

RE ORILLIA 1 SOLAR PROJECT

Water Body Site Investigations Report

August 3, 2011

RECURRENT
ENERGY





RE Orillia 1 ULC

Water Body
Site Investigations Report

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Project Report

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1. Introduction

1.1 Project Description

RE Orillia 1 ULC is proposing to develop and operate a 10-megawatt (MW) solar photovoltaic (Solar PV) facility, on an approximately 25-hectare (ha) parcel of land, located about 7 km west-southwest of Orillia in the Township of Oro-Medonte in Simcoe County; herein referred to as “RE Orillia 1” or the “Project”.

1.2 Legislative Requirements

Ontario Regulation (O. Reg.) 359/09 – *Renewable Energy Approvals Under Part V.0.1 of the Act*, (herein referred to as the REA Regulation) made under the *Environmental Protection Act* identifies the Renewable Energy Approval (REA) requirements for renewable energy projects in Ontario. As per Section 4 of the REA Regulation, ground mounted solar facilities with a name plate capacity greater than 10 kilowatts (kW) are classified as Class 3 solar facilities, and therefore, require an REA.

Section 31 of the REA Regulation requires proponents of Class 3 solar projects to undertake a water site investigation for the purpose of determining

- a) whether the results of the analysis summarized in the (Water Body Records Review) report prepared under Subsection 30 (2) are correct or require correction, and identifying any required corrections
- b) whether any additional waterbodies exist, other than those that were identified in the (Water Body Records Review) report prepared under Subsection 30 (2)
- c) the boundaries, located within 120 m of the project location, of any water body that was identified in the records review or the site investigation; and
- d) the distance from the project location to the boundaries determined under Clause (c).

The REA Regulation has specific requirements if designated lake trout lakes are present within 300 m of the Project location. These requirements were not deemed applicable to the Project as no such lakes were found during the Water Body Records Review (Hatch Ltd., 2010a).

Waterbodies are defined in Section 1(1) of the REA Regulation to include a lake, a permanent stream, an intermittent stream or a seepage area, but does not include

- a) grassed waterways
- b) temporary channels for surface drainage, such as furrows, or shallow channels that can be tilled or driven through
- c) rock chutes and spillways
- d) roadside ditches that do not contain a permanent or intermittent stream
- e) temporarily ponded areas that are normally farmed
- f) dugout ponds, or

- g) artificial bodies of water intended for the storage, treatment or recirculation of runoff from farm animal yards, manure storage facilities and sites and outdoor confinement areas.

Subsection 3 of Section 31 of the REA Regulation requires the proponent to prepare a report setting out the following:

1. A summary of any corrections to the (Water Body Records Review) report prepared under Subsection 30 (2) and the determinations made as a result of conducting the site investigations under Subsection (1).
2. Information relating to each water body identified in the (Water Body) records review and in the site investigations, including the type of water body, plant and animal composition and the ecosystem of the land and water investigated.
3. A map showing
 - i. the boundaries mentioned in Clause (1) (c)
 - ii. the location and type of each water body identified in relation to the project location, and
 - iii. the distance mentioned in Clause (1) (d)
4. The dates and times of the beginning and completion of the site investigation.
5. The duration of the site investigation.
6. The weather conditions during the site investigation.
7. A summary of methods used to make observations for the purposes of the site investigation.
8. The name and qualifications of any person conducting the site investigation.
9. Field notes kept by the person conducting the site investigation.

This Water Body Site Investigations Report has been prepared to meet these requirements. It has also been prepared in accordance with the Ministry of Environment’s DRAFT Technical Bulletin – Guidance for Preparing the Water Assessment and Water Body Report (dated January 28, 2011).

2. Summary of Results of Records Review

Table 2.1 summarizes the results of the Water Body Records Review Report (Hatch Ltd., 2010a).

Table 2.1 Summary of Records Review Determinations

Determination to be Made	Yes/No	Description
Is the project in a water body?	No	No part of the Project will be constructed within a water body.
Is the project within 120 m of the average annual high water mark of a lake, other than a lake trout lake that is at or above development capacity?	No	Bass Lake is located approximately 800 m north of the Project location.

Determination to be Made	Yes/No	Description
Is the project within 300 m of the average annual high water mark of a lake trout lake that is at or above development capacity?	No	No lake trout lakes are present within 300 m of the Project location.
Is the project within 120 m of the average annual high water mark of a permanent or intermittent stream?	No	No watercourses were identified on or within 120 m of the Project location.
Is the project within 120 m of a seepage area?	No	No seepage areas were identified within 120 m of the Project location.

Based on the results of the Water Body Records Review, there are no waterbodies on or within 120 m of the Project location. This was to be confirmed during the Site Investigation.

3. Site Investigation Methodology

3.1 Date, Time, and Duration of Site Investigation

- Date: May 26, 2010
- Start Time: 09:30 a.m.
- Duration: 3 hours

3.2 Weather Conditions During Site Investigation

- Temperature: 22°C
- Beaufort Wind: 3 (24 km/h)
- Cloud Cover: 0%

3.3 Name and Qualifications of Person Conducting Site Investigation

The site investigation was completed by Martine Esraelian.

Martine Esraelian, B.Sc. is an Environmental Scientist specializing in species at risk and terrestrial ecosystems. She has a B.Sc. from Trent University where she specialized in Conservation Biology and Ecological Management and an Ecosystem Management Technician diploma from Sir Sandford Fleming College. During her time at Trent University, she completed a 1-yr internship with the MNR which involved developing a genetic-based protocol for the extraction of DNA from unknown turtle eggshells to assist with species identification. The project entailed extensive molecular genetics research and intensive lab work to develop a protocol able to supplement existing conservation management practices.

She offers expertise across the full breadth of the field from environmental assessments and technical analysis of environmental data to conservation management, corporate and government consulting, and community outreach. Martine has liaised with all levels of government, the community, and a portfolio of clients that includes consulting firms, planners, and high-profile developers. She has both technical and hands-on experience conducting site investigations (terrestrial and aquatic),

evaluations of significance, environmental and agricultural impact studies, constraint analyses, water quality and soil assessments, species at risk, wildlife management and fisheries studies to meet regulatory requirements.

Martine has a wide range of field experience related to terrestrial and aquatic ecosystems and species at risk. She has conducted reptile and amphibian surveys, small-mammal trapping, benthic invertebrate monitoring and fisheries inventories (seine netting and electrofishing). She has conducted detailed natural areas inventories which involve species identification of flora and fauna, vegetation community mapping, identifying rare vegetation communities and significant wildlife habitats.

Martine has project management and fieldwork experience for a number of species at risk monitoring projects. Some of the species she has been involved with include: fowler's toad, massasauga rattlesnake, gray ratsnake, Jefferson salamander, northern dusky and mountain alleghany dusky salamander, blanding's turtle, map turtle, spotted turtle, snapping turtle, queen snake, milksnake, ribbonsnake, flowering dogwood, swamp rose mallow and spoon-leaved moss.

Martine is a certified Butternut Health Assessor (BHA) and also holds a certificate in the Ecological Land Classification (ELC) system.

3.4 Survey Methods

The entire site was searched by the observer on foot in order to document waterbodies. Photographs of the site were taken. Any observations of waterbodies, including the type of water body, instream habitat types, surrounding riparian areas, average annual high water mark and wildlife use were noted. Geographic coordinates at representative areas of the average annual high water mark for waterbodies on and within 120 m of the Project location were recorded using a sub-meter accuracy GPS for mapping purposes.

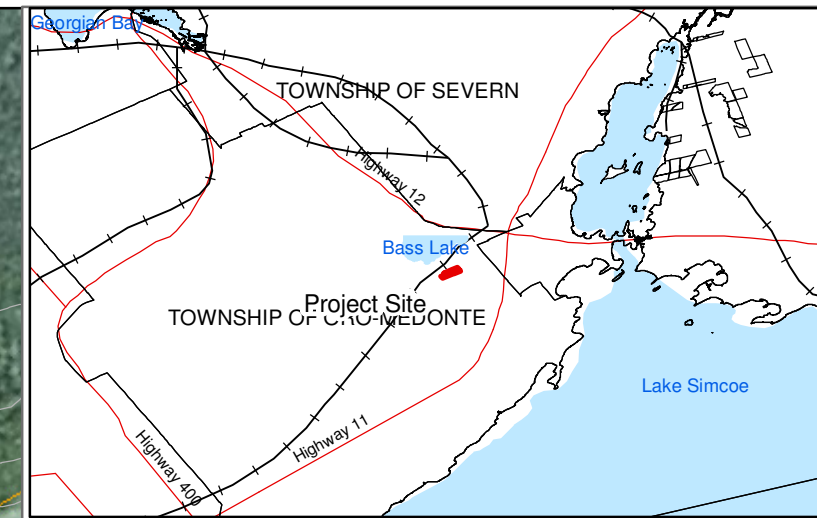
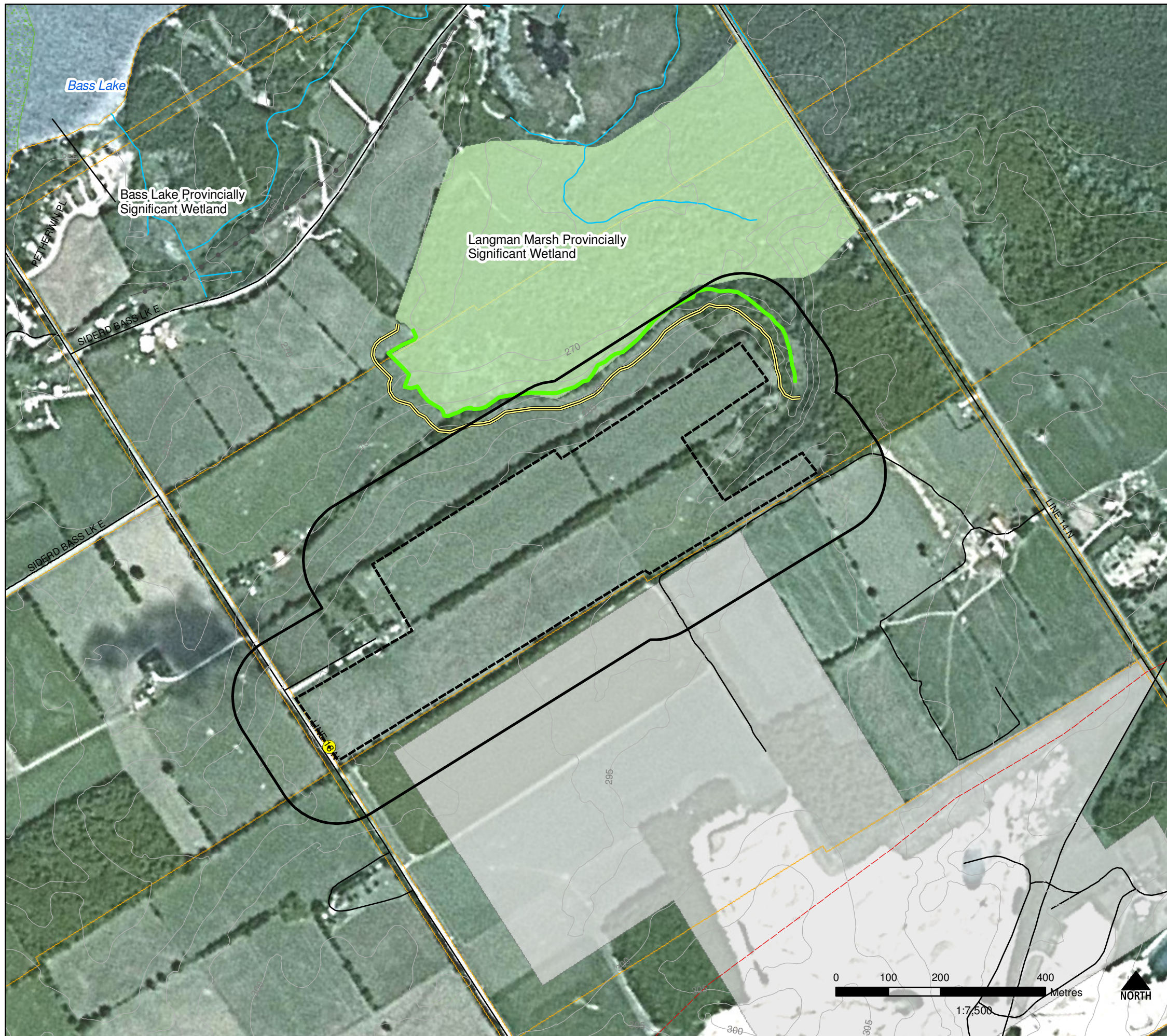
A copy of the field notes kept by the observer is provided in Appendix A.

4. Results of Site Investigation

This section documents the results of the Site Investigation and discusses specific water features observed on and adjacent to the Project location. Features noted in the following sections, including the proposed Project footprint boundary, seepage areas and the average annual high water mark of watercourses adjacent to the Project location, are shown in Figure 4.1.

4.1 Seepage Areas

There are no seepage areas on the Project location. A potential seepage area was observed at the base of a valley adjacent to the eastern end of the Project location. The head of the valley commences at the Project boundary, but there is no evidence of seepage in this location. Vegetation predominantly consists of open grassy meadow and scattered pockets of trees dominated by upland tree species including sugar maple (*Acer saccharum*), white ash (*Fraxinus americana*) and hawthorn species. A photograph of this area is provided in Figure 4.2.



Legend

- Road
- - - Snowmobile Trail
- Topographic Contour (5m interval)
- Watercourse
- Seepage Area
- ▭ Parcels
- ▭ 30m Setback From Seepage Area
- ▭ Pit/Quarry
- ▭ Evaluated Wetland

Project Components

- Connection Point With Existing Distribution Line
- ▭ Project Location
- ▭ 120 m from Project Location

Notes:
 1. Base data downloaded from www.geographynetwork.ca, other environmental data from LIO.
 2. Spatial Referencing UTM NAD83.
 3. Natural Resource Solutions Inc. provided additional evaluated wetland boundaries, Sept. 2010.

Figure 4.1
 Recurrent Energy
RE Orillia 1
 Water Body and
 Project Boundaries



Blank back



**Figure 4.2 Photograph of Conditions at the Head of the Valley
at the Western End of the Project Location**

As the valley descends in a northeasterly direction, vegetation transitions into a mixed woodland dominated by sugar maple, largetooth aspen (*Populus grandidentata*), hawthorn, white birch (*Betula papyrifera*) and eastern white cedar (*Thuja occidentalis*). Ground cover is dominated by a variety of forbs and grasses. At the point shown in Figure 4.1, some evidence of seepage was observed where the valley begins to level out at its base. There were several areas of shallow standing pooled water in mucky soils, as shown in Figure 4.3. This is potentially indicative of groundwater seepage at the base of the valley and a shallow groundwater table in this generally wet section of the woodland.



Figure 4.3 Photograph of Conditions at Potential Seepage Area East of the Project Location

Wetland vegetation became more predominant in this section of the woodland and the area appears to be a generally wet extension of the adjacent Langman Marsh Provincially Significant Wetland. As discussed in the Natural Heritage Site Investigation for this Project (Hatch Ltd., 2010b), the wetland boundary was revised on the basis of the presence of this wetland vegetation, as shown in Figure 4.1.

Therefore, in summary, a possible seepage area, consisting of seepage from the adjacent valley or a generally high groundwater table, is present in the woodland east of the Project location. As shown in Figure 4.1, the proposed Project footprint will be located in the agricultural fields approximately 30 m west and upslope from this potential seepage area. There is no defined watercourse associated with this seepage/high groundwater table area. The closest watercourse is located approximately 200 m northeast of the Project location.

4.2 Permanent or Intermittent Streams

No permanent or intermittent streams were observed on or within 120 m of the Project location. However, the seepage area appears to form the headwaters for a first order stream that ultimately drains into the tributary within the Langman Marsh PSW.

5. Conclusions

Based on the results of the site investigation discussed above, there is one correction to the results of the Water Body Records Review (Hatch Ltd., 2010a) required. This involves addition of a seepage area supplying the headwaters of a first order stream at the northeastern end of the Project location.

In addition, the Project Footprint and associated study area has been refined in this Site Investigation Report compared to that shown in the Records Review Report, which only showed the area of the property that was leased.

Based on the results of the site investigation and the proposed Project components and boundaries shown in Figure 4.1, some components of the Project will be located between 30 and 120 m of this seepage area. Therefore, an Environmental Impact Study (EIS) will be required to assess the potential effects of the Project and the required mitigation measures.

6. References

Hatch Ltd. 2010a. RE Orillia 1 Solar Project – Water Body Records Review Report. Prepared for RE Orillia 1 ULC.

Hatch Ltd. 2010b. RE Orillia 1 Solar Project – Natural Heritage Site Investigations Report. Prepared for RE Orillia 1 ULC.

Appendix A
Site Investigation
Field Notes

Project: Orillia 1, 2 + 3
Date: May 26, 2010
Location: 1599 Line 13 N, Hawkestone
Time: 0930-1230 (3hrs)
Temp: 22°C
%HC: 0%
Wind: SE 24km/h Beaufort 3

Orillia 1

SE Treeline

- AW (large)
 - Or (large)
 - MS (immature)
 - black cherry
- black bear scat?

Orchard (western boundary)

- old apple trees
- AW (D)
- Hawthorn
- Black cherry?
- Starbuck Gum (D)
- Sugar Maple
- marbled maple (2)

Apple
maple (D)

North west boundary, Tree line

- Basswood (A)
 - Sugar maple (D)
 - white ash (D)
 - Hawthorn (A)
 - Elm (C)
 - Ironwood (B)
 - white Birch (R)
- maple
ashes (D)

Forest
Groundhog

Orellia Fish & Game
 Conservation Club (north of
 project site - trail through wetland)
 (705)-826-4263

White Birch Area / Woodlot
 mixed Woodland
 White Birch Hawthorn
 Large tooth Aspen (D) Sugar maple
 white cedar

Langman Marsh PSW

NE side of road (land of mine) L
 CW (White Cedar) aspen
 PW (White Pine)

Cherry Birch

Now cedar - M (D) American Beech

Tall Buttercup Alder Hawthorn

Field Strawberry Elm (O) (P) on
 wild geranium
 wild ginger

Bald (A)

PW (A) (P) (B)

near: red maple mix saw my yellow birch (B)

Swampy area - cedar saw my

dogwood saw red pine

Beech (A) Jack in pine

Brown (A) Alder

Cherry Birch (A)

