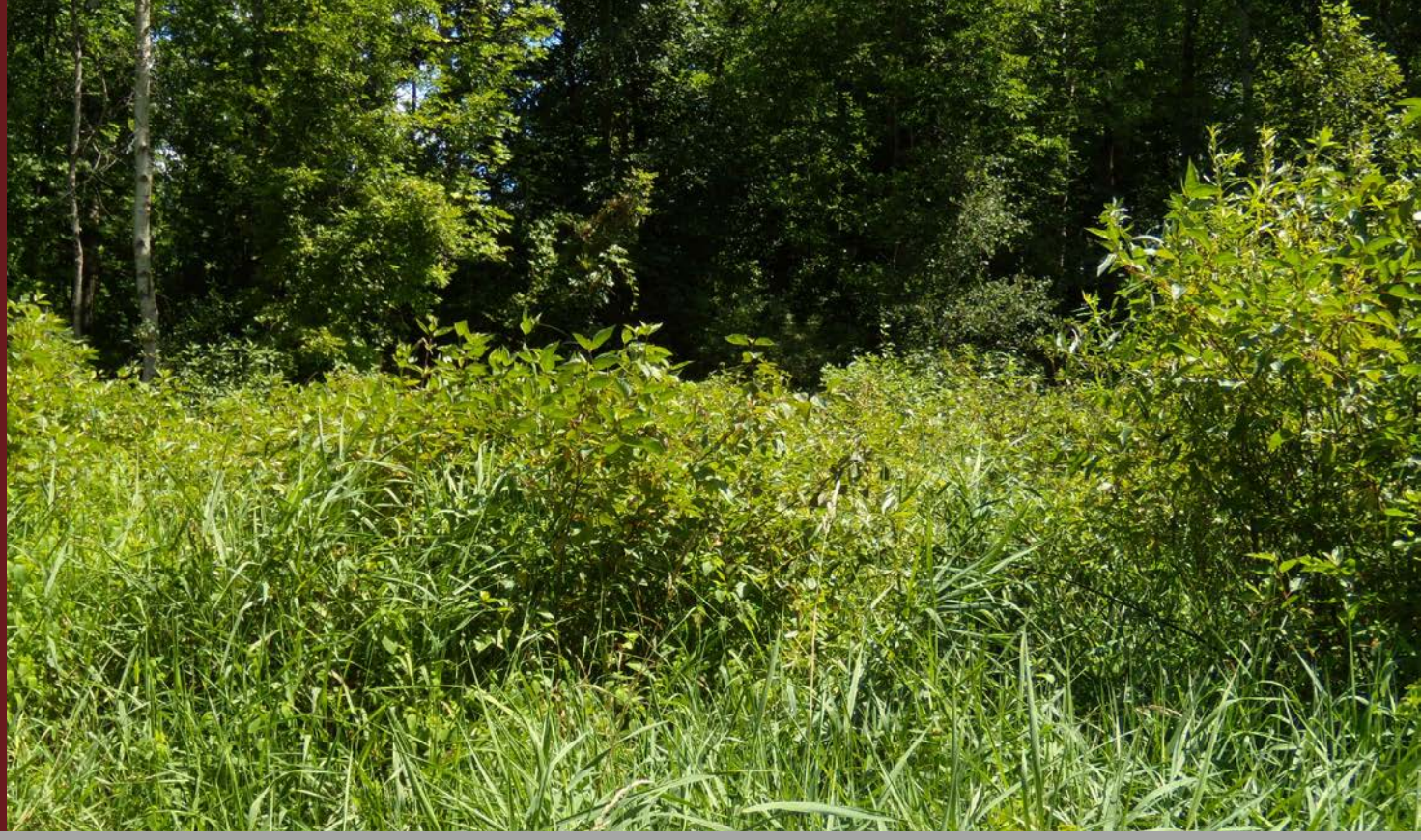

Ainley Farm Environmental Impact Study: Addendum

Prepared for Black, Shoemaker, Robinson, Donaldson

Date: 24 July, 2019

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1.0 Introduction

An EIS for proposed development on Ainley Farm property was prepared by North-South Environmental Inc. (NSE) in 2017. Comments on the EIS were provided by the Grand River Conservation Authority (GRCA) on July 31, 2018. For each comment relating to natural heritage, a detailed response is provided in this Addendum. Appendix 1 summarizes which section addresses each of the comments.

2.0 Wetland and Woodland Boundary Staking

Wetland and woodland boundaries were surveyed in areas in proximity to proposed development by a hand-held GPS on September 4th, 2018 (Garmin GPSMAP 64csx, accurate to 3.6m), with Ryan Hamelin of Grand River Conservation Authority (GRCA). Boundaries determined during the field visit (as well as the other ELC boundaries) are shown on Figure 1.

A small wetland on the northwest boundary, noted in the previous EIS (NSE 2017), which was previously dominated by Red-osier Dogwood (*Cornus stolonifera*), was noted at the time of the field visit to have succeeded to a thicket dominated by Red Raspberry (*Rubus idaeus*), Common Buckthorn (*Rhamnus cathartica*) and Red Current (*Ribes rubrum*): all species not considered wetland plants according to the Ontario Wetland Evaluation System (OWES: MNR 2014, Appendix 10). Since this community is dominated by over 50% upland vegetation it was agreed (in consultation with Ryan Hamelin) that it no longer qualifies as a wetland.

3.0 Impacts of Walser Road Extension

The Walser Road extension was previously approved in 2004. The extension will remove the western woodland edge: an area approximately 200 m in length. In 2018, this edge was dominated by very similar vegetation to that in 2006, though with more young trees. It is dominated by an open canopy of young trees and shrubs at its south end, primarily Manitoba Maple (Acer negundo), Eastern White Cedar (*Thuja occidentalis*), Trembling Aspen (*Populus tremuloides*), Basswood (*Tilia americana*) and American Elm (*Ulmus americana*), with abundant shrubs and a ground layer of cultural meadow species such as goldenrods and Smooth Brome (*Bromus inermis*). The north end was dominated by mature Sugar Maple (*Acer saccharum*); part of a former hedgerow.

Potential impacts of removal of the edge of the woodland are as follows:

- Encroachment of physical edge effects such as drying winds and sunlight deeper into the woodland, potentially affecting the western woodland edge as well;
- Removal of trees used as nesting or roosting sites by wildlife such as birds and bats;

- Increased noise and lighting within the west edge of the woodland and wetland;
- Road runoff may enter the woodland and wetland; though appropriate curbs and storm sewers will mitigate most of this potential.

The following mitigation is recommended. Recommendations for restoration are provided in Section 7.

- Construction should follow recommendations provided in the EIS for limiting impacts to the woodland.
- Vegetation should be removed only during seasons when birds and bats are not nesting: from October to March (i.e. vegetation should not be removed from April to September).
- Runoff from the road should be directed to appropriate storm sewers.
- The road edge and embankment adjacent to the woodland should be planted with Eastern White Cedar to provide a screen against wind, light and noise.
- Shrubs should be planted under cedars to provide additional screening for road runoff, and to improve diversity along this edge, including species such as Nannyberry (*Viburnum lentago*),
- Snow storage should avoid draining to the woodland.
- Lighting along Walser Street should be directed to the north, away from the woodland.
- Trees with large caliper should be planted where possible to replace large caliper trees lost as soon as possible.

4.0 Water Balance

The volume of water that enters the wetlands during storm events is expected to decrease slightly relative to the pre-development conditions (Table 1). Pre-and post-development volumes (from GM Blue Plan 2019) and calculated depths for storm events are shown in Table 1. There will be little increase related to storm events, as they are expected to outlet quickly (within 1 or 2 days).

Table 2 provides depths associated with runoff for each month. Monthly totals will increase by an average of approximately 14 cm. From June to September, average monthly totals may increase by as much as 20-40 cm as a worst-case scenario.

Predicted increases from June to August would possibly kill some trees and shrubs, and result in a reversion of the vegetation to a more open meadow marsh or shallow marsh community. Vegetation within the wetlands is primarily composed of transitional species

Ainley Farm EIS

Figure 1: Ecological Land Classification, Wetland Locations, Wetlands and Woodland Boundaries

Legend

Ecological Land Classification

CUM1 - Mineral Cultural Meadow
CUT1 - Mineral Cultural Thicket
CUT1-5 - Raspberry Cultural Thicket
CUW - Cultural Woodland
CUW1 - Mineral Cultural Woodland
FOD8 - Fresh-Moist Poplar-Sassafras Deciduous Forest
FOD8-1 - Fresh-Moist Poplar Deciduous Forest
SWM1-1 - White Cedar-Hardwood Mineral Mixed Swamp
SWT2-5 - Red-osier Mineral Thicket Swamp
SWT3-2 - Willow Organic Thicket Swamp

Former Wetland

Wetland Boundary Recorded by GPS on September 4th , 2018 with GRCA

Woodland Dripline Recorded by GPS on September 4th, 2018 with GRCA

Property

N
W E
S

0 50 100 200
Meters

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Table 1. Comparison of existing and post-development volumes and depths in the wetland

	Pre-development Volume in cubic metres (From Table 3)	Pre-development depth in metres (From Table 4)	Post-Development Volume in cubic metres (From Table 16)	Post-development depth in metres (From Table 12)	Difference in Pre- and Post-Development Depth in metres
2-Year	779.70	0.02	1,415.40	0.02	0.00
5-Year	1,953.80	0.06	2,955.90	0.03	-0.03
10-Year	2,759.80	0.10	4,023.50	0.05	-0.05
25-Year	4,337.40	0.14	5,551.60	0.08	-0.06
50-Year	5,515.20	0.16	6,760.50	0.10	-0.06
100-Year	6,762.60	0.19	8,144.60	0.11	-0.08
Regional Storm	30,583.90	0.21	33,085.00	0.10	-0.11
					-0.06

Note: The decrease in depth in the wetland under post-development conditions, even though the volume entering the wetland has increased, is because the flows entering the wetland occur over a much longer period during under the post-development condition due to the upstream pond; by the time the pond drains down, the earliest flows that entered the wetland have already discharged downstream.

Table 2. Water depths based on estimates of monthly volumes

	Pre-development Volume in cubic metres (From Appendix A)	Pre-development depth in metres (extrapolated from Stage Storage table for the Wetland)	Post-Development Volume in cubic metres (From Appendix A)	Post-development depth in metres (extrapolated from Stage Storage table for the Wetland)	Difference in Pre- and Post-Development Depth
January	1,894.00	0.33	2,180.00	0.37	0.04
February	947.00	0.20	1,090.00	0.22	0.02
March	474.00	0.13	545.00	0.14	0.01
April	9,020.00	0.83	9,268.00	0.85	0.01
May	24,883.00	1.01	27,006.00	1.09	0.09
June	12,197.00	0.98	14,883.00	1.10	0.12
July	4,531.00	0.56	8,331.00	0.79	0.24
August	1,347.00	0.25	5,477.00	0.63	0.38
September	791.00	0.17	4,470.00	0.55	0.38
October	424.00	0.12	3,031.00	0.44	0.31
November	8,055.00	0.78	9,180.00	0.84	0.07
December	3,788.00	0.50	4,361.00	0.54	0.05
					0.14

Note: The monthly analysis does not consider the effect that the pond has on slowing down the flows to the wetland, as the analysis predominantly includes storm events less than the 2-year storm. However, there will be likely be a small reduction in depth based on the impact of the pond. As such, the increase in depth seen under post-development conditions during the monthly analysis should be considered as worst-case, as in reality the impact will likely be slightly less.

such as Red-osier Dogwood and Eastern White Cedar, species that can survive a variety of moisture conditions, so it is likely that these species would survive in higher areas. These wetlands appear (on the basis of changes noted since 2006) to be drier than in the past (with one wetland having succeeded to an upland community and others with a higher density of trees and shrubs) and a slight increase in the amount of water entering the wetland would likely help to maintain the function of the wetland. Increased water depths would also facilitate amphibian breeding if the conductivity of the water were maintained (i.e. if salt did not enter the wetland). It is therefore recommended that snow storage that could contain road salt be avoided on roads adjacent to the wetland.

5.0 GRCA 2015 Wetland Policy (Update)

The storm water facility for the development is proposed within the Zone of Influence of the southeastern wetland. GRCA 2015 policies note that stormwater facilities may be permitted within the 30 m Zone of Influence of a wetland provided they satisfy the following conditions:

8.4.15 Stormwater Management Facilities for water quality control will not be permitted within a wetland, but may be permitted in the area of interference where it can be demonstrated that:

a) all structural components and actively managed components of the stormwater management facility including constructed wetlands, are located outside of the wetland,
b) a detailed study demonstrates how the hydrologic and ecological functions of the wetland will be protected, restored and/or enhanced,
c) pollution and sedimentation during construction and post construction are minimized using best management practices including site and facility design, construction controls, and appropriate remedial measures,
d) design and maintenance requirements as determined by the GRCA are met, and
e) works are constructed, repaired or maintained according to accepted engineering principles and approved engineering standards or to the satisfaction of the GRCA, whichever is applicable based on the scale and scope of the project.

The following mitigation is proposed to maintain the for the stormwater facility:

- All structural components of the stormwater facility are outside the wetland except the outlet, which will be constructed to discharge to the southeast portion of the wetland, close to the wetland buffer.
- Ecological functions of the wetland will be maintained or potentially enhanced through a slight increase in water levels (approximately 11 cm); this is expected to promote growth of wetland plants and amphibian breeding, as the function of these wetlands has been declining since 2006 because of the drying trend, which has already resulted in succession of one of the wetlands to an upland community;
- the edge of the stormwater facility should be planted with a screen of dense shrubs and trees to improve diversity within the woodland/wetland edge; and

- design and maintenance requirements as determined by the GRCA are met;
- the works will be constructed, repaired or maintained according to accepted engineering principles and approved engineering standards and to the satisfaction of the GRCA.

6.0 Site Plan Revision

The site plan has been revised to provide the following environmental setbacks, as shown in Figure 2:

- 10 m buffer to woodland dripline;
- Setback of between 30 m and 12 m from the southeastern wetland boundary.

Development of the storm cell is proposed within a small portion of the Area of Interference for the southeastern wetland. The area proposed for development has been used in the past for intensive agriculture, and is regularly ploughed each year. The proposed storm cell development is not expected to cause additional impacts, with mitigation in the form of restoration. Proposed restoration for this area is addressed in Section 7.

7.0 Restoration Areas

Areas of proposed restoration are shown in Figure 3. It is recommended that restoration of native species be focused on areas at the interface of the development and the natural area, while restoration areas should be planned where feasible in the stormwater block and in the park.

7.1 Restoration Area 1.

Restoration adjacent to Walser Street should be planned along the edge of the road and on the road embankment, as discussed in Section 3. The restoration should be focused on species that have a high capacity to screen such as Eastern White Cedar, with other shrubs in the understory such as

- Nannyberry (*Viburnum lentago*)
- Prickly-ash (*Zanthoxylem americanum*)
- Red-osier Dogwood (*Cornus stolonifera*)
- Alternate-leafed Dogwood (*Cornus alternifolia*)
- Maple-leafed Viburnum (*Viburnum acerifolium*)
- Northern Arrowwood (*Viburnum rafinesquianum*)
- Canada Yew (*Taxus canadensis*)

Ainley Farm EIS

Figure 2: Proposed Development and Constraints

Legend

- Wetland
- Wetland - 30m Area of Interference
- Woodland Dripline
- Dripline - 10m Buffer
- Lots
- Streets
- Property

BLOCK 121
SWM CELL

BLOCK 119
MULTI-FAMILY BLOCK

BLOCK 118
APARTMENT BLOCK

BLOCK 120 - PARK

BLOCK 124
FUTURE
DEVELOPMENT

BLOCK 123 - OPEN SPACE

BLOCK 122 - SWM CELL

Gerrie Road

Walser Street

Keating Drive

Fladd Court

Thomas Boulevard

Keating Drive

1 5 6 10 15 17 18 25 29 30 35 36 42 43 49 50 55 57 58 62 63 67 68 75 81 82 90 91 94 95 100 104 105 110 115

N
W E
S

0 50 100 200
Meters

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Orthoimagery Date: 2010

Ainley Farm EIS

Figure 3: Proposed Development and Restoration Zones

Legend

- Restoration Zone 1
- Restoration Zone 2
- Restoration Zone 3
- Wetland
- Wetland - 30m Area of Interference
- Woodland Dripline
- Dripline - 10m Buffer
- Lots
- Streets
- Property

BLOCK 121
SWM CELL

BLOCK 119
MULTI-FAMILY BLOCK

BLOCK 118
APARTMENT BLOCK

BLOCK 120 - PARK

BLOCK 124
FUTURE
DEVELOPMENT

BLOCK 123 - OPEN SPACE

BLOCK 122 - SWM CELL

Gerrie Road

Thomas Boulevard

Walser Street

Keating Drive

Fladd Court

Keating Drive

N
W E
S

0 50 100 200
Meters

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At the base of the embankment, and at the end of the wetland node that will be affected by the road widening, shrubby species of willow could also be used (e.g. Pussy Willow, *Salix discolor*, Slender Willow, *S. petiolaris*, and Cottony Willow (*S. eriocephala*).

7.2 Restoration Area 2

A high diversity of trees and shrubs should be planted within Restoration Area 2 to enhance diversity and improve buffer function. These should include the following species (Eastern White Cedar is excluded as it is already abundant in this area):

Trees
Bur Oak (*Quercus macrocarpa*)
Red Oak (*Q. rubra*)
Black Cherry (*Prunus virginiana*)
Black Walnut (*Juglans nigra*)
Sugar Maple (*Acer saccharum*)
White Pine (*Pinus strobus*)
Large-tooth Aspen (*Populus grandidentata*)

Shrubs
- Nannyberry (*Viburnum lentago*)
- Prickly-ash (*Zanthoxylem americanum*)
- Red-osier Dogwood (*Cornus stolonifera*)
- Alternate-leafed Dogwood (*Cornus alternifolia*)
- Maple-leafed Viburnum (*Viburnum acerifolium*)
- Northern Arrowwood (*Viburnum rafinesquianum*)
- Canada Yew (*Taxus canadensis*)

7.3 Restoration Area 3

It is recommended that in Restoration Area 3, restoration of native species be constrained to patches where a) the function of the areas are not compromised and b) the restoration be constructed to have high public acceptance. Pollinator meadow species are recommended for these areas to complement the function of the woodlot. Species should include widely-spaced shrubs as listed above, as well as:
- New England Aster (*Symphyotrichum novae-angliae*)
- Arrow-leaved Aster (*Symphyotrichum urophyllum*)
- Hoary Vervain (*Verbena stricta*)
- Butterfly Weed (*Asclepias tuberosa*)
- Swamp Milkweed (*A. incarnata*)
- Common Milkweed (*A. syriaca*)
- Hairy Beardtongue (*Penstemon hirsutus*)
- Foxglove Beardtongue (*P. digitalis*)

Appendix 1: Summary of Responses to Comments from GRCA

Appendix 1. Response Matrix for GRCA Comments dated July 31st, 2018

GRCA Comment	**Response**
1. Two SWM facilities have been proposed for quantity control, however no details have been provided regarding the type and characteristics of the proposed SWM facilities. This will potentially impact SWM block sizing and lot allocation. More details regarding the proposed SWM facilities are required.	Addressed by GM Blue Plan under separate cover
2. Groundwater Recharge under existing conditions appears to be significantly under-estimated. The recharge rate for native silt tills is estimated to be 125 mm without any reference or calculations. MOE 2003 water balance table has 145 mm of groundwater recharge as the lowest value for clay soils. In addition, no mitigation has been provided for groundwater recharge reduction while the runoff to the wetland has increased significantly, resulting in over flooding the wetland during the wet season. Given the shallow seasonally high ground water table, it is not clear as to how the pre-development groundwater recharge levels will be matched under post-development conditions.	Addressed by GM Blue Plan under separate cover
3. Water Balance calculations presented in report need to be revised to provide a monthly water balance budget; given that SWM facility No. 1 will directly discharge to the wetland.	Addressed by GM Blue Plan under separate cover
4. As an advisory note to the municipality, SWM facility No.2 has been proposed to outlet to the existing roadside ditch along Gerrie Road and ultimately to a tributary of the Grand River which may result in conveyance capacity constraints for the receiving ditch. It needs to be clearly demonstrated that the ditch has enough capacity to receive the additional runoff.	Addressed by GM Blue Plan under separate cover
5. Multiple tables and figures within the EIS and Preliminary Servicing & Stormwater Management Report were not provided at the correct size and could not be reviewed. Please provide all figures at the correct size in future submissions.	Revised figures and tables are provided at the correct size in this addendum, and in GM Blue Plan's response.
6. As indicated in the 2014 GRCA response to the Terms of Reference, the wetland boundary should be staked in the field then confirmed by GRCA staff. This work should be completed between May and October. The appropriateness of treating portions of the wetland feature as anthropogenic wetland should be confirmed while in the field.	Wetland and woodland boundaries were staked on September 4, 2018 as discussed in Section 2
7. The extension of Walser Street on to the subject property is proposed to be directly adjacent to the wetland feature and within the Significant Woodlot feature. The Planning Justification Report (2018) indicates that this proposed alignment and extension of Walser Street on to the Ainley Farm property was previously resolved following consultation with municipal and GRCA staff in 2004. Given the time since this was last looked at, please review the area and provide an opinion on potential impacts, and any mitigation measures that may be used to eliminate or reduce potential impacts.	Impacts and mitigation are discussed in the EIS Addendum Section 3
8. Section 3.2 of the EIS refers to GRCA's 2003 Wetland Policy for the policy review. Documentation should be provided indicating why the 2003 policies are appropriate for the review of the file or the policy review should be updated to reflect the current GRCA Wetland Policies from 2015.	2015 Wetland Policies are discussed in the EIS Addendum Section 5
9. The EIS does not provide sufficient rationale for the proposed wetland buffer and buffer encroachments. Please provide additional rational for the buffer limits and any encroachments.	The site plan has been revised to provide additional setbacks as discussed in Section 6 of the EIS Addendum. Rationale for revised minor encroachments is provided in Section 6. Mitigation for encroachments is described in Section 7 of the EIS Addendum
10. The proposed water balance should be revised to more closely match the existing conditions with no significant hydrological changes to the wetland feature. The proposed substantial change in the inundation period following storms may result in significant ecological impacts to the wetland feature.	Predicted water depths (per calculations by GM Blue Plan) and a discussion of impacts to the wetland are provided in Section 4.

a. The projected water balance for the wetland should be provided and broken down into monthly intervals. b. Expected hydrological changes to the wetland and downstream tributary should be quantified and potential impacts to the features identified. Appropriate mitigation measures should be provided.	
11. It's recommended that the limits of the Significant Woodland be confirmed by municipal staff and that greater protections afforded to the feature. The park and stormwater blocks should be located outside of the natural feature and appropriate buffers applied.	• Revised boundaries discussed in Section 2
12. It should be identified early in the process if any new trails or formalization of existing trails are proposed.	• New trails are not proposed within the natural features