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Staff Report

Operations Department

Report To: Committee of the Whole
Meeting Date: November 3, 2020
Report Number: CSOPS.20.054
Subject: Thornbury West Drainage and Development Follow Up
Prepared by: Shawn Carey, Director of Operations
Brian Worsley, P.Eng., Manager of Development Engineering

A. Recommendations

THAT Council receive Staff Report CSOPS.20.054, entitled "Thornbury West Drainage and Development Follow Up" for their information and be considered a formal follow up to the deputation provided by Ms. Porter.

B. Overview

This report is being brought in response to Council direction following a deputation by Ms. Porter. This report provides an overview of the Town's current approach to stormwater management and drainage in Thornbury West and how current and future development proposals are reviewed in this regard.

C. Background

At the June 16, 2020 Committee of the Whole meeting Council directed Staff to provide a report in response to Ms. Porter's deputation (Attachment #1).

In Ms. Porter's deputation there were several questions raised which are addressed below.

1) What is the high-level plan regarding drainage for Thornbury West?

Stormwater Management Needs Study

In 2015, the Town undertook a Stormwater Needs Study as part of the Thornbury Road Improvements Project (TRIP). This study identified several deficiencies in the existing drainage system. Specifically, the study identified portions of the Thornbury West drainage area that had deficient infrastructure under minor and major storm events. In addition to capacity issues under existing conditions, the study identified existing storm infrastructure that is reaching its service life expectancy and deteriorating.

Thornbury Road Infrastructure Project Stormwater Management Needs Study

In 2016, the Town undertook the Stormwater Management Infrastructure Conditions Assessment Report as part of TRIP. This report was prepared to identify and describe the existing minor and major drainage systems, present the hydraulic and hydrologic model results and highlight the deficiencies with each drainage system.

Thornbury West Drainage Master Plan

In 2019, the Town completed a Master Plan under the Municipal Class Environmental Assessment process to develop solutions to address identified drainage deficiencies, reduce flooding, resolve public safety concerns and improve maintenance opportunities throughout the Thornbury West downtown area (Attachment #2) using the Stormwater Management Needs Study as the baseline/basis for the Plan.

Recommendations from the reports and studies identified above are being implemented as the Town progresses with implementing the various capital improvement projects that fall under TRIP (e.g. Elma & Alice and Victoria & Louisa Reconstruction Projects) and where other opportunities are presented. Through these projects, the Town is also looking for opportunities to relocate minor and major drainage systems from private to municipal lands.

These background studies, particularly the Environmental Study Report from the Thornbury West Master Drainage Plan, will also be used to inform development constraints and opportunities. Additionally, legislative changes (such as the pending roll out of the Ministry of Environment, Conservation and Parks (MECP) new water balance/ Low Impact Design criteria) and practicalities, such as the operational costs of Manufactured Treatment Devices capable of achieving the 80% particulate / pollutant removal mandated by the MECP, will inform design.

Reports including the Environmental Study Report can be found on the Town's website at https://www.thebluemountains.ca/thornbury-west-master-drainage-plan-ea.cfm

The Town of the Blue Mountain's Official Plan (2016)

The Official Plan provides guidance for land use changes, municipal initiatives and the provision of public works. As such, Section C5 of the Town's Official Plan provides specific policies for the effective management of stormwater and requires that all major commercial, industrial, institutional and residential development are supported by a stormwater management report that shall:

- Provide recommendations on a stormwater quantity control system which ensures that post-development run-off rates will not be greater than the pre-development run-off rates for storms up to and including the 1:100 year flood and the regional storm flood; additionally, where downstream capacity limitations exist, over-control and/or downstream improvements will be implemented;

- Document the possible impacts of development on watershed flow regimes including their interconnection with groundwater resources;
- Provide recommendations on how to maintain pre-development water quality and improve run-off where appropriate;
- Document the means by which stormwater volume control will be provided;
- Provide a design that considers recreational amenity opportunities; and,
- Determine and describe the necessary measures required to be undertaken during construction to mitigate potential negative impact of development.

2) What are the Town's objectives and guidelines for drainage for Thornbury West with respect to current and future development proposals given it could be upwards of 24 months before the Master Plan would be available for review?

The Town will require developers to provide site specific drainage information that demonstrates the proposed stormwater management strategy will be compliant with the Town's Engineering Standards and MECP requirements and have an adequate outlet, such that there will effectively be a net improvement in drainage as a result of land use development. As is currently the practice during development review, Town staff will continue to assess Stormwater Management Reports submitted for developments proposed in the area to ensure stormwater management solutions and infrastructure are considered as comprehensively as possible.

3) What are the challenges that rezoning (i.e. R1 to R2) brings to proposed and future development proposals in the context of drainage?

The built form, rather than zoning, will dictate the required stormwater management strategy, as both the impermeable area created and the drainage system will be relevant. Utilization of lower footprint / taller buildings will reduce runoff generated as will (modified) rural section / Low Impact Development roadways.

4) How is the Town going to ensure the stormwater capacity meets not only the demands of today, but the potential demands of tomorrow?

In accordance with the Town's guidelines referenced above, all new development shall follow the MECP Stormwater Management Planning and Design Manual (Manual) which provides an integrated approach to effective stormwater management planning and design focused on water quality, water quantity and erosion control. The Manual, as well as more recent publications, (as listed in Item 5 below), provide guidance for the effective design of lot level, conveyance, and end-of-pipe stormwater practices. The objectives of the Manual are to apply an integrated treatment train approach to manage stormwater to maintain hydrologic cycle, protect water quality and prevent increased erosion and flooding.

Staff are currently initiating a comprehensive Town-wide Master Drainage Plan. The goals of this Plan are to identify and recommend drainage improvements to address, in a

comprehensive manner, stormwater management solutions for both existing and anticipated issues, and those that may be associated with climate change. The Master Drainage Plan will serve as a long-term strategy for the Town to best address management of stormwater resources for both existing and new growth areas and to integrate the Town's regard for ecological sustainability with flood, erosion, water quality, quantity, and volume control requirements.

Staff are also currently updating the 2009 Engineering Standards. This review includes assessing the Town standards for stormwater management infrastructure with regards to the impact of climate change. The Town's Engineering Standards are used to guide the requirements for the design of infrastructure including both Town-led capital infrastructure projects and works to be assumed by the Town as a result of development.

5) What are the actions the Town is taking to give predictability to the way the drainage issues will be dealt with now and going forward?

The stormwater and drainage studies discussed above are currently being utilized in Thornbury West for both capital projects and ongoing development. Additionally, through the current update to the Engineering Standards, the Town will better describe expectations for drainage works. Furthermore, as previously stated, Town staff will continue to assess Stormwater Management Reports submitted for developments proposed in the area to ensure stormwater management solutions and infrastructure are considered as comprehensively as possible.

Going forward, the Town will be relying on both the Master Drainage Plan, the Provincial Stormwater Management Planning and Design Manual, the MTO Drainage Management Manual, as well as a number of other Industry publications, such as:

- American Society of Civil Engineers (ASCE), ANSI/ASCE/EWRI 45-16 (2017) Standard Guidelines for the Design of Urban Stormwater Systems
- CSA Group, W204-19, Flood resilient design for new residential communities
- Construction Industry Research and Information Association (CIRIA). 2014. Managing urban flooding from heavy rainfall - encouraging the uptake of designing for exceedance. CIRIA Research Project RP991
- Credit Valley Conservation and Zizzo Strategy (2018). Developing a Stormwater Quality Management Standard (QMS) in Light of a Changing Climate
- Engineers Canada Amec Foster Wheeler and Credit Valley Conservation. 2017. National Infrastructure and Buildings Climate Change Adaptation State of Play Report. Prepared for the Infrastructure and Buildings Working Group, part of Canada's Climate Change Adaptation Platform: https://engineerscanada.ca/sites/default/files/ibwg_sop_2017.pdf
- Public Safety Canada. 2018. Federal Flood Mapping Guidelines Series. Available at: https://www.publicsafety.gc.ca/cnt/mrgnc-mngmnt/dsstr-prvntn-mtgtn/ndmp/fldpln-mppng-en.aspx

D. Analysis

N/A

E. Strategic Priorities

1. Communications and Engagement
We will enhance communications and engagement between Town Staff, Town residents and stakeholders.

2. Organizational Excellence
We will continually seek out ways to improve the internal organization of Town Staff and the management of Town assets.

3. Community
We will protect and enhance the community feel and the character of the Town, while ensuring the responsible use of resources and restoration of nature.

4. Quality of Life
We will foster a high quality of life for full-time and part-time residents of all ages and stages, while welcoming visitors.

F. Environmental Impacts

Effective stormwater management enables increased protection of the natural environment.

G. Financial Impact

N/A

H. In Consultation With

Nathan Westendorp, Director of Planning and Development Services

Jim McCannell, Manager of Roads and Drainage

Michael Campbell, Construction Coordinator

I. Public Engagement

The topic of this Staff Report will be subject to a Public Consultation Process as part of the development of the Master Drainage Plan. Comments regarding this report should be submitted to Shawn Carey, Director of Operations, at directorops@thebluemountains.ca.

J. Attached

1. Deputation from June Porter – Thornbury West Drainage and Development
2. Thornbury West Drainage Master Plan Site Location Plan

Respectfully submitted,

_____
Brian Worsley, MSc, P.Eng., MICE, PMP
Manager of Development Engineering

_____
Shawn Carey
Director of Operations

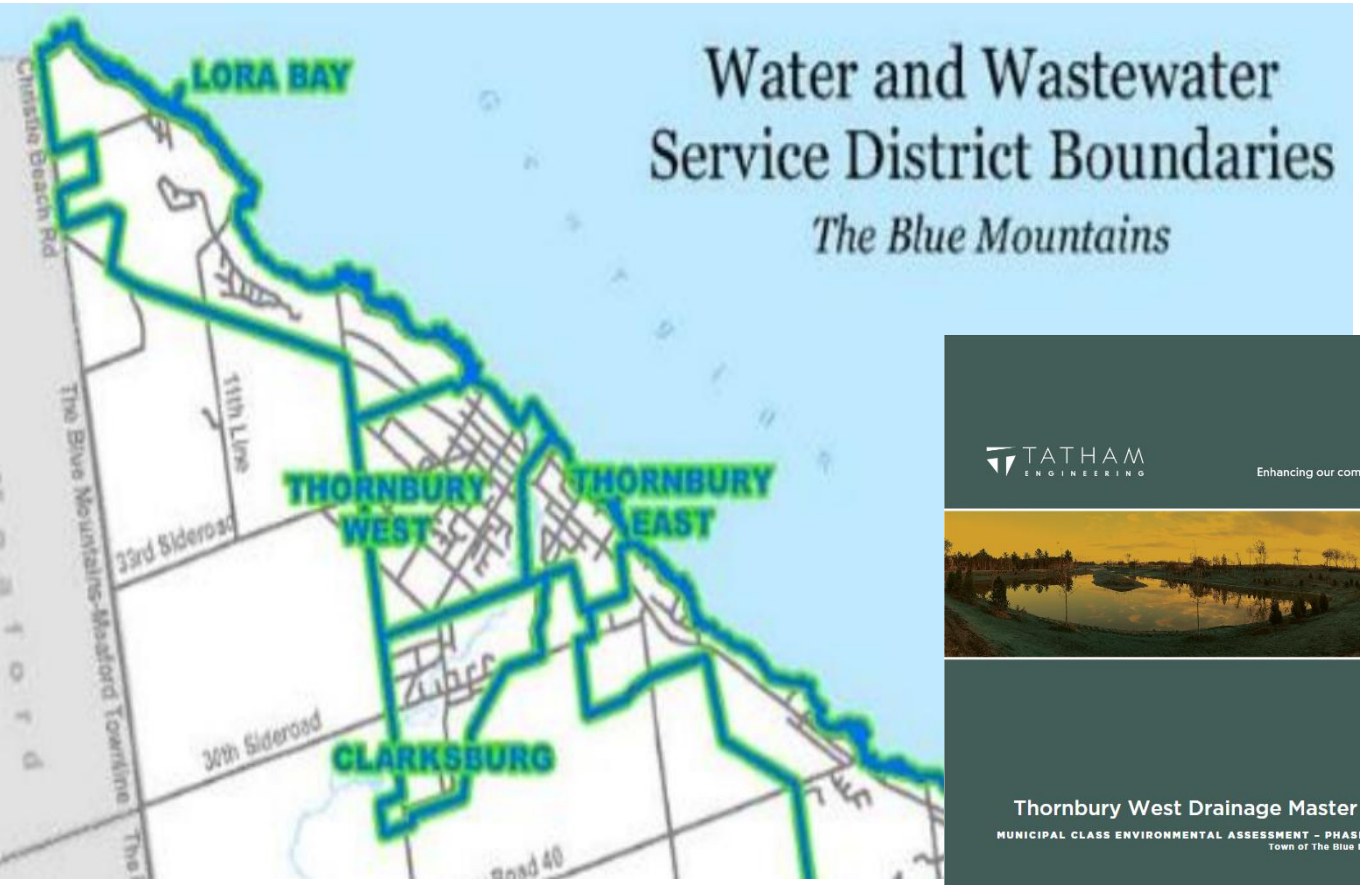
For more information, please contact:
Shawn Carey
directorops@thebluemountains.ca
519-599-3131 extension 260

Thornbury West Drainage and Development

June 16th 2020

June Porter

Thornbury West faces ***Major*** Drainage Challenges and has had major reports, 2016, 2019



Technology & Science

Yes, we're getting more extreme rainfall, and it's due to climate change, study confirms

A new study published in June 2020 from researchers at Environment and Climate Change Canada found that climate change has made:

- *Rainfall more extreme*
- *Storms with extreme rainfall more frequent*

"We're finding that in North America, we have seen an increase in the frequency and severity of heavy rainfall events and this is largely due to global warming," said Megan Kirchmeier-Young, a research scientist at Environment and Climate Change Canada and lead author of the study. She also says storms that would happen:

- Once a century without human-caused climate change now happen every 20 years. And if the world gets to 2 C of warming above pre-industrial temperatures, those storms would happen once every five years.
- Once every 20 years without human-caused climate change now happen every five years. And they're expected to happen about every other year if the world gets to 2 C of warming above pre-industrial temperatures.

Municipal Stormwater Management in the Light of Climate Change

- Stormwater is rainwater, snowmelt, or other form of precipitation that has contacted the ground or any surface. Upon such contact, stormwater follows the principles of the water cycle, which include infiltration, evapotranspiration, run-off, storage in water bodies, and precipitation.
- Stormwater management is complex and climate change is an additional factor contributing to the complexity
- In Ontario, municipalities are responsible for municipal stormwater management (e.g. planning, design, establishment, operation and maintenance). Municipal stormwater management deals with the component of the urban surface run-off that is or would be collected by means of separate municipal storm sewers.
- The urbanization of an area alters the local water balance, with potential alteration of the subsurface groundwater level and flow.
- Stormwater management requires sufficient understanding of the groundwater and surface water linkages prior to finalizing development. Ninety-eight percent of Ontario's population lives in the drainage basin of the Great Lakes and St. Lawrence River. The Great Lakes and St. Lawrence River are particularly vulnerable to both the pollution that enters the lakes through stormwater and other sources, and to the impacts of our changing climate.

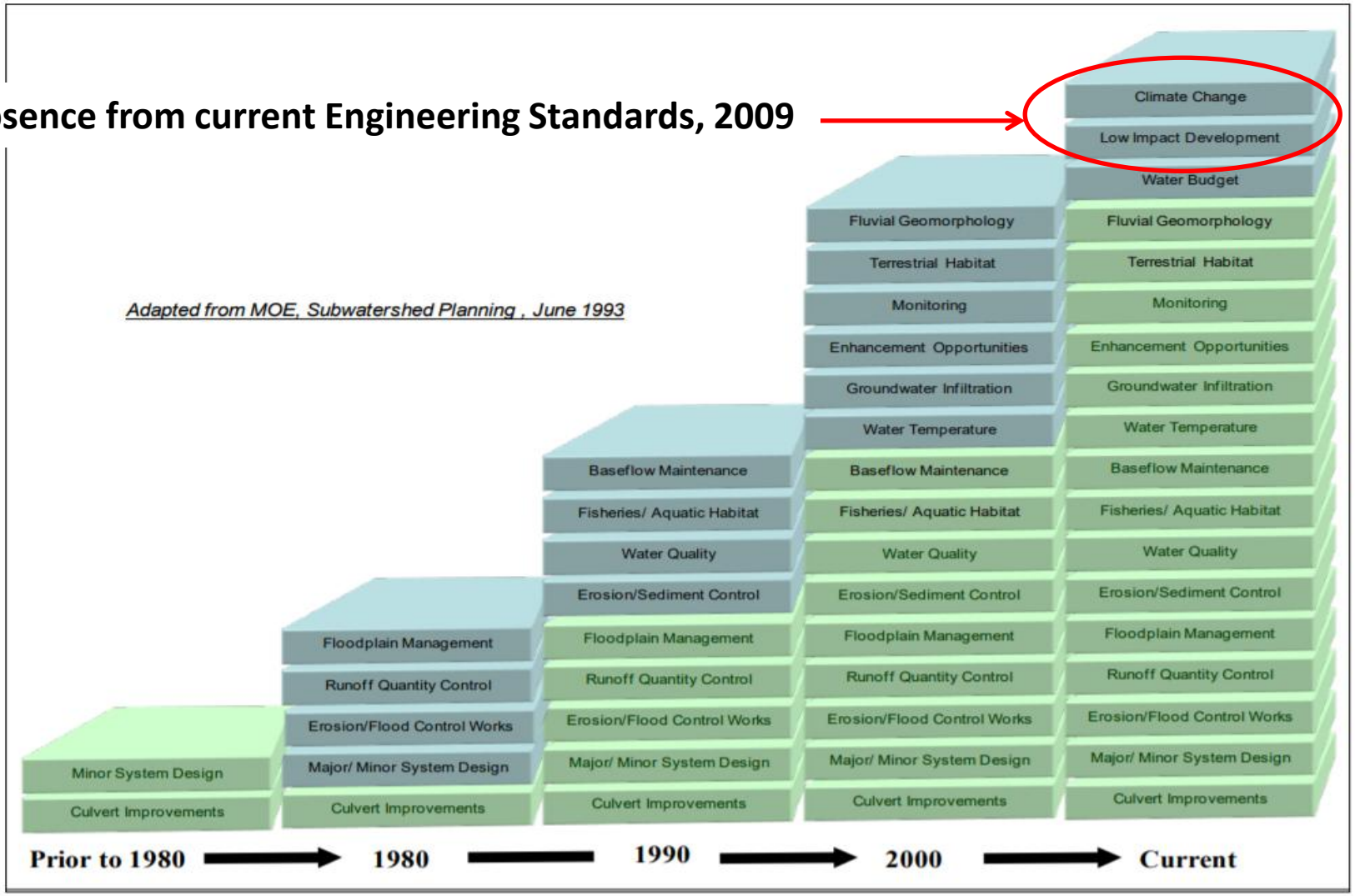
Ontario

https://www.ontario.ca/page/policy-review-municipal-stormwater-management-light-climate-change April 2016

Evolution of Stormwater Management Ontario

Figure 1.2.1 Evolution of stormwater management practice in Ontario

Absence from current Engineering Standards, 2009



Spring 2020 ‘On The Bay’…

“

With high development activity, primarily in the areas of Craigleith, Blue Mountain and Lora Bay, we identified as a primary focus the need to be completely transparent, engage with the community and keep people continually informed about the status of projects. This includes access to complete information on our website, including staff reports, public documents and the latest plans. We are coordinating efforts across town departments to make sure that we are not overextending ourselves with respect to services and infrastructure.

Nathan Westendorp,
Town of The Blue Mountains

‘Ask’ of Council...

The ‘ask’ of Council is to know:

- What is the high level plan regarding drainage for Thornbury West?
- What are the Town’s objectives and guidelines for drainage for Thornbury West with respect to current and future development proposals given it could be upwards of 24 months before the Master Plan would be available for review?
- What are the challenges rezoning i.e. R1 to R2 brings to proposed and future development proposals in the context of drainage?
- How is the Town going to ensure the stormwater capacity meets not only the demands of today, but the potential demands of tomorrow?
- What are the actions the Town is taking to give predictability to the way the drainage issues will be dealt with now and going forward?

The ‘ask’ of Council is to have current and future development proposals

- Transparently resolve identified undocumented drainage systems (Thornbury Master Plan) on their respective development properties;
- Be required to meet the soon to be updated engineering standards as opposed to the current 2009 to ensure that changing climate conditions and low impact design for stormwater management are addressed (Goal #5, Strategic Plan 2015-2020)

Why the ‘*ask*’*?*

Current Situation

Thornbury West Drainage Challenges

Deficiencies in the areas of:

- Engineering Standards (2009) to access planning applications are outdated, specifically concerning:
  - Changing climate conditions; and
  - Low impact design
- Stormwater systems, as outlined in Thornbury Road Infrastructure Project Stormwater Management Needs Study October 2016 Thornbury West Master Drainage Plan EA March 2019 **not referenced** in Functional Servicing & Stormwater Management Reports for planning applications
- Three undocumented drainage systems with a level of service that is largely unknown one of which includes the old Maple Leaf Gravel Pit between Huron and Bay Street unopened road allowance
- Areas of flooding
- Potential and current development would add upwards of over 200 residential unit load in the absence of a flooding
- Existing minor drainage systems are deficient under existing land, future development and intensification will increase runoff to each drainage system magnify deficiencies in the minor drainage systems
- Inconsistent submission of Environmental Assessments within planning applications

Three Undocumented Drainage Systems

Impact of Outdated Engineering Standards, 2009

- Planning Application Functional Servicing & Stormwater Management Reports' **not required to reflect**:
  - Changing climate conditions
  - Low impact design which may include:
    - Rainwater harvesting
    - Vertical rain gardens," trees when planted properly, trees can capture rainwater and runoff.
    - Green roofs
    - Permeable pavement
    - Enhanced grass swales
    - Vegetative filter strips

Thornbury West Master Drainage Plan EA March 2019, *not referenced*

This document, a tool that the town uses to understand one aspect of municipal infrastructure namely the stormwater system in a defined area **identified** deficiencies, however, is **NOT** referenced in Functional Servicing & Stormwater Management Reports for:

- Alfred Street Subdivison, September 2019
- Ashbury East Development, September 2019
- Abbott Subdivision, October 2019

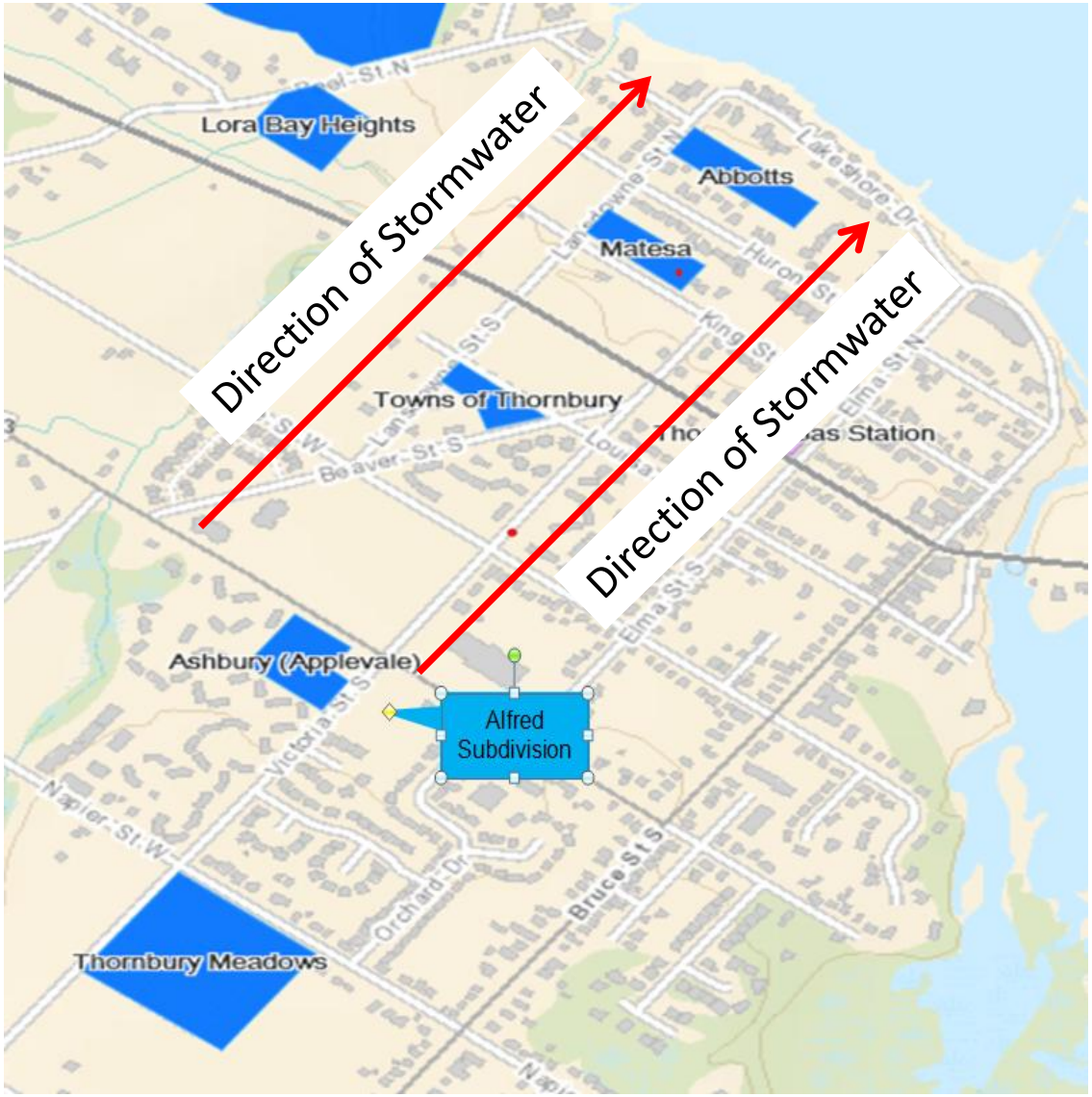
Developers' proposed solutions are project specific as opposed to part of an overall master drainage plan

Development Increases Stormwater Runoff

- Development increases the amount of impervious cover and disrupts the natural water balance. The amount of stormwater runoff increases dramatically (see arrows).
- Preventative approaches include protection of natural areas and site design of communities to reduce stormwater runoff generation

https://www.ontario.ca/page/understanding-stormwater-management-introduction-stormwater-management-planning-and-design

Cumulative Impact of Stormwater



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Thank you...

TATHAM ENGINEERING

THORNBURY WEST DRAINAGE MASTER PLAN SITE LOCATION PLAN

DWG. No. **FIG. 1**

SCALE: NTS | DATE: MAY/18 | JOB NO. 117092