



Town of The Blue Mountains Drainage Master Plan

Notice of Completion

PRESENTATION TO COUNCIL



Welcome

Tatham Engineering Limited has been retained to prepare this Drainage Master Plan for the Town.



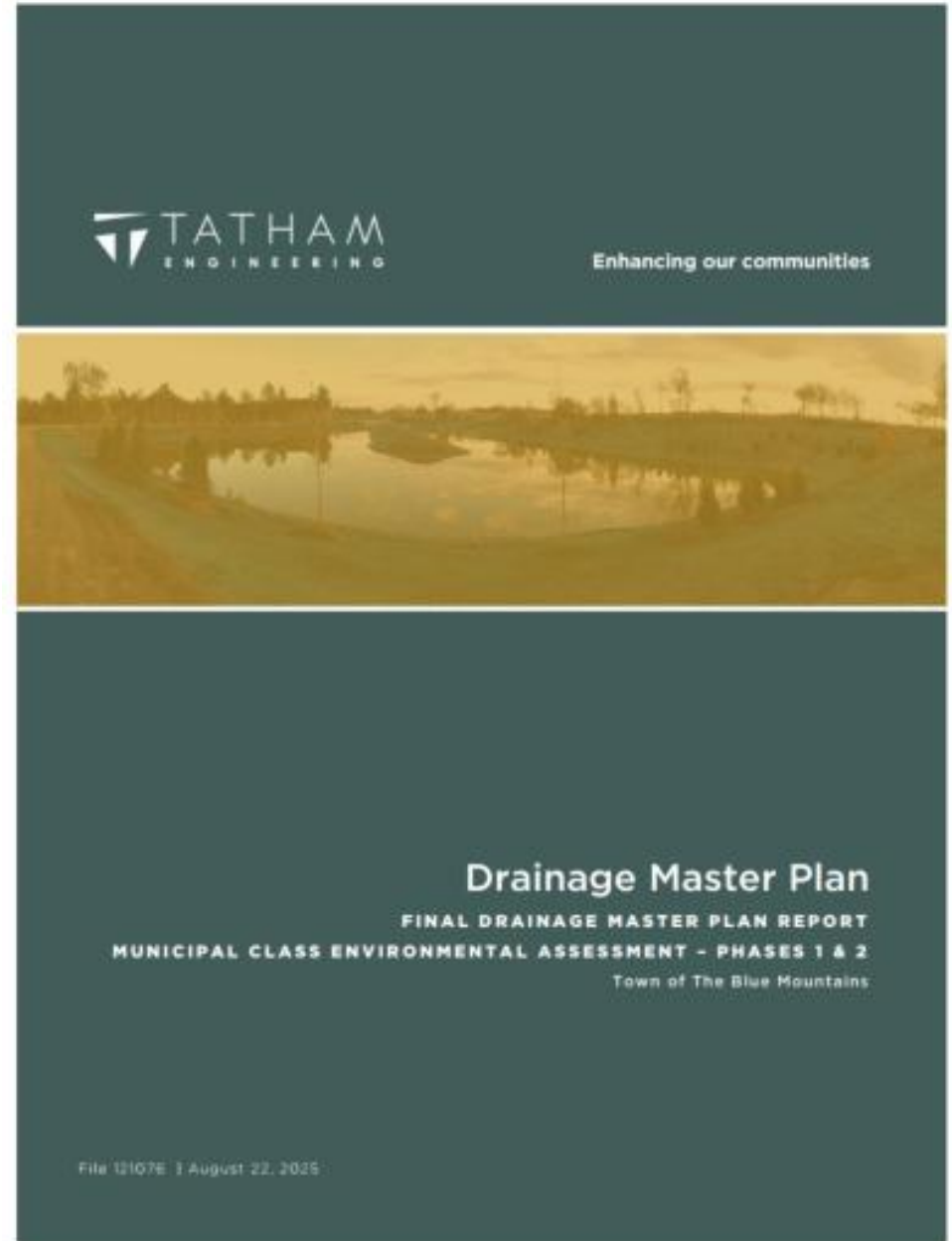
Municipal Class Environmental Assessment (MCEA)

This Drainage Master Plan is a broad level assessment detailing the existing drainage deficiencies identified in the study area. It considers improvement options available to address these deficiencies accounting for both climate change and future growth, and then evaluates these alternatives on their ability to satisfy the problem statement. A preferred solution is then selected for implementation.

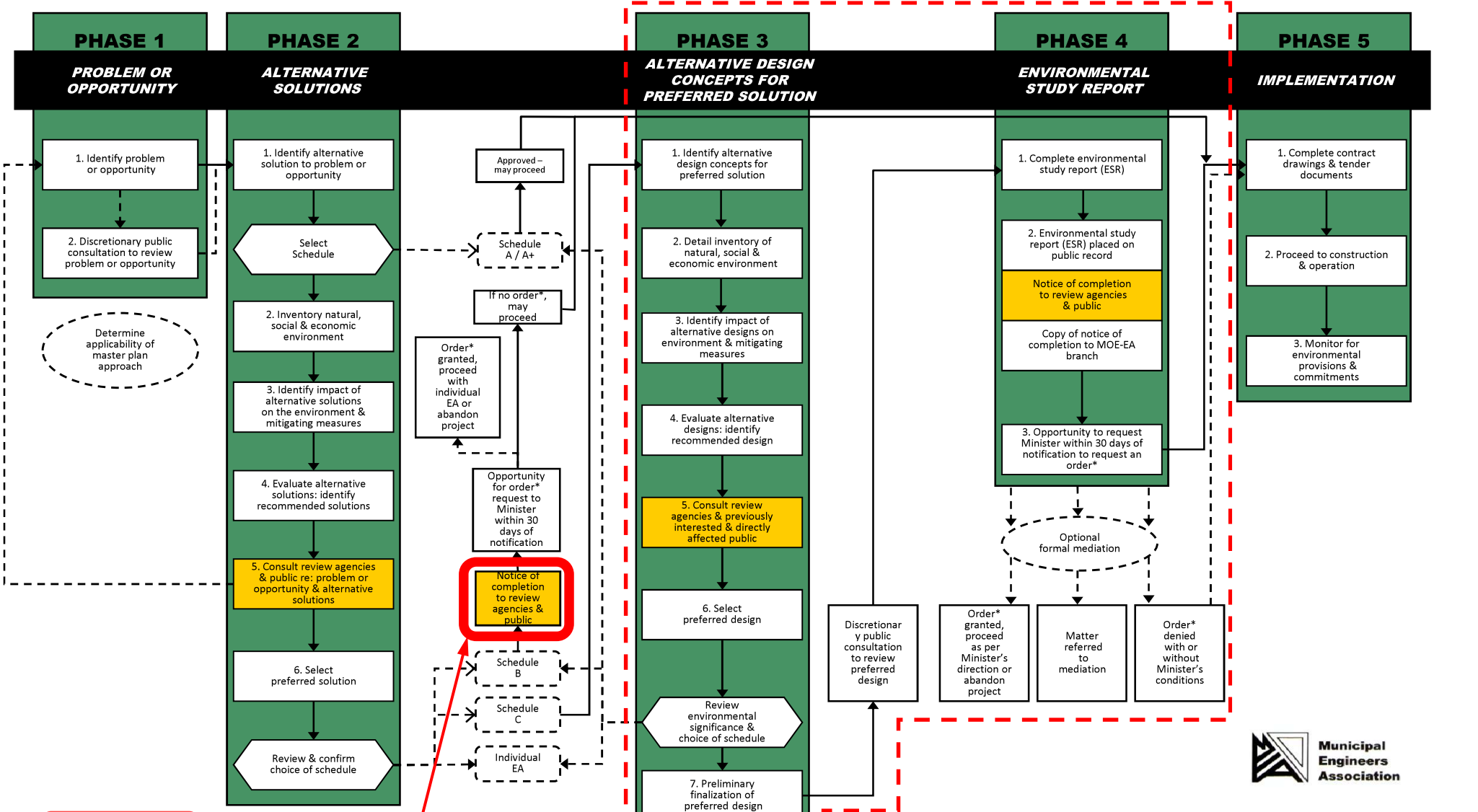
Project
Contact

Daniel Twigger, P.Eng.

Manager - Water Resources
Tatham Engineering Limited
115 Sandford Fleming Drive, Suite 200
Collingwood, ON L9Y 5A6
Tel: (705) 444-2565 ext. 2090
Email: dtwigger@tathameng.com



Municipal Class Environmental Assessment and Master Planning Process



We are Here

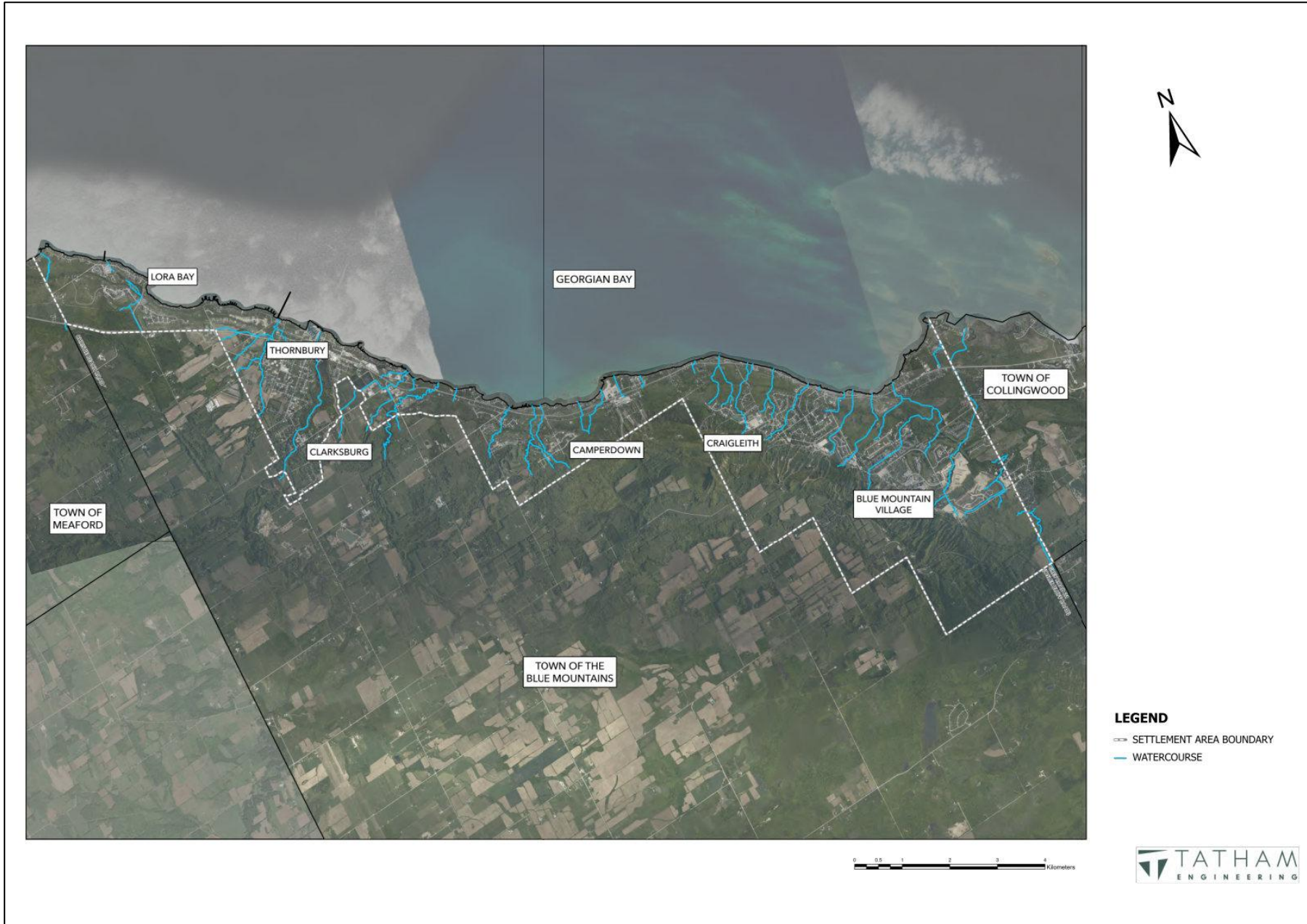
Phases 3 and 4 are not included in the scope of the Drainage Master Plan Project which follows Approach #2 of the MCEA Master Planning Process

- > Indicates possible events
- > Indicates probable events
- > Indicates mandatory events
- > Indicates possible events
- Yellow box: Mandatory public contact points
- Hexagon: Decision points on choice of schedule
- Dotted circle: Optional

* Section 16 order



Study Area



Municipal Class EA Process – Phase 1

Problem or Opportunity

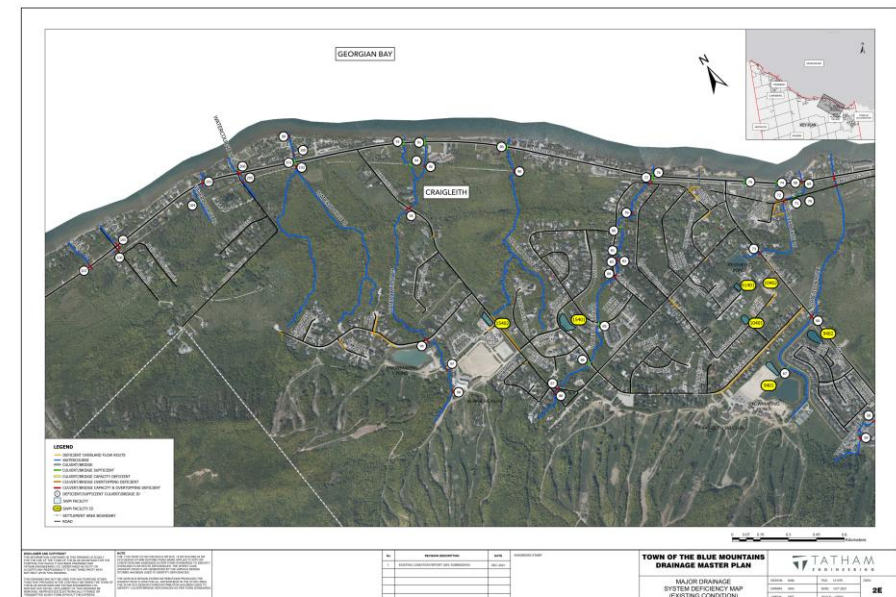
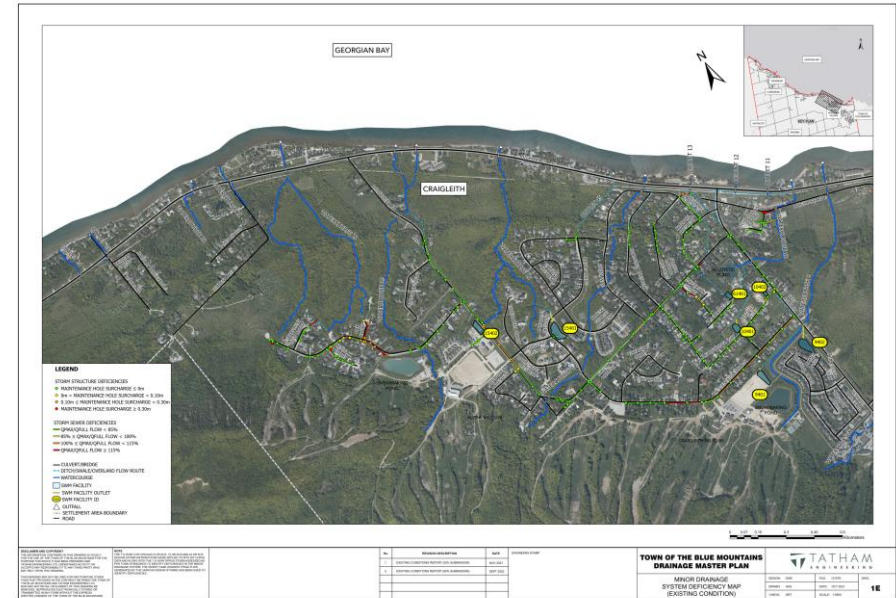
- Minor and major drainage system model development;
- Identified:
 - Minor drainage system deficiencies;
 - Major drainage system deficiencies; and
 - Extents of flooding.
- General improvement options were identified, including:
 - Storm sewer improvements;
 - Water quality/flow reduction improvements; and
 - Conveyance capacity improvements.

Public Information Centre 1 (February 2022)

Held to present results of Phase 1 of the MCEA and Elicit feedback from the public and interested stakeholders.

Preliminary Improvement Options Survey Results

IMPROVEMENT OPTION	# OF RESPONDENTS
1. Do Nothing	0 (0%)
2. Storm Sewer Improvements	7 (100%)
3. Water Quality/ Flow Reduction Improvements	3 (43%)
4. Conveyance Improvements	6 (86%)



Municipal Class EA Process – Phase 2

Alternative Solutions

- Developed, assessed and evaluated the alternative solutions;
- Selected the preliminary preferred solution which included:
 - General Recommendations consisting of:
 - Minor drainage system improvements;
 - Water quality improvements;
 - Operation and maintenance procedures.
 - Individual Drainage Projects consisting of:
 - SWMF improvements;
 - Culvert/watercourse improvements; and
 - Trunk storm sewer improvements.

Public Information Centre 2 (March 2023)

Held to present results of Phase 2 of the MCEA and Elicit feedback from the public and interested stakeholders.

Preliminary General Recommendations

IMPROVEMENT	ESTIMATED COST
Minor Drainage System	\$9,071,000
Water Quality	\$10,940,000 - \$47,494,000
Operation and Maintenance	\$238,000 per year
Total	\$20,249,000 - \$56,803,000

Preliminary Individual Drainage Projects

IMPROVEMENT	ESTIMATED COST
SWMF	\$2,175,000
Minor Drainage System	\$2,011,000
Culvert/Watercourse	\$87,922,000
Trunk Storm Sewer	\$4,086,000
Total	\$96,194,000
Cost to TOBM	\$62,496,000
Replacement Cost	\$19,448,000
Improvement Cost	\$43,048,000





Preferred Solution

General Recommendations - Final

Minor Drainage System Improvements

- Upsize storm sewer to satisfy current design standards;
- Relocate drainage infrastructure from private property to municipal lands; and
- Improve areas absent of minor drainage systems to include storm sewers or roadside ditches.

Water Quality Improvements

- Encourage residents to implement Lot Level LIDs;
- Implement Linear LIDs as part of future road reconstruction projects; and
- Install Mechanical Treatment Devices within the storm sewer network.

Drainage System Operation and Maintenance

- Formalize procedure for the inspection, operation and maintenance of drainage infrastructure;
- Implement design criteria changes to address drainage deficiencies identified through inspections; and
- Progressively purchase property or easements for drainage infrastructure and outlets where it is in the Town’s interest to do so.

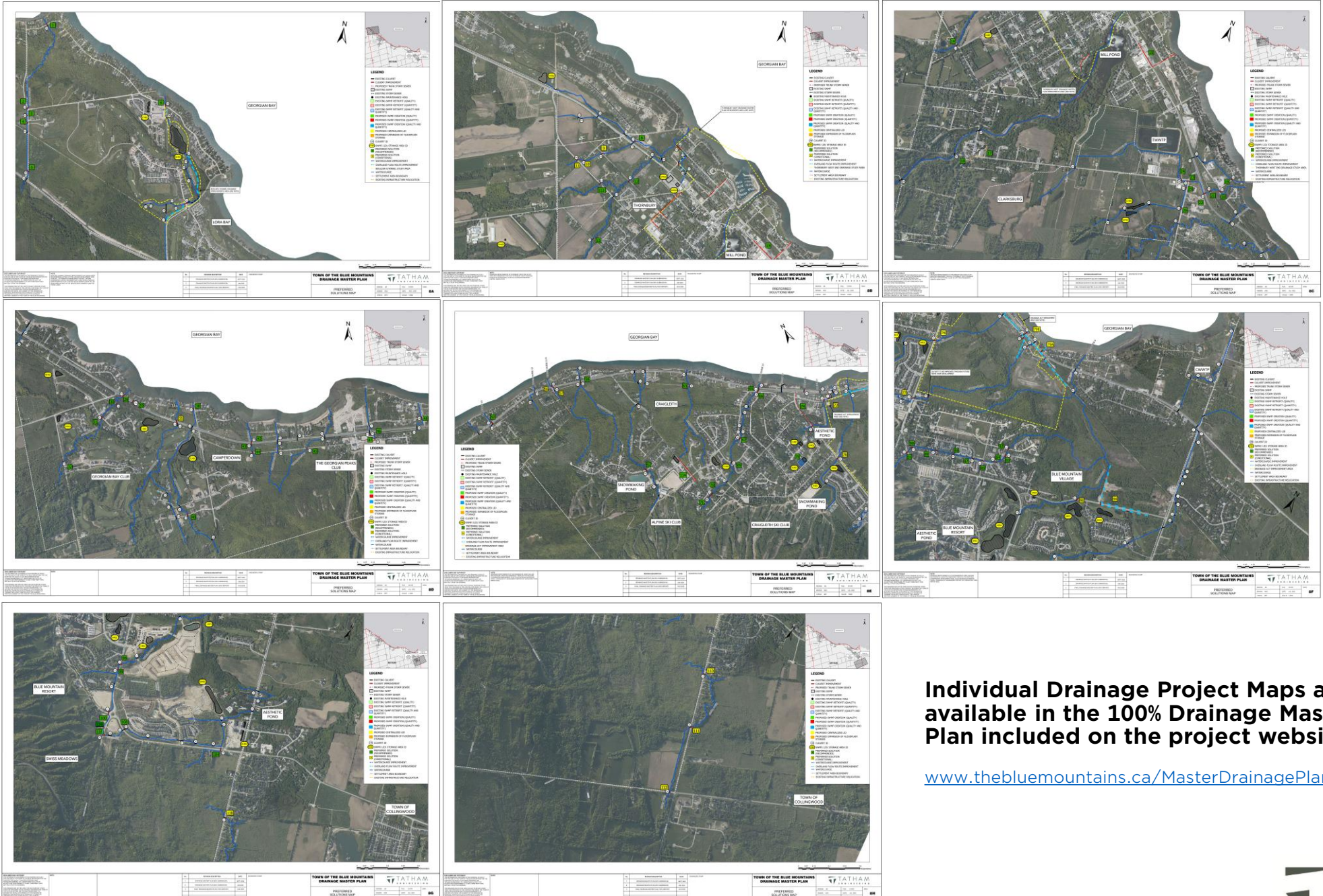
Minor Drainage System Improvements

The estimated costs to implement the general recommendations included in the preferred solution are summarized in the table below.

Alternative	Estimated Cost
Encourage Residents to Implement Lot Level Low Impact Development Measures	\$0
Linear Low Impact Development Measures	\$47,494,000
Mechanical Treatment Devices (Oil Grit Separators)	\$10,940,000
Minor Drainage System Improvements	\$9,071,000
Operation and Maintenance	\$238,000
Total	\$20,249,000 - \$56,803,000



Individual Drainage Projects



Individual Drainage Project Maps are available in the 100% Drainage Master Plan included on the project website

www.thebluemountains.ca/MasterDrainagePlanEA



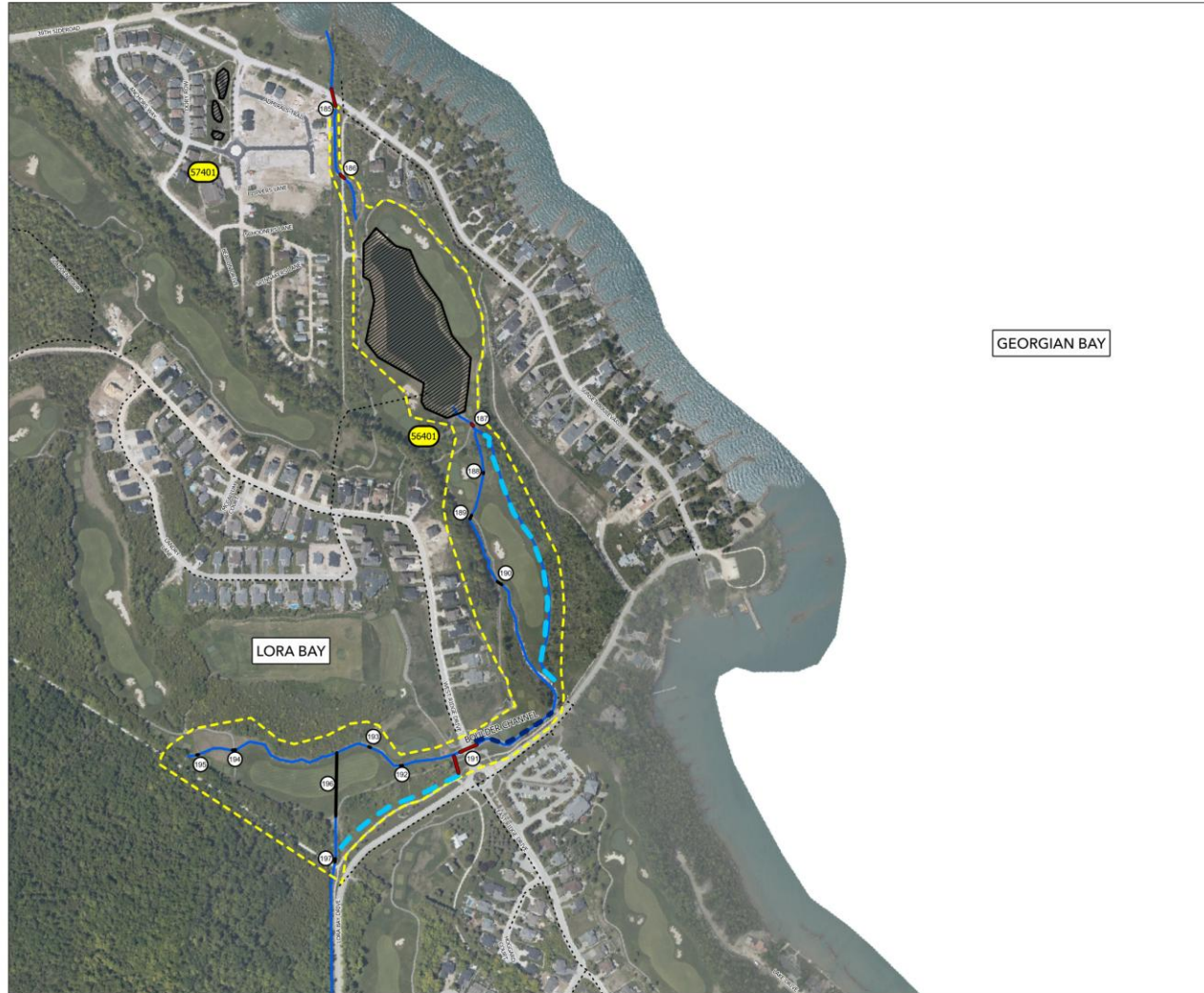
Individual Drainage Projects - Final

Summary of individual drainage projects included in preliminary preferred solution.

Alternative	No. Individual Projects Evaluated	No. Individual Projects Recommended	Estimated Cost
Retrofit/New Stormwater Management Facilities for Quantity Control	1	0	-
Retrofit/New Stormwater Management Facilities for Quality Control	7	1	\$2,175,000
Expansion of Existing Floodplain Storage Areas	5	0	-
Minor Drainage System Improvements	3	3	\$2,110,000
Culvert/Watercourse Major Drainage System Improvements	97	74	\$86,116,000
Trunk Storm Sewer/Overland Flow Route Major Drainage System Improvements	6	2	\$4,086,000
Total Preferred Solution	118	80	\$94,486,000
Total Cost to TOBM			\$64,085,000
Replacement Cost (TOBM Only)			\$17,061,000
Cost Increase for Improvements			\$47,024,000



Lora Bay Development Area



TATHAM
ENGINEERING

**TOWN OF THE BLUE MOUNTAINS
DRAINAGE MASTER PLAN**

BOULDER CHANNEL DRAINAGE IMPROVEMENTS AREA

LEGEND

- EXISTING CULVERT
- CULVERT IMPROVEMENT
- ▨ EXISTING SWMF
- - EXISTING STORM SEWER
- EXISTING MAINTENANCE HOLE
- Ⓜ CULVERT ID
- Ⓜ SWMF/ LID/ STORAGE AREA ID
- - WATERCOURSE IMPROVEMENT
- - OVERLAND FLOW ROUTE IMPROVEMENT
- - BOULDER CHANNEL IMPROVEMENT AREA
- - WATERCOURSE



Thornbury West Drainage Master Plan Area

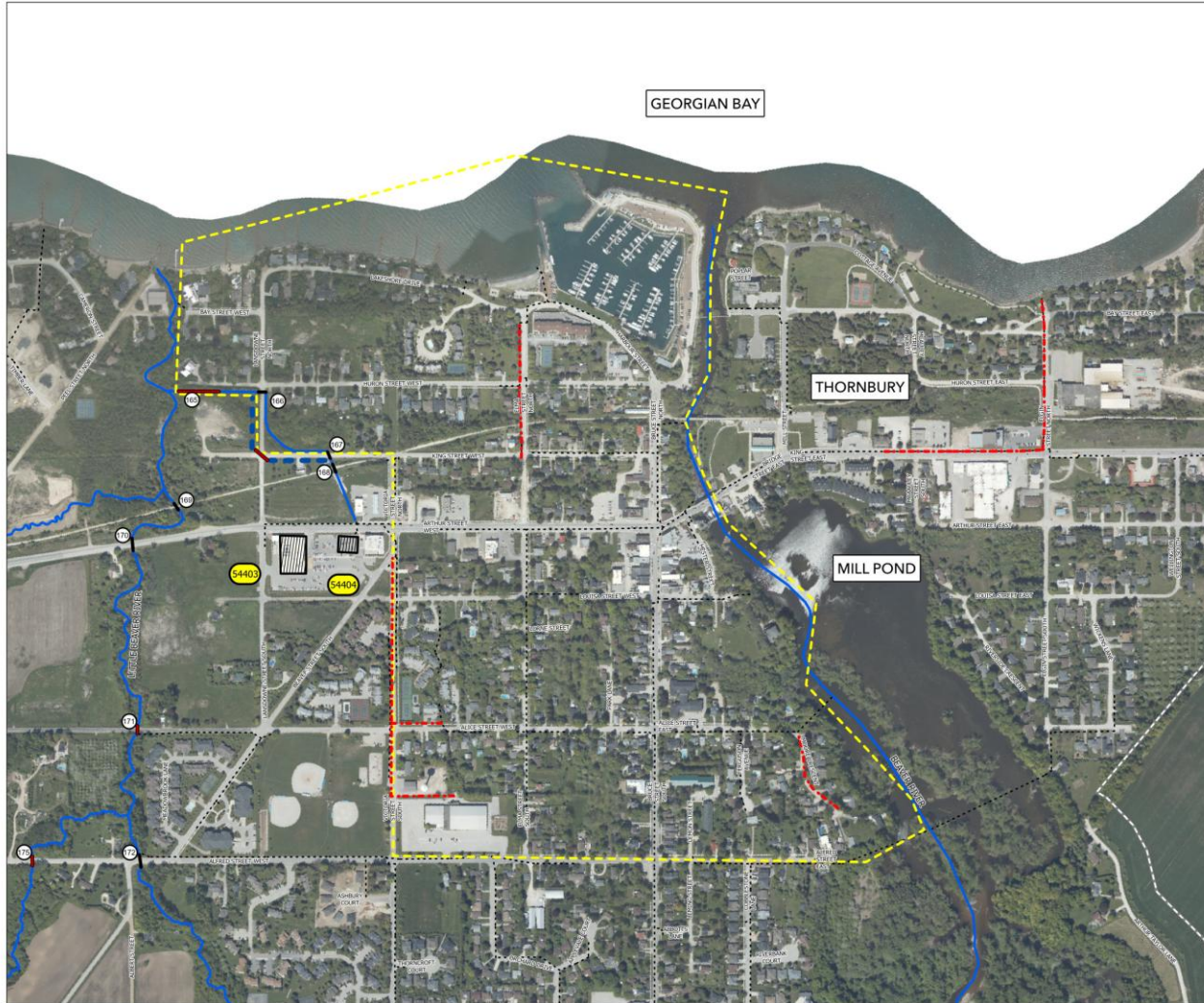


**TOWN OF THE BLUE MOUNTAINS
DRAINAGE MASTER PLAN**
THORNBURY WEST END DRAINAGE
IMPROVEMENT AREA

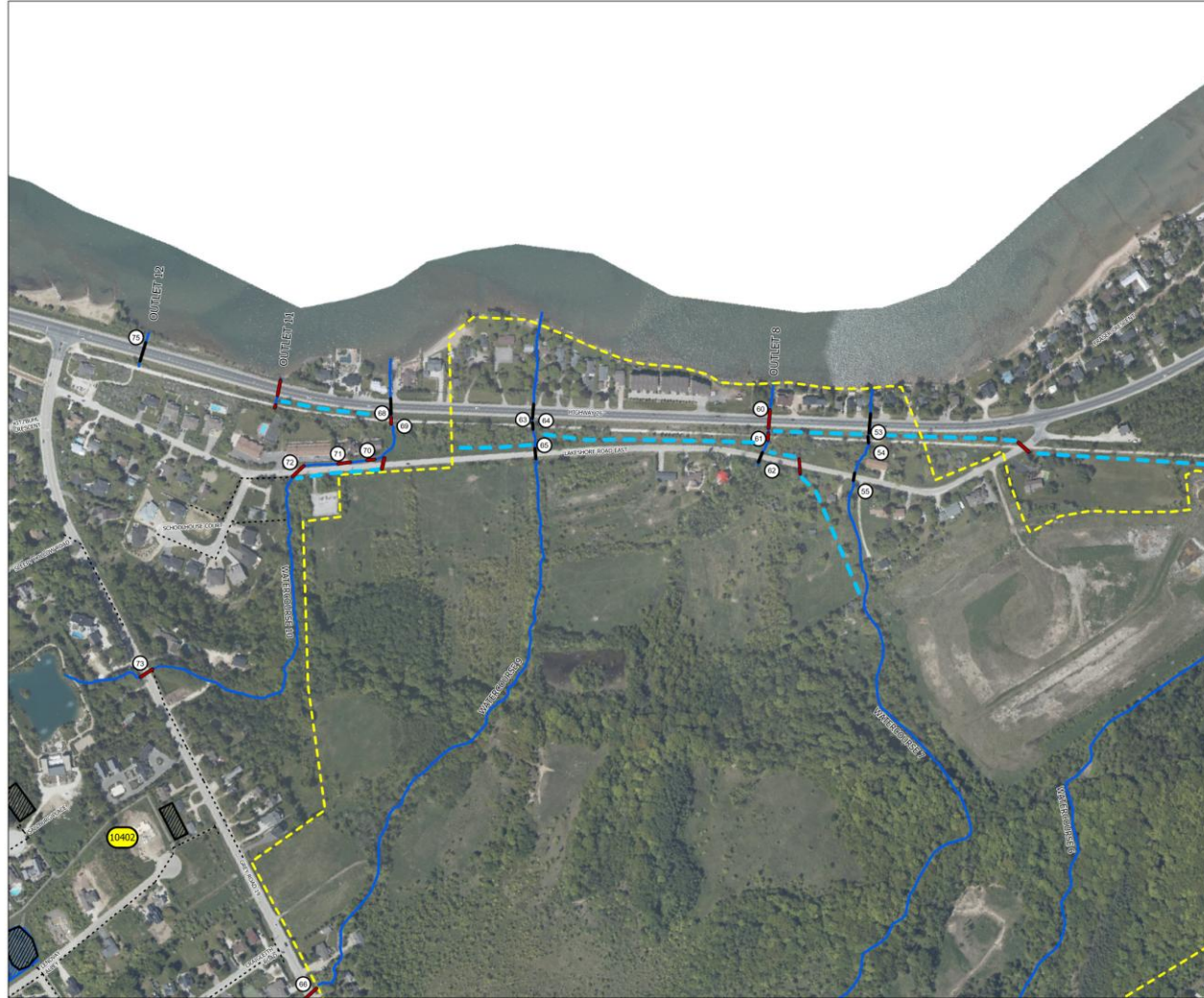


LEGEND

- EXISTING CULVERT
- CULVERT IMPROVEMENT
- - - PROPOSED TRUNK STORM SEWER
- ▨ EXISTING SWMF
- - - EXISTING STORM SEWER
- EXISTING MAINTENANCE HOLE
- ⊙ CULVERT ID
- ⊙ SWMF/ LID/ STORAGE AREA ID
- - - WATERCOURSE IMPROVEMENT
- - - OVERLAND FLOW ROUTE IMPROVEMENT
- - - THORNBURY WEST END IMPROVEMENT AREA
- - - WATERCOURSE



Drainage Act Improvements



TOWN OF THE BLUE MOUNTAINS DRAINAGE MASTER PLAN

DRAINAGE ACT IMPROVEMENT AREA

LEGEND

- EXISTING CULVERT
- - - CULVERT IMPROVEMENT
- ▨ EXISTING SWMF
- - - EXISTING STORM SEWER
- EXISTING MAINTENANCE HOLE
- CULVERT ID
- SWMF/ LID/ STORAGE AREA ID
- - - WATERCOURSE IMPROVEMENT
- - - OVERLAND FLOW ROUTE IMPROVEMENT
- - - DRAINAGE ACT IMPROVEMENT AREA
- WATERCOURSE





Implementation Plan

Project Prioritization

Risk Assessment

- Individual projects prioritized through risk assessment considering:
 - Severity of the deficiency;
 - Probability of failure; and
 - Economic, social and environmental consequence of failure.
- The preliminary prioritization of the individual projects was established from the cumulative risk.

Other Considerations

- From the preliminary prioritization, other factors were considered to establish the final prioritization ranking, such as:
 - Identified replacement date;
 - Planned works (road, sanitary, water and drainage improvements) included in Capital Plans;
 - Order of implementation required for the individual drainage projects.

Risk Assessment Matrix

PROBABILITY OF FAILURE	CONSEQUENCE OF FAILURE				
	None	Insignificant	Minor	Moderate	Major
Rare	No Risk	Low Risk	Low Risk	Moderate Risk	Moderate Risk
Occasional / Possible	No Risk	Low Risk	Moderate Risk	Moderate Risk	High Risk
Moderate / Likely	No Risk	Moderate Risk	Moderate Risk	High Risk	Extreme Risk
Certain / Very Likely	No Risk	Moderate Risk	High Risk	Extreme Risk	Extreme Risk



10-Year Implementation Program

REPLACEMENT DATE	PROJECT NO.	IMPROVEMENT NAME/ID	LOCATION	COST
2026	79E	New Outlet to Georgian Bay	Watercourse 6	\$1,886,000
2026	73G	Culverts No. 69, 70, 71 and 72	Lakeshore Road East	\$1,158,000
2027	17A	Storm Sewer Relocation	Clark Street / Mary Street	\$1,295,000
2027	119A	Scenic Caves Road Ditch Improvement	Scenic Caves Road	\$99,000
2028	94	Monterra Road Drainage Improvements	Monterra Road	\$1,678,000
2029	20G	Culvert No. 147 / TOBM Asset ID CUL88	Lakeshore Road	\$2,063,000
2029	21G	Culvert No. 148	Georgian Trail	\$1,194,000
2030	18A	Decommission Historical Flume	Beaver River	\$716,000
2030	74H	Trunk Storm Sewer No. 6	Grey Road 19	\$3,246,000
2032	24A	Culvert No. 156	Clark Street	\$1,400,000
2033	15A	Trunk Storm Sewer No. 2	King Street East / Elgin Street North	\$2,625,000
2034	38E	Culvert No. 124 / TOBM Asset ID CUL93	Hoover Lane	\$1,410,000
2035	70A	Culvert No. 87 / TOBM Asset ID CUL118	Arrowhead Road	\$856,000
2035	71A	Culvert No. 88 / TOBM Asset ID CUL119	Arrowhead Road	\$568,000
Total				\$20,194,000



Development Framework

- A development framework describing the recommended approach and design criteria for drainage and stormwater management in the Town has been prepared which provides:
 - A methodology to establish water quantity control requirements;
 - A means to identify required existing drainage infrastructure improvements;
 - A mechanism to improve water quality treatment; and
 - A mechanism to satisfy area specific infiltration targets and volume control.

DC Eligibility and Funding Review

- Alternative funding mechanisms to the traditional general tax-based approach have been explored to cover the growing costs of operating, maintaining and replacing drainage infrastructure including:
 - Development Charges (\$12 M) in DC eligible costs identified);
 - Stormwater utilities; and
 - Federal and provincial funding opportunities (\$15.2 M) identified.
- A stormwater utility is the only dedicated funding mechanism capable of covering the growing costs.

DC Eligible Costs

PROJECT	DC ELIGIBLE COST	PROJECT	DC ELIGIBLE COST
8	\$157,600	85	\$249,200
9	\$72,400	87	\$224,400
11	\$38,800	88	\$16,800
12	\$117,600	89	\$115,600
13	\$582,800	90	\$224,400
14	\$556,800	91	\$278,400
20	\$588,000	94	\$671,200
21	\$417,600	96	\$252,400
24	\$494,000	98	\$696,000
42	\$120,000	99	\$375,200
43	\$10,800	100	\$86,000
44	\$103,200	104	\$236,400
62	\$887,600	110	\$680,400
79	\$754,400	111	\$726,000
82	\$726,800	112	\$102,800
83	\$589,200	113	\$148,400
84	\$688,400	TOTAL	\$11,989,600

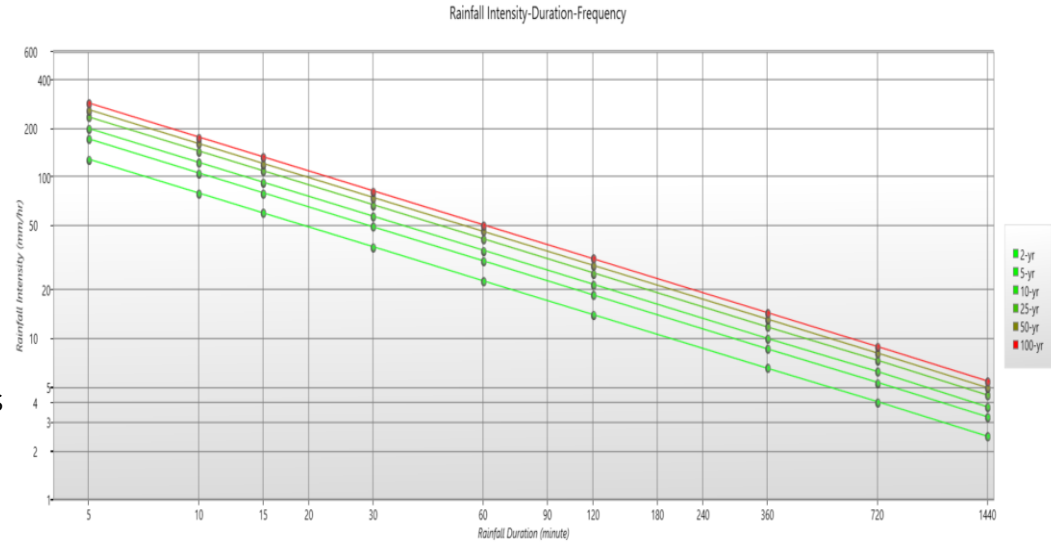
Municipalities with Stormwater Utilities



Climate Change

- A review of the Town’s current approach to adapting to climate change was completed:
 - Town applies a 10% increase to current rainfall intensity-duration-frequency data developed from historic rainfall data; and
 - Climate change models predict a 4% to 10% increase in rainfall depth and intensity through 2050 and 2100.
- It’s recommended the Town reassess the climate change adjustment factor as part of future design standard updates to ensure storm infrastructure is properly designed for its estimated life-span.

Town’s Climate Adjusted IDF Curves



Model Calibration

- A recommendation of the Drainage Master Plan is to calibrate the major drainage system hydrologic model.
- The Town initiated a streamflow monitoring program in the spring of 2024 to collect the necessary data to complete the hydrologic model calibration.
- The streamflow monitoring program is continuing through 2025 and model calibration will follow once sufficient data has been collected.
- Following model calibration, the Town will consider whether re-evaluating the recommendations of the Drainage Master Plan are warranted.
- The calibrated hydrologic model will be used to design Town drainage infrastructure once available.

Peak Flow Comparison

WATERCOURSE	1:100-YEAR PEAK FLOW (m ³ /s)			
	SWS (1993)	DMP CHICAGO	DMP 6 HOUR SCS	DMP 24 HOUR SCS
Watercourse 1	11.34	9.20	14.19	21.32
Watercourse 6	8.89	13.64	19.43	27.28
Watercourse 7	7.24	6.56	9.77	14.17
Watercourse 14	7.85	4.23	6.47	8.83
Watercourse 15	3.34	4.48	6.89	12.33
Watercourse 19	11.55	17.11	25.93	37.62
Watercourse 21	2.85	5.66	8.24	11.49



PIC #3

A third Public Information Centre (PIC3) question and answer session was held at Town Hall on October 29, 2024 to present the final recommendations of the DMP.

Town and Tatham staff were present to answer questions from attendees.

A Draft Environmental Assessment document was posted to the Town's website and made available for public review.

The screenshot shows a web page for the 'Town-Wide Master Drainage Plan Environmental Assessment'. At the top, there is a navigation bar with links for 'Resident Services', 'Recreation & Culture', 'Planning, Building & Construction', 'Business & Economy', and 'Town Hall'. A search bar is located in the top right corner. The main content area is divided into several sections:

- Back to Municipal Infrastructure Projects**: A green button with a left-pointing arrow.
- Who's Listening**: A section featuring contact information for Tatham Engineering Ltd. (Daniel Twigger, B.Sc.Eng., P.Eng., Senior Engineer, Group Leader, (705) 444-2565 ext. 2090) and a 'Send Email' button. It also identifies the project as being from 'The Town of The Blue Mountains Operations Department'.
- Follow This Project**: A yellow box with a 'Subscribe' button and text: 'Subscribe now to receive timely updates regarding this project direct to your inbox.'
- Project Timeline**: A section with a radio button selected for 'Assessment Period' and a '+ Show full timeline details' link.
- Town-Wide Master Drainage Plan Environmental Assessment**: The main title, accompanied by a large photograph of a wetland area with a path and mountains in the background.
- Please Note**: A section stating: 'If you're experiencing imminent flooding on your property, please create a new Service Request through the Town's Online Services Portal.'
- On this page:** A list containing '1. Project Updates' and '2. Public Meetings & Information Centres'.
- Introduction**: A paragraph explaining that the Town is undertaking a comprehensive Town-wide Drainage Master Plan following the Municipal Class Environmental Assessment Planning Process to serve as a long-term strategy for managing stormwater in existing and new growth areas.
- Objectives**: A bulleted list of goals, including identifying drainage deficiencies, developing solutions, evaluating risks, selecting preferred solutions, prioritizing solutions based on funding and development, and creating a policy framework.
- Focus Areas**: A paragraph stating the plan will focus on settlement areas including Lora Bay, Thornbury and Clarksburg, Camperdown, Craigleith and Swiss Meadows, the Blue Mountain Village Area and Caste Glen.
- Contract**: A paragraph stating the Town has awarded Tatham Engineering Limited the contract for the Drainage Master Plan, starting in Spring 2021, with the final plan presented to council by the third quarter of 2022.
- Why Now?**: A section explaining the town is completing this assessment to create a long-term strategy for stormwater management.
- Project Updates**: A list of key dates with expandable buttons: 'May 31, 2022 - PIC Follow-up Staff Report', 'January 20, 2022 - Notice of Public Information Centre', and 'December 15, 2021 - Notice of Commencement'.
- Public Meetings and Information Centres**: A list with an expandable button for 'Public Information Centre #1 - February 2022'.
- Breadcrumbs**: A path at the bottom of the main content area: 'Planning, Building & Construction > Current Projects & Initiatives > Municipal Infrastructure Projects > Town-Wide Master Drainage Plan Environmental Assessment'.

The footer contains several utility boxes: 'Subscribe for email updates to your inbox' with a 'Subscribe' button; 'Submit Online Service Requests 24/7 for a variety of Town services.' with links for 'Service Requests / Report an Issue' and 'Staff Directory & Contact Information'; and 'Connect with the Town on social media' with icons for Facebook, Twitter, YouTube, and LinkedIn. Below these are contact details: '32 Mill Street, Box 310 Thornbury, ON N0H 2P0', phone numbers '(519) 595-3131' and '(888) 258-6867', and a list of links: 'Employment Opportunities', 'Accessibility', 'Privacy Policy', 'Contact the Town', and 'Website by Upanup'. A 'Visit Explore Blue for tourism and recreation information.' link and the 'EXPLORE BLUE' logo are also present.



Notice of Study Completion


A Notice of Study Completion will be issued providing the following information:

- History of study and public information centres.
- Public location of the Drainage Master Plan ESR;
- Tatham and Town Contact Information;
- MECP contact Information

Following the successful completion of the Municipal Class EA process, the Town shall intend to implement Preferred Solutions.

Ongoing Work:

- An ongoing streamflow monitoring program is being conducted for five watercourses throughout the Town.
- Upon completion of the monitoring program, the hydrologic model will be calibrated and reviewed by the Tatham.
- Tatham & the Town will determine if re-evaluation of recommendations is warranted.



Town of the Blue Mountains Drainage Master Plan Municipal Class Environmental Assessment Notice of Study Completion

The Corporation of the Town of The Blue Mountains has completed a Drainage Master Plan under the Municipal Class Environmental Assessment Master Planning Process (Phases 1 & 2) to identify the existing drainage deficiencies and develop drainage solutions to address the deficiencies, reduce flooding, resolve public safety concerns and improve maintenance opportunities throughout the Town. In accordance with Approach #2 of the Master Planning Process, the investigation, consultation and documentation completed for this Master Plan are consistent with the requirements for Schedule B projects. Schedule A, A+ and B projects have been recommended as part of the Preferred Solution. With Schedule A and A+ projects being pre-approved, this Notice of Completion pertains to the Schedule B projects.

Three (3) Public Information Centers (PICs) were held where the public and interested stakeholders could provide comment on the project details and the various physical, natural, social, cultural and economic impacts. Public and agency comments received have been considered as part of the selection of the Preferred Solutions. An Environmental Study Report (ESR) has been prepared that documents the study process and presents the Preferred Solutions.

By this notice, the Drainage Master Plan ESR is available for public review starting **October #8, 2025**, at the following locations:

Hardcopy The Town of The Blue Mountains Clerk's Office 32 Mill Street, Thornbury Ontario, Canada, N0H 2P0	Digital Drainage Master Plan Final Report
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If you have questions or concerns related to the Preferred Solution recommended in the ESR, please contact Pruthvi Desai at the Town or Daniel Twigger, P.Eng. at Tatham Engineering Limited at the addresses below within 30 calendar days from the date of this Notice.

Pruthvi Desai, PMP Manager, Capital Projects Town of The Blue Mountains 32 Mill Street, P.O. Box 310 Thornbury, ON N0H 2P0 Tel: (519) 599-3131 ext. 310 Email: pdesai@thebluemountains.ca	Daniel Twigger, P.Eng. Manager, Water Resources Engineering Tatham Engineering Limited 115 Sandford Fleming Drive, Suite 200 Collingwood, ON L9Y 5A6 Tel: (705) 444-2565 ext. 2090 Email: dtwigger@tathameng.com
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In addition, a request to the Minister of the Environment, Conservation and Parks for an order imposing additional conditions or requiring a comprehensive environmental assessment may be made on the grounds that the requested order may prevent, mitigate or remedy adverse impacts on constitutionally protected Aboriginal and treaty rights.

Requests should include your full name and contact information. Requests should specify what kind of order is being requested for what project(s) (additional conditions or a comprehensive environmental assessment), explain how an order may prevent, mitigate or remedy potential adverse impacts, and can include any supporting information. The request should be sent by mail or email to:

Minister Ministry of the Environment, Conservation and Parks 777 Bay Street, 5th Floor Toronto ON M7A 2J3 Minister.mecp@ontario.ca	Director, Environmental Assessment Branch Ministry of the Environment, Conservation and Parks 135 St. Clair Avenue West, 1st Floor Toronto ON M4V 1P5 EABDirector@ontario.ca
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A duplicate copy of the request must also be forwarded to Pruthvi Desai at the Town, at the address provided above. For more information on the section 16 order process, please visit: <https://www.ontario.ca/page/class-environmental-assessments-section-16-order>.

If no requests are received, the Town, upon receipt of the necessary approvals, plans to proceed to implementation of the Schedule A, A+ and B projects recommended in the Drainage Master Plan through a phased approach, dependent on future budget approvals.

All personal information included in your request - such as name, address, telephone number and property location - is collected, under the authority of section 30 of the Environmental Assessment Act and is collected and maintained for the purpose of creating a record that is available to the general public. As this information is collected for the purpose of a public record, the protection of personal information provided in the Freedom of Information and Protection of Privacy Act (FIPPA) does not apply (s.37). Personal information you submit will become part of a public record that is available to the general public unless you request that your personal information remain confidential.





Thank you!