



## REPORT

To: **General Committee**

Date of Meeting: April 7, 2014

Prepared By: George Elliott, Commissioner of Transportation and Public Works

Approved By: Gary Dyke, CAO

Department: Transportation & Public Works

Date to Management Committee: April 2, 2014

Report No.: 14-011 (TPW)

File No.:

Ward No.: 1 & 2

**Blackbridge Road EA  
Study Heritage  
Conservation District  
(HCD) Study -  
UPDATE (Wards 1 & 2)**

### Recommendation

THAT Council receive Report 14-011 (TPW) regarding a project update for the Heritage Needs Study of the Black Bridge area as information, and

THAT Council direct staff to undertake additional public consultation with the landowners of the subject lands that will be directly impacted by protection measures proposed in the Black Bridge Area Cultural Heritage Study report,

AND THAT Council direct staff to report back to Council with a presentation of the Black Bridge Area Cultural Heritage Study report findings and staff recommendations on or before June 9, 2014.

**Existing Policy/By-Law:**

The 2012 Cambridge Official Plan provides the policy framework for considering heritage preservation mechanisms such as establishing Cultural Heritage Landscapes. The Black Bridge Area Cultural Heritage Study was completed as an initial step to assess if protection for the area was appropriate. The undertaking of the Black Bridge Area Cultural Heritage Study and its findings are consistent with the process expectations within the Official Plan.

**Financial Impact:**

The completion of the "Black Bridge Area Cultural Heritage Study" was funded through the Black Bridge Road Environmental Assessment Study capital project budget. This Study component of the project is complete and no additional expenditures are required to be funded under the EA Study project, or otherwise, for this initiative.

However, should Council choose to advance this heritage initiative to undertake a Cultural Heritage Landscape Technical Study as recommended within the Black Bridge Area Cultural Heritage Study additional funding would be required.

**Public Input:**

Per Council's direction, public consultation for this project has been completed. The public have been engaged through four primary groups as noted below:

1. Heritage Cambridge
2. Blackbridge Community Association
3. Heritage Resource Centre – neighbourhood consultations
4. General Public consultations through TPW project team

The project team meetings included two primary consultations with Heritage Cambridge and the Blackbridge Community Association. These were held at the start of the project (January 10, 2013) and to review the consultant draft findings (September 17, 2013). These primary sessions were held with representatives of MHAC, HPAC, Council, Consultants and City staff.

In addition, as directed by Council on March 3, 2014, additional public consultation and review of the study at the MHAC meeting of March 20, 2014 was conducted. At this meeting presentations were made to the committee by:

- |                            |  |
|----------------------------|--|
| • George Elliott           | Presenting staff report 14-006 (TPW)             |
| • Dr. Robert Shipley       | Responded to MHAC questions                      |
| • Linda Lennox             | Opposing the CHL designation                     |
| • Linda Lennox             | Reading letter - opposition from Ruggieri family |
| • Black Bridge Com. Assoc. | In support of CHL                                |
| • Ron Shantz               | Opposing the CHL designation                     |

### **Comments/Analysis:**

At the MHAC meeting of March 20, 2014, there was debate about many issues surrounding the Heritage needs in the Black Bridge area. A key focal point of the debate was trying to ascertain the level of support for the proposed CHL measures. This point of the debate was routed in the fact that there had been both significant support and opposition presented to the Committee. Dr. Shipley as a heritage expert was instrumental in assisting the Committee members to weigh the concerns.

Dr. Shipley's advice was that the MHAC had a singular role which is the duty to advise Municipal Council on the merits of heritage conservation for the City. Their role does not require full community support or consensus to make a recommendation and that their consideration of the issues should not be based on a "popularity contest". As such, the MHAC decision was made recognizing that they had already supported the findings of the Black Bridge Area Cultural Heritage Study and that in their opinion the timeline for implementing the protection measures was the critical issue.

As municipal staff and ultimately City Council have a wider duty of care to consider all community and resident needs, the level of support identifying the breakdown of the balance of support and opposition to the report is necessary. In order for Council to make a fully informed decision, staff recommend that additional research and consultation is needed to better define the balance of opinions in the Black Bridge area.

### **Further Research & Consultation**

Comments within the presentations at the MHAC meeting exposed a concern that there is a general misunderstanding within the public in the Black Bridge area of the exact limits of the recommended Cultural Heritage Landscape. This misunderstanding was noted due to confusion at the time of scoping the study. Further, as noted by the presenters, the study has been an exercise in education about the Heritage process and that it has been like "drinking from a firehose" to take in and understand all of the information. As such, additional clarification and definition of the boundary is prudent.

**Staff recommend that clarification of the final area boundary in which the Cultural Heritage Landscape would be considered needs to be made.**

Further, in response to the noted concerns for clarifying who the landowners are within the area that will be directly impacted by the CHL designation, additional work is needed to identify these landowners. With the landowners identified, the balance of support or opposition can be ascertained through additional consultation specifically with these landowners that may be directly impacted.



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MAR 27 2014

Township of Puslinch

File: 2517

By: Email & Mail

March 25, 2014

Township of Puslinch  
7404 Wellington Road 34  
RR# 3  
Guelph, Ontario  
N1H 6H9

Attention: Mrs. Karen Landry  
Clerk/ CAO

CLERK'S DEPARTMENT	
TO	
Copy	
Please Handle	
For Your Information	
Council Agenda	April 16/2014
File	E13- PRESTON SAND & GRAVEL

Dear: Mrs. Landry

**Re: 2013 Ecological and Aquatic Monitoring Report for the Roszell Pit**

As requested, I have reviewed the 2013 Ecological and Aquatic Monitoring Report prepared by Dance Environmental Inc. for the Roszell Pit. I also inspected the site on March 24th to confirm certain information provided in the report. Based on the information supplied and my field observations I offer the following comments.

1. Dance reported that no incidents of soil erosion and deposition had occurred in the 30 m setback from the western woodland/wetland feature. Since he did not confirm that the required silt fencing was installed along the setback limit I inspected the site and found that this protective fencing had still not been erected as recommended in my April 17, 2013 correspondence to the Township. However, t-bars and a strand of wire had been erected at about 30m from the woodland/wetland edge and no extraction operations had occurred beyond this point. Although soil stockpiles and/or extraction areas were still not in close proximity to this natural feature, the silt fencing should nonetheless be installed in the appropriate locations as per the approved Site Plans since the level of extraction activity will likely escalate in 2014. Furthermore, the boundary line fencing erected along the western woodland/wetland edge needs to be repaired at the north end due to damage sustained by blowdown trees.
2. Cattle are still allowed across to the wetland area where vegetation plots A and B had to be located due to the close proximity of groundwater seepage. Ongoing cattle grazing damages vegetation due to their trampling and browsing activities which could mask the effects of potential changes to the groundwater regime and hence invalidate the interpretation of monitoring data. I therefore reiterate that CBM should encourage the landowner to shift the electric fence that now runs through the wetland to the river further northwards so that cattle no longer have access to the area where monitoring plots are established. This would likely only result in the loss of less than an acre of poor quality woodland/wetland pasture.

3. The vegetation monitoring procedures incorporated the additional data collection I suggested in my 2013 correspondence. I have no concerns with the data collected to date.
4. Brook trout spawning beds (redds) were found in the Main Creek and Tributary #7 during the 2012 and 2013 surveys. The number of redds observed in Tributary #7 was the same during both years but in the Main Creek about twice as many redds were reported in 2013. Hence, it doesn't appear that the mining carried out to date has affected fish habitat.
5. A salamander egg mass survey was initiated in the isolated southwestern wetland (SWT2-2) on the Roszell pit property and many Blue-spotted Salamander egg masses were observed. Stovel previously only reported the presence of Spotted Salamander egg masses in this wetland. I have no concerns with the collection of this baseline data.
6. During the spring of 2013 amphibian call surveys were also initiated in the vicinity of the Roszell wetland and Dance observed the presence of spring peepers, wood frogs, green frogs, gray tree frogs and northern leopard frogs. Stovel previously did not report wood frogs inhabiting this area but noted the presence of American toad and western chorus frog. The pond on the adjacent Jones property was also surveyed but no frogs were heard calling from this area. I understand that trout were previously stocked in this pond and the presence of fish may explain the absence of frogs in this area.

In summary, I feel the ecological and aquatic monitoring data is being effectively collected and will prove useful in the evaluation of potential environmental impacts. However, I still have concerns regarding the lack of silt fencing at the woodland/wetland setback limit and cattle access to vegetation monitoring plots. Please do not hesitate to contact me if further clarification is needed on these matters.

Yours truly,

**GWS Ecological & Forestry Services Inc.**



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

cc: Nathan Garland, Grand River Conservation Authority



DANCE  
ENVIRONMENTAL  
INC.

6.3(b)

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**2013  
Ecological and Aquatic  
Monitoring Report  
Roszell Pit,  
Puslinch Township.  
ARA Licence No. 625189.**

**Prepared for:**

CBM Aggregates  
55 Industrial Street  
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Attn: Collin Evans

**Prepared by:**

Dance Environmental Inc.  
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December 16, 2013.  
DE-382

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## **1.0 BACKGROUND**

Dance Environmental Inc. was retained on September 7, 2012 by CBM Aggregates to begin initial data collection on wetland vegetation, fish spawning, and sediment and erosion control monitoring in accordance with the site plans for the Roszell Pit, Puslinch Township.

The Roszell pit was approved for aggregate extraction prior to 2012. The Roszell Pit is licenced for extraction into the water table.

The Summer of 2012 was characterized as a hot dry summer with lower than average precipitation, resulting in low water levels in streams and rivers throughout much of Ontario.

## **2.0 PURPOSE OF MONITORING**

The monitoring which was conducted during the Fall of 2012 was conducted in order to meet ecological mitigation measures and ecological and aquatic monitoring requirements laid out in the site plan conditions for the Roszell Pit.

The ecological mitigation measures include:

1. The dripline of all forest systems of the pit should be flagged in the field, confirmed by relevant staff, surveyed and shown on the site plans (completely previously).
2. The limits of all wetland systems in proximity to the pit should be flagged in the field, confirmed by relevant staff, surveyed and shown on the site plans (completed previously).
3. The setback (for extraction above the water table) from the wetland system to the west of the site, i.e. lands associated with the Speed River Wetland Complex should be 30m from the limits of the wetland.
4. The setback (for extraction above the water table) from the dripline of the forest system to the west of the site should be 30m.
5. Sediment and erosion control measures should be established along the western limits of the site in areas adjacent to forest and wetland systems on and adjacent to the site. Sediment and erosion control measures should be established prior to soil stripping and berm construction in areas close to these natural features. Sediment and erosion control measures, i.e. silt fencing should be regularly inspected and maintained over the life of the pit. Siltation barriers will be inspected immediately after a significant rainfall event until such time as adequate vegetation has become established on berms or other features which could cause sediment to be introduced into the forest or wetland system adjacent to the site. The status of sediment and erosion control measures should be documented in the annual compliance assessment report.
6. Prior to final rehabilitation of the site, including final wetland rehabilitation, a Vegetation Management Plan will be prepared and submitted to the Ministry of Natural Resources, GRCA, and the Township of Puslinch. This report should provide details on the type, size, and location of native trees, shrubs and ground cover to be planted in selected areas of the site. On an annual basis, the health

of the re-forestation project along the western portion of the site should be documented and submitted to the MNR as part of the annual compliance assessment report.

7. The ecological and aquatic monitoring, as determined by consultation with the MNR, will be implemented upon receipt of the licence.

#### Ecological and Aquatic Monitoring:

1. Frog call surveys will be undertaken in general accordance with the Canadian Wildlife Service's Marsh Monitoring Program at the Roszell wetland on an annual basis. Three evening visits will be completed when temperatures first exceed 6, 10 and 17°C. The results of these surveys will be provided to the MNR, GRCA and County of Wellington and Township of Puslinch as part of the annual compliance assessment report.
2. Salamander egg mass surveys will be conducted annually at the Roszell wetland. The results of this survey will be provided to the MNR, GRCA and County of Wellington and Township of Puslinch as part of the annual compliance assessment report.
3. During the spring high water period and the summer period, ecological inspections of the Roszell wetland and seepage areas of the Speed River Wetland Complex will be completed, focused on the wetland vegetation and flora. As part of these site inspections, photomonitoring (fixed point photography stations) and permanent 10X10 m vegetation monitoring plots will be established. Staff gauges may be established at some of the monitoring stations. Photo monitoring stations and vegetation monitoring plots will allow for repeated monitoring of events during baseline (pre-extraction), extraction and post-extraction conditions. The results of this survey will be provided to the MNR, GRCA and County of Wellington and Township of Puslinch as part of the annual compliance assessment report.
4. Prior to the initiation of below water table extraction at the site, a comprehensive report documenting existing baseline conditions of the Roszell wetland and seepage areas of the Speed River Wetland Complex will be completed, focused on wetland vegetation, flora, and amphibian breeding habitat. The results of this survey will be provided to the MNR, GRCA and County of Wellington and Township of Puslinch as part of the annual compliance assessment report.
5. Prior to initiation of below water table extraction at Lake 3, (i.e., after Lakes 1 and 2 are in place), a comprehensive report documenting the Roszell wetland and seepage areas of the Speed River Wetland Complex will be completed, focused on wetland vegetation, flora, and amphibian breeding habitat. The results of this survey will be provided to the MNR, GRCA and County of Wellington and Township of Puslinch as part of the annual compliance assessment report.
6. Should significant changes in wetland vegetation (composition and/or structure) and/or use by amphibian breeding (including population estimates) be detected at any phase of operations at the Roszell Pit, the licensee will contact the MNR immediately to discuss implications and to activate the contingency program, as set out in the hydrogeological recommendations. If changes are observed, then



it will be important to establish whether or not any documented changes are directly related to the pit operation versus other potential causes.

7. Annual spawning surveys of Main Creek and Tributaries 7, 8, and 9 will be undertaken to record spawning activity. The results of these spawning surveys will be provided to the MNR, GRCA and County of Wellington and Township of Puslinch as part of the annual compliance assessment report.
8. Prior to opening the pit, the licensee will contact landowners south of Roszell Road to ask permission to access their lands for the purpose of documenting the wetland boundary and characterizing the condition of existing aquatic resource features, i.e. pond, wetland, watercourses. Documentation of these features will be done using methods which can be repeated in the future to assess the impact, if any, of adjacent extraction activities on these features.
9. If the licensee is denied access by these land owners, prior to opening Lake 3, the licensee will again ask permission to access these same lands and monitor as deemed necessary.

### **3.0 MONITORING METHODS**

#### **3.1 Erosion/Sediment Control Monitoring**

As a result of the proximity of aggregate extraction to the Speed River Wetland Complex and the topographic relief to the west of the aggregate extraction area, sediment control measures were recommended in the site plans.

Monitoring for the establishment and maintenance of sediment control measures was to be conducted immediately after significant rainfall events. Photos were to be taken of any significant sedimentation found.

#### **3.2 Vegetation Monitoring**

##### **Wetland Vegetation Quadrat Sampling**

**Objective:** The objective of the 2012 vegetation quadrat sampling was to document the vegetation composition (species and relative abundance) and structure (vertical structure within the wetland) before extensive extraction had occurred, to record the baseline vegetation community conditions.

The baseline data will provide a basis for comparison as the extraction progresses both above and below the water table. As noted previously, Fall is not an ideal time for monitoring of flowering herbaceous vegetation, and therefore in successive years monitoring will be conducted in Spring and Summer.

##### **Data Collection Methods:**

The locations of the six 10x10 m quadrats which were established in 2012 are shown on Figure 1. The exact locations of the 10x10 m quadrats were randomly selected, but were generally placed near the upslope seepage areas of some of the tributaries within the Speed River Wetland Complex adjacent to the Roszell Pit, and were sited near existing piezometer locations. The location of quadrat placement was selected to specifically document vegetation and conditions around significant groundwater



seepage features that the hydrogeology consultants had identified and monitored along the eastern margin of the wetland, to the west of the extraction area. Quadrats were placed in these locations since this is where any change in groundwater discharge might be first observed and subsequently where vegetation changes could be first observed.

The centre of each quadrat was marked by a steel T-bar with the top sprayed white. The outer margins of each quadrat were marked by wooden stakes which had the tops sprayed orange. The ground vegetation was to be monitored during early Fall 2012 and in successive years will be monitored in both Spring and late Summer to ensure accurate identification of species and to capture plants blooming at different times throughout the season (CVC 2010).

#### Collection of Herbaceous vegetation Information:

Four 1x1 m quadrats were then set-up to record the herbaceous species and their relative abundance within each of the 10x10 m quadrats. The 1x1 m quadrats were set-up so that the one corner of the quadrat was on the ordinal direction stake, with the quadrat being entirely inside the 10x10 m quadrat, see Figure 2. The percent cover that each species within the 1x1 m quadrat occupied, was recorded. The percent cover within each 1x1 m quadrat that roots, deadfall, or mosses occupied were also recorded. The water depth within each 1x1 quadrant was recorded. These steps were repeated for each of the 4 quadrats within each of the six 10x10 m quadrats. An example of a completed data sheet from 2012, with data from a vegetation plot at the Roszell Pit, is contained in Appendix 1.

#### Collection of tree and shrub Information within vegetation plots:

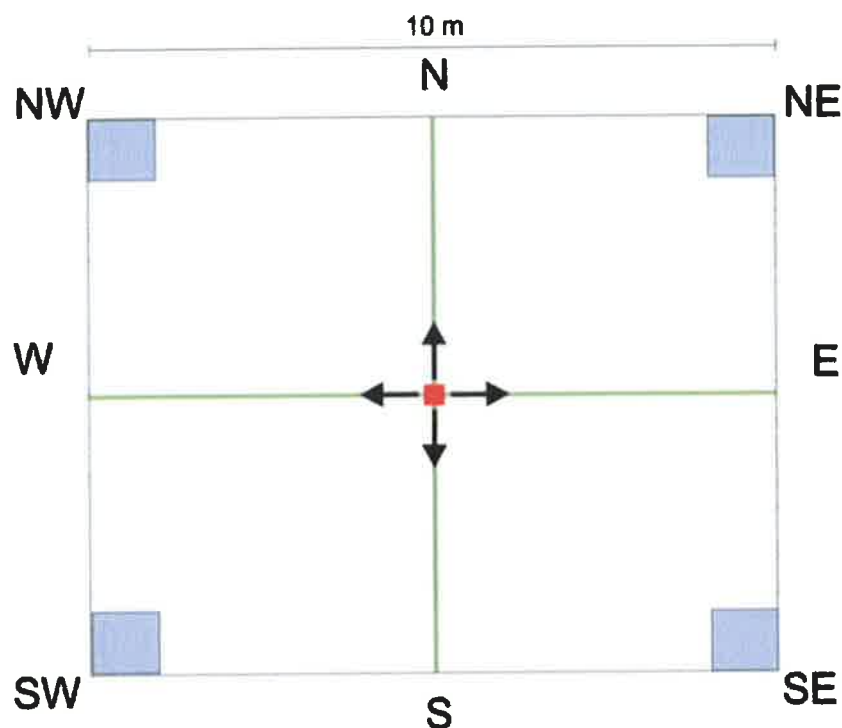
As changes to shrubs and trees happens more in the long-term, data was to be collected on trees and shrubs within the vegetation plots only during the late summer inventory.

Information on the trees and shrubs within the vegetation plots was modified from 2012 based on Greg Scheifele's comments on the 2012 vegetation monitoring. In order to capture trends/changes in the higher strata within the 10x10 m quadrat, two transect lines were surveyed within each 10x10 m quadrat. The transect lines were conducted to record information about trees and shrubs including density, species composition, and strata (sub-canopy or understory) in which they are present within each of the six 10x10 m quadrats.






Trees or shrubs which were <10cm DBH were identified as being within the understory category for height class. For consistency between all six 10x10 m quadrats, the one transect line that was sampled ran north-south and the other ran east-west across each 10x10 m quadrat. Along each of the tree and shrub transect lines data was collected for a 1 m wide area centered along the entire transect. Standing dead trees were also recorded, along with the strata in which they occurred. An example of a completed data sheet from 2013, with data from the tree and shrub transect, is contained in Appendix 2.



**Figure 2. Vegetation Monitoring Plot Layout and Position and Direction of Photomonitoring.**



#### LEGEND

-  = Tree and Shrub Monitoring Transect
-  = 1x1 m Vegetation Monitoring Sub-plot
-  = 10x10 m Monitoring Plot
-  = Metal T-bar in Center of Quadrat
-  = Direction in which Photomonitoring Photos are Taken

A digital soil moisture meter (Vegetronics VG-METER-200 and VH-400 soil moisture sensor) was used to provide volumetric water content for soils in each of the six vegetation plots. The soil moisture probe was pressed into the soil until the entire probe was in the soil, and then a reading was taken. Soil moisture content was to be recorded as a percent and was recorded at the north, east, south and west corners of each vegetation monitoring plot, providing 4 soil moisture values from across the plot.

Starting in 2013, the health of each tree or shrub stem encountered along the east-west and north-south transect lines were to be recorded as dead, poor, or good.

It was also recommended by Greg Scheifele that tree health of all trees of >10cm dbh within the entire vegetation plot be recorded. For each tree >10cm dbh within the entire vegetation plot, the tree's health and whether it was a canopy or sub-canopy tree were recorded. We also recorded the same information for standing dead trees.

#### **Photomonitoring:**

As outlined in the site plans for the Roszell Pit, photomonitoring was to take place at fixed point locations so that photos can document potential changes to the vegetative conditions within the Speed River Wetland Complex adjacent to the Roszell pit.

Photomonitoring locations were to be located at the steel T-bar in the center of each of the 10x10 m vegetation quadrats. A total of six fixed point photo monitoring locations were set-up in 2012 with photos taken from the steel T-bar facing north, east, south and west, see Figure 2.

### **3.3 Spawning Surveys**

The spawning surveys were to be conducted along Main Creek and Tributaries 7, 8, and 9 located within the Speed River Wetland Complex, to the west of the extraction area of the Roszell Pit. Surveyors wore polarized glasses and walked along each of the streams to be surveyed.

The location, number, size and species of redds were mapped and described on data sheets. Trout redds are the particular focus of the spawning surveys. Weather conditions including wind speed, percent cloud cover, precipitation, and air temperature were recorded during each survey visit and water temperatures were recorded for each of the streams or tributaries which were surveyed.

Observations of trout and their activities were recorded. Substrate conditions and water depth where spawning was observed were to be noted.

Spawning surveys were conducted at two times: one early in the spawning season (November 27, 2013) and a second visit (December 10, 2013) to document the range of spawning dates and locations.

The following approach will be followed in the future to determine whether the pit operation has affected fish habitat in a measureable way:

- Evaluate what the groundwater/hydrology consultant has determined about any significant changes in stream temperature, stream flow, ground water flux relative to meteorological conditions during the study period;
- Determine geographically where ground water/surface water changes have occurred relative to the aggregate pit margins and predicted impact zones;
- Where groundwater/ surface water data show significant changes the potential effects on fisheries data will be carefully inspected for any evidence of changes

Sediment control inspections were conducted on June 29<sup>th</sup>, July 22<sup>nd</sup>, August 4<sup>th</sup>, and September 23<sup>rd</sup>, 2013.

No incidents of soil washing into the wetland buffer, the wetland itself or other important natural features were observed during the 2013 sediment control inspections.

#### **4.2 Vegetation Monitoring**

A total of six permanent vegetation monitoring plots were set up near the eastern edge of the Speed River Wetland Complex, adjacent to extraction area of the Roszell Pit. Vegetation monitoring quadrats were set up on September 28, 2012 (Plots A, B, and C) and October 1, 2012 (Plots D, E, and F).

The UTM co-ordinates (obtained with a hand-held GPS) for vegetation monitoring plots A to F, are shown in Table 1.

**Table 1. UTM Co-ordinates for the Center of Vegetation Monitoring Plots and Photo Monitoring Locations**

Plot Name	UTM Co-ordinates
Plot A	17T 0557139 4812349
Plot B	17T 0557132 4812259
Plot C	17T 0557057 4811973
Plot D	17T 0557042 4811849
Plot E	17T 0557005 4811745
Plot F	17T 0557017 4811664

As outlined in the ecological and aquatic monitoring site plans, vegetation monitoring was to be conducted in the spring and late summer. The first late summer vegetation information was conducted on September 28 and October 1, 2012, while the first set of spring vegetation information was collected on May 30, 2013. The 2013 late summer vegetation inventory was conducted on September 20<sup>th</sup>.

It was noted when setting up the vegetation plots that cattle from the farm to the north of the Roszell Pit had access to the Speed River Wetland Complex in the area of vegetation plots A and B. It was evident during the spring and fall 2013 monitoring that the cattle still had access to the areas of vegetation plots A and B.

Soil moisture was recorded during both vegetation monitoring seasons in 2013 using a Vegetronics VG-METER-200 digital soil moisture probe. The soil moisture data will be analyzed once more than a year of data is available for comparison.

Overall, 2013 has been noted as a very wet year in Waterloo Region, with it being a nearly record breaking year for precipitation (The Waterloo Region Record 2013).

The dominant taxa, their percent cover, and total number of species for each sub-plot for vegetation plots A to F during Spring 2013 is summarized in Appendix 3. The late summer vegetation survey results showing dominant taxa, their percent cover, and total



generally saturated indicating that where there was no surface water, there was water near the surface.

Tree and shrub diversity within the transects was very limited, with only two species being present, Glossy Buckthorn and Eastern White Cedar. In the understory along the east-west transect Glossy Buckthorn (3) was the only species present at >1m in height, all in good health. No tree or shrub species were present along the north-south transect line. Eastern White Cedar was the only tree species present at >10cm dbh, with trees found in good health (17), fair health (5), and poor health (3). No dead fall was noted within this vegetation plot in 2013.

#### **Vegetation Plot D:**

The vegetation Plot D was located in wet cedar swamp located in the upstream seepage area which enters Tributary #8 near the eastern edge of the wetland. Vegetation Plot D was located just east of drive point piezometer DP3. This vegetation plot is on a slope with scattered seeps with marl deposits. No surface water was present in any of the sub-plots but soil moisture readings indicate varying degrees of soil saturation within the plot.

Within vegetation Plot D no tree or shrub species were encountered along the north-south or east-west transects. This vegetation plot is located within cedar swamp, with Eastern White Cedar and Yellow Birch as the tree species of >10 cm dbh which were present within the entire plot. Eastern White Cedar was present in good health (18), fair health (6), and standing dead (1), while Yellow Birch was present in fair health (2). Also of note was an uprooted Eastern White cedar which was an old deadfall, as well an Eastern White Cedar that was uprooted but was still alive.

#### **Vegetation Plot E:**

The vegetation Plot E was located in fresh-moist cedar swamp. Vegetation Plot E was located in a seepage area approximately 30m downslope of the trail along the Speed River, in the bottomlands of the cedar swamp. The seepage area in which vegetation plot E was located is part of Tributary #9 and is located downslope of drive point piezometer DP7, see Figure 1. None of the sub-plots had surface water within them, and soil moisture readings indicate moderately saturated soils.

Tree and shrub species along the north-south and east-west transects at >1m in height were very limited in this vegetation plot. Only Glossy Buckthorn (6) along the east-west transect was present and were all in good health. There were three species of trees and shrubs of >10cm dbh found within the entire vegetation plot, including: Eastern White Cedar, Yellow Birch, and Black Ash. Within the entire vegetation plot F Eastern White Cedar was found in good health (12) and fair health (1), Yellow Birch was found in good health (6) and fair health (2), and Black Ash was found in fair health (1). No deadfalls within the plot were noted. None of the sub-plots had surface water within them, and soil moisture readings indicate moderately saturated soils.

**Vegetation Plot F:**

The vegetation Plot F was located in the bottomlands of a fresh-moist cedar swamp, dense with Eastern White Cedar. Vegetation Plot F was located in a seepage area downslope of the trail along the Speed River, to the west of the southeastern corner of the extraction area of the Roszell Pit. The closest drive point piezometer is DP7, to the northeast. Vegetation plot F is not in a seepage area which contributes to a tributary through surface water flow, Tributary #9 is the closest tributary to this vegetation plot and is located to the west of it. None of the sub-plots had surface water within them, however, soil moisture readings indicated moderate to saturated soils.

The tree and shrub transect data from vegetation plot F indicates a limited understory as no tree or shrub species were present along the east-west or north-south transects. Tree and shrubs species within the entire vegetation plot of >10cm dbh include Eastern White Cedar, Alternate-leaved Dogwood, Tamarac, and White Birch. Eastern White Cedar was present in good health (12), fair health(1), and standing dead (2), Alternate-leaved Dogwood in fair health (1), standing dead Tamarac (2), and White Birch in good health (1). No recent deadfall was noted in this vegetation plot.

**Photo Monitoring Stations:**

A total of six fixed point photo monitoring stations were established in 2012, which provide baseline photos of the Speed River Wetland Complex located to the west of the Roszell pit. Photos were taken at each photo monitoring station facing north, east, south and west, from the center T-bar of the 10x10 m plots. Photos were taken at all of the photo monitoring stations in the spring on May 30, 2013. A photo from each of the six vegetation plots in spring 2013 are shown in Appendix 5. Photos were taken at the vegetation monitoring plots in late summer on September 20, 2013. A photo from each of the six vegetation plots in late summer 2013 are shown in Appendix 6.

**4.3 Trout Spawning Surveys**

Two surveyors, Kevin Dance and Ken Dance, undertook the trout spawning surveys in 2012 and 2013. The Main Creek and Tributaries #7 & 8 were surveyed on November 7<sup>th</sup> and December 5<sup>th</sup> in 2012. Tributary 9 was surveyed on November 9<sup>th</sup> and December 6<sup>th</sup> in 2012. During the 2013 spawning period the Main Creek and tributaries #7, 8, and 9 were surveyed for trout redds on November 27<sup>th</sup> and December 10<sup>th</sup>, 2013. A summary of the survey dates and weather conditions during searches for trout redds by year are shown in Table 2.

The locations of the Main Creek and Tributary #7, 8 and 9, are all shown on Figure 1. Brook Trout Redds were found in 2012 and 2013 in Tributary 7 and the Main Creek channel, the approximate locations of Brook Trout redds are shown on Figure 1. Field data sheets from 2012 and 2013 have been archived for future reference.

**Table 2 . Summary of Dates and Weather Conditions for Trout Redd Surveys on the Main Creek, and Tributaries #7, 8, and 9.**

Year	Survey Date	Weather Conditions
<b>2012</b>	November 7	Air Temp. = 5.6 <sup>0</sup> C; Wind = 1-6 km/hr; Percent Cloud = <50%; No Precip. Water Temperature: Main Creek= 6.5 <sup>0</sup> C, Trib. #7 & 8 = 7.0 <sup>0</sup> C
	November 9	Air Temp. = 9.2 <sup>0</sup> C; Wind =>2 km/hr; Percent Cloud = >50%; No Precip. Water Temperature: Trib. #9 = 7.0 <sup>0</sup> C
	December 5	Air Temp. = 1.3 <sup>0</sup> C; Wind = >2.1 km/hr; Percent Cloud = <40%; No Precip. Water Temperature: Main Creek= 5.5 <sup>0</sup> C, Trib. #7 & 8 = 5.5 <sup>0</sup> C
	December 6	Air Temp. = 0.8 <sup>0</sup> C; Wind = >2.4 km/hr; Percent Cloud = <40%; No Precip. Water Temperature: Trib. #9 = 5.0 <sup>0</sup> C
<b>2013</b>	November 27	Air Temp. = -2 <sup>0</sup> C; Wind = 15 km/hr; Percent Cloud = 30%; No Precip. Water Temperature: Main Creek= 3.5 <sup>0</sup> C, Trib. #7 = 6.5 <sup>0</sup> C, Trib. #8 & 9 = 4 <sup>0</sup> C
	December 10	Air Temp. = -0.5 <sup>0</sup> C; Wind = 5-10 km/hr; Percent Cloud = 40-60%; No Precip. Water Temperature: Main Creek= 3.5 <sup>0</sup> C, Trib. #7, 8 & 9 = 3.5 <sup>0</sup> C

The results of the 2013 trout spawning surveys are summarized in Table 3 along with the 2012 survey results. Table 3 lists the redd numbers by watercourse for 2012 and 2013. The 2012 trout spawning survey data represents baseline data prior to any significant aggregate extraction occurring at the Roszell Pit. The 2013 trout spawning survey is the first data collected after approximately a year of aggregate extraction occurring at the Roszell Pit.

The Main Creek had the most redds present in 2012 and 2013 of all the creeks surveyed, with redds occurring in 4 locations in 2012 and at 5 locations in 2013. The numbers of redds present in the Main Creek in 2013 was double that of 2012.

Tributary #7 had 5 redds distributed over 3 locations in 2012 and 5 redds distributed over 2 locations in 2013.

The trout spawning surveys conducted in both 2012 and 2013 did not result in any trout redds being found in either tributaries #8 or #9.

**Table 3. Summary of 2012 and 2013 Brook Trout Spawning Survey, Roszell Pit.**

	Tributary Name	Station Location	2012	Total Number of Redds
			Number of Redds	
2012	Main Creek	M-1	2 to 3	8 to 9
		M-2	2	
		M-3	1	
		M-4	3	
	Tributary 7	7-1	2	5
		7-2	2	
		7-3	1	
	Tributary 8		No redds	0
	Tributary 9		No redds	0
2013	Main Creek	M-1(13)	3	19
		M-2 (13)	3	
		M-3 (13)	6	
		M-4 (13)	5	
		M-5 (13)	2	
	Tributary 7	7-1	1	5
		7-2	4	
		7-3	0	
	Tributary 8		No redds	0
	Tributary 9		No redds	0

#### 4.4 Salamander Egg Mass Survey

A survey for salamander egg masses within the southwestern wetland on the Rozell Pit property was conducted on April 30, 2013 under good weather conditions from 12:00 hrs to 15:25 hrs. Weather conditions during the survey were as follows: temperature: 19°C; wind: 8 km/hr; water temperature: 15.4°C; cloud <70%; no precipitation, and water pH: 8.

A total of 12 general areas where salamander egg masses were concentrated were found in the wetland in 2013. The approximate locations of areas where egg masses were concentrated are shown on Figure 3.




For our analysis we have divided the wetland in three different areas based on the wetlands ecological characteristics, see Figure 3. Wetland area "A" comprises of reed canary grass and red-osier dogwood around the wetland edges and willow thicket through the majority of it. Area "B", shown on Figure 3, exhibits the characteristics of a silver maple swamp, very limited emergent vegetation with leaves and sticks being





**Figure 3. Areas Searched for Salamander Egg Masses, and Amphibian Call Survey Station Locations, Roszell Pit.**

**LEGEND**

-  Area Searched for Salamander Egg Masses, Areas "A to C" Categorized by Habitat Type
-  **Frog\_2** Approximate Amphibian Call Survey Station Location
-  Approximate Property Boundary of the Jones Property

Base Map Source: GRCA GRINS mapping 2012



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predominant in the water column. Area "C" comprises the southern wetland lobe which extends in a southwesterly direction.

Substrates to which the Blue-spotted Salamander egg masses were attached included Reed Canary Grass, sticks, Woolgrass, Bladder Sedge, Poplar leaves, Bittersweet Nightshade, and Red-osier Dogwood.

A summary of the 2013 findings for the Roszell wetland are provided in Table 4. All of the salamander egg masses found within the wetland in 2013 were that of the Blue-spotted Salamander. Egg masses of frogs were also found, specifically Spring Peeper egg masses. Within area "A" a large number of Spring Peeper egg masses (15) were found, many with hatching larvae with >5000 larvae/eggs being present. Spring Peeper egg masses were also found in Area "C" where there was submerged stems of Reed Canary Grass, with larvae hatching out in the 100s to 1000s.

**Table 4. Summary of Total Number of Salamander Egg Mass Found in 2013.**

Wetland Area	Species	Number of Egg Masses 2013
<b>A</b>	Blue-spotted Salamander	46
<b>B</b>	Blue-spotted Salamander	9
<b>C</b>	Blue-spotted Salamander	3
<b>Total # Egg Masses</b>	Blue-spotted Salamander	58

As wetland area "A" is mapped in Figure 3, it comprises nearly half of the total area of the wetland. In 2013, 79% of Blue-spotted Salamander egg masses were located within area "A". The area of the wetland which had the least number of blue-spotted salamander egg masses found in it was area "C".

#### **4.5 Amphibian Call Surveys**

Amphibian call surveys were conducted in 2013 at the wetland to the south of the southern extraction limit of the pit (Roszell Wetland) and a small wetland to the southwest of the Roszell Wetland (Wetland A). Adjacent landowners with a pond/wetland on their property were also contacted in spring 2013 by CBM staff to see if any would allow for frog call surveys to be undertaken on their property. One land owner, Denise Jones, gave permission to conduct the amphibian surveys on her property (#6512 Roszell Road), see Figure 3 for its location.

Amphibian call surveys were conducted on April 17, 2013, May 6, 2013, and June 24, 2013. Details on the weather conditions for each of the survey dates for amphibians are shown in Table 5.



During the 2013 amphibian call surveys a total of 5 frog species were heard or observed, see Table 6. The results of the 2013 amphibian call surveys for each of the 4 point count stations (including the Jones Property) where data was collected are summarized in Table 6. Both survey station Frog\_1 and Frog\_2 had the same 4 species recorded at them, with large numbers of Spring Peepers and Wood Frogs breeding, as the highest call level codes were recorded in these locations. Survey station Frog\_3 had 4 species recorded in this location, but frog numbers were limited as call level codes of 1 were heard for most of the species. No frogs were heard calling from the wetland/pond on the Jones Property during 2013 (Frog\_4).

**Table 5. Amphibian Call Survey Dates and Weather Conditions, Roszell Pit.**

Survey #	Survey Date	Time (hrs)	Weather Conditions
1	April 17, 2013	19:40 to 20:35 hrs	Air Temp. = 9 <sup>0</sup> C; Water Temp. = 8.8 <sup>0</sup> C ; Wind = 2 (Beaufort); Percent Cloud = 100%; No Precip.; Water pH = 7.6 to 8.5;
2	May 6, 2013	20:45 to 21:15 hrs	Air Temp. = 19 <sup>0</sup> C; Water Temp. = 18.2 <sup>0</sup> C; Wind = 0 km/hr; Percent Cloud = 10%; No Precip.; Water pH =7.6 to 8.5;
3	June 24, 2013	21:29 to 21:52 hrs	Air Temp. = 26.6 <sup>0</sup> C; Water Temp. = 25.7 <sup>0</sup> C; Wind = 0-1; Percent Cloud = 40%; No Precip.; Water pH =7.7 to 8.8

**Table 6. Summary of 2013 Amphibian Call Surveys by Species, Call Level Code and Station Number, Roszell Pit, Puslinch.**

Species	Survey Visit #	Survey Station Number			
		Frog_1	Frog_2	Frog_3	Frog_4 (Jones Property #6512 Roszell Road)
Spring Pepper	1	3	3	-	-
	2	3	3	2	-
	3	-	-	-	-
Wood Frog	1	3	3	-	-
	2	-	-	-	-
	3	-	-	-	-
Green Frog	1	1	-	-	-
	2	-	-	1	-
	3	1	2	1	-
Grey Tree Frog	1	-	-	-	-
	2	-	-	1	-
	3	2	1	-	-
Northern Leopard Frog	1	-	-	-	-
	2	-	-	1	-
	3	-	-	-	-

#### LEGEND:

##### Call level codes (MMP):

1 = calls can be counted; not simultaneous

2 = some simultaneous call; but distinguishable

3= calls not distinguishable, individually overlapping

## **5.0 Discussion**

Data interpretation in the future will assess the relative abundance of the obligate wetland plants as well as the relative abundance of non-native species (such as Glossy Buckthorn, and Coltsfoot) and herbaceous species of drier habitats as their increased abundance may indicate changes in groundwater discharge.

Since 2013 is the first full year of monitoring and the tree/shrub monitoring method was refined, a comparison of vegetation results among years will occur in the 2014 report.

The 2013 frog and salamander monitoring data provide good quality baseline data for future comparison.

No incidents of soil erosion and deposition in the 30m setback or wetland itself occurred in 2013.

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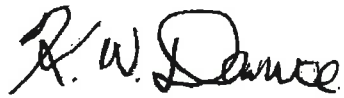
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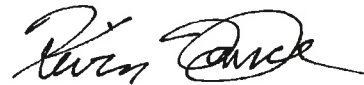
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A handwritten signature in black ink, appearing to read "K.W. Dance". The letters are cursive and somewhat stylized.

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