



Comprehensive Stormwater Management Master Plan Guidelines

Guidelines for the Development and Implementation of Comprehensive Stormwater Management Master Plans in the Lake Simcoe Watershed



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Purpose

Stormwater management is an important part of good watershed stewardship. Changes in land use, especially urbanization, can have a significant impact on watershed hydrology and water quality. In particular, increases in impervious area (such as roofs and parking lots), removal or alteration of natural vegetation, and alteration of the drainage regime can have a dramatic impact on the natural processes that control the movement of stormwater through watersheds. These impacts can include flashier and less predictable flows, altered timing and duration of high and low flow periods, changes in groundwater recharge and reduction in water quality in adjacent waterbodies. For those reasons, the Lake Simcoe Protection Plan (LSPP) sets out specific requirements for the management of stormwater in existing and planned settlement areas, through the preparation of comprehensive Stormwater Management Master Plans (CSWM-MP).

This document provides direction to municipalities on how to prepare and implement CSWM-MPs for settlement areas located in the Lake Simcoe watershed, in accordance with the intent of Policy 4.5-SA of the Lake Simcoe Protection Plan.

Background

The development and implementation of master plans for the settlement areas in the Lake Simcoe Watershed is seen as a key vehicle for meeting the vision and objectives of the Lake Simcoe Protection Plan (LSPP). The master plans will provide direction to municipalities on how the LSPP objectives will be achieved through the effective management of stormwater within existing and expanding settlement areas.

The contribution of the master plans will be particularly relevant to the objectives and policies of the LSPP focused on:

- Reducing loadings of phosphorus and other nutrients of concern to Lake Simcoe and its tributaries
- Reducing discharge of pollutants to Lake Simcoe and its tributaries

The policies of Section 4 of the LSPP call for “comprehensive master plans to improve the management of stormwater for both existing and planned development. Applications for new major development must demonstrate how phosphorus loadings and changes in water balance will be minimized. The MOE have stringent requirements on approvals for new stormwater works and will also review and if necessary, revise existing approvals.”

Policy 4.5-SA of the Lake Simcoe Protection Plan, which provides specific directions on how these master plans will be prepared, states:

Stormwater Management

Within five years of the date the Plan comes into effect, municipalities, in collaboration with the LSRCA, will prepare and implement comprehensive stormwater management master plans for each settlement area in the Lake Simcoe watershed. The stormwater management master plans will be prepared in accordance with the Municipal Class Environmental Assessment and will include:

- A characterization of existing environmental conditions on a subwatershed basis, consistent with any relevant subwatershed evaluations, if available;
- An evaluation of the cumulative environmental impact of stormwater from existing and planned development;
- 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;
- 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;
- 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;
- A description of existing or planned programs for regular maintenance of stormwater management works;
- An identification of the recommended approaches for stormwater management in each settlement area; and
- An implementation plan for the recommended approaches.

The completion of the CSWM-MP is seen as crucial to the successful achievement of many of the other stormwater management policies contained in the LSPP. The policies of Policies 4.6 to 4.12 (stormwater management), 4.20 (construction activity controls), 4.21 (site alteration controls) and Policy 4.24 (implementation of phosphorus reduction measures) are particularly relevant and have been attached as Schedule 1. A matrix showing how this guideline meets the requirements of Policy 4.5 of the LSPP is attached as Schedule 2.

The LSPP requires that all CSWM-MPs will be prepared and implemented by June 2014. Extensions to this deadline can only be granted by the Ministry of the Environment, Central Region, Lake Simcoe Project, in consultation with the LSRCA.

This guideline document sets out the ten steps that will need to be followed by municipalities and identifies related Lake Simcoe Protection Plan policies that should be considered when developing the CSWM-MP in order to achieve the intent of the LSPP.



Step One- Scoping

The municipality will identify the settlement areas in their municipality where the requirements of Policy 4.5 of the LSPP will be applied

Settlement Areas are defined in the LSPP 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”.

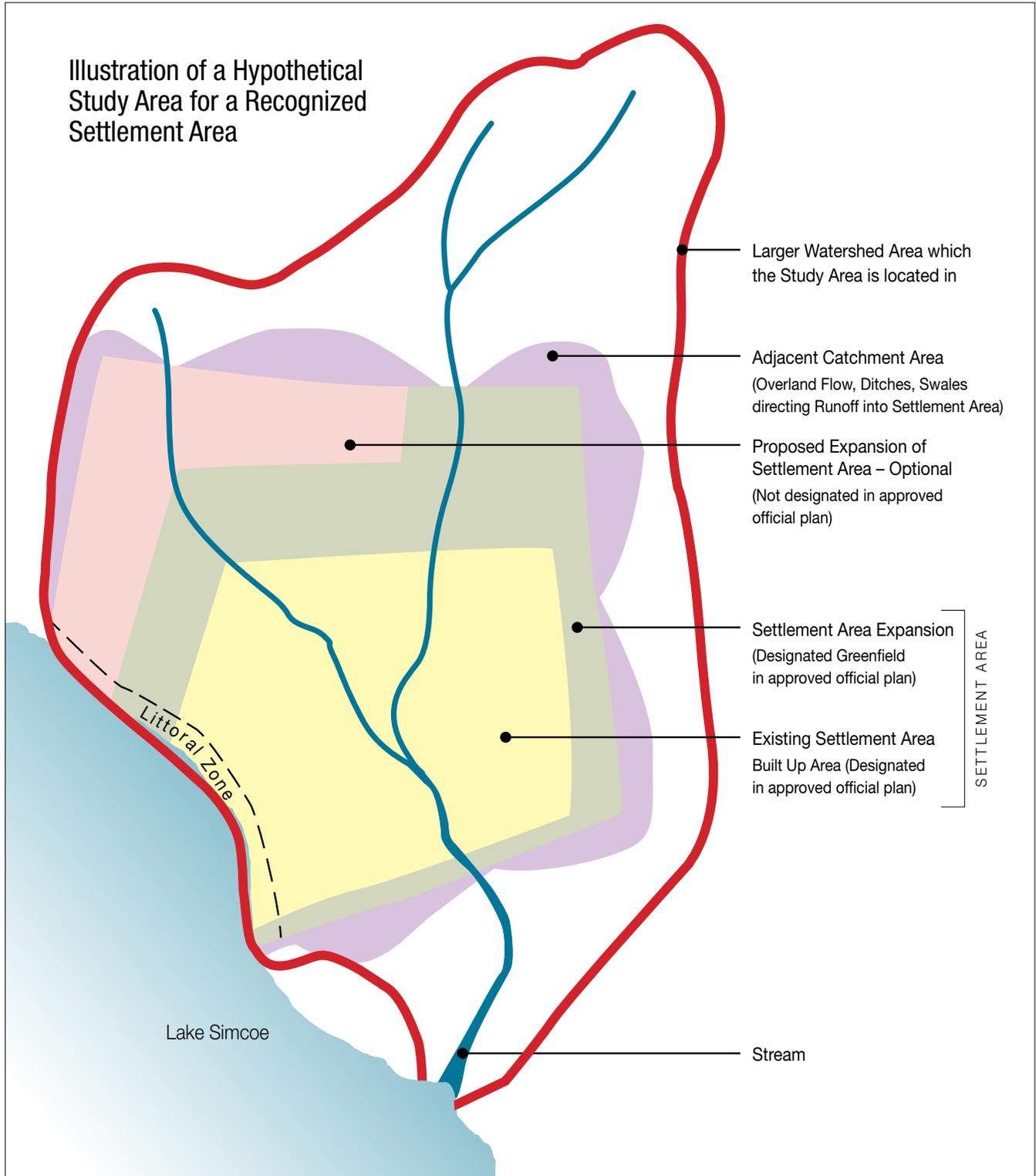
Generally this step requires the municipality to identify areas that correspond to previously defined settlement areas contained in their Official Plan.

Step Two- Determine the Study Area for the Settlement Area

For each settlement area identified in Step One, the municipality shall identify a Study Area, which will include:

- The existing settlement area designated in the official plan of the local municipality, including permanent and intermittent streams and littoral zones more or less enclosed within the settlement area envelope
- Adjacent areas where overland drainage or concentrated flow along ditches or swales will direct stormwater into the settlement area envelope, but not including adjacent permanent or intermittent streams or littoral zones of Lake Simcoe
- The study area may also include additional areas adjacent to the settlement area that are only proposed or contemplated for development by the municipality but not yet approved. However such inclusion will not constitute or imply support for development by the LSRCA or the Province

Illustration of a Hypothetical Study Area for a Recognized Settlement Area



Step Three- Develop a Characterization of the Study Area

For each study area, the municipality shall prepare an evaluation that provides:

- Characterization of the land use and environmental conditions, including a characterization of the watershed and subwatershed in which the CSWM-MP is located
- Relevant policy and regulatory direction
- Previously completed technical studies carried out for the area
- Restrictions and opportunities that may affect the development of the CSWM-MP

Components of the characterization shall include:

Relevant Information or Direction in Policy Documents

- Identification of policy and technical information or directions provided in provincial plans such as the Growth Plan, the Greenbelt Plan, the Oak Ridges Moraine Conservation Plan, the Lake Simcoe Protection Plan or the Provincial Policy statement
- Identification of policy and technical direction contained in relevant provincial and conservation authority guidelines and manuals
- The requirements and directions identified in the Phosphorus Reduction Strategy referred to under Policy 4.24 of the LSPP (See attached as Schedule 1)
- Identification of policy and technical information or directions provided in the regional, county or single tier official plan, local official plan and zoning by-laws
- Identification of policy and technical directions or information provided in regional, county or single tier and local municipal infrastructure plans such as transportation, sewage or water master plans, community servicing plans or park management plans
- Identification of policy and technical information or direction provided in Watershed Plans and Subwatershed Plans prepared by the LSRCA or others
- Identification of Source Water Protection Areas and programs, water conservation and efficiency initiatives, and any restrictions or directions related thereto (Policy 5 of the LSPP)
- Identification of any other regulatory requirements that may need to be addressed as part of the CSWM-MP

Watershed Context

The municipality will describe the role and location of the study area in a watershed context including:

- Mapping showing the location of the study area in its surrounding subwatershed and watershed
- The hydrological role that the study area plays in the watershed context (i.e., headwater area, recharge area, downstream area, etc.)
- The implications of these broader watershed roles for stormwater management and the development of a CSWM-MP
- The location of other settlement areas in other parts of the watershed that may constitute opportunities or limitations in stormwater control
- Direction and recommendations contained in watershed plans and subwatershed plans prepared by the municipality and/or the LSRCA that apply to the settlement area and the preparation of the CSWM-MP

Natural Heritage Information

- Natural cores – key natural heritage features, key hydrological features
- Natural corridors – wildlife movement corridors, where known
- Natural Vegetation Protection Zones
- Restoration Areas as may be identified in provincial policies and plans, official plans, watershed and subwatershed plans, studies prepared by LSRCA, MNR or MOE, etc.

Soil Conditions

- Delineation of soil and or geologic deposits according to texture, fertility, depth to bedrock and drainage conditions

Natural Hazards

- Flood-prone areas
- Areas highly susceptible to erosion
- Areas with high soil instability or compressibility
- Any other known hazard that may pose limitations in the settlement area

Significant Groundwater Features and Functions If Known

- Areas highly vulnerable to groundwater contamination due to high water tables and/or highly porous drainage conditions
- Significant recharge areas
- Significant discharge areas

Surface Water Features and Functions

- Streams (intermittent and permanent)
- Lakes and ponds
- Associated riparian and littoral zones
- Known springs and seepage areas
- Wetlands including swamps, marshes, bogs, and fens
- Significant valleyland systems
- Existing drainage patterns
- Surface water temperature regime if known (i.e., coldwater or warmwater stream)

Known Wellhead and Intake Protection Areas

- Including related policy or development restrictions associated with such areas

Existing Stormwater Management Facilities and Systems

- By location and type, and limits of sewersheds

Areas of Known Environmental Degradation

- For example, polluted groundwater, elevated pollutant concentrations arising from malfunctioning septic systems, areas of accelerated erosion, and so on

Existing Land Uses

Land Use Designations in the Official Plan and Zoning By-law

Areas Requiring Remedial Strategies as Identified in the LSPP and Municipal or LSRCA Studies

Stormwater Facility and System Retrofit Opportunities Previously Identified by the LSRCA or Municipality

- Including, where possible, the design capacity, age, and condition of stormwater management facilities as they relate to the characteristics of the receiving water body such as temperature, total dissolved solids concentration, type of fish habitat, etc.

Potential Land Use Changes

- As portrayed in the Municipal Official Plan and Provincial Plans and Policies

Transportation Network and Related Facilities

- Existing and proposed

Other Utility Corridors

- Existing and proposed, where known

It is intended that the data required for this step in the process will be derived primarily from existing information sources. Some verification of this data may be required through field inspection and/or use of remote sensing techniques

Data Sources

Data must be collected and analyzed at a level considered appropriate for community based studies, which is generally about 1:5000 in scale.

Data will be collected primarily from existing data sources including:

- OBM mapping
- Provincial policies and plans
- Watershed and subwatershed plans
- Official plans and secondary plans prepared at regional, county or area municipal level
- Source water protection studies

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- CA regulations and mapping
 - MNR and CA natural heritage studies, inventories and maps
 - County soil reports
 - Geological Survey of Canada and Ontario Geological Survey mapping
 - Health Unit reports and studies
 - Orthophotography

Much of the information required in this Step can be obtained from LSRCA as demonstrated in Schedule 2. In some cases more detailed data will need to be developed for the characterization of some features or attributes. For example, in most cases provincial and federal soil and geologic mapping will provide sufficient information to identify the hydrological character of soils and parent materials. However, in some communities more refined data may be needed on textural or drainage attributes in order to determine runoff characteristics in more detail. The LSRCA can provide more detailed advice to the municipality on these matters where necessary.

Step Four- Divide the Area into Management Units Where Appropriate

For large settlement areas, or settlement areas with multiple or complex landscape patterns it may be necessary to divide the study area into discrete management units.

Based on analysis of Step Three, the results may show that the study area is better broken into discrete management units that identify groupings of areas with shared characteristics requiring specific stormwater management approaches suited to the soils and topographic conditions. Examples include:

- Large open space areas where landform alteration and vegetation enhancement opportunities exist to ameliorate runoff, increase infiltration, or otherwise manage runoff close to its source
- Drainage areas underlain by relatively pervious soils, where infiltration techniques could be used to enhance infiltration
- Drainage areas underlain by relatively impervious soils, where stormwater management practices could be used to increase surface flow detention and storage

Step Five- Evaluate the Cumulative Environmental Impact of Stormwater from Existing and Planned Development

The municipality will be required to identify and predict the potential impacts of stormwater, nutrient loading and erosion and sedimentation generated by both existing and new development and redevelopment. This requires an assessment of water balance, water quality, and water quantity under a variety of climate and management scenarios, and for the following situations:

- Current conditions
- Post-development conditions that would exist after all proposed development and redevelopment were completed

Municipalities will be required to assess both changes in the hydrologic regime (water balance) and in water quality, particularly phosphorus loadings, and water quantity (flood and erosion control).

Water Balance

Paragraph 6.3 of the LSRCA Watershed Development Policies states that “the SWM plan must make every feasible effort to maintain the pre-development infiltration and evapotranspiration rates and temperatures to the receiving waterbody and watershed”. A water balance assessment may be required as per the MOE’s “Stormwater Management Planning and Design Manual” (March 2003). For example, such an assessment is required if the site is in a recharge area, or an ESA.

The consultant preparing the CSWM-MP should contact LSRCA staff regarding the necessity and required detail of a water balance assessment.

Water Quality

For areas less than 750 ha in size, the unit area load approach (kg/ha/yr) is an acceptable method for estimating phosphorus loads. This method can be employed using a spreadsheet with phosphorus loads based on existing and proposed land use. The municipality should consult with LSRCA regarding the selection of unit area loads appropriate for a given settlement area.

Areas larger than 750 ha in size should be modeled with an appropriate computer simulation tool. A variety of hydrologic and water quality models are available, some of which have been applied in the Lake Simcoe watershed. Municipalities and their consultants should select an appropriate modeling tool based on considerations such as:

- The current size and anticipated level of growth for the settlement
- Current water quality and flow conditions
- The complexity and variability of flow and water quality regimes, both under existing conditions and under future planned development
- Model availability and cost
- Available technical expertise, including past experience in this watershed

These models vary considerably in their complexity, ease of use, and appropriateness for specific issues or water bodies within the Lake Simcoe watershed. The municipality should justify and confirm its choice of model with LSRCA.

Notes:

1. The Ontario Ministry of the Environment is currently developing a phosphorus loading assessment tool that may be appropriate for use in the preparation of CSWM-MPs. It should be noted that this tool is primarily for the development community at the catchment/site specific level, but will help inform the CSWM-MP process.
2. Climate change will have significant implications for the hydrologic regime of the Lake Simcoe watershed, including stormwater. It is recommended that municipalities evaluate a range of possible future climate conditions in Step 5. Look for guidance from the Climate Change Adaptation Strategy in the Lake Simcoe Protection Plan - Policy 7.11.

Water Quantity

Policy 6.4 of the LSRCA's Development Policies states in part that "Stormwater runoff peak flow discharges must be controlled to a minimum of the pre-development levels for all design storm events (i.e., 1:2 year, 1:5 year, 1:10 year, 1:25 year, 1:50 year, and 1:100 year) on the proposed development site, or as specified by an approved master drainage plan or watershed plan". Furthermore, Policy 6.5 states that "A minimum of 24 hour detention of runoff from a 25mm storm shall be required for erosion protection and baseflow maintenance where feasible. The detention time and storage volume requirements may be increased as specified by an approved master drainage plan or watershed plan." Every effort should be made to maintain existing catchment boundaries. Also, an erosion analysis will be required for both existing and future conditions.

Step Six- Determine the Effectiveness of Existing Stormwater Management Systems

In Step Six, the municipality will be required to assess the effectiveness of existing stormwater and drainage systems including individual facilities, inlets and outlets within the study area at reducing the impacts of stormwater on the environment including the:

- Ability to ameliorate flow characteristics of stormwater so that they more closely emulate pre-development conditions that would be anticipated in a natural landscape such as reducing urban peak flows, flooding and in-stream and overland erosion
- Ability to improve water quality of stormwater so it more closely emulates water quality that would be anticipated in a natural landscape, in particular its ability to reduce sediment loads and phosphorus loads

These determinations should be based mainly on information derived in Steps One to Five of this process.

The municipality should also identify areas where there is insufficient information available to assess the condition and or effectiveness of existing stormwater management systems.

Such predictions should take into account that alterations to the hydrologic regime caused by climate change could affect the ability of traditional stormwater management systems to function and alter the vulnerability of existing SWM Practices, including the long and short term impact off:

- More frequent and intense storm events
- More extended and frequent droughts
- More frequent winter thaws
- Earlier spring thaws and associated freshets
- Altered plant communities, including die-outs in some vegetation types, reductions in the densities of some species, and introduction of new possibly less desirable species

At minimum, this assessment should be based on an inventory of the number, location, and age of stormwater management facilities, the original design capacity and intention (i.e., quantity control only, or also quality control), and maintenance history. Ideally, the assessment should be confirmed with field inspection of facilities.

Step Seven- Identify and Evaluate Stormwater Improvement and Retrofit Opportunities

The municipality shall identify stormwater management system improvement or retrofit opportunities that have been:

- Identified in studies prepared by the municipality, LSRCAs or others for areas where stormwater is currently uncontrolled or inadequately controlled, or
- Identified as part of investigations carried out in Steps One to Six of this guideline

These will include but not be limited to:

- Opportunities to retrofit or redesign existing SWM facilities including:
 - Stormwater systems that no longer function to levels of performance they were designed to because of their state of deterioration, inadequate design or lack of regular maintenance
 - Systems that were designed for water quantity control only
 - Systems whose performance could be improved by modifications in design or size
- Stormwater management systems where there is insufficient information to make the assessment described above. In this case the municipality should identify the kinds of assessments and levels of effort that need to be carried out in order to determine improvement and retrofit opportunities
- For each improvement or retrofit opportunity identified, the municipality will need to discuss financial implications such as increased operation and maintenance costs and the challenges of integrating such changes into existing municipal infrastructure servicing plans for the purpose of benefit cost analysis.
- Opportunities to introduce Low Impact Development (LID) techniques as part of new development or redevelopment and the upgrade or replacement of existing transportation, utility or other infrastructure facilities, especially stormwater management or drainage systems. This will include the identification of opportunities for introducing water re-use and water harvesting
- Opportunities to integrate landform alteration and re-vegetation techniques, and LID measures, into the open space elements of the settlement area, especially in school sites and parks next to streams and riparian areas which ameliorate the erosive effects of stormwater flow, remove sediments and nutrients, increase detention time of runoff and enhance infiltration
- Re-evaluation of recommendations provided in current remedial strategies, especially the policies, directions and recommendations contained in official plans, regulations and subwatershed and watershed plans

Each of the opportunities or needs identified above will be evaluated and rated in terms of its feasibility, construction cost, long term maintenance costs and effectiveness in terms of improving water quality and overland flow characteristics to more closely emulate predevelopment conditions, including under altered climate conditions. The consultant and/or municipality should consult the Climate Change Adaptation Strategy developed as per Policy 7.11-SA of the LSPP.

Step Eight- Establish a Recommended Approach for Stormwater Management for the Study Area

Based on the information collected in the previous steps, and as required by Policies 4.7 and 4.8 of the LSPP, the municipality shall develop an overall strategy for stormwater management within the study area that most effectively manages stormwater flow characteristics, water quantity and water quality within the subwatershed. This strategy should include identification of targets and objectives to guide the development of management approaches and techniques employed in each settlement area. Targets should be as specific and quantifiable as possible.

Components of this Strategy should also include:

- In accordance with Phases 1 and 2 of the Municipal Class EA planning process, the strategy will provide a statement of problems, opportunities and alternatives that are being addressed in the strategy. (See Schedule 3 for more information)
- Where warranted, the identification of broad management approaches for the management units identified in Step Four appropriate to the conditions and characteristics of that area
- The identification of specific SWM systems and facilities that should be created or improved in the study area
- The identification of LID techniques that should be promoted as part of any new development, redevelopment, and/or the upgrading or replacement of infrastructure within the study area
- The identification of phosphorus reduction techniques consistent with the direction contained in the Phosphorus Reduction Strategy developed in accordance with Policy 4.24 of the LSPP
- The identification of how the management needs of the watershed plans and subwatershed plans have been addressed in the CSWM-MP, where applicable
- The identification of policies that need to be incorporated into the official plan to ensure the strategies discussed herein are incorporated as part of the overall municipal planning approach. This includes ensuring that specific requirements of Policies 4.7 and 4.8 (see Schedule 1) are specifically included

In accordance with Phase 2 of the Municipal Class EA planning process, the municipality shall identify other alternatives that were considered in the development of the strategy, management approaches, works, techniques and initiatives and justify why the proposed or recommended approach was deemed to be preferable to these alternatives. This will include a discussion of the improvements or benefits of the recommend approach over continuing the status quo. This will be carried out in a manner that meets the requirements of Phases 1 and 2 of the Municipal Environmental Assessment Class EA planning process, attached as Schedule 3.

Step Nine- Develop an Implementation Plan for the Recommended Approaches

An implementation plan is required to determine how the components of the overall strategy identified in Step Eight will be carried out. An implementation plan must include:

- Identification of responsibility, scheduling and potential funding sources for installing, upgrading and maintaining the appropriate stormwater management facilities and LID measures
- Identification of the mechanisms and requirements by which developers and infrastructure agencies will address LID requirements as part of new development, redevelopment, and/or the upgrading or replacement of infrastructure in areas such as school sites, park lands, and other publicly owned lands
- Identification of the means by which recommended LID approaches are communicated to other public agencies such as school boards and the MTO
- Identification of a strategy whereby the municipality will make necessary adjustments or amendments to other servicing plans in place in the municipality including transportation management plans, community servicing plans and park management plans, and work with upper tier municipalities to seek necessary adjustments to infrastructure management plans that they may have in place
- Identification of responsibility, scheduling and potential funding sources for integration of stormwater management practices into public open space planning, design and maintenance
- Identification of responsibility and scheduling for the integration of new maintenance and management practices for improved stormwater management
- Identification of potential funding sources for the establishment of assistance and stewardship programs for private landowners, and identification of potential funding sources for the development of public education programs
- Development of appropriate policies and identification of how and when they will be incorporated into documents such as Official Plans, Secondary Plans, and Development Policies
- Identification of responsibility, scheduling and potential funding for the development and maintenance of an inspection and maintenance program to confirm compliance and effectiveness of the CSWM-MP during construction phase of development or redevelopment (i.e., to assist in meeting policy DP-4.20 of the LSPP)

The implementation plan will also provide an accounting on how the relevant policies of Policy 4 of the LSPP have been met respecting the development and implementation of the necessary stormwater management works. Policies 4.5 to 4.12 and 4.24 to 4.26 are particularly relevant in this regard.

Step Ten- Develop Programs for Inspection and Maintenance of Stormwater Management Facilities

A CSWM-MP must include an inspection and maintenance schedule that is set up to:

- Verify that the works specified in Steps 7, 8 and 9 will be implemented during the construction phase and be maintained throughout the intended life of any works in the manner intended, and
- Determine if the works being carried out are working or will work in the manner intended

This will require the establishment of an inspection and maintenance schedule to:

- Provide for annual reporting of progress made in the implementation of the CSWM-MP, and
- Recommend contingency funding be created for remedial works required to address any problems encountered

These maintenance inspection programs need to be done periodically, based on technologies of the day. Relevant parts of the LSPP include Policies 4.10-DP and 4.11-DP.

Consultation and Approvals

The CSWP-MP will be prepared in accordance with the requirements of the Class EA provisions for Municipal Undertakings and will constitute completion of Phases 1 and 2 of the Municipal Class EA planning process attached as Schedule 3. Individual stormwater management systems, facilities or practices that are identified in the master plan may be required to meet any additional applicable requirements of the Class EA process.

In addition, all SWM systems, facilities and practices flowing from the requirements of the CSWM-MP are subject to required permissions or approvals under relevant regulations under provincial and federal statutes, including the Ontario Water Resources Act, the Environmental Assessment Act, Planning Act, Drainage Act, Fisheries Act, etc.

The CSWP-MP will be prepared by the local municipality and will be confirmed by the municipal Council as meeting the expectation of the LSPP and these guidelines.

The LSRCA has agreed to review the CSWM-MP to confirm that it has met the technical requirements of these guidelines.

This process will include a consultation component whereby the municipality will present the findings of the CSWM-MP to the community and other stakeholders having an interest in the proposed works and actions contained therein. As a minimum, consultation should be provided to present the results of Steps 8 and 9. Consultation sessions can be combined with other consultation venues, for example as may be required under a related matter carried out under the Planning Act.

The CSWP-MP will also be forwarded to the Ministry of the Environment for their consideration in accordance with the requirements of the Municipal Class EA. Ministry of the Environment staff may provide comments or recommendations for modifying the CSWM-MP but will not be approving the document.

Every two years, in consultation with municipalities within the Lake Simcoe watershed, the LSRCA will prepare a progress report to the Province on the preparation and implementation of CSWM-MPs.

The CSWM-MP can be considered completed once the municipality has:

- confirmed that the requirements of the LSPP, Phases 1 and 2 of the Municipal Class EA planning process and these guidelines have been met, and
- completed consultations described above and has addressed any comments or concerns where appropriate

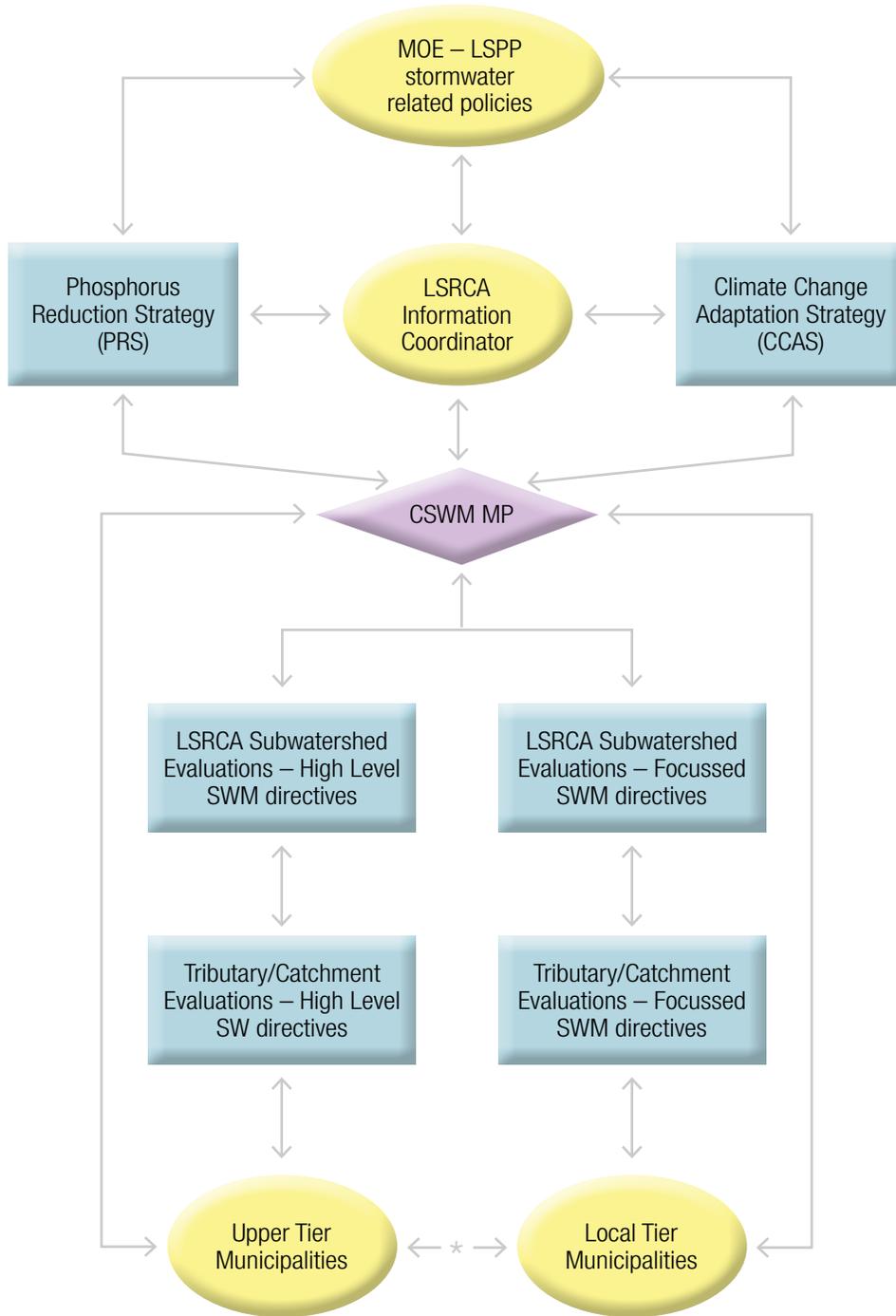
Approvals of New SWM Facilities and Systems Prior to the Completion of the CSWM-MP.

Applications for SWM facilities and systems initiated prior to the completion of these guidelines shall continue to be reviewed and processed in accordance with policies and regulations in place at the time the application was submitted.

Until such time as the CSWM-MP has been completed, applications for SWM facilities and systems initiated after the completion of these guidelines shall be reviewed in accordance with meeting the intent of Policy 4.5 of the LSPP and these guidelines. This includes applications that may have resulted from conditions of development approvals that occurred prior to the completion of these guidelines. In such situations, it is recognized that full compliance with the intent of Policy 4.5 of the LSPP and these guidelines may not be practical given the conditions or limitations posed by the planning approval. In such cases the applicant shall be required to demonstrate best efforts to meet the intent of Policy 4.5 of the LSPP.

The following schematic shows a possible communication sequence for CSWM-MP development.

Draft Conceptual LS CSWM MP Communications Schematic



* Upper Tier and Local Tier CSWM MP relationship needs to be defined

LSRCA and Subwatershed Evaluations

LSRCA will continuously review and update subwatershed evaluations. As more information is gathered on each subwatershed, including tributary and catchment level characteristics, CSWM master planning directives will become better identified.

Roles of the Upper and Local Tier Municipalities

It is suggested the upper tiers be responsible for reflecting all subwatershed and tributary (where available) high level directives within their respective CSWM Master Plans and the local municipalities would then reflect fewer but more focused subwatershed directives (in line with the upper tier high level directives) and more tributary and catchment level focussed directives (in line with the upper tiers' tributary high level directives).

Upper Tier

For example the Upper Tier CSWM MPs should provide broad or general SWM directives such as the use of appropriate LID techniques based on specific subwatershed and tributary level characterizations.

Local Tier

The local tier municipalities would provide more focussed and specific SWM directives (more at the tributary and catchment levels) such as specific LID techniques based on a decision matrix and in harmony with their respective upper tier municipality.

Glossary

Comprehensive Stormwater Management – Master Plan (CSWM-MP) – A comprehensive strategy for the identification and characterization of existing and anticipated environmental conditions, stormwater flows and quality, and management works and practices aimed at reducing the negative impacts of stormwater on the environment, within a given settlement area in the Lake Simcoe watershed. The CSWM-MP must be prepared in accordance with the Municipal Class Environmental Assessment process, and must take into account the cumulative environmental impact of stormwater from existing and planned development, opportunities for retrofit and facility improvements, and the potential impacts of climate change on the effectiveness of stormwater management works.

Littoral Zone – The shoreline environment of a lake or stream, encompassing the shoreline to the high water mark, and permanently-submerged shallow-water areas adjacent to the land.

Low Impact Development – Land use planning, design, construction and operation practices designed to manage stormwater management in such a way as to emphasize conservation and use of on-site natural features and processes to protect water quality and emulate natural runoff characteristics. This approach implements engineered small-scale hydrologic controls to replicate the pre-development hydrologic regime of watersheds through infiltration, filtering, storing, evaporating, and detaining runoff close to its source.

Pre-development Conditions – Water quality and hydrologic characteristics such as runoff rates, stormwater flow patterns and peak flows that would be expected to exist in an undisturbed drainage system dominated by natural vegetation cover.

Stormwater Management – The management of stormwater runoff, which may include:

- The collection and transport of stormwater runoff, including storm sewers and facilities that attenuate the hydrograph and detain or infiltrate stormwater runoff
- Facilities and means to treat and address the quality of stormwater runoff
- Water management facilities that minimize impacts of wave action, flooding, erosion, and bank and valley wall instabilities
- Facilities or structures that affect fisheries, such as fish ladders, wetland operations and maintenance of the above.

Stormwater Management (SWM) Facilities – Discrete structural works designed and built to control stormwater quality and/or flow characteristics such as stormwater ponds, storm sewer pipes, inlets, outflows, etc.

Stormwater Management (SWM) Plan – The selection of best management practices, the specifics for design of control facilities and details of protection measures, and/or the enhancement of rehabilitation programs to meet the stormwater management objectives set by the watershed and subwatershed plan.

Stormwater Management (SWM) Practices – A practice or combination of practices that are the most effective and practical (including technological, economic, and institutional considerations) means of controlling stormwater quality and quantity characteristics targeted in the CWSM-MP.

Stormwater Management (SWM) System – All structural and non-structural works in a defined drainage area intended for the management of stormwater water quality and/or runoff flow characteristics.

List of Acronyms

CA – Conservation Authority

CSWM-MP – Comprehensive Stormwater Management Master Plans

EA – Environmental Assessment

ESA – Environmentally Sensitive Area

Ha – Hectare

Kg – Kilogram

L – Litre

LID – Low Impact Development

LSPP – Lake Simcoe Protection Plan

LSRCA – Lake Simcoe Region Conservation Authority

Mg – Milligram

MNR – (Ontario) Ministry of Natural Resources

MOE – (Ontario) Ministry of the Environment

OBM – Ontario Base Maps

SWM – Stormwater Management

Yr – Year

Schedule 1- Most Relevant Policies of the Lake Simcoe Protection Plan

Stormwater Management

These policies call for comprehensive master plans to improve the management of stormwater for both existing and planned development. Applications for new *major development* must demonstrate how phosphorus loadings and changes in water balance will be minimized. The MOE will place stringent requirements on approvals for new stormwater works and will also review and, if necessary, revise existing approvals.

4.5-SA Within five years of the date the Plan comes into effect, municipalities, in collaboration with the LSRCA, will prepare and implement comprehensive stormwater management master plans for each settlement area in the Lake Simcoe watershed. The stormwater management master plans will be prepared in accordance with the Municipal Class Environmental Assessment and will include:

- 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.

4.6-SA Municipalities are encouraged to implement a stormwater retrofit prior to the completion of a stormwater management master plan if a stormwater retrofit opportunity has been identified as a priority for a *settlement area* and is determined to be economically feasible.

4.7-DP Municipalities shall incorporate into their official plans policies related to reducing stormwater runoff volume and pollutant loadings from *major development* and *existing settlement areas* including policies that:

- a. encourage implementation of a hierarchy of source, lot-level, conveyance and end-of-pipe controls;
- b. encourage the implementation of innovative stormwater management measures;
- c. allow for flexibility in development standards to incorporate alternative community design and stormwater techniques, such as those related to site plan design, lot grading, ditches and curbing, road widths, road and driveway surfaces, and the use of open space as temporary detention ponds;
- d. support implementation of programs to identify areas where source control or elimination of cross connections may be necessary to reduce pathogens or contaminants; and
- e. support implementation of source control programs, which are targeted to existing areas that lack adequate stormwater controls.

4.8-DP An application for *major development* shall be accompanied by a stormwater management plan that demonstrates:

- a. consistency with stormwater management master plans prepared under policy 4.5, when completed;
- b. consistency with subwatershed evaluations prepared under policy 8.3 and water budgets prepared under policy 5.2, when completed;
- c. an *integrated treatment train approach* will be used to minimize stormwater management flows and reliance on end-of-pipe controls through measures including source controls, lot-level controls and conveyance techniques, such as grass swales;
- d. through an evaluation of anticipated changes in the water balance between pre-development and post-development, how such changes shall be minimized; and
- e. through an evaluation of anticipated changes in phosphorus loadings between pre-development and post-development, how the loadings shall be minimized.

4.9-DP Stormwater management works that are established to serve new *major development* in the *Lake Simcoe watershed* shall not be permitted unless the works have been designed to satisfy the *Enhanced Protection* level specified in Chapter 3 of the MOE's "Stormwater Management Planning and Design Manual 2003", as amended from time to time. This policy does not apply if the works are intended to serve an *infill development* or a *redevelopment* within a *settlement area*, it is not feasible to comply with the specified design standard, and the person seeking to establish the works demonstrates that the works incorporate the most effective measures in the circumstances to control the quality and quantity of stormwater related to the *development* or *redevelopment*.

4.10-DP Every owner and operator of a new stormwater management works in the *Lake Simcoe watershed* shall be required to inspect and maintain the works on a periodic basis.

4.11-DP Every owner and operator of a new *priority stormwater management* works in the *Lake Simcoe watershed* shall be required to monitor the operation of works, including monitoring the quality of the effluent from the works, on a periodic basis.

4.12-SA The MOE will review the approvals issued under section 53 of the Ontario Water Resources Act in respect of existing *priority stormwater management works* within the *Lake Simcoe watershed*. If a review of an approval for an existing *priority stormwater management works* determines that the conditions in the approval are inadequate, having regard to the objectives of the Plan, including the conditions related to inspection, maintenance and monitoring, the approval will be referred to the *Director* for the purpose of determining whether an amendment to the approval is necessary to assist in meeting the objectives of the Plan.

4.20-DP Municipalities shall ensure that the following measures are incorporated into subdivision agreements and site plan agreements:

- a. keep the removal of vegetation, grading and soil compaction to the minimum necessary to carry out development activity;
- b. removal of vegetation shall not occur more than 30 days prior to grading or construction;
- c. put in place structures to control and convey runoff;
- d. minimize sediment that is eroded offsite during construction;
- e. seed exposed soils once construction is complete and seasonal conditions permit;
and
- f. ensure erosion and sediment controls are implemented effectively.

4.21-HR *Site alteration* in the *Lake Simcoe watershed* shall be undertaken in a manner that incorporates the measures set out in policy 4.20.

Phosphorus Reduction Strategy

In order to achieve the ambitious reductions in phosphorus loadings proposed in the Plan, there is a need to reduce loadings from all sources that contribute to excess phosphorus throughout the watershed. The following policies recognize this need by requiring the development of a phosphorus reduction strategy for the *Lake Simcoe watershed*, which will support a phased, coordinated and adaptive management approach to reducing excess phosphorus loadings. These policies also consider the need for innovative solutions to reducing phosphorus, like the proposal to conduct a feasibility study to determine the effectiveness of a *water quality trading* program in the watershed.

4.24-SA Within one year of the date the Plan comes into effect, the MOE, in collaboration with other Provincial ministries, the First Nations and Métis communities, the LSRCA and municipalities will develop a Phosphorus Reduction Strategy for the *Lake Simcoe watershed* for the purpose of reducing phosphorus loadings to achieve the target of *dissolved oxygen* of 7 mg/L. The Strategy will be designed to accommodate the implementation of the Growth Plan for the Greater Golden Horseshoe, where relevant. The components of the Phosphorus Reduction Strategy will include:

- a. the development of subwatershed phosphorus loading targets;
- b. if determined to be necessary, the development of phosphorus loading targets for specific areas of Lake Simcoe, including individual targets for Kempenfelt Bay, Cook's Bay, and the main basin;
- c. an assessment of sources or sectors that contribute phosphorus loadings to the watershed, including:
 - i. *sewage* treatment plants,
 - ii. tributary sources,
 - iii. *subsurface sewage systems*,
 - iv. stormwater runoff, and
 - v. sources of atmospheric deposition;
- d. an identification of practical and effective actions that should be taken to address each source or sector assessed under sub-paragraph c;

-
- e. the proposal of a long-term total phosphorus loading cap for each *sewage treatment plant in the Lake Simcoe watershed*. These long-term phosphorus loading caps will be integrated and consistent with phosphorus loading goal established in the Plan and targets referred to under sub-paragraph a. and b., and will consider the following:
 - i. detailed evaluations of treatment efficiency, flow capacity and economic feasibility in achieving various effluent limits,
 - ii. flow capacity needed to accommodate the population and employment growth allocated to the areas serviced by a *sewage treatment plant*,
 - iii. minimum standards for phosphorus removal, and
 - iv. timelines required for achieving compliance with the new loading caps;
and
 - f. an examination of how effluent re-use opportunities in the *Lake Simcoe watershed* may contribute to reducing phosphorus loadings to achieve the *dissolved oxygen* target of 7 mg/L.

Water Supply

The policies below will support the maintenance of adequate flows required to maintain healthy aquatic ecosystems in the *Lake Simcoe watershed*.

5.1-SA The MOE and the MNR will develop in-stream flow targets for water quantity stressed subwatersheds in collaboration with LSRCA. This includes the development of targets for in-stream flow regimes and water extraction limits for the Maskinonge River subwatershed within two years of the date the Plan comes into effect. The targets will build on watershed information and assessments developed through Drinking Water Source Water Protection Program (Clean Water Act, 2006) and will consider the potential impacts of climate change and will be used to inform future strategies related to water taking. These strategies may lead to policies that:

- a. require the development of targets for all other subwatersheds, and set out how much water can be allocated among users in a subwatershed, including setting aside an allocation to support the natural functions of the ecosystem;
- b. specify requirements on the Directors when issuing or amending Permits To Take Water in that subwatershed; or
- c. address climate change adaptation for water taking in the watershed.

5.2-SA The LSRCA, in partnership with municipalities, will complete *Tier 2 water budgets* for all subwatersheds that have not been completed in the assessment report required under the Clean Water Act, 2006 for the Lake Simcoe and Couchiching/Black River Source Protection Area. Priority should be given to all stressed subwatersheds identified in Policy 5.1, where *Tier 2 water budgets* have not been completed under the Clean Water Act, 2006. The water budgets may be used to inform:

- a. municipal water conservation and efficiency plans, including those prepared under Policy 5.3 and municipal decisions concerning growth and *development*;
- b. water-taking strategies prepared under Policy 5.1 and decisions made by the Director concerning Permits To Take Water;
- c. the identification of significant groundwater recharge areas identified in Policy 6.36-DP of this Plan; or
- d. policies that would be included in future amendments to the Plan.

Water Conservation and Efficiency

The policies below will promote greater efforts to conserve and use water more efficiently throughout the Lake Simcoe watershed.

5.3-SA Within five years of the date the Plan comes into effect, the municipalities of Barrie, Orillia, New Tecumseth, Bradford West Gwillimbury, Innisfil, Oro- Medonte and Ramara will prepare and begin implementation of a water conservation and efficiency plan, that has regard to the recommended standards and practices for the municipal sector including those recommended by the Ontario Water Works Association. A water conservation and efficiency plan will, at a minimum:

- a. establish targets for water conservation and/or efficiency with timeframes for achieving these targets;
- b. identify and evaluate:
 - i. water conservation measures such as improved management practices, the use of flow-restricting devices and other hardware, water reuse and recycling, and practices and technologies associated with water reuse and recycling,
 - ii. water conservation incentives such as full-cost pricing, and
 - iii. methods for promoting water conservation measures and water conservation incentives, including public education and awareness programs for rural residents not served by a municipal water supply system;

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- c. analyze the costs and benefits of the measures described in clause (a);
 - d. require the use of specified water conservation measures and incentives;
 - e. contain an implementation plan for those specified measures and incentives that reconciles the demand for water with the water supply;
 - f. provide for monitoring and reporting of the effectiveness of the conservation plan and achievement of water conservation and/or efficiency targets; and
 - g. consider the potential impacts of climate change.

5.4-SA The MAFRA, in cooperation with key stakeholders, will assist and encourage water conservation and efficiency efforts in the agricultural community through stewardship programs aimed at promoting the adoption of best management practices. Specific opportunities may include:

- a. education and outreach under the Environmental Farm Plan other *Lake Simcoe watershed*-focused programs, and related cost-share support to implement agricultural water conservation and efficiency best management practices; or
- b. in stressed subwatersheds, where adoption of individual best management practices through the Environmental Farm Plan does not address agricultural water supply challenges, investigation of a strategic approach to water supply planning to identify communal infrastructure, other stewardship programs, or cost-share and partnership opportunities, as appropriate.

5.5-SA The MOE will work with other water use sectors, such as the major recreational use sector and other commercial and industrial sectors, in the Lake Simcoe watershed to encourage the development and implementation of water conservation and efficient use practices for their sector.

5.6-DP An application to establish or expand a major recreational use shall be accompanied by a recreation water use plan that demonstrates:

- a. water use for maintenance or snow-making or both are kept to a minimum;
- b. grassed, watered and manicured areas are limited to sports fields surfaces, golf fairways, tees and greens, and landscaped areas around buildings and structures; grass mixtures that require minimal watering and upkeep will be used for sports fields and golf fairways where applicable;
- c. crossings of intermittent and permanent streams are kept to a minimum;
- d. water-conserving technologies (such as low-flow toilets and shower heads) are used in clubhouses and restaurants where applicable;

-
- e. water-conserving technologies (such as timed irrigation systems designed to reduce evaporation losses, and recycling of water from under greens) are used in the irrigation and watering of sports field surfaces, golf fairways, tees and greens, and landscaped areas around buildings and structures, where applicable;
 - f. other water conservation technologies (such as rainwater harvesting or reuse of stormwater) will be used to reduce water use; and
 - g. stormwater treatment facilities are used to capture and treat runoff from areas with impervious surfaces.

Climate Change Adaptation Strategy

7.11-SA Within two years of the date the Plan comes into effect, the MOE, in collaboration with the MNR, the MAFRA, the First Nations and Métis communities, the LSRCA, municipalities, and interested academic institutions, will develop a climate change adaptation strategy for the *Lake Simcoe watershed*. The climate change adaptation strategy will identify key recommended adaptation actions needed to increase the resiliency of the *Lake Simcoe watershed* to the impacts of climate change; identify roles and responsibilities for relevant parties; and identify potential amendments to the Plan to ensure the recommended actions are undertaken. As new information becomes available, the strategy will be amended, as necessary.

To support the development and implementation of the strategy, at a minimum, the following tasks will be undertaken by the MOE and collaborators specified above:

- a. assess and evaluate the risk of climate change impacts on the watershed;
- b. promote, conduct and support additional research to better understand the impacts of climate change in the watershed, including impacts on *wetlands*, aquatic life, terrestrial species and ecosystems, headwaters, conservation of life cycles, ground-water temperature, and water table levels;
- c. develop an integrated climate change monitoring program to inform decision making and model the impacts of climate change on the watershed; and
- d. begin the development of climate change adaptation plans and promote the building of a Lake Simcoe watershed community of practice in adaptation planning.

Subwatershed Evaluations

8.1-SA Within one year of the date the Plan comes into effect, the MOE and LSRCA in collaboration with other ministries, the First Nations and Métis communities, watershed municipalities, the *Lake Simcoe Coordinating Committee* and the *Lake Simcoe Science Committee* will develop guidelines to provide direction on:

- a. identifying sub-lake areas and subwatersheds of the Lake Simcoe watershed and determining which sub-lake areas and subwatersheds are of priority;
- b. preparing subwatershed evaluations including, where appropriate, developing subwatershed-specific targets and recommending actions that need to be taken within subwatersheds in relation to:
 - i. the phosphorus reduction strategy (Chapter 4),
 - ii. stormwater management master plans, including consideration of the amount of impervious surfaces within subwatersheds (Chapter 4),
 - iii. water budgets (Chapter 5),
 - iv. instream flow regime targets (Chapter 5),
 - v. preventing invasive species and mitigating the impacts of existing invasive species (Chapter 7),
 - vi. natural heritage restoration and enhancement (Chapter 6),
 - vii. increasing public access (Chapter 7), and
 - viii. climate change impacts and adaptation (Chapter 7);
- c. monitoring and reporting in relation to subwatershed targets that may be established; and
- d. consultation to be undertaken during the preparation of the subwatershed evaluations.

8.2-SA In developing the guidance outlined in 8.1, the partners identified above will develop approaches to undertake the subwatershed evaluations in a way that builds upon and integrates with source protection plans required under the Clean Water Act, 2006, as well as relevant work of the LSRCA and watershed municipalities.

8.3-SA Within five years of the date the Plan comes into effect, the LSRCA in partnership with municipalities and in collaboration with the MOE, MNR, and MAFRA will develop and complete subwatershed evaluations for priority subwatersheds.

Schedule 2- Provisions for Comprehensive Stormwater Master Planning Under the Lake Simcoe Protection Plan – Matrix

For further clarification regarding this matrix, please contact the LSRCA.

Policy 4.5 SA of the LSPP	Components	Possible Existing Sources of Data	Availability of Data	Core Requirement Of SWM Master Plan	Work Required for SWM Master Plan (for Settlement Area only)
		WP – Watershed Plan SWP – Sub Watershed Plan SP – Secondary Plan Studies DWSWP – Drinking Water Source Water Protection Studies ORMCP – Oak Ridges Moraine RS – SWM Retrofit Strategy S – Specific Source (name) REG – CA Regulation Mapping N/A – Not applicable/available	Y – Yes N – No P – Partial MA – Macro Scale Only	Y – Yes N – No I - Include if available	Y – Yes N – No
Policy 4.5 SA of the LSPP Within five years of the date the Plan comes into effect, municipalities, in collaboration with the LSRCA, will prepare and implement comprehensive stormwater management master plans for each settlement area in the Lake Simcoe watershed. The stormwater management master plans will be prepared in accordance with the Municipal Class Environmental Assessment and will include:					
a. A characterization of existing environmental conditions on a subwatershed basis, consistent with any relevant subwatershed evaluations, if available;	Natural Heritage	WP, SWP, SP, REG		Y	
	Natural Hazard	SP, REG		Y	
	Groundwater Vulnerability	DWSWP		I	
	Groundwater Recharge Discharge	S (LSRCA ESA)		I	
	Well head and Intake protection zones	DWSWP		I	
	Watercourses/Water Bodies	REG		Y	
	Wildlife Assessment including corridors	SP		I	
	Significant Valley Lands	S (Region or County)		I	
	Regionally Significant Forests	S (Region or County)		I	
	Storm Water Quality and quantity	SWP, SP, S (LSRCA – MOE)		Y	
	Inventory of SWM Facilities	RS		Y	
	Agricultural lands	S (OMAFRA)		Y	
	Land use and zoning	S (Municipality), ORMCP		Y	
	Transportation Network	S (Municipality)		Y	
	Municipal and Private Services	S (Municipality)		Y	
Utility corridors	S (Municipality)		Y		
b. An evaluation of the cumulative environmental impact of stormwater from existing and planned development;	Peak Flow Modelling of existing and future conditions	SWP, S (LSRCA)		Y	
	Phosphorus Loads, existing and future conditions – Unit Area Loads	SWP, S (LSRCA MOE)		Y	
	Water Budget – Pre and Post	DWSWP		Y	
	Erosion Analysis of existing and future conditions	N/A		Y	

Policy 4.5 SA of the LSPP	Components	Possible Existing Sources of Data WP – Watershed Plan SWP – Sub Watershed Plan SP – Secondary Plan Studies DWSWP – Drinking Water Source Water Protection Studies ORMCP – Oak Ridges Moraine RS – SWM Retrofit Strategy S – Specific Source (name) REG – CA Regulation Mapping N/A – Not applicable/available	Availability of Data Y – Yes N – No P – Partial MA – Macro Scale Only	Core Requirement Of SWM Master Plan Y – Yes N – No I - Include if available	Work Required for SWM Master Plan (for Settlement Area only) Y – Yes N – No
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;	Quality and Quantity Sensitivity analysis looking at existing SWM effectiveness and then factoring in a number of assumptions regarding climate change	SWP		Y	
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;	Examination of Existing Retrofit strategies developed by the municipality and / or LSRCA	RS		RS	
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;	Update Retrofit Strategy (if one already exists)	RS		I	
	Development New Retrofit Strategy (if none exists)	RS		Y	
f. A description of existing or planned programs for regular maintenance of stormwater management works;	SWM facility maintenance program	RS		Y	
g. An identification of the recommended approaches for stormwater management in each settlement area;	Recommendations (and basic requirements) for site specific studies	SP		Y	
	Limits of development (as defined in official plan or secondary plan)	SP, S (Official Plan)		Y	
	Natural Heritage Areas to be protected	SP		Y	
	Natural Heritage Areas to be enhanced	SP		I	
h. An implementation plan for the recommended approaches.	Recommended policies	SP		Y	
	Public consultation / education	SP		Y	
	Recommended Amendments to Official Plans	SP		Y	
	SWM Standards, SWM Retrofit Strategies	SP, RS		Y	
	Identify Sources of funding	N/A		Y	

Schedule 3- Relevant Excerpts from the Planning Process for the Municipal Environmental Assessment – Class EA Process

FIVE PHASE CLASS EA PLANNING PROCESS

The main elements of the Class EA planning process are incorporated in the following five phases:

	PHASE 1		PHASE 2		PHASE 3		PHASE 4		PHASE 5
	Problem or Opportunity	➔	Alternative Solutions	➔	Alternative Design Concepts for Preferred Solution	➔	Environmental Study Report	➔	Implementation
Consultation Requirements	Optional		Mandatory		Mandatory		Mandatory		Optional

In brief, the phases may be summarized as follows:

Phase 1	Identify the problem (deficiency) or opportunity .
Phase 2	Identify alternative solutions to address the problem or opportunity by taking into consideration the existing environment, and establish the preferred solution taking into account public and review agency input . At this point, determine the appropriate Schedule for the undertaking (see Appendix 1) and document decisions in a Project File for Schedule B projects, or proceed through the following Phases for Schedule C projects.
Phase 3	Examine alternative methods of implementing the preferred solution , based upon the existing environment, public and review agency input, anticipated environmental effects and methods of minimizing negative effects and maximizing positive effects.
Phase 4	Document, in an Environmental Study Report a summary of the rationale, and the planning, design and consultation process of the project as established through the above Phases, and make such documentation available for scrutiny by review agencies and the public.
Phase 5	Complete contract drawings and documents, and proceed to construction and operation; monitor construction for adherence to environmental provisions and commitments. Where special conditions dictate, also monitor the operation of the completed facilities.

The planning and design process shall be undertaken in such a way as to allow a reviewer to trace each step of the process. In particular, the documentation should explain the reasons for the criteria used to identify and assess the alternatives, the proponent's weighing of these criteria and the decision making process followed.

To ensure that the planning and design process is easily traceable, the proponent shall ensure that:

- the analysis is understandable to the reasonable lay observer;
- all conclusions drawn from the analysis follow logically from the information gathered and presented; and
- a reasonable lay observer is able to replicate the conclusions based on the information presented.

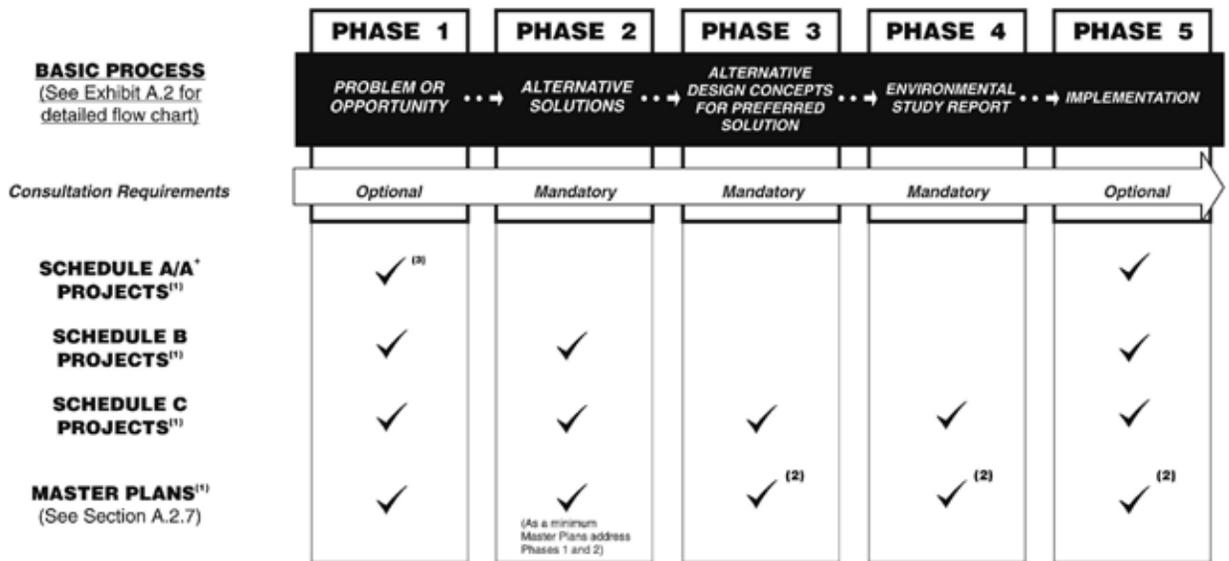
The main phases and their application to single projects or Master Plans are identified in Exhibit A.1. The steps in each phase are identified in the Flow Chart, Exhibit A.2, which illustrates the process followed in the planning and design of projects covered by this Class EA. The flow chart incorporates the steps considered essential for compliance with the requirements of the EA Act, which are discussed commencing in Section A.2.2.

It should also be noted that the process outlined in the following sections is not necessarily sequential. It can be an iterative process whereby the results of one step may necessitate re-evaluation of a previous step.

Exhibit A.1 - Key Features of The Municipal Class EA

EXHIBIT A.1 KEY FEATURES OF THE MUNICIPAL CLASS EA

NOTE: This flow chart is to be read in conjunction with Part A of the Municipal Class EA



NOTES:

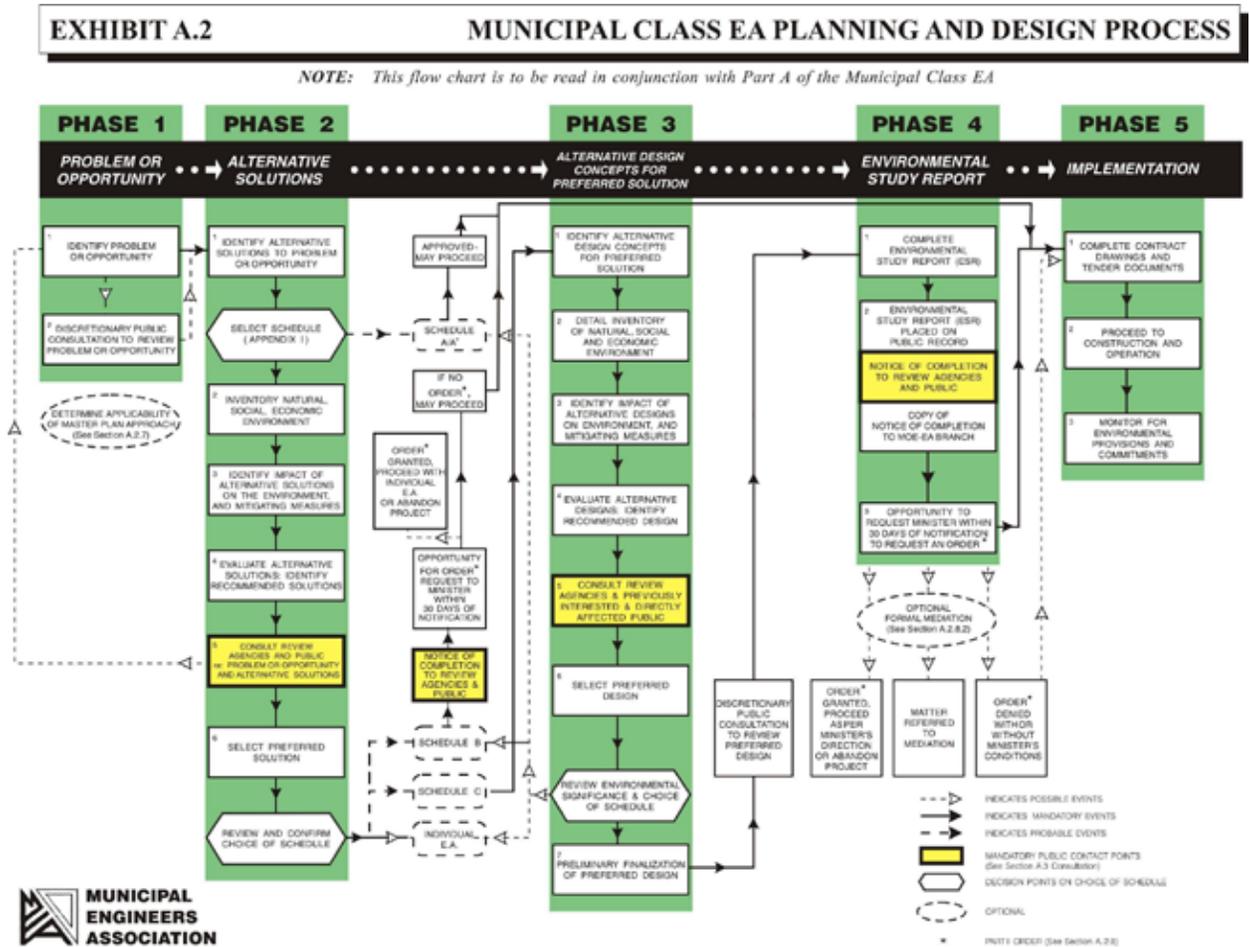
✓ Actions required during relevant phase

(1) Schedule A, A*, B and C projects and Master Plans can also be integrated with the requirements of the Planning Act (See Section A.2.9)

(2) Complete Phases 3 and 4 for any Schedule C projects included in the Master Plan prior to implementation

(3) For Schedule A* projects, public to be advised. See Section A.1.2.2.

Exhibit A.2 - Municipal Class EA Planning and Design Process



Level of Complexity

The following sections describe the planning process in this Class EA. It is important, however, to recognize that there is flexibility within the process to be responsive to specific project and consultation needs, while ensuring that the requirements of the Class EA are met.

Level of complexity or sensitivity can relate to the nature of the problem or opportunity being addressed, the level of investigation required to assess alternatives and environmental effects, and public and agency issues and concerns. The level of complexity may affect the selection of the project schedule, and the scope of each phase in the Class EA process as well as the need to revisit steps in the process. **The level of complexity will therefore affect the manner in which a project proceeds through the process.**

The complexity of a project is based on many components, including environmental effects, public and agency input and technical considerations, and how these interrelate on a specific project. **Accordingly, the determination of complexity (and its ongoing assessment) requires sound professional judgement, is an inherent function of the management of a project and, is the responsibility of the proponent.**

Given the varying levels of complexity, the divisions amongst Schedules A, B and C projects are therefore often not distinct. For example, a Schedule B project with many issues and broad community interest could approach the complexity of a Schedule C project. As a result, some proponents may choose to follow the process for a Schedule B, while others may decide to follow the process for a Schedule C. **While the Class EA document defines the minimum requirements for environmental assessment planning, the proponent is responsible for “customizing” it to reflect the specific complexities and needs of a project.**

The foregoing should be considered not only at the outset of project planning but as one proceeds through the process and reviews and confirms the project schedule.

All activities undertaken in the planning process must be documented and records maintained in a form which can be presented to the public for review. However, the proponent need only gather and document information which is likely to have a direct bearing on impacts and mitigating measures. The level of detail of the information to be inventoried should reflect the potential severity of the impacts predicted.

Lastly, it should also be noted that the process outlined in the following sections is not necessarily sequential. It can be an iterative process whereby the results of one Step may necessitate reevaluation of a previous Step.

Phase 1 - Problem or Opportunity

Step 1	<p>Identification and description of the problem or opportunity. Municipalities generally undertake projects in response to certain identified problems or deficiencies. On the other hand, there may be opportunities which need to be addressed. These problems or opportunities may or may not be obvious to the public but it is necessary to document factors which lead to the conclusion that an improvement or change is needed. Earlier studies or reviews undertaken by the proponent may be available to assist in defining the problem. This phase should therefore lead to the development of a clear statement of the problem or opportunity being addressed.</p> <p>From the problem statement, a project will be developed. In assessing the magnitude and extent of a problem therefore the scope of the project, it is important that the projects, and not be broken down, or piecemealed, into component parts or phases, with each part being addressed as a separate project. If the component parts are dependent on each other, then all of the components must be combined and dealt with as a single project.</p>
Step 2	<p>Discretionary Public Consultation. For projects which are expected to generate considerable public interest or controversy, the proponent may find it advantageous to introduce a discretionary Step 2 and commence the public consultation process in order that the public may be involved at this stage in defining the problem and formulating the problem statement.</p>
Optional	<p>Prior to commencing the study, or during the course of defining the problem or opportunity, it may become apparent that a Master Plan approach is appropriate, or co-ordination with the Planning Act is beneficial. These are discussed in Sections A.2.7 and A.2.9 respectively.</p>

Phase 2 - Alternative Solutions

The procedures outlined in Phase 2 will lead the proponent to the conclusion that the project:

- is pre-approved (Schedule A or A+);
- is approved subject to Screening (Schedule B);
- is subject to the full Five Phase Planning Process (Schedule C); or,
- should proceed through an Individual Environmental Assessment.

Project schedules are provided in Appendix 1.

The planning process in Phase 2 will involve the following Steps:

Step 1	<p>Identification of alternative solutions to the problem. There is usually more than one way to solve a problem.</p> <p>All reasonable and feasible solutions shall be identified and described.</p> <p>At the conclusion of Step 1, the proponent is usually able to establish whether the project falls under Schedule A/A+ or not. This is the first Schedule decision point and the proponent is presented with the following alternatives:</p> <p>The proponent may arrive at the conclusion that the solution is an activity which falls under Schedule A or A+ and is therefore pre-approved. The proponent may therefore proceed to implement the project without any further environmental assessment while recognizing the obligation to minimize environmental impacts while doing so. The problem identified in Phase 1 will be considered to have been resolved.</p> <p>Should the proponent decide that a project which would normally fall under Schedule A is likely to have significant environmental impacts, then the project should be planned under Schedule B or C.</p> <p>Alternatively, the proponent may decide that the solution to the problem will result in a project which will fall under Schedule B or Schedule C, in which case the proponent shall continue to plan the project through the following Steps.</p> <p>These are preliminary decisions, however, and depending on the nature and complexity of the project may need to be reviewed and confirmed at later points in Phases 2 and 3.</p> <p>In some cases, the proponent may conclude not to continue with the project, for example, should the project have significant environmental effects which are not mitigable.</p>
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Step 2	<p>Preparation of a physical description of the area where the project is to occur, and a general inventory of the natural, social and economic environments which are to be considered when reviewing the effects of a project in that area.</p>
Step 3	<p>Identification of the magnitude of the net positive and negative effects of each alternative solution in Step 1, with respect to the environmental factors identified in Step 2. Identify mitigating measures.</p>
Step 4	<p>Evaluation of all reasonable alternative solutions, identified in Step 1, taking into consideration the environmental and other factors identified in Steps 2 and 3.</p> <p>For projects which are relatively straightforward and uncontroversial this Step may lead to the preliminary identification of a recommended solution which should be conveyed to the public and the review agencies in the following Step 5. This has the advantage that reviewers will have a better idea of the proponent's preliminary conclusions and will allow reviewers to focus their attention on the recommended solution.</p> <p>It is important that the recommended solution not be presented as a decision but as a preliminary preference based on a rational evaluation of available information. Public input is necessary and important at this point to assist the proponent by providing additional information, in reviewing the evaluation and in arriving at the best decision.</p>
Step 5	<p>Consultation with review agencies and the public to solicit comment and input. By making interested parties aware of the information gained to this point in the process, including the problem or opportunity, the environmental considerations to be addressed during the evaluation of alternatives, the alternative solutions being considered and their impact on the environment, and the evaluation itself, other pertinent factors may come to light. The notification may also include the proponent's recommended solution, as outlined in Step 4 above. (See Section A.3 Consultation and Appendix 3, Screening Criteria, for further details.) This is the first mandatory point of contact with the public.</p>
Step 6	<p>Selection or confirmation of the preferred solution to the problem or opportunity taking into consideration input and comment received from the review agencies and the public and after evaluation of the net environmental effects of the various alternatives. Depending on the situation, the preferred solution may involve a combination of alternative solutions rather than a single outcome.</p>