



Town of Newmarket **AGENDA**

Committee of the Whole

Monday, June 19, 2017 at 1:30 PM

Council Chambers

Additions & Corrections to the Agenda

Note: Additional items to this Agenda are shown under the Addendum header.

Declarations of Pecuniary Interest

Presentations & Recognitions

Deputations

1. Pilot Textile Diversion Program

Mr. Ryan Michaels, Mr. Simon Langer and Dr. Calvin Lakhan on behalf of Diabetes Canada and York University

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Consent Items

2. Supplemental Capital Budget - Government Grant Funding Approvals

Joint Office of CAO/Strategic Initiatives, Development and Infrastructure Services and Corporate Services Commissions
May 24, 2017

Page 8

1. That Joint Office of the CAO/Strategic Initiatives, Development and Infrastructure Services and Corporate Services Commissions Report 2017-05 regarding Supplementary Capital Budget - Government Grant Funding Approvals be received and the following recommendation be adopted:

a. That the proposed 2017 Supplementary Capital Budget with expenditures of \$3,125,000 be approved.

3. 2017 Six Year Water and Wastewater Financial Plan

Financial Services
June 7, 2017

Page 3

1. That Corporate Services Report - Financial Services 2017-26 dated June 7, 2017 regarding the 2017 Six Year Water and Wastewater Financial Plan be received and the following recommendation be adopted:

a. That Council adopt the proposed 2017 Six Year Water and Wastewater Financial Plan.

4. 2017 Six Year Stormwater Financial Plan

Page 56

Financial Services
June 5, 2017

1. That Corporate Services Report - Financial Services 2017-30 dated June 5, 2017 regarding the Six Year Stormwater Financial Plan (2018-2023) be received and the following recommendation be adopted:

a. That Council adopt the proposed 2017 Six Year Stormwater Financial Plan.

5. Traffic By-law Update - Schedule XI (Bike Lanes)

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Engineering Services
May 19, 2017

1. That Development and Infrastructure Services Report - Engineering Services 2017-21 dated May 19, 2017 entitled "Traffic By-law Update - Schedule XI (Bike Lanes)" be received and the following recommendations be adopted:

a. That Appendix A be adopted; and,

b. That the necessary By-law be prepared and submitted to Council for approval.

6. Urban Centres Zoning By-law Project - Directions Report

Page 75

Planning and Building Services
June 19, 2017

1. That Development and Infrastructure Services Report - Planning and Building Services 2017-14 dated June 19, 2017 regarding the Urban Centres Zoning By-law Project - Directions Report be received and the following recommendation be adopted:

a. That staff be directed to proceed with the creation of the Urban Centres Zoning By-law framework, as described in Report 2017-14.

7. Application for Official Plan and Zoning By-law Amendment - 260 Eagle Street

Page 8

Planning and Building Services
June 19, 2017

1. That Development and Infrastructure Services Report - Planning and Building Services 2017-21 dated June 19, 2017 regarding Application for Official Plan Amendment and Zoning By-law Amendment be received and the following recommendations be adopted:

a. That the Application for Official Plan Amendment and Zoning By-law Amendment as submitted by 711371 Ontario Corp. for lands being composed of Lots 13 through 19 inclusive on Plan 371, municipally known as 260 Eagle Street be approved and that staff be directed to prepare the necessary Official Plan and Zoning By-law Amendments; and,

b. That Ms. Kerigan Kelly, Groundswell Urban Planners Inc., 30 West Beaver Creek Road, Suite 19, Vaughan, ON L4K 5K8 be notified of this action.

8. Inter-Municipal Agreement with the Town of Aurora

Page

Planning and Building Services
June 19, 2017

1. That Development and Infrastructure Services Report - Planning and Building Services 2017-23 dated June 19, 2017 regarding the Inter-municipal agreement between the Town of Newmarket and the Town of Aurora be received and the following recommendation be adopted:

a. That Council direct the Chief Administrative Officer the authority to execute the necessary inter-municipal agreement substantially in the form attached as Appendix "A" to this report.

9. Newmarket Public Library Board Meeting Minutes of April 19, 2017

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1. That the Newmarket Public Library Board Meeting Minutes of April 18, 2017 be received.

10. List of Outstanding Matters

Page 1

June 19, 2017

1. That the List of Outstanding Matters be received.

Action Items

Reports by Regional Representatives

Notices of Motion

Motions

Closed Session (if required)

11. Personal matters about identifiable individuals as per Section 239 (2) (b) of the Municipal Act, 2001 - Appointment Committee (Closed Session) Meeting Minutes of June 12, 2017 recommending Appointment of a representatives to the Accessibility Advisory Committee, Appeal Committee, Newmarket Economic Development Advisory Committee and Newmarket Environmental Advisory Committee. (if required)

New Business

Public Hearing Matters - 7:00 PM

12. Public Meeting - Application for Zoning By-law Amendment and Draft Approval of Subdivision - Azure Homes 172-178 Old Main Street

Page 1

Planning and Building Services
February 27, 2017

Addendum (Additions and Corrections)

13. Deputation - Textile Recycling/Diversion

Page 138

Mr. Blaine Hobson on behalf of Steps to Recovery

Note: This item is related to Item 1.

14. Newmarket Theatre Progress Update and Next Steps

Page 13

Recreation and Culture

June 12, 2017

1. That Community Services - Recreation and Culture Report 2017-10 dated June 12, 2017 regarding Newmarket Theatre and Old Town Hall Marketing Initiatives be received and the following recommendation be adopted:

a) That Council approve an expenditure of up to \$150,000 for the development of brand identification, marketing strategy and corresponding collateral material for Newmarket Theatre and Old Town Hall - to be funded entirely from the CIF Fund.

15. Bill 139 - The proposed Building Better Communities and Conserving Watersheds Act, 2017

Page 143

Planning and Building Services

June 19, 2017

1. That Development and Infrastructure Services/Planning & Building Services Report 2017-22 dated June 19, 2017 regarding Bill 139 - The proposed Building Better Communities and Conserving Watersheds Act, 2017 (new legislation regarding the Ontario Municipal Board), be received and that the following recommendation be adopted:

a. That Council direct staff to submit Report 2017-22 to the Ministry of Municipal Affairs and Housing as the Town of Newmarket's comments on Bill 139 – the proposed Building Better Communities and Conserving Watersheds Act, 2017.

16. Comprehensive Stormwater Management Master Plan

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Engineering Services

June 8, 2017

1. That Development and Infrastructure Services Report - Engineering Services 2017-23 dated June 8, 2017 entitled "Comprehensive Stormwater Management Master Plan" be received and the following recommendation be adopted:

a. That the Town's Comprehensive Stormwater Management Master Plan be adopted.

17. Appointment Committee Meeting Minutes of June 12, 2017

Page 415

1. That the Appointment Committee Meeting Minutes of June 12, 2017 be received.

18. Appointment Committee (Closed Session) Meeting Minutes of June 12, 2017

1. That the Appointment Committee (Closed Session) Minutes of June 12, 2017 be received; and,

- a. That the individuals identified in the Appointment Committee (Closed Session) Meeting Minutes recommended for appointment to the following boards/committees be considered at the June 26, 2017 Council meeting in Open Session:

- Accessibility Advisory Committee
- Appeal Committee
- Newmarket Economic Development Advisory Committee
- Newmarket Environmental Advisory Committee

19. Heritage Newmarket Advisory Committee Meeting Minutes of May 2, 2017.

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1. That the Heritage Newmarket Advisory Committee Meeting Minutes of May 2, 2017 be received.

Adjournment

Deputation and Further Notice Request Form

Please complete this form to speak at a meeting of Town Council or Committee of the Whole or to receive further notification regarding an item on the agenda. If filling out by hand please print clearly.

Please email to clerks@newmarket.ca, fax to 905-953-5100 or mail or drop off at Legislative Services Department, Town of Newmarket Municipal Offices, 395 Mulock Drive, PO Box 328, STN Main, L3Y 4X7

Name:	
Organization / Group/ Business represented:	
Address:	Postal Code:
Daytime Phone No:	Home Phone:
Email:	Date of Meeting:
Is this an item on the Agenda? <input type="checkbox"/> Yes <input type="checkbox"/> No	Agenda Item No:
<input type="checkbox"/> I request future notification of meetings	<input type="checkbox"/> I wish to address Council / Committee
Describe in detail the reason for the deputation and what action you will be asking Council/Committee to take (if applicable):	
Do you wish to provide a written or electronic communication or background information <input type="checkbox"/> Yes <input type="checkbox"/> No Please submit all materials at least 5 days before the meeting.	

Deputation Guidelines:

- Deputations related to items on the agenda can be accommodated up to and including the meeting day;
- Deputations related to items not on the agenda may be scheduled within sixty (60) days of receipt of this form;
- Deputations will not be heard on a matter decided upon by Council until ninety (90) days have passed from the date of the matter's disposition by Council;
- Deputations are limited to 5 minutes.

Be advised that all Council and Committee of the Whole meetings are audio-video recorded and live streamed online. If you make a presentation to Council or Committee of the Whole, your presentation becomes part of the public record and you will be listed as a presenter in the minutes of the meeting. We post our minutes online, so the listing of your name in connection with the agenda item may be indexed by search engines like Google.

Personal information on this form will be used for the purposes of sending correspondence relating to matters before Council. Your name, address, comments, and any other personal information, is collected and maintained for the purpose of creating a record that is available to the general public in a hard copy format and on the internet in an electronic format pursuant to Section 27 of the Municipal Freedom of Information and Protection of Privacy Act, R.S.O. 1990, c.M.56, as amended. Questions about this collection should be directed to the Director of Legislative Services/Town Clerk, Town of Newmarket, 395 Mulock Drive, P.O. Box 328, STN Main, Newmarket, ON L3Y 4X7; Telephone 905 895-5193 Ext. 2211 Fax 905-953-5100



Textile Diversion Program for the Town of Newmarket



Who we are & what we do

- Diabetes Canada has been operating for over 30 years
- Our collections contribute over \$10 million/year to Diabetes Canada to support its mission to end diabetes
- Divert over 100 M lbs of textiles from landfill every year
- We have over 100 municipal partnerships across Canada
- Our organization collects textiles from 1.7M homes, 4,000 textile recycling bins and over 2,900 partnerships
- Proud member of the National Zero Waste Council among many other established and reputable sustainability and environmental organizations across the country

Importance of textile diversion

Despite all of the organizations involved in textile recycling:

- **85%** of all textiles go to landfill sites across Canada
- Textiles account for **5-11%** of all garbage
- It is estimated that over **1 Billion pounds** of textile waste is going to Ontario's landfill sites every year
- Studies indicate that every consumer in Canada produces **80 pounds** of textile waste per year

Why don't more people recycle?

Research shows residents are more likely to recycle if:

- It is convenient and accessible
- They have confidence in the organization
- If they are fully educated in what can be donated
- If they know how their donations impact their community
- Only **42%** of the participants in a recent study in Ontario were aware of at least one bin that is very convenient to reach.

Textile waste diversion strategies

Strategic Placement of textile recycling boxes on municipal property

Providing convenient and accessible donation locations that are well known to the public significantly increases textile waste diversion efforts. Some examples of these sites include: community centres, arenas, libraries, city hall, landfill sites, fire stations, police stations etc.

This municipal program can be easily incorporated into the Diabetes Canada drop box locator tool on our website that allows the user to find and locate the bin closest to them.

Municipal branded recycling boxes are available at no cost to the municipality.



Textile Diversion through municipal bin placements in Newmarket

- Placement of 10 bins at 5 municipal pilot sites would divert 150,000 pounds of textiles from area landfills yearly. (conservative estimates)

Town of Newmarket Annual Social and Environmental Impact - Municipal Bins					
10 bins at 5 municipal sites at avg 43 lbs/day	Lbs Collected Annually in Kg's	Kids to D-Camp	Kg of Co2 reduction	Trees Saved	Cars Driven Around the World
150,000	68,039	20	170,097	12,247	61

Multi-Residential Textile Diversion Bins

- Placed in the interior of building (garbage room, recycling room, moving room, underground parking, laundry room, etc.)
- 3 ft. wide x 2 ft. deep x 5.1 ft. tall
- Accessible to residents only
- Secure and locked
- Serviced weekly with a customized pick-up schedule
- Collection data tracked for each building and bin



Textile Diversion through multi-residential bin placements in Newmarket

Proposed Strategic Pilot Locations:

- Town of Newmarket multi-residential sites = 20 (approx.) prospective sites = 10 pilot locations = 10 bins
- Placement of 10 bins at 10 multi-residential pilot sites would divert an estimated 50,000 pounds of textiles from the area landfills yearly.
(conservative estimates)

The Town of Newmarket Annual Social and Environmental Impact - Multi-Res					
10 bins at 10 multi-res sites at 5000 lbs per yr per bin ntl avg	Lbs Collected Annually in Kg's	Kids to D-Camp	Kg of Co2 reduction	Trees Saved	Cars Driven Around the World
50,000	22,680	7	56,699	4,082	20

Multi-Residential Textile Diversion Bins in the City of Markham



Municipal branded boxes are available at no cost.



City branded boxes increases confidence.

Diabetes Canada Pilot Program

How does it work?

1. Collaborate with town/city staff to identify best spots
2. Joint communication piece created
3. Sites selected in a specific municipality
4. Bin placement determined
5. Service schedule created
6. Bins are ordered and placed
7. Data collected at each site, information is forwarded to the municipality
8. Social impact & sustainability reports delivered
9. Direct access to local operation and Diabetes Canada territory manager
10. Program adjusted as needed

Benefits of partnering with Diabetes Canada

- Through working with Diabetes Canada and York University, the Town of Newmarket will be contributing to Canada's first national textile diversion research study
- Potential to divert over **200,000 pounds** of textiles from the landfill on a yearly basis
- Education and awareness campaign that addresses textile waste and collection efforts
- Significant cost savings for the Town of Newmarket waste management infrastructure
- Customized operational service plan to meet the specific needs of the Town of Newmarket (service runs 7 days a week)
- Diabetes Canada is fully insured, \$2 million liability insurance for each bin placement
- Town of Newmarket branded textile recycling bins at no additional cost (supplied and maintained by Diabetes Canada)
- Textile collection diversion data provided on provided on an ongoing basis
- Convenient and accessible donation locations to help increase textile waste diversion
- Diabetes Canada's textile diversion program is a FREE service

Diabetes Canada is proud to partner with:



Canada united in the achievement of zero waste, now and for future generations



Contact

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March 15, 2017

Diabetes Canada's Multi-Residential Textile Diversion Program for the Town of Newmarket

Dear respected members of Council,

Given the enormous social, economic, and environmental benefits that textile recovery has the potential to create, Diabetes Canada would deeply appreciate the opportunity to partner with the Town of Newmarket to develop a strategic textile diversion program for multi-residential properties. This program would include educating the residence about the reuse/recyclability of the various textiles they dispose of and make it as easy as possible for these residents to donate their textiles in the buildings in which they reside.

For this initiative to be successful, it would be necessary to have our Diabetes Canada textile diversion bins placed in the interior or at the exterior of each multi-residential building in the municipality so that they are highly accessible to all potential donors. Based on our conversation with Deputy Mayor Taylor, Diabetes Canada would like to propose starting this exciting prospective pilot program in 10 of the approximately 20 multi-residential condo buildings in Newmarket, with the town pre-selecting the 10 sites that will be utilized for the pilot program. We would appreciate it if we could set an activation date that would allow us to proceed with the second group of sites, once the initial pilot was deemed to be successful.

These bins are typically placed in the recycling rooms, garbage rooms, moving rooms and underground parking lots of these facilities. If indoor space is an issue, we could place our outdoor bins at the exterior of a prospective building (usually in a back area e.g. recycling pen). Having these two options available, will allow us to maximize textile diversion for all property types, regardless of their size and space limitations.

There are four main arguments that we believe support this important initiative:

1) It provides the Town of Newmarket the opportunity to take on a leadership position regarding textile diversion and lead by example.

2) More points of contact mean more textile diversion opportunities, the placement of these strategic bins will allow donations to be easier and more convenient for all the residents who reside in these buildings, which will significantly increase the opportunity for textile diversion.

3) This program would significantly increase the diversion of textiles from landfill which could mean substantial cost savings for the municipality.

4) The Diabetes Canada Multi-Residential Textile Diversion Program is available at no cost to the municipality. Please note: Diabetes Canada would be pleased to place Newmarket's name/logo (at no cost) on the bins if this would be of interest to the municipality. Both of our communication/marketing teams could collaborate on putting this together.

Why should the Town of Newmarket consider partnering with Diabetes Canada?

- Diabetes Canada currently has over 500 textile diversion bins in Canada (200 in the G.T.A., including 60 of 120 bins placed in the City of Markham as part of Canada's first municipally sponsored multi-res textile diversion program)
- We are currently working with some of the leading property management firms including: Del Property Management, Brookfield Condominium Services, Times Property Management, First Service etc.
- Diabetes Canada's textile collection program has been collecting and selling used clothing in support of Diabetes Canada for more than 30 years.
- Newmarket can be included (attached letter from York U.) as one of the first municipalities in Canada to participate in Canada's first textile diversion research study in partnership with York University and Diabetes Canada. (Markham and King Township have already signed on to participate)
- Diabetes Canada helps 11 million (29%) Canadians affected by diabetes and prediabetes. Example: DC funds and operates 12 medically-supervised camps (D-Camps) in Canada for children, youth and young adults with type 1 diabetes. (e.g. Camp Huronda in Huntsville Ontario)
- Diabetes Canada's Textile Diversion Program is 100% owned by Diabetes Canada and is 100% not for profit.
- 100% of the net proceeds (\$10M in 2016) generated by Diabetes Canada's textile collection program go directly to Diabetes Canada to fund research, education, programs, advocacy, and D-Camps.
- Diabetes Canada collects clothing from 1.7M homes, 4000 clothing donation bins and 2900 partnerships.
- Diabetes Canada collects from 2,500 communities across Canada from 28 regional operations.
- Diabetes Canada has over 100 municipal partnerships across Canada.
- 95% of what we collect is recycled and reused.
- Diabetes Canada diverts more than 100M lbs of textile waste from Canadian landfills each year.
- **Our services are 100% FREE**

Why should textile diversion be a top priority for the Town of Newmarket and its sustainability departments?

Basic Market Research/Statistics

- Because 85% of textiles go to landfill sites across Canada, municipalities across Canada are taking notice and textiles are becoming the next big thing in sustainability and waste management.
- Recent studies suggest Ontario generates more than **500,000 tons** of residential textile waste annually
- Studies indicate that every consumer in Canada produces 30-40 kilograms (66-88 lbs.) of textile waste per year
- On average, Canadians purchase 62 new textile items per year, plus 7 pairs of shoes per year x 36 million = waste problem = 2.2 billion garments, 252 million shoes
- Textiles account for 5-11% of all garbage in landfills
- Based on Stats Canada research, Canadians will spend \$36.7 Billion in Retail Clothing in 2016 - more used clothes will be coming to our landfills, municipalities need to take action!
- Countries such as Burundi, Kenya, Rwanda, Tanzania, and Uganda are all considering banning second-hand clothes and leather. If these bans are put into place, these clothes could potentially be staying in our domestic market, putting more pressure on our waste management infrastructure.

The results of an online survey conducted in 2015 by Survey Sampling International (410 valid surveys, a sufficient sample size for Ontario) found the following:

- There a lack of knowledge about what types of clothes can be donated.
- It showed that textiles, such as towels or bed sheets are often forgotten.
- The survey indicated that there is a need for consumer education about what can be donated.
- Those involved in textile collections need to change their communication strategies - this is where the partnership between Diabetes Canada and the Town of Newmarket is very important!
- Clothing donations are dependent on convenience and accessibility of donation bins, only 42% of the participants know at least one spot that is very convenient to reach. These numbers suggest that for many people donation bins are not placed in convenient locations.

Operational Service Plan for the Multi-Residential Textile Diversion Program

Our Operational Service Plan for the 10 prospective bins would be to integrate them into our current service model. These bins will be managed by the Ontario Regional Director, York Region Operations Manager and Central Ontario Territory Managers. The standard service procedures utilized at our 4000 clothing donation bins and 2900 partnerships would be incorporated into the management of these bins. We will also be utilizing our experience with the 500 condominiums and apartment buildings that we are currently servicing across Canada.

In addition, it would be our pleasure to offer Newmarket a customized service agreement contract that would provide the regular pickup schedule for these bins (our operations run 7 days a week). For the first 30 days of bin placement, Diabetes Canada will send our service truck to clean out the bins 3 times per week. We do this to gather collection data so that we can plan an appropriate service schedule for each bin location, we will then share this information with the municipality. Once this information is collected and shared, a service schedule program will be agreed upon by both parties and put into place. This service schedule is completely flexible and can be changed at any time to meet the demands of the donations provided. Please note that Diabetes will also be responsible to moving any additional items (small household items or other items) that are placed in the area surrounding the bin, keeping the area clean and presentable at all times.

Newmarket Multi-Residential Donation Bins – Design and Dimensions

There are two Diabetes Canada donation bin sizes which are utilized at multi-residential sites.

Design: Please see the included sheet

Indoor Bin: These bins are typically placed in the recycling room, garbage room, moving room and underground parking lots of these facilities.

Dimensions: 39"W x 24"D x 61.5"H

Outdoor Bin: These bins are typically placed in the back of the building, when indoor space is not available.

Dimensions: 47"W x 40"D x 68"H

Roll-out Plan and Timetable

Diabetes Canada has the full capabilities to roll-out this entire program in approximately 30-45 days. This would involve conducting a site visit at each site, where we would meet with the property manager and or building superintendent to find a suitable location of a bin.

Insurance and WSIB Coverage

Diabetes Canada is responsible for supplying, maintaining, servicing and insuring all our textile donation bins. The following documents have included:

1. Certificate of Insurance (example)
2. WSIB Clearance Certificate

Textile Collection Data including Sustainability and Impact Reports

Diabetes Canada will provide Newmarket with quarterly and yearly collection reports that will summarize the total amount of textiles (by pounds) that were diverted from landfill. This collection data will be tracked on a weekly basis and will always be made available to the municipality when required. Our impact reports will also outline how these collection efforts have impacted our organization and the 11 million Canadians that suffer from Diabetes and Pre-Diabetes. For example, Diabetes Canada will be able to quantify how many children were able to attend our D-Camp program (for children that have Type 1 Diabetes) as the result of the donations that we received. All this information can also be shared with the public so that they have clear understanding of how their textile donations are impacting our organization.

Customer Service

Since 1985 Diabetes Canada (formerly Canadian Diabetes Association Clothesline) has been collecting donations of resalable clothing and small household items from Canadians.

- Our fleet of trucks and drivers make over 1.7 million house pickups annually and collect regularly from more than 4,500 bin locations.
- Our own inbound and outbound call centre, places over 10 million calls annually
- Relationships are maintained with over 2,000 individual hosts who partner with us to place a donation bin on their property including longstanding partnerships with various organizations, such as municipalities, leading property management firms and some of Canada's largest corporations.

Diabetes Canada relies solely on the generosity of donations to End Diabetes. We have extensive training for all our staff and drivers which includes customer service training focused on providing our donors with a superior customer service experience. To ensure that our staff and operations maintain high levels of service we have introduced Standardized Operating Procedures across our organization. As well, our Human Resources Manual contains the following policies which all employees must review upon start of employment and adhere to throughout their employment.

- Policy 2.0.0 Code of Conduct
- Policy 2.1.0 Human Rights
- Policy 2.2.0 Violence in the Workplace
- Policy 2.3.0 Employee Relationship to Volunteers

- Policy 2.10.0 Dress Standards/Uniform Policy
- Policy 2.11.0 Alcohol/Substance Use

Health and Safety

- Policy 3.0.0 OHS
- Policy 3.1.0 Smoking in the Workplace
- Policy 3.2.0 Allergies and Sensitivities
- Policy 3.3.0 Personal Hygiene/Grooming

Management of Material Streams for donations collected

Diabetes Canada

Every year, we ask Canadians to keep Diabetes Canada in mind when they're cleaning and getting rid of gently used clothing, textiles and small household items.

Since 1985, the Canadian Diabetes Association Clothesline program now **Diabetes Canada** has enjoyed an exclusive partnership with Value Village where all items donated generate much needed funding for Diabetes Canada. Value Village is a thrift retailer, owned and operated by Savers Inc.

Diabetes Canada's textile diversion program is responsible for soliciting, picking-up and delivering goods to Value Village stores. Diabetes Canada is paid by the volume of goods delivered. Value Village operates the retail store.

Items which Diabetes Canada collects include, but are not limited to:

- Clothing, Shoes and Accessories
- Bed & Bath (towels, pillows, blankets etc)
- Draperies & Linens
- Plush Toys

Value Village

Our partner, Value Village, leads the industry in textile reuse and recycling, with over 95% of all clothing items avoiding disposal annually. Each item is sorted and assessed to ensure that it has been given the best opportunity to be useful again.

Value Village sells goods to shoppers on their sales floor, to wholesale processors, and to commodity recyclers in repurposed forms (i.e. copper content from holiday lights, fabric into insulation or rags); each transaction diverts reusable items from landfills.

In the rare case when they aren't able to find a new purpose for any given donation, Value Village compacts materials and works with waste management companies to responsibly dispose of them. They take care to select waste management partners that closely monitor their freight. For example, their waste partners evaluate intake at specialized material reuse facilities; this often means that, even in cases where they lack capability to recycle a particular item, their partners can recover the goods downstream and recycle them thanks to their due diligence. Value Village partners also regularly perform audits of their waste stream in order to give them a better understanding of what they are choosing to pass to them.

Recycling is serious business for Value Village. They've dedicated an entire division of their company to the practice and have indirectly enabled the employment of several thousand people worldwide via their recycling customers. Still, 'recycling' is often a misnomer for the type of work they do because the vast majority of the goods processed are reused in the item's original form. In other words, clothing is often put back to use as clothing, books are rarely converted to pulp and so forth. In cases where this simply isn't possible, they find a workaround: textiles can be repurposed as insulation and metals from clothing and electronics can be sold for their raw value. All in all, Value Village prevents more than 650 million pounds of goods from reaching landfills annually.

Value Add Activities

In addition to these multi-residential bins, Diabetes Canada would like to work with the Town of Newmarket to provide additional 'value add' services to the area residents.

Some ideas in the future could include working with area residents, schools, and youth groups to raise awareness of the human impact of diabetes and the environmental impact of not reusing and recycling clothing, household items, etc. while highlighting the significant positive impact of reusing and recycling items through donation.

Although this is not an exhaustive list events and activities may include:

- Provide education seminars to the residents at multi residential sites
Topics could include:
 - Environmental Awareness
 - Reuse and Recycling
 - Diabetes Awareness
 - How to Manage Diabetes

On behalf of the 11 million Canadians that have diabetes and pre-diabetes, we sincerely appreciate your consideration Diabetes Canada's multi-residential textile diversion program for the Town of Newmarket.

Should you have any questions regarding any aspect of this proposal, please do not hesitate to contact us.

We look forward to hearing from you.

Simon Langer

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Bin Design:

Textile Diversion Program for the Town of Newmarket in support of [Diabetes Canada](#)
Changing the Conversation – Clothing Donation Bin Bylaws to Textile Diversion Strategies

The Importance of Textile Diversion:

- **85%** of all textiles go to landfill sites across Canada
- Textiles account for **5-11%** of all garbage
- It is estimated that over **500,000 tons** of textile waste is going to Ontario's landfill sites every year
- Studies indicate that every consumer in Canada produces **30-40 kilograms (66-88 Lbs.)** of textile waste per year
- Based on Stats Canada research, Canadians spent **\$36.7 Billion** in Retail Clothing last year - more used clothes will be coming to our landfills, municipalities need to take action!

Who We Are

- Diabetes Canada's Textile Diversion programs contribute **\$10 million/year** to Diabetes Canada to support its mission to **End Diabetes**
- Diabetes Canada supports the **11 million Canadians (30% of the population)** that suffer from diabetes or pre-diabetes
- Diabetes Canada diverts over **100M Lbs** of textiles from landfill every year
- Diabetes Canada has over **100** municipal partnerships across Canada, including The City of Toronto, The Township of King, Simcoe County, The City of Ottawa, The City of Markham, The City of Vancouver, The City of Calgary, The City of Peterborough, Peel Region, Durham Region, among many others.
- Diabetes Canada collects textiles from **1.7M homes, 4,000 textile diversion bins and 2,900 partnerships**
- Diabetes Canada is a member and or partner of the **National Zero Waste Council, Municipal Waste Association, Ontario Waste Management Association, Partners in Project Green, the Recycling Council of Alberta, Coast Waste Management Association**, among many other established and reputable sustainability and environmental organizations that work with us in bringing attention to the importance of textile diversion and recycling

Transitioning From Standard Clothing Bin Bylaws to a Comprehensive Textile Diversion Strategy:

- Clothing Donation Bylaws have not proved to be a successful deterrent for illegal bin placements in the majority of municipalities across Canada
- Bylaws that restrict strategic bin placements in a municipality simply encourage textiles going to the landfill
- The majority of bylaws have not proven themselves capable of dealing with "charity pretenders" that use certain terminology to misrepresent their "causes" identity – which negatively impacts diversion efforts
- In most cases, "Charity Pretenders" do not have the operational capabilities to service their bins appropriately, so they become dumping grounds, and residents rightfully complain, this further hinders our ability to divert textiles from landfill

- **“Along with expanding the textile recycling program, the plan this year is twofold: to be more aggressive with unregulated donation bins, and to ban textiles from curbside collection. We should send the message, if you put a bin in Markham, we will confiscate it,” as stated by Claudia Marsales, Senior Manager, Waste Management, City of Markham, who called for tougher bylaws on non-regulated clothing donation bins. (please see enclosed article “ Markham's textile recycling program to save taxpayers \$86,000”)**
- Donation bin bylaw enforcement is an expensive and time consuming process, it might be more proactive to utilize resources to create communication strategies that educate the public about the importance of textile recycling, and inform residence where they can find reputable municipal sponsored textile diversion bins
- Providing convenient and accessible clothing Donation Bins are the cornerstone of running a successful textile diversion program, recent research suggests that only 40% of the population is aware of a donation bin that is convenient and highly accessible in most communities
- **We are kindly requesting that the Town of Newmarket continue their leadership position in sustainability and waste management and join with Diabetes Canada in expanding our very successful partnership in textile diversion to create the Town of Newmarket’s own municipally sponsored Textile Diversion Program in support of Diabetes Canada**

The Town of Newmarket and Diabetes Canada – opportunities to expand:

Strategic Municipal Placements:



Newmarket Town Hall = 2 bins

Ray Twinney Recreation Complex = 2 bins

Hollingsworth Arena = 2 bins

Newmarket Seniors Meeting Place = 2 bins

Newmarket Community Centre Lions Hall = 2 bins

Total Pilot Locations = 5

Total Pilot Bins = 10

Based on our current collection averages in York Region, all **5** prospective sites could potentially divert an additional **150,000** pounds of textiles from the landfill each year and would send an additional **20 children** to our D-Camp program annually.

Multi-Residential Placements:



The Town of Newmarket currently has approximately **20** multi-residential buildings = 10 pilot locations = 10 bins

Based on our current national collection averages, the 10 prospective sites could potentially divert over **50,000** pounds from the landfill each year and send an additional **7 children** to our D-Camp program annually.

Overall Social and Environmental Impact – Municipal and Multi-Residential Sites

The Town of Newmarket Annual Social and Environmental Impact					
Annual Collection from Municipal & Multi-Res Sites	Lbs Collected Annually in Kg's	Kids to D-Camp	Kg of Co2 reduction	Trees Saved	Cars Driven Around the World
200,000	90,718	27	226,796	16,329	82

What are the benefits for the Town of Newmarket to create their own municipal and multi-residential textile diversion program, in partnership with Diabetes Canada?

- Through partnering with Diabetes Canada and York University, the Town of Newmarket will be contributing to Canada's first national textile diversion research study
- Potential to divert over **200,000** pounds of textiles from the landfill (conservative estimates)
- Education and awareness campaign that addresses textile waste and collection efforts
- Significant cost saving for the the Town of Newmarket and York Region's waste management infrastructure
- Customized operational service plan to meet the specific needs of the the Town of Newmarket (service runs 7 days a week)
- Diabetes Canada is fully insured, \$2 million liability insurance for each bin placement
- Town of Newmarket branded textile diversion bins at no additional cost (supplied and maintained by Diabetes Canada)
- Textile collection diversion data provided on provided on an ongoing basis
- Convenient and accessible donation locations to help increase textile waste diversion
- Diabetes Canada's textile diversion program is a **FREE** service

Steps to Expand the Town of Newmarket's Textile Diversion Program with Diabetes Canada and York University

1. Diabetes Canada and York University provides the Town of Newmarket with our Textile Diversion Pilot Program and Research Study Proposal
2. Town of Newmarket Textile Diversion Program Proposal accepted
3. Joint communication piece created to educate the public about the importance of textile diversion
4. Municipal sites selected (i.e. multi-res, strategic placements, environmental day initiatives)
5. Bin location determined at each individual site
6. Customized service schedule created for each site
7. Town of Newmarket textile diversion bins are ordered and placed
8. Municipal Textile Diversion Data collected and provided on an ongoing basis
9. Social impact & sustainability reports delivered to the Town of Newmarket on an ongoing basis
10. Program adjusted on an ongoing basis

On behalf of the 11 million Canadians that suffer from Diabetes and prediabetes, we sincerely appreciate your kind consideration of Diabetes Canada's Textile Diversion Program for the Town of Newmarket.

Sincerely Yours,

Simon Langer

Manager, Government and Strategic Partnerships
National Diabetes Trust

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May 24, 2017

**JOINT OFFICE OF THE CAO/STRATEGIC INITIATIVES,
DEVELOPMENT AND INFRASTRUCTURE SERVICES AND CORPORATE SERVICES
COMMISSIONS REPORT 2017-05**

TO: Mayor Van Bynen and Members of Council

SUBJECT: Supplemental Capital Budget - Government Grant Funding Approvals

ORIGIN: Strategic Initiatives Office

RECOMMENDATIONS

THAT Joint Office of the CAO/Strategic Initiatives, Development and Infrastructure Services and Corporate Services Commissions Report 2017-05 regarding Supplementary Capital Budget – Government Grant Funding Approvals be received and the following recommendations be adopted:

- 1. THAT the proposed 2017 Supplementary Capital Budget with expenditures of \$3,125,000 be approved.**

COMMENTS

Joint Office of the CAO/Strategic Initiatives and Development and Infrastructure Services Information Report 2017-03 dated April 28, 2017 provided an update on government grant funding. This report provides a further update, in light of a recent grant funding announcement, as well as a request for approval of a 2017 Supplementary Capital Budget.

Background

Staff submitted nine (9) Water/Wastewater project applications through the Clean Water Wastewater Fund on January 26, 2017. The timing of these applications followed the setting of the budget target and draft budget information made available to the public December 12, 2016. The formal adoption of the 2017 Budget by Council occurred on February 13, 2017. At that time, staff had no information on the status or possibility of success of the Clean Water Wastewater Fund applications. On May 23, 2017 it was announced that Newmarket was successful in receiving approval for 8 applications totaling \$3,125,000 worth of infrastructure projects with the following funding sources:

- Federal Government - \$1,562,500 (50%)
- Provincial Government - \$781,250 (25%)
- Town's requirement - \$781,250 (25%)

Hence, staff is requesting Council approval of the 2017 supplementary capital budget in the amount of \$3,125,000 for the following infrastructure projects:

Project	Total Costs	Federal Contribution	Provincial Contribution	Town Contribution
Optimization and Automation of Drinking Water Distribution System (study and plan)	\$700,000	\$350,000	\$175,000	\$175,000
Newmarket watermain condition assessment program	\$750,000	\$375,000	\$187,500	\$187,500
Asset Condition Assessment and Develop Maintenance Strategy for Water / Wastewater Valves	\$225,000	\$112,500	\$56,250	\$56,250
Develop and implement backflow prevention / cross connection program	\$100,000	\$50,000	\$25,000	\$25,000
Development and Implementation of a GIS Strategy for Water and Wastewater Linear Assets	\$250,000	\$125,000	\$62,500	\$62,500
Condition Inspection, Design and Remediation of Gorham Street watermain	\$500,000	\$250,000	\$125,000	\$125,000
Assessment, Construction and Implementation of a Drinking Water System Dead-End Looping Strategy in the Central Pressure Zone	\$200,000	\$100,000	\$50,000	\$50,000
Srigley Street Structural Relining of existing Cast Iron Watermain	\$400,000	\$200,000	\$100,000	\$100,000
TOTAL	\$3,125,000	\$1,562,500 (50%)	\$781,250 (25%)	\$781,250 (25%)

The Town's portion will come from the Asset Replacement Fund (ARF) (\$100,000) and Water and Wastewater Reserves (\$681,250).

STRATEGIC AND BUSINESS PLAN LINKAGES

This report supports and aligns with:

- the Town's Strategic Plan vision of "Being Well beyond the ordinary" in all five strategic directions;
- the Town's Asset Management Plan; and
- Council's Strategic Priority theme of Efficiency / Financial Management

CONSULTATION

Public

Information about this report has been posted in the Town Page on June 1, 8 and 15, 2017 providing the public with at least 21 days' notice prior to the report and recommendations being considered at the June 19, 2017 Committee of the Whole meeting.

Administrative

This Report has also been circulated to members of the Strategic and Operational Leadership Teams for input as appropriate.

HUMAN RESOURCE CONSIDERATIONS

Additional project management will be required to deliver these projects and would be secured through temporary or consulting assignments. These positions would be funded through the noted project budget(s).

BUDGET IMPACT

Operating Budget and Capital Budgets (Current and Future)

The proposed 2017 Supplementary Capital Budget includes \$3,125,000 in new expenditures. Funding will come from the Federal and Provincial governments and the Town (50%, 25% and 25% respectively).

The impact on the Operating Budget is anticipated to be minimal.

CONTACT

For more information on this report, contact Peter Noehammer, Commissioner, Development and Infrastructure Services at pnoehammer@newmarket.ca or at 905-953-5300 Ext. 2201.



Cindy Wackett
Corporate Project Consultant
Strategic Initiatives



per Mike Mayes, Director
Financial Services/Treasurer



Esther Armchuk, Commissioner
Corporate Services



Chris Kalimootoo, Director
Public Works Services



Peter Noehammer, Commissioner
Development and Infrastructure Services



Bob Shelton, CAO

e-copies: Strategic Leadership Team
Operational Leadership Team

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June 7, 2017

CORPORATE SERVICES REPORT – FINANCIAL SERVICES – 2017-26

TO: Mayor Tony Van Bynen and Members of Council
SUBJECT: 2017 Six-Year Water and Wastewater Financial Plan
ORIGIN: Financial Business Analyst

RECOMMENDATION:

THAT Corporate Services Report - Financial Services-2017-26 dated June 7, 2017 regarding the 2017 Six-Year Water and Wastewater Financial Plan be received and the following recommendation be adopted:

THAT Council adopt the proposed 2017 Six-Year Water and Wastewater Financial Plan.

COMMENTS:

Purpose

The purpose of this report is to update the water and wastewater plan to better reflect consumption levels, rate revenues and amortization expenses.

Budget Impact

The impact of adopting this financial plan is that the projected combined water and wastewater rates will increase by an average of 4.6% per year for the typical residential customer and by an average of 6.3% for typical commercial and industrial property. This represents an average annual increase of \$57 for the typical residential property and an average annual increase of \$799 for the typical commercial and industrial property over the 2018-2023 period.

Summary

Due to better than expected revenues, the rates are being adjusted to ensure cost recovery. By adopting this financial plan, projected annual rates will decrease by \$61 for the average residential property in 2021 as compared to the previous plan.

Background

The Sustainable Water and Sewage System Act, 2002 (SWSSA) requires that both water and wastewater systems are financially self-sustaining. The Town's Six-Year Water and Wastewater Financial Plan helps to ensure that the utilities are financially sustainable. The last water and wastewater financial plan was updated in 2015.

The utilities are performing better than projected. Staff is recommending revising the projections to ensure that the utilities perform at a cost recovery level. This will result in a lower rate increase than the previous plan.

Rate Drivers

Three major factors are driving the recommended reduction of rate increases compared to the previous financial plan. These factors are consumption projections, revenue projections and amortization expenses.

1. Consumption Projections

The Town previously experienced a per capita consumption decrease of 3.25% per year. The previous plan assumed this trend would continue. However, the past three years of consumption have been better than projected. This plan assumes per capita consumption will decrease by 2.25%. This adjustment reduces the rate increase in this plan.

2. Revenue Projections

Additional adjustments were made to the revenue projections to increase their accuracy. With more accurate projections, the Town will expect higher revenue than in the previous plan. These adjustments reduce the rate increases in this plan.

3. Amortization Expenses

This plan increases the expected useful life of the water and wastewater mains from 50 to 80 years, to better reflect their lifespans. As the estimated useful life of the assets is higher, the annual amortization expense is lower.

Despite better than expected revenues and lower amortization expenses, rates need to increase over the course of the financial plan due to three major factors:

1. Inflation and Growth

Inflation is a constant cost driver in the municipal sector. This plan assumes a 2.5% inflation rate for the utility. What's more, consumption in Newmarket is not increasing but due to new development, the service area is growing. A growing service area means new costs. This plan assumes maintenance costs will increase by 1.24% per year due to growth.

2. Regional Rate Increases

The Region is the bulk supplier of water to the Town. The Region's rate projections cover up to and including 2021. The Region projects to increase its rate by 9% per year up until and including 2020, and projects to increase its rate by 3% in 2021. It is conservatively estimated in the Town's recommended water and wastewater financial plans that the Region's rate increases will be 4% per year in 2022 and 2023.

3. Emergency Maintenance

Water main breaks have become more challenging due to the pipe material and type of break. The Town currently contracts out a significant portion of its emergency repairs. Staff is currently reviewing if contracted repairs are the best way to handle unpredictable main breaks. The current impact of the more challenging main breaks is an estimated upward pressure of 1.25% on the combined water and wastewater rates.

Reserves and Reserve Funds

The water and wastewater utilities have reserves to cover unexpected circumstances and asset replacement. These reserves are the Rate Stabilization Reserve and the Asset Replacement Fund.

Rate Stabilization Reserve

To stabilize rates, the Town has a rate stabilization reserve, which the Town draws from during years of low consumption and contributes to in years of higher consumption. The Town has set a rate stabilization reserve guideline to be between 5% and 10% of rate revenues. Because of higher than expected revenue in previous years, the rate stabilization reserve has exceeded the 10% range. Therefore, this plan eases the balance back to the guideline range by reducing rate increases.

Table 1: Rate Stabilization Reserve as a percent of rate revenues

	2016	2017	2018	2019	2020	2021	2022	2023
Rate Stabilization Reserve as a % of rate revenues	13.3%	14.2%	14.1%	13.6%	12.4%	11.7%	10.3%	8.1%

Capital Renewal and Investments

Water and wastewater pipes reliably last nearly a century and are costly to replace. It is prudent to set money aside as these assets age. The Town has set up asset replacement funds to ensure that the water and wastewater assets can be replaced once they reach the end of their useful lives and the Town can maintain current service levels.

The Town tracks the capital reserve as a percent of accumulated amortization. By tracking the capital reserve as a percent of accumulated amortization, the Town can track whether it is setting sufficient money aside to ensure the Town can replace its aging assets and preserve current service levels. The target capital reserve as a percent of accumulated amortization is 100%.

Table 2: Capital Reserves as a percent of accumulated amortization

	2016	2017	2018	2019	2020	2021	2022	2023
Capital Reserves as a % of accumulated amortization	57.7%	60.7%	59.7%	59.2%	59.2%	63.7%	68.5%	73.7%

The capital reserves as a percent of accumulated amortization will remain around 60% from 2017 to 2020 due to the Smart Meter Project. The replacement project will help the Town better measure water consumption, which enables the Town to lower the rate increases.

This plan ensures that the capital expenditures as outlined in the Town's *Asset Management Plan* adopted in 2014 will be financed through contributions to the Asset Replacement Fund.

Town Rate Projections

The above analysis shows the strong financial health of the water and wastewater utilities. This plan recommends an average annual increase of 4.6%.

The following table compares the projected combined revenue increases of the current 2015 Six-Year Water and Wastewater Financial Plans and recommended 2017 Six-Year Water and Wastewater Financial Plans.

Table 3: Comparison of Rate Increases and rates between 2015 and 2017 Six-Year Water and Wastewater Financial Plans

2015 Water and Wastewater Financial Plan Rates						
	2018	2019	2020	2021	2022	2023
Rate Increase (%)	6.9%	7.2%	7.2%	4.0%	n/a	n/a
Volumetric Rate (per m ³)	\$3.99	\$4.27	\$4.58	\$4.77	n/a	n/a
Fixed Rate (per month)	\$33	\$35	\$38	\$39	n/a	n/a
2017 Water and Wastewater Financial Plan Rates						
	2018	2019	2020	2021	2022	2023
Rate Increase (%)	5.9%	5.1%	4.9%	4.0%	3.8%	3.8%
Volumetric Rate (per m ³)	\$3.93	\$4.13	\$4.33	\$4.50	\$4.67	\$4.85
Fixed Rate (per month)	\$33	\$34	\$36	\$38	\$39	\$40

Rate Impact

There is a lower projected rate increase in this recommended plan than the previous plan. Table 4 compares the annual water and wastewater rates paid by the average residential property owner. In 2021, the average homeowner will save \$61 in this plan compared to the 2015 plan projections.

Table 4: Impact of Implementing the Recommended 2017 Water and Wastewater Financial Plan

	2018	2019	2020	2021	2022	2023
2015 Water and Wastewater Financial Plan average annual residential bill	\$1,181	\$1,266	\$1,358	\$1,412	n/a	n/a
2017 Water and Wastewater Financial Plan average annual residential bill	\$1,179	\$1,238	\$1,299	\$1,351	\$1,403	\$1,457
Annual savings compared to previous plan	\$2	\$28	\$59	\$61	n/a	n/a

The water and wastewater bill is comprised of volumetric and fixed charges. The basic fixed charge residential customers pay is set to be 33% of the total annual residential bill.

The Town is currently in the process of implementing tiered fixed rates where customers with larger meters pay more. The reason for this rate structure is because larger meters are more costly to maintain and require greater standby capacity. As a result, the average customer with a 2" meter or larger will have an average increase of 7.1% per year.

Table 5 shows the average annual charges projected in this plan for all customer types broken down by meter size. 66% of businesses in Newmarket have a residential sized meter (smaller than 2").

Table 5: Annual Water and Wastewater Bill by Meter Type

	Quantity	2018	2019	2020	2021	2022	2023
Residential Meter	26,530	\$1,179	\$1,238	\$1,299	\$1,351	\$1,403	\$1,457
2" Meter	271	\$19,658	\$21,461	\$23,384	\$24,320	\$25,244	\$26,204
3" Meter	42	\$30,076	\$33,120	\$36,376	\$37,831	\$39,271	\$40,767
4" Meter	33	\$91,408	\$98,536	\$106,096	\$110,340	\$114,522	\$118,863

BUSINESS PLAN AND STRATEGIC PLAN LINKAGES

This report links to Newmarket's key strategic directions in being Well Managed through fiscal responsibility.

CONSULTATION

Public Works Services was consulted to obtain a better understanding of the emergency maintenance costs.

HUMAN RESOURCE CONSIDERATIONS

Not applicable to this report.

BUDGET IMPACT

Operating Budget (Current and Future)

The impact of adopting this financial plan is that the projected combined water and wastewater rates will increase by an average of 4.6% per year for the average residential customer and by an average of 7.1% for the average customer with a 2" meter or larger over the period 2018-2023.

Capital Budget

Not applicable to this report.

CONTACT

For more information on this report, contact: Mike Mayes at 905-953-5300, ext. 2102 or via e-mail at mmayes@newmarket.ca



Kevin Yaraskavitch
Financial Business Analyst



per Mike Mayes, CPA, CGA, DPA
Director, Financial Services/Treasurer



Esther Armchuk, LL.B
Commissioner, Corporate Services

MM/ne

Attachments:

- a) 2017 Six-Year Water Financial Plan (9 pgs.)
- b) 2017 Six-Year Wastewater Financial Plan (9 pgs.)

THE CORPORATION OF THE TOWN OF NEWMARKET

2017 Six-Year Water Financial Plan

CONTENT	Page
Statement of Financial Position	1
Statement of Operations	2
Statement of Changes in Net Financial Assets	3
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Notes to the Water Financial Plan	5-8

**THE CORPORATION OF THE TOWN OF NEWMARKET
WATER SYSTEM**

2017 Six-Year Water Financial Plan

As at December 31

Statement of Financial Position

	2016	FORECAST						
		2017	2018	2019	2020	2021	2022	2023
Financial Assets								
Cash and cash equivalents	\$23,987,055	\$25,852,857	\$23,628,281	\$21,817,828	\$20,549,472	\$22,726,427	\$24,985,400	\$27,287,415
Accounts receivable	2,394,285	2,300,000	2,536,000	2,772,000	2,973,000	3,077,000	3,169,000	3,264,000
Inventory for resale	57,197	57,197	57,197	57,197	57,197	57,197	57,197	57,197
Total Financial Assets	26,438,537	28,210,054	26,221,478	24,647,025	23,579,669	25,860,624	28,211,597	30,608,612
Liabilities								
Accounts payable & accrued liabilities	1,190,448	2,505,000	2,703,000	3,009,000	3,128,000	3,245,000	3,348,000	3,454,000
Interest payable on debt	156,223	156,223	156,223	156,223	156,223	114,000	114,001	114,002
Deferred revenue	503,077	513,000	523,000	533,000	544,000	555,000	566,000	577,000
Long-term debt	5,050,037	4,758,037	4,457,037	4,147,037	3,828,037	3,500,037	3,163,037	2,817,037
Total Liabilities	6,899,785	7,932,260	7,839,260	7,845,260	7,656,260	7,414,037	7,191,038	6,962,039
Net Financial Assets	19,538,752	20,277,794	18,382,218	16,801,765	15,923,409	18,446,587	21,020,559	23,646,573
Non-Financial Assets								
Tangible Capital Assets	53,591,368	55,404,776	60,546,155	65,640,864	70,689,265	72,358,401	74,023,654	75,685,418
Total Non-Financial Assets	53,591,368	55,404,776	60,546,155	65,640,864	70,689,265	72,358,401	74,023,654	75,685,418
Total Net Assets	73,130,120	75,682,569	78,928,373	82,442,628	86,612,674	90,804,988	95,044,213	99,331,990
Accumulated Surplus	\$73,130,120	\$75,682,569	\$78,928,373	\$82,442,628	\$86,612,674	\$90,804,988	\$95,044,213	\$99,331,990

**THE CORPORATION OF THE TOWN OF NEWMARKET
WATER SYSTEM**

2017 Six-Year Water Financial Plan

For the years ended December 31

	2016	FORECAST							Statement of Operations		
		2017	2018	2019	2020	2021	2022	2023			
Revenues											
Rate based revenue	\$15,171,352	\$15,335,617	\$16,909,802	\$18,479,478	\$19,821,014	\$20,512,932	\$21,127,705	\$21,761,771			
Contributed / Assumed assets	1,737,381	1,737,381	1,737,381	1,737,381	1,737,381	1,737,381	1,737,381	1,737,381			
Gain/loss on sale of tangible capital assets	-	-	-	-	-	-	-	-			
Investment income	313,031	233,234	229,037	209,686	191,844	192,356	211,582	233,235			
Other revenue	281,960	287,599	293,351	299,218	305,202	311,306	317,533	323,883			
Total Revenues	17,503,724	17,593,831	19,169,571	20,725,763	22,055,441	22,753,975	23,394,200	24,056,270			
Expenditures											
Water purchases	7,790,787	8,349,944	9,011,485	10,029,359	10,426,016	10,817,678	11,159,669	11,512,472			
Operating and maintenance	4,085,054	4,238,000	4,397,000	4,562,000	4,733,000	4,910,000	5,094,000	5,285,000			
Allocated overhead	1,077,041	1,109,000	1,142,000	1,176,000	1,211,000	1,247,000	1,284,000	1,323,000			
Interest expense	286,165	281,165	276,165	271,165	266,165	261,165	256,165	251,165			
Amortization	1,025,484	1,063,273	1,097,117	1,172,983	1,249,214	1,325,819	1,361,141	1,396,856			
Total Expenditures	14,264,532	15,041,382	15,923,767	17,211,507	17,885,396	18,561,662	19,154,975	19,768,493			
Annual Surplus / (Deficit)	3,239,192	2,552,449	3,245,804	3,514,255	4,170,046	4,192,313	4,239,225	4,287,777			
Accumulated Surplus, beginning of year	69,890,928	73,130,120	75,682,569	78,928,373	82,442,628	86,612,674	90,804,988	95,044,213			
Accumulated Surplus, end of year	\$73,130,120	\$75,682,569	\$78,928,373	\$82,442,628	\$86,612,674	\$90,804,988	\$95,044,213	\$99,331,990			

**THE CORPORATION OF THE TOWN OF NEWMARKET
WATER SYSTEM**

2017 Six-Year Water Financial Plan

For the years ended December 31

Statement of Changes in Net Financial Assets

	2016	FORECAST						
		2017	2018	2019	2020	2021	2022	2023
Annual surplus / (Deficit)	\$3,239,192	\$2,552,449	\$3,245,804	\$3,514,255	\$4,170,046	\$4,192,313	\$4,239,225	\$4,287,777
Less: Acquisition of tangible capital assets	-1,454,927	-1,139,300	-4,501,116	-4,530,310	-4,560,235	-1,257,574	-1,289,013	-1,321,238
Less: Contributed tangible capital assets	-1,737,381	-1,737,381	-1,737,381	-1,737,381	-1,737,381	-1,737,381	-1,737,381	-1,737,381
Add: Amortization of tangible capital assets	1,025,484	1,063,273	1,097,117	1,172,983	1,249,214	1,325,819	1,361,141	1,396,856
Add: Proceeds from sale of TCA								
Less: Gain on sale of tangible capital assets								
Changes in Net Financial Assets	1,072,368	739,042	- 1,895,576	- 1,580,453	- 878,356	2,523,178	2,573,972	2,626,014
Net Financial Assets, beginning of year	18,466,384	19,538,752	20,277,794	18,382,218	16,801,765	15,923,409	18,446,587	21,020,559
Net Financial Assets, end of year	\$19,538,752	\$20,277,794	\$18,382,218	\$16,801,765	\$15,923,409	\$18,446,587	\$21,020,559	\$23,646,573

**THE CORPORATION OF THE TOWN OF NEWMARKET
WATER SYSTEM
2017 Six-Year Water Financial Plan**

For the years ended December 31

Statement of Cash Flows

	2016	FORECAST						2022	2023
		2017	2018	2019	2020	2021	2022		
Cash Provided By (Used in):									
Operating Activities									
Annual surplus/deficit	3,239,192	2,552,449	3,245,804	3,514,255	4,170,046	4,192,313	4,239,225	4,287,777	
Add: Amortization	1,025,484	1,063,273	1,097,117	1,172,983	1,249,214	1,325,819	1,361,141	1,396,856	
Less: Contributed/assumed assets	-1,737,381	-1,737,381	-1,737,381	-1,737,381	-1,737,381	-1,737,381	-1,737,381	-1,737,381	
Less: Gain on sale of tangible capital assets	0	0	0	0	0	0	0	0	
(Increase)/decrease in A/R	-105,285	94,285	-236,000	-236,000	-201,000	-104,000	-92,000	-95,000	
(Increase)/decrease in inventory for resale	42,803	0	0	0	0	0	0	0	
Increase/(decrease) in A/P	-1,201,329	1,314,552	198,000	306,000	119,000	74,777	103,001	106,001	
Increase/(decrease) in deferred revenue	77	9,923	10,000	10,000	11,000	11,000	11,000	11,000	
Net change in cash from operating activities	1,263,561	3,297,101	2,577,540	3,029,857	3,610,879	3,762,528	3,884,986	3,969,253	
Capital Activities									
Proceeds from sale of tangible capital assets									
Cash used to acquire tangible capital assets	-1,454,927	-1,139,300	-4,501,116	-4,530,310	-4,560,235	-1,257,574	-1,289,013	-1,321,238	
Net change in cash from capital activities	-1,454,927	-1,139,300	-4,501,116	-4,530,310	-4,560,235	-1,257,574	-1,289,013	-1,321,238	
Financing Activities									
Proceeds from debt issues									
Net change in cash from financing activities	-239,526	-292,000	-301,000	-310,000	-319,000	-328,000	-337,000	-346,000	
Net Change in Cash	-430,892	1,865,802	-2,224,576	-1,810,453	-1,268,356	2,176,955	2,258,973	2,302,015	
Cash, beginning of year	24,417,947	23,987,055		23,628,281	21,817,828	20,549,472	22,726,427	24,985,400	
Cash, end of year	\$ 23,987,055	\$ 25,852,857	\$ 23,628,281	\$ 21,817,828	\$ 20,549,472	\$ 22,726,427	\$ 24,985,400	\$ 27,287,415	

THE CORPORATION OF THE TOWN OF NEWMARKET

Notes to the 2017 Six-Year Water Financial Plan

2017 Six-Year Water Financial Plan

The Town of Newmarket, with a population of approximately 87,000, is located in the Regional Municipality of York, Province of Ontario, Canada. The Town owns and operates its Drinking Water Distribution System that consists of 315 kilometers of distribution water mains and distributes drinking water to approximately 29,000 property owners. The Region of York is responsible for water supply, production, treatment, storage, and trunk distribution.

1. SAFE DRINKING WATER ACT

Under the *Safe Drinking Water Act*, 2002, S.O. 2002, c.32, the Town was issued a municipal drinking water licence for its drinking water distribution system on August 23, 2011. As per *Safe Drinking Water Act* regulation O. Reg. 453/07, the Town must provide to the Ministry of Municipal Affairs and Housing a minimum six year water financial plan within six months after the date the licence is issued.

The six year financial plan must include: Statement of Financial Positions, Statement of Operations, Statement of Net Financial Assets, and Statement of Cash Flows.

The financial plan must be approved by a resolution that indicates that the drinking water system is financially viable and that is passed by the Council of the Municipality.

2. FINANCIAL PLAN ASSUMPTIONS

The development of the projected six year consolidated financial statements incorporates the trend from 2013 to 2016, and assumptions for decreases of consumption volumes, inflationary factors, lifecycle capital replacement forecast, and water rate forecast.

3. FINANCIAL ASSETS

Financial assets consist of cash & cash equivalents, accounts receivables and inventory for resale. Inventory for resale is water meters to be sold to developers. Forecasted accounts receivable and inventory for resale are based on historical trends.

4. LIABILITIES

Liabilities consist of accounts payable and accrued liabilities, interest payable on debt, deferred revenue and long-term debt.

(a) Accounts Payable and Accrued Liabilities

Accounts payable and accrued liabilities represent the costs of goods and services acquired in the period and are recognized whether or not payments have been made or invoices received. Forecasted accounts payable and accruals are based on historical trend.

(b) Interest Payable on Debt

Interest payable on debt includes half of the balance of the unamortized premium of the debenture for the New Operations Centre and accrued interest expense for the debenture related to water.

THE CORPORATION OF THE TOWN OF NEWMARKET Notes to the 2017 Six-Year Water Financial Plan

(c) Deferred Revenue

Deferred revenue represents the balance of the area specific development charges related to water. These funds, by their nature, are restricted in their use and, until applied to specific capital works, are recorded as deferred revenue. Amounts applied to qualifying capital projects are recorded as revenue in the fiscal period they are expended.

(d) Long-term Debt

Long-term debt consists of the debenture and FCM loan for the New Operations Centre which will mature in 2029 and 2031 respectively, and the water portion of debt for the Harry Walker Parkway extension which will mature in 2024. No additional debentures are projected in this forecast period.

5. **TANGIBLE CAPITAL ASSETS (TCA)**

(a) Tangible Capital Assets

Tangible capital assets are physical assets with useful lives extending beyond the current year and are not intended for sale in the ordinary course of operations.

TCA are recorded at cost, which includes all amounts that are directly attributable to acquisition, construction, development or betterment of an asset. The cost, less residual value, of the tangible capital assets are amortized on a straight-line basis over their estimated useful lives as follows:

	<u>Useful Life - Years</u>
Buildings and building components	20 - 40
Vehicles	4 - 10
Machinery and equipment	3 - 10
Linear assets	
- Watermain	80

Annual amortization is charged in the year the asset is available for productive use and in the year of disposal. Assets under construction are not amortized until the asset is available for productive use.

Tangible capital assets are shown on a net basis in the financial statements. Residual value is assumed to be \$0 for all TCA contained within the forecast period. Gains/losses on disposal are assumed to be \$0 as well.

(b) Additions and Disposals

Additions are based on the Asset Management Plan and disposals are based on the historical trend from 2013 to 2016. For 2018 to 2020, additions forecasted include \$10.0 million in smart meter implementation costs. After the smart meter implementation, there will be a potential increase in revenues due to more accurate meter readings. These revenues are incorporated in the forecast starting in 2018.

THE CORPORATION OF THE TOWN OF NEWMARKET
Notes to the 2017 Six-Year Water Financial Plan

(c) Contributed / Assumed Assets

These are tangible capital assets contributed by developers or other parties. TCA received as contributions are recorded at their fair value at the date of receipt, and that fair value is also recorded as revenue. The forecasted amount of contributed /assumed assets is based on the historical trend.

(d) Summary of Water System Tangible Capital Assets

	2016	FORECAST							
		2017	2018	2019	2020	2021	2022	2023	
As at December 31									
Opening TCA Balance(Historical Cost)	\$82,029,658	\$85,052,784	\$87,760,283	\$93,829,597	\$99,928,107	\$106,056,540	\$108,882,313	\$111,739,525	
Additions	3,192,308	2,876,681	6,238,497	6,267,691	6,297,616	2,994,955	3,026,394	3,058,619	
Disposals	169,182	169,182	169,182	169,182	169,182	169,182	169,182	169,182	
Closing TCA Balance(Historical Cost)	\$85,052,784	\$87,760,283	\$93,829,597	\$99,928,107	\$106,056,540	\$108,882,313	\$111,739,525	\$114,628,963	
Opening Accumulated Amortization	30,541,004	31,461,416	32,355,507	33,283,442	34,287,243	35,367,275	36,523,912	37,715,871	
Amortization Expense	1,025,484	1,063,273	1,097,117	1,172,983	1,249,214	1,325,819	1,361,141	1,396,856	
Accumulated Amortization on Disposals	105,072	169,182	169,182	169,182	169,182	169,182	169,182	169,182	
Ending Accumulated Amortization	\$31,461,416	\$32,355,507	\$33,283,442	\$34,287,243	\$35,367,275	\$36,523,912	\$37,715,871	\$38,943,545	
Work - in - Progress	-	-	-	-	-	-	-	-	
Net Book Value	\$53,591,368	\$55,404,776	\$60,546,155	\$65,640,864	\$70,689,265	\$72,358,401	\$74,023,654	\$75,685,418	

6. NET FINANCIAL ASSETS

Net financial assets as defined is the difference between financial assets and liabilities and is a key indicator in determining the water system financial ability to replace its infrastructure. As reflected in the Statement of Changes in Net Financial Assets. The Town is in a net financial assets position which indicates the Town has sufficient resources to finance current and future activities. Forecasted net financial assets for the years 2017-2023 are \$20.3 million - \$23.6 million.

THE CORPORATION OF THE TOWN OF NEWMARKET
Notes to the 2017 Six-Year Water Financial Plan

7. ACCUMULATED SURPLUS

The Accumulated Surplus is comprised of the following:

	2016	FORECAST					
		2017	2018	2019	2020	2021	2021
<i>As at December 31</i>							
Water Rate Stabilization Reserve	\$1,556,714	\$1,009,379	\$829,229	\$812,017	\$1,327,640	\$1,706,914	\$1,871,590
Asset Replacement Fund	22,853,574	24,026,451	22,010,026	20,136,785	18,423,806	20,239,709	24,592,019
Investment in tangible capital assets	53,591,368	55,404,776	60,546,155	65,640,864	70,689,265	72,358,401	75,685,418
Debentures	-5,050,037	-4,758,037	-4,457,037	-4,147,037	-3,828,037	-3,500,037	-2,817,037
Accumulated Surplus	\$72,951,619	\$75,692,569	\$78,928,373	\$82,442,628	\$86,612,674	\$90,804,988	\$95,044,213
							\$99,331,990

THE CORPORATION OF THE TOWN OF NEWMARKET

2017 Six-Year Wastewater Financial Plan

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Statement of Operations	2
Statement of Changes in Net Financial Assets	3
Statement of Cash Flows	4
Notes to the Wastewater Financial Plan	5-8

THE CORPORATION OF THE TOWN OF NEWMARKET
Wastewater System
2017 Six-Year Wastewater Financial Plan

As at December 31

Statement of Financial Position

	2016	FORECAST									
		2017	2018	2019	2020	2021	2022	2023			
Financial Assets											
Cash and cash equivalents	\$21,604,360	\$26,713,669	\$29,960,326	\$33,083,384	\$35,859,916	\$38,812,141	\$42,132,069	\$45,684,208			
Accounts receivable	2,394,285	2,929,000	3,091,000	3,202,000	3,365,000	3,478,000	3,595,000	3,715,000			
Inventory for resale	-	-	-	-	-	-	-	-			
Total Financial Assets	23,998,645	29,647,669	33,051,326	36,285,384	39,224,916	42,290,141	45,727,069	49,399,208			
Liabilities											
Accounts payable & accrued liabilities	1,190,448	3,587,000	3,885,000	4,112,000	4,573,000	4,608,000	4,754,000	4,904,000			
Interest payable on debt	156,223	269,000	233,000	196,000	155,000	114,000	114,001	114,002			
Deferred revenue	150,270	153,000	156,000	159,000	162,000	165,000	168,000	171,000			
Long-term debt	5,050,037	4,758,037	4,457,037	4,147,037	3,828,037	3,500,037	3,172,038	2,844,040			
Total Liabilities	6,546,978	8,767,037	8,731,037	8,614,037	8,718,037	8,387,037	8,208,039	8,033,042			
Net Financial Assets	17,451,667	20,880,632	24,320,289	27,671,347	30,506,879	33,903,104	37,519,030	41,366,166			
Non-Financial Assets											
Tangible Capital Assets	68,325,233	71,358,901	74,386,612	77,408,960	80,426,552	83,440,012	86,449,978	89,457,107			
Total Non-Financial Assets	68,325,233	71,358,901	74,386,612	77,408,960	80,426,552	83,440,012	86,449,978	89,457,107			
Total Net Assets	85,776,900	92,239,533	98,706,901	105,080,307	110,933,430	117,343,115	123,969,008	130,823,274			
Accumulated Surplus	\$85,776,900	\$92,239,533	\$98,706,901	\$105,080,307	\$110,933,430	\$117,343,115	\$123,969,008	\$130,823,274			

THE CORPORATION OF THE TOWN OF NEWMARKET
Wastewater System

2017 Six-Year Wastewater Financial Plan

For the years ended December 31

Statement of Operations

	2016	FORECAST					
		2017	2018	2019	2020	2021	2022
Revenues							
Rate based revenue	\$18,302,566	\$19,524,464	\$20,604,137	\$21,344,431	\$22,436,305	\$23,187,533	\$23,963,970
Contributed / Assumed assets	2,522,399	2,522,399	2,522,399	2,522,399	2,522,399	2,522,399	2,522,399
Gain/(loss) on sale of TCA							
Investment income	266,336	202,102	226,763	254,197	284,662	318,439	355,832
Other revenue	282,997	288,657	294,431	300,319	306,326	312,452	318,701
Total Revenues	21,374,299	22,537,622	23,647,729	24,421,346	25,549,691	26,340,823	27,160,902
Expenditures							
Rate based expenditure	11,264,400	11,956,594	12,951,320	13,707,631	15,242,351	15,361,358	15,846,994
Operating and maintenance	1,368,580	1,420,000	1,456,000	1,492,000	1,529,000	1,567,000	1,606,000
Allocated overhead	956,964	981,000	1,006,000	1,031,000	1,057,000	1,083,000	1,110,000
Interest expense	286,165	281,165	276,165	271,165	266,165	261,165	256,165
Amortization	1,382,195	1,436,231	1,490,875	1,546,144	1,602,052	1,658,615	1,715,850
Total Expenditures	15,258,305	16,074,990	17,180,361	18,047,940	19,696,568	19,931,138	20,535,009
Annual Surplus / (Deficit)	6,115,994	6,462,632	6,467,368	6,373,406	5,853,123	6,409,685	6,625,893
Accumulated Surplus, beginning of year	79,660,906	85,776,900	92,239,533	98,706,901	105,080,307	110,933,430	117,343,115
Accumulated Surplus, end of year	\$85,776,900	\$92,239,533	\$98,706,901	\$105,080,307	\$110,933,430	\$117,343,115	\$123,969,008

THE CORPORATION OF THE TOWN OF NEWMARKET
Wastewater System

2017 Six-Year Wastewater Financial Plan

For the years ended December 31

Statement of Changes in Net Financial Assets

	2016	FORECAST						
		2017	2018	2019	2020	2021	2022	2023
Annual surplus / (Deficit)	\$6,115,994	\$6,462,632	\$6,467,368	\$6,373,406	\$5,853,123	\$6,409,685	\$6,625,893	\$6,854,265
Less: Acquisition of tangible capital assets	-1,249,469	-1,947,500	-1,996,188	-2,046,092	-2,097,244	-2,149,676	-2,203,417	-2,258,503
Less: Contributed tangible capital assets	-2,522,399	-2,522,399	-2,522,399	-2,522,399	-2,522,399	-2,522,399	-2,522,399	-2,522,399
Add: Amortization of tangible capital assets	1,382,195	1,436,231	1,490,875	1,546,144	1,602,052	1,658,615	1,715,850	1,773,773
Add: Loss on sale of tangible capital assets								
Changes in Net Financial Assets	3,726,321	3,428,964	3,439,657	3,351,058	2,835,531	3,396,225	3,615,926	3,847,136
Net Financial Assets, beginning of year	13,725,346	17,451,667	20,880,632	24,320,289	27,671,347	30,506,879	33,903,104	37,519,030
Net Financial Assets, end of year	\$17,451,667	\$20,880,632	\$24,320,289	\$27,671,347	\$30,506,879	\$33,903,104	\$37,519,030	\$41,366,166

THE CORPORATION OF THE TOWN OF NEWMARKET
Wastewater System

2017 Six-Year Wastewater Financial Plan

For the years ended December 31

Statement of Cash Flows

	2016	FORECAST					
		2017	2018	2019	2020	2021	2022
Cash Provided By (Used in):							
Operating Activities							
Annual surplus/deficit	6,115,994	6,462,632	6,467,368	6,373,406	5,853,123	6,409,685	6,625,893
Add: Amortization	1,382,195	1,436,231	1,490,875	1,546,144	1,602,052	1,658,615	1,715,850
Less: Contributed/assumed assets	-2,522,399	-2,522,399	-2,522,399	-2,522,399	-2,522,399	-2,522,399	-2,522,399
Add: Loss on sale of tangible capital assets							
(Increase)/decrease in A/R	59,715	-534,715	-162,000	-111,000	-163,000	-113,000	-117,000
Increase/(decrease) in A/P	-1,845,329	2,509,329	262,000	190,000	420,000	-6,000	146,001
Increase/(decrease) in deferred revenue	270	2,730	3,000	3,000	3,000	3,000	3,000
Net change in cash from operating activities	3,190,446	7,353,808	5,538,845	5,479,151	5,192,776	5,429,901	5,851,345
Capital Activities							
Cash used to acquire tangible capital assets	-1,249,469	-1,947,500	-1,996,188	-2,046,092	-2,097,244	-2,149,676	-2,203,417
Net change in cash from capital activities	-1,249,469	-1,947,500	-1,996,188	-2,046,092	-2,097,244	-2,149,676	-2,203,417
Financing Activities							
Proceeds from debt issues							
Principal repayment on long-term debt	-239,526	-292,000	-301,000	-310,000	-319,000	-328,000	-327,999
Net change in cash from financing activities	-239,526	-292,000	-301,000	-310,000	-319,000	-328,000	-327,999
Net Change in Cash	1,701,451	5,114,308	3,241,657	3,123,058	2,776,531	2,952,225	3,319,928
Cash, beginning of year	19,902,909	21,604,360	26,718,669	29,960,326	33,083,384	35,859,916	38,812,141
Cash, end of year	\$ 21,604,360	\$ 26,718,669	\$ 29,960,326	\$ 33,083,384	\$ 35,859,916	\$ 38,812,141	\$ 42,132,069
							\$ 45,684,208

THE CORPORATION OF THE TOWN OF NEWMARKET

Notes to the 2017 Six-Year Wastewater Financial Plan

2017 Six-Year Wastewater Financial Plan

The Town of Newmarket, with a population of approximately 87,000, is located in the Regional Municipality of York, Province of Ontario, Canada. The Town owns and operates its Wastewater Collection System servicing approximately 29,000 property owners. The Region of York is responsible for treatment of wastewater.

1. SIX-YEAR WASTEWATER FINANCIAL PLAN

The six-year financial plan includes: Statement of Financial Position, Statement of Operations, Statement of Net Financial Assets, and Statement of Cash Flows.

The financial plan must be approved by a resolution that indicates that the wastewater system is financially viable and that is passed by the Council of the Municipality.

2. FINANCIAL PLAN ASSUMPTIONS

The development of the projected six year consolidated financial statements incorporates the trend from 2013 to 2016, and assumptions for a decrease in consumption volumes, inflationary factors, lifecycle capital replacement forecast, and wastewater rate forecast.

3. FINANCIAL ASSETS

Financial assets consist of cash & cash equivalents and accounts receivables. Forecasted accounts receivable is based on historical trends.

4. LIABILITIES

Liabilities consist of accounts payable and accrued liabilities, interest payable on debt, deferred revenue and long-term debt.

(a) Accounts Payable and Accrued Liabilities

Accounts payable and accrued liabilities represent the costs of goods and services acquired in the period and are recognized whether or not payments have been made or invoices received. Forecasted accounts payable and accruals are based on historical trend.

(b) Interest Payable on Debt

Interest payable on debt includes half of the balance of the unamortized premium of the debenture for the New Operations Centre and accrued interest expense on the debenture related to wastewater.

THE CORPORATION OF THE TOWN OF NEWMARKET Notes to the 2017 Six-Year Wastewater Financial Plan

(c) Deferred Revenue

Deferred revenue represents the balance of the area specific development charges related to wastewater. These funds, by their nature, are restricted in their use and, until applied to specific capital works, are recorded as deferred revenue. Amounts applied to qualifying capital projects are recorded as revenue in the fiscal period they are expended.

(d) Long-term Debt

Long-term debt consists of debenture and FCM loan for New Operations Centre which will mature at 2029 and 2031 respectively, and wastewater portion of debt for Harry Walker Parkway extension which will mature at 2024. No additional debentures are projected in this forecast period.

5. TANGIBLE CAPITAL ASSETS (TCA)

(a) Tangible Capital Assets

Tangible capital assets are physical assets with useful lives extending beyond the current year and are not intended for sale in the ordinary course of operations.

TCA are recorded at cost, which includes all amounts that are directly attributable to acquisition, construction, development or betterment of an asset. The cost, less residual value, of the tangible capital assets are amortized on a straight-line basis over their estimated useful lives as follows:

	Useful Life - Years
Buildings and building components	20 - 40
Vehicles	4 - 10
Machinery and equipment	3 - 10
Linear assets	
- Wastewater	80

Annual amortization is charged in the year the asset is available for productive use and in the year of disposal. Assets under construction are not amortized until the asset is available for productive use.

Tangible capital assets are shown on a net basis in the financial statements. Residual value is assumed to be \$0 for all TCA contained within the forecast period. Gains/losses on disposal are assumed to be \$0 as well.

(b) Additions and Disposals

Additions are based on the Asset Management Plan and disposals are based on the historical trend from 2010 to 2014.

THE CORPORATION OF THE TOWN OF NEWMARKET
Notes to the 2017 Six-Year Wastewater Financial Plan

(c) Contributed / Assumed Assets

These are tangible capital assets contributed by developers or other parties. TCA received as contributions are recorded at their fair value at the date of receipt, and that fair value is also recorded as revenue. Forecasted amount of contributed /assumed assets is based on the historical trend.

(d) Summary of Wastewater System Tangible Capital Assets

	2016	FORECAST							
		2017	2018	2019	2020	2021	2022	2023	
As at December 31									
Opening TCA Balance(Historical Cost)	\$106,244,301	\$109,869,144	\$114,192,018	\$118,563,580	\$122,985,580	\$127,457,664	\$131,982,714	\$136,561,505	
Additions	3,771,868	4,469,899	4,518,587	4,568,491	4,619,643	4,672,075	4,725,816	4,780,902	
Disposals	147,025	147,025	147,025	147,025	147,025	147,025	147,025	147,025	
Closing TCA Balance(Historical Cost)	\$109,869,144	\$114,192,018	\$118,563,580	\$122,985,046	\$127,457,664	\$131,982,714	\$136,561,505	\$141,195,382	
Opening Accumulated Amortization	39,998,485	41,321,057	42,610,263	43,954,113	45,353,232	46,808,259	48,319,848	49,888,673	
Amortization Expense	1,382,195	1,436,230.93	1,490,875	1,546,144	1,602,052	1,658,615	1,715,850	1,773,773	
Accumulated Amortization on Disposals	59,623	147,025	147,025	147,025	147,025	147,025	147,025	147,025	
Ending Accumulated Amortization	\$41,321,057	\$42,610,263	\$43,954,113	\$45,353,232	\$46,808,259	\$48,319,848	\$49,888,673	\$51,515,421	
Work - in - Progress	-	-	-	-	-	-	-	-	
Net Book Value	\$68,548,087	\$71,581,755	\$74,609,466	\$77,631,814	\$80,649,406	\$83,662,866	\$86,672,832	\$89,679,961	

6. NET FINANCIAL ASSETS

Net financial assets as defined is the difference between financial assets and liabilities and is a key indicator in determining the wastewater system financial ability to replace its infrastructure. As reflected in the Statement of Changes in Net Financial Assets, the Town is in a net financial assets position which indicates the Town has sufficient resources to finance current and future activities. Forecasted net financial assets for the years 2017-2023 are \$20.9 million - \$41.4 million.

THE CORPORATION OF THE TOWN OF NEWMARKET
Notes to the 2017 Six-Year Wastewater Financial Plan

7. ACCUMULATED SURPLUS

The Accumulated Surplus is comprised of the following:

	2016	FORECAST						
		2017	2018	2019	2020	2021	2022	2023
<i>As at December 31</i>								
Wastewater Rate Stabilization Reserve	\$2,942,625	\$3,931,938	\$4,459,030	\$4,597,374	\$3,893,069	\$3,393,009	\$2,733,324	\$1,890,868
Asset Replacement Fund	19,138,657	21,483,876	24,095,442	26,998,156	30,218,993	33,787,277	37,734,890	42,096,484
Investment in tangible capital assets	68,548,087	71,581,755	74,609,466	77,631,814	80,649,406	83,662,866	86,672,832	89,679,961
Debentures	-5,050,037	-4,758,037	-4,457,037	-4,147,037	-3,828,037	-3,500,037	-3,172,038	-2,844,040
Accumulated Surplus	\$85,579,332	\$92,239,533	\$98,706,901	\$105,080,307	\$110,933,430	\$117,343,115	\$123,969,008	\$130,823,274



CORPORATE SERVICES COMMISSION
Financial Services

TOWN OF NEWMARKET
395 Mulock Drive
P.O. Box 328
Newmarket, ON L3Y 4X7

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mmayes@newmarket.ca
905.895.5193 ext 2102

June 5, 2017

CORPORATE SERVICES REPORT – FINANCIAL SERVICES – 2017-30

TO: Mayor Tony Van Bynen and Members of Council

SUBJECT: 2017 Six-Year Stormwater Financial Plan

ORIGIN: Financial Business Analyst

RECOMMENDATION:

THAT Corporate Services Report - Financial Services-2017-30 dated June 5, 2017 regarding the Six-Year Stormwater Financial Plan (2018-2023) be received and the following recommendation be adopted:

THAT Council adopt the proposed 2017 Six-Year Stormwater Financial Plan.

COMMENTS:

Purpose

The purpose of this report is to introduce the first Six-Year Stormwater Financial Plan for the stormwater utility. This financial plan is used to monitor the overall financial health of the new utility and ensure a sustainable funding model.

Budget Impact

The impact of adopting this financial plan is that the projected rates will increase by an average of 10.6% per year for all customers. This represents an average annual increase of \$4.20 for the typical residential property and an average annual increase of \$67 for the typical commercial and industrial property over the 2018-2023 period.

Summary

The Six-Year Stormwater Financial Plan ensures the Town will address the three major cost drivers for stormwater management: environmental protection, aging assets and flood prevention. This plan will also help the Town to improve stormwater management coverage by providing the financial means.

Background

The Town provides a stormwater management service to protect the community and environment from stormwater runoff. Stormwater runoff is water that flows off properties mostly due to rain and snow events. Stormwater management services require sufficient funding to serve the community.

With Financial Services report 2016-40, Council approved the implementation of the new stormwater charge to help further protect homes and businesses from flooding.

Flooding has been a concern in several sections of the Town, especially in low-lying areas along the subwatersheds of creeks such as the Western Creek subwatershed. The Town has been investigating these issues and is conducting appropriate capital projects, including implementing new Low Impact Development (LID) solutions to solve them. These types of projects will result in major capital and operating expenditures due to more frequent and more intense storms, particularly in areas which have compromised or no stormwater controls.

28% of the Town's wet stormwater management ponds are filled with sediment to 50% capacity or greater. When stormwater management ponds are filled to 50% capacity, they significantly lose their effectiveness.

Moreover, some areas of the Town have little to no stormwater controls. According to the Lake Simcoe Conservation Authority, 33.5% of Newmarket's land area has uncontrolled stormwater runoff.

The Town's Comprehensive Stormwater Master Plan focuses on the needed stormwater works. This Plan was recently completed by the Engineering Department. All that remains for the Plan to be officially adopted is final approval by the Lake Simcoe Region Conservation Authority (LSRCA), which is the provincial sign-off authority for all stormwater master plans for municipalities within the Lake Simcoe Watershed, and endorsement by Council, which are both imminent.

In this report, staff is recommending to implement a best financial practice by adopting a six-year stormwater financial plan to address the issues the utility faces. This plan forecasts rate increases, spending levels and asset replacement fund contributions. Overall, the financial plan is used to monitor the financial health of the new utility.

Staff presented provisional rate estimates with financial services information report 2016-48. This report updates the rate estimates with further analysis.

Rate Drivers

The purpose of the charge is to fund the three major cost drivers for the service, which are environmental protection, aging infrastructure and flood prevention.

1. Environmental Protection

As water runs off properties, it can carry contaminants with it. Runoff from urban and rural areas has upset Lake Simcoe's ecosystem. The Town has completed a Comprehensive Stormwater Master Plan, as per the regulatory requirements outlined in the Lake Simcoe Protection Act. The Master Plan identifies priority areas to implement best stormwater management practices, pond maintenance requirements and phosphorus reduction opportunities. These projects and legislative requirements will require new funding.

2. Aging Infrastructure

The Town has 53 ponds, 55 kilometres of waterways and 225 kilometres of sewers that are maintained and replaced as they age. An estimated \$17 million is required over the next 10 years to replace assets that are reaching the end of their useful life. The existing funding level is likely to fall short to maintain current service levels.

3. Flood Prevention

In some parts of Canada, severe weather events that previously occurred every forty years now occur every six years. As a consequence, damage from storm events has recently become the biggest cause for insurance claims in Canada. The funding provided by the rate will help us adapt to and protect homes and businesses in Newmarket from severe weather events.

To enhance the stormwater utility's financial health, this plan introduces a rate stabilization reserve and adjusts the asset replacement fund strategy. How these items impact the provisional rate estimates is explained below.

Rate Stabilization Reserve

For the water and wastewater utilities, the Town has rate stabilization reserves to protect the Town from unforeseen circumstances. Staff is recommending a stabilization reserve for stormwater areas as well. To build up the stormwater reserve, staff recommends an additional 0.5% in annual rate increases compared to the preliminary plan. A 0.5% rate increase represents a \$0.20 increase in the annual stormwater charge for the typical Newmarket homeowner. The targeted reserve level is 5-10% of rate revenue. The table below shows the projected rate stabilization reserve balance and reserve as a percent of rate revenue.

Table 1: Rate stabilization balance and Rate Stabilization Reserve as a percent of rate revenues

	2018	2019	2020	2021	2022	2023
Projected rate stabilization balance	\$25,880	\$39,684	\$65,268	\$104,805	\$160,622	\$250,083
Rate stabilization reserve as a % of rate revenues	1.4%	1.9%	2.8%	4.1%	5.8%	8.3%

Capital Renewal and Investments

Stormwater management was previously funded through taxes. The Town has an asset replacement fund to support all tax supported capital assets. Because stormwater is no longer funded through taxes, it is appropriate to segregate stormwater's share of the asset replacement fund from the general tax supported asset replacement fund. \$1.7 million was allocated to the stormwater asset replacement fund by using a relative accumulated amortization calculation.

Considering the immediate need to improve stormwater management in the Town, staff is recommending to draw on the asset replacement fund more than it contributes for the first five years of the plan. The Capital Financing Sustainability Strategy, conducted by Hemson Consulting, recommends that the Town spend \$1.7 million per year to replace our stormwater assets that are reaching the end of their useful lives. In this plan, the \$1.7 million annual spending level is comprised of \$1.6 million in capital spending from the asset replacement fund and \$100,000 to support a staff position to manage the projects.

Table 2 shows the projected asset replacement fund balance, considering the contributions and spending levels. To work toward improving the balance of the reserve fund, staff is recommending an additional 4.5% increase to the stormwater rate in 2023.

Table 2: Asset Replacement Fund Continuity Schedule from 2018 to 2023

	2018	2019	2020	2021	2022	2023
Opening Balance	\$1,792,061	\$1,236,874	\$ 818,641	\$ 539,074	\$ 399,906	\$ 404,905
Contributions to Asset Replacement Fund	1,044,813	1,181,767	1,320,433	1,460,832	1,604,999	1,781,155
Capital Spending from Asset Replacement Fund	1,600,000	1,600,000	1,600,000	1,600,000	1,600,000	1,600,000
Closing Balance	1,236,874	818,641	539,074	399,906	404,905	586,060
Asset Replacement Fund as a % of Accumulated Amortization	3.3%	2.1%	1.4%	1.0%	1.0%	1.4%

Projected Rate Increases

Considering the approach of building up a rate stabilization reserve and increasing contributions to the asset replacement fund, Table 3 below compares the rate increase from the provisional estimate provided in 2016 and the Six-Year Stormwater Financial Plan provided in this report.

Table 3: Comparing Rate Increases between the Preliminary Rate Estimates and the Recommend Six-Year Stormwater Financial Plan from 2018 to 2023

	2018	2019	2020	2021	2022	2023
Provisional estimate increases	12.3%	11.3%	10.4%	9.7%	9.2%	4.0%
Recommended rate increases	12.3%	11.8%	10.9%	10.2%	9.7%	9.0%

Impact of Rate Increases

The stormwater charge is calculated by multiplying the size of the property by its respective runoff level rate. Natural areas are in the low runoff level group, residential and institutional properties are in the medium runoff level group, and industrial and commercial properties are in the high runoff level group. For the impact of the recommended rate increases on the average property of each group, see Table 4.

Table 4: Annual rates and rate increases for the average property by runoff level group from 2018 to 2023

	2018	2019	2020	2021	2022	2023
Low Runoff Level Charge	\$ 212	\$ 237	\$ 263	\$ 290	\$ 318	\$ 346
Increase (\$)	23.31	24.94	25.75	26.80	28.10	28.60
Medium Runoff Level Charge	\$ 44	\$ 49	\$ 54	\$ 60	\$ 66	\$ 72
Increase (\$)	4.81	5.15	5.32	5.54	5.80	5.91
High Runoff Level Charge	\$ 544	\$ 608	\$ 674	\$ 742	\$ 814	\$ 888
Increase (\$)	59.72	63.91	65.98	68.67	72.00	73.28

The medium runoff level group contains both residential and institutional properties. The large institutional properties in Newmarket greatly impact the average charge for the medium runoff level group. Therefore, to get a better sense of how the typical homeowner will be impacted, it is appropriate to look at the median charge from the medium runoff level group. Table 5 on the following page shows the typical stormwater charge for the typical homeowner.

Table 5: Annual rates and rate increases for the typical residential property from 2018 to 2023

	2018	2019	2020	2021	2022	2023
Typical Residential Charge	\$ 34	\$ 38	\$ 42	\$ 46	\$ 51	\$ 55
Increase (\$)	3.73	3.99	4.12	4.29	4.50	4.58

Next Financial Plan Update

Stormwater is a new utility. As the Town is transitioning from stormwater being tax supported to being rate supported, it would be prudent to perform annual reviews of the financial plan in the following years to ensure its reasonableness, accuracy and completeness.

Business Plan and Strategic Plan Linkages

This report links to Newmarket's key strategic directions in being Well Managed through fiscal responsibility.

Consultation

Engineering Services and Public Works Services were consulted to ensure that the projections were reasonable for the period of this plan.

Human Resource Considerations

Staffing levels are not immediately impacted by the recommendations in this report. A staff submission will be proposed through the 2018 budget process to manage stormwater management projects.

Budget Impact*Operating Budget*

The impact of adopting this financial plan is that the projected rates will increase by an average of 10.6% per year for all customers. This represents an average annual increase of \$4.20 for the typical residential property and an average annual increase of \$67 for the typical commercial and industrial property over the 2018-2023 period.

Capital Budget

This financial plan will ensure that the stormwater utility will be able to meet its short term capital needs.

CONTACT

For more information on this report, contact: Mike Mayes at 905-953-5300, ext. 2102 or via e-mail at mmayes@newmarket.ca



Kevin Yaraskavitch
Financial Business Analyst



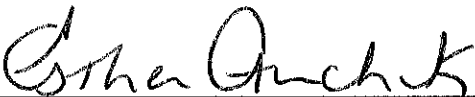
per Mike Mayes, CPA, CGA, DPA
Director, Financial Services/Treasurer



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Infrastructure services

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Attachment:

- a) 2017 Six-Year Stormwater Financial Plan – 9 pgs

The Corporation of the Town of Newmarket

2017 Six Year Stormwater Financial Plan

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THE CORPORATION OF THE TOWN OF NEWMARKET
STORMWATER SYSTEM
2017 Six-Year Stormwater Financial Plan

As at December 31

Statement of Financial Position

	2016	FORECAST						
		2017	2018	2019	2020	2021	2022	2023
Financial Assets								
Cash and cash equivalents	\$1,788,097	\$1,681,966	\$1,114,587	\$692,741	\$420,775	\$302,428	\$343,621	\$594,266
Accounts receivable		131,891	148,167	165,584	183,567	202,283	221,905	241,877
Other Assets	-							
Total Financial Assets	1,788,097	1,813,857	1,262,754	858,325	604,342	504,711	565,527	836,143
Liabilities								
Accounts payable & accrued liabilities	-	-	-	-	-	-	-	-
Interest payable on debt	-	-	-	-	-	-	-	-
Long-term debt	-	-	-	-	-	-	-	-
Total Liabilities	-	-	-	-	-	-	-	-
Net Financial Assets	1,788,097	1,813,857	1,262,754	858,325	604,342	504,711	565,527	836,143
Non-Financial Assets								
Prepaid expenses								
Tangible Capital Assets	44,163,344	45,831,581	48,087,492	50,307,155	52,490,571	54,637,739	56,748,659	58,823,332
Total Non-Financial Assets	44,163,344	45,831,581	48,087,492	50,307,155	52,490,571	54,637,739	56,748,659	58,823,332
Total Net Assets	45,951,441	47,645,438	49,350,246	51,165,480	53,094,912	55,142,449	57,314,186	59,659,474
Accumulated Surplus	\$45,951,441	\$47,645,438	\$49,350,246	\$51,165,480	\$53,094,912	\$55,142,449	\$57,314,186	\$59,659,474

THE CORPORATION OF THE TOWN OF NEWMARKET
STORMWATER SYSTEM
2017 Six-Year Stormwater Financial Plan

For the years ended December 31

Statement of Operations

	2016	FORECAST						
		2017	2018	2019	2020	2021	2022	2023
Revenues								
Rate based revenue	\$1,648,636	\$1,648,636	\$1,852,084	\$2,069,804	\$2,294,583	\$2,528,537	\$2,773,817	\$3,023,461
Contributed / Assumed assets	1,546,069	1,631,436	1,631,436	1,631,436	1,631,436	1,631,436	1,631,436	1,631,436
Gain/loss on sale of tangible capital assets	-	-	-	-	-	-	-	-
Contribution from developers (DC earned)	-	-	-	-	-	-	-	-
Investment income	-	22,124	18,813	12,767	8,433	5,832	4,999	6,155
Other revenue	-	-	-	-	-	-	-	-
Total Revenues	3,194,705	3,302,195	3,502,333	3,714,007	3,934,452	4,165,804	4,410,252	4,661,051
Expenditures								
Operating and maintenance	350,000	350,000	482,000	516,000	553,000	594,000	638,000	660,000
Allocated overhead	312,000	312,000	340,000	371,000	404,000	440,000	480,000	499,000
Interest expense	-	-	-	-	-	-	-	-
Amortization	919,167	946,198	975,525	1,011,772	1,048,020	1,084,268	1,120,515	1,156,763
Total Expenditures	1,581,167	1,608,198	1,797,525	1,898,772	2,005,020	2,118,268	2,238,515	2,315,763
Annual Surplus / (Deficit)	1,613,538	1,693,997	1,704,808	1,815,235	1,929,432	2,047,537	2,171,737	2,345,289
Accumulated Surplus, beginning of year	44,337,903	45,951,441	47,645,438	49,350,246	51,165,480	53,094,912	55,142,449	57,314,186
Accumulated Surplus, end of year	\$45,951,441	\$47,645,438	\$49,350,246	\$51,165,480	\$53,094,912	\$55,142,449	\$57,314,186	\$59,659,474

**THE CORPORATION OF THE TOWN OF NEWMARKET
STORMWATER SYSTEM**

2017 Six-Year Stormwater Financial Plan

For the years ended December 31

Statement of Changes in Financial Position

	2016	FORECAST						
		2017	2018	2019	2020	2021	2022	2023
Annual surplus / (Deficit)	1,613,538	1,693,997	1,704,808	1,815,235	1,929,432	2,047,537	2,171,737	2,345,289
Less: Acquisitions of tangible capital assets	-702,903	-983,000	-1,600,000	-1,600,000	-1,600,000	-1,600,000	-1,600,000	-1,600,000
Less: Contributed tangible capital assets	-1,546,069	-1,631,436	-1,631,436	-1,631,436	-1,631,436	-1,631,436	-1,631,436	-1,631,436
Add: Amortization of tangible capital assets	919,167	946,198	975,525	1,011,772	1,048,020	1,084,268	1,120,515	1,156,763
Add: Proceeds from sale of TCA	-	-	-	-	-	-	-	-
Less: Gain on sale of tangible capital assets	-	-	-	-	-	-	-	-
Changes in Net Financial Assets	283,733	25,760	-551,103	-404,429	-253,984	-99,631	60,816	270,616
Net Financial Assets, beginning of year	1,504,364	1,788,097	1,813,857	1,262,754	858,325	604,342	504,711	565,527
Net Financial Assets, end of year	\$ 1,788,097	\$ 1,813,857	\$ 1,262,754	\$ 858,325	\$ 604,342	\$ 504,711	\$ 565,527	\$ 836,143

**THE CORPORATION OF THE TOWN OF NEWMARKET
STORMWATER SYSTEM
2017 Six Year Stormwater Financial Plan**

For the years ended December 31

Statement of Cash Flows

	2016	FORECAST					
		2017	2018	2019	2020	2021	2022
Cash Provided By (Used in):							
Operating Activities							
Annual surplus/deficit	1,613,538	1,693,997	1,704,808	1,815,235	1,929,432	2,047,537	2,171,737
Add: Amortization	919,167	946,198	975,525	1,011,772	1,048,020	1,084,268	1,120,515
Less: Contributed/assumed assets	-1,546,069	-1,631,436	-1,631,436	-1,631,436	-1,631,436	-1,631,436	-1,631,436
Less: Gain on sale of tangible capital assets	0	0	0	0	0	0	0
(Increase)/decrease in A/R	0	-131,891	-16,276	-17,418	-17,982	-18,716	-19,622
Increase/(decrease) in deferred revenue	0	0	0	0	0	0	0
Net change in cash from operating activities	986,636	876,869	1,032,621	1,178,154	1,328,034	1,481,653	1,641,194
Capital Activities							
Proceeds from sale of tangible capital assets							
Cash used to acquire tangible capital assets	-702,903	-983,000	-1,600,000	-1,600,000	-1,600,000	-1,600,000	-1,600,000
Net change in cash from capital activities	-702,903	-983,000	-1,600,000	-1,600,000	-1,600,000	-1,600,000	-1,600,000
Financing Activities							
Proceeds from debt issues	-	-	-	-	-	-	-
Principal repayment on long-term debt	-	-	-	-	-	-	-
Net change in cash from financing activities	0	0	0	0	0	0	0
Net Change in Cash	283,733	-106,131	-567,379	-421,846	-271,966	-118,347	41,194
Cash, beginning of year	1,504,364	1,788,097	1,681,966	1,114,587	692,741	420,775	302,428
Cash, end of year	\$ 1,788,097	\$ 1,681,966	\$ 1,114,587	\$ 692,741	\$ 420,775	\$ 302,428	\$ 343,621
							\$ 594,266

The accompanying notes are an integral part of these consolidated financial statements.

THE CORPORATION OF THE TOWN OF NEWMARKET

Notes to the 2017 Six Year Stormwater Financial Plan

The Town of Newmarket, with a population of approximately 87,000, is located in the Regional Municipality of York, Province of Ontario, Canada. The Town owns and operates its stormwater management system that consists of 53 ponds and 225 kilometers of sewers.

1. FINANCIAL PLAN ASSUMPTIONS

The development of the projected six year consolidated financial statements incorporates the trends from 2013 to 2016, inflationary factors, lifecycle capital replacement forecast, and the stormwater rate forecast.

2. FINANCIAL ASSETS

Financial assets consist of cash & cash equivalents, accounts receivables and other assets. Forecasted accounts receivable are based on historical trends of property tax receivables.

3. LIABILITIES

Liabilities consist of accounts payable and accrued liabilities, interest payable on debt, deferred revenue and long-term debt.

(a) Accounts Payable and Accrued Liabilities

Accounts payable and accrued liabilities represent the costs of goods and services acquired in the period and are recognized whether or not payments have been made or invoices received.

(b) Interest Payable on Debt

The stormwater system has no debt.

THE CORPORATION OF THE TOWN OF NEWMARKET

Notes to the 2017 Six Year Stormwater Financial Plan

4. TANGIBLE CAPITAL ASSETS (TCA)

(a) Tangible Capital Assets

Tangible capital assets are physical assets with useful lives extending beyond the current year and are not intended for sale in the ordinary course of operations.

TCA are recorded at cost, which includes all amounts that are directly attributable to acquisition, construction, development or betterment of an asset. The cost, less residual value, of the tangible capital assets are amortized on a straight-line basis over their estimated useful lives as follows:

	<u>Useful Life - Years</u>
Buildings and building components	20 - 40
Vehicles	4 - 10
Machinery and equipment	3 - 10
Storm water management pond	25
Linear assets	
- Stormsewer	80

Annual amortization is charged in the year the asset is available for productive use and in the year of disposal. Assets under construction are not amortized until the asset is available for productive use.

Tangible capital assets are shown on a net basis in the financial statements. Residual value is assumed to be \$0 for all TCA contained within the forecast period. Gains/losses on disposal are assumed to be \$0 as well.

(b) Additions and Disposals

Additions are based on the Asset Management Plan and disposals are based on the historical trend from 2013 to 2016.

(c) Contributed / Assumed Assets

These are tangible capital assets contributed by developers or other parties. TCA received as contributions are recorded at their fair value at the date of receipt, and that fair value is also recorded as revenue. Forecasted amount of contributed /assumed assets is based on the historical trend.

THE CORPORATION OF THE TOWN OF NEWMARKET
Notes to the 2017 Six Year Stormwater Financial Plan

(d) Summary of Storm Water System Tangible Capital Assets

	2016	FORECAST									
		2017	2018	2019	2020	2021	2022	2023			
As at December 31											
Opening TCA Balance(Historical Cost)	78,114,828	\$80,277,349	\$82,623,477	\$85,523,286	\$88,423,094	\$91,322,903	\$94,222,712	\$97,122,520			
Additions and Assumed Disposals	2,248,972	2,614,436	3,231,436	3,231,436	3,231,436	3,231,436	3,231,436	3,231,436			
	86,451	268,307	331,627	331,627	331,627	331,627	331,627	331,627			
Closing TCA Balance(Historical Cost)	\$80,277,349	\$82,623,477	\$85,523,286	\$88,423,094	\$91,322,903	\$94,222,712	\$97,122,520	\$100,022,329			
Opening Accumulated Amortization	35,229,897	36,114,005	36,791,896	37,435,794	38,115,939	38,832,332	39,584,973	40,373,861			
Amortization Expense	919,167	946,198	975,525	1,011,772	1,048,020	1,084,268	1,120,515	1,156,763			
Accumulated Amortization on Disposals	35,058	268,307	331,627	331,627	331,627	331,627	331,627	331,627			
Ending Accumulated Amortization	\$ 36,114,005	\$36,791,896	\$37,435,794	\$38,115,939	\$38,832,332	\$39,584,973	\$40,373,861	\$41,198,997			
Work - in - Progress	-	-	-	-	-	-	-	-			
Net Book Value	\$44,163,344	\$45,831,581	\$48,087,492	\$50,307,155	\$52,490,571	\$54,637,739	\$56,748,659	\$58,823,332			

5. NET FINANCIAL ASSETS

Net financial assets as defined is the difference between financial assets and liabilities and is a key indicator in determining the storm water system financial ability to replace its infrastructure. As reflected in the Statement of Changes in Net Financial Assets, the Town is in a net financial assets position which indicates the Town has sufficient resources to finance current and future activities. Forecasted net financial assets for the years 2017 - 2023 are \$1.8 million - \$0.8 million.

THE CORPORATION OF THE TOWN OF NEWMARKET
Notes to the 2017 Six Year Stormwater Financial Plan

6. ACCUMULATED SURPLUS

The Accumulated Surplus is comprised of the following:

	2016	FORECAST						
		2017	2018	2019	2020	2021	2022	2023
As at December 31								
Stormwater Rate Stabilization Reserve	\$0	\$21,796	\$25,880	\$39,684	\$65,268	\$104,805	\$160,622	\$250,083
Asset Replacement Fund	1,788,097	1,792,061	1,236,874	818,641	539,074	399,906	404,905	586,060
Investment in tangible capital assets	44,183,344	45,831,581	48,087,492	50,307,155	52,490,571	54,637,739	56,748,659	58,823,332
Accumulated Surplus	\$45,951,441	\$47,645,438	\$49,350,246	\$51,165,480	\$53,094,912	\$55,142,449	\$57,314,186	\$59,659,474

**ENGINEERING SERVICES****Town of Newmarket**

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May 19, 2017

**DEVELOPMENT & INFRASTRUCTURE SERVICES REPORT
ENGINEERING SERVICES 2017 - 21**

TO: Committee of the Whole

SUBJECT: Traffic Bylaw Update – Schedule XI (Bike Lanes)

ORIGIN: Director, Engineering Services

RECOMMENDATIONS

THAT Development and Infrastructure Services Report – ES 2017-21 dated May 19, 2017 entitled “Traffic Bylaw Update – Schedule XI (Bike Lanes)” be received and the following recommendations be adopted:

- 1. THAT Appendix A be adopted;**
- 2. AND THAT the necessary By-law be prepared and submitted to Council for approval.**

COMMENTS

This is a housekeeping amendment to incorporate the new “East-West Bikeway” cycling lanes into the Town’s Traffic Bylaw (Bylaw No. 2011-24, as amended). Appendix A of this report shows the changes that will be made to Schedule XI of the Bylaw, which pertains to bike lanes. The bike lanes being added to the bylaw are being constructed with the assistance of a 2017 Ontario Municipal Cycling Infrastructure Program (OMCIP) grant.

Therefore, it is recommended that Appendix A be adopted.

PUBLIC CONSULTATION

This is purely a housekeeping exercise. Public consultation was conducted through a Public Information Centre (PIC) that was held in March 2017.

BUSINESS PLAN AND STRATEGIC PLAN LINKAGES

- Well-planned and connected...strategically planning for the future to improve information access and enhance travel to, from and within Newmarket.

HUMAN RESOURCE CONSIDERATIONS

No impact on current staffing levels.

IMPACT ON BUDGET**Operating Budget (Current and Future)**

No impact on the Operating Budget.

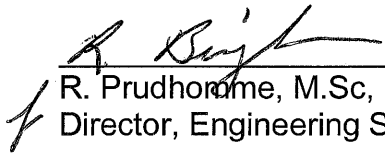

Capital Budget

Capital Budget considerations have been accounted for in the 2017 Capital Budget and the OMCIP grant.

CONTACT

For more information on this report, please contact Mark Kryzanowski at 905-895-5193 extension 2508; mkryzanowski@newmarket.ca.

Prepared by:


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Development & Infrastructure Services

APPENDIX A

A BY-LAW TO AMEND BY-LAW 2011-24, AS AMENDED, BEING A BY-LAW TO REGULATE TRAFFIC WITHIN THE TOWN OF NEWMARKET.

(Schedule XI – Bike Lanes)

WHEREAS it is deemed necessary to amend By-law 2011-24, as amended, being a by-law to regulate traffic within the Town of Newmarket.

THEREFORE BE IT ENACTED by the Council of the Corporation of the Town of Newmarket as follows:

THAT Schedule XI (Bike Lanes) of the Traffic Bylaw 2011-24, as amended, be further amended by adding the following:

3. Srigley Street from Leslie Street to Prospect Street
4. Timothy Street from Prospect Street to Doug Duncan Drive
5. Park Avenue from Main Street to Lorne Avenue
6. Lorne Avenue from Park Avenue to Millard Avenue
7. Millard Avenue from Lorne Avenue to Yonge Street
8. Millard Avenue West from Yonge Street to Eagle Street West
9. Eagle Street West from Millard Avenue West to Davis Drive (Multi-use Path)

June 19, 2017

DEVELOPMENT AND INFRASTRUCTURE SERVICES/PLANNING & BUILDING SERVICES REPORT 2017-14

TO: Committee of the Whole

SUBJECT: Urban Centres Zoning By-law Project – Directions Report
Marketing the Corridors
NP-17-14

ORIGIN: Planning and Building Services

RECOMMENDATIONS

THAT Development and Infrastructure Services/Planning & Building Services Report 2017-14 dated June 19, 2017 regarding the Urban Centres Zoning By-law Project – Directions Report be received and that the following recommendation(s) be adopted:

1. THAT staff be directed to proceed with the creation of the Urban Centres Zoning By-law framework, as described in Report 2017-14.

PURPOSE OF THIS REPORT

The purpose of this report is to provide a summary of the Directions Report that has been prepared for the Urban Centres Zoning By-law project (available in its entirety through the Planning Department and here: <http://bit.ly/2ryk2l8>). The Directions Report has been prepared by the project's consulting team and provides recommendations regarding: (i) the type of zoning by-law that would be most appropriate for Newmarket's Urban Centres; (ii) the possible inclusion of a Community Planning Permit System; and (iii) the form of implementation of the zoning approach, either through an amendment to the existing zoning by-law or through the development of a new, site-specific zoning by-law.

BACKGROUND

The Urban Centres Zoning By-law project consists of four Phases:

- Phase 1 – Project Start-up and Parking Standard Background Study
- Phase 2 – Background Review and Directions Report Preparation
- **Phase 3 – Urban Centres Zoning By-law Preparation** ← WE ARE ABOUT TO BEGIN THIS PHASE
- Phase 4 – By-law Refinement and Enactment

Phase 1 was completed in February, 2017. As described in Staff Report 2016-31, this first phase consisted largely of the Parking Standard Background Study and associated amendment to the existing Zoning By-law to introduce new parking standards. The by-law adopting the new standards was approved by Council on February 13, 2017. These new parking standards encourage higher density development, the usage of both active transportation and public transit, and reduce overall development costs by reducing parking requirements where appropriate.

The subject of this Report, Phase 2, was completed more recently. This Phase included the preparation of a Directions Report which contained an assessment of the various forms of zoning by-laws that currently exist, and a determination of which one that would best achieve the goals of effectively implementing the Secondary Plan, reduce barriers to development, and provide a user-friendly document.

Phase 3 will include the preparation of the draft Zoning By-law document, as well as another stakeholder Open House.

Phase 4 will include the finalizing the draft Zoning By-law document, presenting the draft By-law to Committee, holding the statutory Public Meeting, finalizing the By-law and obtaining Council approval.

COMMENTS

Three main questions were analysed and answered through the Urban Centres Zoning By-Law Directions Report:

- a) Which type of zoning by-law is most appropriate for Newmarket's Urban Centres;
- b) Will a Community Planning Permit System (CPPS) be included, and
- c) Will the new by-law be an amendment to the existing zoning by-law (Zoning by-law 2010- 40) or an entirely new zoning by-law.

Each of these questions is analysed below, followed by a recommendation.

1. Type of Zoning By-law

Three main types of Zoning By-laws exist: Conventional Zoning By-laws; Form-based Zoning By-laws and Hybrid Zoning By-laws. In addition, a Community Planning Permit System (CPPS) can be created for a defined geographical area, in concert with a Conventional Zoning By-law, Form-based Zoning By-law, or a Hybrid Zoning By-law. As such, there is a wide range of zoning by-law options that exist. Each type is useful for different applications depending on local context and planning goals.

a) Conventional Zoning By-law

Prepared under Section 34 of the Planning Act, this is the standard zoning approach that groups land uses into separate, single use zones and assigns specific development standards for each zone. Historically, this

approach has been very good at separating land uses that were not intended to mix, such as residential and heavy industrial land uses.

However, land use planning theory has evolved since the introduction of zoning in the early 1900s, and it has become clear that urban areas benefit the most when uses are mixed. Conventional zoning by-laws have also evolved to include more progressive practices to reflect this shift. For example, the leading conventional by-laws now include 'Mixed-Use' zones which permit a mix of uses in a single zone, and allow for ranges in development standards such as height and setbacks.

Conventional Zoning By-laws have a consistent layout, with definitions, general provisions, parking standards, uses by zone, development standards by zone, exceptions and other special provisions. This layout is familiar to the development industry and contains its own, known terminology.

b) Form-based Zoning By-law

Like Conventional Zoning By-laws, Form-Based Zoning By-laws are prepared under Section 34 of the Planning Act, however they are fundamentally different in that they control building *form* first and building *use* second. Form-Based Zoning By-laws create predictable built form results and a high-quality public realm by using physical form (rather than separation of uses) as the organizing principle. The philosophy is that most modern land uses are generally compatible with each other and therefore Conventional Zoning, which specializes on separating land uses, is no longer the optimal zoning approach. This approach is most appropriate when applied to an area where a mix of uses is envisioned.

Form-based zoning by-laws are rare on Ontario, with only one municipality utilizing this approach for two of their planning districts (the Bouffard & Howard Planning Districts in LaSalle, Ontario). In addition, these by-laws contain their own, unique layouts and terminology that are dissimilar from conventional by-laws.

Although this option is ideal for mixed use areas that are held to a high urban design standard, these by-laws have not been implemented or tested in areas planned for high growth such as the Urban Centres. In addition, it is felt that their unique composition and terminology would present usability issues for the development industry and staff alike. Finally, as made apparent through written correspondence from stakeholders, there is little appetite on behalf of the local development industry for such an approach.

c) Hybrid Option

The Hybrid option is a combination between a conventional zoning by-law and a form-based zoning by-law. This option implements the progressive best practices of conventional zoning such as 'Mixed-Use' zones and an allowance for ranges in development standards, but also contains form-based elements such as drawings and illustrations to help explain the by-law regulations. In short, this option includes the most desirable elements of the Form-based option and presents them through the familiar layout of a conventional by-law, which is known and accepted by the development industry.

Recommendation on Type of Zoning By-law: It is recommended that a graphics-focused, conventional zoning by-law be prepared for the Urban Centres. This is essentially the Hybrid option described above.

2) Inclusion of a Community Planning Permit System (CPPS)

In accordance with Section 14.2.6 of the Urban Centres Secondary Plan, which states: “The Town may investigate the development of a Community Planning Permit System for use throughout the Urban Centres or in portions of the Urban Centres...”, the CPPS was researched for implementation in a logical area of the Urban Centres.

A Community Planning Permit System (CPPS) was formerly known as a Development Permit System (DPS). Unlike Conventional and Form-Based Zoning By-laws, CPPSs are not governed by Section 34 of the Planning Act; they’re created by Section 70.2 of the Planning Act, and governed by O. Reg 173/16 and introduce completely different procedures and timelines.

In an area subject to a CPPS, local zoning does not apply. A future vision is determined through extensive ‘up-front’ planning work by the Town and landowners, specifically preparing a master plan which specifies road networks, land uses and building heights and densities, etc, which are then formalized in a local CPPS By-law. This by-law takes the place of the zoning by-law. Another unique aspect of a CPPS is that it combines three traditionally separate planning processes (Zoning By-law Amendments, Minor Variances and Site Plan Approval processes) into a single process.

By front-ending the planning work for the specified area and combining separate planning processes into a single process, a shortened planning review timeline is achieved because there is theoretically less material for staff to assess and decisions to be made (O. Reg 173/16 provides a maximum of 45 days for a recommendation to be provided by a municipality on an application in a CPPS area, as opposed to a 180 day maximum for an Official Plan Amendment and a 120 day maximum for a Zoning By-law Amendment).

The Yonge & Davis Character Area was considered most appropriate as a potential CPPS area by staff, given it is the area identified by the Secondary Plan to see the greatest levels of intensification. On March 2, 2017, staff and the consulting team met individually with the owners of 5 key properties in the Yonge & Davis Character Area to describe the project and gain input regarding the potential inclusion of a CPPS.

These meetings were productive and further conveyed the ‘marketing the corridors’ message to key landowners and developers. However, it was made clear to staff and the consulting team that a CPPS may have the unintended effect of committing the redevelopment of properties to specific plans when, at this point, future market demands are unknown. It was clear that the CPPS option was not deemed to be desirable to the stakeholders.

Although this option is ideal for accelerating application review timelines, there are cost implications for the Town associated with completing significant planning work for a small geographic area. In addition, CPPSs have also not been implemented or tested in high-growth areas on Ontario, more often being established in areas focused on preserving an existing situation. Finally, as made apparent through

meetings with key landowners and written correspondence, there is little appetite on behalf of the local development industry for such a system.

Recommendation on Inclusion of a CPPS: It is recommended that a CPPS not be included in the proposed zoning approach for the Urban Centres.

3) Amendment vs. Site Specific By-law

The zoning approach for the Urban Centres can be implemented either through an amendment to the Town's Zoning By-law (2010-40), or through the creation of a new, stand-alone zoning by-law.

An amendment to the Town's zoning by-law would involve repealing Section 6.4 and creating new section(s) specific to the Urban Centres. These new sections would still have to cross-reference other parts of the zoning by-law such as definitions and general provisions, which contain a number of areas to be improved (which are being addressed through a separate planning initiative). This approach would also commit the zoning of the Urban Centres to a pre-defined, conventional framework.

Creating a new, site-specific by-law provides the opportunity to start with progressive elements as first principles. This option allows the opportunity to create a new by-law without inheriting the existing areas to be improved of Zoning By-law 2010-40, which is beneficial from a usability aspect.

Recommendation on implementation of zoning approach: It is recommended that the zoning for the Urban Centres be implemented through the creation of a new, stand-alone zoning by-law.

Summary of Recommended Approach

Given the above, as more thoroughly examined in the Directions Report prepared by the consulting team, it is being recommended that a graphics-based, conventional approach be pursued without a CPPS component. This zoning approach is further recommended to be implemented as a separate, area-specific zoning by-law that does not form part of the Town's Zoning By-law 2010-40.

Among other progressive elements, the area-specific zoning by-law for the Urban Centres will likely include:

- Minimums in addition to maximums for development standards where a range is necessary or desired;
- Regulations for FSI and angular planes;
- "Build-to-Areas" rather than conventional 'setbacks';
- Specific regulations that implement the Priority Commercial Area policies of the Secondary Plan;
- Built form regulations dealing directly with building podiums; and
- Transition zones to offer a buffer between low-rise residential neighbourhoods and more intense areas of development.

This by-law will take a graphics-based approach to explain these progressive elements, through the use of high quality drawings and illustrations.

Next Steps

Assuming the Recommended Approach is supported by Council, it is intended that a framework for the new Zoning By-law be prepared over the summer of 2017. This framework would provide a draft outline / table of contents of the new document, develop a zone classification system, and begin preparing the graphics needed for the final document. As this draft framework is being prepared over the summer months when many residents are away, this draft framework will not include any property-specific zoning.

This draft framework will then be presented to stakeholders, Council, and the general public in the fall of 2017. After such a review amongst the interested parties, a new zoning by-law would be drafted including property-specific zoning, which will be presented at a statutory Public Meeting in the winter of 2017-18.

COMMUNITY CONSULTATION

Early community consultation has occurred as part of the process to determine the type of Zoning By-law to be prepared for the Urban Centres through the following:

- On March 2, 2017, staff and the consulting team met individually with the owners of 5 key properties in the vicinity of Yonge Street and Davis Drive to describe the project and gain input regarding the potential inclusion of a CPPS.
- On April 4, 2017, staff and the consulting team hosted a Stakeholder Engagement Session at the Newmarket Senior's Meeting Place to describe the project and gain input regarding the type of zoning by-law to be prepared. Notice for this Session was provided via a mail-out to all property owners in the Urban Centres and specific email invitations. Approximately 65 people attended the session.

Staff also maintain a project website which provides project information and details on any upcoming public input opportunities.

Once a draft Zoning By-law is prepared, the statutory public consultation process as per the requirements of the Planning Act will be followed. This is expected to occur in the winter of 2017-18.

HUMAN RESOURCE CONSIDERATIONS

There are no human resource considerations associated with this report.

BUDGET IMPACT

There are no budget impacts directly associated with this report. This project has already been budgeted for and is tracking to be completed within budget.

BUSINESS PLAN AND STRATEGIC PLAN LINKAGES

Living Well

- Contributing to sustainable practices including innovative traffic and growth management strategies.

Well Balanced

- Encouraging a sense of community through an appropriate mix of land uses and amenities.

Well Planned and Connected

- Strategically planning for the future by promoting transportation linkages, transit options and active transportation.

CONTACT

For more information on this report, contact: Adrian Cammaert, Senior Planner, Policy, at 905-953-5321, ext. 2459; acammaert@newmarket.ca



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June 19, 2017

**DEVELOPMENT AND INFRASTRUCTURE SERVICES/PLANNING & BUILDING SERVICES REPORT
2017-21**

TO: Committee of the Whole

SUBJECT: **Application for Official Plan and Zoning By-law Amendment
260 Eagle Street
Town of Newmarket
711371 Ontario Corp. (Oxford homes)
File No.:D09NP1515, D14NP1515**

ORIGIN: Planning and Building Services

RECOMMENDATIONS

THAT Development and Infrastructure Services/Planning and Building Services Report 2017-21 dated June 19, 2017 regarding Application for Official Plan Amendment and zoning by-law amendment be received and the following recommendation(s) be adopted:

- a) **THAT the Application for Official Plan Amendment and zoning by-law amendment as submitted by 711371 Ontario Corp. for lands being composed of Lots 13 through 19 inclusive on Plan 371, Municipally known as 260 Eagle Street be approved and that staff be directed to prepare the necessary Official Plan and Zoning By-Law Amendments**
- b) **AND THAT Kerigan Kelly, Groundswell Urban Planners Inc., 30 West Beaver Creek Road, Suite 19 Vaughan, ON L4K 5K8 be notified of this action.**

COMMENTS**Location and Surrounding Land Uses**

The Subject Lands are located at the southeast corner of Eagle Street and Cawthra Boulevard (See Location Map attached). The property has an area of approximately 0.55 hectares and has a frontage on Eagle Street of approximately 115 metres and a frontage on Cawthra Boulevard of approximately 46 metres. The properties are municipally known as 260 Eagle Street.

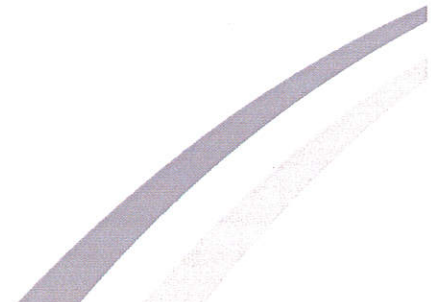
The subject property is currently vacant. The following are the adjacent land uses:

North: Convenience and Service Commercial uses

South: Single Detached Dwellings

East: Retail Commercial (the Arts Music Store)

West: Convenience Commercial uses and Townhouse Dwellings



Proposal

The applicant has amended their application from a 6 storey residential apartment building accommodating 124 dwelling units to a proposed townhouse development consisting of 27 condominium townhouse units. Two points of access are proposed, one on Eagle Street and on Cawthra Boulevard. A row of townhomes adjacent to Eagle Street would front Eagle Street, however garages for these units would be accessed by way of the internal road. The proposed site plan is attached to this report.

The statutory public meeting was held on November 7, 2016 and public comments focused on the following:

1. Compatibility including impact on adjacent properties
2. Traffic issues and potential traffic signalization at Eagle St. and Cawthra Blvd.

Community Consultation

Compatibility - The proposal is generally compatible with the existing community being a mix of residential, commercial and institutional uses. Specifically, the residential community to the south of the subject lands is generally single detached dwellings. There are a number of office, retail and service commercial uses along Eagle Street and existing townhouse dwellings are located immediately west of the site.

While townhouse dwellings are a denser dwelling type than the abutting single family dwellings to the south, in principle townhouse dwellings are not incompatible with adjacent single-detached residential neighbours. The Town's practice has historically been that new development adjacent to existing development should be of a similar built form, notwithstanding that throughout Newmarket and in new development there are adjacent different residential built forms. The Official Plan and sound planning principles require the consideration of compatibility to ensure that any development minimizes any impacts on the surrounding area. It is noted that an existing townhouse complex is located immediately to the west across Cawthra Boulevard.

The density has been reduced from the original application for a 6 storey 124 unit apartment building to 27 3 storey townhouse dwellings on a private condominium road. The existing mature vegetation along the rear property line will be maintained creating a visual buffer from the single family homes to the south.

Traffic – Eagle Street is identified in the Official Plan as a Primary Collector Road and as such designed to carry medium volumes of traffic between arterial Roads, Minor Collector Roads and Local Roads. Both the Region of York and Town Engineering Services have reviewed the submitted Traffic Impact Report and have no objection to the Official Plan and Zoning By-law amendment. It would appear that the warrants for traffic signalization at Eagle Street and Cawthra Boulevard have not been met. Some minor comments have been provided to be addressed through the site plan process. This development is not anticipated to have a significant impact on traffic operations of the surrounding road network.

Provincial Policy Statement

The Provincial Policy Statement (PPS) provides policy direction on matters of provincial interest related to land use planning and development. As a key part of Ontario's policy-led planning system, the PPS sets the policy foundation for regulating the development and use of land. It also supports the provincial goal to enhance the quality of life for the citizens of Ontario.

Planning decisions shall be consistent with the Provincial Policy Statement. The PPS provides for appropriate development while protecting resources of provincial interest, public health and safety, and the

quality of the natural environment. The PPS supports improved land use planning and management, which contributes to a more effective and efficient land use planning system.

The Provincial Policy Statement is intended to be read in its entirety and the relevant policies are to be applied to each situation.

The relevant sections of the PPS as they relate to Newmarket are found in the “Building Strong Communities” policies which direct municipalities to promote efficient development and land use patterns, to accommodate an appropriate range and mix of residential, employment, recreational and open space uses to meet long-term needs, and to promote cost-effective development standards to minimize land consumption and servicing costs. The “Settlement Areas” and “Housing” policies of the PPS further direct municipalities to establish land use patterns based on densities and a mix of land uses which efficiently use land and resources, and which are appropriate for, and efficiently use, the infrastructure and public service facilities which are planned or available. Land use patterns within settlement areas are to be based on a range of uses and opportunities for intensification and redevelopment where this can be accommodated taking into account existing building stock or areas, including brownfield sites and the availability of suitable existing or planned infrastructure and public service facilities required to accommodate the projected needs. Finally, planning authorities are directed to provide for an appropriate range of housing types and densities required to meet projected requirements of current and future residents of the regional market area.

Official Plan Considerations

The subject property is dually designated. The westerly two thirds of the site is designated Stable Residential and the easterly one third is designated Commercial on Schedule “A” Land Use Plan in the 2006 Official Plan. The Stable Residential permitted uses include single and semi detached dwellings, but would preclude townhouse uses. The Commercial designation contemplates a number of commercial uses but precludes residential uses. The applicant is applying to replace the existing designations on the subject lands with the Emerging Residential designation to permit the proposed 27 townhouse units on a private road.

As noted in Section 2.1 of the Official Plan, a key principle reinforced throughout the Plan is the commitment to protect and strengthen existing neighbourhoods. Any development or redevelopment in stable residential areas must respect the existing character of the area.

The “Residential Areas” policies of the Official Plan found in Section 3.0 describe the two residential designations, being Stable Residential and Emerging Residential. Stable Residential Areas currently have a mix of housing forms including rowhouses, townhouses, duplexes, fourplexes, apartments and other multi-unit buildings however, only permit single detached and semi detached dwellings through new infill development. Emerging Residential areas permit single detached and semi detached dwellings, however townhomes are also permitted provided the use is appropriately justified.

The focus of future intensification is directed by this Plan primarily to the Urban Centres. Limited intensification is permitted in Stable and Emerging Residential Areas in a form and location that will maintain the residential character and amenities.

When assessing new development proposals against the policies of the Official Plan, the compatibility with the scale of the surrounding neighbourhood, the physical suitability of the site to accommodate the proposal and the availability of hard services and road access requirements are reviewed and considered.

Compatibility with the scale of the surrounding neighbourhood

The existing neighbourhood is predominantly low density with a majority of single family dwellings. There are various small scale commercial establishments along Eagle Street as well as some institutional uses including the regionally owned and operated building to the west and the pioneer cemetery to the north.

The Town's Official Plan is, in part, a response to the Provincial Growth Plan and as such has identified areas for intensification, being the Provincial Urban Centre, the Regional Urban Centre and the Historic Downtown Centre. The majority of the existing residential areas in Newmarket are designated Stable Residential, which, according to the Plan, will see limited intensification.

To address compatibility issues, the owners have revised the proposal from a 6 storey apartment building to ground related 3 storey townhouses. Directly adjacent to the rear yards of the existing adjacent dwelling are the rear yards of the proposed townhouses. The existing vegetation along the south property line is intended to remain.

Physical Suitability of the site to accommodate the proposal

The subject lands are relatively flat with no significant grades to take into account. The proposal is sited on the subject lands to have two blocks of townhouses fronting onto Eagle Street with each unit having a two car driveway and a one car garage accessed by an internal lane. Two more blocks of townhouses are proposed internal to the site with the front yards facing the proposed private road and rear yards abutting the existing residential properties to the south. The road width is proposed to be 6.0 metres and intended to be used as a fire route so no visitor parking can be accommodated on the private road.

The site can appear to accommodate the proposed development while providing necessary parking, amenity space and buffers.

Availability of hard services and road access requirements

Engineering Services have confirmed that water, storm and sanitary servicing along with road access can be accommodated appropriately on site. They have provided detailed comments to be addressed at the site plan stage.

Zoning Bylaw Consideration

The Subject Property is currently zoned Residential Detached Dwelling 15m zone (R1-D-119) by Bylaw Number 2010-40, as amended. The Applicant wishes to rezone the Subject Property to the Residential Townhouse Condominium Plan Dwelling (R4-CP) Zone to implement the plan. The applicant will also require site specific performance standards to implement the proposed plan.

Staff have utilised Section 16.1.1, policy 3 in the Town's Official Plan with regard to the Zoning By-Law Amendment:

"3. In considering an amendment to the Zoning By-Law, Council shall be satisfied that:

a. the proposed change is in conformity with this Plan;

The applicant has applied for an Official Plan amendment that would permit townhouse dwellings. As a result of the review and analysis of the submitted studies and reports, staff are recommending approval of the Official Plan Amendment. All relevant policies of the Official Plan have been addressed.

b. the proposed use is compatible with adjacent uses, and where necessary, buffering is provided to ensure visual separation and compatibility between uses;

As noted in the above discussions, it is staffs opinion that the proposal is compatible with the surrounding community.

c. potential nuisance effects upon adjacent uses are mitigated;

Nuisance effects typically refer to impact of noise and airborne particles on occupiers of neighbouring properties, usually from employment uses. It is not anticipated that this development will cause any nuisance effects with the exception of construction activities which will be addressed in a construction management plan at the detailed design stage.

d. adequate municipal services are available;

Engineering Services have advised that the site can be adequately serviced. There are some detailed engineering comments that are to be addressed through the site plan process.

e. the size of the lot is appropriate for the proposed use;

The proposed development can be accommodated on the subject lands while providing the necessary parking and buffering.

f. the site has adequate road access and the boundary roads can accommodate the traffic generated;

Engineering services have reviewed the submitted traffic impact study and have concluded that traffic is not anticipated to be an issue for this proposal.

g. the on-site parking, loading and circulation facilities are adequate; and,

The proposed private road is adequately sized to meet town standards and parking can be appropriately accommodated.

h. public notice has been given in accordance with the Planning Act.”

Public notice has been provided in accordance with the Planning Act.

Servicing Allocation

Servicing allocation has not been granted for this proposal. As this development proposal does not have servicing allocation, the Holding (H) provisions of the Planning Act will be required in the event the property is rezoned.

Departmental and Agency Comments

Engineering Services have no objection to the Official Plan and Zoning By-law Amendments. A number of comments related to the servicing of the site have been provided to be addressed at the site plan approval stage. ES have noted that due to constraints resulting from the preservation of trees along the rear of the lot where it abut existing residential, the rear amenity areas of the new lots will be limited.

Noise – While the noise analysis has not yet been accepted by the Town’s peer review consultant, it is anticipated that this work can be finalized through the site plan approval process. It is also anticipated that mitigation measures and warning clauses will be required based on the noise generated from vehicles on Eagle Street. The necessary finalization of the noise work will be a condition of removing the Holding provision from the zoning, if these applications are approved.

Region of York – have no objections to the proposed Official Plan and Zoning By-law Amendments. Regional Transportation has provided comments to be addressed through the site plan approval process.

Lake Simcoe Region Conservation Authority have indicated that they are satisfied from a watershed management perspective that the proposed Official Plan Amendment and Zoning By-law Amendment are consistent with the Natural Heritage and Natural Hazard policies of the Provincial Policy Statement, conform to the requirements of the Lake Simcoe Protection Plan, and Ontario Regulation 179/06 under the Conservation Authorities Act. Accordingly, the LSRCA has no objection to the approval of these applications.

BUSINESS PLAN AND STRATEGIC PLAN LINKAGES

This report has linkages to the Community Strategic Plan by engaging the community in civic affairs; being *Well*-equipped & managed by providing for varied housing types and densities within the area; and, being *Well* Balanced by encouraging a sense of community through an appropriate mix of land uses and amenities.

BUDGET IMPACT

Operating Budget (Current and Future)

The appropriate planning application fees have been received for Official Plan amendment and zoning bylaw amendment. The Town will also receive revenue from development charges and assessment revenue with the development of these lands in the event the applications are approved.

Capital Budget

There is no direct capital budget impact as a result of this report.

CONTACT

For more information on this report, contact: Dave Ruggle, Senior Planner – Community Planning, at 905-953-5321, ext 2454; druggle@newmarket.ca

Attachments

- 1 - Location Map
- 2 - Proposed site plan



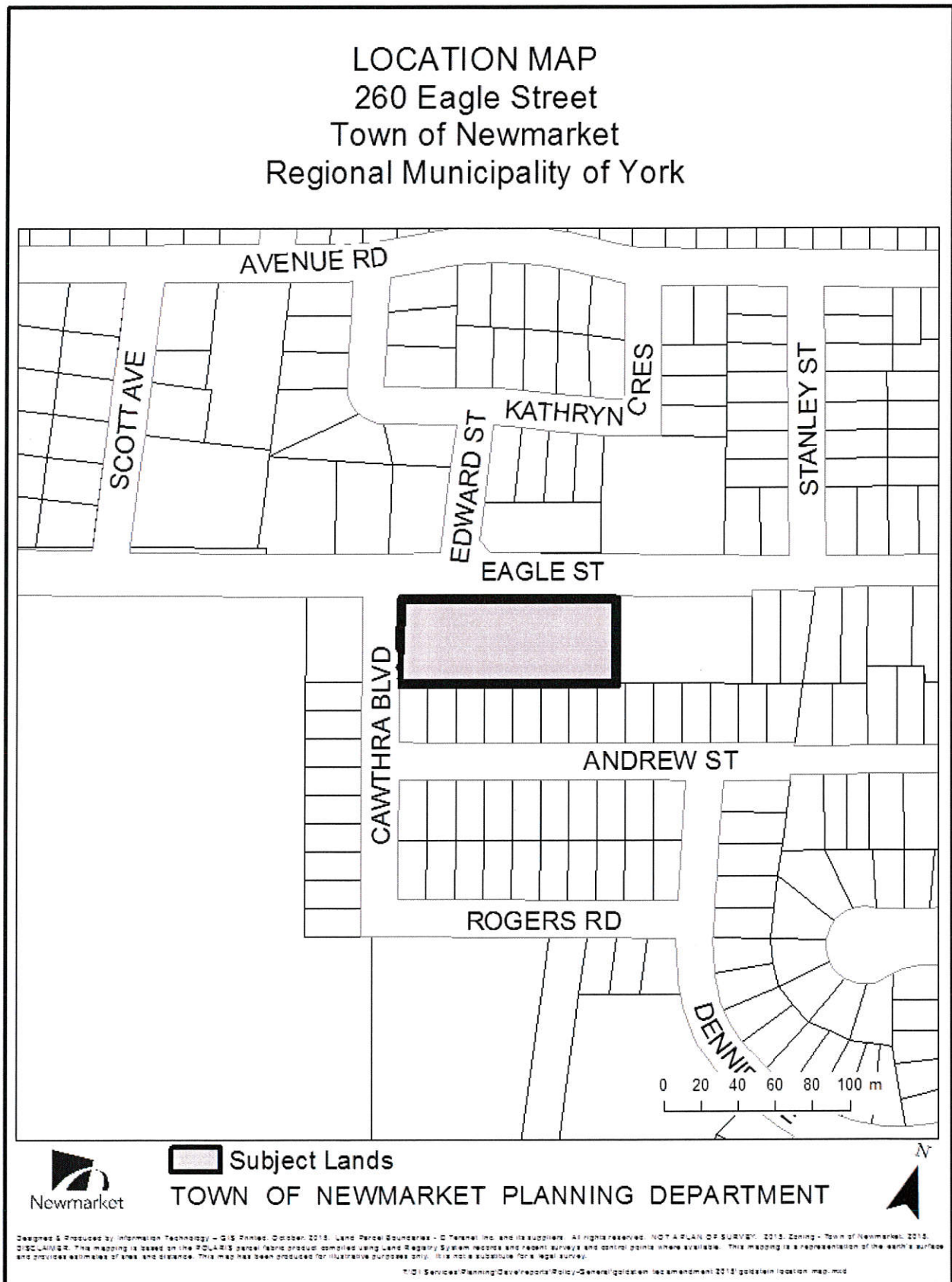
Commissioner Development and Infrastructure
Services



Director of Planning and Building Services



Senior Planner – Community Planning





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June 19, 2017

DEVELOPMENT AND INFRASTRUCTURE SERVICES/PLANNING & BUILDING SERVICES - REPORT 2017-23

TO: Committee of the Whole

SUBJECT: Inter-municipal Agreement with the Town of Aurora

ORIGIN: Development and Infrastructure Services - Planning and Building Services

RECOMMENDATIONS

THAT Development and Infrastructure Services/Planning and Building Services Report 2017-23 dated June 19, 2017 regarding the Inter-municipal agreement between the Town of Newmarket and the Town of Aurora be received and the following recommendation(s) be adopted:

That Council direct the Chief Administrative Officer the authority to execute the necessary inter-municipal agreement substantially in the form attached as Appendix "A" to this report.

BACKGROUND

Through the draft plan approval of the Cedar Manor (Trinison) subdivision in the town's southeast quadrant, a connection to a land locked parcel (Sikura Subdivision) in the Town of Aurora has been accommodated by terminating Bob Gapp Drive at the Town's shared boundary with Aurora. Bob Gapp Drive has been designed in anticipation of the future development in Aurora.

This connection through the town of Newmarket is necessary as it is the only access to the Aurora lands. As Aurora was proceeding through a secondary plan process for these lands, a Business Park designation was proposed adjacent to the existing residential subdivision in Newmarket. The Aurora secondary plan intended the Sikura lands to be accessed from St. John's side road. The secondary plan was appealed to the Ontario Municipal Board in part, to allow for residential uses on these lands. One determining factor was the natural heritage system extending from Leslie Street to Hwy 404 bisecting the lands in Aurora and the ability to provide infrastructure through this protected area. The Board determined that *"the Environmental Protection Area is worthy of protection that should not be compromised by the Town's proposed diagonal minor collector road crossing for the purpose of linking employment uses – a linkage that comes at a cost to the important environmental features of the Sikura lands and an offence of the applicable and previously-cited environmental policies."*

To ensure residents in Newmarket abutting these lands are aware of the proposed development in Aurora, the Cedar Manor subdivision agreement included Notice requirements obligating the developer to provide notice to the purchasers of lots abutting Aurora advising of the future development to the south.

Municipal Council of the Town of Aurora has draft approved the subdivision plan and associated zoning. A copy of the approved draft plan, consisting of 109 single family dwellings, is attached to this report. Council will note that the proposed lot sizes in the Aurora draft plan of subdivision are of a similar size to the existing lots in Newmarket where they abut.

Staff have been working with the Town of Aurora to determine the roles and responsibilities of each municipality as it relates to the services provided to Sikura subdivision. Staff also engaged the consulting firm Hemson to assist in developing a fair approach to the noted roles and responsibilities of how services would be provided by Newmarket to the residents in the Sikura Subdivision. The inter-municipal agreement has been drafted to ensure the design and installation of services provided and maintenance of such does not negatively impact the Town of Newmarket financially or otherwise. The proposed draft inter-municipal agreement is appended to this report for council's review. At this time the agreement has been provided to the Town of Aurora for comment. This report is recommending that council direct the CAO to execute the agreement, once finalized, provided it is substantially in accordance with the draft agreement attached.

BUSINESS PLAN AND STRATEGIC PLAN LINKAGES

Well respected – by establishing effective working relationships and joint planning initiatives with municipal neighbours championing co-operation and collaboration.

CONTACT

For more information on this report, contact: Dave Ruggle, Senior Planner – Community Planning, at 905-953-5321, ext 2454; druggle@newmarket.ca



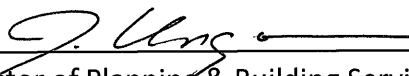
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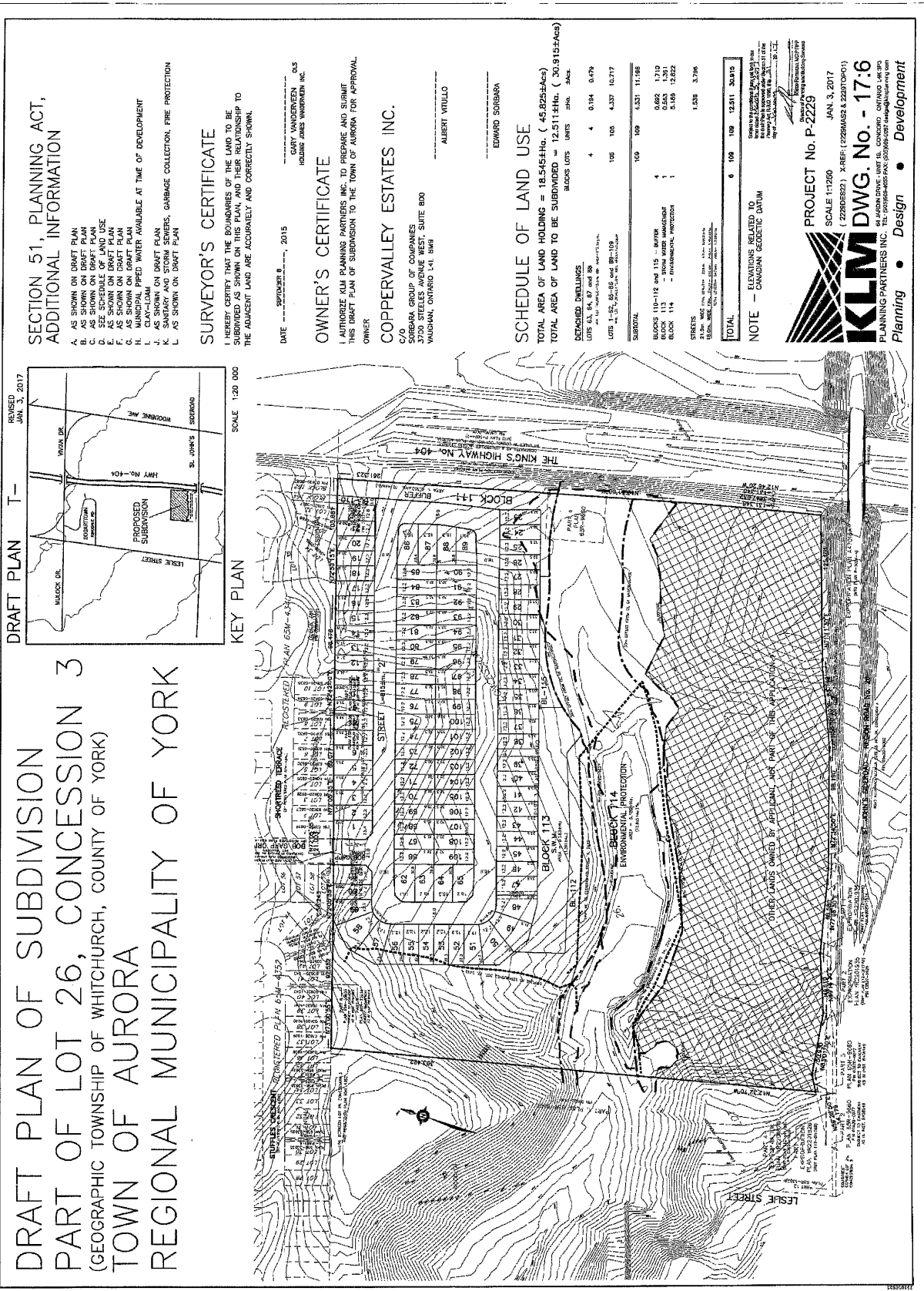
Commissioner, Development
and Infrastructure Services



Senior Planner Community Planning



for Director of Planning & Building Services



SERVICES EXTENSION AGREEMENT

Copper Valley Development, Aurora

THIS AGREEMENT made as of the day of , 2017.

B E T W E E N:

CORPORATION OF THE TOWN OF NEWMARKET

Party of the First Part

THE CORPORATIN OF THE TOWN OF AURORA

Party of the Second Part

WHEREAS the Corporation of the Town of Newmarket (hereinafter “**Newmarket**”) is a local municipality within the Regional Municipality of York;

AND WHEREAS The Corporation of the Town of Aurora (hereinafter “**Aurora**”) is a local municipality within the Regional Municipality of York, adjoining Newmarket;

AND WHEREAS each of Newmarket and Aurora has been empowered to acquire, establish, maintain and operate public utilities as provided for in Section 11 of the *Municipal Act 2001*, including waterworks;

AND WHEREAS Newmarket owns and operates works and facilities for the distribution of water, including the necessary conduits, pipes, and administration offices (hereinafter the “**Water Works**”) for the use and benefit of the inhabitants of Newmarket;

AND WHEREAS the Ontario Municipal Board has ordered (the “**OMB Decision**”) that there be a connection to development lands located in the Town of Aurora, as hereinafter further described, from a residential area located immediately north of these lands in the Town of Newmarket (the “**Cedar Manor Development**”);

AND WHEREAS as a result of the OMB Decision Aurora has determined that it is expedient and in the public interest to request a municipal road connection from these development lands in Aurora to Bob Gapp Drive within the Cedar Manor Development (“**Bob Gapp Drive**”), and that Newmarket undertake the Road Works (as hereinafter defined);

AND WHEREAS as a result of the OMB Decision Aurora has determined that it is expedient and in the public interest to request that Newmarket extend its Water Works on Bob Gapp Drive from their present terminus in Newmarket and to link such Water Works to other Newmarket Water Works (the “**Point of Connection**”) to service the development lands in Aurora which are located south of the Cedar Manor Development and described as Part of Lot 26, Concession 3, Geographic Township of Whitchurch, County of York and which lands are proposed to be developed for a residential development comprising 101 single family dwelling units and known as the Hill and Dale Development (the “**Development**”) and illustrated on Schedule A attached;

AND WHEREAS Newmarket has agreed to the extension of its Water Works provided such extension shall not compromise Newmarket’s ability to provide an adequate supply at adequate operating pressure of potable water to land within Newmarket;

AND WHEREAS The Regional Municipality of York (the “**Region**”) has consented to the Aurora purchase of water from Newmarket as provided for in this Agreement;

NOW THEREFORE the parties hereto agree one with the other as follows:

1.0 SERVICES AND WORKS

1.1 WATER

1.1.1 Newmarket agrees to permit the extension of the Water Works so as to be available to service **only** the proposed Development . The works necessary to complete the extension of the Water Works are set out on a general servicing plan attached as Schedule B (the “**General Servicing Plan**”), and as may be amended and approved from time to time by the Ontario Ministry of the Environment and Climate Change (hereinafter the “**MOECC**”) and Newmarket’s Director of Engineering and Director of Public Works Services (the “**Water Works Extension**”).

1.1.2 The Water Works Extension is essentially an extension of Newmarket’s water main from Newmarket into Aurora including all required appurtenances, including but not limited to meter chamber, valves, hydrants and anti-tampering devices, all to be installed within Bob Gapp Drive as illustrated on Schedule C and constructed to serve the Development but shall exclude all water works constructed upon privately owned lands.

1.1.3 Aurora covenants and agrees, in order to ensure compatibility with Newmarket’s Water Works and the availability of water supply to Newmarket, at its sole cost and expense, to:

- (a) ensure that all hydrants and water valves are equipped with anti-tampering devices to the satisfaction of Newmarket;
- (b) ensure that no hydrants are used for any purpose other than fire-fighting unless the express written permission of Aurora’s Director of Environmental Services (hereinafter the “**Director**”) has been obtained with notice to Newmarket’s Director of Public Works. Aurora agrees that permission to use a hydrant may be given by Aurora’s Director for such purposes as

street-flushing but, under no circumstances, for the provision of water for the purposes of building/construction trades;

(c) ensure that arrangements have been made satisfactory to Newmarket's Manager of Water/Wastewater for the provision of water for the building/construction trades prior to the commencement of construction of any improvement upon the lands of the proposed Development (the "**Lands**"); and

(d) following commissioning of the water main, ensure that, under no circumstances, hydrants or valves are operated by persons other than the Central York Fire Services for firefighting purposes, certified operators from Aurora's department of _____ or Newmarket's Public Works Services.

1.2 ROADS

1.2.1 Newmarket agrees to allow a municipal road connection from the Development to Bob Gapp Drive and an emergency access route from the Development to McCron Crescent, and to undertake the maintenance and operational activities **only** with respect to the roads within the Development and emergency access route connecting to the Development, illustrated in Schedule D of the Agreement (the "**Roads**"), upon the final acceptance of the said works under the Development Agreement, as defined in Section 2.1, (the "**Final Acceptance**"). The maintenance and operational activities with respect to the Roads shall be undertaken by Newmarket based on Newmarket standards for such road activities (the "**Road Works**").

1.2.2 The parties agree that the ownership of the Roads will remain with Aurora and that all capital replacement and rehabilitation activities will remain solely, completely and at the expense of Aurora. Aurora shall submit all capital replacement and rehabilitation plans to Newmarket for approval prior to undertaking any such works. The frequency and standards of the capital replacement and rehabilitation of the Roads shall be as determined by both municipalities.

1.2.3 Aurora shall pay Newmarket a fee, plus applicable taxes, for the Road Works as set out in Schedule E of this Agreement. The said fees and taxes shall be invoiced by Newmarket and payable by Aurora as set out in Section 12.3 of this Agreement.

1.2.4 Aurora covenants and agrees to enact such by-law(s) under the *Municipal Act* to restrict parking on the Roads such that: (a) no vehicle is permitted to park for more than three (3) consecutive hours on the Roads except between the hours of 7:00 p.m. to 11:00 p.m.; (b) vehicles are only permitted to park on one specified side of the Roads; (c) no vehicle is permitted to park in any cul-de-sac in the Development; and (d) no vehicle is permitted to park on the Roads between 2 a.m. and 6 a.m. during the period of November 1 to April 15 of each year.

1.2.5 Aurora herein consents to Newmarket, its servants, employees or agents entering upon the Roads without notice to perform the Road Works.

1.3 SOLID WASTE COLLECTION

1.3.1 The parties acknowledge that the collection and transportation of garbage, recyclable material, source separated organic material, yard waste and special waste for the residences of the Development (the “**Solid Waste Collection**”) shall be undertaken in accordance with the terms of the applicable agreement between the “Northern 6” municipalities in the Region regarding the Solid Waste Collection and the waste collection contractor, as may be amended (the “**N6 Contract**”). The parties further agree that the Solid Waste Collection shall occur in accordance with and as an extension of Newmarket’s collection for solid waste collection within the Town of Newmarket.

1.3.2 Aurora shall reimburse Newmarket for the cost of the Solid Waste Collection based on the rate of tonnage of solid waste collected under the Solid Waste Collection as set out in Schedule F of this Agreement (the “**Solid Waste Cost**”). The Solid Waste Cost will be subject to annual increases based on any cost increases under the N6 Contract, and a review of total tonnage collected and divided by the number of households serviced for the prior year.

1.3.3 Aurora covenants and warrants that it has enacted a by-law under the *Municipal Act* regulating solid waste (the “**Solid Waste By-law**”). Notwithstanding Section 1.3.1, the parties agree that Aurora’s Solid Waste By-law, as may be amended, will govern to regulate the Solid Waste Collection for the residences of the Development.

1.3.4 The parties agree that complaints by residents of the Development which may arise from the Solid Waste Collection will be directed to Newmarket for address.

1.4 CONSENTS

1.4.1 Each of the parties hereby provides the other party consent for the Water Works Extension, the Road Works and the Solid Waste Collection as provided for in Section 19 of the *Municipal Act, 2001*, as amended.

1.5 TERM

1.5.1 Provided that Aurora is not in default of this Services Extension Agreement, and subject to Section 20.0 of this Agreement, Newmarket agrees to provide the services set out in this Agreement for the following periods:

- a) two (2) years from the effective date of this Agreement, which term shall be automatically extended for three further terms of one (1) year each; and
- b) thereafter automatically extended for a term of twenty (20) years, which term shall be further automatically extended for further 20 year terms on each 20 year anniversary date thereof.

2.0 OWNERS AGREEMENT

2.1 Aurora shall enter into a development agreement as soon as is practical with the registered owners of the Development (the “**Owner**”) which agreement shall be registered on title to the Lands (the “**Development Agreement**”). Aurora shall provide Newmarket with a copy of the Development Agreement immediately upon execution of same and with registration particulars forthwith upon registration.

2.2 Aurora shall include as a condition of approval of the Development that this Services Extension Agreement be executed between Aurora and Newmarket.

2.3 Aurora represents and warrants that the Development Agreement shall require the following:

- a. the Owner to provide optimal water main design, including back flow prevention as may be required to minimize the potential for back flow into the Newmarket Water Works and maximize flow through mains located upon privately owned lands all in accordance with plans and specifications approved by Newmarket;
- b. the Owner to provide detailed engineering designs and drawings for review and approval;
- c. the Owner to provide a construction management plan to the satisfaction of Newmarket (the “**CMP**”) which shall include management of construction traffic and mud, dust and other debris affecting roads located in the municipality of Newmarket (the “**Newmarket Roads**”), and a letter of credit in favour of Newmarket in the amount of \$10,000 to ensure compliance with the CMP ;
- d. the Owner’s agreement that all streets, including the Roads and the Newmarket Roads, will be kept free and clear of mud, dust or other debris related to the Development;
- e. the Owner to provide payment of cash in lieu of the conveyance of parkland in regards to the Development in accordance with the requirements of the *Planning Act, 1990*, as amended (the “**Parkland Contribution**”) as set out in in Schedule G of this Agreement;
- f. the Owner to provide payment of a community benefit charge equal to \$2,500 for each residence of the Development (the “**Community Benefit Charge**”);

2.4 Upon execution of the Development Agreement, Aurora shall pay to Newmarket the following amounts for the sole benefit of and retention by Newmarket:

- a. fifty (50%) percent of the Parkland Contribution;
- b. fifty (50%) percent of the Community Benefit Charge; and
- c. half of the cost for the maintenance of Newmarket’s trails, recreation facilities and parks for each residence of the Development (the “**Facilities Maintenance Cost**”). The Facilities Maintenance Cost shall be paid to Newmarket annually in accordance with Section 12.3 of this Agreement, and will be based upon and increased in accordance with

Newmarket's annual budget. For information purposes, the applicable half share rate per residence for 2016 was \$220.86.

2.5 Notwithstanding any other term of this Agreement, all access and works relating to municipal land located in the Town of Newmarket, including the Newmarket Roads, shall be subject to the consent and/or permit requirements of Newmarket for such access and works.

3.0 DESIGN, CONSTRUCTION AND COMMISSIONING OF THE WATER WORKS EXTENSION AND THE ROADS

3.1 Aurora shall be responsible for the design and construction of the Water Works Extension and the Roads. Such design and construction shall be built in accordance with plans and specifications approved by applicable agencies, and in accordance with all applicable law. Such design and construction shall be reviewed by Newmarket for comment. Notwithstanding the foregoing, Aurora represents and warrants that the Water Works Extension shall be fully compatible with Newmarket's Water Works and shall in no manner adversely affect the Newmarket Water Works.

3.2 Aurora shall, at its sole cost, retain a professional consulting engineer, skilled and experienced in municipal work, to design, supervise, layout, inspect, and maintain the Water Works Extension and the Roads, and to remedy any defect discovered in the Water Works Extension and the Roads up until the date of Final Acceptance of the said works.

3.3 Aurora shall provide Newmarket with the engineering design drawings for the Water Works Extension and the Roads including hard copies and electronic copies of the drawings in the formats specified by Newmarket. The designs contained within the said engineering drawings shall be consistent with all accepted reports, studies, plans and recommendations. The engineering drawings shall also identify lands, if any, which are required to be conveyed as easements to Aurora and which Newmarket may utilize to carry out maintenance and activities as set out in this Agreement. Upon completion of construction of the Water Works Extension and the Roads, Aurora shall provide Newmarket with "as built" or "as constructed" drawings in the formats specified by Newmarket.

3.4 Aurora shall also provide Newmarket with hard and electronic copies of its composite utility plan which plan shall show the location of all works and appurtenances comprising the Water Works Extension, including but not limited to all valves and hydrants.

3.5 Notwithstanding any review, acceptance, criticism and/or modifications given by Newmarket or its consultants, neither Newmarket nor any of its consultants shall have any liability or responsibility for the engineering design, drawings, plans or specifications. Aurora shall be solely responsible for the soundness of the engineering design and for ensuring that the Water Works Extension and the Roads function as intended and that the Water Works Extension is fully compatible with Newmarket's Water Works.

3.6 Prior to commissioning the Water Works Extension, or any part thereof, Aurora shall, at its sole cost and expense, procure and install a valve chamber, valve and water meter, complete with

remote reader, secured to post, at the Point of Connection, or at such other location that may be specified by Newmarket which valve and meter shall become the property of Newmarket upon the installation thereof. The meter shall be purchased from Newmarket or from Newmarket's supplier. The valve chamber shall be designed and installed to conform to Newmarket's specifications such that, subject to Newmarket's consent, it will be in place if required for future uses. In addition, the Town of Aurora shall install a sample station approved by Newmarket at the far extremities of the water system within the Development for monitoring and sampling by Newmarket.

3.7 Aurora shall not commission the Water Works Extension or any part thereof, without the prior written approval Newmarket's Director of Public Works which approval shall not be unreasonably withheld. Without limiting the generality of the foregoing, Aurora shall not commission the Water Works Extension, including any new water mains without certifying that the said water mains have met the testing requirements of Appendix 7 of the Newmarket Engineering Design Standards & Criteria, as may be amended. Any operation of valves or hydrants prior to commissioning must be carried out by a contractor approved by both Aurora and Newmarket, and whose employee carrying out said operation is certified with a minimum level 1 Water Distribution Certification as per O.Reg 128/04, as may be amended.

3.8 Aurora shall complete the Water Works Extension and the Roads within 12 months of the effective date of this Services Extension Agreement or within such other period of time as Newmarket and Aurora may agree.

3.9 Prior to the commencement of any works comprising part of the Water Works Extension and the Roads, Aurora shall file with Newmarket a detailed schedule setting out the times when the various works comprising the Water Works Extension and the Road Works shall be carried out and completed, and all such works comprising part of the Water Works Extension and the Roads shall be constructed and installed in accordance with such schedule as it may be varied, by agreement, from time to time.

4.0 OWNERSHIP, OPERATION AND MAINTENANCE OF THE WATER WORKS EXTENSION

4.1 WATER WORKS EXTENSION

4.1.1 The parties agree that the ownership and the capital replacement and rehabilitation of the Water Works Extension will remain solely and completely with Aurora. Aurora shall submit all capital replacement and rehabilitation plans to Newmarket for approval prior to undertaking any capital replacement and/or rehabilitation works for the Water Works Extension. Provided however that Newmarket, as soon as any part of the Water Works Extension is commissioned, shall have the right to read the meter(s) installed at the Point of Connection and to collect from Aurora Newmarket's combined utility rate, at Newmarket's rate in effect from time to time, which rates shall be payable by Aurora upon receipt of Newmarket's invoices therefor. All such utility rates collected by Newmarket shall be retained by Newmarket. Aurora shall, at all times be responsible, for reading all meters located within the Development, save for the meters

installed at the Point of Connection, and shall be free to collect it's utility rate(s) at Aurora's rate in effect from time to time which utility rate(s) and levies shall be retained by Aurora.

4.1.2 The parties agree that Newmarket will be responsible for the maintenance and operation of the Water Works Extension, including the hydrants and the water valves, and such maintenance and operation shall be in accordance with Newmarket standards for such activities (the "**Maintenance and Operations**"), and will invoice Aurora for the Maintenance and Operations in accordance with the fees set out in Schedule H attached to this Agreement.

4.1.3 The parties agree that the Maintenance and Operations will include the service connections from the water main to the boundary of the private lands in the Development connected thereto, as well as the reporting and other requirements set out in Section 7.1 of this Agreement.

4.1.4 If Aurora elects to service the Development by means other than the Water Works Extension services provided by Newmarket herein, Aurora shall, at its sole cost and expense, undertake such action and construct such works, as may be required by Newmarket to ensure the preservation of acceptable water quality and chlorine residuals within the Newmarket Water Works subsequent to any proposed disconnection. Aurora shall be responsible for the operation, maintenance, repair and replacement of the Aurora component of the Water Works Extension and Newmarket shall have no further responsibilities under this Agreement.

4.1.5 Aurora herein consents to Newmarket, its servants, employees or agents entering upon the Lands without notice to perform the Maintenance and Operations.

5.0 RIGHT OF ENTRY TO PERFORM WORK

5.1 In addition to the Maintenance and Operations, if at any time the Water Works Extension and/or the Roads do not, in Newmarket's opinion, function properly and, if in Newmarket's opinion, work or repairs must be performed to prevent damage or hardship to persons or property in Newmarket, and if Newmarket is required, Aurora consents to Newmarket, its servants, employees or agents, entering upon the Lands without notice and performing such work and making whatever repairs may be considered by Newmarket to be necessary at the sole cost and expense of Aurora which costs and expenses shall be payable by Aurora forthwith upon demand.

6.0 PERFORMANCE GUARANTEE

6.1 Aurora represents and warrants that the Water Works Extension and the Roads shall all be constructed and installed in a good and workmanlike manner consistent with the highest standards found in the engineering profession and the construction industry. Aurora shall guarantee any defect arising from faulty workmanship, material and design so that the Water Works Extension and the Roads shall operate as intended and be free of any defect.

6.2 Aurora covenants and agrees that from time to time, if requested by Newmarket, it shall cause its consulting engineer to monitor and test the Water Works Extension and to supply such reports as Newmarket may require, setting out the results of such monitoring and testing. In the

event, that such monitoring and testing indicates that remedial work must be undertaken to enable the said system to function as intended, Aurora shall immediately notify Newmarket who will undertake such work, at the sole cost and expense of Aurora.

7.0. MINISTRY OF THE ENVIRONMENT AND CLIMATE CHANGE REPORTING REQUIREMENTS

7.1 Newmarket will be responsible, at the expense of Aurora, for all MOECC reporting requirements related to the Water Works Extension, including but not limited to all requirements of the *Safe Drinking Water Act, 2002*, as amended, and regulations thereunder. The cost for Newmarket's reporting activities herein shall be included in Schedule H of this Agreement.

7.2 Aurora shall be solely responsible for ensuring that water works installed on privately owned lands within the Development are designed operated and maintained to ensure preservation of acceptable water quality in accordance with MOECC guidelines and shall be solely responsible to meet its obligations in law or arising from the provisions of this agreement for ensuring that any such owner and/or occupant resolves any water quality issues that may arise related to the privately owned water works.

7.3 Aurora shall, at its sole cost and expense, be responsible for ensuring that a monitoring and remediation program is in place to ensure the preservation of chlorine residuals and good water quality until such time as occupancies at the Development are such that site water consumption is able to maintain adequate chlorine residuals and water quality. Aurora will provide Newmarket with a report prior to first occupancy of any structure within the Lands setting out the procedures to be followed as part of said monitoring and remediation program and shall amend the procedures outlined upon Newmarket's request. Any flushed water used to maintain water quality prior to assumption by Aurora must be recorded with total volume of water used paid to Newmarket.

7.4 In the event that either Aurora or Newmarket receives notification of any adverse water conditions or problems with the Water Works system that may affect water quality or water supply in the other municipality, Aurora or Newmarket, as the case may be, shall immediately provide the other with full particulars of any such notification.

8.0 RESTRICTION ON CONNECTIONS AND EXTENSIONS

8.1 Aurora shall not approve the development of the Lands without first obtaining Newmarket's approval of the Development. Without limiting the generality of the foregoing, Newmarket may withhold its approval of the Development if it will have the effect of restricting Newmarket's ability to provide an adequate supply at adequate operating pressure of potable water to land within Newmarket as determined by Newmarket in its sole and only discretion, Newmarket and Aurora shall convene a meeting of their respective public works or engineering staff prior to approval of the development of the Lands for the purpose of making such determination.

8.2 Aurora shall not, under any circumstances whatsoever, permit the owner or occupier of any land located outside of the Lands to connect to the Water Works Extension without the prior written consent of Newmarket, which consent may be unreasonably withheld. In the event that an unauthorized connection occurs, Newmarket shall have the right to terminate the unauthorized connection upon 24 hours written notice to Aurora. Aurora agrees that it shall indemnify and save harmless Newmarket from and against all loss, cost, charges, damages, expenses, claims, demands and liens whatsoever which Newmarket may incur by reason of terminating delivery of water or terminating to any unauthorized connections.

9.0 EASEMENTS

9.1 Prior to commencing work, Aurora shall obtain and register easements in favour of Aurora from the registered owners of all lands within the Development upon which any part of the Water Works Extension shall be constructed. All such easements shall be obtained and registered against the subject lands by Aurora at its sole cost and expense, and shall include Newmarket's ability to enter on, upon and under such lands for the purposes set out in this Agreement.

10.0 BYLAW UNDER THE PLANNING ACT

10.1 Aurora warrants that it has enacted a bylaw under *Planning Act* prohibiting the issuance of building permits for dwelling units unless full municipal services are connected.

11.0 BUILDING PERMITS

11.1. Aurora agrees that it shall not issue any building permits for the Development until Newmarket confirms receipt of all required charges and payments as set out in this Agreement.

12.0 CHARGES AND RATES

12.1 Aurora agrees and acknowledges that, for the purposes of any bylaw which may be enacted by Newmarket pursuant to Part XII of the *Municipal Act* regarding fees and charges, the extension, connection and provision of the Water Works Extension, the Road Works and the Solid Waste Collection are services or activities provided by Newmarket on behalf of Aurora.

12.2 Newmarket may employ a user fee bylaw pursuant to Part XII of the *Municipal Act*, a capital cost rate under Part XII of the *Municipal Act, 2001*, as amended, or similar or subsequent legislation to provide for the establishment of the water and waste water rates for which Aurora shall be responsible pursuant to this Agreement (hereinafter the **"By-Law"**).

12.3 It is agreed that, for purposes of the payments of fees and charges by Aurora to Newmarket as set out in Sections 1.2, 1.3, 4.1 and 7.1 of this Agreement, Newmarket shall invoice Aurora yearly on August 31 of every year and Aurora shall remit payment within 30 days of the date of any such invoice. It is agreed that all fees and charges for the fiscal year in

which they apply shall be set by Newmarket, or as may be agreed by both parties, on August 31 of the previous year.

13.0 INSURANCE

13.1 Before commencing any of the work or services contemplated in this Agreement, Aurora shall provide Newmarket with proof of public liability insurance policy naming Newmarket and its consulting engineers as co-insured, in such form as and with such coverages as may be required by Newmarket. Aurora shall maintain in effect at all time comprehensive insurance of not less than \$10,000,000.00.

14.0 INDEMNIFICATION AND RELEASE

14.1 Aurora covenants and agrees to indemnify and save harmless Newmarket and Newmarket's consultants from and against all liability, loss, cost, charges, damages, expenses, claims, demands and liens whatsoever which Newmarket and/or Newmarket's consultants may incur, suffer or sustain or for which they may be liable by reason of anything done or omitted to be done during the design, construction, maintenance, alteration, repair, replacement or operation of the systems and services contemplated by this Agreement.

Without limiting the generality of the foregoing, Aurora agrees to indemnify and save harmless Newmarket from and against all liability, loss, cost charges, damages, expenses, claim, demands and liens whatsoever to which Newmarket may incur, suffer, sustain, or be liable by reason of:

- (a) anything done or omitted to during construction, maintenance, alteration, repair, replacement or operation of the Water Works;
- (b) anything done or omitted to be done by reason of the design, construction, alteration, operation, maintenance or repair of the Water Works Extension;
- (c) anything done or omitted to be done by reason of the design, construction, alteration, operation, maintenance or repair of the Roads and/or the Road Works;
- (d) anything done or omitted to be done by reason of the Solid Waste Collection; and
- (e) any adverse condition or defect attributable to water works located on privately owned lands.

14.2 Aurora covenants and agrees to release and forever discharge Newmarket and Newmarket's consultants from any and all liability and responsibility of any kind or nature whatsoever, which Aurora may have against the Town and/or Newmarket's consultants arising out of anything done or omitted to be done during the design, construction, maintenance,

alteration, repair, replacement or operation of the systems and services contemplated by this Agreement.

Without limiting the generality of the foregoing, Aurora agrees to release and forever discharge Newmarket and/or Newmarket's consultants from any and all liability whatsoever and responsibility of any kind arising out of :

- (a) anything done or omitted to during construction, maintenance, alteration, repair, replacement or operation of the Water Works;
- (b) anything done or omitted to be done by reason of the design, construction, alteration, operation, maintenance or repair of the Water Works Extension;
- (c) anything done or omitted to be done by reason of the design, construction, alteration, operation, maintenance or repair of the Roads and/or the Road Works;
- (d) anything done or omitted to be done by reason of the Solid Waste Collection; and
- (e) any adverse condition or defect attributable to water works located on privately owned lands.

15.0 NEWMARKET'S CONSULTANTS

15.1 Upon execution of this Agreement, Aurora shall pay Newmarket a deposit in the amount of \$ 25,000.00 (the "**Fee Deposit**") to be applied by Newmarket in respect of fees and applicable taxes charged to Newmarket by Newmarket's consulting engineers, inspection firms and/or any other consultant retained by Newmarket. The Fee Deposit shall be subject to the following additional conditions:

- (a) in the event that Newmarket is required to pay its consultants fees, including applicable taxes, in excess of the Fee Deposit, Aurora shall pay Newmarket any such excess amount forthwith upon demand; and
- (b) in the event that fees, including applicable taxes, incurred by Newmarket in respect of its consultants are less than the Fee Deposit, the balance of the Fee Deposit will be refunded to Aurora within 90 days of Final Acceptance by Aurora of all of the Water Works Extension, and the Roads contemplated by this Agreement.

15.2 The Fee Deposit shall be used to compensate Newmarket for consulting fees, including applicable taxes, incurred for performing the following works:

- (a) to ensure construction and restoration of the Water Works Extension and the Roads are carried out strictly in accordance with the approved drawings, specifications and standards

- (b) to ensure that disinfection and potability tests are carried out in accordance with the requirements of all applicable law;
- (c) to ensure that pressure testing and all related procedures are satisfactorily carried out before the Water Works Extension is commissioned for use;
- (d) to ensure that all maintenance requirements regarding the Water Works Extension and the Roads are properly addressed during the maintenance period as defined in the subdivision agreement for the Development; and (e) engineering design review and field monitoring.

16.0 CHARGES RELATED TO NEWMARKET'S REVIEW AND APPROVAL OF THE WATER WORKS EXTENSION AND THE ROADS

16.1 Upon execution of this Agreement, Aurora shall pay Newmarket a deposit in the amount of \$ 35,000.00 (the "**Administration Deposit**") to be applied by Newmarket in respect of costs, including applicable taxes, incurred through the use of its staff regarding the following:

- (a) technical review of the pre-design/feasibility report(s);
- (b) technical review of the preliminary and final designs for the works contemplated by this Agreement ;
- (c) review of the CMP;
- (d) meetings and discussions with Aurora and the developers of the Land;
- (e) preparation of the within Agreement, including any future amendments hereto;
- (f) Newmarket's involvement with the administration of this Agreement and the construction of the works contemplated by this Agreement to completion of construction; and
- (g) Newmarket's annual costs associated with the administration of this Agreement during the term of this Agreement.

The Administration Deposit shall be subject to the following additional conditions:

- (i) in the event that Newmarket's incurred costs, including applicable taxes, exceed the Administration Deposit, Aurora shall pay Newmarket any such excess amount forthwith upon demand; and
- (ii) in the event that Newmarket's incurred costs, including applicable taxes, to the date of completion of construction of the Works are less than the Administration Deposit, the

balance will be refunded to Aurora within 90 days of Final Acceptance by Aurora of the Works.

Newmarket acknowledges receipt of \$25,000.00 towards payment of the Administration Deposit.

16.2 For greater certainty and notwithstanding any provision in this Agreement to the contrary Aurora covenants and agrees to pay to Newmarket all of its costs, including applicable taxes, arising from this Agreement, including any such costs and applicable taxes incurred as a result of termination of this Agreement

17.0 CEDAR MANOR NEWMARKET WATERMAIN

17.1 Aurora acknowledges that the development of the Lands requires the provision of water from, and connection to, the Bob Gapp Drive water main system which has been constructed at the expense of the Cedar Manor Home Corporation and Trinison Management Corporation (“**Cedar Manor and Trinison**”) Aurora acknowledges and agrees that this Agreement shall be conditional upon; (a) Aurora concluding, at its sole cost and expense, an agreement with Cedar Manor and Trinison; and (b) Aurora providing Newmarket with a release from Cedar Manor and Trinison releasing Newmarket from any and all claims that Cedar Manor and Trinison may have against Newmarket as a result of Newmarket permitting the Water Works Extension to occur. Notwithstanding the provisions of paragraph 17.0 and for greater certainty, Aurora shall indemnify, save harmless and defend Newmarket from and against all loss, cost, charges, damages, expenses, claims, demands and whatsoever which Newmarket may incur, sustain, suffer or be liable, or be put by Cedar Manor and Trinison by reason of permitting the Water Works Extension to occur.

18.0 USE OF RECREATION FACILITIES

18.1 Newmarket agrees that, for the purposes of membership regarding the use of Newmarket’s recreation facilities, trails and parks, the residents of the Development will be recognized as residents of Newmarket.

19.0 NO OBLIGATION

19.1 Newmarket shall have no obligations under this Agreement until Aurora has obtained any and all approvals in respect of the Water Works Extension required to be obtained from the Region, the Province of Ontario and any other authority or agency with jurisdiction and nothing herein shall relieve Aurora from obtaining all approvals and consents as may be required in order to construct and operate the Water Works Extension in accordance with all applicable law.

20.0 DEFAULT AND REMEDY

20.1 If, in the sole opinion of Newmarket, default under the terms of this Agreement has occurred, Aurora agrees that Newmarket may exercise such remedies as are set out below in such manner as Newmarket deems to be appropriate. Without limiting the generality of the foregoing, default may include Aurora's failure to carry out, or cause to be carried out, perform, commence, install, complete, maintain and repair as applicable, the Works or with respect to any obligation on the part of Aurora set out in this Agreement. Aurora shall also be considered in default, if Newmarket or its agents, employees and/or consultants are required to undertake or perform anything that would, in Newmarket's opinion, be Aurora's responsibility or obligation under the terms of this Agreement.

20.2 Where Aurora is in default of this Agreement, Newmarket shall not be obliged to complete Aurora's obligations with respect to the said default, but Newmarket may take such steps with respect to the default as Newmarket in its discretion deems appropriate under the circumstances and in Newmarket's interest. Newmarket shall charge Aurora for all of Newmarket's costs incurred by it in rectifying or curing the particular default, including all legal, engineering, administrative and any consultant fees, together with all disbursements that Newmarket incurs which amounts shall be payable by Aurora forthwith upon demand.

20.3 Where Aurora is in default of this Agreement, Newmarket, at its option, may require Aurora, or anyone acting with the permission or authority given by Aurora, to cease and desist from the continued construction of any of the Works.

21.0 TERMINATION

21.1 Aurora shall have the right to terminate this Agreement at any time upon 12 months written notice thereof given to Newmarket, or such other lesser period as Aurora and Newmarket may agree. Immediately upon completion of such notice period Newmarket shall have no further responsibilities under this Agreement. Upon termination of this Agreement by Aurora, Aurora shall, at its expense undertake the works contemplated in Section 4.1.4 hereof.

22.0 ESTOPPEL

22.1 The parties agree that they have the jurisdiction and the authority to enter into this Agreement and that they are forever estopped from challenging the validity of this Agreement or any of its provisions before the Courts of Ontario, any administrative tribunal or other authority having jurisdiction to rescind, vary or amend the provisions of this Agreement without the concurrence of all parties.

22.2 In the event there is any dispute arising from the terms of this Agreement, the parties agree that such dispute shall be referred to and settled by a single arbitrator, acceptable to both parties pursuant to the provisions of the *Arbitrations Act* RSO 1990 c. A24.

23.0 SEVERABILITY AND FURTHER ASSURANCES

23.1 In the event that a court quashes any portion of this Agreement or declares any portion of this agreement to be null or unenforceable such provisions(s) shall be severed from the remainder of this agreement which shall continue in full force and effect. The parties agree to execute such further assurances as may be necessary to carry into effect the provisions(s) quashed or declared to be null or unenforceable.

IN WITNESS WHEREOF the parties hereto have executed this agreement under the hands of their authorized signing officers in that regard.

CORPORATION OF THE TOWN OF NEWMARKET

Per:

Name:

Office:

THE CORPORATION OF THE TOWN OF AURORA

Per:

Name:

Office:

SCHEDULE A

Development Plan

[PLANNING/AURORA TO PROVIDE]

DRAFT

SCHEDULE B
(*Section 1.1.1*)

**General Servicing Plan
to Complete the Extension of the Water Works**

[ENGINEERING/AURORA TO PROVIDE]

DRAFT

SCHEDULE C
(*Section 1.1.2*)

Water Works Extension Limits
Proposed Water Mains
Existing Watermain

[ENGINEERING/AURORA TO PROVIDE]

DRAFT

SCHEDULE D
(*Section 1.2.1*)

Roads

[ENGINEERING/AURORA TO PROVIDE]

DRAFT

SCHEDULE E
(*Section 1.2.3*)

Fees and Charges Payable by Aurora for the Road Works

Subject to annual increases based on Newmarket's annual budget, Aurora shall pay to Newmarket per year of each term of this Agreement the amount of \$14,000 per lane kilometer, plus applicable taxes.

SCHEDULE F
(Section 1.3.2)

Solid Waste Collection Fees Payable by Aurora to Newmarket

Curbside Collection Costs for Inter Municipal Agreement between Aurora and Newmarket

<u>Material</u>	<u>Tonnage</u>	<u>Divided by 16643</u>	<u>Times 101 Homes</u>	<u>Equals Metric Tonnes</u>	<u>Cost per Tonne</u>	<u>Total Cost</u>
Green Bin	4666.54	0.280	101	28.28	\$ 129.50	\$ 3,662.26
Recycling	4871.54	0.293	101	29.59	\$ 131.00	\$ 3,876.29
Waste	6063.16	0.364	101	36.76	\$ 96.00	\$ 3,528.96
Yard Waste	2149.43	0.129	101	13.03	\$ 106.00	\$ 1,381.18
						\$ 12,448.69
					plus HST 13%	\$ 1,618.33
					Total	\$ 14,067.02

Note 1: Tonnages based on Aurora's 2016 total tonnages divided by 16,643 households

Note 2: Annual increase based on Annual CPI increase as per GFL contract

Note 3: Houses fall under Aurora's collection Bylaw

SCHEDULE G
(Section 2.3(d))

Parkland Contribution

[TO BE PROVIDED BY AURORA]

DRAFT

SCHEDULE H*(Sections 4.1.2, 4.1.3 and 7.1)*

**Fees and Charges Payable by Aurora
for Maintenance and Operations of the Water Works Extension**
(Includes fees for water reporting and other requirements set out in Section 7.1)

Subject to annual increases based on Newmarket's annual budget, Aurora shall pay to Newmarket per year of each term of this Agreement the amount of \$11,000 per kilometer of pipe, plus applicable taxes.

DRAFT



**Newmarket Public Library Board
Regular Board Meeting
Wednesday, April 19, 2017
Newmarket Public Library Board Room**

Present: Joan Stonehocker, Chair
Tara Brown, Vice Chair
Kelly Broome
Darcy McNeill (arrived at 5:33 pm)
Venkatesh Rajaraman (arrived at 5:45 pm)
Jane Twinney
Tom Vegh (left at 7:05 pm)

Staff Present: Todd Kyle, CEO
Linda Peppiatt, Deputy CEO
Lianne Bond, Administrative Coordinator

The Library Board Chair called the meeting to order at 5:30 pm

Adoption of Agenda Items

1. Adoption of Regular Agenda
2. Adoption of the Closed Session Agenda
3. Adoption of Consent Agenda items

The Chair advised that a request for a deputation to the Library Board was received and asked to amend the agenda to add this to be the first item on to the agenda.

Motion 17.04.188

Moved by Tara Brown

Seconded by Kelly Broome

That Agenda items 1) to 3) be adopted as amended.

Carried

4. Deputation

Mr. Benson addressed the Library Board regarding the correspondence he received from the Library CEO requesting that Mr. Benson discuss issues relating to the management of the library directly with the Library CEO.

Motion 17.04.189

Moved by Jane Twinney

Seconded by Kelly Broome

That the deputation by Mr. Benson regarding the correspondence he received from the Library CEO be received.

Carried.

Declarations

None were declared.

Consent Agenda Items:

5. Adoption of the Regular Board Meeting Minutes for Wednesday, February 15, 2017
6. Strategic Operations Report for February and March, 2017
7. Library Statistical Data for March, 2017
8. Monthly Bank Transfer

Motion 17.04.190

Moved by Tara Brown

Seconded by Tom Vegh

That Consent Agenda items 4) to 7) be received and approved as presented.

Carried

Closed Session

9. Motion to move into Closed Session

Motion 17.04.191

Moved by Tom Vegh

Seconded by Tara Brown

That the Library move into a Closed Session for matters pertaining to Labour Relations and matters pertaining to an identifiable individual at 5:55 pm.

Carried

Motion 17.04.192

Moved by Tara Brown

Seconded by Tom Vegh

That the Library move out of Closed Session at 7:10 pm

Carried

Motions arising from Closed Session:

Motion 17.04.193

Moved by Jane Twinney

Seconded by Venkatesh Rajaramn

That the Library Board confirm the direction to the CEO regarding the Labour Relations matter.

Carried

Motion 17.04.194

Moved by Darcy McNeill

Seconded by Tara Brown

That the Library Board confirm the direction to the CEO on the personal matters pertaining to an identifiable individual.

Carried

Reports

10. First Quarter Financial Statements

The Library is on target for the first quarter of 2017 in both expenditures and revenue.

Motion 17.04.195

Moved by Tara Brown

Seconded by Jane Twinney

That the Library Board receive the First Quarter Financial Statements.

Carried

Business Arising

11. Leadership by Design e-Learning

a) Knowledge Gap Analysis

Deferred to the next Regular Library Board meeting.

12. Inter-Departmental Charges

The CEO has followed up with Town of Newmarket Public Works regarding charges for the use of trucks when library work is requested. The Town of Newmarket Public Works confirmed that these charges are to be applied when library work is required.

13. Efficiencies Review

A vendor to conduct the Efficiencies review is expected to be chosen shortly.

14. Library Board Action List

The Library Board reviewed and updated the Action list.

Motion 17.04.196

Moved by Darcy McNeill

Seconded by Tara Brown

That the Library Board receive the Library Board Action List.

Carried

New Business

15. Strategic Initiative Consultant

The CEO reviewed the report regarding utilizing the 2016 surplus for capacity building projects and the creation of Strategic Initiatives position to increase the Library's capacity to leverage community impact and to plan for the future.

Motion 17.04.197

Moved by Tara Brown

Seconded by Venkatesh Rajaraman

That the Library Board receive the report on Strategic Initiatives Consultant;

And That the Library Board approve the transfer of the 2016 Library operating reserve to the Strategic Plan Implementation Fund, such transfer contingent on Council review of all reserve transfers;

And That the Library Board approve the allocation of the balance of the Strategic Plan Implementation Fund, with the exception of that allocated to IdeaMarket expenses, to the creation of a Strategic Initiatives position.

Carried

16. Facility Needs Study and Peer Comparison Report

The CEO advised that the Commissioner of Community Services and Chief Administrative Officer of the Town of Newmarket are proposing to bring a report to the May 8, 2017 Committee of the Whole meeting requesting approval and direction on a facility needs study. A Peer Comparison report, contracted with the Federation of Ontario Public Libraries (FOPL), which will be shared with the Board, will provide additional background and valuable input into a facility needs assessment.

Motion 17.04.198

Moved by Darcy McNeill

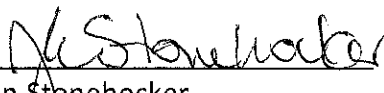
Seconded by Kelly Broome


That the Library Board receive the report on facility needs study and peer comparison report.

Carried

Date(s) of Future Meetings

17. The next regular Library Board meeting is scheduled to May 17, 2017 at 5:30 in the Library Board room.

Adjournment**Motion 17.04.198****Moved by Tara Brown****Seconded by Darcy McNeill****That there being no further business meeting adjourned at 7:45 pm.****Carried**

Joan Stonehocker
Chair

Todd Kyle, CEO
Secretary/Treasurer

TOWN OF NEWMARKET

Outstanding Matters Schedule A

	Item Subject	Recommendations & Responsibility	Date to come back to Committee	Comments
1.	Committee of the Whole – February 22, 2016 – Item 27 Motion – Councillor Hempen Welcome Entrance Sign	<p>THAT staff report back on the feasibility and suitable location for the installation of a community welcome entrance sign at the intersection of Longford Drive and Davis Drive;</p> <p>AND THAT staff also provide a suitable design for the welcome sign. The cost of the sign will be covered by private fundraising.</p> <p>➤ Development and Infrastructure Services</p>	<p>Q2/Q3, 2016 Q4, 2016 Q1, 2017 Q2, 2017 June 10, 2017 Q2-Q3 2017</p>	Subject to confirming preferred location of installation with adjacent property owner
2.	Council – April 4, 2016 – Item 5 Joint Report Community Services - Recreation and Culture, Development and Infrastructure Services - Public Works, Engineering, Corporate Services - Finance 2016-14 dated March 31, 2016 regarding Implementation Plan - Future Facilities and Land Use	<p>THAT Phase 2 of the Recreation Playbook Implementation Plan be approved as outlined in the report, with public consultation done as part of applicable design processes;</p> <p>AND THAT Phase 3 of the Recreation Playbook Implementation Plan be shared with the community through a public consultation process and that staff then report back;</p> <p>AND THAT future Council Workshops be done to consider specific uses and negotiation strategies on potential property acquisitions, as outlined in the report;</p> <p>AND THAT as part of the 2016 Capital Budget, the design for an outdoor basketball court at Ken Sturgeon Park be undertaken, and funding for construction be requested in the 2017 Capital Budget funded from Development Charges and Capital Reserves, in order to include this project in Phase 2 of the Recreation Playbook implementation plan.</p> <p>➤ Recreation and Culture</p>	<p>Q4, 2016 Q2, 2017 Q4, 2017</p>	An information report will be forthcoming in June, 2017 outlining a series of PIC's that will be related to various aspects of Phase 3 of the Recreation Playbook

	Item Subject	Recommendations & Responsibility	Date to come back to Committee	Comments
3.	Council June 27, 2016 – Item 34 Development and Infrastructure Services Report – ES 2016-24 regarding Savage Road/Sandford Street Traffic Review	<p>THAT Item 4 – Active Transportation Plan (bicycle lanes) on Sandford Street from Mulock Drive to Savage Road with a possible extension along Savage Road to Paul Semple Park entrance be deferred in order to provide an opportunity to work with residents to monitor and evaluate the traffic calming measures.</p> <p>➤ Engineering Services</p>	<p>A meeting was held between staff and the Ward Councillor on May 11, 2017, to explore public consultation options. It was confirmed by the Councillor that the measures implemented by Engineering Services in 2016 (flexible bollards) have resolved the issues on Sandford St. The measures will continue through 2017. A public consultation and report to CoW is no longer required, according to the Ward Councillor. Staff will produce an Info Report instead.</p>	<p>Meeting scheduled with Councillor May 11th and further updates provided following the meeting</p> <p>Information Report to follow</p>
4.	<p>Committee of the Whole – February 6, 2017 – Item 14 – Motion –Councillor Kwapis – Vacant Storefronts</p> <p>Committee of the Whole – April 10, 2017 – Item 11 (2)</p>	<p>THAT Council direct staff to review options, best practices and by-laws that are used by towns and cities to prevent and/or manage unsightly vacant storefronts in areas of special interest such as Main Street. This report to be brought back to Council within 120 days.</p> <p>A suggestion was made to include residential dwellings/units as part of staff's review.</p> <p>➤ Legislative Services</p>	<p>June 19, 2017 August 28, 2017</p>	<p>Meeting with Legislative Services, Planning and Economic Development Officer held and staff proceeding with research options and best practices to provide Council</p>
5.	Committee of the Whole – February 27, 2017 – Item 19 – Development & Infrastructure Services – Planning & Building Services and Public Works Services Report 2017-05 – Tree Removal, Protection Policies and Regulations	<p>THAT Council direct staff to update the existing Tree Preservation, Protection, Replacement and Enhancement Policy.</p> <p>➤ Planning and Building Services</p>	Q3/Q4, 2017	
6.	Committee of the Whole – February 27, 2017 – Item 23 – Motion – Councillor Bisanz	<p>THAT staff prepare a report on options and opportunities to address residential on street and off street parking challenges. Specifically, the report should consider the impact that changing economics and demographics have on housing occupancy and ways in which the Town of Newmarket can better balance reasonable parking needs with streetscape aesthetics, active transportation objectives and effective by-laws enforcement.</p> <p>➤ Planning and Building Services</p>	Q3/Q4, 2017	

	Item Subject	Recommendations & Responsibility	Date to come back to Committee	Comments
7.	Committee of the Whole – February 27, 2017 – Item 21 – Item 3 of Central York Fire Services – Joint Council Committee Minutes of October 4, 2016 regarding Burning By-laws Discussion	<p>THAT the Central York Fire Services – Joint Council Committee recommendation be approved and that staff be directed to review the current burning by-law in conjunction with Aurora staff (specifically, By-law and Fire Services)</p> <p>➤ Central York Fire Services</p>	CYFS-JCC Minutes to be brought forward to August 28, 2017 CoW meeting	<p>Report considered at May 16, 2017 JCC meeting</p> <p>Excerpt of Minutes of CYFS-JCC meeting of May 16, 2017 – Item 11</p> <p>That Fire Services Report 2017-04 dated May 9, 2017 regarding Outdoor Burning By-law be received; and,</p> <p>That there be no amendments made to the current Outdoor Burning By-laws 2009-064 and 5111-09; and,</p> <p>That an education and communication plan be implemented</p>
8.	Council – March 27, 2017 – Item – Motion Councillor Twinney	<p>To ask staff to review Zoning By-law 2010-40 and 2013-40 to address best practices related to infill development standards across the town as a whole.</p> <p>➤ Planning & Building Services</p>	Q3/Q4, 2017	
9.	Committee of the Whole – May 8, 2017 – Item 26 – Community Services – Commissioner and Newmarket Public Library Joint Report 2017-07 regarding Library Facility Needs Assessment	<p>That the library facility needs assessment be referred to staff to be brought forward with the operational efficiency review.</p> <p>➤ Community Services – Commissioner/Library</p>	Q4, 2017	To follow Efficiency Review

	Item Subject	Recommendations & Responsibility	Date to come back to Committee	Comments
10.	Committee of the Whole – May 8, 2017 – Item 32 – Motion – Councillor Bisanz Information Document for Residents Related to Construction Sites	<p>That Council approve the following motion in principle:</p> <p>That staff be directed to prepare an information document that can be provided to residents in the vicinity of new construction sites, the purpose of which is to advise and to communicate to the residents, the various activities, potential impacts and expected timelines associated with each phase of construction, from site clearing through to house construction; and,</p> <p>That developers, through their consulting engineers, be required to ensure that residents, and the relevant Ward Councillor, in adjacent areas receive advance written notice of construction events to take place, so that they can be better informed and prepared for any disruption that may occur as a result.</p> <p>And that the aforementioned motions be referred to staff for a report back including options and resource requirements.</p> <p>➤ Planning & Building Services</p>	Q4, 2017	
11.	Special Council – May 29, 2017 Motion – Temporary re-zoning of 195 Harry Walker Parkway	That a Town led temporary re-zoning application for the property known as 195 Harry Walker Parkway be initiated with a Public Planning session scheduled over the summer months to accommodate a temporary location for the Community Living Newmarket Aurora District administration and programming facility with a completion target date of no later than September 1, 2017	Statutory Public Meeting scheduled for July 10, 2017	

TOWN OF NEWMARKET

Outstanding Matters Schedule B

	Item Subject	Recommendations & Responsibility	Date to come back to Committee	Comments
1.	<p>Council – December 14, 2015 – Item 35 – Joint Development and Infrastructure Services – Planning and Building Services/ES 2015-44 – Proposed Trail from Yonge Street to Rita's Avenue</p> <p>Council – January 18, 2016 – Item 35</p>	<p>THAT staff provide alternate trail options for this area at a lower cost.</p> <p>THAT Item 35 of the Council Minutes of December 14, 2015 being Joint Development and Infrastructure Services - Planning and Building Services and Engineering Services Report 2015-44 dated November 19, 2015 regarding a proposed trail from Yonge Street to Rita's Avenue be reconsidered.</p> <p>THAT staff provide alternate trail options for this area at a lower cost, including the option of extending the trail through George Luesby Park along Clearmeadow Boulevard to Yonge Street and further connecting the trail from Flanagan Court/Rita's Avenue to the George Luesby Park Trail;</p> <p>AND THAT staff also include in the report the option of installing lighting along the George Luesby Park Trail.</p> <p>➤ Planning and Building Services</p>	<p>Timeline to be determined</p>	<p>Deferred subsequent to VivaNext construction</p>
2.	<p>Committee of the Whole – November 28, 2016 – Item 23</p> <p>Development & Infrastructure Services Report – ES 2016-54 Public Consultation and Support Plan – Transportation Services Update</p>	<p>THAT the Public Consultation and Support Plan as outlined in Appendix A be adopted for use starting January 1, 2017;</p> <p>AND THAT the Public Consultation and Support Plan be reviewed both internally and by the public throughout 2017 for improvements for 2018, if necessary.</p> <p>➤ Engineering Services</p>	<p>Q1, 2018</p>	

	Item Subject	Recommendations & Responsibility	Date to come back to Committee	Comments
3.	Internet Voting and Ranked Ballots	<p>THAT staff report back on Internet Voting and Ranked Ballots in 2019 immediately following the 2018 Municipal Election.</p> <p>➤ Legislative Services</p>	Q1, 2019	
4.	Committee of the Whole – February 27, 2017 – Item 19 – Development & Infrastructure Services – Planning & Building Services and Public Works Services Report 2017-05 – Tree Removal, Protection Policies and Regulations	<p>AND THAT Council direct staff to prepare and bring to a future meeting a by-law regulating and protecting significant trees on private property;</p> <p>AND THAT Council direct staff to prepare and bring to a future Council meeting a by-law protecting trees on municipal property.</p> <p>➤ Planning and Building Services</p>	2018	
5.	Committee of the Whole – March 20, 2017 – Item 20 – CAO/Finance/Human Resources Report 2017-03 – Council Remuneration and Tax Status	<p>THAT Council maintain the 1/3 tax free status relative to Council remuneration;</p> <p>AND THAT the matter of Council Remuneration and Tax Status be brought forward within the first twelve months of a new term of Council beginning in 2018.</p> <p>➤ CAO/Finance/Human Resources</p>	2018	
6.	Council – December 5, 2016 – Item 44 Development & Infrastructure Services – Planning & Building Services Report 2016-25 – 178, 170, 184, 188, 190 and 194 Main Street	<p>THAT in 120 days, staff be directed to bring back an amendment to the Heritage Conservation District Plan and By-law for consideration of Council that would outline the criteria which would need to be met by applicants in order to be considered for approval for a fourth storey set back from the street by a minimum of 15 (fifteen) feet.</p> <p>➤ Planning and Building Services</p>		This direction has been deferred as it will be Council's position at the Ontario Municipal Board hearing related to 178-194 Main Street South
7.	Council – June 7, 2016 – Item 35 Joint Office of the CAO and Commissions of Development and Infrastructure Services, Community and Corporate Services Report 2016-08 – Federal Infrastructure Funding	<p>THAT staff provide Council with a prioritized list of infrastructure projects currently not funded through Development Charges, the Asset Replacement Fund or Other Reserve Funds for implementation between 2018 to 2025 that augment existing priorities, strategies and master plans or leverage grant funding for initiatives that achieve our Corporate Vision of a 'Community Well Beyond the Ordinary'</p> <p>➤ Strategic Initiatives</p>	2018	Awaiting next phase of funding announcements

8.	<p>Committee of the Whole – August 29, 2016 – Item 20 – Corporate Services Report – Legislative Services 2016-17 regarding ‘Potential Regulation of Driving School Instructors’</p> <p>Committee of the Whole – May 8, 2017 – Item 3 – Corporate Services Report – Legislative Services 2017-07 – “Restricted Area for Driving Schools and Instructors”</p>	<p>THAT staff host a PIC in November, 2016 to seek Council, public and industry input on the potential regulation of driving school instructors operating in the Town of Newmarket;</p> <p>AND THAT staff continue to work with the MTO and driving school instructors operating in the Town of Newmarket to mitigate traffic and perceived safety concerns raised by residents;</p> <p>AND THAT staff bring back a report in the first quarter of 2017 regarding the potential regulation of driving school instructors operating in the Town of Newmarket.</p> <ul style="list-style-type: none"> 1. That Option 1 of the Report be implemented; and, 2. That staff provide a status report on the “Restricted Area” within 12 months of implementing Option 1 of the Report. <p>➤ Legislative Services</p>	May, 2018	
9.	<p>Committee of the Whole – May 8, 2017 – Item 23 – Development and Infrastructure Services Report – Engineering Services Information Report 2017-15 regarding 2017 Newmarket East-West Bikeway PIC Report</p>	<ul style="list-style-type: none"> 1. That Development and Infrastructure Services Report – Engineering Services Information Report 2017-15 regarding 2017 Newmarket East-West Bikeway PIC Report be received; and, 2. That staff monitor the implementation of the bike lanes, analyze the impacts for a one year period and provide a report back to Council in one year. <p>➤ Engineering Services</p>	May, 2018	

14. Development and Infrastructure Services - Planning and Building Services Report 2017-06 dated February 27, 2017 regarding Application for Zoning By-law Amendment and Draft Plan of Subdivision - Azure Homes Inc. - 172-178 Old Main Street.
- a) THAT Development and Infrastructure Services - Planning and Building Services Report 2017-06 dated February 27, 2017 regarding Application for a Zoning By-law Amendment and Draft Plan of Subdivision be received and the following recommendations be adopted:
- i) THAT the Application for a Zoning By-law Amendment and a Draft Plan of Subdivision, as submitted by Azure Homes Inc. for lands located at 172-178 Old Main Street be referred to a public meeting;
- ii) AND THAT following the public meeting, issues identified in this report, together with comments from the public, Committee, and those received through agency and departmental circulation of the application be addressed by staff in a comprehensive report to the Committee of the Whole, if required;
- iii) AND THAT Azure Homes, 82 Boothbay Crescent, Newmarket, ON L3Y 1Y5 be notified of this action;
- iv) AND THAT Macauley Shiomi Howson Ltd., Attention: Ms. A. Sciberras, 471 Timothy Street, Newmarket, ON L3Y 1P9 be notified of this action.

**PLANNING & BUILDING SERVICES**

Town of Newmarket
395 Mulock Drive
P.O. Box 328, STN Main
Newmarket, ON L3Y 4X7

www.newmarket.ca
planning@newmarket.ca
T: 905.953.5321
F: 905.953.5140

INCOMING MAIL		READ COPY
TO	TO	TO
MAY 25 2017		

**PUBLIC MEETING CONCERNING
PROPOSED ZONING BY-LAW AMENDMENT AND DRAFT PLAN APPROVAL**

TAKE NOTICE that the Council of the Corporation of the Town of Newmarket will hold a statutory public meeting on

MONDAY JUNE 19th, 2017 AT 7:00 P.M.

in the **Council Chambers at the Municipal Offices, 395 Mulock Drive**, to consider a proposed Zoning By-Law Amendment under Section 34 of the Planning Act, RSO 1990, c. P. 13 as amended and a Draft Plan Approval under Section 51 of the Planning Act, RSO 1990, c. P. 13 as amended.

Purpose and Effect: An application has been submitted for a Zoning By-Law Amendment and Draft Plan Approval for lands located on the west side of Old Main Street and on the north side of Bexhill Road, municipally known as 172-178 Old Main Street. A location map is provided on the reverse of this notice. The effect of this application is to permit six new semi-detached lots; creating 12 homes.

ANY PERSON may attend the public meeting to make written or verbal representation either in support of or in opposition to the proposed Zoning By-Law Amendment and Draft Plan Approval. If you wish to use the Town's audio/visual system, please contact the Clerk's Office not later than noon on the day of the meeting to make the appropriate arrangements. Should you be unable to attend the public meeting, your written submission will be received up to the time of the meeting.

IF YOU WISH TO BE NOTIFIED of the adoption of the proposed Zoning By-Law Amendment and Draft Plan Approval, you must make a written request to the Town of Newmarket, 395 Mulock Drive, P.O. Box 328, STN MAIN NEWMARKET, ON L3Y 4X7

IF A PERSON OR PUBLIC BODY does not make oral submissions at a public meeting or make written submissions to the Town of Newmarket before the by-law is passed, the person or public body is not entitled to appeal the decision of the Town of Newmarket to the Ontario Municipal Board.

IF A PERSON OR PUBLIC BODY does not make oral submissions at a public meeting, or make written submissions to the Town of Newmarket before the by-law amendment and Draft Plan Approval is passed, the person or public body may not be added as a party to the hearing of an appeal before the Ontario Municipal Board unless, in the opinion of the Board, there is reasonable grounds to do so.

ADDITIONAL INFORMATION relating to the proposed Zoning By-Law Amendment and Draft Plan Approval is available online at www.newmarket.ca and for inspection between 8:30 a.m. and 4:30 p.m. Monday to Thursday and 8:30 a.m. to 4:00 p.m. on Fridays at the Municipal Offices, 395 Mulock Drive, Newmarket.

Direct any inquiries to the Planning Department phone: 905-953-5321 or email: planning@newmarket.ca

Please refer to File No. D14NP1703 (ZBA) and D09NP1703 (DPA)

Dated May 30, 2017

**PLANNING AND BUILDING SERVICES**

Town of Newmarket

395 Mulock Drive

P.O. Box 328, STN Main

Newmarket, ON L3Y 4X7

www.newmarket.ca

planning@newmarket.ca

T: 905.953.5321

F: 905.953.5140

February 27, 2017

Development and Infrastructure Services – Planning & Building Services Report 2017-06

TO: Committee of the Whole

SUBJECT: Application for Zoning By-law Amendment and Draft Approval of Subdivision
 Proposed Residential Development
 Azure Homes
 172-178 Old Main Street
 File No.: D11 NP1703/D09 NP1703

ORIGIN: Application Submitted to the Planning Department

Recommendations

THAT Development and Infrastructure Services – Planning & Building Services Report 2017-06 dated February 27, 2017 regarding applications for a Zoning By-law Amendment and Draft Plan of Subdivision be received and the following recommendations be adopted:

1. THAT the applications for a Zoning By-law Amendment and a Draft Plan of Subdivision, as submitted by Azure Homes Inc. for lands located at 172-178 Old Main Street, be referred to a public meeting.
2. AND THAT following the public meeting, issues identified in this report, together with comments from the public, Committee, and those received through agency and departmental circulation of the application, be addressed by staff in a comprehensive report to the Committee of the Whole, if required.
3. AND THAT Azure Homes, 82 Boothbay Crescent, Newmarket Ontario, L3Y 1Y5, be notified of this action. .
4. AND THAT Macaulay Shiomi Howson Ltd, Attention: Angela Sciberras, 471 Timothy Street, Newmarket Ontario, L3Y 1P9, be notified of this action

Background**Location**

The subject land is located on the north-east side of Old Main Street, north-west of Bexhill Road, being Part of Lot 97, Concession 1, EYS, municipally known as 172 and 178 Old Main Street (see location map attached).

Proposal

Applications have been submitted for a Zoning By-law Amendment and Draft Plan Approval. The applicant is proposing rezone the subject lands from the existing Residential Detached Dwelling 30m (R1-B) Zone to

the Residential Semi-Detached Dwelling 13.6m Exception (R2-H-**) to permit the construction of 6 semi-detached dwellings, for a total of 12 new homes. The applicant is requesting site specific zone standards based on the proposed development. There are two existing single detached dwellings; the dwelling at 172 Old Main Street will be demolished. The dwelling at 178 Old Main Street (more northerly property) will be retained.

Site Description

The subject lands have an approximate area of 7,500 square metres, with a lot frontage of approximately 107m metres on Old Main Street. There is currently a single detached dwelling on each property.

The subject site has a significant rise in grade from street level west towards the cemetery. The rear or westerly part of the site is tree covered forming part of the woodlot located on the cemetery property. The remainder of the subject site is manicured lawn; and, in the case of 178 Old Main Street, is improved with a paved driveway, retaining walls, garden patio and planting beds.

The surrounding land uses are:

North: St. John's Cemetery

South: across Old Main Street, properties zoned OS-2 and a 4 storey residential condominium building on the east side of Main Street North at Bexhill Road (155 Main Street North)

East: residences on Bexhill Road

West: existing low density residential dwellings (along Old Main Street)

Comments

Official Plan Considerations

The subject lands are designated Stable Residential and Natural Heritage by the Official Plan.

The Stable Residential designation permits the semi-detached units contemplated by the applicant. The objectives of the Stable Residential designation are to provide for a range of residential accommodations by housing type, tenure, size, location and price ranges and encourage the provision for a range of innovative and affordable housing types, zoning standards and subdivision design.

The rear or westerly portion of the subject site is designated Natural Heritage by the Official Plan as it is part of a woodlot. The Natural Heritage System designation aims to preserve the Town's woodlots. Development adjacent to a woodlot is permitted if an EIS has demonstrated that there will be no negative impacts on the natural features. The applicant has submitted the required environmental studies which are being reviewed by staff and the Lake Simcoe Region Conservation Authority. The Region, the Conservation Authority and the applicant have confirmed the developable area on the property.

An amendment to the Official Plan is not required at this time.

Zoning By-law Considerations

The subject lands are currently zoned Residential Detached Dwelling 30m (R1-B) Zone by By-law 2010-40. The applicant is proposing to rezone the subject lands to the Residential Semi-Detached Dwelling 13.6m Exception (R2-H-**) with site specific provisions reflecting the proposed built form. A slight modification to the side yard setback provisions is required; all other zoning standards for the proposed zone category

appear to be met. The applicant is proposing side yard setbacks of 0.90m for each side of the buildings for a total of 1.80m separation between them.

Section 16.1.1 of the Official Plan sets forth the policies Council must have regard for when considering a Zoning By-law Amendment. Compliance with these policies will be addressed in a comprehensive report to Council following the consultation process including the statutory public meeting.

Draft Plan of Subdivision

The applicant has applied for a Draft Plan of Subdivision to create 6 semi-detached, residential lots comprising of 12 dwellings. The existing dwelling located at 178 Old Main Street will be retained. Through the subdivision application process it is proposed to re-align the property line between 172 and 178 Old Main to provide for more regular shaped lots. Each dwelling will have direct driveway access to Old Main Street.

Provincial Policy Statement

The Provincial Policy Statement (PPS) provides policy direction on matters of provincial interest related to land use planning and development. Decisions affecting planning matters "shall be consistent" with this policy statement. The PPS is intended to be read in its entirety and the relevant policies are to be applied to each situation.

Section 1.1.3 of the PPS relates to settlement areas being the focus of growth and promoting their vitality and regeneration. The PPS encourages municipalities to provide for a mix of residential uses. The application for a residential development is consistent with the Provincial Policy Statement.

Departmental and Agency Comments

The following departments and agencies have provided comments on the application:

Engineering Services have received the application and are completing their review of the studies submitted.

Central York Fire Services have no concerns with the application.

Public Comments

Residents of Old Main Street have contacted the Planning Department and are very engaged in the review process of this application. Staff and the residents continue to dialogue as the technical review of the supporting studies is underway.

Agency Comments

The Lake Simcoe Region Conservation Authority has not provided any comments at the time of writing this report. Enbridge, York Catholic District School Board, Hydro One, Rogers, Southlake Regional Health Centre, York Region District School Board, and Canada Post have reviewed the application and advised that they have no concerns with the proposal. As this property abuts the railway, this application was sent to GoTransit for review; comments have been received and sent to the application to address. Other agency comments remain outstanding as of the time of writing this report.

Supporting Studies and Reports

In support of the application a Planning Justification Report, a Phase 1 ESA, a Stage 1 – 2 Archaeological Assessment, a Functional Servicing Report, a Geotechnical Investigation, and a Tree Inventory have been submitted. As noted above, the Phase 1 ESA, the Geotechnical Investigation, the Functional Servicing

Report, and the Traffic Impact Statement are being reviewed by Engineering Services. The Stage 1 – 2 Archaeological Assessment has been sent by the archaeologist to the Ministry of Tourism, Culture and Sport for review. The Tree Inventory is being reviewed by the Town's consulting arborist.

Conclusion

The subject application for Zoning By-law Amendment and Draft Plan of Subdivision is sufficiently advanced to warrant its referral to a statutory public meeting.

Attachments: Location Map
Site Plan (conceptual)

Community Consultation

A statutory public meeting will be required as part of the *Planning Act* requirements for the proposed changes to the Zoning By-law and the Draft Plan of Subdivision

Human Resource Considerations

Not applicable to this report

Budget Impact

The Town will receive income in the form of building permit fees, and assessment revenue associated with the redevelopment of the subject lands. Should the application be referred to a public meeting, there will be the typical costs associated with providing notice and holding the public meeting.

Business Plan and Strategic Plan Linkages

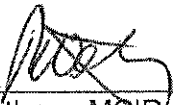
The applications for Zoning By-law Amendment and Draft Plan of Subdivision support the Community Strategic Plan by being *Well-Balanced* for the potential to encourage a strong sense of community through an appropriate mix of lands uses, specifically types of residential uses.

Contact

For more information on this report, contact Meghan White, Planner, at x 2460; mwhite@newmarket.ca



Meghan White, MCIP RPP
Planner



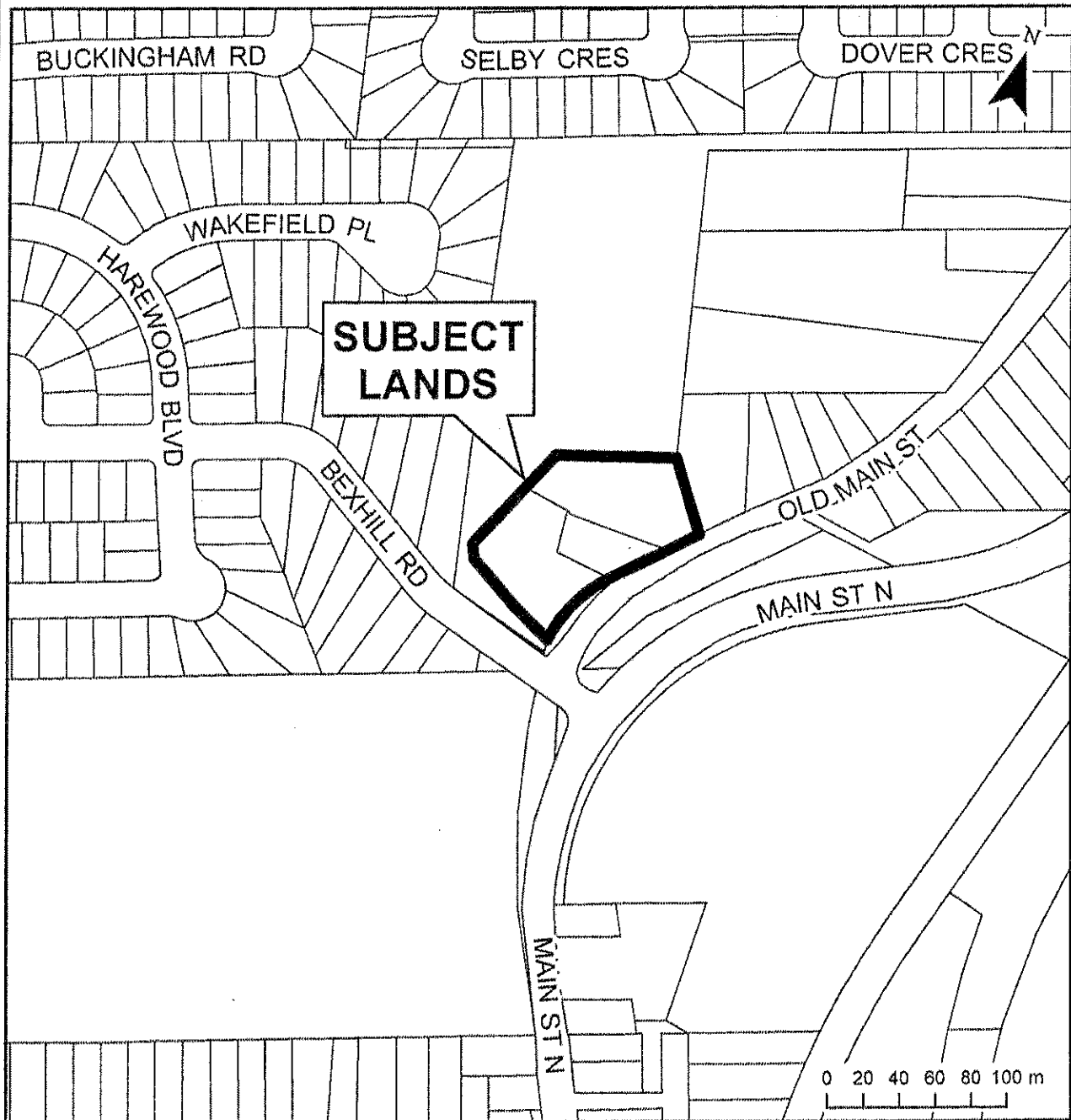
Rick Nethery, MCIP, RPP
Director of Planning & Building Services



Peter Noehammer, P. Eng.
Commissioner Development and Infrastructure
Services

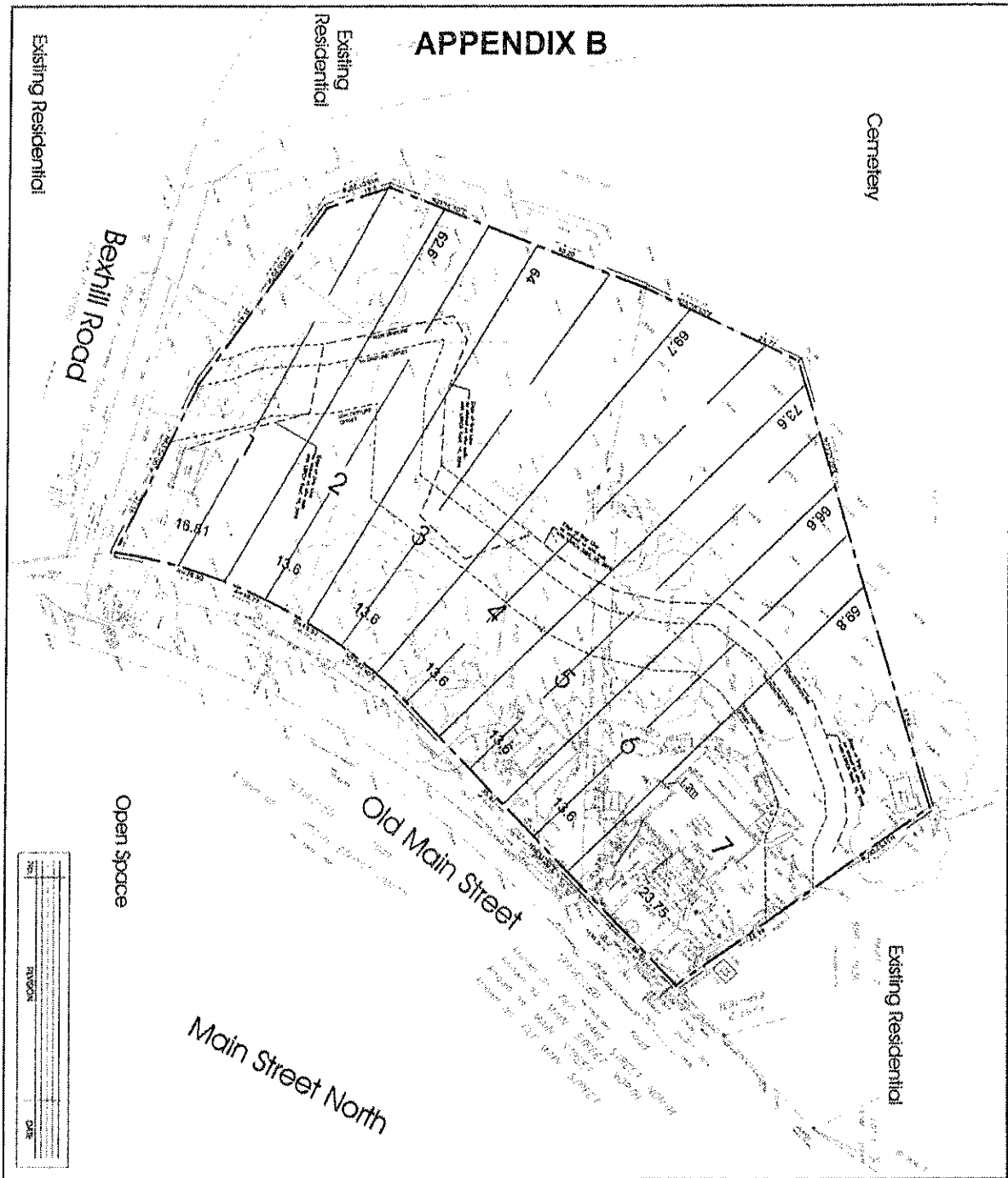
APPENDIX A

LOCATION MAP 172-178 OLD MAIN ST



Town of Newmarket Planning Department





MSH
 Municipal Services
 Planning & Building Services
 17280 178th Avenue
 Everett, WA 98201
 Phone: 425.336.1234
 Fax: 425.336.1235
 Email: info@msheverett.com
 Website: www.msheverett.com

DRAFT PLAN OF SUBDIVISION
 172 & 178 OLD MAIN STREET
 PART OF LOT 17
 CONVEYANCE 1, EAST OF YONGE STREET
 PROPERTY DESCRIBED IN THE
 TOWN OF NEVADARET
 REGIONAL AUTHORITY OF YORK

KEY PLAN
 SCALE 1:10,000

SCHEDULE OF LAND USE

Lot	Area (sq. ft.)	Use
1	18.81	Residential
2	1.6	Residential
3	1.6	Residential
4	1.6	Residential
5	1.6	Residential
6	1.6	Residential
7	20.75	Residential

ADDITIONAL INFORMATION

RECORDED UNDER SECTION 5(1) OF THE PLANNING ACT

1. THE PLAN OF SUBDIVISION IS A DRAFT PLAN OF SUBDIVISION AND IS NOT A FINAL PLAN OF SUBDIVISION.

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OWNERS' AUTHORIZATION

I, the undersigned, being the owner of the land described in the plan of subdivision, do hereby authorize the preparation and filing of the plan of subdivision.

SIGNED: _____

DATE: _____

Deputation and Further Notice Request Form

Please complete this form to speak at a meeting of Town Council or Committee of the Whole or to receive further notification regarding an item on the agenda. If filling out by hand please print clearly.

Please email to clerks@newmarket.ca, fax to 905-953-5100 or mail or drop off at Legislative Services Department, Town of Newmarket Municipal Offices, 395 Mulock Drive, PO Box 328, STN Main, L3Y 4X7

Name: Blaine Hobson	
Organization / Group/ Business represented: Steps to Recovery	
Address: 570 Steven Court, Unit B	Postal Code: L3Y 6Z2
Daytime Phone No:	Home Phone:
Email:	Date of Meeting: June 19, 2017
Is this an item on the Agenda? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Agenda Item No:
<input checked="" type="checkbox"/> I request future notification of meetings	<input checked="" type="checkbox"/> I wish to address Council / Committee
Describe in detail the reason for the deputation and what action you will be asking Council/Committee to take (if applicable): JOINT VENTURE WITH CONSORTIUM OF CHARITIES & THE TOWN TO DIVERT TEXTILES FROM LANDFILL FOLLOWING THE MODEL IMPLEMENTED BY MARKHAM. DIVERTING TEXTILES WILL SAVE MILLIONS IN TIPPING FEES. MINIMAL COSTS TO THE TOWN - CAPITAL AND OPERATING EXPENSES BORN BY CHARITIES. REVENUE FROM TEXTILE RECYCLING WILL SUPPORT STEPS - A NEWMARKET BASED CHARITY FOCUSED ON ADDICTION/HOMELESSNESS & MENTAL HEALTH-REDUCING COSTS OF SERVICES IN YORK REGION. ORGANIZING A COMMUNITY RECYCLING PROGRAM WILL ELIMINATE "BIN ISSUES" - ENFORCEABILITY	
Do you wish to provide a written or electronic communication or background information <input type="checkbox"/> Yes <input type="checkbox"/> No	
Please submit all materials at least 5 days before the meeting.	

Deputation Guidelines:

- Deputations related to items on the agenda can be accommodated up to and including the meeting day;
- Deputations related to items not on the agenda may be scheduled within sixty (60) days of receipt of this form;
- Deputations will not be heard on a matter decided upon by Council until ninety (90) days have passed from the date of the matter's disposition by Council;
- Deputations are limited to 5 minutes.

Be advised that all Council and Committee of the Whole meetings are audio-video recorded and live streamed online. If you make a presentation to Council or Committee of the Whole, your presentation becomes part of the public record and you will be listed as a presenter in the minutes of the meeting. We post our minutes online, so the listing of your name in connection with the agenda item may be indexed by search engines like Google.

Personal information on this form will be used for the purposes of sending correspondence relating to matters before Council. Your name, address, comments, and any other personal information, is collected and maintained for the purpose of creating a record that is available to the general public in a hard copy format and on the Internet in an electronic format pursuant to Section 27 of the Municipal Freedom of Information and Protection of Privacy Act, R.S.O. 1990, c.M.56, as amended. Questions about this collection should be directed to the Director of Legislative Services/Town Clerk, Town of Newmarket, 395 Mulock Drive, P.O. Box 328, STN Main, Newmarket, ON L3Y 4X7; Telephone 905 895-5193 Ext. 2211 Fax 905-953-5100

June 12, 2017

**COMMUNITY SERVICES
RECREATION & CULTURE
REPORT # 2017-10**

TO: Committee of the Whole

SUBJECT: Newmarket Theatre – Progress Update and Next Steps

FOLLOW UP: Recreation and Culture Department

RECOMMENDATION

THAT Community Services – Recreation & Culture Report # 2017-10 dated June 12, 2017 regarding Newmarket Theatre and Old Town Hall Marketing initiatives be received and the following recommendation(s) be adopted:

- 1. THAT Council approve an expenditure of up to \$150,000 for the development of brand identification, marketing strategy and corresponding collateral material for Newmarket Theatre and Old Town Hall – to be funded entirely from the CIF Fund.**

COMMENTS

Over the last three years the Recreation & Culture Department has seen tremendous growth. Program participation numbers have increased by 35% overall with the increase in participation realized in many different areas of our business including aquatics, camps, seniors, youth, family, special needs and fitness programming. In actual numbers, this means an increase from 18,992 program participants to over 29,147 program participants in 2016. This increase in participation in programming represents a corresponding revenue increase of over 40% in Town delivered Recreation and Culture based programs. This growth has been realized through a focused approach in delivering high quality services and a strategic approach to the marketing of these services.

The Town has established an improved quality standard that residents have come to appreciate but also expect. Efforts will continue to maintain that level of focus and strategy. While maintaining this, attention must also be further applied to our Newmarket Theatre and Old Town Hall operations, specifically around the areas of marketing.

In May of 2015, Recreation and Culture staff presented Council with the Theatre Task Force report. That report contained a series of recommendations, which were the culmination of an extensive process involving staff and a volunteer group of stakeholders referred to as the Theatre Task Force. Since the completion of the report staff has been working with this task force (now termed the Ideas Committee) to

implement the recommendations contained within that report. This report will serve to update Council on the progress to date and identify key next steps. While the report focused on the Newmarket Theatre specifically, with the re-opening of Old Town Hall in the Fall of 2016, many of the Theatre Task Force's strategic recommendations needed to be more broadly applied to the cultural portfolio. With nearly one theatre season complete at the Old Town Hall, the Town is now ideally suited to move forward with the remaining recommendations contained within the initial report while also considering the broader implications of the cultural portfolio of the Town.

The Task force recommendations were categorized into 4 themes. Below please find key performance accomplishments for each area:

Booking Processes, Ticketing

Recommendations around booking processes and ticketing focused on repositioning the Newmarket Theatre as a professional theatre with professional entertainment as the priority. Community theatre would then be accommodated at Old Town Hall if seating capacity permitted. Community use was still to be accommodated at Newmarket Theatre – it just would not be the top priority. As well, the ticketing processes and user experience around ticketing were to be completely revamped. Significant progress has been made on these recommendations:

- Old Town Hall has supported the transition to utilize the Theatre as the “professional” theatre space in town. With Old Town Hall now online, staff are presently crafting a balanced 2017-2018 theatre season, with considerations for the 2018 – 2019 season to accomplish the 12 to 18 month scheduling target.
- A variety of new acts have been introduced to the community over the last year.
- After a market review, staff renewed the contract with Tix Hub (Newtix) to provide ticketing services, with a more engaging and refreshed user experience. Mobile ticketing and home printing of tickets will be launched as of July 1st, 2017.
- The Newtix system now offers a 3 Dimensional seat map allowing patrons the opportunity to see online the types of views that will be experienced when attending a live performance.

Atmosphere & Experience

These recommendations were focused on the experience surrounding the actual live performance including addressing the institutional feel of the lobby area, improvement of concession operations, etc. Again, significant progress has been made in this regard:

- A renovation of the Newmarket Theatre Lobby is currently in the tender process, with estimated completion of Fall 2017 – this has been facilitated with the assistance of a professional design firm. A grand reopening and 20th anniversary celebration is being planned for this fall.
- As part of the renovation, concession operations will be overhauled improving efficiency and overall experience.

Staffing & Volunteers

Recommendations around staffing and volunteers focused on diversifying the volunteer pool, enhancing use of existing resources, departmental restructuring to focus staff on the potential of live performance and the extension of an external volunteer team similar to the Task Force to offer feedback on ongoing progress of the implementation of recommendations. The following are key accomplishments in this regard:

- A number of staffing changes have occurred including a new Manager of Culture & Community Events, a new Supervisor of Cultural Services, and a new Supervisor of Marketing & Sponsorship.

The team is now ideally positioned with a wealth of external experience to lead the cultural portfolio moving forward.

- New volunteer recruitment strategies have been developed and deployed resulting in a variety of new volunteers including students right through to older adults.
- The Theatre Task Force has morphed into the Idea Team and have continued to meet regularly since the initial report was presented to Council.

Marketing & Sponsorship

The fourth key theme focused on the area of Marketing and Sponsorship. Strategically, it was necessary to accomplish the other recommendations before fully addressing the recommendations focused around Marketing and Sponsorship – specifically it would be ineffective and detrimental to long term operations if active branding and promotion was done but the experience failed to match the promotion. Given the significant progress on the other recommendations, attention and focus will now shift to implementation of the recommendations around Marketing and Sponsorship. As such, staff are seeking Council approval to fund up to \$150,000 from the CIF fund for the following:

- The development of a professional Newmarket Theatre / Old Town Hall brand
- Make significant improvements to the online experience
- Develop specific promotional campaigns around series of performances
- Actively solicit sponsorships for series of performances
- Develop a social media presence.

This position will be funded through the CIF Fund - the CIF Fund was created by establishment of a \$2.00 surcharge on every ticket sold at Newmarket Theatre and now Old Town Hall. The mandate of the fund is to specifically pay for projects that contribute to the ongoing success of Newmarket Theatre and Old Town Hall. This fund originated from an agreement with the School Board that funds would be set aside for refurbishment and/or replacement of the theatre. Between this fund and what is currently allocated within the Asset Replacement Fund, the Town has met the obligations of this agreement. As such, the School Board has no objections to the use of these funds for marketing initiatives. There is currently a balance of over \$700,000 within the CIF Fund. As such, there will be no budgetary impact with funding this position.

BUSINESS PLAN AND STRATEGIC PLAN LINKAGES

Well-balanced

- Striving for cultural harmony and ethnic diversity
- Events that help shape identity and contribute to community spirit

Well-equipped & managed

- Small town feel with city amenities
- Clear vision of the future and aligned corporate/business plans

Well-respected

- Being well thought of and valued for our judgement and insight
- Discovering innovative and creative solutions for future well-being
- Being tradition-based and forward looking

CONSULTATION

Consultation has been completed through the members of the public who sat upon the *Newmarket Theatre Task Force*, and subsequently on the *Newmarket Theatre Ideas Team*. Further, staff have personally engaged visitors to cultural venues as well as the external staffing recruitments.

HUMAN RESOURCE CONSIDERATIONS

Staff will explore whether an outside consultant or a combination of consultant and short term staff support will be utilized to ensure that this exercise is complete efficiently while maximizing resources.

BUDGET IMPACT

Operating Budget (Current and Future)

Operational items recommended through the task force report have been covered within exiting operational budgets.

Capital Budget

Planned Theatre renovations and the Marketing Generalist will be covered through the CIF Fund which currently has a balance of over \$700,000 in that reserve. With these initiatives, it is still expected the reserve will have a healthy balance of over \$400,000.

CONTACT

For more information on this report, contact: Colin Service, Director Recreation & Culture, at ext. 2601 or cservice@newmarket.ca.



Colin Service
Director, Recreation and Culture



Ian McDougall
Commissioner, Community Services



June 19, 2017

DEVELOPMENT AND INFRASTRUCTURE SERVICES/PLANNING & BUILDING SERVICES REPORT 2017-22

TO: Committee of the Whole

SUBJECT: Bill 139 - The proposed Building Better Communities and Conserving Watersheds Act, 2017
(new legislation regarding the Ontario Municipal Board)
NP-16-47
EBR Registry Number: 013-0590

ORIGIN: Planning and Building Services

RECOMMENDATIONS

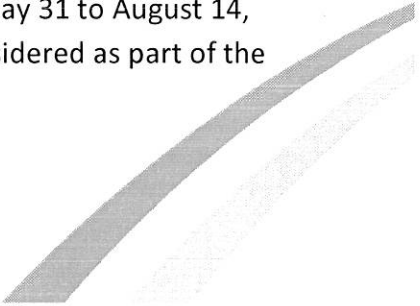
THAT Development and Infrastructure Services/Planning & Building Services Report 2017-22 dated June 19, 2017 regarding Bill 139 - The proposed Building Better Communities and Conserving Watersheds Act, 2017 (new legislation regarding the Ontario Municipal Board), be received and that the following recommendation(s) be adopted:

1. THAT Council direct staff to submit Report 2017-22 to the Ministry of Municipal Affairs and Housing as the Town of Newmarket's comments on Bill 139 – the proposed Building Better Communities and Conserving Watersheds Act, 2017.

BACKGROUND

On May 31 2017, the Ministry of Municipal Affairs and Housing released new legislation to replace the Ontario Municipal Board (OMB) with the Local Planning Appeal Tribunal (LPAT) and make amendments to existing legislation, including the *Planning Act*, to give communities a stronger voice in land use planning.

The new legislation is called "the Building Better Communities and Conserving Watersheds Act, 2017" (Bill 139), and is currently undergoing a 75-day commenting period, extending from May 31 to August 14, 2017. All written comments provided to the Ministry during this time will be considered as part of the decision-making process by the Ministry.



Although some reform was expected to the OMB, the currently proposed changes are more significant than anticipated. The changes transfer much of the authority that currently rested with the province towards communities, locally elected bodies and local planners. As discussed in this Report, these changes are supportable however some additional recommendations are provided.

This Report builds on information previously provided to Council through:

1. Information Report #2016-44, dated November 2, 2016 - which provided background information regarding the OMB review process, timelines, statistics of the OMB, powers of the OMB compared with other jurisdictions, and a summary of the Regional Planning Commissioners of Ontario (RPCO)'s recommendations; and
2. Information Report #2016-47, dated November 28, 2016 - which provided staff's assessment of three of the most significant issues being examined by the Ministry as part of the review, and provides specific recommendations on each.

PURPOSE OF THIS REPORT

This Report will provide: (i) a summary of, and staff recommendation on, the major changes to the land use appeals process being proposed by the new legislation; (ii) an indication of whether or not the new legislation reflects the Town's previously provided comments; and (iii) an outline of the extended timelines for making decisions. It is also recommended that this Report act as the Town's formal comments to be sent to the Ministry on the proposed legislation.

COMMENTS

1. Summary of the newly proposed major changes to the land use appeals process

Bill 139 proposes to replace the OMB with the Local Planning Appeal Tribunal (LPAT), a new tribunal which would be mandated to give greater weight to the decisions of local communities.

The Bill also includes measures to make the planning appeals more accessible to the public, specifically by creating the Local Planning Appeal Support Centre (LPASC). This would be a new agency that would provide free legal and planning advice, as well as representation to citizens who may want to participate in local planning appeals.

In order to implement the changes at the planning level, Bill 139 proposes changes to the Ontario Planning Act. The Planning Act sets out the ground rules for land use planning in Ontario. It defines the approach to planning and assigns or provides roles and responsibilities for decision-makers, applicants and the

public. It also sets out opportunities for dispute resolution. A flowchart of the proposed hearing LPAT process is included as Attachment 1.

If passed, the new legislation would:

- Give more weight to local and provincial decisions. It is proposed that major land use planning matters could only be appealed on the grounds that they don't conform or aren't consistent with provincial/municipal plans/policies.
- Bring fewer municipal and provincial decisions before the LPAT eliminating appeals of provincially approved municipal official plans and major updates. Municipal interim control by-laws, when first put in place would not be appealable, and applications to change new secondary plans would only be allowed if the municipality supported them, within the first two years.
- Support transit by giving municipalities the ability to remove appeals (except by the province) of official plans and zoning by-laws that support appropriate development around higher-order transit such as train and bus rapid transit stations.
- Make it clear that the LPAT can only deal with official plan policies that are part of the municipal council's decision.
- Remove the ability for anyone to require the Minister of Municipal Affairs to refer a minister's zoning order to the LPAT.
- Expand the authority of local appeal bodies to hear matters related to site plan control, which deals with disputes on individual properties such as things like landscaping, driveways or lighting.
- Give planning authorities more time to assess planning applications by extending the decision timelines by 30 days in relation to official plans and zoning by-laws.
- Require the LPAT to send new material back to the municipality for re-evaluation when adjudicating subdivision appeals.
- Clarify that policy statements, like the Provincial Policy Statement, may identify matters that require specific provincial approvals for any of the matters provided for in the policy statement.
- Require that all municipalities include climate change policies in their official plans.

Staff supports the direction of these changes as they will uphold municipal Official / Secondary Plans and empower local municipal planning decisions.

2. Do the changes adequately respond to the Town's three main issues of concern, as per previously provided?

Through Information Report #2016-47, staff identified three main areas of concern with the current OMB process. Each area of concern is summarized below followed by a statement on whether or not each has been adequately addressed by the proposed legislation:

- a. The OMB's limited resources relative to the high volume of matters that appear before the Board. It has previously been reported that this is largely due to the uniquely broad scope of the OMB, resulting in over 1500 files being received per year. This stretches the OMB's resources as well as reduces local planning authority. To address this, staff previously recommended to create a non-appealable 'matters of public interest' list, prohibit appeals to municipally led comprehensive and area-wide Official Plans and Official Plan Amendments, prohibit appeals to less complex matters, and more actively promote mediation.

The new legislation proposes a more robust approach to restricting the number of appealable matters. The proposed legislation:

- Prohibits appeals related to provincial approvals of official plans and official plan updates if the Minister is the approval authority.
- Prohibits applications to amend new secondary plans for two years, unless permitted by municipal council, and
- Limits the ability to appeal an interim control by-law when first passed for a period of up to one year; and
- Provides both single-tier and upper-tier municipalities with the authority to identify protected areas for existing or planned higher order transit in the municipality's official plans (including GO Train stations and Bus Rapidway Stations). Once an area has been approved as protected for higher order transit, both that designation and the associated by-laws cannot be appealed except by the Minister.

The new legislation also significantly reduces the province's role in rendering other land use planning decisions:

- For appeals related to official plans, zoning by-laws, or plans of subdivision, the LPAT would only have the authority to overturn a municipal decision if it is convinced that the original decision under appeal is inconsistent with or does not conform with provincial policies or local plans.
- Even if the LPAT determines that a municipal decision does not follow provincial policies or municipal plans, it would not substitute its own decision for that of the municipal council; rather, it would be required to return the matter to the municipal council with written reasons explaining the Tribunal's rationale for overturning the decision. The municipality would then have 90 days to reconsider the application, with the benefit of the LPAT's decision. Only when, on a second appeal, the municipality's subsequent

decision still fails to follow provincial policies or municipal plans, would the LPAT have the authority to substitute its own order for an order of municipal council.

Finally, the new legislation required mandatory case conferences for complex hearings to encourage early settlements.

This area of concern has been adequately addressed by the proposed legislation. Staff supports these changes as they would help reduce the time and cost of appeals and empower local planning decisions.

- b. The level of regard the OMB has for the decisions of municipal staff and Councils / *de novo* hearings. *De novo* hearings (hearing that start anew) are of concern because they are heard as though no previous decision has been made, largely ignoring the decision of a municipal Council and associated rationale. To address this, staff previously recommended that the OMB be required to review municipal decisions on a standard of reasonableness, and limit the authority of the OMB so that it can only overturn a decision made by a municipality if that decision is deemed not to follow local or provincial policies.

The new legislation proposes to replace the “*de novo*” hearing structure with a new test: whether the municipal decision is consistent/conforms with provincial/local policies. If the LPAT finds that a matter does not conform or is inconsistent with provincial or local plans, it will send the matter back to the municipality for reconsideration (see Attachment 1). The LPAT will retain the authority to make a final decision on matters where, on a second appeal, the municipality's second decision fails to follow provincial policies or municipal plans.

This area of concern has been adequately addressed by the proposed legislation. Staff supports this change as it would reduce the subjectivity of planning decisions and empower local planning documents.

- c. The litigious nature of the OMB process and effective citizen participation. The issue of concern here is that OMB hearings look and feel very litigious, become quite expensive at the party status, and can have the effect of reducing public participation. To address this, staff previously recommended that the existing Citizen Liaison Office (CLO) be expanded and better promoted, and establish funding tools to help citizens retain their own planning experts and/or lawyers. The Town cautioned, however, that funding tools be allocated through third parties, in a way that does not favour one party over another, and such tools not financially burden municipalities.

Included as Schedule 2 to the new legislation is the Local Planning Appeal Support Centre Act, 2017. This Act will create a support centre for citizens which will provide free and independent advice and representation to residents on land use planning appeals. The Local Planning Appeal Support Centre Act, 2017 is clear that the Centre will be Independent from, but accountable to, the Province. However the Act states that the Centre shall establish criteria for determining the eligibility of persons to receive support services from the Centre, and the budget shall be submitted to the Minister for approval, but no upset limit or funding structure is provided.

This area of concern has generally been addressed by the proposed legislation. Staff supports this change as it would lead to increased citizen participation, however it is recommended that the Act provide a clearer set of eligibility criteria for support services, set out the annual budget and identify a funding structure.

3. Extended Timelines for Making Decisions and Additional Responsibility

The new legislation would also extend the timelines within which municipalities are required to make decisions with respect to official plans and zoning by-laws as follows:

- For zoning by-law amendments, the timeline is extended from 120 days to 150 days, unless the application also requires an official plan amendment, in which case the timeline is 210 days;
- For applications to remove holding provisions, the timeline is extended from 120 days to 150 days;
- For decisions of the approval authority with respect to new official plans, from 180 days to 210 days;
- For decisions of council with respect to an official plan amendment from 180 days to 210 days.

Under the LPAT framework, more importance is placed on the decision of municipal councils in terms of decisions being consistent with / conforming to provincial/local policies. Not being consistent/in conformity with these higher-order policies and plans is the only reason why an appeal could be entertained by LPAT. Therefore, added responsibility is incumbent on municipal planning staff to provide recommendations that are consistent/conforms with provincial/local policies. The additional time provided by these new timelines will assist in allowing for a proper review to take place.

Staff supports these changes as they would assist in providing the necessary time to adequately assess planning applications within the new appeals framework.

COMMUNITY CONSULTATION

As part of the public consultation process for the OMB Review, the Province has organized numerous Town Hall Meetings throughout the Province between October 18 and November 24, 2016. One of these meetings was held in Newmarket during the evening of October 18, which was well attended.

An Environmental Registry posting was also created for the proposed legislation: <http://bit.ly/2rFAs1y> which provides general information and means to submit comments. The deadline for comments to the province is August 14, 2017.

HUMAN RESOURCE CONSIDERATIONS

There are no human resource considerations resulting from this Report.

BUDGET IMPACT

There are no budget impacts resulting from this Report.

BUSINESS PLAN AND STRATEGIC PLAN LINKAGES

Well-respected:

- Being an influential contributor to regional and provincial affairs.

CONTACT

For more information on this report, contact: Adrian Cammaert, Senior Planner, Policy, at 905-953-5321, ext. 2459; acammaert@newmarket.ca




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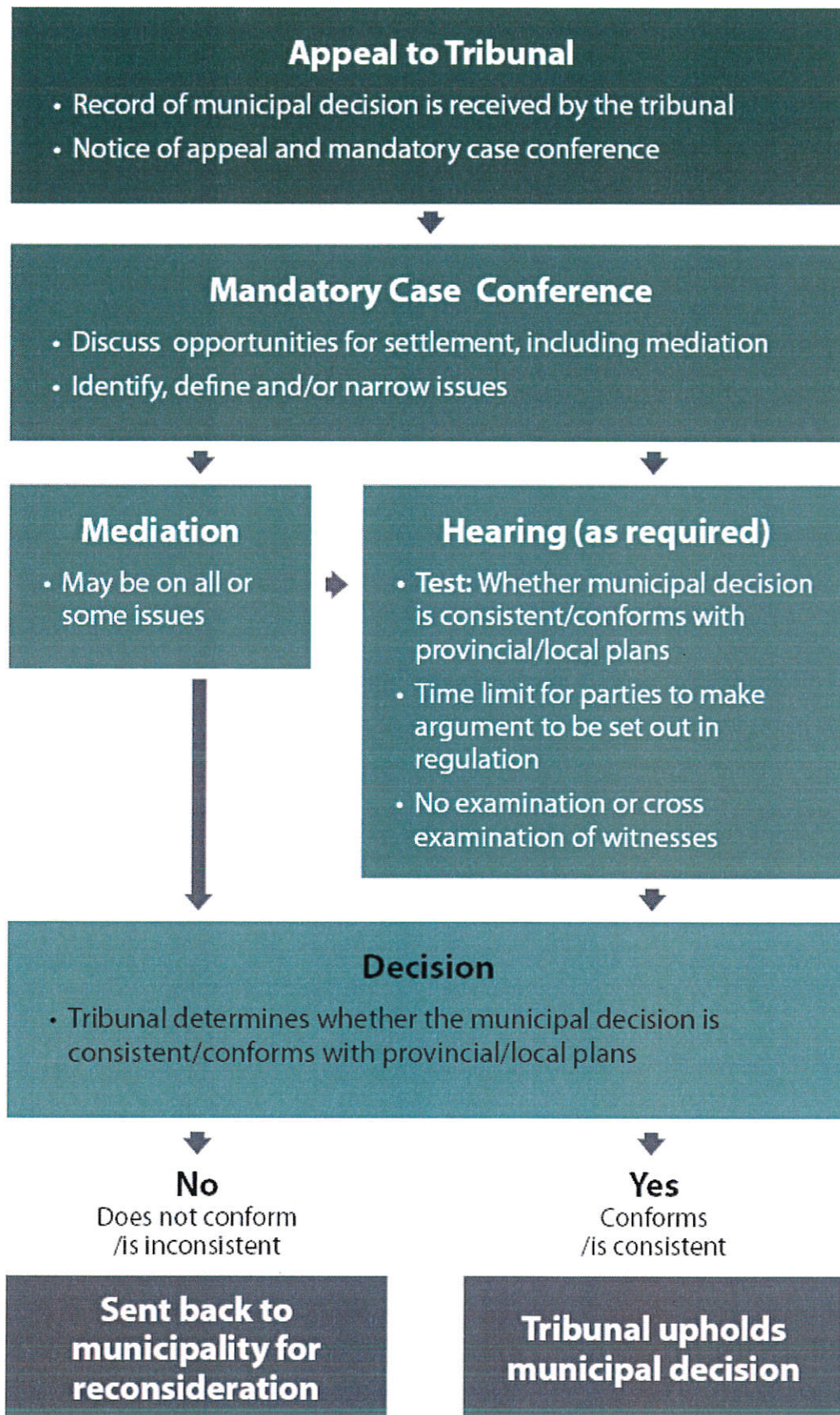


Peter Noehammer, P. Eng.
Commissioner Development & Infrastructure
Services

Attachments:

Attachment 1 - Flowchart of the proposed LPAT hearing process.

Proposed Hearing Process:





DEVELOPMENT AND INFRASTRUCTURE SERVICES – ENGINEERING SERVICES
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June 8, 2017

**DEVELOPMENT AND INFRASTRUCTURE SERVICES REPORT
ENGINEERING SERVICES 2017-23**

TO: Committee of the Whole
SUBJECT: Comprehensive Stormwater Management Master Plan
ORIGIN: Director, Engineering Services

RECOMMENDATIONS

THAT Development and Infrastructure Services Report – Engineering Services 2017-23 dated June 8, 2017, entitled “Comprehensive Stormwater Management Master Plan” be received and the following recommendation be adopted:

- 1. THAT the Town’s Comprehensive Stormwater Management Master Plan be adopted.**

BACKGROUND

The Lake Simcoe Protection Plan (LSPP) is a legislated plan under the Lake Simcoe Protection Act, 2008, S.O. 2008, Chapter 23. The LSPP contains policies and objectives designed to reduce the phosphorus and other pollutant content in Lake Simcoe and its tributaries and to protect and restore the ecological health of Lake Simcoe and its entire watershed.

One of the requirements of the LSPP is the development and implementation of a Comprehensive Stormwater Management Master Plans (Master Plans) to cover the management of stormwater for both existing and planned development in each municipality within the Lake Simcoe watershed. Very specific direction is provided in the LSPP on what needs to be included in the municipal Master Plans. Master Plans are seen as a key vehicle for meeting the vision and objectives of the legislation under the Lake Simcoe Protection Act.

COMMENTS

The Town has been working since 2015 on the creation of its Stormwater Master Plan. The Master Plan has been reviewed and recently approved by the Lake Simcoe Region Conservation Authority (LSRCA). The document is a vital resource for the short and long term planning of stormwater management and stormwater assets in the Town. By adopting this Plan, the Town commits to meeting its legislative and moral obligations regarding stormwater management.

BUSINESS PLAN AND STRATEGIC PLAN LINKAGES

- a) Well planned and well connected...planning for the future impacts of climate change and land use changes on stormwater management.
- b) Well-Equipped & Managed... ensuring that the Town meets its legislated requirements.

CONSULTATION

This document was prepared using a Class Environmental Assessment (EA) approach to evaluate the expected outcomes and the environmental, social and economic/cost impacts. The master planning process was conducted as prescribed in the Municipal Engineers' Association (MEA) Municipal Class Environmental Assessment document. The work has been scoped to satisfy Phases 1 and 2 of the EA process and to fulfil requirements of projects identified as "Schedule B". The Master Plan will form the basis of investigations of any specific Schedule C projects that are proposed in the future.

Consultation occurred initially with the LSRCA to confirm the scope of the work and to obtain background information related to the study area. Consultation with the LSRCA continued throughout the preparation of the Master Plan. Furthermore, a Public Information Centre (PIC) was held on March 31, 2015, to gather input from Newmarket residents and other agencies and stakeholders. Details of the consultation are given in Section 7 of the Master Plan. Comments and the materials presented at the PIC can be viewed in **Appendix A** of the Master Plan.

HUMAN RESOURCE CONSIDERATIONS

There are no human resource considerations at this time, as all engineering work related to Stormwater Management is currently being led by the Town's Senior Environmental Coordinator, Climate Change Adaptation. This is a contract position which is being funded 100% through external sources. Funding for this position ends in March, 2018. In order to continue meeting the Town's responsibilities for Climate Change Adaptation and Stormwater Management, and to meet the Town's requirements under the Ontario Legislation, it will be necessary to continue this position onward in the future.

BUDGET IMPACT

Operating Budget

Requests will be made through the regular budgeting process for any operating funds that will be required as a result of the Master Plan. It is recommended that, in order to meet the Town's legislated obligations and to reduce the risk of liability, the position of Senior Environmental Coordinator, Climate Change Adaptation, be continued into the future as a full-time FTE. This request will be made for Council to consider through the regular 2018 budget process.

Capital Budget

The implementation of the Stormwater Master Plan will be funded separately, on an annual basis, through the Town's Stormwater Utility budget and will be within the funding envelope provided in "Corporate Services Report – Financial Services Report 2017-30", entitled "Six Year Stormwater Financial Plan" and dated June 5, 2017.

CONTACT

For more information regarding this report, please contact: Jen Slykhuis, M.Sc., Senior Environmental Coordinator – Climate Change Adaptation, by phone at 905-953-5300, press "2", then extension 2506; or via e-mail at jslykhuis@newmarket.ca.



Jen Slykhuis, M.Sc.

Senior Environmental Coordinator – Climate Change Adaptation



Rachel Prudhomme, M.Sc., P.Eng.
Director, Engineering Services



Peter Noehammer, P. Eng.
Commissioner,
Development and Infrastructure Services

Town of Newmarket

Town of Newmarket Comprehensive Stormwater Management Master Plan

Prepared by:

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60330930

Date:

June, 2017

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The attached Report (the "Report") has been prepared by AECOM Canada Ltd. ("Consultant") for the benefit of the client ("Client") in accordance with the agreement between Consultant and Client, including the scope of work detailed therein (the "Agreement").

The information, data, recommendations and conclusions contained in the Report (collectively, the "Information"):

- is subject to the scope, schedule, and other constraints and limitations in the Agreement and the qualifications contained in the Report (the "Limitations");
- represents Consultant's professional judgement in light of the Limitations and industry standards for the preparation of similar reports;
- may be based on information provided to Consultant which has not been independently verified;
- has not been updated since the date of issuance of the Report and its accuracy is limited to the time period and circumstances in which it was collected, processed, made or issued;
- must be read as a whole and sections thereof should not be read out of such context;
- was prepared for the specific purposes described in the Report and the Agreement; and
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This Statement of Qualifications and Limitations is attached to and forms part of the Report and any use of the Report is subject to the terms hereof.

June 12, 2017

Jen Slykhuis
Town of Newmarket
395 Mulock Drive
P.O. Box 328
Station Main
Newmarket, ON L3Y 4X7

Dear Ms. Slykhuis:

Project No: 60330930

Regarding: Town of Newmarket Stormwater Master Plan

We are providing you with our report for the above named project with all sections completed. Please contact the undersigned if you have any questions or comments.

Sincerely,
AECOM Canada Ltd.



Pippy Warburton, P.Eng.
Water Resources Manager, Water
pippy.warburton@aecom.com

Encl.

Distribution List

# of Hard Copies	PDF Required	Association / Company Name
	1	Town of Newmarket

Revision Log

Revision #	Revised By	Date	Issue / Revision Description
0		Feb 2015	Draft Characterization complete
1	team	July 2015	Draft Report
2	team	January 2016	Final Report
3	team	July 2016	Revised Final Report to include requested water quantity input
4	team	January 2017	Revised Final Report to include LSRCA Review Comments
5	team	April 2017	Revised Final Report to include LSRCA Review Comments
6	team	June 2017	Revised Final Report to include LSRCA Review Comments

AECOM Signatures

Report Prepared By:



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Ecology



Veronica Kroess, P. Eng.
Water Resources

Report Reviewed By:



Pippy Warburton, P. Eng.
Water Resources



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Appendices

Appendix A.	Study Correspondence
Appendix B.	Phosphorus Loading and Removal Efficiency Calculations
Appendix C.	Water Balance Calculations

List of Acronyms and Abbreviations

ANSI	Area of Natural and Scientific Interest
BMP	Best Management Practice
CAMC	Conservation Authorities Moraine Coalition
COA	Certificate of Approval
COSEWIC	Committee on the Status of Endangered Wildlife in Canada
COSSARO	Committee on the Status of Species at Risk in Ontario
CSWMMP	Comprehensive Stormwater Master Plan
CVC	Credit Valley Conservation
EA	Environmental Assessment
ELC	Ecological Land Classification
ESA	Endangered Species Act
GIS	Geographic Information System
ha	Hectare
HVA	Highly Vulnerable Aquifer
IDF	Intensity-Duration-Frequency
LID	Low Impact Development
LSPP	Lake Simcoe Protection Plan
LSRCA	Lake Simcoe Region Conservation Authority
mAMSL	Metres Above Mean Sea Level
Mbgs	Metres Below Ground Surface
MCEA	Municipal Class Environmental Assessment
MNRF	Ministry of Natural Resources and Forestry
MOECC	Ministry of Environment and Climate Change
NHIC	Natural Heritage Information Centre
NRVIS	Natural Resource Values Information System
ORM	Oak Ridges Moraine
ORMCP	Oak Ridges Moraine Conservation Plan
OWES	Ontario Wetland Evaluation System
PIC	Public Information Centre
PSW	Provincially Significant Wetland
PTool	Lake Simcoe Phosphorus Loading Development Tool
QA/QC	Quality Assurance / Quality Control
RGA	Rapid Geomorphic Assessment
ROP	Regional Official Plan
SARA	Species at Risk Act
SGRA	Significant Groundwater Recharge Area
SMF	Stormwater Management Facility
SWH	Significant Wildlife Habitat
SWM	Stormwater Management
SWMF	Stormwater Management Facility
Town	Town of Newmarket
TRCA	Toronto Region Conservation Authority
TSS	Total Suspended Solids
UYSS	Upper York Sewage Solutions
WHPA	Wellhead Protection Area
YPDT	York, Peel Durham Region
YSA	Yonge Street Aquifer

1. Introduction

The Lake Simcoe Protection Plan (LSPP) has identified urban stormwater runoff as a significant source of phosphorus to Lake Simcoe and its tributaries, contributing to excessive algae and plant growth, oxygen depletion, and degraded water quality. The LSPP requires municipalities to prepare and implement Comprehensive Stormwater Management Master Plans (CSWMMPs) for each settlement area in the Lake Simcoe watershed. These plans are to be prepared in accordance with the Municipal Class Environmental Assessment (MCEA) study process and adhere to the local municipal and regulatory agency guidelines. This is to ensure that the management of stormwater for both existing and planned development meets the overall technical, environmental as well as social and cultural objectives for the study area, and ultimately the protection and/or enhancement of Lake Simcoe water quality.

The Town of Newmarket Comprehensive Stormwater Management Master Plan provides an integrated assessment of existing and proposed/future conditions with respect to stormwater management within the Town of Newmarket (Town). The report also details opportunities for improvement and recommendations for future actions with the ultimate goal of decreasing phosphorus loading to Lake Simcoe. Given the inter-relationship of stormwater management with natural systems (i.e. watercourses, wetlands, woodlots) as well as the overall hydrologic cycle (surface/groundwater) and existing infrastructure and land uses, staff from several technical disciplines contributed to the CSWMMP.

The CSWMMP complies with the 10 steps identified in the Lake Simcoe Region Conservation Authority's (LSRCA) Comprehensive Stormwater Management Master Plan Guidelines (LSRCA, 2011).

- Step 1: Scoping to identify settlement areas in the municipality
- Step 2: Determine the Study Area for the Settlement
- Step 3: Develop a Characterization of the Study Area
- Step 4: Divide the Area into Management Units where appropriate
- Step 5: Evaluate the Cumulative Environmental Impact of Stormwater from Existing and Planned Development
- Step 6: Determine the Effectiveness of Existing Stormwater Management Systems
- Step 7: Identify and Evaluate Stormwater Improvement and Retrofit Opportunities
- Step 8: Establish a Recommended Approach for Stormwater Management for the Study Area
- Step 9: Develop an Implementation Plan for the Recommended Approaches
- Step 10: Develop Programs for Inspection and Maintenance of Stormwater Management Facilities

These steps are discussed in subsequent sections of this report (not necessarily in order). The Town of Newmarket has completed relatively recent studies to evaluate the effectiveness of stormwater management in the study area completing a Stormwater Management Pond Inventory and Maintenance Plan in 2008-2009 and a Town-wide Drainage Study in 2008-2012. These two studies form the basis of the analysis completed in the current study with updates to reflect a more broad based approach required of an EA process and any changes in conditions or additional information available since the completion of those studies.

1.1 Study Area {Steps 1-2}

The Town of Newmarket is a municipality in the heart of the Region of York, midway between Toronto and Barrie. The Town covers 14.2 square miles (38.1 square kilometers) with a population of 84,000. The population is projected to grow to 98,000 by 2026 (Town of Newmarket, 2009). According to the Town's Official Plan (2014), the majority of existing land use within the Town's boundaries is categorized as residential. Industrial areas primarily lie adjacent to Highway 404. Parks and open space are scattered within the Town's boundaries and provide recreational, natural, and environmental value.

According to the LSRCA Comprehensive Stormwater Management Master Plan Guidelines (2011) the settlement area is defined as “urban areas and rural settlement areas (e.g., cities, towns, villages, and hamlets) where development is concentrated and lands are designated in municipal official plans for development over the long term.” Within the Town of Newmarket this encompasses built up areas (designated in the approved official plan), and adjacent areas where overland stormwater drainage will flow into the settlement area. The Town of Newmarket GIS database of existing and planned land use was used to identify the settlement area.

1.1.1 Management Units {Step 4}

The Study Areas (i.e., settlement areas) were divided into discrete management units in order to identify specific stormwater management constraints, opportunities and recommendations. Each management unit represents a grouping of areas with shared characteristics based on the results of the existing conditions review. Stormwater management pond catchment areas provided by the Town of Newmarket were related to individual watercourses within the Study Area, including: East Holland River, Western Creek, Ansnorveldt Creek, Weslie Creek, Armitage Creek, Tannery Creek and Bogart Creek. Management units were further delineated and grouped based on the following factors:

- Surficial geology;
- Topography;
- Existing land use; and
- Aquatic and terrestrial ecological features.

A total of eleven management areas were identified and are mapped on **Figure 1-2**.

Environmental constraints, opportunities and recommendations have been identified in Section 5 of this report, both generally for the Study Area and also specifically for each management unit.

1.2 Class Environmental Assessment Master Plan Process

The CSWMMP is a long range plan that integrates the existing and future land use needs of the study area with environmental assessment planning principles. This plan examines the needs of the area in order to outline a framework for planning for subsequent projects. Similar to an EA in evaluating options, a broad-based process is used including functional performance, environmental, social and economic/cost considerations. The CSWMMP allows for an integrated planning approach that the Town of Newmarket can adopt as it continues to grow and a methodology for implementing new and upgrading existing stormwater management facilities.

The Study follows the approved master planning process as outlined in Section A.2.7 (Approach #2 in Appendix 4) of the Municipal Engineer's Association (MEA) Municipal Class Environmental Assessment (October 2000, amended in 2011). The work has been scoped to satisfy Phases 1 and 2 of the EA process and to fulfil requirements of projects identified as Schedule B. The Master Plan will become the basis for future investigations of any specific Schedule C projects that are proposed within.

Consultation occurred initially LSRCA to confirm the scope of the work and obtain background information related to the study area. Additional consultation that occurred during the study is documented in Section 7 and in **Appendix A**.

1.3 History of Stormwater Management in Ontario

The history of Stormwater Management (SWM) in Ontario shows an extensive evolution in objectives and scope. In the early to mid-1980s, objectives of master drainage plans focused on minimizing flooding impacts of development

on downstream watercourses. In the following years, increased environmental awareness and public pressures shifted the objectives to include maintaining and enhancing natural systems within developing watersheds.

During this same time frame the scope of issues originally consisted of the management of the quantity of surface runoff to minimize impacts of development on downstream flooding and erosion. Typical issues included runoff quantity control, floodplain management, erosion control and flood control, culvert improvements, erosion and sediment control, and major/minor system designs within subdivisions.

The development of SWM and master drainage plans resulted in additional issues, including potential impacts on water quality, linkages and relationships of urban drainage to environmental features, groundwater protection issues, and the concepts of ecosystem planning. The range of issues continued to grow to include fisheries/aquatic habitat protection and enhancement, water temperature, baseflow maintenance, infiltration requirements, best management practices, monitoring, and the protection of some woodlots and wetlands.

Today, SWM strives to maintain water balance through infiltration to groundwater and maintaining runoff at low rates, prevent erosion through flow control and vegetative planting, pollution reduction through vegetation (nutrient uptake), SWM measures, and Low Impact Development (LID) measures. LID measures are a large component of today's SWM tools, as they aim to create a hydrologic landscape that replicates the predevelopment hydrologic regime. Additional SWM measures include source pollution prevention such as reduced fertilizer and pesticide use, road salt reduction programs, and community action programs such as alternate lawn practices, pet litter control, and sewer use By-law enforcement. Today's SWM incorporates source and lot-level controls, conveyance system controls, end-of-pipe facilities, and treatment train approaches. The table below summarizes the history of SWM in Ontario.

1.4 Existing Policies

The following section summarizes the objectives and background of the relevant policies reviewed in support of the CSWMMP.

1.4.1 Lake Simcoe Protection Plan

Lake Simcoe Protection Plan Policies 4.5-SA provides specific requirements on what needs to be in a CSWMMP. The remaining policies and actions listed (4.6-SA, 4.7- DP, 4.10-DP & 4.11-DP) would be supported by the completion of a Stormwater Management Master Plans in accordance with the Municipal Class Environmental Assessment (EA), and includes the following:

- a) A characterization of existing environmental conditions on a subwatershed basis, consistent with any relevant subwatershed evaluations, if available;
- b) An evaluation of the cumulative environmental impact of stormwater from existing and planned development;
- c) A determination of the effectiveness of existing stormwater management works at reducing the negative impacts of stormwater on the environment, including consideration of the potential impacts of climate change on the effectiveness of the works;
- d) An examination of any stormwater retrofit opportunities that have already been identified by the municipality or the LSRCA for areas where stormwater is uncontrolled or inadequately controlled;
- e) The identification of additional stormwater management retrofit opportunities or improvements to existing stormwater management works that could improve the level of treatment within a particular settlement area;
- f) A description of existing or planned programs for regular maintenance of stormwater management works;
- g) An identification of the recommended approaches for stormwater management in each settlement area; and
- h) An implementation plan for the recommended approaches.

Additional approaches may be relevant to the current study and can be described generally as follows:

- Provide “Enhanced” stormwater quality treatment controls, as defined by the Ministry of the Environment for all new development;
- Evaluate an integrated treatment-train approach to minimize reliance on end-of-pipe stormwater management;
- Minimize post-development impacts on water balance, targeting zero impact on predevelopment annual infiltration;
- Minimize post-development impacts on phosphorus loads, targeting zero net impact post-development; and,
- Assess any stormwater retrofit opportunities where stormwater is uncontrolled or inadequately controlled.

1.4.2 Wellhead Protection Plan

A Wellhead Protection Area (WHPA) is the area known as capture zone which surrounds the wellhead. Land use activities in this area have the greatest potential to affect the quality of groundwater within the aquifer from which the well derives its source, and as such, WHPAs are vulnerable to contamination.

There are three (3) pieces of legislation that currently apply to the protection of drinking water supplies within study area:

- **Provincial Policy Statement (2005)** – provides broad policy direction on matters of provincial interest as it relates to land use planning and development.
- **Regional Official Plan (2010)** – provides land use and resource management direction for the land and water outside of the Oak Ridges Moraine as it applies to WHPA's.
- **Clean Water Act (2006)** – Ontario government's commitment to protect drinking water at the source as part of the overall commitment to human health and the environment.

The Regional Official Plan (ROP) provides a policy that restricts and/or prohibits certain land uses due to their potential impact to groundwater quality. To ensure that municipal well water quality and quantity is protected from contamination the policy states:

...“That the storage or use of pathogen threats by new land uses, including the siting and development of stormwater management ponds and rapid infiltration basins or columns, except for the storage of manure for personal or family use, is prohibited within the 100-metre pathogen zone around each municipal well shown on Map 6 and may be restricted within the 100-metre to 2-year time of travel.”... (York Region, 2010)

1.4.3 Ministry of Environment and Climate Change Stormwater Management Guidelines

The Stormwater Management Planning and Design Manual (MOE, 2003) provides planning and design guidelines for stormwater management. The Manual outlines design methods for water quality, erosion and flood control. The following policies apply specifically to the Town of Newmarket Stormwater Master Plan:

- Water quality control to be established to the standards outlined in the Stormwater Management Planning and Design Manual for the requisite level of control required by the receiving watercourse (Enhanced Level control as specified by the Lake Simcoe Protection Plan [LSPP]); and

- Provide the requisite erosion control for protection of downstream watercourses to ensure they remain stable (Ontario Water Resources Act as administered by the Ministry of the Environment).

MOECC released an Interpretation Bulletin (February 2015) clarifying their guidance and approvals approach for Stormwater Management. The main item this bulletin identifies is the need to maintain the natural hydrologic cycle to the greatest extent possible. It notes that the MOECC will be releasing a guidance document related to Low Impact Development in late 2016 and states that “Low impact development stormwater management is relevant to all forms of development, including urban intensification and retrofit.” In addition, the MOECC provides guidance on the assessment of phosphorus loading and management through the Phosphorus Budget Tool (PTool) (Hutchinson Environmental Services Ltd, March 2012 for MOE).

1.4.4 Lake Simcoe Region Conservation Authority

The LSRCA provides environmental and planning expertise to developers and municipalities with respect to development and construction in the Lake Simcoe Watershed, to ensure provincial, federal and conservation authority policies and regulations are followed. LSRCA also manages regulated areas within the watershed and provides general guidelines for development, by way of their Comprehensive Stormwater Management Master Plan Guidelines (LSRCA, 2011). The LSRCA has provided guidance and data to support this CSWMMP.

1.4.5 Town of Newmarket Official Plan

The Town of Newmarket Official Plan was adopted in 2008 and consolidated in September 2014 and addresses stormwater management in the following sections:

PART II – BUILDING A STRONG COMMUNITY

12.0 Urban Design and Compatibility

12.3 Sustainability in Design

Innovative energy producing options, green industry and green building designs and construction practices will be supported and encouraged in building renovation and redevelopment through the site plan process. Specific sustainability features sought by the Town may include:

- innovative methods of reducing stormwater flows;*

PART III – URBAN SYSTEMS

14.0 Servicing

14.4 Stormwater Management

Proper stormwater management eliminates or reduces the risk flooding, erosion, pollution of streams, rivers and lakes and possible impairment of drinking water resources. By controlling the quantity and quality of stormwater runoff the Town's streams, rivers, lakes and groundwater can be improved. Proper stormwater management will involve the preparation of subwatershed planning studies and stormwater management studies. These studies assist in identifying measures for stormwater management for all development within individual subwatersheds.

Policies

- New developments will provide appropriate stormwater management facilities as approved by Council and, where necessary, the Lake Simcoe Region Conservation Authority.*
- Stormwater drainage facilities will be designed and constructed so as to protect receiving watercourses and adjacent land uses from any potential adverse impacts of stormwater runoff.*

3. Stormwater management facilities shall maintain natural stream geometry wherever possible and control the quantity and protect and enhance the quality of stormwater runoff entering the receiving watercourses, including the control of erosion and sedimentation during the after construction.

4. Council may prepare comprehensive subwatershed planning studies for specific subwatersheds or development areas within the Town.

5. Council will require the preparation of stormwater management studies in support of any development proposal. Stormwater management studies will identify:

a. the facilities required, including their size, location, and capacity, for controlling the quantity and quality of stormwater runoff, including:

i. storm sewers and/or channels;

ii. culverts;

iii. detention or retention ponds;

iv. upstream stormwater diversions; and,

v. the use of rooftop, parking lot, or parks and open space as temporary detention areas;

b. the measures necessary to control erosion, sedimentation and stream bank stability during and after construction;

c. the storm sewer and outfalls to the receiving watercourses; and,

d. the environmental impacts of stormwater management facilities on fisheries, forest and wildlife resources.

6. Stormwater management studies shall be prepared in accordance with subwatershed planning studies.

For areas where a subwatershed planning study has not been prepared, the stormwater management study shall be prepared using engineering and hydrologic models acceptable to the Town and those other authorities with jurisdiction.

7. The size of stormwater management facilities shall be based on the ultimate development pattern within the subwatershed or development area.

8. All stormwater management facilities shall be designed to the satisfaction of the Town and those other authorities with jurisdiction.

14.8 Environmentally Progressive Services

Environmentally progressive services will help reduce current resource inputs and outputs to and from homes and buildings. Such practices will help decrease impacts on the environment, water cycle, and climate. Environmentally progressive services are encouraged to be incorporated into developments and may include:

- reduced stormwater flows;
- reduced use of water;
- reduced waste production and increased recycling;
- use of renewable energy systems and energy efficient technologies; and,
- creation of innovative green spaces such as green roofs.

Several components of the plan related to Natural Heritage Systems, Floodplains and Hazard Lands impact SWM Planning, as they restrict SWM facility locations, and recommend SWM measures reduce impacts on the natural environment.

1.4.6 The Newmarket Urban Centres Secondary Plan

The Newmarket Urban Centres Secondary Plan covers an area located along the Davis Drive and Yonge Street Corridors. The Secondary Plan updates the Official Plan Land Use categorization through these corridors and identifies planning requirements for redevelopment of these lands. Stormwater Management is specifically identified in several areas but in general identify that the increased density, impervious area and development provided for in the rezoning shall be mitigated by the implementation of low impact development stormwater management measures to improve conditions with respect to stormwater volumes and contaminant loadings and that maximize infiltration.

The Plan also specifies the enhancement and/or creation of Neighbourhood and Open Space Parks. Several of these parks have existing stormwater management facilities or are located along the stream corridor within the

floodplain. The Plan also identifies 7 km of Green Streets slotted to have increased tree canopy and enhanced vegetation plantings.

1.4.7 Newmarket Engineering Design Standards

Section C of the Newmarket Engineering Design Standards (Town of Newmarket, 2009) identifies design requirements of stormwater management infrastructure for new development. This includes design standards for storm sewers, culverts, stormwater management ponds and overland flow routes. The 2012 Town-wide Drainage Study recommended changes to these guidelines to reflect recommendations from that study as well as updated IDF curves. These are currently being implemented.

The standards related to stormwater management generally defers to the 2003 MOE Guidelines and requirements related to on-site stormwater management are generally limited to parking lot and roof top storage to reduce peak flows.

1.4.8 York Region Official Plan

Adopted in 2010 the York Region Official Plan (subject to ongoing review to address site specific appeals), has several components that address stormwater management. Section 2.3 Water Systems generally outlines the policy requirements. The specific sections related to Stormwater Management are listed below. Other Sections (5.2 Sustainable Cities, Sustainable Communities and 5.4 Regional Centres and Corridors for example) reiterate these items.

Stormwater Management

Stormwater is the runoff that occurs in urbanized areas, increasing downstream watercourse erosion, pollution and increased water temperatures. Stormwater can intensify flooding during storm events. Stormwater should be managed as a resource. The use of sustainable stormwater planning and practices will help ensure the continued health of the streams, rivers, lakes, fisheries and terrestrial habitats in our watersheds.

Objective

To ensure the careful management of stormwater through the use of innovative techniques.

It is the policy of Council:

36. To work in partnership with local municipalities, the Province, conservation authorities and other agencies in the implementation of stormwater management initiatives.

37. To require the preparation of comprehensive master environmental servicing plans, or appropriate technical studies, as a component of secondary plans and major development or re-development to minimize stormwater volume and contaminant loads, and maximize infiltration through an integrated treatment approach, which may include techniques such as rainwater harvesting, phosphorus reduction, constructed wetlands, bioretention swales, green roofs, permeable surfaces, clean water collection systems, and the preservation and enhancement of native vegetation cover.

38. That local municipalities require that stormwater management works be inspected and maintained to ensure that they function as designed.

39. To work with local municipalities and the Lake Simcoe Region Conservation Authority in the preparation and implementation of comprehensive stormwater management master plans for each settlement area within the Lake Simcoe Watershed by June 2014.

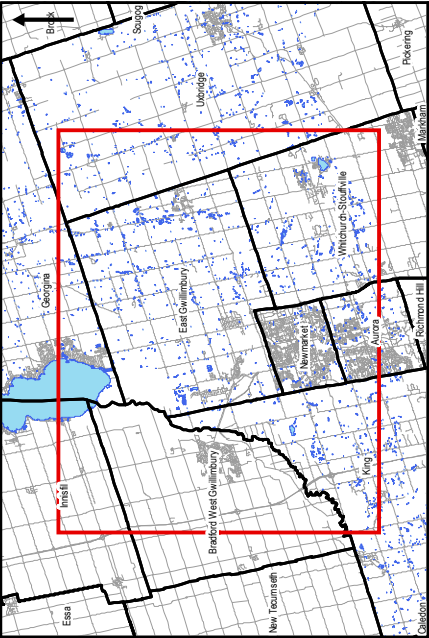
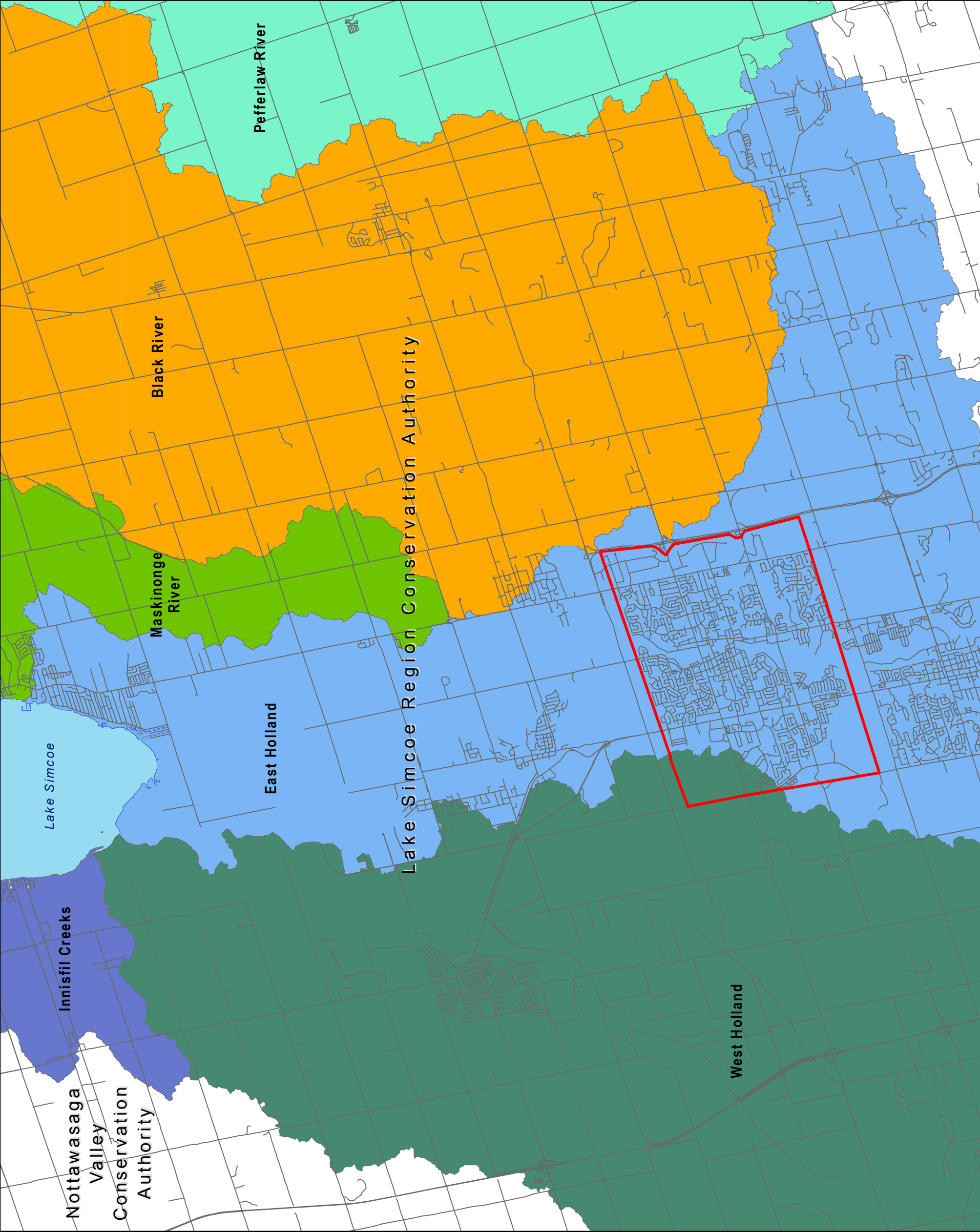
1.4.9 Oak Ridges Moraine Conservation Plan

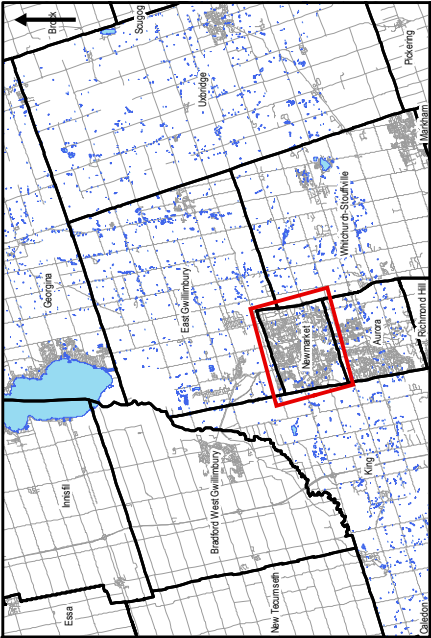
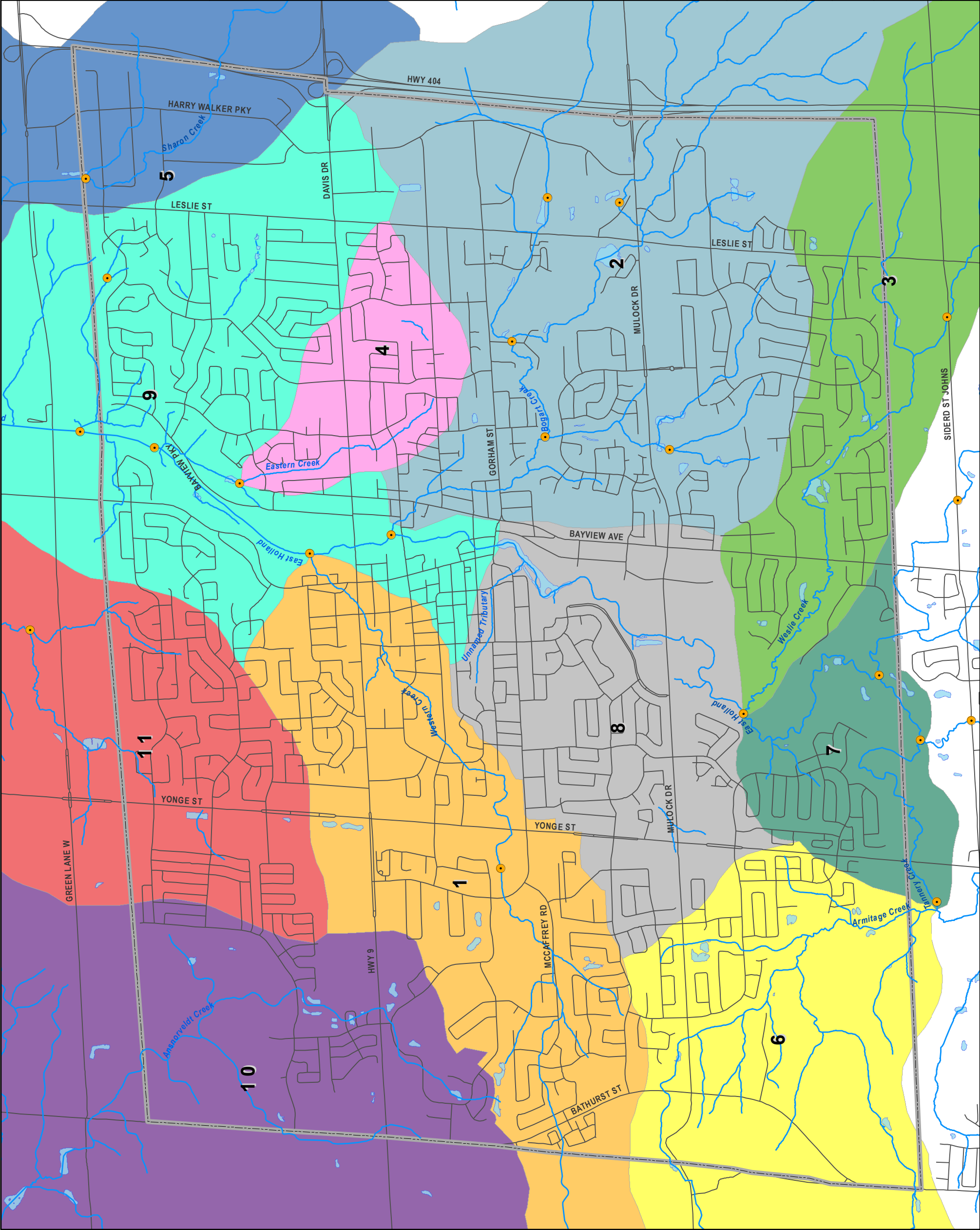
A portion of the study area falls within the Oak Ridges Moraine, and must conform with the Oak Ridges Moraine Conservation Plan (2001). The plan outlines requirements for stormwater management for development within the Oak Ridges Moraine including construction related stormwater management, with development requiring a stormwater management plan meeting the following criteria:

- (1) The objectives of a stormwater management plan are to;*
 - (a) maintain groundwater quantity and flow and stream baseflow;*
 - (b) protect water quality;*
 - (c) protect aquatic species and their habitat;*
 - (d) prevent increases in stream channel erosion; and*
 - (e) prevent any increase in flood risk.*
- (2) A stormwater management plan shall provide for an integrated treatment train approach that uses a planned sequence of methods of controlling stormwater and keeping its impact to a minimum by techniques including, without limitation;*
 - (a) lot level controls such as devices and designs that direct roof discharge to rear yard ponding areas;*
 - (b) conveyance controls such as grassed swales; and*
 - (c) end-of-pipe controls such as wet ponds at the final discharge stage.*
- (3) A stormwater management plan shall be prepared in accordance with the applicable watershed plan under section 24, if one exists.*

1.4.10 Considerations for New Policies

The draft Lake Simcoe Watershed Model By-law and LID SWM Guidelines for Municipalities (April 16, 2015 draft) is intended to provide a model framework for LID SWM requirements to be defined within the Municipal legislative framework. It is still up to each Municipality to select some or all of the draft Model By-law and LID SWM Guidelines, as they so choose. The Town of Newmarket needs to consider the adoption of these new guidelines.

<



Legend

Management Units*

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11

* Refer to Section 1.1.1 of the Town of Newmarket Stormwater Master Plan for a description of how management units were identified.

Base Layers

- Roads
- Watercourse
- Waterbodies
- Municipal Boundary



Town of Newmarket Stormwater Master Plan

Management Units

July 2016	1:25,000	Datum: NAD 83 Zone 17 Source: Town of Newmarket, York Region
PH: 60330930	V#: 001	

AECOM

Figure 1-2

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2. Existing Conditions {Step 3, 5}

2.1 Existing Development

Existing land uses for the Study Area were provided by the Town of Newmarket and are shown in **Figure 2-1**.

Table 2-1 provides a detailed summary of the existing land uses. The four most dominant land uses in the Study Area include urban, natural heritage, industrial areas and transportation. Approximately 42 percent of the Study Area is dominated by urban land use, which consists of a broad range of commercial, office, institutional, and residential land uses that support jobs, housing and services (Town of Newmarket, 2014). Natural heritage features which are part of the Town's Natural Heritage System are the second dominant land use and represent 15 percent of the Study Area. Natural heritage features consist of locally significant meadows, woodlands and wetlands, as well hydrological networks of watercourse and floodplains associated with the East Holland River (Town of Newmarket, 2014). Industrial areas, which provide employment opportunities, are concentrated adjacent to Highway 404 and represent approximately 9 percent of the Study Area. The Town's transportation network, which is served by roads and railway systems and connects to the Greater Toronto Area and other parts of Ontario, also contributes 9 percent of the existing land use (Town of Newmarket, 2014).

The parks and open spaces land use type consists of major parks, golf courses, conservation areas, trail systems and river corridors, which comprise 7 percent of the Study Area (Town of Newmarket, 2014). These areas promote active and passive recreation and provide physical linkages between natural heritage features. Institutional and commercial land uses, each comprise 6 percent of the Study Area, respectively. Institutional areas primarily consist of post-secondary educational facilities, long-term care facilities and social, cultural and administrative facilities (Town of Newmarket, 2014). Commercial areas mainly promote retail and service orientated activities (Town of Newmarket, 2014). Only 4 percent of the study area is dominated by intensive and non-intensive agriculture and the remaining 2 percent consists of estate residential and rural developments.

Table 2-1. Existing Land Use in the Study Area

Land Use Type	Area (ha)	Percentage (%)
Urban	1589.27	41.61
Natural Heritage	554.10	14.51
Industrial	345.02	9.03
Transportation Network:		
Rail	11.77	0.31
Road	326.91	8.56
Subtotal:	338.69	8.87
Parks and Open Spaces:		
Manicured Open Space	182.18	4.77
Golf Course	103.10	2.70
Subtotal:	285.27	7.47
Institutional	238.65	6.25
Commercial	235.41	6.16
Agriculture:		
Intensive agriculture	129.60	3.39
Non-intensive agriculture	21.20	0.56
Subtotal:	150.80	3.95
Estate Residential	48.00	1.26
Rural Development	33.99	0.89
Total:	3819.19	100.00

2.2 Hydrology

The Study Area is located in the Lake Simcoe watershed, which is situated in Southern Ontario between Lake Ontario and Georgian Bay of Lake Huron. The watershed has an area of approximately 3,557 square kilometers. Lake Simcoe itself has a surface area of 722 square kilometers. The Lake drains into Lake Couchiching through the Atherley Narrows and into Georgian Bay through the Trent Severn Waterway (Scott et al, 2006). The Lake Simcoe watershed consists of 33 subwatersheds. The watershed boundary for the Town of Newmarket regional hydrology is presented on **Figure 2-2**.

The Study Area is located mainly in the East Holland River watershed, with a very small area in the north-west located in the West Holland River watershed. The Holland River watershed is composed of the East Holland River, the West Holland River (also called the Schomberg River) and the main branch of the Holland River. The East and West Holland Rivers join near 10th Line and flow into the main branch of the Holland River before draining into Lake Simcoe at Cook's Bay.

2.2.1 East Holland River Watershed

The East Holland River watershed is located in the southwest portion of the Lake Simcoe watershed. The watershed extends from the Oak Ridges Moraine in the south to Lake Simcoe in the north. The watershed neighbours with the West Holland River watershed to the west, the Black River watershed to the east, and the Maskinonge River watershed to the northeast. The East Holland River watershed covers an area of 268 km² (Beak Consultants, 1994). The watershed is located almost entirely within the York Region, with a small part within the regional municipalities of Durham and Simcoe.

The East Holland watershed has a maximum elevation of 403 mAMSL, a minimum elevation of 198 mAMSL, and an average elevation of 274 mAMSL. The watershed has mostly low topographic relief, steeper areas are found in the southern portion of the watershed. The majority of the watershed falls within the Simcoe Lowlands. The Oak Ridges Moraine extends into the watershed in the southeast, accounting for approximately 12 percent of the watershed area (The Louis Berger Group, 2006). Sandy-loam and clay-loam are dominant soils in the watershed.

The major streams in the East Holland River watershed include the East Holland River and its main tributaries, Tannery Creek, Marsh Creek, Weslie Creek, Armitage Creek, Bogart Creek, Western Creek, Sharon Creek, Holland Landing Creek, Queensville Drain, Holborne Drain, Ravenshoe/Boag Drain, and Youngs Point Creek. The East Holland River flows in a northerly direction and drains into Cook's Bay. The East Holland River flows through the centre of the Town of Newmarket, along with various tributaries. Bogart Creek meanders into the Town from the Oak Ridges Moraine, and empties into the main branch in north-central Newmarket. Western creek empties into the main branch in the Town's north end. Tannery creek is a stream that joins the main branch in south Newmarket. Other tributaries include Weslie Creek, Armitage Creek, both in the south end of the Town. There are numerous waterbodies and storm water management ponds throughout the Town. There are two reservoirs in Newmarket; Fairy Lake is a former mill pond on the East Holland River, and is managed by the LSRCA. Bogart Pond is also a former mill pond, and is located on Bogart Creek. The water level in the reach of the East Holland north of Davis Drive is controlled from an unfinished Newmarket Canal lock, now used as a weir. There are a number of storm water management ponds in the Town of Newmarket. A portion of these ponds are private, some are under the control of developers, and some are under the control of the Town of Newmarket.

According to the LSRCA, the East Holland watershed is the most populated and environmentally degraded region of the Lake Simcoe watershed (LSRCA, 2010a). The watershed is one of the most urbanized watersheds in the Lake Simcoe watershed with over 27 percent urban areas. Other major land uses in the watershed include agricultural areas (35 percent) and forested lands (24 percent), (The Louis Berger Group, 2006).

2.2.2 West Holland River Watershed

The West Holland watershed is located in the southwestern portion of the Lake Simcoe watershed. Similarly to the East Holland River, the watershed extends from the Oak Ridges Moraine in the south to Lake Simcoe in the north. The West Holland River watershed has an area of 348 km² (Beak Consultants, 1994). The larger part of the watershed lies within the York Region, with the remaining part in Simcoe County, and in the Peel region.

The major streams in the West Holland River watershed include the West Holland River and its main tributaries, North Schomberg River, South Schomberg River, Pottageville Creek, Kettleby Creek, Keele Creek, Glenville Creek, Arnsnorvelt Creek, Frazer Creek, Scanlon Creek, Coulsons Creek, William Neeley Creek, and North and South Canal. The North and South Schomberg Rivers originate in the southern portion of the watershed, and flow into the West Holland River. The West Holland River then flows in a northeasterly direction and drains into Cook's Bay. The Town of Newmarket encompasses only a very small portion of the West Holland River watershed in the northwest section of the Town.

The West Holland watershed has a maximum elevation of 370 mAMSL, a minimum elevation of 199 mAMSL, and an average elevation of 258 mAMSL. The majority of the watershed is flat, steeper areas are found in the southern and southeastern portions of the watershed. The majority of the watershed falls within the Simcoe Lowlands, the remaining area is part of Upland Till Plains. Many of the uplands are associated with the Oak Ridges Moraine, which extends into the West Holland Watershed in the south, comprising approximately 7 percent of the watershed area (The Louis Berger Group, 2006). Sandy-loam and clay-loam are dominant soils in the watershed.

The West Holland River watershed is characterized by intensive market gardening activity, with dominant agricultural (59 percent) land use. Forested areas occupy 22 percent of the areas. Urban areas make up approximately (8 percent) of the watershed (The Louis Berger Group, 2006). Also, the Holland Marsh is a significant land use feature in this watershed.

2.3 Stream Morphology

Geomorphological conditions and processes within East and West Holland subwatersheds were documented in the following reports:

- AECOM (2009). Townwide Drainage Study. Prepared for Town of Newmarket, June 2009.
- Conestoga-Rovers & Associates (2013). Upper York Sewage Solutions Environmental Assessment: Natural Environment Baseline Conditions Report. Prepared for The Regional Municipality of York.
- LSRCA (2010a). East Holland River Subwatershed Plan. Lake Simcoe Region Conservation Authority.
- LSRCA (2010b). West Holland River Subwatershed Plan. Lake Simcoe Region Conservation Authority.
- LSRCA (2010c). Lake Simcoe Basin Best Management Practices Inventory. Lake Simcoe Region Conservation Authority.
- PARISH Geomorph Ltd. 2007. Basin Scale Fluvial Geomorphology Assessment for the York Region Watersheds. Prepared for the Lake Simcoe Conservation Authority. 20 pp plus appendices.

2.3.1 General Observations

The following are general observations regarding fluvial geomorphological form and processes with the Town of Newmarket:

- The majority of channels are intermittent or ephemeral in nature (Conestoga-Rovers & Associates 2013).

- Many channels have been historically straightened for agricultural and urban purposes. Historic straightening has increased erosion potential and has resulted in the removal of riparian vegetation, which is a key component of bank strength (Conestoga-Rovers & Associates 2013).
- Historic aerial analysis reveals that channel planform has been relatively stable over the past half century (LSRCA 2010a, 2010b).
- Meander belt widths are generally less than 60 m within the Town, except for the main branch of The East Holland River which has a meander belt of 61-100 m in the southern portion of the Town and it increases to 101-160 m downstream of its confluence with Western Creek near Davis Drive (PARISH Geomorphic Inc., 2007).

2.3.2 Rapid Geomorphological Assessment

The Rapid Geomorphic Assessment (RGA) was designed by the Ontario Ministry of Environment and Climate Change (1999) to assess reaches in urban channels. Reaches can be defined as lengths of channel that display similar physical characteristics and have a setting that remains nearly constant along their length. Thus, in a reach, the controlling and modifying influences on the channel are similar, and are reflected in similar geomorphological form, function and processes within the reach. RGA is a presence/absence methodology designed to document evidence of channel instability. The various indicators are grouped into four categories indicating a specific geomorphic process: aggradation, degradation, channel widening and planimetric form adjustment. Upon tallying the results, a given reach is determined to be either 'In-Regime or Stable' (least sensitive), 'Transitional or Stressed' (moderately sensitive), or 'In-Adjustment' (most sensitive).

In the East Holland Watershed all watercourses were determined to be either 'In-Regime or Stable' or 'Transitional or Stressed' (i.e. no 'In-Adjustment' channels were observed) and channel widening was found to be the dominant channel process (LSRCA, 2010a). Likewise, only one reach was determined to be 'In-Adjustment' in the West Holland River subwatershed and the dominant channel process was also widening (LSRCA, 2010b). Widening is common in urban watersheds as the channels enlarge their cross-section to accommodate large flow events.

2.3.3 Channel Classification

As part of the Upper York Sewage Solutions (UYSS) EA study (Conestoga-Rovers & Associates 2013), a reconnaissance-level fluvial geomorphic assessment was completed for all watercourses within the UYSS study area, which included the Town of Newmarket. Reaches within the study area were defined based on desktop assessment of characteristics including sinuosity, valley setting, geology, gradient, land use and tributary confluences, using aerial photography, drainage network, geology and topographic mapping. Each reach was assigned a category A through F. **Table 2-2** provides description of each of the categories. The distribution of reach categories can be observed in **Figure 2-3**. Note the UYSS study area did not include the western edge of the Town of Newmarket and thus those channels were not classified.

Representative reaches were walked in July 2011 to field-truth the desktop analyses and collect additional information including bankfull channel dimensions and channel boundary materials. As well, the extent of anthropogenic intervention, severity of bed and bank erosion, and dominant mode of channel adjustment was also noted during the field investigations. Based on these field indicators, the ability of each reach type to assimilate increased discharge was assessed. Channel dimensions, substrate, processes, and ability to assimilate higher discharges can be observed in **Table 2-2**.

Over half (52 percent) of the watercourses assessed were classified as small altered watercourses (Class E). As well, an additional 18.6 percent of channel length is classified as large altered watercourses (Class B). The high percentage of altered watercourses is attributed to urbanization and agriculture. The altered channels are generally

found in the northern portion of the Town. These altered channels are more susceptible to erosion than natural channels due to decreased channel length (i.e. increased slope) and loss of natural hydraulic roughness.

Furthermore, total stream power is the rate of energy expenditure along a channel and can be used to identify segments of channel that are predisposed to bed and bank erosion. Stream power (Ω) was determined along all second-order channels and higher that have a drainage area larger than 100 hectares according to the following equation:

$$\Omega = \gamma QS$$

where γ is specific weight of water (9810 N/m³), Q is the two year return discharge (m³/s), and S is the bed gradient (m/m). Q was determined using ArcHYDRO module of ESRI's ArcGIS and S was estimated from a 5 m digital elevation model. The distribution of stream power within the Town of Newmarket can be observed in **Figure 2-4**. Stream power is highest along sections of Western Creek and the East Holland River where the channel has been historically straightened (i.e. reduction of channel length increases channel slope and thus stream power).

Table 2-2. Summary of Reach Characteristics within the Town of Newmarket (Conestoga-Rovers & Associates 2013)

Reach Class	Description	Approximate Channel Length (m)	Typical Bankfull Width (m)	Typical Bankfull Depth (m)	Typical Channel Pattern	Typical Bed/Bank Material	Relative Extent of Anthropogenic Influence	Relative Severity of Erosion	Dominant Mode of Channel Adjustment	Sensitivity to Flow Supplementation
A	Large Natural Watercourse	2114 (6.7%)	5 – 17	0.5 – 0.75	Irregular Meander	Sand, Silt, Gravel	Minor	Minor	Widening	Moderate
B	Large Altered Watercourse	5860 (18.6%)	6 – 17	0.2 – 0.8	Straight/Irregular Meander	Sand, Silt, Pebbles, Gravel	Major	Moderate	Widening	Moderate
C	Backwatered Watercourse	0 (0.0%)	4 – 54	8 – 10	Irregular Meander	Organic Material, Sand, Silt	Moderate	Negligible	Natural Meander Processes	Low
D	Small Natural Watercourse	2349 (7.5%)	1.5 – 3	0.3 – 0.6	Irregular Meander	Sand, Silt	Minor	Moderate	Natural Meander Processes	Moderate to High
E	Small Altered Watercourse	16367 (52.0%)	1.5 – 4	0.2 – 0.5	Irregular Meander	Sand, Silt, Gravel	Moderate	Major	Widening	Moderate to High
F	Swales and Drains	4099 (13.0%)	NA	NA	Poorly Defined to Sinuous	Silt, Sand, Pebbles, Organic Material (commonly vegetated)	Moderate	Minor	None to Degradation	High
G	Straight Drainage Ditch	666 (2.1%)	1 – 4	0.4 – 0.8	Straight	Silt, Sand	Moderate	Minor	Widening	Moderate to High

2.3.4 Stream Inventories

In 2009, AECOM field staff conducted stream inventories along Western, Eastern, and Boggart Creeks and an unnamed tributary of the East Holland River (refer to Figure 2.3 and 2.4 for channel locations). Below is a summary of documented morphological conditions for each reach:

- *Western Creek*: Development occurs up to the edges of the banks at many locations resulting in the use of hard engineering approaches (e.g. gabion baskets, armour stone). Western Creek has the most erosion issues of the four channels investigated. Channel straightening was noted throughout.
- *Eastern Creek*: The cross-sectional area was enlarging through widening and downcutting. More pronounced riparian buffer than the other three channels.
- *Boggart Creek*: Development occurs up to the edges of the banks at many locations resulting in the use of hard engineering approaches (e.g. gabion baskets, armourstone). Channel straightening was noted throughout.
- *Unnamed Tributary of the East Holland River*: Channelized, vegetation choked channel. Minor erosion issues.

2.4 Hydrogeology

2.4.1 Purpose

The purpose of the hydrogeological investigation is to provide an overview of groundwater conditions within the Newmarket Stormwater Management Plan study area. Through completion of a desktop study, areas of differing environmental sensitivity with respect to groundwater have been identified. Understanding groundwater resources within the study area allows for proper planning of the Town of Newmarket's stormwater management facilities and addresses both environmental and design aspects during the planning phases of development. Groundwater conditions at a stormwater management pond affects the pond's ability for surface water infiltration, as well as its ability to mitigate adverse impacts from surrounding development on baseflow contribution to local surface water resources; including wetlands, creeks and streams.

2.4.2 Methods

A review of secondary source information was undertaken to confirm geological and hydrogeological conditions within the study area. Several key reports were reviewed to determine the hydrogeological setting of the study area and included the following:

- Upper York Sewage Solutions Environmental Assessment – Natural Environment Baseline Conditions Report (AECOM, 2013);
- South Georgian Bay Lake Simcoe Source Protection Plan (LSRCA, 2012)

A Geographic Information System exercise was performed to identify areas of high vulnerability to groundwater contamination. For example, surficial geology mapping was used to identify highly permeable soils at surface that may indicate potential groundwater recharge areas. Coincident high permeability sediments, wetlands and stream headwaters were mapped to identify potential groundwater discharge areas. In addition, Ministry of the Environment and Climate Change (MOECC) water well locations within the study area were mapped, and selected water well records were consulted to characterize the subsurface distribution of sediments and identify the location of high groundwater tables within the study area.

2.4.3 Results

2.4.3.1 Geology

Bedrock Geology

Locally, the upper bedrock contact is known to occur at depths ranging from 50 m near Lake Simcoe to greater than 200 m within bedrock valleys underlying the Oak Ridges Moraine (ORM; AECOM, 2013).

Geological mapping for the area indicates overburden deposits that overlie shale of the Blue Mountain Formation in the southern half of the study area and limestone of the Lindsay formation in the northern half of the study area. The Blue Mountain Formation is a dark blue-grey to black shale that is thinly interbedded with limestone or calcareous siltstone. This formation is Upper Ordovician in age and overlies the Lindsay Formation (Armstrong and Dodge, 2007). The Lindsay Formation is Middle Ordovician in age and is one of 5 units of the Simcoe Group. It can be described as a fine to coarse grained, fossiliferous limestone in which the uppermost part consists of black, organic-rich shaly limestone known as the Collingwood Member (Armstrong and Dodge, 2007).

Quaternary Geology

The Quaternary geology of the study area is illustrated on **Figure 2-5**. The study area is underlain by a complex sequence of glacial and postglacial overburden deposits. The Quaternary sediments within the study area were largely deposited during the Wisconsin stage during the advance and retreat of glacial ice sheets. During the post-glacial period, regional rivers cut through the Pleistocene sediments depositing modern alluvial (river or flowing water) sediment deposits.

Recent Deposits

Modern alluvial deposits of clay, silt, sand and gravel were laid down in river floodplains during the post-glacial period. Within the study area, these deposits are primarily located within the floodplain of the Holland River and its associated tributary system.

Organic deposits are mapped in the south-central portion of the study area, located east of Bayview Avenue (**Figure 2-5**).

Glaciolacustrine Deposits (8a, 9b and 9c)

Surficial geology within the study area consists primarily of glaciolacustrine deposits. These deposits were formed during and after the final retreat of the Wisconsin ice sheets making them the youngest glacial sediments within the study area. These deposits primarily are massive to well laminated clay and silt deposits that were deposited in deeper water (low energy) environments.

Coarse textured glaciolacustrine deposits of sand and gravel, deposited in shallow, near shore environments, also are also present along the outer parameter of the study area (**Figure 2-5**). Although these sediments generally form a thin veneer, locally they can be several metres thick. These units represent local ponding of water or higher water levels in major post-glacial lakes following retreat of the glaciers. While these deposits can serve as an aquifer and provide water to local private wells, they are not targeted as a source by any municipal wells in York Region.

Kettleby Till (5d)

The Halton Till sheet was deposited as glacial ice advanced out of the Lake Ontario basin approximately 13,000 years ago (Barnett, 1992). The Kettleby Till was deposited at about the same time to the north of ORM by southward flowing ice of the Lake Simcoe lobe. The Kettleby Till generally is comprised of clayey silt till interbedded

with clay, sand and gravel. Within the study area, the Kettleby Till occurs predominantly as a local surface till on topographic highs, discontinuous, and generally is less than 20 m in thickness (AECOM, 2013). The fine-grained texture of the Kettleby Till tends to limit infiltration (recharge) to underlying units, but at the same time also serves to impede the vertical movement of contaminants into the ORM and other deeper formations.

Newmarket Till (5b)

The advance of the Laurentide Ice Sheet during the Late Wisconsinan period resulted in the deposition of a regionally extensive subglacial till sheet, referred to as the Newmarket till. The Newmarket till is a thick, widespread deposit that underlies the Oak Ridges Moraine and most of southcentral Ontario. It is described as a silty sand to sandy silt, dense diamicton that ranges in thickness from 5 to 30 m, but locally can be up to 100 m thick or more (AECOM, 2013). In certain areas, the till sheet has been eroded completely by glaciofluvial processes (channels) providing hydraulic gateways to the lower aquifer system.

Within the central portion of study area, Newmarket Till can be found surrounded by glaciolacustrine deposits, forming distinct 'islands' that are typically associated with drumlins (**Figure 2-5**). The Newmarket Till tends to be more continuous along the western perimeter of the study area where topography is higher.

Lower Deposits

Lower deposits are considered to be those sediments which underlie surficial deposits and do not outcrop within the study area. They are typically encountered at depths greater than 40 metres below ground surface (mbgs). These deposits include the Thorncliffe Formation, Sunnybrook Drift and Scarborough Formation. These deposits have been interpreted to extend under most of York Region from Lake Simcoe to Lake Ontario.

The Thorncliffe Formation is a glaciofluvial and glaciolacustrine sediment and is comprised of extensive stratified sands, silty sand and commonly silt and clay near the base of the deposit. The Thorncliffe Formation underlies the Newmarket Till in the study area and is an important source of drinking water for both private and municipal well supplies.

The Scarborough Formation is interpreted to be a fluvio-deltaic system deposited by an extensive braided melt water stream and river system draining from an advancing ice sheet. Similar to the Thorncliffe Formation, municipal water supply wells commonly source water from the Scarborough Formation.

2.4.3.2 Hydrogeology

Hydrostratigraphic Units and Local Aquifers

Aquifers are classically defined as a geological unit that is sufficiently permeable to permit the extraction of a useable supply of water. Aquifer units within the study area are typically comprised of coarse textured unconsolidated (overburden) sediments. However, weathered surficial till and extensive fractures within the till may also form secondary aquifer conditions. Unconfined aquifers are aquifers which are open to receive water from the surface directly and in which the water table surface is free to fluctuate depending on the recharge or discharge rate. Alternatively, confined aquifers are aquifers overlain by low permeability materials that form a confining layer and inhibit groundwater movement, also known as Aquitards. Aquitards within the study area are considered to be fine textured glaciolacustrine deposits of silts and clays and consolidated till deposits.

Hydrostratigraphy is the classification of the various major stratigraphic units into aquifers and aquitards, with some simplification or combination of units with similar properties. Previous studies of the hydrostratigraphy of the ORM included eight (8) simplified hydrostratigraphic layers. The study area and surrounding area has been extensively studied as part of the Oak Ridges Moraine Groundwater Management Strategy (CAMC-YPDT, 2006). The deeper

overburden geology and hydrogeology were assessed using conceptualization developed by the Conservation Authorities Moraine Coalition (CAMC) and their study partners, as part of the CAMC – YPDT (York, Peel Durham, Region) project. This detailed hydrostratigraphic model for the Oak Ridges Moraine has particular emphasis on the 'core area', which includes the Toronto and Region Conservation Authority watersheds, Lake Simcoe Region Conservation Authority, York Region and parts of Durham and Peel regions. The groundwater flow model for the core area is comprised of all eight previously-identified hydrostratigraphic layers. This model has been used to provide a baseline understanding of hydrogeological conditions on a regional scale. As described in the UYSS EA (AECOM, 2013), the hydrostratigraphic framework of the study area consists of fine textured glaciolacustrine silt and clay deposits and consolidated tills, overlying glacial lacustrine and glacial fluvial sand. Thin and discontinuous surficial deposits overlying the till may be locally significant.

Regional hydrostratigraphic units include the following:

- Recent Deposits (gravel, sand, silt, clay, peat, muck, marl, fill) – **Unconfined Aquifer or Aquitard;**
- Glaciolacustrine Deposits (gravel, sand, silt and clay) – **Unconfined Aquifer or Aquitard;**
- Kettleby Till (clayey silt to silt till) – **Aquitard;**
- Oak Ridges Moraine (sand and gravel) – **Unconfined Aquifer;**
- Interstadial Sand Deposits (fine to coarse sand, and gravel) – **Confined Aquifer;**
- Channel Deposits (silt) – **Aquitard;**
- Newmarket Till (sandy silt to sand till) – **Aquitard;**
- Thorncliffe Formation (silty sand, sand) – **Confined Aquifer;**
- Sunnybrook drift (silty clay) – **Aquitard;**
- Scarborough Formation (fine to coarse sand) – **Confined Aquifer;** and
- Bedrock (shale, limestone) – **Aquitard.**

Regional aquifers in the study area are typically found in the Oak Ridges Moraine, Interstadial Sand Deposits, Thorncliffe Formation and Scarborough Formation (AECOM, 2013). Recent surficial river floodplain deposits, organic deposits and glaciolacustrine deposits are typically thin and discontinuous, and generally do not support domestic well supplies. These surficial coarse textured deposits may locally be significant however, functioning as a pathway for surface water runoff and shallow groundwater flow to wetlands and other areas.

Regional aquitard units include the Kettleby Till, Channel Deposits (silt), Newmarket Till, Sunnybrook Drift and bedrock. Glaciolacustrine silt and clay deposits overlying the till and channel deposits may locally combine with these deposits and restrict recharge.

The till deposits typically have a low hydraulic conductivity and limited ability to transmit groundwater, however, local features such as heterogeneities, secondary porosity, permeability features and fractures may locally permit a low yield, and/or provide groundwater recharge-discharge pathways (AECOM, 2013).

In general, the hydrogeology of the study area can be described as a regionally low permeability fine textured glaciolacustrine and till aquitard unit, overlying and confining a deeper regional aquifer system consisting of the Interstadial Sand Deposits, Thorncliffe Formation and Scarborough Formation.

Significant Groundwater Recharge Areas

Surface water received from precipitation will percolate or infiltrate into the ground until it reaches the water table. This occurs in surficial sediments that are permeable and allow for easy movement of water through its pore spaces. Areas such as these are known as recharge areas.

Significant Groundwater Recharge Areas (SGRA) are characterized by high permeable soils at surface, such as sand or gravel, which allows water to readily pass from the ground surface to an aquifer. These areas are considered significant when they aid in maintaining the water level in an aquifer that provides water for potable means or supplies groundwater to a cold water ecosystem.

Within the study area, SGRA is associated with coarse textured glaciolacustrine deposits and ice-contact stratified deposits of sand and gravel in the western portion of the study area (**Figure 2-5**). As indicated in Section 2.4.3.1, these deposits can be described as highly permeable sediments with capabilities of transmitting large quantities of groundwater. Since these soils are exposed at surface they also have the capability of allowing water to infiltrate from the surface to recharge the unconfined groundwater aquifer, allowing them to be classified as SGRA. The remaining surficial soils within the study area are considered fine grained (i.e., till, fine textured glaciolacustrine deposits, glaciofluvial deposits and modern alluvial deposits) and do not possess the soil characteristics necessary to allow for significant quantities of groundwater recharge.

Highly Vulnerable Aquifers

A highly vulnerable aquifer (HVA) is one that is susceptible to contamination due to its location near ground surface or the type of material found in the ground around the aquifer. Aquifers that are near the ground surface and have less of a barrier between the ground surface and water below the ground are considered to be HVA.

Within the study area, HVA consists of the land surrounding the East Holland River and major associated tributaries as well as areas with coarse textured glaciolacustrine deposits mapped at surface (**Figure 2-6**).

2.4.3.3 Groundwater Resources

Wellhead Protection Zones

A significant aquifer, known as the Yonge Street Aquifer (YSA), underlies a portion of the study area. This aquifer is used to supply the communities of Aurora, Newmarket, Holland Landing and Sharon-Queensville with municipal water. The YSA can be described as a channel aquifer complex within the Lake Simcoe Basin. The YSA is located along the trail of municipal water supply wells, generally extending along Yonge Street in York Region from Vandorf Sideroad north to Green Lane, then deflecting in a northeast direction to the Town of East Gwillimbury (AECOM, 2013) (**Figure 2-7**). The regional groundwater model (YPDT, 2006) correlates the YSA with the Thorncliffe Aquifer Complex. Four (4) municipal water supply wells are located within the study area, each of which targets YSA as its groundwater source.

As described in Section 1.3.2, areas that are vulnerable to contamination have been delineated for the municipal wells and are known as Wellhead Protection Areas (WHPA). A WHPA is the area or capture zone surrounding the wellhead where land use activities have the greatest potential to affect the quality of groundwater within the aquifer from which the well derives its source. The WHPA's for York Region YSA municipal wells are shown on **Figure 2-7**. A review of **Figure 2-7** indicates that the Yonge Street Aquifer WHPA covers the majority of the study area.

Groundwater Resources

Aquifers within the study area provide groundwater supplies for private domestic, large municipal and industrial/commercial purposes. MOECC water well records for the area include identification of the type of use, including agricultural (e.g., farms), commercial (e.g., garden centres, golf courses), institutional (e.g., churches, schools), municipal or communal well supplies, wells used for engineering purposes (e.g., test holes, monitoring wells), and domestic well supplies. MOECC water well records provide key information about the well, including type, depth, static water level, available drawdown, and formation into which the well is screened. **Figure 2-7**

indicates the locations of MOECC water well records, primary use of the wells and highlights shallow wells that are screened at a depth of less than 10 mbgs.

A review of MOECC water well records within the study area indicates the occurrence of approximately fifty (50) agricultural well supplies, seventeen (17) commercial well supplies, three (3) cooling and air conditioning well supply uses, five (5) industrial well supplies, seventeen (17) municipal supply wells, twenty (20) public supply wells, two hundred and sixty five (265) monitoring wells and test holes, three hundred and sixty eight (368) domestic wells, and three hundred and seventy six (376) well records that are classified as either dewatering, not used, other and wells with unknown use. A total of three hundred and thirteen (313) water wells within the study area are shown to have a depth of 10 m or less. Only forty-three (43) of these are classified as domestic water wells, the remaining are monitoring and/or test holes or have unknown use information stated. These wells would be more susceptible to negative impacts due to land use surrounding the well than those wells completed at greater depth.

The actual number of shallow wells within the study area may be greater than that stated above, as dug, bored and drivepoint wells commonly are unregistered, and thus would not be reflected within the MOECC database.

Finally, it should not be assumed that all MOECC water wells within the study area are currently active. Some of the wells identified within the MOECC record database may be decommissioned or no longer in use.

2.5 Aquatic Ecology

2.5.1 Background Information Review

A background information review of aquatic and hydrological features and functions located within the Study Area was conducted using the following available secondary sources:

- Ontario Ministry of Natural Resources and Forestry (MNRF) Natural Resource Values Information System (NRVIS) mapping;
- MNRF Natural Heritage Information Centre (NHIC) Rare Species Records;
- Conservation Ontario 2014 Aquatic Species at Risk Distribution Mapping;
- MNRF Significant Wildlife Technical Guide (MNRF, 2000);
- East Holland River Subwatershed Plan (LSRCA, 2010a);
- West Holland River Subwatershed Plan (LSRCA, 2010b);
- UYSS Environmental Assessment, Natural Environment Baseline Conditions Report (CRA *et al.*, 2013); and
- Digital orthoimagery.

Relevant information about aquatic features was also requested from the LSRCA, the Town of Newmarket and Regional Municipality of York.

2.5.2 Results

Aquatic features identified in the Study Area through the background information review are summarized in the following sections.

2.5.2.1 East Holland River Subwatershed

The majority of the Study Area (92 percent) is located within the East Holland River Subwatershed (**Figure 2-8**). This subwatershed extends from the Oak Ridges Moraine in the south to the Lake Simcoe in the north and covers a drainage area of 268 km² (CRA *et al.*, 2013). A large proportion (52.9 percent) of the land use within this subwatershed is agriculture followed by urban land use (23.1 percent), while the remaining area (19.1 percent)

consists of natural areas (LSRCA, 2010a). Within the Study Area, the main drainage features are the East Holland River and its tributaries, including Western Creek, Bogart Creek, Weslie Creek, Tannery Creek and Armitage Creek. The East Holland River Subwatershed contains cold to coolwater tributaries that originate on the Oak Ridges Moraine and become warmwater as they flow north through the Study Area towards Lake Simcoe. The majority of the tributaries within the Town of Newmarket are warmwater while the coldwater tributaries are prominent at the periphery of the Town and closer to the headwaters on the Oak Ridges Moraine (**Figure 2-8**).

The LSRCA has an extensive record of fish data collected for the East Holland River Subwatershed. A total of 35 species have been captured within the East Holland River from 1930 to 2007 (LSRCA, 2010a). These are summarized in **Table 2-3**. The fish communities found within the East Holland River Subwatershed represent a mixture of coldwater and warmwater species.

Table 2-3. Fish Species of the East Holland River

Common Name	Scientific Name	Thermal Regime	Provincial/ S Rank	COSEWIC	Tolerance
Black Crappie ^a	<i>Pomoxis nigromaculatus</i>	Warm	S4	-	Tolerant
Blackchin Shiner	<i>Notropis heterodon</i>	Cool	S4	NAR	Intolerant
Blacknose Dace	<i>Rhinichthys atratulus</i>	Cool	S5	-	Tolerant
Blacknose Shiner	<i>Notropis heterolepis</i>	Cool	S5	-	Intolerant
Bluegill	<i>Lepomis macrochirus</i>	Warm	S5	-	Intermediate
Bluntnose Minnow	<i>Pimephales notatus</i>	Warm	S5	-	Intermediate
Bowfin	<i>Amia calva</i>	Warm	S4	-	Intermediate
Brassy Minnow	<i>Hybognathus hankinsonii</i>	Cool	S5	-	Intermediate
Brook Stickleback	<i>Culaea inconstans</i>	Cool	S5	-	Intolerant
Brook Trout	<i>Salvelinus fontinalis</i>	Cold	S5	-	Intolerant
Brown Bullhead	<i>Ameiurus nebulosus</i>	Warm	S5	-	Intermediate
Central Mudminnow	<i>Umbra limi</i>	Cool	S5	-	Tolerant
Common Carp ^b	<i>Cyprinus carpio</i>	Warm	-	-	Tolerant
Common Shiner	<i>Luxilus cornutus</i>	Cool	S5	-	Intermediate
Creek Chub	<i>Semotilus atromaculatus</i>	Cool/Warm	S5	-	Tolerant
Emerald Shiner	<i>Notropis atherinoides</i>	Cool	S5	-	Intermediate
Fathead Minnow	<i>Pimephales promelas</i>	Warm	S5	-	Tolerant
Golden Shiner	<i>Notemigonus crysoleucas</i>	Cool	S5	-	Intermediate
Goldfish ^b	<i>Carassius auratus</i>	Warm	-	-	Tolerant
Greenside Darter	<i>Etheostoma blennioides</i>	Cool	S4	NAR	Intolerant
Iowa Darter	<i>Etheostoma exile</i>	Cool	S5	-	Intermediate
Largemouth Bass	<i>Micropterus salmoides</i>	Warm	S5	-	Tolerant
Longnose Dace	<i>Rhinichthys cataractae</i>	Cool	S5	-	Intermediate
Mottled Sculpin	<i>Cottus bairdii</i>	Cold	S5	-	Intermediate
Northern Pike	<i>Esox lucius</i>	Cool	S5	-	Intermediate
Northern Redbelly Dace	<i>Phoxinus eos</i>	Cool	S5	-	Intermediate
Pumpkinseed	<i>Lepomis gibbosus</i>	Warm	S5	-	Intermediate
Rainbow Darter	<i>Etheostoma caeruleum</i>	Cool	S4	-	Intolerant
Redside Dace ^c	<i>Clinostomus elongatus</i>	Cool	S2	END	Intolerant
Rock Bass	<i>Ambloplites rupestris</i>	Cool	S5	-	Intermediate
Sand Shiner	<i>Notropis stramineus</i>	Warm	S4	-	Intermediate
Slimy Sculpin	<i>Cottus cognatus</i>	Cold	S5	-	Intolerant
Spottail Shiner	<i>Notropis hudsonius</i>	Cool	S5	-	Intermediate

Common Name	Scientific Name	Thermal Regime	Provincial/ S Rank	COSEWIC	Tolerance
Yellow Perch	<i>Perca flavescens</i>	Cool	S5	-	Intermediate
White Sucker	<i>Catostomus commersonii</i>	Cool	S5	-	Tolerant
Notes: a. non-native species b. non-native invasive species c. endangered species 1. S-rank: The Natural Heritage provincial ranking system (provincial S-rank) is used by the MNRF Natural Heritage Information Centre (NHIC) to set protection priorities for rare species and natural communities. Definitions are as follows: S1 - Extremely rare in Ontario; usually 5 or fewer occurrences in the province or very few remaining individuals; S2 - Very rare in Ontario; usually between 5 and 20 occurrences in the province or with many individuals in fewer occurrences; S3 - Rare to uncommon in Ontario; usually between 20 and 100 occurrences in the province; S4 - Common and apparently secure in Ontario; usually with more than 100 occurrences in the province. S5 - Very common and demonstrably secure in Ontario. SX - Extirpated from Ontario. Species at Risk are those species designated as Threatened and Endangered by the Status of Species at Risk in Ontario (COSSARO) and are protected under the Endangered Species Act 2007 (ESA). COSEWIC – Committee on the Status of Endangered Wildlife in Canada; NAR – not at risk; END - endangered Reference – East Holland River Subwatershed Report (LSRCA, 2010a); Upper York Sewage Solutions Environmental Assessment, Natural Environment Baseline Conditions Report (CRA et al., 2013).					

Redside Dace (*Clinostomus elongatus*), is the only species listed as Endangered or Threatened under the federal *Species at Risk Act* (SARA) and the provincial *Endangered Species Act 2007* (ESA) that has been recorded within the subwatershed. It has last been recorded in 1994 within the coldwater stream of Sharon Creek, which is located outside of the Study Area (CRA et al., 2013). According to the LSRCA 2014 Aquatic Species at Risk mapping (Conservation Ontario, 2014), a section of a coldwater branch of the East Holland River located in the northeast corner of the Study Area is identified as having known distributions of fish species designated by COSEWIC as Extirpated, Endangered and/or Threatened that are under consideration for listing under Schedule 1 of the federal SARA. These species and their respective federal and provincial designations are identified in **Table 2-4**. Species listed in Schedule 1 as Extirpated, Endangered or Threatened receive protection under the SARA while species currently under consideration for listing on Schedule 1 do not. However, development within this reach should treat these species as if they are listed in Schedule 1 by the time that the proposed development is initiated (Fisheries and Oceans Canada, 2014).

Table 2-4. Fish Species Under Consideration for Listing on Schedule 1 of SARA

Common Name	Scientific Name	Federal Designation by COSEWIC ¹	Provincial Designation by COSSARO ²
American Eel	<i>Anguilla rostrata</i>	Threatened	Endangered
Lake Sturgeon	<i>Acipenser fulvescens</i>	Special Concern	Threatened
Redside Dace	<i>Clinostomus elongatus</i>	Endangered	Endangered

Notes:

1. COSEWIC – Committee on the Status of Endangered Wildlife in Canada
2. COSSARO – Committee on the Status of Species at Risk in Ontario

2.5.2.2 West Holland River Subwatershed

The northwest corner of the Study Area is located in the West Holland River Subwatershed (**Figure 2-8**) and contains Ansnorveldt Creek. This subwatershed extends from the Oak Ridges Moraine in the south to Lake Simcoe in the north and covers a drainage area of 348 km² (CRA et al., 2013). Approximately 8.0 percent of the Study Area is within the West Holland River Subwatershed. Similar to the East Holland River Subwatershed, the headwaters of

this subwatershed originate on the Oak Ridges Moraine in the south and flow north to Lake Simcoe. The section of Ansnorveldt Creek within the Study Area is characterized as warmwater and considered to have low to moderate sensitivity (CRA *et al.*, 2013). A total of 34 fish species have been recorded by LSRCA within this subwatershed from 1930 to 2008 (LSRCA, 2010b). These are summarized in **Table 2-5** and consist of warm, cool and coldwater species. According to the LSRCA 2014 Aquatic Species at Risk mapping (Conservation Ontario, 2014), the section of Ansnorveldt Creek within the Study Area does not have known distributions of any fish or mussel Species at Risk.

Table 2-5. Fish Species of the West Holland River Watershed

Common Name	Scientific Name	Thermal Regime	Provincial/ S Rank	COSEWIC	Tolerance
Black Crappie^a	<i>Pomoxis nigromaculatus</i>	Warm	S4	-	Tolerant
Blacknose Dace	<i>Rhinichthys atratulus</i>	Cool	S5	-	Tolerant
Bluntnose Minnow	<i>Pimephales notatus</i>	Warm	S5	-	Intermediate
Bowfin	<i>Amia calva</i>	Warm	S4	-	Intermediate
Brassy Minnow	<i>Hybognathus hankinsonii</i>	Cool	S5	-	Intermediate
Brook Stickleback	<i>Culaea inconstans</i>	Cool	S5	-	Intermediate
Brook Trout	<i>Salvelinus fontinalis</i>	Cold	S5	-	Intolerant
Brown Bullhead	<i>Ameiurus nebulosus</i>	Warm	S5	-	Intermediate
Central Mudminnow	<i>Umbra limi</i>	Cool	S5	-	Tolerant
Common Carp^b	<i>Cyprinus carpio</i>	Warm	-	-	Tolerant
Common Shiner	<i>Luxilus cornutus</i>	Cool	S5	-	Intermediate
Creek Chub	<i>Semotilus atromaculatus</i>	Cool/Warm	S5	-	Tolerant
Emerald Shiner	<i>Notropis atherinoides</i>	Cool	S5	-	Intermediate
Fathead Minnow	<i>Pimephales promelas</i>	Warm	S5	-	Tolerant
Golden Shiner	<i>Notemigonus crysoleucas</i>	Cool	S5	-	Intermediate
Goldfish^b	<i>Carassius auratus</i>	Warm	-	-	Tolerant
Greenside Darter	<i>Etheostoma blennioides</i>	Warm	S4	NAR	Intolerant
Iowa Darter	<i>Etheostoma exile</i>	Cool	S5	-	Intermediate
Johnny Darter	<i>Etheostoma nigrum</i>	Cool	S5	-	Tolerant
Largemouth Bass	<i>Micropterus salmoides</i>	Warm	S5	-	Tolerant
Longnose Dace	<i>Rhinichthys cataractae</i>	Cool	S5	-	Intermediate
Mottled Sculpin	<i>Cottus bairdii</i>	Cold	S5	-	Intermediate
Northern Pike	<i>Esox lucius</i>	Cool	S5	-	Intermediate
Northern Redbelly Dace	<i>Phoxinus eos</i>	Cool	S5	-	Intermediate
Pearl Dace	<i>Margariscus margarita</i>	Cool	S5	-	Intermediate
Pumpkinseed	<i>Lepomis gibbosus</i>	Warm	S5	-	Intermediate
Rainbow Darter	<i>Etheostoma caeruleum</i>	Cool	S4	-	Intolerant
Redside Dace^c	<i>Clinostomus elongatus</i>	Cool	S2	END	Intolerant
Rock Bass	<i>Ambloplites rupestris</i>	Cool	S5	-	Intermediate
Slimy Sculpin	<i>Cottus cognatus</i>	Cold	S5	-	Intolerant
Spottail Shiner	<i>Notropis hudsonius</i>	Cool	S5	-	Intermediate
Yellow Bullhead	<i>Ameiurus natalis</i>	Warm	S4	-	Tolerant
Yellow Perch	<i>Perca flavescens</i>	Cool	S5	-	Intermediate
White Sucker	<i>Catostomus commersonii</i>	Cool	S5	-	Tolerant

Notes:

a. non-native species

b. non-native invasive species

c. endangered species

Common Name	Scientific Name	Thermal Regime	Provincial/ S Rank	COSEWIC	Tolerance
<p>1. S-rank: <i>The Natural Heritage provincial ranking system (provincial S-rank) is used by the MNRF Natural Heritage Information Centre (NHIC) to set protection priorities for rare species and natural communities. Definitions are as follows:</i></p> <p><i>S1 - Extremely rare in Ontario; usually 5 or fewer occurrences in the province or very few remaining individuals;</i></p> <p><i>S2 - Very rare in Ontario; usually between 5 and 20 occurrences in the province or with many individuals in fewer occurrences;</i></p> <p><i>S3 - Rare to uncommon in Ontario; usually between 20 and 100 occurrences in the province;</i></p> <p><i>S4 - Common and apparently secure in Ontario; usually with more than 100 occurrences in the province.</i></p> <p><i>S5 - Very common and demonstrably secure in Ontario.</i></p> <p><i>SX – Extirpated from Ontario.</i></p> <p><i>Species at Risk are those species designated as Threatened and Endangered by the Status of Species at Risk in Ontario (COSSARO) and are protected under the Endangered Species Act 2007 (ESA).</i></p> <p>COSEWIC – Committee on the Status of Endangered Wildlife in Canada; NAR – not at risk; END - endangered</p> <p>References – East Holland River Subwatershed Report (LSRCA, 2010a); Upper York Sewage Solutions Environmental Assessment, Natural Environment Baseline Conditions Report (CRA et al., 2013).</p>					

2.5.2.3 Seeps and Springs

Seeps and springs are areas where groundwater comes to the surface. They are often found within headwater areas and coldwater watercourses, which can support sensitive fish species. These features can also be important feeding and drinking areas for wildlife, especially in the winter, and will typically support a variety of plant and animal species (MNR, 2000). Information pertaining to seeps and springs was requested from the LSRCA, York Region and the Town of Newmarket. There are no known seeps and springs within the Study Area, although these are likely to be present in association with the intermittent and coldwater watercourses located in the southern portion of the Town of Newmarket (**Figure 2-8**).

2.5.2.4 LSRCA Regulated Areas

Portions of the Study Area are located within areas regulated by the LSRCA Regulation Limit under the *Conservation Authorities Act* (**Figure 2-8**). Section 2 of Ontario Regulation 179/06 states that development is prohibited in or on areas that are subject to flooding, erosion, unstable stream valleys, or where interference in or within 120 m of Provincially Significant Wetlands (PSWs) and 30 m of all other wetlands, and site alterations to shorelines and watercourses may result in negative impacts on the hydrologic functions of these sensitive features. Any proposed development or site alteration within these Regulated Limit areas would require a permit from the LSRCA.

2.5.3 Restoration Areas

It is LSRCA's objective to improve the aquatic ecosystems within the East Holland River and West Holland River Subwatersheds. Recommended actions to achieve this objective include but are not limited to the following (LSRCA, 2010a and 2010b):

- Work with partners to continue monitoring aquatic communities and habitats in the subwatersheds;
- Work with partner municipalities to improve and restore aquatic ecological functions within the subwatersheds such as fish migration barrier removal, wetland creation, natural channel design and restoring floodplain functions;
- Continue to implement and utilize buffer requirements and timing guidelines; and
- Assess the feasibility of increasing natural cover in the subwatersheds.

Information pertaining to opportunities for restoration areas was requested from the LSRCA, York Region and the Town of Newmarket.

Barriers to fish movement in the forms of perched culverts, dams, weirs and other type of barriers prevent fish from accessing part of their habitats that are critical for carrying out important life functions. According to data received from LSRCA, there are 72 identified opportunities for removal of fish migration barriers along surveyed watercourses in the Town of Newmarket (**Figure 2-8**).

Increases in water flow resulting from bank hardening and channelization of watercourses can degrade aquatic habitat through creation of unstable banks, increased flooding, bank erosion and sedimentation. LSRCA has identified 149 opportunities to improve bank hardening and channelization in the Town of Newmarket (**Figure 2-8**).

2.6 Terrestrial Ecology

2.6.1 Background Information Review

A background information review of terrestrial natural heritage features and functions located within the Study Area was conducted using the following available secondary sources:

- Ontario MNRF NRVIS mapping;
- MNRF NHIC Rare Species Records (2014a);
- York Region Official Plan (2010);
- Town of Newmarket Official Plan (2014);
- Ontario Breeding Bird Atlas (BSC *et al.*, 2006);
- Ontario Butterfly Atlas Online (Jones *et al.*, 2012);
- Ontario Reptile and Amphibian Atlas (Ontario Nature, 2012);
- Atlas of Mammals in Ontario (Dobbyn, 1994);
- Significant Wildlife Technical Guide (MNRF, 2000);
- East Holland River Watershed Plan (LSRCA, 2010a); and
- Digital orthoimagery.

Relevant information about terrestrial natural heritage features was also requested from the LSRCA, the Town of Newmarket and Regional Municipality of York.

2.6.2 Results

Terrestrial natural heritage features identified in the Study Area through the background information review are summarized in the following sections.

2.6.2.1 Natural Cores - Key Natural Heritage Features

Vegetation Communities

Ecological Land Classification (ELC) vegetation community delineations for the Study Area were obtained from LSRCA. These ELC community delineations were categorized into the Community Series level (Lee *et al.*, 1998). The Community Series are identified based on the type of vegetation cover or plant form present that represents the community (i.e., open, shrub or treed vegetation cover) and is the lowest level in ELC that can be identified without field investigations (Lee *et al.*, 1998). The Community Series that occur within the Study Area are summarized in **Table 2-6** below and the locations are shown in **Figure 2-9**.

Table 2-6. Summary of ELC Community Series within the Study Area

ELC Community Series		ELC Code	Area (Hectares)	% of Study Area
Anthropological Areas	n/a	n/a	3265.10	85.49
Cultural Communities	Cultural Meadow	CUM	150.75	3.95
	Cultural Plantation	CUP	0.22	0.01
	Cultural Thicket	CUT	9.46	0.25
	Cultural Woodland	CUW	64.14	1.68
Total for Cultural Communities :			224.57	5.88
Forest Communities	Coniferous Forest	FOC	17.18	0.45
	Deciduous Forest	FOD	142.15	3.72
	Mixed Forest	FOM	90.00	2.36
Total for Forest Communities:			249.33	6.53
Aquatic and Wetland Communities	Meadow Marsh	MAM	15.38	0.40
	Shallow Marsh	MAS	4.14	0.11
	Open Aquatic	OAD	13.00	0.34
	Submerged Shallow Aquatic	SAS	1.75	0.05
	Coniferous Swamp	SWC	19.66	0.51
	Deciduous Swamp	SWD	12.47	0.33
	Mixed Swamp	SWM	6.22	0.16
	Thicket Swamp	SWT	7.59	0.20
Total for Aquatic and Wetland Communities:			80.21	2.10
Total:			3819.21	100.00

The majority (85 percent) of the Study Area is dominated by anthropological land use areas such as residential, commercial, institutional, agriculture and industrial areas that are of low ecological significance. A variety of different vegetation communities are present outside of the anthropological areas, with the majority concentrated along the stream corridors, including wetlands, cultural meadows and various forest types.

Forest communities comprise approximately 7 percent of the Study Area, of which deciduous forest is the most dominant. Interior forest habitat is an important wildlife habitat feature which may support woodland area-sensitive species that are less tolerant of anthropogenic disturbance and require large interior habitats (LSRCA, 2010a).

Cultural communities, which include cultural meadows, woodlands and plantations, represent approximately 6 percent of the Study Area. Most of the cultural meadows within the East Holland River Subwatershed are dominated by non-native cool season grasses as well as native and non-native forbs and shrubs (LSRCA, 2010a). Despite the high degree of non-native plants, these meadows may provide suitable habitat for a variety of native plants and wildlife, including rare species.

The remaining 2 percent consists of wetland communities and include portions of the Provincially Significant Aurora Marsh Wetland Complex and Ansnorveldt Wetland Complex, as well as the Locally Significant Newmarket Wetland. These wetlands are described in further detail below.

Significant Wetlands

Wetlands are described as lands that are seasonally or permanently flooded by shallow water as well as lands where the water table is close to the surface and an abundance of water that has caused the formation of hydric soil, which supports primarily hydrophytic or water tolerant plants (MNR, 2013). The MNRF evaluates the significance of wetlands through the Ontario Wetland Evaluation System (OWES). This evaluation system uses a scoring system to assign values to four principal components of the wetland, which are the biological, social, hydrological, and special

features. Based on the resulting score of an evaluation, a wetland can fall into one of two classes: Provincially Significant or Locally Significant (MNRF, 2013).

Within the Study Area, there are two Provincially Significant Wetlands and one Locally Significant Wetland. These are summarized in **Table 2-7** below and mapped on **Figure 2-10**. Wetland descriptions were obtained from the *Upper York Sewage Solutions Environmental Assessment, Natural Environment Baseline Conditions Report* (CRA et al., 2013).

Table 2-7. Significant Wetlands within the Study Area

Wetland Name	Significance	Wetland Description
Ansnorveldt Wetland Complex	Provincial	This provincially significant Ansnorveldt Wetland Complex is located in King Township on the edge of the Holland Marsh, with some wetland units extending onto the lower slopes of the Oak Ridges Moraine within the Study Area. The wetland complex extends from Weston Road east to Dufferin Street and from Highway 9 north to South Canal Road. All surveyed wetland units are located along six tributary streams in the West Holland River Subwatershed and are hydrologically connected along a discharge zone at or near the base of the Oak Ridges Moraine.
Aurora (McKenzie) Marsh Wetland Complex	Provincial	A provincially significant wetland complex, consisting of two individual wetlands, composed of two wetland types including swamp, and marsh. This wetland complex is located along the southern boundary of the Study Area and is associated with tributaries of the East Holland River.
Newmarket Wetland	Local	This locally significant wetland is situated in downtown Newmarket, bordered by Prospect Street, Sprigley Street, Queen Street and Stickwood Court. This wetland is less than 2 ha in size, however it was evaluated due to it being one of the few wetlands within the Town of Newmarket and on the Schomberg Clay Plain. The wetland is 0.75 ha in size and is located on the floodplain of Bogart Creek, a tributary of the East Holland River. A smaller tributary enters the Newmarket Wetland from the south and the wetland is in turn connected to the adjacent Bogart Creek via two channels.

Areas of Natural and Scientific Interest

An Area of Natural and Scientific Interest (ANSI) is defined as an area of land and/or water containing natural landscapes or features that have been scientifically identified (by the MNRF) as having life science or earth science values related to protection, scientific study or education (MNRF, 2014b). ANSIs are designated as earth science (geological) or life science (biological) depending on the features present. There is one earth science and one life science ANSI identified within the Study Area (**Figure 2-10**). **Table 2-8** provides a summary of these ANSIs and descriptions of their significance. ANSI descriptions were obtained from the *Upper York Sewage Solutions Environmental Assessment, Natural Environment Baseline Conditions Report* (CRA et al., 2013).

Table 2-8. ANSIs within the Study Area

ANSI Name	Area Type	Significance	ANSI Description
Glenville Hills	<i>Earth Science</i>	Provincial Candidate	This feature is approximately 524.3 ha in size and contains Late Wisconsinan, Port Bruce Stadial Newmarket Till and Port Huron Stadial Kettleby Till, kames, kame slopes and some minor Schomberg Ponds sediments. The Lake Ontario ice lobe deposited most of the Oak Ridges Moraine sediments found in this area. This is an excellent site for kame development on the north flank of the Oak Ridges Moraine. The northern part of the site is covered by the Kettleby Till and marks the southernmost advance of Lake Simcoe sublobe during Port Bruce Stadial.
Glenville Hills Kames	<i>Life Science</i>	Provincial Candidate	This ANSI is 86.4 ha in size and is part of the Glenville Hills Earth Science ANSI (LSRCA, 2010a).

Environmentally Significant Areas

An Environmentally Sensitive Area is a natural area identified by a municipality or Conservation Authority as fulfilling certain criteria for ecological significance or sensitivity. There are no environmentally sensitive areas identified within the Study Area.

Significant Woodlands

Woodlands are an important key natural heritage feature in the Town of Newmarket and also in the Regional Municipality of York. Woodlands provide critical ecological services and benefits including habitat for a diversity of plants and wildlife (including provincially rare plants and Species at Risk), soil erosion prevention, water retention, purification of air and water, recreation and sustainable harvest of woodland products. According to Section 2.2.45 of the York Region Official Plan (2010), a woodland is considered significant if it meets at least one of the following criteria:

1. *It is at least 0.5 ha and supports any of the following:*
 - a. *Any provincially significant species or vegetation community as designated by NHIC; or,*
 - b. *Any Species at Risk designated as threatened or endangered by COSEWIC or COSSARO; or,*
2. *It is within 30 m of a provincially significant wetland, water body, permanent stream or intermittent stream.*
3. *It is at least 2 ha and:*
 - a. *It is within 100 m of another significant feature (ANSI, Provincially Significant Wetland or locally significant wetland, significant valleyland, ESAs or fish habitat); or,*
 - b. *Occurs within the Regional Greenlands System.*
4. *It is located south of the Oak Ridges Moraine (ORM) that is greater than or equal to 4 ha in size.*
5. *It is located north of the Oak Ridges moraine that is greater than or equal to 10 ha in size.*
6. *Any woodland that occurs on lands designated as part of the ORM, the Greenbelt Natural Heritage System and/or the Lake Simcoe Watershed that will be evaluated for significant based on the requirement of each respective Plan and its associated guidelines.*

Generally, the Town of Newmarket contains low forest cover (approximately 9 percent) as a result of its highly urbanized landscape (Town of Newmarket, 2014). According to the *York Regional Significant Woodland Study* (North-South Environmental Inc., 2005), the Town of Newmarket contains 8.7 percent of the woodlands considered as significant within the York Region. Significant forests within the Town of Newmarket are mapped in **Figure 2-10**. These forests are generally associated with watercourses and wetlands within the Study Area, and some fall within the Oak Ridges Moraine Boundary and the Greenbelt – Protected Countryside boundary.

Conservation Areas

Four conservation areas owned by the LSRCA occur within the Study Area (**Figure 2-10**). These include the following:

- **Mabel Davis Conservation Area** – This include a 7 ha strip of land in the middle of the Town of Newmarket which provides habitat for a variety of plants and animals (LSRCA, 2014).
- **Wesley Brooks Conservation Area** – This is a 13.4 ha area that includes a heavily wooded island and several marshy areas that are excellent nesting and feeding grounds for local waterfowl (LSRCA, 2014).
- **Queen Street Conservation Area** – There is no information currently available on this Conservation Area.
- **Bailey Ecological Park** – this is considered as a valuable bird and animal sanctuary (LSRCA, 2014).

Significant Valleylands

A valleyland is a natural landform depression that is typically associated with a river or stream. Generally, the East Holland River Subwatershed does not contain significant valleylands (LSRCA, 2010a).

Significant Wildlife Habitat

Significant Wildlife Habitat (SWH) is an area that is considered to be an important habitat for a particular species or concentration of species (LSRCA, 2010a). The MNRF identifies four principal types of SWH in the *Significant Wildlife Habitat Technical Guide* (MNR, 2000). These are habitats for seasonal concentration of animals, rare vegetation communities, habitats of species of conservation concern and wildlife movement corridors. Within the Study Area, there are no deer wintering yards, which is a type of a seasonal concentration habitat, and there are no known rare vegetation communities. According to the East Holland Subwatershed Plan (LSRCA, 2010a), there is only one rare vegetation community within the subwatershed and it includes a fen located within the Provincially Significant Holland Marsh Wetland, which is located north of the Study Area. There may be habitat of species of conservation concern where provincially significant species (i.e., those ranked as S1, S2 or S3) and species designated as Special Concern by COSSARO occur within the Study Area. There are also natural corridors that promote wildlife movement identified within the Study Area; these are further discussed in **Section 2.6.2.3**.

Although the majority of the Study Area is heavily developed and urbanized, remaining wetland, woodland and cultural meadow features still provide habitat for a diversity of wildlife species. A review of several wildlife atlases resulted in a total of 193 recorded wildlife species within the Study Area, including birds, amphibians, reptiles, mammals and butterflies. **Table 2-9** provides a summary of these results and identifies any provincially significant species and Species at Risk. It is important to note that some of these records are more than 20 years old and are therefore considered to be historical. Some of these may no longer persist within the Study Area.

Table 2-9. Summary of Recorded Wildlife within the Study Area

Type of Wildlife	Number of Recorded Species	Provincially Significant (S1, S2, S3 & Special Concern) ¹	Species At Risk (Threatened and Endangered) ²	Atlas Source
Birds	103 (of which 56 are confirmed breeders)	<u>2 Special Concern Species:</u> Eastern Wood Pewee (<i>Contopus virens</i>) Wood Thrush (<i>Hylocichla mustelina</i>)	<u>4 Threatened Species:</u> Bank Swallow (<i>Riparia riparia</i>) Barn Swallow (<i>Hirundo rustica</i>) Bobolink (<i>Dolichonyx oryzivorus</i>) Chimney Swift (<i>Chaetura pelagica</i>)	Atlas of the Breeding Birds of Ontario; 10 x10 km Square No. 17PJ27 (BSC <i>et al.</i> , 2006).
Amphibians	Toads and Frogs: 8 Salamanders: 6	None	<u>1 Endangered Species:</u> Jefferson Salamander (<i>Ambystoma jeffersonianum</i>)	Ontario Reptile and Amphibian Atlas (Ontario Nature, 2013).
Reptiles	Turtles: 3 Snakes: 5	<u>2 Special Concern Species:</u> Eastern Milksnake (<i>Lampropeltis triangulum</i>) Snapping Turtle (<i>Chelydra serpentina</i>)	<u>1 Threatened Species:</u> Blanding's Turtle (<i>Emydoidea blandingii</i>)	Ontario Reptile and Amphibian Atlas (Ontario Nature, 2013).
Mammals	31	None	<u>1 Endangered Species:</u> Little Brown Bat (<i>Myotis lucifugus</i>)	Atlas of the Mammals of Ontario (Dobbyn, 1994).
Butterflies	37	<u>1 Special Concern Species:</u> Monarch (<i>Danaus plexippus</i>)	None	Ontario Butterfly Atlas Online; 10 x10 km Square No. 17PJ27 (Jones <i>et al.</i> , 2012).
Odonates	Unknown	Unknown	Unknown	Online Odonate Atlas unavailable at time of preparation of this report.

¹**S-rank:** The Natural Heritage provincial ranking system (provincial S-rank) is used by the MNRF Natural Heritage Information Centre (NHIC) to set protection priorities for rare species and natural communities. Definitions are as follows:

S1 - Extremely rare in Ontario; usually 5 or fewer occurrences in the province or very few remaining individuals;

S2 - Very rare in Ontario; usually between 5 and 20 occurrences in the province or with many individuals in fewer occurrences;

S3 - Rare to uncommon in Ontario; usually between 20 and 100 occurrences in the province;

S4 - Common and apparently secure in Ontario; usually with more than 100 occurrences in the province.

S5 - Very common and demonstrably secure in Ontario.

SX – Extirpated from Ontario.

²**Species at Risk** are those species designated as Threatened and Endangered by the Status of Species at Risk in Ontario (COSSARO) and are protected under the *Endangered Species Act 2007 (ESA)*.

Forest interior habitats can provide specialized habitat for wildlife that require deeper forests and are not tolerant to edge effects. Forest interior habitats are defined as the part of a wooded area that is greater than 100 m from the perimeter of the woodland. Forested areas within the first 100 m from the wooded edge are considered to be “edge” habitats which are more subject to predators, parasites, high winds, and have higher susceptibility to human interference and introduction of invasive species (LSRCA, 2010a). Within the Study Area, the majority of the fragmented woodland patches have little to no forest interior habitats and are primarily composed of edge habitats. Higher quality forest interior habitat is found at the edge of the Study Area within the Glenville Hills Kames Earth Science ANSI and also within the woodland adjacent to the Provincially Significant Ansnorveldt Wetland Complex (**Figure 2-11**).

Provincially Rare Species and Species at Risk

Species at Risk include species listed as Special Concern, Threatened or Endangered in Ontario by COSSARO. Provincially rare species include species with designations by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC), as well as Provincially Ranked S1 (extremely rare in Ontario), S2 (very rare in Ontario), or S3 (rare to uncommon in Ontario) species.

The MNRF's NHIC rare species records (2014a) were searched for 1 km² squares that intersect with the Study Area. The search resulted in nine provincially rare species or Species at Risk, including three Threatened and two Special Concern species (**Table 2-10**). The majority of the records are greater than 20 years old and are considered to be historical. Some of these may no longer persist in the Study Area with the exception of Bobolink (*Dolichonyx oryzivorus*), Eastern Meadowlark (*Sturnella magna*) and Snapping Turtle (*Chelydra serpentina*).

Table 2-10. NHIC Rare Species Records for the Study Area

Taxon	Scientific Name	Common Name	S-Rank ¹	COSEWIC Status	COSSARO Status	Year Last Observed
Bird	Bobolink	<i>Dolichonyx oryzivorus</i>	S4B	Threatened	Threatened	2003
	Eastern Meadowlark	<i>Sturnella magna</i>	S4B	Threatened	Threatened	2004
Insect	Azure Bluet	<i>Enallagma aspersum</i>	S3	-	-	1954
Mollusk	Tapered Vertigo	<i>Vertigo elatior</i>	S2S3	-	-	1939
Plant	Schweinitz's Sedge	<i>Carex schweinitzii</i>	S3	-	-	1981
	Weak Blue Grass	<i>Poa languida</i>	S3	-	-	1980
Reptile	Blanding's Turtle	<i>Emydoidea blandingii</i>	S3	Threatened	Threatened	1983
	Milksnake	<i>Lampropeltis triangulum</i>	S3	Special Concern	Special Concern	1979
	Snapping Turtle	<i>Chelydra serpentina</i>	S3	Special Concern	Special Concern	2010

¹**S-rank:** The Natural Heritage provincial ranking system (provincial S-rank) is used by the MNRF Natural Heritage Information Centre (NHIC) to set protection priorities for rare species and natural communities. Definitions are as follows:

S1 - Extremely rare in Ontario; usually 5 or fewer occurrences in the province or very few remaining individuals;

S2 - Very rare in Ontario; usually between 5 and 20 occurrences in the province or with many individuals in fewer occurrences;

S3 - Rare to uncommon in Ontario; usually between 20 and 100 occurrences in the province;

S4 - Common and apparently secure in Ontario; usually with more than 100 occurrences in the province.

S5 - Very common and demonstrably secure in Ontario.

SX – Extirpated from Ontario.

Additionally, the LSRCA has records of the following three Endangered species within the East Holland River Subwatershed: Eastern Prairie Fringed Orchid (*Platanthera leucophaea*), King Rail (*Rallus elegans*) and Redside Dace (*Clinostomus elongatus*) (LSRCA, 2010a). However, the Eastern Prairie Fringed Orchid and the King Rail have been recorded well north of the Study Area.

2.6.2.2 Natural Corridors – Animal Movement Corridors

Natural corridors connect natural areas and habitats at a larger landscape scale and facilitate the movement of wildlife to find resources they need to survive from one habitat to another. These are important as they promote genetic diversity in species populations, and allow for seasonal migration and dispersal of animals (MNRF, 2000). Human development often fragments connecting habitats, which may obstruct species movement and change ecological processes.

There are relatively few natural corridors within the Study Area, and most are surrounded by residential, industrial and commercial areas. All of these are considered to be of lower habitat quality that follow riparian habitat but still provide some wildlife corridor functions. Natural corridors occur along sections of the East Holland River and its tributaries, Bogart Creek, Weslie Creek, Ansnorveldt Creek, Tannery Creek and Armitage Creek (**Figure 2-11**). The strongest connectivity occurs at the northwest and southwest corners of the study area with adjacent areas to the west.

2.6.2.3 Natural Vegetation Protection Zones

The entire Study Area falls within the boundaries of the 2009 LSPP Watershed Boundary. Additionally, portions of the Study Area fall within the boundaries of the *Greenbelt Plan 2005* and the *Oak Ridges Moraine Conservation Plan 2002 (ORMCP)*. These areas are mapped on **Figure 2-10** and include portions of the Provincially Significant Ansnorveldt Wetland Complex and the surrounding significant woodland, which are part of the Protected Countryside of the *Greenbelt Plan 2005*, and the significant woodlands located along Bathurst Street in the Town of Newmarket that fall within the boundary of the *ORMCP*.

Sections 2.2.15, 2.2.16 and 2.2.18 of the *York Region Official Plan (2010)*, require that a minimum vegetation protection zone (i.e. buffer) of 30 m shall be applied to the key natural heritage and hydrological features that fall within the boundaries of each respective planning document as summarized in **Table 2-11** below.

Table 2-11. Key Natural Heritage and Hydrological Features that Receive Vegetation Protection Zones

Plan	ORMCP	LSPP	Greenbelt Plan 2005
Section of the York Region Official Plan (2010)	2.2.15	2.2.16	2.2.18
Features	<ul style="list-style-type: none"> Wetlands; Significant woodlands; Significant valleylands; Seepage areas and springs; Fish habitat; Permanent streams; Intermittent streams; Sand Barrens; Savannahs; Tallgrass prairies; and, Kettle Lakes. 	<ul style="list-style-type: none"> Wetlands; Significant woodlands; Permanent streams; Intermittent streams; Lakes other than Lake Simcoe; and, Natural areas abutting Lake Simcoe 	<ul style="list-style-type: none"> Wetlands; Significant woodlands; Seepage areas and springs; Fish habitat; Permanent streams; Intermittent streams; and, Lakes.

Development or site alteration is not permitted in these key natural heritage features and their associated vegetation protection zones on the Oak Ridges Moraine, in the Lake Simcoe Watershed, or in the Greenbelt.

Additionally, the following minimum natural vegetative buffers are required from any proposed development as specified under Sections 9.2 and 9.3 of the *Town of Newmarket Official Plan (2014)* from the following features:

- 15 m on either side of a warm water stream;
- 30 m on either side of a cold water stream;
- 10 m from all woodlands, including a 3 m wide vegetated strip measured from the tree dripline and 7 m setback to the nearest proposed development; and
- 15 m from all wetlands.

2.6.2.4 Restoration Areas

It is LSRCA's objective to improve the terrestrial natural heritage system within the East Holland River and West Holland River Subwatersheds. Recommended actions to achieve this objective include but are not limited to the following (LSRCA, 2010a and 2010b):

- Assessing the feasibility of increasing natural cover in the subwatershed;
- Identify opportunities for land securement of priority sites;
- Work with partner municipalities to enhance existing woodland areas; and
- Encourage partner municipalities to identify opportunities for restoration works on development sites.

Information pertaining to opportunities for restoration areas was requested from the LSRCA, York Region and the Town of Newmarket.

According to the LSRCA, there are 144 identified opportunities to restore insufficient riparian vegetative buffers along surveyed watercourses in the Town of Newmarket (**Figure 2-11**). Restoration of riparian vegetative buffers would increase vegetation cover and habitat connectivity within the West and East Holland Subwatersheds, provide habitat for wildlife species, increase erosion prevention, enhance water quality and improve aquatic habitat.

2.7 Water Quality

A background information review of water quality and hydrological features and functions located within the Study Area was conducted using the following available secondary sources:

- East Holland River Subwatershed Plan (LSRCA, 2010a);
- West Holland River Subwatershed Plan (LSRCA, 2010b);
- UYSS Environmental Assessment, Natural Environment Baseline Conditions Report (CRA *et al.*, 2013); and
- LSRCA Lake Simcoe Watershed Report Card, 2013 (LSRCA, 2013).

The East Holland River Subwatershed Plan presents a summary of water quality data based on the MOE Provincial Water Quality Objectives (PWQOs), which are numerical and narrative ambient surface water quality criteria that the MOE strives to maintain in surface waters. The PWQOs are intended to protect all forms of aquatic life and all aspects of the aquatic life cycle during indefinite exposure to surface water. For the East Holland River Subwatershed, the monitoring data collected between 2002 to 2008 shows that median concentrations of Phosphorus, Total Suspended Solids (TSS) iron, aluminum, and zinc are above the objectives at numerous locations. The Phosphorus data shows a decreasing trend through the period of record, however current concentrations are still impairing water quality.

The West Holland River Subwatershed Plan also presents a summary of water quality data based on the MOE PWQOs. It notes that based on the water quality data collected between 2002 and 2008 indicates that Phosphorus is the main parameter impacting water quality in the West Holland River, with median concentrations exceeding the PWQO guidelines. The monitoring data shows that despite the phosphorus levels exceeded the PWQO guidelines, historical data shows there is a general decreasing trend in phosphorus concentrations since levels were recorded in the 1970s. Chloride and nitrate were also identified as exceeding the PWQOs to a lesser extent along with TSS and iron.

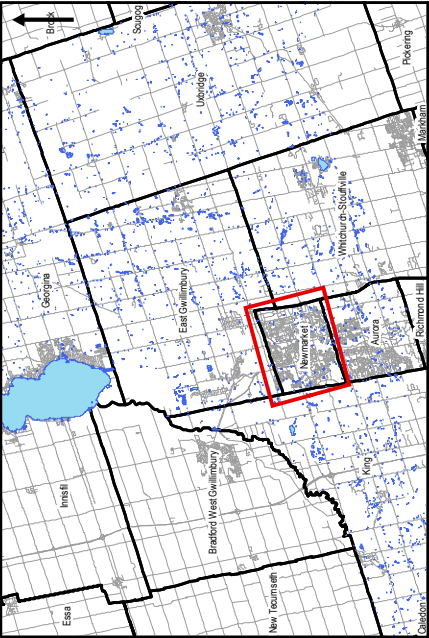
The UYSS report presents a summary of extensive water quality data obtained from the MOE's Provincial Water Quality monitoring Network, and LSRCA. Data from various monitoring stations were analyzed. Values were compared to the PWQOs:

- Water temperatures vary seasonally, with summer month averages ranging from 20.5 °C to 21.8 °C, and daily maximum temperatures ranging from 24.5 °C to 29.6 °C.
- Field pH data generally fell within the PWQO recommended range of 6.5 to 8.5, with only one single data point exceeding pH 8.5.
- The PWQO for Dissolved Oxygen (DO) concentration is based on the oxygen needed to sustain aquatic life relative to oxygen saturation concentrations. The long-term DO concentrations have exceeded 6 mg/L for all records with the exception of a single data point. The PWQO minimum DO concentration varies based on water temperature, but generally falls between 4 mg/L and 8 mg/L.
- The PWQOs state that current scientific evidence is insufficient to develop a firm TP objective at this time, however, TP concentrations in rivers and streams should not exceed 0.03 mg/L to prevent excessive plant growth. Total Phosphorus (TP) data ranged from approximately 0.1 mg/L to 0.2 mg/L. Maximum monthly average concentrations were observed in the summer months. The monthly average TP concentrations of 0.08 mg/L to 0.19 mg/L in the East Holland River consistently exceed the PWQO of 0.03 mg/L.
- There is no PWQO for nitrate/nitrite, however interim Canadian water quality guidelines have been developed at 13 mg/L for the nitrite ion in freshwater and marine system, and 16 mg/L as nitrate. Concentrations in the East Holland River ranged from 0.64 mg/L to 0.75 mg/L, and are well within the guidelines.
- There are no PWQOs for Total Dissolved Solids (TDS), although generally water is considered unfit for human consumption when TDS levels exceed 1,000 mg/L. The limited TDS data available from the monitoring stations indicate that TDS concentrations were generally in the range of 300 to 600 mg/L, with an average TDS concentration in the East Holland River of 460 mg/L.

The LSRCA 2013 Report Card gives an overall grade of D, or Poor, to the East Holland River and C, or Fair, to the West Holland River subwatersheds. The gradings are based on concentration of Phosphorus and benthic invertebrate communities. The grades indicate that these are more heavily impacted by human activity, such as the East Holland and Maskinonge Rivers. The land uses contribute phosphorus to watercourses and can cause changes to stream habitat that negatively affect the benthic invertebrate community.

2.8 Water Quantity

The *Hydrology Report for the West Holland River, East Holland River and Maskinonge River Watersheds* (Cumming Cockburn Ltd., 2005) included hydrologic modeling for each of the three watersheds. Key flow points were created throughout each watershed for pre and post development conditions. Current peak flow conditions for points found within and directly outside of the Town of Newmarket are listed in **Table 4-3**. Further information about the study and results can be found in **Section 4.2.2**.

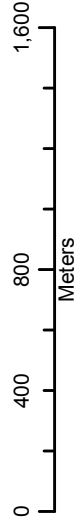



Legend

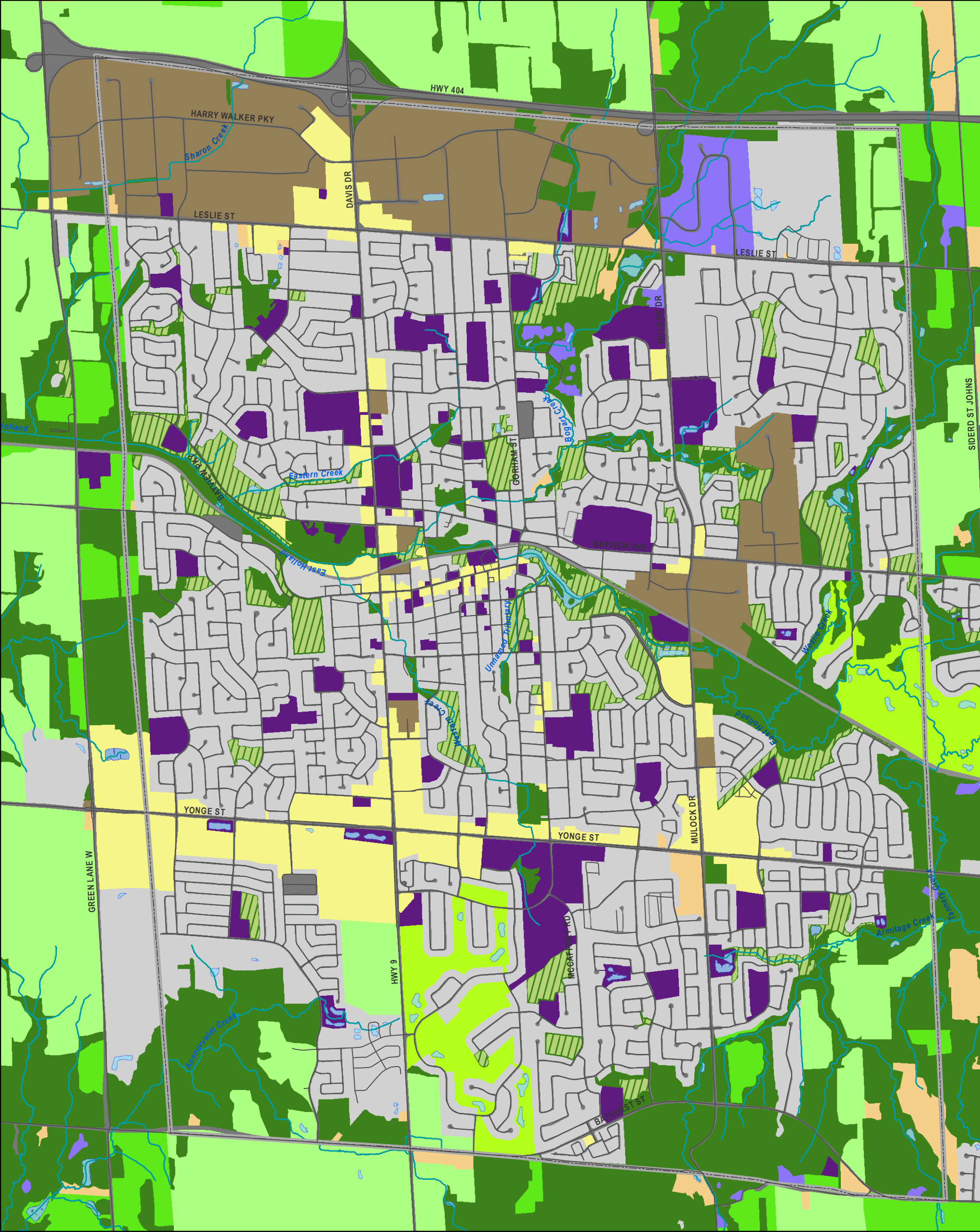
- Land Use
- Active Aggregate
 - Commercial
 - Estate Residential
 - Industrial
 - Institutional
 - Intensive Agriculture
 - Manicured Open Space
 - Natural Heritage Feature
 - Non-intensive Agriculture
 - Open Space
 - Rail
 - Road
 - Rural Development
 - Urban

Base Layers

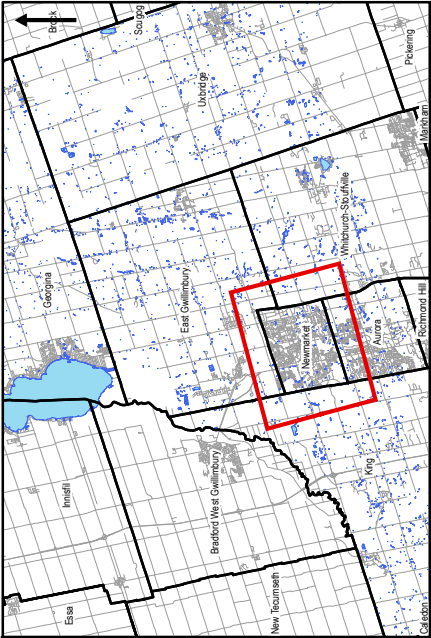
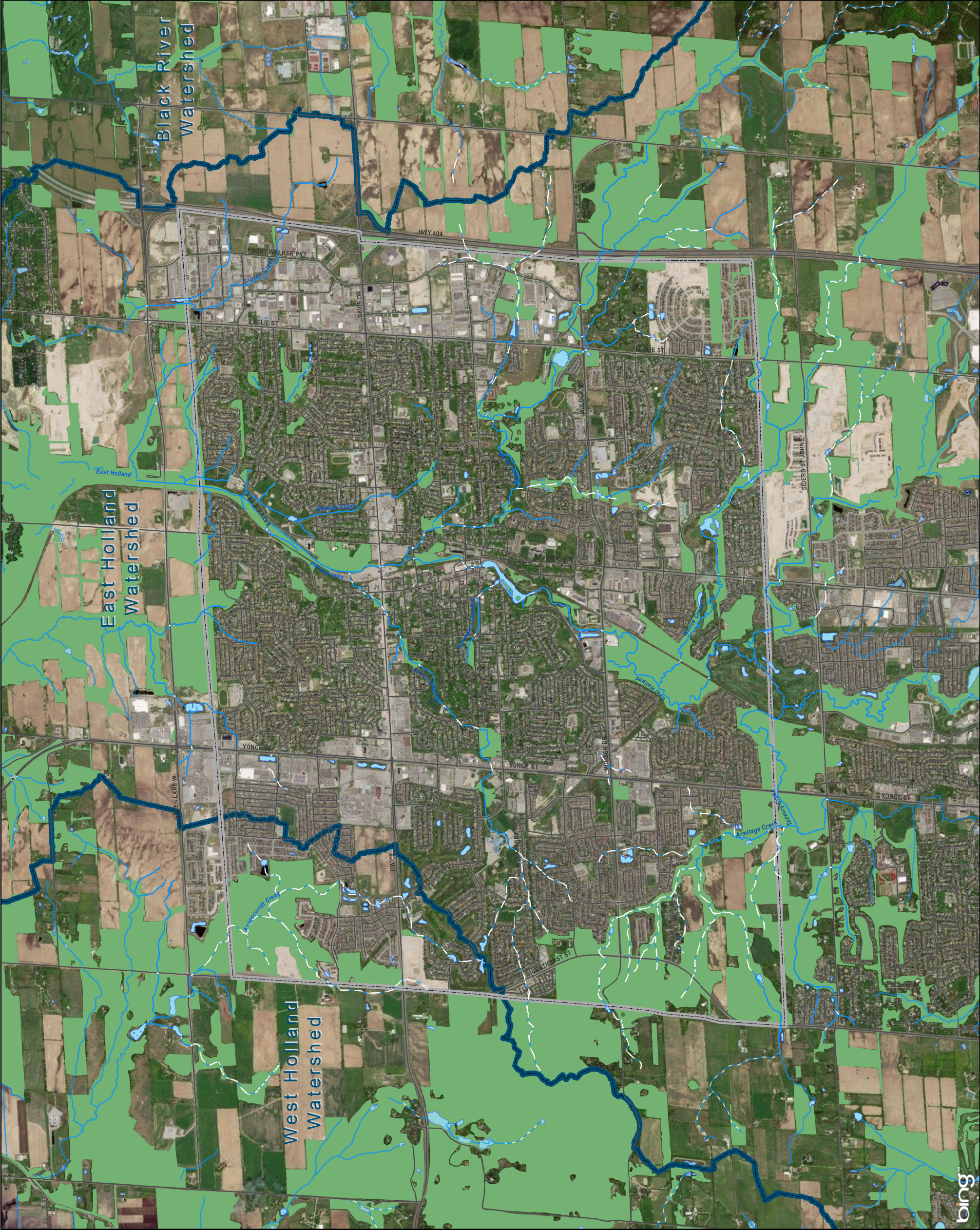
- Watercourses
- Roads
- Waterbodies
- Municipal Boundary



Town of Newmarket Stormwater Master Plan			
Existing Land Use in Study Area			
October 2016	1:25,000	Datum: NAD 83 Zone 17 Source: Natural Environment Baseline Conditions Report - Upper York Sewage Solutions EA, Town of Newmarket, York Region	
PH#: 60330930	V#: 002	 Figure 2-1	



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Legend

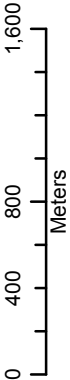
Watercourse Regime

- Permanent
- Intermittent



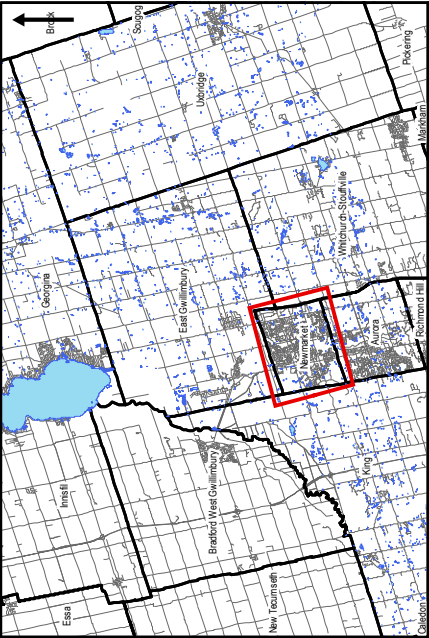
Base Layers

- Roads
- Waterbodies
- Town of Newmarket Significant Forests
- Municipal Boundary



Town of Newmarket Stormwater Master Plan			
Regional Hydrology			
June 2017	1:35,000	Datum: NAD 83 Zone 17 Source: Town of Newmarket, York Region	
P#: 60330930	V#: 002	Figure 2-2	
AECOM			

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Legend

Stream Classification

- A: Large Natural Watercourse
- B: Large Altered Watercourse
- D: Small Natural Watercourse
- E: Small Altered Watercourse
- F: Swales and Drains
- G: Straight Drainage Ditch
- Unclassified

Base Layers

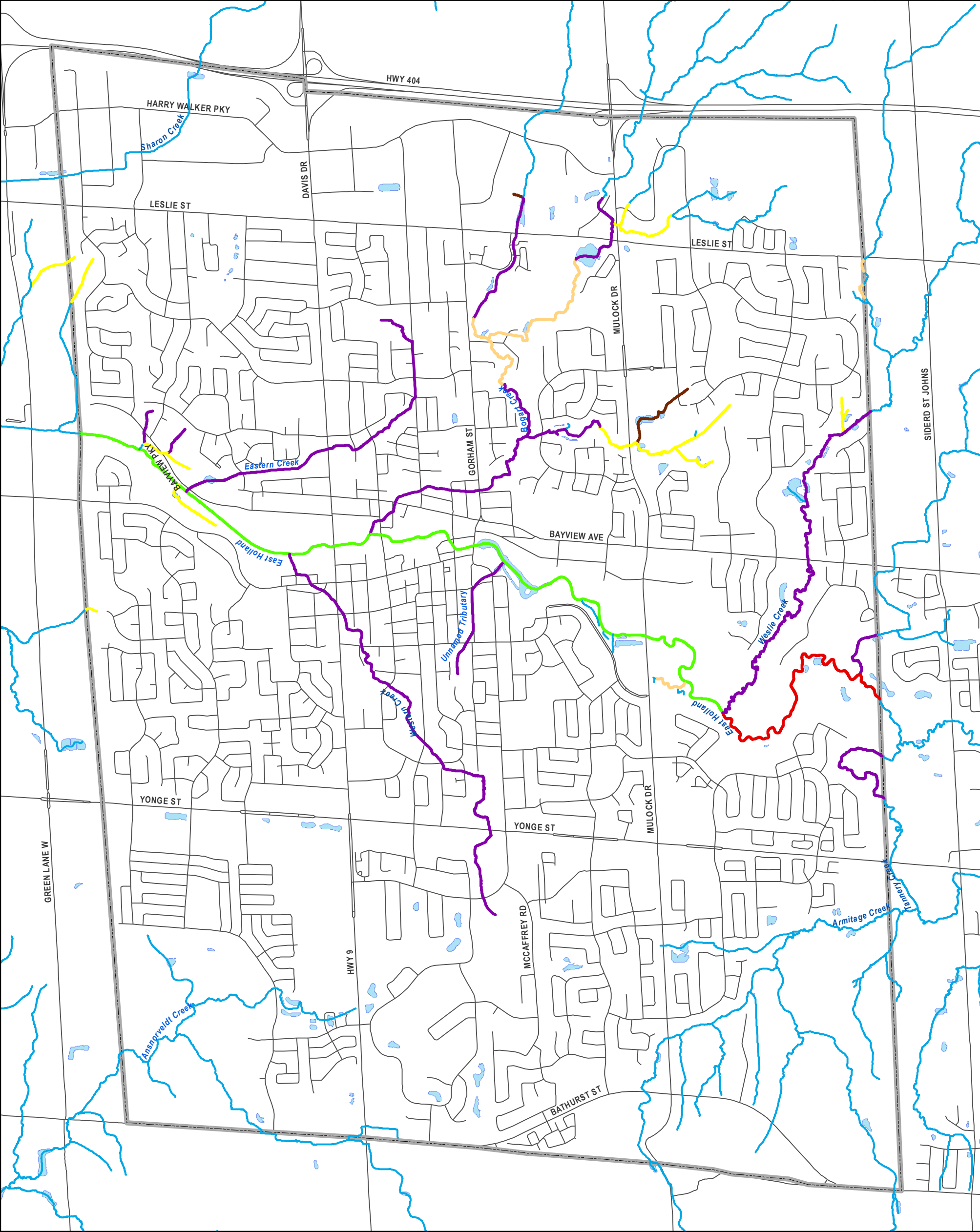
- Watercourses
- Roads
- Waterbodies
- Municipal Boundary

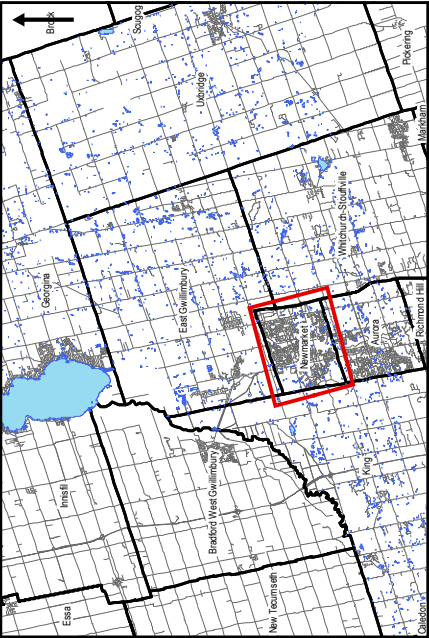
200



Comprehensive SWM Plan		
Town of Newmarket		
Stream Classification		
July 2016	1:25,000	Datum: NAD 83 Zone 17 Source: Natural Environment Conditions Report - Upper York Sewage Solutions EA, York Region
PH: 60330930	V#: 001	
AECOM		
Figure 2-3		

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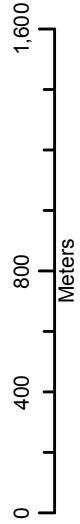


2-Yr Flow Total Stream Power (W/m)

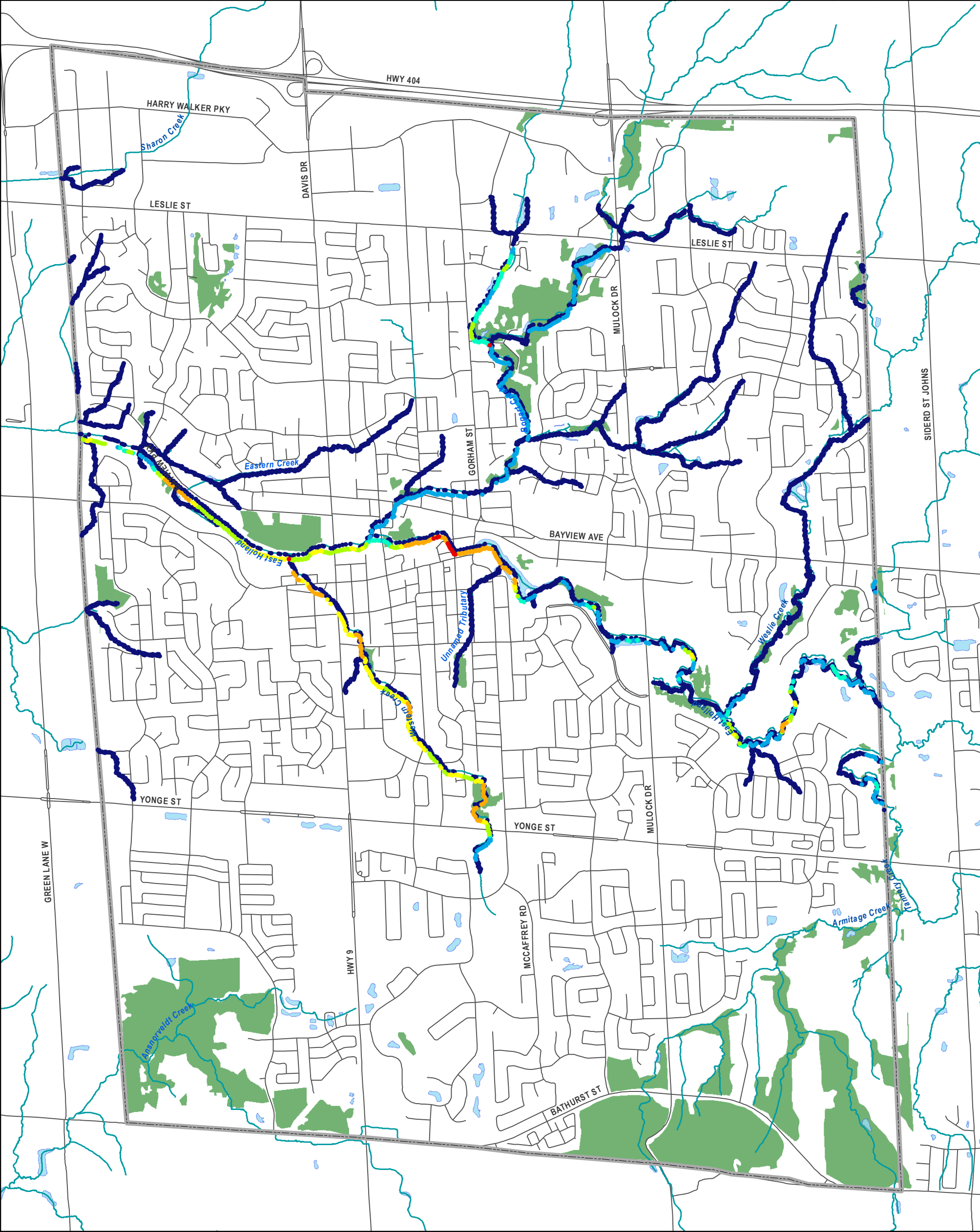
- 0 - 200
- 200 - 400
- 400 - 600
- 600 - 800
- 800 - 1000
- 1000 - 1500
- 1500 - 3500

Base Layers

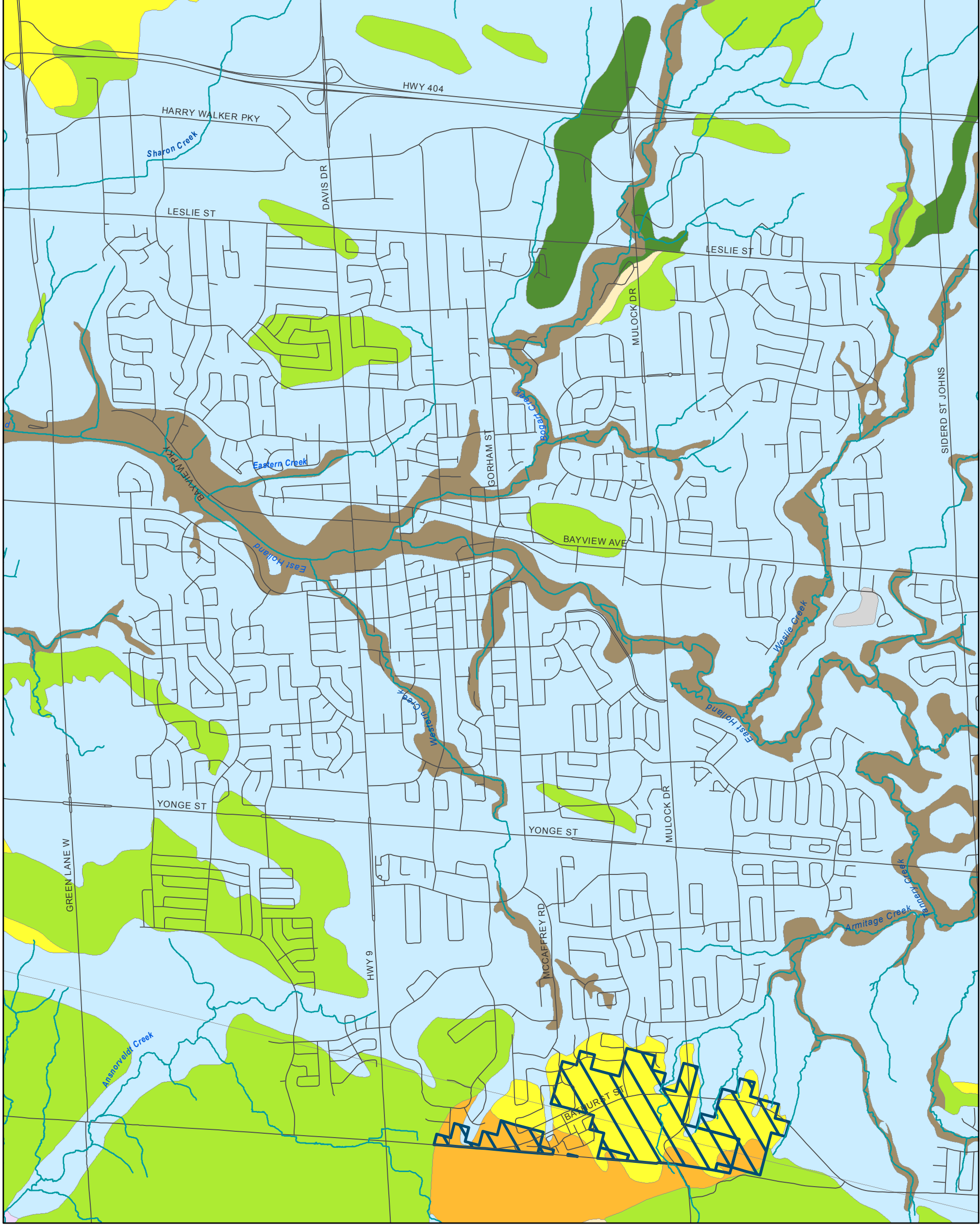
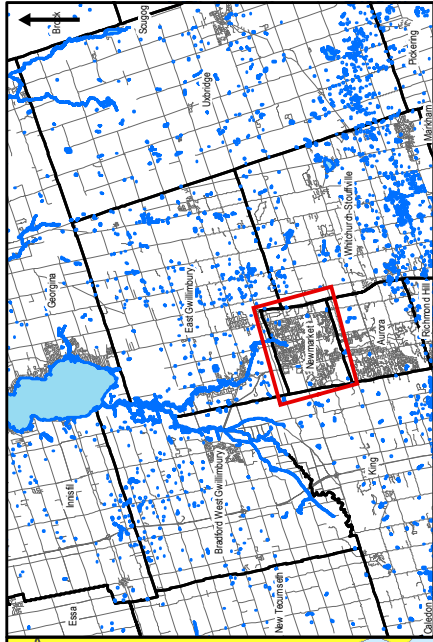
- Watercourses
- Roads
- Waterbodies
- Town of Newmarket Significant Forests
- Municipal Boundary

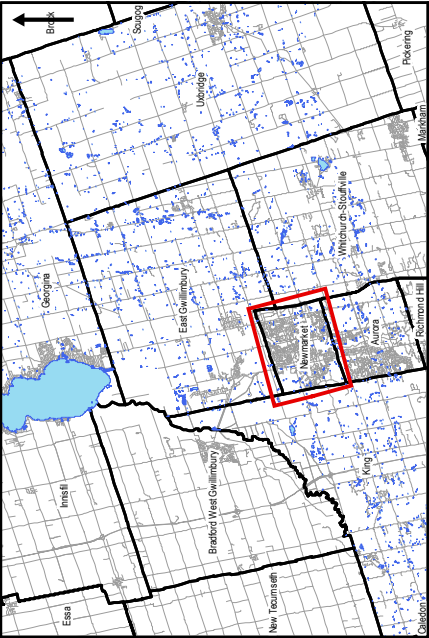


Comprehensive SWM Plan Town of Newmarket		
Total Stream Power (W/m)		
July 2016	1:25,000	Datum: NAD 83 Zone 17 Source: Natural Environment Baseline Conditions Report - Upper York Sewage Solutions EA, York Region
P#: 60330930	V#: 001	Figure 2-4
AECOM		



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High Vulnerable Aquifers (LSRCA)

Aquifer Rating

1

2

Base Layers

Watercourses

Roads

Waterbodies

Municipal Boundary

N

0

200

400

800

1,200

1,600

Meters

Town of Newmarket Stormwater Master Plan

High Vulnerable Aquifers

November 2016

1:25,000

PH: 60330930

V#: 01

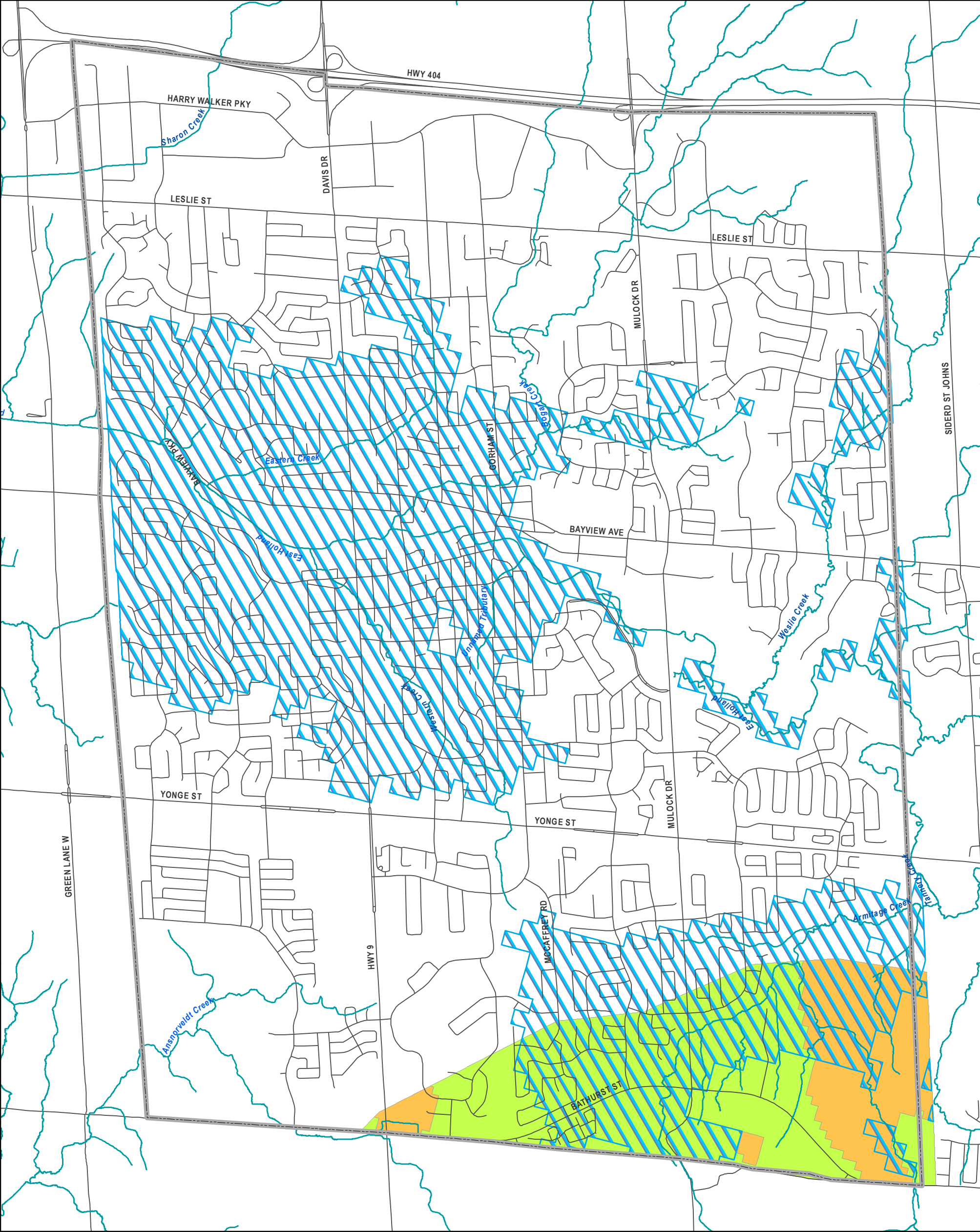
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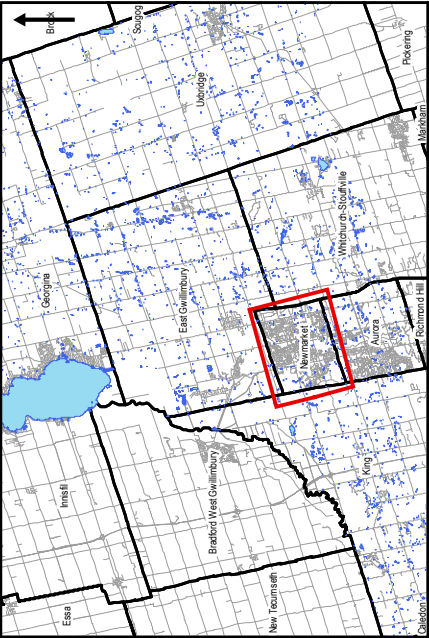
Source: LSRCA, Town of Newmarket, York Region

AECOM

Figure 2-6

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Legend

Water Well Depth

<10 m

Water Well Types

Commercial

Cooling / AC

Domestic

Industrial

Municipal

Unknown

Wellhead Protection Areas

WHPA-A

WHPA-B = 2 year

WHPA-C = 5 year

WHPA-D = 25 year

Base Layers

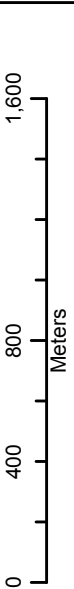
Watercourses

Roads

Waterbodies

Municipal Boundary

N



Town of Newmarket Stormwater Master Plan

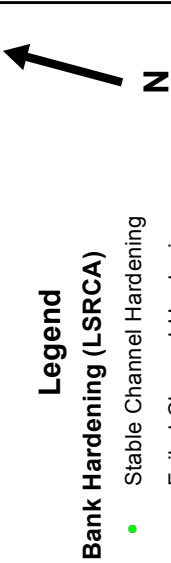
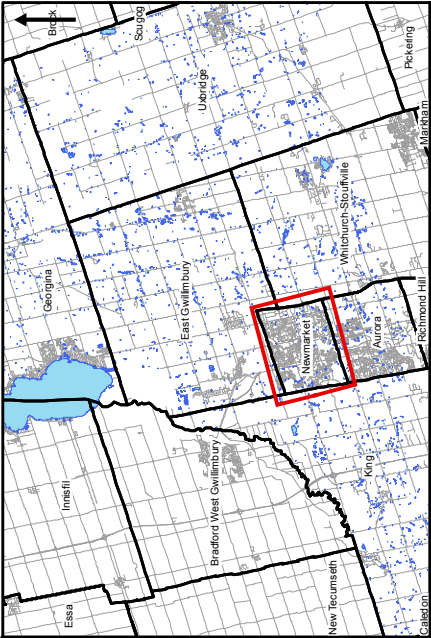
MOE Water Wells

November 2016	1:25,000	Datum: NAD 83 Zone 17 Source: Town of Newmarket Official Plan 2006-2026, MOE, York Region
PH: 60330930	V#: 002	



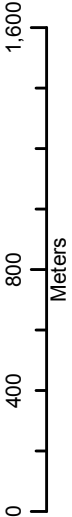
Figure 2-7

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Legend

- Bank Hardening (LSRCA)**
 - Stable Channel Hardening
 - Failed Channel Hardening
- Fish Migration Barrier (LSRCA)**
 - Perched Culvert
 - Dam
 - Weir
 - Other Barrier
- Watercourse Regime**
 - Cold
 - Warm
 - Permanent
 - Intermittent
- Base Layers**
 - Subwatersheds
 - Regulation Limit
- Base Layers**
 - Roads
 - Waterbodies
 - Town of Newmarket Significant Forests
 - Municipal Boundary



Town of Newmarket Stormwater Master Plan

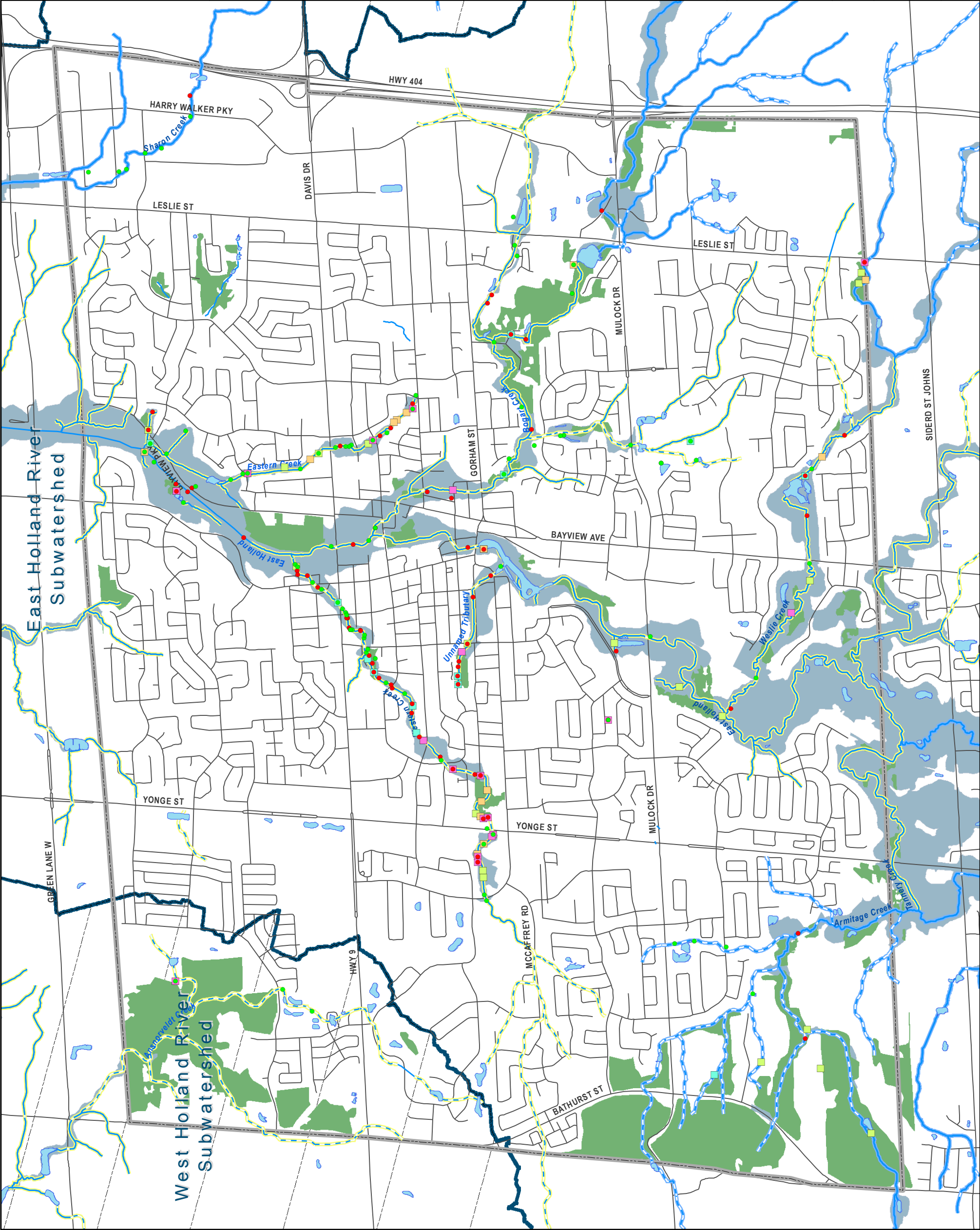
Key Hydrological Features

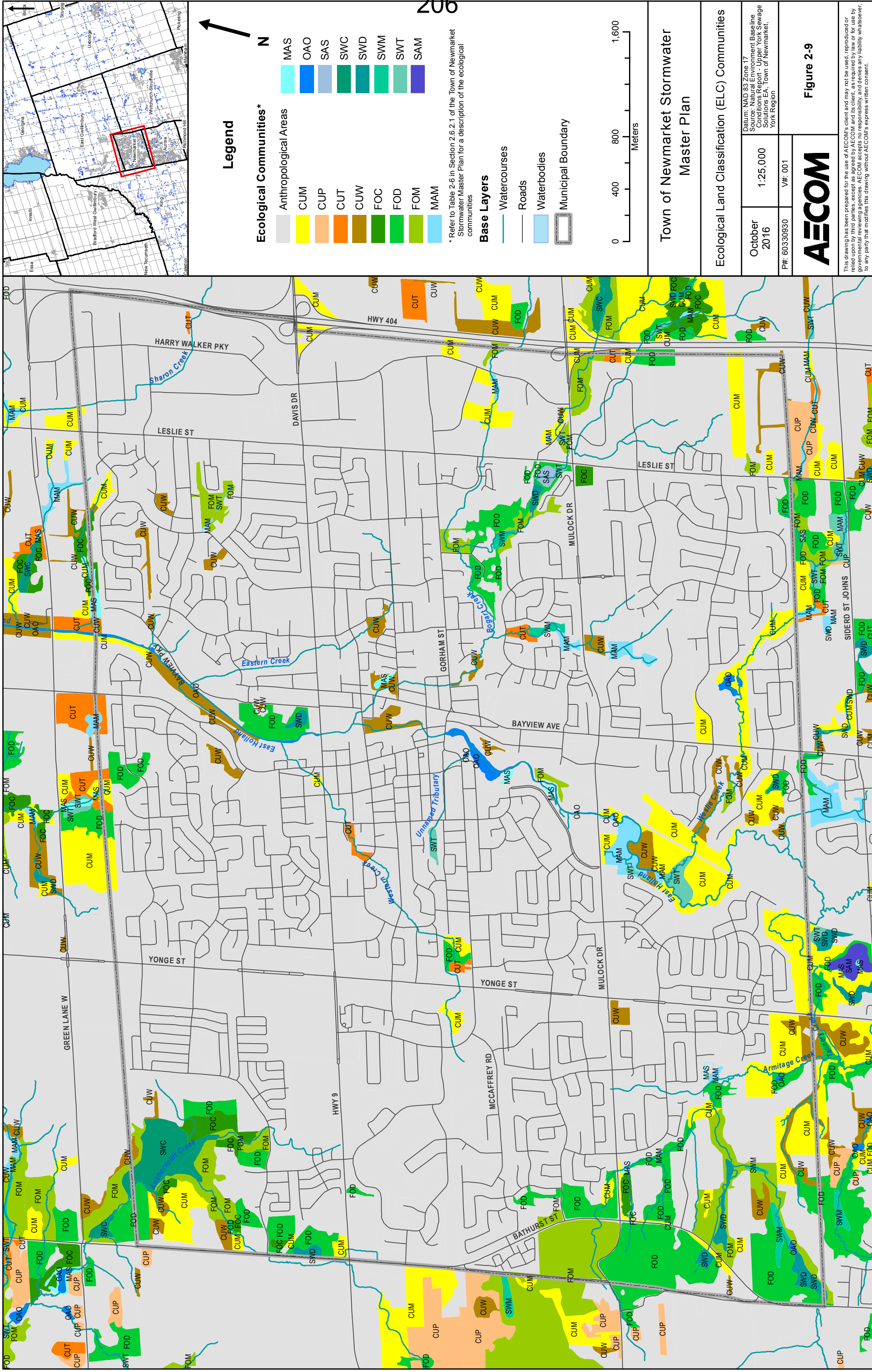
November 2016	1:25,000	Datum: NAD 83 Zone 17 Source: LSRCA, Town of Newmarket, York Region
PH: 60330930	V#: 002	

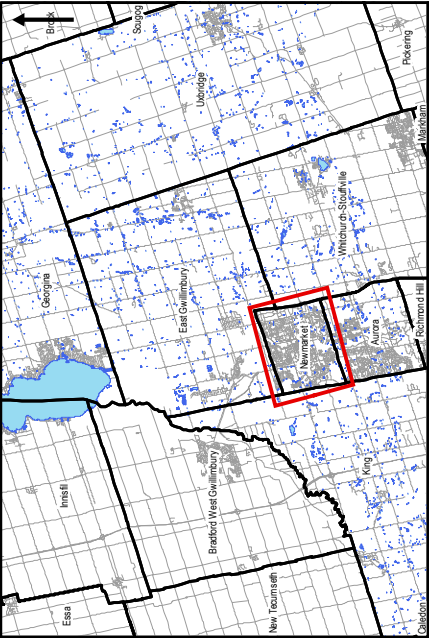


Figure 2-8

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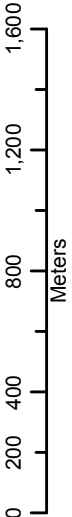
Legend

Environmental Layers

- Locally Significant Wetland
- Provincially Significant Wetland
- Unevaluated Wetlands
- Provincial Candidate ANSI, Earth Science
- Provincial Candidate ANSI, Life Science
- Town of Newmarket Significant Forests
- Oak Ridges Moraine
- Greenbelt
- Conservation Areas
- Natural Heritage Feature - Core Areas

Base Layers

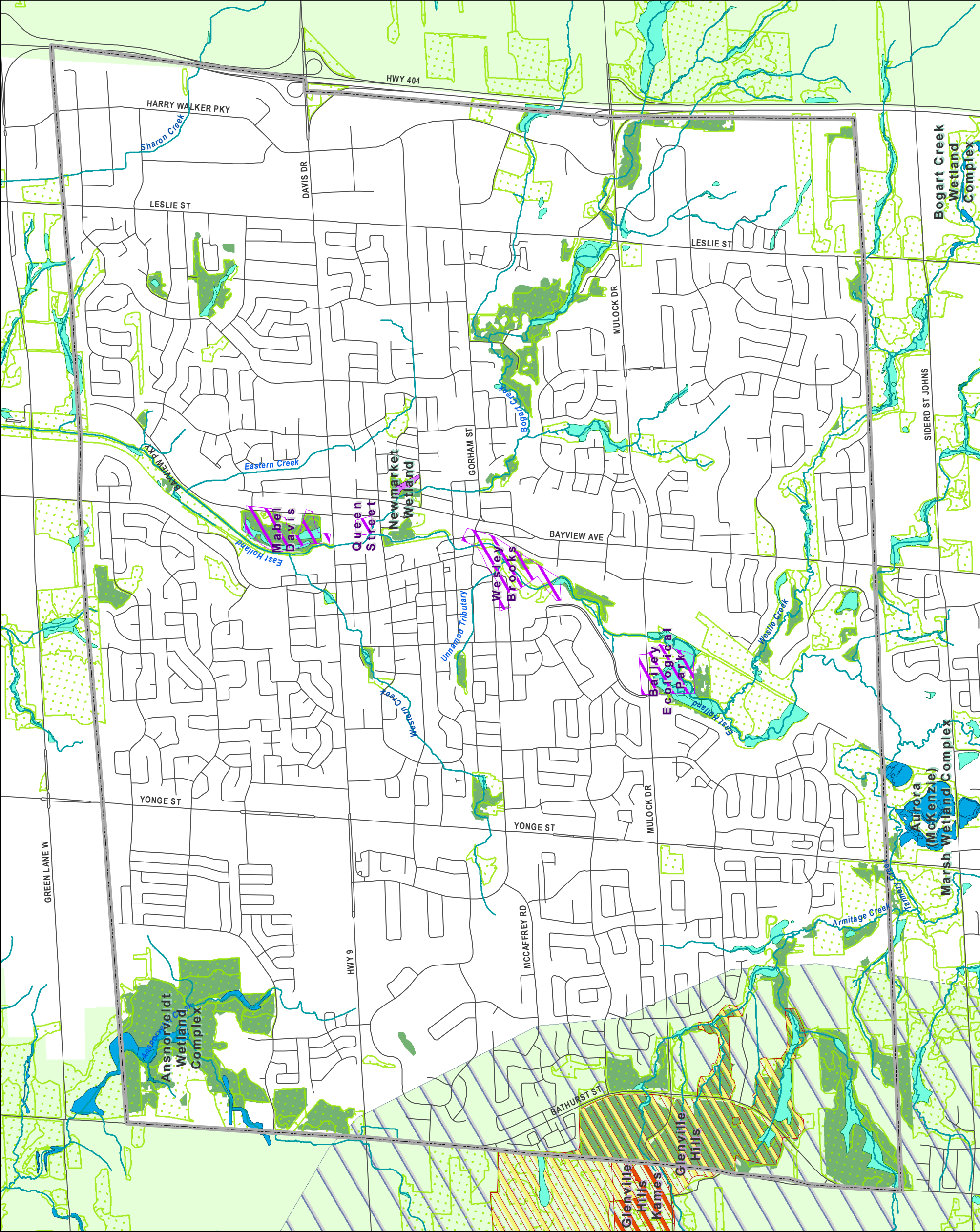
- Watercourses
- Roads
- Waterbodies
- Municipal Boundary



Town of Newmarket Stormwater Master Plan

Natural Core - Key Natural Heritage Features

November 2016	1:25,000	Datum: NAD 83 Zone 17 Source: Natural Environment Baseline Conditions Report - Upper York Sewage Solutions EA, LIO, Town of Newmarket, York Region	
PH: 60330930	V#: 01		
AECOM		Figure 2-10	
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3. Effectiveness of Existing Stormwater Systems {Step 6}

Records indicate that the SWM facilities were first constructed in the Town of Newmarket nearly 30 years ago. Stormwater management was first introduced to mitigate potential flooding problems. Stormwater management was later updated to provide for water quality protection to reduce the impact of urban development on receiving watercourses. This led to the first set of Ministry of the Environment (MOE) Stormwater Management Guidelines. The most recent MOE guidelines (2003) now include reference to groundwater protection and erosion control. There has also been a trend to move away from the use of SWM ponds, placed at the discharge point, where stormwater enters the watercourse, to a series of SWM measures that can be located further upstream within a development area. These are commonly put into one of three classifications:

- at source control measures to control stormwater as close to the source as possible;
- conveyance controls to treat stormwater as it is conveyed; and
- end-of-pipe controls to treat stormwater prior to it entering the receiving system.

These suites of controls are often referred to today as Best Management Practices or BMP's. There are approximately 100 SWM ponds within the Town of Newmarket, 58 of which are currently owned and operated by the Town. The main types of facilities found throughout the Town include:

- dry ponds, (designed to drain following a runoff event), provide water quantity control;
- wet ponds, (include a permanent pool), provide water quantity and quality control; and
- instream channels; control structures within a natural stream to provide water quantity control.

The SWM facilities are operated under the authorization of the MOE through the issuance of a Certificate of Approval (COA) or Environmental Compliance Approval (ECA), since they are deemed to be sewage works under the Ontario Water Resources Act. The Town is the owner and operator of the facilities and is required to ensure that the facilities provide the appropriate level of flood protection and water quality control, and ensure that they are maintained and fully operable at all times.

The SWM facility Level of Protection discussed in this report are taken from the Ministry of the Environment's 2003 Stormwater Management Planning and Design Manual. **Table 3-2** of this report identifies the Protection Level for ponds based on Storage volume per impervious levels for contributing drainage areas. The protection levels are as follows:

- Enhanced (formerly Level 1) based on an 80 percent long-term suspended sediment removal;
- Normal (formerly Level 2) based on a 70 percent long-term suspended sediment removal; and
- Basic (formerly Level 3) based on a 60 percent long-term suspended sediment removal.

The suspended sediment removal rates do not correlate directly to the phosphorus removal rates. For example, wet SWM facilities may be classified as a Level 1 (Enhanced) facility, however based on the PTool, the phosphorus removal efficiency of a wet pond is 63 percent. Similarly, a dry pond is categorized as a Level 3 (Basic) facility with a 60 percent suspended sediment removal efficiency, yet is expected to provide a 10 percent Phosphorus removal efficiency based on the PTool.

3.1 Summary of Previous Studies

3.1.1 Newmarket Stormwater Management Pond Inventory and Maintenance Plan

This report was prepared for the Town of Newmarket by AECOM in 2009. The main objective of this study was to perform an inventory and survey of these facilities, and to complete detailed overall stormwater management pond maintenance needs plan. Restoring the original design function of these facilities helps to safeguard public health,

reduce flooding potential for public and/or private lands, demonstrate due diligence with respect to good asset management principles, and can help maximize the life expectancy of the facility by correcting problems at the most cost effective time. The report outlines the actions required for implementing the monitoring and maintenance program. The study also recommends construction of stormwater management facilities or other storage devices in vacant lots or park sites in older developed areas to address the drainage problems, downstream flooding and erosion problems.

Additionally, the study recommends improvements in stormwater management facility function. Retrofitting provides an opportunity to improve existing water quality Best Management Practices (BMPs) that may be inadequate or performing poorly. It recommended installing pre-treatment technologies such as sediment traps, filter strips and oil and grit separators upstream of the facilities to reduce sediment loads. It also recommends disconnecting roof leaders and encouraging grassed swales which helps infiltration of clean stormwater directly into the ground. The study provided a prioritized list of ponds identified as requiring sediment cleanout, together with associated sediment removal and disposal costs. These are summarized in **Table 3-1** below. It also identified facilities that had not yet been assumed by the Town, and noted that the facilities should have sediment removed before being assumed by the Town, shown in **Table 3-2** below. Pond locations are provided on **Figure 3-1**.

Table 3-1. Cleanout Priority as Identified in 2009 SWM Facility Inventory and Maintenance Needs Plan

Sediment Cleanout Priority	AECOM Pond ID	Meets MOE Design Guidelines?	Meets MOE Maintenance Guidelines?	% of Permanent Pool as Sediment	Estimated Volume of Sediment (m ³)
1	43	Yes	No	128	943
2	36	Yes	No	32	446
3	39	No	No	149	1327
4	84	No	No	114	49
5	86	No	No	82	9
6	74	No	No	67	330
7	44	No	No	58	1557
8	70	No	No	52	2300
9	89	No	No	37	479
10	41	No	No	33	298
11	90	Yes	Yes	70	2276
12	35	Yes	Yes	67	2546

Table 3-2. Sediment Summary of Privately Owned Ponds and Ponds Not Yet Assumed by the Town of Newmarket

AECOM Pond ID	% of Permanent Pool as Sediment	Estimated Volume of Sediment (m ³)
14	52	3,098
22	29	365
23	17	215
29	22	317
30	10	74
31	61	533
55	1	120
58	56	862
71	44	1,926
34	106	728
3	49	940
12	33	1,013

3.1.2 Town of Newmarket Town-Wide Drainage Study

This study was prepared by AECOM in 2009. The focus of the report was stormwater quantity and flooding issues, as well as erosion considerations and stormwater management quality controls. It reviewed the Town's stormwater management conveyance by item (storm sewers and channels) to identify causes of flooding, and areas where the system may be under capacity. It focused on the older areas of the Town that were developed prior to the adoption of modern stormwater management practices (core areas). The study examined the existing drainage system, looking at pipes greater than 600 mm diameter, and identified opportunities for improvements. On September 16, 2006, the Town of Newmarket experienced a 100-year storm that resulted in flooding in the Eastern, Western and Bogart Creek Drainage Basins that are tributary to the East Holland River. The Town received many surface and basement flooding reports which provided the impacts for this study and focused on areas of concern. The study identified storm sewers requiring upgrades to ameliorate flooding conditions. The report further recommended further exploration of the cost and benefit of a foundation drain disconnection program, to further reduce capacity impacts on the existing sanitary sewers and to promote infiltration of stormwater runoff to pervious surfaces.

This study also identified additional opportunities for water quantity and quality control, including rain barrels, decreased use of fertilizers and pesticides, increased street sweeping and catchbasin cleaning, roof gardens, vegetated swales, tree planting, nature-scaping, pervious pavers, and infiltration measures. A table showing the prioritization of improvement works and associated costs was provided in the report. The recommendations included catchbasin installations at various locations, remediation work including replacing and twinning sewers at multiple locations, and further investigating increasing channel capacity at one location. The summary is presented in **Table 3-3** below. AECOM's Management Units have been included in the table for reference purposes. The study also references the 16 SWM facilities identified for retrofitting in the LSRCA 2007 Lake Simcoe Basin Stormwater Retrofit Opportunities. These pond retrofits and the LSRCA report are discussed in further detail in the following section.

Table 3-3. Table 5 Prioritization of Improvement Works from 2009 Town-wide Drainage Study

Location	AECOM Management Unit	Recommendations for Improvement	Priority Group	Estimated Cost
Srigley St west of Carlson Drive	4	Remediation work would include replacing/twinning the sewer from east of Oris Drive to the edge of the creek to increase capacity and minimize the water levels in the sewers. Suggested remediation includes equivalent of pipe twinning or upsizing several segments of the storm sewer system as follows: 270 m upstream section upsized to 750 mm and 380 m downstream section upsized to 1350 mm diameter pipe.	1	\$649,000
Intersection of Eagle St. and Scott Av	8	Install catchbasins (3 DCBs) Restoration considerations in Lions Park to address flooding issues.	1	\$9,000
Davis Dr. east of Yonge St.	1	Install catchbasins (1 DCB)	1	\$3,000
Walter Ave just west of Newbury Dr.	1	Recommend to add inlet structures (e.g. 2 DCBs) in this area to connect to minor system to relieve major system.	1	\$6,000
Crusader Way South of Srigley St.	4	Remediation work would include twinning/upgrading the sewer on Srigley St. from east of Oris Drive to the edge of the creek to increase capacity and minimize the water levels in the sewers. Investigate increasing channel capacity.	2	\$649,000
Gorham St. east of Maple Street	2	Install catchbasins (1DCB) and increase storm sewer capacity	2	\$3,000
Eagle Street east of Lorne Av.	8	Install catchbasins (1DCB) and increase storm sewer capacity	2	\$3,000
Penn Ave. just south of Gwillimbury Rd.	1	Install catchbasins (1DCB) and increase storm sewer capacity	3	\$3,000
Eagle St. between Lorne Ave. and William St.	8	None	-	-
Main St. North of Davis Dr.	1	None	-	-
Gorham St. west of Carlson Dr.	2	None	-	-
Birchwood Park (tennis court area)	4	None	-	-

3.1.3 LSRCA Publications

3.1.3.1 Lake Simcoe Basin Stormwater Management Retrofit Opportunities 2007

The purpose of this study was to create a complete, consistent and contemporary data set of all urban catchments, outlets, existing SWM facilities and locations of potential SWM facilities, and to calculate the phosphorus load associated with urban stormwater runoff in the Lake Simcoe Watershed.

The report noted that the total phosphorus loading without existing stormwater treatment in Newmarket is approximately 4,713 kg/year, and phosphorus loading with existing stormwater treatment is 3,310 kg/year. It identified stormwater remediation opportunities including construction of ponds in uncontrolled catchments, or upgrading existing facilities. The report identified 16 SWM facilities within the town of Newmarket that require retrofitting. These ponds are identified in **Table 3-4** below.

Table 3-4. Cleanout Priority as Identified in 2007 LSRCA SWM Pond Retrofit Study

Cleanout Priority	LSRCA Pond Identifier	AECOM Pond Identifier	Design Pond Level	Current Pond Level
1	N-NW6	43	1	NA
2	N-SW4	19	1	NA
3	N-CE2	38	1	3
4	N-CW21	77	1	3
5	N-CW6	14	1	3
6	N-SW5	18	1	NA
7	N-NW3	1	1	4
8	N-NW4	3	3	4
9	N-CE20	?	1	2
10	N-SW11	22	1	3
11	N-SE11	28	3	4
12	N-SW18	?	1	3
13	N-SE9	34	1	2
14	N-SW12	58	1	NA
15	N-SW10	24	1	2
16	N-SE10	73	3	4

The study recommended small lot level remediation practices that could be effective at mitigating some of the impacts of stormwater if adopted at a large scale, including the initiation of a rain barrel program to educate the public about stormwater. Mitigation measures for temperature issues associated with stormwater runoff were also identified. Suggested alterations of stormwater pond design were identified to help to minimize temperature increase in receiving water courses, including construction of a bottom-draw outlets, planting of vegetative buffers along pond edges, and the implementation of night time or early morning stormwater pond release. The report also identified additional water quality issues, including salt loading and contaminant loading from pesticides. It identified remediation measures including; increased street cleaning in late winter to avoid accumulated sand and salt from being washed into water bodies, examining potential alternatives to road salt, and consideration of a ban on the cosmetic use of pesticides.

3.1.3.2 Stormwater Pond Maintenance and Anoxic Conditions Investigation 2011

If the percent of urban land-use in a watershed is high (e.g. Aurora-Newmarket) stormwater runoff may be the predominant source of nutrient loading to receiving waters. The objectives of this study were to assess current levels of select stormwater ponds and to examine the prevalence of low oxygen conditions in stormwater ponds. The ponds located in larger urban areas of Newmarket, Aurora, Barrie, Innisfil, Keswick and Uxbridge were selected.

Under normal conditions dissolved phosphorus has a strong affinity to iron resulting in the incorporation of iron bound phosphorus into sediments such as those captured in Stormwater facilities. However, under low (hypoxic) to no (anoxic) oxygen conditions iron is reduced and the bound phosphorus is released into the water column resulting in an internal source of phosphorus loading to the pond. The data also suggested that due to the low residence time of the stormwater pond, hypoxic conditions develop rapidly with storm events causing a mixing of waters and release of the unbound phosphorus to receiving waterbodies. As the vast majority of stormwater pond monitoring has focused on the efficiency of a pond during storm events the development and impact of low oxygen conditions have largely gone unnoticed. Therefore, a second objective of the above project was to examine the prevalence and extent of low oxygen conditions in Stormwater facilities and begin to quantify the significance of the issue.

The above report indicated that Phosphorus loads were calculated by catchment based on catchment size, level of imperviousness (residential area = 0.45, industrial / commercial = 0.85), and an average phosphorus load per hectare per year of 1.32 (residential) or 1.82 (industrial / commercial) based on monitoring data from Liang, 1999. phosphorus reductions specific to the above report were identified as 4 levels of control as follows:

- Level 1 = 80% phosphorus reduction
- Level 2 = 69% phosphorus reduction
- Level 3 = 54% phosphorus reduction
- Level 4 = 40% phosphorus reduction

The above levels differ from the standard Level of Protection for SWM facilities discussed elsewhere in this report. According to the study completed in 98 ponds, 56 ponds had dropped by 1 or more levels of efficiency, 12 of which had dropped below level 4 (the lowest level of efficiency). Interestingly, 37 of the ponds studied were found to have greater volumes than listed in the design information. While the reasons for the greater volumes is unknown, it may be that in some instances ponds were over excavated when first constructed to allow for collection of excess sediment during the servicing of the subdivision and the house building phase. Appendix D of the report specifies 16 SWM facilities within the Town of Newmarket, ranked in order of cleanout priority. This report used the SWM facilities identified in the 2007 LSRCA SWM Pond Retrofit Study, identified in **Table 3-1** above.

The study presents several maintenance recommendations. Municipalities should develop and implement maintenance programs to return stormwater management ponds to their design levels. The 12 ponds which had dropped below Level 4 should be given highest priority for clean out and maintenance. Step 10 of Comprehensive Stormwater Management Master Plan Guidelines indicates that municipalities will need to establish an ongoing program that assesses the effectiveness of individual stormwater ponds. These programs should include field inspections of ponds including volume/design levels. It should be noted that the Town of Newmarket has such a stormwater facility inspection and maintenance plan in place.

The study further recommends that enhanced street cleaning be conducted in spring to remove sand applied to roads during winter, specifically for the subwatersheds with ponds that have the highest sediment accumulation rates. Investigation is recommended into stormwater ponds that apparently have larger volumes than design criteria. This investigation will help uncover if this is a data management issue/deficiency, operational failing of the pond, or a construction/post construction issue. The information gathered would inform maintenance decisions along with operations/design considerations. The study also recommends that municipalities adopt the Yellow Fish program along with other initiatives aimed at educating the general public about limiting pollutants from entering storm drains and ponds.

Low oxygen conditions were fairly prevalent in the stormwater ponds, with 42 of the 98 ponds surveyed showing daytime hypoxic/anoxic conditions. Water quality sampling at a select number of ponds yielded strong evidence for nutrient release under these conditions. Furthermore, the hot and dry weather that was found to promote these low oxygen conditions are predicted to become more frequent under 2050 climate model scenario. The extent of low oxygen conditions in stormwater ponds was studied and recommendations were provided. Further investigation and implementation of alternative approaches to stormwater management should be considered that do not involve potential for standing water to become anoxic. Figure 5 of the report shows approximately three ponds within the Newmarket area as having a Dissolved Oxygen (DO) levels between 2.5 mg/L and 5 mg/L, and approximately four ponds having DO levels of less than 2.5 mg/L. Appendix D of the report provides data for DO values, however not all of the SWM facilities are identified, with privately owned and operated facilities in the Town of Newmarket missing identification labels. Based on the information provided, it was noted that SWM facility 1 (identified as N-NW3 in the Anoxic report) was sampled to have a DO level of 1.2 mg/L.

Low Impact Design and innovative stormwater management systems could be alternative approaches considered. Further monitoring of stormwater ponds (water and sediment) was suggested, to determine the frequency and

duration of low oxygen conditions, quantity the nutrient release, and assess total nutrient loads exiting stormwater ponds. The report also suggests testing methods and technologies for preventing stormwater pond anoxia or controlling nutrient release from sediments. Incorporating methodologies for monitoring of low oxygen nutrient release into all stormwater ponds is also recommended.

3.2 Phosphorus Loading under Existing Conditions

The Phosphorus loading rates by land use as used by the PTool are provided in **Table 3-5**.

Table 3-5. Phosphorus Loading Rates by Land Use

Land Use	Phosphorus Loading Rate (kg/ha/yr)
High Intensity Commercial	1.82
High Intensity Residential	1.32
Low Intensity Development	0.13
Sod Farm/Golf Course	0.24
Forest	0.1
Transition	0.16
Quarry	0.18
Cropland	0.36
Hay – Pasture	0.12
Open Water	0.26
Unpaved Road	0.83
Wetland	0.1

3.2.1 Methods

The Ontario Ministry of the Environment and Climate Change has provided an online PTool for the Lake Simcoe subwatershed. The methodology used to determine phosphorus loading and removal efficiencies was to use the PTool. The PTool allows one to apply phosphorus loading to a development based on land usage, and then further determine the phosphorus removal efficiency achieved through the use of various best management practices (BMPs).

As the Ptool setup is limited to the number of BMPs that can be applied to each area, the PTool was also recreated in electronic spreadsheet form. This allowed for greater flexibility in calculating phosphorus loading and removal rates within the management units, specifically for calculating removal efficiencies for additional non-SWM facility BMPs. The same phosphorus loading rates and removal efficiencies were applied in the spreadsheet.

The PTool was used to determine the Phosphorus loading rates for all areas, and the Phosphorus removal rates for areas serviced by dry and wet SWM facilities. It should also be noted that the Phosphorus loading and removal calculations were only applied to the Management Unit areas that fall within the Town of Newmarket boundaries. GIS land use areas were not provided outside of the boundary and are outside the scope of this work.

The storm catchment areas were provided by the LSRCA, along with land use data in GIS format. This data was summarized for input into the PTool to determine the Phosphorus loading and removal rates. The total Phosphorus loading and removal rates were then summarized for each Management Unit.

3.3 Phosphorus Removal under Existing Conditions

The impacts of providing SWM BMPs for phosphorus removal were investigated as part of this study. The Phosphorus removal efficiencies by BMP as provided by the PTool are provided in **Table 3-6**.

Table 3-6. Phosphorus Removal Efficiency by BMP

BMP	Phosphorus Removal Efficiency (%)
Bioretention System	0
Constructed Wetland	77
Dry Detention Pond	10
Dry Swales	0
Enhanced Grass/WQ Swales	0
Flow Balancing Systems	77
Green Roofs	0
Perforated Pipe Infil/Exfil	87
Sand or Media Filters	45
Soakaway/Infiltration Trench	60
Sorbative Media Interceptors	79
Underground Storage	25
Vegetated Filter Strip	65
Wet Detention Pond	63

3.3.1 Existing Conditions Removal Efficiency of SWM Facilities

GIS data was provided by the Town of Newmarket which included stormwater management facility locations and stormwater catchment areas. In some instances catchment areas contained multiple SWM facilities; individual catchment areas were not provided for each SWM facility. The SWM facilities are shown on **Figure 3-1**.

Phosphorus loading rates were determined separately for SWM-serviced and non-SWM serviced areas based on existing land use, using the PTool. The PTool was then used to determine the Phosphorus removal rates for SWM-serviced areas. This was done for three scenarios; Existing Conditions (based on the existing removal capacity of the SWM facilities), Proposed Conditions (based on the design removal capacity of the SWM facilities as they would function post clean-out); and a Do Nothing scenario (assuming all SWM facilities will fill over time and at best function with a removal efficiency comparable to a dry SWM facility).

The MOE Stormwater Planning and Design Manual is used in SWM facility design to determine the required permanent pool and active storage volume required to meet the required protection level, based on the percent imperviousness and size of the contributing catchment area. As sediment accumulates within the SWM ponds, the available permanent pool volume is reduced, thereby reducing the sediment removal efficiency of the facility. Desktop and field data was gathered pertaining to the existing conditions of the SWM facilities within the Town of Newmarket. This data was amalgamated from several sources to determine the current functioning protection level, based on the existing available permanent pool volume. The current protection level used to determine if the pond currently functions as a wet pond (protection levels 1 or 2), or a dry pond (protection level 3). The PTool applies a Phosphorus removal efficiency of 63% to wet SWM facilities, and a removal efficiency of 10% for dry SWM facilities. **Table 3-7** provides a summary of the original design protection levels, as well as the current protection levels based on available permanent pool volume. Data was not provided for all of the ponds, and those with insufficient data are not included in the table.

Table 3-7. Original Design Protection Levels for SWM Facilities

Pond ID	Design Pond Type	Design Permanent Pool Volume (m ³)	Catchment Area (ha)	% Impervious	Design Storage Volume (m ³ /ha)	Current Storage Volume (with sediment) (m ³ /ha)	Management Unit	Design Protection Level
1	Wet	655	8.5	74	96	84	11	1
2	Wet	19,646	60	73	346	317	11	1
3	Wet	1,921	19.6	74	170	106	1	3
4	Wet	2,580	25.5	74	206	190	1	3
5	Wet	-	0.42	-	-	-	7	-
6	Wet	7,619	13	2	1,016	1,009	10	1
7	Wet	4,471	11.1	8	417	375	10	1
8	Wet	3,669	11.3	19	360	356	1	1
9	Wet	6,913	37.9	18	230	230	1	1
10	Wet	4,275	13.1	12	296	285	10	1
11	Wet	7,045	19.8	33	255	251	10	1
12	Wet	3,052	9.5	-	540	374	1	1
13	Wet	9,409	3.2	3	2,523	2,281	1	1
14	Wet	5,911	67.3	12	144	89	1	2
16	Wet	-	5.77	-	-	-	7	-
17	Wet	-	1.99	-	-	-	7	-
18	Dry	-	13.1	28	40	38	7	3
19	Wet	201	92.7	28	43	43	7	1
22	Wet	1,272	16.6	24	107	88	7	1
25	Wet	-	7.58	-	-	-	7	-
26	Wet	-	40.5	-	-	-	2	-
27	Wet?	-	-	-	-	-	6	-
28	Wet	-	24.2	-	-	-	3	-
29	Wet	1,428	47.4	25	70	63	3	-
30	Wet	755	18.6	27	81	77	3	-
31	Wet	867	2.1	1	455	200	3	-
32	Wet	-	-	-	-	-	6	-
33	Dry	-	-	-	-	-	6	-
34	Dry	690	35.4	47	67	39	2	3
35	Wet	3,785	19	28	235	104	2	1
36	wet	1,400	37.7	38	77	65	2	2
37	Dry	-	19	-	-	-	2	-
38	Wet	8,209	60.8	62	307	306	2	1
39	Wet	893	17	42	98	12	2	1
40	Dry	-	-	-	-	-	2	-
41	Wet	909	25.4	30	58	52	2	1

Pond ID	Design Pond Type	Design Permanent Pool Volume (m ³)	Catchment Area (ha)	% Impervious	Design Storage Volume (m ³ /ha)	Current Storage Volume (with sediment)	Management Unit	Design Protection Level
42	Wet	-	80.7	37	-	-	8	1
43	Wet	739	97.2	25	123	17	9	1
44	Wet	2,701	53.6	42	90	61	9	1
45	Dry	-	-	-	-	-	10	-
46	Dry	-	-	-	-	-	9	-
47	Dry	-	-	-	-	-	9	-
48	Dry	-	-	-	-	-	9	-
49	Dry	-	-	-	-	-	9	-
50	Dry	-	-	-	-	-	9	-
51	Wet	-	-	-	-	-	6	-
52	Wet	2,951	21.1	29	163	158	1	1
53	Wet	563	4.8	66	170	170	2	1
54	Dry	-	2	-	-	-	2	-
55/56/62-one pond	Wet	10,308	86.9	58	1,340	1,325	6	1
57	Wet	-	-	-	-	-	2	-
58	Dry	1,533	20.7	45	109	70	3	1
59	Dry	-	-	-	-	-	9	-
60	Dry	-	-	-	-	-	9	-
61	Wet	-	28.7	-	-	-	2	-
63	Dry	-	8.04	-	-	-	4	-
64	Wet	-	10.44	-	-	-	2	-
65	Dry	-	13.85	-	-	-	2	-
66	online	-	-	-	-	-	1	-
67	Wet	-	20.57	-	-	-	10	1
68	Dry	-	24.48	-	-	-	10	-
70	Wet	4,452	31.6	67	107	72	5	-
71	Wet	4,382	24.2	67	233	148	6	1
73	Dry	-	14	26	40	40	3	3
74	Wet	491	53.2	35	50	43	2	1
75	Wet	120	6.3	9	59	59	2	1
76	Dry	41	55.3	43	41	41	4	3
77	Wet	8,498	101.5	47	219	196	8	1
79	Dry	-	22.3	33	40	40	1	3
80	Dry	15	15.4	29	41	40	1	3
81	Wet	200	76.6	44	43	43	1	1
83	online	-	7.4	-	-	-	1	-
84	Wet	43	80.3	33	41	40	11	1
85	Dry	-	8.1	27	40	40	9	3

Pond ID	Design Pond Type	Design Permanent Pool Volume (m ³)	Catchment Area (ha)	% Impervious	Design Storage Volume (m ³ /ha)	Current Storage Volume (with sediment)	Management Unit	Design Protection Level
86	Wet	11	7.7	26	41	40	9	1
87	Dry	-	115.3	23	40	40	9	3
88	Dry	-	17.4	27	40	40	9	3
89	Wet	1,302	26.6	77	89	71	5	1
91	Dry	-	15.6	52	40	40	8	1
92	Dry	-	1.3	57	40	40	8	3
93	Wet	-	-	-	-	-	2	-
94	Wet	-	-	-	-	-	10	1
95	Dry	-	22.8	-	-	-	10	-
96	Wet	-	-	-	-	-	2	1
97	Wet	-	17.1	-	-	-	6	1
98	Wet	-	12.9	-	-	-	2	1
99	Wet	-	16.53	-	-	-	10	1
101	Wet	-	18.7	-	-	-	2	-
102	Wet	-	13.72	-	-	-	3	-
23&24	Wet	-	5.5	-	-	-	7	1

The PTool was used to determine the existing conditions Phosphorus loading rates based on land use, and the Phosphorus removal rates based on the existing SWM facility functional protection levels. A summary of the functional protection level for each pond under existing and proposed conditions is provided in **Appendix B**. Due to the high potential for resuspension of sediment, online SWM facilities were not included in the Phosphorus removal calculations. Phosphorus removal was calculated using the PTool (see output provided in **Appendix B**). Phosphorus removal is calculated in the PTool by subtracting the post-development Phosphorus loading from the pre-development Phosphorus loading rate.

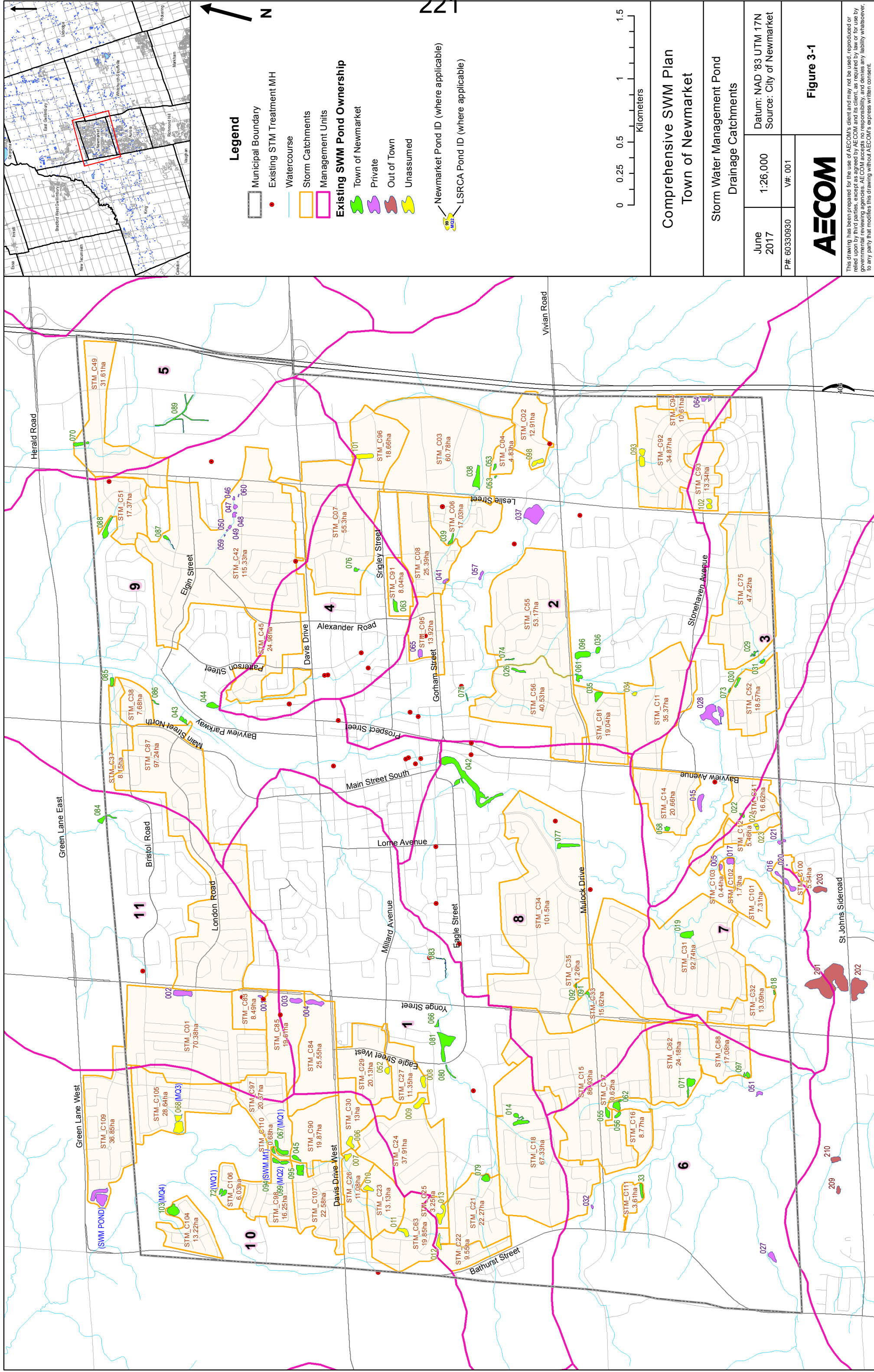
The Phosphorus loading and removal rates for existing conditions are summarized in **Table 3-8** for each of the management units. The SWM facilities are shown on **Figure 3-1**.

Table 3-8. Existing Conditions Phosphorus Loading and Removal Rates for SWM Facilities

Management Unit	SWM Facilities ¹	Area ² (ha)	Existing Conditions		
			Existing Development without SWM – Annual TP Loading (kg)	Existing Development & Existing SWM – Annual TP Loading (kg)	Effectiveness of Existing SWM (% of TP loading reduction &/or comments)
1	3,4,8,9,12,13,14,52,66,79,80,81,83	526.4	696.8	546.5	22
2	26,34,35,36,37,38,39,40,41,53,54,57,64,64,65,74,75,93,96,98,101	731.1	978.6	760.3	22
3	28,29,30,31,58,73,102	248.4	238.6	204.7	14
4	63,76	152.7	224.0	215.2	4
5	70,89	124.3	223.6	193.6	13
6	27,32,33,51,55,56,62,71,97	369.4	260.5	210.5	19
7	5,16,17,18,19,22,23/24,25	164.7	130.4	69.3	47
8	42,77,91,92	416.8	553.6	474.6	14
9	43,44,46,47,48,49,50,59,60,85,86,87,88	533.3	687.9	651.3	5
10	6,7,10,11,45,67,68,94,95,99 (MQ2), WQ1, MQ4	305.9	223.5	150.2	33
11	1,2,84	241.8	349.0	271.0	22

Notes:

1. All ponds shown, ponds not included in Phosphorus removal calculations (e.g. online) shown as crossed out.
2. Management Unit areas represent the portion of each management unit located **within the Town of Newmarket boundary**.
3. Phosphorus loading and removal calculations are provided in **Appendix B**.



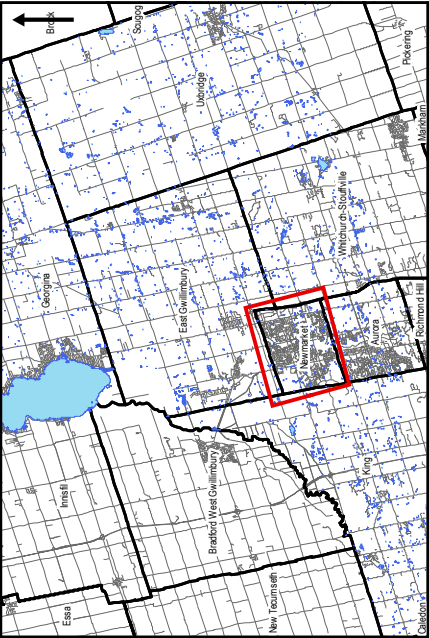
4. Future Conditions {Step 5}

4.1 Proposed Development

Proposed land uses for the Study Area were provided by the Town of Newmarket and are shown on **Figure 4-1** and are summarized in **Table 4-1**. Refer to **Table 2-1** for existing land use in the study area. The three most dominant land uses in the Study Area include urban centres, residential, and open space. Approximately 54 percent of the Study Area is dominated by residential, which consists of estate residential (Town of Newmarket, 2014). The parks and open spaces land use type consists of major parks, golf courses, conservation areas, trail systems and river corridors, which comprise 11 percent of the Study Area (Town of Newmarket, 2014). Urban land use (8 percent) consists of a broad range of office, and spaces that support jobs, housing and services (Town of Newmarket, 2014). Natural heritage features which are part of the Town's Natural Heritage System (6 percent) consist of locally significant meadows, woodlands and wetlands, as well hydrological networks of watercourse and floodplains associated with the East Holland River (Town of Newmarket, 2014). These areas promote active and passive recreation and provide physical linkages between natural heritage features. Institutional and commercial land uses, each comprise 2 percent and 3 percent of the Study Area, respectively. Institutional areas primarily consist of post-secondary educational facilities, long-term care facilities and social, cultural and administrative facilities (Town of Newmarket, 2014). Commercial areas mainly promote retail and service orientated activities (Town of Newmarket, 2014).

Table 4-1. Proposed Land Use Area

Land Use Type	Area (ha)	Percentage (%)
Urban Centre	312.24	8%
Natural Heritage	225.03	6%
General Employment	153.20	4%
Mixed Employment	167.80	5%
<i>Subtotal:</i>	858.26	
Open Spaces and Oak Ridge Moraine:		
Open Space	397.28	11%
Oak Ridge Moraine	272.52	7%
<i>Subtotal:</i>	669.80	
Institutional	78.75	2%
Commercial	107.53	3%
Residential	1999.33	54%
<i>Subtotal:</i>	2185.62	
Total:	3713.68	100%

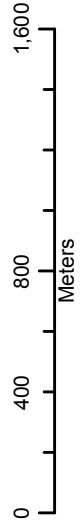


Legend

- Land Use***

 - Commercial
 - Emerging Residential
 - General Employment
 - Mixed Office/Light Employment
 - Institutional
 - Manicured Open Space
 - Natural Heritage Feature
 - Intensive Agriculture
 - Oak Ridge Moraine Boundary
 - Stable Residential
 - Urban Centre
- Base Layers**

 - Watercourses
 - Roads
 - Waterbodies
 - Municipal Boundary



Town of Newmarket Stormwater Master Plan

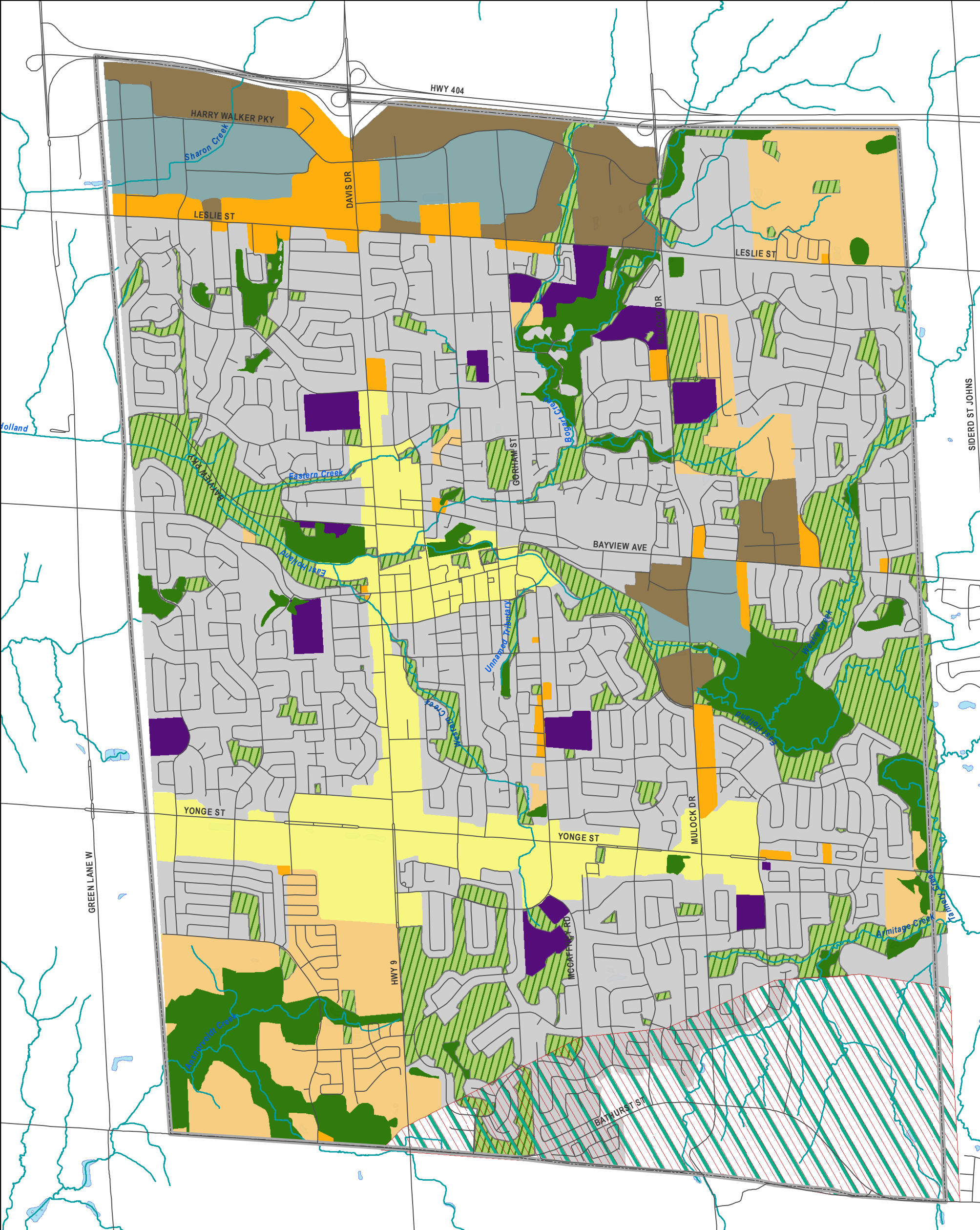
Future Land Use in Study Area

November 2016	1:25,000	Datum: NAD 83 Zone 17 Source: Town of Newmarket - Official Plan 2006-2026 - Schedule A, York Region
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Figure 4-1

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4.2 Hydrology

The development and the intensification under future conditions shows an increasing trend in impervious area. The increased imperviousness results in an increase in runoff if not mitigated. The increase in runoff comes with a secondary issue of increased sediment and contaminant loading to downstream water bodies. Low Impact Development (LID) and Best Management Practices (BMPs) can be implemented to mitigate the effects of increased runoff. Various methods of reducing runoff are discussed in subsequent sections of this report, some of which include downspout and roof leader disconnection programs, reconnecting floodplains where possible, and retrofitting existing SWM facilities.

4.2.1 Water Balance

Infiltration within a sub catchment joins the groundwater flow system, and under steady state conditions eventually discharges to the surface watercourses as base flow. This simplified version implies that no significant interflow occurs and that no long-term changes occur in the volume of water stored in the surface water and groundwater reservoirs. This suggests that the annual precipitation, P , is equal to the sum of the average annual stream flow, Q , and the average annual evapotranspiration, ET , such that $P = Q + ET$.

The water balance for the study areas was developed in accordance with Section 3.2 of the 2003 MOE Stormwater Management Planning and Design Manual (Manual). Based on the Management Unit catchment area and an average annual precipitation of 767 mm, the average annual precipitation was calculated as summarized in **Table 4-2**.

The average annual evapotranspiration rate was obtained from Table 3.1 of the Manual. The table takes into account topography, soils, and ground cover. Site specific values were estimated using this table for both existing and proposed conditions, with percent impervious values used to evaluate evapotranspiration and recharge values. The existing and proposed conditions annual precipitation values remain unchanged, with slight modifications applied to evapotranspiration and recharge values to reflect the minor changes between existing and proposed conditions identified in the land use analysis. Values for recharge were further revised for proposed conditions to account for the infiltration that will be provided by the proposed LID measures. Values for LID infiltration were based on an assumed 10 mm rainfall capture, distributed over the total LID treatment area for each measurement unit. MOE climate data was referenced to determine the total number of annual events exceeding 10 mm. This annual volume was applied to the proposed conditions recharge value in **Table 4-2** below. As the intent of the LID measures is mainly to reduce phosphorus loading, the increase in infiltration is secondary, and will have the added benefit of mitigating the effects of development. Detailed calculations are provided in **Appendix C**.

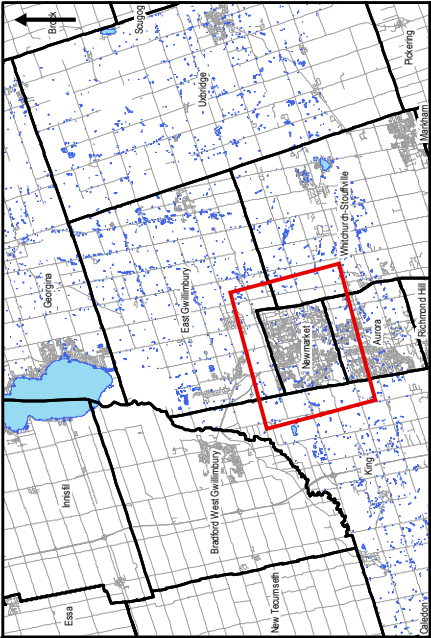
Table 4-2. Water Balance Summary

Parameter	Area (ha)	Imperviousness (%)	Precipitation [P] (m)	Evapo-transpiration [ET] (m)	Infiltration [I]	Runoff [(Q _s)]	Q _s Difference Exs vs Prop
EXISTING CONDITIONS							
Management Unit 1	525.64	75.72	4,031,659	684,072	232,278	3,115,308	
Management Unit 2	747.9	75.68	5,736,393	974,927	331,038	4,430,428	
Management Unit 3	251.76	67.06	1,930,999	444,503	150,932	1,335,564	
Management Unit 4	152.72	84.85	1,171,362	124,015	42,109	1,005,238	
Management Unit 5	118.36	86.96	907,821	82,727	28,090	797,004	
Management Unit 6	378.57	45.13	2,903,632	1,113,386	378,053	1,412,193	
Management Unit 7	97.85	52.97	750,510	246,661	83,754	420,094	
Management Unit 8	416.82	76.36	3,197,009	528,154	179,336	2,489,519	
Management Unit 9	518.45	75.39	3,976,512	683,885	232,215	3,060,411	
Management Unit 10	303.33	56.33	2,326,541	710,008	241,085	1,375,448	
Management Unit 11	228.38	85.21	1,751,675	181,047	61,475	1,509,153	
PROPOSED CONDITIONS - WITH LID							
Management Unit 1	525.64	77.86	4,031,659	684,072	226,431	3,121,156	5,848
Management Unit 2	747.9	81.83	5,736,393	974,927	254,369	4,507,098	76,670
Management Unit 3	251.76	74.59	1,930,999	444,503	116,429	1,370,066	34,503
Management Unit 4	152.72	83.97	1,171,362	124,015	44,555	1,002,792	-2,446
Management Unit 5	118.36	88.96	907,821	82,727	40,229	784,865	-12,139
Management Unit 6	378.57	49.7	2,903,632	1,113,386	346,566	1,443,680	31,487
Management Unit 7	97.85	65.05	750,510	246,661	62,241	441,607	21,513
Management Unit 8	416.82	81.32	3,197,009	528,154	142,834	2,526,021	36,502
Management Unit 9	518.45	80.24	3,976,512	683,885	187,576	3,105,050	44,639
Management Unit 10	303.33	73.39	2,326,541	710,008	148,028	1,468,505	93,057
Management Unit 11	228.38	85.85	1,751,675	181,047	67,432	1,503,196	-5,957
PROPOSED CONDITIONS - NO LID							
Management Unit 1	525.64	77.86	4,031,659	623,779	211,806	3,196,074	74,918
Management Unit 2	747.9	81.83	5,736,393	728,389	247,326.04	4,760,678	253,580
Management Unit 3	251.76	74.59	1,930,999	342,891	116,429.43	1,471,679	101,612
Management Unit 4	152.72	83.97	1,171,362	131,218	44,555.45	995,589	-7,203
Management Unit 5	118.36	88.96	907,821	70,039	23,782	814,001	29,136
Management Unit 6	378.57	79.7	2,903,632	1,020,655	139,866.47	1,743,110	299,431
Management Unit 7	97.85	65.05	750,510	183,304	62,241.41	504,964	63,357
Management Unit 8	416.82	81.32	3,197,009	417,340	141,708.80	2,637,960	111,939
Management Unit 9	518.45	80.24	3,976,512	549,109	186,451.21	3,240,951	135,901
Management Unit 10	303.33	73.39	2,326,541	432,638	146,903.33	1,746,999	278,495
Management Unit 11	228.38	85.85	1,751,675	173,213	58,814.70	1,519,647	16,452

Note: Evapotranspiration and Recharge coefficients taken from Table 3.1 of the 2003 MOE SWM Planning and Design Manual.

4.2.2 Additional Peak Flow Studies for the Town of Newmarket

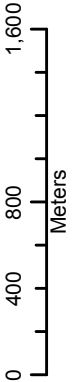
As stated in Section 2-8, hydrological modeling was conducted for the *Hydrology Report for the West Holland River, East Holland River and Maskinonge River Watersheds* (Cumming Cockburn Ltd., 2005). Hydrologic modeling for each watershed was conducted using updated land use information and development plans in order to better understand the impact of urban intensification. The report used an event-based flow model, generating results for a variety of storm events (2, 5, 10, 25, 100 and regional storm events) for key flow points within each watershed (shown in **Figure 4-2**). For the purposes of this report, the results from the key flow points located within and directly outside of the Town of Newmarket’s boundary were extracted and can be viewed in **Table 4-3**. The table displays the difference between existing peak flows and modeled future peak flows for the storm events previously listed. Future peak flows under a no SWM control scenario are also included. It can be noted that an increase in peak flow rates occurs at the majority of flow points under the no SWM control scenario.



Legend

- Flow Node*
- Node Catchment*
- Watercourse Regime
 - Permanent
 - Intermittent
- Subwatersheds
- Base Layers
 - Roads
 - Waterbodies
 - Municipal Boundary

Source: Cumming Cockburn Limited, 2005; Hydrology Report (Final) – Hydrologic and Hydraulic Modeling For the West Holland River, East Holland River and Maskonge River Watersheds.



Town of Newmarket Stormwater Master Plan

CCL 2005 Flow Nodes and Catchments for Peak Flow Analysis

November 2016	1:35,000	Datum: NAD 83 Zone 17 Source: CCL, York Region Town of Newmarket
PH: 60330930	V#: 002	

AECOM

Figure 4-2

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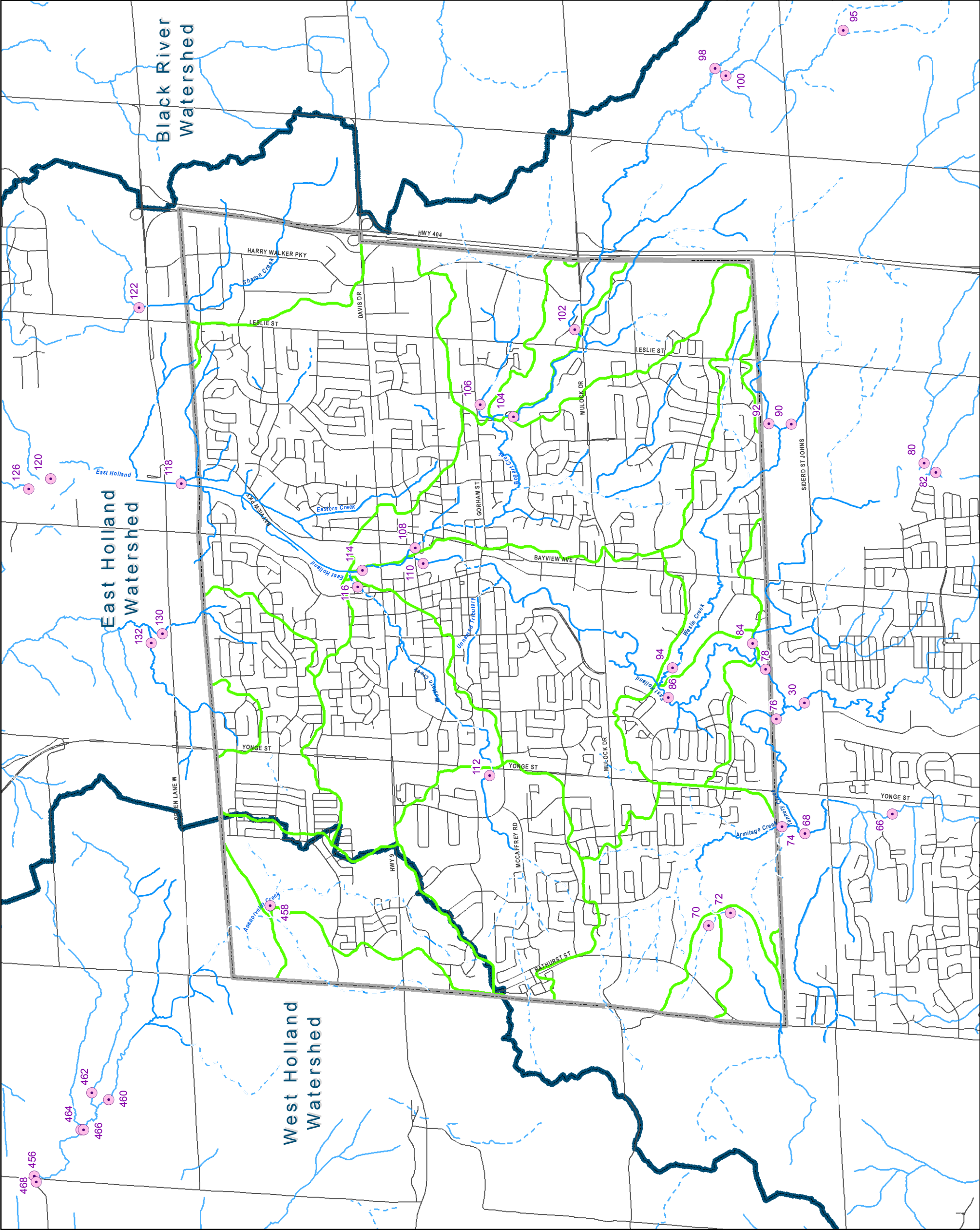


Table 4-3. CCL 2005 Peak flow modeling results

Flow Point	Drainage Area (ha)	Type of Simulated Peak Flow	Peak Flows (m ³ /s) under Design and Regional Storms						
			2-Year	5-Year	10-Year	25-Year	50-Year	100-Year	Regional
70	41.5	Peak Flow - Existing (m ³ /s)	0.5	0.8	1.1	1.5	1.7	2.0	4.4
		Peak Flow - Future (m ³ /s)	0.5	0.8	1.1	1.5	1.7	2.0	4.4
		Peak Flow Difference (m ³ /s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		Peak Flow Difference (%)	0%	0%	0%	0%	0%	0%	0%
		Peak Flow - Future without SWMFs (m ³ /s)	0.5	0.8	1.1	1.5	1.7	2.0	
72	256.1	Peak Flow - Existing (m ³ /s)	1.4	2.4	3.1	4.1	4.9	5.8	21.5
		Peak Flow - Future (m ³ /s)	1.4	2.4	3.2	4.2	5.0	5.9	21.6
		Peak Flow Difference (m ³ /s)	0.0	0.1	0.1	0.1	0.1	0.1	0.1
		Peak Flow Difference (%)	1%	2%	2%	2%	2%	2%	0%
		Peak Flow - Future without SWMFs (m ³ /s)	1.4	2.4	3.2	4.2	5.0	5.8	
74	688.2	Peak Flow - Existing (m ³ /s)	3.0	5.8	8.3	11.4	13.9	16.6	57.8
		Peak Flow - Future (m ³ /s)	3.9	7.1	10.5	16.2	19.9	23.2	66.5
		Peak Flow Difference (m ³ /s)	0.9	1.3	2.1	4.8	6.1	6.5	8.6
		Peak Flow Difference (%)	30%	22%	26%	42%	44%	39%	15%
		Peak Flow - Future without SWMFs (m ³ /s)	6.8	10.5	14.0	18.4	22.1	30.0	
76	3885.3	Peak Flow - Existing (m ³ /s)	19.0	31.7	41.5	54.3	65.0	75.9	279.2
		Peak Flow - Future (m ³ /s)	21.0	35.0	46.0	60.4	73.1	85.2	298.7
		Peak Flow Difference (m ³ /s)	2.0	3.3	4.5	6.2	8.1	9.3	19.5
		Peak Flow Difference (%)	11%	10%	11%	11%	12%	12%	7%
		Peak Flow - Future without SWMFs (m ³ /s)	26.1	41.0	51.9	66.3	79.9	92.6	
78	9106.1	Peak Flow - Existing (m ³ /s)	23.6	39.3	52.9	70.7	84.7	99.0	400.1
		Peak Flow - Future (m ³ /s)	27.1	46.4	61.7	82.6	100.7	117.8	441.4
		Peak Flow Difference (m ³ /s)	3.5	7.1	8.8	11.9	16.0	18.7	41.2
		Peak Flow Difference (%)	15%	18%	17%	17%	19%	19%	10%
		Peak Flow - Future without SWMFs (m ³ /s)	36.2	55.8	70.0	89.7	107.5	125.2	
84	959.2	Peak Flow - Existing (m ³ /s)	5.9	10.5	14.9	20.6	24.6	31.5	84.0
		Peak Flow - Future (m ³ /s)	7.2	11.8	16.5	24.5	31.0	36.3	99.6
		Peak Flow Difference (m ³ /s)	1.3	1.2	1.6	3.9	6.5	4.8	15.6
		Peak Flow Difference (%)	22%	12%	11%	19%	26%	15%	19%
		Peak Flow - Future without SWMFs (m ³ /s)	14.1	22.2	28.2	37.2	49.0	57.2	
86	10065.3	Peak Flow - Existing (m ³ /s)	23.2	39.3	52.4	70.7	85.2	99.6	435.9
		Peak Flow - Future (m ³ /s)	25.7	44.4	60.3	82.5	100.4	118.0	488.8
		Peak Flow Difference (m ³ /s)	2.5	5.1	7.9	11.8	15.2	18.4	52.9
		Peak Flow Difference (%)	11%	13%	15%	17%	18%	18%	12%
		Peak Flow - Future without SWMFs (m ³ /s)	37.6	58.2	72.5	95.2	113.6	133.0	
94	1301.1	Peak Flow - Existing (m ³ /s)	4.1	7.8	10.1	13.6	16.3	18.9	70.0
		Peak Flow - Future (m ³ /s)	4.1	7.8	10.0	13.2	16.1	19.3	86.6
		Peak Flow Difference (m ³ /s)	0.0	0.0	0.0	-0.4	-0.1	0.4	16.6
		Peak Flow Difference (%)	-1%	0%	0%	-3%	-1%	2%	24%
		Peak Flow - Future without SWMFs (m ³ /s)	7.3	11.3	15.5	20.2	24.1	28.2	
102	1429.4	Peak Flow - Existing (m ³ /s)	2.2	3.8	5.0	6.9	8.5	10.2	63.4
		Peak Flow - Future (m ³ /s)	2.4	4.1	5.5	7.5	9.4	11.5	68.4
		Peak Flow Difference (m ³ /s)	0.2	0.3	0.5	0.6	0.9	1.3	5.0
		Peak Flow Difference (%)	10%	9%	9%	9%	11%	13%	8%
		Peak Flow - Future without SWMFs (m ³ /s)	2.6	4.4	5.8	7.9	9.7	11.7	
104	1619.5	Peak Flow - Existing (m ³ /s)	2.8	4.8	6.4	8.8	10.7	12.9	74.7
		Peak Flow - Future (m ³ /s)	2.9	5.0	6.6	9.4	11.5	13.7	77.9
		Peak Flow Difference (m ³ /s)	0.1	0.2	0.3	0.7	0.8	0.8	3.2
		Peak Flow Difference (%)	4%	4%	4%	8%	7%	7%	4%
		Peak Flow - Future without SWMFs (m ³ /s)	5.8	8.4	10.5	13.1	15.1	18.8	
106	234.2	Peak Flow - Existing (m ³ /s)	3.0	6.9	8.3	11.6	13.3	15.3	30.4
		Peak Flow - Future (m ³ /s)	3.0	6.9	8.3	11.5	13.1	15.1	30.7
		Peak Flow Difference (m ³ /s)	0.0	0.0	0.0	-0.1	-0.2	-0.2	0.3
		Peak Flow Difference (%)	2%	0%	0%	-1%	-2%	-1%	1%
		Peak Flow - Future without SWMFs (m ³ /s)	10.2	14.9	18.0	23.5	27.0	30.6	

Flow Point	Drainage Area (ha)	Type of Simulated Peak Flow	Peak Flows (m ³ /s) under Design and Regional Storms						
			2-Year	5-Year	10-Year	25-Year	50-Year	100-Year	Regional
108	2288.4	Peak Flow - Existing (m ³ /s)	7.6	13.0	17.8	24.5	30.0	35.4	127.7
		Peak Flow - Future (m ³ /s)	9.6	14.9	20.2	28.5	35.0	42.2	140.3
		Peak Flow Difference (m ³ /s)	2.0	1.9	2.4	4.1	5.0	6.8	12.5
		Peak Flow Difference (%)	26%	15%	13%	17%	17%	19%	10%
		Peak Flow - Future without SWMFs (m ³ /s)	22.4	32.5	40.9	57.3	66.9	78.0	
110	11834.9	Peak Flow - Existing (m ³ /s)	27.3	45.8	60.3	80.5	96.1	111.7	478.2
		Peak Flow - Future (m ³ /s)	30.3	51.8	70.2	94.3	113.6	133.1	541.1
		Peak Flow Difference (m ³ /s)	3.1	6.0	9.9	13.7	17.5	21.4	62.9
		Peak Flow Difference (%)	11%	13%	16%	17%	18%	19%	13%
		Peak Flow - Future without SWMFs (m ³ /s)	45.4	68.8	85.1	108.3	127.6	146.3	
112	324.4	Peak Flow - Existing (m ³ /s)	5.3	8.0	9.8	12.1	13.9	16.4	38.7
		Peak Flow - Future (m ³ /s)	5.1	7.8	9.5	11.7	13.4	15.9	38.7
		Peak Flow Difference (m ³ /s)	-0.1	-0.2	-0.3	-0.4	-0.5	-0.5	0.0
		Peak Flow Difference (%)	-2%	-3%	-3%	-3%	-4%	-3%	0%
		Peak Flow - Future without SWMFs (m ³ /s)	10.2	15.1	18.3	24.4	28.2	32.2	
114	599.9	Peak Flow - Existing (m ³ /s)	13.5	21.0	25.8	32.3	37.3	42.5	69.1
		Peak Flow - Future (m ³ /s)	13.2	20.3	24.7	30.8	35.7	40.8	69.6
		Peak Flow Difference (m ³ /s)	-0.3	-0.7	-1.1	-1.5	-1.6	-1.7	0.4
		Peak Flow Difference (%)	-2%	-4%	-4%	-5%	-4%	-4%	1%
		Peak Flow - Future without SWMFs (m ³ /s)	19.0	28.7	34.8	43.5	50.0	56.5	
116	14123.3	Peak Flow - Existing (m ³ /s)	32.2	54.1	70.9	94.2	112.3	131.1	573.7
		Peak Flow - Future (m ³ /s)	35.8	60.8	81.8	109.6	131.8	154.4	648.9
		Peak Flow Difference (m ³ /s)	3.6	6.8	10.9	15.4	19.5	23.3	75.2
		Peak Flow Difference (%)	11%	13%	15%	16%	17%	18%	13%
		Peak Flow - Future without SWMFs (m ³ /s)	58.3	91.6	116.9	148.7	176.3	203.3	
118	15415.5	Peak Flow - Existing (m ³ /s)	35.6	58.7	75.7	98.4	115.5	133.6	594.6
		Peak Flow - Future (m ³ /s)	39.2	65.4	85.1	110.7	129.8	153.7	670.3
		Peak Flow Difference (m ³ /s)	3.6	6.7	9.5	12.4	14.3	20.1	75.8
		Peak Flow Difference (%)	10%	11%	13%	13%	12%	15%	13%
		Peak Flow - Future without SWMFs (m ³ /s)	69.0	102.1	123.9	148.9	172.4	195.4	
458	426.7	Peak Flow - Existing (m ³ /s)	2.8	4.8	7.0	9.5	12.4	14.4	36.4
		Peak Flow - Future (m ³ /s)	4.2	8.2	10.6	15.9	19.3	23.4	52.6
		Peak Flow Difference (m ³ /s)	1.4	3.4	3.6	6.3	6.9	9.0	16.2
		Peak Flow Difference (%)	49%	70%	52%	67%	56%	62%	45%
		Peak Flow - Future without SWMFs (m ³ /s)	10.9	17.3	21.3	28.3	33.0	37.8	

In addition to the CCL 2005 Study, two of the Town of Newmarket's Official Plan Amendments (OPA) made water quantity control recommendations for future development. The OPAs included peak flow analysis to determine the overall impact of future development on local watercourses. Both OPAs found that post development peak flows increased under an uncontrolled future scenario. The following recommendations were made in each OPA:

Armitage Valley Southwest Newmarket Master Servicing Update (Schaeffers, 2001)

- Recommended that a 2 year (36mm) 24 hour detention erosion control be implemented within the watershed
- Recommended that quantity control for post development conditions remain consistent with pre-development conditions through the use of SWM controls.
- Recommended four SWM ponds were to be used to service the proposed development; see **South West Newmarket Land Use Plan- Location of Official Plan Amendment 6**, (Figure 1 Armitage Valley Southwest Newmarket Land Use Plan), from the February 2009 Armitage Valley Southwest Newmarket Master Servicing Update prepared by Schaeffer & Associates Ltd)
 - o Pond A is an existing pond. Pond retrofitting was recommended to allow the pond to handle the increased amount of stormwater runoff.
 - o Pond B and C are existing ponds that were relocated to help better service the new community.

- Pond D was created to help further control the increased stormwater runoff from the new development.
- Recommended that ponds be designed with the ability to adequately control 100 year storm events.

Woodland Hills Subdivision – Phase 1 (Schaeffers, 2000)

- Recommended major and minor systems to be designed to convey flows up to and including 100 year storm events to end-of-pipe controls.
- Recommended retrofitting the existing pond (Pond E2) to accommodate the increased run-off associated with post-development conditions, (see **North West Newmarket - Location of Official Plan Amendment 55**, Figure 1.1 and Figure 1.2 of from the January 2000 Woodland Hills Subdivision – Phase 1 Northwest Newmarket OTTSWMM and H.G.L. Analysis, prepared by Schaeffer & Associates Ltd).

While both OPAs pertain more to localized development within the Town of Newmarket their methods and recommendations for water quantity control can act as guidelines for future development in Newmarket.

4.3 Stream Morphology

Watercourses are dynamic features that are constantly adjusting their boundaries to achieve equilibrium and erosion is a natural and necessary process that occurs along all watercourses. However, erosion processes may also be accelerated by anthropogenic impacts, notably urbanization. When urbanization occurs the catchment becomes more impervious than under natural vegetative conditions. As such, urbanization drastically alters the flow regime of receiving watercourses by increasing the intensity and frequency of channel altering flood events. Depending on the magnitude of land use and degree of stormwater management control, the impacts on the channel may include accelerated adjustment (e.g., bank and bed erosion, meander migration) that may result in risk to property or infrastructure. Channels throughout the Town of Newmarket are currently adjusting to historic land use changes. Further changes in land use could have the potential to exacerbate channel adjustments.

Aside from change in flow regime, the following are potential impacts/consequences of urban development on stream morphology that should be considered as the Town of Newmarket continues to evolve and grow:

- *Channelization of Watercourses:* In an effort to reduce the area of a watercourse, reaches are often straightened. Straightening a channel increase the energy gradient which causes the channel to become unstable and shift towards a new equilibrium.
- *Changes in Sediment Supply Regime:* Land use change alters the quantity and calibre of sediment supplied to the channel which can drastically change channel morphology.
- *Reduction in Riparian Vegetation:* Locally, loss of riparian vegetation can increase runoff and accelerate sediment supply. As well, a reduction in riparian vegetation drastically reduces bank strength which can lead to increased scouring and channel migration.
- *Loss of Channels:* Often ephemeral headwater channels are buried/removed to make way for development/infrastructure. Loss of headwater channels alters the natural flow and sediment supply regimes.

Future land use change was assessed in each management unit from a stream morphology perspective. Units #1 and #4 are considered high constraint as channels within these units have been historically straightened (i.e. reduction in channel length) leading to high stream power which has caused bank and bed scouring. Also, debris and sediment accumulations were noted throughout these management units. As well, several headwater tributaries have been removed during previous development. Future land use conditions in both units indicate an increase in Urban Centre land use. Further urbanization within these units can exacerbate channel instability and erosional issues through flow and sediment regime alteration and reduction in riparian vegetation. This increased channel instability degrades aquatic and riparian habitat and can put surrounding infrastructure at risk.

The other nine management units do not pose the potential risk that Units 1 and 4 do. However, as development occurs throughout the Town of Newmarket the potential impacts/consequences of urban development on stream morphology as noted above should be considered.

Furthermore, although urban development can often negatively impact stream morphology, future changes in land use can present opportunities to improve stream morphological conditions. The following are opportunities to improve stream morphological conditions throughout the Town of Newmarket, and especially within Management Units 1 and 4:

- *Re-establish Riparian Vegetation:* Rooting systems of riparian vegetation drastically increases bank strength which reduces bank erosion and channel migration.
- *Naturalize Previously Altered Reaches:* Applying the principles of natural channel design to previously altered/channelized reaches will improve reach stability and the quality and quantity of aquatic habitat.
- *Re-establish Floodplain:* Urban development often occurs within a channel's floodplain and well into the riparian zone. The floodplain can be re-established by removing anthropogenic fill, wetland creation, and reducing impervious surfaces. Re-naturalizing the floodplain provides water and sediment storage which reduces the magnitude of flood events and curtails fine sediment loading as well as improves aquatic and terrestrial habitat.

4.4 Hydrogeology

Changes in land use which results in a net increase in impervious surface area has the potential to reduce the quantity of aquifer recharge from infiltration. The magnitude of potential impact will be dependent on a combination of pre-existing soil properties and topography within the subject area. For example, highly permeable soils (i.e. sand and/or gravel) offer high infiltration rates and are typically designated as groundwater recharge areas. Increases in the amount of impervious surface arising from land use changes within these areas will pose a more significant impact on groundwater recharge rates as compared to those areas which are dominated by fine-textured soils (i.e., silt, clay and till) which offer a lower infiltration opportunity and are subject to proportionately high quantities of surface run off. As illustrated in **Figure 2-5**, the study area is dominated by fine-textured soils that generally offer minimal opportunities for groundwater recharge. The only component of the study area designated as a groundwater recharge area is located within the ORM, which encompasses a portion of Management Units 1, 6, and 10. Since future land use within the ORM is restricted, the only areas in which there could potentially be a net increase in impervious surface area due to future development will occur outside of the designated groundwater recharge area. Therefore, potential impacts related to groundwater recharge are considered minor within the study area.

Increases in groundwater demand (i.e., municipal pumping) will occur as a result of planned future development within the study area. Currently, there are four (4) municipal water supply wells located within the study area, as identified in **Figure 2-7**. These wells obtain their source water from deep aquifer systems (Thornccliffe Aquifer and the Yonge Street Aquifer) that generally are not considered to be hydraulically connected to local surface water features, such as wetlands and coldwater streams. Although increases in municipal pumping will pose a low likelihood of impacting the quantity and/or quality of groundwater discharge within the study area, municipal groundwater taking from the deep aquifers and subsequently discharged via sewage treatment would not be returned to the same subwatershed.

Increases in groundwater use for the purpose of private water supply (i.e., domestic, commercial and/or industrial purposes) may derive their source from shallow aquifers. Shallow aquifers have a high potential to be hydraulically connected to local surface water features, and therefore, an increase in private water supply demand may potentially impact groundwater discharge to local surface water features within the area of influence.

Reduction in groundwater quality due to the increased application of winter road maintenance products (i.e., salt, brines, etc.), hydrocarbon impacts from roadways, and nutrient loading from fertilizer use (primarily nitrogen,

potassium and Phosphorus) within areas of surficial sand deposits applies to areas within the ORM. Outside the ORM, there is no significant pathway from the surface to the underlying aquifer due to thick low permeability aquitard materials at surface, with the exception of areas with coarse-textured alluvial deposits and glaciofluvial deposits. Therefore, the potential for impacts to groundwater due to increases in these contaminants is considered low.

4.5 Aquatic Ecology

Increases in surface water run-off as a result of increases in impervious surfaces associated with land use changes, such as reductions in natural vegetation cover to support urban land development, may negatively affect receiving watercourses and waterbodies identified in the study area. Increased volumes and velocities of surface water flowing into nearby watercourses may cause stream bank and bed erosion, increases in turbidity, increases in water temperatures and decreases in water quality, all of which can lead to degradation of aquatic habitats. Additionally, eutrophication of watercourses and waterbodies, in which algal blooms form in response to increased level of nutrients, may result from increases in phosphorus loading. Consequently, this may also lead to increased turbidity, decreased water quality, decreased aquatic species diversity, and may also lead to anoxic conditions of the affected watercourse and water body (Chislock *et al.*, 2013). Aquatic features identified as being potentially affected by increased run-off and phosphorus loading due to changes in future land use are described below.

Management Units 2, 3, 5 and 6 contain tributaries of Bogart Creek, Weslie Creek, Sharon Creek and Armitage Creek that are identified as cold water reaches, respectively. These reaches may support cold water aquatic species that are sensitive to changes in water temperature and water quality. Reductions in open space and natural heritage lands for future development within Management Units 2 and 3 are anticipated to result in increased volumes of surface water entering Bogart Creek and Weslie Creek, respectively, due to increases in impervious surfaces. Both Management Units are anticipated to have a moderate increase in phosphorus loading. No significant changes in land use or surface water run-off are anticipated for Management Unit 5; however, there is anticipated to be a moderate to high increase in phosphorus loading. Most of Armitage Creek and its tributaries fall within the Oak Ridges Moraine Boundary within Management Unit 6. Increases in impervious areas as result of future development within this management unit are limited to outside of the Oak Ridges Moraine, and there are no anticipated changes in phosphorus loading. Potential impacts to Armitage Creek in Management Unit 6 are considered to be relatively minor.

The remaining tributaries of the East Holland River, Western Creek, and Tannery Creek in the other Management Units are identified as warm water reaches that may support aquatic species that are tolerant of some environmental disturbances and less sensitive to changes in water temperature. With the exception of Management Unit 11, all of these Management Units are anticipated to have an increase in surface water run-off resulting from increases in impervious surfaces. Management Units 4, 10 and 11 are anticipated to have reductions in phosphorus loading, while the remaining units show small to moderate increases.

4.6 Terrestrial Ecology

Wetlands, woodlands and other vegetation communities may be susceptible to land use changes that lead to large increases in run-off volume and increases in phosphorus loading. In particular, wetlands are key components of a terrestrial ecosystem and serve many ecological functions, including natural stormwater management. Wetlands can attenuate flooding, maintain and improve water quality, provide erosion protection, control and store surface water, recharge and discharge groundwater, support habitat for a diversity of plant and wildlife species and provide corridors for wildlife movement (LSRCA, 2014b). Woodlands also have important functions such as water and air quality improvement, floodwater attenuation, maintenance of groundwater quantity and quality, increase in infiltration and provision of habitat for wildlife species (Government of Canada, 2014). Hydrology is important to these features' ecological composition, structure and functions (TRCA, 2012). Increases in run-off may increase surface water inputs and decrease availability of groundwater, change soil moisture conditions and change species composition and community structure, which may reduce the ecological functions of wetlands, woodlands and other vegetation

communities (TRCA, 2012). Aquatic features identified as being potentially affected by increased run-off and phosphorus loading due to changes in land use within the study area are described below.

All of the Management Units contain areas with either significant forests, unevaluated wetlands and/or other natural areas that provide wildlife habitat and are a part of the Town of Newmarket's Natural Heritage System. All of the Management Units are anticipated to have an increase in surface water run-off due to land use changes, with the exception of Management Units 5 and 11. Open space is proposed to be reduced in Management Units 2, 3, 8 and 10 for future residential, commercial, urban and/or employment area developments.

The Locally Significant Newmarket Wetland is located in Management Unit 2. A small parcel of residential area contributing surface run-off to this wetland is planned to be replaced by a commercial area, which will likely result in more impervious surfaces than residential areas (Town of Newmarket, 2009). It is also expected that use of road salts will increase from existing conditions, which will decrease the water quality directly flowing into this wetland.

The Provincially Significant Ansnorveldt Wetland Complex is located in Management Unit 10. Some adjacent areas of open space and the Natural Heritage System lands will be removed for residential development but not the wetland itself. An impact assessment will be required if any development is planned within 120 m of this Provincially Significant Wetland.

Riparian vegetation along tributaries of Bogart Creek, East Holland River and Arnosveldt Creek in Management Units 2, 7, 9 and 10 function as low quality natural corridors that may facilitate wildlife movement. If vegetation removal is planned in support of future development, this may further decrease the quality of these natural corridors.

Management Unit 8 contains two conservation areas, Wesley Brooks and Bailey Ecological Park. Management Unit 9 contains Mabel Davis and Queen Street Conservation Areas. There are no significant changes in the natural vegetation cover from existing conditions in these conservation areas.

Portions of Management Units 1, 6 and 10 fall within the Oak Ridges Moraine boundary. The Glenville Hills Kames Provincial Candidate Life Science ANSI is located within Management Units 1 and 6. Land use changes associated with increased impervious surfaces within Management Units 1, 6 and 10 are limited to outside of the Oak Ridges Moraine.

Management Units 1, 2, 3, 5, 7, 8 and 9 are expected to have small to moderate increase in phosphorus loading as result of future changes in land use. No change in phosphorus loading is expected in Management Unit 6, and phosphorus loading in the remaining Management Units 4, 10 and 11 is expected to decrease. Generally, increases in surface water run-off as result of increased impervious surfaces, and increases in phosphorus loading may potentially change the hydrology and negatively impact the features identified above. Impacts on significant forests, unevaluated wetlands and ANSIs located within the Oak Ridges Moraine are considered to be minimal given the lack of future land use change in these areas within Management Units 1, 6 and 10.

4.7 Water Quality

The proposed intensification of the Town of Newmarket as identified in the future land uses indicate that water quality control measures will be required to mitigate the negative effects on water quality that are associated with increased development. Low Impact Development methods for Proposed water quality control measures are discussed in further detail in subsequent sections of this report, along with suggested retrofits to existing SWM facilities.

4.8 Water Quantity

The Town has developed Master Drainage Plans to address potential peak flow increases as part of the NW and SW Newmarket Secondary Plans, and will continue to do so in the future. An increase in runoff quantity could be expected from the intensification of the Town of Newmarket, which should be managed on a site-specific basis as development is identified and proceeds through the design stages. On a broader level, water quantity control is addressed in this report as it is mitigated to some extent through the implementation of the proposed LID measures and the SWM facility retrofits. Quantifying the level of water quantity control as a direct result of these measures is difficult without running a hydrologic model to determine peak runoff values, however, the implementation of the LID measures and the retrofit of SWM facilities will provide water quantity and peak flow controls. The SWM facility retrofits will provide water quantity and peak flow controls in that under the post-retrofit scenario the SWM facilities will be functioning at their full design capacities. General volumetric quantities were determined based on the proposed LID retrofits. Volumes were calculated by applying an assumed rainfall capture depth across the area to be treated by the LID methods. The rainfall capture depth was assumed to be 10 mm, and MOE climate data was used to determine the number of annual rainfall events that exceeds 10 mm (i.e. the number of events that would maximize the available LID infiltration volume). The areas to be treated can be found in **Appendix B** as part of the LID design calculations.

Table 4-4. Water Quantity Calculations

Parameter	Area treated by LID (infiltration) (ha)	Number of Annual Storm events > 10 mm*	Difference Δ (m ³)
PROPOSED CONDITIONS			
Management Unit 1	6.5	22.5	14,625
Management Unit 2	3.13	22.5	7,043
Management Unit 3	0	22.5	-
Management Unit 4	0	22.5	-
Management Unit 5	7.31	22.5	16,448
Management Unit 6	0	22.5	-
Management Unit 7	0	22.5	-
Management Unit 8	0.5	22.5	1,125
Management Unit 9	0.5	22.5	1,125
Management Unit 10	0.5	22.5	1,125
Management Unit 11	3.83	22.5	8,618

*Number of annual storm events exceeding 10 mm derived from MOE climate data.

5. Improvement and Retrofit Opportunities {Step 7}

In 1999 the LSRCA completed a study which recommended retrofits for six SWM facilities in the Town of Newmarket. To date five of the facilities have been retrofitted. **Table 5-1** below summarizes completed and LSRCA recommended retrofits. Retrofits of SWM ponds allow for the SWM quality component of the ponds to be restored or upgraded, thereby improving the Phosphorus removal efficiency in conjunction with the sediment removal efficiency. Further, Phosphorus removal for ponds was evaluated as part of the 2007 UYSS offset program. Four ponds were identified for retrofit to offset phosphorus loading increases due to the proposed Water Reclamation Centre.

The Lake Simcoe Basin Stormwater Management and Retrofit Opportunities (2007) report by the LSRCA has identified the need for a complete, consistent, and contemporary data set associated with stormwater runoff in the Lake Simcoe Watershed. This data set includes all urban catchments, outlets, existing SWMFs and locations, and

phosphorus loads associated with stormwater runoff in the Town of Newmarket. This report also identifies retrofit opportunities including facilities that can be upgraded, or areas that can support a SWMF. A total of 16 of these opportunities in Newmarket have been identified, affecting a total of 959.95 hectares. The total estimated cost associated with the proposed retrofits is \$11,836,184.00, with a potential phosphorus reduction of 776.48 kg/yr. The following **Table 5-1** shows the Newmarket pond retrofit opportunities as provided in the LSRCA 2007 report.

Table 5-1. Newmarket Retrofit Opportunities (LSRCA, 2007)

Pond ID	Size of SWMP (m ³)	Phosphorus Reduction (kg/yr)	Estimated Cost (\$150/m ³ excavated)	Estimated Cost (per kg P removed)	Constraints	Retrofit Status	Retrofits Recommended by LSRCA in 1999 or 2007 UYSS	UYSS 2007 Phosphorus Removal Estimates (kg/yr)
3	4,709	19	\$706,434	\$35,481	None		Retrofit of existing level 3 wet pond to level 1 wet pond	-
19							Install flow splitter, construct 0.3m deep wetland with plunge pools and sediment forebay 3,946m ³ .	-
22	n/a	n/a	\$20,000	n/a	None		Major maintenance and repair of existing pond including new outfall and restoration	-
37						Silt was removed from this pond in August 2008		-
N-SE4, 35	16,552	123	\$2,482,891	\$20,159	Potential fisheries concerns		Combine level 2 wet pond and quantity pond to form level 1 wet pond to treat both catchments	-
38						In 2006, the town completed retrofit for quality control of the Leslie street SWM pond located on the east side of Leslie street approximately 350m south of Gorham Street.	Construct 2m deep wet pond parallel to watercourse 4,730m ³ . Retrofit existing pond to provide a level 3 wet pond.	-
39	1,930	16	\$289,627	\$17,757	Fisheries concerns		Retrofit of existing quantity pond to level 1 wet pond	-
41							Remove internal access roads and over excavate west and east ponds 2m deep. West pond = 1,405m ³ East pond= 1,292m ³ . Retrofit the existing east and west ponds to provide level 3 protection.	-
42						LSRCA completed the dredging of a section of Fairy Lake in 2008 (Water Street)		-
44	3,307	28	\$496,140	\$17,757	None	In 2008, LSRCA was successful in its application to Environment Canada to retrofit the pond in George Richardson Park (East side of Bayview Parkway	Retrofit of existing quantity pond to level 1 wet pond . Install forebay and excavate as required to provide 3,133m ³ of storage.	-

Pond ID	Size of SWMP (m ³)	Phosphorus Reduction (kg/yr)	Estimated Cost (\$150/m ³ excavated)	Estimated Cost (per kg P removed)	Constraints	Retrofit Status	Retrofits Recommended by LSRCA in 1999 or 2007 UYSS	UYSS 2007 Phosphorus Removal Estimates (kg/yr)
						approx 500m south of Elgin Street) A red sand filter was installed to remove Phosphorus.		
74	2,821	42	\$423,223	\$9,881	None	Planned as part of the UYSS Water Reclamation Project.	Retrofit of existing quantity pond to level 2 wet pond. Remove internal access roads and over excavate west and east ponds 2m deep. West pond = 1,405m ³ East pond= 1,292m ³ . Retrofit the existing east and west ponds to provide level 3 protection.	23
26N-CE18	3,067	46	\$460,090	\$9,881	None	Planned as part of the UYSS Water Reclamation Project.	Retrofit of existing quantity pond to level 2 wet pond	25
N-CE4, 76	3,467	53	\$520,108	\$9,647	Pond footprint would be located in park		Retrofit of existing quantity pond to level 2 wet pond	-
76	13,139	126	\$1,970,887	\$15,624	Pond would be located in East Gwillimbury		Retrofit of existing quantity pond to level 1 wet pond	-
77						In 2001 the Town constructed the SWM/QUALITY pond beside 395 Mulock Drive (municipal offices).	Install flow spiller, maintain channel as overflow, and excavate 2m deep 11,713m ³ wet pond. Preserve existing trees. Construct a level 1 wet pond at an estimated cost of \$150 000.	-
80							Construct 0.3m deep wetland with plunge pools and forebay – 1,546m ³	-
81, N-CW2, 8, 79, N-CW7	4,842	n/a	\$726,340	n/a	None, phosphorus reduction could not be calculated for wetland, therefore estimated cost per kg P removed cannot be calculated	Planned as part of the UYSS Water Reclamation Project.	Retrofit of existing quantity pond to level 2 wetland pond. Install flow splitter; construct 0.3m deep wetland with plunge pools and sediment forebay 3,946m ³ .	132
84	9,659	81	\$1,448,956	\$17,754	Pond located on	Planned as part of the UYSS Water	Retrofit of existing quantity pond to level 1	56

Pond ID	Size of SWMP (m ³)	Phosphorus Reduction (kg/yr)	Estimated Cost (\$150/m ³ excavated)	Estimated Cost (per kg P removed)	Constraints	Retrofit Status	Retrofits Recommended by LSRCA in 1999 or 2007 UYSS	UYSS 2007 Phosphorus Removal Estimates (kg/yr)
					Town of East Gwillimbury property	Reclamation Project.	wet pond. Construct 0.3m deep wetland with plunge pools and forebay – 1,546m ³ .	
87, N-NE7	3,650	94	\$547,519	\$5,787	Fisheries concerns		No existing pond, room for level 3 wet pond.	-
89	6,154	97	\$923,221	\$9,489	None	Planned as part of the UYSS Water Reclamation Project.	Retrofit of existing quantity pond to level 2 wet pond and LID in adjacent grass roadside ditches.	36
N-NE9	3,790	32	\$568,618	\$17,758	Some tree removal		No existing pond, room for level 1 wet pond.	-
N-NW7	1,263	10	\$189,483	\$17,758	Property ownership and tree removal		No existing pond, room for level 1 wet pond.	-
N-SW6	418	4	\$62,641	\$17,745	Some tree removal		No existing pond, room for level 1 wet pond.	-
	Total:	776.48	\$11,836,184					

Stormwater Management Facility Inventory and Maintenance Needs Plan (AECOM, 2009) recommended retrofits for the SWMFs in Newmarket. It was determined that the design of 17 of the facilities do not provide adequate storage based upon MOE design guidelines. The ponds that did not meet MOE design guidelines as noted in the 2009 report are listed in **Table 5-2**.

Table 5-2. Ponds not meeting MOE Guidelines for Water Quality Control (AECOM, 2009)

Pond ID	Catchment Area (ha)	% Impervious of Contributing Area	MOE Guideline for Minimum Available Storage Required (m ³)	Permanent Pool Volume (m ³)	Additional Storage Required to meet MOE Guidelines for Minimum Available Storage (m ³)
39	15.4	42	1,151	893	878
84	80.3	33	4,763	43	3,401
34	25.5	47	2,117	690	1,427
86	8.4	26	392	11	258
74	47.6	35	2,964	491	1,772
44	53.6	42	4,026	2,701	1,325
58	22.3	45	1,795	1,533	262
70	66.8	67	7,974	4,452	3,522
89	26.6	77	3,627	1,302	603
41	49.3	30	2,681	909	2,473
1	11.8	74	1,533	655	521
19	70.6	28	3,602	201	5,781
80	15.4	29	720	199	4720
81	76.6	44	5,981	200	381
73	14.0	26	603	0	2,325
91	8.7	52	803	0	803
92	23.8	57	1,829	36	1,793

Notes: None of the listed ponds have been retrofitted to date

The Upper York Sanitary Solutions EA evaluated the options for the required phosphorus offset to reduce phosphorus inputs to the East Holland Subwatershed due to increases in Phosphorus loading from the proposed Water Reclamation Centre. This review identified stormwater pond retrofits to water quality wet-ponds or using Low Impact Development Best Management Practices as the preferred alternative. Ponds 26, 70, 74, and 89 will be retrofitted by 2021 by York Region.

5.1 Opportunities for Additional Infiltration - Low Impact Development

Low Impact Development (LID) provides opportunities for urban development to maintain the natural hydrologic cycle by collecting and filtering stormwater naturally, and directing the water back into the ground as under pre-development conditions. In addition to the SWM facilities, LID measures may also help to reduce phosphorus loading, by reducing runoff volumes and allowing filtration of stormwater through soil media.

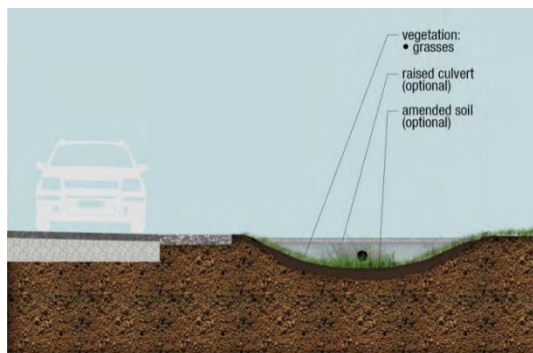
LID measures may include infiltration trenches, rain gardens, and road right of way options including bioretention, roadside swales, perforated pipes, and pervious pavement. LID measures reduce runoff volume, help prevent soil

erosion, filter pollutants, recharge groundwater, and enhance streetscapes. Design features such as curb cuts or urban road sections may be used in conjunction with LID methods to provide a surface water flow path to enhanced ditches or bioretention swales.

Enhanced grass swales are vegetated open channels designed to convey, treat and attenuate stormwater runoff. Check dams and vegetation slow the water to allow suspended particulates to settle out, and infiltration through the root zone also allows for uptake of nutrients by the vegetation. In addition to providing a water quality control component to stormwater runoff, enhanced grass swales also reduce impervious cover and accent the natural landscape, providing aesthetic benefits.

Rain gardens are shallow depressions designed with bioretention features that are suited to receive overland flows diverted from paved areas. Bioswales are similar to enhanced grass swales in terms of the design, however they also incorporate aspects of bioretention cells consisting of bioretention soil media, a gravel storage layer, and optional underdrain components. They can significantly enhance neighbourhood aesthetics when planted with vegetation that tolerates both dry and wet growing conditions. Infiltration methods such as perforated pipes (e.g. the Etobicoke System) provide water quality and quantity control. Perforated pipes are generally wrapped in filter fabric to prevent blockage of the perforations and encased in a granular stone trench. Water flowing within the pipe is able to exfiltrate into the surrounding soil as it is conveyed through the pipe. **Figure 5-1** shows various LID options.

Figure 5-1. LID Options



Enhanced Grass Swale – “Grey to Green Road Retrofits”, Credit Valley Conservation



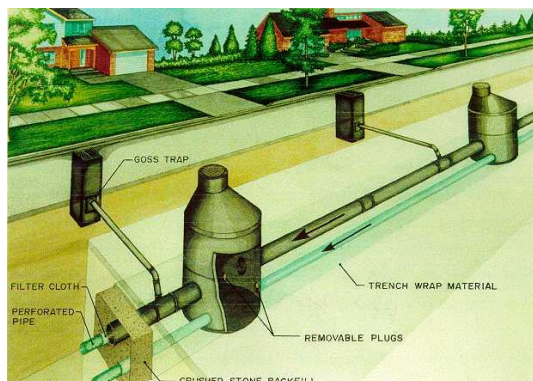
Enhanced Grass Swale – Prien & Newhof



Bioretention Swale – “Grey to Green Road Retrofits”, Credit Valley Conservation



Rain Garden in Residential Neighbourhood, Credit Valley Conservation



Etobicoke Exfiltration System, Ryerson University



Residential Rain barrel, Credit Valley Conservation



Maplewood Mall, Minnesota Rainwater Tank, Credit Valley Conservation



Green Roof, Credit Valley Conservation

5.2 Low Impact Development Measures and Phosphorus Removal Methods

As discussed earlier in this report, the impacts of providing LID measures for phosphorus removal were investigated as part of this study. The removal efficiencies for proposed conditions are the same as those presented earlier in this report.

Infiltration via soakaway pits or infiltration trenches was generally recommended for captured rooftop runoff from appropriate sites. Rooftop runoff is generally considered 'clean' and requires no treatment prior to infiltration. For the purposes of the phosphorus loading calculations, a land use of Low Intensity Development was applied to the rooftop runoff to reflect the relatively clean nature of the roof runoff, even if the site location itself would be classified as High Intensity. For the remainder of the removal efficiencies, the applicable land use was attributed to the location for which the LID was proposed. Potential BMP locations are shown on **Figure 5-2**.

Additional measures to consider include an education and engagement campaign to invite residents to become part of the solution. Various LID measures could be proposed to the general public to implement, such as the use of rain barrels, rain gardens, providing additional tree canopy, downspout disconnection programs for older neighbourhoods, or the incorporation of LID measures into boulevards. These measures could be reviewed to determine how they could be translated into policies and guidelines.

5.3 Phosphorus Removal under Future Conditions

The impacts of providing SWM BMPs for phosphorus removal were investigated as part of this study. The Phosphorus removal efficiencies by BMP as provided by the PTool are provided in **Table 5-3**.

Table 5-3. Phosphorus Removal Efficiency by BMP

BMP	Phosphorus Removal Efficiency (%)
Bioretention System	0
Constructed Wetland	77
Dry Detention Pond	10
Dry Swales	0
Enhanced Grass/WQ Swales	0
Flow Balancing Systems	77
Green Roofs	0
Perforated Pipe Infil/Exfil	87
Sand or Media Filters	45
Soakaway/Infiltration Trench	60
Sorbative Media Interceptors	79
Underground Storage	25
Vegetated Filter Strip	65
Wet Detention Pond	63

The methodology used to determine phosphorus removal efficiencies by each non-SWM Facility BMP (LID) was to recreate PTool in an electronic spreadsheet. This allowed for greater flexibility in calculating phosphorus loading and removal rates within the management units. The same phosphorus loading rates and removal efficiencies were applied in the spreadsheet. The total annual phosphorus loading rate was calculated for each management unit for verification. The phosphorus removal rate was then calculated for each non-SWM Facility BMP (LID) treatment type and summarized for each management unit.

For Future Conditions, the PTool was used to determine the Phosphorus removal for the Future Conditions/As Designed scenario. The Future conditions “As Designed” scenario includes Phosphorus removal rates based on all SWM facilities functioning at original Design levels, and proposed LID measures implemented as recommended.

Table 5-4 summarizes the Phosphorus removal rates for the Management Units for all BMPs including SWM facilities and the individual proposed LIDs, for the Future Conditions/As Designed scenario. **Table 5-5** presents a summary of the overall Existing and Future Conditions Phosphorus loading and removal rates for all scenarios.

Table 5-4. Future Conditions “As Designed” Phosphorus Loading and Removal Summary

Management Unit	Area ¹ (ha)	Overall P Loading (kg/yr)	Treatment Type	Treatment Method	P Removal Efficiency (%)	P Removal (kg/yr)
1	526.4	676	Potential rooftop infiltration at Upper Canada Mall	Soakaway/infiltration	60	3.48
			Potential rooftop infiltration at Region building (Yonge and Eagle)	Soakaway/infiltration	60	0.63
			Potential parking lot treatment at Ray Twinney complex	Soakaway/infiltration	60	1.42
			All SWM facilities functioning at original design level	SWM Facilities	10-65	151.7
				Total:		157.2
2	731.1	926	Potential infiltration by funded LID at Industrial or Commercial site	Soakaway/infiltration	60	0.55
			Potential rooftop infiltration at Magna Centre	Soakaway/infiltration	60	1.19
			Potential infiltration of parking lot runoff at Magna Centre	Soakaway/infiltration	60	1.23
			All SWM facilities functioning at original design level	SWM Facilities	10-65	295.1
				Total:		298.1
3	248.4	259	All SWM facilities functioning at original design level	SWM Facilities	65	38.3
4	152.7	207	All SWM facilities functioning at original design level	SWM Facilities	65	8.54
5	124.3	206	Potential infiltration by funded LID at Industrial or Commercial site	Soakaway/infiltration	60	0.55
			Potential rooftop infiltration – Pony Drive/Stellar Drive	Soakaway/infiltration	60	3.84
			Potential parking lot infiltration – Pony Drive/Stellar Drive	Soakaway/infiltration	60	2.14
			All SWM facilities functioning at original design level	SWM Facilities	10-65	33.5
				Total:		40.0
6	369.4	235	All SWM facilities functioning at original design level	SWM Facilities	10-65	113.4
7	164.7	152	All SWM facilities functioning at original design level	SWM Facilities	10-65	86.0
8	416.8	546	All SWM facilities functioning at original design level	SWM Facilities	10-65	80.4
			Lion's Park restoration - LID catchment wide retrofit program	Soakaway/infiltration	60	0.07
				Total:		80.5
9	533.3	644	Bioswale/filter consideration in the Wayne and Waratah intersection	Soakaway/infiltration	60	0.11
			All SWM facilities functioning at original design level	SWM Facilities	10-65	100
				Total:		100.11
10	305.9	277	Potential infiltration by funded LID at Industrial or Commercial site	Soakaway/infiltration	60	0.55
			All SWM facilities functioning at original design level	SWM Facilities	10-65	94.5
				Total:		95.1
11	241.8	325	Potential parking lot infiltration near Yonge and Bonshaw	Soakaway/infiltration	60	2.44
			Potential rooftop infiltration near Yonge and Bonshaw	Soakaway/infiltration	60	1.27
			All SWM facilities functioning at original design level	SWM Facilities	10-65	54.8
				Total:		58.5

Note: 1. Management Unit areas represent the portion of each management unit located within the Town of Newmarket boundary.
2. Phosphorus calculations can be found in Appendix B.

The PTool was also used to determine the results for the Do Nothing scenario, as summarized in **Table 5-5**. For the Do Nothing scenario, it was assumed that no LIDs will be constructed, and that with time all SWM facilities will become sediment laden. Under this scenario, it was assumed that SWM facilities designed as Wet facilities would function at best as dry SWM facilities, with a maximum Phosphorus removal efficiency of 10 percent. It was further assumed that all SWM facilities designed as Dry facilities would provide little to no Phosphorus removal benefits. As such, areas contributing to Dry SWM facilities were modelled as ‘untreated’ in the Do Nothing scenario.

Table 5-5 presents an overall summary of the Existing and Future conditions Phosphorus loading and removal scenarios. The Existing conditions total Phosphorus loading rate is presented for each of the Management Units. Phosphorus loading rates are then shown for all scenarios including the Existing conditions with SWM controls, Future conditions loading rates for the Do Nothing scenario, Future with retrofit SWM controls, and Future with retrofit SWM and LID controls. The percent improvement as compared to existing conditions loading rates is provided for each scenario.

As summarized in **Table 5-5**, the overall Phosphorus removal efficiency for the Future with retrofit SWM and LID scenario shows an increase in Phosphorus removal ranging from 8 percent to 55 percent. Although the additional Phosphorus removal benefits of the LID measures seem negligible, this is only due to the fact that the LID treatment areas are very small as compared to the SWM facility treatment areas. The LID measures also function to provide additional water quality and quantity benefits and contribute to the balancing of the water budget. The implementations of the proposed SWM facility retrofit and LID measures clearly have a beneficial effect on Phosphorus removal.

Table 5-5. Future Conditions Phosphorus Loading Rates and Removal Rates for SWM Facilities and LID

Management Unit	SWM Facilities ¹	Area ² (ha)	Existing Conditions			Future Total Annual TP Loading (kg)	Uncontrolled (Do Nothing ³)		Future- SWM retrofits		Future- SWM retrofits & LID	
			Existing Development without SWM – Annual TP Loading (kg)	Existing Development & Existing SWM – Annual TP Loading (kg)	Effectiveness of Existing SWM (% of TP loading reduction &/or comments)		– Annual TP Loading (kg)	Change from Existing (% TP reduction)	– Annual TP Loading (kg)	Change from Existing (% TP reduction)	– Annual TP Loading (kg)	Change from Existing (% TP reduction)
1	3,4,8,9,12,13,14, 52,66,79,80,81, 83	526.4	696.8	546.5	22	676.0	652.4	6	524.3	25	518.8	26
2	26,34,35,36,37, 38,39,40,41,53, 54,57,61,64,65, 74,75,93,96, 98,101	731.1	978.6	760.3	22	926.0	879.9	10	630.8	36	627.9	36
3	28,29,30,31, 58,73,102	248.4	238.6	204.7	14	258.9	254.0	-6	220.5	8	220.6	8
4	63,76	152.7	224.0	215.2	4	207.1	207.1	8	198.6	11	198.6	11
5	70,89	124.3	223.6	193.6	13	202.7	197.4	12	169.2	24	162.7	27
6	27,32,33,51, 55,56,62, 71,97	369.4	260.5	210.5	19	234.8	216.8	17	121.4	48	121.4	48
7	5,16,17,18,19, 22,23/24,25	164.7	151.3	69.5	54	151.8	137.4	-9	69.8	54	69.8	54
8	42,77,91,92	416.8	553.6	474.6	14	546.1	533.8	4	465.7	16	465.6	16
9	43,44,46,47,48,4 9,50,59,60,85, 86,87,88	533.3	687.9	651.3	5	644.2	562.0	18	544.3	21	544.1	21
10	6,7,10,11,45,67, 68,94,95, 99 (MQ2), WQ1, MQ4	305.9	223.5	150.2	33	256.4	242.3	-8	161.9	28	161.3	28
11	1,2,84	241.8	349.0	271.0	22	324.6	315.9	9	269.8	23	266.1	24

Notes:

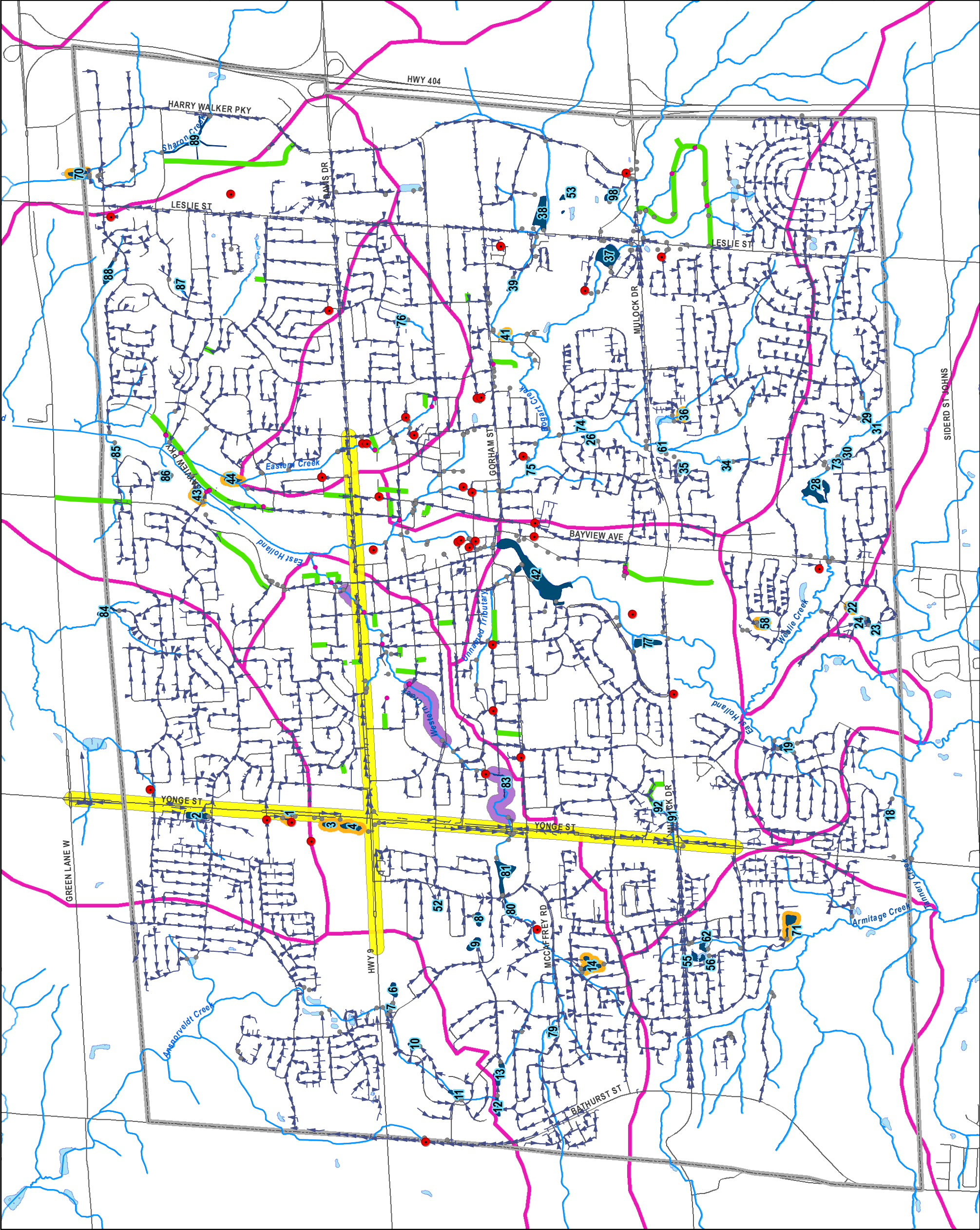
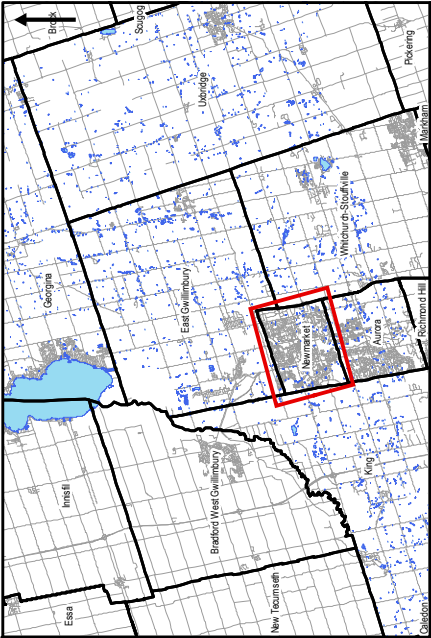
1. All ponds shown, ponds not included in sediment removal (e.g. online) shown as crossed out.
2. Management Unit areas represent the portion of each management unit located **within the Town of Newmarket boundary**.
3. Do Nothing scenario modelled with designed "Wet Ponds" modelled as "Dry Ponds", and designed "Dry Ponds" catchment areas modelled as "untreated" areas.
4. Phosphorus loading and removal calculations are provided in **Appendix B**.

5.4 Instream Best Management Practices

LSRCA conducted a Best Management Practices Inventory along watercourses within its jurisdiction in 2008 and 2009, which included the Town of Newmarket. The purpose of the inventory was to identify potential restoration projects along stream corridors in the Lake Simcoe watershed in order to improve fish habitat and reduce phosphorus input into Lake Simcoe. The inventory allowed LSRCA to prioritize future restoration works. Many of the opportunities identified by the field staff was directly or indirectly related to the fluvial geomorphological form and processes. **Figure 5-2** illustrates the opportunities identified within the Town of Newmarket.

Furthermore, the location of bank erosion, sediment accumulations, and debris accumulations within the Town of Newmarket can be observed in **Figure 5-3**. These three categories are direct indicators of local geomorphological conditions. There is a high density of erosion sites along Western Creek, a small historically straightened watercourse that contains high stream power. As well, there are numerous erosion sites and sediment accumulations along Eastern Creek, which has also been historically straightened.

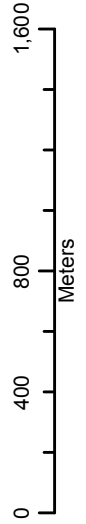
Although not represented in the above tables or in the removal calculations, additional measures are recommended in that they reduce runoff and thereby phosphorus loading to downstream water bodies. One method is to reconnect floodplain storage where feasible. This would allow for additional storage within the floodplain and also reduce instream erosion containing phosphorus.



Legend

- SWM Pond ID
 - Existing STM Treatment MH
 - STM Outfalls
 - Potential STM Treatment MH
 - Storm Mains
 - Planned Road Construction (10 Year Plan subject to change)
 - Floodplain Enhancement
 - Yonge/Davis Intensification Area
 - Inspected Stormwater Ponds (Owned and Operated by the Town of Newmarket)
 - Retrofit Ponds
 - Management Units
- Base Layers**
- Roads
 - Watercourse
 - Waterbodies
 - Municipal Boundary

Note: Potential exists for LID implementation throughout the Town as part of road reconstruction and intensification.



Town of Newmarket Stormwater Master Plan

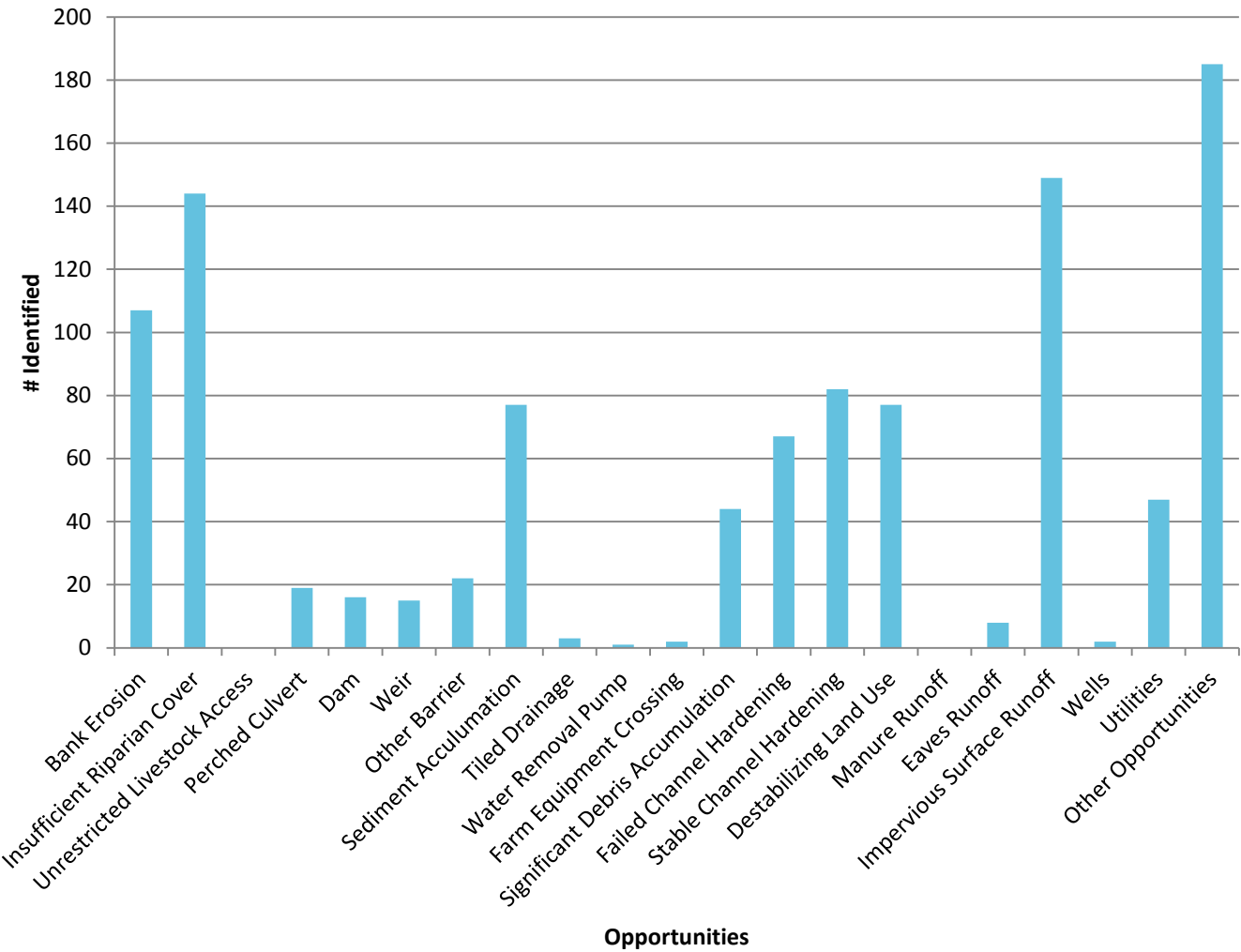
Potential Future Conditions Best Management Practices

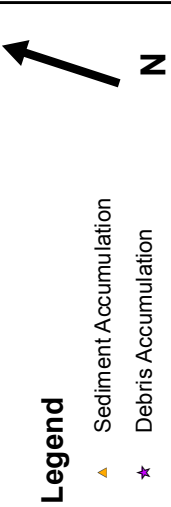
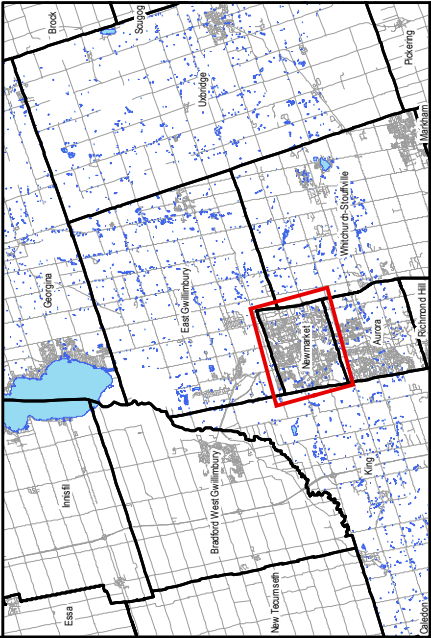
November 2016	1:25,000	Datum: NAD 83 Zone 17 Source: Town of Newmarket, York Region
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Figure 5-2

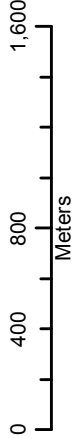
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Figure 5-3. BMP Inventory Opportunities – Town of Newmarket





- Legend**
 - Sediment Accumulation
 - Debris Accumulation
 - Bank Erosion
- Stream Classification**
 - A: Large Natural Watercourse
 - B: Large Altered Watercourse
 - D: Small Natural Watercourse
 - E: Small Altered Watercourse
 - F: Swales and Drains
 - G: Straight Drainage Ditch
 - Unclassified
- Roads**
 - Freeway
 - Expressway / Highway
 - Ramp
 - Major Road
 - Local Road
- Study Area Boundary**



Comprehensive SWM Plan

Town of Newmarket

BMP Inventory Opportunities - Bank Erosion

November 2016

1:30,000

Datum: NAD 83 Zone 17
Source: Lake Simcoe Basin Best Management Practices Inventory.LSRCA

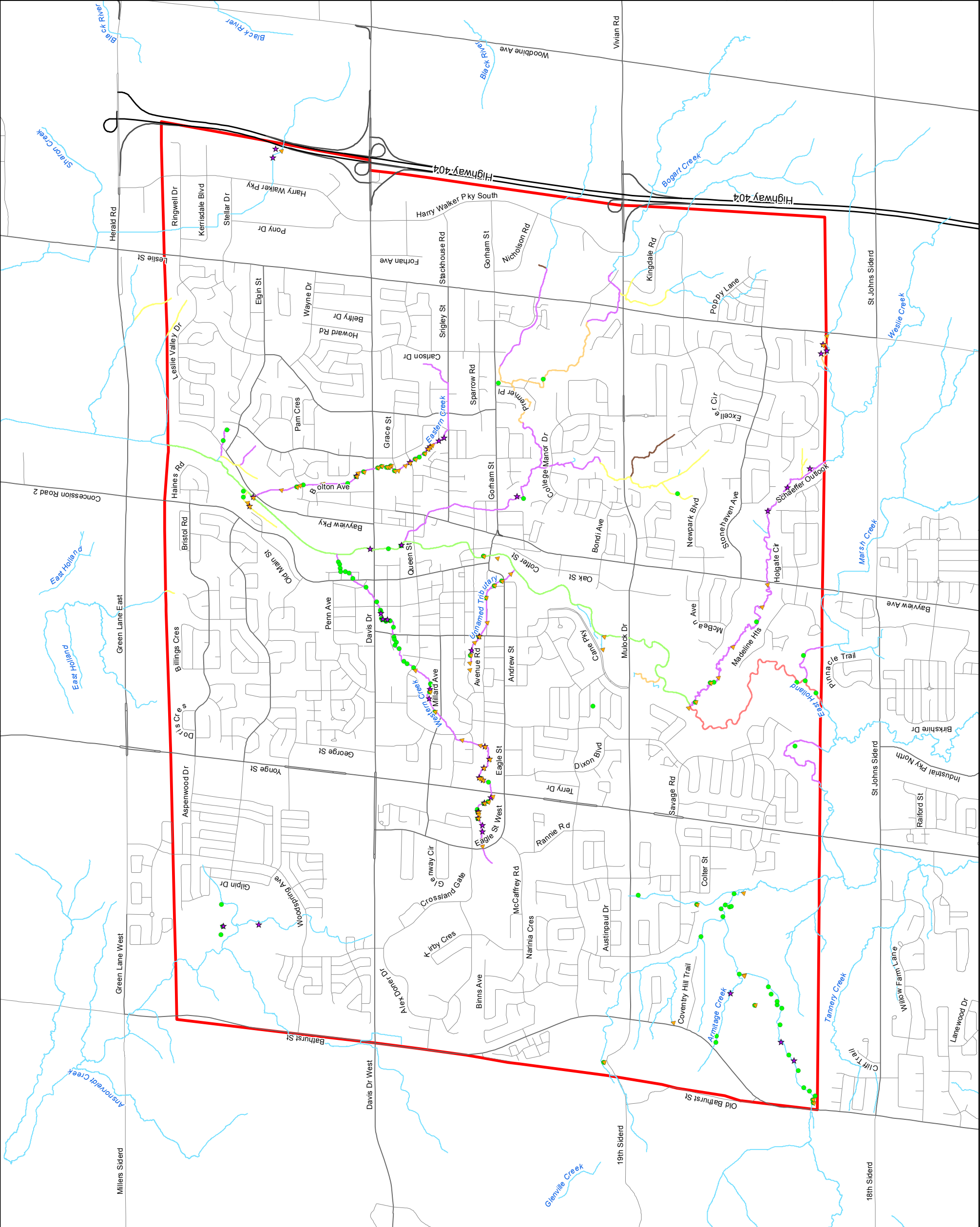
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AECOM

Figure 5-4

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5.5 Hydrogeology

5.5.1 Opportunities

Opportunities to mitigate potential impacts from the reduction in groundwater recharge due to increases in impervious area from future development within all Management Units include the following:

- Maximize infiltration through integrated techniques such as; constructed wetlands, bioretention swales, infiltration galleries, green roofs, permeable surfaces, preservation and enhancement of native vegetation cover;
- Implement Best Management Practices (BMP) that promote groundwater infiltration/recharge, for the purpose of trying to establish post-development infiltration at pre-development levels; and
- Implement appropriate Low Impact Development (LID) techniques to encourage shallow groundwater recharge into surficial till and/or clay soils.

In addition to the opportunities listed above, rapid infiltration ponds or columns can be constructed in coarse-textured surficial soils to promote groundwater recharge. Potential areas for the new construction of rapid infiltration ponds, outside the ORM, include the area designated as 'Glaciofluvial Deposits' as illustrated on **Figure 2-5**, located within Management Unit 2.

Opportunities to mitigate potential groundwater quality impacts from increased application of winter road maintenance products (i.e., salt, brines, etc.), hydrocarbon impacts from roadways, and nutrient loading from fertilizer use (primarily nitrogen, potassium and Phosphorus) within areas with coarse-textured alluvial deposits and glaciofluvial deposits include the following:

- Implement best management practices for the reduction of application of winter road maintenance products within subject areas;
- Provide pre-treatment through filter strips, or sumps, to prevent the infiltration of contaminated water into the water table; and
- Reduce spill response time for incidents with the potential to release gasoline, oil or other contaminants into uncontrolled areas.

5.5.2 Constraints

Well Head Protection Areas

Three (3) individual pieces of legislation currently apply for the protection of drinking water supplies in York Region; including the study area:

- **Provincial Policy Statement (2014)** – provides broad policy direction on matters of provincial interest as it relates to land use planning and development.
- **Regional Official Plan (2010)** – provides land use and resource management direction for the land and water outside of the Oak Ridges Moraine as it applies to WHPAs.
- **Clean Water Act (2006)** – Ontario government's commitment to protect drinking water at the source as part of the overall commitment to human health and the environment.

The Regional Official Plan (ROP) provides a policy that restricts or even prohibits certain land uses due to their potential impact to groundwater quality. To ensure that municipal well water quality and quantity is protected from contamination the policy states:

...“That the storage or use of pathogen threats by new land uses, including the siting and development of stormwater management ponds and rapid infiltration basins or columns, except for the storage of manure for personal or family use, is prohibited within the 100-metre pathogen zone around each municipal well shown on Map 6 and may be restricted within the 100-metre to 2-year time of travel.”... (York Region Official Plan, 2010)

Figure 2-7 illustrates the extent of existing WHPA and the land designated as the 2-year time of travel to which the above restriction applies.

Oak Ridges Moraine

Management Units 1, 6 and 10 contain part of the Oak Ridges Moraine (ORM) boundary, and therefore are guided by policies of land use contained within the Oak Ridges Moraine Conservation Plan (ORMCP) (O.Reg 140/02). Through the Plan, the Ontario Government has set a policy framework for protecting the ORM by providing land use and resource management direction for land within the ORM. Among other land use restrictions, the Plan provides the following guidance pertaining to the management of stormwater:

“...New stormwater management ponds siting in the ORM are prohibited within the respect to land in key natural heritage features and hydrologically sensitive features (permanent and intermittent streams, wetlands, kettle lakes, seepage areas and springs)...” (O.Reg 140/02, s.45(8)).

“...new rapid infiltration basins and new rapid infiltration columns are prohibited...” (O.Reg 140/02, s.47)

The ORMCP defines ‘hydrologically sensitive features’ as permanent and intermittent streams, wetlands, kettle lakes and seepage areas and springs. As previously discussed in **Section 2.5.2**, cold water streams are mapped in the southwestern portion of the Study Area and are associated with a number of unevaluated wetlands. Through the interpretation of available surficial geology mapping and thermal regime mapping of watercourses it is interpreted that seeps and springs may exist within the east and southeastern portion of the study area, where the headwaters of numerous coldwater streams are mapped. The ORMCP provides minimum areas of influence and minimum vegetation protection zones for hydrologically sensitive features as 30 metres from any part of the feature.

5.6 Aquatic Ecology

5.6.1 Constraints

Constraints associated with aquatic features identified to be potentially affected by stormwater management include the following:

- Stormwater management facilities are known to have warming effects on water discharged into receiving watercourses by acting as heat sinks which can have significant effects on downstream coldwater aquatic habitats (LSRCA, 2007; TRCA, 2013). Stormwater management facilities in Management Units 2, 3, 5 and 6 placed upstream of cold water reaches should be designed to minimize thermal effects in addition to controlling water quantity and improving water quality. Examples of mitigating thermal effects can include construction of bottom-draw outlet, planting a vegetation buffer along the perimeter of the pond (particularly with trees that provide shade) and/or releasing the water at night or early morning (LSRCA, 2007).

- Management Units 1, 4, 7, 8, 9, 10 and 11 have warm water reaches which support aquatic species that are less sensitive but still susceptible to changes in water quality and quantity. Stormwater management facilities placed upstream of warm water reaches should also be designed to maintain or improve the water temperature and water quality of the watercourses downstream.
- According to the *Town of Newmarket Official Plan* (2014), 15 m and 30 m vegetative buffers are required for warm water and cold water streams, respectively, from any proposed development.
- Management Units 1, 6 and 10 have tributaries that are located within the Oak Ridges Moraine and therefore guided by policies of land use mandated in the ORCMP (O.Reg. 140/02). Section 45, Subsection 8 of the ORCMP states the following:

“New stormwater management ponds siting in the ORM are prohibited within the respect to land in key natural heritage features and hydrologically sensitive features (permanent and intermittent streams, wetlands, kettle lakes, seepage areas and springs).”

5.6.2 Opportunities

Stormwater management practices can provide opportunities to protect and enhance aquatic features and their functions (CVC and TRCA, 2010). Opportunities to mitigate potential impacts of increased run-off from future development within all of the Management Units are identified as follows:

- As identified in **Section 2.5.3** of this report, the LSRCA has identified opportunities along surveyed streams for removal of fish migration barriers and to improve bank hardening and channelization (refer to **Figure 2-8**). Consideration should be given to replacing hardened straight-edge shorelines with less hard or sloping shorelines that could include rip rap, gravel or native vegetation where feasible. These opportunities should be considered during implementation of retrofit opportunities for existing stormwater facilities as well as during the design of new stormwater management facilities.
- As identified in **Section 2.6.2.4** of this report, the LSRCA has identified opportunities along surveyed streams where the riparian buffer can be improved (refer to **Figure 2-11**). Increasing riparian vegetation cover along the cold water reaches is particularly important as this will help moderate water temperatures by providing shade, stabilize the banks, reduce soil erosion and sediment inputs into the reaches, increase infiltration of run-off, and filter sediments and contaminants out of the run-off prior to it reaching the watercourse.

5.7 Terrestrial Ecology

5.7.1 Constraints

Constraints associated with terrestrial features identified to be potentially affected by stormwater management include the following:

- According to the *Town of Newmarket Official Plan* (2014), stormwater management facilities should be located at least 10 m from all woodlands and 15 m from all wetlands, for all Management Units.
- Stormwater management facilities should be placed outside of the Locally Significant Newmarket Wetland and the Provincially Significant Arnosveldt Wetland Complex.

- Significant forests, unevaluated wetlands and the Glenville Hills Kames Provincial Candidate Life Science ANSI are located within the Oak Ridges Moraine and are protected by the policies mandated by the Oak Ridges Moraine Conservation Plan (O.Reg. 140/02). Section 45, subsection 8 of the ORCMP states the following:

“New stormwater management ponds siting in the ORM are prohibited within the respect to land in key natural heritage features and hydrologically sensitive features (permanent and intermittent streams, wetlands, kettle lakes, seepage areas and springs)...” (O.Reg 140/02, s.Oak Ridges Moraine Conservation Plan, 2002)

- Removal of existing riparian vegetation along watercourses for any new stormwater management facilities or retrofitting opportunities should be avoided. Generally, vegetation removal should be kept to a minimum to the extent possible and outside of the bird breeding season (May 1 to July 31) to avoid contravention of the *Migratory Birds Convention Act, 1994* (MBCA).

5.7.2 Opportunities

Stormwater management practices can provide opportunities to protect and enhance terrestrial features and their functions (CVC and TRCA, 2010). Opportunities to mitigate potential impacts of increased run-off and phosphorus loading from future development within all of the Management Units are identified as follows:

- As identified in **Section 2.6.2.4** of this report, the LSRCA has identified opportunities along surveyed streams where the riparian buffer can be improved (refer to **Figure 2-11**). Enhancing riparian buffers with appropriate vegetation can improve land connectivity and quality of The Town's Natural Heritage System core areas. Particularly, enhancing natural corridors identified as poor quality land linkages that follow the tributaries of Bogart Creek, East Holland River and Arnosveldt Creek in Management Units 2, 7, 9 and 10 can improve habitat quality and facilitate wildlife movement to other parts of the Town.
- A future commercial area is planned to replace an existing residential area immediately upstream of the Locally Significant Newmarket Wetland located on Srigley Street just east of Bayview Avenue, as shown on **Figure 2-10**. A stormwater management facility should be placed upstream of this wetland and designed to control the quantity and quality of run-off discharging into the wetland in order to mitigate the potential effects associated with this land use change.
- Innovative landscaping designs for existing and new stormwater management facilities should make allowances for naturalization and integration with the surrounding natural areas. This can be achieved by increasing vegetation cover to the extent possible by planting native species appropriate to the surrounding vegetation communities along the perimeter of the stormwater management pond and also the outfall channel. Additional vegetation cover (e.g., shrubs, immature trees, etc.) can cool the water in the stormwater management pond by providing shade. It can also increase species diversity by providing habitat that supports a variety of plant and wildlife species. Grass surrounding stormwater management ponds should not be cut but allowed to grow as this will further enhance surface water quality and also deter nuisance species such as geese from congregating near the ponds (Gallagher, 2013).

6. Recommended Approach for Stormwater Management {Step 8, 9}

6.1 Class EA Process Alternatives

The Class EA Process requires the identification and analysis of alternatives, to ensure that all options are considered. Phase 1 of the Class EA process involves:

- identifying the problem or opportunity;
- discretionary public consultation to review the problem or opportunity; and
- determination of the applicability of the Master Plan Approach.

Phase 2 of the Class EA process includes:

- identifying alternative solutions to the problem or opportunity;
- selecting a schedule;
- creating an inventory of natural, social, and economic environment issues;
- identifying the impact of alternative solutions on the environment and identifying mitigating measures;
- evaluating alternative solutions and identifying the recommended solution;
- consultation with agencies and public;
- selection of the preferred solution;
- and review and confirmation of the schedule.

The Alternatives for this study included an analysis of the following scenarios:

- Do Nothing;
- Existing Conditions with Retrofitted SWM facilities; and
- Proposed Conditions/As Designed (Retrofitted) SWM facilities with proposed LID and BMP measures.

These scenarios are discussed in further detail in the following sections of this report.

6.2 Evaluation of Alternatives

The 2007 LSRCA report indicated that the cost for the pond retrofits (cleanout) for the prioritized 16 SWM facilities would be approximately \$11.8 million. Additional costs would be associated with the proposed LID and BMP measures. This is the recommended alternative as it successfully mitigates the effects of Phosphorus loading, and is in keeping with the Town's policies. The results show that the SWM facilities provide a substantial benefit in Phosphorus reduction due to the fact that they treat the large areas. The additional LID measures provide localized benefits that contribute to the overall health of the stormwater and receiving water systems and are in keeping with the Town's policies.

Table 6-1 presents a summary matrix of the alternatives rating them against various categories. Overall, the Proposed Conditions/As Designed with additional LID and BMP Measures Alternatives scored the highest. Despite being the most cost prohibitive option, this negative aspect is outweighed by the overall benefits of the SWM facilities and additional LID and BMP measures, particularly when considering the water quality issues as discussed in the Water Quality section of this report.

Table 6-1. Evaluation of Alternatives

Restoration Alternative	Erosion Protection	Sediment Transport	Natural Environment	Construct-ability	Flooding	Life Cycle	Long Term Integration	Approv-ability	Cost	Total
1. Do Nothing	1	1	1	3	2	1	1	1	3	14
2. Existing Conditions with Retrofit	2	2	2	2	2	2	2	2	2	18
3. Proposed Conditions with Retrofit plus BMP/LID	3	3	3	2	3	2	3	3	1	23

1 = Poor

2 = Fair

3 = Good

6.3 Recommended Approach

An existing conditions analysis was carried out based on the assumption that all of the SWM facilities are functioning at existing conditions. No additional proposed LID or BMP measures were accounted for in this analysis. This analysis indicates that a total reduction in Phosphorus of 45 percent is achieved under existing conditions when assessing only the area serviced SWM Facilities.

The Do Nothing alternative is clearly not feasible. For this analysis it was assumed that no additional LID or BMP measures would be implemented, and that no further retrofits, maintenance or clean out of existing SWM facilities would occur. It was assumed that in the long term the permanent pools would eventually fill with sediment, and in effect operate as dry SWM facilities. A corresponding 10 percent Phosphorus removal efficiency was applied to all SWM facilities for this scenario. The analysis indicates that the overall Phosphorus reduction would amount to only 40 percent under this scenario (when assessing only the area serviced by SWM Facilities). Despite having no costs associated with it, this alternative is not recommended as the negative environmental impacts are too great and not in keeping with the Town's policies.

An analysis was also carried out for the Future Conditions/As Designed scenario. For this analysis it was assumed that all SWM facilities would be cleaned out and operating at full design capacity. The additional LID measures as proposed in this report were also accounted for in the calculations. This analysis indicated that an overall Phosphorus reduction of 78 percent could be achieved through the implementation of these measures (when assessing only the area serviced by BMPs including SWM Facilities and LID measures). The LID infiltration measures should be implemented such that 10 mm of rainfall is captured over the LID contributing area for storm events equal to or greater than 10 mm.

A summary of the recommended approach specific to each Management Unit is provided in **Table 6-2** below. Included in the recommendations are additional proposed areas that, if designed for a 10 mm runoff infiltration capacity, could balance the water budget as shown in **Table 4-2**.

Table 6-2. Summary of Recommended Approach

Management Unit	Area ¹ (ha)	Treatment Type
1	526.4	Clean out and retrofit all SWM facilities to original design level Provide LID's as follows: <ul style="list-style-type: none"> - rooftop infiltration capacity of 10mm event at Upper Canada Mall - rooftop infiltration capacity of 10mm event at Region building (Yonge and Eagle) - parking lot treatment at Ray Twinney complex -capture additional 2.6 ha area with 10 mm infiltration capacity to balance water budget
2	731.1	Clean out and retrofit all SWM facilities to original design level Provide LID's as follows: <ul style="list-style-type: none"> - infiltration capacity of 10mm event by funded LID at Industrial or Commercial site - rooftop infiltration capacity of 10mm event at Magna Centre - infiltration capacity of 10mm event of parking lot runoff at Magna Centre -capture additional 34 ha area with 10 mm infiltration capacity to balance water budget
3	248.4	Clean out and retrofit all SWM facilities to original design level -capture 15 ha area with 10 mm infiltration capacity to balance water budget
4	152.7	Clean out and retrofit all SWM facilities to original design level
5	124.3	Clean out and retrofit all SWM facilities to original design level Provide LID's as follows: <ul style="list-style-type: none"> -Potential infiltration capacity of 10mm event by funded LID at Industrial or Commercial site -Potential rooftop infiltration capacity of 10mm event – Pony Drive/Stellar Drive -Potential parking lot infiltration capacity of 10mm event – Pony Drive/Stellar Drive
6	369.4	Clean out and retrofit all SWM facilities to original design level -capture 14 ha area with 10 mm infiltration capacity to balance water budget
7	164.7	Clean out and retrofit all SWM facilities to original design level -capture 10 ha area with 10 mm infiltration capacity to balance water budget
8	416.8	Clean out and retrofit all SWM facilities to original design level Provide LID's as follows: <ul style="list-style-type: none"> -Lion's Park restoration - LID catchment wide retrofit program –infiltration capacity of 10mm event -capture additional 16 ha area with 10 mm infiltration capacity to balance water budget
9	533.3	Clean out and retrofit all SWM facilities to original design level Provide LID's as follows: <ul style="list-style-type: none"> -Bioswale/filter consideration in the Wayne and Waratah intersection – infiltration capacity of 10mm event -capture additional 20 ha area with 10 mm infiltration capacity to balance water budget
10	305.9	Clean out and retrofit all SWM facilities to original design level Provide LID's as follows: <ul style="list-style-type: none"> -Potential infiltration capacity of 10mm event by funded LID at Industrial or Commercial site -capture additional 41 ha area with 10 mm infiltration capacity to balance water budget
11	241.8	Clean out and retrofit all SWM facilities to original design level Provide LID's as follows: <ul style="list-style-type: none"> -Potential parking lot infiltration capacity of 10mm event near Yonge and Bonshaw -Potential rooftop infiltration capacity of 10mm event near Yonge and Bonshaw

Note: Management Unit areas represent the portion of each management unit located within the Town of Newmarket boundary.

Additional methods to reduce Phosphorus loading may include reducing runoff and capturing flows. Reducing runoff could be accomplished by implementing various methods such as infiltration trenches or swales, or soakaway pits. Developing a downspout disconnection program and promoting the roof leader disconnection program will also contribute to reduced runoff. Retrofitting of SWM facilities may help to reduce downstream storm peaks and flow

velocities, and thereby pollutant loadings. Capturing flows for treatment using bioswales, oil grit separators, and SWM facilities will reduce the TSS and phosphorus loading to receiving water bodies. The Wayne and Warratah Area Flooding and Erosion Remediation Study (AECOM, 2015 DRAFT) also recommends an increase in sewer size installation to the 10 year design storm going forward, particularly downstream of areas with flooding issues.

In addition to the above, best management practices should be implemented across the watershed to reduce phosphorus loading. Additional measures to consider include implementing best management practices for agricultural areas to minimize contribution of phosphorus loading to streams and waterways. Where possible, offline ponds should be maintained along with natural floodplain storage. Floodplain storage should be reconnected where possible to reduce flows, thereby decreasing sediment loads and the associated phosphorus loading.

6.4 Recommended Inspection and Maintenance Programs {Step 10}

The following sections are as outlined in the 2009 Newmarket SWM Facility Inventory and Maintenance Needs Plan as the actions required for implementing the required monitoring and maintenance program. If appropriated staff cannot be allocated as recommended, the Town may choose to retain a qualified consultant to perform some or all of the implementation activities.

6.4.1 Annual Facility Inspection

The Town should designate appropriate staff to perform inspections and ensure staffs have appropriate training in regards to SWM facilities inspections and safety. Specific safety training may include water safety training and confined spaces training entry training as underground facilities such as manholes and catchbasins are common in SWM facilities.

It is recommended that annual facility inspections be completed in the autumn to co-ordinate debris clearing from trash racks and pipes before the winter or in spring to co-ordinate with post melt litter removal prior to the wet season.

Equipment:

- GPS unit with inventory inspection form;
- Small boat (i.e. canoe, Zodiac boat);
- Chest waders;
- Stadia rod or other calibrated rod for measuring water and sediment depth;
- Camera; and
- Consider installing staff gauges to monitor water levels.

The goal of the inspection program is to establish standards to ensure that the facility inspections are consistent and reliable and to identify deficiencies requiring maintenance early so they can be addressed with minimal cost.

6.4.1.1 LID Operation and Maintenance Plans

Operation and maintenance plans for LID measures should be carried out as applicable to the LID method installed. For infiltration trenches this may include monitoring during periods of inundation as well as observing the wet/dry cycling of soils. Additional maintenance may include monitoring of water quality, groundwater elevation, long-term infiltration capacity, and plant tolerances. The most frequently cited maintenance concern for infiltration trenches is clogging caused by organic matter and fine silts. Maintaining appropriate surface vegetation may also become an issue and should be included in the operation and maintenance plan.

Rain gardens require regular inspection and maintenance, with inspections ideally carried out after heavy rainfall for blockage or damage. Full inspections should be carried out annually. Flow tests should be carried out to verify that the underdrain is working properly and that full drainage occurs within 24 hours. Should ponding occur for longer than 24 hours, maintenance tasks may include replacing the soil mix with new soils to reinstate percolation rates, loosening or tilling the existing soil, removing fine sediment layers prior to turning over the top layer of soil, clearing overflow and discharge pipes, and ensuring that the surface of the ponding area is approximately 200-300 mm below the surrounding hard surfaces and overflow.

Bioretention or roadside swales have a flood conveyance role that must be maintained, including the swale configuration and the cover. Weed removal and replanting may be required to prevent erosion and to maintain the hydraulic properties of the swale. Strong healthy growth of vegetation is critical to the performance of bioretention swales. Debris deposition will require clearing to maintain the hydraulic function. Maintenance items should include routine inspection of the swale profile, inspection of inlet and outlet points, removal of sediment if it impedes conveyance or smothers vegetation, repairing any damage due to erosion or scour, tilling of trench surface if there is evidence of clogging, mowing of vegetation to preserve the optimal design height for the vegetation, removal of invasive weeds, and regular irrigation as required to establish healthy vegetation growth.

Maintenance of perforated pipes consists of clearing out debris and accumulated sediment caught in pre-treatment devices. Inspections should be performed to confirm that the draining time is in accordance with the original design. If drain times exceed the design values the pump may require cleanout via pumping and flushing. If slow drainage persists, the system may need removal or replace of granular material and/or geotextile liner.

Pervious pavements must be cleaned periodically to maintain the permeable surface. Cleaning is performed by vacuuming to remove sediments that have accumulated. The frequency of vacuuming is dependent on the sediment accumulation. Routine maintenance should include visual inspection of the pervious pavement to ensure that it is clean of debris and sediments. Routine maintenance should be carried out approximately monthly, such as surface blowing (with a leaf blower or similar equipment), truck sweeping and/or dry vacuuming. These maintenance practices may help prevent stubborn clogging by keeping sediment from becoming ground deep into the pavement's void structure. In areas where freezing occurs, maintenance just prior to winter may ensure that the voids are free of non-compressible materials that may inhibit drainage, thereby contributing to freeze-thaw damage. Pressure washing may be required following winter to remove anti-skid materials that may have been used on the surface.

6.4.2 Sediment Quantity Monitoring

Sediment monitoring should be completed for 5 consecutive years after the Town has assumed the pond. This monitoring will establish a sediment loading rate, which will be used to predict timing of future sediment removal. Sediment quantity monitoring should be completed every five years afterwards to ensure sediment loading rates have not changed and sediment levels have not exceeded permissible volumes. Standard sediment quantity monitoring procedures should be established upon completion of sediment quantity assessments, the priority list of ponds requiring sediment removal should be updated with the new information.

6.4.3 Sediment Quality Testing

Sediment quality testing should be completed prior to initiating any sediment removal. The following steps should be undertaken as part of a sediment quality testing program.

- Develop standard operating procedures for testing sediment quality;
- Establish when sediment quality samples are required, research and identify accredited laboratories;
- Determine the required number of samples required to accurately characterize the sediment;

- Develop a standard sediment collection technique and consider purchasing or leasing the appropriate equipment (i.e. core sampler); and
- Develop appropriate forms for recording sample locations and analysis.

6.4.4 SWM Facility Database

The SWM Facility Database is to be updated annually upon completion of annual inspection. The updated database will provide a valuable tool in assessing future maintenance and retrofit opportunities. The following steps should be undertaken as part of the SWM facility database program:

- Develop procedures to ensure SWM facility inspection and the maintenance database is continuously updated;
- Ensure records of COA requirements that are in addition to standard conditions (e.g. for monitoring and reporting) are included;
- Teach staff to set-up, populate and maintain the database; and
- Incorporate user or public complaints into the database.

6.4.5 Additional Programs

The establishment of an annual inspection program, sediment quality testing and SWM facility database will provide a tracking system to determine how the SWM facilities are performing. Additional programs may be considered to help identify areas of improvement. These programs include:

- SWM facility water quality and quantity monitoring program; and
- SWM Retrofit study to identify design enhancements to achieve new legislative requirements or watershed targets implemented since the original design.

6.4.6 Sediment Removal & Disposal

Depending on whether the works are undertaken by the Town or by a licensed contractor, a sediment and erosion control plan will be required to prevent the release of sediment from entering the receiving drainage system and causing serious harm to fish or fish habitat. Sediment release is not only detrimental to the health of the receiving system but can result in costly maintenance for the downstream infrastructure. Sediment removal may require a permit from the LSRCA. Refer to **Section 3.6** for details on sediment removal and disposal options.

If a licensed contractor is hired by the Town, construction and maintenance plans will be required. These plans must identify any diversion methods that will be required to safely bypass flows during the maintenance work. As well, all drawdown pipes will need to be identified and protected prior to sediment removal in wet ponds.

6.4.7 Funding Opportunities for LID Implementation

LSRCA's Landowner Environmental Assistance Program (LEAP) is a program that provides landowners with funding and technical assistance for environmental projects. Funding is available through this program for lot level storm projects such as rain gardens.

LSRCA's Stewardship and Forestry team continues to adapt programming to support environmental improvements within the watershed, including efforts to reduce the negative impacts of stormwater caused by urbanization. While continuing to work collaboratively with municipalities across the watershed, new programming from LSRCA aimed at

urban restoration will support funding and technical assistance to meet the stormwater challenges faced by the institutional, commercial, and industrial sectors.

The LSRCA has also developed the Lake Simcoe Phosphorus Offset Program to offset TP generation for stormwater retrofits, including conventional controls and LID measures. The program is predicated on a zero TP load via a partial “cash-in-lieu” type system, where new development pays an offset fee that would be applied to other areas which can be mitigated more effectively. This program is still awaiting final approval from the MOECC and is not yet operational as of the submission date of this report.

As with other cities and towns, the Town of Newmarket is considering provisions for SWM Financing through various sources such as Property Taxes, Utility Fee programs, Development charges, Stormwater Fee-in-Lieu, and Infrastructure Renewal Levies.

Additional environmental grants may be available for funding through granting agencies such as RBC, Blue-Water, Enbridge Savings by Design, TD Green Funds.

7. Consultation and Approvals

A Public Information Centre (PIC) was held March 31, 2015 to gather input from Newmarket residents, and other agencies and stakeholders related to the Comprehensive Stormwater Management Master Plan (CSWMMP). Presented materials and comments from this meeting are provided in **Appendix A**.

8. Conclusions and Recommendations

The following conclusions and recommendations include those carried forward from the Townwide Drainage Study and the Town of Newmarket Stormwater Management Facility Inventory and Maintenance Needs Plan (AECOM, 2009). The following recommendations are a result of the above and of this study:

- Carry out pond retrofits and clean outs as recommended;
- Implement roadway curb cuts and no curb systems where feasible to allow for roadway runoff to roadside planting and infiltration systems;
- Install Oil Grit Separators as identified for road reconstruction projects proposed within the next 10 years;
- Install LID retrofits at the Ray Twinney Complex, Magna complex, and at other Town facilities identified where feasible;
- Install LID retrofits as outlined in the report to provide water balance, water quality, and water quantity benefits as demonstrated in the report;
- Implement corridor restoration and reconnection of floodplain storage to streams where identified and feasible;
- Pursue future funding opportunities to support identified and additional LID and urban restoration opportunities within the Study Area; and
- Develop a Public Education and Engagement Campaign to promote sustainable practices and stormwater management throughout the community, together with the necessary review to translate the practices into policies and guidelines.

Recommended LID and retrofit measures as discussed in this report are summarized below.

Table 8-1. Treatment Recommendations

Man Unit	Treatment Proposed	Water Quality	Water Quantity	Water Budget	Treatment Method
1	Rooftop infiltration capacity of 10mm event at Upper Canada Mall	✓	✓	✓	Soakaway/infiltration
	Potential Parking lot treatment at Region building (Yonge and Eagle)	✓	✓	✓	Soakaway/infiltration
	Rooftop infiltration capacity of 10mm event at Region building (Yonge and Eagle)	✓	✓	✓	Soakaway/infiltration
	Potential parking lot treatment at Ray Twinney complex	✓	✓	✓	Soakaway/infiltration SWM Facilities
	Clean out and retrofit SWM facilities to original design level	✓	✓	□	SWM Facilities
2	Further study may be feasible to evaluate over-control of future development to increase infiltration and reduce peak flows	□	□	□	
	Capture additional 3 ha area and provide LID with 10 mm infiltration capacity to balance water budget and reduce peak flows	✓	✓	✓	Soakaway/infiltration
	Infiltration capacity of 10mm event by funded LID at Industrial or Commercial site	✓	✓	✓	Soakaway/infiltration
	Rooftop infiltration capacity of 10mm event at Magna Centre	✓	✓	✓	Soakaway/infiltration
	Infiltration capacity of 10mm event of parking lot runoff at Magna Centre	✓	✓	✓	Soakaway/infiltration
3	Clean out and retrofit SWM facilities to original design level	✓	✓	□	SWM Facilities
	Further study may be feasible to evaluate over-control of future development to increase infiltration and reduce peak flows	□	□	□	
	Capture additional 15 ha area and provide LID with 10 mm infiltration capacity to balance water budget and reduce peak flows	✓	✓	✓	Soakaway/infiltration
	Clean out and retrofit SWM facilities to original design level	✓	✓	✓	Soakaway/infiltration
	Further study may be feasible to evaluate over-control of future development to increase infiltration and reduce peak flows	□	□	□	
4	Capture additional 34 ha area and provide LID with 10 mm infiltration capacity to balance water budget and reduce peak flows	✓	✓	✓	Soakaway/infiltration
	Clean out and retrofit SWM facilities to original design level	✓	✓	✓	Soakaway/infiltration
	Potential infiltration capacity of 10mm event by funded LID at Industrial or Commercial site	✓	✓	✓	Soakaway/infiltration
	Potential rooftop infiltration capacity of 10mm event – Pony Drive/Stellar Drive	✓	✓	✓	Soakaway/infiltration
	Potential parking lot infiltration capacity of 10mm event – Pony Drive/Stellar Drive	✓	✓	✓	Soakaway/infiltration
5	Clean out and retrofit SWM facilities to original design level	✓	✓	✓	SWM Facilities
	Clean out and retrofit SWM facilities to original design level	✓	✓	✓	SWM Facilities
	Further study may be feasible to evaluate over-control of future development to increase infiltration and reduce peak flows	□	□	□	
	Capture additional 14 ha area and provide LID with 10 mm infiltration capacity to balance water budget and reduce peak flows	✓	✓	✓	Soakaway/infiltration
	Clean out and retrofit SWM facilities to original design level	✓	✓	✓	SWM Facilities
6	Further study may be feasible to evaluate over-control of future development to increase infiltration and reduce peak flows	□	□	□	
	Capture additional 14 ha area and provide LID with 10 mm infiltration capacity to balance water budget and reduce peak flows	✓	✓	✓	Soakaway/infiltration
	Clean out and retrofit SWM facilities to original design level	✓	✓	✓	Soakaway/infiltration
	Further study may be feasible to evaluate over-control of future development to increase infiltration and reduce peak flows	□	□	□	
	Capture additional 14 ha area and provide LID with 10 mm infiltration capacity to balance water budget and reduce peak flows	✓	✓	✓	Soakaway/infiltration
7	Clean out and retrofit SWM facilities to original design level	✓	✓	✓	SWM Facilities
	Further study may be feasible to evaluate over-control of future development to increase infiltration and reduce peak flows	□	□	□	
	Capture additional 14 ha area and provide LID with 10 mm infiltration capacity to balance water budget and reduce peak flows	✓	✓	✓	Soakaway/infiltration
	Clean out and retrofit SWM facilities to original design level	✓	✓	✓	Soakaway/infiltration
	Further study may be feasible to evaluate over-control of future development to increase infiltration and reduce peak flows	□	□	□	

Man Unit	Treatment Proposed	Water Quality	Water Quantity	Water Budget	Treatment Method
	Capture additional 10 ha area and provide LID with 10 mm infiltration capacity to balance water budget and reduce peak flows	✓	✓	✓	Soakaway/infiltration
8	Clean out and retrofit SWM facilities to original design level	✓	✓	□	SWM Facilities
	Lion's Park restoration - LID catchment wide retrofit program –infiltration capacity of 10mm event Further study may be feasible to evaluate over-control of future development to increase infiltration and reduce peak flows	✓	✓	✓	Soakaway/infiltration
	Capture additional 16 ha area and provide LID with 10 mm infiltration capacity to balance water budget and reduce peak flows	□	□	□	
	Capture additional 16 ha area and provide LID with 10 mm infiltration capacity to balance water budget and reduce peak flows	✓	✓	✓	Soakaway/infiltration
9	Bioswale/filter consideration in the Wayne and Waratah intersection – infiltration capacity of 10mm event	✓	✓	✓	Soakaway/infiltration
	Clean out and retrofit SWM facilities to original design level	✓	✓	□	SWM Facilities
	Further study may be feasible to evaluate over-control of future development to increase infiltration and reduce peak flows	□	□	□	
	Capture additional 20 ha area and provide LID with 10 mm infiltration capacity to balance water budget and reduce peak flows	✓	✓	✓	Soakaway/infiltration
10	Potential infiltration capacity of 10mm event by funded LID at Industrial or Commercial site	✓	✓	✓	Soakaway/infiltration
	Clean out and retrofit SWM facilities to original design level	✓	✓	□	SWM Facilities
	Further study may be feasible to evaluate over-control of future development to increase infiltration and reduce peak flows	□	□	□	
	Capture additional 41 ha area and provide LID with 10 mm infiltration capacity to balance water budget and reduce peak flows	✓	✓	✓	Soakaway/infiltration
11	Potential parking lot infiltration capacity of 10mm event near Yonge and Bonshaw	✓	✓	✓	Soakaway/infiltration
	Potential rooftop infiltration capacity of 10mm event near Yonge and Bonshaw	✓	✓	✓	Soakaway/infiltration
	Clean out and retrofit SWM facilities to original design level	✓	✓	✓	SWM Facilities

9. Next Steps

The next steps include obtaining Approval by Council and Implementation of the Recommended Approach.

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Impacts of Stormwater Ponds.

Appendix A

Study Correspondence

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Please complete the sign-in sheet and review display materials.

The project team is available to answer your questions and address any concerns.

Your input is valued! Please fill out a comment sheet.

AECOM

Welcome!

Town of Newmarket Comprehensive Stormwater Master Plan Public Information Centre No. 1 March 31, 2015



This Comprehensive Stormwater Master Plan provides an integrated assessment of existing and proposed/future conditions with respect to stormwater management within the Town of Newmarket. The Plan details opportunities for improvement and recommendations for future actions, and complies with the 10 steps identified in the Lake Simcoe Region Conservation Authority's Comprehensive Stormwater Management Master Plan Guidelines. The steps followed in this include :

1. Scope and definition of settlement areas within the entire urban boundary of the Town;
2. Determination of Study Area;
3. Characterization of Study Area;
4. Division of the Study Area into Management Units;
5. Evaluation of Cumulative Environmental Impacts of Stormwater Management from Existing and Proposed/Future Developing;
6. Determine Effectiveness of Existing SWM Systems;
7. Identification and evaluation of Stormwater improvement and retrofit opportunities;
8. Establishing a Recommended Approach for Stormwater Management for the Study Area;
9. Developing an Implementation Plan for Recommended Approaches; and
10. Developing Programs for Inspection and Maintenance of Stormwater Management Facilities.

Town of Newmarket

Comprehensive Stormwater Master Plan

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The Purpose of the Comprehensive Stormwater Master Plan is to explore various alternatives to reduce the Phosphorus loading in runoff with in the Study Area.

The Plan is an integrated assessment of existing and proposed/future conditions with respect to stormwater management within the Town of Newmarket, and details opportunities for improvement and recommendations for future actions.

AECOM

Purpose of the Comprehensive Stormwater Master Plan

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This study has been undertaken according to the Master Planning process, set out within the Municipal Class Environmental Assessment (Municipal Engineers Association, October 2000, as amended in 2007 and 2011), and is subject to the requirements of the Environmental Assessment Act.

The Comprehensive Stormwater Master Plan is a long range plan that integrates the existing and future land use needs of the Study Area with environmental assessment planning principles. This plan examines the needs of the area in order to outline a framework for planning for subsequent projects. Similar to an Environmental Assessment (EA) in evaluating options, a broad-based process is used including functional performance, environmental, social and economic/cost considerations. The Comprehensive Stormwater Master Plan allows for an integrated planning approach that the Town of Newmarket can adopt as it continues to grow, and a methodology for implementing new and upgrading existing stormwater management facilities.

As part of the projects AECOM will ensure that requirements of Phases 1 and 2 of the Municipal Class EA process are completed.

The Class Environmental Assessment Planning Process is depicted graphically on the following panel.

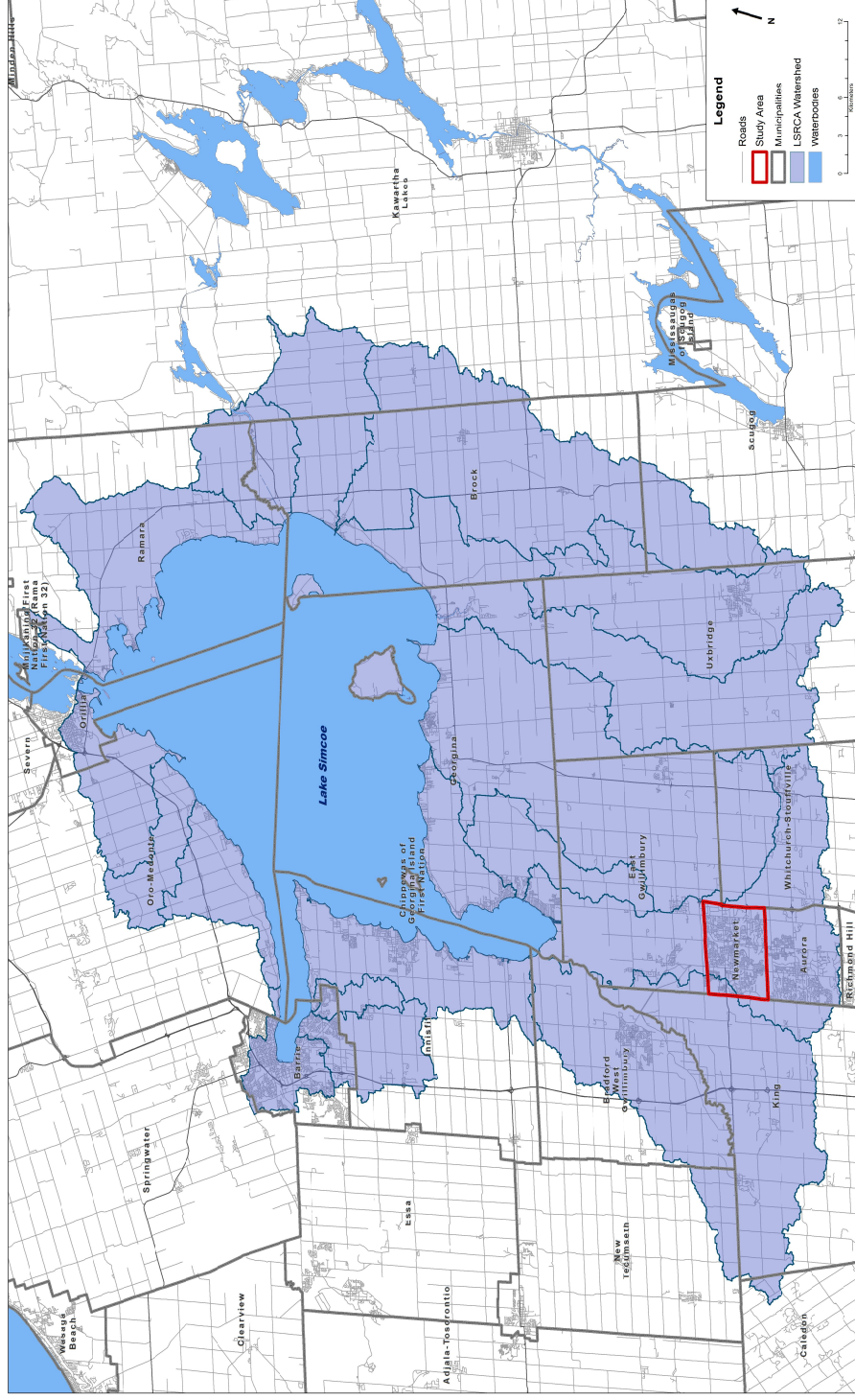
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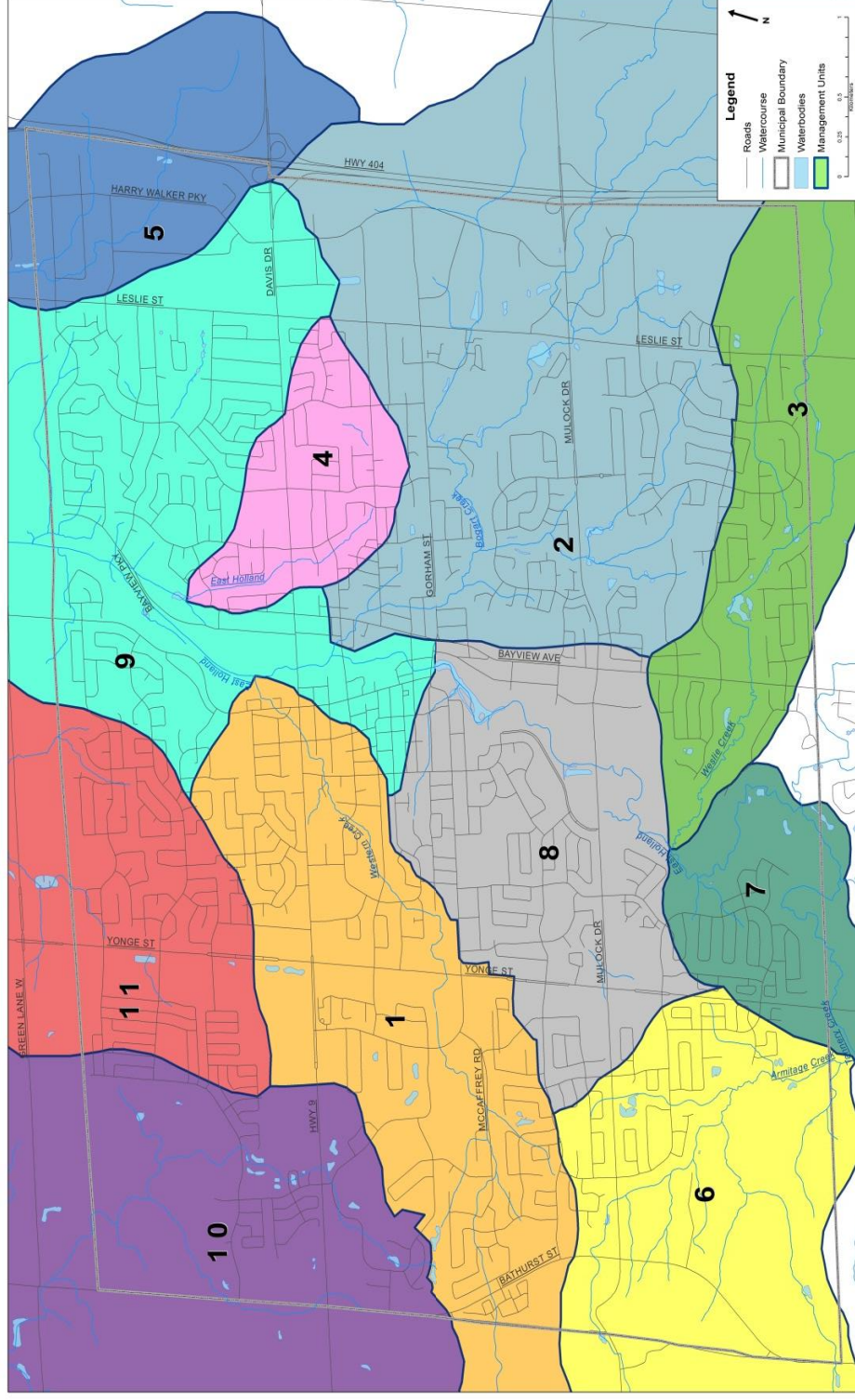
Municipal Class Environmental Assessment (EA) Process

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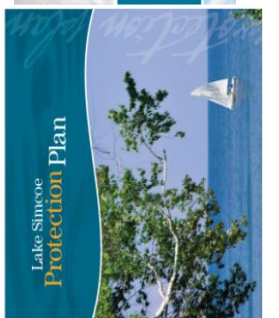


REPLACE WITH EA PROCESS BOARD





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SECTION C
STORM DRAINAGE
&
STORMWATER MANAGEMENT

NEWMARKET URBAN CENTRES
SECONDARY PLAN

RECOMMENDED TO THE REGION OF YORK FOR APPROVAL

Lake Simcoe Basin Stormwater
Management and Retrofit
Opportunities
2007

Oak Ridges Moraine
Conservation Plan



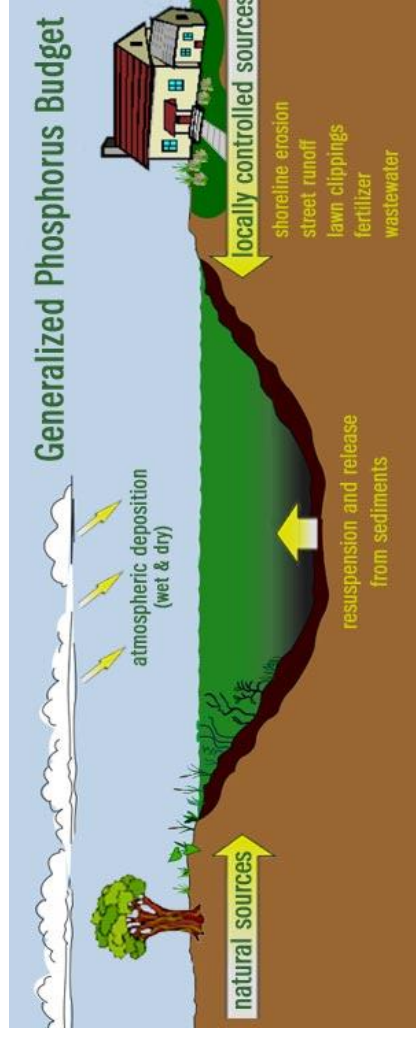
Numerous studies have been carried out previously for both Stormwater Management and Phosphorus loading. Those relevant to the Town of Newmarket Comprehensive Stormwater Master Plan were reviewed as part of this study.

Of specific interest to this study were the Town-Wide Drainage Study, the Upper York Sewage Solutions Individual EA, the Stormwater Facility Inventory and Maintenance Plan and Stormwater Pond Studies by LSRCA.

AECOM Background Information

What is Phosphorus?

Phosphorus is a naturally occurring nutrient in our environment and is also commonly found in commercial fertilizers and other household products. While Phosphorus is a valuable nutrient that helps plants to grow, such as our lawns and gardens, when there is an excessive amount of phosphorus, it can have a negative impact on our watershed environment, including the quality of water in Lake Simcoe² and its river system.⁵



Phosphorus sources, Lake Access

What is Phosphorus?

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Human activities lead to increased inputs of P in streams. The most obvious sources are from municipal wastewater (sewage) treatment plants and from industry and are called point sources that are regulated by monitoring loads at the ends of their discharge pipes and setting strict limits. Diffuse, or non point sources, are much more difficult to measure and to control.

The major sources of P to most urban lakes are non point, are all controllable to a large extent by homeowners and/or local community agencies and typically include:

- soil-P from erosion (construction sites, road banks, shoreline and stream bank disturbance, lawns & gardens)
- road and roof runoff (sediment and organic matter that accumulates between rainfalls)
- lawn clippings, leaves and other organic matter
- excess lawn fertilizer

All of these sources collect on the ground and are washed into sewers and streams when it rains.

AECOM How is Phosphorus transported?

Why is it bad for Lake Simcoe?

Excessive phosphorus has been the most significant cause of water quality impairment in Lake Simcoe and its rivers, or tributaries. It leads to excessive aquatic plant and algal growth in the lake. When algae decay in the deeper areas of the lake, they create an oxygen shortage that affects coldwater fish such as lake trout and lake whitefish, which need sufficient levels of oxygen to survive and reproduce.

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Lake Simcoe has seen a dramatic decline in some fish species, along with an increase in algae blooms and aquatic weed growth. Phosphorus emissions from both urban and rural sources have upset the lake's ecosystem and fostered excessive aquatic plant growth, raising water temperatures, and decreasing oxygen levels, thereby rendering limited breeding grounds inhospitable.

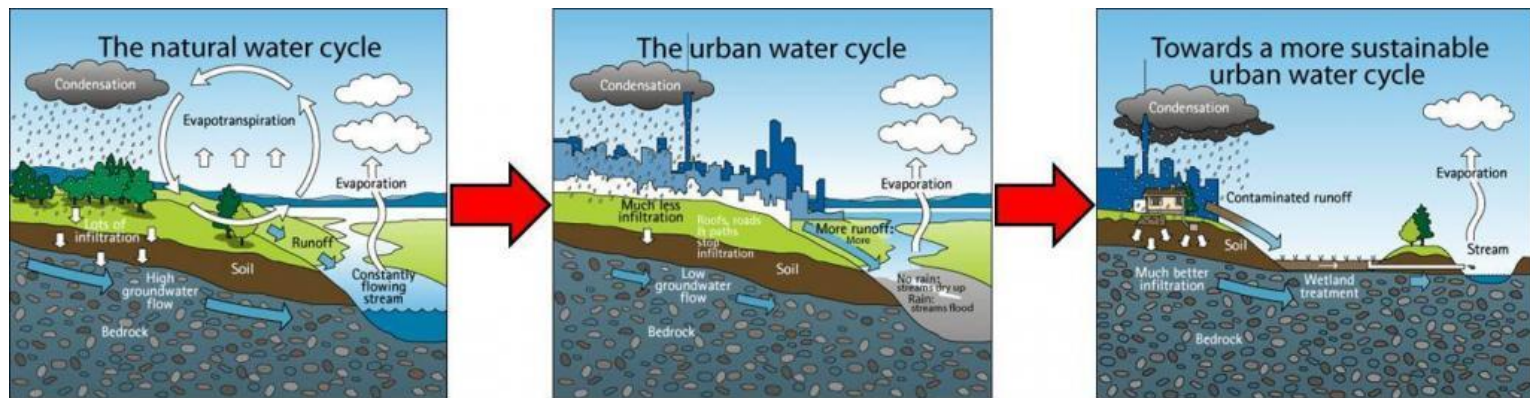
What is Phosphorus? Why is it bad for Lake Simcoe?

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Stormwater runoff is water that flows over surfaces and across the land when it rains. The water is routed into minor (sewers) and major (overland) drainage systems and ultimately into natural areas including creeks, wetlands, and lakes.

Urban development increases the area of hard (impervious) surfaces, increasing the stormwater runoff and decreasing the amount of water infiltrating into the ground.



Stormwater in Urban Areas, SSWM.info

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What is Stormwater Management (SWM)?

Stormwater runoff is water that flows over surfaces and across the land when it rains. The water is routed into minor (sewers) and major (overland) drainage systems and ultimately into natural areas including creeks, wetlands, and lakes.

Stormwater Management is the process of controlling the runoff to mitigate erosion, flooding, and water quality to protect our water resources.

The implementation of stormwater management measures results reducing phosphorus loading:

- **By reducing runoff – less water to wash phosphorus off the surface**
- **By filtering the runoff – removing phosphorus attached to particles**
- **By settling – allowing phosphorus attached to particles to settle out of the runoff**

What is Stormwater Management (SWM)?

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Dry stormwater ponds are an end of pipe stormwater measure that capture runoff and provide a controlled release. Dry ponds have no permanent pool and act mainly as quantity control facility. They are effective for providing erosion control and reducing the risk of flooding. They provide only minimal water quality control. These ponds are generally depressional areas with surrounding berm designed to store water to reduce peak outflows. Can be manicured grass for park, sports field or naturalized area.



Dry Stormwater Pond (Newmarket), AECOM



Dry Stormwater Pond (Kitchener), AECOM



Dry Stormwater Pond (Guelph), AECOM



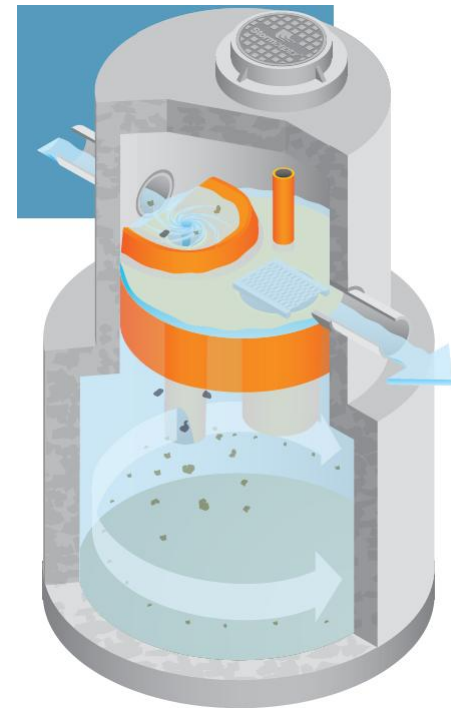
Types of SWM - Dry Ponds

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A Treatment Manhole or Oil-Grit Separator (OGS) is a specially designed manhole structure on the storm sewer system that promotes sediment settling and removes oil and grease. These manholes need regular cleanouts to maintain their function.

Phosphorus is removed through settling of particulate matter.



Oil Grit Separator, Imbrium

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Wet stormwater detention ponds are also an end of pipe stormwater measure, and work by capturing and detaining stormwater runoff and releasing it slowly at a designed rate. The permanent pool allows for the suspended particulates in the stormwater runoff to settle out in the pond. The water is then released at the designed rate to continue downstream in the system. Wet ponds can be designed to provide varying levels of water quality and quantity control. Maintenance is required in the form of pond cleanouts to preserve the permanent pool volume and the designed water quality control effectiveness.



Wet Stormwater Pond (Newmarket), AECOM



Wet Stormwater Pond (Brant), AECOM



Wet Stormwater Pond (Guelph), AECOM



Types of SWM - Wet Ponds

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Low Impact Development (LID) provides opportunities for urban development to maintain the natural hydrologic cycle by collecting and filtering stormwater naturally, directing water back into the ground as under pre-development conditions. LID measures may also help to reduce phosphorus loading, mainly through infiltration reducing overall surface runoff. These may include infiltration trenches, rain gardens, and road right of way options including bioretention, roadside swales, perforated pipes, and pervious pavement. LID measures reduce runoff volume, help prevent soil erosion, filter pollutants, recharge groundwater, and enhance streetscapes.

Design features such as curb cuts or urban road sections may be used in conjunction with LID methods to provide a surface water flow path to enhanced ditches or bioretention swales.

Types of SWM – LID

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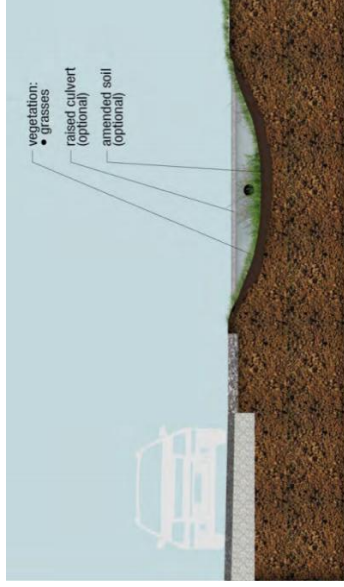
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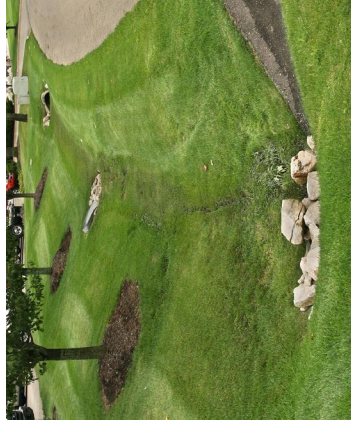


Enhanced grass swales are vegetated open channels designed to convey, treat and attenuate stormwater runoff. Check dams and vegetation slow the water to allow suspended particulates to settle out, and infiltration through the root zone also allows for uptake of nutrients by the vegetation. In addition to providing a water quality control to stormwater runoff, enhanced grass swales also reduce impervious cover and accent the natural landscape, providing aesthetic benefits.

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Enhanced Grass Swale – “Grey to Green Road Retrofits”,
Credit Valley Conservation



Enhanced Grass Swale – Prien&Newhof

Low Impact Development (LID) options

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Rain gardens are shallow depressions designed with bioretention features that are suited to receive overland flows diverted from paved areas.

Bioswales are similar to enhanced grass swales in terms of the design, however they also incorporate aspects of bioretention cells consisting of bioretention soil media, a gravel storage layer, and optional underdrain components. They can significantly enhance neighbourhood aesthetics when planted with vegetation that tolerates both dry and wet growing conditions.

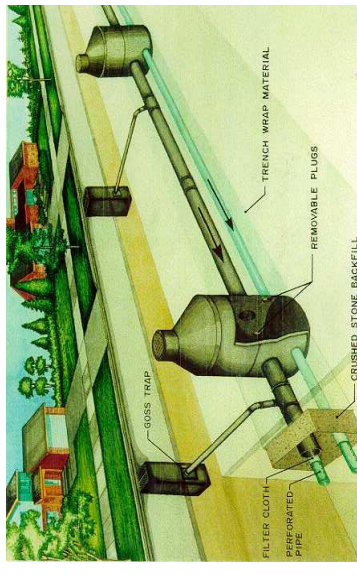
Infiltration methods such as perforated pipes (e.g. the Etobicoke System) provide water quality and quantity control.



Rain Garden in Residential Neighbourhood,
Credit Valley Conservation



Bioretention Swale – "Grey to Green Road Retrofits",
Credit Valley Conservation



Etobicoke Exfiltration System, Ryerson University

AECOM Low Impact Development (LID) options

Town of Newmarket

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Rainwater harvesting reduces stormwater runoff by collecting rainwater (usually from rooftop downspouts) and using it between storm events for irrigation, car/truck washing, toilet flushing or other non-potable uses. Rainwater can be collected in above ground rainbarrels, tanks or cisterns or underground tanks fitted with pumps.

Green roofs consist of a thin layer of growing media installed on top of a conventional flat roof. Green roofs reduce the rate and volume of runoff by providing temporary storage on the surface of the vegetation, within the growing media and drainage layers, as well as allowing water to be lost to the atmosphere via evapotranspiration. Green roofs can help to lower your heating and cooling costs.



Residential Rainbarrel,
Credit Valley Conservation



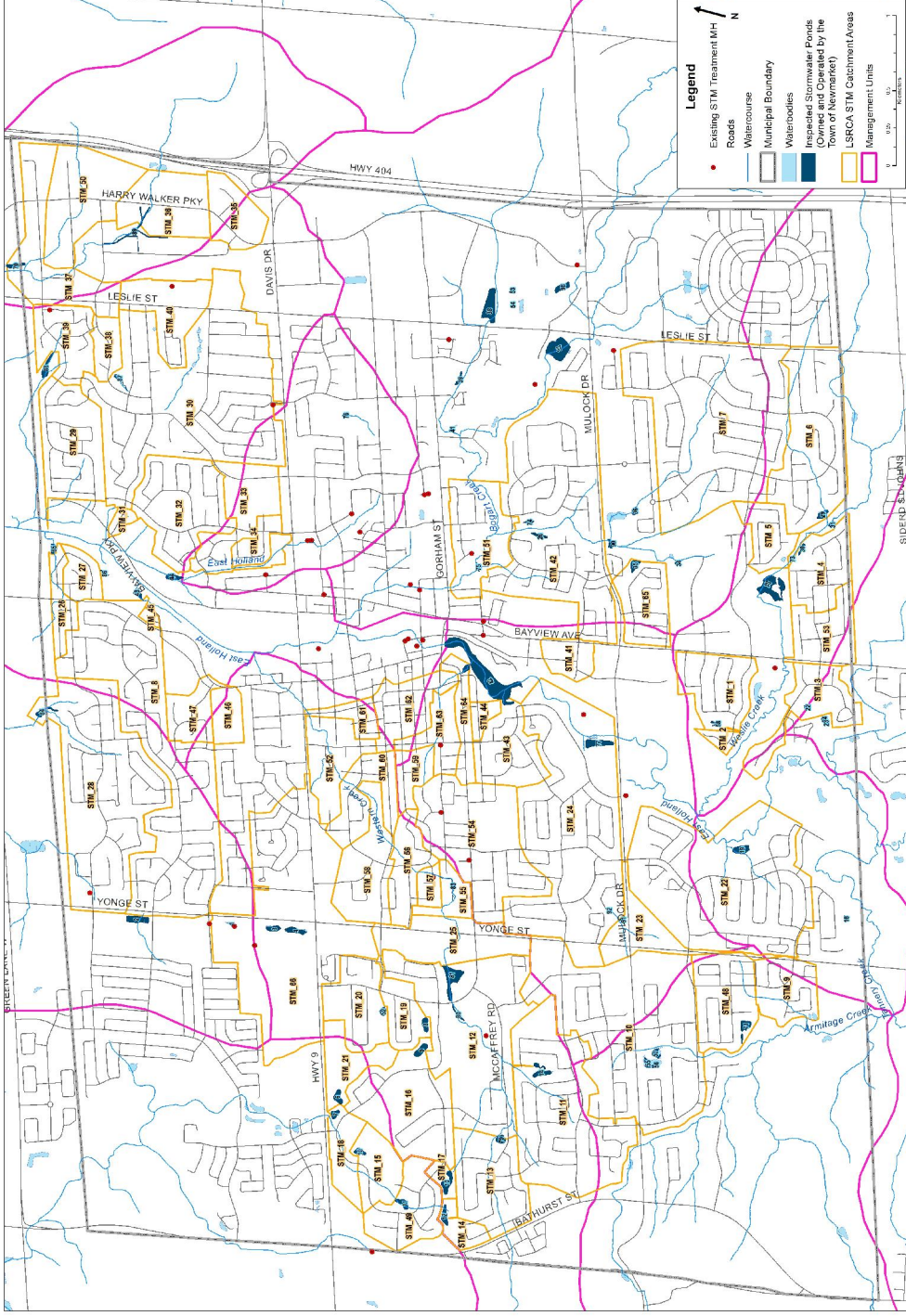
Maplewood Mall, Minnesota Rainwater Tank, Credit
Valley Conservation



Green Roof, Credit Valley Conservation

AECOM Low Impact Development (LID) options

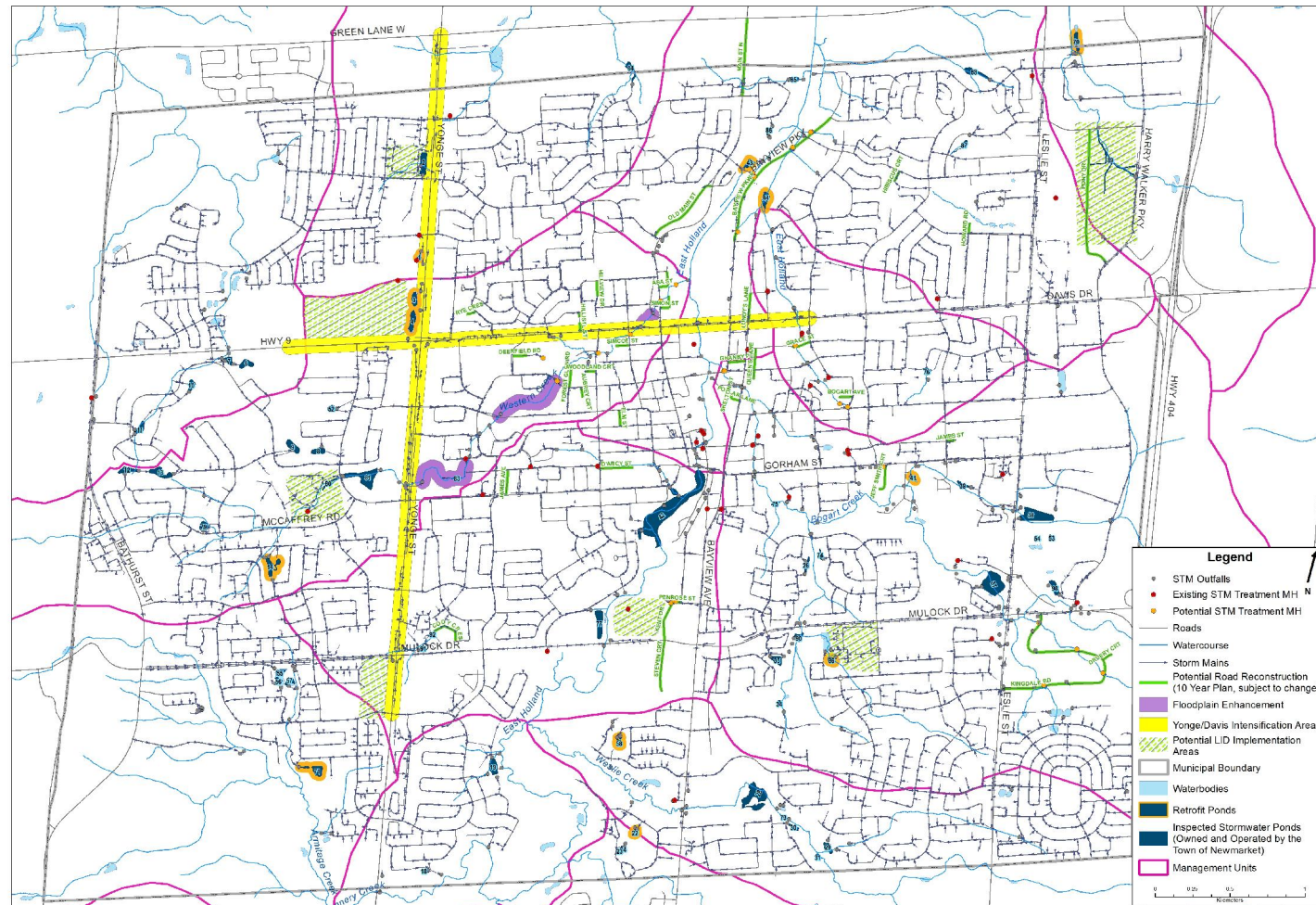
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Study Components

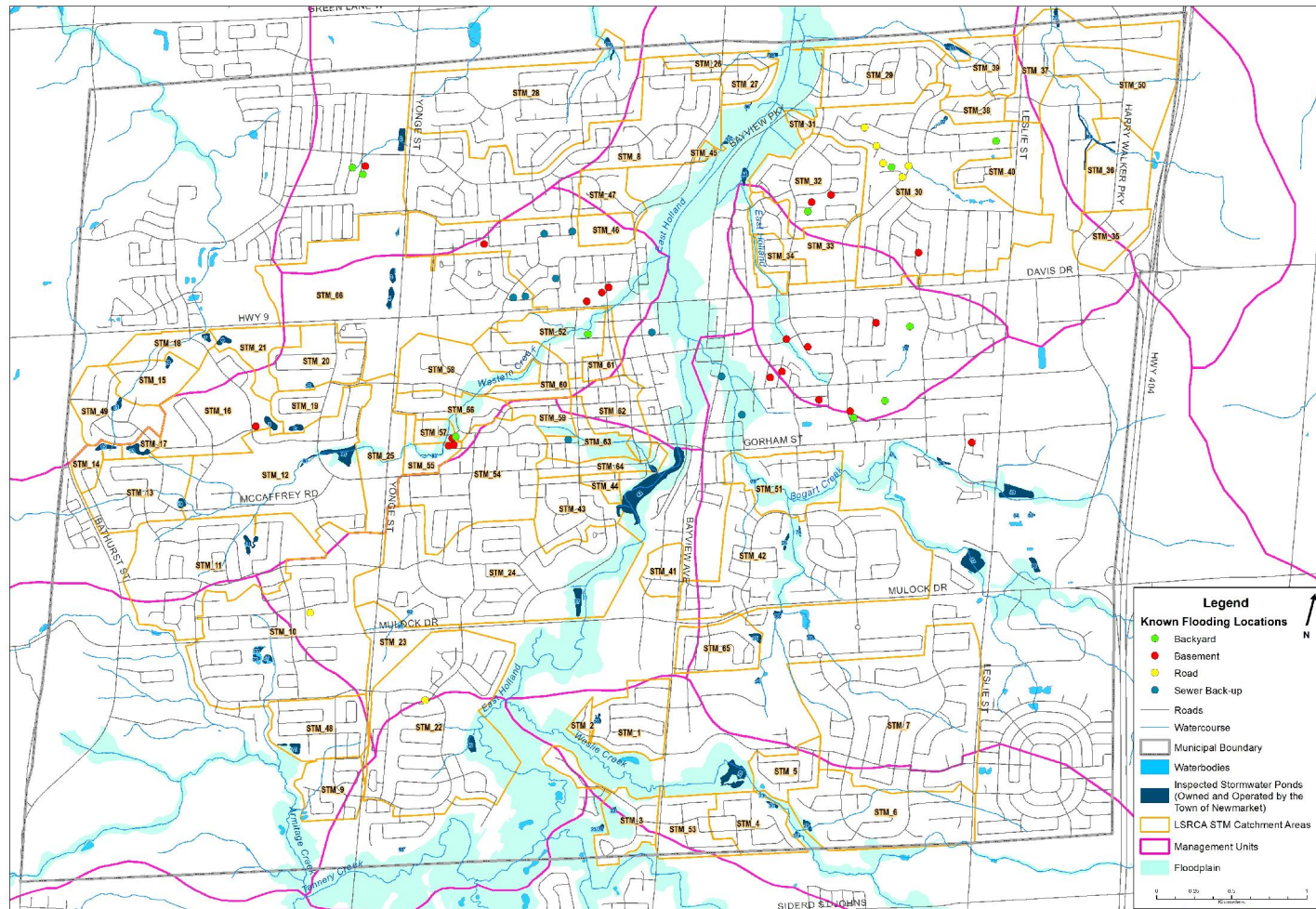


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AECOM Existing and Future SWM Upgrades

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The following recommendations are a result of the analysis of the study:

- **Carry out pond retrofits and clean outs as outlined in the Plan;**
- **Implement roadway curb cuts and no curb systems where feasible to allow for roadway runoff to planting systems and infiltration systems;**
- **Install Oil Grit Separators where necessary and/or feasible for road reconstruction projects proposed within the next 10 years;**
- **Install LID measures at the Ray Twinney Complex and at other Town facilities where feasible;**
- **Implement corridor restoration and reconnection of floodplain storage to streams where feasible; and**
- **Public Education and Engagement Campaign to promote sustainable practices and stormwater management throughout the community.**

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The following steps will be completed next:

- **Finalizing the report and recommendations based on public input;**
- **Approval by Council;**
- **Implementation of Recommended Approach.**

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Comprehensive Stormwater Master Plan
Public Information Centre No. 1
March 31, 2015



Contact Information

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COMMENT SHEET

PUBLIC INFORMATION CENTRE – Drop In Stormwater Master Plan

Date: Tuesday March 31, 2015 - 6:30 p.m. to 8:00 p.m.

Location: Council Chamber, Municipal Offices, 395 Mulock Drive

YOU ARE INVITED TO OFFER ANY COMMENTS:

- the emphasis is on phosphorus; will mitigation of other pollutants be studied?
- how will this impact new developments or developments that have been approved but not yet started
- will maintenance (both ongoing and rebuilding) be properly budgeted for

(Please use back if there is not enough space)

Please provide name and address below (**PLEASE PRINT**):

Name: _____

Address: _____

Postal Code: _____

E-Mail: _____

Please place this Comment Sheet in the box provided or you may fax, mail or e-mail it by no later than Friday, April 10, 2015 to:

Meredith Goodwin
Capital Projects Mgr
Town of Newmarket
395 Mulock Drive
Newmarket, ON L3Y 4X7

or
mgoodwin@newmarket.ca
Fax Number: 905-953-5138



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YOU ARE INVITED TO OFFER ANY COMMENTS:

Councillor Tom Heupen - Ward 4

- Study in

2008 sewer backup complaints.

are they still relevant?

how there been backups since?

- what were the recommendations from

those in the report

Slide - Known Flooding Areas

(Please use back if there is not enough space)

Please provide name and address below (PLEASE PRINT):

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Address: _____

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Appendix B

Phosphorus Loading and Removal Efficiency Calculations

Appendix B1

Pond Summary Table

Pond Number	Existing Ownership	Management Unit	Pond Type	Pond Design	Existing Function	Designed Level of Enhancement
3	Private	1	-	Wet	Wet	3
4	Private	1	-	Wet	Wet	3
8	Unassumed	1	-	Wet	Wet	1
9	Unassumed	1	-	Wet	Wet	1
12	Unassumed	1	-	Wet	Wet	1
13	Unassumed	1	-	Wet	Wet	1
14	Town of Newmarket	1	quality/quantity	Wet	Wet	2
52	Unassumed	1	-	Wet	Wet	1
66	Town of Newmarket	1	online	-	-	n/a
79	Town of Newmarket	1	quantity	Dry	Dry	3
80	Town of Newmarket	1	online	-	-	3
81	Town of Newmarket	1	quality/quantity-online	-	-	1
83	Town of Newmarket	1	online	-	-	n/a
26	Town of Newmarket	2	quantity	Dry	Dry	n/a
34	Unassumed	2	quality/quantity	Wet	Wet	3
35	Town of Newmarket	2	quality/quantity	Wet	Wet	1
36	Town of Newmarket	2	quantity-online	-	-	2
37	Private	2	quality/quantity-online	-	-	n/a
38	Town of Newmarket	2	quality/quantity	Wet	Wet	1
39	Town of Newmarket	2	quality/quantity	Wet	Dry	1
40	Town of Newmarket	2	removed from inventory	-	-	n/a
41	Private	2	quality/quantity	Wet	Wet	1
53	Town of Newmarket	2	quality/quantity	Wet	Wet	1
54	Town of Newmarket	2	Removed from Inventory	-	-	n/a
57	Private	2	online - not a SWM pond	-	-	n/a
61	Town of Newmarket	2	quantity-online	-	-	n/a
64	Private	2	-	Wet?	Wet?	n/a
65	Private	2	-	Wet	Wet	n/a
74	Town of Newmarket	2	quality/quantity	Wet	Dry	1
75	Town of Newmarket	2	quality/quantity-online	-	-	1
93	UNASSUMED	2	n/a	Wet	Wet	n/a
96	Town of Newmarket	2	quality/quantity-online	-	-	1
98	Unassumed	2	quality/quantity	Wet	Dry	1
101	Unassumed	2	-	Wet	Wet	n/a
28	Private	3	online	-	-	n/a
29	Town of Newmarket	3	quality/quantity	Dry	Dry	n/a
30	Town of Newmarket	3	quantity	Dry	Dry	n/a
31	Town - Removed from Inventory	3	Removed from Inventory	-	-	n/a
58	Town of Newmarket	3	quality/quantity	Wet	Wet	1
73	Town of Newmarket	3	quantity-online	-	-	3
102	UNASSUMED	3	-	Wet	Wet	n/a
63	Town of Newmarket	4	-	Dry	Dry	n/a
76	Town of Newmarket	4	quantity	Dry	Dry	3
70	Town of Newmarket	5	-	Wet	Wet	n/a
89	Town of Newmarket	5	online	-	-	1
27	Private	6	online	-	-	n/a
32	Private	6	online	-	-	n/a
33	Town of Newmarket	6	Dry pond/wetland	Dry	Dry	n/a
51	Private	6	online - not a SWM pond	-	-	n/a
55/56/62	Town of Newmarket	6	quality/quantity	Wet	Dry	1
71	Town of Newmarket	6	quality/quantity	Wet	Wet	1
97	Town of Newmarket	6	quality/quantity	Wet	Wet	1
5	Private - Golf Course	7	quality/quantity	Wet	Wet	n/a
16	Private - Golf Course	7	quality/quantity	Wet	Wet	n/a
17	Private - Golf Course	7	quality/quantity	Wet	Wet	n/a
18	Town of Newmarket	7	quality/quantity	Dry	Dry	3
19	Town of Newmarket	7	quality/quantity	Wet	Wet	1
22	Town of Newmarket	7	quality/quantity	Wet	Wet	1
23&24	Ponds23/24 same pond/connected	7	-	Wet	Wet	1
25	Private	7	online - not a SWM pond	-	-	n/a
42	Town of Newmarket	8	quality/quantity-online	-	-	1
77	Town of Newmarket	8	-	Wet	Wet	1
91	Town of Newmarket	8	-	Dry	Dry	1
92	Town of Newmarket	8	quantity	Dry	Dry	3
43	Town of Newmarket	9	quality/quantity	Wet	Dry	1
44	Town of Newmarket	9	quality/quantity-online	-	-	1
46	Private	9	online	-	-	n/a
47	Private	9	online	-	-	n/a
48	Private	9	online	-	-	n/a
49	Private	9	online	-	-	n/a
50	Private	9	online	-	-	n/a
59	Private	9	online	-	-	n/a
60	Private	9	online	-	-	n/a
85	Town of Newmarket	9	quantity	Dry	Dry	3
86	Town of Newmarket	9	quality/quantity	Wet	Wet	1
87	Town of Newmarket	9	quantity	Dry	Dry	3
88	Town of Newmarket	9	quantity	Dry	Dry	3
6	Unassumed	10	-	Wet	Wet	1
7	Unassumed	10	-	Wet	Wet	1
10	Unassumed	10	-	Wet	Wet	1
11	Unassumed	10	-	Wet	Wet	1
45	Town of Newmarket	10	online	-	-	n/a
67 (MQ1)	Town of Newmarket	10	quality/quantity	Wet	Dry	1
68 (MQ3)	Unassumed	10	-	Dry	Dry	n/a
94	Town of Newmarket	10	quality/quantity-online	-	-	1
95	Town of Newmarket	10	-	Wet	Wet	n/a
72 (WQ1)	Town of Newmarket	10	quality/quantity	Wet	Wet	n/a
99 (MQ2)	Town of Newmarket	10	quality/quantity	Dry	Dry	1
103 (MQ4)	Town of Newmarket	10	quality/quantity	Wet	Wet	n/a
1	Private	11	-	Wet	Wet	1
2	Private	11	quality/quantity	Wet	Wet	1
84	Town of Newmarket	11	online	-	-	1

Shaded Ponds are online ponds and were not included in the phosphorus removal calculations.

EXISTING CONDITIONS			
AREAS NOT TREATED BY SWM PONDS		AREAS TREATED BY SWM PONDS	
	UNTREATED	WET	DRY
Mangement Unit 1			
Cropland	4.49		
High Intensity - Comm/Industrial	144.34	42.68	0.32
High Intensity - Residential	122.06	112.06	19.48
Sod farm/Golf course	42.42	36.05	2.46
Total Area:	313.32	190.78	22.27
Mangement Unit 2			
Cropland	0.27		
High Intensity - Comm/Industrial	130.51	104.76	31.26
High Intensity - Residential	183.06	95.20	75.44
Sod farm/Golf course	73.68	19.96	16.94
Total Area:	387.52	219.92	123.64
Mangement Unit 3			
Cropland	22.00		
High Intensity - Comm/Industrial	29.59	0.29	0
High Intensity - Residential	33.15	30.43	55.93
Sod farm/Golf course	63.32	3.66	10.04
Total Area:	148.06	34.38	65.97
Mangement Unit 4			
Cropland	0.00		
High Intensity - Comm/Industrial	35.42	0	19.58
High Intensity - Residential	54.27	0	38.76
Sod farm/Golf course	0.00	0	4.71
Total Area:	89.68	0.00	63.05
Mangement Unit 5			
Cropland	0.00		
High Intensity - Comm/Industrial	96.71	24.82	0
High Intensity - Residential	0.00	1.65	0
Sod farm/Golf course	0.00	1.13	0
Total Area:	96.71	27.60	0.00
Mangement Unit 6			
Cropland	62.69		
High Intensity - Comm/Industrial	8.54	5.08	25.34
High Intensity - Residential	4.48	36.50	54.16
Sod farm/Golf course	152.55	12.67	7.44
Total Area:	228.26	54.25	86.93
Mangement Unit 7			
Cropland	0.00		
High Intensity - Comm/Industrial	0.00	15.56	0
High Intensity - Residential	0.00	67.64	13.10
Sod farm/Golf course	28.98	39.45	0
Total Area:	28.98	122.65	13.10
Mangement Unit 8			
Cropland	0.00		
High Intensity - Comm/Industrial	115.03	18.11	14.79
High Intensity - Residential	140.15	62.91	0.50
Sod farm/Golf course	43.27	20.48	1.57
Total Area:	298.45	101.50	16.86
Mangement Unit 9			
Cropland	7.97		
High Intensity - Comm/Industrial	161.72	0.00	20.40
High Intensity - Residential	46.08	7.64	197.41
Sod farm/Golf course	71.78	0.03	20.23
Total Area:	287.56	7.68	238.04
Mangement Unit 10			
Cropland	52.15		
High Intensity - Comm/Industrial	9.96	3.15	6.87
High Intensity - Residential	11.32	68.07	24.55
Sod farm/Golf course	68.11	56.08	5.68
Total Area:	141.54	127.30	37.10
Mangement Unit 11			
Cropland	1.28		
High Intensity - Comm/Industrial	48.42	44.98	0
High Intensity - Residential	101.40	31.22	0
Sod farm/Golf course	11.55	2.91	0
Total Area:	162.65	79.11	0.00
Total Area:	2183	965	667

PROPOSED CONDITIONS			
AREAS NOT TREATED BY SWM PONDS		AREAS TREATED BY SWM PONDS	
	UNTREATED	WET	DRY
Mangement Unit 1			
High Intensity - Comm/Industrial	110.30	38.68	0.00
High Intensity - Residential	152.10	119.33	19.60
Sod farm/Golf course	47.47	36.51	2.40
Total Area:	309.86	194.51	22.00
Mangement Unit 2			
High Intensity - Comm/Industrial	21.93	165.42	0.00
High Intensity - Residential	268.05	116.37	36.39
Sod farm/Golf course	94.01	24.79	4.14
Total Area:	383.99	306.57	40.53
Mangement Unit 3			
High Intensity - Comm/Industrial	0.45	12.07	0
High Intensity - Residential	89.03	19.68	57.48
Sod farm/Golf course	59.14	2.25	8.33
Total Area:	148.62	34.00	65.80
Mangement Unit 4			
High Intensity - Comm/Industrial	17.89	0	12.55
High Intensity - Residential	66.67	0	46.64
Sod farm/Golf course	4.84	0	4.14
Total Area:	89.39	0.00	63.34
Mangement Unit 5			
High Intensity - Comm/Industrial	80.23	28.48	0
High Intensity - Residential	0.00	0.99	0
Sod farm/Golf course	14.61	0.00	0
Total Area:	94.84	29.47	0.00
Mangement Unit 6			
High Intensity - Comm/Industrial	0.00	18.44	0
High Intensity - Residential	0.00	108.33	0
Sod farm/Golf course	228.23	14.44	0
Total Area:	228.23	141.21	0.00
Mangement Unit 7			
High Intensity - Comm/Industrial	0.00	12.36	0
High Intensity - Residential	0.00	72.79	13.10
Sod farm/Golf course	29.47	37.01	0
Total Area:	29.47	122.16	13.10
Mangement Unit 8			
High Intensity - Comm/Industrial	87.79	16.97	14.58
High Intensity - Residential	170.78	66.60	1.04
Sod farm/Golf course	39.91	17.93	1.21
Total Area:	298.49	101.50	16.83
Mangement Unit 9			
High Intensity - Comm/Industrial	113.62	2.68	15.39
High Intensity - Residential	81.33	93.60	110.41
Sod farm/Golf course	92.57	8.62	15.05
Total Area:	287.52	104.90	140.85
Mangement Unit 10			
High Intensity - Comm/Industrial	0.63	16.73	0.00
High Intensity - Residential	26.88	76.27	40.90
Sod farm/Golf course	98.30	42.45	3.78
Total Area:	125.81	135.45	44.68
Mangement Unit 11			
High Intensity - Comm/Industrial	37.79	21.39	0
High Intensity - Residential	126.32	33.92	0
Sod farm/Golf course	8.70	13.65	0
Total Area:	172.81	68.96	0.00
Total Area:	2169	1,239	407

Appendix B2

**SWM Pond Areas - Land Uses for
Existing Conditions**

Existing Conditions								
MU	Pond	Model Exs Pond As	Model Prop Pond As	STM Area	CatchName	Land Use	AREA (ha)	%
1	3	Wet	Wet	19.6	STM_C85	High Intensity - Comm/Industrial High Intensity - Residential	19.61 0.00	100% 0%
1	4	Wet	Wet	25.5	STM_C84 STM_C84 STM_C84	Sod farm/Golf course High Intensity - Comm/Industrial High Intensity - Residential	0.33 18.16 7.06	1% 71% 28%
1	8	Wet	Wet	11.3	STM_C27 STM_C27 STM_C27	Sod farm/Golf course High Intensity - Comm/Industrial High Intensity - Residential	4.09 0.11 7.14	36% 1% 63%
1	9	Wet	Wet	37.9	STM_C24 STM_C24	Sod farm/Golf course High Intensity - Residential	15.73 22.18	41% 59%
1	12	Wet	Wet	9.5	STM_C22 STM_C22 STM_C22	Sod farm/Golf course High Intensity - Comm/Industrial High Intensity - Residential	3.04 0.14 6.36	32% 2% 67%
1	13	Wet	Wet	3.2	STM_C25 STM_C25	Sod farm/Golf course High Intensity - Residential	1.97 1.28	61% 39%
1	14	Wet	Wet	67.3	STM_C18 STM_C18 STM_C18	Sod farm/Golf course High Intensity - Comm/Industrial High Intensity - Residential	8.03 1.35 54.07	12% 2% 80%
1	52	Wet	Wet	21.1	STM_C29 STM_C29 STM_C29	Sod farm/Golf course High Intensity - Comm/Industrial High Intensity - Residential	2.85 3.30 13.97	14% 16% 69%
1	79	Dry	Dry	22.3	STM_C21 STM_C21 STM_C21	Sod farm/Golf course High Intensity - Comm/Industrial High Intensity - Residential	2.46 0.32 19.48	11% 1% 87%
2	26	Dry	Dry	40.5	STM_C56 STM_C56 STM_C56	Sod farm/Golf course High Intensity - Comm/Industrial High Intensity - Residential	4.36 1.09 35.08	11% 3% 87%
2	34	Wet	Wet	35.4	STM_C11 STM_C11 STM_C11	Sod farm/Golf course High Intensity - Comm/Industrial High Intensity - Residential	5.71 18.74 10.92	16% 53% 31%
2	35	Wet	Wet	19	STM_C81 STM_C81 STM_C81	Sod farm/Golf course High Intensity - Comm/Industrial High Intensity - Residential	2.38 1.20 15.45	13% 6% 81%
2	38	Wet	Wet	60.8	STM_C03 STM_C03 STM_C03	Sod farm/Golf course High Intensity - Comm/Industrial High Intensity - Residential	6.54 53.60 0.64	11% 88% 1%
2	39	Wet/FULL-EXS DRY	Wet	17	STM_C06 STM_C06 STM_C06	Sod farm/Golf course High Intensity - Comm/Industrial High Intensity - Residential	6.19 3.78 7.07	36% 22% 42%
2	41	Wet	Wet	25.4	STM_C08 STM_C08	High Intensity - Comm/Industrial High Intensity - Residential	4.21 18.01	17% 71%
2	53	Wet	Wet	4.8	STM_C04	High Intensity - Comm/Industrial	4.83	100%
2	64	Wet	Wet	10.44 STM_C94 STM_C94		Sod farm/Golf course High Intensity - Comm/Industrial High Intensity - Residential	3.92 0.00 6.51	38% 0% 62%
2	65	Wet	Wet	13.85 STM_C95 STM_C95		Sod farm/Golf course High Intensity - Comm/Industrial High Intensity - Residential	1.04 3.29 9.52	7% 24% 69%
2	74	Wet/FULL-EXS DRY	Wet	53.2	STM_C55 STM_C55 STM_C55	Sod farm/Golf course High Intensity - Comm/Industrial High Intensity - Residential	3.88 16.00 33.28	7% 30% 63%
2	93	Wet	Wet	34.7 STM_C92 STM_C92		Sod farm/Golf course High Intensity - Comm/Industrial High Intensity - Residential	0.35 0.21 34.14	1% 1% 98%
2	98	Wet/FULL-EXS DRY	Dry	12.9	STM_C02 STM_C02	Sod farm/Golf course High Intensity - Comm/Industrial	2.52 10.40	19% 81%
2	101	Wet	Wet	18.7 STM_C96 STM_C96		Sod farm/Golf course High Intensity - Comm/Industrial High Intensity - Residential	0.02 18.68 0.00	0% 100% 0%
3	29	Wet/FULL-EXS DRY	Dry	47.4	STM_C75 STM_C75	Sod farm/Golf course High Intensity - Residential	9.39 38.02	20% 80%
3	30	Dry	Dry	18.6	STM_C52 STM_C52	Sod farm/Golf course High Intensity - Residential	0.65 17.91	3% 96%
3	102	Wet UNASSUMED	Wet	13.72 STM_C93 STM_C93		Sod farm/Golf course High Intensity - Comm/Industrial High Intensity - Residential	2.41 0.29 11.02	18% 2% 80%
3	58	Wet	Wet	20.7	STM_C14 STM_C14 STM_C14	Sod farm/Golf course High Intensity - Comm/Industrial High Intensity - Residential	1.25 0.00 19.41	6% 0% 94%
4	63 NEW	DRY	Dry	8.04	STM_C91 STM_C91 STM_C91	Sod farm/Golf course High Intensity - Comm/Industrial High Intensity - Residential	1.00 4.43 2.61	12% 55% 32%
4	76	Dry	Dry	55.3	STM_C07 STM_C07 STM_C07	Sod farm/Golf course High Intensity - Comm/Industrial High Intensity - Residential	4.00 15.15 36.15	7% 27% 65%
5	70	Wet	Wet	31.6	STM_C49 STM_C49 STM_C49	Sod farm/Golf course High Intensity - Comm/Industrial High Intensity - Residential	3.80 24.82 2.98	12% 79% 9%
6	33	Enhanced Wetland	Wet	3.59	STM_C??	Sod farm/Golf course High Intensity - Comm/Industrial High Intensity - Residential	0.00 0.00 3.59	0% 0% 100%
6	55 55/56/62 'same' pond	Wet/FULL-EXS DRY	Wet	86.9	STM_C15 STM_C15 STM_C15	Sod farm/Golf course High Intensity - Comm/Industrial High Intensity - Residential	7.44 25.34 54.16	9% 29% 62%

6	56	Wet /FULL-EXS DRY	Wet	8.8	STM_C16	Sod farm/Golf course	2.75	31%
	55/56/62 'same' pond				STM_C16	High Intensity - Comm/Industrial	2.17	25%
					STM_C16	High Intensity - Residential	3.84	44%
6	62	Wet /FULL-EXS DRY	Wet	0.6	STM_C17	Sod farm/Golf course	0.62	100%
	55/56/62 'same' pond							
6	71	Wet	Wet	24.2	STM_C62	Sod farm/Golf course	2.14	9%
					STM_C62	High Intensity - Comm/Industrial	2.55	11%
					STM_C62	High Intensity - Residential	19.49	81%
6	97	Wet	Wet	17.1	STM_C88	Sod farm/Golf course	7.16	42%
					STM_C88	High Intensity - Comm/Industrial	0.36	2%
					STM_C88	High Intensity - Residential	9.58	56%
7	5		Wet	0.42		Sod farm/Golf course	0.42	100%
						High Intensity - Comm/Industrial	0.00	0%
						High Intensity Residential	0.00	0%
7	16		Wet	5.77	STM_C100	Sod farm/Golf course	5.13	89%
					STM_C101	High Intensity - Comm/Industrial	0.00	0%
					STM_C102	High Intensity Residential	0.64	11%
7	17		Wet	1.99	STM_C102	Sod farm/Golf course	1.99	100%
					STM_C102	High Intensity - Comm/Industrial	0.00	0%
					STM_C102	High Intensity Residential	0.00	0%
7	18	Dry	Dry	13.1	STM_C32	High Intensity - Residential	13.10	100%
7	19	Wet	Wet	92.7	STM_C31	Sod farm/Golf course	20.99	23%
					STM_C31	High Intensity - Comm/Industrial	15.56	17%
					STM_C31	High Intensity - Residential	56.15	61%
7	22	wet	Wet	16.6	STM_C41	Sod farm/Golf course	6.63	41%
					STM_C41	High Intensity - Residential	9.67	59%
7	23&24 Ponds23/24 same pond/connected	wet	Wet	5.5	STM_C12	Sod farm/Golf course	4.28	78%
						High Intensity - Residential	1.18	22%
7	25 Golf cours	REMOVE NOT A SWM POND	Wet	7.58	STM_C101	Sod farm/Golf course	7.26	97%
					STM_C101	High Intensity - Comm/Industrial	0.21	3%
					STM_C101	High Intensity Residential	0.00	0%
8	77	Wet	Wet	101.5	STM_C34	Sod farm/Golf course	20.48	20%
					STM_C34	High Intensity - Comm/Industrial	18.11	18%
					STM_C34	High Intensity - Residential	62.91	62%
8	91	dry	Dry	15.6	STM_C33	Sod farm/Golf course	1.54	10%
					STM_C33	High Intensity - Comm/Industrial	13.56	87%
					STM_C33	High Intensity - Residential	0.50	3%
8	92	dry	Dry	1.3	STM_C35	High Intensity - Residential	0.03	2%
					STM_C35	High Intensity - Comm/Industrial	1.23	98%
9	43	Wet /FULL-EXS DRY	Wet	97.2	STM_C87	Sod farm/Golf course	7.73	8%
					STM_C87	High Intensity - Comm/Industrial	7.26	7%
					STM_C87	High Intensity - Residential	82.24	85%
9	85	Dry	Dry	8.1	STM_C37	Sod farm/Golf course	0.03	0%
					STM_C37	High Intensity - Residential	8.08	99%
9	86	Wet	Wet	7.7	STM_C38	Sod farm/Golf course	0.03	0%
					STM_C38	High Intensity - Residential	7.64	100%
9	87	Dry	Dry	115.3	STM_C42	Sod farm/Golf course	12.20	11%
					STM_C42	High Intensity - Comm/Industrial	11.11	10%
					STM_C42	High Intensity - Residential	92.02	80%
9	88	Dry	Dry	17.4	STM_C51	Sod farm/Golf course	0.27	2%
					STM_C51	High Intensity - Comm/Industrial	2.02	12%
					STM_C51	High Intensity - Residential	15.07	87%
10	6	wet	wet	13	STM_C30	Sod farm/Golf course	12.97	100%
					STM_C30	High Intensity - Residential	0.02	0%
10	7	wet	wet	11.1	STM_C26	Sod farm/Golf course	6.14	55%
					STM_C26	High Intensity - Residential	4.94	45%
10	10	wet	wet	13.1	STM_C23	Sod farm/Golf course	8.99	68%
					STM_C23	High Intensity - Residential	4.14	32%
10	11	wet	wet	19.8	STM_C63	Sod farm/Golf course	6.04	30%
					STM_C63	High Intensity - Residential	13.81	70%
10	67	(MQ1) Wet /FULL-EXS DRY	Dry	20.57	STM_C97	Sod farm/Golf course	0.81	4%
						High Intensity - Comm/Industrial	4.44	22%
						High Intensity - Residential	15.32	74%
10	68 NEW	wet (M2/MQ3)	Wet	28.48?	Sod farm/Golf course	Sod farm/Golf course	1.35	5%
					STM_C105	High Intensity - Comm/Industrial	2.22	8%
					STM_C105	High Intensity - Residential	24.91	87%
10	95	("Future MQ2"-Toth)	Wet	22.8	STM_C107	Sod farm/Golf course	1.68	7%
						High Intensity - Comm/Industrial	0.86	4%
						High Intensity - Residential	20.26	89%
10	99	(MQ2) Wet /FULL-EXS DRY	Dry	16.53	STM_C98	Sod farm/Golf course	4.86	29%
						High Intensity - Comm/Industrial	2.43	15%
						High Intensity - Residential	9.23	56%
10	72 new subdivision	(WQ1) Wet	Wet	5.56	STM_C106	Sod farm/Golf course	5.56	100%
						High Intensity - Comm/Industrial	0.00	0%
						High Intensity - Residential	0.00	0%
10	103	wet (MQ4)	Wet	13.41?	STM_C104	Sod farm/Golf course	13.34	99%
						High Intensity - Comm/Industrial	0.07	1%
						High Intensity - Residential	0.00	0%
11	1	Wet	Wet	8.5	STM_C83	High Intensity - Comm/Industrial	8.48	100%
					STM_C83	High Intensity - Residential	0.01	0%
11	2	Wet	Wet	60	STM_C01	Sod farm/Golf course	2.91	4%
						High Intensity - Comm/Industrial	36.50	52%
						High Intensity - Residential	31.21	44%

Appendix B3

**SWM Pond Areas -
Land Uses for
Proposed Conditions**

Proposed Conditions								
MU	Pond	Model Exs Pond As	Model Prop Pond As	STM Area	CatchName	Land Use	AREA (ha)	%
1	3	Wet	Wet		STM_C85			
					STM_C85	High Intensity - Comm/Industrial	18.54	95%
					STM_C85	High Intensity - Residential	1.07	5%
								100%
1	4	Wet	Wet		STM_C84	Sod farm/Golf course	0.31	1%
					STM_C84	High Intensity - Comm/Industrial	16.42	64%
					STM_C84	High Intensity - Residential	8.78	34%
								100%
1	8	Wet	Wet		STM_C27	Sod farm/Golf course	3.86	34%
					STM_C27	High Intensity - Comm/Industrial	0.22	2%
					STM_C27	High Intensity - Residential	7.28	64%
								100%
1	9	Wet	Wet		STM_C24	Sod farm/Golf course	15.33	40%
					STM_C24	High Intensity - Residential	22.52	59%
								100%
1	12	Wet	Wet		STM_C22	Sod farm/Golf course	3.03	32%
					STM_C22	High Intensity - Comm/Industrial	0.00	0%
						High Intensity - Residential	6.38	67%
								99%
1	13	Wet	Wet		STM_C25	Sod farm/Golf course	2.02	62%
					STM_C25	High Intensity - Residential	1.27	39%
								101%
1	14	Wet	Wet		STM_C18	Sod farm/Golf course	9.33	14%
					STM_C18	High Intensity - Comm/Industrial	0.00	0%
					STM_C18	High Intensity - Residential	58.00	86%
								100%
1	52	Wet	Wet		STM_C29	Sod farm/Golf course	2.63	13%
					STM_C29	High Intensity - Comm/Industrial	3.49	17%
					STM_C29	High Intensity - Residential	14.03	70%
								100%
1	79	Dry	Dry		STM_C21	Sod farm/Golf course	2.40	11%
					STM_C21	High Intensity - Comm/Industrial	0.00	0%
						High Intensity - Residential	19.60	88%
							216.51	
2	26	Dry	Dry		STM_C56	Sod farm/Golf course	4.14	10%
					STM_C56	High Intensity - Comm/Industrial	0.00	0%
						High Intensity - Residential	36.39	90%
2	34	Wet	Wet		STM_C11	Sod farm/Golf course	3.10	9%
					STM_C11	High Intensity - Comm/Industrial	16.02	45%
					STM_C11	High Intensity - Residential	16.25	46%
2	35	Wet	Wet		STM_C81	Sod farm/Golf course	1.34	7%
					STM_C81	High Intensity - Comm/Industrial	1.59	8%
					STM_C81	High Intensity - Residential	16.10	85%
2	38	Wet	Wet		STM_C03	Sod farm/Golf course	6.24	10%
					STM_C03	High Intensity - Comm/Industrial	53.71	88%
					STM_C03	High Intensity - Residential	0.83	1%
2	39	Wet /FULL-EXS DRY	Wet		STM_C06	Sod farm/Golf course	1.39	8%
					STM_C06	High Intensity - Comm/Industrial	7.97	47%
					STM_C06	High Intensity - Residential	7.67	45%
2	41	Wet	Wet			Sod farm/Golf course	2.03	8%
					STM_C08	High Intensity - Comm/Industrial	2.00	8%
					STM_C08	High Intensity - Residential	21.36	84%
2	53	Wet	Wet		STM_C04	High Intensity - Comm/Industrial	4.83	100%
2	64	Wet?	Wet			Sod farm/Golf course	0.01	0%
					STM_C94	High Intensity - Comm/Industrial	10.60	100%
					STM_C94	High Intensity - Residential	0.00	0%
								100%
2	65		Wet			Sod farm/Golf course	0.05	0%
					STM_C95	High Intensity - Comm/Industrial	13.78	99%
					STM_C95	High Intensity - Residential	0.09	1%
								100%
2	74	Wet /FULL-EXS DRY	Wet		STM_C55	Sod farm/Golf course	5.94	11%
					STM_C55	High Intensity - Comm/Industrial	11.82	22%
					STM_C55	High Intensity - Residential	35.41	67%
2	93	Wet	Wet			Sod farm/Golf course	2.17	6%
					STM_C92	High Intensity - Comm/Industrial	32.70	94%
					STM_C92	High Intensity - Residential	0.00	0%
								100%
2	98	Wet /FULL-EXS DRY	Wet		STM_C02	Sod farm/Golf course	2.51	19%
					STM_C02	High Intensity - Comm/Industrial	10.40	81%
2	101	Wet	Wet			Sod farm/Golf course	0.00	0%
					STM_C96	High Intensity - Comm/Industrial	0.00	0%
					STM_C96	High Intensity - Residential	18.66	100%
							347.10	100%
3	29	Dry	Dry		STM_C75	Sod farm/Golf course	7.63	16%
					STM_C75	High Intensity - Residential	39.60	84%
3	30	Dry	Dry		STM_C52	Sod farm/Golf course	0.69	4%
					STM_C52	High Intensity - Residential	17.87	96%
3	102	Wet	Wet			Sod farm/Golf course	1.00	7%
					STM_C93	High Intensity - Comm/Industrial	12.07	90%
					STM_C93	High Intensity - Residential	0.28	2%
								100%
3	58	Wet	Wet		STM_C14	Sod farm/Golf course	1.26	6%
					STM_C14	High Intensity - Comm/Industrial	0.00	0%
					STM_C14	High Intensity - Residential	19.40	94%
							99.80	
4	63 NEW	DRY	Dry		STM_C91	Sod farm/Golf course	2.26	10%
					STM_C91	High Intensity - Comm/Industrial	0.78	28%
					STM_C91	High Intensity - Residential	5.00	62%
4	76	Dry	Dry		STM_C07	Sod farm/Golf course	1.88	3%
					STM_C07	High Intensity - Comm/Industrial	11.77	21%
					STM_C07	High Intensity - Residential	41.64	75%
							63.34	
5	70	Wet	Wet		STM_C49	Sod farm/Golf course	0.00	0%
					STM_C49	High Intensity - Comm/Industrial	28.48	90%
					STM_C49	High Intensity - Residential	3.12	10%
							31.60	

Appendix B4

**PTool - P Loading and
Removal for Existing
Conditions**

Project DEVELOPMENT Summary

DEVELOPMENT: MU 1

Subwatershed: East Holland

Total Pre-Development Area (ha)	526.37	Total Pre-Development Phosphorus Load (kg/yr)	696.76
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Pre-Development Land Use	Area (ha)	P coeff. (kg/ha)	P Load (kg/yr)
Cropland	4.49	0.36	1.62
High Intensity - Comm/Industrial	187.34	1.82	340.96
High Intensity - Residential	253.61	1.32	334.77
Sod Farm / Golf Course	80.93	0.24	19.42

DEVELOPMENT: MU 1**Subwatershed: East Holland****POST-DEVELOPMENT LOAD**

Post-Development Land Use	Area (ha)	P coeff. (kg/ha)	Best Management Practice applied with P Removal Efficiency	P Load (kg/yr)
Cropland	4.49	0.36	NONE	0% 1.62
High Intensity - Comm/Industrial	144.34	1.82	NONE	0% 262.70
High Intensity - Comm/Industrial	0.32	1.82	Dry Detention Ponds	10% 0.52
High Intensity - Comm/Industrial	42.68	1.82	Wet Detention Ponds	63% 28.74
High Intensity - Residential	122.06	1.32	NONE	0% 161.12
High Intensity - Residential	19.49	1.32	Dry Detention Ponds	10% 23.15
High Intensity - Residential	112.06	1.32	Wet Detention Ponds	63% 54.73
Sod Farm / Golf Course	42.42	0.24	NONE	0% 10.18
Sod Farm / Golf Course	2.46	0.24	Dry Detention Ponds	10% 0.53
Sod Farm / Golf Course	36.05	0.24	Wet Detention Ponds	63% 3.20

Post-Development Area Altered: **526.37**Total Pre-Development Area: **526.37**Unaffected Area: **0****P Load (kg/yr)**Pre-Development: **696.76**Post-Development: **696.76**Change (Pre - Post): **0.00**

0% Net Reduction in Load

Post-Development (with BMPs): **546.50**Change (Pre - Post): **150.27**

22% Net Reduction in Load

DEVELOPMENT: MU 1

Subwatershed: East Holland

CONSTRUCTION PHASE LOAD

SUMMARY WITH IMPLEMENTATION OF BMPs		P Load (kg/yr)
Pre-Development:		696.76
Construction Phase Amortized Over 8 Years :		to be determined
Post-Development:		546.50
Post-Development + Amortized Construction:		to be determined
Pre-Development Load - Post-Development Load:		150.27
Conclusion:		22% Reduction in Load
Pre-Development Load - (Post-Development + Amortized Construction Load):		to be determined
Conclusion:		to be determined
Based on a comparison of Pre-Development and Post-Development loads, and in consideration of Construction Phase loads, the Ministry would encourage the Municipality to:		



MINISTRY OF THE ENVIRONMENT

Database Version: V 2.0 Release Update
Update Date: 30-Mar-12

Project DEVELOPMENT Summary

DEVELOPMENT: MU 2

Subwatershed: East Holland

Total Pre-Development Area (ha)	731.09	Total Pre-Development Phosphorus Load (kg/yr)	978.62
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Pre-Development Land Use	Area (ha)	P coeff. (kg/ha)	P Load (kg/yr)
Cropland	0.27	0.36	0.10
High Intensity - Comm/Industrial	266.53	1.82	485.08
High Intensity - Residential	353.71	1.32	466.90
Sod Farm / Golf Course	110.58	0.24	26.54

DEVELOPMENT: MU 2**Subwatershed: East Holland****POST-DEVELOPMENT LOAD**

Post-Development Land Use	Area (ha)	P coeff. (kg/ha)	Best Management Practice applied with P Removal Efficiency		P Load (kg/yr)
Cropland	0.27	0.36	NONE	0%	0.10
High Intensity - Comm/Industrial	31.26	1.82	Dry Detention Ponds	10%	51.20
High Intensity - Comm/Industrial	104.76	1.82	Wet Detention Ponds	63%	70.55
High Intensity - Comm/Industrial	130.51	1.82	NONE	0%	237.53
High Intensity - Residential	75.44	1.32	Dry Detention Ponds	10%	89.62
High Intensity - Residential	95.2	1.32	Wet Detention Ponds	63%	46.50
High Intensity - Residential	183.06	1.32	NONE	0%	241.64
Sod Farm / Golf Course	16.94	0.24	Dry Detention Ponds	10%	3.66
Sod Farm / Golf Course	19.96	0.24	Wet Detention Ponds	63%	1.77
Sod Farm / Golf Course	73.69	0.24	NONE	0%	17.69

Post-Development Area Altered: **731.09**Total Pre-Development Area: **731.09**Unaffected Area: **0****P Load (kg/yr)**Pre-Development: **978.62**Post-Development: **978.61**Change (Pre - Post): **0.01**

0% Net Reduction in Load

Post-Development (with BMPs): **760.25**Change (Pre - Post): **218.37**

22% Net Reduction in Load

DEVELOPMENT: MU 2

Subwatershed: East Holland

CONSTRUCTION PHASE LOAD

SUMMARY WITH IMPLEMENTATION OF BMPs	P Load (kg/yr)
Pre-Development:	978.62
Construction Phase Amortized Over 8 Years :	to be determined
Post-Development:	760.25
Post-Development + Amortized Construction:	to be determined
Pre-Development Load - Post-Development Load:	218.37
Conclusion:	22% Reduction in Load
Pre-Development Load - (Post-Development + Amortized Construction Load):	to be determined
Conclusion:	to be determined
Based on a comparison of Pre-Development and Post-Development loads, and in consideration of Construction Phase loads, the Ministry would encourage the Municipality to:	



MINISTRY OF THE ENVIRONMENT

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Project DEVELOPMENT Summary

DEVELOPMENT: MU 3

Subwatershed: East Holland

Total Pre-Development Area (ha)	248.42	Total Pre-Development Phosphorus Load (kg/yr)	238.55
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Pre-Development Land Use	Area (ha)	P coeff. (kg/ha)	P Load (kg/yr)
Cropland	22	0.36	7.92
High Intensity - Comm/Industrial	29.88	1.82	54.38
High Intensity - Residential	119.52	1.32	157.77
Sod Farm / Golf Course	77.02	0.24	18.48

DEVELOPMENT: MU 3**Subwatershed: East Holland****POST-DEVELOPMENT LOAD**

Post-Development Land Use	Area (ha)	P coeff. (kg/ha)	Best Management Practice applied with P Removal Efficiency	P Load (kg/yr)
Cropland	22	0.36	NONE	0% 7.92
High Intensity - Comm/Industrial	0.29	1.82	Wet Detention Ponds	63% 0.20
High Intensity - Comm/Industrial	29.59	1.82	NONE	0% 53.85
High Intensity - Residential	55.93	1.32	Dry Detention Ponds	10% 66.44
High Intensity - Residential	30.43	1.32	Wet Detention Ponds	63% 14.86
High Intensity - Residential	33.15	1.32	NONE	0% 43.76
Sod Farm / Golf Course	10.04	0.24	Dry Detention Ponds	10% 2.17
Sod Farm / Golf Course	3.67	0.24	Wet Detention Ponds	63% 0.33
Sod Farm / Golf Course	63.32	0.24	NONE	0% 15.20

Post-Development Area Altered: **248.42**Total Pre-Development Area: **248.42**Unaffected Area: **0****P Load (kg/yr)**Pre-Development: **238.55**Post-Development: **238.54**Change (Pre - Post): **0.01**

0% Net Reduction in Load

Post-Development (with BMPs): **204.73**Change (Pre - Post): **33.83**

14% Net Reduction in Load

DEVELOPMENT: MU 3

Subwatershed: East Holland

CONSTRUCTION PHASE LOAD

SUMMARY WITH IMPLEMENTATION OF BMPs		P Load (kg/yr)
Pre-Development:		238.55
Construction Phase Amortized Over 8 Years :		to be determined
Post-Development:		204.73
Post-Development + Amortized Construction:		to be determined
Pre-Development Load - Post-Development Load:		33.83
Conclusion:		14% Reduction in Load
Pre-Development Load - (Post-Development + Amortized Construction Load):		to be determined
Conclusion:		to be determined
Based on a comparison of Pre-Development and Post-Development loads, and in consideration of Construction Phase loads, the Ministry would encourage the Municipality to:		

Project DEVELOPMENT Summary

DEVELOPMENT: MU 4

Subwatershed: East Holland

Total Pre-Development Area (ha)	152.73	Total Pre-Development Phosphorus Load (kg/yr)	224.01
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Pre-Development Land Use	Area (ha)	P coeff. (kg/ha)	P Load (kg/yr)
High Intensity - Comm/Industrial	54.99	1.82	100.08
High Intensity - Residential	93.03	1.32	122.80
Sod Farm / Golf Course	4.71	0.24	1.13

DEVELOPMENT: MU 4**Subwatershed: East Holland****POST-DEVELOPMENT LOAD**

Post-Development Land Use	Area (ha)	P coeff. (kg/ha)	Best Management Practice applied with P Removal Efficiency	P Load (kg/yr)
High Intensity - Comm/Industrial	19.58	1.82	Dry Detention Ponds	10% 32.07
High Intensity - Comm/Industrial	35.42	1.82	NONE	0% 64.46
High Intensity - Residential	38.75	1.32	Dry Detention Ponds	10% 46.03
High Intensity - Residential	54.27	1.32	NONE	0% 71.64
Sod Farm / Golf Course	4.71	0.24	Dry Detention Ponds	10% 1.02

Post-Development Area Altered: **152.73**Total Pre-Development Area: **152.73**Unaffected Area: **0****P Load (kg/yr)**Pre-Development: **224.01**Post-Development: **224.02**Change (Pre - Post): **0.00**

0% Net Increase in Load

Post-Development (with BMPs): **215.23**Change (Pre - Post): **8.79**

4% Net Reduction in Load

DEVELOPMENT: MU 4

Subwatershed: East Holland

CONSTRUCTION PHASE LOAD

SUMMARY WITH IMPLEMENTATION OF BMPs	P Load (kg/yr)
Pre-Development:	224.01
Construction Phase Amortized Over 8 Years :	to be determined
Post-Development:	215.23
Post-Development + Amortized Construction:	to be determined
Pre-Development Load - Post-Development Load:	8.79
Conclusion:	4% Reduction in Load
Pre-Development Load - (Post-Development + Amortized Construction Load):	to be determined
Conclusion:	to be determined
Based on a comparison of Pre-Development and Post-Development loads, and in consideration of Construction Phase loads, the Ministry would encourage the Municipality to:	

Project DEVELOPMENT Summary

DEVELOPMENT: MU 5

Subwatershed: East Holland

Total Pre-Development Area (ha)	124.31	Total Pre-Development Phosphorus Load (kg/yr)	223.63
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Pre-Development Land Use	Area (ha)	P coeff. (kg/ha)	P Load (kg/yr)
High Intensity - Comm/Industrial	121.53	1.82	221.18
High Intensity - Residential	1.65	1.32	2.18
Sod Farm / Golf Course	1.13	0.24	0.27

POST-DEVELOPMENT LOAD

Post-Development Land Use	Area (ha)	P coeff. (kg/ha)	Best Management Practice applied with P Removal Efficiency	P Load (kg/yr)
High Intensity - Comm/Industrial	24.82	1.82	Wet Detention Ponds 63%	16.71
High Intensity - Comm/Industrial	96.71	1.82	NONE 0%	176.01
High Intensity - Residential	1.65	1.32	Wet Detention Ponds 63%	0.81
Sod Farm / Golf Course	1.13	0.24	Wet Detention Ponds 63%	0.10

Post-Development Area Altered:	124.31	P Load (kg/yr)
Total Pre-Development Area:	124.31	
Unaffected Area:	0	
		Pre-Development: 223.63
		Post-Development: 223.63
		Change (Pre - Post): 0.00
		0% Net Reduction in Load
		Post-Development (with BMPs): 193.63
		Change (Pre - Post): 30.00
		13% Net Reduction in Load

DEVELOPMENT: MU 5**Subwatershed: East Holland****CONSTRUCTION PHASE LOAD**

SUMMARY WITH IMPLEMENTATION OF BMPs	P Load (kg/yr)
Pre-Development:	223.63
Construction Phase Amortized Over 8 Years :	to be determined
Post-Development:	193.63
Post-Development + Amortized Construction:	to be determined
Pre-Development Load - Post-Development Load:	30.00
Conclusion:	13% Reduction in Load
Pre-Development Load - (Post-Development + Amortized Construction Load):	to be determined
Conclusion:	to be determined
Based on a comparison of Pre-Development and Post-Development loads, and in consideration of Construction Phase loads, the Ministry would encourage the Municipality to:	
	



MINISTRY OF THE ENVIRONMENT

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Project DEVELOPMENT Summary

DEVELOPMENT: MU 6

Subwatershed: East Holland

Total Pre-Development Area (ha)	369.44	Total Pre-Development Phosphorus Load (kg/yr)	260.48
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Pre-Development Land Use	Area (ha)	P coeff. (kg/ha)	P Load (kg/yr)
Cropland	62.69	0.36	22.57
High Intensity - Comm/Industrial	38.95	1.82	70.89
High Intensity - Residential	95.14	1.32	125.58
Sod Farm / Golf Course	172.66	0.24	41.44

DEVELOPMENT: MU 6**Subwatershed: East Holland****POST-DEVELOPMENT LOAD**

Post-Development Land Use	Area (ha)	P coeff. (kg/ha)	Best Management Practice applied with P Removal Efficiency	P Load (kg/yr)
Cropland	62.69	0.36	NONE	0% 22.57
High Intensity - Comm/Industrial	8.54	1.82	NONE	0% 15.54
High Intensity - Comm/Industrial	25.34	1.82	Dry Detention Ponds	10% 41.51
High Intensity - Comm/Industrial	5.08	1.82	Wet Detention Ponds	63% 3.42
High Intensity - Residential	4.48	1.32	NONE	0% 5.91
High Intensity - Residential	54.16	1.32	Dry Detention Ponds	10% 64.34
High Intensity - Residential	36.5	1.32	Wet Detention Ponds	63% 17.83
Sod Farm / Golf Course	152.54	0.24	NONE	0% 36.61
Sod Farm / Golf Course	7.44	0.24	Dry Detention Ponds	10% 1.61
Sod Farm / Golf Course	12.67	0.24	Wet Detention Ponds	63% 1.13

Post-Development Area Altered: **369.44**Total Pre-Development Area: **369.44**Unaffected Area: **0****P Load (kg/yr)**Pre-Development: **260.48**Post-Development: **260.50**Change (Pre - Post): **-0.02**

0% Net Increase in Load

Post-Development (with BMPs): **210.46**Change (Pre - Post): **50.02**

19% Net Reduction in Load

DEVELOPMENT: MU 6**Subwatershed: East Holland****CONSTRUCTION PHASE LOAD**

SUMMARY WITH IMPLEMENTATION OF BMPs	P Load (kg/yr)
Pre-Development:	260.48
Construction Phase Amortized Over 8 Years :	to be determined
Post-Development:	210.46
Post-Development + Amortized Construction:	to be determined
Pre-Development Load - Post-Development Load:	50.02
Conclusion:	19% Reduction in Load
Pre-Development Load - (Post-Development + Amortized Construction Load):	to be determined
Conclusion:	to be determined
Based on a comparison of Pre-Development and Post-Development loads, and in consideration of Construction Phase loads, the Ministry would encourage the Municipality to:	
<div></div>	

Project DEVELOPMENT Summary

DEVELOPMENT: MU 7

Subwatershed: East Holland

Total Pre-Development Area (ha)	164.73	Total Pre-Development Phosphorus Load (kg/yr)	151.32
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Pre-Development Land Use	Area (ha)	P coeff. (kg/ha)	P Load (kg/yr)
High Intensity - Comm/Industrial	15.56	1.82	28.32
High Intensity - Residential	80.74	1.32	106.58
Sod Farm / Golf Course	68.43	0.24	16.42

DEVELOPMENT: MU 7**Subwatershed: East Holland****POST-DEVELOPMENT LOAD**

Post-Development Land Use	Area (ha)	P coeff. (kg/ha)	Best Management Practice applied with P Removal Efficiency	P Load (kg/yr)
High Intensity - Comm/Industrial	15.56	1.82	Wet Detention Ponds	63% 10.48
High Intensity - Residential	13.1	1.32	Dry Detention Ponds	10% 15.56
High Intensity - Residential	67.64	1.32	Wet Detention Ponds	63% 33.04
Sod Farm / Golf Course	28.98	0.24	NONE	0% 6.96
Sod Farm / Golf Course	39.45	0.24	Wet Detention Ponds	63% 3.50


Post-Development Area Altered: **164.73**Total Pre-Development Area: **164.73**Unaffected Area: **0****P Load (kg/yr)**Pre-Development: **151.32**Post-Development: **151.32**Change (Pre - Post): **0.00**

0% Net Increase in Load

Post-Development (with BMPs): **69.53**Change (Pre - Post): **81.78**

54% Net Reduction in Load

DEVELOPMENT: MU 7**Subwatershed: East Holland****CONSTRUCTION PHASE LOAD**

SUMMARY WITH IMPLEMENTATION OF BMPs	P Load (kg/yr)
Pre-Development:	151.32
Construction Phase Amortized Over 8 Years :	to be determined
Post-Development:	69.53
Post-Development + Amortized Construction:	to be determined
Pre-Development Load - Post-Development Load:	81.78
Conclusion:	54% Reduction in Load
Pre-Development Load - (Post-Development + Amortized Construction Load):	to be determined
Conclusion:	to be determined
Based on a comparison of Pre-Development and Post-Development loads, and in consideration of Construction Phase loads, the Ministry would encourage the Municipality to:	
	



MINISTRY OF THE ENVIRONMENT

Database Version: V 2.0 Release Update
Update Date: 30-Mar-12

Project DEVELOPMENT Summary

DEVELOPMENT: MU 8

Subwatershed: East Holland

Total Pre-Development Area (ha)	416.81	Total Pre-Development Phosphorus Load (kg/yr)	553.61
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Pre-Development Land Use	Area (ha)	P coeff. (kg/ha)	P Load (kg/yr)
High Intensity - Comm/Industrial	147.93	1.82	269.23
High Intensity - Residential	203.56	1.32	268.70
Sod Farm / Golf Course	65.32	0.24	15.68

DEVELOPMENT: MU 8**Subwatershed: East Holland****POST-DEVELOPMENT LOAD**

Post-Development Land Use	Area (ha)	P coeff. (kg/ha)	Best Management Practice applied with P Removal Efficiency	P Load (kg/yr)
High Intensity - Comm/Industrial	14.79	1.82	Dry Detention Ponds	10% 24.23
High Intensity - Comm/Industrial	18.11	1.82	Wet Detention Ponds	63% 12.20
High Intensity - Comm/Industrial	115.03	1.82	NONE	0% 209.35
High Intensity - Residential	0.5	1.32	Dry Detention Ponds	10% 0.59
High Intensity - Residential	62.91	1.32	Wet Detention Ponds	63% 30.73
High Intensity - Residential	140.15	1.32	NONE	0% 185.00
Sod Farm / Golf Course	1.57	0.24	Dry Detention Ponds	10% 0.34
Sod Farm / Golf Course	20.48	0.24	Wet Detention Ponds	63% 1.82
Sod Farm / Golf Course	43.27	0.24	NONE	0% 10.38

Post-Development Area Altered: **416.81**Total Pre-Development Area: **416.81**Unaffected Area: **0****P Load (kg/yr)**Pre-Development: **553.61**Post-Development: **553.61**Change (Pre - Post): **0.00**

0% Net Increase in Load

Post-Development (with BMPs): **474.64**Change (Pre - Post): **78.97**

14% Net Reduction in Load

DEVELOPMENT: MU 8

Subwatershed: East Holland

CONSTRUCTION PHASE LOAD

SUMMARY WITH IMPLEMENTATION OF BMPs	P Load (kg/yr)
Pre-Development:	553.61
Construction Phase Amortized Over 8 Years :	to be determined
Post-Development:	474.64
Post-Development + Amortized Construction:	to be determined
Pre-Development Load - Post-Development Load:	78.97
Conclusion:	14% Reduction in Load
Pre-Development Load - (Post-Development + Amortized Construction Load):	to be determined
Conclusion:	to be determined
<p>Based on a comparison of Pre-Development and Post-Development loads, and in consideration of Construction Phase loads, the Ministry would encourage the Municipality to:</p> <div style="background-color: #cccccc; height: 40px; width: 100%;"></div>	

Project DEVELOPMENT Summary

DEVELOPMENT: MU 9

Subwatershed: East Holland

Total Pre-Development Area (ha)	533.27	Total Pre-Development Phosphorus Load (kg/yr)	687.92
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Pre-Development Land Use	Area (ha)	P coeff. (kg/ha)	P Load (kg/yr)
Cropland	7.97	0.36	2.87
High Intensity - Comm/Industrial	182.12	1.82	331.46
High Intensity - Residential	251.14	1.32	331.50
Sod Farm / Golf Course	92.04	0.24	22.09

DEVELOPMENT: MU 9**Subwatershed: East Holland****POST-DEVELOPMENT LOAD**

Post-Development Land Use	Area (ha)	P coeff. (kg/ha)	Best Management Practice applied with P Removal Efficiency	P Load (kg/yr)
Cropland	7.97	0.36	NONE	0% 2.87
High Intensity - Comm/Industrial	20.4	1.82	Dry Detention Ponds	10% 33.42
High Intensity - Comm/Industrial	161.72	1.82	NONE	0% 294.33
High Intensity - Residential	197.42	1.32	Dry Detention Ponds	10% 234.53
High Intensity - Residential	7.64	1.32	Wet Detention Ponds	63% 3.73
High Intensity - Residential	46.08	1.32	NONE	0% 60.83
Sod Farm / Golf Course	20.23	0.24	Dry Detention Ponds	10% 4.37
Sod Farm / Golf Course	0.03	0.24	Wet Detention Ponds	63% 0.00
Sod Farm / Golf Course	71.78	0.24	NONE	0% 17.23

Post-Development Area Altered: **533.27**Total Pre-Development Area: **533.27**Unaffected Area: **0****P Load (kg/yr)**Pre-Development: **687.92**Post-Development: **687.92**Change (Pre - Post): **0.00**

0% Net Increase in Load

Post-Development (with BMPs): **651.31**Change (Pre - Post): **36.62**

5% Net Reduction in Load

DEVELOPMENT: MU 9

Subwatershed: East Holland

CONSTRUCTION PHASE LOAD

SUMMARY WITH IMPLEMENTATION OF BMPs	P Load (kg/yr)
Pre-Development:	687.92
Construction Phase Amortized Over 8 Years :	to be determined
Post-Development:	651.31
Post-Development + Amortized Construction:	to be determined
Pre-Development Load - Post-Development Load:	36.62
Conclusion:	5% Reduction in Load
Pre-Development Load - (Post-Development + Amortized Construction Load):	to be determined
Conclusion:	to be determined
<p>Based on a comparison of Pre-Development and Post-Development loads, and in consideration of Construction Phase loads, the Ministry would encourage the Municipality to:</p> <div style="background-color: #cccccc; height: 40px; width: 100%;"></div>	

Project DEVELOPMENT Summary

DEVELOPMENT: MU 10

Subwatershed: East Holland

Total Pre-Development Area (ha)	305.94	Total Pre-Development Phosphorus Load (kg/yr)	223.51
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Pre-Development Land Use	Area (ha)	P coeff. (kg/ha)	P Load (kg/yr)
Cropland	52.15	0.36	18.77
High Intensity - Comm/Industrial	19.98	1.82	36.36
High Intensity - Residential	103.94	1.32	137.20
Sod Farm / Golf Course	129.87	0.24	31.17

DEVELOPMENT: MU 10**Subwatershed: East Holland****POST-DEVELOPMENT LOAD**

Post-Development Land Use	Area (ha)	P coeff. (kg/ha)	Best Management Practice applied with P Removal Efficiency	P Load (kg/yr)
Cropland	52.15	0.36	NONE	0% 18.77
High Intensity - Comm/Industrial	9.96	1.82	NONE	0% 18.13
High Intensity - Comm/Industrial	6.87	1.82	Dry Detention Ponds	10% 11.25
High Intensity - Comm/Industrial	3.15	1.82	Wet Detention Ponds	63% 2.12
High Intensity - Residential	11.32	1.32	NONE	0% 14.94
High Intensity - Residential	24.55	1.32	Dry Detention Ponds	10% 29.17
High Intensity - Residential	68.07	1.32	Wet Detention Ponds	63% 33.25
Sod Farm / Golf Course	68.11	0.24	NONE	0% 16.35
Sod Farm / Golf Course	5.68	0.24	Dry Detention Ponds	10% 1.23
Sod Farm / Golf Course	56.08	0.24	Wet Detention Ponds	63% 4.98

Post-Development Area Altered: **305.94**Total Pre-Development Area: **305.94**Unaffected Area: **0****P Load (kg/yr)**Pre-Development: **223.51**Post-Development: **223.51**Change (Pre - Post): **0.00**

0% Net Reduction in Load

Post-Development (with BMPs): **150.18**Change (Pre - Post): **73.33**

33% Net Reduction in Load

DEVELOPMENT: MU 10

Subwatershed: East Holland

CONSTRUCTION PHASE LOAD

SUMMARY WITH IMPLEMENTATION OF BMPs		P Load (kg/yr)
Pre-Development:		223.51
Construction Phase Amortized Over 8 Years :		to be determined
Post-Development:		150.18
Post-Development + Amortized Construction:		to be determined
Pre-Development Load - Post-Development Load:		73.33
Conclusion:		33% Reduction in Load
Pre-Development Load - (Post-Development + Amortized Construction Load):		to be determined
Conclusion:		to be determined
Based on a comparison of Pre-Development and Post-Development loads, and in consideration of Construction Phase loads, the Ministry would encourage the Municipality to:		

Project DEVELOPMENT Summary

DEVELOPMENT: MU 11

Subwatershed: East Holland

Total Pre-Development Area (ha)	241.76	Total Pre-Development Phosphorus Load (kg/yr)	348.98
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Pre-Development Land Use	Area (ha)	P coeff. (kg/ha)	P Load (kg/yr)
Cropland	1.28	0.36	0.46
High Intensity - Comm/Industrial	93.4	1.82	169.99
High Intensity - Residential	132.62	1.32	175.06
Sod Farm / Golf Course	14.46	0.24	3.47

DEVELOPMENT: MU 11**Subwatershed: East Holland****POST-DEVELOPMENT LOAD**

Post-Development Land Use	Area (ha)	P coeff. (kg/ha)	Best Management Practice applied with P Removal Efficiency	P Load (kg/yr)
Cropland	1.28	0.36	NONE	0.46
High Intensity - Comm/Industrial	48.42	1.82	NONE	88.12
High Intensity - Comm/Industrial	44.98	1.82	Wet Detention Ponds	30.29
High Intensity - Residential	101.4	1.32	NONE	133.85
High Intensity - Residential	31.22	1.32	Wet Detention Ponds	15.25
Sod Farm / Golf Course	11.55	0.24	NONE	2.77
Sod Farm / Golf Course	2.91	0.24	Wet Detention Ponds	0.26

Post-Development Area Altered: **241.76**Total Pre-Development Area: **241.76**Unaffected Area: **0****P Load (kg/yr)**Pre-Development: **348.98**Post-Development: **348.98**Change (Pre - Post): **0.00**

0% Net Reduction in Load

Post-Development (with BMPs): **271.00**Change (Pre - Post): **77.98**

22% Net Reduction in Load

DEVELOPMENT: MU 11

Subwatershed: East Holland

CONSTRUCTION PHASE LOAD

SUMMARY WITH IMPLEMENTATION OF BMPs	P Load (kg/yr)
Pre-Development:	348.98
Construction Phase Amortized Over 8 Years :	to be determined
Post-Development:	271.00
Post-Development + Amortized Construction:	to be determined
Pre-Development Load - Post-Development Load:	77.98
Conclusion:	22% Reduction in Load
Pre-Development Load - (Post-Development + Amortized Construction Load):	to be determined
Conclusion:	to be determined
Based on a comparison of Pre-Development and Post-Development loads, and in consideration of Construction Phase loads, the Ministry would encourage the Municipality to:	

Appendix B5

**PTool - P Loading and
Removal for Do
Nothing Scenario**

Project DEVELOPMENT Summary

DEVELOPMENT: MU 1

Subwatershed: East Holland

Total Pre-Development Area (ha)	526.37	Total Pre-Development Phosphorus Load (kg/yr)	676.02
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Pre-Development Land Use	Area (ha)	P coeff. (kg/ha)	P Load (kg/yr)
High Intensity - Comm/Industrial	148.98	1.82	271.14
High Intensity - Residential	291.02	1.32	384.15
Sod Farm / Golf Course	86.37	0.24	20.73

DEVELOPMENT: MU 1**Subwatershed: East Holland****POST-DEVELOPMENT LOAD**

Post-Development Land Use	Area (ha)	P coeff. (kg/ha)	Best Management Practice applied with P Removal Efficiency	P Load (kg/yr)
High Intensity - Comm/Industrial	110.3	1.82	NONE	0% 200.75
High Intensity - Comm/Industrial	38.68	1.82	Dry Detention Ponds	10% 63.36
High Intensity - Residential	171.7	1.32	NONE	0% 226.64
High Intensity - Residential	119.32	1.32	Dry Detention Ponds	10% 141.75
Sod Farm / Golf Course	49.87	0.24	NONE	0% 11.97
Sod Farm / Golf Course	36.5	0.24	Dry Detention Ponds	10% 7.88

Post-Development Area Altered: **526.37**Total Pre-Development Area: **526.37**Unaffected Area: **0****P Load
(kg/yr)**Pre-Development: **676.02**Post-Development: **676.02**Change (Pre - Post): **0.00**

0% Net Increase in Load

Post-Development (with BMPs): **652.35**Change (Pre - Post): **23.67**

4% Net Reduction in Load

DEVELOPMENT: MU 1

Subwatershed: East Holland

CONSTRUCTION PHASE LOAD

SUMMARY WITH IMPLEMENTATION OF BMPs	P Load (kg/yr)
Pre-Development:	676.02
Construction Phase Amortized Over 8 Years :	to be determined
Post-Development:	652.35
Post-Development + Amortized Construction:	to be determined
Pre-Development Load - Post-Development Load:	23.67
Conclusion:	4% Reduction in Load
Pre-Development Load - (Post-Development + Amortized Construction Load):	to be determined
Conclusion:	to be determined
<p>Based on a comparison of Pre-Development and Post-Development loads, and in consideration of Construction Phase loads, the Ministry would encourage the Municipality to:</p> <div style="background-color: #cccccc; height: 30px; width: 100%;"></div>	

Project DEVELOPMENT Summary

DEVELOPMENT: MU 2

Subwatershed: East Holland

Total Pre-Development Area (ha)	731.09	Total Pre-Development Phosphorus Load (kg/yr)	925.95
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Pre-Development Land Use	Area (ha)	P coeff. (kg/ha)	P Load (kg/yr)
High Intensity - Comm/Industrial	187.35	1.82	340.98
High Intensity - Residential	420.81	1.32	555.47
Sod Farm / Golf Course	122.93	0.24	29.50

DEVELOPMENT: MU 2**Subwatershed: East Holland****POST-DEVELOPMENT LOAD**

Post-Development Land Use	Area (ha)	P coeff. (kg/ha)	Best Management Practice applied with P Removal Efficiency	P Load (kg/yr)
High Intensity - Comm/Industrial	21.93	1.82	NONE	0% 39.91
High Intensity - Comm/Industrial	165.42	1.82	Dry Detention Ponds	10% 270.96
High Intensity - Residential	304.44	1.32	NONE	0% 401.86
High Intensity - Residential	116.37	1.32	Dry Detention Ponds	10% 138.25
Sod Farm / Golf Course	98.14	0.24	NONE	0% 23.55
Sod Farm / Golf Course	24.79	0.24	Dry Detention Ponds	10% 5.35

Post-Development Area Altered: **731.09**Total Pre-Development Area: **731.09**Unaffected Area: **0****P Load (kg/yr)**Pre-Development: **925.95**Post-Development: **925.95**Change (Pre - Post): **0.00**

0% Net Increase in Load

Post-Development (with BMPs): **879.89**Change (Pre - Post): **46.06**

5% Net Reduction in Load

DEVELOPMENT: MU 2**Subwatershed: East Holland****CONSTRUCTION PHASE LOAD**

SUMMARY WITH IMPLEMENTATION OF BMPs	P Load (kg/yr)
Pre-Development:	925.95
Construction Phase Amortized Over 8 Years :	to be determined
Post-Development:	879.89
Post-Development + Amortized Construction:	to be determined
Pre-Development Load - Post-Development Load:	46.06
Conclusion:	5% Reduction in Load
Pre-Development Load - (Post-Development + Amortized Construction Load):	to be determined
Conclusion:	to be determined
Based on a comparison of Pre-Development and Post-Development loads, and in consideration of Construction Phase loads, the Ministry would encourage the Municipality to:	
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Project DEVELOPMENT Summary

DEVELOPMENT: MU 3

Subwatershed: East Holland

Total Pre-Development Area (ha)	248.42	Total Pre-Development Phosphorus Load (kg/yr)	258.88
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Pre-Development Land Use	Area (ha)	P coeff. (kg/ha)	P Load (kg/yr)
High Intensity - Comm/Industrial	12.52	1.82	22.79
High Intensity - Residential	166.18	1.32	219.36
Sod Farm / Golf Course	69.72	0.24	16.73

DEVELOPMENT: MU 3**Subwatershed: East Holland****POST-DEVELOPMENT LOAD**

Post-Development Land Use	Area (ha)	P coeff. (kg/ha)	Best Management Practice applied with P Removal Efficiency		P Load (kg/yr)
High Intensity - Comm/Industrial	0.45	1.82	NONE	0%	0.82
High Intensity - Comm/Industrial	12.07	1.82	Dry Detention Ponds	10%	19.77
High Intensity - Residential	146.51	1.32	NONE	0%	193.39
High Intensity - Residential	19.68	1.32	Dry Detention Ponds	10%	23.38
Sod Farm / Golf Course	67.46	0.24	NONE	0%	16.19
Sod Farm / Golf Course	2.25	0.24	Dry Detention Ponds	10%	0.49

Post-Development Area Altered: **248.42**Total Pre-Development Area: **248.42**Unaffected Area: **0****P Load
(kg/yr)**Pre-Development: **258.88**Post-Development: **258.89**Change (Pre - Post): **-0.01**

0% Net Increase in Load

Post-Development (with BMPs): **254.04**Change (Pre - Post): **4.84**

2% Net Reduction in Load

DEVELOPMENT: MU 3**Subwatershed: East Holland****CONSTRUCTION PHASE LOAD**

SUMMARY WITH IMPLEMENTATION OF BMPs	P Load (kg/yr)
Pre-Development:	258.88
Construction Phase Amortized Over 8 Years :	to be determined
Post-Development:	254.04
Post-Development + Amortized Construction:	to be determined
Pre-Development Load - Post-Development Load:	4.84
Conclusion:	2% Reduction in Load
Pre-Development Load - (Post-Development + Amortized Construction Load):	to be determined
Conclusion:	to be determined
Based on a comparison of Pre-Development and Post-Development loads, and in consideration of Construction Phase loads, the Ministry would encourage the Municipality to:	
<div></div>	

Project DEVELOPMENT Summary

DEVELOPMENT: MU 4

Subwatershed: East Holland

Total Pre-Development Area (ha)	152.73	Total Pre-Development Phosphorus Load (kg/yr)	207.13
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Pre-Development Land Use	Area (ha)	P coeff. (kg/ha)	P Load (kg/yr)
High Intensity - Comm/Industrial	30.44	1.82	55.40
High Intensity - Residential	113.31	1.32	149.57
Sod Farm / Golf Course	8.98	0.24	2.16

POST-DEVELOPMENT LOAD

Post-Development Land Use	Area (ha)	P coeff. (kg/ha)	Best Management Practice applied with P Removal Efficiency	P Load (kg/yr)
High Intensity - Comm/Industrial	30.44	1.82	NONE	0% 55.40
High Intensity - Residential	113.31	1.32	NONE	0% 149.57
Sod Farm / Golf Course	8.98	0.24	NONE	0% 2.16

Post-Development Area Altered:	152.73	P Load (kg/yr)
Total Pre-Development Area:	152.73	
Unaffected Area:	0	
	Pre-Development:	207.13
	Post-Development:	207.13
	Change (Pre - Post):	0.00
	0% Net Reduction in Load	
	Post-Development (with BMPs):	207.13
	Change (Pre - Post):	0.00
	0% Net Reduction in Load	

DEVELOPMENT: MU 4

Subwatershed: East Holland

CONSTRUCTION PHASE LOAD

SUMMARY WITH IMPLEMENTATION OF BMPs	P Load (kg/yr)
Pre-Development:	207.13
Construction Phase Amortized Over 8 Years :	to be determined
Post-Development:	207.13
Post-Development + Amortized Construction:	to be determined
Pre-Development Load - Post-Development Load:	0.00
Conclusion:	0% Increase in Load
Pre-Development Load - (Post-Development + Amortized Construction Load):	to be determined
Conclusion:	to be determined
Based on a comparison of Pre-Development and Post-Development loads, and in consideration of Construction Phase loads, the Ministry would encourage the Municipality to:	

Project DEVELOPMENT Summary

DEVELOPMENT: MU 5

Subwatershed: East Holland

Total Pre-Development Area (ha):	124.31	Total Pre-Development Phosphorus Load (kg/yr):	202.67
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Pre-Development Land Use	Area (ha)	P coeff. (kg/ha)	P Load (kg/yr)
High Intensity - Comm/Industrial	108.71	1.82	197.85
High Intensity - Residential	0.99	1.32	1.31
Sod Farm / Golf Course	14.61	0.24	3.51

POST-DEVELOPMENT LOAD

Post-Development Land Use	Area (ha)	P coeff. (kg/ha)	Best Management Practice applied with P Removal Efficiency	P Load (kg/yr)
High Intensity - Comm/Industrial	80.23	1.82	NONE	0% 146.02
High Intensity - Comm/Industrial	28.48	1.82	Dry Detention Ponds	10% 46.65
High Intensity - Residential	0.99	1.32	Dry Detention Ponds	10% 1.18
Sod Farm / Golf Course	14.61	0.24	NONE	0% 3.51

Post-Development Area Altered:	124.31	P Load (kg/yr)
Total Pre-Development Area:	124.31	
Unaffected Area:	0	
		Pre-Development: 202.67
		Post-Development: 202.67
		Change (Pre - Post): 0.00
		0% Net Increase in Load
		Post-Development (with BMPs): 197.35
		Change (Pre - Post): 5.31
		3% Net Reduction in Load

DEVELOPMENT: MU 5

Subwatershed: East Holland

CONSTRUCTION PHASE LOAD

SUMMARY WITH IMPLEMENTATION OF BMPs	P Load (kg/yr)
Pre-Development:	202.67
Construction Phase Amortized Over 8 Years :	to be determined
Post-Development:	197.35
Post-Development + Amortized Construction:	to be determined
Pre-Development Load - Post-Development Load:	5.31
Conclusion:	3% Reduction in Load
Pre-Development Load - (Post-Development + Amortized Construction Load):	to be determined
Conclusion:	to be determined
Based on a comparison of Pre-Development and Post-Development loads, and in consideration of Construction Phase loads, the Ministry would encourage the Municipality to:	

Project DEVELOPMENT Summary

DEVELOPMENT: MU 6

Subwatershed: East Holland

Total Pre-Development Area (ha)	369.44	Total Pre-Development Phosphorus Load (kg/yr)	234.80
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Pre-Development Land Use	Area (ha)	P coeff. (kg/ha)	P Load (kg/yr)
High Intensity - Comm/Industrial	18.44	1.82	33.56
High Intensity - Residential	108.33	1.32	143.00
Sod Farm / Golf Course	242.67	0.24	58.24

POST-DEVELOPMENT LOAD

Post-Development Land Use	Area (ha)	P coeff. (kg/ha)	Best Management Practice applied with P Removal Efficiency	P Load (kg/yr)
High Intensity - Comm/Industrial	18.44	1.82	Dry Detention Ponds 10%	30.20
High Intensity - Residential	108.33	1.32	Dry Detention Ponds 10%	128.70
Sod Farm / Golf Course	228.23	0.24	NONE 0%	54.78
Sod Farm / Golf Course	14.44	0.24	Dry Detention Ponds 10%	3.12

Post-Development Area Altered:	369.44	P Load (kg/yr)
Total Pre-Development Area:	369.44	
Unaffected Area:	0	
	Pre-Development:	234.80
	Post-Development:	234.80
	Change (Pre - Post):	0.00
	0% Net Reduction in Load	
	Post-Development (with BMPs):	216.80
	Change (Pre - Post):	18.00
	8% Net Reduction in Load	

DEVELOPMENT: MU 6

Subwatershed: East Holland

CONSTRUCTION PHASE LOAD

SUMMARY WITH IMPLEMENTATION OF BMPs	P Load (kg/yr)
Pre-Development:	234.80
Construction Phase Amortized Over 8 Years :	to be determined
Post-Development:	216.80
Post-Development + Amortized Construction:	to be determined
Pre-Development Load - Post-Development Load:	18.00
Conclusion:	8% Reduction in Load
Pre-Development Load - (Post-Development + Amortized Construction Load):	to be determined
Conclusion:	to be determined
Based on a comparison of Pre-Development and Post-Development loads, and in consideration of Construction Phase loads, the Ministry would encourage the Municipality to:	
<div></div>	

Project DEVELOPMENT Summary

DEVELOPMENT: MU 7

Subwatershed: East Holland

Total Pre-Development Area (ha):	164.73	Total Pre-Development Phosphorus Load (kg/yr):	151.83
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Pre-Development Land Use	Area (ha)	P coeff. (kg/ha)	P Load (kg/yr)
High Intensity - Comm/Industrial	12.36	1.82	22.50
High Intensity - Residential	85.89	1.32	113.37
Sod Farm / Golf Course	66.48	0.24	15.96

POST-DEVELOPMENT LOAD

Post-Development Land Use	Area (ha)	P coeff. (kg/ha)	Best Management Practice applied with P Removal Efficiency	P Load (kg/yr)
High Intensity - Comm/Industrial	12.36	1.82	Dry Detention Ponds 10%	20.25
High Intensity - Residential	85.89	1.32	Dry Detention Ponds 10%	102.04
Sod Farm / Golf Course	29.47	0.24	NONE 0%	7.07
Sod Farm / Golf Course	37.01	0.24	Dry Detention Ponds 10%	7.99

Post-Development Area Altered:	164.73	P Load (kg/yr)
Total Pre-Development Area:	164.73	
Unaffected Area:	0	
	Pre-Development:	151.83
	Post-Development:	151.83
	Change (Pre - Post):	0.00
	0% Net Reduction in Load	
	Post-Development (with BMPs):	137.35
	Change (Pre - Post):	14.48
	10% Net Reduction in Load	

DEVELOPMENT: MU 7

Subwatershed: East Holland

CONSTRUCTION PHASE LOAD

SUMMARY WITH IMPLEMENTATION OF BMPs		P Load (kg/yr)
Pre-Development:		151.83
Construction Phase Amortized Over 8 Years :		to be determined
Post-Development:		137.35
Post-Development + Amortized Construction:		to be determined
Pre-Development Load - Post-Development Load:		14.48
Conclusion:		10% Reduction in Load
Pre-Development Load - (Post-Development + Amortized Construction Load):		to be determined
Conclusion:		to be determined
Based on a comparison of Pre-Development and Post-Development loads, and in consideration of Construction Phase loads, the Ministry would encourage the Municipality to:		

Project DEVELOPMENT Summary

DEVELOPMENT: MU 8

Subwatershed: East Holland

Total Pre-Development Area (ha)	416.81	Total Pre-Development Phosphorus Load (kg/yr)	546.09
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Pre-Development Land Use	Area (ha)	P coeff. (kg/ha)	P Load (kg/yr)
High Intensity - Comm/Industrial	119.34	1.82	217.20
High Intensity - Residential	238.42	1.32	314.71
Sod Farm / Golf Course	59.05	0.24	14.17

DEVELOPMENT: MU 8**Subwatershed: East Holland****POST-DEVELOPMENT LOAD**

Post-Development Land Use	Area (ha)	P coeff. (kg/ha)	Best Management Practice applied with P Removal Efficiency	P Load (kg/yr)
High Intensity - Comm/Industrial	102.37	1.82	NONE	0% 186.31
High Intensity - Comm/Industrial	16.97	1.82	Dry Detention Ponds	10% 27.80
High Intensity - Residential	171.82	1.32	NONE	0% 226.80
High Intensity - Residential	66.6	1.32	Dry Detention Ponds	10% 79.12
Sod Farm / Golf Course	41.12	0.24	NONE	0% 9.87
Sod Farm / Golf Course	17.93	0.24	Dry Detention Ponds	10% 3.87

Post-Development Area Altered: **416.81**Total Pre-Development Area: **416.81**Unaffected Area: **0****P Load
(kg/yr)**Pre-Development: **546.09**Post-Development: **546.09**Change (Pre - Post): **0.00**

0% Net Increase in Load

Post-Development (with BMPs): **533.78**Change (Pre - Post): **12.31**

2% Net Reduction in Load

DEVELOPMENT: MU 8

Subwatershed: East Holland

CONSTRUCTION PHASE LOAD

SUMMARY WITH IMPLEMENTATION OF BMPs	P Load (kg/yr)
Pre-Development:	546.09
Construction Phase Amortized Over 8 Years :	to be determined
Post-Development:	533.78
Post-Development + Amortized Construction:	to be determined
Pre-Development Load - Post-Development Load:	12.31
Conclusion:	2% Reduction in Load
Pre-Development Load - (Post-Development + Amortized Construction Load):	to be determined
Conclusion:	to be determined
Based on a comparison of Pre-Development and Post-Development loads, and in consideration of Construction Phase loads, the Ministry would encourage the Municipality to:	

Project DEVELOPMENT Summary

DEVELOPMENT: MU 9

Subwatershed: East Holland

Total Pre-Development Area (ha)	533.27	Total Pre-Development Phosphorus Load (kg/yr)	644.22
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Pre-Development Land Use	Area (ha)	P coeff. (kg/ha)	P Load (kg/yr)
High Intensity - Comm/Industrial	131.69	1.82	239.68
High Intensity - Residential	285.34	1.32	376.65
Sod Farm / Golf Course	116.24	0.24	27.90

DEVELOPMENT: MU 9**Subwatershed: East Holland****POST-DEVELOPMENT LOAD**

Post-Development Land Use	Area (ha)	P coeff. (kg/ha)	Best Management Practice applied with P Removal Efficiency	P Load (kg/yr)
High Intensity - Comm/Industrial	129	1.82	NONE	0% 234.78
High Intensity - Comm/Industrial	2.68	1.82	Wet Detention Ponds	63% 1.80
High Intensity - Residential	191.74	1.32	NONE	0% 253.10
High Intensity - Residential	93.6	1.32	Wet Detention Ponds	63% 45.71
Sod Farm / Golf Course	107.63	0.24	NONE	0% 25.83
Sod Farm / Golf Course	8.62	0.24	Wet Detention Ponds	63% 0.77


Post-Development Area Altered: **533.27**Total Pre-Development Area: **533.27**Unaffected Area: **0****P Load
(kg/yr)**Pre-Development: **644.22**Post-Development: **644.21**Change (Pre - Post): **0.02**

0% Net Reduction in Load

Post-Development (with BMPs): **561.99**Change (Pre - Post): **82.23**

13% Net Reduction in Load

DEVELOPMENT: MU 9**Subwatershed: East Holland****CONSTRUCTION PHASE LOAD**

SUMMARY WITH IMPLEMENTATION OF BMPs	P Load (kg/yr)
Pre-Development:	644.22
Construction Phase Amortized Over 8 Years :	to be determined
Post-Development:	561.99
Post-Development + Amortized Construction:	to be determined
Pre-Development Load - Post-Development Load:	82.23
Conclusion:	13% Reduction in Load
Pre-Development Load - (Post-Development + Amortized Construction Load):	to be determined
Conclusion:	to be determined
Based on a comparison of Pre-Development and Post-Development loads, and in consideration of Construction Phase loads, the Ministry would encourage the Municipality to:	
	

Project DEVELOPMENT Summary

DEVELOPMENT: MU 10

Subwatershed: East Holland

Total Pre-Development Area (ha)	305.94	Total Pre-Development Phosphorus Load (kg/yr)	256.43
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Pre-Development Land Use	Area (ha)	P coeff. (kg/ha)	P Load (kg/yr)
High Intensity - Comm/Industrial	17.36	1.82	31.60
High Intensity - Residential	144.05	1.32	190.15
Sod Farm / Golf Course	144.53	0.24	34.69

DEVELOPMENT: MU 10**Subwatershed: East Holland****POST-DEVELOPMENT LOAD**

Post-Development Land Use	Area (ha)	P coeff. (kg/ha)	Best Management Practice applied with P Removal Efficiency	P Load (kg/yr)
High Intensity - Comm/Industrial	0.63	1.82	NONE	0% 1.15
High Intensity - Comm/Industrial	16.73	1.82	Dry Detention Ponds	10% 27.40
High Intensity - Residential	67.78	1.32	NONE	0% 89.47
High Intensity - Residential	76.27	1.32	Dry Detention Ponds	10% 90.61
Sod Farm / Golf Course	102.08	0.24	NONE	0% 24.50
Sod Farm / Golf Course	42.45	0.24	Dry Detention Ponds	10% 9.17

Post-Development Area Altered: **305.94**Total Pre-Development Area: **305.94**Unaffected Area: **0****P Load (kg/yr)**Pre-Development: **256.43**Post-Development: **256.43**Change (Pre - Post): **0.00**

0% Net Reduction in Load

Post-Development (with BMPs): **242.30**Change (Pre - Post): **14.13**

6% Net Reduction in Load

DEVELOPMENT: MU 10

Subwatershed: East Holland

CONSTRUCTION PHASE LOAD

SUMMARY WITH IMPLEMENTATION OF BMPs	P Load (kg/yr)
Pre-Development:	256.43
Construction Phase Amortized Over 8 Years :	to be determined
Post-Development:	242.30
Post-Development + Amortized Construction:	to be determined
Pre-Development Load - Post-Development Load:	14.13
Conclusion:	6% Reduction in Load
Pre-Development Load - (Post-Development + Amortized Construction Load):	to be determined
Conclusion:	to be determined
Based on a comparison of Pre-Development and Post-Development loads, and in consideration of Construction Phase loads, the Ministry would encourage the Municipality to:	

Project DEVELOPMENT Summary

DEVELOPMENT: MU 11

Subwatershed: East Holland

Total Pre-Development Area (ha)	241.76	Total Pre-Development Phosphorus Load (kg/yr)	324.59
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Pre-Development Land Use	Area (ha)	P coeff. (kg/ha)	P Load (kg/yr)
High Intensity - Comm/Industrial	59.18	1.82	107.71
High Intensity - Residential	160.24	1.32	211.52
Sod Farm / Golf Course	22.34	0.24	5.36

DEVELOPMENT: MU 11**Subwatershed: East Holland****POST-DEVELOPMENT LOAD**

Post-Development Land Use	Area (ha)	P coeff. (kg/ha)	Best Management Practice applied with P Removal Efficiency	P Load (kg/yr)
High Intensity - Comm/Industrial	37.78	1.82	NONE	0% 68.76
High Intensity - Comm/Industrial	21.39	1.82	Dry Detention Ponds	10% 35.04
High Intensity - Residential	126.32	1.32	NONE	0% 166.74
High Intensity - Residential	33.92	1.32	Dry Detention Ponds	10% 40.30
Sod Farm / Golf Course	8.7	0.24	NONE	0% 2.09
Sod Farm / Golf Course	13.65	0.24	Dry Detention Ponds	10% 2.95

Post-Development Area Altered: **241.76**Total Pre-Development Area: **241.76**Unaffected Area: **0****P Load (kg/yr)**Pre-Development: **324.59**Post-Development: **324.57**Change (Pre - Post): **0.02**

0% Net Reduction in Load

Post-Development (with BMPs): **315.87**Change (Pre - Post): **8.71**

3% Net Reduction in Load

DEVELOPMENT: MU 11

Subwatershed: East Holland

CONSTRUCTION PHASE LOAD

SUMMARY WITH IMPLEMENTATION OF BMPs	P Load (kg/yr)
Pre-Development:	324.59
Construction Phase Amortized Over 8 Years :	to be determined
Post-Development:	315.87
Post-Development + Amortized Construction:	to be determined
Pre-Development Load - Post-Development Load:	8.71
Conclusion:	3% Reduction in Load
Pre-Development Load - (Post-Development + Amortized Construction Load):	to be determined
Conclusion:	to be determined
Based on a comparison of Pre-Development and Post-Development loads, and in consideration of Construction Phase loads, the Ministry would encourage the Municipality to:	

Appendix B6

**PTool - P Loading and
Removal for Proposed
Conditions**

Project DEVELOPMENT Summary

DEVELOPMENT: MU 1

Subwatershed: East Holland

Total Pre-Development Area (ha)	526.37	Total Pre-Development Phosphorus Load (kg/yr)	676.02
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Pre-Development Land Use	Area (ha)	P coeff. (kg/ha)	P Load (kg/yr)
High Intensity - Comm/Industrial	148.98	1.82	271.14
High Intensity - Residential	291.02	1.32	384.15
Sod Farm / Golf Course	86.37	0.24	20.73

DEVELOPMENT: MU 1**Subwatershed: East Holland****POST-DEVELOPMENT LOAD**

Post-Development Land Use	Area (ha)	P coeff. (kg/ha)	Best Management Practice applied with P Removal Efficiency	P Load (kg/yr)
High Intensity - Comm/Industrial	110.3	1.82	NONE	0% 200.75
High Intensity - Comm/Industrial	38.68	1.82	Wet Detention Ponds	63% 26.05
High Intensity - Residential	152.1	1.32	NONE	0% 200.77
High Intensity - Residential	19.6	1.32	Dry Detention Ponds	10% 23.28
High Intensity - Residential	119.32	1.32	Wet Detention Ponds	63% 58.28
Sod Farm / Golf Course	47.47	0.24	NONE	0% 11.39
Sod Farm / Golf Course	2.4	0.24	Dry Detention Ponds	10% 0.52
Sod Farm / Golf Course	36.5	0.24	Wet Detention Ponds	63% 3.24

Post-Development Area Altered: **526.37**Total Pre-Development Area: **526.37**Unaffected Area: **0****P Load (kg/yr)**Pre-Development: **676.02**Post-Development: **676.02**Change (Pre - Post): **0.00**

0% Net Increase in Load

Post-Development (with BMPs): **524.28**Change (Pre - Post): **151.74**

22% Net Reduction in Load

DEVELOPMENT: MU 1**Subwatershed: East Holland****CONSTRUCTION PHASE LOAD**

SUMMARY WITH IMPLEMENTATION OF BMPs	P Load (kg/yr)
Pre-Development:	676.02
Construction Phase Amortized Over 8 Years :	to be determined
Post-Development:	524.28
Post-Development + Amortized Construction:	to be determined
Pre-Development Load - Post-Development Load:	151.74
Conclusion:	22% Reduction in Load
Pre-Development Load - (Post-Development + Amortized Construction Load):	to be determined
Conclusion:	to be determined
Based on a comparison of Pre-Development and Post-Development loads, and in consideration of Construction Phase loads, the Ministry would encourage the Municipality to:	
<div></div>	

Project DEVELOPMENT Summary

DEVELOPMENT: MU 2

Subwatershed: East Holland

Total Pre-Development Area (ha)	731.09	Total Pre-Development Phosphorus Load (kg/yr)	925.95
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Pre-Development Land Use	Area (ha)	P coeff. (kg/ha)	P Load (kg/yr)
High Intensity - Comm/Industrial	187.35	1.82	340.98
High Intensity - Residential	420.81	1.32	555.47
Sod Farm / Golf Course	122.93	0.24	29.50

DEVELOPMENT: MU 2**Subwatershed: East Holland****POST-DEVELOPMENT LOAD**

Post-Development Land Use	Area (ha)	P coeff. (kg/ha)	Best Management Practice applied with P Removal Efficiency	P Load (kg/yr)
High Intensity - Comm/Industrial	165.42	1.82	Wet Detention Ponds	63% 111.39
High Intensity - Comm/Industrial	21.93	1.82	NONE	0% 39.91
High Intensity - Residential	36.39	1.32	Dry Detention Ponds	10% 43.23
High Intensity - Residential	116.37	1.32	Wet Detention Ponds	63% 56.84
High Intensity - Residential	268.05	1.32	NONE	0% 353.83
Sod Farm / Golf Course	4.14	0.24	Dry Detention Ponds	10% 0.89
Sod Farm / Golf Course	24.78	0.24	Wet Detention Ponds	63% 2.20
Sod Farm / Golf Course	94.01	0.24	NONE	0% 22.56

Post-Development Area Altered: **731.09**Total Pre-Development Area: **731.09**Unaffected Area: **0****P Load (kg/yr)**Pre-Development: **925.95**Post-Development: **925.95**Change (Pre - Post): **0.00**

0% Net Reduction in Load

Post-Development (with BMPs): **630.86**Change (Pre - Post): **295.09**

32% Net Reduction in Load

DEVELOPMENT: MU 2

Subwatershed: East Holland

CONSTRUCTION PHASE LOAD

SUMMARY WITH IMPLEMENTATION OF BMPs		P Load (kg/yr)
Pre-Development:		925.95
Construction Phase Amortized Over 8 Years :		to be determined
Post-Development:		630.86
Post-Development + Amortized Construction:		to be determined
Pre-Development Load - Post-Development Load:		295.09
Conclusion:		32% Reduction in Load
Pre-Development Load - (Post-Development + Amortized Construction Load):		to be determined
Conclusion:		to be determined
Based on a comparison of Pre-Development and Post-Development loads, and in consideration of Construction Phase loads, the Ministry would encourage the Municipality to:		

Project DEVELOPMENT Summary

DEVELOPMENT: MU 3

Subwatershed: East Holland

Total Pre-Development Area (ha)	248.42	Total Pre-Development Phosphorus Load (kg/yr)	258.88
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Pre-Development Land Use	Area (ha)	P coeff. (kg/ha)	P Load (kg/yr)
High Intensity - Comm/Industrial	12.52	1.82	22.79
High Intensity - Residential	166.18	1.32	219.36
Sod Farm / Golf Course	69.72	0.24	16.73

DEVELOPMENT: MU 3**Subwatershed: East Holland****POST-DEVELOPMENT LOAD**

Post-Development Land Use	Area (ha)	P coeff. (kg/ha)	Best Management Practice applied with P Removal Efficiency	P Load (kg/yr)
High Intensity - Comm/Industrial	12.07	1.82	Wet Detention Ponds	63% 8.13
High Intensity - Comm/Industrial	0.45	1.82	NONE	0% 0.82
High Intensity - Residential	57.48	1.32	Dry Detention Ponds	10% 68.29
High Intensity - Residential	19.68	1.32	Wet Detention Ponds	63% 9.61
High Intensity - Residential	89.02	1.32	NONE	0% 117.51
Sod Farm / Golf Course	8.33	0.24	Dry Detention Ponds	10% 1.80
Sod Farm / Golf Course	2.25	0.24	Wet Detention Ponds	63% 0.20
Sod Farm / Golf Course	59.14	0.24	NONE	0% 14.19

Post-Development Area Altered: **248.42**Total Pre-Development Area: **248.42**Unaffected Area: **0****P Load (kg/yr)**Pre-Development: **258.88**Post-Development: **258.88**Change (Pre - Post): **0.00**

0% Net Increase in Load

Post-Development (with BMPs): **220.54**Change (Pre - Post): **38.33**

15% Net Reduction in Load

DEVELOPMENT: MU 3

Subwatershed: East Holland

CONSTRUCTION PHASE LOAD

SUMMARY WITH IMPLEMENTATION OF BMPs	P Load (kg/yr)
Pre-Development:	258.88
Construction Phase Amortized Over 8 Years :	to be determined
Post-Development:	220.54
Post-Development + Amortized Construction:	to be determined
Pre-Development Load - Post-Development Load:	38.33
Conclusion:	15% Reduction in Load
Pre-Development Load - (Post-Development + Amortized Construction Load):	to be determined
Conclusion:	to be determined
Based on a comparison of Pre-Development and Post-Development loads, and in consideration of Construction Phase loads, the Ministry would encourage the Municipality to:	

Project DEVELOPMENT Summary

DEVELOPMENT: MU 4

Subwatershed: East Holland

Total Pre-Development Area (ha)	152.73	Total Pre-Development Phosphorus Load (kg/yr)	207.13
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Pre-Development Land Use	Area (ha)	P coeff. (kg/ha)	P Load (kg/yr)
High Intensity - Comm/Industrial	30.44	1.82	55.40
High Intensity - Residential	113.31	1.32	149.57
Sod Farm / Golf Course	8.98	0.24	2.16

DEVELOPMENT: MU 4**Subwatershed: East Holland****POST-DEVELOPMENT LOAD**

Post-Development Land Use	Area (ha)	P coeff. (kg/ha)	Best Management Practice applied with P Removal Efficiency	P Load (kg/yr)
High Intensity - Comm/Industrial	12.55	1.82	Dry Detention Ponds	10% 20.56
High Intensity - Comm/Industrial	17.89	1.82	NONE	0% 32.56
High Intensity - Residential	46.64	1.32	Dry Detention Ponds	10% 55.41
High Intensity - Residential	66.67	1.32	NONE	0% 88.00
Sod Farm / Golf Course	4.14	0.24	Dry Detention Ponds	10% 0.89
Sod Farm / Golf Course	4.84	0.24	NONE	0% 1.16

Post-Development Area Altered: **152.73**Total Pre-Development Area: **152.73**Unaffected Area: **0****P Load
(kg/yr)**Pre-Development: **207.13**Post-Development: **207.13**Change (Pre - Post): **0.00**

0% Net Reduction in Load

Post-Development (with BMPs): **198.59**Change (Pre - Post): **8.54**

4% Net Reduction in Load

DEVELOPMENT: MU 4

Subwatershed: East Holland

CONSTRUCTION PHASE LOAD

SUMMARY WITH IMPLEMENTATION OF BMPs	P Load (kg/yr)
Pre-Development:	207.13
Construction Phase Amortized Over 8 Years :	to be determined
Post-Development:	198.59
Post-Development + Amortized Construction:	to be determined
Pre-Development Load - Post-Development Load:	8.54
Conclusion:	4% Reduction in Load
Pre-Development Load - (Post-Development + Amortized Construction Load):	to be determined
Conclusion:	to be determined
Based on a comparison of Pre-Development and Post-Development loads, and in consideration of Construction Phase loads, the Ministry would encourage the Municipality to:	

Project DEVELOPMENT Summary

DEVELOPMENT: MU 5

Subwatershed: East Holland

Total Pre-Development Area (ha):	124.31	Total Pre-Development Phosphorus Load (kg/yr):	202.67
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Pre-Development Land Use	Area (ha)	P coeff. (kg/ha)	P Load (kg/yr)
High Intensity - Comm/Industrial	108.71	1.82	197.85
High Intensity - Residential	0.99	1.32	1.31
Sod Farm / Golf Course	14.61	0.24	3.51

POST-DEVELOPMENT LOAD

Post-Development Land Use	Area (ha)	P coeff. (kg/ha)	Best Management Practice applied with P Removal Efficiency	P Load (kg/yr)
High Intensity - Comm/Industrial	28.48	1.82	Wet Detention Ponds 63%	19.18
High Intensity - Comm/Industrial	80.23	1.82	NONE 0%	146.02
High Intensity - Residential	0.99	1.32	Wet Detention Ponds 63%	0.48
Sod Farm / Golf Course	14.61	0.24	NONE 0%	3.51

Post-Development Area Altered: **124.31**

Total Pre-Development Area: **124.31**

Unaffected Area: **0**

P Load (kg/yr)

Pre-Development: **202.67**

Post-Development: **202.67**

Change (Pre - Post): **0.00**

0% Net Increase in Load

Post-Development (with BMPs): **169.19**

Change (Pre - Post): **33.48**

17% Net Reduction in Load

DEVELOPMENT: MU 5

Subwatershed: East Holland

CONSTRUCTION PHASE LOAD

SUMMARY WITH IMPLEMENTATION OF BMPs	P Load (kg/yr)
Pre-Development:	202.67
Construction Phase Amortized Over 8 Years :	to be determined
Post-Development:	169.19
Post-Development + Amortized Construction:	to be determined
Pre-Development Load - Post-Development Load:	33.48
Conclusion:	17% Reduction in Load
Pre-Development Load - (Post-Development + Amortized Construction Load):	to be determined
Conclusion:	to be determined
Based on a comparison of Pre-Development and Post-Development loads, and in consideration of Construction Phase loads, the Ministry would encourage the Municipality to:	

Project DEVELOPMENT Summary

DEVELOPMENT: MU 6

Subwatershed: East Holland

Total Pre-Development Area (ha)	369.44	Total Pre-Development Phosphorus Load (kg/yr)	234.80
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Pre-Development Land Use	Area (ha)	P coeff. (kg/ha)	P Load (kg/yr)
High Intensity - Comm/Industrial	18.44	1.82	33.56
High Intensity - Residential	108.33	1.32	143.00
Sod Farm / Golf Course	242.67	0.24	58.24

POST-DEVELOPMENT LOAD

Post-Development Land Use	Area (ha)	P coeff. (kg/ha)	Best Management Practice applied with P Removal Efficiency	P Load (kg/yr)
High Intensity - Comm/Industrial	18.44	1.82	Wet Detention Ponds 63%	12.42
High Intensity - Residential	108.33	1.32	Wet Detention Ponds 63%	52.91
Sod Farm / Golf Course	228.23	0.24	NONE 0%	54.78
Sod Farm / Golf Course	14.44	0.24	Wet Detention Ponds 63%	1.28

Post-Development Area Altered: **369.44**

Total Pre-Development Area: **369.44**

Unaffected Area: **0**

Pre-Development: **234.80**

Post-Development: **234.80**

Change (Pre - Post): **0.00**

0% Net Reduction in Load

Post-Development (with BMPs): **121.38**

Change (Pre - Post): **113.41**

48% Net Reduction in Load

DEVELOPMENT: MU 6

Subwatershed: East Holland

CONSTRUCTION PHASE LOAD

SUMMARY WITH IMPLEMENTATION OF BMPs	P Load (kg/yr)
Pre-Development:	234.80
Construction Phase Amortized Over 8 Years :	to be determined
Post-Development:	121.38
Post-Development + Amortized Construction:	to be determined
Pre-Development Load - Post-Development Load:	113.41
Conclusion:	48% Reduction in Load
Pre-Development Load - (Post-Development + Amortized Construction Load):	to be determined
Conclusion:	to be determined
Based on a comparison of Pre-Development and Post-Development loads, and in consideration of Construction Phase loads, the Ministry would encourage the Municipality to:	

Project DEVELOPMENT Summary

DEVELOPMENT: MU 7

Subwatershed: East Holland

Total Pre-Development Area (ha)	167.73	Total Pre-Development Phosphorus Load (kg/yr)	155.79
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Pre-Development Land Use	Area (ha)	P coeff. (kg/ha)	P Load (kg/yr)
High Intensity - Comm/Industrial	12.36	1.82	22.50
High Intensity - Residential	88.89	1.32	117.33
Sod Farm / Golf Course	66.48	0.24	15.96

DEVELOPMENT: MU 7**Subwatershed: East Holland****POST-DEVELOPMENT LOAD**

Post-Development Land Use	Area (ha)	P coeff. (kg/ha)	Best Management Practice applied with P Removal Efficiency	P Load (kg/yr)
High Intensity - Comm/Industrial	12.36	1.82	Wet Detention Ponds	63% 8.32
High Intensity - Residential	13.1	1.32	Dry Detention Ponds	10% 15.56
High Intensity - Residential	72.79	1.32	Wet Detention Ponds	63% 35.55
Sod Farm / Golf Course	29.47	0.24	NONE	0% 7.07
Sod Farm / Golf Course	37.01	0.24	Wet Detention Ponds	63% 3.29

Post-Development Area Altered: **164.73**Total Pre-Development Area: **167.73**Unaffected Area: **3****P Load (kg/yr)**Pre-Development: **155.79**Post-Development: **151.83**Change (Pre - Post): **3.96**

3% Net Reduction in Load

Post-Development (with BMPs): **69.80**Change (Pre - Post): **85.99**

55% Net Reduction in Load

DEVELOPMENT: MU 7

Subwatershed: East Holland

CONSTRUCTION PHASE LOAD

SUMMARY WITH IMPLEMENTATION OF BMPs	P Load (kg/yr)
Pre-Development:	155.79
Construction Phase Amortized Over 8 Years :	to be determined
Post-Development:	69.80
Post-Development + Amortized Construction:	to be determined
Pre-Development Load - Post-Development Load:	85.99
Conclusion:	55% Reduction in Load
Pre-Development Load - (Post-Development + Amortized Construction Load):	to be determined
Conclusion:	to be determined
Based on a comparison of Pre-Development and Post-Development loads, and in consideration of Construction Phase loads, the Ministry would encourage the Municipality to:	

Project DEVELOPMENT Summary

DEVELOPMENT: MU 8

Subwatershed: East Holland

Total Pre-Development Area (ha)	416.81	Total Pre-Development Phosphorus Load (kg/yr)	546.09
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Pre-Development Land Use	Area (ha)	P coeff. (kg/ha)	P Load (kg/yr)
High Intensity - Comm/Industrial	119.34	1.82	217.20
High Intensity - Residential	238.42	1.32	314.71
Sod Farm / Golf Course	59.05	0.24	14.17

DEVELOPMENT: MU 8**Subwatershed: East Holland****POST-DEVELOPMENT LOAD**

Post-Development Land Use	Area (ha)	P coeff. (kg/ha)	Best Management Practice applied with P Removal Efficiency	P Load (kg/yr)
High Intensity - Comm/Industrial	14.58	1.82	Dry Detention Ponds	10% 23.88
High Intensity - Comm/Industrial	16.97	1.82	Wet Detention Ponds	63% 11.43
High Intensity - Comm/Industrial	87.79	1.82	NONE	0% 159.78
High Intensity - Residential	1.04	1.32	Dry Detention Ponds	10% 1.24
High Intensity - Residential	66.6	1.32	Wet Detention Ponds	63% 32.53
High Intensity - Residential	170.78	1.32	NONE	0% 225.43
Sod Farm / Golf Course	1.21	0.24	Dry Detention Ponds	10% 0.26
Sod Farm / Golf Course	17.93	0.24	Wet Detention Ponds	63% 1.59
Sod Farm / Golf Course	39.91	0.24	NONE	0% 9.58

Post-Development Area Altered: **416.81**Total Pre-Development Area: **416.81**Unaffected Area: **0****P Load (kg/yr)**Pre-Development: **546.09**Post-Development: **546.09**Change (Pre - Post): **0.00**

0% Net Increase in Load

Post-Development (with BMPs): **465.71**Change (Pre - Post): **80.37**

15% Net Reduction in Load

DEVELOPMENT: MU 8

Subwatershed: East Holland

CONSTRUCTION PHASE LOAD

SUMMARY WITH IMPLEMENTATION OF BMPs	P Load (kg/yr)
Pre-Development:	546.09
Construction Phase Amortized Over 8 Years :	to be determined
Post-Development:	465.71
Post-Development + Amortized Construction:	to be determined
Pre-Development Load - Post-Development Load:	80.37
Conclusion:	15% Reduction in Load
Pre-Development Load - (Post-Development + Amortized Construction Load):	to be determined
Conclusion:	to be determined
<p>Based on a comparison of Pre-Development and Post-Development loads, and in consideration of Construction Phase loads, the Ministry would encourage the Municipality to:</p> <div style="background-color: #cccccc; height: 40px; width: 100%;"></div>	

Project DEVELOPMENT Summary

DEVELOPMENT: MU 9

Subwatershed: East Holland

Total Pre-Development Area (ha)	533.27	Total Pre-Development Phosphorus Load (kg/yr)	644.22
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Pre-Development Land Use	Area (ha)	P coeff. (kg/ha)	P Load (kg/yr)
High Intensity - Comm/Industrial	131.69	1.82	239.68
High Intensity - Residential	285.34	1.32	376.65
Sod Farm / Golf Course	116.24	0.24	27.90

DEVELOPMENT: MU 9**Subwatershed: East Holland****POST-DEVELOPMENT LOAD**

Post-Development Land Use	Area (ha)	P coeff. (kg/ha)	Best Management Practice applied with P Removal Efficiency	P Load (kg/yr)
High Intensity - Comm/Industrial	15.39	1.82	Dry Detention Ponds	10% 25.21
High Intensity - Comm/Industrial	2.68	1.82	Wet Detention Ponds	63% 1.80
High Intensity - Comm/Industrial	113.62	1.82	NONE	0% 206.79
High Intensity - Residential	110.41	1.32	Dry Detention Ponds	10% 131.17
High Intensity - Residential	93.6	1.32	Wet Detention Ponds	63% 45.71
High Intensity - Residential	81.33	1.32	NONE	0% 107.36
Sod Farm / Golf Course	15.05	0.24	Dry Detention Ponds	10% 3.25
Sod Farm / Golf Course	8.62	0.24	Wet Detention Ponds	63% 0.77
Sod Farm / Golf Course	92.57	0.24	NONE	0% 22.22

Post-Development Area Altered: **533.27**Total Pre-Development Area: **533.27**Unaffected Area: **0****P Load (kg/yr)**Pre-Development: **644.22**Post-Development: **644.22**Change (Pre - Post): **0.00**

0% Net Reduction in Load

Post-Development (with BMPs): **544.27**Change (Pre - Post): **99.95**

16% Net Reduction in Load

DEVELOPMENT: MU 9

Subwatershed: East Holland

CONSTRUCTION PHASE LOAD

SUMMARY WITH IMPLEMENTATION OF BMPs	P Load (kg/yr)
Pre-Development:	644.22
Construction Phase Amortized Over 8 Years :	to be determined
Post-Development:	544.27
Post-Development + Amortized Construction:	to be determined
Pre-Development Load - Post-Development Load:	99.95
Conclusion:	16% Reduction in Load
Pre-Development Load - (Post-Development + Amortized Construction Load):	to be determined
Conclusion:	to be determined
Based on a comparison of Pre-Development and Post-Development loads, and in consideration of Construction Phase loads, the Ministry would encourage the Municipality to:	
<div></div>	

Project DEVELOPMENT Summary

DEVELOPMENT: MU 10

Subwatershed: East Holland

Total Pre-Development Area (ha)	305.94	Total Pre-Development Phosphorus Load (kg/yr)	256.43
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Pre-Development Land Use	Area (ha)	P coeff. (kg/ha)	P Load (kg/yr)
High Intensity - Comm/Industrial	17.36	1.82	31.60
High Intensity - Residential	144.05	1.32	190.15
Sod Farm / Golf Course	144.53	0.24	34.69

DEVELOPMENT: MU 10**Subwatershed: East Holland****POST-DEVELOPMENT LOAD**

Post-Development Land Use	Area (ha)	P coeff. (kg/ha)	Best Management Practice applied with P Removal Efficiency	P Load (kg/yr)
High Intensity - Comm/Industrial	16.73	1.82	Wet Detention Ponds	63% 11.27
High Intensity - Comm/Industrial	0.63	1.82	NONE	0% 1.15
High Intensity - Residential	40.9	1.32	Dry Detention Ponds	10% 48.59
High Intensity - Residential	76.27	1.32	Wet Detention Ponds	63% 37.25
High Intensity - Residential	26.88	1.32	NONE	0% 35.48
Sod Farm / Golf Course	3.78	0.24	Dry Detention Ponds	10% 0.82
Sod Farm / Golf Course	42.45	0.24	Wet Detention Ponds	63% 3.77
Sod Farm / Golf Course	98.3	0.24	NONE	0% 23.59

Post-Development Area Altered: **305.94**Total Pre-Development Area: **305.94**Unaffected Area: **0****P Load (kg/yr)**Pre-Development: **256.43**Post-Development: **256.43**Change (Pre - Post): **0.00**

0% Net Reduction in Load

Post-Development (with BMPs): **161.91**Change (Pre - Post): **94.52**

37% Net Reduction in Load

DEVELOPMENT: MU 10

Subwatershed: East Holland

CONSTRUCTION PHASE LOAD

SUMMARY WITH IMPLEMENTATION OF BMPs	P Load (kg/yr)
Pre-Development:	256.43
Construction Phase Amortized Over 8 Years :	to be determined
Post-Development:	161.91
Post-Development + Amortized Construction:	to be determined
Pre-Development Load - Post-Development Load:	94.52
Conclusion:	37% Reduction in Load
Pre-Development Load - (Post-Development + Amortized Construction Load):	to be determined
Conclusion:	to be determined
Based on a comparison of Pre-Development and Post-Development loads, and in consideration of Construction Phase loads, the Ministry would encourage the Municipality to:	

Project DEVELOPMENT Summary

DEVELOPMENT: MU 11

Subwatershed: East Holland

Total Pre-Development Area (ha)	241.76	Total Pre-Development Phosphorus Load (kg/yr)	324.59
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Pre-Development Land Use	Area (ha)	P coeff. (kg/ha)	P Load (kg/yr)
High Intensity - Comm/Industrial	59.18	1.82	107.71
High Intensity - Residential	160.24	1.32	211.52
Sod Farm / Golf Course	22.34	0.24	5.36

DEVELOPMENT: MU 11**Subwatershed: East Holland****POST-DEVELOPMENT LOAD**

Post-Development Land Use	Area (ha)	P coeff. (kg/ha)	Best Management Practice applied with P Removal Efficiency	P Load (kg/yr)
High Intensity - Comm/Industrial	21.39	1.82	Wet Detention Ponds	63% 14.40
High Intensity - Comm/Industrial	37.78	1.82	NONE	0% 68.76
High Intensity - Residential	33.92	1.32	Wet Detention Ponds	63% 16.57
High Intensity - Residential	126.32	1.32	NONE	0% 166.74
Sod Farm / Golf Course	13.65	0.24	Wet Detention Ponds	63% 1.21
Sod Farm / Golf Course	8.7	0.24	NONE	0% 2.09

Post-Development Area Altered: **241.76**Total Pre-Development Area: **241.76**Unaffected Area: **0****P Load (kg/yr)**Pre-Development: **324.59**Post-Development: **324.57**Change (Pre - Post): **0.02**

0% Net Reduction in Load

Post-Development (with BMPs): **269.77**Change (Pre - Post): **54.81**

17% Net Reduction in Load

DEVELOPMENT: MU 11

Subwatershed: East Holland

CONSTRUCTION PHASE LOAD

SUMMARY WITH IMPLEMENTATION OF BMPs		P Load (kg/yr)
Pre-Development:		324.59
Construction Phase Amortized Over 8 Years :		to be determined
Post-Development:		269.77
Post-Development + Amortized Construction:		to be determined
Pre-Development Load - Post-Development Load:		54.81
Conclusion:		17% Reduction in Load
Pre-Development Load - (Post-Development + Amortized Construction Load):		to be determined
Conclusion:		to be determined
Based on a comparison of Pre-Development and Post-Development loads, and in consideration of Construction Phase loads, the Ministry would encourage the Municipality to:		

Appendix B7

**P Removal for
Recommended
LID's -Excel
Spreadsheets**

MANAGEMENT UNIT 1

Potential P Load Reduction with BMPs = 5.54 kg/yr

TP Removal
Efficiency (%)

BMP:

Bioretention system	0
Constructed Wetland	77
Dry Detention Pond	10
Dry Swales	0
Enhanced Grass/WO Swales	0
Flow Balancing Systems (?)	77
Green roofs	0
Perforated Pipe Infil/Exfil	87
Sand or Media Filters	45
Soakaway/Infiltration trench	60
Sorbive media interceptors	79
Underground Storage	25
Veget. Filter Strip/buffer	65
Wet Detention Pond	63

Potential Rooftop Infiltration at Upper Canada Mall:

	Area	P coeff (kg/ha/yr)	P Load (kg/yr)	BMP	Efficiency %	BMP P (kg/yr)	BMP P (kg/yr)
High Intensity Commercial	0.00	1.82	0.00		0	0.00	0.00
High Intensity Residential	4.40	1.32	5.81	Soakaway/Infiltration tr	60	3.48	3.48
Low Intensity Development	0.00	0.13	0.00		0	0.00	0.00
Sod Farm/Golf Course	0.00	0.24	0.00		0	0.00	0.00
Transition	0.00	0.16	0.00		0	0.00	0.00
Forest	0.00	0.10	0.00		0	0.00	0.00
Quarry	0.00	0.18	0.00		0	0.00	0.00
*Used Low Intensity Development to represent 'clean' rooftop runoff in commercial area							3.48 kg/yr removed

Potential Rooftop Infiltration at Town Building at Yonge & Eagle:

	Area	P coeff (kg/ha/yr)	P Load (kg/yr)	BMP	Efficiency %	BMP P (kg/yr)	BMP P (kg/yr)
High Intensity Commercial	0.00	1.82	0.00		0	0.00	0.00
High Intensity Residential	0.80	1.32	1.06	Soakaway/Infiltration tr	60	0.63	0.63
Low Intensity Development	0.00	0.13	0.00		0	0.00	0.00
Sod Farm/Golf Course	0.00	0.24	0.00		0	0.00	0.00
Transition	0.00	0.16	0.00		0	0.00	0.00
Forest	0.00	0.10	0.00		0	0.00	0.00
Quarry	0.00	0.18	0.00		0	0.00	0.00
*Used Low Intensity Development to represent 'clean' rooftop runoff in commercial area							0.63 kg/yr removed

Potential Parking lot treatment at Ray Twinney Complex:

	Area	P coeff (kg/ha/yr)	P Load (kg/yr)	BMP	Efficiency %	BMP P (kg/yr)	BMP P (kg/yr)
High Intensity Commercial	1.30	1.82	2.37				
High Intensity Residential	0.00	1.32	0.00	Soakaway/Infiltration tr	60	1.42	1.42
Low Intensity Development	0.00	0.13	0.00		0	0.00	0.00
Sod Farm/Golf Course	0.00	0.24	0.00		0	0.00	0.00
Transition	0.00	0.16	0.00		0	0.00	0.00
Forest	0.00	0.10	0.00		0	0.00	0.00
Quarry	0.00	0.18	0.00		0	0.00	0.00
*Used Low Intensity Development to represent 'clean' rooftop runoff in commercial area							1.42 kg/yr removed

MANAGEMENT UNIT 2

Potential P Load Reduction with BMPs = 2.96 kg/yr

TP Removal
Efficiency (%)

BMP:

Bioretention system	0
Constructed Wetland	77
Dry Detention Pond	10
Dry Swales	0
Enhanced Grass/WQ Swales	0
Flow Balancing Systems (?)	77
Green roofs	0
Perforated Pipe Infil/Exfil	87
Sand or Media Filters	45
Soakaway/Infiltration trench	60
Sorbive media interceptors	79
Underground Storage	25
Veget. Filter Strip/buffer	65
Wet Detention Pond	63

0.5 ha High Intensity Commercial - provide LID as per LRSCA request in Comments received

	Area	P coeff (kg/ha/yr)	P Load (kg/yr)	BMP	Efficiency %	BMP P (kg/yr)
High Intensity Commercial	0.50	1.82	0.91	soakaway/infiltration	60	0.55
High Intensity Residential	0.00	1.32	0.00		0	0.00
Low Intensity Development	0.00	0.13	0.00		0	0.00
Sod Farm/Golf Course	0.00	0.24	0.00		0	0.00
Transition	0.00	0.16	0.00		0	0.00
Forest	0.00	0.10	0.00		0	0.00
Quarry	0.00	0.18	0.00		0	0.00
						0.55 kg/yr removed

Potential infiltration of parking lot runoff at Magna Centre:

	Area	P coeff (kg/ha/yr)	P Load (kg/yr)	BMP	Efficiency %	BMP P (kg/yr)
High Intensity Commercial	1.13	1.82	2.05	soakaway/infiltration	60	1.23
High Intensity Residential	0.00	1.32	0.00		0	0.00
Low Intensity Development	0.00	0.13	0.00		0	0.00
Sod Farm/Golf Course	0.00	0.24	0.00		0	0.00
Transition	0.00	0.16	0.00		0	0.00
Forest	0.00	0.10	0.00		0	0.00
Quarry	0.00	0.18	0.00		0	0.00
						1.23 kg/yr removed

Potential Rooftop Infiltration at Magna Centre:

	Area	P coeff (kg/ha/yr)	P Load (kg/yr)	BMP	Efficiency %	BMP P (kg/yr)
High Intensity Commercial	0.00	1.82	0.00		0	0.00
High Intensity Residential	1.50	1.32	1.98	soakaway/infiltration	60	1.19
Low Intensity Development	0.00	0.13	0.00		0	0.00
Sod Farm/Golf Course	0.00	0.24	0.00		0	0.00
Transition	0.00	0.16	0.00		0	0.00
Forest	0.00	0.10	0.00		0	0.00
Quarry	0.00	0.18	0.00		0	0.00
						1.19 kg/yr removed

*Used Low Intensity Development to represent 'clean' rooftop runoff in commercial area

Potential OGS units:

	Area	P coeff (kg/ha/yr)	P Load (kg/yr)	BMP	Efficiency %	BMP P (kg/yr)
High Intensity Commercial	0.25	1.82	0.45		0	0.00
High Intensity Residential	0.00	1.32	0.00		0	0.00
Low Intensity Development	0.00	0.13	0.00		0	0.00
Sod Farm/Golf Course	0.00	0.24	0.00		0	0.00
Transition	0.00	0.16	0.00		0	0.00
Forest	0.00	0.10	0.00		0	0.00
Quarry	0.00	0.18	0.00		0	0.00
						0.00 kg/yr removed

Management Unit 3

Potential P Load Reduction with BMPs = 0 kg/yr

BMP:	TP Removal Efficiency (%)
Bioretention system	0
Constructed Wetland	77
Dry Detention Pond	10
Dry Swales	0
Enhanced Grass/WO Swales	0
Flow Balancing Systems (?)	77
Green roofs	0
Perforated Pipe Infil/Exfil	87
Sand or Media Filters	45
Soakaway/Infiltration trench	60
Sorbitive media interceptors	79
Underground Storage	25
Veget. Filter Strip/buffer	65
Wet Detention Pond	63

Existing OGS units:

	Area	P coeff (kg/ha/yr)	P Load (kg/yr)	BMP	Efficiency %	BMP P (kg/yr)	BMP P (kg/yr)
High Intensity Commercial	0.01	1.82	0.01		0	0.00	0.00
High Intensity Residential	0.00	1.32	0.00		0	0.00	0.00
Low Intensity Development	0.00	0.13	0.00		0	0.00	0.00
Sod Farm/Golf Course	0.00	0.24	0.00		0	0.00	0.00
Transition	0.00	0.16	0.00		0	0.00	0.00
Forest	0.00	0.10	0.00		0	0.00	0.00
Quarry	0.00	0.18	0.00		0	0.00	0.00
						0.00 kg/yr removed	0.00 kg/yr removed

Management Unit 4

	Potential P Load Reduction with BMPs = 0.0 kg/yr
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TP Removal
Efficiency (%)

BMP:

Bioretention system	0
Constructed Wetland	77
Dry Detention Pond	10
Dry Swales	0
Enhanced Grass/WQ Swales	0
Flow Balancing Systems (?)	77
Green roofs	0
Perforated Pipe Infil/Exfil	87
Sand or Media Filters	45
Soakaway/Infiltration trench	60
Sorbitive media interceptors	79
Underground Storage	25
Veget. Filter Strip/buffer	65
Wet Detention Pond	63

Existing OGS units:

	Area	P coeff (kg/ha/yr)	P Load (kg/yr)	BMP	Efficiency %	BMP P (kg/yr)	BMP P
High Intensity Commercial	0.01	1.82	0.02		0	0.00	0.00
High Intensity Residential	0.00	1.32	0.00		0	0.00	0.00
Low Intensity Development	0.00	0.13	0.00		0	0.00	0.00
Sod Farm/Golf Course	0.00	0.24	0.00		0	0.00	0.00
Transition	0.00	0.16	0.00		0	0.00	0.00
Forest	0.00	0.10	0.00		0	0.00	0.00
Quarry	0.00	0.18	0.00		0	0.00	0.00
						0.00	kg/yr removed

Potential OGS units:

	Area	P coeff (kg/ha/yr)	P Load (kg/yr)	BMP	Efficiency %	BMP P (kg/yr)	BMP P
High Intensity Commercial	0.00	1.82	0.00		0	0.00	0.00
High Intensity Residential	0.00	1.32	0.004		0	0.00	0.000
Low Intensity Development	0.00	0.13	0.00		0	0.00	0.00
Sod Farm/Golf Course	0.00	0.24	0.00		0	0.00	0.00
Transition	0.00	0.16	0.00		0	0.00	0.00
Forest	0.00	0.10	0.00		0	0.00	0.00
Quarry	0.00	0.18	0.00		0	0.00	0.00
						0.00	kg/yr removed

Management Unit 5

Potential P Load Reduction with BMPs = 6.53 kg/yr

TP Removal
Efficiency (%)

BMP:

Bioretention system	0
Constructed Wetland	77
Dry Detention Pond	10
Dry Swales	0
Enhanced Grass/WQ Swales	0
Flow Balancing Systems (?)	77
Green roofs	0
Perforated Pipe Infil/Exfil	87
Sand or Media Filters	45
Soakaway/Infiltration trench	60
Sorbitive media interceptors	79
Underground Storage	25
Veget. Filter Strip/buffer	65
Wet Detention Pond	63

0.5 ha High Intensity Commercial - provide LID as per LRSCA request in Comments received

	Area	P coeff (kg/ha/yr)	P Load (kg/yr)	BMP	Efficiency %	BMP P (kg/yr)	BMP P (kg/yr)
High Intensity Commercial	0.50	1.82	0.91	soakaway/infiltration	60	0.55	0.55
High Intensity Residential	0.00	1.32	0.00		0	0.00	0.00
Low Intensity Development	0.00	0.13	0.00		0	0.00	0.00
Sod Farm/Golf Course	0.00	0.24	0.00		0	0.00	0.00
Transition	0.00	0.16	0.00		0	0.00	0.00
Forest	0.00	0.10	0.00		0	0.00	0.00
Quarry	0.00	0.18	0.00		0	0.00	0.00
							0.55 kg/yr removed

Potential Roof areas for Infiltration - Pony Drive/Stellar industrial area

	Area	P coeff (kg/ha/yr)	P Load (kg/yr)	BMP	Efficiency %	BMP P (kg/yr)	BMP P (kg/yr)
High Intensity Commercial	0.00	1.82	0.00		0	0.00	0.00
High Intensity Residential	4.85	1.32	6.40	soakaway/infiltration	60	3.84	3.84
Low Intensity Development	0.00	0.13	0.00		0	0.00	0.00
Sod Farm/Golf Course	0.00	0.24	0.00		0	0.00	0.00
Transition	0.00	0.16	0.00		0	0.00	0.00
Forest	0.00	0.10	0.00		0	0.00	0.00
Quarry	0.00	0.18	0.00		0	0.00	0.00
							3.84 kg/yr removed

Potential Parking lot treatment - Pond Drive/Stellar industrial area:

	Area	P coeff (kg/ha/yr)	P Load (kg/yr)	BMP	Efficiency %	BMP P (kg/yr)	BMP P (kg/yr)
High Intensity Commercial	1.96	1.82	3.57	soakaway/infiltration	60	2.14	2.14
High Intensity Residential	0.00	1.32	0.00		0	0.00	0.00
Low Intensity Development	0.00	0.13	0.00		0	0.00	0.00
Sod Farm/Golf Course	0.00	0.24	0.00		0	0.00	0.00
Transition	0.00	0.16	0.00		0	0.00	0.00
Forest	0.00	0.10	0.00		0	0.00	0.00
Quarry	0.00	0.18	0.00		0	0.00	0.00
							2.14 kg/yr removed

Management Unit 6

Potential P Load Reduction with BMPs = 0 kg/yr

BMP:	TP Removal Efficiency (%)
Bioretention system	0
Constructed Wetland	77
Dry Detention Pond	10
Dry Swales	0
Enhanced Grass/WQ Swales	0
Flow Balancing Systems (?)	77
Green roofs	0
Perforated Pipe Infil/Exfil	87
Sand or Media Filters	45
Soakaway/Infiltration trench	60
Sorbitive media interceptors	79
Underground Storage	25
Veget. Filter Strip/buffer	65
Wet Detention Pond	63

	Area	P coeff (kg/ha/yr)	P Load (kg/yr)	Efficiency		BMP P (kg/yr)	Efficiency		BMP P (kg/yr)
				BMP	%		BMP	%	
High Intensity Commercial	0.00	1.82	0.00			0			0
High Intensity Residential	0.00	1.32	0.00			0			0
Low Intensity Development	0.00	0.13	0.00			0			0
Sod Farm/Golf Course	0.00	0.24	0.00			0			0
Transition	0.00	0.16	0.00			0			0
Forest	0.00	0.10	0.00			0			0
Quarry	0.00	0.18	0.00			0			0

Management Unit 7

Potential P Load Reduction with BMPs = 0 kg/yr

BMP:	TP Removal Efficiency (%)
Bioretention system	0
Constructed Wetland	77
Dry Detention Pond	10
Dry Swales	0
Enhanced Grass/WQ Swales	0
Flow Balancing Systems (?)	77
Green roofs	0
Perforated Pipe Infil/Exfil	87
Sand or Media Filters	45
Soakaway/Infiltration trench	60
Sorbitive media interceptors	79
Underground Storage	25
Veget. Filter Strip/buffer	65
Wet Detention Pond	63

Area	P coeff (kg/ha/yr)	P Load (kg/yr)	BMP	Efficiency %	BMP P (kg/yr)	BMP P (kg/yr)
High Intensity Commercial	1.82	0.00		0	0.00	0.00
High Intensity Residential	1.32	0.00		0	0.00	0.00
Low Intensity Development	0.13	0.00		0	0.00	0.00
Sod Farm/Golf Course	0.24	0.00		0	0.00	0.00
Transition	0.16	0.00		0	0.00	0.00
Forest	0.10	0.00		0	0.00	0.00
Quarry	0.18	0.00		0	0.00	0.00

Area	P coeff (kg/ha/yr)	P Load (kg/yr)	BMP	Efficiency %	BMP P (kg/yr)	BMP P (kg/yr)
High Intensity Commercial	1.82	0.00		0	0.00	0.00
High Intensity Residential	1.32	0.00		0	0.00	0.00
Low Intensity Development	0.13	0.00		0	0.00	0.00
Sod Farm/Golf Course	0.24	0.00		0	0.00	0.00
Transition	0.16	0.00		0	0.00	0.00
Forest	0.10	0.00		0	0.00	0.00
Quarry	0.18	0.00		0	0.00	0.00

Potential P Load Reduction with BMPs = 0.07 kg/yr

BMP:	TP Removal Efficiency (%)
Bioretention system	0
Constructed Wetland	77
Dry Detention Pond	10
Dry Swales	0
Enhanced Grass/WQ Swales	0
Flow Balancing Systems (?)	77
Green roofs	0
Perforated Pipe Infil/Exfil	87
Sand or Media Filters	45
Sakaway/Infiltration trench	60
Sorbive media interceptors	79
Underground Storage	25
Veget. Filter Strip/buffer	65
wet detention pond	63

Lion's Park restoration - LID catchment wide retrofit program

	Area	P coeff (kg/ha/yr)	P Load (kg/yr)	BMP	Efficiency %	BMP P (kg/yr)	BMP P (kg/yr)
High Intensity Commercial	0.00	1.82	0.00		0	0.00	0.00
High Intensity Residential	0.00	1.32	0.00		0	0.00	0.00
Low Intensity Development	0.00	0.13	0.00		0	0.00	0.00
Sod Farm/Golf Course	0.50	0.24	0.12	soakaway/infiltration	60	0.07	0.07
Transition	0.00	0.16	0.00		0	0.00	0.00
Forest	0.00	0.10	0.00		0	0.00	0.00
Quarry	0.00	0.18	0.00		0	0.00	0.00
						0.07	0.07

Existing OGS units:

kg/yr removed

Potential OGS units:

	Area	P coeff (kg/ha/yr)	P Load (kg/yr)	BMP	Efficiency %	BMP P (kg/yr)	BMP P (kg/yr)
High Intensity Commercial	0.10	1.82	0.18		0	0.00	0.00
High Intensity Residential	0.00	1.32	0.00		0	0.00	0.00
Low Intensity Development	0.00	0.13	0.00		0	0.00	0.00
Sod Farm/Golf Course	0.00	0.24	0.00		0	0.00	0.00
Transition	0.00	0.16	0.00		0	0.00	0.00
Forest	0.00	0.10	0.00		0	0.00	0.00
Quarry	0.00	0.18	0.00		0	0.00	0.00
						0.00	0.00

kg/yr removed

BMP:	TP Removal Efficiency (%)
Bioretention system	0
Constructed Wetland	77
Dry Detention Pond	10
Dry Swales	0
Enhanced Grass/WQ Swales	0
Flow Balancing Systems (?)	77
Green roofs	0
Perforated Pipe Infil/Exfil	87
Sand or Media Filters	45
Soakaway/Infiltration trench	60
Sorbitive media interceptors	79
Underground Storage	25
Veget. Filter Strip/buffer	65
wet detention pond	63

LID as per LRSCA request in Comments received-bioswale/filter consideration in the Wayne and Waratah intersection

	Area	P coeff (kg/ha/yr)	P Load (kg/yr)	BMP	Efficiency %	BMP P (kg/yr)	BMP P (kg/yr)
High Intensity Commercial	0.10	1.82	0.18	Soakaway/infiltration	60	0.11	0.11
High Intensity Residential	0.00	1.32	0.00		0	0.00	0.00
Low Intensity Development	0.00	0.13	0.00		0	0.00	0.00
Sod Farm/Golf Course	0.00	0.24	0.00		0	0.00	0.00
Transition Forest	0.00	0.16	0.00		0	0.00	0.00
Forest	0.00	0.10	0.00		0	0.00	0.00
Quarry	0.00	0.18	0.00		0	0.00	0.00
						0.11	0.11

	Area	P coeff (kg/ha/yr)	P Load (kg/yr)	BMP %	Efficiency	BMP P (kg/yr)	BMP P (kg/yr)
High Intensity Commercial	0.08	1.82	0.15		0	0.00	0.00
High Intensity Residential	0.00	1.32	0.00		0	0.00	0.00
Low Intensity Development	0.00	0.13	0.00		0	0.00	0.00
Sod Farm/Golf Course	0.00	0.24	0.00		0	0.00	0.00
Transition	0.00	0.16	0.00		0	0.00	0.00
Forest	0.00	0.10	0.00		0	0.00	0.00
Quarry	0.00	0.18	0.00		0	0.00	0.00
							0.00 kg/yr removed

Potential P Load Reduction with BMPs = 0.55 kg/yr

TP Removal
Efficiency (%)

BMP:

Bioretention system	0
Constructed Wetland	77
Dry Detention Pond	10
Dry Swales	0
Enhanced Grass/WQ Swales	0
Flow Balancing Systems (?)	77
Green roofs	0
Perforated Pipe Infil/Exfil	87
Sand or Media Filters	45
Soakaway/Infiltration trench	60
Sorbive media interceptors	79
Underground Storage	25
Veget. Filter Strip/buffer	65
Wet Detention Pond	63

0.5 ha High Intensity Commercial - provide LID as per LRSCA request in Comments received

	Area	P coeff (kg/ha/yr)	P Load (kg/yr)	BMP	Efficiency %	BMP P (kg/yr)	BMP P (kg/yr)
High Intensity Commercial	0.50	1.82	0.91	soakaway/infiltration	60	0.55	0.55
High Intensity Residential	0.00	1.32	0.00		0	0.00	0.00
Low Intensity Development	0.00	0.13	0.00		0	0.00	0.00
Sod Farm/Golf Course	0.00	0.24	0.00		0	0.00	0.00
Transition	0.00	0.16	0.00		0	0.00	0.00
Forest	0.00	0.10	0.00		0	0.00	0.00
Quarry	0.00	0.18	0.00		0	0.00	0.00
						0.55	0.55

kg/yr
removed

	Area	P coeff (kg/ha/yr)	P Load (kg/yr)	BMP	Efficiency %	BMP P (kg/yr)	BMP P (kg/yr)
High Intensity Commercial	0.00	1.82	0.00		0	0.00	0.00
High Intensity Residential	0.00	1.32	0.00		0	0.00	0.00
Low Intensity Development	0.00	0.13	0.00		0	0.00	0.00
Sod Farm/Golf Course	0.00	0.24	0.00		0	0.00	0.00
Transition	0.00	0.16	0.00		0	0.00	0.00
Forest	0.00	0.10	0.00		0	0.00	0.00
Quarry	0.00	0.18	0.00		0	0.00	0.00

Potential P Load Reduction with BMPs = 3.70 kg/yr

BMP:	TP Removal Efficiency (%)
Bioretention system	0
Constructed Wetland	77
Dry Detention Pond	10
Dry Swales	0
Enhanced Grass/WQ Swales	0
Flow Balancing Systems (?)	77
Green roofs	0
Perforated Pipe Infil/Exfil	87
Sand or Media Filters	45
Soakaway/Infiltration trench	60
Sorbive media interceptors	79
Underground Storage	25
Veget. Filter Strip/buffer	65
Wet Detention Pond	63

Potential rooftop Infiltration near Yonge and Bonshaw:

	Area	P coeff (kg/ha/yr)	P Load (kg/yr)	BMP	Efficiency %	BMP P (kg/yr)
High Intensity Commercial	0.00	1.82	0.00		0	0.00
High Intensity Residential	1.60	1.32	2.11	soakaway/infiltration	60	1.27
Low Intensity Development	0.00	0.13	0.00		0	0.00
Sod Farm/Golf Course	0.00	0.24	0.00		0	0.00
Transition	0.00	0.16	0.00		0	0.00
Forest	0.00	0.10	0.00		0	0.00
Quarry	0.00	0.18	0.00		0	0.00

*Used Low Intensity Development to represent 'clean' rooftop runoff in commercial area

1.27 kg/yr removed

Potential parking lot treatment near Yonge and Bonshaw:

	Area	P coeff (kg/ha/yr)	P Load (kg/yr)	BMP	Efficiency %	BMP P (kg/yr)
High Intensity Commercial	2.23	1.82	4.06			
High Intensity Residential	0.00	1.32	0.00	soakaway/infiltration	60	2.44
Low Intensity Development	0.00	0.13	0.00		0	0.00
Sod Farm/Golf Course	0.00	0.24	0.00		0	0.00
Transition	0.00	0.16	0.00		0	0.00
Forest	0.00	0.10	0.00		0	0.00
Quarry	0.00	0.18	0.00		0	0.00

2.44 kg/yr removed

Appendix C

Water Balance Calculations

Water Balance

Newmarket Annual Precipitation (mm)=	767	
Existing Annual ET (mm)	536	
Existing Annual Recharge (mm)	182	0 mm recharge for impervious areas
Proposed Annual ET (mm)	536	
Proposed Annual Recharge (mm)	182	0 mm recharge for impervious areas

Parameter	Area (ha)	Imperviousness (%)	Precipitation [P] (m ³)	Evapo-transpiration [ET] (m ³)	Infiltration [I] (m ³)	Runoff [Q _s] (m ³)	Q _s Difference Exs vs Prop
EXISTING CONDITIONS							
Management Unit 1	525.64	75.72	4,031,659	684,072	232,278	3,115,308	
Management Unit 2	747.9	75.68	5,736,393	974,927	331,038	4,430,428	
Management Unit 3	251.76	67.06	1,930,999	444,503	150,932	1,335,564	
Management Unit 4	152.72	84.85	1,171,362	124,015	42,109	1,005,238	
Management Unit 5	118.36	86.96	907,821	82,727	28,090	797,004	
Management Unit 6	378.57	45.13	2,903,632	1,113,386	378,053	1,412,193	
Management Unit 7	97.85	52.97	750,510	246,661	83,754	420,094	
Management Unit 8	416.82	76.36	3,197,009	528,154	179,336	2,489,519	
Management Unit 9	518.45	75.39	3,976,512	683,885	232,215	3,060,411	
Management Unit 10	303.33	56.33	2,326,541	710,008	241,085	1,375,448	
Management Unit 11	228.38	85.21	1,751,675	181,047	61,475	1,509,153	
PROPOSED CONDITIONS - WITH PROPOSED LID							
Management Unit 1	525.64	77.86	4,031,659	684,072	226,431	3,121,156	5,848
Management Unit 2	747.9	81.83	5,736,393	974,927	254,369	4,507,098	76,670
Management Unit 3	251.76	74.59	1,930,999	444,503	116,429	1,370,066	34,503
Management Unit 4	152.72	83.97	1,171,362	124,015	44,555	1,002,792	-2,446
Management Unit 5	118.36	88.96	907,821	82,727	40,229	784,865	-12,139
Management Unit 6	378.57	49.7	2,903,632	1,113,386	346,566	1,443,680	31,487
Management Unit 7	97.85	65.05	750,510	246,661	62,241	441,607	21,513
Management Unit 8	416.82	81.32	3,197,009	528,154	142,834	2,526,021	36,502
Management Unit 9	518.45	80.24	3,976,512	683,885	187,576	3,105,050	44,639
Management Unit 10	303.33	73.39	2,326,541	710,008	148,028	1,468,505	93,057
Management Unit 11	228.38	85.85	1,751,675	181,047	67,432	1,503,196	-5,957
PROPOSED CONDITIONS - NO LID							
Management Unit 1	525.64	77.86	4,031,659	623,779	211,806	3,196,074	74,918
Management Unit 2	747.9	81.83	5,736,393	728,389	247,326.04	4,760,678	253,580
Management Unit 3	251.76	74.59	1,930,999	342,891	116,429.43	1,471,679	101,612
Management Unit 4	152.72	83.97	1,171,362	131,218	44,555.45	995,589	-7,203
Management Unit 5	118.36	88.96	907,821	70,039	23,782	814,001	29,136
Management Unit 6	378.57	79.7	2,903,632	1,020,655	139,866.47	1,743,110	299,431
Management Unit 7	97.85	65.05	750,510	183,304	62,241.41	504,964	63,357
Management Unit 8	416.82	81.32	3,197,009	417,340	141,708.80	2,637,960	111,939
Management Unit 9	518.45	80.24	3,976,512	549,109	186,451.21	3,240,951	135,901
Management Unit 10	303.33	73.39	2,326,541	432,638	146,903.33	1,746,999	278,495
Management Unit 11	228.38	85.85	1,751,675	173,213	58,814.70	1,519,647	16,452

Notes:

Evapotranspiration and Recharge coefficients taken from Table 3.1 of the 2003 MOE SWM Planning and Design Manual.

*LID Area represents total area within Management Unit that is serviced by LID infiltration

*Annual Volume based on number of events with >10mm infiltration

The meeting of the Appointment Committee was held on Monday, June 12, 2017 in the Cane Room, 395 Mulock Drive, Newmarket.

Members Present: Mayor Van Bynen
Councillor Bisanz, Vice Chair

Members Absent: Councillor Twinney, Chair

Staff Present: S. Niezen, Records and Projects Coordinator

The meeting was called to order at 9:36 AM.

Councillor Bisanz in the Chair.

Additions & Corrections to the Agenda

None.

Declarations of Pecuniary Interest

None.

Deputations

None.

Items for Discussion

1. Appointment Committee Meeting Minutes of May 16, 2016.

Moved by: Mayor Van Bynen
Seconded by: Councillor Bisanz

1. That the Appointment Committee Meeting Minutes of May 16, 2016 be approved.

Carried

2. Appointment Committee (Closed Session) Meeting Minutes of May 16, 2016.

Moved by: Mayor Van Bynen
Seconded by: Councillor Bisanz

1. That the Appointment Committee (Closed Session) Meeting Minutes of May 16, 2016 be approved.

Carried

3. Appointment Committee Meeting Minutes of May 15, 2017.

Moved by: Mayor Van Bynen
Seconded by: Councillor Bisanz

1. That the Appointment Committee Meeting Minutes of May 15, 2017 be approved.

Carried

Closed Session

4. Personal Matters about identifiable individuals as per Section 239 (2) (b) of the Municipal Act, 2001.

Moved by: Mayor Van Bynen
Seconded by: Councillor Bisanz

That the Appointment Committee resolve into a Closed Session for the purpose of discussing personal matters about identifiable individuals as per Section 239 (2) (b) of the Municipal Act.

Carried

The Appointment Committee resolved into Closed Session at 9:38 AM.

The Appointment Committee (Closed Session) Minutes are recorded under separate cover.

The Appointment Committee resumed into Public Session at 10:13 AM.

New Business

None.

Adjournment

Moved by: Mayor Van Bynen

Seconded by: Councillor Bisanz

That the Appointment Committee meeting adjourn at 10:14 AM.

Carried

Date

Councillor Bisanz, Vice Chair

The meeting of the Heritage Newmarket Advisory Committee was held on Tuesday, May 2, 2017 in the Mulock Room, 395 Mulock Drive, Newmarket.

Members Present: Athol Hart, Chair
Soni Felix-Raj
Councillor Hempen
Billie Locke
Joan Seddon
Rohit Singh
Malcolm Watts

Staff Present: D. Ruggle, Senior Planner – Community Planning
A. Mollicone, Senior Solicitor
M. Mayes, Director of Financial Services/Treasurer
L. Moor, Council/Committee Coordinator

Guests: D. Clark, Acting Design Chief, York Region Rapid Transit
C. Webber, Communications Department, York Region Rapid Transit
W. Morgan, Heritage Consultant

The meeting was called to order at 7:00 p.m.

A.Hart in the Chair.

The Chair advised that the order of the agenda items will be rearranged to accommodate guests in attendance.

Declarations of Interest

None.

Additions & Corrections to Agenda

None.

Presentations/Deputations

1. York Region Rapid Transit – VivaNext

Mr. David Clark, Acting Design Chief, York Region Rapid Transit provided a verbal update regarding the proposed course of action for remediation of the building known as the former Union Hotel at the northeast corner of Davis Drive and Main Street. The Chair requested clarification regarding reference to shiplap and clapboard siding. The Chair provided a fact sheet defining the two types of siding. Mr. Wayne Morgan, Heritage Consultant provided his opinion with respect to the exterior of the building which was wood siding in early years that was then covered with brick overlay. Mr. Clark further advised that the interior of the structure would need significant investment to bring it to a useable standard. Discussion ensued regarding potential salvageable bricks, could they be donated to Heritage Newmarket, storage accommodation and possible re-uses. Mr. Morgan provided a copy of a Heritage detail report to the Chair. Mr. Clark advised that should Town of Newmarket Council choose to designate the building known as the former Union Hotel, that the York Region Rapid Transit Corporation would have no objection.

The Chair thanked Mr. Clark, Mr. Morgan and Ms. Webber for their attendance and advised that the Heritage Newmarket Advisory Committee Members are comfortable with the proposed exterior wood siding remediation efforts to the building known as the former Union Hotel.

2. Items - Financial Statements/Reports

The Chair introduced Mr. Mike Mayes, Director of Financial Services/Treasurer. Mr. Mayes distributed copies of the Heritage Newmarket Advisory Committee's budget balance as of March 31, 2017. The Chair expressed his concern on behalf of the Committee with respect to the budget allotment figures and lack of communication. The Director of Financial Services/Treasurer provided a verbal explanation of the line items contained within the Committee's budget as well as a reserve fund balance. He advised that the Committee does not have the authority to spend the budget monies on behalf of the Town of Newmarket, only the authority to recommend expenditures. Mr. Mayes suggested that the Committee Members compile a business case for submission to the Legislative Services Department in an effort to secure budget allotment for the 2018 fiscal year. Discussion ensued regarding operating expenses/sustainability and potential fundraising methods to increase the reserve fund account. Mr. Mayes advised that he would provide quarterly financial statements to the Committee. The Chair requested that the Council/Committee Coordinator organize a meeting with the Director of Legislative Services/Town Clerk, the Director of Financial Services/Treasurer and the Senior Planner – Community

Planning to examine the requirements of the Heritage Newmarket Advisory Committee and to establish a 2018 budget business case.

3. New Business – Legal Description of 470, 474 Davis Drive

The Senior Planner – Community Planning and the Senior Solicitor provided a verbal update regarding a proposed Amendment to Designating By-law 1987-110, modification to the legal description of the properties known as 470 and 474 Davis Drive by excluding a portion of roadway that was needed for the Davis Drive VivaNext road re-construction project. The Chair advised that the portion of roadway to be excluded has no heritage impact.

Moved by: Billie Locke
Seconded by: Malcolm Watts

1. That the verbal update by the Senior Planner – Community Planning and the Senior Solicitor regarding a proposed Amendment to Designating By-law 1987-110, modification to the legal description of the properties known as 470 and 474 Davis Drive by excluding a portion of roadway be received as information; and,
2. That the Heritage Newmarket Advisory Committee has no objection to the proposed modification to the legal description of the properties known as 470 and 474 Davis Drive.

Carried

Approval of Minutes

4. Heritage Newmarket Advisory Committee Minutes of April 4, 2017.

An amendment was made to Item 8 of the Heritage Newmarket Advisory Committee Minutes of April 4, 2017 by replacing the words “shiplap” in Recitals # 1 and 2 to “wood siding finish” and “siding” respectively.

Moved by: Rohit Singh
Seconded by: Joan Seddon

1. That the Heritage Newmarket Advisory Committee Meeting Minutes of April 4, 2017, with the above referenced amendments be approved.

Carried

New Business

5. The Chair requested staff involvement in securing a location to store the salvaged bricks from the building known as the former Union Hotel should they be recoverable and usable.

Moved by: Councillor Hempen
Seconded by: Joan Seddon

1. That the Heritage Newmarket Advisory Committee requests that the salvageable bricks from the building known as the former Union Hotel be donated to the Committee's ownership; and,
2. That the Senior Planner – Community Planning find a suitable storage location for the quantity of bricks; and,
3. That a donation for value be contemplated as a possible revenue source for the Heritage Fund to increase the reserve fund and assist area homeowners with heritage home repair who need that pattern of bricks for heritage renovation projects as there is no existing source for bricks of this type and size.

Carried

Correspondence

6. Correspondence from the Planning and Building Services Department regarding a Public Meeting on May 8, 2017 at 7:00 p.m. concerning Proposed Official Plan and Zoning By-law Amendments – 751 and 757 Gorham Street.

Moved by: Billie Locke
Seconded by: Rohit Singh

1. That the Correspondence from the Planning and Building Services Department regarding a Public Meeting on May 8, 2017 at 7:00 p.m. concerning Proposed Official Plan and Zoning By-law Amendments – 751 and 757 Gorham Street be received for information.

Carried

Reports of Committee Members

7. Correspondence from the Planning and Building Services Department regarding a Public Meeting on May 8, 2017 at 7:00 p.m. concerning Proposed Official Plan and Zoning By-law Amendments – 751 and 757 Gorham Street.

Moved by: Billie Locke
Seconded by: Rohit Singh

1. That the Correspondence from the Planning and Building Services Department regarding a Public Meeting on May 8, 2017 at 7:00 p.m. concerning Proposed Official Plan and Zoning By-law Amendments – 751 and 757 Gorham Street be received for information.

Carried

8. a) Designated Property Maintenance and Concerns

The Chair advised that a Heritage Permit has been issued for the property known as 336 Millard Avenue.

The Chair advised that the Committee collectively is in favour of the designation of the building known as the former Union Hotel.

The Heritage Newmarket Advisory Committee recommends to Council:

Moved by: Councillor Hempen
Seconded by: Billie Locke

1. That the Heritage Newmarket Advisory Committee recommends Council designate the property under the Ontario Heritage Act with the process commencing at such time as the restoration has been substantially complete; and,
2. That the Heritage Newmarket Advisory Committee recommends that York Region Rapid Transit have their Heritage Consultant provide a report which can be used in support of the designation and inform the necessary designation by-law.

Carried

- b) Site Plaques

Nothing to report at this time.

c) Residence Plaques

Nothing to report at this time.

d) Heritage Location Plaques

Discussion ensued regarding updates to the non-designated heritage registry. The Chair advised that he and Mr. Watts will investigate the status of the plaque inventory using previous term Heritage Advisory Committee Minutes as reference.

John Bogart House

The Senior Planner – Community Planning provided a verbal update regarding the property known as the John Bogart House. He advised that the owner has retained a heritage architect to conduct a conservation report to show short and long term options associated with restoration efforts of the house on the property.

Christian Baptist Church

The Senior Planner – Community Planning distributed a document providing details of the Official Plan designation and zoning of the property known as the Christian Baptist Church and provided a verbal update with respect to the property. He advised that representatives of the Church are currently in the process of obtaining quotations for repairs to the derelict portions which have been recognized as Property Standards offences. Discussion ensued regarding the condition of the Church steeple, front steps and exterior deterioration. The Senior Planner – Community Planning advised he would request an update regarding the Property Standards order from By-law Enforcement staff and report back.

Moved by: Joan Seddon
Seconded by: Soni Felix Raj

1. That the verbal update by the Senior Planner – Community Planning regarding the property known as the Christian Baptist Church be received.

Carried

9. Reports of Committee Members

M. Watts advised that he has sent correspondence to the Municipal Property Assessment Corporation requesting assistance in their process used in establishing heritage dates and information relevant to residence plaques however he has not received a formal response as yet. Discussion ensued regarding Town staff access to realtor software in an effort to conduct research associated with heritage dates.

Moved by: Joan Seddon

Seconded by: Billie Locke

1. That Councillor Hempen investigate with Town staff any opportunity available to access realtor software associated with Municipal Property Assessment Corporation services and information relative to property heritage dates.

Carried

a) Architecture, Recreation, Culture, Heritage (ARCH) Committee

The Chair advised the Architecture, Recreation, Culture and Heritage Committee is moving forward with an initiative to raise funds, refurbish and relocate Colonel Cotter's gazebo to Fairy Lake Park and ARCH will be using Soni Felix Raj's expertise in setting up a GoFundMe Account to accept donations.

The Chair advised of a company in Town willing to produce heritage plaques and a sub-committee task force has been struck within ARCH to obtain and document historical information of buildings on Main Street.

Moved by: Billie Locke

Seconded by: Joan Seddon

1. That coordination efforts with representatives of the Architecture, Recreation, Culture, Heritage Committee and Heritage Newmarket Advisory Committee take place regarding Heritage Conservation District signage.

Carried

The Chair advised that ARCH has received a commitment from the Director of Recreation and Culture regarding funding and location for a Rebel Heartland event scheduled for September, 2018.

b) Elman W. Campbell Museum Board

Billie Locke advised of the upcoming Victorian Tea for Mother's Day at the Museum and a garage sale scheduled for May 31, 2017. She advised that the proposed new Museum signage matter has been discussed at the Board and the Town's Manager of Culture and Community Events will be invited to a future Board meeting to provide clarification regarding signage.

c) Lower Main Street South Heritage Conservation District Advisory Group

The Chair advised that he has had some interactions with the owner of the new restaurant ("Snckmrkt") and there are various alterations to the building taking place as well as construction of concrete columns in the Holland River. The Senior Planner – Community Planning advised that he will provide an update regarding the construction alterations as soon as he obtains one.

The Senior Planner – Community Planning advised that he will send copies of building elevation drawings to Members of the Heritage Newmarket Advisory Committee of the former York Blueprint building which is being re-developed into a restaurant.

d) Newmarket Historical Society Board of Directors

Joan Seddon advised that the Historical Society has their Annual General Meeting scheduled for May 17, 2017 with a speaker scheduled who attended Vimy Ridge recently. She further advised that the Historical Society Members are exploring ways to fundraise.

New Business (continued)

a) The Senior Planner – Community Planning suggested that a budget framework for 2018 commence as soon as possible.

b) Councillor Hempen advised that the photographs of designated properties will be taken within the next couple months.

Adjournment

Moved by: Billie Locke

Seconded by: Rohit Singh

That the meeting adjourn at 9:35 PM.

Carried

Date

A. Hart, Chair