ENVIRONMENTAL IMPACT STATEMENT
and
LEVEL 1 and 2 NATURAL ENVIRONMENT REPORT

FERNBANK ROAD QUARRY

LOTS 13 and 14, CONCESSION X
GEOGRAPHIC TOWNSHIP of GOULBOURN
CITY of OTTAWA

A report prepared for:

2226561 Ontario Inc.

by Muncaster Environmental Planning Inc.

July, 2012
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1.0 INTRODUCTION and BACKGROUND REVIEW

The site is on the north side of Fernbank Road, east of Jinkinson Road and south of the TransCanada Trail (on an abandoned rail bed) within Lots 13 and 14, Concession X, of the Geographic Township of Goulbourn, City of Ottawa, Ontario. The site is bounded by active quarries to the north, northwest and west, a rifle range to the east, with forested lands further to the east and forested lands and wetlands to the south, south of Fernbank Road. The municipal address is 7315 Fernbank Road.

The site is currently a combination of young forests parcels, meadows and thicket habitats. Thicket and swamp wetland habitat is present, with the wetland parcels in the south-central and northeast portion of the site part of the Goulbourn Provincially Significant Wetland Complex. A 100.3 hectare area of extraction is proposed within a licensed area of 115.1 hectares. The extraction operation area will exclude the southwest and south-central portions of the site, including the provincially significant wetland as well as the wetland habitats in the northwest and northeast portions of the site. The adjacent quarries and this proposed quarry will target the limestone of the Gull River Formation. Quarrying the limestone will result in an open excavation that will extend below the water table.

The majority of the site is designated Limestone Resource Area, with the southwest portion shown as Rural Natural Features Area on Schedule A of the 2003 City of Ottawa Official Plan (City of Ottawa, 2003). A 2011 Ontario Municipal Board Hearing determined that the Rural Natural Features Area boundary would be modified to a thirty setback from the south-central and northeast Provincially Significant Wetland parcels. No Areas of Natural and Scientific Interest (ANSI) or Natural Environment Areas, as designated on Schedule A, are in proximity to the site. Schedule K in the Official Plan identifies the west portion of the site within a Wellhead Protection Area, with small areas of organic soils north of Fernbank Road and adjacent to the TransCanada Trail. The majority of the site is zoned Mineral Resource (MR1), with the southwest portion zoned Rural (RU).

The majority of the site is not within a Natural Area, as identified in the former Region of Ottawa Carleton’s Natural Environment System Strategy (Keddy, 1997). However a small portion of the high-rated Stittsville West Natural Area (Natural Area 304) is along the north portion of the site, including the northwest corner and the northeast wetland. The moderately rated Jinkinson at Fernbank Natural Area (Natural Area 331) includes the southwest cedar forests, the southwest channel and the wetland habitat to the east of the channel north of Fernbank Road (Figure 1).

For the Stittsville West Natural Area Keddy (1997) applied a high significance to four evaluation criteria, rare vegetation community/landform representation, common vegetation community/landform representation, vegetation community/landform diversity and endangered, threatened and rare species. Moderate significance was attached to the other four criteria, hydrological features, seasonal wildlife concentrations, landscape attributes and condition of natural area. The Stittsville West Natural Area consists of a variety of upland and lowland deciduous, mixed and coniferous forests, most of which are submature (Keddy, 1997). A great
blue heron colony, an important feature of the Stittsville West Natural Area, is not in proximity to the site, approximately 3.3 kilometres to the northeast. Keddy (1997) noted that the perimeter of the natural area borders on highly modified, large areas of old field and agricultural land. The forests were considered primarily young to intermediate aged.

The vegetation of the Stittsville West Natural Area includes a few floral species representative of alvar communities (Keddy, 1997) and an inter-regional terrestrial linkage is present. The Natural Area was considered by Keddy (1997) to be in good condition, with a low-moderate degree of human disturbance and site fragmentation, and a low-moderate impact of non-native species.

The Jinkinson at Fernbank Natural Area consists of mixed and coniferous swamps, along with thicket swamps and upland coniferous forests. The fen habitat associated with this Natural Area is south of Fernbank Road and not on this site. None of the eight evaluation criteria were assigned a high significance for the Jinkinson at Fernbank Natural Area. Five criteria were rated moderate; landscape attributes, rare vegetation community/landform, endangered, threatened and rare species, vegetation community/landform diversity and hydrological features. Condition of natural area and seasonal wildlife concentrations were assigned a low significance while no common vegetation community/landform representation is present. The Natural Area supports an inter-regional terrestrial linkage and was considered by Keddy (1997) to be in fair condition, with a low degree of human disturbance, moderate impact of non-native species and high site fragmentation.

1.1 Scoping the Environmental Impact Statement

The EIS was prepared in accordance with Section 4.7.8 of the City of Ottawa Official Plan (City of Ottawa, 2003), following the City’s EIS Guidelines, found at http://www.ottawa.ca/residents/planning/dev_review_process/guide/environmental_impact/index_en.html, with input from the Natural Heritage Reference Manual (OMNR, 2010) and includes the components of an Environmental Impact Statement as identified in Section 4.7.8.2 a) through h) of the City of Ottawa Official Plan (City of Ottawa, 2003).

The field surveys and this report were completed by Bernie Muncaster, who has a Master’s of Science in Biology and over twenty-three years of experience in completing natural environment assessments. Daniel Brunton, a very well established naturalist in Ontario, also completed field surveys of the site and adjacent lands.

The major objective of this EIS is to determine the anticipated impacts associated with the proposed aggregate operation on the significant features and functions of the on-site and adjacent provincially significant wetlands, Natural Areas and any other significant natural heritage features, and to provide the methodology to mitigate any negative impact on the significant natural heritage features and functions in the area. To attain this objective, an iterative process was applied to establish the proposed extraction area and mitigation measures developed based on field observations of the features and functions of the natural environment.
The following items were identified for particular attention, recognizing that many of these issues are interrelated:

- what are the features and functions of the terrestrial features of the site and adjacent lands, including wooded areas, wetlands, other vegetation communities and wildlife habitat, and as required how can these features and functions be protected and enhanced?
- is there any alvar habitat on the site, and what is the condition of the alvar habitat?
- are the mapped boundaries of the provincially significant wetland consistent with the current field conditions? What are the characteristics of the wetland habitat not included in the provincially significant parcels?
- how are the features and functions of the natural area such as linkages and unique habitats influenced or supported by the site?
- are any special features attributable to the Stittsville West or Jinkinson at Fernbank Natural Areas located on the site? Will the Natural Areas be directly or indirectly impacted by the proposed extraction area?
- will new forest edges be created as a result of the extraction or will forest interior conditions be impacted?
- what is the fish habitat in the southwest channel and is there any other fish habitat on the site? and,
- will the extraction and associated changes in the infiltration and groundwater levels impact the provincially significant wetland parcels?

In addition to fulfilling the requirements of an Environmental Impact Statement, this report also represents a Natural Environment Level 1 and 2 Technical Study. A Natural Environment Level 1 Study, including an inventory of natural heritage features on the Subject Lands and within 120 metres of the Subject Lands, determines whether there are any “significant wetlands, significant portions of the habitat of endangered or threatened species, fish habitat, significant woodlands, significant valleylands, significant wildlife habitat, and significant areas of natural and scientific interest” within 120 meters of the Subject Lands. This Natural Environment Technical Report follows the principles and methodology of Policy 2.01.07 of the Aggregate Resources Act. The Provincial Policy Statement defines the natural heritage features that must be addressed when completing Level 1 and 2 reports under the Aggregate Resources Act:

- significant wetlands;
- significant portions of the habitat of endangered and threatened species;
- fish habitat;
- significant valleylands;
- significant woodlots;
- significant Areas of Natural or Scientific Interest (ANSIs); and,
- significant wildlife habitat.

If any of the above natural features are identified on or within 120 metres of the Subject Lands, a Natural Environment Level 2 Technical Report is required. This consists of an impact assessment to determine the impact on the natural features or ecological functions for which the area is
identified, and includes any proposed preventative, mitigative or remedial measures recommended that would avoid or limit impacts. Level 1 reporting documents the occurrence of significant natural heritage features on or within 120 metres of the Subject Lands. Significant natural heritage features are defined in the PPS and supporting technical manuals (OMNR, 2010).

No development is permitted in significant wetlands, fish habitat and significant portions of the habitat of endangered and threatened species. Development on lands adjacent to these significant natural heritage features is permitted if it can be demonstrated that there will be no negative impacts on the features or functions for which the area was originally designated.

Development may not occur in and adjacent to the other types of natural heritage features unless it can be demonstrated that there will be no negative impacts on the features or functions for which the area was originally designated.

The Provincial Policy Statement is to be read in its entirety and the natural heritage policies referenced in this report must be considered and implemented taking into account other Provincial interests including the availability of mineral aggregate resources.

As the Level 1 analysis determined that significant natural heritage features, Provincially significant wetlands, fish habitat and the presence of an endangered and threatened species (butternut), occur or have the potential to occur on or adjacent to the property, a Level 2 assessment was undertaken. This EIS includes the elements of a Level 2 report which identifies the presence of these significant natural heritage features, potential impacts on the features and associated functions, and recommendations to avoid these impacts.

2.0 METHODOLOGY

Environmental information was collected and summarized through site summaries and other data for the Stittsville West and Jinkinson at Fernbank Natural Areas, correspondence with Kemptville District Ministry of Natural Resources and the City of Ottawa, and a review of existing databases including the Natural Heritage Information Centre, Ontario Breeding Bird Atlas and Biodiversity Explorer.

Colour aerial photography (2008) was used to assess the natural environment features in the general vicinity of the site. Field observations were conducted on October 6th (Muncaster (BWM)) and 30th (Brunton (DFB)), 2009; April 29th (DFB), May 14th (BWM) and June 22nd (BWM and DFB), 2010, and May 2nd (BWM) and September 26th (BWM), 2011, both on and adjacent to the site. The June 22nd, 2010 field survey began at 06:00, with partly cloudy and calm conditions, ideal for observing breeding birds. The air temperature was 15° C. Ms. Rose Fleguel, a certified butternut health assessor, assessed the butternuts on and adjacent to the site on July 14, 17th and 22nd, 2010. Additional nocturnal surveys were completed for whip-poor-will in June and July, 2012.

Ecological units were defined based on species present, the wetness index of the species, dominant species, drainage observations, health, age, topography and soil conditions. Records of wildlife were made through direct sightings and observations of tracks and scat. Other aspects of
the surveys included photographs of site representative features and observations on the level of disturbance from human activities and other disturbances such as non-native flora.

NHIC (2011) and Muncaster and Brunton (2005) were used for the current status of the flora and fauna observed.

For the purposes of this report Fernbank Road and the TransCanada trail are assumed to run in an east-west orientation.

3.0 EXISTING CONDITIONS

3.1 Geologic Conditions

The topography on the site is level to gently sloping to the south-southeast. Topographic elevations range from about 149 mASL at the northern boundary of the site parallel to the TransCanada Trail to about 134 mASL along the southern property boundary, within the Provincially Significant Wetland (AECOM, 2012).

The site is located on a limestone plain where the bedrock is largely exposed at surface with localized areas of minor shallow sandy beach deposits and organic deposits in low lying depressional areas (AECOM, 2012). Bedrock consists of limestone and dolostone of the mid-Ordovician Gull River Formation. The shallow bedrock is weathered and fractured and underlain by more competent bedrock throughout the rest of the strata (AECOM, 2012). AECOM (2012) concluded that shallow groundwater occurs within the weathered and fractured bedrock with the water table likely perched on the competent bedrock, generally found about five metres below the surface. Shallow groundwater flow generally follows the pattern of topographic contours of the area. All May 2011 water table measurements were between 1 and 2.5 metres below ground (AECOM, 2012). AECOM (2012) concluded that groundwater present in deeper competent bedrock are unlikely to have a hydraulic connection with the perched water table in the shallow weathered and fractured bedrock.

The site is relatively flat such that drainage is not well defined. AECOM (2012) noted that approximately half of the annual precipitation (910 mm) is lost to evapotranspiration, with the balance of water available for runoff and infiltration. It is anticipated that the percentage of surplus water will increase to the range of 90 percent in the bare rock areas where vegetation and the weathered/fractured bedrock have been removed. There is a channel in the southwest portion of the site and a ditch on the north side of Fernbank Road. The southwest channel leads to the Hobb’s Drain and eventually reaches the Jock River about 11 kilometres to the south of the site. Flow from the Beagle Club Quarry adjacent to the west edge of the site discharges into the southwest channel. The Certificate of Approval for the adjacent quarry allows for dewatering discharge at a rate of between 90 L/s and 205 L/s (AECOM, 2012). The southwest channel has been channelized in the past.

Overburden soils (where present) in the proposed extraction area consist mainly of well drained coarse textured sandy materials. The sands are typical at topographically higher elevations and as localized deposits associated with post-glacial beach formations (AECOM, 2012). On-site
borehole information described by AECOM (2012) indicates that there is very little overburden on the site, with thicknesses ranging up to 0.56 metres. Greater sandy overburden is present in the northwest corner and organic soils and greater overburden are common in the south-central wetland parcel (Schut and Wilson, 1987; AECOM, 2012).

### 3.2 Aquatic Habitat

**Southwest Channel**

The central and upstream portions of the channel in the southwest portion of the site have been historically excavated and are incised (Photo 4). The channel receives flow from the quarry to the west of the site. Three stations were sampled for fish on this channel on May 2\textsuperscript{nd}, 2011. The fish sampling station locations are shown on Figure 1.

**Station 1 – Southwest Channel**

Station 1 was located immediately upstream of the culvert at Fernbank Road. The station length was 60 metres. The water temperature was 9.0°C at 13:40 on May 2\textsuperscript{nd}, 2011, the pH was 8.18, conductivity was 578 μs, total dissolved solids were 295 ppm and the air temperature was 11.0°C. The average wetted width and depths were 280 cm and 28 cm, respectively. The area fished was 168 m\textsuperscript{2} and the shock time was 845 seconds. A total of twenty six fish representing five species were captured: central mudminnow, northern redbelly dace, finescale dace, creek chub and brook stickleback (Table 1). The banks are well vegetated with shrubs and ground cover, including common elderberry, glossy buckthorn, reed canary grass, joe-pye-weed, coltsfoot, evening primrose, common burdock, poison ivy, tall goldenrod, New England aster and small white aster (Photo 1). After a dry period in September, 2011, portions of the channel were dry although a small amount of flow remained (Photo 2). Sand and silts are the dominant substrates with some cobbles. In-stream structure includes small woody debris and aquatic vegetation such as variable-leaved pondweed and chara.

<table>
<thead>
<tr>
<th>Species Name</th>
<th>Scientific Name</th>
<th>Trophic Class</th>
<th>Thermal Regime</th>
<th>Number Caught</th>
<th>Size Range (FL mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>central mudminnow</td>
<td><em>Umbra limi</em></td>
<td>insectivore / piscivore</td>
<td>cool / warm</td>
<td>1</td>
<td>80</td>
</tr>
<tr>
<td>northern redbelly dace</td>
<td><em>Phoxinus eos</em></td>
<td>herbivore</td>
<td>cool / warm</td>
<td>3</td>
<td>56-64</td>
</tr>
<tr>
<td>finescale dace</td>
<td><em>Phoxinus neogaeus</em></td>
<td>insectivore</td>
<td>cool</td>
<td>1</td>
<td>71</td>
</tr>
<tr>
<td>creek chub</td>
<td><em>Semotilus atromaculatus</em></td>
<td>insectivore / generalist</td>
<td>cool</td>
<td>6</td>
<td>41-108</td>
</tr>
<tr>
<td>brook stickleback</td>
<td><em>Culaea inconstans</em></td>
<td>insectivore</td>
<td>cool</td>
<td>15</td>
<td>35-59</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td></td>
<td>26</td>
<td></td>
</tr>
</tbody>
</table>

(Coker et al., 2001; MTO, 2006)
Photo 1 – Southwest channel looking upstream (north) from Fernbank Road at Station 1 (May 2nd, 2011)

Photo 2 – Southwest channel north, upstream, of Fernbank Road after late summer dry period.
Station 2 – Southwest Channel

Station 2 was located 215 m upstream (northwest) from Station 1. The station length was 60 metres. The average wetted width and depths were 188 cm and 15 cm, respectively. The area fished was 113 m² and the shock time was 743 seconds. A total of one hundred and eighteen fish representing five species were captured: northern redbelly dace, finescale dace, brassy minnow, creek chub and brook stickleback (Table 2). The banks continue to be well vegetated (Photo 3).

Table 2 Fish Community in Southwest Channel at Station 2 (May 2, 2011)

<table>
<thead>
<tr>
<th>Species Name</th>
<th>Scientific Name</th>
<th>Trophic Class</th>
<th>Thermal Regime</th>
<th>Number Caught</th>
<th>Size Range (FL mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>northern redbelly dace</td>
<td><em>Phoxinus eos</em></td>
<td>herbivore</td>
<td>cool / warm</td>
<td>6</td>
<td>57-69</td>
</tr>
<tr>
<td>finescale dace</td>
<td><em>Phoxinus neogaeus</em></td>
<td>insectivore</td>
<td>cool</td>
<td>2</td>
<td>59</td>
</tr>
<tr>
<td>brassy minnow</td>
<td><em>Hybognathus hankinsoni</em></td>
<td>omnivore / herbivore</td>
<td>cool</td>
<td>1</td>
<td>63</td>
</tr>
<tr>
<td>creek chub</td>
<td><em>Semotilus atromaculatus</em></td>
<td>insectivore / generalist</td>
<td>cool</td>
<td>58</td>
<td>31-101</td>
</tr>
<tr>
<td>brook stickleback</td>
<td><em>Culaea inconstans</em></td>
<td>insectivore</td>
<td>cool</td>
<td>51</td>
<td>31-52</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td></td>
<td></td>
<td><strong>118</strong></td>
<td></td>
</tr>
</tbody>
</table>

(Coker et al., 2001; MTO, 2006)

*Photo 3 - Station 2 looking southeast, downstream on May 2, 2011*
Station 3 – Southwest Channel

Station 3 along the southwest channel is to the east of the west site boundary, 105 metres upstream from Station 2. The station length was 85 m. The water temperature was 9.0°C at 13:20 on May 2nd, 2011, the pH was 8.19, conductivity was 633 µs, total dissolved solids were 321 ppm and the air temperature was 11.0°C. The average wetted width and depths were 255 cm and 17 cm, respectively with an excavated channel and typical trapezoid ditch cross-section (Photo 4). The area fished was 217 m² and the shock time was 1,020 seconds. A total of twenty fish representing four species were captured: white sucker, northern redbelly dace, creek chub and brook stickleback (Table 3).

Table 3   Fish Community in Southwest Channel East of West Site Boundary (Station 3) (May 2, 2011)

<table>
<thead>
<tr>
<th>Species Name</th>
<th>Scientific Name</th>
<th>Trophic Class</th>
<th>Thermal Regime</th>
<th>Number Caught</th>
<th>Size Range (FL mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>white sucker</td>
<td><em>Catostomus commersoni</em></td>
<td>insectivore / omnivore</td>
<td>cool</td>
<td>1</td>
<td>107</td>
</tr>
<tr>
<td>northern redbelly dace</td>
<td><em>Phoxinus eos</em></td>
<td>herbivore</td>
<td>cool / warm</td>
<td>1</td>
<td>70</td>
</tr>
<tr>
<td>creek chub</td>
<td><em>Semotilus atromaculatus</em></td>
<td>insectivore / generalist</td>
<td>cool</td>
<td>6</td>
<td>42-56</td>
</tr>
<tr>
<td>brook stickleback</td>
<td><em>Culaea inconstans</em></td>
<td>insectivore</td>
<td>cool</td>
<td>12</td>
<td>26-57</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td></td>
<td></td>
<td><strong>20</strong></td>
<td></td>
</tr>
</tbody>
</table>

*Photo 4 – Southwest channel at Station 3 looking east, downstream, near west edge of site (May 2, 2011)*
Downstream of the site, south of Fernbank Road, the southwest channel appears to have recently been excavated (Photo 5).

Photo 5 - Recent excavation in southwest channel south (downstream) of Fernbank Road

In summary, the southwest channel supports a variety of common cool and warm water forage fish, with six species netted, in relatively high densities. In addition one white sucker was netted at the upstream site. This fish may utilize primarily the ponded area in the excavation footprint immediately to the west of the site.

Northwest Channel

A second channel, in the northwest portion of the site, was examined for potential fish habitat. This northwest channel crosses the TransCanada Trail 230 metres east of Jinkinson Road, within a cattail marsh and willow thicket swamp. In June 2010 the wetted width of the channel ten metres downstream (south) of the culvert under the TransCanada Trail was less than 40cm, with a wider pocket of water adjacent to the culvert (Photo 6). A former beaver dam at the south end of the marsh containing the northwest channel is now breeched, resulting in much less standing water at the south end of the marsh than shown on the 2008 aerial photography.

In the spring of 2011 the channel was sampled for fish using a backpack electrofisher and dip nets. The upstream end of the south station was 125 metres downstream (south) of the TransCanada Trail (Station 5 on Figure 1). The station length was 60 metres. The water temperature was 10.0° C at 14:27 on May 2nd, 2011, the pH was 8.08, conductivity was 371 µs,
total dissolved solids were 189 ppm and the air temperature was 12.0° C. The water was shallow and wide, with average wetted width and depths of 323 cm and 5 cm, respectively (Photo 7). The area fished was 194 m², the shock time was 265 seconds and 20 dips were taken. No fish were captured during this sampling.

A second fish station was sampled on May 2nd, 2011 between the TransCanada Trail and Station 5 described above (Station 4 on Figure 1). The station length was 45 metres. The water temperature was 10.0° C at 14:48 on May 2nd, 2011, the pH was 8.07, conductivity was 365 µs, total dissolved solids were 186 ppm and the air temperature was 12.0° C. The average wetted width and depths were 172 cm and 6 cm, respectively (Photo 8). The area fished was 77 m², the shock time was 185 seconds and 15 dips were taken. Only one fish, a central mudminnow with a fork length of 71 mm, was captured. This fish is very common in all types of marginal fish habitat.

On September 26th, 2011 many sections of the northwest channel were dry (Photo 9). No flow and very limited standing water was observed on the south side of the TransCanada Trail (Photo 10). Vegetation is common completely through the channel (Photo 11).

**Photo 6 – Northwest channel looking south, from TransCanada Trail**
Photo 7 – South (downstream) end of downstream station of northwest channel on May 2\textsuperscript{nd}, 2011, looking north, upstream. No fish captured

Photo 8 - South (downstream) end of upstream, north, station on May 2\textsuperscript{nd}, 2011, looking north, upstream. One central mudminnow captured
Photo 9 – Northwest channel dry on area of exposed bedrock 205 metres south of the TransCanada Trail. View looking south

Photo 10 – Small amount of standing water and lesser duckweed over muck in the northwest channel on south side of TransCanada Trail
Photo 11 – Wetland vegetation is throughout most of the northwest channel. This example is looking south 215 metres south of the TransCanada Trail

Based on these observations the northwest channel supports marginal intermittent direct fish habitat for approximately 60 metres south of the TransCanada Trail. The extent of fish habitat in the channel is extremely limited and is likely only a result of fish temporarily accessing the area from a large area of standing water to the north of the TransCanada Trail during periods of more water flow. Further downstream the channel dissipates into the ground in the vicinity of a dug well approximately 320 metres south of the TransCanada Trail. Although some of the older mapping shows this channel continuing south to the southwest channel, no evidence of a connection was observed in the field and there is no connection potential through the spoil piles along the north side of the incised southwest channel. Thus there is no connection to potential fish habitat to the south for the northwest channel and thus the channel provides no potential fish migration function beyond the vicinity of the TransCanada Trail.

No other channels with potential aquatic habitat were observed on or adjacent to the site.
3.3 Terrestrial Features

3.3.1 Upland Communities – Vegetation and Wildlife

The site is dominated by upland communities, which are a combination of open field meadow and thicket habitat, and small deciduous, mixed and coniferous forest parcels (Figure 1).

Cultural Meadow

The fields were likely formerly used for pasture with fences common on the site. The majority of the species are invasive including wild carrot, heal-all, orchard grass, bluegrass, brome grass, common strawberry, common milkweed, New England aster, heart-leaved aster, white avens, yellow-sweet clover, balsam ragwort, Canada goldenrod, tall goldenrod, Canada thistle, ox-eye daisy, evening primrose, tall buttercup, tufted vetch, poison ivy, woodland lily, flowering dogbane, harebell, hairy beardtongue, daisy fleabane, poverty oat grass, Canada anemone, common burdock and pearly everlasting (Photo 12). Regenerating white cedar, trembling aspen and white pine stems up to 14cm diameter at breast height (dbh) are common along with common juniper, common buckthorn and staghorn sumac shrubs. A few regenerating tamarack stems and pussy willow shrubs are also present. Meadow habitat in the southwest portion of the site is dominated by goldenrod.

Although bedrock is common at the surface, the community lacks alvar characteristics, with a large cultural component throughout. Wildlife observed in and adjacent to the meadow habitat included American crow, common grackle, blue jay, killdeer, field sparrow, red squirrel and eastern cottontail. Turkey vultures were observed overhead.

Cultural Thicket

These areas were also likely formerly used for pasture. Common juniper is dominant in most areas, with red raspberry and glossy buckthorn well established in others (Photo 13). Round-leaved dogwood, staghorn sumac, narrow-leaved meadowsweet, smooth rose and crabapple are also present, along with regenerating white elm, white spruce, balsam poplar and white cedar stems. The ground flora is typically invasive including common strawberry, ox-eye daisy, lichen, bluegrass, common mullein, pearly everlasting, blueweed, wild carrot, Canada thistle, black-eyed susan, tufted vetch, large-leaved aster, heart-leaved aster, heal-all, common yarrow, fringed gentian, horseweed, New England aster, rough-stemmed goldenrod, wild grape, poison ivy, silvery cinquefoil, wild columbine, yellow hawkweed, common dandelion, white-sweet clover, red clover, alsike clover, Philadelphia fleabane, rough-fruited cinquefoil, eastern bracken, thimbleweed, common milkweed and calico aster. Scattered white cedar, Scot’s pine, white pine, butternut, white elm and white spruce stems are up to 35cm dbh (Photo 14).

Wildlife observed in and adjacent to the thicket habitat included American crow, black-capped chickadee, mourning dove, common grackle, gray catbird, field sparrow, song sparrow, dark-eyed junco, white-throated sparrow, brown thrasher, cedar waxwing, white-breasted nuthatch, eastern cottontail and white-tailed deer. A red-tailed hawk was noted overhead.
Dry-Fresh Poplar Deciduous Forest

Trembling aspen is dominant in many areas, with white elm, ironwood, white cedar and balsam fir also present. The largest trees are poplars up to 22cm dbh (Photo 15). Common buckthorn is well established in the understory. White snakeroot, poison ivy, helleborine and herb robert are examples of the ground flora.

Wildlife noted in this community included rose-breasted grosbeak, alder flycatcher, brown thrasher, black-capped chickadee and white-breasted nuthatch.

Dry-Fresh Sugar Maple Deciduous Forest

Sugar maple and ironwood are the dominants in this forest community, with the largest maple trees in the range of 35cm dbh. This vegetation type often supports regionally uncommon plant species in the Ottawa area however the sole example of this community on the site has been severely degraded by a long history of livestock grazing as indicated by the low diversity of ground vegetation and almost complete absence of native grasses and sedges. Combined with a low potential for natural renewal due to its isolation from comparable habitat areas, these factors indicate that this vegetation type possesses limited intrinsic ecological significance here. Helleborine, sweet cicely, straw sedge and rattlesnake fern are typical ground flora, with regenerating ash stems common.

Wildlife noted in this community included red-eyed vireo, black-capped chickadee and eastern phoebe.

Dry-Fresh White Cedar-Poplar Mixed Forest

White cedar is dominant, with trembling aspen and large-toothed aspen very common (Photo 16). White elm, sugar maple, tamarack, white birch, red ash, white ash, balsam fir, basswood, red oak, white pine, red oak, bur oak and white spruce are also present. A few scattered white cedars and red oaks are up to 37cm and 44cm dbh, respectively, but the majority of stems are less than 20cm dbh. Natural deadfall and wind throw are especially common in this community and the canopy is more open in many areas. Glossy buckthorn, gray dogwood, red-osier dogwood and common juniper are well represented at the edges of this community, with black current common in the more central portions. White cedar regeneration is good in many areas, with some young red ash stems as well. Wild grape coverage is extensive on the lower branches of many of the trees. Ground flora includes wild sarsaparilla, white snakeroot, lady fern, false Solomon-seal, white trillium, foamflower, blue violet, woodland strawberry, large-leaved aster, heart-leaved aster, poison ivy, heal-all, yellow wood sorrel, tufted vetch, red clover, eastern bracken, Canada mayflower, barren strawberry, bunchberry and helleborine.

Wildlife observed included porcupine, white-breasted nuthatch, American robin, Baltimore oriole, brown thrasher, American crow, black-capped chickadee, northern flicker, red-eyed vireo, American woodcock, ruffed grouse, great-crested flycatcher and ovenbird. A deer stand was noted at the edge of one of the examples in this community in the southwest corner of the site.
Dry-Fresh White Pine-Sugar Maple Mixed Forest

In addition to sugar maple and white pine, large-toothed aspen, basswood and white cedar are present. A 48cm dbh white spruce was also noted in this community. Blue violet, Canada mayflower, wild sarsaparilla, yellow violet, barren strawberry, poison ivy and common strawberry are representative of the ground flora, with common buckthorn and crabapple in the understory.

Wildlife observed in this community included red-eyed vireo, eastern towhee, black-and-white warbler, white-breasted nuthatch and ovenbird.

Dry-Fresh White Cedar-White Pine Coniferous Forest

White pines and white spruce up to 37cm dbh are the largest trees in this community, with white cedar dominant in many areas (Photo 17). White birch, basswood, red oak, white elm, red ash, tamarack and balsam fir are also present. A small area of white pine plantation appears to be in the north-central portion of the site. Common buckthorn and common juniper are well represented in the understorey with some chokecherry and black currant. Where the cedar density is very high the ground flora is minimal, elsewhere poison ivy, Philadelphia fleabane, tall buttercup, ox-eye daisy, eastern bracken, wild sarsaparilla, clintonia, Canada mayflower, large-leaved aster, heart-leaved aster, common strawberry, tufted vetch, field pussytoes, bluegrass, lady fern, Pennsylvania sedge, starflower and white snakeroot are present.

Wildlife observed in and adjacent to this community included white-tailed deer, American robin, white-throated sparrow, magnolia warbler, song sparrow, blue jay, great-crested flycatcher, American woodcock, ovenbird and red squirrel. A deer stand was observed in one of the large white pines.

Fresh-Moist White Cedar Coniferous Forest

White cedar is very dense in many areas of this community. Red maple, white elm, red ash, balsam fir, tamarack, white pine, white birch, white spruce and trembling aspen are also present. The largest trees are up to 30cm dbh. Glossy buckthorn is common in the understorey, with common juniper, gray dogwood, red-osier dogwood, red raspberry shrubs, and regenerating white spruce and balsam fir stems. Balsam fir and white cedar regeneration is good in areas. The ground flora is generally reflective of the disturbed conditions including helleborine, bluegrass, Pennsylvania sedge, yellow sweet clover, poison ivy, New England aster, heal-all and common strawberry, with wild sarsaparilla, Canada mayflower, clintonia, Indian pipe, Canada anemone, goldthread, yellow lady’s-slipper, false Solomon-seal, wood strawberry, lady fern, sensitive fern and oak fern also present.

Wildlife observed in the cedar forests included white-tailed deer, veery, red-eyed vireo, ruffed grouse (with chicks), pileated woodpecker, red-breasted nuthatch, rose-breasted grosbeak, eastern kingbird, warbling vireo and great-crested flycatcher.
3.3.2 Wetland Communities – Vegetation and Wildlife

Cattail Marsh

This community is represented in the northwest portion of the site, extending for approximately 190 metres south of the TransCanada Trail. A former beaver dam at the south end of the marsh is breeched, resulting in little standing water now in the marsh, as described in Section 3.2. In addition to broad-leaved cattail, narrow-leaved cattail, purple loosestrife, field horsetail, marsh fern, sensitive fern, enchanter’s nightshade, awl-fruited sedge and reed canary grass are common. Shrub species include slender willow, glossy buckthorn, speckled alder and red-osier dogwood. Cedar stems, including dead examples, are also present.

Wildlife observed in and adjacent to the cattail marsh included American toad, green frog, yellow warbler, common yellowthroat, red-winged blackbird, white-throated sparrow, common snipe, blue jay and mourning dove. No turtles were observed, with a muskrat noted in the marsh habitat to the north of the site and the TransCanada Trail.

Thicket Swamp

Some elements of fen habitat were observed in the willow-dominated thicket swamp in the northwest corner of the site. This, includes the uncommon grass species Kalm’s brome grass. There is a strong cultural element present, however, including strong representation by non-native purple loosestrife and tall buttercup and by weedy native species such as the locally uncommon drooping bulrush. Thus the sensitivity and significance of this habitat is reduced and the community is considered at least substantial cultural (non-natural) in origin. Other ground flora include broad-leaved cattail, narrow-leaved goldenrod, tall goldenrod, Dudley’s rush, path rush, yellow sedge, inland sedge, porcupine sedge, crested sedge, boneset, hard-stemmed bulrush and New England aster, along with alder buckthorn, pussy willow, slender willow, shining willow, white cedar and narrow-leaved meadowsweet shrubs. Scattered regenerating tamarack and white cedar stems are also present.

A sedge meadow marsh is immediately to the east of the site in the northeast corner. The sedge meadow marsh has been extensively disturbed by apparent past drainage attempts on the adjacent lands. Although wetland vegetation remains greater than fifty percent in this community the features and functions of this community and associated sensitivity have been greatly reduced. A glossy buckthorn thicket adjacent to the meadow marsh represents the provincially significant wetland in the northeast corner. In addition to thick areas of buckthorn, red-osier dogwood and highbush cranberry are shrub species present. The ground flora includes marsh fern, joe-pye-weed, dwarf raspberry, Pennsylvania sedge, field horsetail, water horehound and heal-all. Scattered tamarack, white birch, balsam fir, balsam poplar and white cedar stems up to 15cm dbh were also observed.

Slender willow, speckled alder, red-osier dogwood and glossy buckthorn dominate the other small representations of thicket swamp on the site, with common elderberry and regenerating...
white cedar and red ash stems also present (Photo 18). Marsh fern, purple loosestrife and reed canary grass are typical ground flora, with the regionally rare beaked sedge in the central-east portion of the site (marked with an ‘S’ on Figure 2).

Wildlife observed in this community included eastern garter snake, northern leopard frog, green frog, American goldfinch, white-throated sparrow, yellow warbler, common yellowthroat, American robin and red-winged blackbird.

**Ash Mineral Deciduous Swamp**

This wetland may be in transition to more of an upland habitat but for now is an ash deciduous swamp (Photo 19). The mapping on the City's website reflects the actual wetland boundary in the field, extending about 170 metres north of Fernbank Road. In addition to black ash, balsam fir, white elm and white cedar trees up to 15cm dbh, red-osier dogwood, black currant, slender willow, prickly gooseberry, narrow-leaved meadowsweet, red raspberry and glossy buckthorn are representative of the woody vegetation in this community. The extent of buckthorn is greater closer to Fernbank Road and many of the ash trees are dead. The ground flora includes marsh fern, joe-pye-weed, ostrich fern, interrupted fern, sensitive fern, boneset, spotted jewelweed, reed canary grass, Canada bluejoint, purple loosestrife, jack-in-the-pulpit, Canada goldenrod, wild grape, heal-all, meadow horsetail, dwarf raspberry and white snakeroot.

A common raven was observed overhead from this community, with alder flycatcher, black-capped chickadee, red-eyed vireo, cedar waxwing, veery and white breasted nuthatch noted in the community. A few of the dead ash trees could provide nesting cavities for small birds.

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*Photo 12 – Example of cultural meadow habitat in northeast portion of the site*
Photo 13 – Cultural thicket habitat in north-central portion of the site

Photo 14 – Butternut tree assessed as healthy (‘retainable’) in thicket habitat in central portion of the site
Photo 15 – Poplar deciduous forest in southeast portion of the site

Photo 16 – Example of mixed forest in central portion of the site
Photo 17 – Cedar coniferous forest in southwest portion of the site

Photo 18 – Willow thicket swamp in the northwest corner of the site.
Photo 19 – Ash deciduous swamp to the east of the southwest channel, north of Fernbank Road

3.4 Species of Interest

At an October 16th, 2009 meeting at Kemptville district, Laura Melvin, Mary Van Sleeuwen and Shawn Thompson of the Ministry of Natural Resources identified the following Species at Risk as potentially occurring in the general area; butternut (endangered), loggerhead shrike (endangered), whip-poor-will (threatened) and Blanding’s turtle (threatened). Twenty-four butternuts trees were observed on the site, generally in proximity to the southwest channel, with a couple of butternuts in the central-east portion of the site and along the edges (Figure 2). Less than half (11 of 24) butternuts were assessed as retainable (i.e. healthy). Of these healthy butternuts the proposed license area will remove only four of the healthy butternuts, as discussed in Section 6.2 (Photo 14, Figure 2).

A Blanding’s turtle observation was reported to Shawn Thompson immediately to the north of the site in the area of standing water and cattail marsh on the north side of the TransCanada trail. This marsh habitat contains large areas of standing water which are not present on the site itself. However Blanding’s turtle utilizes extensive upland areas as part of its habitat and areas among wetland parcels may be considered significant based on this. The spring surveys, including April and May and June field dates gave no evidence of utilization of the site itself by Blanding’s Turtle, however, and no such expanses of open water are present among the marsh and thicket swamp habitat on the site. No turtles were observed during the field surveys.

Potential habitat for loggerhead shrike (endangered) is noted north of the property and low quality shrike habitat exists on the property, as it does for vast areas of thinly buried limestone plain in western Ottawa. No loggerhead shrikes have utilized the vicinity of the subject property...
for over 25 years and no confirmed loggerhead shrike nests have been reported in the overall City of Ottawa since 2002.

A survey for whip-poor-will (threatened) was completed during the night on June 6th and 7th, 2012. Approximately 95 percent of the moon’s surface was visible, with calm winds and an air temperature of 15° C. Four whip-poor-wills were heard calling, one to the south of Fernbank Road, southeast of the southeast corner of the site; one near the southwest edge of the overall site; one to the northwest of Jinkinson Road, west of the site; and one to the north of the northeast portion of the overall site, north of the Trans-Canada Trail. An additional whip-poor-will survey was completed during the night on July 2nd and 3rd, 2012. Greater than 95 percent of the moon’s surface was visible, with calm winds, clear skies and an air temperature of 16° C. Three whip-poor-wills were heard calling, one to the south of Fernbank Road, to the southwest of the overall site, one to the northwest of Jinkinson Road, west of the site; and one to the north of the northeast portion of the overall site, north of the Trans-Canada Trail. No whip-poor-will have been heard calling on or within 120 metres of the proposed extraction area. Additional whip-poor-will surveys will be undertaken in late July under appropriate moon conditions.

Several Special Concern species are reported from the general area, including milksnake, eastern ribbonsnake and rusty blackbird. Suitable habitat exists here for milksnake (as it does in rocky areas throughout western Ottawa), but this species was not observed, with the eastern garter snake the only snake observed during the field surveys. It is unlikely that the very local and frequently misidentified eastern ribbonsnake occurs within 15-20 km of the subject property and no suitable habitat, margins of streams, ponds and lakes, is present on or adjacent to the site. A flock (11 individuals) of rusty blackbirds was observed on the property on October 29th, 2009. This species does not breed here but briefly utilizes variously woodland and wetland habitats here during spring and fall migratory passage.

The ram’s head orchid is a provincially rare species reported in the general area and could possibly occur in what appears to be suitable habitat in the cedar coniferous forest (vegetation community 8 on Figure 1) in the southwest corner of the site. Mid and late spring surveys did not detect ram’s head orchid or the provincially rare pinedrops, which also could be expected in such habitat and thus warranted particular attention during our field investigations.

The Ontario Ministry of Natural Resources’ biodiversity explorer website was also reviewed (http://www.biodiversityexplorer.mnr.gov.on.ca/nhicWEB/main.jsp). This site allows for a search of Threatened and Endangered species covered by the 2008 Endangered Species Act, as well as other species of interest. Searches were conducted on the 10 km square including the site and the general area (18VR20). One Species at Risk is reported from the overall 10 km square, the endangered loggerhead shrike, which is described above. Four rare species are also reported for the overall 10 km square including two species of special concern (milksnake (discussed above) and yellow rail) and two Provincially rare species (ram's-head lady's-slipper (discussed above) and long-styled rush). The breeding birds listed in the Ontario Breeding Bird Atlas for the 10 km square 18VR20 identified common nighthawk, whip-poor-will, barn swallow, eastern meadowlark and bobolink as Species at Risk in the overall 10 km square including the site.
Bobolink and eastern meadowlark utilize grass hay fields, habitat not present on or adjacent to the site. Common nighthawk is a ground nester of open sites. No suitable habitat was observed on the site for the aquatic wetland species of special interest, long-styled rush or yellow rail. No potential nesting structures for barn swallow were observed on or adjacent to the site.

The potential Species at Risk in the City of Ottawa were reviewed, with an emphasis on the endangered and threatened species historically reported in the overall City, including butternut, American ginseng, eastern prairie fringed-orchid, flooded jellyskin, wood turtle, spiny softshell, Blanding’s turtle, musk turtle, Henslow’s sparrow, loggerhead shrike, barn swallow, bobolink, eastern meadowlark, hickorynut, whip-poor-will, bald eagle, golden eagle, least bittern, peregrine falcon, eastern cougar, common gray fox, lake sturgeon, cerulean warbler and American eel. The habitat requirements of these species along with those listed as special concern were reviewed.

Other than butternut and whip-poor-will none of these Species at Risk were observed during the field surveys and except for butternut, whip-poor-will, milksnake and ram’s head orchid no good examples of the specific habitat characteristics related to these potential Species at Risk were observed on or adjacent to the site.

A regionally rare sedge, beaked sedge (*Carex urticulata*), was observed in one of the willow thickets in the central-east portion of the site (marked with an ‘S’ on Figure 2). Such species are not subject to provincial or municipal protection requirements. Protection for this regionally significant sedge could readily be achieved, however, by transplanting representatives of this population to a willow thicket more on the periphery of the site prior to the alteration of its present location.

### 3.5 Summary of Level 1 Analysis

The Level 1 analysis determines whether any of the significant natural heritage features identified by the Provincial Policy Statement (PPS) occur on or within 120 metres of the Subject Lands.

Each significant natural heritage feature is detailed in the following. A summary is provided in Table 1. Natural Heritage features that have not been recorded on or adjacent to the Subject Lands are not an issue and do not require discussion in the Level 2 analysis.

<table>
<thead>
<tr>
<th>Natural Heritage Feature</th>
<th>On or Adjacent to Subject Lands?</th>
<th>Discussion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Significant Wetlands</td>
<td>Yes</td>
<td>- two parcels of the provincially significant Goulbourn Wetland Complex, in the south-central and northeast corner of the site, with additional parcels to the south and east of the site. The northwest wetland is to be treated as provincially significant based on the Blanding’s turtle report in the adjacent lands to the north. Other small on-site wetland parcels too disturbed to be considered part of the provincially significant wetland complex</td>
</tr>
<tr>
<td>Natural Heritage Feature</td>
<td>On or Adjacent to Subject Lands?</td>
<td>Discussion</td>
</tr>
<tr>
<td>--------------------------</td>
<td>----------------------------------</td>
<td>-------------</td>
</tr>
<tr>
<td>Significant portions of the habitat of endangered and threatened species</td>
<td>Yes</td>
<td>• Butternut observed on the Subject Lands. Eleven butternuts assessed as healthy, with four of those proposed for removal. Mitigation (planting) plan to be developed. Blanding’s turtle reported to the north of the site within the adjacent lands and whip-poor-will heard in the vicinity of the overall site.</td>
</tr>
<tr>
<td>Fish Habitat</td>
<td>Yes</td>
<td>• fish habitat observed in channels in the northwest and southwest portions of the Subject Lands, with fish habitat continuing to the north and south of the channels, respectively, on the adjacent lands.</td>
</tr>
<tr>
<td>Significant Woodlands</td>
<td>No</td>
<td>• no significant woodlands on or adjacent to Subject Lands</td>
</tr>
<tr>
<td>Significant Valleylands</td>
<td>No</td>
<td>• no significant valleylands on or adjacent to Subject Lands</td>
</tr>
<tr>
<td>Significant ANSIs</td>
<td>No</td>
<td>• the Areas of Natural and Scientific Interest on or adjacent to the Subject Lands</td>
</tr>
<tr>
<td>Significant Wildlife Habitat</td>
<td>No</td>
<td>• no observations of significant migration corridors, seasonal concentration areas, or rare or specialized habitats</td>
</tr>
</tbody>
</table>

### 3.6 Level 2 Analysis - Species of Interest and Other Significant Features

Outside of the wetland parcels discussed below, the balance of the site is a combination of cultural meadows and thickets and relatively young and open coniferous and mixed forests of minimal natural environment significance. The field observations confirmed that meadow habitat that appeared to be potential alvar areas on aerial photography did not check out in the field as having alvar characteristics, with a large cultural component throughout.

#### 3.6.1 Significant Wetlands

The mapped provincially significant wetland boundaries for the south-central and northeast corner of the site were consistent with the wetland community boundaries reviewed in the field. The boundary between wetland and upland habitat was determined using the methodology of the Ontario Wetland Evaluation System (OWES) for Southern Ontario by an OWES trained evaluator (BWM). OWES defines wetland habitat where at least 50% (by area coverage) of a plant community is represented by wetland plants. In addition based on the Blanding’s turtle observation immediately to the north of the site, the contiguous cattail marsh extending onto the
site in the northwest corner will also be treated in a manner consistent with a provincially significant designation.

During the October 16th, 2009 meeting, Ministry of Natural Resources staff noted that with additional considerations in regards to diversity, landscape, size, function and other features, the boundaries of the provincially significant wetlands on the property could potentially expand or be ‘complexed’ with other small wetland pockets. The only other wetland habitat observed on the site outside of the provincially significant areas and the northwest marsh is thicket swamps. The low ecological quality of the thicket swamp habitats, including disturbance from non-native flora and lack ecological diversity and function lead us to conclude that the thicket habitats are of insufficient natural significance to be considered for complexing. There is no surface hydrological connection between these areas and the provincially significant wetland parcels and these areas are separated from the significant wetland parcels by large tracts of disturbed upland meadow and thicket habitat. The thicket swamps are too small to significantly contribute to the wildlife habitat on a local landscape scale. The thicket swamps do not represent headwater wetlands and do not provide important hydrological functions with respect to flood attenuation, upstream detention of surface water, improvement to water quality and potential for groundwater recharge. The thicket swamps do not assist significantly in maintaining local populations in the landscape. The thicket swamps can be considered as disconnected wet areas that are too small and too disturbed to be included as part of the provincial wetland complex.

3.6.2 Significant Habitat for Endangered Species and Threatened Species

The Committee on the Status of Endangered Wildlife in Canada (COSEWIC) designated butternut as a nationally endangered species in November 2003 and it is now also considered endangered in Ontario. During leaf-out conditions the on-site butternuts were assessed by a qualified Butternut Health Assessor. As discussed in Section 3.4 twenty-four butternuts trees were observed on the site, generally in proximity to the southwest channel, with a couple of butternuts in the central-east portion of the site and along the edges (Figure 2). Less than half (11 of 24) butternuts were assessed as retainable (i.e. healthy). Of these healthy butternuts the proposed license area will remove only four of the healthy butternuts, as discussed in Section 6.2 and shown on Figure 2.

Another Species at Risk observations is the reported Blanding’s turtle immediately to the north of the site in the cattail marsh and open water habitat north of the TransCanada Trail. The contiguous cattail marsh habitat onto the site to the south will be retained and protected. In addition, further surveys will determine the use of whip-poor-will on and adjacent to the site.

3.6.3 Fish Habitat

Based on the fish sampling, fish habitat is considered present in the northwest and southwest channels (Figure 2) and extends to the adjacent lands to the north and south. The southwest channel supports a variety of common cool and warm water forage fish, with six species netted, in relatively high densities. In addition one white sucker was netted at the upstream site. The fish habitat of the southwest channel extends to the south of the site, south of Fernbank Road.
The northwest channel supports marginal direct fish habitat for approximately 60 metres south of the TransCanada Trail. The extent of fish habitat in the channel is extremely limited and is likely only a result of fish temporarily accessing the area from a large area of standing water to the north of the TransCanada Trail during periods of more water flow. Further downstream the channel dissipates into the ground in the vicinity of a dug well approximately 320 metres south of the TransCanada Trail. Although some of the older mapping shows this channel continuing south to the southwest channel, no evidence of a connection was observed in the field and there is no connection potential through the spoil piles along the north side of the incised southwest channel. Thus there is no connection to potential fish habitat to the south for the northwest channel and thus the channel provides no potential fish migration function beyond the vicinity of the TransCanada Trail. Fish habitat is also present in the marsh and open water associated with this channel to the north of the TransCanada Trail.

No other channels with potential aquatic habitat were observed on or adjacent to the site.

3.6.4 Significant Woodlands

Based on the age, the on-site forest cover is not considered representative of Significant Woodlands using the City of Ottawa criteria for rural lands based on a lack of forests with stands greater than eighty years. Although a small representation of the on-site forests are greater than 200 metres in width and thus satisfy the forest interior habitat criterion for Significant Woodlands and a surface water feature is present, all the criteria must be satisfied for the forests to be identified as Significant Woodlands. The forest interior habitat on-site is very minimal as no part of the forests is more than 130 metres from a break in the wooded cover. No portions of the on-site forests extend in a contiguous manner onto adjacent lands.

3.6.5 Significant Wildlife Habitat

Significant wildlife habitat is one of the more complicated natural heritage features to identify and evaluate. There are four general types of significant wildlife: migration corridors, seasonal concentration areas, rare or specialized habitat, and species of conservation concern. None of these habitat types were observed during the field surveys or reported in the background information.

Inter-regional terrestrial linkages are associated with the Stittsville West and Jinkinson at Fernbank Natural Areas, present along portions of the periphery of the site and adjacent lands (Keddy, 1997, Figure 2). The adjacent land use, including quarries to the north, northwest and west and associated truck traffic on Jinkinson and Fernbank Roads greatly reduces the linkage function of the site. Any linkage function in the general area site is anticipated to continue to occur to the east of the site.

Some of the birds observed generally require minimum forested areas for successful breeding, such as ruffed grouse, veery, black-and-white warbler, ovenbird and white-throated sparrow, although these species are found in a variety of habitats (Freemark and Collins, 1989).
In summary the majority of the property represents a locally common landscape recovering from a long history of severe disturbance, with limited natural environment significance. Similarly, the property does not appear to present existing or potential significant ecological function (wildlife corridors, significant wildlife concentration area, or representation of native biodiversity features) which might contribute to consideration of it as a component of a larger, significant natural area. The significant natural heritage features to be protected or compensated for are the healthy butternut trees, potential whip-poor-will and Blanding’s turtle utilization, the provincially significant wetland parcels and the fish habitat.

4.0  PROPOSED AGGREGATE EXTRACTION

Figure 2 identifies the proposed extraction operation area of 100.3 hectares. This area has been selected to avoid direct impacts on the south-central and northeast provincially significant wetlands as well as the northwest wetland area. The proposed setbacks for these areas, discussed in detail in Section 6 of this report and AECOM (2012), are 150 metres from the south-central wetland, 50 metres from the northwest wetland and 30 metres from the northeast wetland.

The Babcaygeon (where present) and Gull River Formations will be extracted with a portion of the Lower Gull River Formation retained as the quarry floor, which have a maximum final elevation of 110 mASL. The quarry will have a typical annual production of less than 200,000 tonnes but will be licensed for a maximum annual production of 500,000 tonnes in order to accommodate market demand. It is assumed that the new quarry would have three benches over its operation history. The first, second and third benches would be set at 130 mASL, 120 mASL and 110 mASL, respectively with a required drawdown of 8 m at 1st Bench, 18 m at 2nd Bench and 28 m at 3rd Bench, based on the average water table at the site (AECOM, 2012).

The excavation will proceed starting in the northwest quadrant of the site towards the northeast and then in a south/southeasterly direction. Rock will be removed by conventional equipment (excavator and trucks). A processing plant (primary and secondary crusher) will be located on-site and move in association with the active face throughout the life of the operations. Aggregate will be stock piled within the plant site area. No fuel will be stored on-site. Fuel trucks may be used to transfer fuel to equipment within the active quarry area.

The quarry sump will initially be established in the northwest portion of the site and used to capture ground and surface water drainage to maintain dry pit floor conditions through dewatering. Any excess water from the site will be discharged from the quarry sump south, flowing into the southwest channel. The sump area and low area of the quarry floor will be large enough to accommodate surplus springtime runoff/snowmelt such that surface discharge can be moderated to avoid excessive flooding of the drainage outlet. Appropriately sized settling ponds will be designed and operated to achieve acceptable water quality objectives (i.e., total suspended solids not to exceed 25 mg/L).
Rehabilitation of the site will result in a lake, surrounded by natural areas. As part of the rehabilitation shallow shoreline areas will be created with slopes of 2:1, water depths up to two metres, islands to provide greater areas of littoral zones, structure for wildlife such as coarse material for fish spawning and insect use, perching and sunning logs for birds and turtles and root wads for fish nursery habitat.
2008 air photo from City of Ottawa website
5.0 POTENTIAL IMPACTS

The potential impacts of the proposed development considered critical to the local natural system were scoped from features identified in the review of existing information, including the features identified in the Stittsville West and Jinkinson at Fernbank Natural Areas and field surveys to the site and adjacent lands.

5.1 Water Quality and Quantity

In a summary of the private well supply, AECOM (2012) noted that none of the responding well owners reported water quality or supply issues though it was noted that five residences had water filters, one residence had ultra-violet treatment and twelve residences had water softeners. Three residents noted sulphur in their water, with two residents reporting iron.

Data collected in the local voluntary monitoring program and assessed by AECOM (2012) note that water levels near the south boundary of the Bell Quarry, to the north of this site on the north side of the Trans-Canada Trail have declined by several metres between April 2008 and December 2010. The recent data also show that water levels in all four monitors near the southwest site boundary of Henderson Quarry to the northwest of this site have also declined by several meters between April 2008 and May 2009. The water level declines in these areas are attributed to dewatering activities at the existing local operating quarries (AECOM, 2012). The water that will be discharged from the site will be a mixture of groundwater seepage and direct precipitation (i.e. rainfall or snowmelt). Quarry discharge will be pumped from settling ponds that will be designed to remove sediment. No water quality impacts are anticipated since the water quality will be similar to the existing conditions (AECOM, 2012).

5.2 Aquatic Habitat

Direct fish habitat is present in the southwest and northwest channels, although the latter is intermittent and extends for a short distance south of the Trans-Canada Trail onto the site. The proposed extraction area has been designed to permit the two channels to remain in their existing alignments to retain the fish habitat and conveyance functions. The southwest channel appears to be both groundwater and surface water fed. The proposed extraction limit is an extended distance, in the range of 200 metres, from the southwest channel. This setback should not be disturbed within 30 metres of the channel to provide ample protection for the fish habitat. As noted previously, the groundwater table in the vicinity of the proposed quarry is perched within the upper weathered bedrock and has poor hydraulic connection with the groundwater in the deeper, more competent bedrock.

During the proposed operations of the quarry, much of the precipitation that falls within the extraction area will be pumped out and directed to the southwest channel. This water will be treated using erosion and sediment control methods to ensure that it is of high quality upon reaching the southwest channel.
AECOM (2012) concluded that it is expected that the discharge water quality of the proposed Fernbank Quarry will be similar to that of the Beagle Club Quarry. As the southwest channel leading to the Hobb’s Drain is currently being used as the receiver of the Beagle Club Quarry discharge, no further negative impacts are expected with the addition of the Fernbank Quarry discharge.

AECOM (2012) conclude that based on historic studies of the two existing quarries that discharge to the Hobb’s Drain, it appears that Hobb’s Drain has the capacity to accommodate discharge from the two existing quarries plus the discharge from the proposed Fernbank Quarry. The results indicate that there would only be a minor increase in peak flood flows of between two and 5.5% with the addition of discharge from all three quarries. Of the two percent at Conley Road and 5.5% at Flewelyn Road increase in peak flows, only 0.2% and 0.8% are attributed to the proposed Fernbank Quarry. It is noted that the channel culverts at Fernbank and Flewellyn Roads have 75% and 85% available capacity, respectively and would not require upgrading (AECOM, 2012).

5.3 Wetland Habitat

Shallow groundwater occurs in the weathered and fractured bedrock under perched water table conditions. The wetlands in the area are most likely weakly hydraulically connected to the perched water table within the shallow, weathered and fractured bedrock underlain by more competent bedrock (AECOM, 2012). It is unlikely that there is hydraulic connection between the perched water table and deeper permeable bedding plane fractures within the competent bedrock as it is likely that shallow bedrock fractures underlying the wetland areas have been filled with fine gained soils washed into these depressional features such that there is very little hydraulic connection.

AECOM (2012) determined that the average saturated thickness of the weathered bedrock is assumed to be about 3.6 m based on monthly water level data from the on-site shallow monitoring wells. With the geometric mean of hydraulic conductivity (1.43 x 10-5 m/s) from well response testing results at all on-site shallow monitoring wells, the radius of influence is calculated by AECOM (2012) to be in the order of about 130 metres from the quarry excavation in all directions. The drainage calculation is designed for use in areas with fairly flat topography, such as the area around the northeast provincially significant wetland parcel. When applied to the south-central provincially significant wetland parcel, the 130 metres radius of influence is considered conservative by AECOM (2012). The natural slope of the land surrounding the south-central provincially significant wetland parcel is gently to the south. As quarry development will be north (upslope) of this provincially significant wetland parcel, groundwater and precipitation in the areas north of the south-central provincially significant wetland parcel will naturally flow to the south, within its catchment area. With quarry development, there will be a narrow zone immediately adjacent to the quarry excavation that will flow towards the open face, however the majority of the flow will travel southward. In addition, the majority of the catchment areas, 70 percent for the south-central and 82 percent for the northeast parcel, surrounding the provincially significant wetland parcels will be retained such that there will still be groundwater and surface water inputs to the provincially significant wetland parcels.
Based on the drawdown analysis by AECOM (2012), the quarry face should be about 130 metres from the edge of the wetland in order to maintain shallow water levels to these features. This estimate is based on conservative, theoretical calculations and assumes that there is good hydraulic connection between the wetlands and the shallow weathered bedrock, which is likely contrary to natural conditions found at these wetlands, as described above. To add an additional level of conservatism, a 150 metre setback has been applied to the south-central provincially significant wetland parcel, as shown on the Site Plans and Figure 2. Due to the disturbed nature of the northeast wetland from off-site attempts to affect the drainage and a large representation of non-native fauna, this community is considered to have a very low sensitivity and as such a 30 metre setback is considered sufficient.

A 50 metre setback has been applied to the northwest wetland. As described in AECOM (2012) the wetland is fed from surface water runoff of the adjacent lands as well as possible minor groundwater component from the shallow fractured weathered bedrock beneath. In addition surficial sand deposits south and east of the northwest wetland may be present that may provide shallow groundwater inputs to the wetland where the sands are upslope (AECOM, 2012). Under existing conditions, shallow groundwater flows in a southward direction within the upper fractured bedrock, closely following the topography. The rate of flow in the upper bedrock is controlled by the fractures. There is very little recharge to depth due to the competent nature of the bedrock. As the quarry extraction is down-gradient of the northwestern wetland, AECOM (2012) concluded that there will be negligible change to the groundwater regime.

AECOM (2012) also examined the sub-catchment area for the northwestern channel and associated cattail marsh. The sub-catchment area lies mostly on the north side of the TransCanada Trail, within the extraction limits for the Bell Quarry. The topographic contours in this area were examined to determine the sub-catchment area feeding the northwestern channel/wetland. The sub-catchment was calculated to cover about 19.5 ha; about 82% on the Bell Quarry property and 18% on the proposed Fernbank Quarry property. In terms of sub-catchment area, this proposed Fernbank Quarry will extract about 6% of the sub-watershed, which AECOM (2012) consider to be minor compared to the catchment area.

Thus the 50 metre setback for the northwest wetland is considered sufficient given that the majority of the hydrologic contributions to the northwest wetland and contiguous wetland habitat to the north are from lands to the north of the site. The small hydrologic contributions of the site can be maintained with the 50 metre setback. Dewatering of the quarry is not anticipated to have negative impacts on the wetlands as the low permeability and poor connectivity of the bedrock will inhibit impacts (AECOM, 2012).

Once the quarry is worked out and rehabilitated per the Rehabilitation Plan the existing wetlands will remain and it is not anticipated that the moisture regime of the wetlands will be impacted due to the surface water features that will be established in the extracted areas. The surface water features will provide a water source through the shallow groundwater for the adjacent wetlands.
5.4 Upland Habitat

The on-site forests are fragmented, disturbed and are not old enough to meet the Significant Woodland designation, as discussed in Section 3.6, and the proposed extraction area has been is located to retain the majority of the Stittsville West and Fernbank at Jinkinson Natural Areas. Given the disturbed nature of the forests it is anticipated that the wildlife and other functions that the forests perform can be replicated in the forested Natural Areas to be retained on and adjacent to the site, and other on-site forests to remain.

Portions of the existing on-site forests are proposed for retention as described in the Section 6.3. The retained forested areas have been maximized by locating the proposed extraction area in the central portion of the site where meadow and thicket habitat is greatest. This will assist in retaining the existing wildlife habitat and limited corridor functions performed by the site and provide good protection for the adjacent natural areas.

Given the fragmented nature of the forest, including many open areas and historical logging, and the young age and relatively low sensitivity of the dominant tree species (white cedar and poplar), it is not anticipated that wind throw and sunscald will be major concerns where new forest edges will be created. The proposed extraction area will avoid the larger contiguous forests in the southwest portion of the overall site.

6.0 MITIGATION MEASURES AND RECOMMENDATIONS

This section outlines recommendations to minimize potential impacts to the natural environment features within and adjacent to the site.

This section also addresses the Design with Nature concepts to encourage ways to maintain and use the natural features of the site.

6.1 Aquatic Habitat

As per Official Plan policies, there will be no site disturbances, including access crossings, within 30 metres of the fish habitat identified in the southwest channel or for portion of the northwest channel identified as fish habitat.

Any dewatering conveyed eventually to an area of fish habitat will be treated first via an engineered channel lined with shot rock and draining away from the quarry. This will minimize erosion and provide for some infiltration. As required additional sediment and erosion control measures will be utilized to ensure high water quality for the discharged water.

Other mitigation measures recommended to protect the fish habitat are:

- No disturbance within 30 metres of the setback from the fish habitat including no storage, refueling or maintenance of equipment;
• Where possible, installation of silt fencing along south perimeters of the setback areas prior to any site alterations;

• Ensure the silt fencing is properly maintained while excavation and other activity is occurring; and

• Ensure no tree removal, dumping of debris or other disturbances occur within the setback areas during the aggregate operation.

6.2 Wetland Habitat

The proposed extraction area is setback 150 metres from the south-central provincially significant wetland parcel and 50 and 30 metres from the northwest and northeast parcels, respectively. Thus the wetland habitat will not be directly disturbed. This increased setback for the south-central provincially significant wetland parcel is a result of the hydrogeological recommendations in AECOM (2012), while the northeast wetland parcel is highly disturbed and thus less sensitive. Much of these setbacks are treed or thicket habitat, which will assist in reducing potential indirect impacts associated with noise and dust. As operations will generally occur during daylight indirect impacts of light are not considered a potential impact. The vast majority of the Goulbourn Wetland Complex is an extended distance from the east boundary of the proposed extraction limit and will not be susceptible to indirect noise and dust impacts.

As the drainage calculation is based on conservative assumptions and theoretical values, long-term monitoring with quarry development will be conducted to confirm if the 150 metre setback for the south-central provincially significant wetland parcel is appropriate. In the future, there may be an opportunity to reduce the setbacks to the south-central provincially significant wetland parcel should water level monitoring results prove favourable.

Mini-piezometers have been installed within the south-central and northeast provincially significant wetland parcels as well as groundwater monitoring wells in the general vicinity of these features (AECOM, 2012). As outlined in Section 8.1 of AECOM (2012) the quarry will have a long-term monitoring program in place to monitor groundwater level changes with quarry development. This monitoring program as well as participation in the Voluntary Monitoring Program will provide information on the water level responses in the wetland areas as the quarry expands. Groundwater monitoring data will be reviewed for water level trends over time. If decreasing water levels are identified, these could be mitigated by measures such as increasing the setbacks from the wetland habitats and direct dewatering discharge to the wetlands.

Depending on monitoring results, a diffuser or recharge trench may be considered to maintain wetland water levels in the wetland habitats as required. The diffuser could be installed within the setback along the upgradient side of the wetland, for example the north side of the south-central wetland and the west side of the northeast wetland. Dewatering discharge could be directed to the diffuser providing disperse flow to the wetland features, similar to natural existing conditions.
In the case of the south-central wetland, the dewatering discharge is planned to be directed to the existing channel running through this feature. The new ditch, directing dewatering discharge to the existing channel, should be constructed with a low gradient (0.5%) to assist in maintaining local water levels.

While placement of the extraction area away from the provincially significant wetland will avoid direct impacts on the wetland, indirect impacts through a significant negative change of the current hydrologic inputs and other components of the moisture regime must also be avoided. The analysis by AECOM (2012) summarized in Section 5.3 indicates that groundwater interference will not occur as a result of the development.

The above protective mitigative measures for fish habitat are also applicable to the provincially significant wetlands including no disturbances within the setback area such as vegetation removal or storage, refueling or maintenance of equipment, installation and maintenance of silt fencing along the perimeters of the setback areas prior to any site alterations.

6.3 Upland Habitat

As always the extent of tree retention should be maximized as much as possible. To protect breeding birds, no tree or shrub removal should occur between April 15th and July 31st, unless a nesting survey conducted within five days of the woody vegetation removal identifies no breeding activity.

The silt fencing recommended in Section 6.1 will delimit the extraction area and any adjacent work areas. By confining all disturbances to within the silt fencing the adjacent trees to be retained and their associated critical root zone will be protected. Where it is not feasible to install silt fencing due to the lack of overburden, sturdy construction fencing should be installed a minimum distance of ten times the tree diameter from the nearest tree trunks to be retained or the outside dripline edge, whichever is greater. No grading or activities that may cause soil compaction such as heavy machinery traffic and stockpiling of material are permitted within the fencing. No machinery maintenance or refuelling, storage of construction materials or stockpiling of earth is to occur within five metres of the outer edge of the dripline of the trees to be retained and protected. The existing grade is not to be raised or lowered within the fencing and no digging is permitted within the fencing. The root system, trunk or branches of the trees to be retained must not be damaged. Exhaust fumes from all equipment during future construction will not be directed towards the canopy of the retained trees. If any roots of trees to be retained are exposed during site alterations, the roots shall be immediately reburied with soil or covered with filter cloth or woodchips and kept moist until the roots can be buried permanently. Signs, notices or posters cannot be attached to any trees to be retained.

There are no specific sensitivities for plantings on the site. As part of the rehabilitation plan, a mix of native species such as sugar maple, red maple, tamarack, white spruce, white pine, red oak, bur oak, bitternut hickory and basswood are recommended.
To mitigate for the four healthy butternut trees proposed for removal, it is proposed to plant 47 pure butternut plantings along the overall site perimeter. The number of plantings is based on two healthy butternuts between 15 and 81 cm dbh (40 plantings) and one healthy tree each between 0 and 2 cm dbh (2 plantings) and 3 and 14 cm dbh (5 plantings). A planting application will be submitted to the Kemptville District Ministry of Natural Resources. The plantings will be sourced from a Rideau Valley Conservation Authority program to ensure pure seedlings are used. The butternut seedlings will be planted adjacent to existing trees in open areas, among and adjacent to existing non-butternut trees. The plantings will be spread over a large area mixed with existing deciduous and coniferous trees and shrubs to avoid a monoculture of disease-prone trees. The butternut plantings will add to the terrestrial and wildlife attributes of the lands to be retained in their existing condition under Taggart ownership over the long term. The butternuts will be planted in similar locations as existing butternuts and thus will be exposed to similar drainage and other physical characteristics.

It is critical to remember that no healthy butternuts can be removed or otherwise harmed until the planting application has been accepted by the Ministry. A setback of 25 metres radius must be left from each butternut tree until the analysis is completed.

Although no turtles were observed on-site during the field surveys, with the Blanding’s turtle observation immediately to the north of the site it is recommended that a monitoring program be established for any Blanding’s turtle utilization of the site. The monitoring will focus on the northwest wetland and adjacent upland areas. The extent of sand present in the upland areas adjacent to the northwest wetland will be confirmed, as this material could be used for nesting by turtles. This is an important component of the monitoring and potential mitigation with respect to Blanding’s turtle and the northwest wetland. If Blanding’s turtle activity is observed on the site potential mitigation measures include extending the setback distance from the northwest wetland and erecting specialized fencing around the north perimeter of disturbed areas to restrict turtle access. The extent of whip-poor-will activity on and adjacent to the site will also be confirmed. To date no whip-poor-will have been heard calling on or within 120 metres of the proposed extraction area.

7.0 CUMULATIVE EFFECTS

With the large number of active quarries in the immediate area, cumulative effects are a potential concern. AECOM (2012) concluded that the proposed Fernbank Quarry may cause minimal drawdown effects on private wells in the area. Although supply issues on a few nearby wells may take place, these can be detected at an early stage through the existing monitoring network and readily remediated through the proposed mitigation and/or contingency measures (AECOM, 2012).

In comparing the zones of influence with greater than one metre drawdown of quarry activity with and without the proposed Fernbank quarry, the two zones of influences are very similar to the north and south between the five existing quarries and with the addition of the proposed Fernbank quarry (AECOM, 2012). However, the edge of the zone of influence would extend further by about 400 metres to the east and about 200 metres to the west with the addition of the
effects from the proposed Fernbank quarry (AECOM, 2012). Although the Beagle Club quarry is immediately to the west of the proposed Fernbank quarry the drawdown effects would extend further west largely due to the shallow sump (117 mASL) at the Beagle Club Quarry to the west compared to the proposed Fernbank quarry (110 mASL).

8.0 SUMMARY and CONCLUSIONS

This Natural Environment Level 1 and 2 Technical Report and Environmental Impact Statement for a proposed licence to extract aggregate from a parcel of land located between Fernbank Road and the TransCanada Trail, to the east side of Jinkinson Road in Goulbourn Ward of the City of Ottawa included a review of published background documents and field surveys to document the natural heritage features as identified in the Provincial Policy Statement, on or adjacent to the site. Direct fish habitat is present in channels in the southwest and northwest portions of the site and significant wetland parcels are present in the south-central and northeast corner of the site, with the northwest wetland also considered important due to the reported sighting of a Blanding’s turtle immediately to the north of the site. In addition several butternut trees, an endangered species, are on the site, including eleven butternuts assessed as healthy.

As part of the Level 2 analysis the extraction area was modified to provide protection for the channels containing fish habitat, the provincially significant wetland parcels and the northwest wetland as well as eight of the eleven butternuts assessed as healthy. In addition the majority of the portions of the overall site contained within the Stittsville West and Fernbank at Jinkinson Natural Areas will be retained and protected. The removal of four butternuts will be mitigated with the planting of 47 pure butternut seedlings on portions of the site that will not be disturbed. Due to the reported Blanding’s turtle to the north of the site, additional monitoring is recommended for this threatened Species at Risk, including potential utilization of the sand overburden adjacent to the northwest wetland. The extent of whip-poor-will activity on and adjacent to the site will also be confirmed.

No other Species at Risk or provincially rare species were observed on or adjacent to the site. The field surveys paid particular attention to the possibility of ram’s head orchid and milksnake on the site and adjacent lands. The fish habitat and provincially significant wetland parcels will be protected with no touch setbacks described in Section 6. The hydrogeological investigation concluded that there is no anticipated zone of influence associated with the groundwater interactions on the adjacent retained wetlands. Existing surface water inputs to the wetlands will be maintained during the quarry operation. Indirect impacts are not anticipated through alterations in groundwater inputs and other changes in the moisture regime.

There are pockets of other wetland habitat in the east-central portion of the site. This wetland habitat is dominated by thickets and is disturbed by non-native flora, having transitioned from agricultural activity. These wetland pockets do not contain a diversity of habitats and are not considered part of the provincially significant wetland.

The balance of the site is a combination of cultural meadows and thickets and relatively young and open coniferous and mixed forests of minimal natural environment significance. The field
observations confirmed that meadow habitat that appeared to be potential alvar areas on aerial photography did not check out in the field as having alvar characteristics, with a large cultural component throughout. The natural features and functions of the forests which are within the proposed extraction area are limited by fragmentation, young age, historical agriculture and logging, abundance of non-native flora and dominance of the invasive buckthorn in many areas. Thus the on-site forests are not considered significant woodlands.

The Natural Environment Level 2 Analysis and this Environmental Impact Statement concludes that the significant natural heritage features on and adjacent to the site, the fish habitat in the southwest and northwest channels and parcels of provincially significant wetlands and the northwest wetland will be adequately protected provided the important mitigation measures in this report are properly implemented. Planting of butternuts is recommended as mitigation for four healthy butternut trees proposed for removal. Additional mitigation measures are required if Blanding’s turtle and whip-poor-will utilization of the site is observed.

9.0 REFERENCES


MTO. 2006. Environmental Guide for Fish and Fish Habitat, Section 5: Sensitivity of Fish and Fish Habitat, October 2006. Ministry of Transportation of Ontario


10.0 Qualifications and Experience

Bernie Muncaster performed the background review, fieldwork and report preparation of this Level 1 and 2 Report and Environmental Impact Statement. For over twenty-three years Bernie has provided natural environment consulting with an emphasis on environmental impact assessments, class EA assignments, environmental effects monitoring, environmental appraisals and watershed studies. Bernie has a range of experience involving inventories of terrestrial and aquatic features, development of criteria to identify critical natural areas and presentations at public meetings. Bernie has provided evidence to the Ontario Municipal, Environmental Assessment and Energy Boards. Bernie is a certified OMNR Wetland Evaluator and a Butternut Health Assessor and is qualified by MTO as a Fisheries Assessment Specialist and Fisheries Contract Specialist and has completed the Ecological Land Classification course.

Daniel Brunton contributed field expertise to this project, especially in botanical identification, identification of potential Species at Risk and other sensitive ecological features and summaries of vegetation communities.
BERNIE W. MUNCASTER, M.Sc., B.Sc.

EDUCATION
M.Sc., Biology, University of Windsor, Area of Emphasis: Aquatic Toxicology, 1987
B.Sc. (Honours), Ecology, College of Biological Sciences, University of Guelph, 1984

POSITIONS HELD
2002-present: Muncaster Environmental Planning Inc., Principal
1995-2002: ESG International Inc., Regional Manager, Principal, Ottawa
1990-1995: Ecological Services for Planning Ltd/ESG International Inc., Project Manager, Guelph
1985-1988: Great Lakes Institute, University of Windsor, Graduate Student and Research Assistant
1984-1985: University of Guelph, Research Assistant, Department of Zoology
1980-1983: Biological Research Division, Ontario Hydro, Toronto; Department of Zoology, University of Guelph, Summer Technician Positions.

EXPERIENCE
Extensive project management experience of environmental assessments, watershed studies and route selection studies. These projects have involved giving evidence at the Ontario Municipal and Energy Boards, considerable agency interaction, obtaining approvals under the Fisheries Act and working jointly with consulting engineers, planners and members of other disciplines.

- Certified as a Fisheries Assessment Specialist and Fisheries Contract Specialist by the Ministry of Transportation following the MTO/DFO/OMNR fisheries protocol
- Certified by the Ministry of Natural Resources as an Ontario Wetland Evaluator
- Completed the Ecological Land Classification for Southern Ontario Training Course
- Certified by the Ministry of Natural Resources as a Butternut Health Assessor

Environmental Assessments and Monitoring for river crossings, highways, residences and quarries

- Provide the natural environment input for the Western LRT study in the City of Ottawa including summarizing the ecological features and functions and assisting in the evaluation of alternatives
- Aquatic, wetland and terrestrial inventories, including fish surveys, impact assessments and production of environmental screening reports for proposed highway, regional and local road construction in eastern Ontario under the Class Environmental Assessment Process, including work in the City of Ottawa on Trim Road, Prince of Wales Drive, Bank Street, Highway 417, Limebank Road, St. Joseph Blvd., Woodroffe Avenue, Hazeldean Road, Cleopatra Street and Terry Fox Drive, Clarence-Rockland on County Road 17, and City of Kingston on Wellington Street
- Completion of the Urban Natural Areas Environmental Evaluation Study of all natural areas in the urban portion of the City of Ottawa
- Completion of Compensation Agreements under the Federal Fisheries Act where impairment to fish habitat was identified. The agreements were completed for bridge crossings, highway reconstructions, watercourse realignments, installation of docks, utility crossings, public transit operations and residential developments
Fisheries assessment and stormwater quality surveys for MTO. Potential impacts and mitigation measures for the natural environment features from bridge reconstructions and highway widenings were established.

Completion of Environmental Screening Reports for the National Capital Commission for multi-use pathways, land disposals and other infrastructure projects, including the Rideau River Pathway.

Conduct existing natural environment inventories and provide mitigation measures for City of Ottawa infrastructure projects such as pump stations and sewer replacements including the twinning of the Rideau River Collector and St. Claire Gardens Viewmount Collector Upgrading.

Inspections for the National Capital Commission and the City of Ottawa for breeding birds prior to removal of woody vegetation during the breeding bird period.

Detailed fish habitat, breeding bird and terrestrial surveys of potential impacts on aquatic and riparian habitat through watercourse crossings and adjacent developments throughout Ontario, including infrastructure such as the South Nepean Collector. Projects involved agency correspondence, identification of mitigation measures and in many cases evidence provided to the Ontario Municipal and Energy Boards.

Production of Tree Conservation Reports for proposed developments as required in Official Plans.

Four season ecological inventories for several public and private lands in the National Capital Region, including the Fernbank, Kanata Lakes and Riverside South study areas. Significant and sensitive habitats were identified. Developed mitigation plans for environmental features.

Surveys of the wetland, terrestrial and aquatic environments for proposed residential developments using a four season’s approach and the Ecological Land Classification methodology. Environmental constraints to development were classified, include core and secondary areas and linkages, and applied in the concept plans. Wildlife corridors connecting ESAs were identified as were other potential mitigation measures such as deer culverts, vegetation plantings to provide maximum benefit to wildlife, construction timing and stream restoration. Evidence provided to the Ontario Municipal and Environmental Assessment Boards.

**Route and Site Selections for Pipelines and Landfills**

- Route selection and environmental and socio-economic impacts assessments of proposed pipelines throughout Ontario, including crossings of the Ottawa River and St. Clair River. Approval obtained from National and Ontario Energy Boards, and evidence provided to the Ontario Energy Board.
- Evaluation of natural environment attributes of candidate areas for landfill operation as part of the Environmental Assessment Act.
- Delineation of wetland, aquatic and terrestrial features for proposed landfill expansions.

**Development of Management Plans**

- The Kanata North, Sawmill Creek, McEwan Creek, Laurel Creek and Grindstone Creek subwatershed studies identified core areas and linkages based on field surveys and reviews of existing information.
- The Urban Natural Areas Environmental Evaluation for the City of Ottawa.
- Production of a Management Plan for the McKay Lake area.

**Management and Scientific Contributions to a Range of Technical Studies**

- Completion of detail Environmental Effects Monitoring for Pulp and Paper Mills in eastern Ontario, including fish and benthic invertebrate sampling design and field work.
- Review of zebra mussel biology and their impacts on industrial operations.
- Referee of manuscripts for scientific journals.

**AWARDS**

University of Windsor, Postgraduate Summer Scholarship, 1987