



LAKE SIMCOE BASIN PRE- TO POST-DEVELOPMENT PHOSPHORUS (P) BUDGET TOOL

Software / Nutrient Management



Phosphorus Budget Tool in Support of Sustainable Development for the Lake Simcoe Watershed

Client: Ontario Ministry of the Environment: Completed 2011.

Lake Simcoe is impacted by nutrients from land use activities in its watershed and has, for many years, been the focus of efforts to protect and restore its water quality. The *Lake Simcoe Protection Act* was passed by the Ontario legislature in 2008 and required establishment of the Lake Simcoe Protection Plan (LSPP). This award-winning Plan was approved in 2009 and includes policies that are intended to restore water quality and other ecological attributes.

This project saw the development of a unique software tool (with documentation) by an Ontario-based team in response to Policy 4.8e of the LSPP, which states:

“An application for major development shall be accompanied by a stormwater management plan that demonstrates...

e.) through an evaluation of anticipated changes in phosphorus loadings between pre-development and post-development, how the loadings shall be minimized.”



MINISTRY OF THE ENVIRONMENT

Lake Simcoe Phosphorus Budget TOOL

Select an Existing Development: P Tool Sample Development

Create a NEW Development VIEW Selected Development

East Holland

MODULE 1: Estimate Pre-Development Load

MODULES 2-3: Estimate Post-Development Load and Add BMPs

MODULE 4: Estimate Construction Phase Load

Project DEVELOPMENT SUMMARY

DATABASE Reference and Release Information V 2.0 Release Update 30-Mar-12 Close Data Application

The “P-Budget Tool” was developed by Greenland and Hutchinson Environmental Sciences. A land use export coefficient approach was used and based on results from calibrated and un-calibrated subwatershed models of the Lake Simcoe Basin. These models were developed previously by Greenland™ using CANWET™. The P-Budget Tool was designed to assess pre- to post-development load conditions, construction phase impacts, and applications of Best Management Practices (or BMPs).

Development: P Tool Sample Development Pre-Development Area (ha): 90.00 Area Excluding WETLAND (ha): 80.00

Subwatershed: East Holland

MODULE 2: Calculate the post-development phosphorus load for the site by selecting a land use from the drop-down list and associated area for each BLOCK. A BLOCK is a unique land use and BMP combination

Land Use	Area (ha)	P coeff. (kg/ha/yr)	P Load (kg/yr)	BMP	Efficiency	BMP P (kg/yr)	Rationale (required)
Forest	5.00	0.10	0.50	NONE	0%	0.500	ELC class of Mixed Deciduous (EIS page 5)
High Intensity - Comm/Industrial	5.00	1.82	9.10	Wet Detention Ponds	85%	1.365	to SWM pond #2 (SWM plan, page 5)
High Intensity - Residential	50.00	1.32	66.00	Treatment Train Approach	88%	7.920	residential housing, infiltration trenches and SWM pond #1 train (SWM plan, page 5)
Low Intensity Development	15.00	0.13	1.95	Treatment Train Approach	88%	0.234	manicured greenspace (park, lawns), infiltration and SWM pond #1 train (SWM plan, page 5)
Open Water	0.50	0.26	0.13	Other	85%	0.019	SWM Pond 2, enhanced efficiency (SWM plan, page 7)

Total Post-Development Area (ha): 90.00 Total Post-Development P Load (kg/yr): 79.85 Review TOTAL Development Summary Total Post-Development P Load with BMPs (kg/yr): 11.33 Potential P Load Reduction with BMPs (%): 85.81%

The P-Budget Tool was intended to standardize the assessment of pre- to post-development phosphorus loadings and encourage Ontario’s development industry to design for phosphorus load reductions in their stormwater management plans. Stakeholder workshops were also completed by the project team.