SAAR

Environmental Limited

July 9, 2020

Ms. L. Warner, Resource Planner
Grand River Conservation Authority
400 Clyde Road, Cambridge ON N1R 5W6

Consolidated EIA

White Rose Park Draft Plan of Subdivision, Phase Three. Lot 227, Concession Range II, Township of Southgate (Proton), Grey County

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SUMMARY

The original study for the proposed White Rose Plan of Subdivision was conducted in 2018 and is appended for the consolidated submission in Appendix B. Since the time of the original draft plan proposal considerable liaison has taken place with the Grand River Conservation Authority (GRCA). A key request of the GRCA has been to remain 30m from the main wetland. The June 2020 plan meets this request. Additional liaison amongst review agents includes the Township of Southgate; input to best align internal roads was adopted and reflected in the draft plan.

Various iterations of the plan have evolved over time and responded to input from review agents. The current plan proposes senior dwelling blocks beside the wetland buffer, rather than the prior internal road network. Also a storm block with 15m wetland buffer would be placed in this location. Later draft plan of subdivision approval conditions will detail the type and amount of native plantings for the storm block.

Mitigation, monitoring and maintenance to safeguard wetland hydrology are provided in this final submission. The hydro-period related to support wetland ecology is discussed, relating the geotechnical findings of Peto MacCallum Limited (PML) and the hydrogeological site assessment (HSA, 2020). This work informs the future health and persistence of the main northwest wetland feature studied by SAAR seasonally and delineated with GRCA.

Hydrogeological analysis was critical to estimating the anticipated dewatering discharge rate for the proposed development to ensure that water taking does not compromise flows currently contributing to the wetland. Key wetland ecology documented during the original surveys is discussed relative to the proposed subdivision land use to confirm that sufficient mitigation, monitoring and maintenance can safeguard the wetland feature post development.

SAAR reviewed the June 23rd, 2020 Peto MacCallum Ltd. (PML) Draft Hydrogeological Site Assessment relative to the ongoing hydrological requirements of wetland flora and fauna. Additional detail requested from the GRCA regarding wetland function protection, including ELC vegetation data for the Spotted Salamander breeding area, has also been incorporated into this final response.

We first review the key changes to the current June 2020 draft plan of subdivision. Technical detail then follows specific to the current GRCA discussions for the area of internal road adjacent to the main wetland: wetland mitigation, monitoring and maintenance.

2020 CHANGES TO DRAFT PLAN

Firstly the Site Plan was revised to attain a 30m setback from the wetland requested by GRCA. Figure 1 illustrates this development setback from the wetland. Figure 1 also details the variety of proposed residential uses including seniors blocks, detached homes, townhomes with internal roads, watermains, storm and sanitary sewers.

Half of the 4.5 hectare site is to be developed, the remainder avoiding natural constraints.

The wetland limit GPS waypoints are provided in the final Appendix C, the last page of this consolidated submission. Waypoint standard error (+-) is also quantified there.

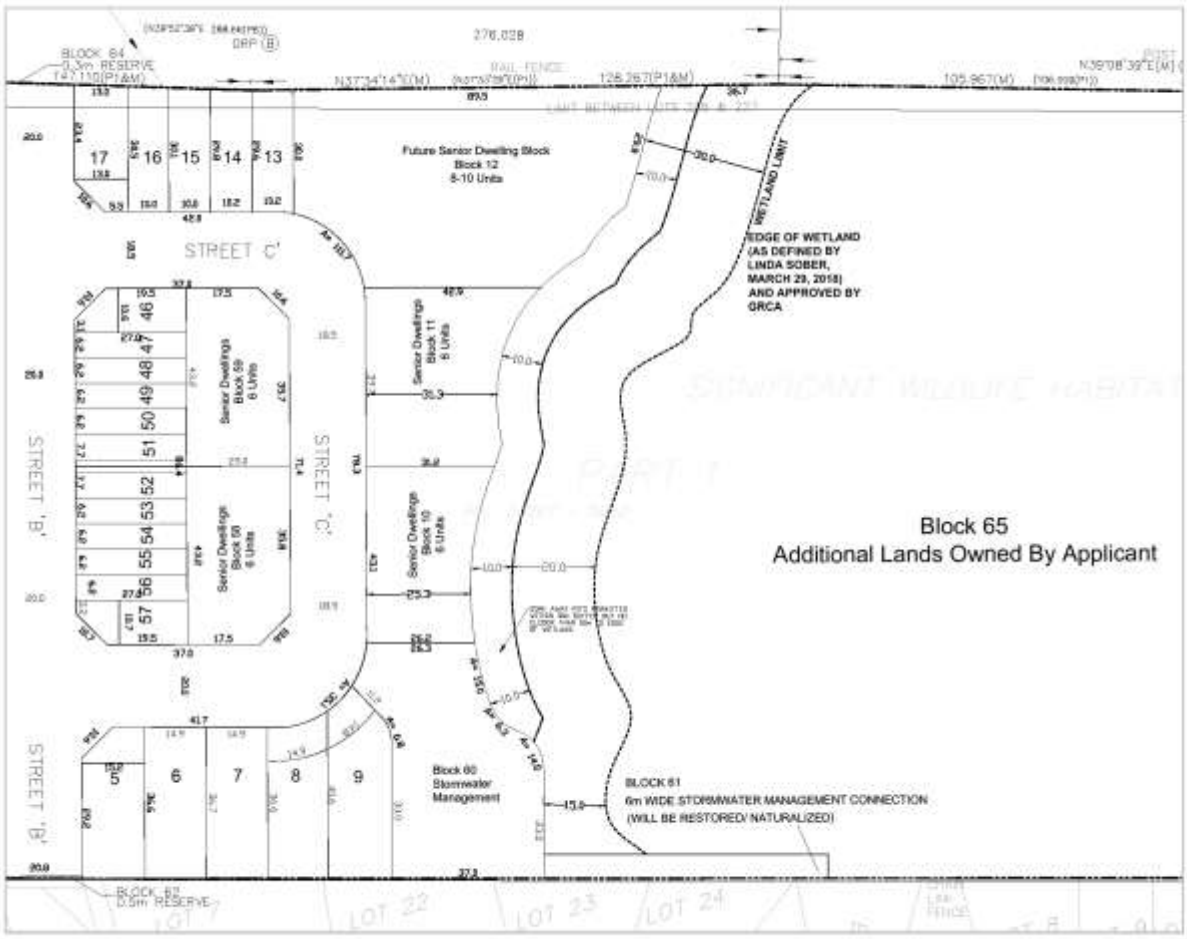

Figure 1: Lower Level view of the current draft plan confirming 30m setback from wetland.

GRCA and SAAR also reviewed the smaller willow pockets of wetland on the south limits of the parcel. These would be removed, transplanted and also incorporated into the recommended total enhancement plantings to be placed within the 30m wetland buffer.

Additional data for the southern wetland patches is provided in response to the GRCA request.

SAAR evaluated the aerial extent of the south wetland patches to ensure transplant areas and plant quantity met and exceeded the south plants being moved. Enhancement planting detail is provided in Appendix A. Appendix B clarifies southern wetlands do not meet GRCA Ontario Regulation 150/06 wetland criteria.

Willow and Red-osier Dogwood pockets at the south end of the parcel are supported on mineral soil. The sandy till is in agreement with PML field results of sandy silt to silty sand on the Dundalk Till Plan of drumlinized till plain and drumlin landform.

Figure 2 illustrates the southern wetland pockets. The wetlands are not connected by a watercourse nor 2 hectares in size or larger. Notwithstanding this, the proponent is in agreement to transplant and augment with new plantings in the 30m wetland buffer. A functional analysis of the willow pockets confirmed no significant wildlife habitat nor conservation status species in these areas. The Willow pockets are fringed in places with Reed Canary Grass.

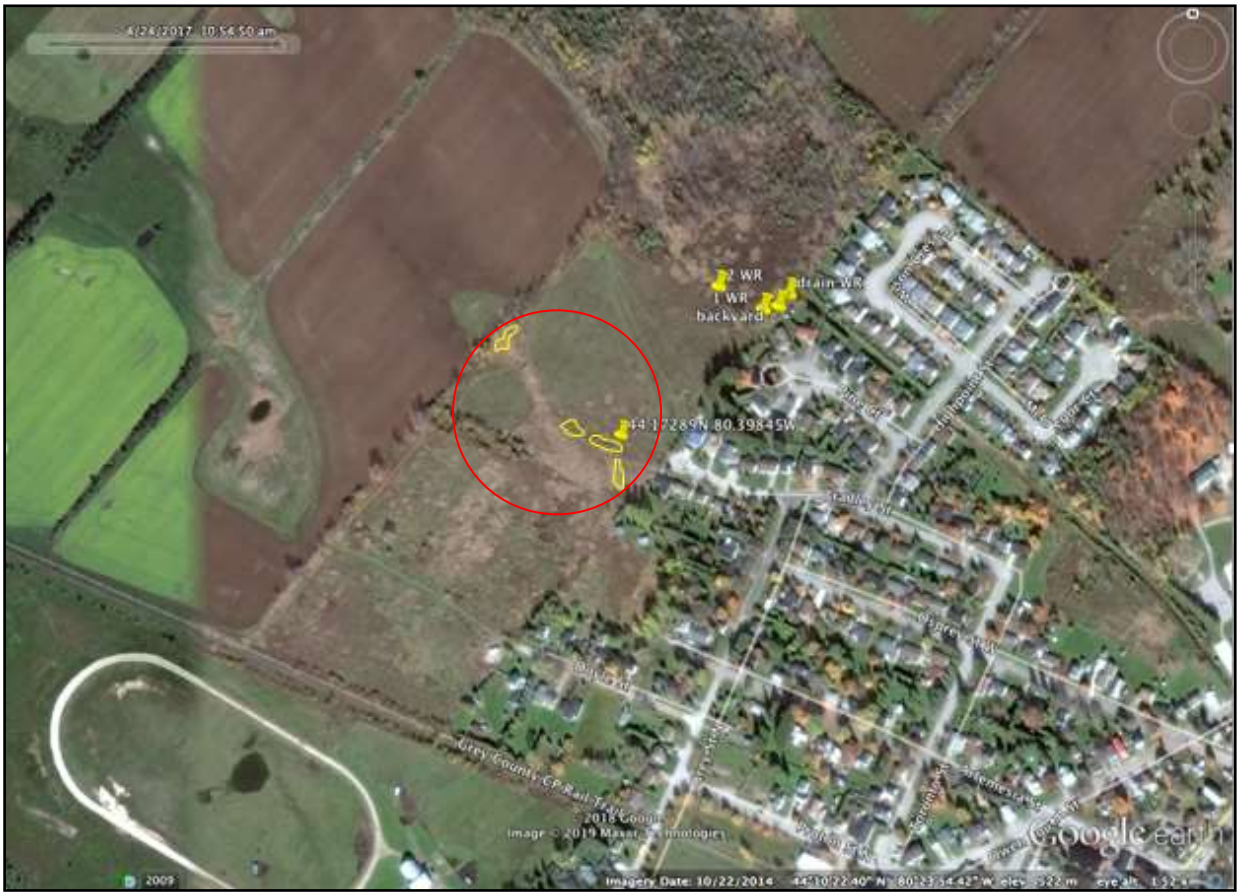

Figure 2: Southern wetland unit delineation in 2019

Planting within the 30m main wetland buffer will provide a privacy screen of shrub and tree species to effects of sunscald, windblown dirt, construction noise and human persistence. The vegetation will also provide a denser barrier to control the spread of invasive and weedy species from the fallow farm field, and future roadbanks, into the wetland.

Other mitigative measures discussed with GRCA applicable within the 30m buffer included soak away pits to collect and convey storm rain events to the wetland.

MAIN WETLAND

The main northwest wetland straddles the north parcel limits, and attains a size of greater than two hectares, with a surfacewater outlet (See following maps).

MNRF Make a Map wetland limits were refined during our seasonal wildlife surveys, and tied in during wetland boundary reconnaissance during the joint site inspection with SAAR and GRCA.

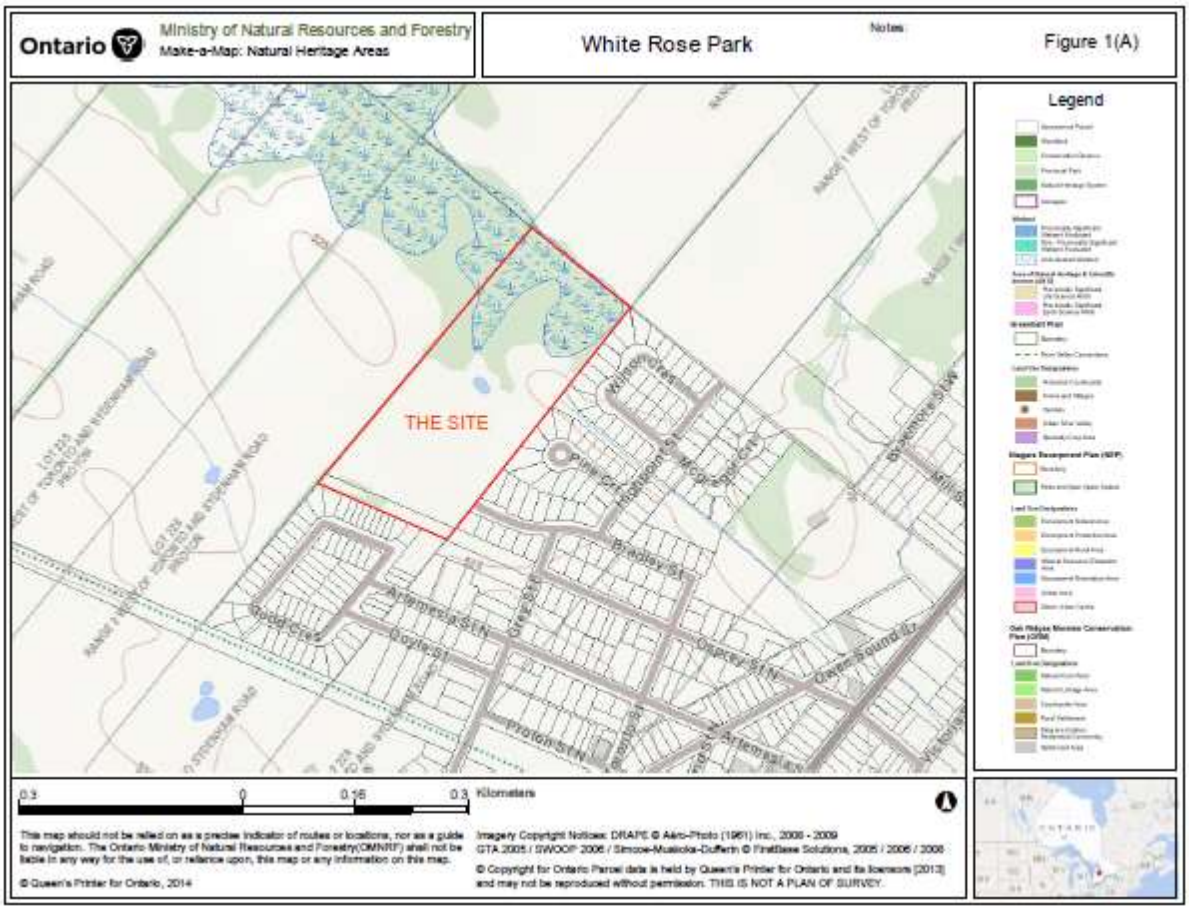

Figure 3: MNRF Wetland Limits. SAAR and GRCA ground truthed larger extent of wetland.

The broader wetland was ground truthed by SAAR and GRCA (earlier Figure 1).

Hydrogeology reporting assessed the maximum construction dewatering rate to assess site and off site dewatering impact, as well as the quality of groundwater gleaned from chemical test results. The intent of our review was to confirm that development setbacks are sufficient, and that the proposed uses of the seniors block adjacent to the wetland can reasonably be seen as sustainable, maintaining the wetland features and functions noted during our wildlife surveys.

Key information from the Peto MacCallum Ltd. hydrogeology reporting included their estimates of dewatering discharge rates which were assessed against the potential impact on nearby water well users. Ground water levels on the proposed development site were measured twice every season (three months) for a year. A hydrogeological conceptual site model was produced which assessed maximum construction dewatering rate to assess dewatering impact, and ground water quality, based on chemical test results; ground water chemical analyses was undertaken for substances related to Storm Sewer Discharge By-Law, and provincial water quality objectives (PWQO) to guide management options for discharge during construction de-watering at the site. This was also reviewed by SAAR relative to PWQO published for various wetland wildlife to ensure tolerance limits can remain within sustainable levels for life. The PML review of water wells included approximately 1.4km square area and thirteen recorded wells. The hydrostatic ground water level ranged from 7-12m depths below ground surface (bgs). The direction of the ground water movement, largely controlled by the topographic elevation, was extrapolated to be moving easterly toward the upper reach of the wetland. Water temperature of ground water indicated the wetland is colder than outlying monitoring wells which may indicate a discharge wetland (rather than perched for instance).

Boreholes were drilled to 6.7m depth bgs, and borehole 6 was purposefully located in the wetland (4.9m bgs). Monitoring wells tested for hydraulic conductivity at all borehole locations from April 4, 2019 ongoing to April of 2020 with two readings per quarter year.

SAAR reviewed this information to inform us regarding potential risks to supported wildlife. Analysis included investigating whether construction could result in a significant change to the ground water contribution to the wetland, in amount, temperature or quality. Current infiltration rates of water entering the site should not differ vastly from those estimated for post construction environment here.

The PML report details the pre and post development water budget; a deficit of 6,733 m3/year of infiltration was estimated. By discharging rooftop rain capture to the ground surface from impermeable roof surfaces, the deficit is reduced to 4,844 m3/yr. PML notes that the deficit can be compensated further by including low impact development (LID) features in the subdivision.

ECOLOGY INPUT TO PML CONSTRUCTION PHASE RECOMMENDATIONS

GRADING

Grading parts of the site will be required to construct the subdivision. PML notes (p.15) surficial topsoil, organic deposits, deleterious material is to be stripped and removed. This is essentially correct, however SAAR adds that the materials should be stockpiled on site (for a finite period on site, not long enough for cavity burrowers such as Belted Kingfisher to colonize stockpiles!) for a local source of infill to limit accepting out of area fill with potentially greater seedbanks of invasive plants.

FOOTINGS AND SLAB ON GRADE

We are in agreement regarding footings and slab on grade construction to avoid significant ground water control, remaining outside of seasonally high ground water elevation.

SEWERS

SAAR notes that no servicing will be placed within the 30m wetland setback, continuing ground water contribution to the wetland.

The estimated zone of influence of the construction dewatering due to the installation of the sewers is about 32 m, and is not expected to reach the edge of the wetland, thus it is not expected that the ground water level in the wetland area will be drawn down. The wetland and creek may experience a temporary reduction in ground water baseflow; however, since the discharge water is to be returned to the creek (after appropriate treatment), the net effect downstream is expected to be negligible.

Significant fill is required to achieve clearance from SHGWL (shallow groundwater level) such that the majority of sanitary sewer depth will only be 1-2 m below the existing ground, and watermain and storm less than 1 m from existing grade. Therefore, dewatering for service installation based on these servicing depths will likely be significantly less (Triton, 2020).

SEASONALITY OF SALAMANDER BREEDING

SAAR has observed the Spotted Salamander breeding in small (5m length) vernal pools within a portion of wetland dominated by Sphagnum, Sensitive Fern, Ostrich Fern and standing Green Ash on organic inclusions. Please note as a point of clarification that the breeding area +50m setback being conserved, from the discrete ELC vegetation community (*Sphagnum-Onoclea sensibilis-Matteuccia struthiopteris-Eupatorium perfoliatum: closest organic soil ELC being SWM6-2*) represents a conservative planning measure. i.e. the Spotted Salamander is not a rare, threatened or endangered species nor was it an abundant (quantity) spawner. The setback represents a precautionary approach by SAAR, the team and the proponent in agreement.

See additional detail on ELC vegetation as requested by GRCA on Figure 4 below.

Figure 4: Ecological Land Classification (ELC) of Spotted Salamander habitat (SWM6-2).

The organic inclusions and sphagnum beneath White Cedar, Poplar and the grove of fern layer used by the salamanders during breeding (SWM6-2) grades outward to other ELC ecotypes.

A shrub succession layer of Red-osier Dogwood and Winterberry is located central in the wetland (ELC Red-osier Mineral Thicket Swamp Type SWT2-5). This leads outward again into upland central pockets covered in Reed Canary Grass on sandier soil, and supports flora of wetland or upland affinity; Balsam Poplar (wetland coefficient of 3), White Cedar, Trembling Aspen, dead-standing Green Ash, American Elm and the wetland affinity Winterberry (shrub elements of Winterberry would meet SWT3-7 if soils were organic, however the entire ELC unit is a mixed swamp SWM1 White Cedar Mineral Mixed Swamp Ecosite). Our soil probe results indicated consistent mineral soils with humic layers, grading to sandy soil on the upland pockets within the wetland. The outer limits of the wetland supported remnant Apple orchard tree specimens, Tamarack amidst the Balsam Poplar, White Spruce and White Cedar.

A 50m setback from the observed salamander breeding activity was applied based on the habitat used by the species. The sphagnum area was saturated with water during the original surveys (1m+), dry by mid June in 2020 ELC checks. The 2020 field inspection confirms that the vegetation is sufficiently unique to be considered an ELC subunit.

BREEDING SCHEDULE

Timing of the breeding event can be as early as the end of March with ice and snow, through to the second week of April. The female egg mass is substantial, with around 100-300 eggs. The eggmass needs the wetland vegetation to adhere to, and cover of water for 30 days (April-May). Once their gilled stage morphs into a terrestrial form the salamander burrows in shrub and forest cover. They move between wetland and upland for breeding. All of the required elements for their life cycle are provided in the wetland and treed edges where we observed their travel and breeding. The water budget calculations, and the proposed location of servicing, provide assurance that measures (e.g. controls for dewatering stage on site) are in place to control for any reduction of baseflow contribution from ground water to the wetland feature supporting the salamander breeding function. Final submissions include the water budget calculation minus the wetland which was requested by GRCA (PML, 2020). Further, Triton also recalculated the percent imperviousness of the developed area in response to GRCA requests (i.e. same area used for water balance calculation), and estimates it at 47%.

GROUNDWATER MITIGATION FOR WETLAND FUNCTION

Mitigation stemming from PML findings relative to observed wetland functions including the salamander breeding is recommended below.

- Restrict deep excavation adjacent to wetland to outside of the spring salamander breeding event and the thirty day incubation period to avoid any change in GW contribution to wetland. This includes restricting construction dewatering to low GW periods when the calculated Zone of Influence will be shorter (PML, 2020).

- Excavation, in particular sanitary sewer excavation which can be as deep as 6m (PML, p.20) should be scheduled for seasonal periods when ground water is not close to surface.

Note that SAAR did observe natural seasonal variations in surface water conditions within the wetland. The wildlife lives in and near the wetland that is at times flooded in March-April with snowmelt and rainwater events, and dries in sections of the wetland by July. The wetland does not persist solely due to ground water contribution, but also surfacewater including precipitation.

Water is also received overland as stormwater from the western uplands, and the watercourse outlet receives significant snow melt as well as stormwater runoff during peak spring events from the neighboring farmed uplands to the west (field observation).

Monitoring wells for the area proposed to be developed are in agreement with the seasonal peaks; the April 26, 2019 water levels of 0.08-0.49m bgs, suggest avoiding excavation at that time. Ground water levels of 0.3m bgs in August-October vs. 2.5m bgs during December-April recorded by PML further help to inform the construction schedule. Depth of ground water should guide the excavation portion of the construction schedule with wetland hydrology in mind; scheduling for the least risk of interference and reduction in potential baseflow contribution to the wetland.

Note that recharge when the GW is at low levels is the priority season; in response to this, PML and Triton designed the LIDs to achieve design clearances, and safety factors noted by GRCA feasible/practical. In addition, the site is intended to be raised significantly, so there will be opportunity to achieve clearance from the high groundwater level to accommodate subsurface LID structures. PML is in agreement with GRCA that an additional round of monitoring will help solidify these findings, and aid in the design for the low GW seasons (PML, 2020).

SURFACEWATER MITIGATION FOR WETLAND FUNCTION

Construction outside of peak spring conditions is recommended. This is a key avoidance measure to deleterious substances (predominantly sediment) that may flow toward the northwest wetland and its associated outlet. Key timing to safeguard surface and ground water quality for wetland ecology is April-May for amphibian and salamander breeding. We note that PML soil data indicate sand, silt and gravel on site, highly permeable at depths of 1.5-2m bgs in this regard, although soil strata like ground water can vary across the site.

- Maintain infiltration and contribution of rain events by installing soak away pits within the 30m wetland buffer consistent with GRCA request to demonstrate infiltration BMPs that capture excess runoff from the development, with enhanced infiltration. The soak away pit LID option is outlined clearly in conditions for the Draft Plan of Subdivision in response to GRCA request Later detailed grading and servicing will inform soak away pit locations, so location detail is not drawn on the Draft Plan, however soak away pit BMP is rather outlined in the conditions of draft plan of subdivision approval. Conditions are subject to GRCA clearance (en sensu, Peto MacCallum and Triton, 2020)

- Triton has included preliminary design details for the SWM facility and outlet. Triton reviewed feasibility of directing SWM outfall to the wetland however topography does not permit this. Rear yards and roof of the adjacent Blocks 10 + 11 will be directed to the wetland, and yards and roof runoff where feasible

- Enhanced erosion and sediment control measures between the seniors block, storm block and the northwest wetland are recommended, including monitoring and maintenance of same. Beyond standard silt fence use adjacent to the wetland during road construction, SAAR has also observed the effectiveness of “coco-mat” fabric on roadside ditch banks, thus recommends this added mitigation as an option for soilbank stability and erosion control from storm events entering or leaving the wetland

SAAR is in agreement with GRCA regarding the usefulness of enhanced buffer plantings, and the appropriate native species, including trees and shrubs at appropriate densities, are detailed in appendices for the 30m wetland buffer.

GRCA notes some works may be permitted in the outer part of the 30m buffer if justified and mitigated by measures, including but not limited to:

- Minor grading in the outer part of the buffer, followed with naturalization (i.e. native seeding) of the disturbed area, detailed in erosion and sediment control plan

- Some stormwater infrastructure in outer part of buffer with naturalization of such features

- Soakaway pits within the first 10m of the 30m buffer (GRCA SAAR liaison)

Enhancement Plant detail is found in Appendix A.

Note the topography below in Figure 5, which generally controls the ground water flow direction.

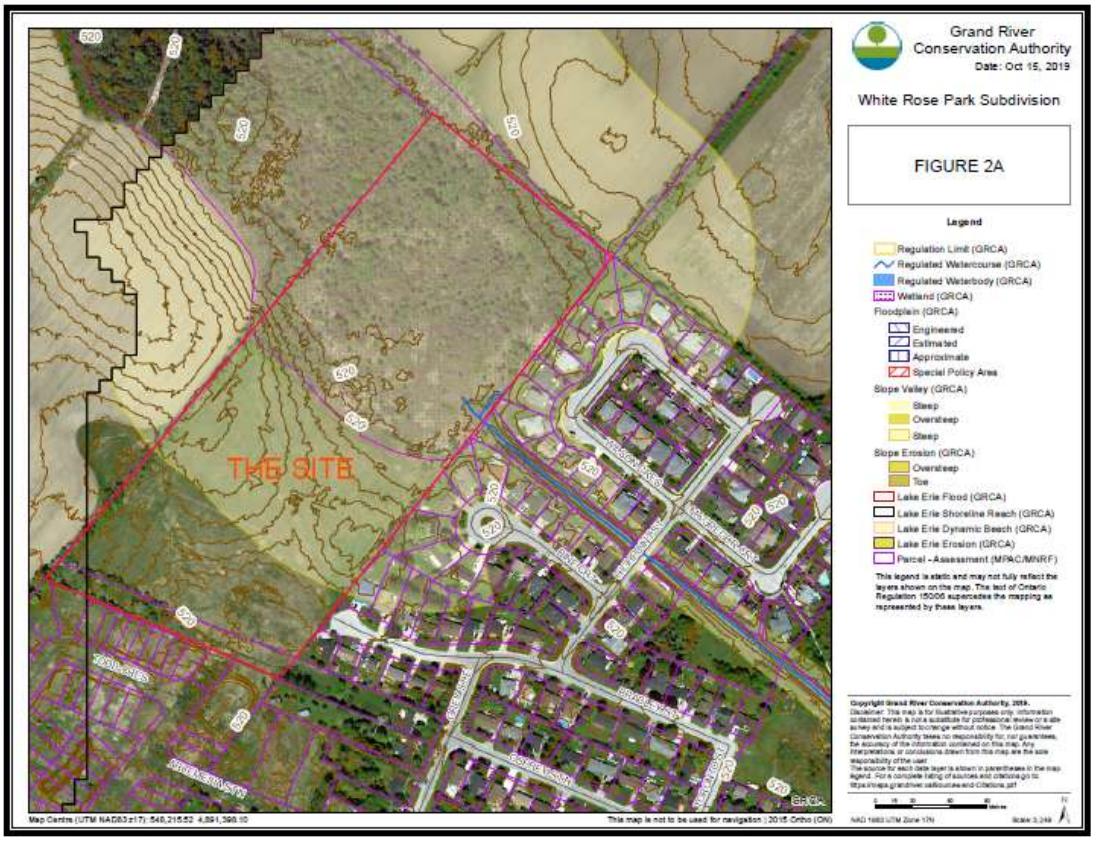

Figure 5: PML Topographical Map

Soil stratigraphy was mostly topsoil over silt till which does not exhibit a high infiltration/recharge function for the site. PML reviewed water balance for the existing and proposed development conditions, including particle size distribution analysis on native silt tills from some of the borehole samples.

PML concluded infiltration and recharge at the site would not be significantly impeded based on the high amounts of sand in the silt tills, and locally gravel with minor clay. Thus, the "not be significantly impeded" above is not referring to effects of the construction, but simply to say that the site's soil types allow for infiltration and recharge.

WETLAND MITIGATION

No excavation, and in particular no excavation into the ground water table, is proposed within the 30m wetland setback. Dewatering activity during construction can, as noted earlier, avoid the peak ground water contribution to wetland period of higher ground water table in the spring to safeguard the spring ecological functions in the wetland.

INTERNAL ROAD CONSTRUCTION MITIGATION

Peto MacCallum (PMC) recommends that “all steps be taken to minimize the dewatering and/or sump pump rates. For example, since the ground water levels may vary, it is best to schedule excavation for periods of low ground water level. Also, excavation footprints and depths should be no more than is needed, and surface water intrusion minimized”.

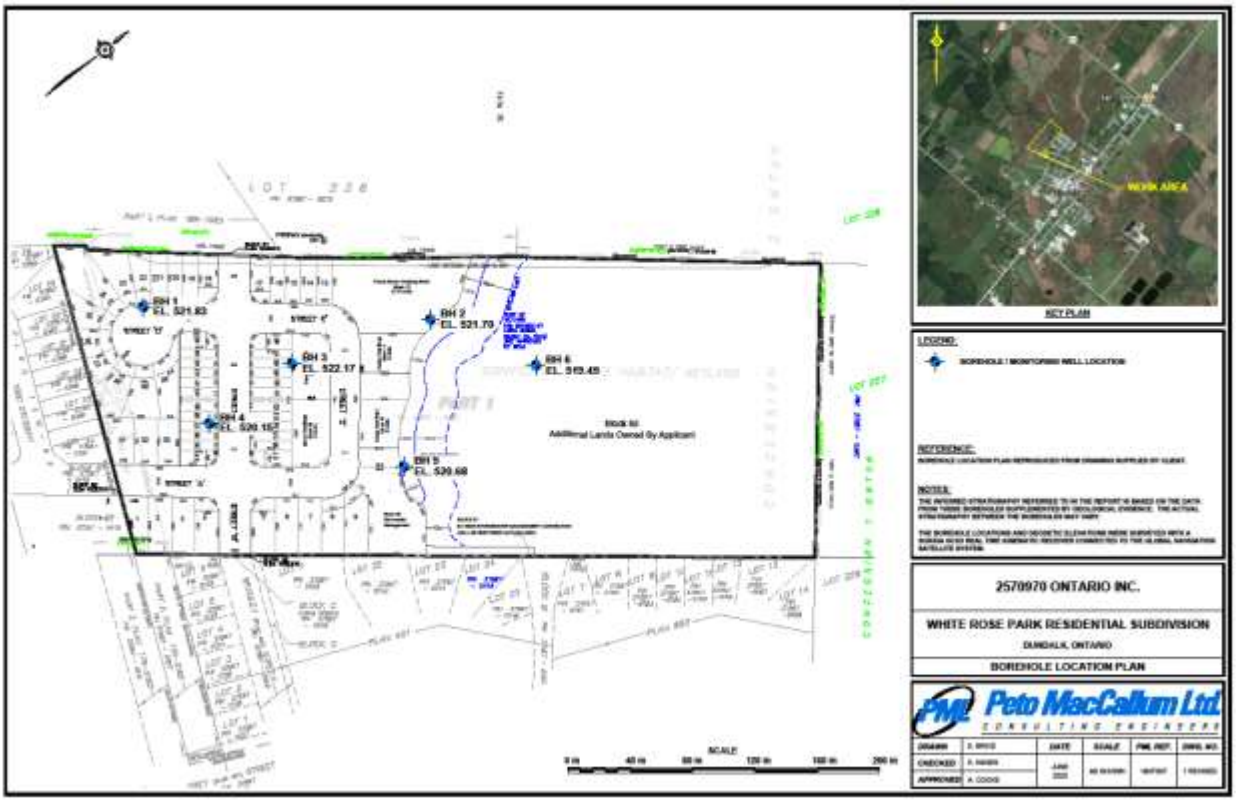

Figure 6: Borehole locations and interpreted ground water flow direction

Groundwater flow direction illustrated above confirms no risk of proposed development truncating shallow or deep groundwater flow regime leaving the central wetland; flow travel is interpreted to be in the other direction, with water flowing toward the wetland. Beyond the 30m setback distance, the type of structures proposed adjacent to the wetland work well with maintaining the pre development flow regime pattern.

We trust the consolidated response and appendices address GRCA queries, in particular the 30m wetland setback refinement on the current draft plan of subdivision and the analysis of site hydrogeology to ensure sufficient standard mitigation and monitoring can guide the subdivision development without significant negative impact to observed ecology in the wetland.

Please feel free to address any questions or comments to the undersigned.

Linda Liisa Sõber, H.B.Sc.
Senior Ecologist
SAAR Environmental Limited
Sarawak Office 519 374 9486
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APPENDIX A

NATIVE PLANTING PLAN

Fifty (50) whips of each shrub and tree species to be distributed along core wetland periphery.

Compliance monitoring includes a field inspection two (2) years post planting after plants establish themselves, to assess the survival rates and install replacement plants if/as required.

This can be effected through the Site Plan Control mechanism, with the inspection conducted by either GRCA, SAAR, independent landscaper/arborist or the municipality.

Salix discolor
Vaccinium cassinoides
Vaccinium acerifolia
Nuphar variegatum (plugs)
Quercus rubrum
Thuja occidentalis

WETLAND BUFFER

Readily available seedmix for top of bank (1kg) hand broadcasted within the 30m buffer:

New England Aster	*Aster nova-angliaea*
Beebalm	*Monarda fistulosa*
Common Milkweed OR Swamp Milkweed*	*Asclepias incarnata*
Wild Carrot	*Daucus carota*

*Swamp Milkweed will likely be preferred due to adjacent current agricultural activity off site; the Common variety of Milkweed is listed under the Noxious Weed Act, caution for cattle.

RIPARIAN ZONE

Plantings along wetland swale outlet to be clusters of 3-5 at 2m intervals along the southwest wetland periphery, sedges and rushes working in part to scour and adsorb nutrient from storm events:

Boneset	*Eupatorium perfoliatum*
Red fruited Sedge	*Scirpus rubrotinctus*
Wool Grass	*S. cyperinus*
Common Rush	*Juncus effusus*

APPENDIX B

ORIGINAL EIS (2018)

Mr. D. Scott, Senior Planner
Cuesta Planning Consultants Inc.
978 First Avenue West
Owen Sound, ON N4K 4K5
519 372 9790

January 22, 2018

Re: Environmental Impact Study
Part Lot 227, Concession III, SWTSR
Township of Southgate (Proton)
County of Grey, Dundalk Settlement Area

Introduction

Further to fall (September 26, October 14, 2017) wetland delineation by SAAR, and November audit with Grand River Conservation Authority (GRCA, October 26), we have synthesized our prior seasonal reconnaissance surveys for review.

The current White Rose development application considers a mix of housing which ranges from single family detached homes, semi-detached, fourplex, townhouse and retirement units.

2017 Updates

During recent discussions with GRCA on the current new wildlife surveys for Species at Risk, SAAR conducted additional surveys including reconnaissance for potential bat roost trees following new MNRF Draft guidelines.

Earlier surveys included spring of 2014 avifauna migration surveys to assist in selecting potential areas for a storm water management pond (April 9th and 10th, 2014), and winter reconnaissance for any upwellings and significant wildlife corridors during track surveys (December 2017).

Terms of Reference for the environmental report to meet current GRCA policy and guidelines were discussed and current MNRF guidelines to determine significant wildlife habitat were incorporated into the 2017 EIA update (MNRF, Significant Wildlife Habitat Criteria for EcoRegion 6E).

Significant wildlife habitat (SWH) that was identified using the more recent criteria include potential bat roost trees, fish habitat, amphibian breeding habitat and salamander vernal pool use in the forested portion of the main wetland.

The document reviews habitat requirements for the observed species and recommends conservation setbacks from the SWH as well as mitigation to guide the construction phase of development and post development use.

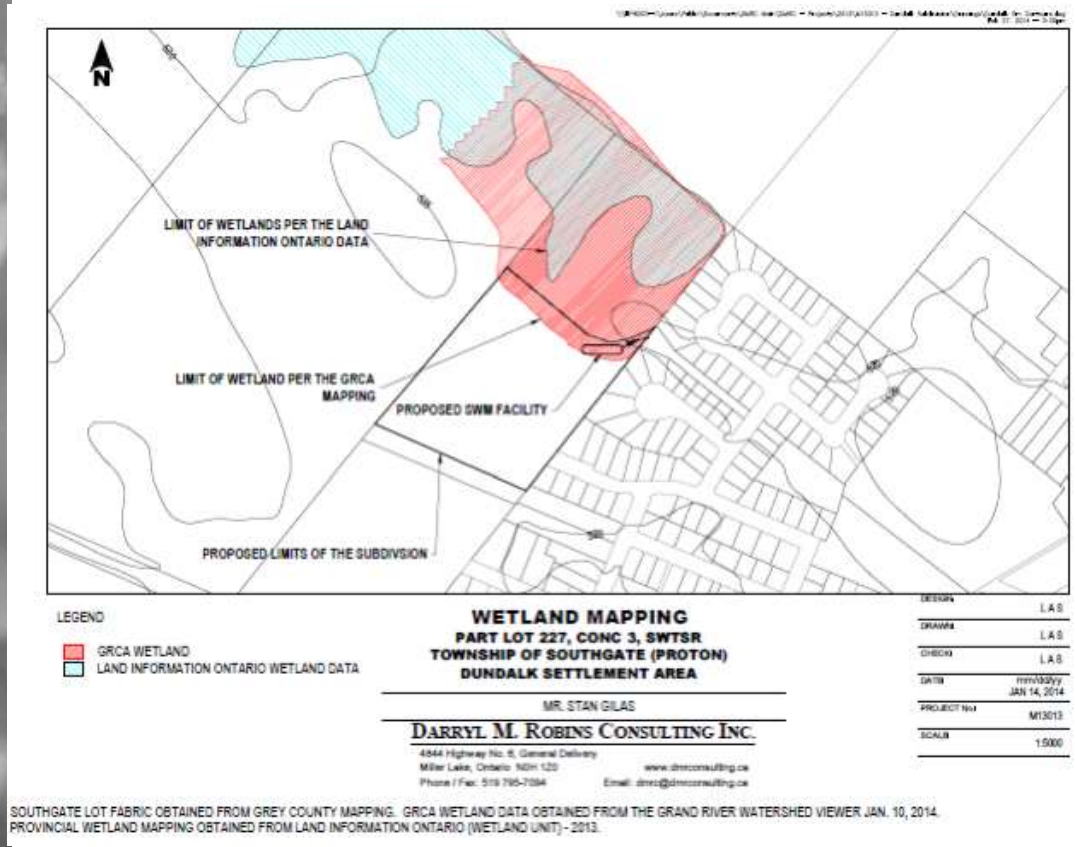


Figure 1: Original area proposed for stormwater management pond relative to the original wetland mapping according to the Province and the Grand River Conservation Authority (GRCA).

Given that vegetation can change over time, wetland mapping was refined in the fall of 2017 by ground truthing (SAAR), later audited with Grand River Conservation Authority (GRCA).

Policy Conformity

Proposed subdivision lands are designated Neighborhood Area. The parcel is zoned Restricted Agricultural (AR) with the east wetland zoned Environmental Protection (EP).

Section 51 (24) a) of the Planning Act as outlined in the planning report (Cuesta Planning Consultants, 2018) requests that the effect of development on matters of provincial interest be regarded. Natural Resources are one of these considerations.

The Township of Southgate Official Plan reflects the natural heritage considerations of the Provincial Policy Statement (PPS, 2014) and natural heritage section 2.3.

Provincial Policy Statement

The EIS first determined whether one or more of the seven natural areas identified in the Provincial Policy Statement (PPS) are found on the subject property, namely

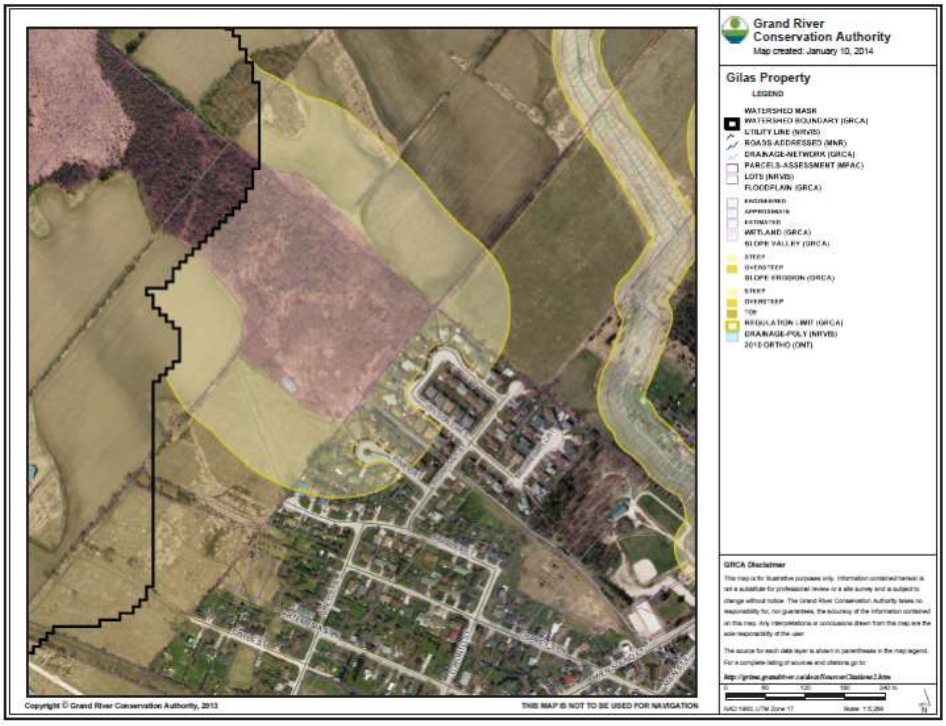
- *significant wetlands (including significant coastal wetlands);*
- *significant habitat of endangered and threatened species;*
- *significant Areas of Natural and Scientific Interest (ANSIs);*
- *significant woodlands (south and east of the Canadian Shield);*
- *significant valleylands (south and east of the Canadian Shield);*
- *significant wildlife habitat; and*
- *fish habitat*

Two of the seven areas identified in the PPS were noted on or near the study site. Significant wildlife habitat for breeding Spotted Salamanders in the main wetland, and fish habitat in the descending drain through the Bradley Street subdivision (Brook stickleback and Common Shiner). These features receive protection consistent with PPS (S.2.1.1).

Natural heritage features and areas: means features and areas, *including significant wetlands, significant coastal wetlands,* other coastal *wetlands* in Ecoregions 5E, 6E and 7E, *fish habitat, significant woodlands and significant valleylands* in Ecoregions 6E and 7E (excluding islands in Lake Huron and the St. Marys River), *habitat of endangered species and threatened species, significant wildlife habitat, and significant areas of natural and scientific interest*, which are important for their environmental and social values as a legacy of the natural landscapes of an area.

Provincial Policy Statement 2014, Section 6.0 Definitions
Italics indicate terms further defined in the PPS

Wetland Update



Map 2: GRCA Wetland and Adjacent Regulation Limit

The above map from the GRCA offers an overview of the wetland and adjacent regulated lands. This generalized wetland area varies significantly from the Ontario Wetland Data of MNRF and it has been refined on site during ground truthing in 2017 by SAAR, then audited with GRCA.

One can see the purple outline of wetland generally follows the limit of tree cover and lower vegetation. Ground truthing refined this map since a portion of forested habitat was found to be upland in the top northwest corner of the main forest patch.

Revised mapping is provided in this reporting and in response to the GRCA internal guidelines on conducting wetland and impact studies, a desktop exercise for provincial wetland potential values was also conducted to determine whether the wetland met criteria for provincial significance. It did not. Notwithstanding that exercise, a provincial wetland would have invoked a 120m zone of study from the wetland limit and this has already been completed within the EIS with a distance exceeding the PSW 120m zone.

Wetland Limits

The Ontario Wetland Evaluation Manual for Southern Ontario including soil analysis was followed to determine the location of wetland habitat.

Grand River Conservation Authority also provided additional soil analysis on site during the fieldwork in October and we are thankful for their prompt attendance and participation before any killing frosts which were imminent. The summary wetland map is provided herein from the field GPS data points. Data resolution standard error is plus or minus 2m for some data points, average 5m, with +-14m for the most northeasterly data point within conifer forest cover (**Appendix C**).

Please note that additional upland habitat was confirmed and agreed upon during the fieldwork to be shown outside of the originally published wetland limits. Our mapping illustrates this in the top northeast portion of the parcel.

Wetland pockets were also noted elsewhere near the southwest parcel corner, mapped for consistency with GRCA ecological offsetting guidelines to arrive at measurement for compensatory plantings. This area appears to have previously drained overland from the northerly adjacent parcel with substantial alteration over time due perhaps to farm drains.

As directed by GRCA, wetland units can fall less than the standard 0.5ha size for mapping ELC units but need to be clearly identified on mapping with ecological justification and explanation of values, further to quantifying the total area of wetland habitat removal for the smaller discrete wetland units.

The smaller wetland patches on the west corner of the parcel would be removed for the subdivision but compensated through native plantings to bolster an existing gap in a north hedgerow, and enhance wetland plant species within the wetland itself. The aerial extent of the rehabilitation planting areas exceeds the wetland pockets to be removed, and can meet the GRCA wetland replacement and ecosystem service values of 3:1 compensation for the proposed size of replacement area.

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Figure 2: Updated Wetland Delineation (SAAR and GRCA Audit, 2017).

Based on the above there will be modifications to the proposed draft plan of subdivision, in particular for the various options to locate the SWMP.

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Wetland Compensatory Plantings

Compensatory planting areas are identified in Figure 3 alongside our recommendations on stormwater management pond location options.

The type, quantity and location of the proposed enhancement plantings may be required to be illustrated on a stand alone map accompanying reporting.

PLANT INSTALLATION

Wetland border plantings will be in clusters of 3 - 5 to employ the method of underplanting; smaller forbs like Woolgrass near shore will be underplanted beneath local shrub species including Alternate-leaved Dogwood, Red-osier Dogwood and Wild Raisin which act to buffer ground covers from shoreline winds. Clustering and underplanting is effective in such an open wind swept location to shelter shorter plants until their roots become firmly established.

Species quantities are listed below for installation. Tree and shrub sizes would be installed from 1 gallon pots to attain the recommended 0.5-1m shrub heights, and 1-2m tree heights as discussed. Fleshy forbs and grasses are in plugs.

Scientific latin name	Common name	Quantity
Thuja occidentalis	White Cedar	10
Cornus alternifolia	Alternate-leaved Dogwood	50
Cornus sericia	Red-osier Dogwood	50
Viburnum cassinoides	Wild Raisin	20
Eupatorium perfoliatum	Boneset	20
Eupatorium maculatum	Joe-pye-weed	40
Chamaedaphne calyculata	Leatherleaf	20
Aster nova-angliae	New England Aster	55
Monarda fistulosa	Bee-balm	100
Scirpus cyperinus	Wool Grass	20

Stormwater Management Plan Border

Wildflower seeds for butterfly plantings around the edges of the SWMP would be gathered by SAAR and rolled into soil balls to limit bird predation.

Seedstock is a five kilogram bag mixed as above, consistent with recommended stocking guidelines of 22-25 kg/ha. Seed is local to this eco-district and is comprised of:

Monarda fistulosa	Bee-balm
Aster nova-angliae	New England Aster
Asclepias incarnata	Common Milkweed

Potential Floating Aquatics, Wetland Interior

Floating aquatic plants such as *Nuphar variegatum* for odonata and fisheries value may also be installed in the central portions of the main wetland however this will be discussed with GRCA before inclusion. *(2020 Note: mid summer not sufficient water for aquatic plant support).*

Site Character

The open fields, forest patch and wetlands are situated adjacent to ongoing farming and residential land uses. As such, the wildlife predominantly reflect this edge habitat with edge tolerant species.

Birds habituated to bird feeders include American Robin, American Goldfinch, Mourning Dove, Blue Jay and Black-capped Chickadee.

Ground animals such as the woodchuck and Eastern Cottontail rabbit traverse the parcel limit hedgerows in part, and also travel across the site to adjacent lands. The hedgerows are mixtures of deciduous and coniferous tree species including Basswood, White Cedar, Elm, White Ash, Sugar Maple.

Meadows contain weedy and invasive species known to fallow farmland such as Chickory, Cow Vetch, Wild Carrot, Dandelion and Goldenrod with Orchard Grass, some Poverty Grass and Reed Canary Grass in the moister soils.

Wetlands show evidence of White-tailed deer bedding sites and travel.

The wetland habitats support Opposite-leaved Dogwood (*Cornus),* Red-ozier Dogwood (*Cornus stolonifera*) Sensitive fern clusters (*Onoclea sensibilis*), White Birch (*Betula papyrifera*), Trembling Aspen (*Populus tremuloides*), Apple trees, specimen Elm, Willow, Green Ash, High-bush Cranberry, White Cedar, dead standing Elm and Grape Vine.

Wetland

Small ponded areas exist within the wetland during spring melt. Vernal pools function for both amphibian and salamander breeding.

Setback dimensions for these wetland functions from the uplands can be appreciated on Figure 4.

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Wetland Significant Wildlife Habitat

Figure 4: Significant Wildlife Habitat Setbacks

50m setback from significant wildlife habitat as indicated above are invoked to maintain the observed and potential ecological support functions in the wetland:

- Big Brown Bat aerial forays, feeding habitat and potential roost trees
- Spotted Salamander breeding
- Western Chorus frog breeding

11

Development Setbacks

50m setback from *breeding events* as indicated above.

Setbacks protect the following observed ecological support functions:

Big Brown Bat aerial forays, feeding habitat

Spotted Salamander breeding

Western Chorus frog breeding

Bat Surveys

Relative to their size, bats have respectively low reproduction rates from an r and k selection perspective, with small litters of just one ‘pup’, rendering them vulnerable to the current pathogen causing White-nose Syndrome. Predators are also present on and near the site including Raccoon, domestic dog, cat and Red-tailed hawk.

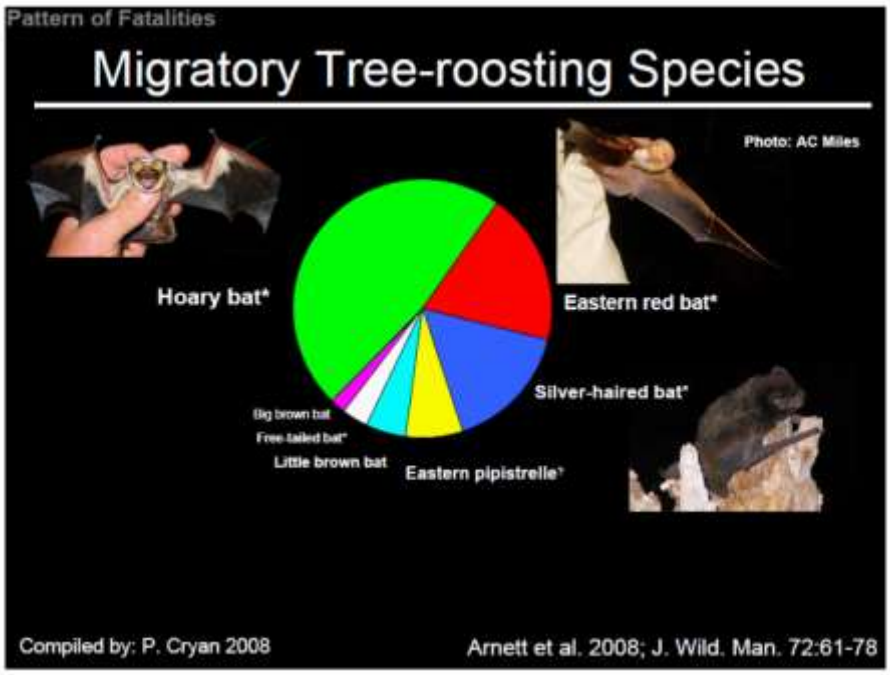
Perhaps the greatest threat to bat populations is direct loss, degradation and/or fragmentation of foraging grounds. Since the bats pick insects directly from tree canopy (gleaning) moths, Coleoptera beetles and flies, during aerial maneouvers along edges of long linear forests (e.g. hydro electric corridor openings in forests) conserving forest edges makes sense.

We conducted bat surveys at dusk, before midnight and pre-dawn using night binoculars in July and September of 2017. We observed Big Brown Bat foraging activity at the edge of the wetland - forest ecotone (see Significant Wildlife Habitat map above.

Spring maternity colonies were not observed during waterfowl surveys in the spring of the year; bats in flight would have been evident at forest edges.

The Big Brown Bat (also referred to as the Big Myotis) will use buildings, and there is little chance of the less common Northern Myotis as habitat does not provide optimal stands of Silver Maples. The Northern Myotis also appears to have more complex behavior in constant relocation of night roosts, its range at 40 kHz overlapping with the other Myotis pulses (Ontario Mammal Atlas, 1996) and the tragus ear detail being quite small to discern with night vision binoculars when bats are in flight. Big Myotis (three) were noted during dusk at the wetland-forest edge.

Timber operation could potentially impact bat species by removal of potential roost trees. As such, we have identified the areas of possible roost tree value within the wetland with dead standing and stub trees, and forest edges for retention of those tree species.



Species of Bats Found in Ontario

Hoary bat Grayish fur, yellowish coloured throat, and have white tipped hairs on its back. Wingspan 38-41 cm, total length 11-15 cm, weight 19-35 g. They inhabit both rural (open areas near forested areas) or an urban environment. Found across Ontario, north to James Bay. Rest and raise young in the canopy of trees. Migrate to southern locations.

Eastern red bat Yellowish-orange to red fur. Wingspan 29-33 cm, total length 8-12 cm, weight 7-15 g. Live in or near forested areas close to open grassy areas. Found throughout southern, eastern and central Ontario, north to James Bay. Migrate to southern locations.

Silver-haired bat Nearly black in colour with white tipped hairs on its back to give it a silver appearance. Wingspan 28-30 cm, total length 9-11 cm, weight 7-18 g Forested areas are their primary habitat; however, they can readily adapt to urban/rural settings including parks and farmlands. Found throughout southern and central Ontario. Migrate to southern locations.

Big brown bat Mainly brown in colour. Wingspan 30-33 cm, total length 9-14 cm, weight 12-48 g. Forested areas are their primary habitat; however, they can readily adapt to urban/rural settings including parks and farmlands. Found around the Great Lakes area in Ontario.

Little brown bat Ranges from light to dark brown in colour. Wingspan 22-27 cm, total length 7-10 cm, weight 5-9 g. This species can be found just about anywhere, in buildings, attics, under roof eaves or the loose bark of trees, etc. They are long lived, (over 31 years in the wild). Found throughout Ontario.

Eastern pipistrelle Yellow to drab brown in colour. Wingspan 19-22 cm, total length 8-9 cm, weight 6 g. Live in shrubby areas and open forests close to water. They will sometimes be found close to the edge of urban areas. Found **throughout southern, central and eastern Ontario.**

Northern bat Mid to dark brown in colour. Wingspan 23-25 cm, total length 8-10 cm, weight 4-9 g. Is found primarily in forested areas and prefers habitat close to water. Found across Ontario, north of James Bay. Impacted by forestry operations, roosting preferences in older trees.

Eastern small-footed bat Glossy fur yellowish-brown in colour. Wingspan 21-25 cm, total length 7-8 cm, weight 3-8 g. They generally inhabit deciduous or mixed forests, sometimes they will be found in open farmland. Found occasionally in the Great Lake-St. Lawrence Forest Region in Ontario.

MNRF Protocols

SAAR implemented the bat survey protocol provided by Guelph MNRF with thanks. The Bat and Bat Habitat Surveys of Treed Habitats, MNRF, is a working draft.

This provides a good measure of habitat for potential bat roosting. SAAR measured the extent of snags, stub and cavity trees greater than or equal to 25cm dbh in the wetland when ground truthing 12.6m fixed radius plots.

The highest number of stub and dead standing cavity trees was 6 per 12.6m square fixed plots within the wetland and these areas of highest potential for roost trees are marked on the Significant Wildlife Habitat mapping.

Mitigation

SAAR has found that tree roosting bats appear most vulnerable to large scale habitat loss or change, and aerial impediments such as tall wind turbine structures. Tremendous energy reserves are required to migrate long distances for instance, and these bats eat 40-50% of their body weight each day. Migration, and/or maternal roost activity, requires high energy expenditure and any land uses that erect obstacles to this flight path, and/or attract bats to these objects as with turbines perhaps invoking supersign stimuli for the bat that may perceive them as large excellent roost trees, is to be avoided.

Subdivision land uses do not introduce tall stationary machinery such as wind farms do with turbine monopile structures at heights that impact both bat migration, and bat aerial forays for food.I suggest that tall objects elicit a sign sti

Mitigation for the White Rose subdivision thus sets a height restriction of two storeys on buildings immediately adjacent to the treed swamp so as not to interfere with these flights.

- Restrict timber operations immediately adjacent to the wetland (15m) and maintain dead standing timber in the wetland feature where it doesn't present a safety hazard. This provides for potential bat roosts and the average 25 perches per hectare recommended (Korte, 2013)

In response to current science and our field observations we have taken decay characteristics of the tree species into consideration for the native planting plan geared to progressive rehabilitation. Signs of primary cavity users such as the woodpecker guild are present here and can be a good indicator of secondary cavity use by other wildlife (in addition to bats). Thus planting softwoods like White Pine will provide future cavity trees for roost tree potential in the hedgerow gaps and openings in the northeast forest patch, as well as the upland portions of the wetland.

Grassland Bird Surveys

As part of the broader agency response to address significant wildlife habitat in greater depth, SAAR conducted a 2017 grassland breeding bird survey in June and did find nesters in the 10km block including Bobolink, Vesper Sparrow and Grasshopper Sparrow during roadside survey.

On the immediate White Rose parcel we did not locate any active breeders of threatened or endangered status. Birds we confirmed nesting included Killdeer, Eastern Phoebe, American Robin, Black-capped Chickadee, Mourning Dove, Blue Jay, Swamp Sparrow, Chipping Sparrow and American Goldfinch with sign of Downy and Hairy Woodpecker in the forest.

We provide a summary of grassland nester requirements for agencies to reflect how the required large tracts of grassland are not available.

Grassland birds are historically documented in this regional agrarian matrix. They are in decline, therefore we have reviewed the Draft Recovery Strategies authored by Bird Studies Canada for consistency with the Endangered Species Act (2007) and current science to inform our restoration plan notes.

Bobolink

Egg Dates 19 May to 16 July (n= 102 nests, Peck and James)

Bobolink continue to be a presence in fallow fields of this region. .

Published science indicates these grassland birds require at least 4ha (10 acres) of grassland.

What kind of grass?

Native Switchgrass and Big Bluestem and sometimes fescues are used, but at heights tall enough to hide the birds. The site fallow field provides patches of reed canary grass and Poverty Grass but no 10 acre habitat patch of uninterrupted habitat. The habitat here appears to have laid fallow and is interrupted by a number of clearings including the cart trail for prior farm equipment access.

Habitat studies

Field research on this bird shows they have used hayfield 8+ years old that is cut annually, and in lesser order of preference, lightly grazed pasture, fallow field, old field and young hayfield (Bollinger and Gavin, 1992: Bollinger, 1995), commonly nesting in old abandoned field (cultural meadow) with less use of grain fields (Martin 1971, Bollinger et al. 1990, Van Damme 1999, Dechant et al. 2001, Norment et al. 2010).

Bobolinks don't appear to select row crops such as corn and soybean (Sample 1989, Jobin et al. 1996) but have in southwestern Ontario (Norfolk, Chatham-Kent, Essex, Durham) nested in fields larger than 50 hectares with winter wheat and rye (D. Martin and J. Holdsworth, pers. comms. 2011, J. McCracken, pers. obs. 2012, Sober, pers. Obs. 2014 North Wellington County). Other field researchers in the draft recovery strategy provincial document suggest the bird may nest in the wheat when the grain is underplanted with clover, alfalfa or supports a wet grassy section (J. McCracken, pers. obs. 2012).

Mean territory size ranges from 0.4ha - 2ha (Wiens 1969, Martin 1971, Wittenberger 1978, Bollinger and Gavin 1992, Lavallée 1998). Nests are built on the ground usually at the base of tall forbs (Martin and Gavin 1995). In the uncut hayfields of Ontario and Quebec nest success rates are 43% (Frei 2009). During the breeding season, adults feed on 57% insects and 43% seeds (Martin and Gavin 1995). Bobolinks now nest primarily in hayfields and pastures (Bollinger and Gavin 1992, Bollinger 1995, Martin and Gavin 1995, Jobin et al. 1996, Cadman et al. 2007). These habitats are typically dominated by Phleum, Poa pratensis, and Trifolium spp (Dale et al. 1997, VanDamme 1999, Frei 2009).

Microhabitat preferences best matched in regularly maintained hayfields that are not cut early in the season and grasslands (McCracken et al. 2013).

Grassland Birds in Decline Observed Within 10 km

Eastern Meadowlark

Egg Dates: 2 May to 3 August (n=322 nests, Peck & James, 1987)

Field Surveys

We observed male Eastern Meadowlark 2km north of the study site, a singing male in an actively farmed field.

Habitat Requirements

Territory sizes average 0.4ha - 2ha (Wiens 1969, Martin 1971, Wittenberger 1978, Bollinger and Gavin 1992, Lavallée 1998) with smaller nesting areas within that. Nests are built on the ground **usually at the base of tall forbs (Martin and Gavin 1995).**

The Meadowlark nests in hayfields, grasslands and savannahs (Roseberry and Klimstra 1970, Lanyon 1995) and also in weedy meadows, orchards, golf courses, restored grassland of surface mines, grassy roadsides, young oak plantations, grain fields, herbaceous fencerows, and grassy airfields (Peck and James 1987, Bryan and Best 1991, Warner 1992, Lanyon 1995, Kershner and Bollinger 1996, DeVault et al. 2002, Hull 2003, Galligan et al. 2006).

Like the Bobolink, it rarely nests in row crops such as corn and soybean (Cadman et al. 2007), except perhaps when grassed waterways are present (Bryan and Best 1991). Hull (2003) found grasses in the grasslands were generally 25-50cm with abundant litter cover and 80% or more grass cover. When grass cover dipped below 20% it was found to have less use. Forbs and woody growth by definition of grasslands were scarce, at 5%, with areas greater than 35% being too dense. An interesting variable was the amount of bare ground (Wiens 1969, Roseberry and Klimstra 1970, Rotenberry and Wiens 1980, Schroeder and Sousa 1982, Askins 1993, Vickery et al. 1994, Granfors et al. 1996, Kershner et al. 2004a, Warren and Anderson 2005, Coppedge et al. 2008) so shielding from predators appears paramount for nest habitat selection.

Perches continue to be important for grassland birds including the Eastern Meadowlark, with use of scattered trees, shrubs, telephone poles, and fence posts for elevated song perches (Wiens 1969, Sample 1989, Hull 2003 *in* Draft Recovery Strategy).

Site Conditions

The meadow on site does not provide vast expanses of grassland the Meadowlark is documented requiring. Recently uncut hayfields in Ontario and Quebec have recorded nest success rate of 43% (Frei, 2009) however we did not observe any ground nesting on site.

As with Bobolink, older hayfields are preferred by Eastern Meadowlarks. As fields age, litter cover, plant diversity and vegetation patchiness increase, whereas total plant cover, legume cover, and vegetation height decrease (Zimmerman 1992, Bollinger 1995). Grass-dominated hayfields are preferred as Eastern Meadowlarks require grass as nesting material (Roseberry and Klimstra 1970).

Grassland Mowing

None of the grassland birds tolerate repeated hay cutting during May-July breeding. The meadow on site receives disturbance in the form of ATV recreation and the immediately adjacent disturbance of a long term subdivision (Bradley), and in progress construction to the west. We have observed nest success on other sites that are grazed by cattle but low intensity with less than 50 head of cattle (Sober, pers. Observ.), grazing that maintains grass at 10-30 cm (Risser et al. 1981, Jones and Vickery 1997).

Eastern Meadowlarks also respond positively to periodic, prescribed burning conducted at intervals of two to four years (Skinner 1975 in Lanyon 1995, Jones and Vickery 1997, Walk and Warner 2000, Hull 2003, Powell 2008, Coppedge et al. 2008). Response to fire varies, however, depending on soil type, climate, grassland type (native vs non-native), fire frequency, and time elapsed between burns (Zimmerman 1992, Hull 2003).

The suitability of grassland habitat for Eastern Meadowlark involves a combination of landscape and patch characteristics (Herkert 1991, Vickery et al. 1994, Renfrew and Ribic 2008). Studies conducted in Missouri and New York suggest that the Eastern Meadowlark is not especially area-sensitive; breeding density was not influenced by patch size and the species was not found to be affected by edge density, distance to another patch of grassland or forest, or by cover, patch size or core area of grassland (Bollinger 1995, Winter 1998, Horn et al. 2000). Neverthess, large tracts of grasslands are generally preferred over smaller ones (Herkert 1991, 1994, Vickery et al. 1994, O'Leary and Nyberg 2000).

There appear to be regional differences in the degree of sensitivity of Eastern Meadowlarks to habitat fragmentation. For example, in Illinois, the species was considered moderately sensitive to grassland habitat fragmentation attributes (O'Leary and Nyberg 2000, Hull 2003). In Wisconsin, relative abundance was greatest in pastures with more grassland core area (i.e., area of grassland occurring >25 m from the edge of a patch) and in landscapes having greater amounts of grassland cover (Renfrew and Ribic 2008).

Bobolinks appear to prefer larger fields than Eastern Meadowlarks.

Bobolinks tolerate and may even prefer wetter portions of fields, and are most apt to select nesting sites that are closer to field centres. Eastern Meadowlarks prefer to nest in drier sites, and will frequently nest around field margins.

Bobolinks are more closely associated with hayfields than Eastern Meadowlarks, and less closely associated with pasture (e.g., Ribic et al. 2009). Forb composition in grass-dominated fields occupied by Eastern Meadowlarks tends to be slightly lower (e.g., 11-15% forb cover; Kershner et al. 2004a, 11.1%; Jensen 1999) than for Bobolinks (e.g., 22.6%; Winter et al. 2004).

Bobolinks tend to nest in patches of denser and taller herbaceous vegetation (Martin 1971, Schneider 1998) than Eastern Meadowlarks (Sample 1989, McCoy 1996).

Eastern Meadowlarks have a higher tolerance to shrub encroachment (e.g., up to 35% shrub cover; Schroeder and Sousa 1982) than Bobolinks (less than 25% shrub cover; Bollinger 1988, Bollinger and Gavin 1992). Bobolinks have a lower tolerance to patches of bare ground (e.g., 0.3%; Schneider 1998, Winter et al. 2004, Warren and Anderson 2005) than Eastern Meadowlarks (e.g., 8.5%; Jensen 1999, 0.5-3%; Kershner et al. 2004a). For Bobolinks, microhabitat preferences are best matched in regularly maintained hayfields and grasslands. If not maintained, Bobolinks may decline significantly due to accumulation of litter and shrub encroachment (Johnson 1997). The species responds positively to properly-timed mowing and burning, with abundance peaking one to three years after disturbance (Bollinger and Gavin 1992, Johnson 1997, Madden et al. 1999).

Eastern Meadowlark densities are higher in heterogeneous vegetation habitat than homogenous (Risser et al. 1981, Schroeder and Sousa 1982). These preferences are best matched with periodically mowed and burned grasslands (3-5 years; Hays and Farmer 1990, King and Savidge 1995), lightly to moderately grazed pastures (Skinner et al. 1984), and idle grasslands.

Construction Phase Impact Assessment

Permeable (crushed gravel) surface vs. pavement for the cul de sac if the design places it within 50m of the wetland.

Breeding Event Wildlife Habitat Illustrated

Color Plate 1: Wetland herptile use in vernal pools

The amphibian function above has been setback from the proposed stormwater pond by 50 metres.

Drainage

SAAR inspected the existing municipal drains at peak flow conditions to gain an appreciation of any spillover areas and ponding.

Color plates illustrate the character of the drain that falls between Wilson Crescent and Pine Court.

Color Plate 2: Spruce bordering the existing subdivision

The existing subdivision to the south is flanked by tall tree screens. These should be retained wherever possible for privacy screening and local stopover function for migrant birds.

Color Plate 3: Spring freshet carried in the municipal drain

Color Plate 4: Illustrates uplands 50m east of the proposed SWMP

Vegetation bordered wetland with American Elm, Apple, Hawthorn and Trembling Aspen on upland grades.

Color Plate 5: Southeast grade of parcel during track surveys.

Field Approach

SAAR walked the subject lands and beyond to a distance of 120 metres, to gain an appreciation of the site. SAAR also conducted reconnaissance at a landscape level for features extending to 500 metres from the site by roving survey in a vehicle.

Spring migration events for birds were conducted on an evening for night flying migrant birds, as well as an early morning for daytime migrants (11 p.m.- 1 a.m. and 5 a.m. – 9 a.m. respectively April 9, 10, 2014).

Early morning bird songs were recorded at transect locations.

Bird song locations were selected using an accepted random unbiased quadrat system across the parcel in question (4 locations), not limited to, but including, the SWMP option areas. Bird tapes using a hand held tape recorder were played, in particular within the forested wetland to elicit any early returning raptors and owls.

Findings

No significant waterfowl stopped over during the spring reconnaissance. Late snow cover precluded potential night time stopover of Greater or Lesser Yellowlegs in any fallow field that might have held storm and snowmelt for a few evenings. One Pileated Woodpecker returned calls and was flushed, with no other large bodied birds and an absence also of Ruffed Grouse. The snowmobile trail around and through this wetland may act as a deterrent for resident larger birds such as the Grouse.

Early morning bird songs were limited to local and migrant Canada Geese, and local resident birds in and on adjacent lands to the wetland which included:

Two Tree Swallows, 6 Canada Geese, Black-capped Chickadees (11), 2 Mourning Dove pairs, 4 Red-winged Blackbirds, American Crow, American Blue Jay, American Cardinal and an Early Phoebe flying amidst 20+ Grackles.

Grackles made use of the southerly Norway Spruce bordering the rear lot limits off of Pine Court.

Specific Mitigation

The spruce noted above should be retained where possible. They offer a privacy screen as well for residents that would avoid additional future planting at that edge after construction of the SWMP.

Limit machinery to avoid more sensitive dawn and dusk for wildlife within the wetland habitat and the 120 metre wide adjacent lands. This timing fluctuates with the season and sunrise and sunset timing. SAAR finds it appropriate to avoid noise before 7 a.m. and after 7 p.m.

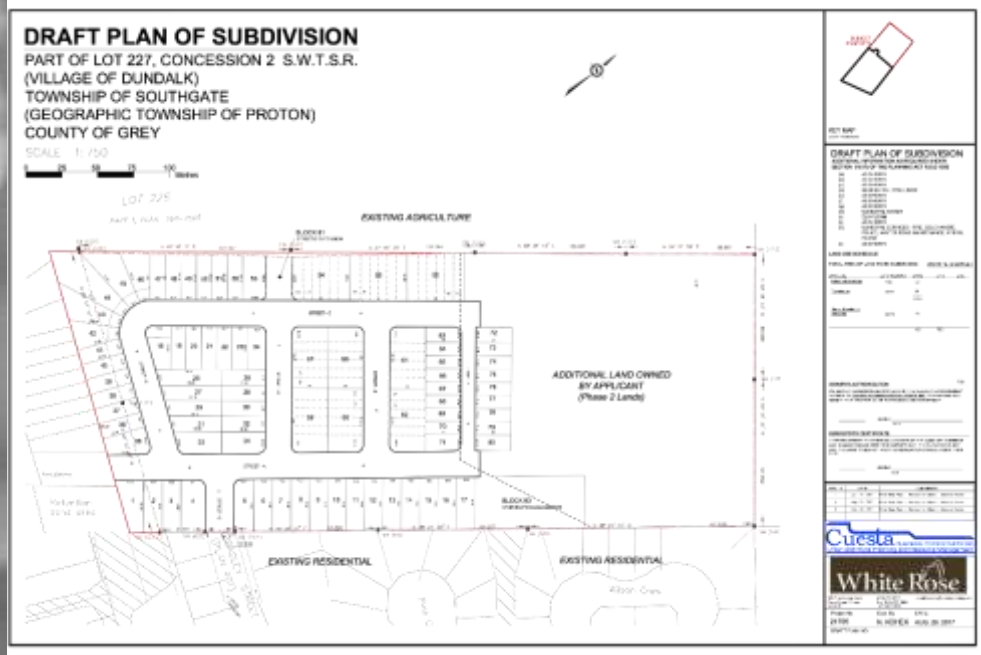
The regional breeding birds that occupy the forested wetland and the surrounding open fallow fields will continue to court, breed, nest and stopover after construction. Butterflies using the wetland edges will continue to be supported and can be enhanced with native plantings.

The site can be enhanced, guided by an Ecological Planting Plan (EPP) that selects local plants suited to the soil, aspect, topography and wildlife requirements. The EPP layers of ground cover, shrub and tree species also provide a dual water quality function by scouring sediment and nutrient through a planted linear wetland swale.

The planting plan has been detailed within this EIA for review agents.

Infra-structure Higher Level Mitigation

- Refine SWMP location to maximize separation distance from wetland
- Ensure the SWMP discharge travels along a linear vegetated swale planted
- with robust sedges, rushes and grasses of the local eco-district for nutrient uptake
- Confirm through stormwater calculations that pre and post development water flow will be maintained such that no drawdown of water currently contributing to wetland support (overland and/or baseflow contribution)
- Add the erosion and sediment control detail to the Draft Plan including locations of filter cloth, stockpile restrictions, timing of machinery operation

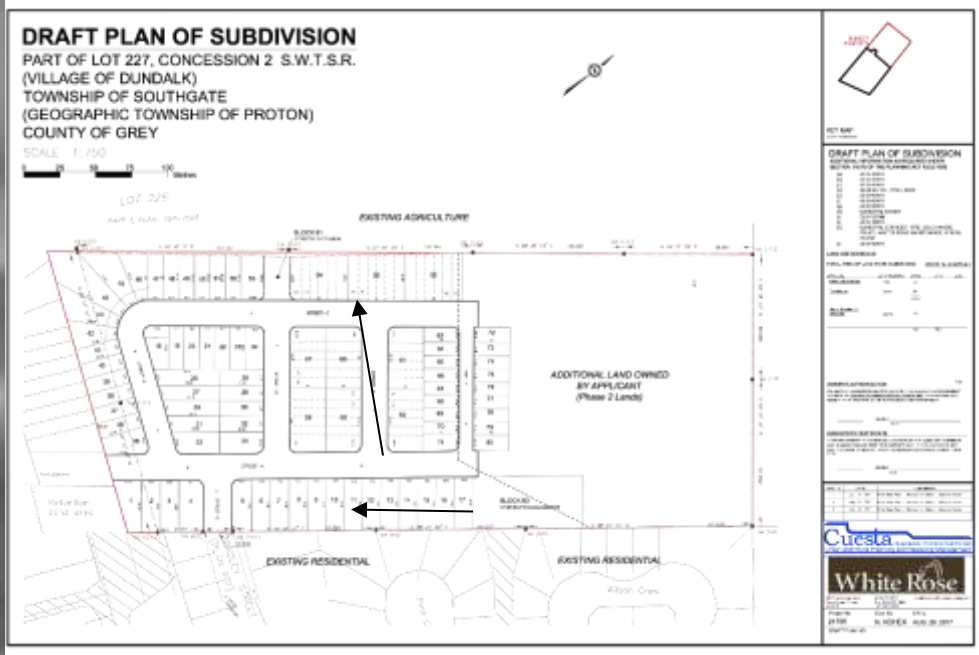


Map 4: Draft Plan of Subdivision (NB: at that time)

Current liaison discussion with GRCA considers the following options for refinement of the stormwater management pond (SWMP) location to maximize separation distance from the wetland feature.

Darryl M. Robins Consulting (DMR, 2014) conducted field assessment and prepared the original servicing report. Existing infra-structure is available from adjacent Bradley Street subdivision for extension to this site (gas, water, sewer). Overland stormwater flow would require a stormwater retention facility and a stormwater management pond (SWMP) has been proposed by DMR. One pond is currently proposed to capture the existing water which flows to two sub-catchments in southeasterly and northeasterly directions. This option, for southcentral location on the parcel for the SWMP, was recommended by DMR as much of the pre development flow moves in this northeasterly direction. Consideration of the southcentral location also arose because the western parcel limit option for discharge is not attainable; the Bradley Street stormsewers could not accommodate the projected future flows.

Southcentral and easterly discharge to the drain east of Bradley Street was thus recommended. Waters would be directed to that existing drain after settling in the stormwater managment pond, and travelling through the outlet linear swale of robust vegetation. The linear swale is a vegetated strip lining the edges of the discharge path on site with robust local vegetation known for nutrient uptake (sedges, rushes and grasses). Suggestions to bring the draft plan into conformity are indicated below. The recommended actions are to shift the retirement block northwest to border the upland forest, moving this out of the wetland. Similarly the SWMP block would require a shift westerly out of the wetland.



Map 5: Recommended draft plan revisions.

Generally shift retirement blocks and stormwater management pond outside of wetland. (NB: See Final 2020 Plan In Consolidated Reports)

Conclusions

The current draft plan of subdivision reviewed by SAAR requires some modification to be consistent with municipal Official Plan and MNRF policy on significant wildlife habitat.

If adhering to the SAAR mitigation, which includes an Ecological Planting Plan, and modification of the draft plan, we find the subdivision can be situated on this landscape. Further, it provides an opportunity to increase the biological diversity of wildlife at the wetland edges and provide viewing opportunities for the future residents and trail users.

Please direct any questions or comments to the undersigned.

Best regards,

_____
L.L. Sõber, H.B.Sc.
Senior Ecologist
SAAR Environmental Limited

ONTARIO REGULATION FOR WETLAND

The southern wetlands size, and lack of watercourse inlet/outlet, as described in Ontario Regulation 150/06 guidelines below, confirms that the pockets do not meet "wetland" criteria:

"wetland" meaning land that,

(a) is seasonally or permanently covered by shallow water or has a water table close to or at its surface,

(b) directly contributes to the hydrological function of a watershed through connection with a surface watercourse,

(c) has hydric soils, the formation of which has been caused by the presence of abundant water, and

(d) has vegetation dominated by hydrophytic plants or water tolerant plants, the dominance of which has been favoured by the presence of abundant water,

but does not include periodically soaked or wet land that is used for agricultural purposes and no longer exhibits a wetland characteristic referred to in clause (c) or (d). ("terre marécageuse") 1998, c. 18, Sched. I, s. 12."

- Watercourse connections
- Greater than 50% wetland plants
- Hydric wetland soils
- Wetland area two hectares or greater

The Conservation Authorities Act doesn't speak to which authority determines wetland vs. upland plants, however the Provincial standard was used (Appendix 10, Provincial Wetland Evaluation Manual, 2013). Reed Canary Grass, for instance on site, is a plant the manual warns against using to conclude "wetland".

2.1.9 Nothing in policy 2.1 is intended to limit the ability of agricultural uses to continue.

Umbrella policies in our Province include the Provincial Policy Statement, which on page 1, Part III: How to Read the Provincial Policy Statement, speaks to the inter-related environmental, economic and social factors, appreciated as foundational ways to minimize disturbance and arrive at the balance the PPS, and the Planning Act.

The southern wetland polygons do not meet provincial or Ontario Regulation definitions and criteria for "wetland". For provincial wetland evaluation, they do not exhibit connectivity to the larger northwest wetland for wetland species life cycle requirements nor hydrology. Speaking to the GRCA Ontario Regulation 150/06, the areas do not meet all the criteria to be considered a "wetland" as listed below:

Wetlands in Ontario need to meet all criteria in the Ontario Regulation policy definition (a), (b), (c) and (d); the definition cannot be fulfilled by one criteria.

The fallow farmed land in question do not meet the definition of wetland in the Act, a *"wetland" meaning land that:*

(a) is seasonally or permanently covered by shallow water or has a water table close to or at its surface,

(b) directly contributes to the hydrological function of a watershed through connection with a surface watercourse,

(c) has hydric soils, the formation of which has been caused by the presence of abundant water, and

(d) has vegetation dominated by hydrophytic plants or water tolerant plants, the dominance of which has been favoured by the presence of abundant water,

but does not include periodically soaked or wet land that is used for agricultural purposes and no longer exhibits a wetland characteristic referred to in clause (c) or (d). ("terre marécageuse") 1998, c. 18, Sched. I, s. 12."

The wetland size criteria of two (2) hectares is not attained for the southern wetlands. The willow pockets most closely resemble the exclusionary clause that follows d) above.

"DEFINING AREAS OF INTERFERENCE

The areas surrounding wetlands where development could interfere with the hydrologic function of the wetland are called "areas of interference". These areas include lands that are 120 metres (394 feet) from the boundaries of *Provincially Significant Wetlands***7** or 30 metres (100 feet) from other wetlands greater than 2 ha in size as shown below. These areas may be adjusted where detailed hydrologic studies define a more accurate "area of interference". For the purpose of the *Regulation*, wetlands less than 2.0 hectares (4.8 acres) do not have an associated area of interference" (Policies for the Administration of the Development, Interference with Wetlands and Alterations to Shorelines and Watercourses, Ontario Regulation).

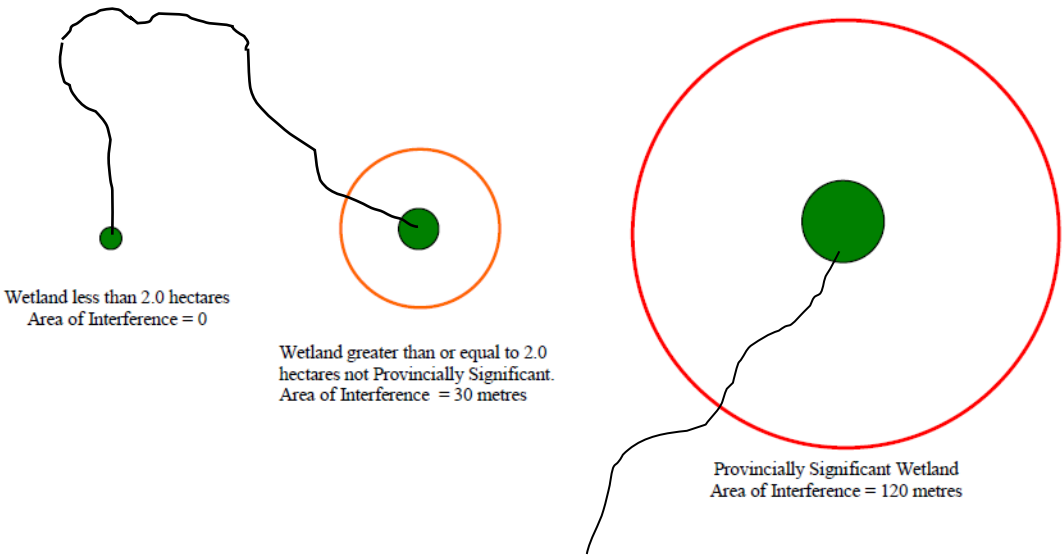


Figure 7. Wetlands and Associated Areas of Interference

Note that the Ontario Regulation policy guidelines require a surfacewater connection between the willow pockets which was not evident on site.

SAAR found the soil to be sandy, and at the base of the willow and red-osier dogwood, aerobic with some Redox iron precipitate – confirming aerobic conditions. There is a fringe Reed Canary Grass but MNRF wetland evaluation manuals guide against using this plant species to conclude presence of a wetland for other evaluation purposes (Provincial Wetland Evaluation). Thus, we do not use RCG to conclude wetland for the Ontario Regulation either, partly using the PSW manual here as the GRCA regulations do not specify the authority to use when discerning upland vs. wetland plants.

Notwithstanding the above technicalities, SAAR confirms that the proponents, further to GRCA request regarding the southern wetland exercise of mapping and selecting future planting area within the core wetland and buffer, are agreed to being good stewards and replenishing the wetland shrub and tree species found on the southern fringe of the parcel.

Native Planting Plan details follow for consideration and input by GRCA.

Species are a mixture of moist upland affinity, and wetland affinity shrubs and trees local to this eco-district with known hardiness for survival, and use as food (fruit or nut), nest structure and screening for the wildlife observed in the wetland.

Quantities exceed the vegetation to be removed in the south pockets of poorer draining land.

APPENDIX C WETLAND GPS

FIELD GPS COORDINATES FROM TURNING POINTS

FIELD FLAGGED WETLAND LIMIT

44 10 26.65N, 80 23 47.32W

44 10 26.28N, 80 23 47.77W

44 10 26.19N, 80 23 48.41W

44 10 26.88N, 80 23 50.31W

44 10 27.59N, 80 23 51.46W

44 10 28.33N, 80 23 52.46W

44 10 28.89N, 80 23 53.26W

44 10 29.90N, 80 23 53.96W

NB: AS DISCUSSED ON SITE DURING WETLAND LIMIT FLAGGING, GPS COORDINATES HAVE A STANDARD ERROR (+-) RANGING FROM 2M, AVERAGE 5M TO 14M FOR FOREST POINTS.