

Appendix I

Archaeological Resource Assessment

Predictive Model

Archaeological Assessment

**Archaeological Assessment of the Proposed Wocawson Wind Farm near
Sussex, NB**
Permit #: 2018 NB 29

Prepared for

Natural Forces

by

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ABSTRACT

On July 5th and 6th, 2018, an archaeological pedestrian survey took place at the location of a proposed wind farm east of Sussex, NB. The pedestrian survey was undertaken to identify any extant heritage/archaeological features of significance, any visible significant artifacts or if any potential exists for the presence of buried archaeological sites.



TABLE OF CONTENTS

ABSTRACT	i
LIST OF FIGURES	iii
INTRODUCTION	1
PREVIOUS RESEARCH	2
METHODS	3
RESULTS	4
CONCLUSIONS & RECOMMENDATIONS	6



LIST OF FIGURES

- Figure 1:** Approximate location of the proposed wind farm.
- Figure 2:** Project area with locations of turbines and infrastructure.
- Figure 3:** Project area on LiDAR data with turbine and transmission line locations.
- Figure 4:** Proposed placement for Turbine 3.
- Figure 5:** Proposed placement for Turbine 5.
- Figure 6:** Proposed placement for Turbine 6.
- Figure 7:** Proposed placement for Turbine 9.
- Figure 8:** Proposed placement for Turbine 12.
- Figure 9:** The view across the valley, near the route of the transmission line.
- Figure 10:** Upper terrace along transmission line.
- Figure 11:** Middle terrace along transmission line.
- Figure 12:** Lower terrace along transmission line.
- Figure 13:** Kennebecasis River crossing along transmission line.
- Figure 14:** Abandoned farm equip at edge of terrace, south of Portage Vale Rd.
- Figure 15:** Turbines, transmission line and tracklog on a topographic map.
- Figure 16:** Trans. line on surficial geology map with areas of arch potential.
- Figure 17:** Trans. line on LiDAR map with areas of arch potential.
- Figure 18:** Trans. line on satellite image with areas of arch potential.
- Figure 19:** Tracklog on satellite image.
- Figure 20:** The required predictive model purchased from the Province.



INTRODUCTION

Natural Forces commissioned the work of an archaeologist to mitigate the potential negative effects of construction activity surrounding the development of a wind farm near Sussex, New Brunswick (see Figures 1 + 2). In advance of their construction activities associated with the wind farm development, the locations of twelve wind turbines, one substation, associated roads and a transmission line, east of Sussex, were assessed for the presence of heritage resources and the potential for buried archaeological remains.



PREVIOUS RESEARCH

Only one recorded archaeological site is registered at Archaeological Services New Brunswick within the vicinity of the proposed construction activities in the area surveyed. Site BkDh-1 lies approximately 3 km east of the proposed turbines (see Figure 19).

The Borden system is a nation-wide, geographically based method for recording sites of archaeological value. In New Brunswick, each Borden block is 10 minutes of latitude by 10 minutes of longitude. Each of these blocks is referred to by a four-letter code, which describes the location of that particular block. Consequently, sites within each Borden block are numbered sequentially in the order in which they are reported. The Borden block that is of concern to this report is BkDh.



METHODS

The information presented in this report was gained through research of relevant documents from Archaeological Services in Fredericton and published materials, including topographic and surficial geology maps & reports, aerial photographs, LiDAR data, and the New Brunswick Register of Historic Places. The field component was conducted using intensive visual inspection through pedestrian surveying. Each turbine area and substation was surveyed, along with a select area of the transmission line (see Figures 15 + 18).



RESULTS

A review of early and modern aerial photographs (1945 8252/020, 8255/027, 8256/040) failed to indicate any extant cultural features of interest. The air photos and topographical mapping indicate that the assessed area of the proposed wind farm is sited across an area that has previously been forested (and to a lesser degree, farmed) and rests at an elevation of ~65-270 m asl. The wide floodplain of the Kennebecasis River was treeless in these early photographs and clearly illustrate the many abandoned channels of the stream. The nearby drainage channels, originating on the high ground where the turbines are sited, are deeply incised and were likely created by seasonal run-off, although minor amounts of water continue to drain through them. There is evidence that the area has been used for gravel extraction in the past, as evidenced by several pits in the near vicinity (e.g. between the turbines and the Kennebecasis River).

The surficial geology of the high ground, where the turbines and substation are proposed, is referred to as the Boss Point till (Pronk, A., Allard, S., and Boldon, R. 2005). Boss Point till consists of well-drained matrix, high in sand content (as much as 75%) with additional clay/silt. As the elevation decreases, along the transmission line, a series of terraces were encountered. The uppermost terrace, at ~140 m asl (see Figure 10) is quite level and suitable for habitation, overlooking the wide valley, particularly during the early post-glacial period. Similarly, the middle terrace at ~100 m asl (see Figure 11) could be used for habitation and resource gathering as the meltwaters receded and the exposed valley floor started to dry up. At the lower terrace, much of the ground is fairly wet and exhibits characteristics similar to wetland environments. However, there are many areas of marginally higher ground, that appear dry and have promoted the growth of different plants/trees. These areas are suitable for habitation and would certainly attract the ancestors of today's Wolastoqiyik when the conditions were similar. This area is approximately 800 m long, along the route of the transmission line, from the edge of the modern floodplain to the sharp rise in elevation to the south. The surficial geology along this section is described as glaciofluvial outwash (deltaic)(mainly sand and gravel)(Seaman, A., 1986). During periods of reduced precipitation and increased temperatures (the Hypsithermal (9000-5000 years ago)), this area may have been better suited for habitation.



The modern floodplain is over 400 m wide (along the transmission line route) and is clearly visible in the satellite imagery and LiDAR data (see Figures 2 + 3). In the early historic aerial photos, satellite imagery and the LiDAR data, the abandoned channels of the former location of the Kennebecasis River are visible. The entire section of this modern floodplain and immediately adjacent, would be suitable for habitation for thousands of years previous. Portions of this modern valley are described as ancient alluvium (sand and gravel, some silt)(Seaman, A., 1986). Immediately south of the Portage Vale Road, towards the river, a farmer's field is evident. At the southern edge of the field, a steep drop in elevation (erosional face) was observed, leading to the modern floodplain and then to the Kennebecasis River (see Figures 13 + 14). The section between the road and the river is also suitable for Indigenous and early European occupation. Some historic farm equipment was noticed on the southern edge of the farmer's field (see Figure 14).

No evidence of extant structures was visible during the desktop survey or in the field. Also, there were not any obvious indications in the field to suggest that the proposed locations of the turbines and substation would be a draw for Native or early European occupation. However, a large portion of the transmission line route meets the criteria for holding high potential for the presence of significant archaeological resources.

Throughout the course of the pedestrian survey, there were not any culturally significant extant or exposed features/artifacts identified. If any change to the proposed footprint of this project is anticipated, then consultation with a permitted archaeologist should occur to ensure a minimal amount of damage to any buried heritage that may be present.



CONCLUSIONS & RECOMMENDATIONS

On July 5th to 6th, 2018, an archaeological pedestrian survey took place at a proposed wind farm east of Sussex, NB. The assessment of this area resulted in the failure to identify any evidence of significant past human use at the locations of the proposed 12 turbines and 1 substation locations. However, a large portion of the transmission line, the northern half, exhibits the geographical characteristics that are traditionally regarded as draws for human habitation since the retreat of the glaciers.

In Figures 16-18, there are two terraces highlighted around the centre portion of the transmission line, the northern edges should be considered as holding high potential for the presence of early postglacial archaeology. Following the *Guidelines* (2012), archaeological test pits should be excavated on these two terraces as follows: *(c) extends within 50 metres of the banks or shores of a current or former body of water (i.e., river, lake, bay, etc.) – for areas between 50-80 metres from current or former body of water see: Medium Potential (a 10 m grid).*

In the orange section along the transmission line, this area is comprised of glaciofluvial outwash and likely deltaic, fairly flat and level and often wet. While it likely will have been suitable for habitation during different periods in the past, its current condition (quite wet) will make it exceptionally difficult to excavate. In the wet areas, archaeological monitoring is recommended. However, there are many discrete areas of slightly higher and drier elevations (see Figure 12) that should have archaeological excavation performed on it in advance of any ground disturbing activities (see *Guidelines*, section *(e) extends onto an active or former floodplain (as determined by most recent and detailed surficial geology maps or data showing alluvial deposits)* test pits on a 5 m grid).

In the red section, at the northern end of the transmission line in the Kennebecasis Valley, this is the more recent location of the meandering river. Within the modern valley and along the outer edges, the entire area should be considered as holding high potential for the presence of significant archaeological remains. While there are abandoned meander belts within this valley, areas that are dry enough for archaeological testing, should have test pits excavated on a 5 m grid (see section (e) above). Essentially, the area along the transmission line, north of the Portage Vale Rd, failed to elicit interest from an archaeological perspective.



REFERENCES

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NB Archaeological Services Unit

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Pronk, A.G., Allard, S., and Boldon, R.

- 2005 *Surface materials of the Petitcodiac map area (NTS 21 H/14), southeastern New Brunswick*. New Brunswick Department of Natural Resources, Minerals, Policy and Planning Division. Plate 2005-18

Seaman, A.

- 1986 *Granular Aggregate Resources of Petitcodiac 21H/14*. Province of New Brunswick, Dept. of Natural Resources and Energy. Plate 86-222.



APPENDIX



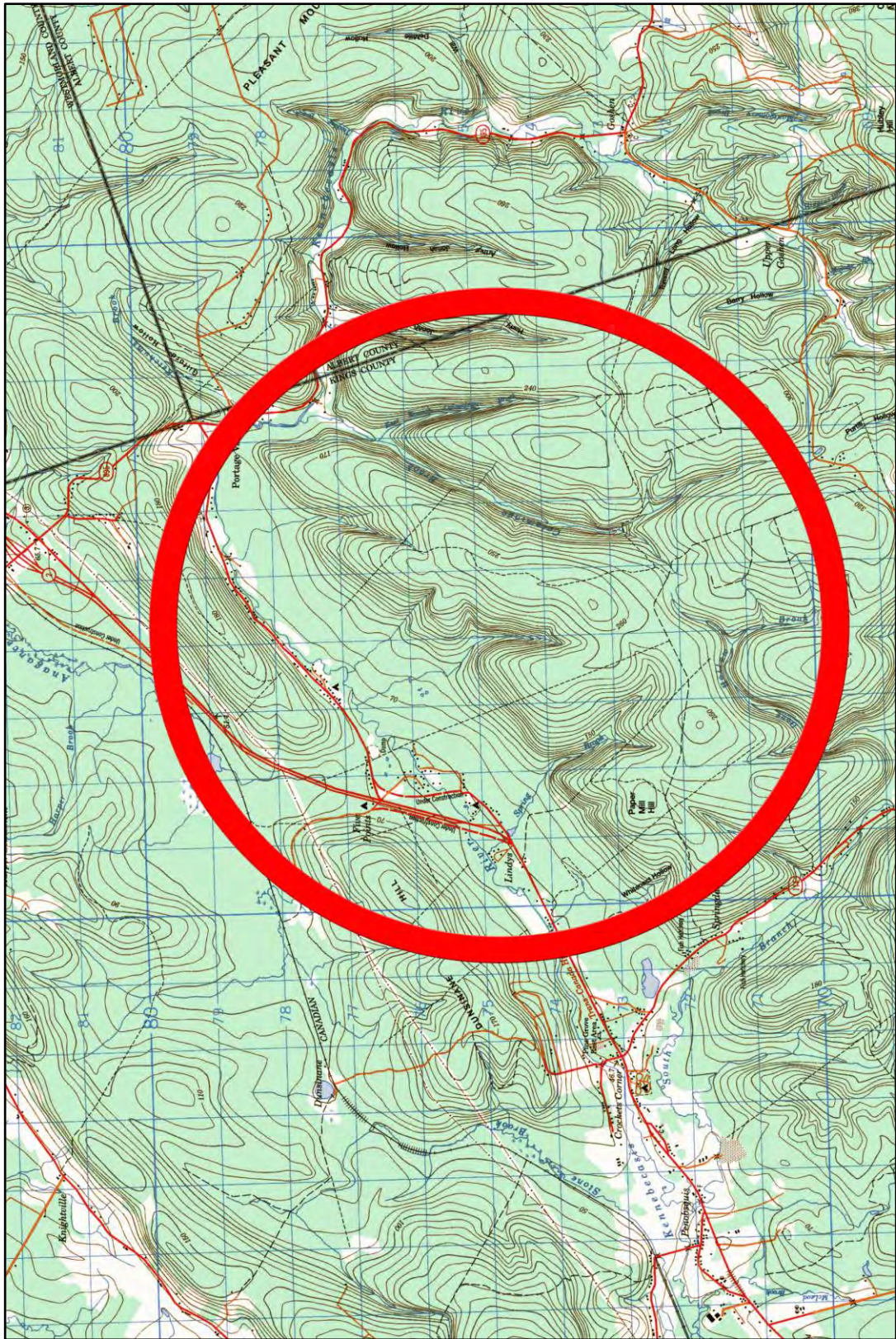


Figure 1: Approximate location of the proposed wind farm.



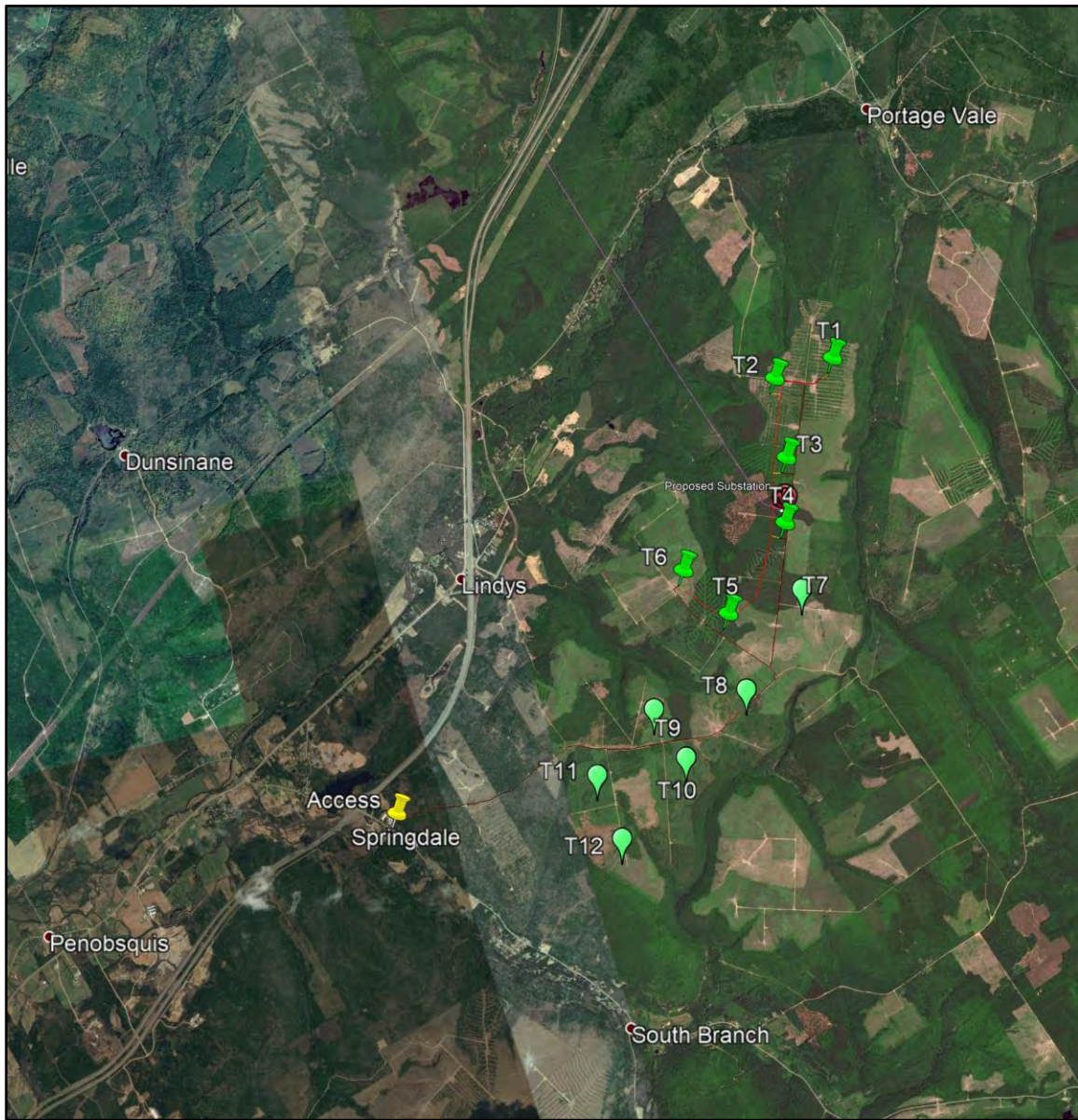


Figure 2: Project area with locations of turbines and infrastructure.



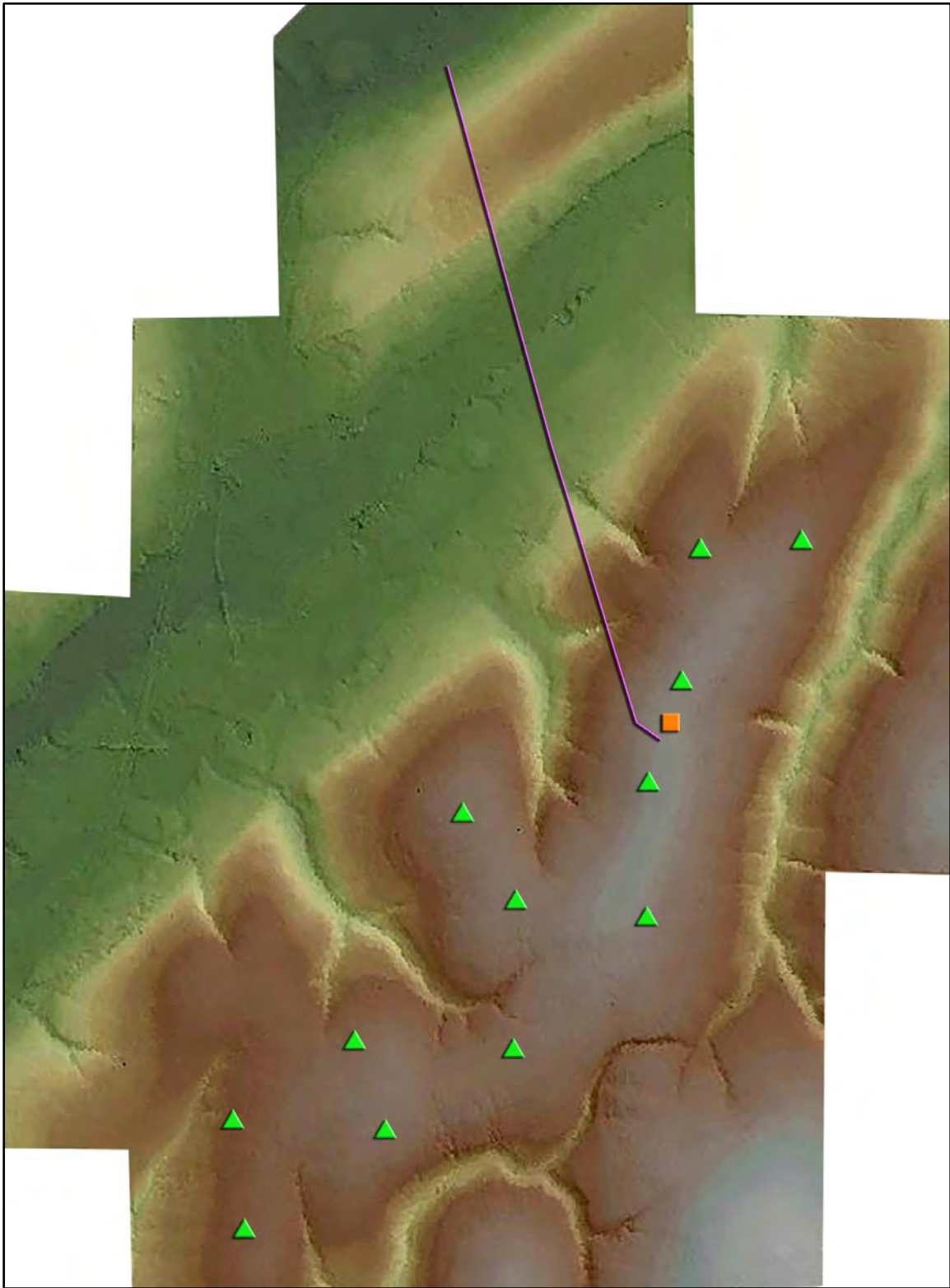


Figure 3: Project area on LiDAR data with turbine and transmission line locations.



Figure 4: Proposed placement for Turbine 3.



Figure 5: Proposed placement for Turbine 5.





Figure 6: Proposed placement for Turbine 6.



Figure 7: Proposed placement for Turbine 9.





Figure 8: Proposed placement for Turbine 12.



Figure 9: The view across the valley, near the route of the transmission line.



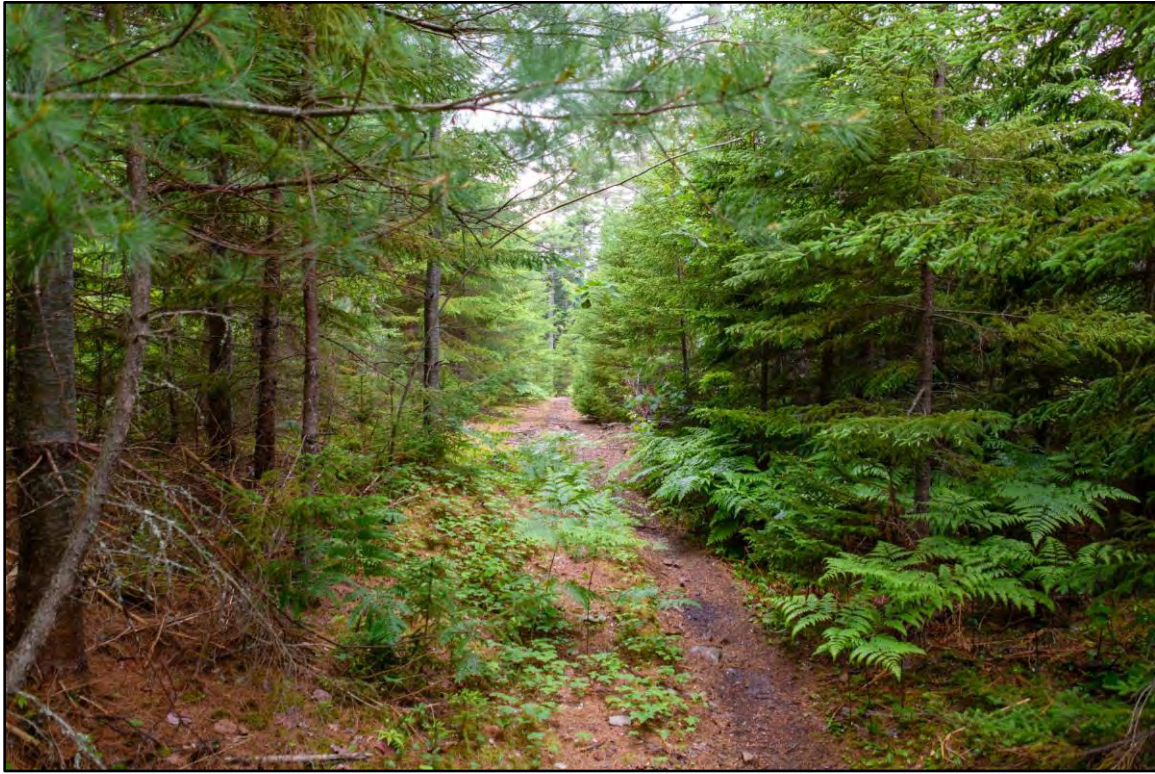


Figure 10: Upper terrace along transmission line.



Figure 11: Middle terrace along transmission line.



Figure 12: Lower terrace along transmission line.



Figure 13: Kennebecasis River crossing along transmission line.



Figure 14: Abandoned farm equip at edge of terrace, south of Portage Vale Rd.

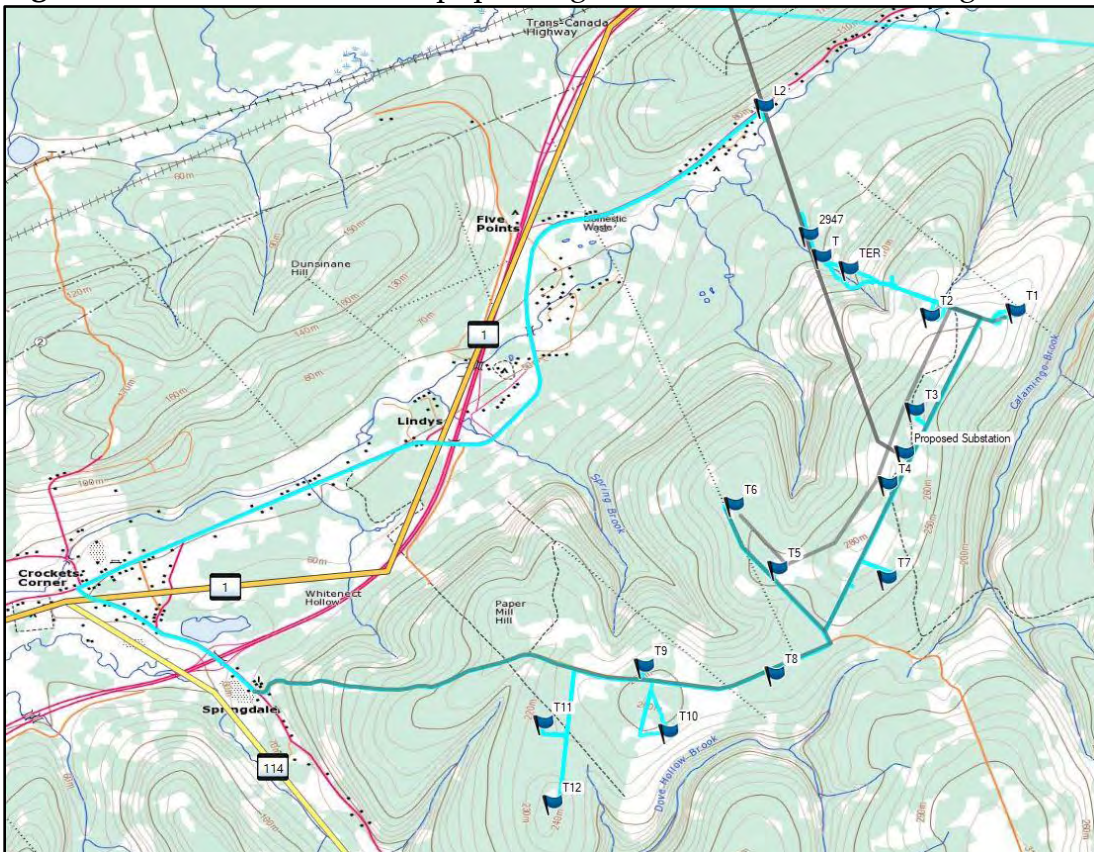


Figure 15: Turbines, transmission line and tracklog on a topographic map.



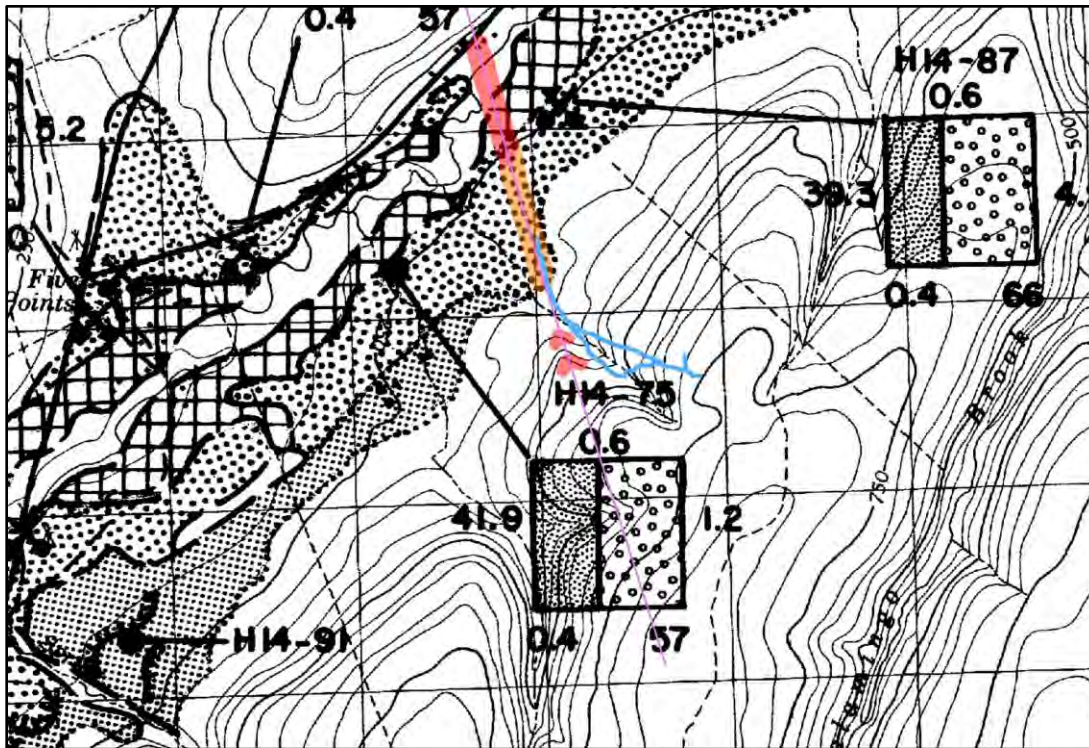


Figure 16: Trans. line on surficial geology map with areas of arch potential.



Figure 17: Trans. line on LiDAR map with areas of arch potential.



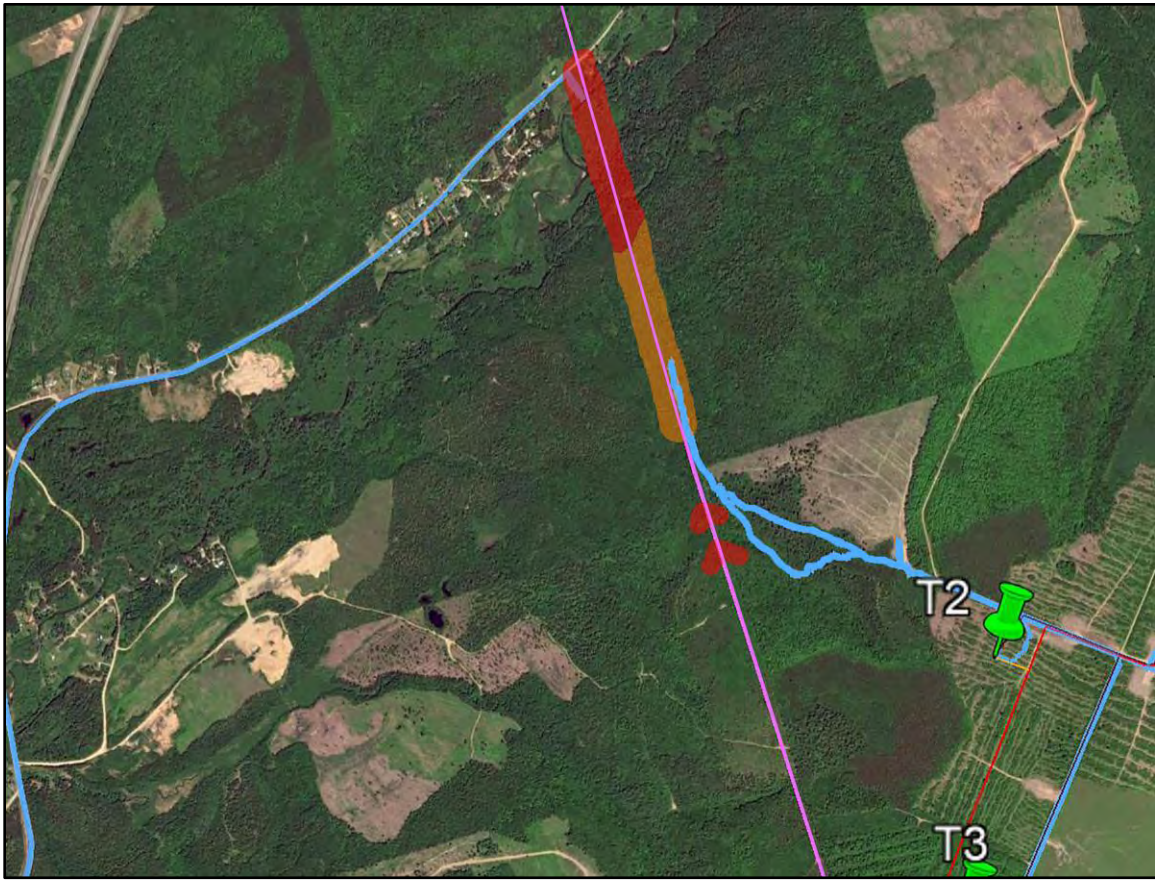


Figure 18: Trans. line on satellite image with areas of arch potential.

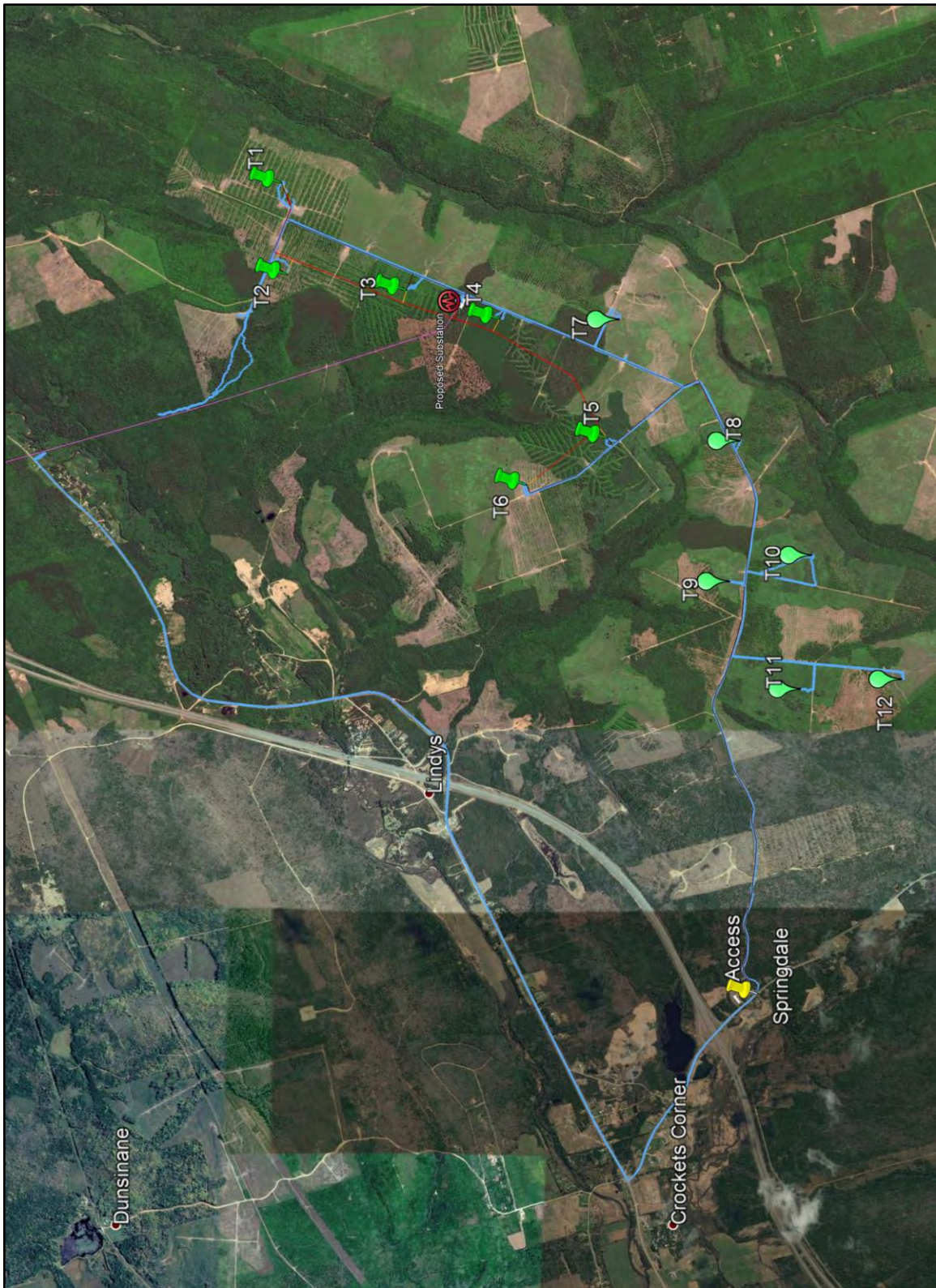


Figure 19: Tracklog on satellite image.

