Book 21
Witness Statement of Greg Scheifele

21-Apr-16

Index

ONTARIO MUNICIPAL BOARD

Commission des affaires municipals de l'Ontario

PROCEEDING COMMENCED UNDER subsection 34(11) of the *Planning Act*, R.S.O. 1990, c. P. 13, as amended

Applicant and Appellant:	James Dick Construction Limited
Subject:	Application to amend Zoning By-law No. 57/1999 - Refusal or neglect of Township of Guelph/Eramosa to make a decision
Existing Zoning:	Agriculture (A) and Hazard (H).
Proposed Zoning:	Extractive Industrial (M3) and Hazard (H)
Purpose:	To permit a quarry
Property Address/Description:	Part Lot 1, Concession 6
Municipality:	Guelph Eramosa
Municipality File No.:	ZBA09/12
OMB Case No.:	PL150494
OMB File No.:	PL150494
OMB Case Name:	James Dick Construction Limited v. Guelph/Eramosa (Township)

PROCEEDING COMMENCED UNDER subsection, 11(5) of the *Aggregate Resources Act,* R.S.O. 1990, c. A.8, as amended

Referred by:	Jane Ireland
Objector:	Shirley Allen
Objector:	Ron & Debbie Brennen
Objector:	John & Ann Brophy
Objector:	Dennis & Laura Campbell; and others
Applicant:	James Dick Construction Limited
Subject:	Application for a Class A licence for the removal of aggregate
Property Address/Description:	Part Lot 1, Concession 6
Municipality:	Guelph Eramosa
OMB Case No.:	PL150494
OMB File No.:	MM150034
OMB Case Name:	James Dick Construction Limited v. Guelph/Eramosa (Township)

WITNESS STATEMENT FOR GREG SCHEIFELE

1. The evidence to be presented by Greg Scheifele will consist of a presentation and review of the following reports and documents.

Tab No.	Reports / Documents
1.	Proposed Hidden Quarry Level II Natural Environment Technical Report, August 2012
2.	Hidden Quarry - Response to MNR Comments, May 27, 2013

3.	Scanned 2011 ELC Field Sheets sent to GRCA May 28, 2013
4.	Hidden Quarry - Response to Wellington County Comments, September 6, 2013
5.	Hidden Quarry Site Meeting Notes -Response to GRCA Comments September 17, 2013
6.	GWS Letter re: Potential Waterfowl Use of Hidden Quarry June 9, 2014
7.	GWS Response - CRC Natural Environment Report by GAIA, August 26, 2014
8.	Wildlife Observations on Halton Region Lands Adjacent to Hidden Quarry, September 22, 2014
9.	G. Scheifele C.V.
10.	Executed OMB Experts Duty Form - G Scheifele

2. In addition, Greg Scheifele will refer to the Ministry and Agency Review Comments and the Township of Guelph/Eramosa Peer Review Comments set out in the Document Books produced by James Dick Construction Limited.

Date: April 21, 2016 Greg Scheifele

Proposed Hidden Quarry
Level II Natural Environment
Technical Report

Prepared for: James Dick Construction Limited
Box 1470
Bolton, Ontario
L7E 5T4

Prepared by:

GWS Ecological & Forestry Services Inc.
4670 Townline Road
Cambridge, Ontario
N3C 2V1

In Association With: Gray Owl Environmental Inc.

August, 2012

Draft Table of Contents

LIST OF TABLES

LIST OF APPENDICES

LIST OF FIGURES

1.0 Introduction

1.1 Background

GWS Ecological & Forestry Services Inc. (GWS) was retained by James Dick Construction Limited to prepare a Level II Natural Environment Technical Report in support of their application for a Category 1, Class "A" Below Groundwater Quarry License under the Aggregate Resources Act (ARA) for their property in the Township of Guelph-Eramosa, hereinafter referred to as the Eramosa Quarry. Since the proposed mineral aggregate extraction area is situated within 120m of significant natural heritage features a Level II Natural Environment Technical Report is required under the Provincial Standards of the ARA.

The Dick property is located in Part Lot 1 Concession 6, Township of Guelph-Eramosa (former Township of Eramosa), County of Wellington. This parcel of land is situated on the north side of Highway # 7 about 2km east of Rockwood as shown in Figure 1, Appendix A. The property is 38.08 hectares (94.1 acres) in size and is also bounded by Concession Road 6 on its west site. For the purpose of this report the subject lands refer to the area to be licensed for aggregate extraction while adjacent lands refer to the 120m zone surrounding the proposed license area. Collectively, these lands represent the study area for this project.

The proposed extraction site was largely cleared and used for agricultural purposes for several decades, particularly as livestock pasture. This historical land use is clearly illustrated in the 1930, 1964 and 1972 air photographs provided in Figures 2, 3 and 4. However, in 1982 the former owner, Mr. R.E. Johnston, entered into an agreement with the Ministry of Natural Resources (MNR) under the Woodlands Improvement Act. As a result, approximately 57 acres were planted with a mixture of white pine and white/Norway spruce seedlings in the spring of 1983. This reforestation work was successful and today the majority of the site consists of conifer plantation. The agreement with MNR expired December 31, 1997. The balance of the site consists of natural upland hardwood and mixedwood forest, open successional communities including several old aggregate extraction areas, treed hedgerows, marsh and a single family residence. A small watercourse flows southward across the eastern half of the property and discharges through a culvert on Highway # 7.

The air photographs shown in Figures 2, 3 and 4 also indicate that aggregate extraction historically occurred in several locations on the property. Figure 2, the 1930 air photograph, indicates that aggregate extraction was occurring in the southwest corner of the property and along Highway # 7 in an area now characterized by mixedwood forest. The 1964 and 1972 air photographs (Figures 3 and 4) show mining disturbance along Highway # 7 and in the northwest corner of the site. These former extraction areas are now covered with a variety of herbaceous and woody vegetation.

The surrounding lands consist of a mixture of farmland, woodland, wetland, private residences and commercial establishments. On the south side of Highway # 7, the land is mainly characterized by upland hardwood forest, although there is some open farmland and a few residences and commercial buildings in this area. Along Concession Road 6, the adjacent lands to the west consist mostly of agricultural cropland (e.g. soybeans, spring grains etc.) although there is a small conifer plantation and wetland found at the intersection with Highway # 7. On the north side of the property, there are 3 residences with access off Concession Road 6 and some actively used farm buildings (i.e. mushroom production). Aside from these buildings, the adjacent lands to the north consist mostly of cropland devoted to hay and spring grains. There is, however, a large lowland and upland forest next to the northeast corner of the site and the stream that bisects the property originates from this natural area. To the east of the property there is open agricultural land that has

been left idle for several years, except for the area next to Highway # 7 which has been zoned for industrial development.

In June 2011 Williams & Associates Forestry Consultants Ltd. prepared a Managed Forest Plan for the James Dick property in accordance with the requirements of the Managed Forest Tax Incentive Program (MFTIP). During the fall and winter of 2011/2012 a first thinning was carried out in the white pine and spruce plantations. Conifer boltwood was removed with a mechanized harvester from every 3rd, 4th or 5th row along with some selection thinning in the residual rows. In this way access was provided to facilitate future harvesting operations.

1.2 Study Purpose

James Dick Construction Ltd. is a long standing producer of mineral aggregate and ready mix concrete in central southern Ontario. The company bought the subject property from Mr. Johnston in 1988 with the intent of eventually extracting its mineral aggregate resources. Small wayside sand and gravel pits were previously established on the property for the purpose of satisfying local road building needs and hence its resource potential was well known. The company would now like to license the property and carry out sand and gravel extraction above the water table and is also proposing to extract the underlying dolostone from below the water table. The proposed quarry license would cover the entire property but the extraction area would be confined to 25.99 hectares (64.2 acres).

The purpose of this Natural Environment Technical Report is to identify environmental features and functions in the study area and then evaluate the impacts of the proposed aggregate extraction operation on these features. This study must also address the requirements of the 2005 Provincial Policy Statement (PPS), as well as the environmental study requirements under the County of Wellington Official Plan and the Township of Guelph-Eramosa Zoning By-law.

1.3 Applicable Legislation and Land Use Planning Policies

The following discussion provides a brief overview of applicable legislation, land use planning policies and regulations that must be considered in evaluating the environmental feasibility of carrying out mineral aggregate extraction on the subject property.

Aggregate Resources Act

This Level II Natural Environment Technical Report has been prepared in accordance with the Provincial Standards for a Category 1 Class “A” license under the ARA. Category 1 Class “A” licenses are for pit or quarry operations with extraction below the water table. The provincial standards of the ARA require a Level I Natural Environment Technical Report to determine whether any of the following exist on and/or within 120m of the site:

- significant wetlands;
- significant habitat of Endangered or Threatened species;
- fish habitat;
- significant woodlands;
- significant valleylands;
- significant wildlife habitat; and
- significant Areas of Natural and Scientific Interest (ANSI).

If any of the seven above natural heritage features are present, then a Level II Natural Environmental Technical Report is required to:

- determine any negative impacts on the natural features or ecological functions for which they are identified; and
- propose any preventative, mitigative or remedial measures that may be necessary.

The subject property and adjacent lands include known areas of significant wetland and as a result, a formal Level I Natural Environment Technical Report was not required to trigger the requirements for a Level II Report. Accordingly, James Dick authorized GWS to conduct the fieldwork needed to satisfy the requirements of a Level II Report.

In addition to the ARA, this report addresses the 2005 Provincial Policy Statement and the relevant municipal planning policies in the Township of Guelph-Eramosa and the County of Wellington as outlined below.

County of Wellington Official Plan, 2002

The County's Official Plan (OP) designates the James Dick property as a Mineral Aggregate Area and Prime Agricultural Area with a small inclusion of Core Greenlands in west corner of the site and along the small watercourse that bisects the property. Mineral aggregate operations may be allowed in Prime Agricultural Areas and Core Greenlands subject to the more detailed policies of this plan. In any event, an Official Plan Amendment is not required for this development application to proceed. The lands to the west and northwest of the site are also designated as Prime Agricultural. Greenlands are identified immediately north of the subject property while lands to the east along Highway # 7 are designated as Rural Industrial.

Township of Guelph-Eramosa

The Township of Guelph-Eramosa relies on the County's OP for guidance on appropriate land use designations within its jurisdiction. With respect to zoning on the subject property, the Township has identified the stream corridor as Hazard Land (H), as well as the marsh found along the 6th Line and two small wetland pockets located to the east of this area. The balance of the property is zoned Agricultural (A).The adjacent lands are also zoned Agricultural, except along the eastern property boundary where the lands are zoned industrial. In order for aggregate extraction to proceed on the subject property the zoning will have to be changed to Extractive Industrial (M3).

2.0 Study Methodology

In preparing this report relevant background information on biophysical conditions and land use planning considerations was obtained from the MNR, Grand River Conservation Authority (GRCA), County of Wellington, Regional Municipality of Halton and other sources. These reports, data sheets, maps and air photographs were reviewed to gain an appreciation for the natural and cultural features found on the site and surrounding lands. An extensive review of these background documents facilitated the initial identification of potential environmental constraints to proposed aggregate extraction. This information also helped to clarify the scope of field studies needed to complete a comprehensive inventory of natural features on and adjacent to the subject property and an analysis of the potential impact of proposed quarry development on these natural resources.

2.1 Background Information

Background data were collected and reviewed for the subject property and adjacent lands to document the known designated features and characteristics of the land, the presence of significant species and identify the regional context. These data were also used to supplement and help guide the field surveys carried out in the study area. Key documents reviewed included, but were not limited to:

- Aerial Photography. 2006. Orthoimagery. Grand River Conservation Authority.
- Atlas of the Breeding Birds of Ontario (2001-2005). Internet database (www.birdsontario.org/atlas/atlasmain.html)
- Cadman, M.D., et.al. 1987. Atlas of Breeding Birds of Ontario. Federation of Ontario Naturalists, Long Point Bird Observatory. 617pp.
- Chapman, L.J and D.F. Putnam. 1984. The Physiography of Southern Ontario, Third Edition. Ontario Geological Survey Special Volume 2, Ministry of Natural Resources. 270pp.
- Dobbyn, J. 1994. Atlas of the Mammals of Ontario. Federation of Ontario Naturalists. 118pp.
- Eagles et.al. 1980. Environmentally Sensitive Areas of Wellington County.
- Grand River Conservation Authority. 2011. Resource Mapping.
- Hoffman, D.W., B.C. Matthews and R.E. Wicklund. 1963. Soil Survey of Wellington County, Ontario, Report No. 35 of the Ontario Soil Survey. Research Branch Canada, the Ontario Department of Agriculture and the Ontario Agricultural College. 69pp.
- Natural Heritage Information Centre (NHIC). 2011. Provincial status of plants, wildlife and vegetation communities database. https://www.biodiversityexplorer.mnr.gov.on.ca/nhicWEB/mainSubmit.do. OMNR, Peterborough.
- Ontario Ministry of Natural Resources. 2010. Natural Heritage Reference Manual for Natural Heritage Policies of the Provincial Policy Statement, 2005.
- Ontario Ministry of Natural Resources. 2000. Significant Wildlife Habitat Technical Guide.
- Oldham, M.J. and W.F. Weller. 2000. Ontario Herpetofaunal Atlas internet database. Natural Heritage Information Centre, Ministry of Natural Resources. Accessed November, 2010. http://nhic.mnr.gov.on.ca/MNR/nhic/herps/ohs.html (updated 15-01-2010).
- Ontario Odonata Atlas. 2005. Natural Heritage Information Centre, Ontario Ministry of Natural Resources. Accessed November, 2010. http://www.mnr.gov.on.ca/MNR/nhic/odonates/ohs.html (updated 15-02-2005)

- Proctor and Redfern Limited. 1995. Blue Springs Creek Linear Corridor Initiative. Final Report. Prepared for the Grand River Conservation Authority.
- Township of Guelph-Eramosa Zoning By Law 57/1999 Schedule A Map 1.
- Wellington County Official Plan. 1999. Last Updated February 24, 2011. County of Wellington.

2.2 Field Surveys

Field investigations for this project were previously undertaken by staff of Prime Environmental Consultants Limited. from June 1995 to May 1996 and they included land use mapping, vegetation cover typing, a botanical survey, wildlife surveys of birds, mammals and herpetofauna (amphibians and reptiles), aquatic habitat assessment and electrofishing in the intermittent stream in accordance with MNR's Manual of Instruction – Aquatic Habitat Inventory Surveys. The results of this fieldwork were presented in a draft report that was submitted to James Dick Construction Limited in 1997 for internal review. For various reasons this report was never circulated to the relevant agencies and municipalities for comment.

Work on this development was put on hold until December 2010 when a forest resource inventory was carried out. Additional field studies were conducted during 2011 and they included detailed inventories of vegetation communities and associated wetlands, wildlife (mammals, amphibians, reptiles, breeding birds, butterflies and odonates), ephemeral pond investigations and an aquatic habitat assessment of the intermittent watercourse on and adjacent to the subject property. Surface water runoff patterns were also evaluated in relation to wetland attributes. Further fieldwork on amphibian utilization of nearby wetlands was carried out during the spring of 2012 These field surveys were undertaken to update and supplement data previously collected during the mid1990's and they are summarized in Table 1. The following discussion outlines the detailed survey procedures.

2.2.1 Vegetation Community and Botanical Survey

An inventory of vegetation communities and botanical resources was previously carried out on the subject property during the summer of 1995 and spring on 1996. This information was supplemented by more recent field investigations in the study area which included a forest inventory, Ecological Land Classification (ELC) of vegetation communities, wetland delineation and a floristic survey. These data were collected during the period from December 2010 to December 2011. The forest and botanical inventories were only completed on the James Dick property while the ELC mapping covered the site and adjacent lands. Where ground access to adjacent lands was not permitted or necessary, aerial photographs were used to determine approximate ELC boundaries. Vegetation communities were first delineated on aerial photographs and then verified in the field. Community characterizations (ecosites and ecotypes) were based on the Ecological Land Classification for Southern Ontario (Lee et al., 1998). Plant species were identified using the nomenclature provided by Newmaster et al. (1998). Samples of plant species that could not be conclusively identified in the field by GWS staff (i.e. certain grasses, sedges, asters etc.) were collected for subsequent lab identification by Carole Ann LaCroix, the Curator of the University of Guelph Herbarium.

Table 1 Site Investigation Record – James Dick Property

DATE	STUDIES COMPLETED	INVESTIGATORS
Dec. 7, 2010	forest resource inventory	A. Buitendyk, M. Scheifele
Dec. 9, 2010	forest resource inventory and preliminary ELC mapping	A. Buitendyk, M. Scheifele
Feb. 23, 2011	winter wildlife survey	G. Scheifele
Mar. 18, 2011	assess ice conditions on ponds	A. Buitendyk
Apr. 3, 2011	installation of minnow traps for salamanders in offsite ponds	A. Buitendyk
Apr. 4, 2011	check minnow traps for salamanders	A. Buitendyk
Apr.5, 2011	check minnow traps for salamanders	A. Buitendyk
Apr. 6, 2011	check minnow traps for salamanders	A. Buitendyk
Apr. 7, 2011	check minnow traps for salamanders	A. Buitendyk, A. Sandilands
Apr. 8, 2011	check and remove minnow traps	A. Buitendyk
Apr. 18, 2011	amphibian egg-mass survey	A. Buitendyk, A. Sandilands
Apr. 28, 2011	calling amphibian survey	G. Scheifele
May 18, 2011	calling amphibian survey	G. Scheifele
May 19, 2011	botanical and wildlife surveys, installation of snake boards	G. Scheifele
May 20, 2011	Least Bittern and marsh bird survey, check snake boards	A. Sandilands
May 30, 2011	Least Bittern, marsh birds, and breeding birds, check snake boards	A. Sandilands
June 6, 2011	installation of baited minnow traps for fish, check snake boards, complete ELC cards	A. Buitendyk, M. Scheifele
June 7, 2011	check minnow traps and snake boards	A. Buitendyk
June 8, 2011	check minnow traps and snake boards	A. Buitendyk
June 9, 2011	check minnow traps and check snake boards	A. Buitendyk
June 10, 2011	check and remove minnow traps, check snake boards	A. Buitendyk
June 12, 2011	Least Bittern and marsh bird survey, check snake boards	A. Sandilands
June 13, 2011	goatsucker and owl survey	A. Sandilands
June 17, 2011	breeding bird survey, check snake boards	A. Sandilands
June 26, 2011	breeding bird survey, check snake boards	A. Sandilands
June 27, 2011	calling amphibian survey	G. Scheifele
June 29, 2011	botanical and wildlife surveys, ELC mapping, check snake boards	G. Scheifele
July 7, 2011	botanical and wildlife surveys, ELC mapping, check snake boards	G. Scheifele
July 26, 2011	bat survey	A. Sandilands
July 27, 2011	check snake boards and complete ELC cards	A. Buitendyk, M. Scheifele
July 27, 2011	odonate and butterfly survey, check snake boards	A. Sandilands
Sept. 12, 2011	botanical and wildlife surveys, ELC mapping, check and remove snake boards	G. Scheifele
Oct. 14, 2011	ELC mapping and wildlife survey	G. Scheifele
Nov. 4, 2011	natural feature setback assessment	G. Scheifele, S. Denhoed
Dec. 7, 2011	forest resource inventory of conifer plantations that were thinned	A. Buitendyk, M. Scheifele

Table 1 Site Investigation Record – James Dick Property

DATE	STUDIES COMPLETED	INVESTIGATORS
Dec. 13, 2011	natural feature setback reassessment	G. Scheifele
Dec., 23, 2011	stream channel assessment, winter wildlife survey	G. Scheifele, S.Denhoed
Mar. 18, 2012	installation of minnow traps for salamanders in offsite ponds	A. Buitendyk
Mar. 19, 2012	check minnow traps for salamanders	A. Buitendyk, M. Scheifele, A. Sandilands
Mar. 20, 2012	check minnow traps for salamanders	A. Buitendyk
Mar. 21, 2012	check minnow traps for salamanders	M. Scheifele
Mar. 22, 2012	check minnow traps for salamanders	M. Scheifele
Mar. 23, 2012	check minnow traps for salamanders	M. Scheifele
Mar. 24, 2012	check minnow traps for salamanders	A. Buitendyk
Mar. 25, 2012	check minnow traps for salamanders	A. Buitendyk
Mar. 25, 2012	calling amphibian survey	G. Scheifele
Mar. 26, 2012	check minnow traps for salamanders	A. Buitendyk
Mar. 27, 2012	check and remove minnow traps in offsite ponds	A. Buitendyk
Apr. 19, 2012	amphibian egg-mass survey	A. Buitendyk, A. Sandilands
May 6, 2012	calling amphibian survey	G. Scheifele
May 15, 2012	Least Bittern and marsh bird survey	A. Sandilands
May 26, 2012	Least Bittern and marsh bird survey	A. Sandilands
June 7, 2012	Least Bittern and marsh bird survey	A. Sandilands
June 18, 2012	calling amphibian survey	G. Scheifele

Natural heritage information collected from the study area was evaluated to determine potential significance at various levels. Provincial significance of vegetation communities was based on the current rankings assigned by the NHIC. The potential sensitivity of communities was based on an assessment of their age, habitat quality, weediness and degree of disturbance. The provincial status of all plant species is based on Newmaster et al. (1998) with updates from the NHIC database. Sensitive native plants were determined by their coefficient of conservatism (CC), which ranges from 0 (low) to 10 (high) based on a species tolerance of disturbance and fidelity to natural habitats (Oldham et al., 1995). The regional and/or local rarity of plants was based on assessments made by MNR (Riley, 1989).

2.2.2 Breeding Bird Surveys

Breeding bird surveys included typical breeding surveys and specialized surveys for Least Bittern (*Ixobrychus exillis*), marsh birds, owls, and goatsuckers. These surveys, the time and effort expended upon them, and weather conditions at the time of the surveys are presented below.

For wildlife species in this report, scientific names are given only for those species that were not detected during the surveys. Scientific names of species that were recorded are listed in Appendix C.

Typical Breeding Bird Surveys

Breeding bird surveys were conducted on mornings when the wind was calm and there was no precipitation. Wandering transects were used to investigate all on-site habitats. Adjacent lands were surveyed from the property boundary or the public road system. Given that the average distance of detection aurally for birds is about 100m, most of the species within adjacent lands

were probably detected. In 2012, permission to access the property east of the site was obtained, resulting in some additions to the wildlife list from adjacent lands. All birds seen and heard were recorded, and it was also noted which general habitat birds occurred within on the subject lands: marsh, plantation, cultural meadow, deciduous forest, and coniferous forest. Birds that were detected on adjacent lands were also distinguished as to whether they were seen on the east, west, south, or north sides of the property. All species that were detected were assumed to be breeding unless there was no suitable habitat for them or other circumstances demonstrated that they were not breeding.

Although most of the breeding bird work was conducted in the morning before 1000 hours, birds observed later in the day while conducting other wildlife surveys were also recorded.

Three visits were devoted primarily to breeding bird surveys: May 30, June 17, and June 26, 2011. Protocols for the Ontario Forest Monitoring Program recommend two surveys annually, one between May 24 and June 17 and the second between June 15 and July 10. The surveys should be a minimum of 7 days apart. Consequently, the on-site surveys were within the recommended time frame and one additional survey was completed.

The May 30th visit extended from 0640 to 1025 hours. The weather was a mix of sun and cloud with temperatures ranging from 18 to 22°C. The wind was light and was 1 to 2 on the Beaufort wind scale.

The June 17th visit was from 0704 to 1138 hours, with the later period of the survey focusing on other wildlife species. The weather was initially somewhat foggy and later sunny with temperature ranging from 14 to 25°C. The wind was light and was 1 to 2 on the Beaufort wind scale.

The June 26th visit was from 0643 to 1043 hours. The weather was a mix of sun and cloud with a temperature of 16 to 22°C. The wind was initially calm (1 to 2 on the Beaufort wind scale) but picked up to 2 to 3 near the end of the survey.

Additional records of breeding birds were made on May 20, June 12, June 13, and July 27, 2011 while surveying other wildlife groups. In addition, observations of breeding birds were made by other study team members while undertaking other inventories.

Three visits were made in 2012 to conduct the Least Bittern and marsh bird surveys and all breeding bird species were noted on these visits. These visits occurred on May 15, May 26, and June 7, 2012.

Least Bittern Survey

A Least Bittern survey was done at the on-site cattail marsh along the Sixth Line and at the adjacent marsh along Highway 7 west of the Sixth Line in 2011. The protocol that was followed was the National Least Bittern Survey Protocol (Jobin et al. 2010). This consists of conducting a 13-minute point count at each station. The point count consists of a 5-minute period of silent listening, 5 minutes of playing broadcast calls, and a final 3 minutes of silent listening. The broadcast segment consists of 30 seconds of the “coo” call followed by 30 seconds of silence with this sequence being played a total of five times.

The Least Bittern survey was conducted on May 20, May 30, and June 12, 2011. On these dates, the point counts were initiated at 0728, 0645, and 0647 hours respectively at the on-site pond and at 0748, 0703, and 0705 hours at the adjacent western marsh.

The weather on May 20th was sunny with a temperature of 12 to 16°C. The wind was calm, measuring 1 to 2 on the Beaufort wind scale. Conditions on May 30th are described above under typical breeding bird surveys. The weather on June 12th was mostly cloudy with a temperature of 15°C, and the wind was 3 to 4 on the Beaufort wind scale.

In 2012, the Least Bittern survey was conducted at the marsh/shrub thicket swamp east of the northeast corner of the site, and this survey was also repeated at the on-site cattail marsh along the Sixth Line. These surveys were conducted on May 15, May 26, and June 7, 2012. On these dates, the point counts were initiated at 0703, 0800, and 0758 hours respectively at the on-site marsh and at 0720, 0851, and 0855 hours at the adjacent eastern marsh.

The weather on May 15th was sunny with a temperature of 7 to 9°C and there was no wind. On May 26th, there was a mix of sun and cloud with a temperature of 18 to 20°C, and there was no wind. It was sunny on June 7th with a temperature of 15 to 18°C and wind measuring 0 to 1 on the Beaufort wind scale.

Marsh Bird Survey

The Bird Studies Canada Marsh Monitoring Program (MMP) tape for marsh birds was played at two stations on three occasions in 2011. The stations were on the Sixth Line at the on-site marsh and along Highway 7 at the marsh west of the Sixth Line on adjacent lands. The station along Highway 7 was down the embankment from the highway but still on the right-of-way on public land. The survey was repeated in 2012 at the on-site marsh on the Sixth Line and at the wetland east of the site.

Some modifications were made to the MMP protocol. For some species, the broadcast segments are too short to elicit a response. The tape consists of a sequence of calls of the Virginia Rail (*Rallus limicola*), Sora (*Porzana carolina*), Least Bittern, a mix of Common Gallinule (*Gallinula galeata*) and American Coot (*Fulica americana*), and Pied-billed Grebe (*Podilymbus podiceps*). The broadcast section for each species is only 30 seconds in duration on the MMP tape. For the Virginia Rail, a separate tape of approximately 3 minutes duration was played. The Sora and Pied-billed Grebe sequences were played three times. As discussed above, a separate survey was conducted for the Least Bittern. The Common Gallinule and American Coot usually respond aggressively to the tape and also to other species' calls on the tape, so only a single sequence was played for this species as per the BBS protocol.

The marsh bird tapes were played on the same dates as the Least Bittern surveys were completed: May 20, May 30, and June 12, 2011 and May 15, May 26, and June 7, 2012. The marsh bird survey was completed immediately after the Least Bittern survey at each station on each visit. Information on weather conditions and timing are presented under the Least Bittern survey methods.

Owl Survey

A call-broadcast survey for owls was conducted on June 13, 2011. The survey consisted of playing calls of the primary species of owls that breed in southern Ontario. The order of species on the tape is Northern Saw-whet Owl (*Aegolius acadicus*), Eastern Screech-Owl (*Megascops otus*), Long-eared Owl (*Asio otus*), Barred Owl (*Strix varia*), and Great Horned Owl (*Bubo virginianus*). The order of species on the tape is arranged from smallest species to largest. Large owls may prey upon smaller owls, so playing a large owl's song first may result in the smaller owls' not responding.

The timing of the survey was within the breeding season of all of the species except the Great Horned Owl, which nests earlier in the year. This species seldom responds to its own calls even during its nesting season. However, it often responds at any time of the year to the calls of other owl species, so the tape is fairly effective in detecting this species even outside of its nesting season.

A single point count at the on-site house was used for the survey. Because of the exceptional hearing of the owls, they can hear the tapes for considerable distances and usually move in to investigate. Therefore, a single station was adequate to cover the study area.

The broadcast survey was done from 2215 to 2240. The weather at this time was 15°C with clear skies and a bright moon. The wind was light and measured 1 to 2 on the Beaufort wind scale.

In addition to the broadcast survey, listening occurred at the site from 2050 onwards. Sunset was at 2103 so the period of dusk when most owls are likely to vocalize was covered.

Goatsucker Survey

This survey targeted two species: the Common Nighthawk and the Eastern Whip-poor-will. The nighthawk is crepuscular, being most evident at dusk and dawn, while the whip-poor-will is nocturnal and may be heard throughout the night from dusk until dawn.

These species, and particularly the whip-poor-will, are most active in the period near the full moon (Mills 1986, 1998). Consequently, the survey was conducted on June 13, 2011, two days before the full moon. The survey was conducted from 2050 to 2240 hours. The weather was initially cloudy but there was full moonlight after dark. The wind was 3 on the Beaufort wind scale until dark, but calmed to 1 to 2 after dark. Temperature during the survey was approximately 15°C. Sunset occurred at 2103 hours.

The survey consisted of doing a single, lengthy point count at the on-site house. The point count spanned 13 minutes before sunset to 1 hour 12 minutes after sunset into complete dark (except for the moonlight). This covered the period when both species should have been active had they been present. A single point was considered adequate as the whip-poor-will can be heard from a distance of 1 km or more and the nighthawk can also be heard from a considerable distance.

2.2.3 Bat Survey

An Anabat SD1 acoustic detector (Titley Electronics PTY Ltd.) was used to determine bat presence in the area. The detector stored data on a removable 1GB compact flash card. Anabat detectors are frequency division detectors, dividing the frequency of ultrasonic calls made by bats by a factor of 16 so that they are audible to humans. The calls are then recorded for subsequent analysis. An Anabat detector was selected based upon their widespread use for this type of survey and their ability to detect a broad frequency range, which allows detection of all species of bats that could occur in Ontario.

Potential call files were extracted from data files using CFRead© software. The default settings for CFRead© were used during the file extraction process, as these settings are recommended for the calls that are characteristic of Ontario bats. This software screens all data recorded by the bat detector and extracts call files using an automatic filter. Using the default setting for this initial screen also ensures comparability between data sets. Settings used by the filter include a maximum time between calls of 5 seconds, a minimum line length of 5 milliseconds, and a smoothing factor of 50. The smoothing factor refers to whether or not adjacent pixels can be

connected with a smooth line. The higher the smoothing factor, the less restrictive the filter is and more noise files are retained within the data set including poor quality call sequences.

A call is a single pulse of sound produced by a bat. A call sequence is a combination of two or more pulses recorded in a call file. Following extraction of call files, each file was visually inspected to ensure that files created by static or some other form of interference that were still within the frequency range of bats were not in the data set. Call sequences were identified based on visual comparison of call sequences to reference calls provided by Chris Corben, developer of the Anabat system. Bat calls typically include a series of pulses characteristic of normal flight or prey location ("search phase" calls) and capture periods ("feeding buzzes") that visually look very different from static, which typically forms a diffuse vibration, or other interference. Using these characteristics, bat files are easily distinguished from non-bat files.

Qualitative visual comparison of recorded call sequences of sufficient length to reference libraries of bat calls allows for relatively accurate identification of bat species (O'Farrell and Gannon 1999; O'Farrell et al. 1999). A call sequence was considered of suitable quality and duration if the individual call pulses were "clean" (i.e., consisting of sharp, distinct lines) and at least five pulses were included within the sequence. Call sequences were classified to species whenever possible, using the reference calls described above.

The primary objective of the bat survey was to determine if the provincially significant eastern pipistrelle (*Pipistrellus subflavus*) was present. The NHIC database search revealed that there had been nearby records of this species.

The eastern pipistrelle is a non-migratory bat that inhabits open habitat with large trees and woodland edges. Little is known of its roosting habits, but it probably roosts in the foliage of trees. Although maternal colonies in a barn and garage have been reported, it probably rarely occurs in buildings. It hibernates in caves and mines where it selects warmer microclimates than other bat species, and it also uses smaller caves than other bats (van Zyll de Jong 1985).

The pipistrelle emerges from its diurnal roost early, at about sunset. It has intermittent foraging periods until midnight and again near dawn. The flight is slow and erratic and it forages back and forth over small areas near trees or over water. It also appears to feed solitarily, but in late summer as many as 4 or 5 may be seen foraging together (van Zyll de Jong 1985).

Because the pipistrelle is a non-migratory species, a mid-summer survey was appropriate. The survey was conducted on July 26, 2011 in the evening at two stations: one on the Sixth Line at the cattail marsh and the other at the on-site house. These were considered the most likely areas to encounter bats due to the presence of water and open habitat. The bat detector was deployed at the marsh from 2105 to 2145 hours, commencing shortly before dark, while it was used at the house from 2148 to 2218 hours.

2.2.4 Amphibian Survey

The study area contains a variety of wetland habitats including riparian areas, treed swamp, thicket swamp and marsh. Where standing water was observed in these features they were surveyed during the spring of 2011 to determine the presence of breeding amphibians.

Evening surveys for calling amphibians were carried out on April 28th, May 18th and June 27th in accordance with the protocol for the Marsh Monitoring Program (Bird Studies Canada, 1994). Weather conditions during these evening surveys are provided below.

- On April 28th it was 6°C under a clear sky with a gentle breeze (i.e. 3 on the Beaufort wind scale) between 21:00 and 22:15 hours.
- On May 18th it was 14°C under an overcast sky with a light breeze (i.e. 1 to 2 on the Beaufort wind scale) and light to heavy rain between 21:30 and 22:40 hours.
- On June 27th it was 19 to 21°C under a clear sky with a light breeze between 21:40 and 22:55 hours.

Three monitoring stations were selected for recording frog calling activity as shown in Figure 5, Appendix A. The protocol required the surveyor to visit each station and listen for a minimum of 3 minutes. All calling activity was described according to the following call level codes.

- Code 1: Calls not simultaneous, number of individuals can be accurately counted
- Code 2: Some calls simultaneous, number of individuals can be reliably estimated.
- Code 3: Full chorus, calls continuous and overlapping, number of individuals cannot be reliably estimated.

Additional surveys for calling amphibians were conducted during the spring of 2012 at an offsite wetland located near the northeast corner of the James Dick property, along with the three monitoring stations established in 2011. Weather conditions during the 2012 surveys are described as follows

- On March 25th it was 8°C under a clear sky with a light to moderate breeze (i.e. 3 on the Beaufort wind scale) between 20:10 and 22:30 hours.
- On May 6th it was 12°C under an overcast sky with occasional light rain and light air (i.e. 1 on the Beaufort wind scale) between 21:45 and 23:15 hours.
- On June 18th it was 18°C under an overcast sky with a light breeze between 21:30 and 23:30 hours.

2.2.5 Reptile Survey

Prior to conducting the reptile survey a Wildlife Scientific Collector's Authorization and an Animal Care Protocol were prepared and subsequently approved by the Ministry of Natural Resources as permits #1062145 and #11-236 respectively. The reptile survey commenced on May 19, 2011 when 5 snake cover boards were placed in suitable habitats on the subject property, as shown in Figure 5.The cover boards consisted of plywood sheets that were painted black so they absorbed heat during the day and retained it through the night. Cover boards were distributed in May to kill emerging vegetation and also allow snakes to get accustomed to their presence.

The snake cover boards were checked 15 times between May 20 and September 12, 2011 when they were removed from the property. Cover boards were always lifted gently to avoid disturbing snakes potentially using the artificial cover. Snake species observed were identified and the number of individuals were recorded at each cover board during every inspection. Prior to re-setting the cover boards, any snakes remaining at these sites were carefully moved to the side to avoid accidental injury.

The snake cover board survey was supplemented by observations of snakes and other reptiles noted during other field studies carried out from spring to late summer. The property was covered on foot several times and rocks and debris were occasionally turned over in search of snakes. Wetland habitats were also searched for basking reptiles.

2.2.6 Salamander Trapping and Egg Mass Observation Survey

A survey for breeding salamanders was conducted at two on-site ponds in April 2011 and two off-site ponds between March and April 2012. The purpose of the surveys was to determine if these ponds functioned as breeding habitat for the Jefferson salamander (*Ambystoma jeffersonianum*) or its polyploids. Because the Jefferson salamander is designated endangered, a permit under Clause 17(2)(b) of the *Endangered Species Act, 2007* (ESA) was required to conduct the study. The 2011 and 2012 surveys were done under the auspices of an ESA permit and Wildlife Scientific Collector's Authorization (WSCA).

Survey Year	ESA Permit #	WSCA #
2011	GU-B-012-11	1062145
2012	GU-B-007-12	1067436

In addition, had salamanders of the Jefferson salamander complex been found, tissue samples would have been taken for genetic analysis. Consequently, an Animal Care Protocol was prepared and subsequently approved by the Ministry of Natural Resources (#11-236). This Animal Care Protocol was renewed for the 2012 study (#12-236).

The two on-site ponds surveyed in 2011 were the cattail marsh near the Sixth Line and a small dugout pond on the intermittent tributary in the south-central portion of the site. In 2012 a thicket swamp northeast of the site was surveyed along with a cattail marsh on Highway 7. Two types of sampling were completed: minnow trapping and an egg-mass survey.

During the 2011 and 2012 surveys minnow trapping consisted of placing unbaited minnow traps within the ponds. Openings to the traps were widened to ensure that salamanders could access the traps. For the on-site ponds the traps were set on the evening of April 3, 2011 and removed the morning of April 8th. Seven traps were placed in the marsh for a total of 35 trap-nights and two were put in the online pond for a total of 10 trap-nights. For the off-site ponds the traps were set on March 18, 2012 and removed on March 27, 2012. Six traps were placed in the thicket swamp for a total of 54 trap-nights and 4 traps were placed in the cattail marsh for a total of 36 trap-nights. During 2011 and 2012 surveys traps were checked every morning for salamanders and other species that may have been caught incidentally. Incidental catches were released unharmed at the location of capture.

If salamanders of the Jefferson complex had been encountered, the protocol required removal of a short portion (no more than 5 mm) of the tail. Tail tips were to be preserved in vials in 70% ethanol and delivered to Dr. Jim Bogart's lab at the University of Guelph for genetic analysis. As soon as salamanders had been sampled in the field, they were to be released unharmed at the point of capture.

The 2011 egg-mass survey was conducted in the morning of April 18th. Weather on that day was cloudy and calm with the temperature ranging from −1 to 0°C. The survey at the marsh was conducted from 0930 to 1100 hours by two persons and consisted of one walking the entire shoreline and the other walking through the pond to search for egg masses. The survey at the online pond was conducted from 1112 to 1127 hours. All observations had to be made from the shoreline at this pond due to the steep slopes of the banks. Water clarity was excellent and there was no problem in seeing through the entire pond.

In 2012 the egg-mass survey was carried out on April 19th under clear skies with an air temperature of 19^{o}C. The thicket swamp survey was conducted from 14:00 to 15:15 hours and it involved two persons searching the periphery and interior of the swamp with the surveyors closely

examining submerged woody debris, shrubs and cattail stalks for egg masses. The cattail marsh along Highway 7 was searched from 15:30 to 16:00 hours. Deep water prevented surveyors from searching the interior of the pond and as a result all observations were made from the shoreline. While an adequate search was carried out the dense growth of cattails established near the pond edges also hindered search efforts.

If egg masses of Jefferson salamander complex were found, they would have been collected and delivered to Dr. Bogart's lab for analysis. Each egg mass would have been placed in a Ziploc bag containing pond water. Bags containing egg masses would have been temporarily stored in a cooler with ice packs and transported to the lab on the day of collection. In the lab, eggs would have been kept until they hatched and a larva from each egg mass would have been sampled genetically, making the assumption that all larvae from an egg mass had the same genetic composition. Larvae that were not used in the genetic analysis were to have been returned to the pond where they were collected and released after being temperature acclimated.

2.2.7 Butterfly and Odonata Survey

All butterflies and odonates observed during all visits were identified and recorded. These species usually did not emerge until 0900 hours or later in the day. Other surveys, such as breeding bird surveys, were frequently extended so that butterflies and odonates could be observed. Observations of butterflies were done visually though binoculars while difficult to identify odonates were captured with a butterfly net.

By extending other wildlife surveys later into the day, butterflies or odonates were observed on the following dates: May 20, May 30, June 17, June 26, and July 27, 2011 and April 19, May 15, May 26, and June 7, 2012. This covers the flight date of most of these invertebrates.

The July 27th survey was specifically for butterflies and odonates. The NHIC search revealed that the clamp-tipped emerald (*Somotochlora tenebrosa*) had previously been detected in the general vicinity of the study area. The habitat of the clamp-tipped emerald is shady forest streams with intermittent rapids and pools. The males patrol over the water near riffles in small shady streams while the females oviposit in water near debris or on stream banks (Jones et al. 2008). Consequently, the entire on-site portion of the tributary was walked to search for this species. In addition, the marsh area and open habitats were also checked for odonates and butterflies.

2.2.8 Fish Survey

Prior to the initiation of fieldwork, a License to Collect Fish for Scientific Purposes (# 1062005) was obtained from MNR.A survey for fish was subsequently carried out during late spring in the on-site marsh along the 6th Line and in the intermittent watercourse that bisects the property. This information would supplement the data previously collected in 1995 and 1996 when a backpack electrofisher was used to determine fish presence in the watercourse both on and off the property. No effort was made in 1995 or 1996 to determine fish presence in the marsh.

On the morning of June 6, 2011, 4 wire mesh minnow traps were distributed along the intermittent watercourse, including one trap in the in-stream pool, while 6 traps were placed in the marsh as illustrated in Figure 5. Each minnow trap was baited with bread crumbs to attract fish and fully submerged in the water to facilitate their access. The minnow traps were anchored to wooden stakes or nearby woody vegetation with yellow polypropylene rope to ensure they did not float away. These traps were checked each morning over the next 4 days and fresh bread crumbs were added to the traps as required. If fish were trapped the location, species, length and age (i.e.

Adult or Young of Year) of each fish caught was to be recorded prior to their release at the capture site. The minnow traps were removed from the site on June 10, 2011.

2.2.9 Winter Wildlife Survey

Fieldwork was conducted in the winter to assess mammal and bird utilization of the site and surrounding lands during this critical period of the year. The study area was inspected on February 23 and December 23, 2011 when there was sufficient fresh snow to facilitate mammal track identification. Wandering transects were taken through all on-site habitats while adjacent lands were surveyed from the property boundary and public roads.

2.2.10 Other Wildlife

Incidental observations of birds, mammals, reptiles, amphibians and butterflies were noted during all field surveys. Inventories of wildlife were compiled based upon visual observations, as well as distinctive sounds and signs of species.

3.0 Local Context – Overview of Natural Features

The Eramosa River-Blue Springs Creek Linear Corridor Initiative (Proctor and Redfern Limited, 1995) identified the subject lands as being within the study area of this land use planning investigation. This study was commissioned by the Grand River Conservation Authority (GRCA), MNR, the Ministry of Environment and Energy and the municipalities within the study area. The goal was to develop a comprehensive Open Space Concept which would identify and guide the short and long range protection, securement and appropriate development of open space along the Eramosa River-Blue Springs Creek. Extensive permeable surficial deposits are found in the corridor study area and these deposits potentially function as groundwater recharge areas. Fractured permeable bedrock forms the primary aquifer in this area and this aquifer is often at or near the ground surface. As a result, the aquifer is susceptible to contamination from surface activities. Given this physical environment the Corridor Open Space Concept identified the on-site watercourse and adjacent riparian habitat as “Open Space-Protection” which refers to lands that are ecologically fragile or highly sensitive to groundwater contamination. The large forested areas to the north and southeast of the site were also identified as Open Space-Protection and/or Conservation (i.e. natural areas of lesser ecological sensitivity).

3.1 Designated Natural Features

3.1.1 Watercourses

The GRCA has identified the watercourse that crosses the Dick property as an unevaluated stream. However, on the south side of Highway #7 this tributary of Blue Springs creek is identified as a coldwater stream. The main channel of Blue Springs Creek is found about 1km downstream of the subject property and this coldwater stream supports resident brook and brown trout populations.

3.1.2 Wetlands

The Eramosa River-Blue Springs provincially significant wetland (PSW) complex encompasses the main channel of Blue Springs Creek and also includes several isolated wetlands located north of this watercourse. One of these wetlands occurs on the Dick property along Concession Road 6. Other PSWs are situated in close proximity to the site, particularly to the north and west. The spatial distribution of these wetlands and watercourses is illustrated in Figure 6. The GRCA has also identified a small unevaluated wetland to the southeast of the PSW on the 6th Line. In addition, the GRCA has established Regulatory Fill Lines for Scheduled Areas within this study area and the Regulation Limits are presented in Figure 7. As a result, a Fill Permit will be required from the GRCA if any filling or grading is proposed within the Scheduled Area. Furthermore, any alteration to the stream would trigger the need for GRCA approval.

3.1.3 Areas of Natural and Scientific Interest

There are no Areas of Natural and Scientific Interest (ANSI) identified on the subject property or adjacent lands. The regionally significant Blue Springs Creek Wetland ANSI is, however, situated about 900m southeast of the James Dick Property.

3.1.4 Environmentally Sensitive Areas

There are no Environmentally Sensitive Areas (ESAs) found on the site or adjacent lands. Halton Region has identified the Blue Springs Creek Valley ESA to the southeast of the site within the

provincially significant Eramosa River-Blue Springs Creek wetland complex. The boundaries of this ESA overlap with those of the regionally significant ANSI.

3.1.5 Greenlands

As previously noted in Section 1.3 the County of Wellington has designated the PSW and watercourse found on the site as Core Greenlands while Greenlands occur immediately north of the site. The Regional Municipality of Halton has also designated the woodlands and wetlands in the vicinity of Blue Springs Creek as Greenlands A and B. In addition, lands in Halton are subject to applicable policies outlined in the 2005 Greenbelt Plan.

3.1.6 Landscape Connectivity Assessment

The local landscape was examined to determine the degree of connectivity that is available for wildlife to move from on natural area to another. Figure 7 illustrates that wildlife can readily move through the extensive woodland and wetland area within the Blue Springs Creek valley. The subject property is well connected to natural areas to the north and west but is weakly linked to lands to the east and south because of Highway # 7, existing residential and commercial developments and a lack of large well connected natural features. Wildlife utilization of lands to the east will become even more constrained in the future, assuming approved industrial development proceeds as planned.

4.0 Site Conditions

4.1 Physiography

The study area lies in the Horseshoe Moraines Physiographic Region (Chapman and Putnam, 1984) which flanks the upland to the west of the Niagara Escarpment. The Region has two chief landform components: the irregular, stony knobs and ridges which are mostly composed of till although some sand and gravel deposits (kames) are present; and the more or less pitted sand and gravel terraces and swampy valley floors associated with meltwater stream deposits. From Rockwood to Georgetown along Highway #7 the landscape is frequently very hilly with local relief of more than 100 feet, often with steep irregular slopes and small “kettles” or enclosed basins which contain water in the spring and early summer. The soil material in these rough stony areas is a coarse, open stony till composed largely of dolostone with traces of red shale.

The topography on the subject property varies from undulating to hilly as illustrated in Figure 8. Where the topography is hilly the slopes are steep, irregular and short, and depressions or potholes are common. Ground elevations range from 354m above sea level (asl) along Highway #7 to 365m in the central portion of the site.

Specific details on stratigraphic conditions across the James Dick property are provided in the Hydrogeological Report prepared by Harden Environmental Services Ltd. (2012). Their fieldwork which was carried out from 1995 to 2012 confirmed that the surficial stratigraphy generally consists of a sand and gravel unit which overlies a narrow continuous layer of silt till (i.e. 0.91m to 4.11m in thickness) which acts as an aquitard. Collectively, these overburden materials range from 6 to 10m in thickness and they are underlain by fractured dolostone bedrock. This stratigraphy creates localized pooling and the formation of an upper aquifer within the surficial sand and gravel deposit. This shallow groundwater generally flows across the site from the west to the east, towards Blue Springs Creek. There is approximately 9m difference in groundwater elevation over the site, as groundwater is found at 354.95m asl along the northwest limits of the property while it occurs at 346.05m asl near the southeast limits of the site.

4.2 Soils

According to the Wellington County Soil Survey (Hoffman and Matthews, 1963) the site is entirely characterized by the Dumfries soil type which is derived from stony calcareous sandy loam till. A typical soil profile exhibits about 30cm of loam topsoil (A horizon) over 30cm of clay loam subsoil (B horizon) over parent material (C horizon). Since the porous Dumfries soils occur on irregular, moderately sloping land they are well drained, except in poorly drained potholes which contain surface water during most or all of the growing season. These potholes cannot be easily drained and hence they do not represent arable land. Soil erosion is common on most cultivated slopes. Stones and boulders are abundant on the surface and throughout the soil mass. Consequently, annual stone picking is often required in cultivated fields and the presence of several stone piles and stone fences on the Dick property confirms this stoniness limitation to agricultural use. All of the land surrounding the site is also characterized by Dumfries soils, except for the lowland forest to the north where poorly drained muck and Parkhill loam soils predominate.

The 1:50,000 Canada Land Inventory (CLI) mapping of soil capability for agriculture identified the site as 50% Class 3 soils and 50% Class 5. Where the slopes are less severe the soil is rated as capability Class 3 with low fertility (F) and droughtiness (M) being the major subclass limitations to agricultural production. The Class 5 land is characterized by adverse topography (T) and surface stoniness (P) that impedes tillage, planting and harvesting. Given the topographic conditions

illustrated in Figure 8 and the abundant evidence of surface stoniness it is apparent that the actual amount of Class 3 soil is well below 50%. In any event, these soil considerations certainly influenced the previous landowner's decision to reforest the entire property.

4.3 Surface Drainage and Aquatic Resources

There is only one watercourse found on the subject property and it originates from groundwater discharge points located on a man-made pond north of the adjacent PSW. The stream enters the property from the north and flows southeast approximately 2.1km to its confluence with Blue Springs Creek. The streambed follows a gentle gradient and drops about 8m in elevation as it crosses the property. The northern portion of the site either drains to this stream or to isolated potholes, except for a small area in the eastern corner that drains to an off-site intermittent drainageway which in turn connects to the subject watercourse at Highway #7. The southern portion of the site either drains southwards to Highway #7 or drains internally to isolated potholes.

The fish inventory and aquatic habitat assessment were initially carried out on July 20, 1995 at stations shown in Figure 5 (see Appendix D for stream survey data sheets). During the mid-summer 1995 survey, cool, clear water entered the property from the north with a moderate current. The current became progressively weaker as the water moved downstream and eventually became negligible where the flow emptied into a pool immediately upstream of a culvert located under the trail that connects the on-site residence to the adjacent home. This pool apparently infiltrated more water than it received since no flow was observed downstream of this point. However, during the May 1996 survey, the water level in the stream was approximately 30cm higher than in 1995 and flow was continuous across the property. At the outfall from the on-site culvert, the water dropped vertically about 25cm. This drop in elevation creates a mini-waterfall which acts as a barrier to fish migration. No fish were found upstream of this point during electroshocking at selected stations in 1995, or in 1996 when the entire stream was electroshocked from Highway #7 to the northern property boundary. However, three brook stickleback (*Culaea inconstans*), a common warm/cool water fish species were caught between this culvert and Highway #7 during the 1996 electrofishing survey. It must also be noted that channel conditions immediately downstream of the culvert on Highway #7 are also unfavourable to upstream fish migration due to a steep gradient and a boulder/rubble substrate.

The 2011 fish survey was undertaken to update and confirm the results from the 1995/96 survey. Once again no fish were caught in the minnow traps that were installed at the previously identified stations. The stream channel appeared to exhibit the same flow regime and physical characteristics as was observed in the mid-1990s. By late July 2011 water was still flowing into the property but there was no flow off-site and incoming flow ceased by early September or sooner. However, by mid-October surface water was again observed flowing onto the property but there was no discharge through the on-site culvert. Continuous flow through the site did not occur until November 2011. This pattern of seasonal stream flow was also recorded at the monitoring stations established by Harden Environmental. They found that in the vicinity of the stream, the water table is about 2m below the elevation of the streambed during the growing season. As previously mentioned, this stream loses flow across the site due to significant infiltration through the streambed and the absence of groundwater discharge contributions to base flow. These relationships are responsible for the stream's seasonal flow characteristics.

With respect to stream morphology approximately 2/3 of the streambed has been channelized on the subject property. This channelization appears to start near the northern edge of the cultural woodland (CUW1-3 in Figure 9) and it continues downstream through the adjacent residential property to Highway #7. The streambanks are typically heavily vegetated with reed canary grass, mixed herbs and red-osier dogwood, except where tree cover is dense. They are generally stable

which indicates this streambed alteration occurred long ago. Silt, muck and occasional pockets of sand are the predominant substrate throughout this channelized reach. Stream morphology is characterized as a series of long runs interspersed with pools and short riffle sections. Typical dimensions of pools range from 3.0 to 4.5m wide and 0.6 to 1.2m deep while runs average 1.5m wide and 0.2m deep during low flow conditions. A moderate density of instream cover consisting of undercut banks, logs and aquatic vegetation (e.g. reed canary grass and water milfoil mostly in pools) exists in numerous sections throughout this channelized reach.

Upstream of the cultural woodland the stream has a more natural appearance. The current is medium to fast and the channel consists of a mixture of riffles and pools. The substrate is characterized by rubble, gravel and sand. The riparian vegetation is dominated by immature hardwoods and cedar.

To summarize, the watercourse on the subject property represents an intermittent, coolwater stream with temperatures ranging between 14^{o}C and 19^{o}C during spring and summer. Data collected by Harden Environmental Services Ltd. (2012) indicate that the stream gradually loses flow over the property due to infiltration through the porous sand and gravel soils to the extent that off-site flow ceases during the summer and early fall.

Aside from the stream, the only other waterbody on the site is the marsh located along Concession Road 6. No fish were caught in the minnow traps that were distributed in this marsh during the 2011 survey. Detailed field studies conducted by Harden Environmental Services Ltd. revealed that groundwater flows into the marsh from the northwest. However, surface water infiltrates out of the marsh along its southeast side, consistent with the general movement of groundwater across the site. As groundwater levels decline, the surface water in the marsh becomes perched above the water table.

4.4 Vegetation

4.4.1 Vegetation Communities

Based on the ELC system the vegetation community types found on the site and adjacent lands are illustrated in Figure 9, Appendix A. The James Dick property is largely forested but surrounding lands consist of a mix of natural and man-made forest, agricultural fields, residential and commercial development. Although the site is mainly characterized by coniferous plantations, small patches of naturally established coniferous, deciduous and mixed forest are also found, mostly in close proximity to the intermittent stream. Some of these naturally established stands are characterized by mature to overmature trees that range in age from 100 to 150 years or more. Non-forested communities are represented by marshes, thicket swamp and cultural meadows and thickets. Deciduous hedgerows also occur around the perimeter of the site. Detailed descriptions of the vegetation community types found in the study area are provided in Table 2.

The forest and wetland vegetation types identified in Table 2 are considered common at the provincial level. Some of the cultural communities (i.e. CUP3-12, CUW1-3 and CUT1-7 are not listed in the ELC for southern Ontario (Lee et al., 1998) but based on the consultant's experience they are considered common and widespread, as is the case with the other cultural communities found in the area.

Table 2 Description of ELC Vegetation Types on the James Dick Property

Area (ha)[1]	ELC Code	Vegetation Type	Overstory Tree Cover							Understory Vegetation				Topography[8]	Comments[9]
			Species Composition	Average Age[3]	Average Diameter (cm)[3]	Average Height (m)[3]	Canopy Closure[4] (trees/ha)	Forest Stand Structure[5]	Basal Area Stocking (m^2/ha)	Tree Regeneration Species[2]	Tree Regeneration Density[6]	Shrub Species[7]	Shrub Density		
1.6	FOC2-2	Dry-Fresh White Cedar Coniferous Forest	$Ce_8Ew_1Oh_1$ (Cb, Mh, Po)	110+	32	16	Closed (1,040)	Mature Sawtimber	48	Ce, Aw, Cb	Low	Haw, Buc, Cur	Low	R	Mature Ce stand with many trees over 26cm dbh (i.e. sawtimber) interspersed with Ew, Mh, Cb and Po. Some dense patches of Po are located on the periphery of the stand generally near the stream. The closed canopy has generally prevented the establishment of tree regeneration and/or a shrub understory. Significant Ce blowdown has occurred in the western portion of this stand adjacent to the intermittent stream. The land slopes towards this water feature. 64% AGS, 6% cull sawtimber.
1.6	FOM2-2	Dry-Fresh White Pine-Sugar Maple Mixed Forest	$Pw_4Mh_3Bd_2Oh_1$(Cb, Ew, Be, Id,)	150+	40	32	Dense (600)	All-aged	28	Mh, Cb, Bd, Pw, Be, Id	High	Gr, Hont, Chc, Haw	Mod.	H	All-aged, fully stocked natural Pw/Mh stand with many overmature trees greater than 64cm dbh (i.e. extra-large sawtimber). Several white pines are super canopy trees. These trees have likely been preserved due to the steeply sloping topography although some disturbance due to past aggregate extraction is evident. Some patches of white pine poletimber have established naturally, however, most of the subcanopy is dominated by Mh and other hardwoods. Dense areas of poplar have also been established but these are generally found on the periphery of the stand. Groundflora has a patchy distribution. 81% Acceptable Growing Stock (AGS). 8% cull sawtimber.

Area (ha)[1]	ELC Code	Vegetation Type	Overstory Tree Cover							Understory Vegetation				Topography[8]	Comments[9]
			Species Composition	Average Age[3]	Average Diameter (cm)[3]	Average Height (m)[3]	Canopy Closure[4] (trees/ha)	Forest Stand Structure[5]	Basal Area Stocking (m^2/ha)	Tree Regeneration Species[2]	Tree Regeneration Density[6]	Shrub Species[7]	Shrub Density		
0.5	FOM4-2	Dry-Fresh White Cedar-Poplar Mixed Forest	$Ce_6Po_1Bd_1Cb_1Oc_1$ (Ps, Sw)	85	20	13	Closed (2,010)	Immature Poletimber	51	Ce, Pot, Bd, Cb,	High	Dog, Buc, Haw, Chc, Hont	Mod.	U	Immature mixedwood stand bordering the intermittent stream. 74% AGS
0.9	FOM7-2	Fresh-Moist White Cedar – Hardwood Mixed Forest	$Ce_3Ms_3Bd_2Wi_1Cb_1$	50	20	12	Dense (1,090)	Immature Poletimber	30	Ce, Bd, Ms, Po, Cb	High	Gr, Hont, Wi, Dog, Buc	Mod.	U	Immature mixedwood stand that has become established within and around the perimeter of an old wayside pit. 55% AGS.
0.4	FOD3-1	Dry-Fresh Poplar Deciduous Forest	Pot_{10}	50	22	18	Dense (1,150)	Immature Poletimber	29.0	Bd, Aw, Pot, Mh	High	Buc, Crt, Rasp, Gr, Hont, Cur, Dog	High	U	Immature poplar stand that has become established between agricultural fields on the adjacent property to the north and conifer plantation to the south. 52% AGS
1.2	FOD5-7	Dry-Fresh Sugar Maple – Black Cherry Deciduous Forest	$Mh_7Cb_2Oh_1$ (Aw, Bd, Haw)	150+	46	20	Dense (480)	Uneven-aged (2/4)	24.0	Mh, Aw, Cb, Id	High	Buc, Haw, Gr, Rasp	High	R	Uneven-aged Mh stand characterized by several overmature trees greater than 64cm dbh (i.e. extra-large sawtimber) and immature poletimber. Some of the overmature Mh appear to have been open grown. These large trees provide excellent nesting cavities for wildlife. There is a diverse understory of trees, shrubs and groundflora. 67% AGS, 29% cull sawtimber.
0.2	FOD5-8	Dry-Fresh Sugar Maple – White Ash Deciduous Forest	$Mh_5Aw_3Cb_1Oc_1$(He, Ce)	65	32	21	Dense (710)	Immature Sawtimber	34.0	Mh, Aw, Ce, Ew	High	Dog, Buc, Cur, Chc	Low	U-R	Upland deciduous forest characterized by immature sawtimber. Only a small portion of this stand is on to the subject property. 71% AGS.

Area (ha)[1]	ELC Code	Vegetation Type	Overstory Tree Cover							Understory Vegetation				Topography[8]	Comments[9]
			Species Composition	Average Age[3]	Average Diameter (cm)[3]	Average Height (m)[3]	Canopy Closure[4] (trees/ha)	Forest Stand Structure[5]	Basal Area Stocking (m^2/ha)	Tree Regeneration Species[2]	Tree Regeneration Density[6]	Shrub Species[7]	Shrub Density		
0.5	CUP3-2	White Pine Coniferous Plantation	Pw_{10}	30	20	14	Closed (1,220)	Immature Poletimber	33	NA	Nil	NA	Nil	U	Immature Pw plantation with trees planted at a 6'x6' spacing. This dense planting has resulted in stagnant growth of some trees and prevented the establishment of tree regeneration and/or a shrub understory. White pine blister rust damage is evident. In 2011 the stand received a 4th row thinning. 64% AGS
0.7	CUP3-3	Scotch Pine Coniferous Plantation	$Ps_4Ew_3Cb_1Sn_1Aw_1$	40	24	14.5	Open (610)	Immature Poletimber	19	Ew, Cb, Aw	High	Buc, Rasp, Gr, Haw, Chc	High	R	This Ps plantation exhibits significant tree mortality and blowdown. As a result several intolerant hardwoods have naturally developed transforming it into a mixedwood stand. The open tree canopy has allowed for a highly diverse understory of trees and shrubs. The rolling terrain generally slopes to the northeast. Much downed woody debris makes it difficult to walk through the area. 58% AGS
1.1	CUP3-8	White Spruce Coniferous Plantation	Sw_{10}	30	16	13	Closed (1,350)	Immature Poletimber	31	NA	Nil	NA	Nil	U	Immature Sw plantation with trees planted at a 6'x6' spacing. This dense planting has resulted in stagnant growth of some trees and prevented the establishment of tree regeneration and/or a shrub understory. In 2011 the west half of the stand received a 3rd row plus selection thinning. 90% AGS

Area (ha)[1]	ELC Code	Vegetation Type	Overstory Tree Cover							Understory Vegetation				Topography[8]	Comments[9]
			Species Composition	Average Age[3]	Average Diameter (cm)[3]	Average Height (m)[3]	Canopy Closure[4] (trees/ha)	Forest Stand Structure[5]	Basal Area Stocking (m^2/ha)	Tree Regeneration Species[2]	Tree Regeneration Density[6]	Shrub Species[7]	Shrub Density		
13.3	CUP3-12a	White Pine – White Spruce Coniferous Plantation	Pw_6Sw_4	30	18	15	Closed (1,480)	Immature Poletimber	34	Sw, Pw, Cb	Low	NA	Nil	R	Immature Pw plantation interspersed with Sw (i.e. 3 rows Pw then 2 rows of Sw). Rows were planted using 6'x6' spacing. Many of the slower growing Sw have stagnated resulting in some tree mortality. Also some white pine blister rust mortality. Naturally established Cb, Ew, Aw and App are sparsely distributed in the stand. Regeneration is typically characterized by suppressed Sw and Pw of sapling size. Topography is generally rolling but ranges from undulating to strongly rolling. An access trail is located near the north edge of the stand and it extends from the 6th line to the stream. Many large boulders and rocks are found throughout. A stone fence that bisects the stand on a northeast-southwest axis reflects the historical agricultural utilization. In 2011 the stand received a 4th row thinning. 71% AGS

Area (ha)[1]	ELC Code	Vegetation Type	Overstory Tree Cover							Understory Vegetation				Topography[8]	Comments[9]
			Species Composition	Average Age[3]	Average Diameter (cm)[3]	Average Height (m)[3]	Canopy Closure[4] (trees/ha)	Forest Stand Structure[5]	Basal Area Stocking (m^2/ha)	Tree Regeneration Species[2]	Tree Regeneration Density[6]	Shrub Species[7]	Shrub Density		
2.7	CUP3-12b	White Pine – White Spruce Coniferous Plantation	Pw_6Sw_4	30	17	14	Closed (1,790)	Immature Poletimber	41	Pw, Sw, Sn	Low	NA	Nil	U	Immature Pw plantation interspersed with Sw and Sn. These trees were planted at a 6'x6' spacing and this dense planting has resulted in some stagnant tree growth as tree regeneration is characterized by suppressed planted conifers. Some white pine blister rust damage is evident. The topography is typically undulating, but, the land rises to the north. An old dug well is located in the southwest portion of the stand near the 6th Line and is likely the location of the original homestead. Garlic mustard is abundant in canopy gaps and along the south edge. In 2011 the stand received a 4th or 5th row plus selection thinning. 73% AGS.
2.3	CUP3-12c	White Pine – White Spruce Coniferous Plantation	$Pw_5Sw_4Oc_1$ (Sn, Pr)	30	18	15	Closed (1,460)	Immature Poletimber	35	Pw, Cb	Low	Buc, Gr, Blber, Rasp	Low	R	Immature Pw plantation interspersed with Sw (i.e. 3 rows Pw then 2 rows of Sw). Some Pr and Sn were also planted. White pine blister rust damage is evident. Tree regeneration is characterized by suppressed, planted conifers. An access trail through this rolling stand leads to the former gravel pit located in the east corner of the property. In 2011 the stand received a 4th or 5th row plus selection thinning. 77% AGS

Area (ha)[1]	ELC Code	Vegetation Type	Overstory Tree Cover							Understory Vegetation				Topography[8]	Comments[9]
			Species Composition	Average Age[3]	Average Diameter (cm)[3]	Average Height (m)[3]	Canopy Closure[4] (trees/ha)	Forest Stand Structure[5]	Basal Area Stocking (m^2/ha)	Tree Regeneration Species[2]	Tree Regeneration Density[6]	Shrub Species[7]	Shrub Density		
5.7	CUP3-12d	White Pine Coniferous Planation	$Pw_7Sw_2Oh_1$ (Cb, Aw, Ew, Mh)	30	18	14	Closed (1,380)	Immature Poletimber	34	Ce, Cb, Aw, Mh	Low	Haw, Gr, Rasp.	Low	R-U	Immature Pw plantation interspersed with Sw. Rows were planted using 6'x6' spacing. This dense planting has resulted in stagnant growth of some trees and occasional mortality. Some white pine blister rust damage was evident and blowdown trees were observed throughout the stand. Naturally established Ce, Cb, Ew, Aw and Mh are sparsely established in canopy gaps. The southern portion of the stand can be accessed from a trail that extends through FOD5-7. Many large boulders and rocks are found throughout. A stone fence bisects the stand on a northeast-southwest axis and is indicative of historical agricultural operations. In 2011 the stand received a 4th row thinning. 70% AGS
0.4	CUW1-3	Poplar Mineral Cultural Woodland	$Pot_5Wi_2Pob_1$ By_1Ps_1	40	24	16	Open (500)	Immature Poletimber	15.0	Pot, Bd, Ew	High	Buc, Rasp, Gr, Chc, Dog, Cur	High	U	immature poplar stand interspersed with openings exhibiting a dense groundcover of grasses, goldenrod, milkweed and garlic mustard. There is some poplar mortality. Common buckthorn is the most abundant shrub in the understory. The land slopes gently towards MAM3-2 and the intermittent creek.
2.1	CUM1-1	Dry – Moist Old Field Meadow	NA	NA	NA	NA	NA	NA	NA	Ps, Mm	Low/Nil	Lilac, Haw, Hont, Gr, Crt	Low	U	Open meadow with some sparse tree and shrub cover. The majority of the woody plants are invasive, non-native species such as lilac and tartarian honeysuckle.
0.2	CUT1-5	Raspberry Cultural Thicket	NA	NA	NA	NA	Nil	NA	NA	NA	Nil	Rasp, Gr, Crt	High	U	This dense, raspberry thicket lies adjacent to MAS2-1.

Area (ha)[1]	ELC Code	Vegetation Type	Overstory Tree Cover							Understory Vegetation				Topography[8]	Comments[9]
			Species Composition	Average Age[3]	Average Diameter (cm)[3]	Average Height (m)[3]	Canopy Closure[4] (trees/ha)	Forest Stand Structure[5]	Basal Area Stocking (m^2/ha)	Tree Regeneration Species[2]	Tree Regeneration Density[6]	Shrub Species[7]	Shrub Density		
0.5	CUT1-7	Lilac Cultural Thicket	NA	NA	NA	NA	NA	NA	NA	Ps, Pe	Low	Lilac, Hont, Haw, Buc, Gr, Crt	High	U	This old field has been invaded by mostly non-native, invasive species that now form a shrub thicket. The size of this community will continue to expand into the adjacent meadow.
0.1	SWT2-2	Willow Mineral Thicket Swamp	NA	NA	NA	NA	NA	NA	NA	Mm, Ce	Low	Wi, RODog	High	U	Shrub swamp has developed in an old wayside pit. Groundflora is characterized by sedges rushes, goldenrods and asters. An unevaluated wetland.
0.3	MAM2-5	Narrow-leaved Sedge Mineral Meadow Marsh	NA	NA	NA	NA	NA	NA	NA	NA	Nil	Wi, RODog	Low	F	Meadow marsh has developed in an old wayside pit. Groundflora is characterized by sedges, grasses and rushes. An unevaluated wetland.
0.4	MAM3-2	Reed-canary Grass Organic Meadow Marsh	NA	NA	NA	NA	NA	NA	NA	Po	Low	Elder, Wi, RODog	Low	F	Meadow marsh occurs on a shallow muck soil and is dominated by reed-canary grass, nettle, aster and jewelweed. An unevaluated wetland
1.0	MAS2-1	Cattail Mineral Shallow Marsh	NA	NA	NA	NA	NA	NA	NA	NA	Nil	NA	Nil	F	Shallow cattail marsh may have been affected by past aggregate extraction. Clusters of Ms are found around the margins of the wetland. Part of the Eramosa River – Blue Springs PSW.
0.1	H1	Deciduous Hedgerow	Mn_3Ms_2 $Mh_2Ar_1Ce_1Oh_1$ (Ll, App)	20-100	15-50	5-20	Open	All Aged	NA	Mh, Ce, Ms	Low	NA	Nil	U	Hedgerow occurs along the 6th Line and is a mix of planted and naturally established trees.
0.3	H2	Deciduous Hedgerow	$Bd_7Mh_1Ew_1$ Oh_1 (Pot, Cb)	70	35	20	Dense	Immature Sawtimber	NA	Bd, Ew, Mh	Mod	Buc, Gr, Rasp, Crt	High	U	Hedgerow occurs along the northern property boundary

Notes: NA: Not Applicable

1. Areas calculated by Harden Environmental GIS Staff

2. Tree Species Codes

Deciduous Trees				Conifers	
Ar	Red Ash	Mh	Sugar Maple	Ce	Eastern White Cedar
Aw	White Ash	Mm	Manitoba Maple	He	Eastern Hemlock
Bd	Basswood	Ms	Silver Maple	Pr	Red Pine
Be	American Beech	Pe	Pear	Ps	Scots Pine
By	Yellow Birch	Pob	Balsam Poplar	Pw	White Pine
Cb	Black Cherry	Pot	Trembling Aspen	Sn	Norway Spruce
Ew	White Elm	Po	Poplar All	Sw	White Spruce
Haw	Hawthorn	Wi	Willow All	Oc	Other Conifers
Id	Ironwood	Oh	Other Hardwoods		
Ll	Little Leaf Linden				

Note: The dominant tree species and major associates are indicated to the nearest 10%.

3. Average age, diameter and height were determined from measurements on dominant and codominant trees

4. Canopy Closure (%)Nil <5% Sparse 5-24% Open 25-60% Dense 61-90% Closed 91-100%

5. Forest Stand Structure

1. Regeneration:	Young stands under 20 years old with most trees less than 10 cm dbh.
2. Immature Poletimber	Stands 20 to 49 years old with most trees 10 to 24 cm dbh and usually containing no appreciable merchantable volume other than fuelwood and boltwood/pulpwood.
3. Immature Sawtimber/Mature Pulpwood:	Stands less than rotation age (i.e. 50 to 89 years except in the case of short-lived intolerant hardwoods and conifers e.g. poplar, white birch, jack pine and tamarack) that contain commercially harvestable volumes of merchantable sawlogs, poles, posts or pulpwood, as many trees are 26 to 48 cm dbh.
4. Mature Sawtimber	Stands of rotation age (90+ years) with significant merchantable sawlog volumes and numerous trees over 50 cm dbh in hardwood/pine stands or over 26cm dbh in cedar stands.
5. All-Aged	Stands containing trees of all age classes from seedlings to mature veterans of rotation age with each age class occupying an equal area and significant sawlog volumes available for harvest. Regeneration must be a least moderately dense in these stands.
6. Uneven-aged	Irregular stands exhibiting two or more distinct age classes, which may yield a variety of products. These stands will be described according to the age classes present. For example, a stand with dense regeneration and an overstory of immature sawtimber would be coded as 6 (1/3) while a stand comprised of just poletimber and mature sawtimber would be identified as 6 (2/4).

6. Regeneration Density

Regeneration Density Classes	Average # of Seedling/ Saplings Hectare
Nil	0
Low	600
Moderate	1,700
High	2,500+

7. Shrub Species Codes

Blb	Black Raspberry	Elder	Elderberry Spp.
Buc	Buckthorn	Gr	Wild Grape Spp.
Chc	Chokecherry	Haw	Hawthorn
Crt	Thicket Creeper	Hont	Tartarian Honeysuckle
Cur	Currant Spp.	Lilac	Common Lilac
Dog	Dogwood Spp.	Rasp	Red Raspberry
Dogr	Red-osier Dogwood	Wi	Willow Spp.

8. Topography Slope%

F – Flat 0-2

U – Undulating 2-5

R – Rolling 5-15

SR – Strongly Rolling 15-25

H – Hilly/Steep >25

9. Tree Quality and Health

AGS – Acceptable Growing Stock

Cull – Trees greater than 26cm in diameter at breast height (dbh) with no merchantable sawlog volume now or in the future.

4.4.1 Vascular Plant Species

A complete list of vascular plants observed on the James Dick property is provided in Appendix B. A total of 268 species were recorded on the subject property during the 1997 and 2011 botanical inventories. Of these plants, 177 (66%) are native species and 91 (34%) are exotic or introduced species. Newmaster et al. (1998) indicates that approximately 30% of the flora in Ontario are non-native species. Hence, areas with a higher percentage of non-native species generally reflect areas that have sustained much human disturbance in the past. In the case of the subject lands, past agricultural use, mineral aggregate extraction and subsequent reforestation have significantly affected the flora now found on this site. In contrast, natural areas with lower proportions of exotic species and higher floristic quality (e.g. less than 25% exotic species and/or assemblages of species with a high coefficient of conservatism values) are associated with forest and wetland areas that have experienced relatively little human disturbance, or are at an advanced successional stage. None of the plants recorded are extremely sensitive or have a high degree of fidelity to a specific habitat type (i.e. coefficient of conservatism value of 9 or 10), except for Ohio buckeye and jack pine which were both planted on the property. The most conservative species are generally found in the marsh and mature mixed and deciduous forest communities.

No nationally or provincially rare, threatened or endangered plant species are found on the subject property. Of the native species, all but eight are ranked as S5 –"secure, common, widespread and abundant in Ontario". The S4 species which are considered apparently secure, uncommon but not rare in Ontario include black maple, small yellow sedge, smooth-sheath sedge, American beech, wirestem muhly grass, clammy ground-cherry, swamp dock and American bur-reed. It is, however, important to note that the last 4 uncommon species were only recorded in 1997. Their apparent absence in 2011 likely reflects changes in plant succession over the past 15 years. In this regard, the number of species recorded has also declined from 237 in 1997 to 188 in 2011, but the aggregate of both inventories yields a total of 268 species. These changes in species composition may be partially explained by tree and shrub growth in upland areas since 1997 and related canopy closure as less light and moisture now reaches the forest floor than in the past. In marsh habitats, water levels were exceptionally high in 2011 and this may have suppressed the germination and/or growth of certain species. Furthermore, cattails and reed canary grass are now more abundant in these wetlands than in 1997 and these tall robust aquatic emergents may have suppressed the growth of smaller less aggressive wetland plants.

Based on data provided by Riley (1989), there are no plants found on the subject property that are considered rare in the Central Region of MNR, or rare in Wellington County.

4.5 Wildlife

A list of wildlife observed within the study area is presented in Appendix C. A total of 147 species were found, including 21 odonates, 26 butterflies, 7 amphibians, 3 reptiles, 73 birds, and 17 mammals. These totals include species that were found during earlier surveys in 1997. During the 2011-2012 inventories, 133 species were found including 21 odonates, 26 butterflies, 6 amphibians, 3 reptiles, 62 birds, and 15 mammals. In 1997, a total of 66 wildlife species were found, including 6 amphibians, 3 reptiles, 47 birds, and 10 mammals. During that time, butterflies and odonates were not surveyed.

The composite list from the two study periods has been prepared so that changes and similarities in the wildlife species present can be discussed. Some species that were present during the first sampling period are now absent, while additional species were detected in 2011 and 2012. Changes are discussed under the various wildlife group sections below and can usually be attributed to changes in habitat or to increases or declines in the abundance of species.

4.5.1 Breeding Birds

The composite list of birds from the two sampling periods includes 73 species of which 60 were considered to be breeding species. In 1997, 47 species were detected of which 34 were considered breeders; in 2011 and 2012, 62 species were detected of which 51 were considered breeders.

There are a few species on the 1997 list that may have been breeders, although they were not indicated as such. These include the Pied-billed Grebe, which was observed in the cattail marsh, American Crow, Red-eyed Vireo, and Red-winged Blackbird. Although the crow may have just been a visitor during this period, it is highly probable that the other three species nested on site. Consequently, it is more likely that 38 of the 47 species observed in 1997 were breeding species, assuming that the crow was also a breeding species.

Non-breeding Species

In 2011 and 2012, 11 bird species were observed that were considered non-breeders. These were the Blue-winged Teal, Great Blue Heron, Green Heron, Turkey Vulture, Sharp-shinned Hawk, Red-tailed Hawk, Spotted Sandpiper, Belted Kingfisher, Tree Swallow, Chestnut-sided Warbler, and Yellow-rumped Warbler.

These can be classified into two groups: those that were simply foraging on or over the site (Great Blue Heron, Green Heron, Turkey Vulture, Red-tailed Hawk, Belted Kingfisher, and Tree Swallow) and migrants (Blue-winged Teal, Sharp-shinned Hawk, Spotted Sandpiper, Chestnut-sided Warbler, and Yellow-rumped Warbler).

Some of these species occasionally nest in habitat similar to what is found on the subject lands, so these are discussed further below.

The Blue-winged Teal could possibly nest in grassy areas around the cattail marsh. However, it was only observed on September 12, 2011 during the fall migration.

The Green Heron occasionally nests in coniferous plantations and, when it does so, it most frequently occurs in small colonies. This species was detected on two occasions in 2011 and both times it was seen flying over the site. The plantations were checked for this species and no evidence of nesting was found. In addition, it is likely that this species would have been heard within the plantations had a nest been present. The field studies extended well into the nestling period for this species and there was no evidence of adults feeding young in an on-site nest.

A single Sharp-shinned Hawk was observed on July 27, 2011 and this species also frequently nests in coniferous plantations. This species is most conspicuous from mid-April to early May when it performs aerial displays. No evidence of this species was obtained during this period or any of the regular breeding bird surveys. It is most likely that this bird was wandering during the post breeding period. It showed no evidence of attachment to the site and quickly flew away.

The Red-tailed Hawk nests in deciduous and mixed forests which are represented within the study area. The nests are relatively conspicuous and easy to find, but there was no evidence of nesting. This species was not seen during any of the surveys targeted towards birds and one was simply seen flying over on one occasion in 2011 and another was seen flying over adjacent lands in 2012.

The Tree Swallow nests both in natural cavities in trees near water and also in nest boxes. Although there are suitable areas for it within the study area, this species was seen only once foraging over the cattail marsh. There was no indication that the species bred on site.

The Yellow-rumped Warbler frequently nests in coniferous plantations. This species was seen only on May 20, 2011 before the breeding season for this species commences but was not observed during the breeding season.

Species Seen in 1997 but not in 2011

Ten bird species were seen in 1997 that were considered breeders that were absent in 2011. These included the Pied-billed Grebe (we have assumed that it was nesting then although it was not identified as a breeder), Sora, Ruby-throated Hummingbird, Willow Flycatcher, Eastern Phoebe, Eastern Kingbird, Yellow Warbler, Clay-colored Sparrow, White-throated Sparrow, and Eastern Meadowlark.

Both the Pied-billed Grebe and Sora previously nested in the cattail marsh along the Sixth Line. These species were clearly absent in 2011 and 2012, with no response to their broadcast calls on the six survey dates. In addition, considerable time was spent at this marsh searching for odonates and other wildlife species, and it is likely that they would have been heard had they been present. The marsh still appears to provide habitat that is suitable for these species but was unoccupied and it is unlikely that there is much difference in the habitat in the marsh between the two sampling periods. Their absence may have been due to a local decline in these species, or the growth of the coniferous plantations around much of the marsh may have made it less attractive.

The Ruby-throated Hummingbird was not detected during the 2011 surveys. This is a relatively difficult species to detect so it is possible that it was present but not observed. However, given the amount of time that was spent on site, it is more likely that it was absent. Habitat on the site has changed considerably since 1997, with the site being much more open during the former period. The plantations have since grown up and filled in making these areas relatively unattractive to the hummingbird. In addition, the flowerbeds around the house would have supported flowers that may have been attractive to this species, but these are now unmaintained and do not support flowers that are used as nectar sources by the hummingbird.

The on-site habitat is currently unsuitable to marginal for the Willow Flycatcher. It nests most frequently in shrubby fields and pastures dominated by hawthorns, often with other species present such as apple, dogwood, willow, and a variety of other species. Less frequently, it nests in willow or willow-dogwood thickets, borders of marshes, and young coniferous plantations with some deciduous trees or shrubs (Peck and James 1987). It is likely that the young plantations were suitable habitat in 1997, but they have become too mature to be attractive to the Willow Flycatcher. The existing shrubby areas are probably too small to support a pair of this species.

The Eastern Phoebe typically nests on cliffs in natural habitats and on buildings and other human-made structures in anthropogenic areas. The rented house and adjacent open areas are suitable habitat for this species, but it was absent in 2011. This is a conspicuous species that would not have been overlooked.

The Eastern Kingbird nests in a variety of open habitats but prefers shrubby meadows and pastures, hedgerows, and open wetlands with standing trees or snags. This kingbird also requires a relatively large open area. Territory sizes of 5.7 to 14.2 ha have been reported and the birds frequently fly outside of the defended area, so home ranges may be much larger (Murphy 1996;

Odum and Kuenzler 1985). There is currently no suitable habitat for the Eastern Kingbird on the subject lands. The largest patch of cultural meadow remaining on site is only slightly larger than 1 ha, considerably smaller than its territory size requirements. In 1997, the plantations were still young and open and therefore provided suitable habitat for the Kingbird.

The Yellow Warbler is another species that prefers open shrubby meadows. Similar to the Eastern Kingbird, the plantations have matured and made the habitat unsuitable for this warbler.

The Clay-colored Sparrow nests in Christmas tree plantations and young plantations in grassy fields as well as in meadows and pastures overgrown with shrubs (Peck and James 1987). In 1997, the young plantations would have provided ideal habitat for this species, but the more mature plantations that are currently present are unsuitable habitat.

The White-throated Sparrow nests mostly in coniferous and mixed forests and less frequently in deciduous forests. Second-growth, open woodlands are preferred over mature and dense tree stands and woodland nests are usually located at edges, clearings, and shorelines of watercourses and water bodies (Peck and James 1987). The white cedar coniferous forest along the stream and the surrounding young plantations probably provided suitable habitat for this species in 1997. The current more-mature plantations surrounding the cedar forest would be much less attractive for the White-throated Sparrow. The song of this species is very conspicuous and the species would not have been overlooked had it been present.

The Eastern Meadowlark is a grassland species that generally is found in open areas of 10 ha or larger. The open areas with young plantation were suitable habitat in 1997 but there is no suitable habitat for the meadowlark at present. This is another conspicuous species that would not have been overlooked had it been present.

Of the ten species that were observed in 1997 but not in 2011 or 2012, good habitat is still present for three species (Pied-billed Grebe, Sora, Eastern Phoebe) and current habitat is marginal or unsuitable for the remaining seven species. The water levels in the marsh along the Sixth Line were much lower in 2012 than in 2011, and a much higher percentage of the marsh was vegetated with cattails. This would have lowered the habitat quality for the Pied-billed Grebe.

Least Bittern Survey Results

All of the Least Bittern surveys at both the on-site marsh and the adjacent marshes were negative.

The general habitat at the on-site marsh is potentially suitable for the Least Bittern. This species typically nests in marshes dominated by cattails or bulrushes, but it may nest in other emergent species such as common reed, arrowheads, bur-reeds, horsetails, sedges, and heaths (McCracken et al. 1981; Meyer and Friis 2008; Peck and James 1983). Jobin et al. (2010) stated that cattail marshes were the preferred habitat, but that marshes dominated by bulrushes, bur-reeds, and reed canary grass should also be surveyed for this species. In addition, shrubby swamps dominated by willows and buttonbush are considered potential habitat that should be surveyed. Consequently, the general habitat of both the on-site and adjacent marshes is consistent with the preferred habitat of the Least Bittern.

Interspersion of emergent vegetation and open water is another important habitat criterion for the Least Bittern. Hemi-marsh conditions (a 50:50 ratio of emergents and open water) provide ideal habitat for the Least Bittern (Hands et al. 1989; Rehm and Baldassarre 2007; Weller and Spatcher 1965). The on-site marsh is approximately 70% vegetated and 30% open water.

Although these are not ideal conditions, the interspersion of habitat is still suitable enough to support the Least Bittern. The adjacent marsh is open in the middle, with cattails mostly around the perimeter, so it is potentially less suitable from an interspersion perspective.

Most authors consider the Least Bittern to be area sensitive, generally occurring in marshes 2 to 5 ha or larger, and large, persistent populations are typically associated with much larger marshes (Austen et al. 1994; Brown and Dinsmore 1986; James 1999; Sandilands 2005). There are, however, records of the Least Bittern nesting in wetlands as small as 1 ha in Ontario (Sandilands and Campbell 1988; Woodliffe 2007). It has been assumed that these small wetlands are population sinks and are not used regularly by Least Bitterns, but this assumption has not been tested (Gray Owl Environmental Inc. 2009).

Probably the greatest limitation to the three wetlands for Least Bitterns is their size, which is near the minimum that is used by this species. The on-site marsh is 1.0 ha in size while the off-site wetlands are even smaller. The off-site wetlands also have a much less than favourable vegetation to open-water ratio.

It is concluded that the Least Bittern is absent both from the site and adjacent lands. The species would have certainly been detected had it been present given the surveys that were undertaken and also the amount of time that was spent near the on-site marsh. The major factor limiting the usage of these marshes by the Least Bittern is their size, although the interspersion of vegetation in the off-site marsh is far from ideal. Lower water levels in 2012 resulted in the on-site wetland being much less suitable for the Least Bittern, as it was approximately 90% vegetated with cattails. The eastern wetland had very low water levels in 2012 and consequently was unsuitable for the Least Bittern.

Marsh Bird Survey Results

All of the surveys at the on-site marsh, the adjacent marsh along Highway 7, and the adjacent wetland in the northeast were negative. It is concluded that the Virginia Rail, Sora, Least Bittern, Common Gallinule, American Coot, and Pied-billed Grebe were absent from the site and adjacent areas in 2011 and 2012.

Owl Survey Results

The owl survey was positive, with a single Eastern Screech-Owl responding to the broadcast call. This bird was in the sugar maple–black cherry deciduous forest north of the rented house. No other owl species responded to the tapes.

It is probable that the Northern Saw-whet Owl is absent as the habitat in the study area is marginal to unsuitable for it. It is an obligate cavity nester and therefore requires intermediate-aged to mature forests. Although it nests in coniferous, mixed, and deciduous forests, it is most common in coniferous forests, especially those dominated by white cedar, tamarack, and red pine. In addition, it is most abundant where there is a well-developed middle canopy of conifers 2-4 m tall (Sandilands 2010). The only potentially suitable habitats are the coniferous and mixed forests along the watercourse, although there is some potential that this species could occur in the more mature deciduous stands. However, the understorey cover that this species requires is absent and these areas are marginal habitat at best. In addition, the larger screech-owl is present, which would be a deterrent to occupation by the saw-whet owl.

The on-site and adjacent habitat is suitable for the Long-eared Owl, as it nests primary in dense coniferous forests, most often in swamps and coniferous plantations (Peck and James 1983). The

Long-eared Owl is an obligate edge species that avoids forest interior and it prefers small forests to extensive tracts of forest (Johnsgard 1988; Marks 1986). Most nests of this species are in old American Crow nests. This species rarely responds to broadcast calls so lack of a response is not necessarily indicative of its absence. In fact, this may be the most difficult owl to detect and it is undoubtedly much more common than atlases and other surveys indicate. Although the presence of this species cannot be entirely ruled out, it is unlikely that it is present. Crow nests (and therefore Long-eared Owl nests) are relatively conspicuous and there was no evidence of nests at the edge of the plantations.

Habitat within the study area is generally unsuitable for the Barred Owl. This species nests in large deciduous and mixed forests that may be either upland or lowland (Peck and James 1983). It is associated with old-growth forest, typically stands with a high density of trees with a diameter at breast height (dbh) of 50 cm or larger. Generally, it is thought that 100-400 ha of forest are required to support a pair (Bushman and Therres 1988). The on-site forest is much too small to support this species.

The Great Horned Owl nests in all types of forest, but greatly prefers deciduous forest. Most of its nests are abandoned raptor nests, particularly those of the Red-tailed Hawk (Peck and James 1983). The only potential habitats for this species are the two deciduous woodlands. These areas were carefully searched and there was no evidence of nesting by the Great Horned Owl.

In summary, the owl survey confirmed the presence of the Eastern Screech-Owl. The Northern Saw-whet Owl, Barred Owl, and Great Horned Owl do not occur within the study area. Although the habitat is suitable for the Long-eared Owl, it is doubtful that it is present.

Goatsucker Survey Results

The survey for the Common Nighthawk and Eastern Whip-poor-will was negative.

In agricultural southern Ontario, the nighthawk nests in both rural and urban habitats. In rural areas, it nests in grasslands, pastures, agricultural fields, gravel pits, prairies and alvars, and at airports. In urban areas, it nests mostly on flat, gravelled roofs, and occasionally on railways and footpaths (Peck and James 1983). In southern Ontario, the nighthawk appears to have largely abandoned nesting in natural habitat and prefers to nest on roofs in urban areas (Sandilands 2007). It is concluded that the Common Nighthawk is absent from the study area. The survey was done under ideal conditions at a period when the species would be most vocal, and the species is relatively conspicuous when it is present. In addition, the habitat in the area is marginal and the species currently seldom occurs in rural areas south of the Canadian Shield.

The Eastern Whip-poor-will nests in deciduous, mixed, and coniferous forests. Ontario nesting habitat includes large forests, pine plantations, and tree-covered sand dunes (Peck and James 1983). It is most common in mixed pine-oak forests, but is also common in large pine plantations. In Ontario, preferred habitats include rock and sand barrens with scattered trees, savannahs, old burns with early successional growth, and open, coniferous plantations (Mills 2007). Although the whip-poor-will is associated with forest edges and openings, it is an area-sensitive species that requires extensive forest. It may occasionally nest in small woodlots, but only where there is a high percentage of forest cover in the general region. In agricultural southern Ontario, it appears to be restricted to areas of contiguous forest that are at least 100 ha in area; 500-1,000 ha may be necessary to support more than a very few pairs (Bushman and Therres 1988; Cooper 1981; Robbins 1979; Robbins et al. 1989). The whip-poor-will is absent from the site. Surveying was done under ideal conditions under full moonlight during the period when this species is most vocal. The on-site plantations would provide suitable habitat, as there are some openings in them,

but the size of the forest within the general study area is far too small to support the whip-poor-will.

MNR typically prefers that three surveys be taken for Species at Risk, but only a single survey was undertaken for the nighthawk and whip-poor-will in this case. A single survey for these species was considered adequate because it was completed under ideal conditions at the time of year when these species are most easily detected. Both of these maintain a breeding home range and will vocalize within this range on a daily basis during the breeding season. Both are conspicuous when present and therefore they would have been detected if they were maintaining breeding home ranges anywhere near the study area.

Species Seen On-site and on Adjacent Lands

A total of 42 breeding bird species were found both on the subject lands and the adjacent lands. It is possible that some species on adjacent lands were overlooked because all off-site surveys were done from roadsides or the subject land boundaries. Nonetheless, bird species diversity on and off the site was very similar.

Nine breeding bird species were found only on the subject lands while nine other breeding bird species were found only on adjacent lands. Two of those found only on-site were related to the presence of the cattail marsh (Wood Duck and Hooded Merganser); the Red-breasted Nuthatch was associated with the coniferous plantation, a habitat represented off-site only west of the site; the Mourning Warbler was associated with the edge habitat of the mixed forest along the watercourse; and the Eastern Screech-Owl occurred in deciduous woodland on site. It is likely that some of the species that were found only on the subject lands also occurred on adjacent lands. These include Ruffed Grouse, American Woodcock, Downy Woodpecker, and Brown-headed Cowbird.

The nine species that were found solely on adjacent lands were definitely absent on site. These included species associated with agricultural row crops (Killdeer and Vesper Sparrow), grasslands (Savannah Sparrow, Grasshopper Sparrow, and Bobolink), coniferous swamp (Veery), and deciduous forest (Red-bellied Woodpecker, Wood Thrush, and Scarlet Tanager).

Given that some species on adjacent lands were probably not detected, it is likely that the adjacent lands supported a slightly higher diversity of breeding birds than the subject lands.

Table 3 provides a summary of the habitat in which birds were found on the subject lands.

The coniferous plantations supported the highest diversity of breeding birds which is not surprising given that it is the largest habitat on site. Within the plantations, there are small openings as well as remnant fence lines with deciduous trees that provided habitat for species that would not normally nest within plantations. Some of the species that were detected within the plantations may have been foraging only and not nesting. These include the Black-billed Cuckoo, Pileated Woodpecker, American Crow, Eastern Bluebird, Mourning Warbler, and American Goldfinch.

The unusually low diversity of the coniferous and mixed forests was due to their small size and mostly linear shape such that birds were mostly associated with vegetation communities adjacent to these habitats. The exception was the Mourning Warbler that spent most of its time at the interface between the reed canary grass marsh in the interior of the site and the riparian white cedar woodland.

Table 3 Distribution of On-site Birds by General Habitat Type

SPECIES	MEADOW	MARSH	PLANTATION	FOD	FOC/FOM
Canada Goose		√			
Wood Duck		√			
Mallard		√			
Hooded Merganser		√			
Ruffed Grouse			√		
Wild Turkey			√		
American Woodcock					√
Mourning Dove			√		
Black-billed Cuckoo			√		
Eastern Screech-Owl				√	
Downy Woodpecker			√		
Hairy Woodpecker			√		
Northern Flicker			√		√
Pileated Woodpecker			√		
Eastern Wood-Pewee			√		√
Great Crested Flycatcher			√		
Red-eyed Vireo			√		
Blue Jay	√	√	√	√	√
American Crow			√		
Black-capped Chickadee	√		√	√	√
Red-breasted Nuthatch			√		
White-breasted Nuthatch				√	
House Wren	√		√		√
Eastern Bluebird	√		√		
American Robin	√		√	√	√
Gray Catbird	√		√		
Cedar Waxwing	√				
Ovenbird			√		
Mourning Warbler			√		√
Common Yellowthroat	√	√			√
Chipping Sparrow	√		√		
Field Sparrow	√				
Song Sparrow	√		√	√	√
Northern Cardinal			√		√
Rose-breasted Grosbeak			√		
Indigo Bunting	√		√		√
Red-winged Blackbird	√	√			
Common Grackle			√		
Brown-headed Cowbird	√				
Baltimore Oriole	√	√			
American Goldfinch	√		√		
TOTALS	**16**	**8**	**28**	**7**	**12**

Summary of Significance of the Birds Present

Of the 51 breeding bird species found within the study area, 30 (58.8%) have an S-rank of S5 which indicates that they are very common and secure in Ontario. One species, the European Starling, is non-native and has an S-rank of SNA. The remaining 20 species have an S-rank of S4 indicating that they are uncommon and apparently secure in the province.

Of the 42 species that nested on the site, 29 (70.7%) have an S-rank of S5, and 12 (29.3%) have an S-rank of S4 and one is SNA. In general, the avifauna of the site is dominated by common to abundant species.

The Bobolink has been designated threatened nationally and provincially. This species was observed on adjacent agricultural lands to the northwest of the site. A maximum of two pairs appeared to be present. They spent most of their time farther than 120 m from the subject lands, but occasionally moved somewhat closer. These fields were in rough hay dominated by grasses. The Bobolink is discussed in more detail in Section 4.5.6, Threatened and Endangered Species.

The Committee on the Status of Endangered Wildlife in Canada (COEWIC) has recently designated the Eastern Meadowlark threatened. This species has also been evaluated by the Committee on the Status of Species at Risk in Ontario (COSSARO) and determined to be threatened. This species was documented as occurring on site in 1997. As discussed above, there is currently no suitable habitat for this species on the subject lands and it is absent. Therefore, there is no significant habitat for the Eastern Meadowlark on or adjacent to the site.

COSSARO plans to evaluate two other bird species that were found within the study area: the Eastern Wood-Pewee and the Wood Thrush. At this point, it cannot be predicted what designations these species will be assigned. The wood-pewee was observed on site and on adjacent lands while the Wood Thrush was observed on adjacent lands only.

On site, the Eastern Wood-Pewee was observed both in the mixed white pine-sugar maple forest (FOM2-2) adjacent to Highway 7 and in the coniferous plantation immediately adjacent to this woodland.

The Wood Thrush was observed in the sugar maple–white ash forest (FOD5-8) north of the site, but did not occur on the subject lands.

Six of the breeding bird species are considered to be area sensitive. These include forest breeding birds (Ruffed Grouse, Hairy Woodpecker, Pileated Woodpecker, Veery, and Scarlet Tanager) and one grassland species, the Bobolink. The Red-breasted Nuthatch, White-breasted Nuthatch, and Savannah Sparrow are identified as being area sensitive in the Significant Wildlife Habitat Technical Guide (SWHTG) (OMNR 2000). However, it is now generally accepted that these species are not area sensitive. A brief summary of each of these three species is provided below.

According to the SWHTG, the Red-breasted Nuthatch is area sensitive, requiring a minimum of 10 ha of forest. Territory sizes of this species range from 0.2 ha to 10 ha (Rail 1996; Sabo 1980) depending upon the availability of suitable nest sites. James (1984) suggested that it only needed 1 ha of forest in Ontario, and one pair nested in an apple tree in a suburban backyard in Waterloo (Cheskey 1990). Because this species frequently nests in very small woodlots that are not much larger than its territory size, it is no longer considered area sensitive.

OMNR (2000) considered the White-breasted Nuthatch area sensitive, requiring a minimum of 10 ha of forest. This species often has a territory size that approaches 10 ha, although territories may occasionally be as small as 3-5 ha (Butts 1931; Kilham 1972, 1981). The species is not truly area sensitive and it may also nest in residential areas and riparian strips of woody vegetation (Peck and James 1987).

The Savannah Sparrow is identified as being area sensitive in the SWHTG and as requiring a minimum of 50 ha. Although this may be true in some areas, it is not the case in Ontario. Rising (2007) noted that it used relatively small patches of suitable habitat in Ontario.

Consequently, the Red-breasted Nuthatch, White-breasted Nuthatch, and Savannah Sparrow are not considered area sensitive and are not discussed further in the section on significant wildlife habitat.

The five woodland bird species that are area sensitive are discussed in more detail under Significant Wildlife Habitat (Section 5.1.6). The Bobolink is not discussed as significant wildlife habitat as habitat for this species is considered significant habitat for a threatened species.

4.5.2 Amphibians

Salamanders

Snow earlier in the evening of April 3, 2011 was predicted to change to rain with temperatures increasing to 12°C overnight. The warmer temperatures did not materialize that evening, however, but the following evening was mild and wet. Emails from others surveying salamanders in other locations noted a major movement of salamanders on the evening of April 4, 2011. Red-spotted newts (*Notophthalmus viridescens*), spotted salamanders (*Ambystoma maculatum*), blue-spotted salamanders (*Ambystoma laterale*), and Jefferson complex salamanders were reported from Glen Morris, Cambridge, Kitchener, Milton, and Terra Cotta.

No salamanders of any species were captured in any pond during the 2011 and 2012 surveys.

The following is a description of the four ponds and results of the survey.

Pond 1

Pond 1 is the shallow cattail marsh along the Sixth Line. It is approximately 1.0 ha in size. The substrate consisted of a thin organic layer over dense mineral soils (i.e. silty sand and/or gravel). The dominant vegetation was broad-leaved cattail with about 70% coverage of the pond. There was a small patch of silver maple standing in the water, a limited amount of red-osier dogwood, and some reed canary grass growing in the pond. There was only about 5% canopy closure by trees over the pond. Egg attachment sites were limited to cattail stems, and some submerged branches in two small areas of the pond. Surrounding habitat was Concession 6 and agricultural land to the west, moist mixed white cedar–hardwood stands to the north, a narrow strip of silver maple to the east, and pine plantations to the south and southeast. Minnow trapping later in the season confirmed that the pond did not support fish.

The only items caught in the minnow traps in this pond were a few green frog tadpoles. During the egg-mass survey, 111 wood frog egg masses were found, 103 of which were in a small concentration along the north shore of the marsh and 8 were in a temporarily flooded area north of the cattail marsh. Other amphibian species detected in the pond were spring peeper, tetraploid gray treefrog, American toad, and northern leopard frog.

Pond 2

Pond 2 is the in-stream pond. This was a dugout pond with a small island composed of the fill removed from the pond. The pond was on an intermittent creek and there was perceptible flow through the pond through much of the sampling period. The pond was essentially a widening of the channel approximately 5-6 m wide. The depth was in excess of 1 m and the slopes of the pond were very steep. There was no overhead cover by trees and no apparent egg attachment sites. The surrounding habitat was upland white cedar forest to the north and east, and small patch of very immature hardwoods to the south, and a small cultural meadow on the west. These latter two communities are too small to map as ELC units. The main habitat to the west is coniferous plantation. Minnow trapping later in the season confirmed that the pond did not support fish.

Nothing was caught in the minnow traps in this pond during the survey. No egg masses of any amphibian species were detected during the egg-mass survey. Other amphibian species documented in this pond were spring peeper, wood frog, and green frog. Amphibians in general were scarce in this pond and the species that were present were represented by very few individuals, possibly only 1 or 2.

It is concluded that the two on-site ponds do not support breeding Jefferson salamanders or any other salamander species. The minnow trapping was thorough and conducted at the peak time of salamander breeding in the province. Major movements of salamanders were documented on the evening of April 4, 2011 by many observers from areas such as Glen Morris, Terra Cotta, Cambridge, Kitchener, and Milton. According to Dr. Bogart, breeding of the Jefferson salamander was confirmed in Ontario in 2011 on March 28 and April 4, 5, 6, 7, 8, 10, 12, and 17. Therefore, sampling at the proposed James Dick pit occurred during the peak of Jefferson salamander breeding and should have resulted in the capture of adults if they had been present. In addition, egg-mass surveys failed to reveal any evidence of salamander breeding.

Habitat of the two on-site ponds is very marginal for the Jefferson salamander. Pond 1 was an open cattail marsh, a habitat that is seldom used by this species. Pond 2 was an in-stream pond with perceptible flow in it. The Jefferson salamander typically avoids flowing water and therefore Pond 2 is unsuitable for this species.

The surrounding terrestrial habitat is unsuitable to marginal for the Jefferson salamander. This species typically requires deciduous or mixed forests for foraging and overwintering habitat. Forests that are used tend to be dominated by climax species and are intermediate-aged or mature. Although there are two small on-site patches of potentially suitable forest (white pine–sugar maple forest (1.7 ha) and sugar maple–black cherry forest (1.2 ha), the dominant vegetation cover is coniferous plantation. Pond 1 is distant from these habitats and salamanders would have to travel through plantations to reach suitable habitat. Although Pond 2 is close to these forest types, the pond itself is not suitable for breeding.

Another factor that limits the potential for the Jefferson salamander to occur on site is the historical usage of the property. One pond is human-made and both ponds would likely have been used for livestock watering as the majority of the property was farmed prior to being reforested with coniferous trees. Thus, there would have been essentially no suitable habitat for the species historically.

To further assess habitat utilization by Jefferson salamander, wetlands within 120m of the site that exhibited ponded surface water were surveyed during March and April 2012. The following discussion provides a description of the two off-site wetlands and results of this survey.

Ball Pond

A shallow cattail marsh (MAS2-1) occurs along Highway 7 on the Ball property. This pond is approximately 0.5 ha in size. Along the north, east and west sides of the pond, the depth of the water increases gradually but near Highway 7 it increases dramatically over a short distance. Consequently, the water depth is quite variable and ranges from 50cm to 140cm. The dominant vegetation is broad-leaved cattail which provides about 50% coverage of the pond. Some scattered shrubs are also found around the perimeter of the marsh. The wetland is surrounded by conifer plantation on the north, east and west sides while Highway 7 forms the southern boundary. Egg attachment sites were limited to cattail stems.

The only creatures caught in the minnow traps were green frog tadpoles and some aquatic beetles. During the egg-mass survey, no egg masses were observed. Other amphibian species detected in the pond were spring peeper, American toad, and northern leopard frog.

Mudge Pond

A Winterberry Organic Thicket Swamp (SWT3-7) is located northeast of the site on the Mudge property. This wetland encompasses about 0.6 ha and exhibits a relatively uniform water depth of about 40 to 50cm. Approximately 40% the swamp is characterized winterberry shrubs while 50% of the area consists of broad-leaved cattails with only 10% occupied by open water. An upland deciduous forest dominated by sugar maple and white ash surrounds the swamp and provides about 20% canopy closure over the wetland. In addition to cattail stems and shrubs there is also downed wood debris throughout the pond that could function as egg attachment sites.

The only animals caught in the minnow were wood frogs, spring peepers, green frogs, aquatic beetles and crayfish. During the egg-mass survey, 1 wood frog egg mass was found near the south shore and numerous American toad tadpoles were observed near the north shore. Northern leopard frogs were also observed in the pond.

No salamander species were captured in either offsite pond during the 2012 survey. Habitat conditions at the Ball pond (i.e. open cattail marsh) are seldom used by Jefferson salamander and it provides marginal habitat at best. Although the aquatic and terrestrial habitats provided in and around the Mudge pond appeared suitable for Jefferson salamander utilization the survey results did not support this observation.

To add further credibility to the survey findings Dr. Bogart indicated there are no records of Jefferson salamander in the Rockwood area.

Based on the above discussion, we conclude that the site and surrounding lands do not support the Jefferson salamander and that there is no potential for this species to occur.

Calling Amphibians

Five species of amphibians were recorded on the subject property during call counts including wood frog, spring peeper, gray tree frog, northern leopard frog and green frog. These same species were also observed on the property during other wildlife surveys conducted during 2011 and 2012 along with American toad. All amphibians recorded on the subject lands were also heard and/or observed in adjacent wetlands. All of these species are ranked as S5, secure-common, widespread and abundant in the province. In 1997 all of these amphibians were also recorded on the site, except for wood frog which was probably missed because no early spring

surveys were carried out. Western chorus frog was also noted inhabiting marsh habitat in 1997 but was not heard during the 2011/12 surveys.

Amphibians were recorded at all four survey sites shown in Figure 5, Appendix A. Full choruses of wood frogs and spring peepers were heard at the on-site cattail marsh (station A2) and the off-site thicket swamp (station A4). A full chorus of spring peepers was also noted at station A3 the off-site cattail marsh along Highway #7. The results of the amphibian call count survey conducted on the subject property and adjacent lands are summarized in Table 4.

4.5.3 Reptiles

Only 1 snake species and 2 turtle species were observed on the subject property. The eastern gartersnake and Midland painted turtle are both ranked S5 indicating that they are very common and secure in Ontario. Snapping turtle is ranked as S3 meaning this species may be vulnerable in Ontario.

Numerous eastern gartersnakes were encountered during the snake cover board survey. Although snake boards were distributed in a variety of habitats the garter snakes preferred open successional communities that had other structural features nearby. This finding was consistent with the observations recorded in 1997.

One Midland painted turtle carapace was found near the on-site cattail marsh during field surveys but a living specimen was never observed in the pond. Nonetheless, this turtle likely inhabits this marsh since it was also noted during wildlife surveys carried out in 1997.

In 2011, two different snapping turtles were observed, one in the on-site cattail marsh and another near the Sixth Line adjacent to this marsh. Snapping turtle was also recorded in this area during the 1997 inventory.

4.5.4 Butterflies and Odonata

Butterflies

In general, most of the 26 species of butterflies that were observed are common in Ontario and locally. All 26 species were seen on the subject lands while only 6 were seen on adjacent lands. This is a reflection of the lack of access to adjacent lands; it is likely that adjacent lands supported a similar diversity of butterflies to the subject lands.

Two of the butterfly species observed are non-native to North America, the European skipper and cabbage white. All but three of the remaining species have an S-rank of S5 indicating that they are very common and secure in Ontario. The other three species have a breeding S-rank of S4 indicating that they are apparently secure in the province.

The monarch has been designated special concern nationally and provincially. Small numbers of this species were seen on June 17 and July 27, 2011 but it was not observed on June 26, 2011 or in 2012. It was observed in a variety of habitats including the cultural meadows, coniferous plantations, the cattail marsh, and the white cedar coniferous forest. Habitat for this species may be considered significant wildlife habitat, so it is discussed in more detail in Section 4.5.7.

Table 4 Amphibian Call Count Survey Results

Station	Date	Abundance Codes and Species Numbers					
		Wood Frog	Spring Peeper	Gray Tree Frog	American Toad	Northern Leopard Frog	Green Frog
A1	April 28/11	1-3*	-	-	-	-	-
	May 18/11	-	-	-	-	-	-
	June 27/11	-	-	-	-	-	1-3
	March 25/12	-	-	-	-	-	-
	May 6/12	-	-	-	-	-	-
	June 18/12	-	-	-	-	-	1-1
A2	April 28/11	1-4	3-20+	-	-	-	-
	May 18/11	-	3-20+	1-1		1-1	
	June 27/11	-	-	1-6	-	-	2-15
	March 25/12	3-20+	3-20+	-	-	1-3	-
	May 6/12	-	3-15+	-	-	1-1	-
	June 18/12	-	-	1-2	-	-	1-3
A3	April 28/11	-	3-20+	-	-	-	-
	May 18/11	-	3-20+	-	1-1	-	-
	June 27/11	-	-	1-6	-	-	2-12
	March 25/12	1-6	3-20+	-	-	-	-
	May 6/12	-	2-10	-	-	1-3	-
	June 18/12	-	-	1-4	-	-	-
A4	March 25/12	3-20+	3-20+	-	-	1-2	-
	May 6/12	-	3-15+	-	-	-	-
	June 18/12	-	-	-	-	-	-

Notes: * First number indicates call code, second number indicates number of individuals.

Odonates

All of the 21 species of odonates were observed on the subject lands while only one was observed on adjacent lands due to access restrictions. Odonates were most abundant around the cattail marsh, in cultural meadows, and in the reed canary grass marsh.

All but three of the odonates observed have an S-rank of S5, indicating that they are very common and secure in Ontario. The remaining species have an S-rank of S4, meaning that they are apparently secure.

The targeted search for the clamp-tipped emerald was negative. Four emeralds were seen during the survey and three of these were caught and proved to be brush-tipped emeralds. The fourth one was seen well enough with binoculars to also be positively identified as a brush-tipped emerald. These were all seen in the reed canary grass marsh and along the trail through the plantation immediately adjacent to this marsh.

It is concluded that the clamp-tipped emerald is absent from the site and that there is no suitable habitat present for this species. Females oviposit into small forest streams where the nymphs develop. Suitable streams have a series of pools and riffles, but they must be permanently flowing as it takes at least a year for the nymphs to develop into adults (Walker and Corbet 1978). The on-site stream is intermittent and therefore is incapable of sustaining nymphs long enough to develop into adults.

4.5.5 Mammals

The bat detector recorded bat calls at the cattail marsh on the 6th Line and the on-site house. At both sites, little brown bats and big brown bats were recorded. These are two of the most common bat species in the province. The little brown bat is declining significantly due to white-nose syndrome, however. It has recently been listed as endangered federally. It has been evaluated at the provincial level, but no official designation has been ascribed to it yet.

There was no evidence of the eastern pipistrelle being present. Habitat for it is rather marginal on site as it generally occurs in open areas and on woodland edges. The site is predominantly coniferous plantation which is relatively poor habitat for this species. Given that numerous calls of two other bat species were recorded, that the pipistrelle is a non-migratory species, that there are no apparent suitable roosts in the area, and that the overall habitat is marginal, it is concluded that the eastern pipistrelle is absent from the site.

The Ontario mammal atlas (Dobbyn 1994) was checked to determine if any significant mammal species had been reported in the vicinity of the subject lands. Within an approximate radius of 40-50 km around the site, a total of 38 mammal species have been reported over the years. Seventeen of these species were found within the study area. All of these mammals are ranked S5 and are considered very common provincially and locally, except for the hairy-tale mole which is ranked S4 (uncommon but apparently secure). A small population of white-tailed deer inhabit the subject property and surrounding lands on a year round basis but MNR has not identified this area as a significant deer wintering area according to the Land Information Ontario website.

Of the remaining 21 species not found in the study area, only two are of provincial significance, the small-footed bat (*Myotis leibii*) and eastern pipistrelle. As indicated above the bat survey determined that both the little brown and big brown bat were present, but the eastern pipistrelle was absent from the site. Even using a bat detector, it is very difficult to distinguish the calls of the little brown bat from those of the small-footed bat. The small-footed bat is a cave-dwelling species

that was most likely previously documented from the Rockwood Conservation Area or similar areas where there are caves. The subject lands do not provide any hibernation habitat or summer roosting habitat for this species. It is possible that it may occur occasionally while it is foraging or on migration, but there is no significant habitat for it within the study area.

4.5.6 Threatened and Endangered Species

The Bobolink was the only endangered or threatened species found within the study area. At least two pairs were present in the grassy hayfields north of the subject lands. This area appears to provide suitable habitat for this species as it was not dominated by alfalfa or cut early in the breeding season. There is no suitable habitat for this species on the subject lands.

The little brown bat has been designated endangered federally, but no formal designation has been ascribed to it in the province yet. Federal designations for mammals do not apply to private lands such as the James Dick site.

The targeted inventories indicated that the Jefferson salamander, Least Bittern, and Eastern Whip-poor-will were absent from the site. Habitat for each of these species is marginal at best and it is concluded that they are absent.

There are a number of other endangered and threatened species that have been documented from Wellington County that were not specifically searched for during this study. The lack of targeted inventories for these species is because there is either no suitable habitat for them in the area or because the study area is not within their known range within the county. Table 5 provides a list of the other 16 endangered and threatened species that have been documented in Wellington County that have not been discussed to date. Of these species only the Blanding's turtle has been historically documented occurring in the vicinity of the subject property according the NHIC database.

Table 5 Other Endangered and Threatened Species Documented in Wellington County

COMMON NAME	SCIENTIFIC NAME	STATUS
American Chestnut	*Castanea dentata*	Endangered
American Ginseng	*Panax quiquefolia*	Endangered
Butternut	*Juglans cinerea*	Endangered
Redside Dace	*Clinostomus elongatus*	Endangered
Spotted Turtle	*Clemmys guttata*	Endangered
Barn Owl	*Tyto alba*	Endangered
Loggerhead Shrike	*Lanius ludovicianus*	Endangered
Henslow's Sparrow	*Ammodramus henslowii*	Endangered
Rainbow Mussel	*Villosa iris*	Threatened
Wavy-rayed Lampmussel	*Lampsilis fasciola*	Threatened
Black Redhorse	*Moxostomma duquesnei*	Threatened
Blanding's Turtle	*Emydoidea blandingi*	Threatened
Butler's Gartersnake	*Thamnophis butleri*	Threatened
Eastern Massasauga	*Sistrurus catenatus*	Threatened
Chimney Swift	*Chaetura pelagica*	Threatened
Grey Fox	*Urocyoncinereo argentateus*	Threatened

Mussel and Fish Species

The four aquatic species (rainbow mussel, wavy-rayed lampmussel, redside dace, and black redhorse) can be eliminated as potential species. Three of these require large, permanently flowing watercourses while the redside dace occurs in small permanently flowing tributaries. There are no permanently flowing streams on site and the fisheries work demonstrated that fish were absent.

Plant Species

The three plants can also be eliminated because they would have been detected during the plant inventories. In addition, the available habitat is very marginal for the ginseng. The primary habitat of ginseng is rich, moist, undisturbed, and relatively mature sugar maple-dominated deciduous forests. It occurs in areas of circumneutral soils such as over limestone or marble bedrock. Colonies often occur near the base of gentle slopes facing southeast to southwest. It is most prevalent in warm microclimates with well-drained soils, and where there is a high diversity of plant species (COSEWIC 2000; Nault and White 1999). Although there are some sugar maple-dominated forests present, they are very small and not suitable for supporting ginseng. The minimum viable population for ginseng has been estimated to be about 170 plants. Based on this criterion, there are only seven viable populations known in Ontario (Nantel et. al. 1996). In order to support this species, a large, undisturbed forest is required.

Spotted Turtle

The two endangered or threatened turtle species are also considered absent. The spotted turtle typically occurs in wetlands with high organic content and considerable aquatic vegetation. It may be present in a wide variety of habitat types including bogs and fens, marshes, ditches, vernal pools, woodland streams, sedge meadows, and sheltered edges of shallow bays. In the northern portions of its range, sphagnum moss, sedge tussocks, cattails, water-lilies, and riparian shrubs are important habitat requirements (COSEWIC 2004). Despite this apparent plasticity in habitat requirements, the spotted turtle is restricted geographically and is rare in the isolated areas that it occurs. This is a very difficult to detect species, so it may have gone unnoticed in some areas.

The spotted turtle has a more complex set of habitat requirements than many turtles. It uses a mosaic of habitat types, displays seasonal shifts in habitat use, and requires terrestrial habitats during certain periods of the year. Nesting occurs in terrestrial sites, including soil-filled crevices in Canadian Shield rock outcrops where there is full exposure to sunlight. In Ontario, nesting may also occur along human-made dykes, on muskrat lodges, and at the base of grass or sedge tussocks (COSEWIC 2004).

The spotted turtle is considered absent because the wide variety of habitats that it usually requires is absent. In addition, the only potential suitable habitat is the cattail marsh which has mineral soils as opposed to the organic soils that the spotted turtle prefers. Finally, this species is restricted geographically in Wellington County where it has been positively identified only from Luther Marsh.

Blanding's Turtle

The Blanding's turtle is considered absent because this is a conspicuous species that would not have been overlooked had it been present. The only suitable habitat is the cattail marsh and considerable time was spent at this habitat searching for turtles and other wildlife species.

Snake Species

The two snake species (Butler's gartersnake and eastern massasauga) are considered absent because detailed snake surveys failed to find them. In addition, the Butler's gartersnake is restricted in Wellington County to Luther Marsh and there are no recent records for the massasauga in the county.

Chimney Swift

The Chimney Swift is considered absent because natural habitat for it on site is highly marginal, there are no suitable chimneys, and it was not observed during the inventories. This is a conspicuous species that would not have been overlooked during the breeding bird work.

Other Bird Species

The three endangered bird species are absent because they are all species that require extensive grassland habitat (Barn Owl, Loggerhead Shrike, and Henslow's Sparrow). The only record of a Barn Owl from the county is a roadkill and there is no evidence that it has ever nested in the county. There are no recent records of the shrike from Wellington County and records of the Henslow's Sparrow in the county are restricted to extensive grasslands near Luther Marsh and Conestogo Lake. There is no suitable habitat for any of these species on site and the Loggerhead Shrike and Henslow's Sparrow would have been detected during the normal breeding bird surveys had they been present.

Grey Fox

The grey fox has not been recorded recently in Wellington County. Judge and Haviernick (2002) stated that the distribution of recent sightings suggests that there may be a breeding population only on Pelee Island and records from elsewhere in Ontario may represent dispersing individuals from the United States. Consequently, even sightings of this species on the mainland portion of Ontario are likely of vagrants. There was no evidence of this species on the site and the presence of a high population of coyotes and a den of that species makes it highly unlikely that this smaller canid could persist in the area.

Based upon the above discussion, it is concluded that all of the 16 additional endangered and threatened species that have been documented in Wellington County are absent within the study area.

4.5.7 Other Significant Species – Special Concern

The targeted survey for the Common Nighthawk confirmed that this species was absent in the study area. Two species designated special concern were documented on the property: the monarch and snapping turtle. Habitat for these two species may be designated significant wildlife habitat. These two species are discussed in more detail below.

Monarch

Low numbers of monarchs were seen on site during two surveys but it was not observed on another visit during the main flight period of this species. It was seen in a variety of habitats including the cattail marsh, coniferous plantations, white cedar coniferous forest, and cultural meadows. The first three habitats are atypical for this species, and it was simply observed flying through these areas.

The monarch is considered vulnerable because of several facets of its life history. It is a migratory species that spends the winter in a small area in Mexico. The wintering habitat is not fully protected, and many of its key migration stopover locations are unprotected. In addition to its migratory habits, it relies extensively on plants in the milkweed family in North America. Eggs are laid on milkweeds and the larvae feed and pupate on these plants. Given that plants of the milkweed family may be toxic to livestock, milkweeds are considered noxious weeds (Crolla and Lafontaine 1997). In Ontario, milkweed is designated as a noxious weed and landowners that do not eradicate it on their properties may be in contravention of the *Weeds Act*.

In Canada and Ontario, the only areas that are considered significant for monarch butterflies are those that support large concentrations of milkweeds. Adults are frequently observed in a wide variety of open habitats, as they are not dependent on milkweeds. They feed on the nectar of goldenrods and asters, and other wildflowers that are typically found in old-field habitats. Feeding areas for adults are not a limiting factor and are not considered significant (Crolla and Lafontaine 1997).

Both common milkweed and swamp milkweed occur on the subject lands, but these species are not abundant or widespread. There was no evidence of monarch caterpillars using milkweed plants.

The Ministry of Natural Resources has recently revised the S-rank of the monarch to S4B, S2N. This suggests that it is not particularly sensitive during the breeding season and is apparently secure. Areas where this species congregates during migration, however, are significant to the species.

It is concluded that the study area does not provide significant habitat for the monarch. It was observed in small numbers on an irregular basis, its host plants are not abundant on site, there was no evidence of caterpillars on site, and there were no concentrations of the species. Consequently, the monarch is not discussed further under significant wildlife habitat.

Snapping Turtle

The snapping turtle is designated as a species of special concern nationally and provincially. The snapping turtles observed during 1997 and 2011 wildlife inventories indicate that the on-site cattail marsh supports a small population of snapping turtles and this population has persisted for over 20 years. Consequently, the on-site cattail marsh should be considered significant wildlife habitat for this species of conservation concern. The primary habitat for this species is the marsh itself. This turtle also needs an area to lay its eggs, and it typically selects a sunny site with sandy to gravelly soils for nesting. The snapping turtle is a highly aquatic turtle that prefers not to travel very far from water to nest. On the subject property the most likely nesting areas are the roadside and gravelly areas along the shoreline of the marsh as well as areas previously exposed by aggregate extraction.

Other Special Concern Species Reported from Wellington County

Ten other special concern species have been documented in Wellington County including seven listed by MNR and three that have been observed by the study team or documented in the Ontario Breeding Bird Atlas (Cadman et al. 2007). They are listed in Table 6 and the potential for each of them to occur within the study area is discussed below.

Table 6 Other Special Concern Species Documented in Wellington County

COMMON NAME	SCIENTIFIC NAME
Tuberous Indian-Plantain	*Cacalia plantaginea*
Silver Shiner	*Notropis photogenis*
Eastern Ribbonsnake	*Thamnophis sauritus*
Eastern Milksnake	*Lampropeltis triangulum*
Bald Eagle	*Haliaeetus leucocephalus*
Black Tern	*Chlidonias niger*
Short-eared Owl	*Asio flammeus*
Red-headed Woodpecker	*Melanerpes erythrocephalus*
Golden-winged Warbler	*Vermivora chrysoptera*
Canada Warbler	*Cardellina canadensis*
Yellow-breasted Chat	*Icteria virens*

Tuberous Indian-Plantain

Tuberous Indian-plantain prefers open sunny areas in wet, calcareous meadows or shoreline fens. It prefers shoreline fens and meadows of Lake Huron and is largely restricted to the shoreline of the lake with few inland records (White, 2002). There is no suitable habitat for this species within the study area, and the site is well outside of its known range. In addition, this is a conspicuous species that would not have been overlooked had it been present.

Silver Shiner

The fisheries work indicated that fish were absent on site. The intermittent tributary is unsuitable habitat for the silver shiner which prefers large watercourses. In Wellington County, it is found in the Grand River through the Elora Gorge.

Eastern Ribbonsnake and Eastern Milksnake

The extensive snake surveying indicated that both the eastern ribbonsnake and eastern milksnake were not present on site. In addition to the snake board survey, the shoreline of the cattail marsh was searched for the ribbonsnake with negative results.

Bald Eagle

The Bald Eagle almost always nests near water, usually on large lakes and less frequently near small lakes or rivers (Peck and James 1983). In northwestern Ontario, lakes with less than 5 km of shoreline were not used unless they were within 1 km of a larger water body (Brownell and Oldham 1984). All reported Ontario nests have been in trees (Peck and James 1983). Trees with crotches large enough to support the huge nest above the canopy are essential. The nest tree must afford an unobstructed view and flight path in all directions (Brownell and Oldham 1984; Peterson 1986).

In winter, the Bald Eagle inhabits large, ice-free rivers. In Cambridge, Timmerman and Halyk (2001) identified wintering habitat as having shallow open water with abundant food, suitable perches within 30 m of the Grand River, tall perches surrounded by open areas or with unobstructed view in at least one direction, islands for perching and feeding in isolation, roosting areas providing protection from inclement weather, and areas isolated from human disturbance (a buffer of 300 m around key habitat features).

There is no suitable breeding, foraging, or wintering habitat for the Bald Eagle within the study area.

Black Tern

The Black Tern prefers to nest in large marshes that are dominated by cattails, but will also nest in other types of emergent wetland vegetation (Peck and James 1983). It has very specific habitat requirements, such as a 50:50 ratio of open water and emergents (hemi-marsh), emergent vegetation that is about 1 m tall by the time eggs hatch, water depths of 50 to 100 cm near the nest, and large wetlands that are a minimum of 20 ha in area (Austen et al. 1994; Dunn 1979; Dunn and Agro 1995; Gerson 1987; Shuford 1999).

Although the on-site marsh is potentially suitable habitat for the Black Tern, it is much too small to support this area-sensitive species. In addition, the Black Tern is a conspicuous species that would not have been overlooked had it been present.

Short-eared Owl

The Short-eared Owl avoids areas of extensive forest and nests in large open areas. These include tundra; large bogs and fens; grassy fields, including airports and abandoned farmland; and marshes (Peck and James 1983). Ontario breeding habitat includes cattail and sedge marshes and adjacent fields, pastures, old fields, heath bogs, and tundra (Cadman 1994). The Short-eared Owl is area-sensitive and is unlikely to inhabit patches much smaller than 100 ha (Cadman 1994).

There is no suitable habitat for the Short-eared Owl within the study area.

Red-headed Woodpecker

In Ontario, the Red-headed Woodpecker has been documented nesting in and at the edge of deciduous and occasionally mixed woodlots; in dead trees flooded by beavers; in trees in fields, pastures, fencerows, and roadsides; in city parks, ravines, golf courses, and residential yards; and at the edges of ponds, rivers and riverine floodplains (Peck and James 1983). In the Kingston area, Weir (1989) reported that it inhabited open deciduous woodlots with scattered large trees.

Habitat for the Red-headed Woodpecker within the study area is marginal at best. It prefers open woodlands or savannahs and the existing habitat is predominantly plantations and closed deciduous and mixed forests. The call of this species is loud and distinctive such that the species would have been easily detected had it been present.

Golden-winged Warbler

The Golden-winged Warbler is a habitat specialist, and this specialization is one of the primary reasons for its decline. It breeds in early successional areas and is therefore often displaced when natural succession proceeds.

In Ontario, the Golden-winged Warbler has nested in fields of tall grasses and weeds overgrown with rose bushes and raspberries, shrubs, and small trees; in or at the edges of open coniferous plantations; in overgrown clearings and edges of deciduous and mixed woods; near roadsides and hedgerows; and at the edges of wet areas of alder growth and in an alder-willow-dogwood thicket swamp. Most nests were found in dry habitats, but 9% were in wet habitats (Peck and

James 1987). It also nests on hydro corridors (pers. obs.). Nesting habitat also includes bogs on the Canadian Shield (Godfrey 1986).

Confer (1992) stated that the Golden-winged Warbler appears to initially thrive with the appearance of shrubby, early succession fields that follow logging, fire, or abandoned farmlands. Local declines subsequently occur with advancing succession and reforestation.

Although the general type of habitat that is used is very broad and common, and despite using a wide variety of vegetation communities for nesting, the habitat within Golden-winged Warbler territories have a consistent pattern. They include patches of herbs, shrubs, and scattered trees, plus a forested edge (Confer 1992). It appears to be specialized for such a pattern of vegetation and may breed in shrubby fields as well as in marshes and bogs with a forest edge. In Ontario, Wisconsin, and Michigan, territories often include the edge of tamarack bogs. In New York and many other areas (including Ontario), the majority of territories are in shrubby fields produced by secondary succession following farmland abandonment. It may also nest in wetlands dominated by alders, in young pine and spruce conifers (that typically still have a grass-forb understorey [pers. obs.]), in marshes with a forested edge, in power line rights-of-way, and in second-growth forests shortly after clear-cutting provided the regeneration of saplings is not thick (Confer 1992).

Of about 75 Golden-winged Warbler territories in New York, a portion of the boundary of every territory was along the edge of a shrubby field with some taller trees. Territorial boundaries extended 5 to 30 m from an open area into a forest. The minimal tree cover along an edge that was used was an old fence line with a dense row of trees and shrubs, some of which were 10 to 15 m tall (Confer 1992).

Habitat for the Golden-winged Warbler is generally unsuitable on the subject lands. The appropriate mix of tall deciduous trees and patches of meadow and shrubs is basically lacking on the site. In addition, this species would have been detected during the normal breeding bird surveys had it been present.

Canada Warbler

The Canada Warbler appears to be area sensitive in Ontario, requiring about 30 ha of forest in the southern portion of the province (OMNR 2000). Its distribution according to the Ontario Breeding Bird Atlas supports this contention. The Canada Warbler often breeds in cedar swamps, but also in upland and lowland mixed, deciduous, and coniferous forests (Conway 1999; Peck and James 1987). It prefers areas where there is dense shrubbery in the understorey and may be most abundant in areas that were heavily logged 5 to 15 years previously (Webb et al. 1977).

Habitat within the study area is generally unsuitable for the Canada Warbler. The best potential suitable habitat is the white cedar forest along the intermittent creek. This, however, is very small and narrow and does not have the dense shrubby growth that is required by the Canada Warbler. In addition, this species would have been easily detected during the breeding bird surveys had it been present.

Yellow-breasted Chat

The Yellow-breasted Chat requires early successional habitats, which may include dense, low deciduous or coniferous vegetation (Eckerle and Thompson 2001). A wide variety of habitats is used, including early shrubby re-growth on abandoned agricultural fields, utility corridors, clear-cuts, fencerows, forest edges and openings, and areas near water bodies, such as streams, ponds, and swamps (Eckerle and Thompson 2001). In Ontario, it uses regenerating old fields,

forest edges, railway and hydro rights-of-way, young coniferous plantations, and, occasionally, wet willow-ash-elm thickets bordering wetlands. Tangles of grape and raspberry are a feature of most breeding sites (Eagles 2007). It occupies young shrublands, where woody cover becomes dominant but there are still patches of herbaceous vegetation (Cadman et al. 2010).

Habitat for the Yellow-breasted Chat is marginal at best within the study area. There is limited early successional habitat on site and those that are present do not support dense enough shrub cover to be attractive to this species. The song of this species is loud and would not have gone undetected if the species were present. In addition, all records from Wellington County are historical. It is concluded that the Yellow-breasted Chat is absent from the study area.

Conclusions

It is concluded that the ten additional special concern species that occur or have occurred in Wellington County are not present within the site. Habitat is either non-existent or marginal for all of them. The typical plant inventories and breeding bird inventories would have detected the significant plant and bird species had they been present. Detailed fish sampling and snake surveys revealed that the significant species in these groups were absent.

5.0 Analysis of Natural Heritage Features

5.1 Provincial Policy Statement

The seven natural heritage features to be considered under the ARA are the same as those listed in Policy 2.1 of the 2005 Provincial Policy Statement (PPS) as given in Section 1.3 of this report. Development is not permitted within significant habitat of endangered and threatened species, significant wetlands or significant coastal wetlands. Development and site alteration is not permitted on lands adjacent to such features, or within or adjacent to significant woodlands, significant valleylands, significant wildlife habitat, and significant areas of natural and scientific interest (ANSIs), unless it has been demonstrated that there will be no negative impacts on the natural heritage features or their ecological functions. Guidance to demonstrate compliance with such policies is taken from the Natural Heritage Reference Manual (OMNR, 2010). Development and site alteration is not permitted within fish habitat, except in accordance with provincial and federal requirements, as outlined in the Policy for the Management of Fish Habitat (DFO, 1986).

With regard to the subject property, these natural features are discussed as follows.

5.1.1 Significant Wetlands

The James Dick property includes an isolated wetland which is part of the provincially significant Eramosa-Blue Springs Creek Wetland Complex. Other wetlands which are also part of this PSW occur on adjacent lands. This large riverine wetland complex mostly consists of swamp communities (i.e. 95% of its area) although some marsh vegetation is also scattered throughout the area. The wetland's major ecological functions include; the provision of spawning and rearing habitat for brook trout and brown trout, winter cover for wildlife (i.e. particularly deer), nesting and feeding areas for colonial water birds, habitat for furbearers, bull frogs and snapping turtles, and the provision of flood attenuation and water quality improvement.

GWS fieldwork confirmed the presence of a small meadow marsh community (MAM3-2) that is situated along the intermittent stream which bisects the subject property. This palustrine wetland was not previously mapped by the MNR or the GRCA. Although this wetland could possibly be considered part of the PSW because of its proximity to other wetlands, it is only 0.4 ha in size and features less than 2 ha are generally not included as part of a wetland complex according to the 3rd Edition of the Ontario Wetland Evaluation System unless they possess special features or perform significant functions. This small, kettle depression does not support any significant flora or fauna, or perform any significant ecological functions. Furthermore, it is dominated by the exotic, invasive strain of reed canary grass (Phalaris arundinacea) that is typically found in agricultural areas and also has an abundance of highly invasive common buckthorn shrubs around its margins.

A small unevaluated wetland is also shown on the GRCA website in the western portion of the James Dick property. This feature has, however, been mistakenly identified since this area is actually an understocked portion of conifer plantation CUP3-12b.

Under the PPS, development is not permitted within significant wetlands but development may occur on adjacent lands provided it can be demonstrated that there will be no negative impacts on the features or ecological functions for which the area is designated. In this case, consideration must also be given to the potential for indirect impacts on the PSW through the alteration of surface water flows and groundwater levels.

5.1.2 Significant Habitat of Endangered and Threatened Species

Endangered and Threatened species are identified by OMNR using procedures established by the Committee on the Status of Species at Risk in Ontario (COSSARO) and by Environment Canada using procedures established by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC). As discussed in Section 4.5.6 the only endangered or threatened species identified on the NHIC database as a possible inhabitant of the study area is the Blanding's Turtle but no evidence of this turtle was found. Although there was no historical evidence of the provincially and federally threatened Least Bittern or Eastern Whip-poor-will nesting in the vicinity of the subject lands a considerable effort was made to determine their possible presence in potentially suitable on-site and off-site habitats. The results of fieldwork were, however, negative. Similarly, efforts to determine the possible presence of the provincially endangered Jefferson salamander in the study area also proved negative. The only threatened species recorded during fieldwork was the Bobolink which was only found in grassy hayfields north of the site. This grassland area will not be affected by proposed mineral aggregate extraction and there is no suitable habitat for this species on the subject lands. Consequently, the proposed development will not have any impact on the significant habitat of endangered and threatened species.

5.1.3 Fish Habitat

Fish habitat is defined as the spawning ground and nursery, rearing, food supply and migration areas on which fish depend directly or indirectly in order to carry out their life processes (OMNR, 2010). As discussed in Section 4.3, fish have never been observed in the intermittent stream or the marsh located along the 6th Line. These waterbodies do not meet the definition of fish habitat as described by the Fisheries Act and the PPS.

5.1.4 Significant Woodlands

Woodland covers 33.5 ha of the James Dick property or 88% of the site. The County of Wellington Official Plan states in Section 5.5.4 that "Woodlands over 10 ha in area are considered to be significant by the County and are included in the Greenlands System" Although the PSW and the watercourse on the subject lands have been identified as Core Greenlands the woodlands have not been mapped as part of the Greenland System, presumably because the balance of the site has been designated as a Mineral Aggregate Area. Furthermore, 26.3 ha of this woodland area (i.e. 79%) consists of artificially established conifer plantation. Even if the on-site woodlands were identified as Greenland, Section 5.6.1 recognizes that mineral aggregate extraction is a permitted use in the Greenland System provided "there are no negative impacts on provincially significant features and functions". The 2005 PPS defines "Significant" in regard to woodlands as "an area which is ecologically important in terms of features such as species composition, age of trees and stand history, functionally important due to its contribution to the broader landscape because of its location, size or due to the amount of forest cover in the planning area; or economically important due to site quality, species composition or past management history."

Although the County's OP indicates that woodlands over 10 ha are considered significant, mineral aggregate operations nonetheless can be considered in these woodlands subject to the policies of this Plan and with regard to the definition of significance. General guidelines for determining the significance of woodlands are also provided in the Natural Heritage Reference Manual (NHRM) for Natural Heritage Policies of the Provincial Policy Statement, 2005 (OMNR, 2010). Criteria suggested by this manual for designating significant woodlands include woodland size, ecological functions (woodland interior habitat, proximity to other woodlands and other habitats, linkages, water protection, woodland diversity) uncommon characteristics and finally economic and social

functional values. With the aid of these criteria and other relevant considerations the significance of woodland communities on the subject property is assessed in Section 7.2 in relation to the proposed mining operation.

5.1.5 Significant Valleylands

Recommended criteria for designating significant valleylands include prominence as a distinctive landform, degree of naturalness, importance of its ecological functions, restoration potential and historical and cultural values. Given these criteria, there are no significant valleylands on the subject property or within 120m of it.

5.1.6 Significant Wildlife Habitat

The Significant Wildlife Habitat Technical Guide (OMNR, 2000) may be used to help decide what areas and features should be considered significant wildlife habitat. There are four general types of significant habitat: seasonal concentration areas, wildlife movement corridors, rare or specialized habitat and habitat for species of conservation concern. Each of these habitat types is discussed below.

Seasonal Concentration Areas

Seasonal concentration areas are those sites where large numbers of species gather together at a particular time of the year, or where several species congregate. On these occasions they are most vulnerable to human disturbance, predation or unfavourable weather conditions. Seasonal concentration areas tend to be localized and relatively small in size compared to the area of habitat used during other times of the year. Some potential types of seasonal concentration areas include winter deer yards, colonial bird nesting sites, waterfowl stopover and staging areas, raptor winter feeding and roosting areas, bat and reptile hibernacula. Only the best examples of the concentration areas are usually designated as significant wildlife habitat. Areas that support a species at risk, or a relatively large population of a species, are examples of seasonal concentration areas which should be designated as significant.

Field investigations and background research indicate that significant seasonal concentration areas are not found on the subject property. Although some deer overwinter on the site and adjacent lands to the north the size of the herd is relatively small and hence MNR has not identified this area as a significant deer yarding area.

Wildlife Movement Corridors

Migration corridors are areas that are traditionally used by wildlife in moving from one habitat to another. These movements are usually in response to different seasonal habitat requirements. Some examples are habitats used by deer when moving to wintering grounds and areas used by amphibians migrating to and from breeding habitat.

Given the distribution of natural features in the study area, no significant migration corridors were identified on the subject property.

Rare Vegetation Communities or Specialized Wildlife Habitats

Rare habitats are those with vegetation communities that are considered rare in the province. Generally, community types with SRANKS of S1 and S3 (extremely rare to rare-uncommon in

Ontario), as defined by the NHIC could qualify. It is assumed that these habitats are at risk and that they are also likely to support additional wildlife species that are considered significant.

No rare vegetation communities occur on, or within 120m of the subject property.

Specialized habitats are microhabitats that are critical to some wildlife species. Potential examples of specialized habitats include habitat for area sensitive species, old growth or mature forest stands, woodland breeding ponds for amphibians, turtle nesting habitat, salt licks for deer, cliffs, seeps and springs.

Three types of specialized habitats were identified as potentially occurring within the study area: area sensitive species habitat, mature forest stands and amphibian woodland breeding ponds. Each of these habitats is discussed as follows.

Area-sensitive Species Habitat

Five area-sensitive species of birds were recorded in woodland habitats within the study area: Ruffed Grouse, Hairy Woodpecker, Pileated Woodpecker, Veery, and Scarlet Tanager. These birds require from 10 to 50 ha of woodland for breeding purposes. All of these species are considered secure or apparently secure in Ontario. The Veery was only heard off-site in the coniferous swamp, the scarlet Tanager occurred only in the deciduous forest around the Mudge property wetland while the other three bird species were all observed on-site in the coniferous plantation. All of these birds would also inhabit the large woodland area to the north of the site, as well as the extensive woodland area along Blue Springs Creek. Consequently, the subject property would not qualify as significant wildlife habitat for area-sensitive species.

Mature Forest Stands

Three small mature stands (e.g. FOC2-2, FOM2-2 and FOD5-7) occur nearby the intermittent stream in the southeast portion of the site. These stands are all less than 2 ha (5 acres) in size and they generally exhibit an uneven-aged structure. Dominant deciduous trees have wide spreading crowns and are relatively short in height which indicates they were grown in the open. These characteristics reflect the former agricultural use of the property. Dominant deciduous and coniferous trees are, nonetheless, over 100 years old and this represent mature to overmature timber. However, these stands do not display the characteristics of bona fide old growth since they lack large accumulations of downed woody debris, pit and mound topography and a rich assemblage of native groundflora.

Amphibian Woodland Breeding Ponds

As discussed in Section 4.5.2, there was no evidence of any salamander utilization of the on-site ponds, or the ponds found on adjacent lands. However, call count surveys determined that all ponds supported a good diversity of common frogs and toads, except for the in-stream pond (Station A1). An abundance of spring peepers and wood frogs were recorded (i.e. full choruses), particularly at the on-site cattail marsh (station A2) and the off-site thicket swamp (station A4). Given the size and diversity of these frog populations the on-site cattail marsh and the two ponds found on adjacent lands are considered to represent significant wildlife habitat.

Species of Conservation Concern

The most significant criterion for the determination of significant wildlife habitat is evidence of species of conservation concern. This includes species that are rare, substantially declining or

have a high percentage of their global population in Ontario but are rare or uncommon in a planning area. Habitat for these species is exclusive of those habitats relevant to Endangered and Threatened Species covered under a separate component of the Natural Heritage Policy of the PPS.

Rare species are considered at five levels: globally rare, nationally rare, provincially rare, regionally rare (at the site region level) and locally rare in a municipality or Site District. This is also the order or priority that should be assigned to the importance of maintaining species. Some species have also been identified as being susceptible to certain land use practices, and their presence may result in an area being designated significant wildlife habitat. Examples include species vulnerable to forest management or human disturbance. Species that are demonstrating a significant decline over an extended period of time may also be considered significant wildlife.

Field surveys revealed the presence of two species that occurred on the subject property and have been designated special concern: the monarch butterfly and snapping turtle. As discussed in Section 4.5.7, the monarch was only irregularly observed in small numbers and its host plant, milkweed, is not abundant on the site. It was therefore concluded that the study area does not provide significant habitat for the monarch. However, the on-site cattail marsh supports a small population of snapping turtles and this area should be considered significant wildlife habitat for this species of conservation concern.

5.1.7 Significant Areas of Natural and Scientific Interest

No provincially significant ANSIs have been designated on the subject property or adjacent lands.

6.0 Description of the Proposed Development

Stovel and Associates Inc. (Stovel) has prepared the Aggregate Resources Act Site Plans for the proposed Eramosa Quarry. The Site Plan and license will control the aggregate extraction process, as well as the rehabilitation of the pit once extraction is completed. The proposed licensed area is approximately 38.08 ha (94.1 acres) with a proposed extraction area of 25.99 ha (64.2 acres).

Extraction will occur above and below the water table in the areas shown on the Site Plans (see Figure 10 enclosed). The site will be operated in three phases, consisting of two lifts as shown on the Operations Plan. The first lift will involve the extraction of the unconsolidated sand and gravel which is situated above the water table. The second lift will involve the extraction of consolidated material (i.e. limestone bedrock) above and below the water table. Due to the variability in stone and sand gradations, and with fluctuations in market demand for various aggregate products, extraction may occur simultaneously at different portions of the site, unless otherwise specified in the technical reports (i.e. noise, dust, hydrogeology etc.) Access to the site will be off the 6th Concession Road and a looped internal road will be constructed with a crossing over the intermittent stream as shown on the Operations Plan. The internal road will be paved from the entrance to the scale house. Processing plants (i.e. crushing, screening and washing plants) will be established at the site.

The areas to be extracted are entirely forested, predominantly with immature conifer plantation. These areas are to be rehabilitated to an ecological after-use mostly comprised of lake and cliff habitats as shown on the Rehabilitation Plan presented in Figure 11 (enclosed). Quarry sideslopes will generally be too steep (i.e. greater than 2:1 slope) to facilitate reforestation, except on the upper slope where overburden may be graded to a 3:1 slope and topsoil may be applied. Approximately 7.18 ha of sideslope will be planted with a mixture of native trees and shrubs.

Based on the proposed extraction limits and setbacks shown on the Site Plans, the total estimated reserves are approximately 22,492,000 tonnes, including, 4,207,000 tonnes of sand and gravel plus 18,285, 000 tonnes of limestone. Of the total tonnage, approximately 80% occurs above the water table with the remaining 20% below water table. The proposed annual tonnage limit for this license is 700,000 tonnes.

7.0 Potential Impacts and Mitigation

The analysis of the seven natural heritage features to be considered under the PPS identified the following significant natural heritage features on, or adjacent to, the area to be licensed.

- Provincially Significant Wetlands
- Significant Woodlands
- Significant Wildlife Habitat

In addition, the County has identified the intermittent stream that flows through the property as a Core Greenlands feature. Although this stream does not provide fish habitat it nonetheless warrants protection since it provides seasonal flow to a tributary of Blue Springs Creek which supports populations of brook and brown trout. Some small, previously unevaluated wetlands which occur nearby the stream and on-site PSW also warrant consideration for protection. The potential impact of proposed quarry development on these features is discussed in the following sections along with appropriate mitigation recommendations where required.

7.1 Provincially Significant Wetland Complex

As shown in Figure 10 (Appendix A) the proposed extraction will not have any direct effect on the on-site PSW (MAS2-1) which will be protected by a 30m buffer. This buffer width closely approximates the limit of the wetland's catchment area and ensures that existing tree and shrub cover established around it's margins is maintained. However, extraction below the water table has the potential to alter groundwater flow and cause an indirect impact. This potential impact is discussed in detail in the Hydrogeological Investigation prepared by Harden Environmental Services Ltd. (2012). Their analysis determined that the wetland contributes water to the shallow groundwater flow system in the overburden south of the wetland and some of this groundwater flows downward through a silt layer into the bedrock aquifer. They conclude that the proposed bedrock extraction will increase the potential for water to flow from the shallow groundwater system into the bedrock due to an increase in the downward hydraulic gradient caused by a lowering of the hydraulic potential in the bedrock. The construction of a hydraulic barrier in the overburden is therefore recommended in order to decrease the shallow groundwater flow to the south and thereby offset the downward loss of water. Pre and post extraction water balance calculations for the wetland demonstrated that during and after extraction the wetland's water balance will be maintained. As a result the key ecological functions of this wetland (i.e. frog and turtle breeding habitat and waterfowl feeding area) will also be protected and maintained.

With respect to the off-site PSWs located immediately north of the site on the Allen (i.e. SWC1-2) and Mudge (i.e. SWT3-7) properties, Harden Environmental determined that both wetlands are underlain by a silt till with relatively low permeability. The Allen wetland receives water from precipitation, run-off and diffuse groundwater discharge along its north edge while the Mudge wetland is a perched feature entirely dependent upon precipitation and run-off. Although bedrock extraction will extend the area of influence within the dolostone aquifer beneath the Allen and Mudge wetlands, neither wetland is dependent upon bedrock groundwater and hence mining will not lower water levels in these wetlands.

The PSW located along Highway #7 (MAS2-1) will also not be affected by mining operations on the James Dick property. Water levels are predicted to rise along the southern edge of the quarry and hence this wetland should not experience any reduction in shallow groundwater inputs from the north.

7.1.1 Other Wetlands

As noted in Sections 4.4.1 and 5.1.1 of this report there are other wetland areas on the subject property that were not included in the provincially significant Eramosa River-Blue Springs Complex. These additional wetland features occur immediately adjacent to the intermittent stream (i.e. MAM3-2) and in the old wayside pit just north of the PSW (i.e. MAM2-5 and SWT2-2). The reed canary grass organic meadow marsh (MAM3-2) located adjacent to the stream will be entirely retained and is to be protected by a 20m buffer. Although this buffer does not extend to the limit of the wetland's catchment area it does extend sufficiently upslope so that it will continue to receive most of the run-off it naturally receives, as well as surface water from stream flooding and shallow groundwater exfiltrating through the streambanks and bottom. In any event, no significant change to the wetland's hydroperiod is anticipated. Furthermore, the wetland appears to be changing into a shrub thicket swamp and this process of secondary plant succession will continue unimpeded.

With regard to the small wetland units that have become established on the floor of the old wayside pit, approximately half of this area (i.e. 0.2 ha) will be removed to accommodate quarry development. These young, artificially created wetlands do not contain any rare plants or provide any significant ecological functions. The western portion of MAM2-5 will, however, be retained and this area should be enlarged slightly and deepened by 0.5 to 1.0m after the existing gravel stockpile has been removed and the hydraulic barrier installed. The greatest depths should be created along the southern edge of this wetland adjacent to FOM7-2 while the north shore should be sculptured so that it gently slopes into the cultural meadow. A sandy gravelly shoreline should be created along the sunny northern edge. In so doing, additional breeding habitat will be created for frogs and turtles.

7.2 Significant Woodlands

Local planning authorities are responsible for selecting appropriate evaluation criteria and designating significant woodlands. To date, the County has only based this determination on one criteria woodland size (i.e. woodlands 10 ha or larger are considered significant), probably because of resource limitations and the fact that certain woodland characteristics require a detailed site inspection for confirmation (e.g. tree species composition, plant diversity, forest stand age, structure and productivity, wildlife utilization etc.). The NHRM encourages planning authorities to undertake a comprehensive study to identify significant woodlands within their jurisdiction but recognizes that an initial comprehensive study cannot assess all woodland characteristics needed to determine significance. Consequently, this manual indicates that "woodlands may be identified as potential or candidate significant woodlands for the purposes of the PPS until appropriate detailed studies can be undertaken at a later planning stage (e.g. development application) to confirm their status (OMNR, 2010:66). It is suggested that this was the approach taken by Wellington County. The subject property contains conifer plantations which have been planted and managed as an interim land stewardship measure pending approval for aggregate extraction. The property has a long history of being designated in planning documents as a mineral resources site. The applicant has previously advised the County and the Township of their land stewardship efforts and interim use of the property. County Planning staff (Van Patter, 1998) acknowledged the concerns of the company with respect to the site's ongoing designation as a "Mineral Aggregate Area" that also included Greenland designations and provided the following explanation regarding the existing pine plantations.

> "Generally, less value would be placed on protecting a pine plantation than remnants of old growth forest. This is especially true if the plantation was specifically established to act as an interim use, until gravel extraction could take place."

As indicated in Section 5.1.4 the County has not identified the woodland on the James Dick property as part of the Greenland System presumably because of its designation as a Mineral Aggregate Area. If this woodland area had been identified as significant woodland (Greenland) mineral aggregate extraction could still be undertaken provided there are no negative impacts on provincially significant features and functions. To further test the status of the subject woodland and whether a loss of 21.07 ha of conifer plantation would have a negative impact on provincially significant features and functions the following analysis is undertaken using the evaluation criteria and standards for determining woodland significance that are recommended in the NHRM.

i. Woodland Size

Woodland size can be readily determined through air-photo interpretation without the need for field confirmation, except in the case of early successional communities. Since larger woodlands generally support more biodiversity and ecological functions than smaller woodlands, most planning authorities have typically used size to determine woodland significance in their jurisdictions. In determining significance the suggested size criteria changes depending on the amount of forest cover in the planning area. According to Riley and Mohr (1994) the amount of forest cover in Wellington County is 18.2% and the NHRM recommends that where forest cover is 15-30% woodlands 20ha in size or larger should be considered significant. However, it is also recommended that in the absence of more complete information, the size threshold should be reduced to include woodlands that otherwise would be missed. Presumably, this was the rational for the County adopting a minimum size threshold of 10 ha. In any event, the James Dick woodland greatly exceeds this size threshold and will still have over 10 ha of well connected woodlands if the quarry development is approved as proposed.

ii. Ecological Functions

Ecological functions can be addressed by considering woodland interior habitat, proximity to other woodlands, linkages, water protection and woodland diversity. The existing woodland area provides approximately 7.0 ha of interior habitat which exceeds the 2.0 ha threshold recommended in the NHRM when woodlands account for 15-30% of the land cover. This forest interior habitat will be lost if the quarry proceeds as proposed. However, as discussed in Section 5.1.6 only 3 area sensitive bird species which are common in southern Ontario (e.g. Ruffed Grouse, Hairy Woodpecker and Pileated Woodpecker) were recorded using the on-site woodlands and all of these birds would also inhabit the large woodland area to the north of the site as well as the extensive woodland area along Blue Springs Creek. Hence the loss of 21.07 ha of conifer plantation will not cause these birds to no longer utilize woodland habitat in the study area. Furthermore, the property does not qualify as significant habitat for area sensitive species.

The James Dick woodlands lie in close proximity to other woodlands and wetlands located to the north and west of the site. As such, they provide an important linkage to these natural features. These functions will not be significantly affected by the proposed loss of conifer plantation from part of the site.

The subject property is not considered important for water protection as it does not represent a sensitive recharge, discharge or headwater area. A watercourse flows through the site but it only flows seasonally and does not provide fish habitat.

All of the birds and mammals inhabiting the woodlands are considered secure in Ontario and they are generally characterized by common to abundant species.

A variety of vegetation communities are found on the site but they do not support any nationally, provincially or locally (i.e. in Wellington County) rare, threatened or endangered plant species. Furthermore, only 66% of the plants recorded on the site are native species and this reflects past disturbance from agricultural use, mineral aggregate extraction and subsequent reforestation with several non-native species. Plant diversity is particularly low in the dense conifer plantations which were established as monoculture blocks or mixtures of two species.

iii. Uncommon Characteristics

All of the woodland communities found on the site are commonly encountered in Ontario, as well as those established on adjacent lands. There are, however, three small naturally established forest stands (i.e. FOC2-2, FOM2-2 and FOD5-7) with many mature to overmature trees that are 100 to 150 years old. Based on the historical air photography (see figures 2, 3 and 4 in Appendix A) and the fact that mature hardwood trees (i.e. trees ≥ 50cm dbh) in these areas have short, wide spreading crowns, which is typical of open-grown trees, these treed areas were likely used for livestock grazing in the past. With the gradual abandonment of agricultural operations tree regeneration was allowed to develop and these communities evolved to their present condition. The mature deciduous and mixed forest stands will be entirely retained on the post-development landscape along with most of the mature cedar stand which lies within the 20 to 30m setback from the stream.

No rare, uncommon or restricted woodland plant species were found on site and none of the vascular plants in the upland woodland communities had high coefficient of conservatism values (i.e. 8-10).

iv. Economic and Social Functional Values

Aside from the recent thinning operation in the conifer plantation, there has been no commercial timber harvesting carried out on this property for over 100 years. Given the small size of the mature stands and the fair to poor quality timber that is presently available it is unlikely these stands could support a commercial harvest of hardwood and/or softwood sawlogs in the foreseeable future. With respect to the conifer plantations, based on current market conditions they will only provide low value boltwood/pulpwood for the next several decades and when mature (i.e. 50 to 70 years) they will only yield low to medium value sawlogs and log home timbers. As a result, the present and future economic value of this woodland is not considered significant.

The woodland has not been used for recreational or educational purposes and it has no identified cultural or historical value.

v. Summary of Woodland Significance

Based solely on the size criteria the woodland on the subject property could qualify as candidate significant woodland. However, the detailed, site specific analysis outlined above

clearly shows that only portions of the naturally established woodland have ecological characteristics and functions that warrant protection as shown in Figures 10 and 11. This residual woodland in conjunction with proposed reforestation will still be of sufficient size to justify incorporation into the Greenlands System if the County wishes to do so in the future.

7.3 Significant Wildlife Habitat

As determined in Section 5.16, the on-site and off-site PSWs (MAS2-1 and SWT3-7) were identified as significant wildlife habitat because their importance for amphibian breeding. In addition, the on-site cattail marsh supports a small population of snapping turtles, a species of conservation concern. This marsh will be effectively protected by a 30m buffer including the installation of a hydraulic barrier as discussed in Section 7.1.

Based on the findings of Harden Environmental, proposed quarry development should have no impact on the hydroperiod of off-site PSWs and hence no effect on amphibian breeding. There will also be no effect on snapping turtle aquatic or breeding habitat

7.4 Maintenance of Intermittent Stream

Harden Environmental (2012) determined that the intermittent stream does not receive groundwater discharge on the James Dick property and instead loses water where relatively permeable sediments occur in the stream channel. They conclude that the quarry will not change the hydrological function of the stream. To ensure there is no disruption to seasonal flow the stream will be protected by a 20m setback north of the meadow marsh (MAM3-2) where the valley slopes are gentle to moderate and a 30m setback to the south of this wetland where the slopes become steeper. In this way, a substantial ecological linkage is also maintained between the off-site woodlands located to the north and east of the site.

7.5 Sediment and Erosion Control, Dust Effects

Due to topographic conditions and the abundance of forest cover on this site, tree protection fencing must be erected at the limit of all required setbacks where ground elevations are equal to or lower than the elevations in the adjacent extraction area. This is particularly required nearby wetlands, in the stream valley and where noise berms are to be constructed. Standard paige wire farm fence or similar fence should be installed in the locations identified on the Operations Plan after tree clearing and grubbing has been completed. Silt screen must also be attached to the paige wire fence where required and have it's base covered with soil to ensure it can effectively trap sediment. However, where setbacks are only protecting residual conifer plantation along property boundaries paige wire fencing is not required but silt fence must be installed where required to protect trees from possible sedimentation damage caused by erosion from noise berms prior to the establishment of vegetation.

With respect to dust control, the notes on the ARA Site Plans (Stovel, 2012) are considered sufficient to ensure that residual woodland and adjacent woodlands are effectively protected from dust damage to their foliage.

7.6 Environmental Enhancement – Progressive and Final Rehabilitations Plan

The proposed extraction area is to be rehabilitated to an ecological after-use, mostly comprised of lake and cliff habitats as illustrated in Figure 11. Approximately 23.92 ha of open water lake will be created along with 316m of exposed cliff face (vertical face and talus slopes). Some sideslopes will,

however, be graded to a 2:1 to 3:1 slope and have topsoil applied so that they can be effectively seeded with a native hillside meadow mix and subsequently planted with native trees and shrubs. Deciduous and coniferous seedling stock will be used for reforestation purposes and the seedlings will be planted at a 2.4m (8 foot) spacing which equates to a planting density of 1,500 trees /ha (600 trees/acre). Assuming some mortality, this will ensure the reforested area will have at least 1,000 trees/ha (400 trees/acre) and qualifies for future protection under the County's Forest Conservation By-law. Approximately 7.18 ha of vegetated sideslopes will be established to provide a forested link between the proposed lake/shoreline wetland and existing woodlands and wetlands. Some of the shoreline will also be designed so that it has a sandy or gravelly substrate that will provide suitable nesting habitat for turtles.

A section of the internal haul road off the 6th Line will be maintained and a gently sloping sand and gravel shoreline will be created in the northwest corner of the quarry, nearby the PSW. In this area a 3:1 sideslope will be created and it will gradually blend into a gently sloping backshore. The foreshore will also be gently sloping to help facilitate the development of a wetland littoral zone. In this area the objective is to create shallow water and shallow marsh habitat, including aquatic submergent, floating and emergent vegetation zones. To help accelerate the natural process of plant succession small clumps and propagules of native aquatic species will be transplanted from local wetlands. The wetland shoreline will be graded to create an irregular edge with variable depths of water ranging from 0.1 to 2m extending 5 to 10m offshore. This approach increases the length of shoreline and the diversity of habitats that may be colonized by a wide range of wetland flora. Large tree trunks, stumps and boulders saved during forest clearing and gravel extraction phases of the development will be strategically placed along the wetland shoreline to further increase aquatic habitat diversity. Additional details on shoreline wetland creation are provided in Figure 12. Approximately 1.48 ha of shoreline wetland habitat will be created which will be attractive to turtles, frogs and waterfowl. The adjacent sideslope which leads to the PSW will be seeded with native grasses and wildflowers but should only be sporadically planted with clusters of native trees and shrubs to facilitate the movement of turtles and frogs from the PSW to the lake. It is anticipated that the lake will also provide suitable habitat for walleye and/or smallmouth bass.

In addition to the ecological rehabilitation work that is recommended within the proposed extraction area, the western portion of the sedge meadow marsh (MAM2-5) is recommended for enlargement and deepening as discussed in Section 7.1.1. This habitat improvement would further enhance conditions for turtle and frog utilization of the area.

8.0 Conclusions and Recommendations

This Level II Natural Environment Technical Report was conducted to determine the significance of natural features that occur in the study area and assess the potential impacts associated with proposed mineral aggregate extraction. Natural features found on the property and adjacent lands include provincially significant wetlands, significant woodlands and significant wildlife habitat. Based on the field investigations completed and subsequent analysis, the following conclusions have been reached.

- There will be no direct or indirect impacts to on-site or off-site PSWs and their significant wildlife habitat functions.

- The woodlands on the subject property have not been previously identified as significant and the analysis provided herein confirms that only a small portion of the existing woodland area has attributes that could potentially warrant this designation. Approximately 13.43 ha of naturally established forest and conifer plantation will be retained on the site and this residual woodland will be augmented by 7.18 ha of proposed reforestation on sideslopes yielding a future woodland area totalling 20.61 ha.

- There will be no effects on significant wildlife habitat which includes amphibian breeding areas and snapping turtle habitat. The progressive rehabilitation will enhance habitat for these species.

- Progressive site rehabilitation will, over time, increase biodiversity on the site through the creation of a lake, additional marsh and meadow habitat, cliff habitat and forested sideslopes. Existing ecological linkages to adjacent natural features will be maintained.

These conclusions are based on implementation of the following recommended environmental protection and mitigation measures.

- A 30m buffer will be established from the limit of the PSW provided the identified Archaeological Feature is cleared. If this is not the case the hydraulic barrier will be installed approximately 20m from the PSW in this area in order to maintain buffer requirements around the Archaeological feature. This is shown in Figure 4-2 of the Hydrogeological Investigation prepared by Harden Environmental Services. A 20 to 30m buffer will be established from the banks of the intermittent stream and the edge of the locally significant wetland (MAM3-2) as shown on the Site Plans prepared by Stovel. Wetland boundaries will be flagged by GWS staff and subsequently confirmed by GRCA staff prior to staking setback limits.

- In the southeastern portion of the site GWS staff will flag and/or stake the dripline of trees which mark the boundary of FOM2-2 and will also assist the surveyor in staking the setback required from the existing off-site residence (i.e. minimum of 165m) which traverses portions of woodland units CUP3-12a, FOC2-2, FOD5-7 and CUP3-12d. Elsewhere on the property the surveyor must stake the required setbacks from property boundaries.

- Prior to the initiation of tree clearing operations trees which occur immediately beyond the specified setbacks will be marked with orange spray paint by GWS staff to further ensure there are no intrusions into tree protection areas. Trees to be removed will be marked with an orange dot at chest height and a slash of the butt which extends to the ground.

- Tree protection fencing will be installed around the limit of the extraction area after all tree clearing and grubbing is completed as discussed in Section 7.5 and shown on the Operations

Plan. All protective fencing will be monitored during operations and maintained in a functional condition.

- To facilitate access to the eastern extraction area an appropriately sized culvert must be installed in the intermittent stream at the location shown in the Operations Plan. Culvert installation should occur in the summer months when there is no flow in the stream.

- Topsoil and overburden will be stripped and stored separately in bermed stockpiles as illustrated on the Operations Plan. All berms will be graded to stable slopes and seeded with a native uplands meadow mix to prevent erosion and minimize dust.

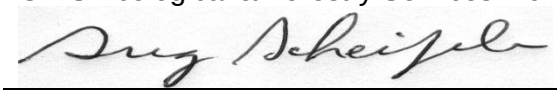
- Dust control will be implemented in accordance with the procedures described on the Operations Plan.

- Progressive rehabilitation will be implemented as specified in the Site Plans and replanting will commence as early as possible with an emphasis on the area adjacent to the PSW and northern property line (i.e. Stage 1 Phase 1 on the Operations Plan).

- All tree and shrub planting stock will be obtained from nurseries that utilize seed from the same genetic seed zone wherein the James Dick property is located.

- Shoreline wetlands will only be planted with native species taken from local wetlands.

GWS Ecological & Forestry Services Inc.



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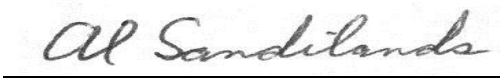

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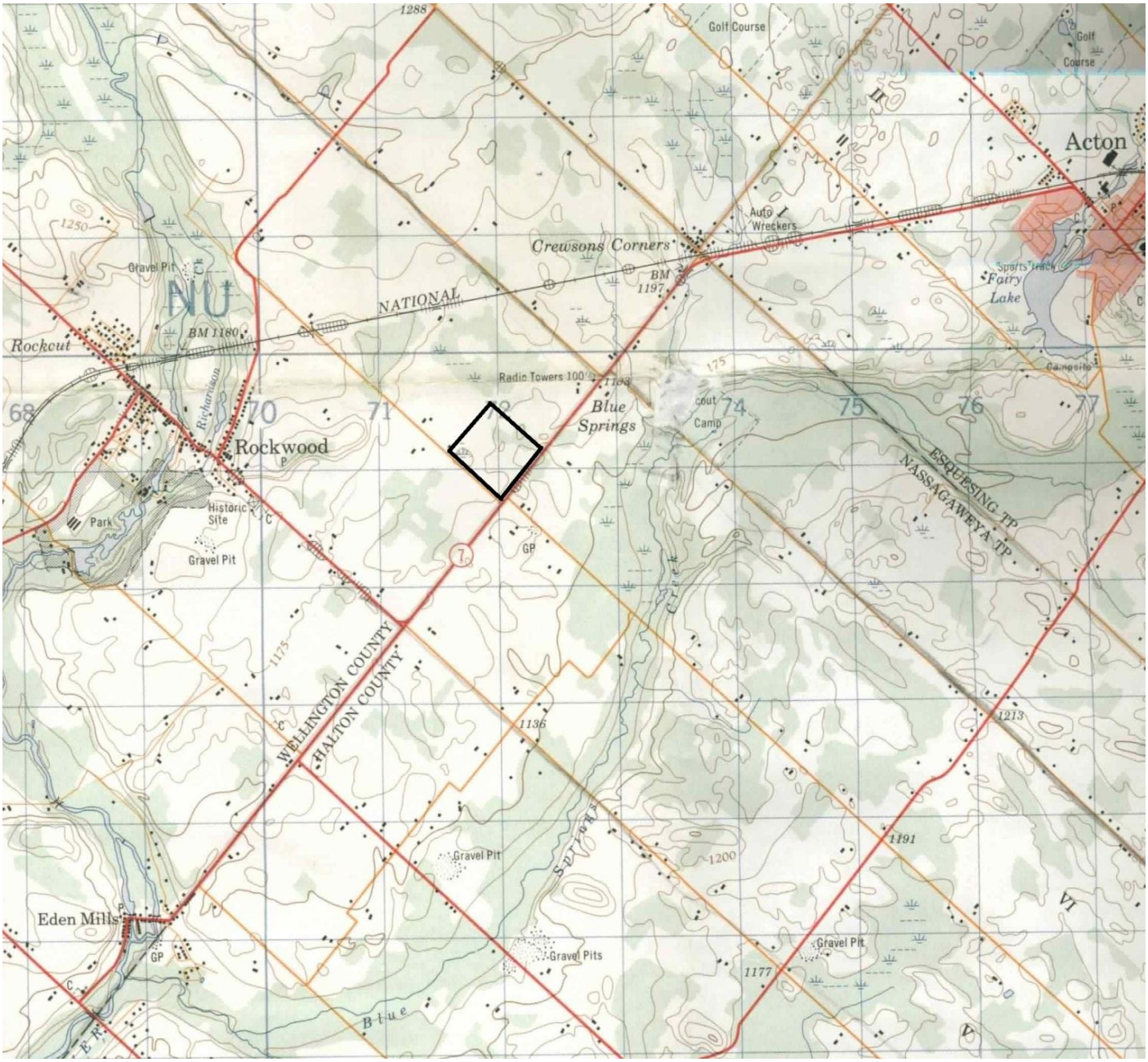
APPENDIX A

FIGURES

Figure 1 – Property Location and Surrounding Area



Legend

Proposed Eramosa Quarry

Source: Department of Energy, Mines and Resources. 1973. Guelph, Map # 40P/9.

Date: December, 2011	Drawn By: AB
Scale: 1:50,000	Project No.: 3028

Figure 2 – April 1930 Air Photograph

Legend

Proposed Eramosa Quarry

Date: December, 2011	Drawn By: AB
Scale: ≈ 1:20,000	Project No.: 3028

Figure 3 – April 1964 Air Photograph

Legend

Proposed Eramosa Quarry

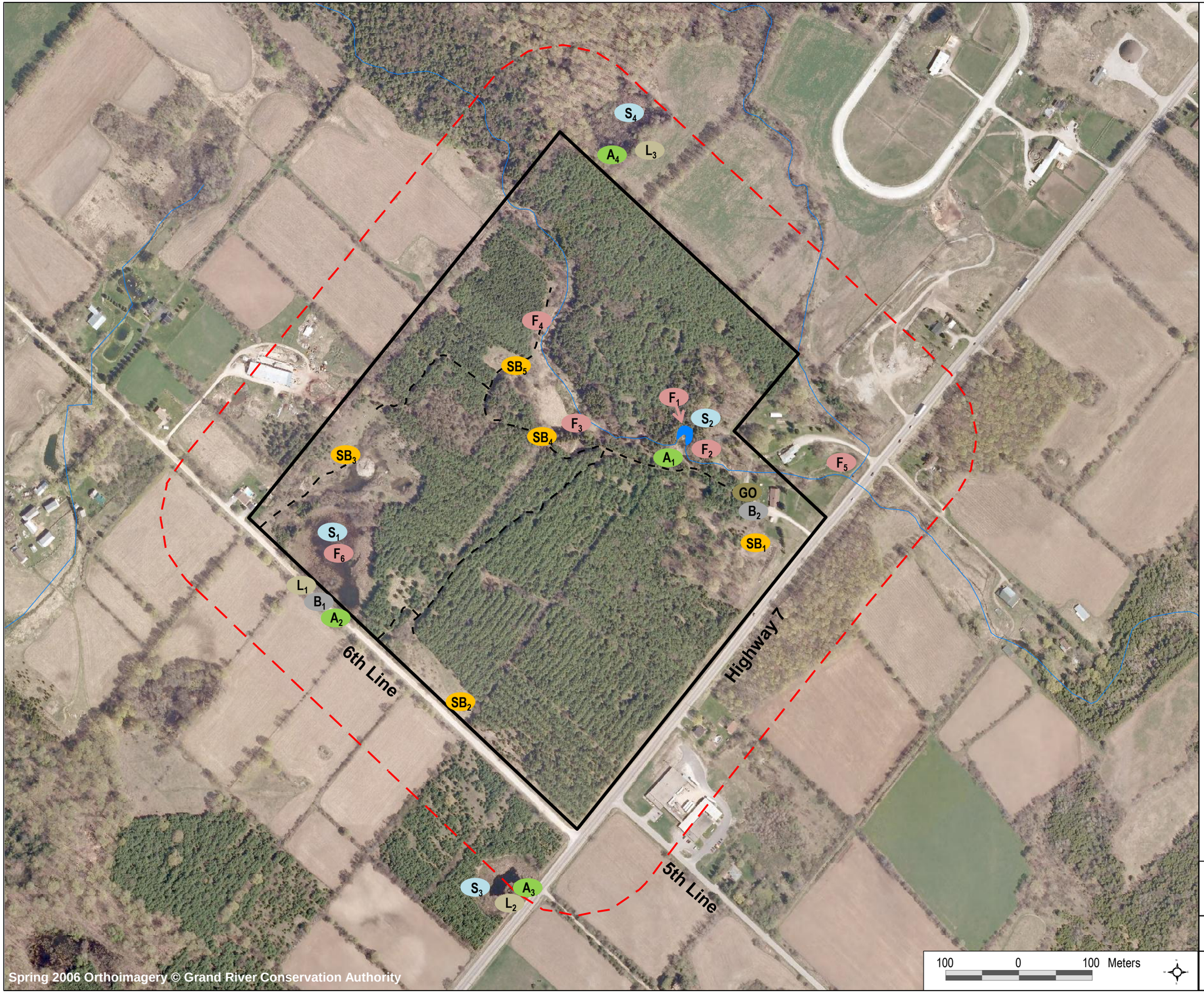
Date: December, 2011	Drawn By: AB
Scale: ≈ 1:27,000	Project No.: 3028

Figure 4 – June 1972 Air Photograph

Legend

Proposed Eramosa Quarry

Date: December, 2011	Drawn By: AB
Scale: ≈ 1:27,000	Project No.: 3028



Legend

- Subject Property
- Study Area (120m Investigation Zone)
- Watercourse
- Trail
- On-line Pond

Field Survey Locations

- A_1 Amphibian Call Monitoring Stations
- B_1 Bat Survey Stations
- F_1 Fish/Aquatic Habitat Assessment Sites
- GO Goatsucker and Owl Survey Station
- L_1 Least Bittern and Marsh Bird Survey Locations
- S_1 Salamander Trapping and Egg Mass Survey Locations
- SB_1 Snake Cover Board Survey Stations

100 0 100 Meters

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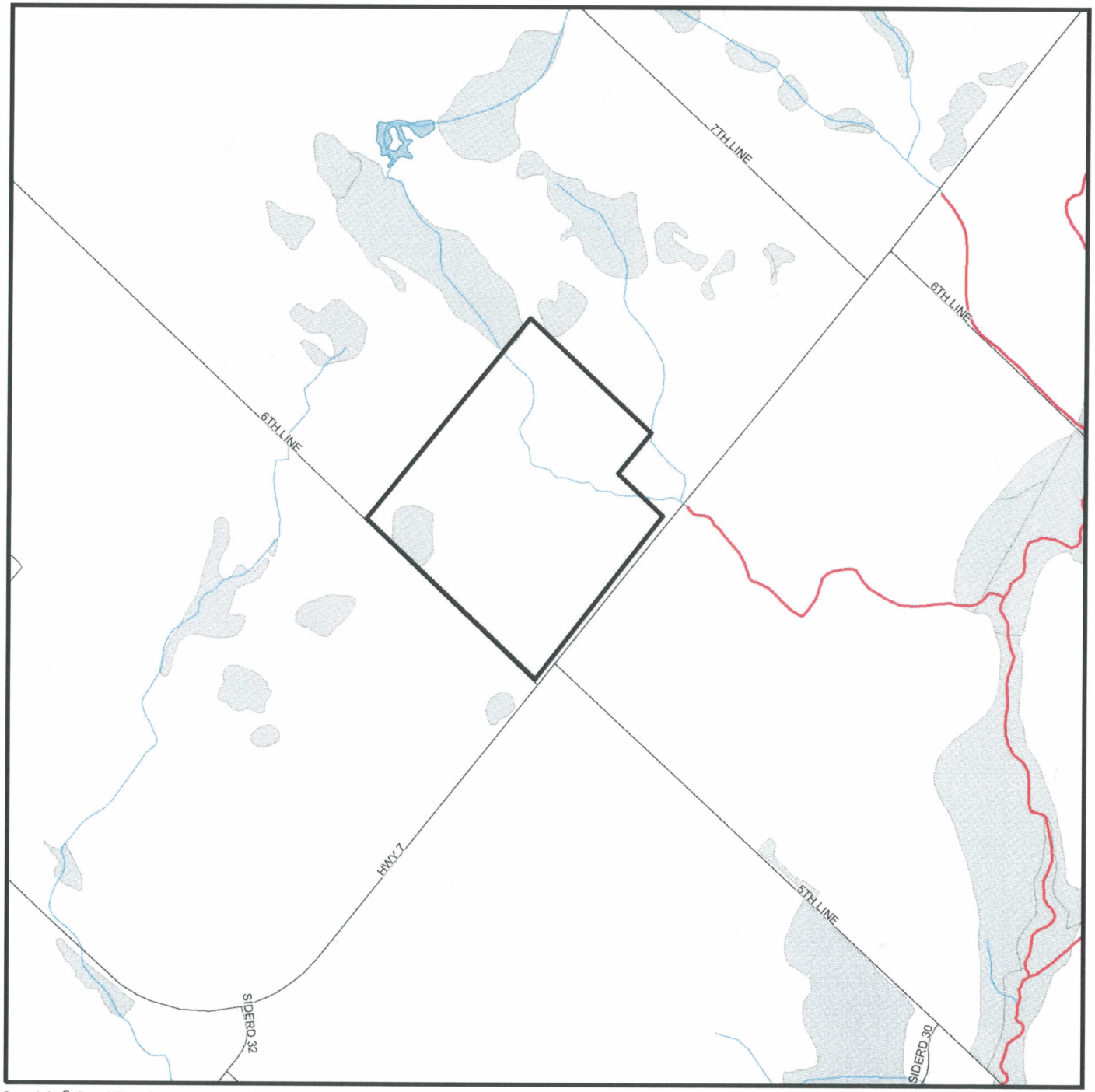
Figure No.

5

Title

STUDY AREA AND FIELD SURVEY LOCATIONS



Grand River Conservation Authority

Map created: January 24, 2012

Figure 6 – Watercourses and Provincially Significant Wetlands

Legend

	Subject Property
	Roads Addressed (MNR)
	Provincially Significant Wetland (NRVIS)
	Cold Water Stream (NRVIS)
	Drainage Network (GRCA)
	Drainage Poly (NRVIS)

GRCA Disclaimer

This map is for illustrative purposes only. Information contained hereon is not a substitute for professional review or a site survey and is subject to change without notice. The Grand River Conservation Authority takes no responsibility for, nor guarantees, the accuracy of the information contained on this map. Any interpretations or conclusions drawn from this map are the sole responsibility of the user.

The source for each data layer is shown in parentheses in the map legend. For a complete listing of sources and citations go to:

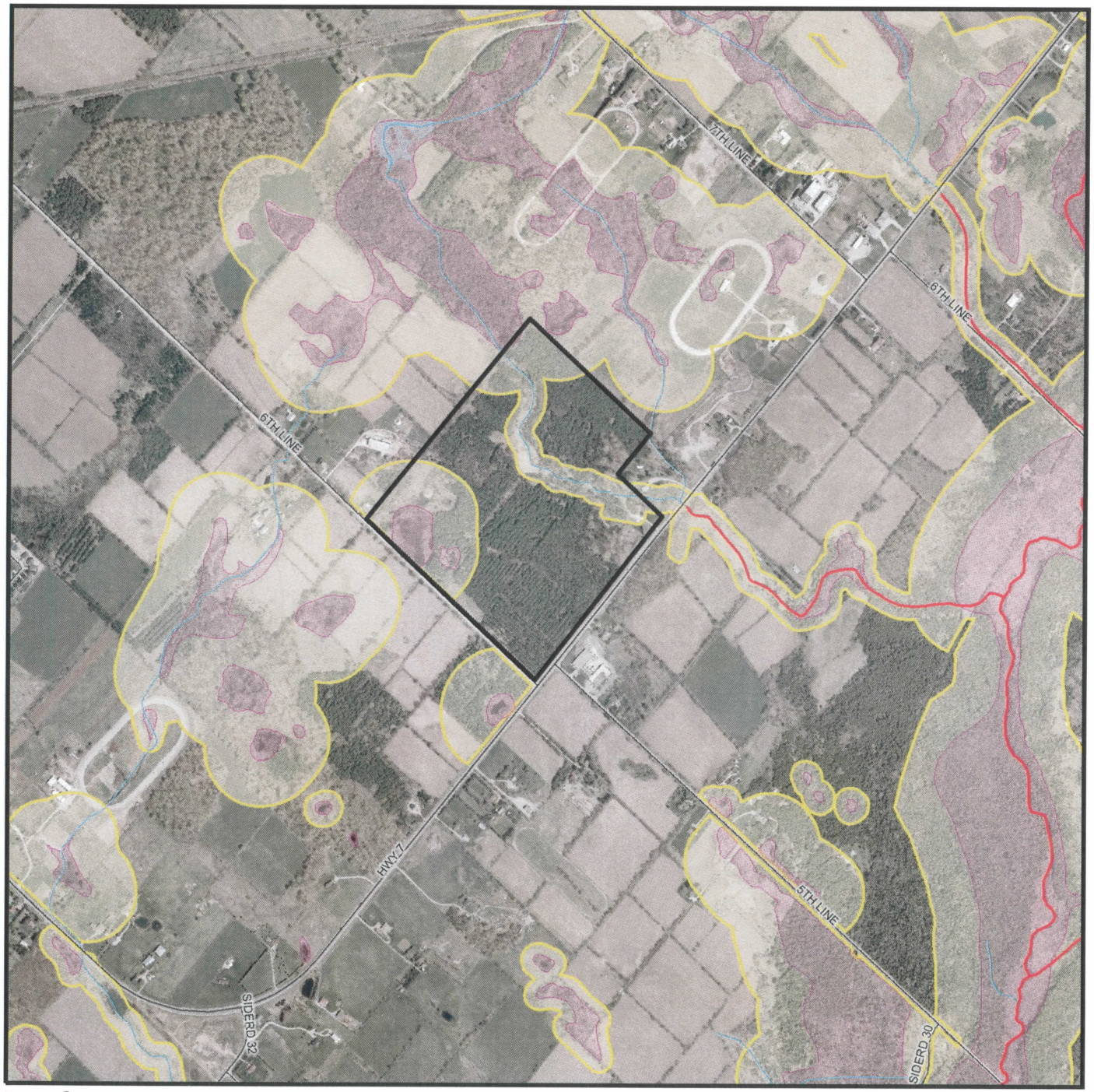
http://grims.grandriver.ca/docs/SourcesCitations2.htm

0 175 350 525 700 m.

NAD 1983, UTM Zone 17 Scale 1:15,000

N

THIS MAP IS NOT TO BE USED FOR NAVIGATION



Grand River Conservation Authority
Map created: January 24, 2012

Figure 7 – GRCA Wetlands and Scheduled Areas

Legend

	Subject Property
	Roads Addressed (MNR)
	Wetlands (GRCA)
	Cold Water Stream (NRVIS)
	Drainage Network (GRCA)
	Drainage Poly (NRVIS)
	Regulated Lands (GRCA)

GRCA Disclaimer

This map is for illustrative purposes only. Information contained hereon is not a substitute for professional review or a site survey and is subject to change without notice. The Grand River Conservation Authority takes no responsibility for, nor guarantees, the accuracy of the information contained on this map. Any interpretations or conclusions drawn from this map are the sole responsibility of the user.

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0 175 350 525 700 m.

NAD 1983, UTM Zone 17 Scale 1:15,000

N

THIS MAP IS NOT TO BE USED FOR NAVIGATION

Legend

- Subject Property
- Study Area (120m Investigation Zone)
- Watercourse
- 1 metre Contour Interval
- Trail

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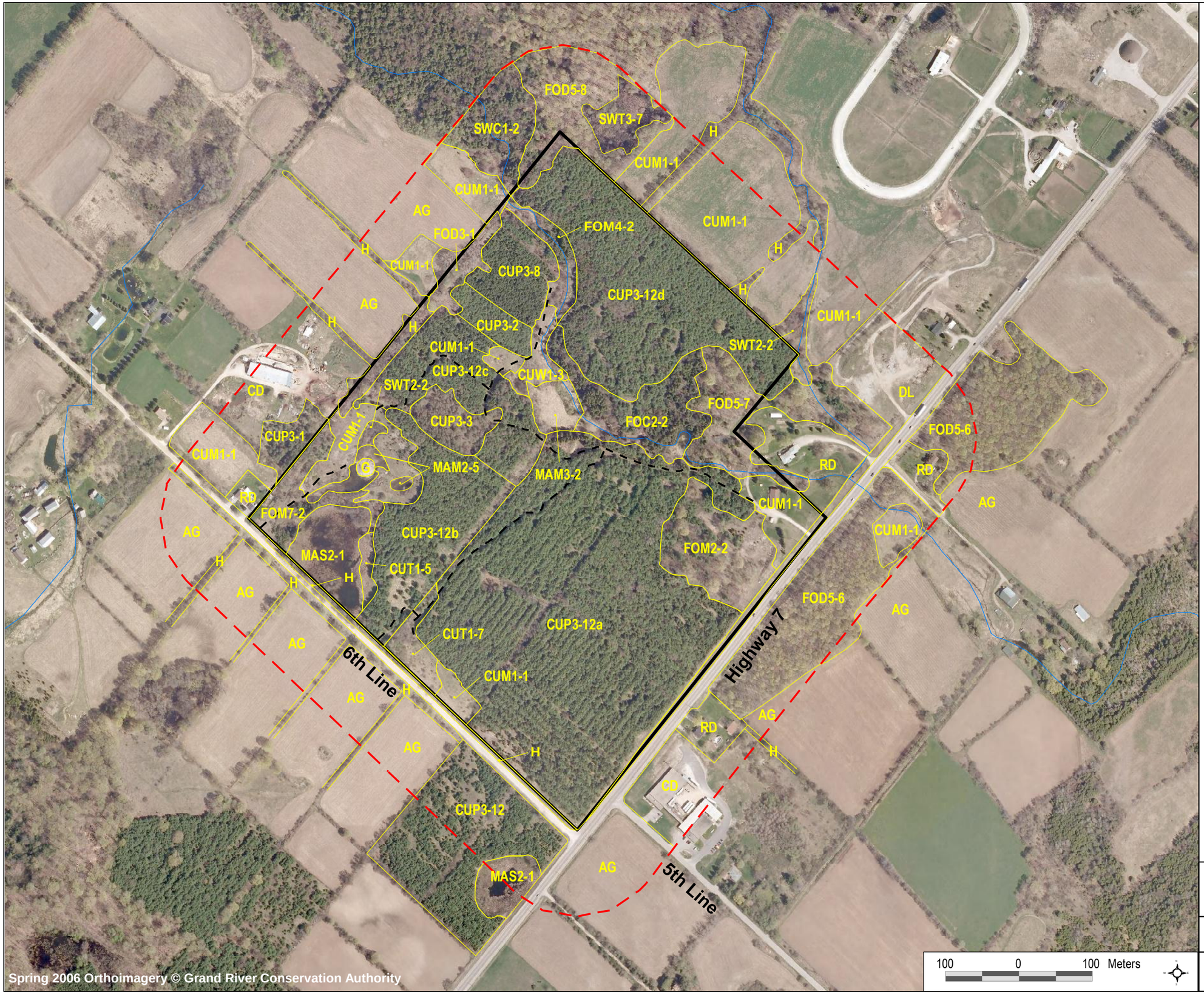
Figure No.

8

Title

TOPOGRAPHY



Legend

- Subject Property
- Study Area (120m Investigation Zone)
- ELC Vegetation Type Boundary
- Watercourse
- Trail

Vegetation Communities

Forest (FO)
Coniferous Forest (FOC)
FOC2-2 Dry-Fresh White Cedar Coniferous Forest
Mixed Forest (FOM)
FOM2-2 Dry-Fresh White Pine – Sugar Maple Mixed Forest
FOM4-2 Dry-Fresh White Cedar – Poplar Mixed Forest
FOM7-2 Fresh-Moist White Cedar – Hardwood Mixed Forest
Deciduous Forest (FOD)
FOD3-1 Dry-Fresh Poplar Deciduous Forest
FOD5-6 Dry-Fresh Sugar Maple – Basswood Deciduous Forest
FOD5-7 Dry-Fresh Sugar Maple – Black Cherry Deciduous Forest
FOD5-8 Dry-Fresh Sugar Maple – White Ash Deciduous Forest

Cultural (CU)
Cultural Plantation (CUP)
CUP3-1 Red Pine Coniferous Plantation
CUP3-2 White Pine Coniferous Plantation
CUP3-3 Scotch Pine Coniferous Plantation
CUP3-8 White Spruce Coniferous Plantation
CUP3-12* White Pine – White Spruce Coniferous Plantation
Cultural Woodland (CUW)
CUW1-3* Poplar Mineral Cultural Woodland
Cultural Meadow (CUM)
CUM1-1 Dry-Moist Old Field Meadow
Cultural Thicket (CUT)
CUT1-5 Raspberry Cultural Thicket
CUT1-7* Lilac Cultural Thicket

Swamp (SW)
Coniferous Swamp (SWC)
SWC1-2 White Cedar-Conifer Mineral Coniferous Swamp
Thicket Swamp (SWT)
SWT2-2 Willow Mineral Thicket Swamp
SWT3-7 Winterberry Organic Thicket Swamp

Marsh (MA)
Meadow Marsh (MAM)
MAM2-5 Narrow-leaved Sedge Mineral Meadow Marsh
MAM3-2 Reed-canary Grass Organic Meadow Marsh
Shallow Marsh (MAS)
MAS2-1 Cattail Mineral Shallow Marsh

OTHER
AG Agricultural
H Deciduous Hedgerow
RD Residential Development with Mowed Lawn
CD Commercial Development
DL Recently Disturbed Land
G Gravel Stockpile

* Not listed in the ELC for Southern Ontario (Lee et.al., 1998)

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Figure No.
9

Title
ELC VEGETATION COMMUNITIES

APPENDIX B

VASCULAR PLANT SPECIES LIST

Appendix B Vascular Plant List for the James Dick Property, Guelph-Eramosa Township

Scientific Name	Common Name	CC[1]	CW[2]	SRANK[3]
Abies balsamea	**Balsam Fir**	**5**	**-3**	**S5**
Acer negundo	**Manitoba Maple**	**0**	**-2**	**S5**
Acer nigrum	**Black Maple**	**7**	**3**	**S4?**
Acer platanoides*	**Norway Maple**		**5**	**SNA**
Acer rubrum	**Red Maple**	**4**	**0**	**S5**
Acer saccharinum	**Silver Maple**	**5**	**-3**	**S5**
Acer saccharum	**Sugar Maple**			**S5**
Achillea millegolium*	**Common Yarrow**		**3**	**S5**
Actaea patchypoda	White Baneberry	6	5	S5
Aesculus glabra*	**Ohio Buckeye**	**10**	**-1**	**SNA**
Ageratina altissima var. altissima	White Snakeroot	5	3	S5
Agrimonia gryposepala	Tall Hairy Agrimony	2	2	S5
Agropyron repens*	**Quack grass**		**3**	**SNA**
Agrostis stolonifera	Redtop	0	-3	S5
Alisma triviale	**Northern Water-plantain**			**S5**
Alliaria petiolata*	**Garlic Mustard**		**0**	**SNA**
*Allium vineale **	Field Garlic	0	3	SNA
Alnus incana	Speckled Alder	6	-5	S5
Ambrosia artemisiifolia	**Common Ragweed**	**0**	**3**	**S5**
Amelanchier laevis	**Smooth Serviceberry**	**5**	**5**	**S5**
Anaphalis margaritacea	Pearly Everlasting	3	5	S5
Anemone canadensis	**Canada Anemone**	**3**	**-3**	**S5**
Anemone virginiana	Thimbleweed	4	5	S5
Antennaria neglecta	Field Pussytoes	3	5	S5
Apocynum androsaemifolium	Spreading Dogbane	3	5	S5
Aquilegia canadensis	Wild Columbine	5	1	S5
Arctium minus *	**Common Burdock**		**5**	**SNA**
Arisaema triphyllum	**Jack-in-the-pulpit**	**5**	**-2**	**S5**
Asclepias incarnata	**Swamp Milkweed**	**6**	**-5**	**S5**
Asclepias syriaca	**Common Milkweed**	**0**	**5**	**S5**
Aster cordifolius	**Heart-leaved Aster**			**S5**
Aster ericoides	White Heath Aster	4	4	S5
Aster lanceolatus	**Panicled Aster**			**S5**
Aster lateriflous	**Calico Aster**			**S5**
Aster novae-angliae	**New England Aster**	**2**	**-3**	**S5**
Aster pilosus	**Hairy Aster**	**4**	**2**	**S5**
Aster puniceus	**Purple-stemmed Aster**	**6**	**-5**	**S5**
Athyrium filix-femina	**Lady Fern**			**S5**
Berberis vulgaris *	**European Barberry**		**3**	**SNA**
Betula alleghaniensis	**Yelllow Birch**	**6**	**0**	**S5**
Bidens cernua	Nodding Begger-ticks	2	-5	S5
Bromus inermis*	**Smooth Brome**		**5**	**SNA**
Cardamine concatenata	Cutleaf Toothwort	6	3	S5
Cardamine diphylla	Two-leaf Toothwort	7	5	S5

Species highlighted in yellow were found on the site in 1997. If a species is highlighted in yellow and has bolded text it was recorded during 2011 field surveys while species that are only bolded were only found during 2011 field surveys.

Scientific Name	Common Name	CC[1]	CW[2]	SRANK[3]
Carduus nutans*	**Nodding Thistle**			**SNA**
Carex bebbii	**Bebb's Sedge**	**3**	**-5**	**S5**
Carex cristatella	**Crested Sedge**	**3**	**-4**	**S5**
Carex cryptolepis	**Small Yellow Sedge**	**7**	**-5**	**S4**
Carex flava	**Yellow Sedge**	**5**	**-5**	**S5**
Carex granularis	**Meadow Sedge**	**3**	**-4**	**S5**
Carex lacustris	Lake-bank Sedge	5	-5	S5
Carex laevivaginata	**Smooth-sheath Sedge**	**8**	**-5**	**S4**
Carex pensylvanica	**Pennsylvania Sedge**	**5**	**5**	**S5**
Carex retrorsa	Retrorse Sedge	5	-5	S5
Carex spicata	**Spiked Sedge**		**5**	**SE5**
Carex stipata	**Stipitate Sedge**	**3**	**-5**	**S5**
Caulophyllum thalictroides	**Blue Cohosh**			**S5**
*Centaurea jacea **	Brown Starthistle		5	SNA
Centaurea nigra*	**Black Knapweed**			**SNA**
*Cerastium fontanum **	Common Mouse-ear Chickweed		3	SNA
Chenopodium album	**Lambs Quarters**			**SNA**
Chrysanthemum leucanthemum *	**Oxeye Daisy**		**5**	**SNA**
*Cichorium intybus**	Chicory		5	SNA
Circaea alpina	Small Enchanter's Nightshade	6	-3	S5
Circaea lutetiana	**Enchanter's Nightshade**			**S5**
Cirsium arvense *	**Canada Thistle**		**3**	**SNA**
Cirsium vulgare *	**Bull Thistle**		**4**	**SNA**
Clinopodium vulgare	**Field Basil**	**4**	**5**	**S5**
Convolvulus arvensis*	**Field Bindweed**		**5**	**SNA**
Coptis trifolia	Goldthread	7	-3	S5
Cornus alternifolia	**Alternate-leaf Dogwood**	**6**	**5**	**S5**
Cornus amomum	**Silky Dogwood**	**5**	**-4**	**S5**
Cornus stolonifera	**Red-osier Dogwood**	**2**	**-3**	**S5**
Coronilla varia *	**Crown Vetch**		**5**	**SNA**
Crataegus spp.	**Hawthorn**			
Dactylis glomerata*	**Orchard Grass**		**3**	**SNA**
Daucus carota *	**Wild Carrot**		**5**	**SNA**
Decodon verticillatus	Hairy Swamp Loosestrife	7	-5	S5
Dicentra cucullaria	Dutchman's Breeches	6	5	S5
*Digitaria sanguinalis **	Hairy Crabgrass		3	SNA
Dipsacus sylvestris *	**Common Teasel**		**5**	**SNA**
Dryopteris marginalis	**Marginal Wood Fern**	**5**	**3**	**S5**
Dulichium arundinaceum	Three-way Sedge	7	-5	S5
Echinocystis lobata	**Wild Cucumber**	**3**	**-2**	**S5**
Echium vulgare *	**Common Viper's-bugloss**		**5**	**SNA**
Eleocharis acicularis	Needle Spike-rush	5	-5	S5
Eleocharis smallii	Creeping Spike-rush	6	5	S5

Species highlighted in yellow were found on the site in 1997. If a species is highlighted in yellow and has bolded text it was recorded during 2011 field surveys while species that are only bolded were only found during 2011 field surveys.

Scientific Name	Common Name	CC[1]	CW[2]	SRANK[3]
*Epilobium hirsutum**	Great-hairy Willow-herb		-4	SNA
Epipactis helleborine*	**Common Helleborine**	**-**	**5**	**SNA**
Equisetum arvense	**Field Horsetail**	**0**	**0**	**S5**
Equisetum hyernale	Common Souring Rush			S5
Equisetum variegatum	**Variegated Horsetail**	**5**	**-3**	**S5**
Erigeron annus	**Daisy Fleabane**	**0**	**1**	**S5**
Erigeron philadelphicus	**Philadelphia Fleabane**	**1**	**-3**	**S5**
*Erysimum cheiranthoides**	Worm-seed Mustard		3	SNA
Erythronium americanum	**Yellow Trout-lily**	**5**	**5**	**S5**
Eupatorium maculatum	**Spotted Joe-pye-weed**			**S5**
Eupatorium perfoliatum	**Boneset**	**2**	**-4**	**S5**
Euphorbia cyparissias*	**Cypress Spurge**		**5**	**SNA**
Eurybia macrophylla	Large-leaved Wood Aster	5	5	S5
Fagus grandifolia	**American Beech**	**6**	**3**	**S4**
Fragaria vesca	Woodland Strawberry	4	4	S5
Fragaria virginiana	**Common Strawberry**	**2**	**1**	**S5**
Frangula alnus*	**Glossy Buckthorn**		**-1**	**SNA**
Fraxinus americana	**White Ash**	**4**	**3**	**S5**
Fraxinus pennsylvanica	**Red Ash**	**3**	**-3**	**S5**
Galium aparine	Catchweed Bedstraw	5	3	S5
Galium asprellum	Rough Bedstraw	6	-5	S5
Galium boreale	Northern Bedstraw	7	0	S5
*Galium mollugo**	Great Hedge Bedstraw		5	SNA
Galium triflorum	**Fragrant Bedstraw**	**4**	**2**	**S5**
Geranium maculatum	Wild Crane's-bill	6	3	S5
***Geranium robertianum **	**Herb-robert**		**5**	**SNA**
Geum aleppicum	**Yellow Avens**	**2**	**-1**	**S5**
Gleditsia triacanthos var. inermis*	**Sunburst Honey-locust**	**3**	**0**	**SNA**
Gymnocarpium dryopteris	**Oak Fern**	**7**	**0**	**S5**
Hemerocallis fulva*	**Day Lily**		**5**	**SNA**
***Hieracium aurantiacum **	**Orange Hawkweed**		**5**	**SNA**
*Hieracium pilosella **	Mouseear		5	SNA
***Hieracium praealtum **	**King Devil**			**SNA**
Hydrophyllum virginianum	**Virginia Waterleaf**	**6**	**-2**	**S5**
***Hypericum perforatum **	**St. John's-wort**		**5**	**SNA**
Hypericum punctatum	**Spotted St. John's-wort**	**5**	**-1**	**S5**
Impatiens capensis	Spotted Touch-me-not	4	-3	S5
Iris versicolor	Blueflag	5	-5	S5
Juncus alpinoarticulatus	Richardson Rush	5	-5	S5
Juncus articulatus	**Jointed Rush**	**5**	**-5**	**S5**
Juncus brachycephalus	**Small-headed rush**	**7**	**-5**	**S4S5**
Juncus tenuis	Slender Rush	0	0	S5
Junglans nigra	Black Walnut	5	3	S5
Juniperus virginiana	**Eastern Red Cedar**	**4**	**3**	**S5**
Lemna minor	Lesser Duckweed	2	-5	S5
Linaria vulgaris*	**Butter-and-eggs**		**5**	**SNA**
Lobelia inflata	Indian Tobacco	3	4	S5

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Scientific Name	Common Name	CC[1]	CW[2]	SRANK[3]
Lonicera dioica	Mountain Honeysuckle	5	3	S5
***Lonicera tatarica* ***	**Tartarian Honeysuckle**		**3**	**SNA**
Lotus corniculatus*	**Birds-foot Trefoil**			**SNA**
Lycopus americanus	**American Water-horehound**	**4**	**-5**	**S5**
Lysimachia ciliate	**Fringed Loosestrife**	**4**	**-3**	**S5**
Lysimachia nummularia*	**Moneywort**		**-4**	**SNA**
Lythrum salicaria *	**Purple Loosestrife**		**-5**	**SNA**
Maianthemum stellatum	False Solomon's Seal	6	1	S5
Malus pumila *	**Common Apple**		**5**	**SNA**
Matricaria perforate*	**Scentless Chamomile**		**5**	**SNA**
Matteuccia struthiopteris	**Ostrich Fern**	**5**	**-3**	**S5**
*Medicago lupulina**	Black Medic		1	SNA
Medicago sativa *	**Alfalfa**			**SNA**
Melilotus albus *	**White Sweet Clover**		**3**	**SNA**
*Melilotus officinalis **	Yellow Sweet Clover		3	SNA
Mentha arvensis	**Field Mint**	**3**	**-3**	**S5**
Mirnulus ringens	Square-stemmed Monkeyflower	6	-5	S5
Morus alba *	**White Mulberry**		**0**	**SNA**
Muhlenbergia frondosa	Wirestem Muhly Grass	5	-3	S4
Myosotis scorpioides *	**True Forget-me-not**		**-5**	**SNA**
Najas flexilis	Slender Naiad	5	-5	S5
*Nepeta cataria**	Catnip		1	SNA
Oenothera biennis	**Common Evening-primrose**	**0**	**3**	**S5**
Onoclea sensibilis	**Sensitive Fern**	**4**	**-3**	**S5**
Ostrya virginiana	**Ironwood**	**4**	**4**	**S5**
Oxalis stricta	**Yellow Wood-sorrel**	**0**	**3**	**S5**
Paeonia spp.*	**Peony**	**-**	**-**	**SNA**
Panicum capillare	Old Witch Panic Grass	0	0	S5
*Panicum miliaceum **	Common Millet		5	SNA
Parthenocissus inserta	**Thicket Creeper**	**3**	**3**	**S5**
Phalaris arundinacea	**Reed Canary Grass**	**0**	**-4**	**S5**
Phleum pratense *	**Timothy Grass**		**3**	**SNA**
Physalis heterophylla	Clammy Ground-cherry	3	5	S4
Picea abies *	**Norway Spruce**		**5**	**SNA**
Picea glauca	**White Spruce**	**6**	**3**	**S5**
Picea pungens *	**Blue Spruce**			**SNA**
Pinus banksiana	**Jack Pine**	**9**	**3**	**S5**
Pinus strobus	**White Pine**	**4**	**3**	**S5**
Pinus sylvestris*	**Scotch Pine**		**5**	**SNA**
Plantago lanceolata *	**English Plantain**		**0**	**SNA**
Plantago major*	**Common Plantain**		**-1**	**SNA**
Poa compressa*	**Canada Bluegrass**	**0**	**2**	**S5**
Poa pratensis	**Kentucky Bluegrass**	**0**	**1**	**S5**
Podophyllum peltatum	May Apple	5	3	S5
Polygonum amphibium	**Water Smartweed**	**5**	**-5**	**S5**

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Scientific Name	Common Name	CC[1]	CW[2]	SRANK[3]
Polygonum lapathifolium	Pale Smartweed	2	-4	S5
***Polygonum persicaria** **	**Lady's Thumb**		**-3**	**SNA**
Populus balsamifera	**Balsam Poplar**	**4**	**-3**	**S5**
Populus tremuloides	**Trembling Aspen**	**2**	**0**	**S5**
Potamogeton natans	**Floating Pondweed**	**5**	**-5**	**S5**
Potamogeton pectinatus	**Sago Pondweed**	**4**	**-5**	**S5**
Potentilla anserina	Silverweed	5	-4	S5
*Potentilla argentea **	Silvery Cinquefoil		3	SNA
Potentilla norvegica	Rough Cinquefoil	0	0	S5
Potentilla recta*	**Rough-fruited Cinquefoil**		**5**	**SNA**
Potentilla simplex	Common Cinquefoil	3	4	S5
Prunella vulgaris	**Heal-all**	**5**	**5**	**S5**
Prunus serotina	**Black Cherry**	**3**	**3**	**S5**
Prunus virginiana	**Choke Cherry**	**2**	**1**	**S5**
Pyrus communis *	**Common Pear**		**5**	**SNA**
Ranunculus acris*	**Common Butter-cup**		**-2**	**SNA**
Ranunculus hispidus var. caricetorum	Swamp Buttercup	8	0	S5
*Ranunculus repens**	Creeping Butter-cup		-1	SNA
Rhamnus cathartica *	**Common Buckthorn**		**3**	**SNA**
Rhus typhina	Staghorn Sumac	1	5	S5
Ribes americanum	**Wild Black Currant**	**4**	**-3**	**S5**
Ribes cynosbati	**Prickly Gooseberry**	**4**	**5**	**S5**
Robinia pseudoacacia *	**Black Locust**			**SNA**
Rosa palustris	**Swamp Rose**	**7**	**-5**	**S5**
Rubus idaeus	**Common Red Raspberry**	**0**	**-2**	**S5**
Rubus occidentalis	**Black Raspberry**	**2**	**5**	**S5**
Rumex crispus*	**Curled Dock**		**-1**	**SNA**
Rumex orbiculatus	Water Dock	6	-5	S4S5
Rumex verticillatus	Swamp Dock	7	-5	S4
Sagittaria latifolia	**Broadleaf Arrowhead**	**4**	**-5**	**S5**
Salix eriocephala	**Heart-leaved Willow**	**4**	**-3**	**S5**
Salix fragilis*	**Crack Willow**	**-**	**-1**	**SNA**
Salix petiolaris	**Slender Willow**	**3**	**-4**	**S5**
Sambucus canadensis	**Common Elderberry**	**5**	**-2**	**S5**
Sambucus racemosa	**Red Elderberry**	**5**	**2**	**S5**
Sanguinaria canadensis	**Bloodroot**	**5**	**4**	**S5**
Scirpus atrovirens	Dark-green Bulrush	3	-5	S5
Scirpus cyperinus	Cottongrass Bulrush	4	-5	S5
Scirpus pendulus	**Lined Bulrush**	**3**	**-5**	**S5**
Scutellaria galericulata	Hooded Skullcap	6	-5	S5
Scutellaria lateriflora	Mad-dog Skullcap	5	-5	S5
Sedum spp.*	**Stonecrop**			**SNA**
*Senecio jacobaea **	Tansy Ragwort		5	SNA
Setaria viridis*	**Green Foxtail Grass**		**5**	**SNA**
Silein vulgaris *	**Bladder Campion**		**5**	**SNA**

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Scientific Name	Common Name	CC[1]	CW[2]	SRANK[3]
Sium suave	**Water Parsnip**	**4**	**-5**	**S5**
***Solanum dulcamara* ***	**Bitter Nightshade**		**0**	**SNA**
Solidago altissima	**Tall Goldenrod**			**S5**
Solidago canadensis	**Canada Goldenrod**	**1**	**2**	**S5**
Solidago flexicaulis	**Zig-zag Goldenrod**	**6**	**3**	**S5**
Solidago gigantean	**Late Goldenrod**	**4**	**-3**	**S5**
Solidago nemoralis	**Gray Goldenrod**	**2**	**5**	**S5**
Solidago juncea	**Early Goldenrod**	**3**	**5**	**S5**
Solidago rugosa	**Rough-stemmed Goldenrod**	**4**	**-1**	**S5**
***Sonchus arvensis* ***	**Field Sow Thistle**			**SNA**
***Sorbus aucuparia* ***	**European Mountain-ash**		**5**	**SNA**
Sparganium americanum	American Bur-reed	6	-5	S4?
Spiranthes cernua	**Nodding Ladies-tresses**	**5**	**-2**	**S5**
*Stellaria media**	Common Chickweed		3	SNA
Syringa vulgaris*	**Common Lilac**		**5**	**SNA**
Taraxacum offisugarcinale*	**Common Dandelion**		**3**	**SNA**
Thalictrum pubescens	Tall Meadow-rue	5	-2	S5
Thelypteris palustris	Marsh Fern	5	-4	S5
Thuja occidentalis	**Eastern White Cedar**	**4**	**-3**	**S5**
Tilia americana	**American Basswood**	**4**	**3**	**S5**
Tilia cordata*	**Little-leaf Linden**			**SNA**
Toxicodendron rydbergii	**Poison Ivy**	**0**	**0**	**S5**
***Tragopogon pratensis* ***	**Yellow Goat's-beard**		**5**	**SNA**
***Trifolium dubium* ***	**Least Hop Clover**		**3**	**SNA**
*Trifolium hybridum *	Alsike Clover		1	SNA
***Trifolium pratense* ***	**Red Clover**		**2**	**SNA**
Trifolium repens*	**White Clover**		**2**	**SNA**
Trillium erectum	Red Trillium	6	1	S5
Trillium grandiflorum	**White Trillium**	**5**	**5**	**S5**
Tsuga canadensis	**Eastern Hemlock**	**7**	**3**	**S5**
***Tussilago farfara* ***	**Coltsfoot**		**3**	**SNA**
Typha latifolia	**Broad-leaf Cattail**	**3**	**-5**	**S5**
Ulmus americana	**American Elm**	**3**	**-2**	**S5**
Urtica dioica ssp. dioica	**Stinging Nettle**	**-**	**-1**	**S5**
Urtica dioica ssp. gracilis	**Slender Nettle**	**2**	**-1**	**S5**
***Verbascum thapsus* ***	**Common Mullein**		**5**	**SNA**
Verbena hastata	Blue Vervain	4	-4	S5
*Veronica officinalis**	Common Speedwell		5	SNA
Viburnum lentago	**Nannyberry**	**4**	**-1**	**S5**
Vicia cracca*	**Cow Vetch**		**5**	**SNA**
Viola pubescens	**Downy Yellow Violet**			**S5**
Viola sororia	**Common Blue Violet**	**4**	**1**	**S5**
Vitis riparia	**Riverbank Grape**	**0**	**-2**	**S5**
Waldsteinia fragarioides	**Barren Strawberry**	**5**	**5**	**S5**

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Summary

Total Number of Species 1997/2011	268
Total Number of Species 2011	188
Number of Non Native Species in 1997/2011 / %	91/34%
SRANK	All S5 and S4
Significant Species	None

Notes: **1. CC – Coefficient of Conservatism** – A rank of 0 to 10 based on the plants degree of fidelity to a range of synecological parameters: (0-3) Taxa found in a variety of plant communities; (4-6) Taxa typically associa ted with a specific plant community but tolerant to moderate disturbance; (7-8) Taxa associated with a plant community in an advanced successional stage that has undergone minor disturbance; (9-10) Taxa with a high fidelity to a narrow range of synecological parameters.

2. CW – Coefficient of Wetness

Coefficient of Wetness	Wetland Category	Description	
-5	OBL	Obligate Wetland	Occurs almost always in wetlands under natural conditions (estimated 99% probability).
-4 to -2	FACW	Facultative Wetland	Usually occurs in wetlands, but occasionally found in non-wetlands (estimated 67-99% probability).
-1 to 1	FAC	Facultative	Equally likely to occur in wetlands or non-wetlands (estimated 34-66% probability).
2 to 4	FACU	Facultative Upland	Occasionally occurs in wetlands, but usually occurs in non-wetlands (estimated 1-33% probability).
5	UPL	Obligate Upland	Occurs almost never in wetlands under natural conditions (estimated <1% probability).

3. SRANK – As per NHIC provincial ranking

SRANK	Description
S1	Critically Imperiled in the nation or state/province because of extreme rarity (often 5 or fewer occurrences) or because of some factor(s) such as very steep declines making it especially vulnerable to extirpation from the state/province.
S2	Imperiled in the nation or state/province because of rarity due to very restricted range, very few populations (often 20 or fewer), steep declines, or other factors making it very vulnerable to extirpation from the nation or state/province.
S3	Vulnerable in the nation or state/province due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors making it vulnerable to extirpation.
S4	Apparently Secure, Uncommon but not rare; some cause for long-term concern due to declines or other factors.
S5	Secure Common, widespread, and abundant in the nation or state/province.
SNR	Unranked, nation or state/province conservation status not yet assessed
SU	Currently unrankable due to lack of information or due to substantially conflicting information about status or trends.
SNA	Not Applicable, a conservation status rank is not applicable because the species is not a suitable target for conservation activities.
S#S#	A numeric range rank (e.g., S2S3) is used to indicate any range of uncertainty about the status of the species or community. Ranges cannot skip more than one rank (e.g., SU is used rather than S1S4).

***** Non-native species (90)

R Rare in Wellington County as determined by Riley, J.L. (et.al.) 1989. Distribution and Status of the Vascular Plants of Central Region, Ontario Ministry of Natural Resources.

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APPENDIX C

WILDLIFE SPECIES LIST

Wildlife Species Recorded from the Proposed Hidden Quarry

COMMON NAME	SCIENTIFIC NAME	ONTARIO STATUS	GLOBAL STATUS	OMNR	COSEWIC	REGION	AREA	COMMENTS
ODONATES								
DAMSELFLIES								
Ebony Jewelwing	*Calopteryx aequabilis*	S5	G5					site
Northern Spreadwing	*Lestes disjuncta*	S5	G5					site
Emerald Spreadwing	*Lestes dryas*	S5	G5					site
Lyre-tipped Spreadwing	*Lestes unguiculatus*	S5	G5					site
Boreal Bluet	*Enallagma boreale*	S5	G5					site
Familiar Bluet	*Enallagma civile*	S5	G5					site
Skimming Bluet	*Enallagma geminatum*	S4	G5					site
Hagen's Bluet	*Enallagma hageni*	S5	G5					site
Eastern Forktail	*Ischnura verticalis*	S5	G5					site
DRAGONFLIES								
Canada Darner	*Aeschna constricta*	S5	G5					site
Common Green Darner	*Anax junius*	S5	G5					site, adjacent
Brush-tipped Emerald	*Somatochlora walshii*	S4	G5					site
Dot-tailed Whiteface	*Leucorrhinia intacta*	S5	G5					site
Widow Skimmer	*Libellula luctuosa*	S5	G5					site
Twelve-spotted Skimmer	*Libellula pulchella*	S5	G5					site
Four-spotted Skimmer	*Libellula quadrimaculata*	S5	G5					site
Common Whitetail	*Plathemis lydia*	S5	G5					site
Cherry-faced Meadowhawk	*Sympetrum internum*	S5	G5					site
White-faced Meadowhawk	*Sympetrum obtruscum*	S5	G5					site
Ruby Meadowhawk	*Sympetrum rubicundulum*	S5	G5					site
Band-winged Meadowhawk	*Sympetrum semicinctum*	S4	G5					site
BUTTERFLIES								
Dreamy Dusky Wing	*Erynnis icelus*	S5	G5					site
Juvenal's Dusky Wing	*Erynnis juvenalis*	S5	G5					site
Arctic Skipper	*Carterocephalus palaemon*	S5	G5			7		site
Least Skipper	*Ancyloxypha numitor*	S5	G5					site
European Skipper	*Thymelicus lineola*	SNA	G5					site
Long Dash Skipper	*Polites mystic*	S5	G5					site
Northern Broken-Dash	*Wallengrenia egermet*	S5	G5					site
Black Swallowtail	*Papilio polyxenes*	S5	G5					site
Eastern Tiger Swallowtail	*Papilio glaucus*	S5	G5					site, adjacent

Wildlife Species Recorded from the Proposed Hidden Quarry

COMMON NAME	SCIENTIFIC NAME	ONTARIO STATUS	GLOBAL STATUS	OMNR	COSEWIC	REGION	AREA	COMMENTS
Mustard White	*Pieris oleracea*	S4	G4G5					site
Cabbage White	*Pieris rapae*	SNA	G5					site, adjacent
Spring Azure	*Celastrina ladon*	S5	G5					site
Pearl Crescent	*Phyciodes tharos*	S4	G5					site
Northern Crescent	*Phycoides pascoensis*	S5	G5					site, adjacent
Question Mark	*Polygonia interrogationis*	S5	G5					site
Eastern Comma	*Polygonia comma*	S5	G5					site
Milbert's Tortoiseshell	*Nymphalis milberti*	S5	G5					site
Red Admiral	*Vanessa atalanta*	S5	G5					site, adjacent
Red-spotted Purple	*Limenitis arthemis astyanax*	S5	G5T5					site
Viceroy	*Limenitis archippus*	S5	G5					site
Northern Pearly Eye	*Enodia anthedon*	S5	G5					site
Eyed Brown	*Satyrodes eurydice*	S5	G4					site
Little Wood-Satyr	*Megisto cymela*	S5	G5					site
Common Ringlet	*Coenonympha tullia*	S5	G5					site, adjacent
Common Wood-Nymph	*Cercyonis pegala*	S5	G5					site
Monarch	*Danaus plexippus*	S4B, S2N	G4	SC	SC			site, adjacent
AMPHIBIANS								
American Toad	*Anaxyrus americanus*	S5	G5					site, adjacent
Tetraploid Gray Treefrog	*Hyla versicolor*	S5	G5					site, adjacent
Western Chorus Frog	*Pseudacris triseriata*	S3	G5	NAR	THR			observed in 1997; currently absent
Spring Peeper	*Pseudacris crucifer*	S5	G5					site, adjacent
Northern Green Frog	*Lithobates clamitans*	S5	G5					site, adjacent
Wood Frog	*Lithobates sylvatica*	S5	G5					site, adjacent
Northern Leopard Frog	*Lithobates pipiens*	S5	G5	NAR	NAR			site, adjacent
REPTILES								
Snapping Turtle	*Chelydra serpentina*	S3	G5	SC	SC			site
Midland Painted Turtle	*Chrysemys picta marginata*	S5	G5T5					site: empty shell found
Eastern Gartersnake	*Thamnophis sirtalis*	S5	G5					site
BIRDS								
Canada Goose	*Branta canadensis*	S5	G5					site: breeding; adjacent: breeding
Wood Duck	*Aix sponsa*	S5	G5					site: breeding; adjacent: breeding
Mallard	*Anas platyrhynchos*	S5	G5					site: breeding; adjacent: breeding

Wildlife Species Recorded from the Proposed Hidden Quarry

COMMON NAME	SCIENTIFIC NAME	ONTARIO STATUS	GLOBAL STATUS	OMNR	COSEWIC	REGION	AREA	COMMENTS
Blue-winged Teal	*Anas discors*	S4	G5					site: migrant
Hooded Merganser	*Lophodytes cucullatus*	S5B, S5N	G5			7		site: possibly breeding
Ruffed Grouse	*Bonasa umbellus*	S5	G5				20	site: breeding
Wild Turkey	*Meleagris gallopava*	S5	G5					site: breeding; adjacent: breeding
Pied-billed Grebe	*Podilymbus podiceps*	S4B, S4N	G5					observed in 1997; currently absent
Great Blue Heron	*Ardea herodias*	S5	G5					site: foraging
Green Heron	*Butorides virescens*	S4B	G5					site: 1997; adjacent: foraging
Turkey Vulture	*Cathartes aura*	S5B	G5					site: overhead; adjacent: overhead
Sharp-shinned Hawk	*Accipiter striatus*	S5	G5	NAR	NAR		20-30	site: migrant
Red-tailed Hawk	*Buteo jamaicensis*	S5	G5	NAR	NAR			site: foraging; adjacent: foraging
American Kestrel	*Falco sparverius*	S5B	G5					observed in 1997; currently absent
Sora	*Porzana carolina*	S4B	G5					breeding in 1997; currently absent
Killdeer	*Charadrius vociferus*	S5B, S5N	G5					adjacent: breeding
Spotted Sandpiper	*Actitis macularia*	S5	G5					site: migrant
American Woodcock	*Scolopax minor*	S4B	G5					site: breeding
Mourning Dove	*Zenaida macroura*	S5	G5					site: breeding; adjacent: breeding
Black-billed Cuckoo	*Coccyzus erythropthalmus*	S5B	G5					site: breeding; adjacent: breeding
Eastern Screech-Owl	*Megascops asio*	S5	G5	NAR	NAR	5		site: breeding
Ruby-throated Hummingbird	*Archilochus colubris*	S5B	G5					observed in 1997
Belted Kingfisher	*Megaceryle alcyon*	S4B	G5					site: foraging
Red-bellied Woodpecker	*Melanerpes carolinus*	S4	G5					adjacent: breeding
Downy Woodpecker	*Picoides pubescens*	S5	G5					site: breeding
Hairy Woodpecker	*Picoides villosus*	S5	G5				10	site: breeding; adjacent: breeding
Northern Flicker	*Colaptes auratus*	S4B	G5					site: breeding; adjacent: breeding
Pileated Woodpecker	*Dryocopus pileatus*	S5	G5				30-50	site: breeding; adjacent: breeding
Eastern Wood-Pewee	*Contopus virens*	S4B	G5					site: breeding; adjacent: breeding
Willow Flycatcher	*Empidonax traillii*	S5B	G5			5		observed in 1997; currently absent
Eastern Phoebe	*Sayornis phoebe*	S5B	G5					observed in 1997; currently absent
Great Crested Flycatcher	*Myiarchus crinitus*	S4B	G5					site: breeding; adjacent: breeding
Eastern Kingbird	*Tyrannus tyrannus*	S4B	G5					observed in 1997; currently absent
Red-eyed Vireo	*Vireo olivaceus*	S5B	G5					site: breeding; adjacent: breeding
Blue Jay	*Cyanocitta cristata*	S5	G5					site: breeding; adjacent: breeding
American Crow	*Corvus brachyrhynchos*	S5B	G5					site: breeding; adjacent: breeding
Tree Swallow	*Tachycineta bicolor*	S4B	G5					site: foraging
Black-capped Chickadee	*Poecile atricapillus*	S5	G5					site: breeding; adjacent: breeding
Red-breasted Nuthatch	*Sitta canadensis*	S5	G5					site: breeding

Wildlife Species Recorded from the Proposed Hidden Quarry

COMMON NAME	SCIENTIFIC NAME	ONTARIO STATUS	GLOBAL STATUS	OMNR	COSEWIC	REGION	AREA	COMMENTS
White-breasted Nuthatch	*Sitta carolinensis*	S5	G5					site: breeding; adjacent: breeding
House Wren	*Troglodytes aedon*	S5B	G5					site: breeding; adjacent: breeding
Eastern Bluebird	*Sialia sialis*	S5B	G5	NAR	NAR			site: breeding; adjacent: breeding
Veery	*Catharus fuscescens*	S4B	G5				10-20	adjacent: breeding
Wood Thrush	*Hylocichla mustelina*	S4B	G5					adjacent: breeding
American Robin	*Turdus migratorius*	S5B	G5					site: breeding; adjacent: breeding
Gray Catbird	*Dumetella carolinensis*	S4B	G5					site: breeding; adjacent: breeding
European Starling	*Sturnus vulgaris*	SNA	G5					site: breeding; adjacent: breeding
Cedar Waxwing	*Bombycilla cedrorum*	S5B	G5					site: breeding
Ovenbird	*Seiurus aurocapilla*	S4B	G5					site: breeding; adjacent: breeding
Mourning Warbler	*Geothlypis philadelphia*	S4B	G5					site: breeding
Common Yellowthroat	*Geothlypis trichas*	S5B	G5					site: breeding; adjacent: breeding
Yellow Warbler	*Setophaga petechia*	S5B	G5					observed in 1997; currently absent
Chestnut-sided Warbler	*Setophaga pensylvanica*	S5B	G5					site: migrant
Yellow-rumped Warbler	*Setophaga coronata*	S5B	G5			7		site: migrant
Chipping Sparrow	*Spizella passerina*	S5B	G5					site: breeding; adjacent: breeding
Clay-colored Sparrow	*Spizella pallida*	S4B	G5			5, 7		observed in 1997; currently absent
Field Sparrow	*Spizella pusilla*	S4B	G5					site: breeding; adjacent: breeding
Vesper Sparrow	*Pooecetes gramineus*	S4B	G5					adjacent: breeding
Savannah Sparrow	*Passerculus sandwichensis*	S4B	G5					adjacent: breeding
Grasshopper Sparrow	*Ammodramus savannarum*	S4B	G5			5		adjacent: breeding
Song Sparrow	*Melospiza melodia*	S5B	G5					site: breeding; adjacent: breeding
White-throated Sparrow	*Zonotrichia albicollis*	S5B	G5					breeding in 1997; currently absent
Scarlet Tanager	*Piranga olivacea*	S4B	G5				20	adjacent: breeding
Northern Cardinal	*Cardinalis cardinalis*	S5	G5			5		site: breeding; adjacent: breeding
Rose-breasted Grosbeak	*Pheucticus ludovicianus*	S4B	G5					site: breeding; adjacent: breeding
Indigo Bunting	*Passerina cyanea*	S4B	G5					site: breeding; adjacent: breeding
Bobolink	*Dolichonyx oryzivorus*	S4B	G5	THR	THR		10	adjacent: breeding
Red-winged Blackbird	*Agelaius phoeniceus*	S5	G5					site: breeding; adjacent: breeding
Eastern Meadowlark	*Sturnella magna*	S4B	G5	THR	THR			observed in 1997; currently absent
Common Grackle	*Quiscalus quiscula*	S5B	G5					site: breeding; adjacent: breeding
Brown-headed Cowbird	*Molothrus ater*	S4B	G5					site: breeding
Baltimore Oriole	*Icterus galbula*	S4B	G5					site; breeding; adjacent: breeding
American Goldfinch	*Spinus tristis*	S5B	G5					site: breeding; adjacent: breeding

Wildlife Species Recorded from the Proposed Hidden Quarry

COMMON NAME	SCIENTIFIC NAME	ONTARIO STATUS	GLOBAL STATUS	OMNR	COSEWIC	REGION	AREA	COMMENTS
MAMMALS								
Masked Shrew	*Sorex cinereus*	S5	G5					site
Hairy-tailed Mole	*Parascalops breweri*	S4	G5					site
Little Brown Bat	*Myotis lucifugus*	S5	G5		END			site, adajcent
Big Brown Bat	*Eptesicus fuscus*	S5	G5					site, adajcent
Eastern Cottontail	*Sylvilagus floridanus*	S5	G5					site, adjacent
Eastern Chipmunk	*Tamias striatus*	S5	G5					site, adjacent
Woodchuck	*Marmota monax*	S5	G5					site
Gray Squirrel	*Sciurus carolinensis*	S5	G5					site
Red Squirrel	*Tamiasciurus hudsonicus*	S5	G5					site
Muskrat	*Ondatra zibethicus*	S5	G5					observed on site in 1997, adjacent
Meadow Vole	*Microtus pennsylvanicus*	S5	G5					observed in 1997
Porcupine	*Erethizon dorsatum*	S5	G5			7		observed in 1997
Coyote	*Canis latrans*	S5	G5					site, adjacent: den
Red Fox	*Vulpes vulpes*	S5	G5					site
Raccoon	*Procyon lotor*	S5	G5					site, adjacent
Striped Skunk	*Mephitis mephitis*	S5	G5					site
White-tailed Deer	*Odocoileus virginianus*	S5	G5					site, adjacent

SUMMARY (including 1997)	***TOTALS FOR 2011-2012***	***SITE***	***ADJ.***
Total Odonates: 21	21	21	1
Total Butterflies: 26	26	26	6
Total Amphibians: 7	6	6	6
Total Reptiles: 3	3	3	0
Total Birds: 73	62	53	45
Total Breeding Birds: 60	51	42	42
Total Mammals: 17	15	14	8
Total Species: 147	133	123	66

SIGNIFICANT SPECIES	***TOTALS FOR 2011-2012***	***SITE***	***ADJ.***
Global: 0	0	0	0
National: 6	4	3	1
Provincial: 4	3	2	1
Regional: 0	0	0	0
Local: 0	0	0	0

Wildlife Species Recorded from the Proposed Hidden Quarry

COMMON NAME	SCIENTIFIC NAME	ONTARIO STATUS	GLOBAL STATUS	OMNR	COSEWIC	REGION	AREA	COMMENTS
Explanation of Status and Acronymns								
OMNR: Designations by the Ontario Ministry of Natural Resources								
COSEWIC: Committee on the Status of Endangered Wildlife in Canada								
REGION: Rare in an Ecoregion								
S2: Imperiled in Ontario								
S3: Vulnerable in Ontario								
S4: Apparently secure in Ontario								
S5: Secure in Ontario								
SB: Status during the breeding season								
SN: Status during the nonbreeding season								
S#S#: Range rank used to indicate any range of uncertainty about status								
SNA: Not Applicable, not a suitable target for conservation efforts								
G4: Common globally								
G5: Very common globally								
T: Denotes that the rank applies to a subspecies or variety								
END: Endangered								
THR: Threatened								
SC: Special Concern								
NAR: Not At Risk								
5: Rare in Site Region 5								
6: Rare in Site Region 6								
7: Rare in Site Region 7								

APPENDIX D

STREAM SURVEY DATA SHEETS

STREAM SURVEY

Date: July 20, 1995

Surveyors: Garry Perfect & Mike Robinson

Station No.: 1

Station Length: 40m

Property: Dick

Location: Eramosa Twp, Con 6, lot 1

UTM Grid Reference: Block NU
Grid E 722 N 293

Air Photo: Flight Line 78-4343
Plate No. 223

Water Temperature: _____ Air Temperature: _____

Instream Cover Type (✓)

☐ Under-cut banks ☐ Boulders ☑ Logs and Trees ☐ Organic Debris ☑ Aquatic Vegetation

Instream Cover Density (✓)

☐ Nil ☐ Sparse ☑ Moderate ☐ Dense

Barriers to Water Flow and Fish Migration (✓)

	Yes	No	Number
Beaver Dams	☐	☐	
Beaver Lodges	☐	☐	
Other Dams/Obstructions	☑	☐	?

Specify: No flow at Hwy #7 so either a downstream obstruction or natural loss of flow

Streambank Vegetation Cover Type (✓)

Upland hardwoods	☐	Hardwood swamp	☐
Upland conifers	☐	Conifer swamp	☐
Upland mixedwoods	☑	Mixedwood swamp	☐
Upland shrubs/brush	☑	Shrub swamp	☐
Grassland/old field	☑	Treed bog/fen	☐
Rock outcrop	☐	Marsh/open fen	☐

Streambank Vegetation Density (✓)

☐ Nil ☐ Sparse ☐ Moderate ☑ Dense

Bottom Substrate Type	%		%
Bedrock:		Silt:	60
Boulder:		Clay:	
Rubble:		Muck:	40
Gravel:		Detritus:	
Sand:			

Stream Dimensions (~~ft.~~ m) of Representative Cross-Sectional Area

Average Width 3.6 Average Depth 0.5 Depth Range from 0.15 to 1.2 ~~feet~~ metres

Flow Volume (✓) ☐ Permanent ☑ Seasonal

Current (✓)

☐ Still ☑ Slow ☐ Medium ☐ Fast

Streambank Erosion (✓)

☑ Nil ☐ Slight ☐ Moderate ☐ High

Stream Morphology (✓)

☐ Rapids ☐ Riffles ☐ Runs ☑ Pools ☐ Flats

Water Colour (✓)

☐ Colourless ☑ Yellow/Brown ☐ Blue/Green ☐ Turbid ☐ Other _____

Aquatic Vegetation (✓)

	Nil	Sparse	Moderate	Dense	Dominant Species
Emergent	☐	☑	☐	☐	water parsnip, reed canary grass
Submergent	☐	☐	☑	☐	milfoil
Floating	☑	☐	☐	☐	

Site Topography (✓)

☐ Flat ☑ Undulating ☐ Rolling ☐ Strongly Rolling ☐ Hilly/Steep

Fish Sampling Gear Used (✓)

☐ Seine Net ☐ Gill Net ☐ Dip Net ☐ Angled ☐ Minnow Trap
☑ Other electroshocker ☐ None

Length of net used _____ feet, and size of mesh _____ inches

Sample Retention (✓)

☐ All kept ☐ None kept ☐ Some kept ☑ No catch

Record of Fish Caught

	Species	Number	Size Range (inches)
1.	NA		
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			

Wildlife Observations monarch butterfly

General Comments shocking distance = 40m and time = 575 seconds
- meander pool mostly holds stormwater
- water levels have recently dropped 0.25 to 0.3m
- dragonfly nymphs, leeches, snails, water striders and water boatmen observed

STREAM SURVEY

Date: July 20, 1995

Surveyors: Garry Perfect + Mike Robinson

Station No.: 2

Station Length: 20m

Property: Dick

Location: Eramosa Twp. Con 6, lot 1

UTM Grid Reference: Block NU
Grid E 721 N 293

Air Photo: Flight Line 78-4343
Plate No. 223

Water Temperature: _____ Air Temperature: _____

Instream Cover Type (✓)

☐ Under-cut banks ☐ Boulders ☑ Logs and Trees ☐ Organic Debris ☑ Aquatic Vegetation

Instream Cover Density (✓)

☐ Nil ☐ Sparse ☑ Moderate ☐ Dense

Barriers to Water Flow and Fish Migration (✓)

	Yes	No	Number
Beaver Dams	☐	☐	
Beaver Lodges	☐	☐	
Other Dams/Obstructions	☑	☐	1

Specify: Downstream culvert at rear of house was installed at too high of an invert elevation to facilitate an even flow of water (ie. min waterfall at downstream end of pipe). There also seems to be a gradual loss of flow in the stream which suggests infiltration into the stream bed.

Streambank Vegetation Cover Type (✓)

Upland hardwoods	☐	Hardwood swamp	☐
Upland conifers	☐	Conifer swamp	☐
Upland mixedwoods	☑	Mixedwood swamp	☐
Upland shrubs/brush	☑	Shrub swamp	☐
Grassland/old field	☐	Treed bog/fen	☐
Rock outcrop	☐	Marsh/open fen	☐

Streambank Vegetation Density (✓)

☐ Nil ☐ Sparse ☐ Moderate ☑ Dense

Bottom Substrate Type

	%		%
Bedrock:		Silt:	50
Boulder:		Clay:	
Rubble:	10	Muck:	10
Gravel:		Detritus:	10
Sand:	20		

Stream Dimensions ~~(ft.)~~ (m) of Representative Cross-Sectional Area

Average Width 1.5 Average Depth 0.2 Depth Range from 0.02 to 0.3 ~~feet~~ metres

Flow Volume (✓) ☐ Permanent ☑ Seasonal

Current (✓)

☐ Still ☑ Slow ☐ Medium ☐ Fast

Streambank Erosion (✓)

☐ Nil ☐ Slight ☑ Moderate ☐ High

Stream Morphology (✓)

☐ Rapids ☐ Riffles ☑ Runs ☐ Pools ☐ Flats

Water Colour (✓)

☐ Colourless ☑ Yellow/Brown ☐ Blue/Green ☐ Turbid ☐ Other _____

Aquatic Vegetation (✓)

	Nil	Sparse	Moderate	Dense	Dominant Species
Emergent	☐	☐	☑	☐	reed canary grass
Submergent	☑	☐	☐	☐	
Floating	☑	☐	☐	☐	

Site Topography (✓)

☐ Flat ☑ Undulating ☐ Rolling ☐ Strongly Rolling ☐ Hilly/Steep

Fish Sampling Gear Used (✓)

☐ Seine Net ☐ Gill Net ☐ Dip Net ☐ Angled ☐ Minnow Trap
☐ Other_____ ☑ None

Length of net used _____ feet, and size of mesh _____ inches

Sample Retention (✓)

☐ All kept ☐ None kept ☐ Some kept ☑ No catch

Record of Fish Caught

	Species	Number	Size Range (inches)
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			

Wildlife Observations_____

General Comments Streambank erosion evident about 0.8m above existing water levels, thus indicating spring flooding.
- Water striders, snails, leeches and water boatmen observed, but no "fish"
- Streambank vegetation shades over 75% of this reach

STREAM SURVEY

Date: July 20, 1995

Surveyors: Garry Perfect & Mike Robinson

Station No.: 3

Station Length: 40m

Property: Dick

Location: Eramosa Twp. Con. 6, lot 1

UTM Grid Reference: Block NU
Grid E 720 N 294

Air Photo: Flight Line 78-4343
Plate No. 223

Water Temperature: _____ Air Temperature: _____

Instream Cover Type (✓)

☑ Under-cut banks ☐ Boulders ☑ Logs and Trees ☐ Organic Debris ☑ Aquatic Vegetation

Instream Cover Density (✓)

☐ Nil ☐ Sparse ☐ Moderate ☑ Dense

Barriers to Water Flow and Fish Migration (✓)

	Yes	No	Number
Beaver Dams	☐	☑	
Beaver Lodges	☐	☑	
Other Dams/Obstructions	☐	☑	

Specify: _____

Streambank Vegetation Cover Type (✓)

Upland hardwoods	☐	Hardwood swamp	☐
Upland conifers	☐	Conifer swamp	☐
Upland mixedwoods	☐	Mixedwood swamp	☐
Upland shrubs/brush	☑	Shrub swamp	☐
Grassland/old field	☑	Treed bog/fen	☐
Rock outcrop	☐	Marsh/open fen	☐

Streambank Vegetation Density (✓)

☐ Nil ☐ Sparse ☐ Moderate ☑ Dense

Bottom Substrate Type	%		%
Bedrock:		Silt:	70
Boulder:		Clay:	
Rubble:		Muck:	20
Gravel:		Detritus:	10
Sand:			

Stream Dimensions (~~ft.~~ m) of Representative Cross-Sectional Area

Average Width 0.6 Average Depth 0.12 Depth Range from 0.05 to 0.6 ~~feet~~ metres

Flow Volume (✓) ☐ Permanent ☑ Seasonal

Current (✓)

☐ Still ☑ Slow ☐ Medium ☐ Fast

Streambank Erosion (✓)

☐ Nil ☑ Slight ☐ Moderate ☐ High

Stream Morphology (✓)

☐ Rapids ☑ Riffles ☐ Runs ☑ Pools ☐ Flats

(up to 0.6 m deep)

Water Colour (✓)

☐ Colourless ☑ Yellow/Brown ☐ Blue/Green ☐ Turbid ☐ Other _____

Aquatic Vegetation (✓)

	Nil	Sparse	Moderate	Dense	Dominant Species
Emergent	☐	☐	☑	☐	reed canary grass
Submergent	☐	☑	☐	☐	milfoil
Floating	☑	☐	☐	☐	

Site Topography (✓)

☐ Flat ☑ Undulating ☐ Rolling ☐ Strongly Rolling ☐ Hilly/Steep

Fish Sampling Gear Used (✓)

☐ Seine Net ☐ Gill Net ☐ Dip Net ☐ Angled ☐ Minnow Trap
☑ Other electro shocker ☐ None

Length of net used _____ feet, and size of mesh _____ inches

Sample Retention (✓)

☐ All kept ☐ None kept ☐ Some kept ☑ No catch

Record of Fish Caught

	Species	Number	Size Range (inches)
1.	NA		
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			

Wildlife Observations leopard frog

General Comments Shocking distance = 40 m and time = 816 seconds
- large log parallel to bank provides good cover for fish
- poplar, speckled alder and willow shrubs shade about 70% of this reach of the stream

STREAM SURVEY

Date: July 20, 1995

Surveyors: Garry Perfect + Mike Robinson

Station No.: 4

Station Length: 40m

Property: Dick

Location: Eramosa Twp. Con. 6, lot 1

UTM Grid Reference: Block NU
Grid E 720 N 295

Air Photo: Flight Line 78-4343
Plate No. 223

Water Temperature: _____ Air Temperature: _____

Instream Cover Type (✓)

☑ Under-cut banks ☐ Boulders ☐ Logs and Trees ☐ Organic Debris ☑ Aquatic Vegetation

Instream Cover Density (✓)

☐ Nil ☐ Sparse ☐ Moderate ☑ Dense

Barriers to Water Flow and Fish Migration (✓)

	Yes	No	Number
Beaver Dams	☐	☑	
Beaver Lodges	☐	☑	
Other Dams/Obstructions	☐	☑	

Specify: _____

Streambank Vegetation Cover Type (✓)

Upland hardwoods	☐	Hardwood swamp	☐
Upland conifers	☐	Conifer swamp	☐
Upland mixedwoods	☐	Mixedwood swamp	☐
Upland shrubs/brush	☑	Shrub swamp	☐
Grassland/old field	☑	Treed bog/fen	☐
Rock outcrop	☐	Marsh/open fen	☐

Streambank Vegetation Density (✓)

☐ Nil ☐ Sparse ☐ Moderate ☑ Dense

Bottom Substrate Type	%		%
Bedrock:		Silt:	20
Boulder:		Clay:	
Rubble:		Muck:	
Gravel:		Detritus:	
Sand:	80		

Stream Dimensions (m) of Representative Cross-Sectional Area

Average Width 0.3 Average Depth 0.05 Depth Range from 0.02 to 0.08 ~~feet~~ metres

Flow Volume (✓) ☐ Permanent ☑ Seasonal

Current (✓)

☐ Still ☐ Slow ☑ Medium ☐ Fast

Streambank Erosion (✓)

☐ Nil ☑ Slight ☐ Moderate ☐ High

Stream Morphology (✓)

☐ Rapids ☑ Riffles ☐ Runs ☐ Pools ☐ Flats

Water Colour (✓)

☑ Colourless ☐ Yellow/Brown ☐ Blue/Green ☐ Turbid ☐ Other _____

Aquatic Vegetation (✓)

	Nil	Sparse	Moderate	Dense	Dominant Species
Emergent	☐	☐	☑	☐	reed canary grass
Submergent	☑	☐	☐	☐	
Floating	☑	☐	☐	☐	

Site Topography (✓)

☐ Flat ☑ Undulating ☐ Rolling ☐ Strongly Rolling ☐ Hilly/Steep

Fish Sampling Gear Used (✓)

☐ Seine Net ☐ Gill Net ☐ Dip Net ☐ Angled ☐ Minnow Trap
☐ Other_____ ☑ None

Length of net used _____ feet, and size of mesh _____ inches

Sample Retention (✓)

☐ All kept ☐ None kept ☐ Some kept ☑ No catch

Record of Fish Caught

	Species	Number	Size Range (inches)
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			

Wildlife Observations deer browsing on shrubs

General Comments - current is much faster than at other stations
- clear water flows through a lowland meadow
- no fish observed

APPENDIX E

CURRICULA VITAE

Curriculum Vitae

Greg W. Scheifele, M.A., R.P.F.

Education

1987	M.A. Regional Planning and Resource Development, University of Waterloo
1976-1982	Ontario Professional Foresters Association - Membership Courses Faculty of Forestry, University of Toronto
1974-1975	Graduate Courses in Biogeography and Resource Management York University
1973	B.A. (Honours), Physical Geography and Biology University of Guelph

Societies

Ontario Professional Foresters Association
International Society of Arboriculture
Ontario Woodlot Association

Certification

Managed Forest Plan Approver for the Ontario Managed Forest Tax Incentive Program
Butternut Health Assessor for the Endangered Species Act, 2007

Professional Experience

1999 - Present	Principal Ecologist/Forester, GWS Ecological & Forestry Services Inc., Cambridge, Ontario
1997 - 1999	Senior Ecologist/Forester, MacKinnon & Associates, Waterloo, Ontario
1995 - 1996	General Manager, Prime Environmental Consultants Limited, Kitchener, Ontario
1988 - 1995	Manager of Forestry and Natural Resources, Environmental Planning Services Division, Gore & Storrie Limited, Cambridge, Ontario
1981 - 1988	Senior Forester and Environmental Planner, Ecologistics Limited, Waterloo, Ontario
1980 - 1981	Log Buyer and Operations Supervisor, Ernest Moore Limited/Simpson Lumber Limited, Cambridge, Ontario
1975 - 1979	Biologist/Forester, Land Management Division Grand River Conservation Authority, Cambridge, Ontario
1974	Biologist, Grand River Conservation Authority, Cambridge, Ontario
1973	Biologist, Ministry of Natural Resources, Cambridge, Ontario

GWS Ecological & Forestry Services Inc.
4670 Townline Road, Cambridge, ON. N3C 2V1
Tel: (519) 651-2224 Fax: (519) 651-2002
E-mail: gwsefs@sympatico.ca

PROFILE OF PROFESSIONAL EXPERIENCE

As a Professional Consultant, Mr. Scheifele has been responsible for a wide variety of projects focusing on environmental evaluations and the management of natural resources. Specific areas of expertise and supervision encompass ecology, forestry, soil survey, wetland evaluation, wildlife inventory and habitat assessment, and resource oriented rural land use planning studies. He has also conducted several Environmental Assessments, as well as numerous community planning and resource development projects for First Nations in northern and southern Ontario.

REPRESENTATIVE PROJECTS

a) Environmental Overviews, Impact Statements, Monitoring and Restoration Plans

- Natural Environment Peer Reviews of Proposed Mineral Aggregate Extraction Operations and Draft Plans of Subdivision in Puslinch Township, Wellington County from 1997 to present
- Served on the Environmental and Ecological Advisory Committee of the Regional Municipality of Waterloo from 1987 to 1994 (Chairman from 1992 onwards) providing technical comments on the potential impacts of proposed development applications to Environmentally Sensitive Policy Areas (ESPA) and other environmental issues as requested by planning staff and Regional Council
- Environmental Impact Study (EIS) for the Westminister Woods Subdivision and follow-up Tree Conservation Plans and Terrestrial Monitoring, Guelph*
- Township of Kincardine Waste Disposal Site North Penetangore River Biomonitoring Program, Kincardine
- Environmental Implementation Report (EIR) for Slope Rehabilitation at the Morningside Retirement Village, including DFO requirements for Fish Habitat Compensation, Mitigation and Monitoring, New Hamburg
- Edinburgh Road Dairy Bush EIS and follow-up Ecological Enhancement Plan and Terrestrial Monitoring, Guelph*
- North Oakville Natural Heritage Inventory and Analysis - Forestry Component, Oakville. Prepared in Association with LGL limited
- Environmental Overview for the Proposed Expansion to the TCG Fonthill Pit, Town of Pelham
- EIS and Planting Plan for the Proposed Storm Water Management Facility (constructed wetland) at the Piller's Industrial Development, Waterloo*
- EIR and Follow-up Environmental Monitoring for the Clair Hills and Erbsville Road Subdivisions, Waterloo *
- EIS for a Proposed Pit and Quarry Operation at the Dick Property, Eramosa Township *
- Bridgeport North Community Environmental Overview and EIR including Ecological Enhancement Planting Plans for Constructed Wetland Stormwater Management Facilities, Kitchener *
- Forestry and Rural Planning Analysis of Proposed Estate Residential Development on the Padfield Property, Normanby Township
- Hespeler East Master Drainage Implementation Study, Cambridge *
- Laurentian West Community Plan Environmental Review, Kitchener *
- Shell/Burloak Planning Review, Oakville

a) Environmental Overviews, Impact Statements, Monitoring and Restoration Plans (continued)

- Preliminary Environmental Report for a Proposed Gas Pipeline to the Canadian Pacific Forest Products Mill at Dryden, Ontario
- Proposed Pipeline Relocation at the Newcastle Landfill Site (Trans Canada Pipelines)
- Carlisle Golf and Country Club Wetland Assessment, Carlisle *
- Year-After Environmental Monitoring, Brampton (Trans Canada Pipelines)
- Duff Property Environmental Impact Assessment and Rehabilitation Plan for a Proposed Sand and Gravel Pit, Georgetown

b) Environmental Assessments

- Bridgeport North/Lexington East Communities Sanitary Sewage Servicing Class Environmental Assessment, Kitchener *
- West River Road Trunk Storm Sewer Outfall Class Environmental Assessment, Cambridge
- Middle Strasburg Creek Trunk Sanitary Sewer Class Environmental Assessment and Environmental Impact Statement to Delineate the Extent of Developable Lands, Natural Environment Component, Kitchener *
- West Side Trunk Sanitary Sewer Class Environmental Assessment, Natural Environment Component, Waterloo *
- New Hamburg/Baden Wastewater Treatment Class Environmental Assessment, Natural and Social Environments Component, Regional Municipality of Waterloo *
- Village of Shallow Lake Waterworks Class Environmental Assessment, Phase 3 Inventory and Evaluation of Natural and Social Environments, Grey County
- Class Environmental Assessment for the Hespeler East Trunk Storm Sewer Outlet, Cambridge *
- Chelmsford Pollution Control Strategy Class Environmental Assessment, Sudbury
- Belleville Water Supply Program Class Environmental Assessment, Belleville
- Class Environmental Assessment for a Proposed Water Storage Reservoir, Owen Sound
- Environmax Recycling and Integrated Waste Management Facility (Full E.A.), Cayuga *
- Class Environmental Assessment for the Clarkson Water Pollution Control Plant Expansion, Mississauga

c) Wetland Studies

- Re-Evaluation of Selected Wetlands, Cambridge District, Ministry of Natural Resources
- Special Features Survey of Selected Wetlands in Maple District, Ministry of Natural Resources

* *Various Projects Requiring Wetland Evaluation*

d) Forest Inventories, Plans and Resource Valuations

- Whistle Bear Golf Course Managed Forest Plan (MFTIP), Cambridge
- Forest Inventory and Preliminary Forest Management Plan for Waterloo Region Forest Properties (1,076 acres)
- Prophet River First Nation Forestry Compensation Claim (24,447 acres), Fort Nelson, British Columbia
- Historical Overview and Comparative Analysis of the Whitefish Lake First Nation Timber Claim, Sudbury
- Twenty Year Forest Management Plan and 5-Year Operating Plan for Grey County Forest Properties (8,164 acres)
- Land Force Central Area Training Centre Meaford 20-Year Forest Management Plan (2002 to 2021) and 5-Year Operating Plan (18,903 acres), Grey County. Prepared in association with the Grey Sauble Conservation Authority
- Moosomin & Thunderchild 1908/09 Surrender Land Claims, Forestry Loss of Use Study, Battleford, Saskatchewan
- Kainaiwa 1889 Surrender Land Claim Forestry Loss of use Study, Lethbridge, Alberta
- Forest Mangement Plan for the Kettle Point Indian Reserve No. 44 (2,600 acres)
- Kahkewistahaw 1907 Surrender Land Claim Forestry Loss of Use Study, Broadview, Saskatchewan
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- Review of the Forestry Loss of Use Study for the Compensation Claim of the Brunswick House First Nation, Chapleau
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- Woolwich Township Tree Inventory, Township of Woolwich

d) Forest Inventories, Plans and Resource Valuations (continued)

- Forest Inventory Update of the Wikwemikong Unceded Indian Reserve (102,000 acres) and Provision of a Silvicultural Worker Training Program, Manitoulin Island
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PUBLICATIONS

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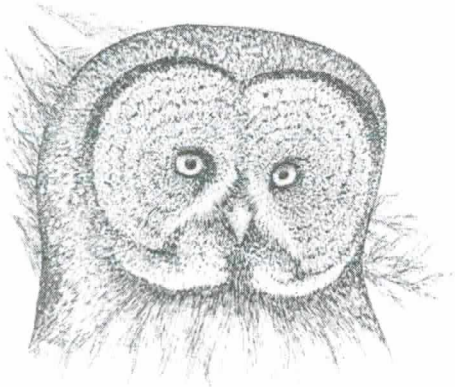
Scheifele, G.W. and Mulamoottil, G. *Predictive Models Applicable to Ontario's Wetland Evaluation System.* Presented at Wetlands '87 Symposium, Edmonton, 1988.

Scheifele, G.W., *An Assessment of Ontario's Wetland Evaluation System with Reference to Predictive Models and Environmentally Sensitive Areas Studies,* Waterloo: University of Waterloo Press, 1987.



GRAY OWL ENVIRONMENTAL INC.

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grayowlenvironmental@sympatico.ca

AL SANDILANDS, B.SC.

EDUCATION

B.Sc., Biology, University of Waterloo, 1970
Temperate Wetlands Restoration Course, 1996

PROFESSIONAL AFFILIATIONS

Canadian Society of Ornithologists
American Ornithologists' Union
Ontario Field Ornithologists, Director and Editor of Ontario Birds, 1990
Wilson Ornithological Society
Bird Studies Canada, Trustee, James L. Baillie Fund, 1994-2006
Haldimand Bird Observatory, Director, 1998-2005
Ontario Breeding Bird Atlas: Chair, Publication Committee, 2002-2007
Member, Technical Committee, 2000-2004
Member, Significant Species Committee, 2000-2007
Species Account Editor, 2006-2007
Ontario Waterbird Conservation Plan: Member, Technical Working Group, 2007-2009

POSITIONS HELD

2003 to present: Gray Owl Environmental Inc., Principal, Senior Ecologist
1998-2003: ESG International, Guelph, Principal, Senior Ecologist
1995-1997: ESG International, Guelph, Senior Ecologist
1988-1995: Gore & Storrie Limited, Senior Biologist/Manager, Biology and Fisheries Section
1980-1988: Ecologistics Limited, Senior Biologist
1971-1979: Grand River Conservation Authority, Biologist

SELECTED EXPERIENCE

Ecosystem and Municipal Planning

- A Review of the Yellow Rail in Ontario. Prepared for the Canadian Wildlife Service. 2009.
- A Review of the King Rail in Ontario. Prepared for the Canadian Wildlife Service. 2009.
- Annotated Literature Review of the Least Bittern and Proposed Pilot Study for Least Bittern at St. Clair National Wildlife Area. Prepared for the Canadian Wildlife Service. 2009.
- Species at Risk Best Available Information Summaries for 11 bird species. Prepared for the Ontario Ministry of Natural Resources. 2008.
- Draft Northern Bobwhite Recovery Strategy. Prepared for the Canadian Wildlife Service. 2008.
- Castle Glen Environmental Constraints Impact Analysis. Prepared for Castle Glen Development Corporation. 2007-2008.
- Technical writer for the Ontario Waterbird Conservation Plan. Prepared for the Ontario Ministry of Natural Resources and the Canadian Wildlife Service. 2007-2009.

- Background Information for the Ontario Waterbird Conservation Plan. Prepared for the Ontario Ministry of Natural Resources and the Canadian Wildlife Service. 2007.
- Second Update of the Significant Wildlife Habitat Decision Support System. Prepared for the Ontario Ministry of Natural Resources. 2007.
- Smithville Strategic Growth Management Plan. Prepared for the Township of West Lincoln. 2007-2008.
- Castle Glen Official Plan. Prepared for the Castle Glen Development Corporation. 1999-2006.
- North Leslie Secondary Plan. Prepared for Emery Investments and the Bayview East Landowners Group. 2002-2006.
- Significant Wildlife Habitat Decision Support System. Prepared for the Ontario Ministry of Natural Resources. 2002.
- Significant Wildlife Habitat Technical Guide. Prepared for the Ontario Ministry of Natural Resources. 2000.
- Temperate Wetland Restoration Guidelines. Prepared for the Ontario Ministry of Natural Resources, Canadian Wildlife Service, and Ducks Unlimited Canada. 1996.

Watershed Planning Studies

- Halton and Hamilton Water Use Study. Prepared for Conservation Halton and the Hamilton Region Conservation Authority. 2006.
- Humber River Wet Weather Flow Master Plan. Prepared for the City of Toronto. 2002.
- Completion of the biological component of 13 other watershed and Master Drainage Plans. 1988 to 2001.

Wildlife

Mr. Sandilands is currently writing a book on the habitat requirements, limiting factors and status of the birds of Ontario. He also completed a four-year field study for Ontario Hydro to determine the effects of forest fragmentation on breeding birds. He has extensive experience with herptofauna; he completed morphological studies on Butler's garter snake at Luther Marsh and wrote the COSEWIC report on it. On Pelee Island, he identified significant habitat for the endangered blue racer and Lake Erie water snake, and for the threatened eastern fox snake, eastern massasauga, and eastern hognose snake on Giant's Tomb Island. He completed studies on Jefferson salamanders and other amphibians near Milton and Cambridge and several other southern Ontario locations.

Environmental Impact Assessment

- Dain City EIS, Region of Niagara. Prepared for Colville Consulting Inc. 2006.
- Eugenia EIS, County of Grey. Prepared for Stovel & Associates Inc. 2006.
- Fox Property EIS and Peer Review, Region of Niagara. Prepared for Colville Consulting Inc. 2006-2007.
- Walker Brothers Compost Facility, Region of Niagara. Prepared for Walker Brothers. 2005.
- Block 20, Vaughan. Prepared for Ages Consultants Limited. 2005.
- Gibbs Property EIS, Simcoe County. Prepared for RJ Burnside and Associates Limited. 2004.
- Brookville Golf Course, Halton Region. Prepared for RJ Burnside and Associates Limited. 2004.
- Cambridge Golf Course Severance, Region of Waterloo. Prepared for the Cambridge Golf Course. 2004.
- Aurora Golf Course, Region of York. Prepared for Ages Consultants Limited. 2004-2005.
- Blue Water Canoe Club Subdivision, Simcoe County. Prepared for Riverdale. 2003.
- Bayfield North ANSI EIS, Huron County. Prepared for Five Seasons Estates. 2003.
- Palgrave Estates West EIS and Oak Ridges Moraine Conformity Report, Peel Region.

Prepared for the Equestrian Management Group. 2003-2004.

Aggregate Resources

- Preparation and implementation of an exemption under the *Endangered Species Act, 2007* for common hoptree, scarlet ammania, and eastern foxsnake on Pelee Island. Prepared for Pelee Quarries Ltd. 2009.
- evaluation of noise effects on wildlife for the Rockfort Quarry. Goodban Environmental Consulting. 2009.
- Cater Gravel Pit Wildlife Component. Prepared for The Miller Group Limited. 2008-2009.
- Preparation of a habitat enhancement plan for endangered species on Pelee Island under Section 58 of the *Endangered Species Act, 2007*. Prepared for Pelee Quarries Ltd. 2007-2008.
- Sayers and Sharp Gravel Pit Level 1 Natural Environment Report, Essex County. Prepared for Erie Sand & Gravel Limited. 2006.
- Reeb Quarry Woodland Restoration, Niagara Region. Prepared for M.A.Q. Aggregates Inc. 2006-2007.
- Acton Quarry Extensions Level 1&2 Natural Environment Report, Halton Region. Prepared for Dufferin Aggregates. 2005-2007.
- Inverhaven Gravel Pit Terrestrial Inventory, Wellington County. Prepared for the Murray Group. 2006, 2008.
- VicDom Gravel Pit Terrestrial Inventory, Durham Region. Prepared for Colville Consulting Inc. 2006.
- Dan Gravel Pit Level 1&2 Natural Environment Report, Essex County. Prepared for Erie Sand & Gravel. 2006.
- Preston Sand & Gravel Terrestrial Inventory, Wellington County. Prepared for Preston Sand & Gravel. 2005.
- Robinson-Kovacs Pit Expansion Level 1&2 Environment Report and Oak Ridges Moraine Conformity Report. Prepared for Skelton-Brumwell and Associates. 2005-2006.
- Manitoulin Island Quarry Input to Level 1&2 Natural Environment Report, Manitoulin Island. Prepared for LaFarge. 2004.
- Willroy-Brooks Pit Terrestrial Inventory, Halton Region. Prepared for J.C. Duff Sand and Gravel. 2004.
- Crystal Lake Vermiculite Mine EIS, Peterborough County. Prepared for Vermiculite Corporation of Canada. 2003-2004.
- McGill Pit Terrestrial Inventory, Kemptville. Prepared for LaFarge. 2003.
- Milton Quarry Extension Study on Jefferson Salamanders, Halton Region. Prepared for Dufferin Aggregates 2002-2004.
- Pelee Island Quarries Study on Blue Racers and Lake Erie Water Snakes, Essex County. Prepared for Pelee Quarries Limited. 1998-2004.
- Seres Pit Level 1&2 Natural Environment Report, Essex County. Prepared for Erie Sand & Gravel Limited. 2002-2003.

Environmental Assessment

- Smithville Wastewater Servicing Study. Prepared for XCG Consultants Ltd. and the Regional Municipality of Niagara. 2008.
- Former Camp Ipperwash Unexploded Ordinance Study, Search for Species at Risk. Prepared for Neegan Burnside Limited and the Department of National Defence. 2007-2009.
- Byersville/Harper Creek Flood Remediation EA, Peterborough. Prepared for the City of Peterborough. 2007.
- Bears Creek Flood Remediation EA, Peterborough. Prepared for the City of Peterborough. 2006-2007.
- Moose Deer Point First Nation Water Supply EA, District of Muskoka. Prepared for the

Moose Deer Point First Nation. 2006.

- Wolfe Island Wind Farm Public Meetings. Prepared for Canadian Hydro Developers, Inc. 2006.
- Simcoe County Road 90 Upgrade, Simcoe County. Prepared for Simcoe County. 2005.
- Melanchton 1 Windfarm Bird Surveys, Dufferin County. Prepared for Canadian Hydro Developers, Inc. 2004-2005.
- Tay Area Water System, Simcoe County. Prepared for Tay Township. 2004.
- Howe Island Ferry Upgrade EA, Frontenac County. Prepared for the Ontario Ministry of Transportation. 2003.
- Feasibility Study for the Upgrade of Highway 24 between Highways 401 and 403, Brant County and Waterloo Region. Prepared for the Ontario Ministry of Transportation. 2002-2003.
- Cambridge Area Route Selection Study, Waterloo Region. Prepared for the Regional Municipality of Waterloo. 1999-2002.
- Lester B. Pearson International Airport Expansion and Airside Development EA. Prepared for Transport Canada. 1993-1994.

International Experience

Mr. Sandilands completed the natural environment component for the Qurum Beach Resort in the Sultanate of Oman. The proposal was to build a 150-room luxury hotel, a water park, and a new access road adjacent to a mangrove swamp. This required assessment of impacts on the mangrove swamp, prawns, molluscs, fish, and birds. Opportunities for enhancing the existing swamp and creating an additional 10 ha of mangrove swamp were identified.

Other international work includes Mill Creek Restoration, Cincinnati, Ohio and opportunities to restore Upper Mill Creek Watershed in Butler County, Ohio.

Hearings

Mr. Sandilands has appeared as an expert witness before the Ontario Municipal Board, the Joint Board, the Ontario Environmental Assessment Board, the Niagara Escarpment Commission, and a federal Environmental Assessment and Review Process panel.

LIST OF SELECTED PUBLICATIONS AND PRESENTATIONS IS AVAILABLE UPON REQUEST

Curriculum Vitae

Greg W. Scheifele, M.A., R.P.F.

Education

1987	M.A. Regional Planning and Resource Development, University of Waterloo
1976-1982	Ontario Professional Foresters Association - Membership Courses Faculty of Forestry, University of Toronto
1974-1975	Graduate Courses in Biogeography and Resource Management York University
1973	B.A. (Honours), Physical Geography and Biology University of Guelph

Societies

Ontario Professional Foresters Association
International Society of Arboriculture
Ontario Woodlot Association

Certification

Managed Forest Plan Approver for the Ontario Managed Forest Tax Incentive Program
Butternut Health Assessor for the Endangered Species Act, 2007

Professional Experience

1999 - Present	Principal Ecologist/Forester, GWS Ecological & Forestry Services Inc., Cambridge, Ontario
1997 - 1999	Senior Ecologist/Forester, MacKinnon & Associates, Waterloo, Ontario
1995 - 1996	General Manager, Prime Environmental Consultants Limited, Kitchener, Ontario
1988 - 1995	Manager of Forestry and Natural Resources, Environmental Planning Services Division, Gore & Storrie Limited, Cambridge, Ontario
1981 - 1988	Senior Forester and Environmental Planner, Ecologistics Limited, Waterloo, Ontario
1980 - 1981	Log Buyer and Operations Supervisor, Ernest Moore Limited/Simpson Lumber Limited, Cambridge, Ontario
1975 - 1979	Biologist/Forester, Land Management Division Grand River Conservation Authority, Cambridge, Ontario
1974	Biologist, Grand River Conservation Authority, Cambridge, Ontario
1973	Biologist, Ministry of Natural Resources, Cambridge, Ontario

PROFILE OF PROFESSIONAL EXPERIENCE

As a Professional Consultant, Mr. Scheifele has been responsible for a wide variety of projects focusing on environmental evaluations and the management of natural resources. Specific areas of expertise and supervision encompass ecology, forestry, soil survey, wetland evaluation, wildlife inventory and habitat assessment, and resource oriented rural land use planning studies. He has also conducted several Environmental Assessments, as well as numerous community planning and resource development projects for First Nations in northern and southern Ontario.

REPRESENTATIVE PROJECTS

a) Environmental Overviews, Impact Statements, Monitoring and Restoration Plans

- Natural Environment Peer Reviews of Proposed Mineral Aggregate Extraction Operations and Draft Plans of Subdivision in Puslinch Township, Wellington County from 1997 to present

- Served on the Environmental and Ecological Advisory Committee of the Regional Municipality of Waterloo from 1987 to 1994 (Chairman from 1992 onwards) providing technical comments on the potential impacts of proposed development applications to Environmentally Sensitive Policy Areas (ESPA) and other environmental issues as requested by planning staff and Regional Council

- Environmental Impact Study (EIS) for the Westminister Woods Subdivision and follow-up Tree Conservation Plans and Terrestrial Monitoring, Guelph*

- Township of Kincardine Waste Disposal Site North Penetangore River Biomonitoring Program, Kincardine

- Environmental Implementation Report (EIR) for Slope Rehabilitation at the Morningside Retirement Village, including DFO requirements for Fish Habitat Compensation, Mitigation and Monitoring, New Hamburg

- Edinburgh Road Dairy Bush EIS and follow-up Ecological Enhancement Plan and Terrestrial Monitoring, Guelph*

- North Oakville Natural Heritage Inventory and Analysis - Forestry Component, Oakville. Prepared in Association with LGL limited

- Environmental Overview for the Proposed Expansion to the TCG Fonthill Pit, Town of Pelham

- EIS and Planting Plan for the Proposed Storm Water Management Facility (constructed wetland) at the Piller's Industrial Development, Waterloo*

- EIR and Follow-up Environmental Monitoring for the Clair Hills and Erbsville Road Subdivisions, Waterloo *

- EIS for a Proposed Pit and Quarry Operation at the Dick Property, Eramosa Township *

- Bridgeport North Community Environmental Overview and EIR including Ecological Enhancement Planting Plans for Constructed Wetland Stormwater Management Facilities, Kitchener *

- Forestry and Rural Planning Analysis of Proposed Estate Residential Development on the Padfield Property, Normanby Township

- Hespeler East Master Drainage Implementation Study, Cambridge *

- Laurentian West Community Plan Environmental Review, Kitchener *

- Shell/Burloak Planning Review, Oakville

a) Environmental Overviews, Impact Statements, Monitoring and Restoration Plans (continued)

- Preliminary Environmental Report for a Proposed Gas Pipeline to the Canadian Pacific Forest Products Mill at Dryden, Ontario
- Proposed Pipeline Relocation at the Newcastle Landfill Site (Trans Canada Pipelines)
- Carlisle Golf and Country Club Wetland Assessment, Carlisle *
- Year-After Environmental Monitoring, Brampton (Trans Canada Pipelines)
- Duff Property Environmental Impact Assessment and Rehabilitation Plan for a Proposed Sand and Gravel Pit, Georgetown

b) Environmental Assessments

- Bridgeport North/Lexington East Communities Sanitary Sewage Servicing Class Environmental Assessment, Kitchener *
- West River Road Trunk Storm Sewer Outfall Class Environmental Assessment, Cambridge
- Middle Strasburg Creek Trunk Sanitary Sewer Class Environmental Assessment and Environmental Impact Statement to Delineate the Extent of Developable Lands, Natural Environment Component, Kitchener *
- West Side Trunk Sanitary Sewer Class Environmental Assessment, Natural Environment Component, Waterloo *
- New Hamburg/Baden Wastewater Treatment Class Environmental Assessment, Natural and Social Environments Component, Regional Municipality of Waterloo *
- Village of Shallow Lake Waterworks Class Environmental Assessment, Phase 3 Inventory and Evaluation of Natural and Social Environments, Grey County
- Class Environmental Assessment for the Hespeler East Trunk Storm Sewer Outlet, Cambridge *
- Chelmsford Pollution Control Strategy Class Environmental Assessment, Sudbury
- Belleville Water Supply Program Class Environmental Assessment, Belleville
- Class Environmental Assessment for a Proposed Water Storage Reservoir, Owen Sound
- Environmax Recycling and Integrated Waste Management Facility (Full E.A.), Cayuga *
- Class Environmental Assessment for the Clarkson Water Pollution Control Plant Expansion, Mississauga

c) Wetland Studies

- Re-Evaluation of Selected Wetlands, Cambridge District, Ministry of Natural Resources
- Special Features Survey of Selected Wetlands in Maple District, Ministry of Natural Resources

* *Various Projects Requiring Wetland Evaluation*

d) Forest Inventories, Plans and Resource Valuations

- Whistle Bear Golf Course Managed Forest Plan (MFTIP), Cambridge
- Forest Inventory and Preliminary Forest Management Plan for Waterloo Region Forest Properties (1,076 acres)
- Prophet River First Nation Forestry Compensation Claim (24,447 acres), Fort Nelson, British Columbia
- Historical Overview and Comparative Analysis of the Whitefish Lake First Nation Timber Claim, Sudbury
- Twenty Year Forest Management Plan and 5-Year Operating Plan for Grey County Forest Properties (8,164 acres)
- Land Force Central Area Training Centre Meaford 20-Year Forest Management Plan (2002 to 2021) and 5-Year Operating Plan (18,903 acres), Grey County. Prepared in association with the Grey Sauble Conservation Authority
- Moosomin & Thunderchild 1908/09 Surrender Land Claims, Forestry Loss of Use Study, Battleford, Saskatchewan
- Kainaiwa 1889 Surrender Land Claim Forestry Loss of use Study, Lethbridge, Alberta
- Forest Mangement Plan for the Kettle Point Indian Reserve No. 44 (2,600 acres)
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Scheifele, G.W. and Mulamoottil, G. *Predictive Models Applicable to Ontario's Wetland Evaluation System.* Presented at Wetlands '87 Symposium, Edmonton, 1988.

Scheifele, G.W., *An Assessment of Ontario's Wetland Evaluation System with Reference to Predictive Models and Environmentally Sensitive Areas Studies,* Waterloo: University of Waterloo Press, 1987.

File: 3028
By: Email

May 27, 2013

James Dick Construction Limited
P.O. Box 470
Bolton, Ontario
L7E 5T4

Attention: Mr. Greg Sweetnam

Dear: Mr. Sweetnam

Re: Hidden Quarry – Response to MNR Comments

With respect to MNR comments on our level II Natural Environment Technical Report we offer the following explanations in the same order as given by MNR

2.2.4 & Figure 5
During our spring site visits standing water was not observed in MAM3-2 so there was little merit in listening for calling amphibians at this location. Furthermore, when wood frogs were reported at Station A1 on April 28, 2011 they were actually heard calling from an upstream area in the vicinity of MAM3-2 which is only about 150 m from this Station.

3.1
Our apology for any confusion caused by the discussion of locally designated natural features, but we felt it was important to note those features which had previously been identified as being important on the local landscape. In retrospect, this discussion could have perhaps been included in Section 5.0.

3.1.2 & 5.1.1 and Figure 6
GWS and MNR agree that the wetland should not be included in the PSW and the proposed 20m buffer will provide ample protection for this wetland. See above comment regarding amphibian surveys.

4.5.5
MNR and GWS agree that the property is not an important deer wintering area.

5.13
Although the intermittent stream may possibly provide a seasonal source of insect food for downstream fish it does not support an on–site fish population. The existing ecological function of this stream will nonetheless be maintained during aggregate extraction.

5.14
James Dick Construction Limited is prepared to discuss the feasibility of forest compensation at another site.

5.16
We acknowledge that a small population of deer utilize the subject property and surrounding lands during the winter and anticipate they will continue to do so in the future even though the amount of on–site forest cover will be reduced.

7.1
Figure 10, the Operations Plan and Figure 11, the Progressive and Final Rehabilitation Plan were provided to MNR as a separate attachment instead of being enclosed in the report

Species at Risk Surveys.

1. Little Brown Myotis
As noted by MNR, this species was not listed as Endangered when the surveys were undertaken. Nonetheless, a special survey was completed for this and other species of bats, recognizing that several bat species were in decline and likely to be protected under the *Endangered Species Act, 2007*.

The Little Brown Myotis hibernates in caves. There is no suitable hibernation habitat on site, and it is likely that local bats hibernate in caves near Rockwood. Maternal roosts occur most commonly in buildings and less frequently in natural habitats (van Zyll de Jong 1985). The only on-site building is a house fronting on Highway 7. This house appears to be relatively intact and it is unlikely that bats can access the interior of the house, although they may be able to enter the garage through a hole in the door. If the site is being used for maternal roosts, it is more likely that they are using natural cavities on site. According to the MNR (2011) bat monitoring protocol, maternity roosts are likely to occur in deciduous and mixed forests (FOD, FOM). Single deciduous and mixed forest stands occur on the subject lands close to the abandoned building. Both of these forest stands will be retained.

We conclude that there will be no impact on the Little Brown Myotis as a result of the proposed Hidden Quarry. There are no areas present that provide suitable hibernation sites. All potential natural maternal roosts will be retained. In the event that some bats are roosting within the existing building, alternative natural roosts will be available to them once the house is removed. Maternal roosts may be used from April when bats come out of hibernation until September (van Zyll de Jong 1985). It is recommended that the house be removed outside of this window when bats are likely to be absent from the site.

2. Rusty-patched Bumble Bee
Although the Rusty-patched Bumble Bee was listed as Endangered in September 2010, it was not on MNR's list of Species at Risk in Wellington County when we did most of our inventories in 2011. Consequently, we were not aware that specific surveys should have been undertaken for this species.

We are of the opinion that this species is absent from the site. The Rusty-patched Bumble Bee is typically associated with large deciduous forests and it may be found both within forested habitat and around forest margins. Although once a very common species in southern Ontario, it has declined significantly and appears to be confined to large habitat patches that are remote from agricultural operations. All recent records are from Pinery Provincial Park. From 1971 to 1973, the Rusty-patched Bumble Bee represented 14% of all bumble bees collected at Guelph and Rockwood. Extensive targeted searches for this species from 2005 to 2008 found only three specimens. A sample of 1,195 bumble bees from Guelph and Rockwood during that period did not contain any Rusty-patched Bumble Bees (Colla 2010; Colla and Taylor-Pindar 2011).

Our conclusion that the Rusty-patched Bumble Bee is absent is based on two factors. The on-site habitat is poor for this species and bumble bees in general. The forest cover is predominantly coniferous plantation which is unsuitable habitat for the species. There are two deciduous/mixed forest stands, but these are very small remnants that are unlikely to provide sufficient habitat for the species. The site is also situated within an agricultural setting that is likely to expose this species to deleterious chemicals.

The second reason why we are of the opinion that the Rusty-patched Bumble Bee is absent is that targeted searches in Guelph and Rockwood from 2005 to 2008 failed to find this species. These surveys were undertaken in locations where the species was formerly common and it was locally extirpated.

3. West Virginia White

As noted in the list of vascular plants (Appendix B), the two species of toothworts were observed during the 1997 inventories but not in 2011. It appears as though these species have become locally extirpated from the site. Consequently, there is no suitable habitat present for the West Virginia White. Even if toothworts were present, the habitat is very marginal for this species on the subject lands. The two forest patches that have the potential to support it are very small. The West Virginia White does not do well from a competitive standpoint when dealing with the cabbage white. The latter species is abundant on the site and the West Virginia white would be unlikely to persist in such small forest fragments where the cabbage white was present.

4. Blanding's Turtle and Spotted Turtle

We believe that the protocols for searching for these turtle species were developed after our surveys were completed, but are uncertain if this is correct. The protocols for surveying for Species at Risk do not appear to be readily available on the MNR's website.

a. Targeted Turtle Surveys

In addition to looking for amphibian egg masses during the April 18, 2011 search in the cattail marsh, turtles were actively searched for. Searching within ponds is an effective method of finding turtles and this search resulted in the snapping turtle observation. Without the in-pond search, it is unlikely that the snapping turtle would have been detected, as this is a highly aquatic species that seldom basks. In-pond searches are the best method for finding the snapping turtle. If this method were used more frequently, it would be realized that this species occurs in a very high proportion of permanent water bodies. However, it goes undetected in most of the areas where it is actually present.

Searching within the pond is also the most effective method for finding spotted turtles. We have searched for spotted turtles with Dr. Jackie Litzgus, who is one of the North American experts on this species. The method that she uses to detect this species is to walk through ponds to search for it within the water column or on the bottom. This is typically done in early to mid-April shortly after ice-out. This is another species that rarely basks and surveys conducted from the shoreline are unlikely to detect it. In addition, once temperatures rise, it often aestivates or remains buried within pond sediments where it will not be observed using standard shoreline surveys.

The April 18, 2011 survey of the cattail marsh was considered a targeted turtle survey as well as an amphibian egg-mass survey. Two individuals spent a total of 1.5 hours each searching for a total effort of 3 person-hours.

b. Weather Conditions during the April 3-8, 2011Salamander Trap Observations

On April 4, it was overcast with a very light breeze, the temperature was −2°C, and there were approximately 2 cm of snow on the ground. On April 5, it was calm and overcast with

a temperature of 2°C. On April 6, it was sunny with a light breeze, the temperature was 1°C, and ice had formed on the marsh and in-stream pool overnight. On April 7, it was overcast with a light breeze and a temperature of 1°C in the morning; the site was revisited in the afternoon and it was 8°C and sunny at that time. On April 8, it was overcast with no wind and the temperature was 5°C.

Weather conditions during most of these visits were not suitable for observing turtles, with the exception of the afternoon of April 7.

c. Weather Conditions during the June 7-10, 2011 Fish Trap Observations
The weather conditions were warm and sunny during days that the fish traps were checked. Mean daily temperatures on those days for Guelph taken from the National Climate and Information Archive website indicate that the mean temperatures were 20.5°C on June 7, 24.2°C on June 8, 17.8°C on June 9, and 13.1°C on June 10, 2011.

Conditions were suitable for turtle basking during the fish trap observation periods.

d. Snapping Turtle Observation
The snapping turtle was observed on April 18, 2011 during the targeted search within the cattail marsh. The weather was cloudy and calm during the survey and the air temperature ranged from −1 to 0°C.

e. Weather Conditions during Bird, Butterfly, and Odonate Surveys
It is correct that the marsh bird surveys were completed well before 9 a.m., but two of the three visits extended beyond that time. The following are descriptions of relevant visits made in 2011. The May 20 survey extended from 0722 to 0953 hours and the weather was sunny, the wind was 1-2 on the Beaufort scale, and the temperature ranged from 12 to 16°C. The May 30 visit was from 0640 to 1025 and the weather was a mix of sun and cloud, wind was 1-2, and the temperature was 18 to 22°C. The June 17 survey was from 0704 to 1138 and the weather was sunny, the wind was 1-2, and the temperature was 14 to 25°C. The June 26 visit was from 0643 to 1043 hours, the weather was a mix of sun and cloud, the wind was 1-2 early on and 2-3 later, and the temperature was 16 to 22°C. The July 27 visit was from 0953 to 1412 and the weather was mostly sunny, the wind was 0 to 1, and the temperature was 20 to 27°C.

Conditions were suitable for observing basking turtles on all of these visits. On almost every visit, the observer parked on the Sixth Line near the cattail marsh and the marsh was searched for all types of wildlife on each visit.

f. Conclusions Regarding the Blanding's Turtle and Spotted Turtle
We still consider these two species to be absent. The Blanding's turtle basks frequently and is typically highly conspicuous when it is present. It is highly unlikely that it would have been overlooked had it been present.

We consider the spotted turtle to be absent for three reasons: it was not observed, the habitat is not suitable, and there are no nearby records of this species. The latter two facts are very important given that this is an extremely difficult species to detect. In the one study that we were involved in, released turtles often disappeared immediately into the sediments and under the vegetation and could only be found again because they were radio-tagged.

Habitat for the spotted turtle is considered unsuitable at the landscape level and marginal within the cattail marsh itself. As can be seen in the air photos presented in the Level II Natural Environment Technical Report, the on-site cattail marsh is isolated within an agricultural landscape. From probably the mid-1800s until the early 1980s, the landscape

was essentially devoid of substantial tree cover. Any spotted turtles that might have existed in the cattail marsh at that time would have been isolated from any other natural habitat by extensive expanses of agricultural land, which is unsuitable habitat for dispersal by this species. Although the spotted turtle has a relatively small home range, it migrates hundreds of metres among aquatic sites and between aquatic and terrestrial sites. Until tree planting occurred on the site and adjacent lands in the early 1980s, it is unlikely that spotted turtles would have been able to move among habitats given the intensive agricultural lands between potential habitat pockets. Even with the existing forest cover, intervening habitat is harsh for spotted turtles between potentially suitable habitat patches. It seems highly unlikely that an isolated population of this species could have persisted in this landscape, if such a population existed in the first place.

The cattail marsh is marginal habitat for the spotted turtle. It is typically associated with highly organic habitats, especially bogs and fens. It does occur in cattail marshes, but usually only those with a high organic content (Litzgus 2004). Soils within the on-site cattail marsh are mineral and may actually be gravel. The substrate was very firm while walking through it and these conditions are generally unsuitable for the spotted turtle. In addition, water levels in this marsh may become quite low during drought years, but it is unknown if it ever dries up completely.

The only records of the spotted turtle for Wellington County appear to be the observation by one of the team members at Luther Marsh on June 12, 1975 and another by MNR staff in June of another year in the 1970s. Although the current Ontario Reptile and Amphibian Atlas does not show a map of the distribution of the spotted turtle for confidentiality reasons, the Ontario Herpetofaunal Atlas on the NHIC website (which was updated in 2010) does. There are no records for the spotted turtle in Waterloo, Halton, Peel, or Hamilton. The nearest records for this species are in excess of 50 km away. There appears to be a broad swath through southern Ontario where the species is absent, including Huron, Perth, Waterloo, Brant, Hamilton, almost all of Wellington, Halton, and Peel. These are some of the more intensively farmed areas in the province. If the spotted turtle ever occurred within this general region, it was probably extirpated as a result of forest clearing and agricultural activities.

Rehabilitation Plan

We agree that soil depth over bedrock must be of sufficient depth in tableland areas to ensure long-term tree growth and feel that this can be achieved by first of all applying overburden to side slopes followed by topsoil as stated on the Rehabilitation Plan. The objective should be to achieve a soil mass that is 50 to 100cm in depth with a topsoil layer that is at least 10cm in depth and preferably 20cm or more as recommended by MNR. We acknowledge that watering may be required during drought periods to ensure tree survival and agree that the final surface should be loose and rough with undulations so that soil depth over bedrock is variable and micro-habitats are created. If soil becomes significantly compacted deep ripping will be required to make it more permeable and plantable. The Rehabilitation Plan will be revised to reflect these desirable site preparation treatments.

With respect to the use of red pine for reforestation purposes on this site, we acknowledge that red pine generally does not sustain good long-term growth on calcareous sites. It has, however performed reasonably well on several properties located elsewhere in Wellington County that are characterized by well drained Dumfries sandy loam soil which is found on the subject property. The intent was to simply incorporate red pine as a minor component in the species mix to enhance biodiversity and help to provide a nurse crop for the eventual establishment of a native hardwood or mixedwood forest. It would not be used in monoculture blocks and it would mainly be planted on the warmer, dryer south facing

slopes. However, if MNR still feels that red pine should not be planted on this site it will be deleted from the species list.

It was anticipated that vegetation monitoring would be carried out to ensure that the survival and growth of planted trees, shrubs and groundcovers was sufficient to effectively restore desired woodland and wetland vegetation. It was assumed that monitoring would be carried out until trees and shrubs are considered free to grow which means their root systems are well established and their shoots extend above the height of competing herbaceous vegetation, particularly grass and goldenrod (i.e. about 3 feet in height). This usually takes about 5 years on most old field sites but may take somewhat longer on rehabilitated gravel pits. A seedling survival census will be carried out annually during late summer/early fall to determine the need for refill planting in fail areas the following spring. The same species will be used for refill planting as were used in the original planting unless there are good reasons for changing. Bareroot transplant stock 20-40cm in height is recommended for planting on these difficult sites. To ensure adequate stocking in reforested areas there must be at least 80% seedling survival after 5 years or when the trees are considered free to grow. Assuming an original planting density of 600 trees/acre at 80% survival = 480 trees/acre which qualifies the area for protection under the County's Forest Conservation By-law. The above details on reforestation procedures and follow-up monitoring can be added to the rehabilitation plan assuming MNR Staff concur with this approach.

We trust the above information adequately addresses the concerns raised by MNR.

Yours truly,

GWS Ecological & Forestry Services Inc.

Greg W. Scheifele, M. A., R.P.F.
Principal Ecologist/Forester

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Leigh Mugford

From: Greg Scheifele <gwsefs@sympatico.ca>
Sent: May-28-13 12:44 PM
To: Fred Natolochny
Cc: Leigh Mugford; Greg Sweetnam
Subject: Hidden Quarry
Attachments: scanned ELC field sheets.pdf

Fred,

Please find attached our ELC Data Sheets for the Hidden Quarry as requested. I did the mapping of vegetation communities on the site and adjacent lands and had my staff complete the detailed ELC community descriptions during subsequent visits. Due to the plantation thinning that was carried out during the fall and winter of 2011/2012 (i.e. after we had completed our ELC mapping) we re-cruised the plantations to obtain up-to-date data on their species composition and basal area. The ELC data sheets were then revised to better reflect current conditions. I personally checked these data to confirm their accuracy.

Please feel free to call me if you have any question regarding this information.

Regards,

Greg

ELC COMMUNITY DESCRIPTION & CLASSIFICATION	SITE: James Dick Erumosa Property		POLYGON: FOC2-2	
	SURVEYOR(S): Adam B & Matt S.	DATE: June 6, 2011	UTME:	
	START: 9:30	END: 4:30	UTMZ:	UTMN:

POLYGON DESCRIPTION

SYSTEM	SUBSTRATE	TOPOGRAPHIC FEATURE	HISTORY	PLANT FORM	COMMUNITY
☒ TERRESTRIAL ☐ WETLAND ☐ AQUATIC	☐ ORGANIC ☒ MINERAL SOIL ☐ PARENT MIN. ☐ ACIDIC BEDRK. ☐ BASIC BEDRK. ☐ CARB. BEDRK.	☐ LACUSTRINE ☐ RIVERINE ☐ BOTTOMLAND ☐ TERRACE ☐ VALLEY SLOPE ☐ TABLELAND ☒ ROLL UPLAND ☐ CLIFF ☐ TALUS ☐ CREVICE / CAVE ☐ ALVAR ☐ ROCKLAND ☐ BEACH / BAR ☐ SAND DUNE ☐ BLUFF	☒ NATURAL ☐ CULTURAL	☐ PLANKTON ☐ SUBMERGED ☐ FLOATING-LVD ☐ GRAMINOID ☐ FORB ☐ LICHEN ☐ BRYOPHYTE ☐ DECIDUOUS ☒ CONIFEROUS ☐ MIXED	☐ LAKE ☐ POND ☐ RIVER ☐ STREAM ☐ MARSH ☐ SWAMP ☐ FEN ☐ BOG ☐ BARREN ☐ MEADOW ☐ PRAIRIE ☐ THICKET ☐ SAVANNAH ☐ WOODLAND ☒ FOREST ☐ PLANTATION
SITE ☐ OPEN WATER ☐ SHALLOW WATER ☒ SURFICIAL DEP ☐ BEDROCK			**COVER** ☐ OPEN ☐ SHRUB ☒ TREED		

STAND DESCRIPTION:

	LAYER	HT	CVR	SPECIES IN ORDER OF DECREASING DOMINANCE (>> MUCH GREATER THAN; > GREATER THAN; = ABOUT EQUAL TO)
1	CANOPY	2	4	Ce, Ew, Oh (Mh, Cb, Pb)
2	SUB-CANOPY	3	2	Ce, Ew, Oh (Mh, Cb, Pb)
3	UNDERSTOREY	4	1	Ce, Aw, Cb Haw, Bfir, Cwr
4	GRD. LAYER	5	1	Herb-Robert, lady fern, Field horsetail, dy violet, variegated horsetail (confined to openings)

HT CODES: 1 = >25 m 2 = 10<HT ≤25 m 3 = 2<HT ≤10 m 4 = 1<HT ≤2 m 5 = 0.5<HT ≤1 m 6 = 0.2<HT ≤0.5 m 7 = HT ≤0.2 m

CVR CODES 0= NONE 1= 0% < CVR ≤ 10% 2= 10 < CVR ≤ 25% 3= 25 < CVR ≤ 60% 4= CVR > 60%

STAND COMPOSITION: Ce8 Ew1 Oh1 (Cb, Mh, Pb)							BA: 48.6
SIZE CLASS ANALYSIS:	O	< 10	A	10 - 24	A	25 - 50	R > 50
STANDING SNAGS:	R	< 10	O	10 - 24	O	25 - 50	R > 50
DEADFALL / LOGS:	O	< 10	O	10 - 24	O	25 - 50	R > 50

ABUNDANCE CODES: N = NONE R = RARE O = OCCASIONAL A = ABUNDANT

COMM. AGE :		PIONEER		YOUNG		MID-AGE	X	MATURE		OLD GROWTH

SOIL ANALYSIS:

TEXTURE: Clay Loam	DEPTH TO MOTTLES / GLEY	g = >100cm	G= >100cm
MOISTURE: 2	DEPTH OF ORGANICS:	1cm	(cm)
HOMOGENEOUS / VARIABLE	DEPTH TO BEDROCK:	>100cm.	(cm)

COMMUNITY CLASSIFICATION:

COMMUNITY CLASS: Forest	CODE: FO
COMMUNITY SERIES: Coniferous Forest	CODE: FOC
ECOSITE: Dry-Fresh White Cedar Coniferous Forest	CODE: FOC2
VEGETATION TYPE: Dry-Fresh White Cedar Coniferous Forest	CODE: FOC2-2
INCLUSION	CODE:
COMPLEX	CODE:

Notes:

ELC COMMUNITY DESCRIPTION & CLASSIFICATION	SITE: James Dick Eramosa Property		POLYGON: FOM2-2	
	SURVEYOR(S): Adam B. ? Matt S.	DATE: June 6, 2011		UTME.
	START: 9:30	END: 3:30	UTMZ:	UTMN.

POLYGON DESCRIPTION

SYSTEM	SUBSTRATE	TOPOGRAPHIC FEATURE	HISTORY	PLANT FORM	COMMUNITY
☒ TERRESTRIAL ☐ WETLAND ☐ AQUATIC	☐ ORGANIC ☒ MINERAL SOIL ☐ PARENT MIN ☐ ACIDIC BEDRK ☐ BASIC BEDRK. ☐ CARB. BEDRK	☐ LACUSTRINE ☐ RIVERINE ☐ BOTTOMLAND ☐ TERRACE ☐ VALLEY SLOPE ☐ TABLELAND ☒ ROLL UPLAND ☐ CLIFF ☐ TALUS ☐ CREVICE / CAVE ☐ ALVAR ☐ ROCKLAND ☐ BEACH / BAR ☐ SAND DUNE ☐ BLUFF	☒ NATURAL ☐ CULTURAL	☐ PLANKTON ☐ SUBMERGED ☐ FLOATING-LVD ☐ GRAMINOID ☐ FORB ☐ LICHEN ☐ BRYOPHYTE ☐ DECIDUOUS ☐ CONIFEROUS ☒ MIXED	☐ LAKE ☐ POND ☐ RIVER ☐ STREAM ☐ MARSH ☐ SWAMP ☐ FEN ☐ BOG ☐ BARREN ☐ MEADOW ☐ PRAIRIE ☐ THICKET ☐ SAVANNAH ☐ WOODLAND ☒ FOREST ☐ PLANTATION
SITE ☐ OPEN WATER ☐ SHALLOW WATER ☒ SURFICIAL DEP ☐ BEDROCK			**COVER** ☐ OPEN ☐ SHRUB ☒ TREED		

STAND DESCRIPTION:

	LAYER	HT	CVR	SPECIES IN ORDER OF DECREASING DOMINANCE (>> MUCH GREATER THAN; > GREATER THAN; = ABOUT EQUAL TO)
1	CANOPY	1	4	Pw, Mh, Bd, Ok (Cb, Ew, Be, Jd)
2	SUB-CANOPY	2	4	Mh, Bd Ok (Cb, Ew, Be, Jd)
3	UNDERSTOREY	4	3	Mh Aw, Cb, Bd, Be, Pw Che, Hunt, Hazw, R. Grape.
4	GRD. LAYER	5	2	Goldenrod strawberry, blue cohosh, lady Fern, yellow trout lily, variegated horsetail

HT CODES: 1 = >25 m 2 = 10<HT ≤ 25 m 3 = 2<HT ≤ 10 m 4 = 1<HT ≤ 2 m 5 = 0.5<HT ≤ 1 m 6 = 0.2<HT ≤ 0.5 m 7 = HT<0.2 m

CVR CODES: 0= NONE 1= 0% < CVR ≤ 10% 2= 10 < CVR ≤ 25% 3= 25 < CVR ≤ 60% 4= CVR > 60%

STAND COMPOSITION: Pw4 Mh3 Bd2 Ok(Cb, Be, Jd, Ew)	BA: 28.0 m²/ha

SIZE CLASS ANALYSIS:	A	< 10	A	10 - 24	A	25 - 50	A	> 50
STANDING SNAGS:	R	< 10	R	10 - 24	O	25 - 50	O	> 50
DEADFALL / LOGS:	R	< 10	O	10 - 24	O	25 - 50	R	> 50

ABUNDANCE CODES: N = NONE R = RARE O = OCCASIONAL A = ABUNDANT

COMM. AGE :		PIONEER		YOUNG		MID-AGE		MATURE	X	OLD GROWTH

SOIL ANALYSIS:

TEXTURE: LOAM	DEPTH TO MOTTLES / GLEY	g = >100cm	G= >100cm
MOISTURE: 2	DEPTH OF ORGANICS: 0		(cm)
HOMOGENEOUS / VARIABLE	DEPTH TO BEDROCK: >100cm		(cm)

COMMUNITYCLASSIFICATION:

COMMUNITY CLASS: Forest		CODE: FO
COMMUNITY SERIES: Mixed Forest		CODE: FOM
ECOSITE: Dry-Fresh White Pine - Maple Oak Mixed Forest		CODE: FOM2
VEGETATION TYPE: Dry-Fresh Pw - Mh Mixed Forest Type.		CODE: FOM2-2
	INCLUSION	CODE:
	COMPLEX	CODE:

Notes:

ELC COMMUNITY DESCRIPTION & CLASSIFICATION	SITE: James Dick Eramosa Property		POLYGON: FOM 4-2	
	SURVEYOR(S): Adam B. & Matt S.	DATE: July 27, 2011		UTME:
	START: 9:30	END 5:30	UTMZ:	UTMN:

POLYGON DESCRIPTION

SYSTEM	SUBSTRATE	TOPOGRAPHIC FEATURE	HISTORY	PLANT FORM	COMMUNITY
☒ TERRESTRIAL ☐ WETLAND ☐ AQUATIC	☐ ORGANIC ☒ MINERAL SOIL ☐ PARENT MIN. ☐ ACIDIC BEDRK. ☐ BASIC BEDRK. ☐ CARB. BEDRK.	☐ LACUSTRINE ☐ RIVERINE ☒ BOTTOMLAND ☐ TERRACE ☐ VALLEY SLOPE ☐ TABLELAND ☐ ROLL. UPLAND ☐ CLIFF ☐ TALUS ☐ CREVICE / CAVE ☐ ALVAR ☐ ROCKLAND ☐ BEACH / BAR ☐ SAND DUNE ☐ BLUFF	☒ NATURAL ☐ CULTURAL	☐ PLANKTON ☐ SUBMERGED ☐ FLOATING-LVD. ☐ GRAMINOID ☐ FORB ☐ LICHEN ☐ BRYOPHYTE ☐ DECIDUOUS ☐ CONIFEROUS ☒ MIXED	☐ LAKE ☐ POND ☐ RIVER ☐ STREAM ☐ MARSH ☐ SWAMP ☐ FEN ☐ BOG ☐ BARREN ☐ MEADOW ☐ PRAIRIE ☐ THICKET ☐ SAVANNAH ☐ WOODLAND ☒ FOREST ☐ PLANTATION
SITE ☐ OPEN WATER ☐ SHALLOW WATER ☒ SURFICIAL DEP. ☐ BEDROCK			**COVER** ☐ OPEN ☐ SHRUB ☒ TREED		

STAND DESCRIPTION:

	LAYER	HT	CVR	SPECIES IN ORDER OF DECREASING DOMINANCE (>> MUCH GREATER THAN; > GREATER THAN; = ABOUT EQUAL TO)
1	CANOPY	2	4	Ce, Po, Bd, Cb, Ps, Sw
2	SUB-CANOPY	2	3	Ce, Po, Bd, Cb
3	UNDERSTOREY	4	3	Ce, Po Bd, Cb, Dogwood, Buckthorn, Hawthorn, Choke Cherry, Tartarian Honeysuckle
4	GRD. LAYER	5	2	Goldenrod, dandelion, grass; sp., Jewelweed

HT CODES: 1 = >25 m 2 = 10<HT≤25 m 3 = 2<HT≤10 m 4 = 1<HT≤2 m 5 = 0.5<HT≤1 m 6 = 0.2<HT≤0.5 m 7 = HT<0.2 m

CVR CODES 0= NONE 1= 0% < CVR ≤ 10% 2= 10 < CVR ≤ 25% 3= 25 < CVR ≤ 60% 4= CVR > 80%

STAND COMPOSITION: Ce6 Po, Bd, Cb, Oc, (Ps, Sw)							BA: 51.4
SIZE CLASS ANALYSIS:	A	< 10	A	10 - 24	O	25 - 50	R	> 50
STANDING SNAGS:	O	< 10	O	10 - 24	O	25 - 50	R	> 50
DEADFALL / LOGS:	A	< 10	O	10 - 24	O	25 - 50	R	> 50

ABUNDANCE CODES: N = NONE R = RARE O = OCCASIONAL A = ABUNDANT

COMM. AGE :		PIONEER	X	YOUNG		MID-AGE		MATURE		OLD GROWTH

SOIL ANALYSIS:

TEXTURE: Loam	DEPTH TO MOTTLES / GLEY	g = 60cm	G= >70cm
MOISTURE: 3	DEPTH OF ORGANICS: 0		(cm)
HOMOGENEOUS / VARIABLE	DEPTH TO BEDROCK: >100		(cm)

COMMUNITYCLASSIFICATION:

COMMUNITY CLASS: Forest	CODE: FO
COMMUNITY SERIES: Mixed Forest	CODE: FOM
ECOSITE: Dry - Fresh White Cedar - Poplar Mixed Forest	CODE: FOM4
VEGETATION TYPE: Dry - Fresh White Cedar - Poplar Mixed Forest	CODE: FOM4-2
INCLUSION	CODE:
COMPLEX	CODE:

Notes:

ELC COMMUNITY DESCRIPTION & CLASSIFICATION	SITE: James Dick Eramosa Property		POLYGON: FOM7-2
	SURVEYOR(S): Adam B. + Matt S.	DATE: July 27, 2011	UTME:
	START: 9:30	END 5:30	UTMZ: / UTMN:

POLYGON DESCRIPTION

SYSTEM	SUBSTRATE	TOPOGRAPHIC FEATURE	HISTORY	PLANT FORM	COMMUNITY
☒ TERRESTRIAL ☐ WETLAND ☐ AQUATIC	☐ ORGANIC ☒ MINERAL SOIL ☐ PARENT MIN. ☐ ACIDIC BEDRK. ☐ BASIC BEDRK. ☐ CARB. BEDRK.	☐ LACUSTRINE ☐ RIVERINE ☐ BOTTOMLAND ☐ TERRACE ☐ VALLEY SLOPE ☐ TABLELAND ☒ ROLL UPLAND ☐ CLIFF ☐ TALUS ☐ CREVICE / CAVE ☐ ALVAR ☐ ROCKLAND ☐ BEACH / BAR ☐ SAND DUNE ☐ BLUFF	☒ NATURAL ☐ CULTURAL	☐ PLANKTON ☐ SUBMERGED ☐ FLOATING-LVD. ☐ GRAMINOID ☐ FORB ☐ LICHEN ☐ BRYOPHYTE ☐ DECIDUOUS ☐ CONIFEROUS ☒ MIXED	☐ LAKE ☐ POND ☐ RIVER ☐ STREAM ☐ MARSH ☐ SWAMP ☐ FEN ☐ BOG ☐ BARREN ☐ MEADOW ☐ PRAIRIE ☐ THICKET ☐ SAVANNAH ☐ WOODLAND ☒ FOREST ☐ PLANTATION
SITE ☐ OPEN WATER ☐ SHALLOW WATER ☒ SURFICIAL DEP. ☐ BEDROCK			**COVER** ☐ OPEN ☐ SHRUB ☒ TREED		

STAND DESCRIPTION:

	LAYER	HT	CVR	SPECIES IN ORDER OF DECREASING DOMINANCE (>> MUCH GREATER THAN; > GREATER THAN; = ABOUT EQUAL TO)
1	CANOPY	2	4	Ce, Ms, Bd, Wi, Cb, Pt, Mh, Em
2	SUB-CANOPY	2	3	Ce, Ms, Bd, Cb, Mh
3	UNDERSTOREY	4	3	Ce, Bd, Ms, Po, Cb, Mh, Em, Wi, Grape, Hort Wi, Rasp, Brac, Creeper, Chc, Hrub, Rasp.
4	GRD. LAYER	5	2	Sedges, horsetail, Poison ivy, sensitive fern, goldenrod, dandelion

HT CODES: 1 = >25 m 2 = 10<HT≤25 m 3 = 2<HT≤10 m 4 = 1<HT≤2 m 5 = 0.5<HT≤1 m 6 = 0.2<HT≤0.5 m 7 = HT<0.2 m

CVR CODES 0= NONE 1= 0% < CVR ≤ 10% 2= 10 < CVR ≤ 25% 3= 25 < CVR ≤ 60% 4= CVR > 60%

STAND COMPOSITION: Ce3 Ms3 Bd2 Wi1 Cb1	BA: 30.5

SIZE CLASS ANALYSIS:	A	< 10	A	10 - 24	O	25 - 50	R	> 50
STANDING SNAGS:	R	< 10	R	10 - 24	O	25 - 50	R	> 50
DEADFALL / LOGS:	A	< 10	O	10 - 24	O	25 - 50	R	> 50

ABUNDANCE CODES: N = NONE R = RARE O = OCCASIONAL A = ABUNDANT

COMM. AGE :		PIONEER	X	YOUNG		MID-AGE		MATURE		OLD GROWTH

SOIL ANALYSIS:

TEXTURE: Loam	DEPTH TO MOTTLES / GLEY	g = 60cm	G= > 7...
MOISTURE: 3	DEPTH OF ORGANICS: 0		(cm)
HOMOGENEOUS / VARIABLE	DEPTH TO BEDROCK: > 100		(cm)

COMMUNITYCLASSIFICATION:

COMMUNITY CLASS: Forest	CODE: FO
COMMUNITY SERIES: Mixed Forest	CODE: FOM
ECOSITE: Fresh-Moist White Cedar Hardwood Mixed Forest	CODE: FOM7
VEGETATION TYPE: Fresh-Moist White Cedar Hardwood Mixed Forest	CODE: FOM7-2
INCLUSION	CODE:
COMPLEX	CODE:

Notes: Water table at 70cm below ground level. This ecosite has been disturbed by past gravel extraction, particularly along the west side.

ELC COMMUNITY DESCRIPTION & CLASSIFICATION	SITE: James Dick Eramosa Property		POLYGON: FOD 3-1	
	SURVEYOR(S): Adam B. & Matt S.	DATE: July 27 2011		UTME:
	START: 9:30	END 5:30	UTMZ:	UTMN:

POLYGON DESCRIPTION

SYSTEM	SUBSTRATE	TOPOGRAPHIC FEATURE	HISTORY	PLANT FORM	COMMUNITY
☒ TERRESTRIAL ☐ WETLAND ☐ AQUATIC	☐ ORGANIC ☒ MINERAL SOIL ☐ PARENT MIN. ☐ ACIDIC BEDRK. ☐ BASIC BEDRK. ☐ CARB. BEDRK.	☐ LACUSTRINE ☐ RIVERINE ☐ BOTTOMLAND ☐ TERRACE ☐ VALLEY SLOPE ☐ TABLELAND ☒ ROLL. UPLAND ☐ CLIFF ☐ TALUS ☐ CREVICE / CAVE ☐ ALVAR ☐ ROCKLAND ☐ BEACH / BAR ☐ SAND DUNE ☐ BLUFF	☒ NATURAL ☐ CULTURAL	☐ PLANKTON ☐ SUBMERGED ☐ FLOATING-LVD. ☐ GRAMINOID ☐ FORB ☐ LICHEN ☐ BRYOPHYTE ☒ DECIDUOUS ☐ CONIFEROUS ☐ MIXED	☐ LAKE ☐ POND ☐ RIVER ☐ STREAM ☐ MARSH ☐ SWAMP ☐ FEN ☐ BOG ☐ BARREN ☐ MEADOW ☐ PRAIRIE ☐ THICKET ☐ SAVANNAH ☐ WOODLAND ☒ FOREST ☐ PLANTATION
SITE ☐ OPEN WATER ☐ SHALLOW WATER ☒ SURFICIAL DEP. ☐ BEDROCK			**COVER** ☐ OPEN ☐ SHRUB ☒ TREED		

STAND DESCRIPTION:

	LAYER	HT	CVR	SPECIES IN ORDER OF DECREASING DOMINANCE (>> MUCH GREATER THAN; > GREATER THAN; = ABOUT EQUAL TO)
1	CANOPY	2	4	Pot
2	SUB-CANOPY	2	3	Pot
3	UNDERSTOREY	4	3	Bue, Rasp, Hort, Dog, Grape, Cowpea, Cor, Bal, Ash, Pot, Wh, Wb
4	GRD. LAYER	5	2	Grasses, nettle, rad, Fern, etc, dandelion

HT CODES: 1 = >25 m 2 = 10<HT≤25 m 3 = 2<HT≤10 m 4 = 1<HT≤2 m 5 = 0.5<HT≤1 m 6 = 0.2<HT≤0.5 m 7 = HT<0.2 m

CVR CODES 0= NONE 1= 0% < CVR ≤ 10% 2= 10 < CVR ≤ 25% 3= 25 < CVR ≤ 60% 4= CVR > 60%

STAND COMPOSITION:	Pot 10	BA: 29.0

SIZE CLASS ANALYSIS:	A	< 10	A	10 - 24	R	25 - 50	N	> 50
STANDING SNAGS:	R	< 10	O	10 - 24	R	25 - 50	N	> 50
DEADFALL / LOGS:	O	< 10	O	10 - 24	N	25 - 50	N	> 50

ABUNDANCE CODES: N = NONE R = RARE O = OCCASIONAL A = ABUNDANT

COMM. AGE :		PIONEER	X	YOUNG		MID-AGE		MATURE		OLD GROWTH

SOIL ANALYSIS:

TEXTURE: Silty Fine sand.	DEPTH TO MOTTLES / GLEY	g = >100 cm	G= >100 cm.
MOISTURE: 2	DEPTH OF ORGANICS: 0		(cm)
HOMOGENEOUS / VARIABLE	DEPTH TO BEDROCK: >100		(cm)

COMMUNITYCLASSIFICATION:

COMMUNITY CLASS:	Forest	CODE: FO
COMMUNITY SERIES:	Deciduous Forest	CODE: FOD
ECOSITE:	Dry-Fresh Poplar - White Birch Deciduous Forest	CODE: FOD3
VEGETATION TYPE: Dry-Fresh Poplar Deciduous Forest		CODE: FOD3-1
INCLUSION		CODE:
COMPLEX		CODE:

Notes:

ELC COMMUNITY DESCRIPTION & CLASSIFICATION	SITE: James Dick Eramosa Property		POLYGON: FOD5-7
	SURVEYOR(S): Adam B. & Ma H.S.	DATE: June 6, 2011	UTME:
	START: 9.30	END: 3.30	UTMZ: UTMN:

POLYGON DESCRIPTION

SYSTEM	SUBSTRATE	TOPOGRAPHIC FEATURE	HISTORY	PLANT FORM	COMMUNITY
☒ TERRESTRIAL ☐ WETLAND ☐ AQUATIC	☐ ORGANIC ☒ MINERAL SOIL ☐ PARENT MIN ☐ ACIDIC BEDRK. ☐ BASIC BEDRK ☐ CARB BEDRK	☐ LACUSTRINE ☐ RIVERINE ☐ BOTTOMLAND ☐ TERRACE ☐ VALLEY SLOPE ☐ TABLELAND ☒ ROLL UPLAND ☐ CLIFF ☐ TALUS ☐ CREVICE / CAVE ☐ ALVAR ☐ ROCKLAND ☐ BEACH / BAR ☐ SAND DUNE ☐ BLUFF	☒ NATURAL ☐ CULTURAL	☐ PLANKTON ☐ SUBMERGED ☐ FLOATING-LVD ☐ GRAMINOID ☐ FORB ☐ LICHEN ☐ BRYOPHYTE ☒ DECIDUOUS ☐ CONIFEROUS ☐ MIXED	☐ LAKE ☐ POND ☐ RIVER ☐ STREAM ☐ MARSH ☐ SWAMP ☐ FEN ☐ BOG ☐ BARREN ☐ MEADOW ☐ PRAIRIE ☐ THICKET ☐ SAVANNAH ☐ WOODLAND ☒ FOREST ☐ PLANTATION
SITE ☐ OPEN WATER ☐ SHALLOW WATER ☒ SURFICIAL DEP ☐ BEDROCK			**COVER** ☐ OPEN ☐ SHRUB ☒ TREED		

STAND DESCRIPTION:

	LAYER	HT	CVR	SPECIES IN ORDER OF DECREASING DOMINANCE (>> MUCH GREATER THAN; > GREATER THAN; = ABOUT EQUAL TO)
1	CANOPY	2	3	Mh > Ch
2	SUB-CANOPY	3	3	Ch, Hw, Bd, Hac, Plum
3	UNDERSTOREY	4	3	Mh Cb Ac Id Rasp Bac, Hac, R Currp.
4	GRD. LAYER	5	2	Goldenrod, blue cohosh, yellow trout lily, strawberry, herb robert

HT CODES: 1 = >25 m 2 = 10<HT· 25 m 3 = 2<HT· 10 m 4 = 1<HT/2 m 5 = 0.5<HT 1 m/ 6 = 0.2<HT· 0.5 m 7 = HT<0.2 m

CVR CODES 0= NONE 1= 0% < CVR · 10% 2= 10 < CVR 25% 3= 25 < CVR · 60% 4= CVR > 60%

STAND COMPOSITION:	Mh7 Cb2 Oh1(Aw, Bd, Hcow)	BA: 24 m^2/ha.

SIZE CLASS ANALYSIS:	A	< 10	A	10 - 24	R	25 - 50	A	> 50
STANDING SNAGS:	R	< 10	R	10 - 24	N	25 - 50	R	> 50
DEADFALL / LOGS:	A	< 10	A	10 - 24	R	25 - 50	N	> 50

ABUNDANCE CODES: N = NONE R = RARE O = OCCASIONAL A = ABUNDANT

COMM. AGE :		PIONEER		YOUNG		MID-AGE		MATURE	X	OLD GROWTH

SOIL ANALYSIS:

TEXTURE: Loam	DEPTH TO MOTTLES / GLEY	g = 200cm	G= 210cm
MOISTURE: 2	DEPTH OF ORGANICS:	0	(cm)
HOMOGENEOUS / VARIABLE	DEPTH TO BEDROCK:	210cm.	(cm)

COMMUNITYCLASSIFICATION:

COMMUNITY CLASS: Forest	CODE: FO
COMMUNITY SERIES: Deciduous Forest	CODE: FOD
ECOSITE: Dry-Fresh Sugar Maple Deciduous Forest	CODE: FOD5
VEGETATION TYPE: Dry-Fresh Sugar Maple - Black cherry Deciduous Forest Type.	CODE: FOD5-7
INCLUSION	CODE:
COMPLEX	CODE:

Notes:

ELC COMMUNITY DESCRIPTION & CLASSIFICATION	SITE: James Dick Erasmus Property		POLYGON: FOD 5-8	
	SURVEYOR(S): Adam B + MattS.	DATE: July 27 2011		UTME:
	START: 9:30	END 5:30	UTMZ:	UTMN:

POLYGON DESCRIPTION

SYSTEM	SUBSTRATE	TOPOGRAPHIC FEATURE	HISTORY	PLANT FORM	COMMUNITY
☒ TERRESTRIAL ☐ WETLAND ☐ AQUATIC	☐ ORGANIC ☒ MINERAL SOIL ☐ PARENT MIN. ☐ ACIDIC BEDRK. ☐ BASIC BEDRK. ☐ CARB BEDRK.	☐ LACUSTRINE ☐ RIVERINE ☐ BOTTOMLAND ☐ TERRACE ☐ VALLEY SLOPE ☐ TABLELAND ☒ ROLL UPLAND ☐ CLIFF ☐ TALUS ☐ CREVICE / CAVE ☐ ALVAR ☐ ROCKLAND ☐ BEACH / BAR ☐ SAND DUNE ☐ BLUFF	☒ NATURAL ☐ CULTURAL	☐ PLANKTON ☐ SUBMERGED ☐ FLOATING-LVD. ☐ GRAMINOID ☐ FORB ☐ LICHEN ☐ BRYOPHYTE ☒ DECIDUOUS ☐ CONIFEROUS ☐ MIXED	☐ LAKE ☐ POND ☐ RIVER ☐ STREAM ☐ MARSH ☐ SWAMP ☐ FEN ☐ BOG ☐ BARREN ☐ MEADOW ☐ PRAIRIE ☐ THICKET ☐ SAVANNAH ☐ WOODLAND ☒ FOREST ☐ PLANTATION
SITE ☐ OPEN WATER ☐ SHALLOW WATER ☒ SURFICIAL DEP. ☐ BEDROCK			**COVER** ☐ OPEN ☐ SHRUB ☒ TREED		

STAND DESCRIPTION:

	LAYER	HT	CVR	SPECIES IN ORDER OF DECREASING DOMINANCE (>> MUCH GREATER THAN; > GREATER THAN; = ABOUT EQUAL TO)
1	CANOPY	2	4	Mh Aw Cb Hk Be
2	SUB-CANOPY	2	3	Hk, Mh, Ew, Ce.
3	UNDERSTOREY	4	3	Dog, Hwe, Cwr, Chc Aw, Mh, Ce, Ew
4	GRD. LAYER	6	2	Sedges, goldenrod

HT CODES: 1 = >25 m 2 = 10<HT≤25 m 3 = 2<HT≤10 m 4 = 1<HT≤2 m 5 = 0.5<HT≤1 m 6 = 0.2<HT≤0.5 m 7 = HT<0.2 m

CVR CODES 0= NONE 1= 0% < CVR ≤ 10% 2= 10 < CVR ≤ 25% 3= 25 < CVR ≤ 60% 4= CVR > 60%

STAND COMPOSITION: Mh5 Aw3 Cb1 Ocl (hemlock + cedar)	BA: 34.0 m²/ha

SIZE CLASS ANALYSIS:	A	< 10	A	10 - 24	A	25 - 50	R	> 50
STANDING SNAGS:	R	< 10	O	10 - 24	O	25 - 50	R	> 50
DEADFALL / LOGS:	O	< 10	O	10 - 24	R	25 - 50	R	> 50

ABUNDANCE CODES: N = NONE R = RARE O = OCCASIONAL A = ABUNDANT

COMM. AGE :		PIONEER		YOUNG	X	MID-AGE		MATURE		OLD GROWTH

SOIL ANALYSIS:

TEXTURE: Silty Fine Sandy.	DEPTH TO MOTTLES / GLEY	g = >100 cm	G= >100 cm
MOISTURE: 2	DEPTH OF ORGANICS:	0	(cm)
HOMOGENEOUS / VARIABLE	DEPTH TO BEDROCK:	>100	(cm)

COMMUNITYCLASSIFICATION:

COMMUNITY CLASS: Forest	CODE: FO
COMMUNITY SERIES: Deciduous Forest	CODE: FOD
ECOSITE: Dry Fresh Sugar Maple Deciduous Forest	CODE: FOD5
VEGETATION TYPE: Dry-Fresh Sugar Maple - White Ash Deciduous Forest	CODE: FOD 5-8
INCLUSION	CODE:
COMPLEX	CODE:

Notes:

ELC COMMUNITY DESCRIPTION & CLASSIFICATION	SITE: James Dick Eramosa Property		POLYGON: CUP3-2	
	SURVEYOR(S): Adam B & M.H.S.	DATE: June 6, 2011	UTME	
	START: 9.30	END: 3.30	UTMZ:	UTMN:

POLYGON DESCRIPTION

SYSTEM	SUBSTRATE	TOPOGRAPHIC FEATURE	HISTORY	PLANT FORM	COMMUNITY
☒ TERRESTRIAL ☐ WETLAND ☐ AQUATIC	☐ ORGANIC ☒ MINERAL SOIL ☐ PARENT MIN ☐ ACIDIC BEDRK. ☐ BASIC BEDRK ☐ CARB BEDRK	☐ LACUSTRINE ☐ RIVERINE ☐ BOTTOMLAND ☐ TERRACE ☐ VALLEY SLOPE ☐ TABLELAND ☒ ROLL UPLAND ☐ CLIFF ☐ TALUS ☐ CREVICE / CAVE ☐ ALVAR ☐ ROCKLAND ☐ BEACH / BAR ☐ SAND DUNE ☐ BLUFF	☐ NATURAL ☒ CULTURAL	☐ PLANKTON ☐ SUBMERGED ☐ FLOATING-LVD ☐ GRAMINOID ☐ FORB ☐ LICHEN ☐ BRYOPHYTE ☐ DECIDUOUS ☒ CONIFEROUS ☐ MIXED	☐ LAKE ☐ POND ☐ RIVER ☐ STREAM ☐ MARSH ☐ SWAMP ☐ FEN ☐ BOG ☐ BARREN ☐ MEADOW ☐ PRAIRIE ☐ THICKET ☐ SAVANNAH ☐ WOODLAND ☐ FOREST ☒ PLANTATION
SITE ☐ OPEN WATER ☐ SHALLOW WATER ☒ SURFICIAL DEP ☐ BEDROCK			**COVER** ☐ OPEN ☐ SHRUB ☒ TREED		

STAND DESCRIPTION:

	LAYER	HT	CVR	SPECIES IN ORDER OF DECREASING DOMINANCE (>> MUCH GREATER THAN; > GREATER THAN; = ABOUT EQUAL TO)
1	CANOPY	2	4	P_w
2	SUB-CANOPY	3	1	P_w
3	UNDERSTOREY		0	
4	GRD. LAYER	5	1	golden rod, grasses Confined to shrub edge.

HT CODES: 1 = >25 m 2 = 10<HT 25 m 3 = 2<HT 10 m 4 = 1<HT 2 m 5 = 0.5<HT 1 m 6 = 0.2<HT 0.5 m 7 = HT<0.2 m

CVR CODES: 0= NONE 1= 0% < CVR 10% 2= 10 < CVR 25% 3= 25 < CVR 60% 4= CVR > 60%

STAND COMPOSITION:	P_w 10	BA: 33.0 m^2/ha

SIZE CLASS ANALYSIS:	N	< 10	A	10 - 24	O	25 - 50	N	> 50
STANDING SNAGS:	N	< 10	R	10 - 24	N	25 - 50	N	> 50
DEADFALL / LOGS:	N	< 10	R	10 - 24	N	25 - 50	N	> 50

ABUNDANCE CODES: N = NONE R = RARE O = OCCASIONAL A = ABUNDANT

COMM. AGE:		PIONEER	X	YOUNG		MID-AGE		MATURE		OLD GROWTH

SOIL ANALYSIS:

TEXTURE: Loam	DEPTH TO MOTTLES / GLEY	g = >100cm	G= >100cm
MOISTURE: 2	DEPTH OF ORGANICS: 2-3		(cm)
(HOMOGENEOUS) / VARIABLE	DEPTH TO BEDROCK: >100cm		(cm)

COMMUNITYCLASSIFICATION:

COMMUNITY CLASS: Cultural	CODE: CU
COMMUNITY SERIES: Plantation	CODE: CUP
ECOSITE: Coniferous Plantation	CODE: CUP3
VEGETATION TYPE: White Pine Coniferous Plantation Type.	CODE: CUP 3-2

INCLUSION		CODE:
COMPLEX		CODE:

Notes:

ELC COMMUNITY DESCRIPTION & CLASSIFICATION	SITE: James Dick Evanview Property		POLYGON: CUP3-3	
	SURVEYOR(S): Adam B9 Matt S	DATE: June 6 2011		UTME
	START: 9.30	END: 3:30	UTMZ:	UTMN.

POLYGON DESCRIPTION

SYSTEM	SUBSTRATE	TOPOGRAPHIC FEATURE	HISTORY	PLANT FORM	COMMUNITY
☒ TERRESTRIAL	☐ ORGANIC	☐ LACUSTRINE	☐ NATURAL	☐ PLANKTON	☐ LAKE
☐ WETLAND	☒ MINERAL SOIL	☐ RIVERINE	☒ CULTURAL	☐ SUBMERGED	☐ POND
☐ AQUATIC	☐ PARENT MIN	☐ BOTTOMLAND		☐ FLOATING-LVD	☐ RIVER
	☐ ACIDIC BEDRK.	☐ TERRACE		☐ GRAMINOID	☐ STREAM
	☐ BASIC BEDRK	☐ VALLEY SLOPE		☐ FORB	☐ MARSH
	☐ CARB BEDRK	☐ TABLELAND		☐ LICHEN	☐ SWAMP
		☒ ROLL UPLAND		☐ BRYOPHYTE	☐ FEN
		☐ CLIFF		☐ DECIDUOUS	☐ BOG
		☐ TALUS		☐ CONIFEROUS	☐ BARREN
		☐ CREVICE / CAVE		☒ MIXED	☐ MEADOW
		☐ ALVAR			☐ PRAIRIE
		☐ ROCKLAND			☐ THICKET
		☐ BEACH / BAR			☐ SAVANNAH
		☐ SAND DUNE			☐ WOODLAND
		☐ BLUFF			☐ FOREST
					☒ PLANTATION

SITE	COVER
☐ OPEN WATER	☐ OPEN
☐ SHALLOW WATER	☐ SHRUB
☒ SURFICIAL DEP	☒ TREED
☐ BEDROCK	

STAND DESCRIPTION:

	LAYER	HT	CVR	SPECIES IN ORDER OF DECREASING DOMINANCE (>> MUCH GREATER THAN; > GREATER THAN; = ABOUT EQUAL TO)
1	CANOPY	2	4	Ps Ew Cb Sn Aw, Hau
2	SUB-CANOPY	3	3	Ew Hu Cb
3	UNDERSTOREY	4	3	Ew, Cb Aw Bue, Rosp, Comp, Hau, Che, Cur.
4	GRD. LAYER	5	3	Goldenrod, garlic mustard, strawberry grasses.

HT CODES: 1 = >25 m 2 = 10<HT · 25 m 3 = 2<HT · 10 m 4 = 1<HT 2 m 5 = 0.5<HT 1 m 6 = 0.2<HT · 0.5 m 7 = HT<0.2 m

CVR CODES 0= NONE 1= 0% < CVR · 10% 2= 10 < CVR 25% 3= 25 < CVR · 60% 4= CVR > 60%

STAND COMPOSITION: Ps4 Ew3 Cb1 Aw1 Sn1	BA: 19 0m²/ha

SIZE CLASS ANALYSIS:	A	< 10	A	10 - 24	O	25 - 50	N	> 50
STANDING SNAGS:	R	< 10	A	10 - 24	R	25 - 50	N	> 50
DEADFALL / LOGS:	N	< 10	A	10 - 24	R	25 - 50	N	> 50

ABUNDANCE CODES: N = NONE R = RARE O = OCCASIONAL A = ABUNDANT

COMM. AGE :		PIONEER	X	YOUNG		MID-AGE		MATURE		OLD GROWTH

SOIL ANALYSIS:

TEXTURE: Sandy Loam	DEPTH TO MOTTLES / GLEY	g = 2 1cm	G= >100cm
MOISTURE: 2	DEPTH OF ORGANICS:	0	(cm)
(HOMOGENEOUS) / VARIABLE	DEPTH TO BEDROCK:	>1m.	(cm)

COMMUNITYCLASSIFICATION:

COMMUNITY CLASS: Cultural	CODE: CU
COMMUNITY SERIES: Plantation	CODE: CUP
ECOSITE: Conifer Plantation	CODE: CUP2
VEGETATION TYPE: Scotch Pine Coniferous Plantation Type	CODE: CUP 3-3

INCLUSION		CODE:
COMPLEX		CODE:

Notes:

ELC COMMUNITY DESCRIPTION & CLASSIFICATION	SITE: James Dick Escarpment Property		POLYGON: CUP3-8	
	SURVEYOR(S): Adam B & M.H.S.	DATE: June 6, 2011		UTME
	START: 9:30	END: 3:30	UTMZ:	UTMN:

POLYGON DESCRIPTION

SYSTEM	SUBSTRATE	TOPOGRAPHIC FEATURE	HISTORY	PLANT FORM	COMMUNITY
☒ TERRESTRIAL ☐ WETLAND ☐ AQUATIC	☐ ORGANIC ☒ MINERAL SOIL ☐ PARENT MIN ☐ ACIDIC BEDRK ☐ BASIC BEDRK ☐ CARB BEDRK	☐ LACUSTRINE ☐ RIVERINE ☐ BOTTOMLAND ☐ TERRACE ☐ VALLEY SLOPE ☐ TABLELAND ☒ ROLL UPLAND ☐ CLIFF ☐ TALUS ☐ CREVICE / CAVE ☐ ALVAR ☐ ROCKLAND ☐ BEACH / BAR ☐ SAND DUNE ☐ BLUFF	☐ NATURAL ☒ CULTURAL	☐ PLANKTON ☐ SUBMERGED ☐ FLOATING-LVD ☐ GRAMINOID ☐ FORB ☐ LICHEN ☐ BRYOPHYTE ☐ DECIDUOUS ☒ CONIFEROUS ☐ MIXED	☐ LAKE ☐ POND ☐ RIVER ☐ STREAM ☐ MARSH ☐ SWAMP ☐ FEN ☐ BOG ☐ BARREN ☐ MEADOW ☐ PRAIRIE ☐ THICKET ☐ SAVANNAH ☐ WOODLAND ☐ FOREST ☒ PLANTATION
SITE ☐ OPEN WATER ☐ SHALLOW WATER ☒ SURFICIAL DEP ☐ BEDROCK			**COVER** ☐ OPEN ☐ SHRUB ☒ TREED		

STAND DESCRIPTION:

	LAYER	HT	CVR	SPECIES IN ORDER OF DECREASING DOMINANCE (>> MUCH GREATER THAN; > GREATER THAN; = ABOUT EQUAL TO)
1	CANOPY	2	4	Sw
2	SUB-CANOPY	3	1	Sw
3	UNDERSTOREY	4	1	Sw
4	GRD. LAYER	5	1	Goldenrod, grasses, dandelion Confined to stand openings + edges.

HT CODES: 1 = >25 m 2 = 10<HT · 25 m 3 = 2<HT · 10 m 4 = 1<HT · 2 m 5 = 0.5<HT 1 m 6 = 0.2<HT · 0.5 m 7 = HT<0.2 m

CVR CODES 0= NONE 1= 0% < CVR · 10% 2= 10 < CVR · 25% 3= 25 < CVR · 60% 4= CVR > 60%

STAND COMPOSITION: Sw 10							BA: 31.0 m²/ha
SIZE CLASS ANALYSIS:	O	< 10	A	10 - 24	R	25 - 50	N > 50
STANDING SNAGS:	R	< 10	R	10 - 24	N	25 - 50	N > 50
DEADFALL / LOGS:	R	< 10	R	10 - 24	N	25 - 50	N > 50

ABUNDANCE CODES: N = NONE R = RARE O = OCCASIONAL A = ABUNDANT

COMM. AGE:		PIONEER	X	YOUNG		MID-AGE		MATURE		OLD GROWTH

SOIL ANALYSIS:

TEXTURE: Loam	DEPTH TO MOTTLES / GLEY	g = >100cm	G= >100cm
MOISTURE: 2	DEPTH OF ORGANICS: 2 cm		(cm)
HOMOGENEOUS / VARIABLE	DEPTH TO BEDROCK: >100cm		(cm)

COMMUNITYCLASSIFICATION:

COMMUNITY CLASS: Cultural	CODE: CU
COMMUNITY SERIES: Plantation	CODE: CUP
ECOSITE: Coniferous Plantation	CODE: CUP3
VEGETATION TYPE: White Spruce Coniferous Plantation	CODE: CUP3-1
INCLUSION	CODE:
COMPLEX	CODE:

Notes:

ELC COMMUNITY DESCRIPTION & CLASSIFICATION	SITE: James Dick Erosion Project		POLYGON: CUP3-12A
	SURVEYOR(S): Adam B. & M. H. S.	DATE: June 6 2011	UTME
	START: 9:30	END: 3:30	UTMZ / UTMN

POLYGON DESCRIPTION

SYSTEM	SUBSTRATE	TOPOGRAPHIC FEATURE	HISTORY	PLANT FORM	COMMUNITY
☒ TERRESTRIAL ☐ WETLAND ☐ AQUATIC	☐ ORGANIC ☒ MINERAL SOIL ☐ PARENT MIN ☐ ACIDIC BEDRK. ☐ BASIC BEDRK ☐ CARB BEDRK	☐ LACUSTRINE ☐ RIVERINE ☐ BOTTOMLAND ☐ TERRACE ☐ VALLEY SLOPE ☐ TABLELAND ☒ ROLL UPLAND ☐ CLIFF ☐ TALUS ☐ CREVICE / CAVE ☐ ALVAR ☐ ROCKLAND ☐ BEACH / BAR ☐ SAND DUNE ☐ BLUFF	☐ NATURAL ☒ CULTURAL	☐ PLANKTON ☐ SUBMERGED ☐ FLOATING-LVD ☐ GRAMINOID ☐ FORB ☐ LICHEN ☐ BRYOPHYTE ☐ DECIDUOUS ☒ CONIFEROUS ☐ MIXED	☐ LAKE ☐ POND ☐ RIVER ☐ STREAM ☐ MARSH ☐ SWAMP ☐ FEN ☐ BOG ☐ BARREN ☐ MEADOW ☐ PRAIRIE ☐ THICKET ☐ SAVANNAH ☐ WOODLAND ☐ FOREST ☒ PLANTATION

SITE	COVER
☐ OPEN WATER ☐ SHALLOW WATER ☒ SURFICIAL DEP ☐ BEDROCK	☐ OPEN ☐ SHRUB ☒ TREED

STAND DESCRIPTION:

	LAYER	HT	CVR	SPECIES IN ORDER OF DECREASING DOMINANCE (>> MUCH GREATER THAN; > GREATER THAN; = ABOUT EQUAL TO)
1	CANOPY	2	4	Pw Sw
2	SUB-CANOPY	3	2	Pw Sw Cb
3	UNDERSTOREY	4	2	Pw Sw Cb Host Hem [illegible]
4	GRD. LAYER	6	1	Cultural [illegible] Confined to stand openings.

HT CODES: 1 = >25 m 2 = 10<HT 25 m 3 = 2<HT 10 m 4 = 1<HT 2 m 5 = 0.5<HT 1 m 6 = 0.2<HT 0.5 m 7 = HT<0.2 m

CVR CODES: 0= NONE 1= 0% < CVR 10% 2= 10 < CVR 25% 3= 25 < CVR 60% 4= CVR > 60%

STAND COMPOSITION: Pw 6 Sw 4	BA: 34.0 m²/ha

SIZE CLASS ANALYSIS:	R	< 10	A	10 - 24	R	25 - 50	N	> 50
STANDING SNAGS:	O	< 10	O	10 - 24	N	25 - 50	N	> 50
DEADFALL / LOGS:	O	< 10	R	10 - 24	N	25 - 50	N	> 50

ABUNDANCE CODES: N = NONE R = RARE O = OCCASIONAL A = ABUNDANT

COMM. AGE		PIONEER	X	YOUNG		MID-AGE		MATURE		OLD GROWTH

SOIL ANALYSIS:

TEXTURE: Loam	DEPTH TO MOTTLES / GLEY	g = >100cm	G= >100cm
MOISTURE: 2	DEPTH OF ORGANICS: 3		(cm)
HOMOGENEOUS / VARIABLE	DEPTH TO BEDROCK: >100cm.		(cm)

COMMUNITYCLASSIFICATION:

COMMUNITY CLASS: Cultural	CODE: CU
COMMUNITY SERIES: Plantation	CODE: CUP
ECOSITE: Coniferous Plantation	CODE: CUP3
VEGETATION TYPE: White Pine - White Spruce Coniferous Plantation	CODE: CUP 3-12
INCLUSION	CODE:
COMPLEX	CODE:

Notes:

ELC COMMUNITY DESCRIPTION & CLASSIFICATION	SITE: James Dick Erumsin Property		POLYGON: CUP3-12B	
	SURVEYOR(S): Adam B. MscH.S.	DATE: June 6, 2011	UTME	
	START: 9:30	END: 3:30	UTMZ:	UTMN

POLYGON DESCRIPTION

SYSTEM	SUBSTRATE	TOPOGRAPHIC FEATURE	HISTORY	PLANT FORM	COMMUNITY
☒ TERRESTRIAL ☐ WETLAND ☐ AQUATIC	☐ ORGANIC ☒ MINERAL SOIL ☐ PARENT MIN ☐ ACIDIC BEDRK ☐ BASIC BEDRK ☐ CARB BEDRK	☐ LACUSTRINE ☐ RIVERINE ☐ BOTTOMLAND ☐ TERRACE ☐ VALLEY SLOPE ☐ TABLELAND ☒ ROLL UPLAND ☐ CLIFF ☐ TALUS ☐ CREVICE / CAVE ☐ ALVAR ☐ ROCKLAND ☐ BEACH / BAR ☐ SAND DUNE ☐ BLUFF	☐ NATURAL ☒ CULTURAL	☐ PLANKTON ☐ SUBMERGED ☐ FLOATING-LVD ☐ GRAMINOID ☐ FORB ☐ LICHEN ☐ BRYOPHYTE ☐ DECIDUOUS ☒ CONIFEROUS ☐ MIXED	☐ LAKE ☐ POND ☐ RIVER ☐ STREAM ☐ MARSH ☐ SWAMP ☐ FEN ☐ BOG ☐ BARREN ☐ MEADOW ☐ PRAIRIE ☐ THICKET ☐ SAVANNAH ☐ WOODLAND ☐ FOREST ☒ PLANTATION
SITE ☐ OPEN WATER ☐ SHALLOW WATER ☒ SURFICIAL DEP ☐ BEDROCK			**COVER** ☐ OPEN ☐ SHRUB ☒ TREED		

STAND DESCRIPTION:

	LAYER	HT	CVR	SPECIES IN ORDER OF DECREASING DOMINANCE (>> MUCH GREATER THAN; > GREATER THAN; = ABOUT EQUAL TO)
1	CANOPY	2	4	Pw Sw Sb
2	SUB-CANOPY	3	2	Pw Sw
3	UNDERSTOREY	3	1	Pw, Sw, Sb, Cb
4	GRD. LAYER	5	1	Coltsfoot, rock, garlic mustard, Grasses; Confined to openings.

HT CODES: 1 = >25 m 2 = 10<HT 25 m 3 = 2<HT 10 m 4 = 1<HT 2 m 5 = 0.5<HT 1 m 6 = 0.2<HT 0.5 m 7 = HT<0.2 m

CVR CODES: 0= NONE 1= 0% < CVR 10% 2= 10 < CVR 25% 3= 25 < CVR 60% 4= CVR > 60%

STAND COMPOSITION: Pw 6 Sw 4 **BA:** 41.0 m^2/ha

SIZE CLASS ANALYSIS:	O	< 10	A	10 - 24	O	25 - 50	N	> 50
STANDING SNAGS:	O	< 10	O	10 - 24	N	25 - 50	N	> 50
DEADFALL / LOGS:	R	< 10	R	10 - 24	N	25 - 50	N	> 50

ABUNDANCE CODES: N = NONE R = RARE O = OCCASIONAL A = ABUNDANT

COMM. AGE :		PIONEER	X	YOUNG		MID-AGE		MATURE		OLD GROWTH

SOIL ANALYSIS:

TEXTURE: Loam	DEPTH TO MOTTLES / GLEY	g = >100 cm	G= >100 cm
MOISTURE: 2	DEPTH OF ORGANICS: 2-3 cm		(cm)
HOMOGENEOUS / VARIABLE	DEPTH TO BEDROCK: >100 cm		(cm)

COMMUNITYCLASSIFICATION:

COMMUNITY CLASS: Cultural	CODE: CU
COMMUNITY SERIES: Plantation	CODE: CUP
ECOSITE: Coniferous Plantation	CODE: CUP3
VEGETATION TYPE: White Pine - White Spruce Coniferous Plantation	CODE: CUP3-12b
INCLUSION	CODE:
COMPLEX	CODE:

Notes:

ELC COMMUNITY DESCRIPTION & CLASSIFICATION	SITE: James Dick Eramosa Property		POLYGON: CUP3-12C	
	SURVEYOR(S): Adam B. & Matt S.	DATE: June 6, 2011		UTME
	START: 9:30	END: 3:30	UTMZ:	UTMN:

POLYGON DESCRIPTION

SYSTEM	SUBSTRATE	TOPOGRAPHIC FEATURE	HISTORY	PLANT FORM	COMMUNITY
☒ TERRESTRIAL ☐ WETLAND ☐ AQUATIC	☐ ORGANIC ☒ MINERAL SOIL ☐ PARENT MIN ☐ ACIDIC BEDRK. ☐ BASIC BEDRK ☐ CARB BEDRK	☐ LACUSTRINE ☐ RIVERINE ☐ BOTTOMLAND ☐ TERRACE ☐ VALLEY SLOPE ☐ TABLELAND ☒ ROLL UPLAND ☐ CLIFF ☐ TALUS ☐ CREVICE / CAVE ☐ ALVAR ☐ ROCKLAND ☐ BEACH / BAR ☐ SAND DUNE ☐ BLUFF	☐ NATURAL ☒ CULTURAL	☐ PLANKTON ☐ SUBMERGED ☐ FLOATING-LVD ☐ GRAMINOID ☐ FORB ☐ LICHEN ☐ BRYOPHYTE ☐ DECIDUOUS ☒ CONIFEROUS ☐ MIXED	☐ LAKE ☐ POND ☐ RIVER ☐ STREAM ☐ MARSH ☐ SWAMP ☐ FEN ☐ BOG ☐ BARREN ☐ MEADOW ☐ PRAIRIE ☐ THICKET ☐ SAVANNAH ☐ WOODLAND ☐ FOREST ☒ PLANTATION
SITE			**COVER**		
☐ OPEN WATER ☐ SHALLOW WATER ☒ SURFICIAL DEP ☐ BEDROCK			☐ OPEN ☐ SHRUB ☒ TREED		

STAND DESCRIPTION:

	LAYER	HT	CVR	SPECIES IN ORDER OF DECREASING DOMINANCE (>> MUCH GREATER THAN; > GREATER THAN; = ABOUT EQUAL TO)
1	CANOPY	2	4	Pw Sw Oc (Sn, Pr)
2	SUB-CANOPY	3	1	Pw Sw Oc (Sn, Pr)
3	UNDERSTOREY	4	1	Pw Oc Bu, Gaya, Elder, Rasp
4	GRD. LAYER	5	1	Grasses, goldenrod Only near trail & along stand edges.

HT CODES: 1 = >25 m 2 = 10<HT≤25 m 3 = 2<HT≤10 m 4 = 1<HT≤2 m 5 = 0.5<HT≤1 m 6 = 0.2<HT≤0.5 m 7 = HT<0.2 m

CVR CODES: 0= NONE 1= 0% < CVR ≤ 10% 2= 10 < CVR ≤ 25% 3= 25 < CVR ≤ 60% 4= CVR > 60%

STAND COMPOSITION: Pw 5 Sw 4 Oc 1 (Pr, Sn)	BA: 35.0 m²/ha

SIZE CLASS ANALYSIS:	R	< 10	A	10 - 24	R	25 - 50	N	> 50
STANDING SNAGS:	R	< 10	R	10 - 24	N	25 - 50	N	> 50
DEADFALL / LOGS:	R	< 10	R	10 - 24	N	25 - 50	N	> 50

ABUNDANCE CODES: N = NONE R = RARE O = OCCASIONAL A = ABUNDANT

COMM. AGE:		PIONEER	X	YOUNG		MID-AGE		MATURE		OLD GROWTH

SOIL ANALYSIS:

TEXTURE: Loam	DEPTH TO MOTTLES / GLEY	g = >100cm	G= >100cm
MOISTURE: 2	DEPTH OF ORGANICS: 3		(cm)
(HOMOGENEOUS) / VARIABLE	DEPTH TO BEDROCK: >100cm		(cm)

COMMUNITYCLASSIFICATION:

COMMUNITY CLASS: Cultural	CODE: CU
COMMUNITY SERIES: Plantation	CODE: CUP
ECOSITE: Coniferous Plantation	CODE: CUP3
VEGETATION TYPE: White Pine-White Spruce Coniferous Plantation	CODE: CUP3-12
INCLUSION	CODE:
COMPLEX	CODE:

Notes:

ELC COMMUNITY DESCRIPTION & CLASSIFICATION	SITE: James Dick Eramosa Property		POLYGON: CUP3-12D	
	SURVEYOR(S): Adam B. & MacH S.	DATE: June 6, 2011	UTME	
	START: 9:30	END: 3:30	UTMZ:	UTMN

POLYGON DESCRIPTION

SYSTEM	SUBSTRATE	TOPOGRAPHIC FEATURE	HISTORY	PLANT FORM	COMMUNITY
☒ TERRESTRIAL ☐ WETLAND ☐ AQUATIC	☐ ORGANIC ☒ MINERAL SOIL ☐ PARENT MIN ☐ ACIDIC BEDRK. ☐ BASIC BEDRK ☐ CARB BEDRK	☐ LACUSTRINE ☐ RIVERINE ☐ BOTTOMLAND ☐ TERRACE ☐ VALLEY SLOPE ☐ TABLELAND ☒ ROLL UPLAND ☐ CLIFF ☐ TALUS ☐ CREVICE / CAVE ☐ ALVAR ☐ ROCKLAND ☐ BEACH / BAR ☐ SAND DUNE ☐ BLUFF	☐ NATURAL ☒ CULTURAL	☐ PLANKTON ☐ SUBMERGED ☐ FLOATING-LVD. ☐ GRAMINOID ☐ FORB ☐ LICHEN ☐ BRYOPHYTE ☐ DECIDUOUS ☒ CONIFEROUS ☐ MIXED	☐ LAKE ☐ POND ☐ RIVER ☐ STREAM ☐ MARSH ☐ SWAMP ☐ FEN ☐ BOG ☐ BARREN ☐ MEADOW ☐ PRAIRIE ☐ THICKET ☐ SAVANNAH ☐ WOODLAND ☐ FOREST ☒ PLANTATION

SITE

☐ OPEN WATER
☐ SHALLOW WATER
☒ SURFICIAL DEP
☐ BEDROCK

COVER

☐ OPEN
☐ SHRUB
☒ TREED

STAND DESCRIPTION:

	LAYER	HT	CVR	SPECIES IN ORDER OF DECREASING DOMINANCE (>> MUCH GREATER THAN; > GREATER THAN; = ABOUT EQUAL TO)
1	CANOPY	2	4	Pr Sx
2	SUB-CANOPY	2	2	Pr Sx Cb Cc
3	UNDERSTOREY	3	2	Cc Cb Hs Hem. Rasp. R.Currant.
4	GRD. LAYER	6	1	Grasses, pillwort, dandelion, strawb. Confined to openings

HT CODES: 1 = >25 m 2 = 10<HT 25 m 3 = 2<HT 10 m 4 = 1<HT 2 m 5 = 0.5<HT 1 m 6 = 0.2<HT 0.5 m 7 = HT<0.2 m

CVR CODES 0= NONE 1= 0% < CVR 10% 2= 10 < CVR 25% 3= 25 < CVR 60% 4= CVR > 60%

STAND COMPOSITION:	Pr 7 Sw 2 Oh 1 (Cb, Aw, Ew, Mh)	BA:	34.0 m²/ha

SIZE CLASS ANALYSIS:	O	< 10	A	10 - 24	A	25 - 50	R	> 50
STANDING SNAGS:	R	< 10	A	10 - 24	R	25 - 50	N	> 50
DEADFALL / LOGS:	A	< 10	A	10 - 24	R	25 - 50	N	> 50

ABUNDANCE CODES: N = NONE R = RARE O = OCCASIONAL A = ABUNDANT

COMM. AGE :		PIONEER	X	YOUNG		MID-AGE		MATURE		OLD GROWTH

SOIL ANALYSIS:

TEXTURE: Sandy Loam.	DEPTH TO MOTTLES / GLEY	g = >100cm	G= >100cm.
MOISTURE: 2	DEPTH OF ORGANICS: 3		(cm)
(HOMOGENEOUS) VARIABLE	DEPTH TO BEDROCK: >100cm.		(cm)

COMMUNITYCLASSIFICATION:

COMMUNITY CLASS: Cultural	CODE: C U
COMMUNITY SERIES: Plantation	CODE: C U P
ECOSITE: Con. Forests Plantation	CODE: C U 3
VEGETATION TYPE: White Pine - White spruce Coniferous Plantation	CODE: C U P 3 - 12

☐ INCLUSION		CODE:
☐ COMPLEX		CODE:

Notes:

ELC COMMUNITY DESCRIPTION & CLASSIFICATION

SITE: James Dick Eramosa Property		POLYGON: CUW 1-3	
SURVEYOR(S): Adam B + Matt S.	DATE: July 27, 2011		UTME:
START: 4:30	END: 5:30	UTMZ:	UTMN:

POLYGON DESCRIPTION

SYSTEM	SUBSTRATE	TOPOGRAPHIC FEATURE	HISTORY	PLANT FORM	COMMUNITY
☒ TERRESTRIAL	☐ ORGANIC	☐ LACUSTRINE	☐ NATURAL	☐ PLANKTON	☐ LAKE
☐ WETLAND	☒ MINERAL SOIL	☐ RIVERINE	☒ CULTURAL	☐ SUBMERGED	☐ POND
☐ AQUATIC	☐ PARENT MIN	☒ BOTTOMLAND		☐ FLOATING-LVD.	☐ RIVER
	☐ ACIDIC BEDRK.	☐ TERRACE		☐ GRAMINOID	☐ STREAM
	☐ BASIC BEDRK.	☐ VALLEY SLOPE		☐ FORB	☐ MARSH
	☐ CARB BEDRK.	☐ TABLELAND		☐ LICHEN	☐ SWAMP
		☐ ROLL UPLAND		☐ BRYOPHYTE	☐ FEN
		☐ CLIFF		☒ DECIDUOUS	☐ BOG
		☐ TALUS		☐ CONIFEROUS	☐ BARREN
SITE		☐ CREVICE / CAVE	**COVER**	☐ MIXED	☐ MEADOW
		☐ ALVAR			☐ PRAIRIE
☐ OPEN WATER		☐ ROCKLAND	☐ OPEN		☐ THICKET
☐ SHALLOW WATER		☐ BEACH / BAR	☐ SHRUB		☐ SAVANNAH
☒ SURFICIAL DEP.		☐ SAND DUNE	☒ TREED		☒ WOODLAND
☐ BEDROCK		☐ BLUFF			☐ FOREST
					☐ PLANTATION

STAND DESCRIPTION:

	LAYER	HT	CVR	SPECIES IN ORDER OF DECREASING DOMINANCE (>> MUCH GREATER THAN; > GREATER THAN; = ABOUT EQUAL TO)
1	CANOPY	2	3	Pot, Crack Willow Pob By, Ps
2	SUB-CANOPY	2	2	Pot, Ps
3	UNDERSTOREY	4	3	Buc, Rosp [illegible] RODog, Chr Dog, Cur, Pot Bd Ew
4	GRD. LAYER	5	3	Grasses, golden rod, garlic mustard, asters, field horsetail

HT CODES: 1 = >25 m 2 = 10<HT≤25 m 3 = 2<HT≤10 m 4 = 1<HT≤2 m 5 = 0.5<HT≤1 m 6 = 0.2<HT≤0.5 m 7 = HT<0.2 m

CVR CODES: 0= NONE 1= 0% < CVR ≤ 10% 2= 10 < CVR ≤ 25% 3= 25 < CVR ≤ 60% 4= CVR > 60%

STAND COMPOSITION: Pot 5 Wi 2 Pob 1, By 1 Ps 1								BA: 15.0 m²/ha
SIZE CLASS ANALYSIS:	A	< 10	A	10 - 24	R	25 - 50	N	> 50
STANDING SNAGS:	N	< 10	O	10 - 24	R	25 - 50	N	> 50
DEADFALL / LOGS:	O	< 10	O	10 - 24	R	25 - 50	N	> 50

ABUNDANCE CODES: N = NONE R = RARE O = OCCASIONAL A = ABUNDANT

COMM. AGE :		PIONEER	X	YOUNG		MID-AGE		MATURE		OLD GROWTH

SOIL ANALYSIS:

TEXTURE: Silty fine sand	DEPTH TO MOTTLES / GLEY	g = >100	G= >100
MOISTURE: 2	DEPTH OF ORGANICS:	0	(cm)
HOMOGENEOUS / (VARIABLE)	DEPTH TO BEDROCK:	>100	(cm)

COMMUNITYCLASSIFICATION:

COMMUNITY CLASS: Cultural	CODE: CU
COMMUNITY SERIES: Cultural Woodland	CODE: CUW
ECOSITE: Mineral Cultural Woodland	CODE: CUW1
VEGETATION TYPE: Poplar Mineral Cultural Woodland	CODE: CUW1-3
☐ INCLUSION	CODE:
☐ COMPLEX	CODE:

Notes: Suspect that the stream channel may have been dredge at some point and this would account for the light brown fine sandy soils in plot 1 were over a dark brown/black loam soil. Plot 2 had silty fine sand soils.

ELC COMMUNITY DESCRIPTION & CLASSIFICATION	SITE: James Dick Erumosa Property		POLYGON: CUM1-1	
	SURVEYOR(S): Adam B & Matt S.	DATE: July 27, 2011		UTME:
	START: 9:30	END 5:30	UTMZ:	UTMN:

POLYGON DESCRIPTION

SYSTEM	SUBSTRATE	TOPOGRAPHIC FEATURE	HISTORY	PLANT FORM	COMMUNITY
☒ TERRESTRIAL ☐ WETLAND ☐ AQUATIC	☐ ORGANIC ☒ MINERAL SOIL ☐ PARENT MIN ☐ ACIDIC BEDRK. ☐ BASIC BEDRK. ☐ CARB. BEDRK	☐ LACUSTRINE ☐ RIVERINE ☐ BOTTOMLAND ☐ TERRACE ☐ VALLEY SLOPE ☒ TABLELAND ☒ ROLL. UPLAND ☐ CLIFF ☐ TALUS ☐ CREVICE / CAVE ☐ ALVAR ☐ ROCKLAND ☐ BEACH / BAR ☐ SAND DUNE ☐ BLUFF	☐ NATURAL ☒ CULTURAL	☐ PLANKTON ☐ SUBMERGED ☐ FLOATING-LVD. ☒ GRAMINOID ☐ FORB ☐ LICHEN ☐ BRYOPHYTE ☐ DECIDUOUS ☐ CONIFEROUS ☐ MIXED	☐ LAKE ☐ POND ☐ RIVER ☐ STREAM ☐ MARSH ☐ SWAMP ☐ FEN ☐ BOG ☐ BARREN ☒ MEADOW ☐ PRAIRIE ☐ THICKET ☐ SAVANNAH ☐ WOODLAND ☐ FOREST ☐ PLANTATION
SITE ☐ OPEN WATER ☐ SHALLOW WATER ☒ SURFICIAL DEP. ☐ BEDROCK			**COVER** ☒ OPEN ☐ SHRUB ☐ TREED		

STAND DESCRIPTION:

	LAYER	HT	CVR	SPECIES IN ORDER OF DECREASING DOMINANCE (>> MUCH GREATER THAN; > GREATER THAN; = ABOUT EQUAL TO)
1	CANOPY	N/A	0	
2	SUB-CANOPY	N/A	0	
3	UNDERSTOREY	4	1	lilac, Hawthorn, grape, Juniper Ps Mm
4	GRD. LAYER	5	4	goldenrod, asters, Can. thistle, wild carrot grasses

HT CODES: 1 = >25 m 2 = 10<HT≤25 m 3 = 2<HT≤10 m 4 = 1<HT≤2 m 5 = 0.5<HT≤1 m 6 = 0.2<HT≤0.5 m 7 = HT<0.2 m

CVR CODES 0 = NONE 1 = 0% < CVR ≤ 10% 2 = 10 < CVR ≤ 25% 3 = 25 < CVR ≤ 60% 4 = CVR > 60%

STAND COMPOSITION: N/A	BA: N/A

		< 10	10 - 24	25 - 50	> 50
SIZE CLASS ANALYSIS: N/A					
STANDING SNAGS: N/A		< 10	10 - 24	25 - 50	> 50
DEADFALL / LOGS:	R	< 10	R 10 - 24	N 25 - 50	N > 50

ABUNDANCE CODES: N = NONE R = RARE O = OCCASIONAL A = ABUNDANT

COMM. AGE :	X PIONEER	YOUNG	MID-AGE	MATURE	OLD GROWTH

SOIL ANALYSIS:

TEXTURE: Silty fine sand	DEPTH TO MOTTLES / GLEY	g = >100 cm	G= > 100cm
MOISTURE: 1	DEPTH OF ORGANICS: 0		(cm)
(HOMOGENEOUS) / VARIABLE	DEPTH TO BEDROCK: >100cm		(cm)

COMMUNITYCLASSIFICATION:

COMMUNITY CLASS: Cultural	CODE: CU
COMMUNITY SERIES: Cultural Meadow	CODE: CUM
ECOSITE: Mineral Cultural Meadow	CODE: CUM 1
VEGETATION TYPE: Dry-Moist Old Field Meadow type	CODE: CUM1-1
☐ INCLUSION	CODE:
☐ COMPLEX	CODE:

Notes: These ecosites have been disturbed by past agricultural & gravel extraction activities.

ELC COMMUNITY DESCRIPTION & CLASSIFICATION	SITE: James Dick Erumosa Property	POLYGON: CUT 1-5	
	SURVEYOR(S): Adam Bs MnHS.	DATE: July 27, 2011	UTME:
	START: 9:30	END 5:30	UTMZ: UTMN:

POLYGON DESCRIPTION

SYSTEM	SUBSTRATE	TOPOGRAPHIC FEATURE	HISTORY	PLANT FORM	COMMUNITY
☒ TERRESTRIAL ☐ WETLAND ☐ AQUATIC	☐ ORGANIC ☒ MINERAL SOIL ☐ PARENT MIN ☐ ACIDIC BEDRK. ☐ BASIC BEDRK. ☐ CARB. BEDRK.	☐ LACUSTRINE ☐ RIVERINE ☐ BOTTOMLAND ☐ TERRACE ☒ VALLEY SLOPE ☐ TABLELAND ☐ ROLL. UPLAND ☐ CLIFF ☐ TALUS ☐ CREVICE / CAVE ☐ ALVAR ☐ ROCKLAND ☐ BEACH / BAR ☐ SAND DUNE ☐ BLUFF	☐ NATURAL ☒ CULTURAL	☐ PLANKTON ☐ SUBMERGED ☐ FLOATING-LVD. ☐ GRAMINOID ☐ FORB ☐ LICHEN ☐ BRYOPHYTE ☒ DECIDUOUS ☐ CONIFEROUS ☐ MIXED	☐ LAKE ☐ POND ☐ RIVER ☐ STREAM ☐ MARSH ☐ SWAMP ☐ FEN ☐ BOG ☐ BARREN ☐ MEADOW ☐ PRAIRIE ☒ THICKET ☐ SAVANNAH ☐ WOODLAND ☐ FOREST ☐ PLANTATION
SITE ☐ OPEN WATER ☐ SHALLOW WATER ☒ SURFICIAL DEP ☐ BEDROCK			**COVER** ☐ OPEN ☒ SHRUB ☐ TREED		

STAND DESCRIPTION:

	LAYER	HT	CVR	SPECIES IN ORDER OF DECREASING DOMINANCE (>> MUCH GREATER THAN; > GREATER THAN; = ABOUT EQUAL TO)
1	CANOPY	N/A	0	
2	SUB-CANOPY	N/A	0	
3	UNDERSTOREY	4	4	Rasp. Grape, creeper
4	GRD. LAYER	5	2	Canada Thistle, wild red grasses

HT CODES: 1 = >25 m 2 = 10<HT≤25 m 3 = 2<HT≤10 m 4 = 1<HT≤2 m 5 = 0.5<HT≤1 m 6 = 0.2<HT≤0.5 m 7 = HT≤0.2 m

CVR CODES 0= NONE 1= 0% < CVR ≤ 10% 2= 10 < CVR ≤ 25% 3= 25 < CVR ≤ 60% 4= CVR > 60%

STAND COMPOSITION: N/A							BA: N/A
SIZE CLASS ANALYSIS: N/A		< 10		10 - 24		25 - 50	> 50
STANDING SNAGS: N/A		< 10		10 - 24		25 - 50	> 50
DEADFALL / LOGS: N/A		< 10		10 - 24		25 - 50	> 50

ABUNDANCE CODES: N = NONE R = RARE O = OCCASIONAL A = ABUNDANT

COMM. AGE :		PIONEER		YOUNG		MID-AGE		MATURE		OLD GROWTH
	X									

SOIL ANALYSIS:

TEXTURE: Loam	DEPTH TO MOTTLES / GLEY	g = 70cm	G= >100cm
MOISTURE: 2	DEPTH OF ORGANICS: 0		(cm)
HOMOGENEOUS / VARIABLE	DEPTH TO BEDROCK: >100		(cm)

COMMUNITYCLASSIFICATION:

COMMUNITY CLASS:	Cultural	CODE: CU
COMMUNITY SERIES:	Cultural Thicket	CODE: CUT
ECOSITE:	Mineral Cultural Thicket	CODE: CUT 1
VEGETATION TYPE:	Rasberry Cultural Thicket	CODE: CUT 1-5
☐ INCLUSION		CODE:
☐ COMPLEX		CODE:

Notes: Water table 80cm below ground level.

ELC COMMUNITY DESCRIPTION & CLASSIFICATION

SITE: James Dick Eramosa Property		POLYGON: CUT 1-7	
SURVEYOR(S): Adam Bs Motts	DATE: July 27, 2011		UTME:
START: 9.30	END: 3.30	UTMZ:	UTMN:

POLYGON DESCRIPTION

SYSTEM
- [x] TERRESTRIAL
- [ ] WETLAND
- [ ] AQUATIC

SITE
- [ ] OPEN WATER
- [ ] SHALLOW WATER
- [x] SURFICIAL DEP.
- [ ] BEDROCK

SUBSTRATE
- [ ] ORGANIC
- [x] MINERAL SOIL
- [ ] PARENT MIN.
- [ ] ACIDIC BEDRK.
- [ ] BASIC BEDRK.
- [ ] CARB. BEDRK

TOPOGRAPHIC FEATURE
- [ ] LACUSTRINE
- [ ] RIVERINE
- [ ] BOTTOMLAND
- [ ] TERRACE
- [ ] VALLEY SLOPE
- [x] TABLELAND
- [ ] ROLL UPLAND
- [ ] CLIFF
- [ ] TALUS
- [ ] CREVICE / CAVE
- [ ] ALVAR
- [ ] ROCKLAND
- [ ] BEACH / BAR
- [ ] SAND DUNE
- [ ] BLUFF

HISTORY
- [ ] NATURAL
- [x] CULTURAL

COVER
- [ ] OPEN
- [x] SHRUB
- [ ] TREED

PLANT FORM
- [ ] PLANKTON
- [ ] SUBMERGED
- [ ] FLOATING-LVD.
- [ ] GRAMINOID
- [ ] FORB
- [ ] LICHEN
- [ ] BRYOPHYTE
- [x] DECIDUOUS
- [ ] CONIFEROUS
- [ ] MIXED

COMMUNITY
- [ ] LAKE
- [ ] POND
- [ ] RIVER
- [ ] STREAM
- [ ] MARSH
- [ ] SWAMP
- [ ] FEN
- [ ] BOG
- [ ] BARREN
- [ ] MEADOW
- [ ] PRAIRIE
- [x] THICKET
- [ ] SAVANNAH
- [ ] WOODLAND
- [ ] FOREST
- [ ] PLANTATION

STAND DESCRIPTION

	LAYER	HT	CVR	SPECIES IN ORDER OF DECREASING DOMINANCE (>> MUCH GREATER THAN; > GREATER THAN; = ABOUT EQUAL TO)
1	CANOPY	N/A	0	
2	SUB-CANOPY	N/A	0	
3	UNDERSTOREY	3	4	Lilac, Haw, Hbnt, Buc, grape, creeper Ps. Pear.
4	GRD. LAYER	5	3	Goldenrod, grasses, strawberry, wild carrot aster

HT CODES: 1 = >25 m 2 = 10<HT≤25 m 3 = 2<HT≤10 m 4 = 1<HT≤2 m 5 = 0.5<HT≤1 m 6 = 0.2<HT≤0.5 m 7 = HT<0.2 m

CVR CODES 0= NONE 1= 0% < CVR ≤ 10% 2= 10 < CVR ≤ 25% 3= 25 < CVR ≤ 60% 4= CVR > 60%

STAND COMPOSITION: N/A							BA: N/A	
SIZE CLASS ANALYSIS:	R	< 10	R	10 - 24	N	25 - 50	N	> 50
STANDING SNAGS:	N	< 10	N	10 - 24	N	25 - 50	N	> 50
DEADFALL / LOGS:	R	< 10	R	10 - 24	N	25 - 50	N	> 50

ABUNDANCE CODES: N = NONE R = RARE O = OCCASIONAL A = ABUNDANT

COMM. AGE :	✓	PIONEER		YOUNG		MID-AGE		MATURE		OLD GROWTH

SOIL ANALYSIS:

TEXTURE: Silty fine sand	DEPTH TO MOTTLES / GLEY	g = >100 cm	G= >100cm
MOISTURE: 1	DEPTH OF ORGANICS: 0		(cm)
(HOMOGENEOUS) / VARIABLE	DEPTH TO BEDROCK: >100cm		(cm)

COMMUNITYCLASSIFICATION:

COMMUNITY CLASS: Cultural	CODE: CU
COMMUNITY SERIES: Cultural Thicket	CODE: CUT
ECOSITE: Mineral Cultural Thicket	CODE: CUT1
VEGETATION TYPE: Lilac Cultural Thicket	CODE: CUT 1-7
INCLUSION	CODE:
COMPLEX	CODE:

Notes: This community was disturbed by past aggregate extraction.

ELC
COMMUNITY DESCRIPTION & CLASSIFICATION

SITE: James Dick Eramosa Property		POLYGON: SWT 2-2	
SURVEYOR(S): Adam B & Matts.	DATE: July 27, 2011		UTME:
START: 9.30	END: 5.20	UTMZ:	UTMN:

POLYGON DESCRIPTION

SYSTEM	SUBSTRATE	TOPOGRAPHIC FEATURE	HISTORY	PLANT FORM	COMMUNITY
☐ TERRESTRIAL	☐ ORGANIC	☐ LACUSTRINE	☐ NATURAL	☐ PLANKTON	☐ LAKE
☒ WETLAND	☒ MINERAL SOIL	☐ RIVERINE	☒ CULTURAL	☐ SUBMERGED	☐ POND
☐ AQUATIC	☐ PARENT MIN.	☒ BOTTOMLAND		☐ FLOATING-LVD.	☐ RIVER
	☐ ACIDIC BEDRK.	☐ TERRACE		☐ GRAMINOID	☐ STREAM
	☐ BASIC BEDRK.	☐ VALLEY SLOPE		☐ FORB	☐ MARSH
	☐ CARB. BEDRK.	☐ TABLELAND		☐ LICHEN	☒ SWAMP
		☐ ROLL. UPLAND		☐ BRYOPHYTE	☐ FEN
		☐ CLIFF		☒ DECIDUOUS	☐ BOG
		☐ TALUS		☐ CONIFEROUS	☐ BARREN
SITE		☐ CREVICE / CAVE	**COVER**	☐ MIXED	☐ MEADOW
☐ OPEN WATER		☐ ALVAR	☐ OPEN		☐ PRAIRIE
☐ SHALLOW WATER		☐ ROCKLAND	☒ SHRUB		☒ THICKET
☒ SURFICIAL DEP.		☐ BEACH / BAR	☐ TREED		☐ SAVANNAH
☐ BEDROCK		☐ SAND DUNE			☐ WOODLAND
		☐ BLUFF			☐ FOREST
					☐ PLANTATION

STAND DESCRIPTION:

	LAYER	HT	CVR	SPECIES IN ORDER OF DECREASING DOMINANCE (>> MUCH GREATER THAN; > GREATER THAN; = ABOUT EQUAL TO)
1	CANOPY	N/A	N/A	
2	SUB-CANOPY	N/A	N/A	
3	UNDERSTOREY	3	2	Ulm Ce Ps Wi, RODog
4	GRD. LAYER	6	2	Sedges, rushes, grasses, goldenrods, asters.

HT CODES: 1 = >25 m 2 = 10<HT≤25 m 3 = 2<HT≤10 m 4 = 1<HT≤2 m 5 = 0.5<HT≤1 m 6 = 0.2<HT≤0.5 m 7 = HT<0.2 m

CVR CODES: 0= NONE 1= 0% < CVR ≤ 10% 2= 10 < CVR ≤ 25% 3= 25 < CVR ≤ 60% 4= CVR > 60%

STAND COMPOSITION: N/A								BA: N/A	
SIZE CLASS ANALYSIS: N/A		< 10		10 - 24		25 - 50		> 50	
STANDING SNAGS: N/A		< 10		10 - 24		25 - 50		> 50	
DEADFALL / LOGS: N/A		< 10		10 - 24		25 - 50		> 50	

ABUNDANCE CODES: N = NONE R = RARE O = OCCASIONAL A = ABUNDANT

COMM. AGE :		PIONEER	X	YOUNG		MID-AGE		MATURE		OLD GROWTH

SOIL ANALYSIS: auger could only get down 20cm,

TEXTURE: Sandy gravel	DEPTH TO MOTTLES / GLEY	g = >20cm	G= >20cm
MOISTURE: 1 to 6	DEPTH OF ORGANICS: 0		(cm)
(HOMOGENEOUS) / VARIABLE	DEPTH TO BEDROCK: >100cm		(cm)

COMMUNITYCLASSIFICATION:

COMMUNITY CLASS: Swamp	CODE: SW
COMMUNITY SERIES: Thicket Swamp	CODE: SWT
ECOSITE: Mineral Thicket Swamp	CODE: SWT2
VEGETATION TYPE: Willow Mineral Thicket Swamp	CODE: SWT2-2
INCLUSION	CODE:
COMPLEX	CODE:

Notes: Dutch auger could only penetrate the first 20cm of soil. This area was disturbed by aggregate extraction in the past. The sandy gravel is likely underlain by a silty sandy clay layer that impedes water movement and causes seasonal ponding.

ELC COMMUNITY DESCRIPTION & CLASSIFICATION	SITE: James Dick Eramosa Pit		POLYGON: MAM 2-5	
	SURVEYOR(S): Adam B. & Matt S.	DATE: July 27, 2011		UTME:
	START 9:30	END 5:30	UTMZ:	UTMN:

POLYGON DESCRIPTION

SYSTEM	SUBSTRATE	TOPOGRAPHIC FEATURE	HISTORY	PLANT FORM	COMMUNITY
☐ TERRESTRIAL ☒ WETLAND ☐ AQUATIC	☐ ORGANIC ☒ MINERAL SOIL ☐ PARENT MIN. ☐ ACIDIC BEDRK. ☐ BASIC BEDRK. ☐ CARB. BEDRK.	☐ LACUSTRINE ☐ RIVERINE ☒ BOTTOMLAND ☐ TERRACE ☐ VALLEY SLOPE ☐ TABLELAND ☐ ROLL UPLAND ☐ CLIFF ☐ TALUS ☐ CREVICE / CAVE ☐ ALVAR ☐ ROCKLAND ☐ BEACH / BAR ☐ SAND DUNE ☐ BLUFF	☐ NATURAL ☒ CULTURAL	☐ PLANKTON ☐ SUBMERGED ☐ FLOATING-LVD. ☒ GRAMINOID ☐ FORB ☐ LICHEN ☐ BRYOPHYTE ☐ DECIDUOUS ☐ CONIFEROUS ☐ MIXED	☐ LAKE ☐ POND ☐ RIVER ☐ STREAM ☒ MARSH ☐ SWAMP ☐ FEN ☐ BOG ☐ BARREN ☐ MEADOW ☐ PRAIRIE ☐ THICKET ☐ SAVANNAH ☐ WOODLAND ☐ FOREST ☐ PLANTATION
SITE ☐ OPEN WATER ☐ SHALLOW WATER ☒ SURFICIAL DEP. ☐ BEDROCK			**COVER** ☒ OPEN ☐ SHRUB ☐ TREED		

STAND DESCRIPTION:

	LAYER	HT	CVR	SPECIES IN ORDER OF DECREASING DOMINANCE (>> MUCH GREATER THAN; > GREATER THAN; = ABOUT EQUAL TO)
1	CANOPY	N/A	N/A	N/A
2	SUB-CANOPY	N/A	N/A	N/A
3	UNDERSTOREY	5	1	Ww, RO Dog
4	GRD. LAYER	6	4	Sedges, grasses, rushes, golden rod

HT CODES: 1 = >25 m 2 = 10<HT≤25 m 3 = 2<HT≤10 m 4 = 1<HT≤2 m 5 = 0.5<HT≤1 m 6 = 0.2<HT≤0.5 m 7 = HT<0.2 m

CVR CODES 0 = NONE 1 = 0% < CVR ≤ 10% 2 = 10 < CVR ≤ 25% 3 = 25 < CVR ≤ 60% 4 = CVR > 60%

STAND COMPOSITION: N/A							BA: N/A
SIZE CLASS ANALYSIS: N/A		< 10		10 - 24		25 - 50	> 50
STANDING SNAGS: N/A		< 10		10 - 24		25 - 50	> 50
DEADFALL / LOGS: N/A		< 10		10 - 24		25 - 50	> 50

ABUNDANCE CODES: N = NONE R = RARE O = OCCASIONAL A = ABUNDANT

COMM. AGE :		PIONEER		YOUNG		MID-AGE		MATURE		OLD GROWTH
	J									

auger went down to 20cm

SOIL ANALYSIS:

TEXTURE: Sandy gravel	DEPTH TO MOTTLES / GLEY	g = >20cm	G= >20cm
MOISTURE: 1 to 6	DEPTH OF ORGANICS: 0		(cm)
HOMOGENEOUS / VARIABLE	DEPTH TO BEDROCK: >100cm		(cm)

COMMUNITYCLASSIFICATION:

COMMUNITY CLASS: Marsh	CODE: MA
COMMUNITY SERIES: Meadow Marsh	CODE: MAM
ECOSITE: Mineral Meadow Marsh	CODE: MAM2
VEGETATION TYPE: Mixed Reed Sedge Mineral Meadow Marsh	CODE: MAM2-5
INCLUSION	CODE:
COMPLEX	CODE:

Notes: Dutch auger could only penetrate the first 20cm of soil which is characterized by sandy gravel these areas were disturbed by aggregate extraction in the past. The sandy gravel is likely over a silt clay or sandy clay soil which impedes water movement and causes seasonal ponding.

ELC COMMUNITY DESCRIPTION & CLASSIFICATION	SITE: James Dick Eramosa Property		POLYGON: MAM3-2
	SURVEYOR(S): Adam B. Matt S.	DATE: July 27, 2011	UTME:
	START: 9.30	END: 3:30	UTMZ:	UTMN:

POLYGON DESCRIPTION

SYSTEM	SUBSTRATE	TOPOGRAPHIC FEATURE	HISTORY	PLANT FORM	COMMUNITY
☐ TERRESTRIAL ☒ WETLAND ☐ AQUATIC	☒ ORGANIC ☐ MINERAL SOIL ☐ PARENT MIN. ☐ ACIDIC BEDRK. ☐ BASIC BEDRK. ☐ CARB. BEDRK.	☐ LACUSTRINE ☐ RIVERINE ☒ BOTTOMLAND ☐ TERRACE ☐ VALLEY SLOPE ☐ TABLELAND ☐ ROLL UPLAND ☐ CLIFF ☐ TALUS ☐ CREVICE / CAVE ☐ ALVAR ☐ ROCKLAND ☐ BEACH / BAR ☐ SAND DUNE ☐ BLUFF	☒ NATURAL ☐ CULTURAL	☐ PLANKTON ☐ SUBMERGED ☐ FLOATING-LVD. ☒ GRAMINOID ☐ FORB ☐ LICHEN ☐ BRYOPHYTE ☐ DECIDUOUS ☐ CONIFEROUS ☐ MIXED	☐ LAKE ☐ POND ☐ RIVER ☐ STREAM ☒ MARSH ☐ SWAMP ☐ FEN ☐ BOG ☐ BARREN ☐ MEADOW ☐ PRAIRIE ☐ THICKET ☐ SAVANNAH ☐ WOODLAND ☐ FOREST ☐ PLANTATION
SITE ☐ OPEN WATER ☐ SHALLOW WATER ☒ SURFICIAL DEP. ☐ BEDROCK			**COVER** ☒ OPEN ☐ SHRUB ☐ TREED		

STAND DESCRIPTION:

	LAYER	HT	CVR	SPECIES IN ORDER OF DECREASING DOMINANCE (>> MUCH GREATER THAN; > GREATER THAN; = ABOUT EQUAL TO)
1	CANOPY	N/A	0	
2	SUB-CANOPY	N/A	0	
3	UNDERSTOREY	N/A	0	
4	GRD. LAYER	5	4	Reed Canary Grass, nettle, jewelweed, cattail

HT CODES: 1 = >25 m 2 = 10<HT≤25 m 3 = 2<HT≤10 m 4 = 1<HT≤2 m 5 = 0.5<HT≤1 m 6 = 0.2<HT≤0.5 m 7 = HT<0.2 m

CVR CODES 0= NONE 1= 0% < CVR ≤ 10% 2= 10 < CVR ≤ 25% 3= 25 < CVR ≤ 60% 4= CVR > 60%

STAND COMPOSITION:	N/A	BA: N/A

		< 10	10 - 24	25 - 50	> 50
SIZE CLASS ANALYSIS:	N/A				
STANDING SNAGS:	N/A				
DEADFALL / LOGS:	N/A				

ABUNDANCE CODES: N = NONE R = RARE O = OCCASIONAL A = ABUNDANT

COMM. AGE :		PIONEER		YOUNG		MID-AGE		MATURE		OLD GROWTH
	X									

SOIL ANALYSIS:

TEXTURE: Organic Muck	DEPTH TO MOTTLES / GLEY	g =	G= 45
MOISTURE: 8	DEPTH OF ORGANICS: 45		(cm)
(HOMOGENEOUS) / VARIABLE	DEPTH TO BEDROCK: >100		(cm)

COMMUNITY CLASSIFICATION:

COMMUNITY CLASS: Marsh	CODE: MA
COMMUNITY SERIES: Meadow Marsh	CODE: MAM
ECOSITE: Organic Meadow Marsh	CODE: MAM3
VEGETATION TYPE: Reed canary grass Organic meadow marsh	CODE: MAM3-2
☐ INCLUSION	CODE:
☐ COMPLEX	CODE:

Notes: Water table at 90cm.

ELC COMMUNITY DESCRIPTION & CLASSIFICATION	SITE: James Dick Erasmus Property		POLYGON: MAS2-1	
	SURVEYOR(S): Adam B. & Matt S.	DATE: July 27, 2011		UTME:
	START: 9:30	END 3:30	UTMZ:	UTMN:

POLYGON DESCRIPTION

SYSTEM	SUBSTRATE	TOPOGRAPHIC FEATURE	HISTORY	PLANT FORM	COMMUNITY
☐ TERRESTRIAL ☒ WETLAND ☐ AQUATIC	☐ ORGANIC ☒ MINERAL SOIL ☐ PARENT MIN ☐ ACIDIC BEDRK. ☐ BASIC BEDRK. ☐ CARB. BEDRK	☐ LACUSTRINE ☐ RIVERINE ☒ BOTTOMLAND ☐ TERRACE ☐ VALLEY SLOPE ☐ TABLELAND ☐ ROLL UPLAND ☐ CLIFF ☐ TALUS ☐ CREVICE / CAVE ☐ ALVAR ☐ ROCKLAND ☐ BEACH / BAR ☐ SAND DUNE ☐ BLUFF	☒ NATURAL ☐ CULTURAL	☐ PLANKTON ☐ SUBMERGED ☐ FLOATING-LVD. ☒ GRAMINOID ☐ FORB ☐ LICHEN ☐ BRYOPHYTE ☐ DECIDUOUS ☐ CONIFEROUS ☐ MIXED	☐ LAKE ☐ POND ☐ RIVER ☐ STREAM ☒ MARSH ☐ SWAMP ☐ FEN ☐ BOG ☐ BARREN ☐ MEADOW ☐ PRAIRIE ☐ THICKET ☐ SAVANNAH ☐ WOODLAND ☐ FOREST ☐ PLANTATION
SITE ☐ OPEN WATER ☒ SHALLOW WATER ☐ SURFICIAL DEP ☐ BEDROCK			**COVER** ☒ OPEN ☐ SHRUB ☐ TREED		

STAND DESCRIPTION:

	LAYER	HT	CVR	SPECIES IN ORDER OF DECREASING DOMINANCE (>> MUCH GREATER THAN; > GREATER THAN; = ABOUT EQUAL TO)
1	CANOPY	N/A	0	
2	SUB-CANOPY	N/A	0	
3	UNDERSTOREY	N/A	0	
4	GRD. LAYER	4	4	Cattail, reed canary grass.

HT CODES: 1 = >25 m 2 = 10<HT≤25 m 3 = 2<HT≤10 m 4 = 1<HT≤2 m 5 = 0.5<HT≤1 m 6 = 0.2<HT≤0.5 m 7 = HT<0.2 m

CVR CODES 0= NONE 1= 0% < CVR ≤ 10% 2= 10 < CVR ≤ 25% 3= 25 < CVR ≤ 60% 4= CVR > 60%

STAND COMPOSITION: N/A					BA: N/A
SIZE CLASS ANALYSIS: N/A	☐ < 10	☐ 10 - 24	☐ 25 - 50	☐ > 50	
STANDING SNAGS: N/A	☐ < 10	☐ 10 - 24	☐ 25 - 50	☐ > 50	
DEADFALL / LOGS: N/A	☐ < 10	☐ 10 - 24	☐ 25 - 50	☐ > 50	

ABUNDANCE CODES: N = NONE R = RARE O = OCCASIONAL A = ABUNDANT

COMM. AGE:	☑ PIONEER	☐ YOUNG	☐ MID-AGE	☐ MATURE	☐ OLD GROWTH

SOIL ANALYSIS:

TEXTURE: Muck over Silty Clay.	DEPTH TO MOTTLES / GLEY	g = 20cm	G=
MOISTURE: G	DEPTH OF ORGANICS: 15cm		(cm)
HOMOGENEOUS / VARIABLE	DEPTH TO BEDROCK: >100cm		(cm)

COMMUNITYCLASSIFICATION:

COMMUNITY CLASS: Marsh	CODE: MA
COMMUNITY SERIES: Shallow Marsh	CODE: MAS
ECOSITE: Mineral Shallow Marsh	CODE: MAS2
VEGETATION TYPE: Cattail Mineral Shallow Marsh Type.	CODE: MAS2-1
☐ INCLUSION	CODE:
☐ COMPLEX	CODE:

Notes:

File: 3028
By: Email & Mail

September 6, 2013

County of Wellington
Planning & Development Department
74 Woolwich Street
Guelph, ON
N1H 3T9

Attention: Mr. Aldo Salis
Planner

Dear: Mr. Salis

Re: Hidden Quarry

We have reviewed Mr. Peter Williams comments on our Level II Natural Environment Technical Report for the Proposed Hidden Quarry.

We appreciate and concur with Mr. Williams' opinion that the proposed project would have limited negative impacts on woodland functions. Although these functions would be temporarily affected by the project, the basic linkages can be maintained by the vegetative corridors on the north and east side of the property and stream channel as proposed. We agree that the affects on connectivity can be further mitigated through other operational considerations such as retaining the current vegetation until just prior to extraction, expeditious restoration back to natural cover and enhancing tree/natural vegetation along the 6th Line.

Mr. Williams indicated a concern for a more detailed discussion about the importance of woodlands on the subject property and their linkage to the nearby Eramosa River and Blue Springs Creek Corridors which are located to the north, west and south respectively. In our report we state, on page 17, "The subject property is well connected to natural areas to the north and west but is weakly linked to lands to the east and south because of Highway #7, existing residential and commercial developments and a lack of large well connected natural features." These land uses are clearly shown on Figures 1, 7 and 8. On page 60 we conclude that "The James Dick woodlands lie in close proximity to other woodlands and wetlands located to the north and west of the site. As such they provide an important linkage to these natural features."

We are therefore in agreement with Mr. Williams regarding the importance of linkages to the north and west but feel the connection to the Blue Springs Creek corridor is not as strong. The right-of-way for Highway #7 is 30 to 40m wide and this provincial highway gets a large volume of traffic well into the evening. This was quite apparent during evening surveys for bats, owls and calling amphibians. Although some mammals, reptiles and amphibians may venture across this highway they are clearly at risk of becoming a road kill. Although common birds that typically nest in a meadows and forest edges may cross the highway for foraging purposes this forest opening is sufficiently wide to adversely affect woodland utilization by area sensitive birds. Existing residential

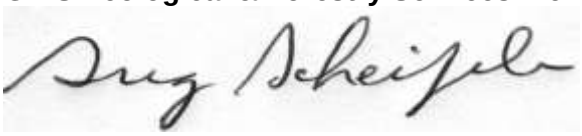
and commercial land uses located on the south side of the highway further impair wildlife movements in a north-south direction.

With respect to Mr. Williams concerns for mitigating potential impacts to connectivity through operational modifications, we confirm that existing vegetation will be retained until just prior to extraction in accordance with the Phasing shown on the Operations Plan. Once extraction is completed in a Phase the area will be promptly restored to the ecological after-use specified in the Progressive Rehabilitation Plan. We also agree there is merit in enhancing tree cover along the 6th Line, particularly within the cultural thicket and meadow communities (CUT1-7 and CUM1-1). The Rehabilitation Plan will therefore be revised to show some tree planting in open areas within these communities. We recommend that coniferous and deciduous trees should be planted in this area with a minimum spacing of 3m to ensure an appropriate forest density for effective corridor establishment. This planting should take place immediately upon the establishment of any berms in this area, prior to aggregate extraction in proximity to the 6th line.

We trust this information adequately addresses the County's concerns. Please do not hesitate to contact us if you require further clarification on these matters.

Yours truly,

GWS Ecological & Forestry Services Inc.



Greg W. Scheifele, M. A., R.P.F.
Principal Ecologist/Forester

cc: Greg Sweetnam, James Dick Construction Limited
Leigh Mugford, James Dick Construction Limited
Rob Stovel, Stovel and Associates

File: 3028
By: Email & Mail

September 16, 2013

Grand River Conservation Authority
400 Clyde Road
P.O. Box 729
Cambridge, Ontario
N1R 5W6

Attention: Mr. Fred Natolochny, MCIP, RPP
Supervisor of Resource Planning

Dear: Mr. Natolochny

Re: Hidden Quarry Site Meeting Notes

We have reviewed your July 15, 2013 comments on the June 7th Site Meeting Notes and offer the following explanations to the concerns raised by your staff. At this time we will also respond to any outstanding GRCA comments that we feel have not been fully addressed in previous correspondence. Our responses are consistent with the numbering sequence used in the Meeting Notes.

Point #1 – The boundary of the woodland area to be retained in the southeast corner of the site was based on the maturity of forest stands, terrain considerations and the ARA blasting requirement for a minimum setback of 165m from the existing off-site residences, particularly the house located northeast of FOM2-2 and southeast of FOD5-7. As indicated at our site meeting, this boundary was shifted further westward to the base of the steep slope that forms the most westerly limit of FOM2-2. It was also agreed to shift the boundary in FOD5-7 further northward to protect a mature sugar maple tree, assuming the tree remains reasonably healthy at the time when tree clearing commences in Phase 2. In any event, virtually all of the mature mixedwood and deciduous forest stands (FOM 2-2 and FOD 5-7) will be retained, as well as most of the mature upland cedar stand (FOC 2-2) and portions of the conifer plantation CUP3-12a and CUP3-12d. The cedar stand is mostly being retained due to the 165m setback required from the off-site residence and the 20 to 30m setbacks recommended from the stream.

With respect to linkages to off-site natural areas, this issue was not discussed at our meeting but it was raised by Peter Williams on behalf of the County. We have attached our response to Mr. Williams concerns for your review.

Point #2 - We understand that agreement/approval of proposed setbacks was not an objective of the site visit from your perspective. Rationale supporting the recommended setbacks from Tributary B and Wetland MAM3-2 was previously provided by GWS and Harden Environmental as shown in #93 of the Comment Matrix assembled by James Dick

Construction (JDC). In addition, Stan Denhoed has confirmed that over the past 15 years flooding in the stream valley would not exceed the proposed setback elevations as discussed in his September 9, 2013 correspondence (attached). It is therefore concluded that flood waters will always be confined to the area within the residual stream valley. If you still have concerns with these setbacks please clarify your position with specific details so we may better understand the concern.

Point #7&8 – The boundaries of the man-made wetland MAM2-5 and SWT2-2 within the former wayside pit were not staked or flagged in advance of the site meeting because 0.2 ha of this wetland is proposed for removal to accommodate quarry development while the balance of the area is proposed for enlargement and deepening, particularly in the area now occupied by a gravel stockpile that is to be removed. Since the boundaries of the residual wetland will change when the gravel stockpile is removed there was little merit in trying to precisely identify the future wetland area. Furthermore, this area will be within the protected zone as shown on the Operations and Rehabilitation Plans. In any event, GRCA staff concluded there was no need to enhance the wetland area which they felt should simply be maintained in its current condition. JDC agreed not to carry out any wetland enhancement work other than the removal of the gravel stockpile.

We trust the above information adequately addresses the comments received to date.

Yours truly,

GWS Ecological & Forestry Services Inc.

Greg W. Scheifele, M. A., R.P.F.
Principal Ecologist/Forester

cc: Greg Sweetnam, James Dick Construction Limited
Leigh Mugford, James Dick Construction Limited

File: 3028
By: Email

June 9, 2014

James Dick Construction Limited
P.O. Box 470
Bolton, Ontario
L7E 5T4

Attention: Greg Sweetnam

Dear: Mr. Sweetnam

Re: Potential Waterfowl Use of Hidden Quarry

It is anticipated that waterfowl will utilize the rehabilitated quarry ponds but not in large numbers. Habitat conditions will generally be unfavourable to heavy waterfowl use of the area, particularly during spring and summer. Habitat features which will discourage waterfowl nesting and feeding include the following.

- There will be 316m of exposed unvegetated cliff face that is unsuitable for waterfowl nesting or feeding.

- After quarry sideslopes are topsoiled and seeded with an upland meadow mix they will be densely reforested. Waterfowl, particularly geese, do not like nesting in treed areas and hence as the trees grow the quality of nesting habitat will decline.

- The grassy reforested sideslopes will not be mowed or fertilized. Geese are attracted to grassy areas that are mowed and fertilized (e.g. golf courses) as these areas provide very nutritious goose pasture.

- Aquatic emergent vegetation will become densely established in shallow shoreline areas adjacent to graded sideslopes and this vegetation will retard the movement of ducklings and goslings from backshore areas to open water. This shoreline vegetation will make waterfowl, particularly young birds, vulnerable to predation.

- The ponds will be about 22m deep and aquatic emergent and submergent vegetation will therefore be limited to the relatively narrow littoral zone where water depths are less than 2m. As a result, there will not be an abundance of food available that is attractive to waterfowl. The wetlands that may develop in the shallow areas will be below the minimum size necessary to support waterfowl broods. Dabbling ducks typically feed in the top 20cm of the water column, so there will be limited areas that are suitable for foraging for them. Most diving ducks can dive to depths of only about 5m, far less than the 22m depth of the quarry ponds, so they will not be able to access food on the ponds' substrate.

Given the above considerations waterfowl nesting and brood rearing in the quarry during the spring and summer months should be minimal. The greatest waterfowl use of the area will likely occur during the fall migration although the number of birds should still be relatively low.

Yours truly,

GWS Ecological & Forestry Services Inc.

Greg W. Scheifele, M. A., R.P.F.
Principal Ecologist/Forester

File: 3028
By: Email

August 26, 2014

James Dick Construction Limited
P.O. Box 470
Bolton, Ontario
L7E 5T4

Attention: Greg Sweetnam

Dear: Mr. Sweetnam

Re: Hidden Quarry – CRC Natural Environment Report by GAIA on Species at Risk

This letter is in response to the report written by GAIA EcoConsultants (hereafter GAIA) on the Hidden Quarry, dated July 4, 2014. It should be noted that the report constitutes an admission of guilt regarding trespassing. It is unfortunate that GAIA did not have the courtesy to ask for permission to visit the property, as the report clearly would have benefitted from discussions with the Hidden Quarry study team ecologists.

There are two facts associated with Species at Risk, particularly those designated endangered and threatened, that should have been taken into account by GAIA. The first is that the mandate for endangered and threatened species in Ontario lies solely with the Ministry of Natural Resources and Forestry (MNRF), formerly known as the Ministry of Natural Resources. The MNRF determines if there is habitat for endangered or threatened species on a given site and if the surveys that have been undertaken to detect these species are adequate. In the case of Hidden Quarry, the Ministry has concluded that the inventory work to determine presence/absence of endangered and threatened species was adequate and that no additional fieldwork was required. This information was provided to the proponent in a letter dated November 3, 2013. It is unfortunate that Mr. Johnson had to pay for a survey that was unnecessary and that could have been avoided through a simple phone call to MNRF.

The second fact related to Species at Risk that should have been considered is that the site is private land where development is proposed under the provincial *Planning Act* and its associated support documents. Therefore, provincial designations of Species at Risk by the MNRF and the Committee on the Status of Species at Risk in Ontario (COSSARO) apply to the site, not federal designations by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC). In many circumstances, the level of risk is the same

federally and provincially, but this is not always the case. For example, GAIA noted that the Wood Thrush is listed as threatened by COSEWIC, but it is listed as special concern provincially and this is the designation that applies to the subject lands.

The GAIA report identified that a single Barn Swallow was observed foraging on both sides of Sixth Line near the on-site marsh, and concluded that it was a breeding individual. The Barn Swallow typically raises two broods in a year and young from the first nest may have fledged by early July when the survey was undertaken. Shortly after leaving the nest, young routinely travel as far as 0.5 km from the nest and may travel considerable distances once they are a little older. There is definitely no nesting habitat for this species on site in the vicinity of the sighting, as the Barn Swallow typically nests on or in human-made structures such as buildings and bridges, habitat that is absent on the site near the marsh. The MNRF has defined the general habitat of the Barn Swallow under the *Endangered Species Act, 2007* (ESA) as an active nest site, a 5-m radius around the nest to account for the species' territory, and a 200-m radius around the nest that constitutes the foraging habitat. Areas outside the 200-m radius are not considered habitat for the Barn Swallow under the ESA even if they are used for foraging. Apparently no attempt was made by GAIA to determine if there were active Barn Swallow nests within 200 m of the sighting. Even if the marsh is within 200 m of an active nest, the wetland will be retained and there will be no effect upon this species. The clearing of the forest and its replacement with open ponds and wetland habitat will create additional foraging habitat for the Barn Swallow. This species prefers to forage above open water and wetlands as these support the highest diversity and density of insects. Other favoured foraging habitat includes grassy fields and meadows, pastures, and hayfields. The species does not forage over treed habitat, so removal of the plantations and replacement of them by open water and wetlands will be beneficial to this species.

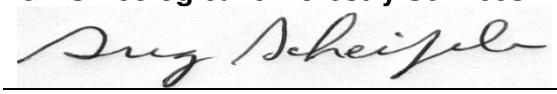
In the discussion on significant turtle species, GAIA states that loss of wetland habitat as a result of quarrying activity would exclude the snapping turtle and Blanding's turtle from the site. Apparently, the Natural Environment Technical Report was not read in detail by GAIA, as the wetland habitats on site are being maintained and additional wetland habitat will be created. The statement that these turtles will be excluded from the site is incorrect. The statement that a permit to authorize activities that would affect these species would be required from Environment Canada is also incorrect. In the event that habitat for the Blanding's turtle was going to be affected, any permits that might be required would be from the Ministry of Natural Resources and Forestry, not Environment Canada. However, this species will not be affected, so no permit is required at any level. In addition, no permit is required for the snapping turtle because it is listed as special concern and therefore is not subject to the provisions of either the provincial *Endangered Species Act, 2007* or the federal *Species at Risk Act*. Habitat for the snapping turtle may be considered significant wildlife habitat under the Provincial Policy Statement. In the case of Hidden Quarry, habitat for the snapping turtle will be maintained and enhanced through retention of the existing wetlands and creation of additional open water and wetland habitat.

GAIA appears to have no expertise in hydrology and therefore the comments in the last paragraph of the report should be given no weight.

In summary, the report by GAIA was unnecessary, essentially added nothing regarding Species at Risk, and many of the conclusions made were erroneous, using the wrong legislation and incorrectly concluding that the on-site wetlands would be lost. No attempt was made to determine where the Barn Swallow was nesting and the location of the area that would be considered habitat under the ESA for this species.

Yours truly,

GWS Ecological & Forestry Services Inc.



Greg Scheifele, M.A., R.P.F.
Principal Ecologist/Forester

Gray Owl Environmental Inc.

Al Sandilands, B.Sc.
Principal, Senior Ecologist

File: 3028
By: Email

September 22, 2014

James Dick Construction Limited
P.O. Box 470
Bolton, Ontario
L7E 5T4

Attention: Greg Sweetnam

Dear: Mr. Sweetnam

Re: Wildlife Observations on Halton Region Lands Adjacent to Hidden Quarry

In response to the September 16, 2014 comments made by staff of Halton Region regarding our wildlife observations on adjacent lands, we normally do not record off-site data by property ownership. Furthermore, in this case our observations were only made from Highway 7, which forms a significant obstruction to wildlife movements, except in the case of the Brydson Farm where we are managing their woodlands under the Management Forest Tax Incentive Program (MFTIP). In any event, only common species of birds and mammals were observed utilizing properties in Halton Region. All reported Species at Risk were found inhabiting lands in Wellington County.

We trust this information adequately addresses the concern for additional details on wildlife utilization of adjacent lands.

Yours truly,

GWS Ecological & Forestry Services Inc.

Greg Scheifele, M.A., R.P.F.
Principal Ecologist/Forester

GWS Ecological & Forestry Services Inc.
4670 Townline Road, Cambridge, ON. N3C 2V1
Tel.: (519) 651-2224 Fax: (519) 651-2002
Email: gwsefs@sympatico.ca

Curriculum Vitae

Greg W. Scheifele, M.A., R.P.F.

Education

1987	M.A. Regional Planning and Resource Development, University of Waterloo
1976-1982	Ontario Professional Foresters Association - Membership Courses Faculty of Forestry, University of Toronto
1974-1975	Graduate Courses in Biogeography and Resource Management York University
1973	B.A. (Honours), Physical Geography and Biology University of Guelph

Societies

Ontario Professional Foresters Association
International Society of Arboriculture
Ontario Woodlot Association

Certification

Managed Forest Plan Approver for the Ontario Managed Forest Tax Incentive Program (MFTIP)
Butternut Health Assessor for the Endangered Species Act, 2007

Professional Experience

1999 - Present	Principal Ecologist/Forester, GWS Ecological & Forestry Services Inc., Cambridge, Ontario
1997 - 1999	Senior Ecologist/Forester, MacKinnon & Associates, Waterloo, Ontario
1995 - 1996	General Manager, Prime Environmental Consultants Limited, Kitchener, Ontario
1988 - 1995	Manager of Forestry and Natural Resources, Environmental Planning Services Division, Gore & Storrie Limited, Cambridge, Ontario
1981 - 1988	Senior Forester and Environmental Planner, Ecologistics Limited, Waterloo, Ontario
1980 - 1981	Log Buyer and Operations Supervisor, Ernest Moore Limited/Simpson Lumber Limited, Cambridge, Ontario
1975 - 1979	Biologist/Forester, Land Management Division Grand River Conservation Authority, Cambridge, Ontario
1974	Biologist, Grand River Conservation Authority, Cambridge, Ontario
1973	Biologist, Ministry of Natural Resources, Cambridge, Ontario

PROFILE OF PROFESSIONAL EXPERIENCE

As a Professional Consultant, Mr. Scheifele has been responsible for a wide variety of projects focusing on environmental evaluations and the management of natural resources. Specific areas of expertise and supervision encompass ecology, forestry, soil survey, wetland evaluation, wildlife inventory and habitat assessment, and resource oriented rural land use planning studies. He has also conducted several Environmental Assessments, as well as numerous community planning and resource development projects for First Nations in northern and southern Ontario.

REPRESENTATIVE PROJECTS

a) Environmental Overviews, Impact Statements, Monitoring and Restoration Plans

- Natural Environment Peer Reviews of Proposed Mineral Aggregate Extraction Operations and Draft Plans of Subdivision in Puslinch Township, Wellington County from 1997 to present

- Served on the Environmental and Ecological Advisory Committee of the Regional Municipality of Waterloo from 1987 to 1994 (Chairman from 1992 onwards) providing technical comments on the potential impacts of proposed development applications to Environmentally Sensitive Policy Areas (ESPA) and other environmental issues as requested by planning staff and Regional Council

- Level II Natural Environment Technical Report for the Proposed Hidden Quarry, James Dick Construction Limited, Guelph-Eramosa Township*

- Environmental Impact Study (EIS) for the Westminister Woods Subdivision and follow-up Tree Conservation Plans and Terrestrial Monitoring, Guelph*

- Township of Kincardine Waste Disposal Site North Penetangore River Biomonitoring Program, Kincardine

- Environmental Implementation Report (EIR) for Slope Rehabilitation at the Morningside Retirement Village, including DFO requirements for Fish Habitat Compensation, Mitigation and Monitoring, New Hamburg

- Scoped EIS for Proposed Residential Development on the Galantai Property, City of Waterloo*

- Edinburgh Road Dairy Bush EIS and follow-up Ecological Enhancement Plan and Terrestrial Monitoring, Guelph*

- North Oakville Natural Heritage Inventory and Analysis - Forestry Component Prepared in Association with LGL limited

- Environmental Overview for the Proposed Expansion to the TCG Fonthill Pit, Town of Pelham

- EIS and Planting Plan for the Proposed Storm Water Management Facility (constructed wetland) at the Piller's Industrial Development, Waterloo*

- EIR and Follow-up Environmental Monitoring for the Clair Hills and Erbsville Road Subdivisions, Waterloo *

- Bridgeport North Community Environmental Overview and EIR including Ecological Enhancement Planting Plans for Constructed Wetland Stormwater Management Facilities, Kitchener *

- Hespeler East Master Drainage Implementation Study, Cambridge *

- Laurentian West Community Plan Environmental Review, Kitchener *

- Shell/Burloak Planning Review, Oakville

a) Environmental Overviews, Impact Statements, Monitoring and Restoration Plans (continued)

- Master Environmental Servicing Plan for the David Dunlap Observatory Lands – Forestry Component Prepared in Association with Beacon Environmental, Richmond Hill
- Level II Natural Environment Report and Ecological Restoration Plan for Nelson Aggregates Proposed Burlington Quarry Extension – Forestry Component Prepared in Association with Savanta and Stantec Consulting, Burlington
- Preliminary Environmental Report for a Proposed Gas Pipeline to the Canadian Pacific Forest Products Mill at Dryden, Ontario
- Proposed Pipeline Relocation at the Newcastle Landfill Site (Trans Canada Pipelines)
- Scoped EIS for Proposed Wellington County Affordable Housing Development, Fergus
- Year-After Environmental Monitoring, Brampton (Trans Canada Pipelines)
- Duff Property Environmental Impact Assessment and Rehabilitation Plan for a Proposed Sand and Gravel Pit, Georgetown

b) Environmental Assessments

- Bridgeport North/Lexington East Communities Sanitary Sewage Servicing Class Environmental Assessment, Kitchener *
- West River Road Trunk Storm Sewer Outfall Class Environmental Assessment, Cambridge
- Middle Strasburg Creek Trunk Sanitary Sewer Class Environmental Assessment and Environmental Impact Statement to Delineate the Extent of Developable Lands, Natural Environment Component, Kitchener *
- West Side Trunk Sanitary Sewer Class Environmental Assessment, Natural Environment Component, Waterloo *
- New Hamburg/Baden Wastewater Treatment Class Environmental Assessment, Natural and Social Environments Component, Regional Municipality of Waterloo *
- Village of Shallow Lake Waterworks Class Environmental Assessment, Phase 3 Inventory and Evaluation of Natural and Social Environments, Grey County
- Class Environmental Assessment for the Hespeler East Trunk Storm Sewer Outlet, Cambridge *
- Chelmsford Pollution Control Strategy Class Environmental Assessment, Sudbury
- Belleville Water Supply Program Class Environmental Assessment, Belleville
- Class Environmental Assessment for a Proposed Water Storage Reservoir, Owen Sound
- Environmax Recycling and Integrated Waste Management Facility (Full E.A.), Cayuga *

c) Wetland Studies

- Re-Evaluation of Selected Wetlands, Cambridge District, Ministry of Natural Resources
- Special Features Survey of Selected Wetlands in Maple District, Ministry of Natural Resources

* *Various Projects Requiring Wetland Evaluation*

d) Forest Inventories, Plans and Resource Valuations

- Whistle Bear Golf Course Managed Forest Plan (MFTIP), Cambridge
- Forest Inventory and Preliminary Forest Management Plan for Waterloo Region Forest Properties (1,076 acres)
- Prophet River First Nation Forestry Compensation Claim (24,447 acres), Fort Nelson, British Columbia
- Forestry Loss of Use Study for the Timber Claim of the Lac Seul First Nation (56,880 acres), Sioux Lookout
- Twenty Year Forest Management Plan and 5-Year Operating Plan for Grey County Forest Properties (8,164 acres)
- Forestry Loss of Use Study for the Flooding Claim of the Wabigoon Lake Ojibway Nation (2,318 acres), Dryden
- Forestry and Water Resources Loss of Use Study for the Treaty Land Entitlement Claim of the Missanabie Cree First Nation (64,000 acres), Wawa
- Land Force Central Area Training Centre Meaford 20-Year Forest Management Plan (2002 to 2021) and 5-Year Operating Plan (18,903 acres), Grey County. Prepared in association with the Grey Sauble Conservation Authority
- Moosomin & Thunderchild 1908/09 Surrender Land Claims, Forestry Loss of Use Study (30,080 acres), Battleford, Saskatchewan
- Kainaiwa 1889 Surrender Land Claim Forestry Loss of use Study (444 acres), Lethbridge, Alberta
- Forest Mangement Plan for the Kettle Point Indian Reserve No. 44 (2,600 acres)
- Kahkewistahaw 1907 Surrender Land Claim Forestry Loss of Use Study (33,281 acres), Broadview, Saskatchewan
- Forest Management Plan for the Expanded Point Grondine Indian Reserve No. 3 for the Period from April 2001 to March 2021 (35,928 acres), Killarney
- Griffith Island Club Managed Forest Plan (MFTIP), Wiarton
- Fishing Lake 1907 Surrender Claim Forestry Loss of Use Study (13,190 acres), Wadena, Saskatchewan
- Enniskillen Township Land Claim Forestry Loss of Use Study (400 acres), Petrolia
- Forest Operating Plan Update (1996-2001) and Pilot Project, Cape Croker First Nation, Bruce County
- Forestry Loss of Use Study for the Whitefish Lake First Nation Northern Boundary Land Claim (6,000 acres), Sudbury
- Forest Operating Plans for the Wikwemikong Unceded Indian Reserve No. 26 for the Periods from April 1994 to March 1999 and April 1999 to March 2009, Manitoulin Island
- Forest Management Plan for the Cape Croker Indian Reserve (17,750 acres), Bruce County
- Woolwich Township Tree Inventory, Township of Woolwich

d) Forest Inventories, Plans and Resource Valuations (continued)

- Forest Inventory Update of the Wikwemikong Unceded Indian Reserve (102,000 acres) and Provision of a Silvicultural Worker Training Program, Manitoulin Island
- Forest Management Plan for the New Credit Indian Reserve, (6,105 acres), Hagersville
- An Evaluation of the Unemployment Insurance/Job Creation Program - Forestry Sector on Indian Lands in Ontario (Canadian Forestry Service)
- Wood Chip Price Survey for RKM Wood Products Limited, Tiverton

e) Urban Tree Conservation Plans

Numerous projects for development proposals involving the full range of services including tree inventory and mapping, impact evaluation and mitigation, plan preparation and construction supervision (ie. tree removal marking, contractor selection and follow-up monitoring of protection measures during tree clearing, lot grading and building phases).

- Tree Inventory and Preservation Plan for the Longyard Subdivision, Vaughan
- Queenston Estates Subdivision Tree Management Plan, Cambridge
- Detailed Vegetation Plan for the Laurentian Village Subdivision, Kitchener
- Palm Place Tree Assessment and Preservation Plan, Oakville
- Tree Preservation Plan for the Buffer Strip at the Bayshire Subdivision, Oakville
- Tree Conservation Plan for the Bronte Creek Watermain Crossing, Oakville
- Tree Management Plan for the Hespeler East Utility Corridor, Cambridge
- Arborist Report for Hillcrest School Expansion, Cambridge
- Townscape Woodlot Evaluation and Tree Saving Plan, Scarborough
- Moffat Creek Village Subdivision Tree Saving Plan, Cambridge

f) Timber Appraisals, Tree Marking and Damage Valuations

Numerous projects involving the appraisal and/or marking of commercial timber, as well as the valuation of damage to shade trees or forest stands.

- Assessment of Forest Destruction at the Proposed West Credit Golf Course, Wellington County
- McKnight Timber Damage Appraisal, Bruce County (Bernie McGlynn Lumber Ltd.)
- Assessment of Forest Health adjacent to the Gerdau Ameristeel Mill, Cambridge
- Aberle Timber Appraisals and Tree Marking, Maryhill and Burk's Falls
- Grey County Forestry Operations (included commercial tree marking, tendering, cut inspection and property monitoring).
- RKM Timber Damage Appraisal, Downie Township, Perth County
- Hydro Corridor Right-of-Way Timber Appraisals (Ontario Hydro)
- Doane Road Timber Appraisal, East Gwillimbury

f) Timber Appraisals, Tree Marking and Damage Valuations (continued)

- Coldwater-Narrows Claim, Forest Resource Valuation Study for the Chippewa Tri-Council
- Appraisal of Tree Removal and Replacement on Golf Course Lands Adjacent to Hamilton Civic Airport (Public Works Canada)
- Commercial Tree Marking, Huronia District, Ministry of Natural Resources (1,100 acres)
- Timber Appraisal for the Alldred Property Expropriation, Wasaga Beach Provincial Park (Ministry of Natural Resources)

g) Resource Planning and Development

- Comprehensive Community Plan for the Mississaugas of the New Credit First Nation, Hagersville
- Natural Features Inventory and Evaluation of the Kanata Site, a Proposed 17th Century Iroquois Village, Brantford
- Resource Inventory of the Expanded Point Grondine Indian Reserve No. 3, Killarney
- Land Use Plan for the Wikwemikong Unceded Indian Reserve, Manitoulin Island
- Land Use Development Plan for the Mississaugas of the New Credit First Nation, Hagersville
- Biophysical Inventory and Evaluation for the Mississaugas of the New Credit First Nation, Hagersville
- Tourist Camp Needs Assessment Study in James and Hudson Bay Lowlands, co-ordinated by Moose First Nation
- Comprehensive Community Plan for the Wikwemikong Unceded Indian Reserve, Manitoulin Island

Hearings

- Provided expert testimony at the following hearing boards:

  - Ontario Municipal Board
  - Ontario Energy Board
  - Niagara Escarpment Commission
  - Provincial and Federal Court

PUBLICATIONS

Scheifele, G.W. *A Market Assessment of Conifer Plantation Thinnings in Southern Ontario, Information Report (COFRDA),* Sault Ste, Marie: Forestry Canada, 1989.

Scheifele, G.W. and Mulamoottil, G, *A Critical Review of Wetland/Natural Area Evaluation Methodologies,* Waterloo: University of Waterloo Press, 1989.

Scheifele, G.W. and Mulamoottil, G. *Predictive Models Applicable to Ontario's Wetland Evaluation System.* Presented at Wetlands '87 Symposium, Edmonton, 1988.

Scheifele, G.W., *An Assessment of Ontario's Wetland Evaluation System with Reference to Predictive Models and Environmentally Sensitive Areas Studies,* Waterloo: University of Waterloo Press, 1987.

Ontario

Ontario Municipal Board
Commission des affaires municipales de l'Ontario

ACKNOWLEDGMENT OF EXPERT'S DUTY

Case Number	Municipality
PL150494	Guelph Eramosa

1. My name is Greg Scheifele (*name*)
   I live at the 4670 Townline Road, Cambridge (*municipality*)
   in the Regional Municipality of Waterloo (*county or region*)
   in the Ontario (*province*)

2. I have been engaged by or on behalf of James Dick Construction Ltd. (*name of party/parties*) to provide evidence in relation to the above-noted Board proceeding.

3. I acknowledge that it is my duty to provide evidence in relation to this proceeding as follows:

   a. to provide opinion evidence that is fair, objective and non-partisan;

   b. to provide opinion evidence that is related only to matters that are within my area of expertise; and

   c. to provide such additional assistance as the Board may reasonably require, to determine a matter in issue.

4. I acknowledge that the duty referred to above prevails over any obligation which I may owe to any party by whom or on whose behalf I am engaged.

Date April 14, 2016 Greg Scheifele
Signature