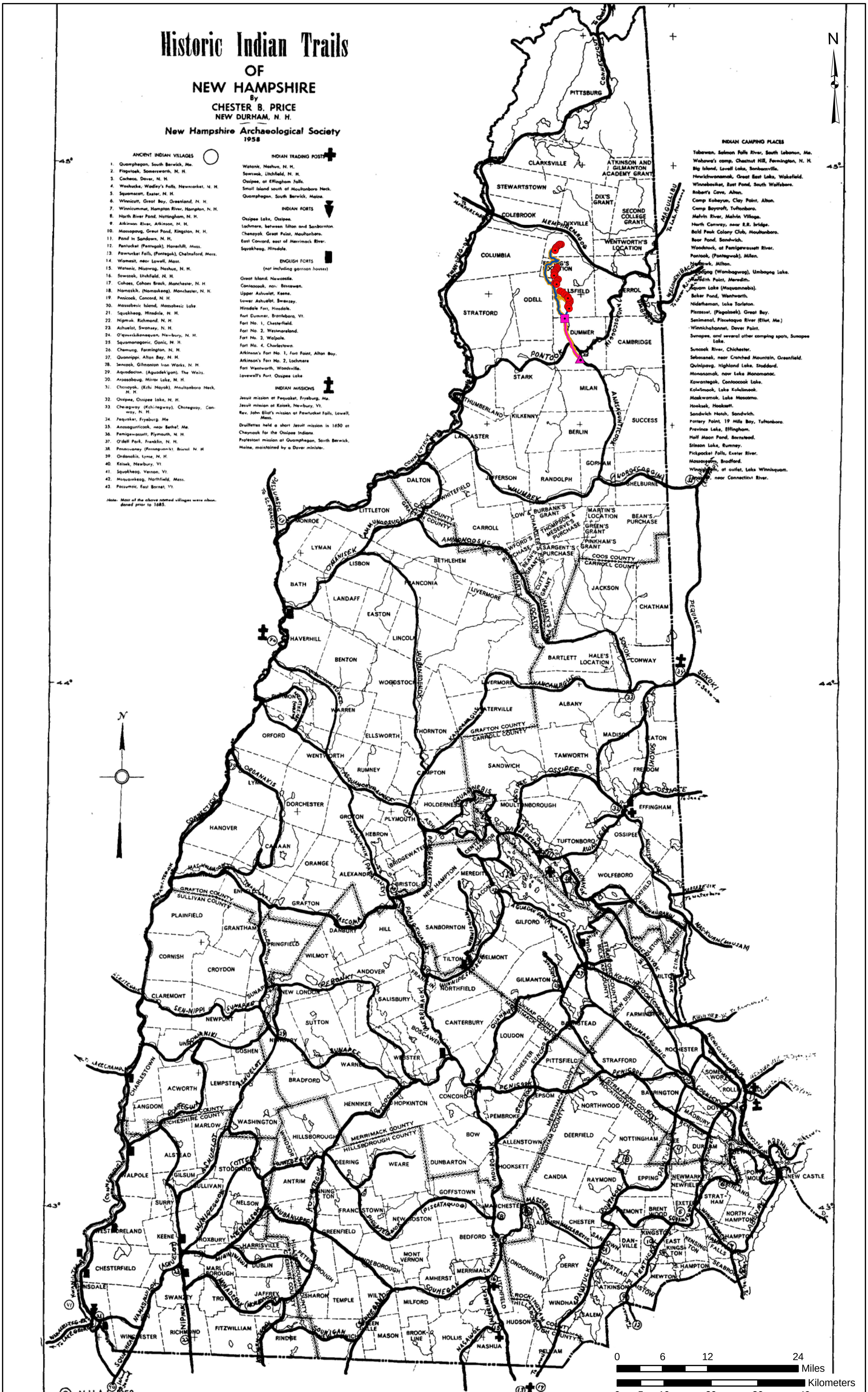

FIGURE 4: Location of Project Area on Historic Indian Trails of New Hampshire Map

SOURCE: Granite Reliable Power 2008; Price 1967

Pennacook confederacy, more specifically by a group called the Cooashaukes, translated as "dwellers in the pine country" (Cook 1976). According to folklore, the last Abenaki tribesman of Coos was named Metallak (Merrill 1888).

In spite of repeated excursions into the region, permanent Euro-American settlement in the White Mountains region was not firmly established until after the English conquest of the French in North America. European immigration into northern New Hampshire was slow, but eventually early pioneers recognized the area east of the Connecticut River as a valuable tract of land, especially the timber resources. By the close of the French and Indian War (1754 to 1763), the first Euro-American settlers had arrived at Lancaster; the act establishing Coos County was enacted in 1803, 40 years after its initial settlement (Carter 1831). Of the original town grants included in the act, two are in the project area, Dummer (later incorporated) and Millsfield. The land for Coos was taken from Grafton County, one of the five original counties of New Hampshire (Merrill 1888). Coos County is bounded on the west by the Connecticut River, bounded to the north and northwest by Canada, bounded on the east by Maine, and bounded to the south by Grafton and Carroll counties. The population grew slowly during the nineteenth century and did not greatly increase until the development of the logging industry in the 1880s and 1890s.

2. History of Towns and Places

The largest population centers of Coos County—Colebrook, Lancaster, and Berlin—all have long cultural histories, but they fall outside the Windpark. As far as can be determined, settlement in the vicinity of the Windpark generally began in the last decades of the nineteenth century. The Windpark is located within four grants of land not yet incorporated, Dixville, Ervings Location, Millsfield, and Odell, and one incorporated town, Dummer. Little historical research has been conducted on the project area itself, and information on the area is limited.

The Town of Dummer was first granted in 1773 to Mark H. Wentworth, Nathaniel A. Haven, and others, but it remained unoccupied for many years (Merrill 1888). Dummer became an incorporated town in 1848. The town was named after William Dummer, Governor of Massachusetts Bay between 1716 and 1730. The logging industry at Dummer is longstanding as lumber has been extensively produced from this heavily forested area (Merrill 1888).

Coos County contains numerous unorganized locations, grants, purchases, etc., typically located in rural mountainous areas known for valuable timber stands and as places of natural beauty. There are four such unincorporated places within the boundaries of the Windpark. The first is Ervings Location, an unpopulated land grant situated in the northern part of the project area, west of Mt. Kelsey. The second is Odell, a small township situated in the southwestern portion of the project area.

The third unincorporated place in the project area is Millsfield, a township located in the east and southeastern portion of the project area. Consisting almost entirely of wilderness, it is watered by Phillips Brook, Clear Stream, and many small ponds. Millsfield was granted in 1774 to Sir Thomas Mills, George Boyd, and others (Merrill 1988). In 1858 there was just a single dwelling in Millsfield; by 1880 the population had risen to 62. In 1952 Millsfield was organized for voting purposes.

The last unincorporated place is Dixville, a township located at the northern extent of the project area. Dixville (originally Dix's Grant) was granted in 1805, and its name came from Col. Timothy Dix (Carter 1831). In 1811 the New Hampshire legislature became interested in constructing a road from Colebrook through Dixville Notch. Eventually the road was built, and it proved to be a valuable direct link to the seaport of Portland, Maine. Dixville became well known throughout New England partly because of the scenic grandeur of the notch and also because of the wealth of timber resources (Merrill 1888). The village of Dixville Notch became famous because of its "midnight" vote: beginning in 1960 and continuing to this day, eligible voters gather at the Balsams Grand Hotel and cast their votes at midnight at the beginning of Election Day.

3. Project Area History

The project area is situated in wild and unpopulated country with a long history of timber harvesting. Historical research has indicated that there were dams on Phillips Brook used for river driving purposes, but none survive today (Doscher 2006). Late nineteenth- and early twentieth-century historical maps of the region do not reveal the presence of any structures in the project area (Figures 5-7). During the 1880s and 1890s the logging industry in northern New Hampshire, and in particular in Coos County, increased dramatically and lumber companies became a major economic force in the region (Pike 1967). During the forestry boom Phillips Brook was the first tract of forest acquired by the International Paper Company after its founding in 1898. It was acquired from the Glen Manufacturing Company. It remained in International Paper ownership until 2004, when it was sold to GMO Renewable Resources as part of a 1.5 million-acre transaction (Doscher 2006).

Besides still being an active logging area, the project area is used by the general public for recreation purposes. In particular, the area is used by hunters to pursue game birds and moose, by anglers, and for hiking, camping, mountain biking, kayaking, cross-country skiing, snowshoeing, and snowmobiling.

E. Previous Archaeological Surveys and Recorded Sites in the Vicinity of the Project Area

Background research at the NHDHR indicates that no archaeological surveys have been conducted and no archaeological sites or sites listed in the National Register of Historic Places have been previously recorded within a 3-mile (4.8-kilometer) radius surrounding the Windpark. The background research also showed that the number of previously recorded archaeological sites in the region is relatively low, but the low number of recorded sites is a result of the limited amount of archaeological research that has been conducted in the regions surrounding the project area and is not necessarily reflective of the sensitivity for site locations in this part of New Hampshire.

Archaeological surveys have been conducted in other parts of Coos County and the region in recent years (Berger 2005a, 2005b; Boisvert 1992, 2003; Bunker et al 1995a; Bunker et al. 1995b; Cassedy 2003; Eichinger and Morin 2006; Feighner 1999; Jefferson 2005; Paquin and Petersen 1988; Petersen and Boushehri 1988; Reeve et. al. 1993; Wheeler 2000; Wheeler et. al. 2001), and these studies have contributed both to our archaeological knowledge of the region and to our ability to determine archaeological sensitivity and testing strategies in northern New Hampshire. Precontact period and historical archaeological sites discovered in the region by these more recent surveys, or by other means, are listed in Tables 2 and 3.

The closest archaeological sites to the project area lie more than 3 miles (4.8 kilometers) northwest of the northern boundary of the APE in the vicinity of the Town of Colebrook. These two sites (27-CO-48 and 27-CO-49) are both historical farmstead sites, and since the APE does not possess soils or the flat terrain suitable for agricultural purposes, it is Berger's opinion that these sites do not add anything to the predictive model for the APE.

The majority of archaeological sites within 20 miles (32.2 kilometers) of the project area are from the precontact period. The most significant of these sites are associated with the extensive Mt. Jasper lithic quarry and its associated workshops. This extremely high-density area of activity has been designated by

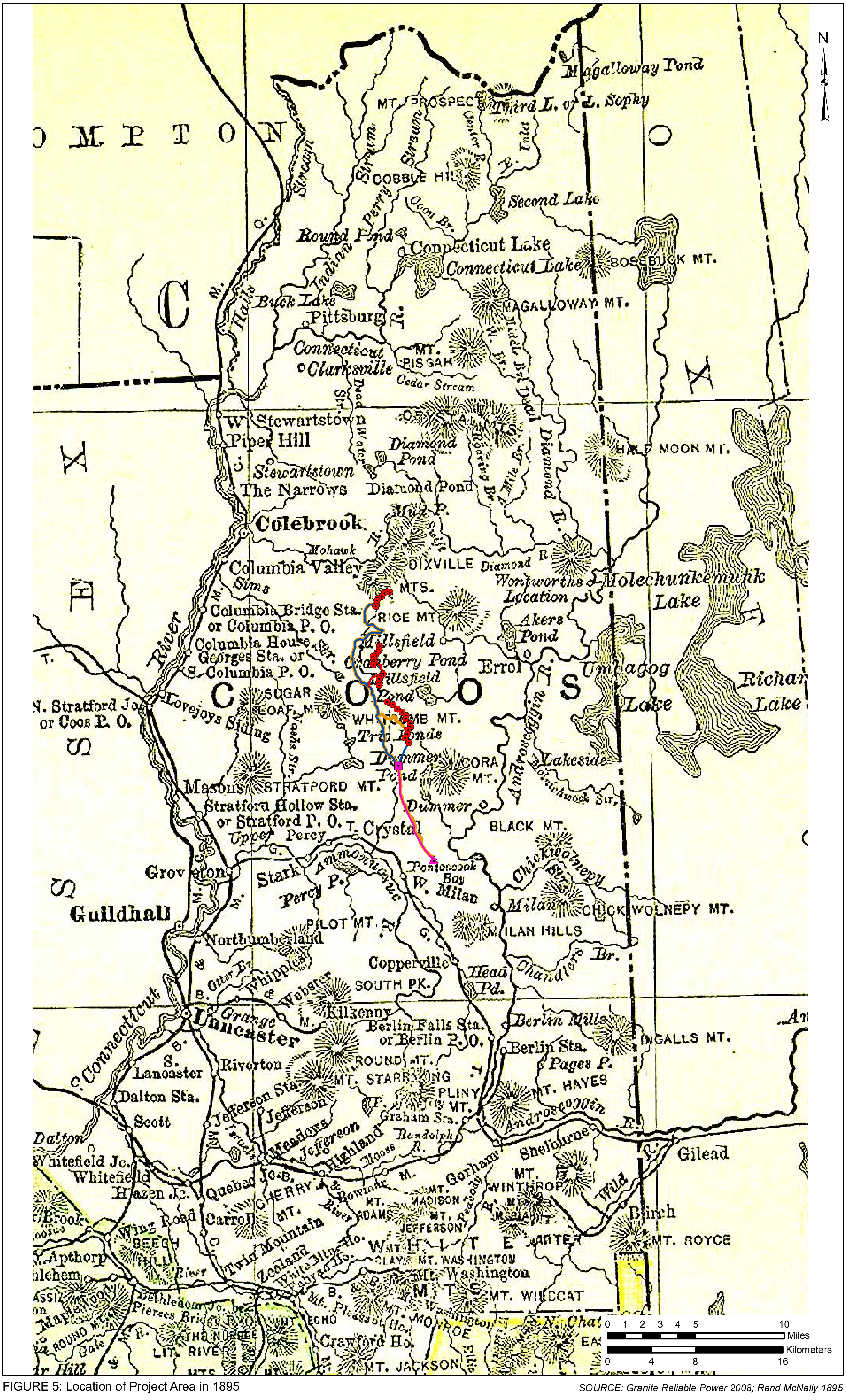

FIGURE 5: Location of Project Area in 1895

SOURCE: Granite Reliable Power 2008; Rand McNally 1895

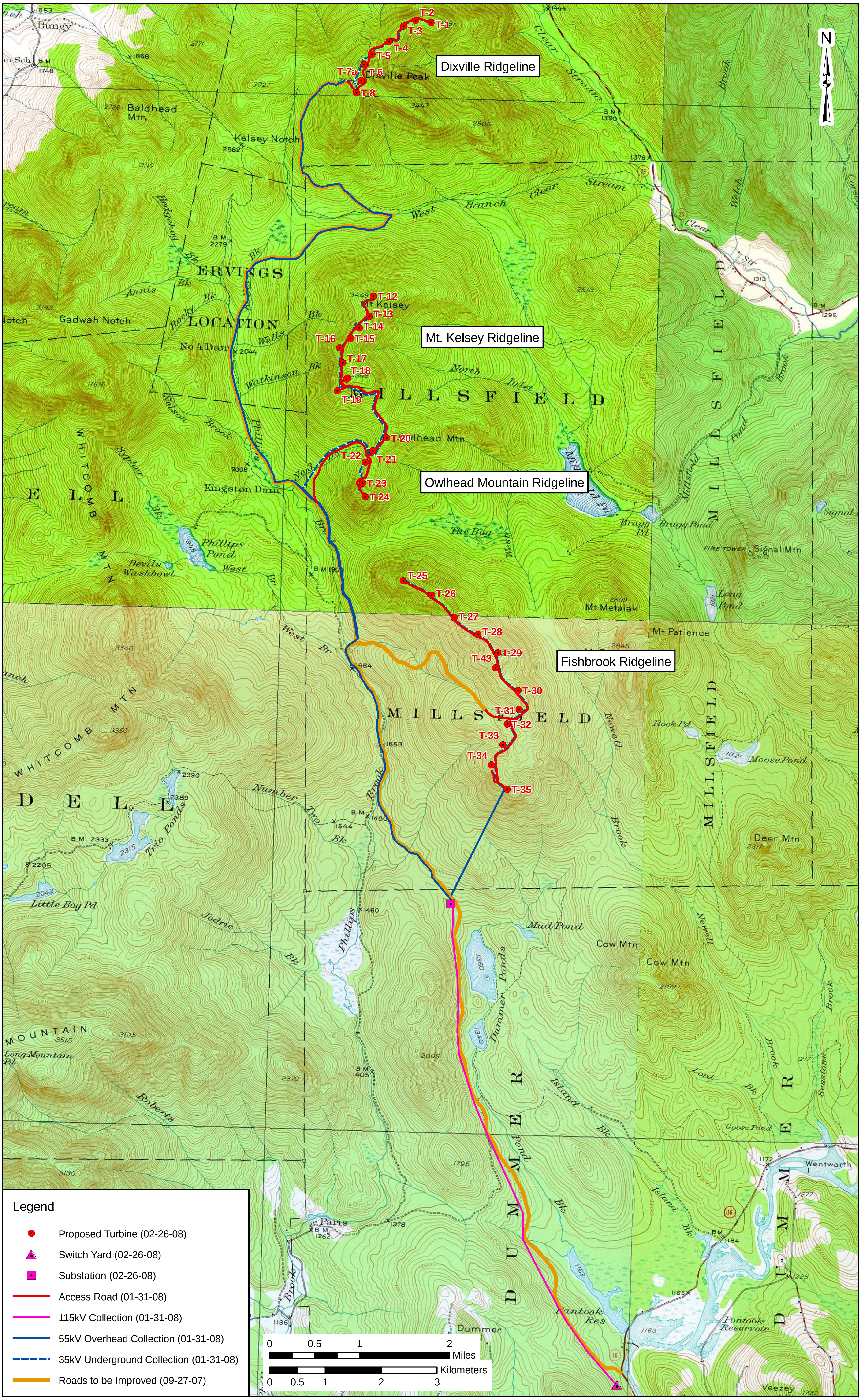

FIGURE 6: Location of Project Area in 1930

SOURCE: Granite Reliable Power 2008; USGS 15-Minute Quadrangles, Dixville, NH 1930a, Errol, NH-ME 1930b, Milan, NH-ME 1930c, and Percy, NH 1930d

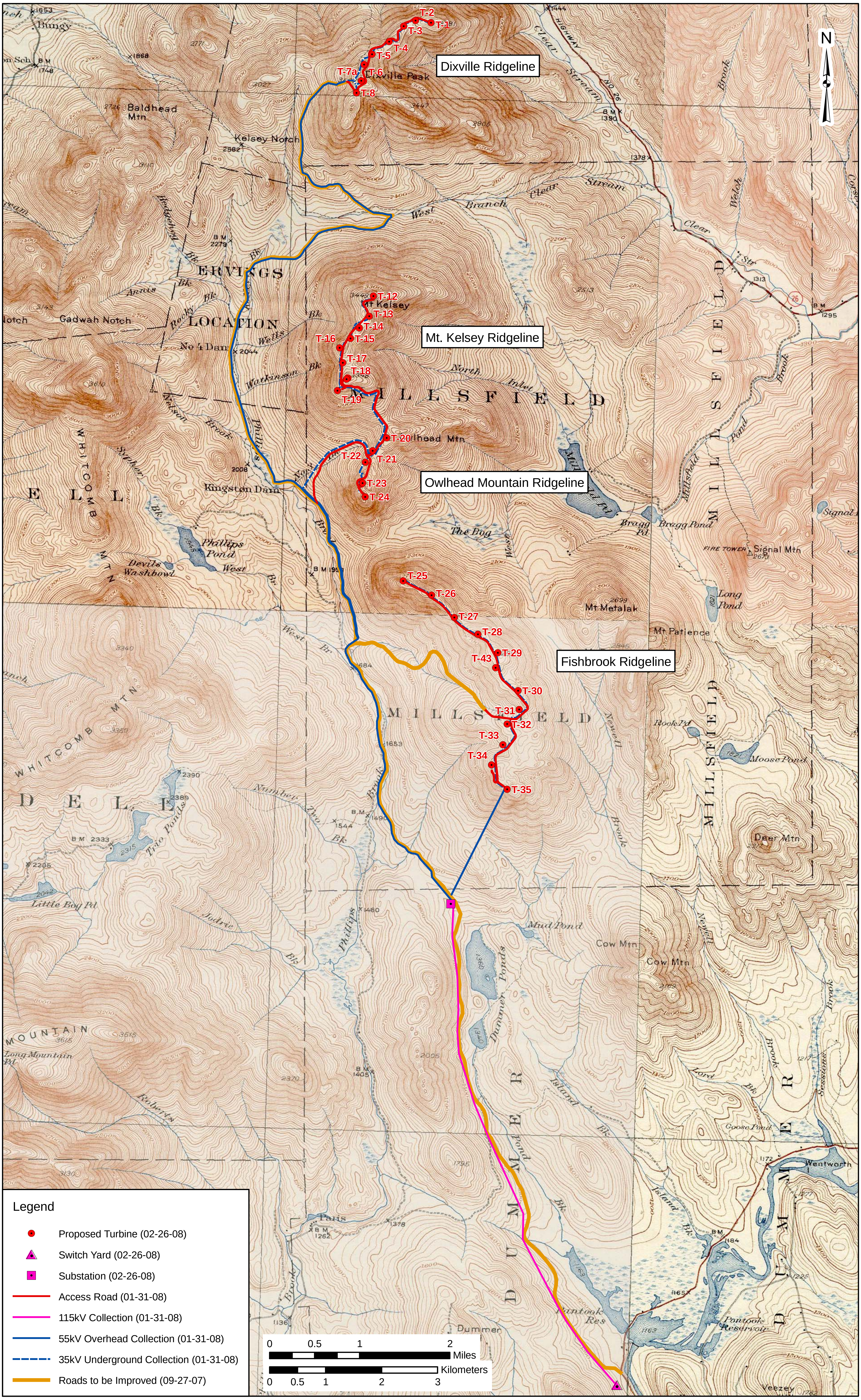

FIGURE 7: Location of Project Area in 1934

SOURCE: Granite Reliable Power 2008; USGS 15-Minute Quadrangles, Dixville, NH 1934a, Errol, NH-ME 1934b, Milan, NH-ME 1934c, and Percy, NH 1934d

TABLE 2

PRECONTACT PERIOD SITES IN VICINITY OF PROJECT AREA

SITE NUMBER	LANDFORM AND LOCALITY	COMPONENT	SITE TYPE
27-CO-01	Mountaintop (Mt. Jasper)	Paleoindian/Archaic	Lithic quarry
27-CO-02	Base of mountain (Mt. Jasper)	Paleoindian/Archaic	Lithic reduction/workshop
27-CO-03	Base of mountain (Mt. Jasper)	Paleoindian/Archaic	Lithic reduction/workshop
27-CO-24	Disturbed hillside, slope	Unknown Precontact	Lithic Scatter
27-CO-28	Low rise with stony till	Paleoindian/Archaic	Lithic Reduction/Manufacture
27-CO-29	Unknown	Paleoindian	Lithic Reduction/Manufacture
27-CO-30	Knoll with stony till	Paleoindian	Lithic Reduction/Manufacture
27-CO-39	Terraces overlooking Connecticut River floodplain	Unknown Precontact	Unknown – possible small lithic reduction station
27-CO-40	Upper tier of a series of outwash terraces, near the Connecticut River	Unknown Precontact	Lithic scatter, short-term camp
27-CO-45	Unknown	Paleoindian	Unknown
27-CO-46	Unknown	Paleoindian	Unknown
27-CO-57	Unknown	Middle Woodland	Middle Woodland
27-CO-58	Island	Unknown Precontact	Unknown
27-CO-59	Floodplain, level and narrow sand ridge between pond and wetland	Middle Archaic	Habitation/ campsite/ Workshop
27-CO-60	Unknown	Unknown Precontact	Paleoindian
27-CO-66	Small uplands knoll	Unknown Precontact	Short-term camp/ Lookout
27-CO-67	Narrow finger ridge at edge of forested uplands overlooking Head Pond and the Upper Ammonoosuc River	Unknown Precontact	Lithic scatter, Short-term camp

TABLE 3

HISTORICAL ARCHAEOLOGICAL SITES IN VICINITY OF PROJECT AREA

SITE NUMBER	LANDFORM AND LOCALITY	COMPONENT	SITE TYPE
27-CO-48	Disturbed upland, level	Historic, Early 20th Century	Farmstead
27-CO-49	Disturbed upland, level	Historic, Early 20th Century	Farmstead
27-CO-51	Small, high knoll	Historic, Early 20th Century	Homestead
27-CO-53	Unknown	Historic, Late 19th Century	Homestead
27-CO-68	Broad, uplands ridge spur at the edge of a fallow agricultural field	Historic, Euro American	Associated with farmstead
27-CO-70	Broad, uplands ridge spur at the edge of a fallow agricultural field	Historic, Late 19th Century	Farmstead

three separate site numbers (27-CO-01, 27-CO-02, and 27-CO-03), and the complex has been listed in the National Register of Historic Places. Mt. Jasper is located approximately 10 miles (16.1 kilometers) from the southern extreme of the project area. Five other sites (27-CO-28, 27-CO-29, 27-CO-30, 27-CO-45, and 27-CO-46) in the region have been very important in evaluating the precontact period in this part of New Hampshire, in particular in Coos County. Located near the town of Jefferson on the Israel River, about 17 miles (27.4 kilometers) south of the project area, the Jefferson I, II, III, IV, and V sites have provided excellent contextual data on Paleoindian lifeways in the region. Finally, one of the most recently discovered precontact period sites in the county is the Colebrook Site (27-CO-38); a Paleoindian site located more than 8 miles (12.9 kilometers) outside the project area and recorded during a gas pipeline survey (Bunker et al. 1997). The Colebrook Site has provided additional important information of site selection characteristics and raw material and resource exploitation in the region during the Paleoindian period.

III. Fieldwork and Results

A. Phase IA Field Methods

The purpose of the survey was to identify and assess areas of archaeological sensitivity (or potential) and identify any archaeological sites within the APE, which includes all parts of the proposed Windpark that will be subject to ground disturbance, including turbine construction, access road improvements and construction, collection line installation, and switchyard and substation construction.

In addition to the background research, a windshield survey and surface reconnaissance of part of the APE (primary access roads, proposed switchyard and substation) were conducted to visually assess the degree of disturbance present and the likelihood of encountering prehistoric or historic archaeological resources. This field visit was made on November 14, 2007. Finally, refined topographic data and LIDAR[3] (light detection and ranging) data of the entire APE were carefully analyzed in order to get an accurate assessment of slope and other environmental features, such as forest wetlands and streams, in the APE. This information was also used in conjunction with topographic USDA Soil Survey maps and soil descriptions to gain an understanding of the terrain and soil conditions throughout the APE.

With the results of the background research and surface reconnaissance, zones of archaeological sensitivity were delineated throughout the APE. Berger used information obtained from archaeological surveys of upland locations (Lacy 1994, 1999) and other large-scale archaeological surveys conducted in New Hampshire, and in particular within Coos County, because few archaeological sites have been recorded in the White Mountain region compared to the rest of the state, and no models have been generated for predicting site locations in this region (Wheeler 2000:3). Factors that archaeologists have considered to define sensitivity on past large-scale New Hampshire surveys include:

- proximity to water sources, such as springs, streams, rivers, wetlands, ponds, and lakes;
- well drained soils;
- level terrain, in addition to views across the landscape and easy access along terraces or uplands;
- presence of natural resources for tool manufacture (stone), pottery making (clay), or food (plants and animals);
- locations on terraces overlooking water sources; and
- floodplains with moderately well drained to well drained soils.

For this investigation Berger has included those same variables into its sensitivity assessment, along with additional factors, notably strategic travel routes, proximity to unique landmarks, and rich or unusual natural resources. Environmental factors present at previously identified archaeological sites associated with and near the Mt. Jasper lithic (rhyolite) quarry and the Androscoggin River watershed south of the project area, namely rocky outcrops in elevated, upland locations, were also considered.

B. Results of Phase IA Research and Archaeological Sensitivity

All areas within the APE that are considered to be sensitive for prehistoric archaeological resources have fairly level terrain, well drained soils, and are in close proximity to sources of water. The areas of potentially higher sensitivity are the flat and gently sloping sections with moderate to well drained soils in

[3] LIDAR is an advanced optical and remote sensing technology that measures properties of scattered light to find range and/or other information of a distant target.

the vicinity of the Androscoggin River and its tributary, Phillips Brook, the West Branch of Clear Stream, and Dummer Pond. Other sections of the APE (access roads and auxiliary components) that are not in proximity to sources of water but are fairly level and dry are considered to possess a lower sensitivity. Although the majority of the APE associated with the ridgelines is evaluated as having a very low (or no) archaeological sensitivity, the potential to discover outcrops of lithic resources for tool making in these often sloped and stony soils cannot be dismissed. Finally, the discovery of the Paleoindian sites in Jefferson on a sloping hillside north of the river, and the presence of Sites 27-CO-66 and 27-CO-67 near Berlin on upland edges, suggests that areas of similar terrain in the APE need to be closely surveyed.

Historical research identified portions of the APE, in particular in the vicinity of bodies of water, as having a low to moderate potential for early to mid-twentieth-century historical archaeological sites. In addition, sections of existing logging roads, in particular adjacent to Phillips Brook and the Dummer Ponds, have a low to moderate potential to contain early to mid-twentieth-century logging camp sites and other historical sites associated with the area's logging industry, most notably breeched logging dams and wood processing facilities.

In order to assess more precisely the archaeological sensitivity for the Windpark, the entire APE has been subdivided into sections, delineated in terms of proposed primary access roads[4], a secondary access road, summit access roads along the ridgelines[5], the areas for turbine construction, and the substation and the switchyard (Figures 8-14). The total size of each section has been calculated based on APE buffers[6] as outlined in Table 4.

TABLE 4

ROW WIDTHS AND ACREAGE FOR WINDPARK

	APE WIDTH feet (meters)	TOTAL ROW SIZE (acres)
Primary Access Roads	50 (15.2)	110.61
Secondary Access Road	50 (15.2)	12.12
Ridgeline Summit Access Roads	75 (22.9)	85.29
Turbines	Radius: 300 ft (91.4 m)	214.17
Switchyard and Substation	-	16.88
TOTAL ROW SIZE	-	439.07

1. Primary Access Roads

The primary access road runs approximately 18.25 miles (29.37 kilometers) south to north on existing logging roads through the project area (see Figures 8-10). The primary access road begins at the junction of New Hampshire Route 16 (White Mountains Road), near the Pontook Reservoir and Dummer Pond Road. From here the access road runs north for approximately 7.10 miles (11.43 kilometers) to the end of Dummer Pond Road. From the end of Dummer Pond Road the access road follows along Phillips Brook Road north for 2.05 miles (3.30 kilometers). The access road merges onto an unnamed forest access road and then continues north for 2.25 miles (3.62 kilometers), as far as Brook No. 3, then continues north

[4] Including the 115kV Collection Line and 55kV Overhead Collection Line.
[5] Including the 35kV Underground Collection Line.
[6] APE size for the Windpark (i.e. all access roads, turbine locations and areas of ground disturbance) was determined and agreed upon by all parties (Berger, Granite, and NHDHR) during a consultation meeting on Nov 13, 2007, in Concord, New Hampshire at NHDHR.

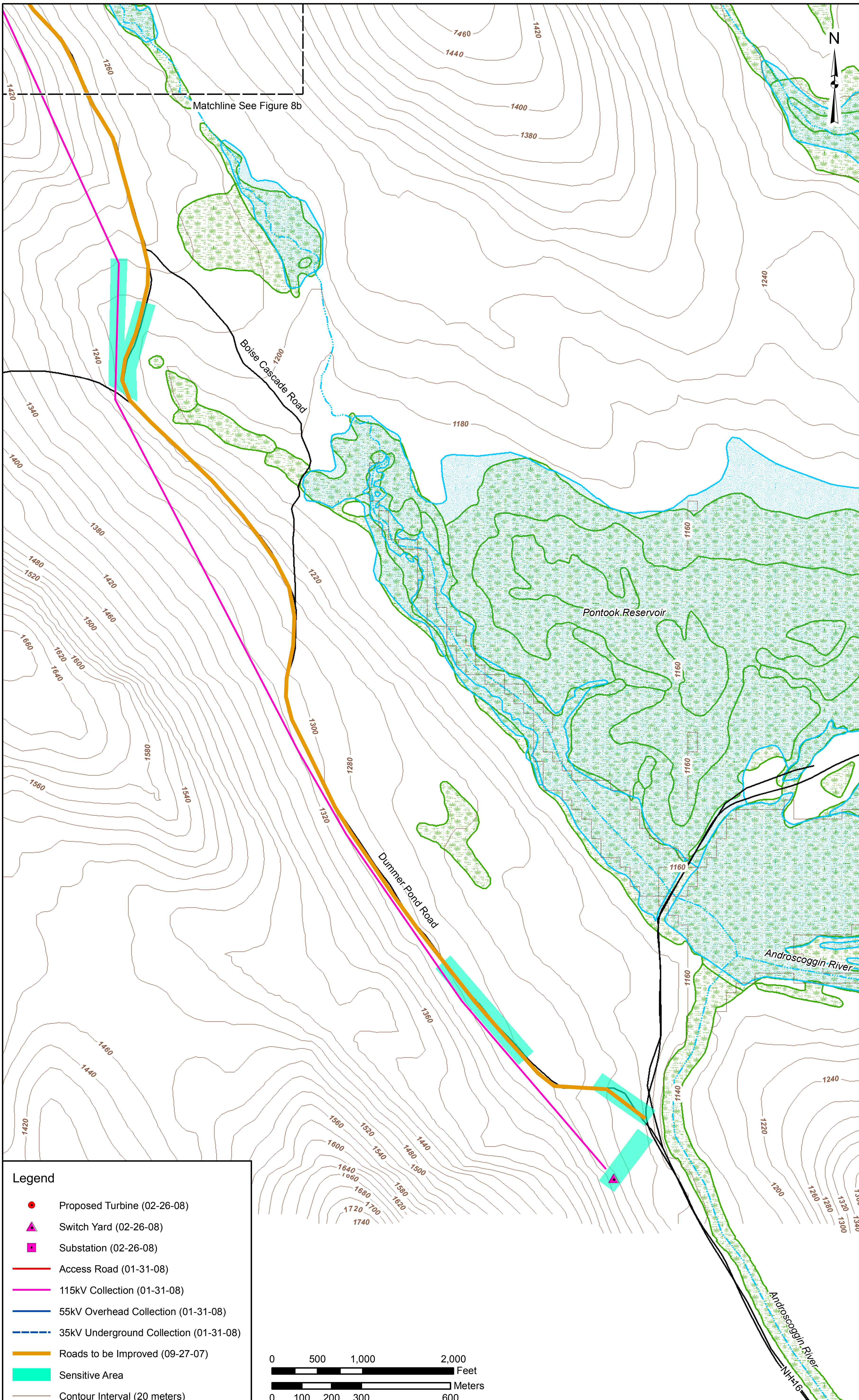

FIGURE 8a: Dummer Pond Road and Switchyard: Sensitive Areas

SOURCE: GRANIT 2007; Granite Reliable Power 2007; Granite Reliable Power 2008

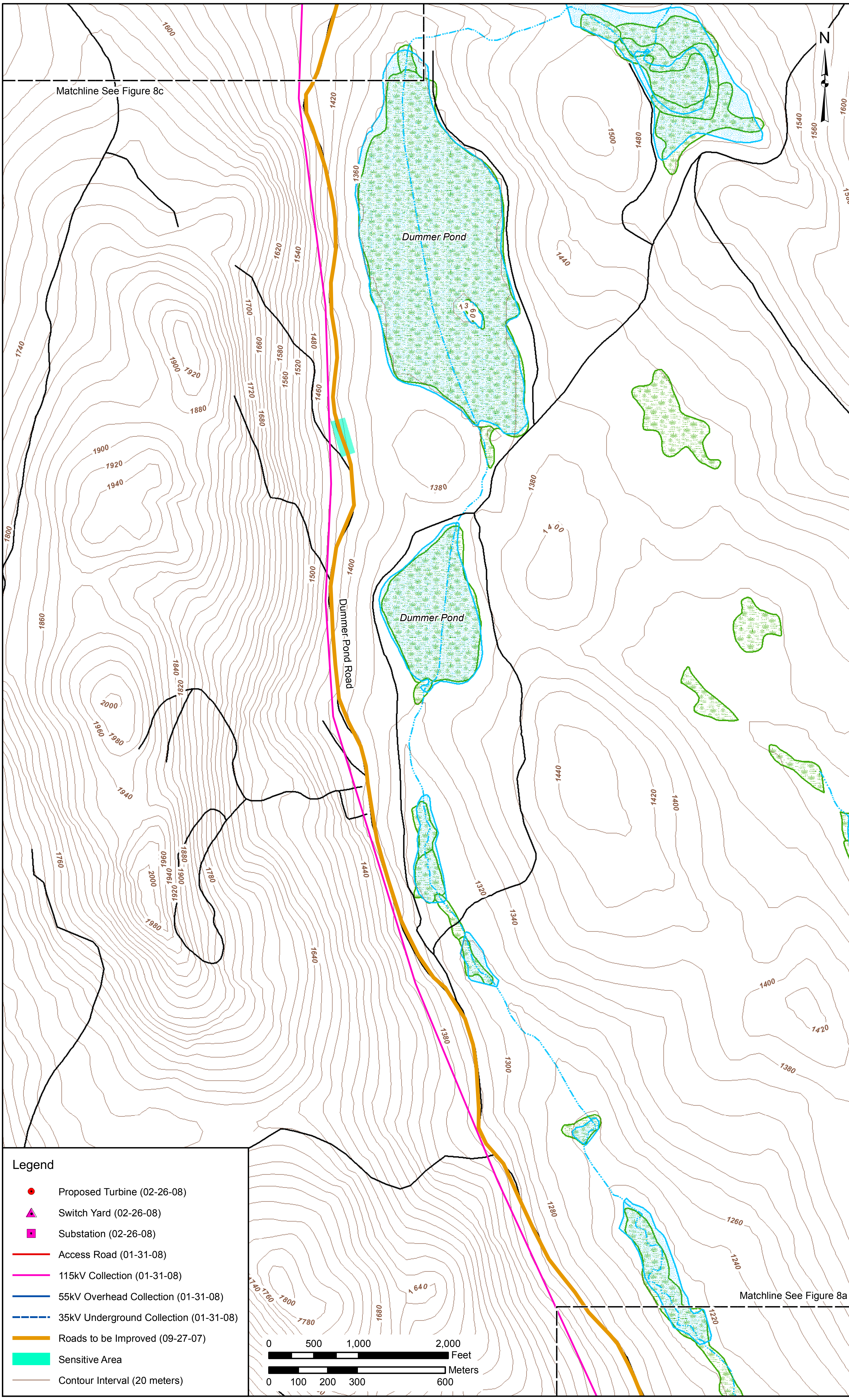

FIGURE 8b: Dummer Pond Road: Sensitive Areas

SOURCE: GRANIT 2007; Granite Reliable Power 2007; Granite Reliable Power 2008

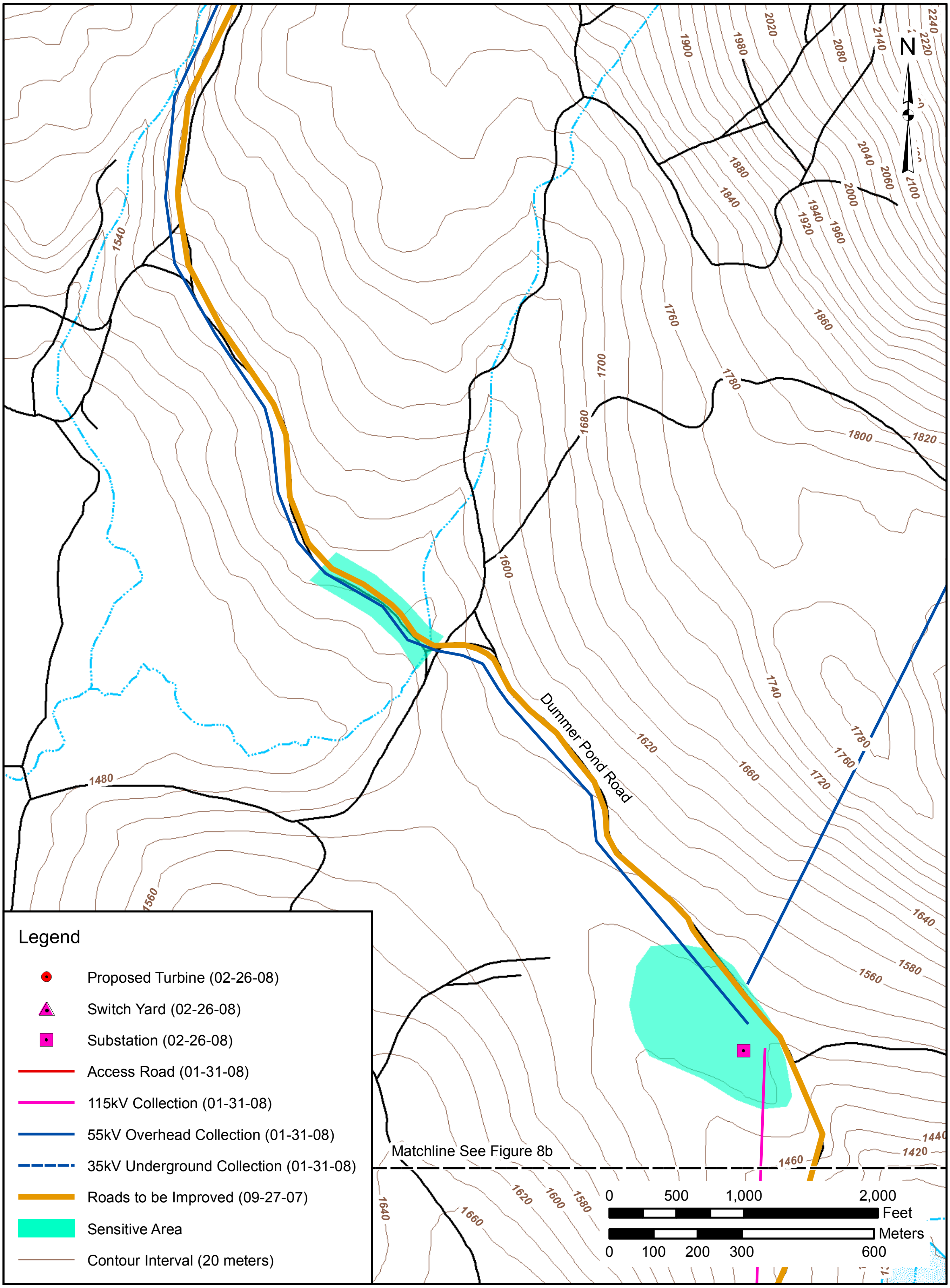

FIGURE 8c: Dummer Pond Road and Substation: Sensitive Areas

SOURCE: GRANIT 2007; Granite Reliable Power 2007; Granite Reliable Power 2008

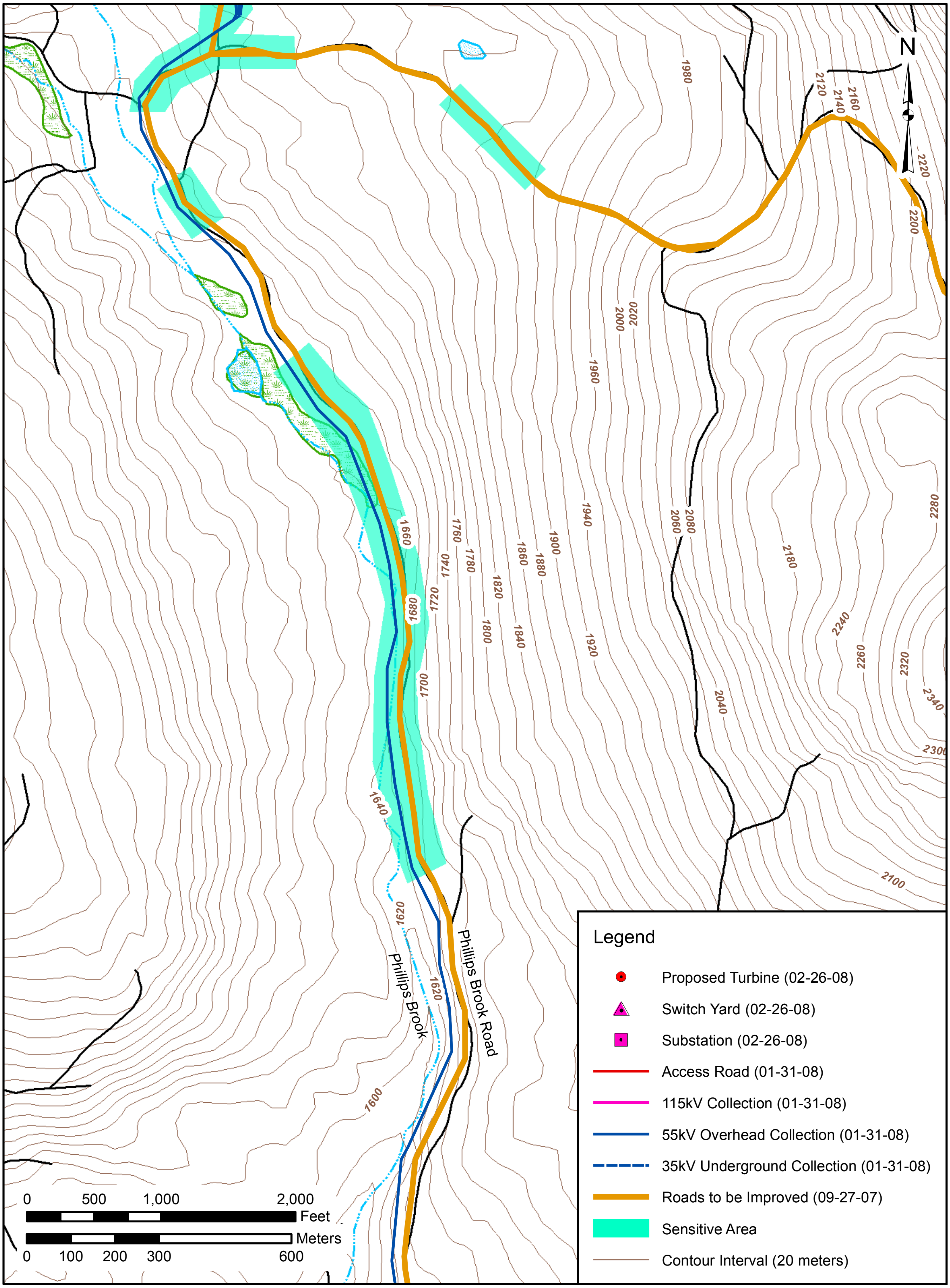

FIGURE 9: Phillips Brook Road: Sensitive Areas

SOURCE: GRANIT 2007; Granite Reliable Power 2007; Granite Reliable Power 2008

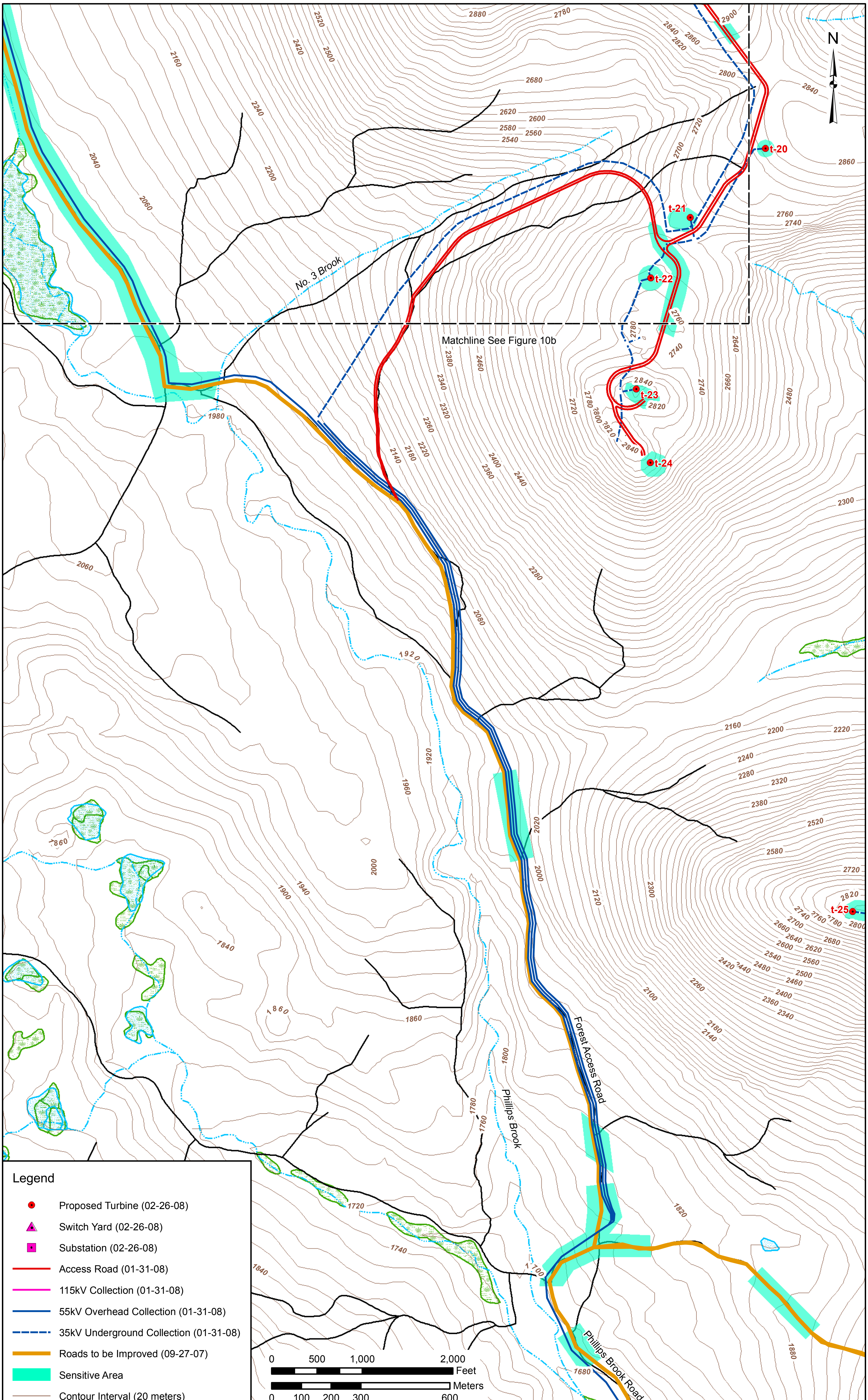

FIGURE 10a: Forest Access Road, Phillips Brook Road to No. 3 Brook: Sensitive Areas

SOURCE: GRANIT 2007; Granite Reliable Power 2007; Granite Reliable Power 2008

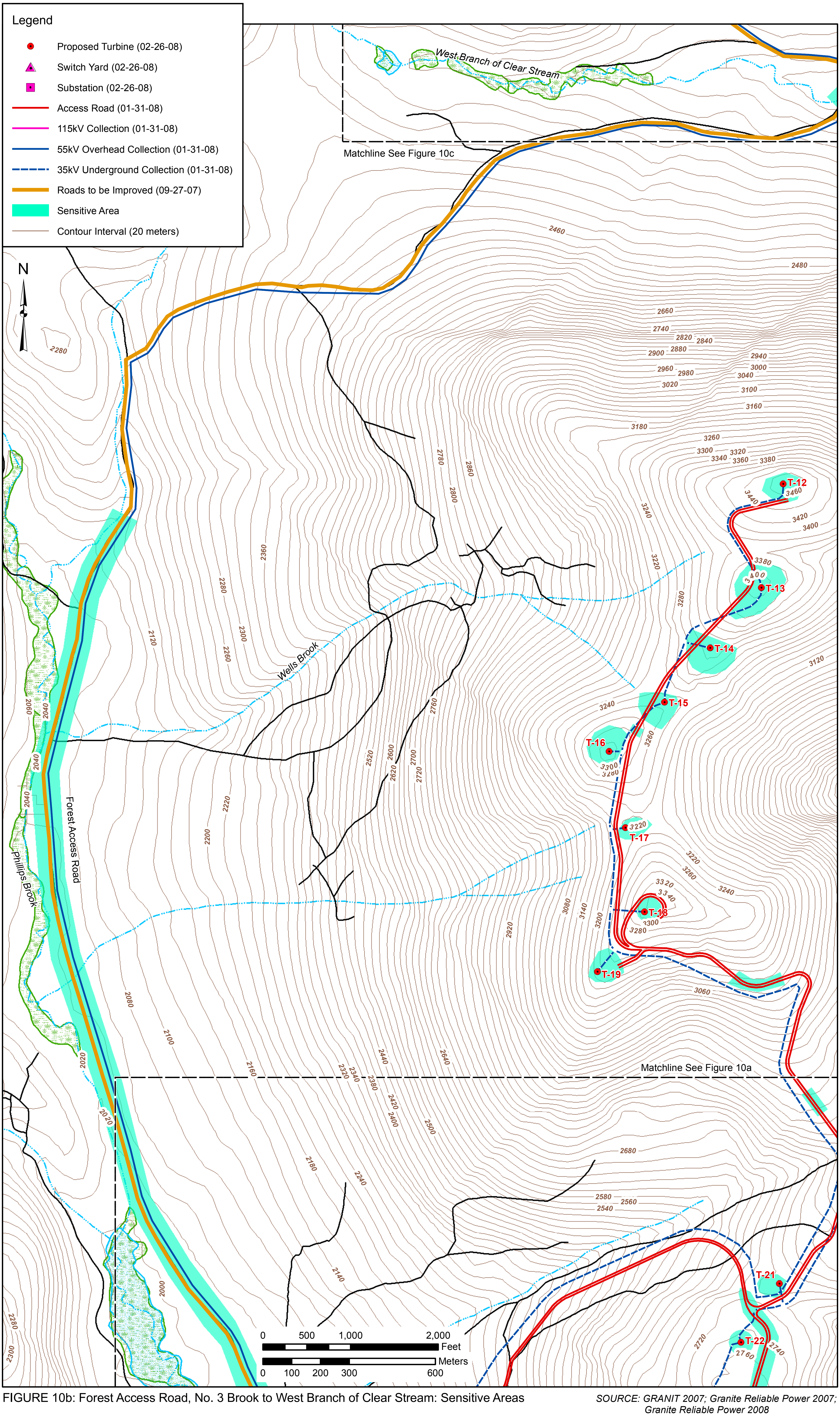

FIGURE 10b: Forest Access Road, No. 3 Brook to West Branch of Clear Stream: Sensitive Areas

SOURCE: GRANIT 2007; Granite Reliable Power 2007; Granite Reliable Power 2008

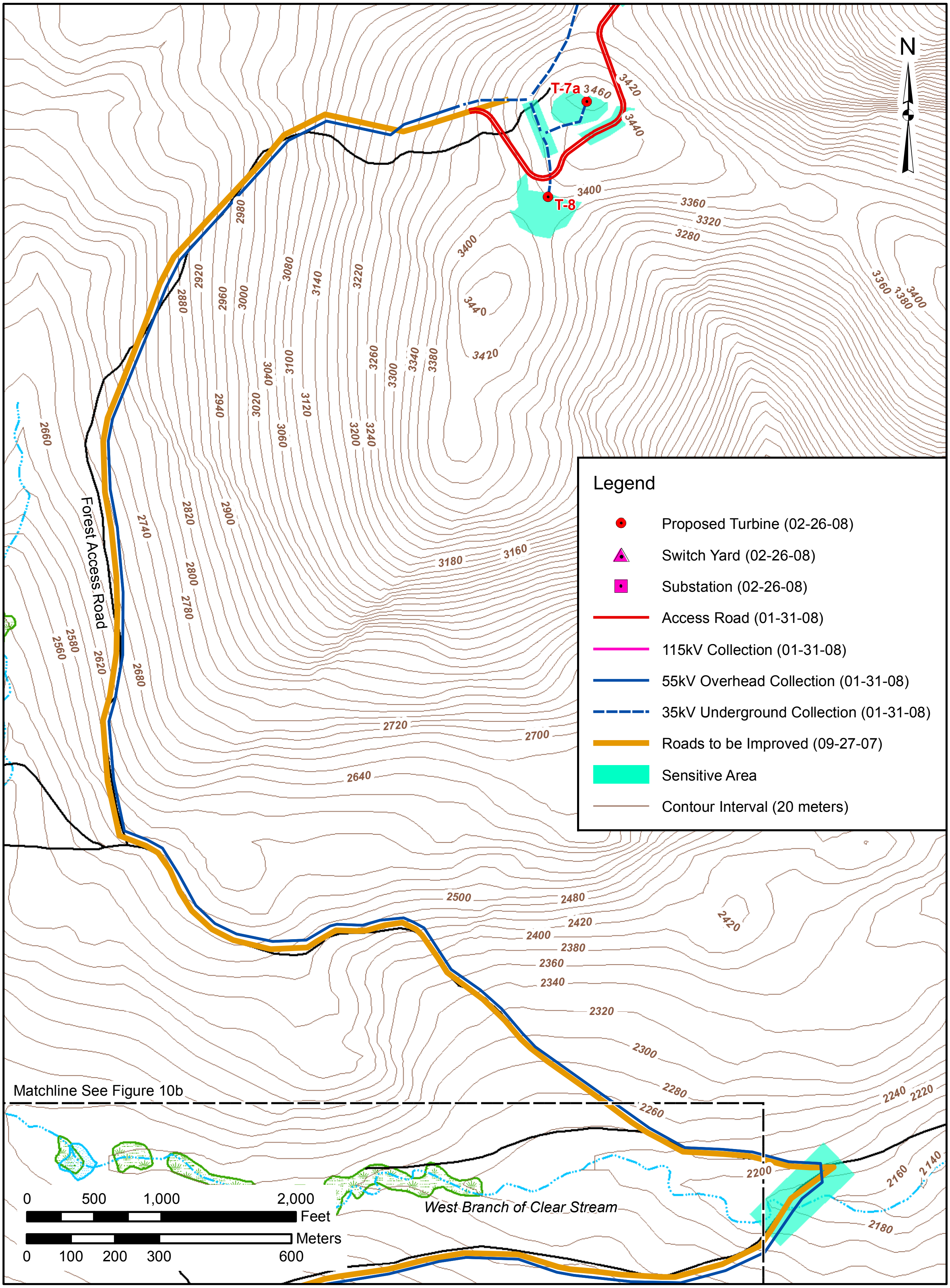

FIGURE 10c: Forest Access Road, West Branch of Clear Stream to Dixville Ridgeline: Sensitive Areas

SOURCE: GRANIT 2007; Granite Reliable Power 2007; Granite Reliable Power 2008

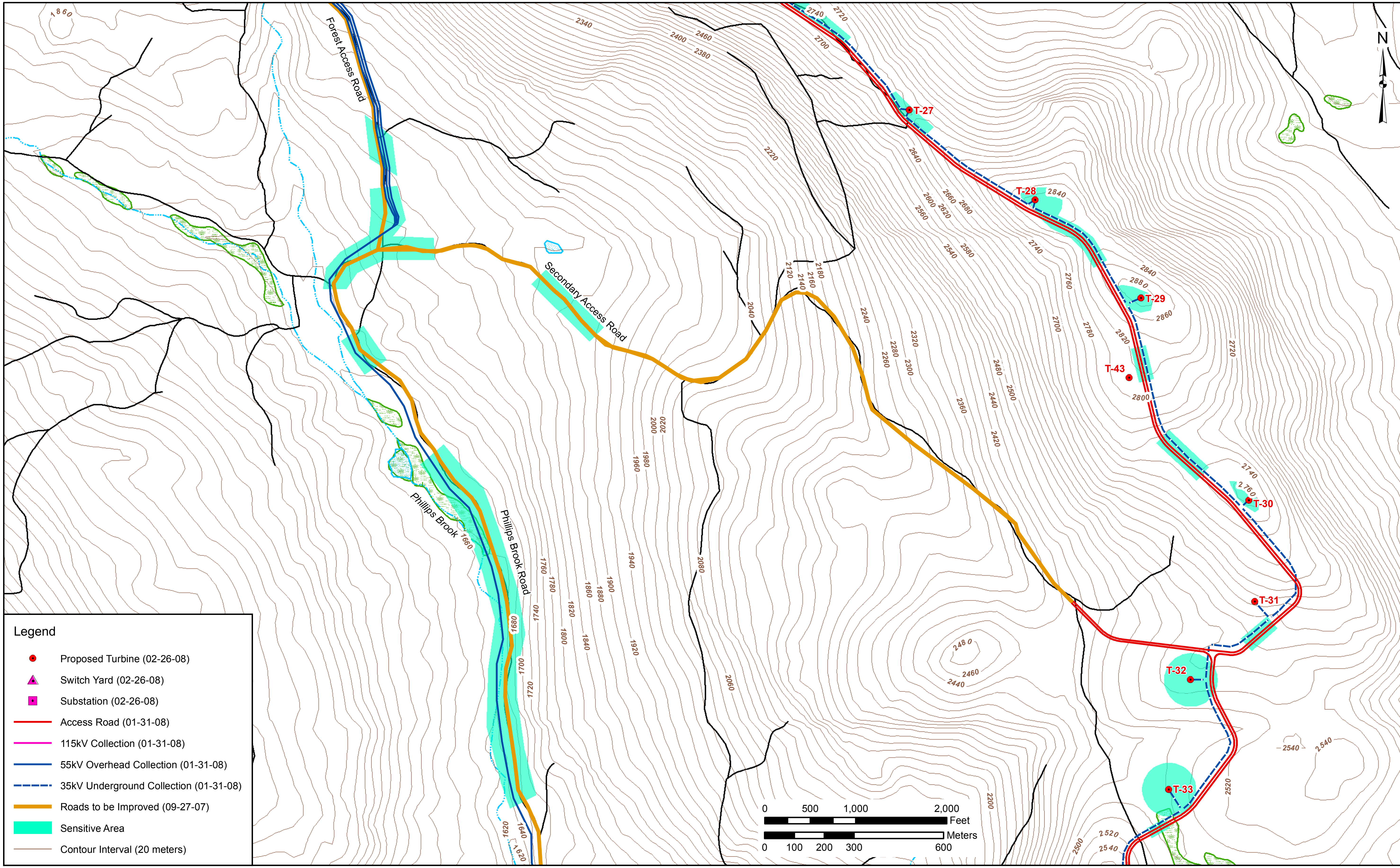

FIGURE 11: Secondary Access Road: Sensitive Areas

SOURCE: GRANIT 2007; Granite Reliable Power 2007; Granite Reliable Power 2008

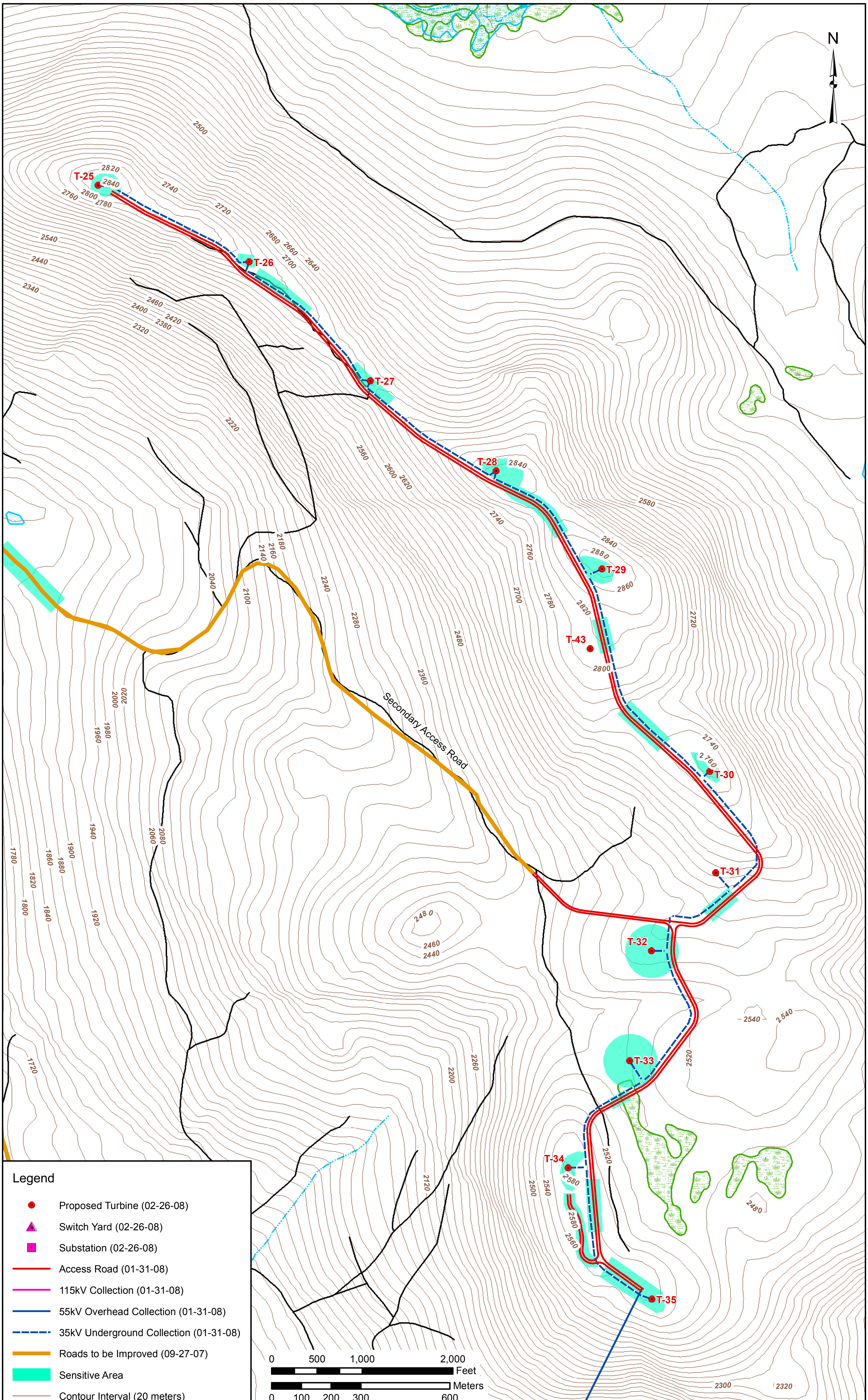

FIGURE 12: Fishbrook Ridgeline, Summit Access Road and Turbine Locations: Sensitive Areas

SOURCE: GRANIT 2007; Granite Reliable Power 2007; Granite Reliable Power 2008

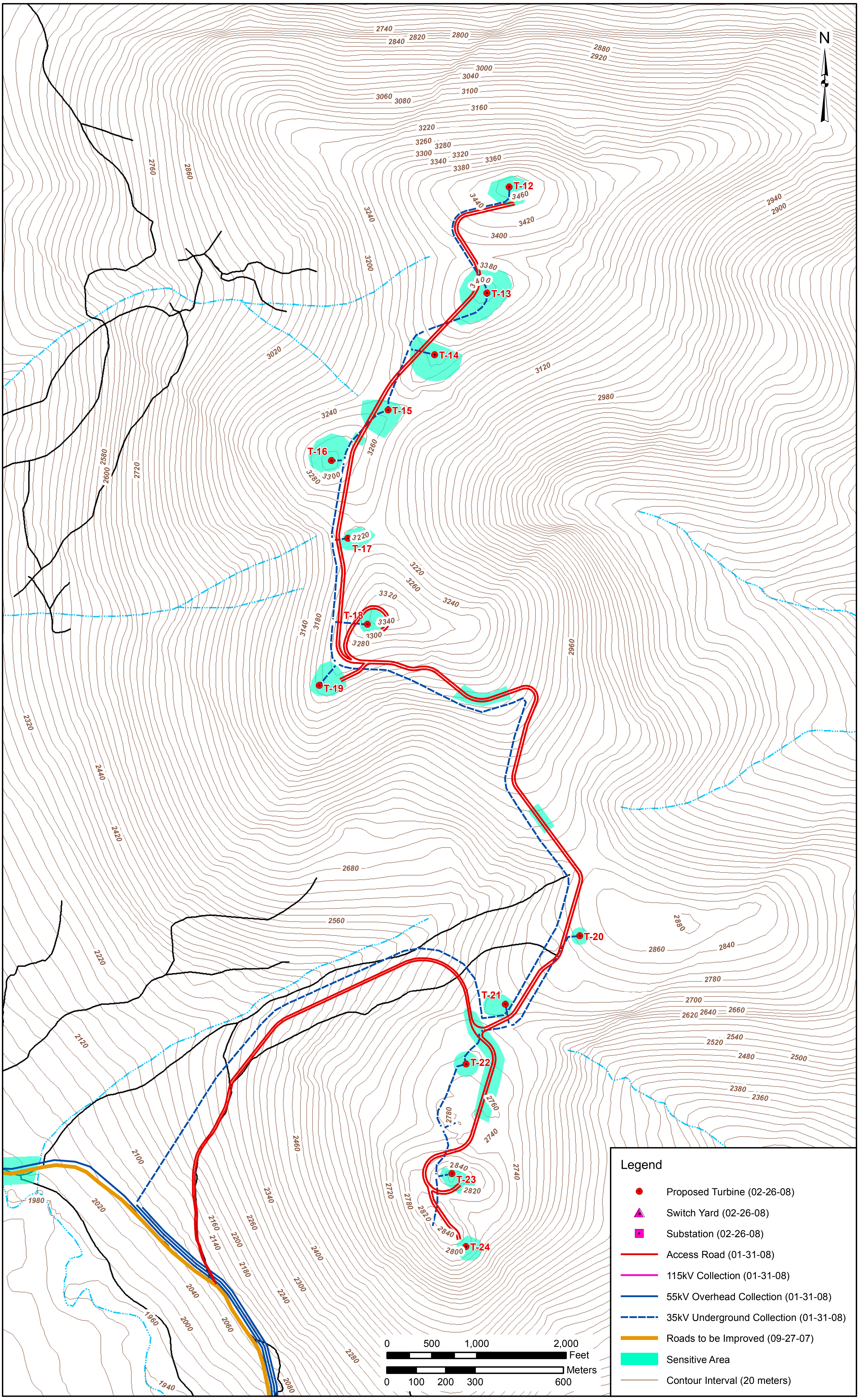

FIGURE 13: Owlhead Mountain and Mt. Kelsey, Summit Access Road and Turbine Locations: Sensitive Areas

SOURCE: GRANIT 2007; Granite Reliable Power 2007; Granite Reliable Power 2008

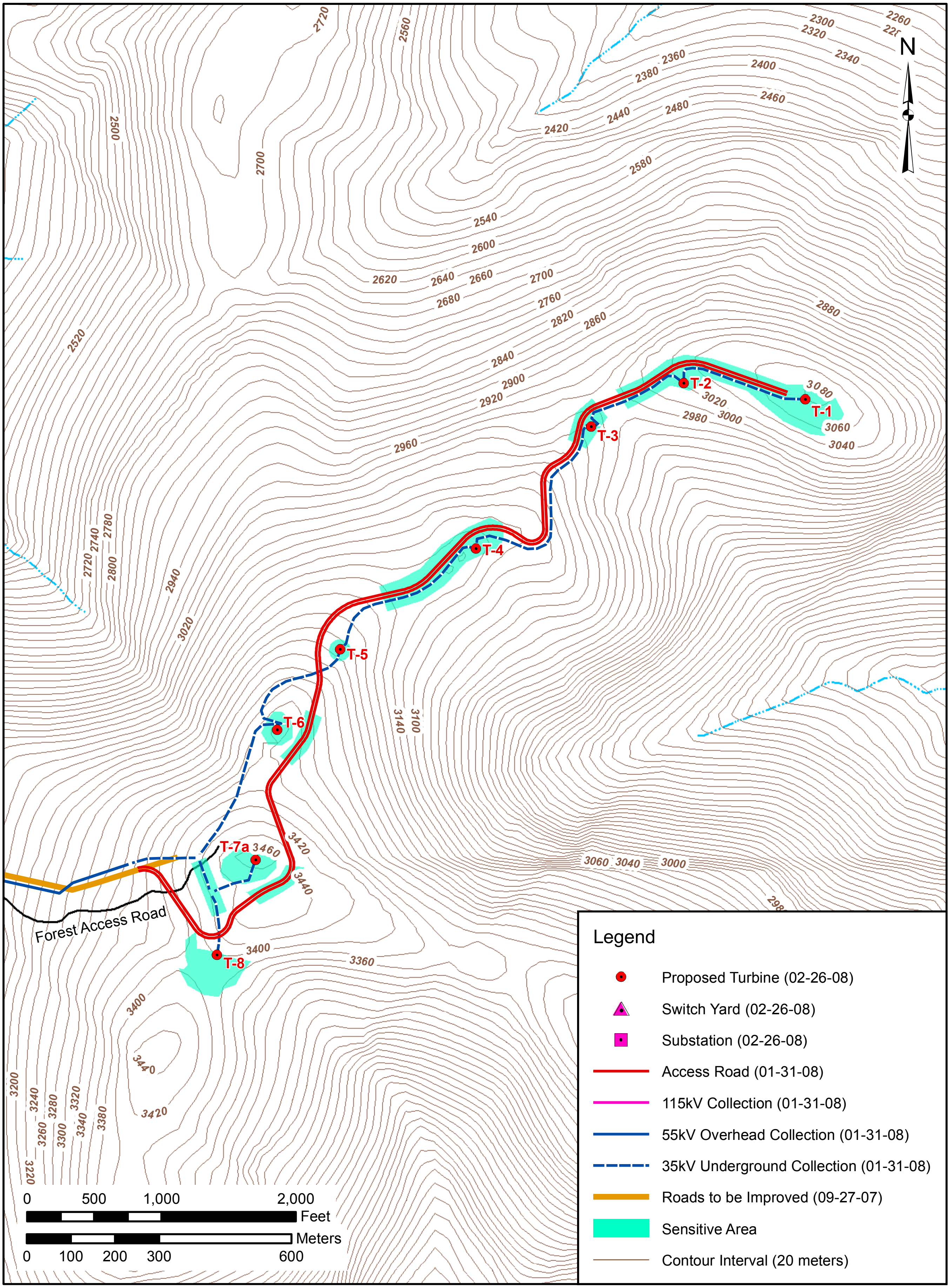

FIGURE 14: Dixville Ridgeline, Summit Access Road and Turbine Locations: Sensitive Areas

SOURCE: GRANIT 2007; Granite Reliable Power 2007; Granite Reliable Power 2008

before veering east northeast along an unnamed forest access logging road as far as the West Branch of Clear Stream for an additional 4.35 miles (7.00 kilometers). From the West Branch of Clear Stream, the primary access road continues northwest on an unnamed forest access road before turning north and continuing until it terminates at the Dixville ridgeline turbine string for a total of 2.50 miles (4.02 kilometers). The primary access road is considered to have a ROW 50 feet (15.2 meters) wide. As outlined in Table 5, there is a total of 18.25 miles (29.37 kilometers) of primary access road, and the total size for this portion of the APE is 110.61 acres.

TABLE 5

ROW OF PRIMARY ACCESS ROADS FOR WINDPARK

PRIMARY ACCESS ROAD	MILES	KILOMETERS	ROW SIZE (acres)
Dummer Pond Road	7.10	11.43	43.03
Phillips Brook Road	2.05	3.30	12.42
Forest Access Road to No. 3 Brook	2.25	3.62	13.64
Forest Access Road to West Branch of Clear Stream	4.35	7.00	26.36
Forest Access Road to Dixville Ridgeline	2.50	4.02	15.15
TOTAL ROW SIZE	18.25	29.37	110.61

a. Dummer Pond Road

As part of the APE, Dummer Pond Road extends for 7.10 miles (11.43 kilometers) from New Hampshire Route 16 north to Phillips Brook Road. The majority of this road is an existing logging road 20 feet (6.1 meters) wide requiring widening by 8 feet (2.4 meters); there are smaller sections with an existing 25-foot (7.6-meter) road width or that need upgrades (Plate 1).

The vast majority of the ROW along Dummer Pond Road is not archaeologically sensitive as it is composed mostly of moderate to steeply sloped terrain and very stony soils. There are, however, pockets of gently to moderately sloping terrain with more favorable soils that are deemed to be archaeologically sensitive. In most cases these sensitive areas coincide with proximity to fresh water or vantage points on the landscape (see Figures 8a, 8b, and 8c). In particular, at the extreme southern portion of Dummer Pond Road, the terrain is moderately sloped with Skerry fine sandy loam soils, and it is located approximately between 330 and 1,640 feet (100 and 500 meters) north of the Pontook Reservoir and Androscoggin River (see Figure 8a). Another section of low archaeological sensitivity is situated approximately 820 feet (250 meters) south of the juncture at Boise Cascade Road. Here sensitivity was based primarily on the fact that the area is only moderately sloped (see Figure 8b). The next area along Dummer Pond Road that has a low potential to contain archaeological resources is a small 500-foot (152-meter) area situated between the Dummer Ponds. The terrain here is at least moderately sloped, but this area is close to a height of land situated between the two ponds, and is located approximately 656 feet (200 meters) from the northern Dummer Pond (see Figure 8c). The final sensitive area along Dummer Pond Road is a small pocket situated approximately 3,281 feet (1,000 meters) north of the northern extreme of the substation (see Figure 8c). Here a small section of the road passes through terrain that is moderately sloped and therefore may possess some areas suitable for past human land use.

b. Phillips Brook Road

As part of the APE, Phillips Brook Road extends for 2.05 miles (3.30 kilometers) from the end of Dummer Pond Road to the junction of an unnamed forest access road and the secondary access road to

PLATE 1: Dummer Pond Road

PLATE 2: Fishbrook Ridgeline

the Fishbrook Ridgeline (see Figure 9). The majority of this access road is in need of upgrades, and a portion will require widening.

Since Phillips Brook Road closely follows Phillips Brook, approximately 3,937 feet (1,200 meters) of this access road's ROW has been determined to be archaeologically sensitive (see Figure 9). All the sections and pockets of archaeological potential were selected for the same qualities: low to moderately sloped terrain and proximity (within 150 meters) to Phillips Brook. The most notable part of the APE considered sensitive for archaeological resources is a 2,600-foot (792-meter) section of gently sloping terrain south of the juncture with the secondary access road (see Figure 9).

c. Forest Access Road

The remainder of the ROW along the Windpark's primary access road is a 9.1-mile (14.64-kilometer) section of unnamed forest access roads (see Figures 10a, 10b, and 10c). For clarity, these roads have been subdivided into three sections where the access road shifts in direction. In general, this tract of the APE is not sensitive for archaeological resources or is of low archaeological sensitivity; however, small pockets that have more gently sloped terrain and are close to water sources are considered sensitive.

(1) Phillips Brook Road to No. 3 Brook

This section of forest access road begins at the junction of Phillips Brook Road and the secondary access road to the Fishbrook Ridgeline for 2.25 miles (3.62 kilometers) and continues as far as No. 3 Brook (see Figure 10a). This entire section of road is in need of upgrades. As part of the ROW, the area is almost non-sensitive, with the exception of one small 656-foot (200-meter) section of relatively gently sloped terrain located approximately 4,921 feet (1,500 meters) north of the junction with Phillips Brook Road (see Figure 10a). The rest of this part of the ROW travels along moderately to very steep terrain and is therefore not considered archaeologically sensitive.

(2) No. 3 Brook to the West Branch of Clear Stream

This section of forest access road begins at the No. 3 Brook and continues north as far as the West Branch of Clear Stream for a total of 4.35 miles (7.00 kilometers). This entire section of road is in need of upgrades. As part of the ROW, this section of forest access road has considerably more archaeological potential then the adjacent sections to the north and south. Here the forest access road runs north along somewhat of a plateau, flanking Phillips Brook, before beginning a steep rise further north and then west as far as the West Branch of Clear Stream. In particular, there are two separate sensitive tracts, approximately 3,281 feet (1,000 meters) and 4,593 feet (1,400 meters) in length, respectively (see Figure 10b). Even though these areas possess very stony soils, they were considered to be sensitive because of the gentle to moderate slope, the proximity to Phillips Brook, and its potential appeal as a natural travel corridor.

A final section of this portion of primary access road considered to be archaeologically sensitive is the area just south of the West Branch of Clear Stream, which measures approximately 410 feet (125 meters) in length (see Figure 10c). Here the terrain becomes less steep on the approach to the stream, and the soils change to gently sloping, yet still very stony.

(3) West Branch of Clear Stream to Dixville Peak

This section of forest access road begins at the West Branch of Clear Stream and continues to the Dixville Ridgeline summit access road for a total of 2.50 miles (4.02 kilometers). This entire section of road is in need of upgrades. As part of the APE, this section of primary access possesses very little archaeological potential, except for a small section on the north side of the West Branch of Clear Stream (see Figure 10c). Terrain in this part of the APE is very steep and stony, with rock outcrops. These localities are not likely to contain traces of past human occupation; however, this area will be scrutinized during an intense walkover survey in an attempt to locate lithic outcrops, caves, and rockshelters.

2. Secondary Access Road to Fishbrook Ridgeline

One proposed secondary access road makes up part of the APE. This access road is coursed along an existing logging road, and it leads east then southeast from the junction of Phillips Brook Road and a northbound forest access road, which is part of the primary access road system (see Figure 11). This secondary road is 2 miles (3.2 kilometers) in length and will provide direct access to the Fishbrook Ridgeline. An ROW measuring 50 feet (15.2 meters) wide has been allocated for the secondary access roads. This secondary access road is in need of upgrades.

The vast majority of this secondary access road is not considered as archaeologically sensitive; however, two small sections may warrant archaeological survey (see Figure 11). The first is a 400-foot (122-meter) section immediately east of the junction with the primary access road, where the terrain is less steep. The second is a 500-foot (152-meter) section along the road approximately 200 feet (61 meters) east of the primary access road, where the terrain again becomes less steep. For the remainder of the APE along this secondary access road, the terrain is extremely steep and rocky and therefore does not warrant subsurface testing; however, this area will be carefully inspected for above-ground resources such as lithic outcrops, caves, and rockshelters during an intense walkover survey.

3. Summit Access Roads

The wind turbine strings are situated on three ridgelines within the project area (see Figures 1-3). The total area of disturbance for the wind turbine strings, as outlined in Table 6 below, consists of summit access roads and, for the most part, the underground 35kV collection line that connect the turbines along the ridgelines. An ROW measuring 75 feet (22.9 meters) wide has been allocated for the turbine summit access roads and underground collection lines on the ridgelines.

TABLE 6

ROW OF SUMMIT ACCESS ROADS FOR WINDPARK

RIDGELINE	SUMMIT ACCESS ROAD LENGTH (miles)	SUMMIT ACCESS ROAD LENGTH (kilometers)	SUMMIT ACCESS ROAD ROW SIZE (acres)
Fishbrook	3.85	6.20	35.02
Owlhead and Mt. Kelsey	3.98	6.41	36.15
Dixville	1.55	2.49	14.12
TOTAL ROW SIZE	9.38	15.10	85.29

a. Fishbrook Summit Access Roads

The area of ground disturbance on the Fishbrook Ridgeline (Plate 2) consists of the construction of 12 turbines and 3.85 miles (6.20 kilometers) of summit access road and the underground 35kV collection line that connects the turbines along the ridgelines (see Figure 12). The total size of the ROW for the summit access roads on the Fishbrook Ridgeline is 35.02 acres. The maximum elevation on the ridgeline is 2,889 feet (881 meters), and the terrain is described as being moderately to steeply sloped, with stony soils of shallow depth and rocky outcrops. On the whole the ridgelines are not sensitive for historical archaeological resources, and for the most part they are not sensitive for precontact cultural resources either. As illustrated in Figure 12, however, there are pockets along the ROW that do possess some flatter sections and may have adequate soil conditions to warrant testing, most notably between Turbine-25 and Turbine-27, between Turbine-29a and Turbine-30; and between Turbine-34 and Turbine-35. These areas will be closely examined during the intensive walkover survey to determine if subsurface testing is plausible. If so, shovel testing will be conducted at 26-foot (8-meter) intervals, where possible, in an effort to locate archaeological materials.

b. Owlhead Mountain and Mt. Kelsey Summit Access Roads

The area of ground disturbance on the Owlhead Mountain (Plate 3) and Mt. Kelsey Ridgeline (Plate 4) consists of the construction of 13 wind turbines and 3.98 miles (6.41 kilometers) of summit access road and the underground 35kV collection line that connects the turbines along the ridgelines (see Figure 13). The total size of the ROW for the turbine access roads on the Owlhead Mountain and Mt. Kelsey Ridgeline is 36.15 acres. The maximum elevation on the Owlhead Mountain section of the ridgeline is 2,878 feet (877 meters). The Mt. Kelsey section of the ridgeline has an elevation of 3,472 feet (1,058 meters), and the terrain is described as being moderate to steeply sloped, with stony soils of shallow depth and rocky outcrops. On the whole the ridgeline is not sensitive for historical archaeological resources, and for the most part it is not sensitive for precontact cultural resources either. As illustrated in Figure 13, however, there are pockets along the ROW that do possess some flatter sections and may have adequate soil conditions to warrant testing, particularly between Turbine-22 and Turbine-23. These areas will be closely examined during the intensive walkover survey to determine to what degree subsurface testing is plausible. If so, shovel testing will be conducted at 26-foot (8-meter) intervals, where possible, in an effort to locate archaeological materials.

c. Dixville Peak Summit Access Roads

The area of ground disturbance on the Dixville Ridgeline consists of the construction of eight wind turbines and 1.55 miles (2.49 kilometers) of summit access road and the underground 35kV collection line that connects the turbines along the ridgelines (see Figure 14). The total size of the APE for the turbine access roads on the Dixville Peak Ridgeline is 14.12 acres. The maximum elevation on the ridgeline is 3,460 feet (1,055 meters), and the terrain is described as being moderately to steeply sloped, with stony soils of shallow depth and rocky outcrops. On the whole the ridgelines are not sensitive for historical archaeological resources, and for the most part they are not sensitive for precontact cultural resources either. As illustrated in Figure 14, however, there are pockets along the ROW that do possess some flatter sections and may have adequate soil conditions to warrant testing, particularly between Turbine-4 and Turbine-5. These areas will be closely examined during the intensive walkover survey to determine if subsurface testing is plausible. If so, shovel testing will be conducted at 26-foot (8-meter) intervals, where possible, in an effort to locate archaeological materials.

4. Ridgeline Wind Turbines

The four wind turbine strings are situated on three ridgelines within the project area (see Figures 12-14). The total ROW for the wind turbines, as outlined in Table 7, consists of the area around each of the 33 individual wind turbines. An ROW with a 300-foot (91-meter) radius (6.49-acre circle) for each turbine has been allocated. The total size of the ROW for all of the

TABLE 7

ROW OF TURBINES FOR WINDPARK

RIDGELINE	NUMBER OF TURBINES	TURBINE ROW SIZE (acres)
Fishbrook	12	77.88
Owlhead and Mt. Kelsey	13	84.37
Dixville	8	51.92
TOTAL ROW SIZE	33	214.17

PLATE 3: Owlhead Mountain Ridgeline

PLATE 4: Mt. Kelsey Ridgeline

turbines is 214.17 acres. As with the summit access roads, the terrain and soil conditions are characterized as being moderately to steeply sloped, with stony soils of shallow depth and rocky outcrops. On the whole the ridgelines are not sensitive for historical archaeological resources, and for the most part they possess a low sensitivity for precontact cultural resources. For most turbine locales, however, there are small areas that do possess some flatter sections that may have adequate soil conditions to warrant testing. These areas will be closely examined during the intensive walkover survey to determine how much subsurface testing is plausible. If necessary, shovel testing will be conducted at 26-foot (8-meter) intervals, where possible, in an effort to locate archaeological materials.

a. Fishbrook Ridgeline

The turbine construction on the Fishbrook Ridgeline consists of 12 wind turbines. The total size of the Fishbrook Turbine ROW is 77.88 acres. For the most part, the terrain on the Fishbrook Ridgeline can be described as moderately to steeply sloped, with poorly drained soils and rocky outcrops. The APE at all 12 turbine locations does contain some flatter sections, however (see Figure 12), and upon further inspection during the intensive walkover survey will most likely require some degree of subsurface testing for potential archaeological deposits.

b. Owlhead Mountain and Mt. Kelsey Ridgeline

The turbine construction on the Owlhead Mountain and Mt. Kelsey Ridgeline consists of 13 wind turbines. The total size of the Owlhead Mountain and Mt. Kelsey Turbine ROW is 84.37 acres. For the most part, the terrain on the Owlhead Mountain and Mt. Kelsey Ridgelines can be described as moderately to steeply sloped, with poorly drained soils and rocky outcrops. The ROW at all 13 turbine locations does contain some flatter sections, however (see Figure 13), and upon further inspection during the intensive walkover survey will most likely require some degree of subsurface testing for potential archaeological deposits.

c. Dixville Peak Ridgeline

The turbine construction on the Dixville Ridgeline consists of eight wind turbines. The total size of the Dixville Peak Ridgeline ROW is 51.92 acres. For the most part, the terrain on the Dixville Peak Ridgeline can be described as moderately to steeply sloped, with poorly drained soils and rocky outcrops. The ROW at all eight turbine locations does contain some flatter sections, however (see Figure 14), and upon further inspection during the intensive walkover survey will most likely require some degree of subsurface testing for potential archaeological deposits.

5. Switchyard and Substation

a. Switchyard

The first auxiliary component of the Windpark is the switchyard, in the southern portion of the APE off Dummer Pond Road (see Figure 8a). This facility makes up 2.53 acres[7] (110,000 square feet) of the APE. A newly constructed access road will connect the switchyard to Dummer Pond Road.

The switchyard is situated in an area characterized of moderately sloped terrain (Plate 5) with stony soils; however, there are likely areas of more gently sloped soils. Since this location is situated in relative proximity to the Androscoggin River, in particular the access road to the switchyard, which begins

[7] This total includes the acreage for the access road connecting the Switchyard with Dummer Pond Road.

PLATE 5: Switchyard Location

PLATE 6: Substation Location

approximately 250 feet (76 meters) from the river, portions of the switchyard area of ground disturbance are considered to be sensitive for archaeological resources.

b. Substation, Maintenance Building and Laydown Yard

The second auxiliary component consists of a 14.35-acre (625,000-square-foot) area on the western side of Dummer Pond Road (see Figure 8c) that has been designated for the proposed substation (including a maintenance building and laydown yard). The substation itself is expected to be a 215x415-foot (65.5x126.5-meter) fenced-in area (2.05 acres) along Dummer Pond Road (Plate 6). There would also be a maintenance building with associated storage located adjacent to the substation. The maintenance building would be about 5,000 square feet (464.5 square meters) in size and occupy approximately 0.2 acres in area. The remainder of the 14.35 acres would be used for temporary storage of parts and equipment during construction. These areas would coincide with areas that have recently been cleared for forest management on the site.

The substation, including the maintenance building and laydown yard, is situated in an upland setting over gently and moderately sloping stony soils. As illustrated in Figure 8c, the northern two thirds of the area of disturbance for these facilities is not as sloped and is therefore likely to contain small areas that have the potential to be archaeologically sensitive. In these sensitive areas Berger will identify localities of suitable terrain and conduct subsurface testing at 13-foot (4-meter) intervals for areas considered historically sensitive and at 26-foot (8-meter) intervals for areas having the potential to contain precontact period archaeological deposits.

6. Collection Lines (not covered by other parts of the APE)

The Electrical Interconnection Line (EIL) (also referred to as the 115kV collection line) runs approximately 7 miles (11.3 kilometers) between the switchyard and substation along Dummer Pond Road and connects with the existing PSNH 115kV transmission line located north of NH Route 110. In most areas the EIL runs within the ROW of the primary access road along Dummer Pond Road; however, there are areas where the transmission line strays outside the ROW. In these areas the ROW has been expanded to include areas of ground impact along the EIL. For the most part, the EIL moves outside the access road ROW in areas of steep terrain that are not considered to be archaeologically sensitive, with one exception (see Figures 8a and 8b). Located north of the switchyard, the collection line traverses a relatively level area with well drained soils that is therefore considered to be archaeologically sensitive. In addition, all areas for proposed pole locations and ground disturbance will be examined and assessed in the field with subsurface testing conducted as required.

The 35kV underground collection line runs adjacent to the summit access roads, with the exception of the area between Turbine-21 and the primary access road. Where the 35kV underground collection line is adjacent to the summit access road, it is part of that ROW previously described. Where it falls outside the ROW of the summit access road, the areas of disturbance will be assessed for sensitivity during a walkover survey. According to topographic data, this area is excessively sloped.

The 35kV overhead collection line runs adjacent to the primary access road from the substation, north as far as the Dixville Ridgeline, and was therefore included within the ROW of the primary access roads.

C. Archaeological Sensitivity Assessment Summary

Even though no archaeological sites have been reported within the APE or even within a 3-mile (4.8-kilometer) radius of the project area, the region does contain areas that are considered to be sensitive for remains from precontact period and historical land use. The types of archaeological sites that may be expected to be located during a Phase IB investigation include but are not limited to the following:

- **Prehistoric Workshop and Camp Sites**. The project area is situated near major water-related resources, including the Upper Ammonoosuc River to the southwest, the Androscoggin River to the east, and the Connecticut River to the west. The area is suitable for resource procurement (e.g., hunting game, gathering), but the soil conditions do not favor agricultural activities. Locations most sensitive for precontact period campsites include areas close to the larger streams, in particular Phillips Brook, as well as those close to Dummer Pond.

  Sensitivity for the presence of lithic quarry sites and workshops is moderate; however, there is not a good understanding on the raw material available in this specific region. Since there are other lithic resources south of the project area in Coos County, in particular the Mt. Jasper lithic quarry site and a rhyolite source in Jefferson, New Hampshire, the potential to locate lithic outcrops and workshop sites cannot be ignored.

- **Rockshelters**. The possibility of locating rockshelter sites is low to moderate. The highly sloped and rocky terrain of the ridgelines, in particular the Dixville Peak Ridgeline, does present the potential to have rock overhangs.

- **Stray/Isolated Finds**. Many locations within the project area are sensitive for stray finds, such as lost or abandoned materials from hunting and gathering excursions into the area.

- **Historic Sites**. The project area has been used historically since the late nineteenth century for logging purposes. The proposed primary and secondary access roads follow existing logging and forest access roads. The parcels of land for the switchyard and substation, as well as other parts of the APE, are in areas of forestry activity in more recent times. The turbine locations are atop the ridgelines and are not in areas that were used historically. Areas within the APE that possess a low to moderate sensitivity for historic resources are along the access roads, particularly in proximity to Dummer Pond and Phillips Brook.

IV. Summary and Recommendations

On behalf of Granite Reliable Power, LLC, a subsidiary of Noble Environmental Power, LLC., of Essex, Connecticut, The Louis Berger Group, Inc. (Berger), has completed a Phase IA archaeological investigation for the proposed Granite Reliable Power Windpark (Windpark), Coos County, New Hampshire. This investigation was designed in accordance with guidelines issued by the New Hampshire Department of Historical Resources. The objective of the survey was to identify and assess areas of archaeological sensitivity (or potential) and identify any archaeological sites within the area of potential effects (APE), which for this survey includes all parts of the proposed Windpark that will be subject to ground disturbance, including turbine construction, access road improvements and construction, collection line installation, and switchyard and substation construction.

No archaeological resources or sites were identified within the APE or within a 3-mile (4.8-kilometer) radius of the Windpark, and no historic structures were recorded in or near areas of ground disturbance; however, particular areas within the Windpark were identified as being archaeologically sensitive. In general, areas of archaeological potential and sensitivity were based on the following criteria: undisturbed areas that are relatively level, have well drained soils or are in the vicinity of water sources such as streams, springs, rivers, ponds or forest wetlands, as well as areas in strategic travel routes and near unique landmarks (see Figures 8-14).

Judging from preliminary results of this survey, it is Berger's opinion that a Phase IB archaeological survey is recommended for the Granite Reliable Power Windpark.

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