



**TOWN OF
GEORGINA**

KESWICK STORMWATER MANAGEMENT STUDY

**PUBLIC INFORMATION CENTRE NO. 2
PRESENTATION
MAY 27, 2010**

COMMUNITIES
TRANSPORTATION
BUILDINGS
INFRASTRUCTURE

OUTLINE OF PRESENTATION

- **Introduction/Background**
 - Concerns for Health of Lake Simcoe & Maskinonge River
 - Study Goals
 - Study Area
 - Scope of Study
- **Municipal Class EA Process**
- **Recap of Stage 1 Results**
 - SWM Facility Survey
 - Sediment Sampling
 - Oil Grit Separator (OGS) Survey
 - Storm Outfall Evaluation
- **Results of Stage 2**
 - Identify & Evaluate Potential SWM Retrofits to Reduce Phosphorus
 - Estimate Degree to Which Retrofits Help Meet Phosphorus Reduction Goals
 - Complete Class EA Process to Recommend Preferred SWM Retrofit Plan
- **Next Steps**
- **Questions**

CONCERNS FOR HEALTH OF LAKE SIMCOE & MASKINONGE RIVER

- More than 20 years of concern over health of L. Simcoe
- Key issue has been eutrophication with Phosphorus (TP) as focus
- Various studies incl. LSEMS where TP load targets 1st established
- Covers all Point Sources (e.g. WWTPs) & Non-Point Sources (e.g. Agricultural Runoff and Stormwater Runoff)
- Expanding development in lake side communities (e.g. Barrie, Innisfil, Keswick) has increased concern over Lake's capacity to handle inputs
- Recent studies (IGAP & Assimilative Capacity Study) have refined loading targets
- Draft "Lake Simcoe Protection Plan" & Act formalize restrictions on loads & require each community to develop a Stormwater Management (SWM) Plan within 5 years
- Approval of OPA 97, "Keswick Business Park" also requires Town to develop overall SWM Plan

STUDY GOALS

- The Town of Georgina has initiated a comprehensive Stormwater Management Study for the Keswick Community.
- Will document the status of existing stormwater management facilities in the community and explore opportunities for retrofits to the entire drainage system to improve its performance.
- The goal is to improve the quality of storm runoff that discharges to Lake Simcoe to contribute to achieving the goals of the Lake Simcoe Protection Plan.
- It will also satisfy an agreement made as a condition of approval of OPA 97 relating to the proposed Keswick Business Park.

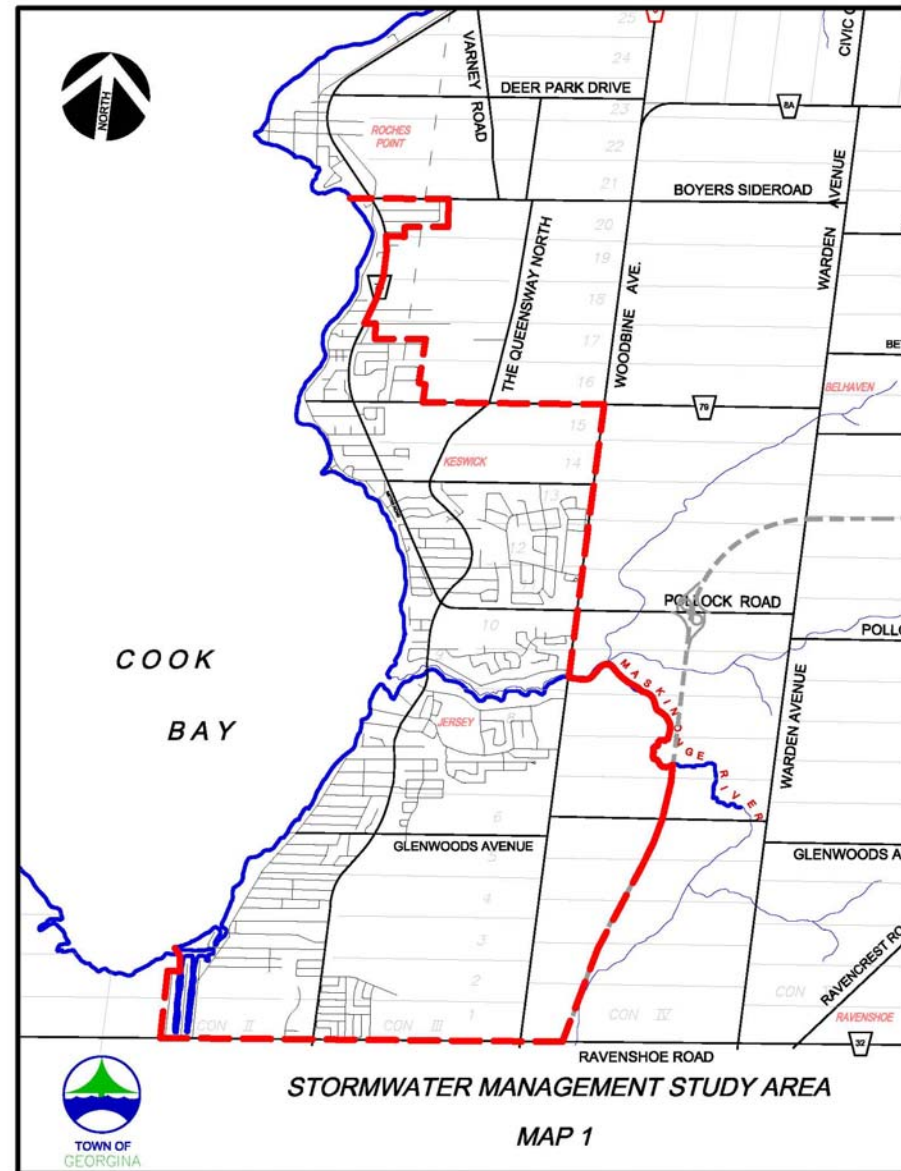
STUDY AREA

All lands in Keswick draining to L. Simcoe & Maskinonge R. but not directly addressing those currently in planning process.

Total Area = 2006. ha.

Area with Existing SWM = 372. ha.

Potential Retrofit Area = 1167. ha.



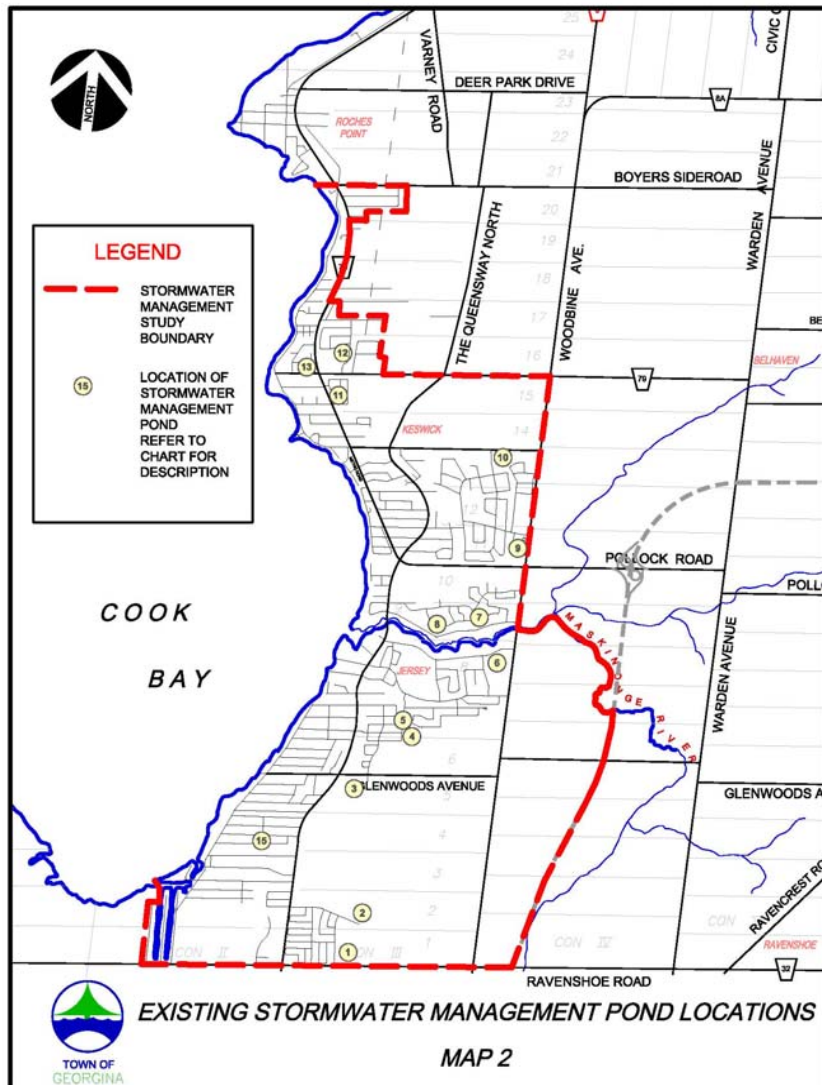
MUNICIPAL CLASS EA PROCESS

- Project is being conducted in accordance with the Master Plan component of the Municipal Class Environmental Assessment (June 2007).
 - A Project File Report will be prepared to document the existing conditions, alternative solutions, the preferred alternative and the public consultation process.
 - Two Public Information Centres (PICs) will be held over the course of the project.
 - At the end of the study process, the report will be made available for a 30-day public review and comment period.

RECAP OF STAGE 1 RESULTS

- Pond Survey & Retrofit Evaluation
- Sediment Sampling.
- Oil Grit Separator Survey
- Storm Outfall Evaluation

Existing SWM Facilities



Fourteen existing SWM facilities have been identified – ten are “wet ponds” with permanent water in them. One “wet pond” has no water. Three are “dry ponds.”

Pond Locations

10 WET PONDS SURVEYED

Day 1: Pond 8 ●

Day 2: Ponds 7, 6 ●

Day 3: Ponds 9, 11 ●

Day 4: Ponds 1, 2 ●

Day 5: Ponds 3, 4, 5 ●



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Data Collection



Data Processing

POND 11 – Tulip Street



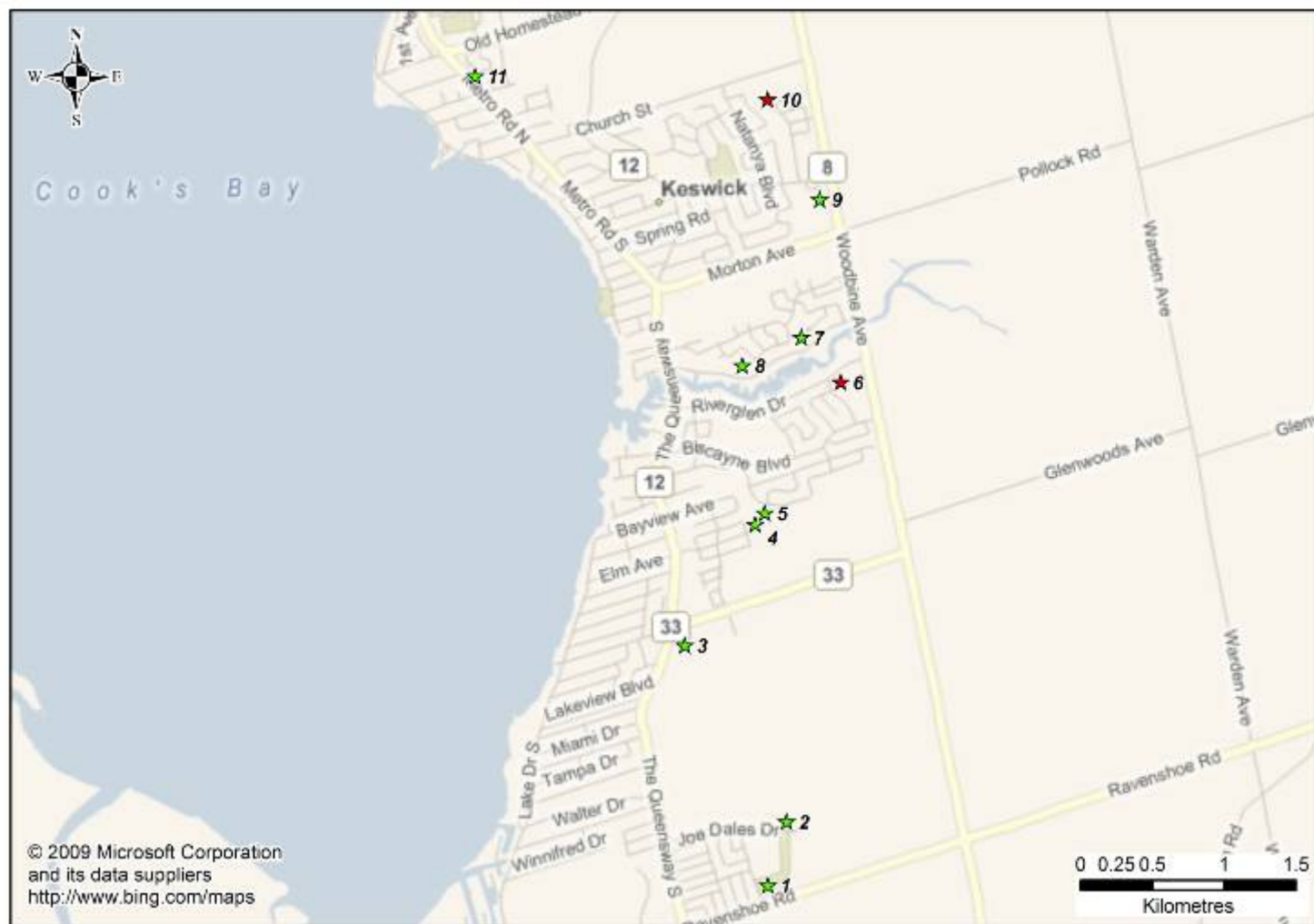
Sediment Depth: 2 – 53 cm

POND 9 – Keswick North



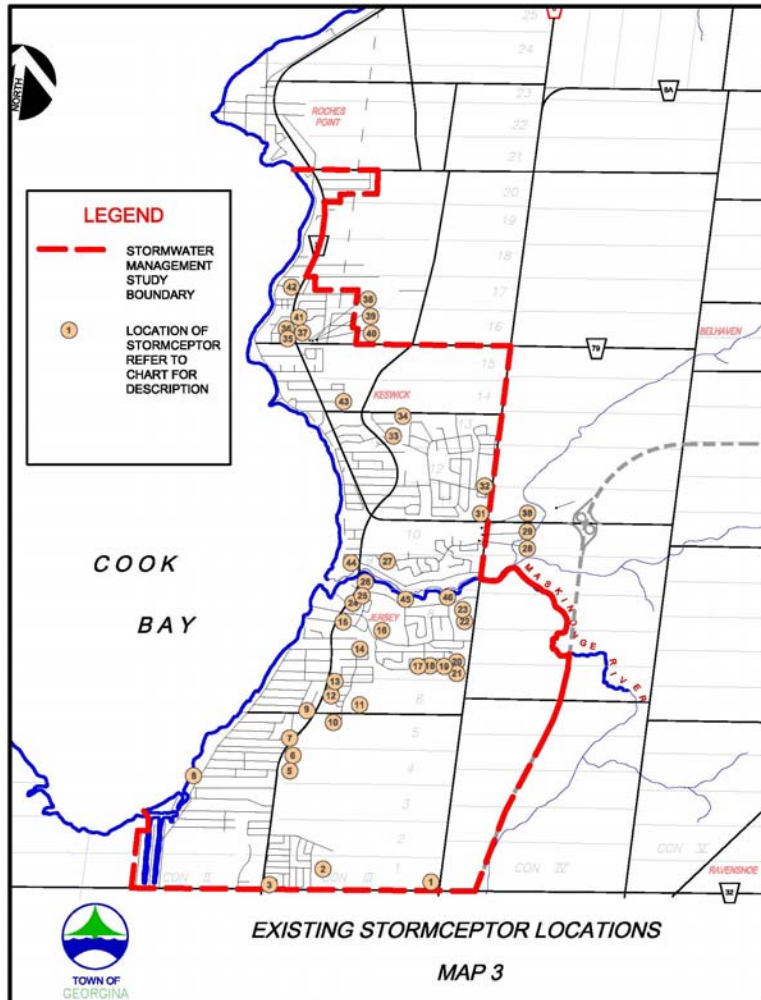
Sediment Depth: 7 – 81 cm

SEDIMENT SAMPLING PROGRAM



Stormwater Management Pond	General Description	Sampling Locations	Sediment Description	Parameter Exceeding MOE Table 2 Standard
SMP-6	Southeast corner of Riverglen Drive and Windover Drive	6A (Main Pond at Inlet)	Silt with trace clay, gravel, fine sand and organic matter. Black. Organic odour.	Petroleum Hydrocarbons F3 Fraction and F4 Gravimetric
		6B (Main Pond - Centre)	Silt with trace clay, gravel, fine sand and organic matter. Black. Organic odour.	
		6C (Main Pond at Outlet)	Silt with trace clay, gravel, fine sand and organic matter. Black. Organic odour.	
SMP-7	Southwest of Margaret Place	7A (Forebay)	Silt with some sand, trace gravel. Dark grey to black. Organic odour.	None
		7B (Forebay)	Silt with some sand, trace gravel. Dark grey to black. Organic odour.	
		7C (Main Pond)	Silt with some sand, trace gravel. Black to dark grey. Organic odour.	
SMP-8	Southwest of Glendower Circle	8A (Forebay)	Silty sand with organic matter. Black. Organic odour.	None
		8B (Forebay)	Silty sand with organic matter. More sand with depth. Black. Organic odour. Rocky bottom.	
		8C (Main Pond)	Clayey silt. Minimal sediment within pond area. Grey.	
SMP-9	Southwest corner of Wexford Drive and Woodbine Avenue	9A (Forebay)	Medium grained sand, trace gravel and silt. Black to grey. Strong organic odour.	None
		9B (Main Pond)	Medium grained sand and silty clay, trace gravel. Black to grey.	
		9C (Forebay)	Medium grained sand, trace gravel and silt. Black. Strong organic odour.	

Existing Oil/Grit Separators

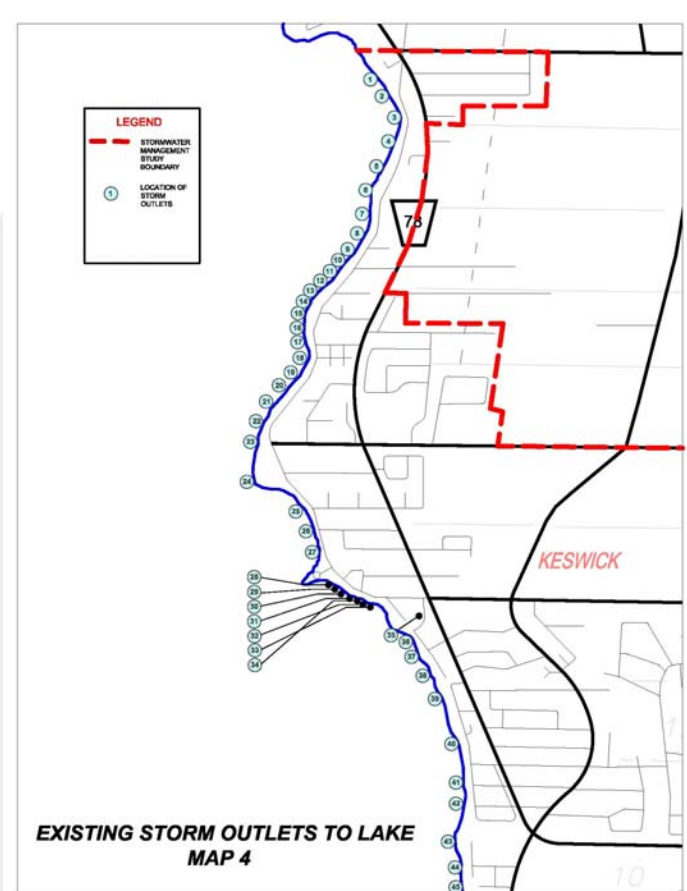
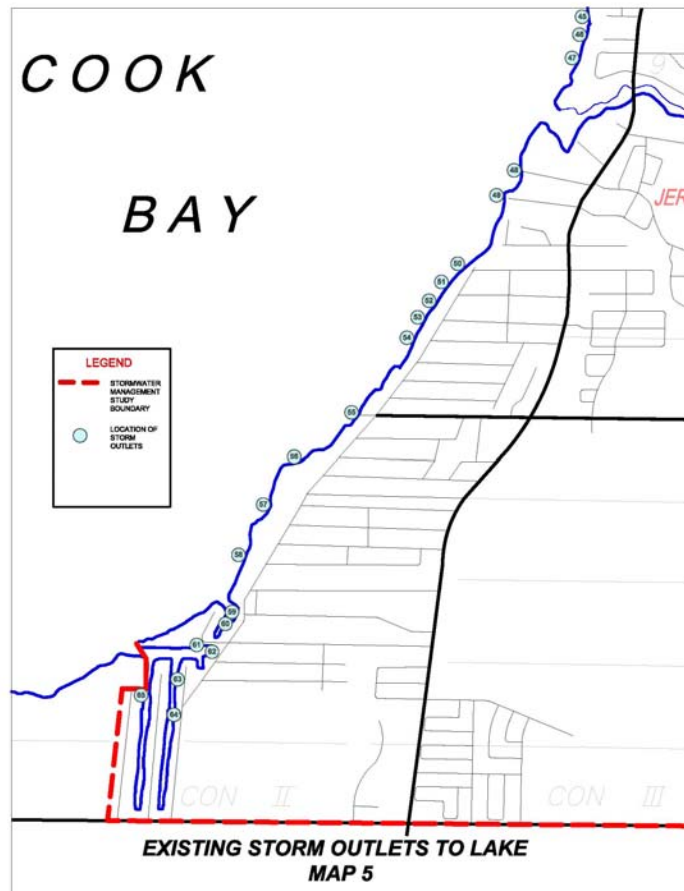


INFRASTRUCTURE



Forty five oil-grit separators have been identified at mostly commercial/institutional properties. All have been inspected. The extent of sediment and oil accumulation in each one has been measured.

Existing Storm Outfalls to L. Simcoe



65 outfalls visited & info. recorded. Several categories of retrofit opportunity identified.

RETROFIT OPPORTUNITIES?



- Lake Drive North
- Oil/Grit Separators?
- Combine several outfalls?



RETROFIT OPPORTUNITIES?



- Many locations
- Enhanced swales?
- Private property issues?

RETROFIT OPPORTUNITIES?



- Few locations
- Municipal property
- SWM Facility?



STAGE 2

TASKS:

- to identify and evaluate potential upgrades to existing SWM facilities and potential sites for additional retrofit facilities.
- to determine how these will contribute to meeting Phosphorus loading targets for Lake Simcoe.
- to identify and evaluate “alternatives” in the Class EA framework & recommend a preferred SWM retrofit plan

STAGE 2

IDENTIFICATION OF POTENTIAL UPGRADES TO SWM FACILITIES

- Two purpose-built “dry” ponds could potentially be retrofit as wet ponds
- Two dry ponds in parks could potentially have underground storage system added



- One or more wet ponds could potentially have a forebay added



STAGE 2

IDENTIFICATION OF POTENTIAL UPGRADES TO SWM FACILITIES

- SWM facilities could have enhanced Phosphorus removal added by filtering effluent through absorptive media



- OGS could have enhanced Phosphorus removal added by inserting purpose-built filter unit

STAGE 2

IDENTIFICATION OF POTENTIAL RETROFITS FOR STORM OUTLETS

- Forty locations where new Oil-Grit Separators (OGS) with enhanced Phosphorus removal technology may be feasible
- Fifteen locations where Enhanced Swales with enhanced Phosphorus removal may be feasible



STAGE 2

IDENTIFICATION OF POTENTIAL RETROFITS FOR STORM OUTLETS

- Seven locations for potential new SWM facilities (either wet ponds or underground storage) at outlet or in upstream drainage area where existing uses would not be impacted
- Eleven locations where new SWM facilities may be feasible with significant impact on existing uses (private beaches/parks)



STAGE 2

ESTIMATION OF PHOSPHORUS LOADING – EXISTING & REDUCED

- Drainage areas & land use identified through GIS for all outlets and existing SWM facilities
- Typical runoff coefficients and event mean concentrations for TP identified for each land use
- SWM removal rates identified for different types of facility
- Annual precipitation of 850 mm for Keswick
- Spreadsheet and GIS used to calculate land use weighted annual loads for each outlet/existing facility
- Various alternative scenarios analysed to find existing and reduced annual Phosphorus loads from study area

STAGE 2

ESTIMATION OF PHOSPHORUS LOADING – EXISTING & REDUCED

- **Alternative 1: Do-Nothing/Existing Conditions** – this is a base condition against which the alternatives are compared.
- **Alternative 2: Standard Retrofits** – this includes upgrading 5 existing stormwater management (SWM) facilities to current design standards.
- **Alternative 3: Enhanced Retrofits** – this includes Alternative 2 upgrades plus enhanced Phosphorus removal for all existing SWM ponds and oil-grit separators. This would be achieved by filtering runoff through a Phosphorus absorbing medium.
- **Alternative 4: Readily Available New Opportunities** – this includes Alternative 3 upgrades plus new Phosphorus removal facilities at or upstream of existing uncontrolled storm runoff outlets where limited permanent and/or temporary disruption of existing uses of the affected space would occur. The types of measures include enhanced swales, enhanced oil-grit separators, sand filters and extended detention wet ponds with enhanced phosphorus removal.
- **Alternative 5: Maximized New Opportunities** – this includes Alternative 4 upgrades plus new Phosphorus removal facilities at or upstream of existing uncontrolled storm runoff outlets where significant, permanent and/or temporary disruption of existing uses of the affected space would occur. The types of measures again include enhanced swales, enhanced oil-grit separators, sand filters and extended detention wet ponds with enhanced phosphorus removal.

STAGE 2

ESTIMATION OF PHOSPHORUS LOADING

Maps show areas serviced by different Alternatives

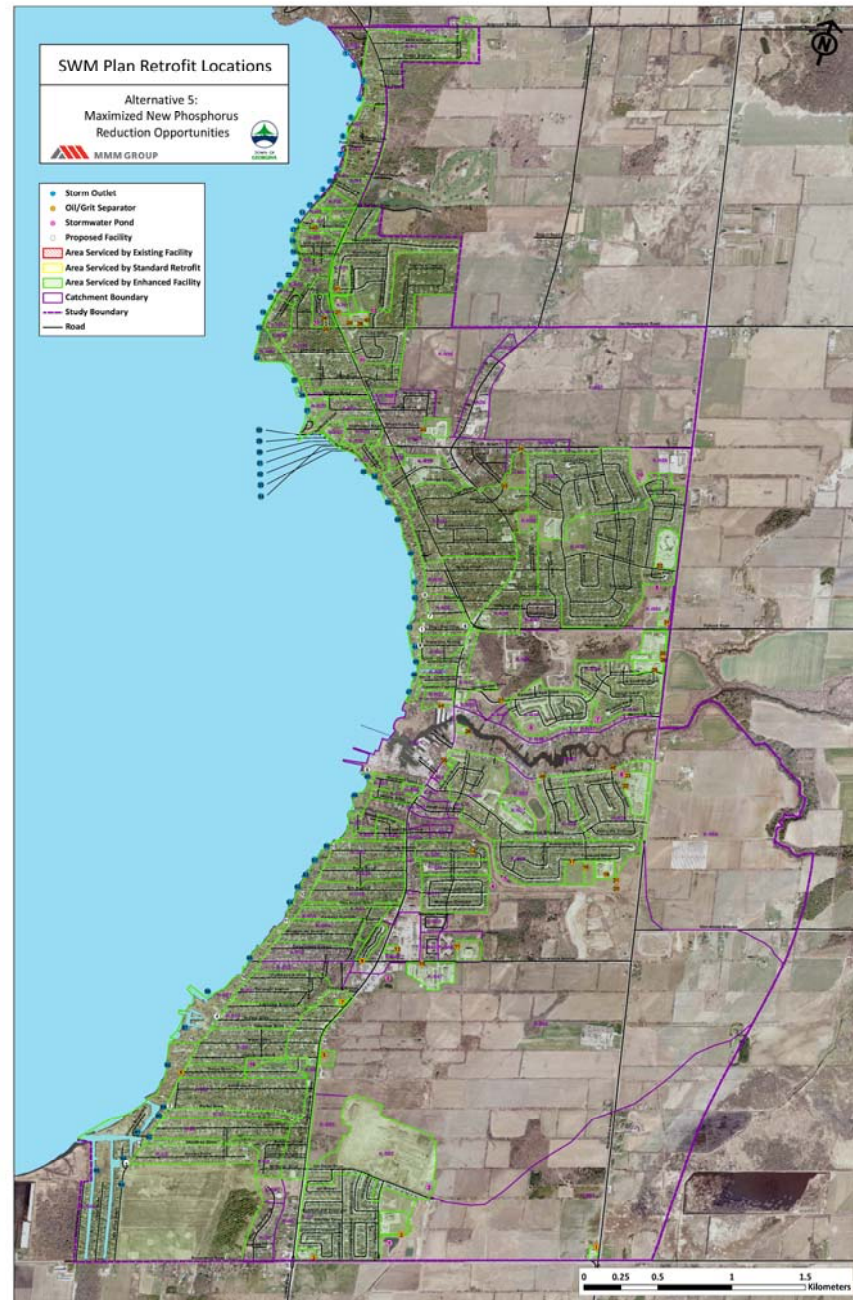
Alternative 1 - 372 Ha.

Alternative 2 - 372 Ha.

Alternative 3 - 372 Ha.

Alternative 4 - 835 Ha.

Alternative 5 - 889 Ha.



STAGE 2

ESTIMATION OF PHOSPHORUS LOADING – EXISTING & REDUCED

ALTERNATIVE SCENARIO	Estimated Annual Phosphorus Loading (kg)	Reduction from “Do-Nothing” Alternative
Uncontrolled Loading from Existing Land Use	1633	n/a
Alternative 1: Do-Nothing/Existing Conditions	1378	0 (0%)
Alternative 2: Standard Retrofits.	1327	51 (4%)
Alternative 3: Enhanced Retrofits	1168	210 (15%)
Alternative 4: Readily Available New Opportunities	729	649 (47%)
Alternative 5: Maximized New Opportunities	632	746 (54%)

STAGE 2

OVERALL EVALUATION OF ALTERNATIVES

Evaluation Factors Considered	Alternatives Evaluated ¹				
	1	2	3	4	5
	Do-Nothing	Standard Retrofits	Enhanced Retrofits	Readily Available New Opportunities	Maximized New Opportunities
Additional Phosphorus Load² Reduction (kg/yr)	0	51	210	649	746
Estimated Capital Cost (\$)	\$0	\$3 million	\$5 million	\$10 million	\$22 million
Degree to Which Alternative Meets Study Goal³	None (0% reduction)	Low (4% reduction)	Medium (15% reduction)	High (47% reduction)	High (54% reduction)
Difficulty of Implementing Alternative⁴	None	Low	Medium	Medium	High
Impact on Community Facilities⁵	None	Low	Medium	Medium	High
Impact of Construction on Natural Environment	None	Low	Low	Medium	Medium
Future Maintenance Requirements⁶	None	Low	Medium	High	High
Construction Impacts (Noise, Dust, Traffic)	None	Low	Medium	High	High
Ranking of Benefit vs Cost/Impact	5th	4th	3rd	1st	2nd

STAGE 2

OVERALL EVALUATION OF ALTERNATIVES

Notes re. Evaluation:

1. Alternatives as per previous list
2. Existing Phosphorus load from lands included in study area is approximately 1633 kg/year
3. Goal is “to improve the quality of storm runoff that discharges to L. Simcoe to contribute to achieving the goals of the Lake Simcoe Protection Plan”
4. Evaluated based upon accessibility, extent to which private lands are affected & must therefore agree to implementation
5. Evaluated based upon level of disruption (either temporary or permanent) of existing uses of affected lands
6. The impact is generally proportional to the number of facilities which are proposed and which eventually have to be maintained by the municipality

Recommended “Preferred Alternative” is No. 4 – enhanced Phosphorus upgrades to existing facilities plus all readily available new opportunities

NEXT STEPS

- Following this PIC, all comments and suggestions will be reviewed and considered.
- The draft Project File Report will be prepared in the next few weeks
- A Notice of Completion will be issued indicating the start of the statutory 30 day review period & how and where the report can be viewed.
- Comments will be dealt with & a final report will be issued & filed with MOE.

Questions?