



**A WORKPLAN TO FULFILL THE WATERSHED PLANNING REQUIREMENTS OF
THE OAK RIDGES MORaine CONSERVATION PLAN REGULATION
(O. Reg. 140/02)**

Part 1 – Final - Revised – December 16, 2003
Part 2 – Final – December 16, 2003



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COMMITMENT TO A WATERSHED PLANNING PARTNERSHIP

The watershed planning requirements of the *Oak Ridges Moraine Act and Conservation Plan (ORMCP) Regulation* (O.Reg. 140/02) represent an opportunity to strengthen a long-established watershed management partnership between the Regional Municipality of York and its two conservation authorities. The ORMCP (s. 24) requires York Region to:

- initiate the preparation of watershed plans by April 22, 2003 for each of its watersheds whose streams originate within York Region;
- incorporate the watershed plan's requirements into the Region's Official Plan;
- complete the watershed plans and ensure all major development conforms with the plan, before approving any major development application that is commenced on or after April 23, 2007; and
- complete a water budget and conservation plan, demonstrating that the water supply required for major development is sustainable, before approving any major development application that is commenced on or after April 22, 2004 for areas serviced by the Yonge Street aquifer.

Watershed planning has been an activity that the Lake Simcoe Region Conservation Authority (LSRCA) and the Toronto and Region Conservation Authority (TRCA) have carried out in partnership with York Region, their other member municipalities, and watershed communities for a number of years. As a result, watershed plans have been initiated on all watersheds within York Region. Their status of completion varies depending on watershed.

Based on the considerable foundation of available watershed information and the expertise in watershed planning, LSRCA and TRCA are committed to assisting York Region in fulfilling its requirements under the ORMCP. The purpose of this document is twofold:

1. To recommend a generic watershed planning process and outline of key deliverables required to fulfill the ORMCP; and
2. To describe the current status of watershed plans and their component studies within York Region watersheds, identify deliverables associated with the 2003 budget request, and present a five year budget forecast of the special funds needed to fulfill the ORMCP.

This document is intended to facilitate a regular process of dialogue between the CAs and the Region staff, which will promote improved coordination and information sharing among our various study responsibilities.

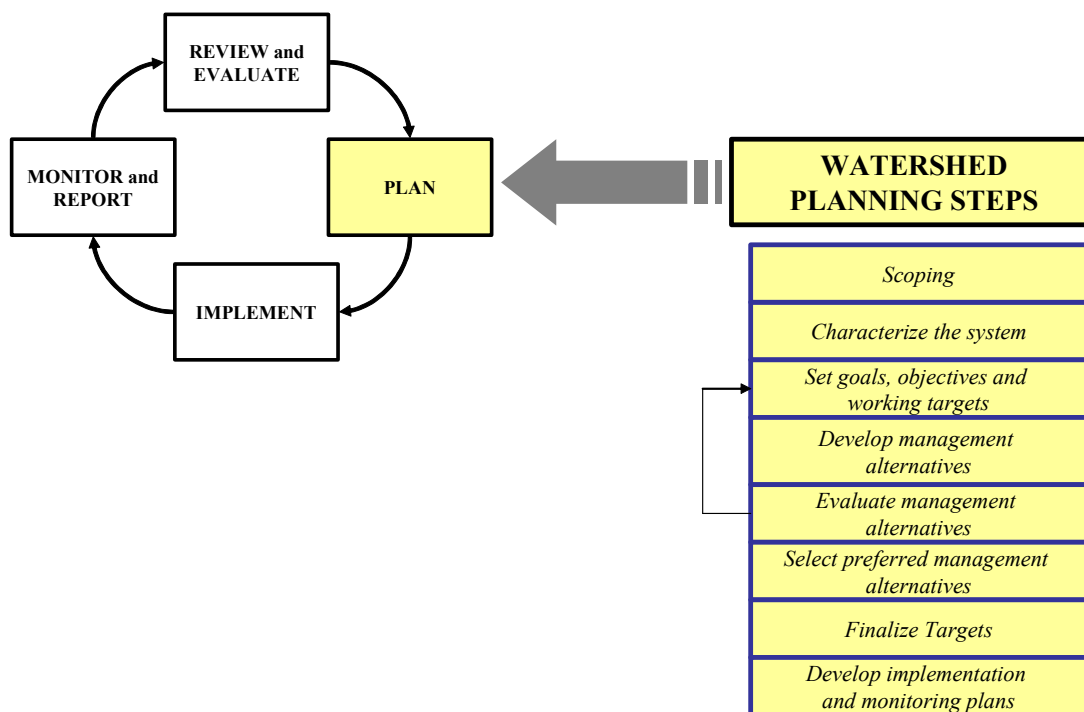
PART 1: GENERIC OUTLINE OF WATERSHED PLANNING REQUIREMENTS TO FULFILL THE ORMCP

1.1 Watershed Planning Process

The watershed planning process is one stage in the ongoing process of watershed management. The basic thrust of watershed management has not changed since first formally described in 1993 (MOEE and MNR, 1993). As illustrated in Figure 1, the process of watershed management has four main stages, including plan development; plan implementation; monitoring and reporting; and reviewing, evaluating and updating the plan. This process is commonly followed by all conservation authorities in Ontario, although each CA may have slightly different terminology associated with individual steps as suited to local watershed needs.

Watershed plans are usually prepared in response to a trigger, such as public concern about environmental conditions, a municipal Official Plan requirement, or, also in this case, the requirements set out by the ORM Act and Conservation Plan.

FIGURE 1: WATERSHED MANAGEMENT PROCESS



Reference: CVC, GRCA and TRCA. 2002.

The steps involved in developing a watershed plan can be described according to three main phases: characterization; analysis and evaluation of management alternatives; and development of the watershed plan and implementation plan.

Characterization involves scoping the issues, gathering the information that is already available, and confirming resource needs. The primary focus of this phase involves the development of a detailed understanding of watershed systems and their interdependencies. Working goals, objectives and targets are defined with stakeholder input to reflect community values and sound science. Study components typically address issues associated with surface and ground water quantity and quality; aquatic habitat and species; and terrestrial habitat and species. Depending on the watershed, studies may also address a broader range of issues, such as human heritage and outdoor recreation. Although it is necessary to disassemble the complex set of watershed systems to study each one individually, the evolving science of integration enables watershed planners to define relationships and interdependencies among the systems.

Analysis and Evaluation of Alternatives involves the development of alternative future land or resource use scenarios and management approaches. Using modeling and analytical tools developed in the characterization phase, each scenario is studied in terms of the effects (positive or negative) it will have on the watershed. The purpose of this analysis is to understand how the watershed will respond to future stresses, determine whether management objectives will be compromised and, if so, identify the effectiveness of various management approaches. Based on a set of agreed-upon evaluation criteria, and with input from the community, a preferred management approach is recommended.

Development of the Watershed Plan and Implementation Plan involves the actual documentation of the management plan and its implementation framework. The plan identifies the final set of management goals, objectives and targets, which is to be used to evaluate the acceptability of future resource use proposals and track progress in implementation. The plan specifies a set of land use and resource use management strategies and associated practices and programs, necessary to fulfill the watershed's objectives. Management strategies are often tailored to specific areas within the watershed. Further study needs may be specified for the watershed scale or for smaller geographic areas, such as subwatershed or site scales. An implementation framework sets out the primary mechanisms expected to be effective means of implementing the plan, roles and responsibilities for key stakeholders, and a recommended schedule for implementation. The municipal land use planning process represents an important vehicle for implementation. The latest generation of watershed plans involve an increasingly close partnership with the municipal partners in the development of land use planning strategies and draft policies that are developed as an integral part of the implementation framework. The monitoring plan recommends the extent of monitoring, timing, responsibilities and reporting frequency.

1.2 Roles and Responsibilities – A Partnership Process

Watershed planning and watershed management is really a partnership involving conservation authorities, municipalities, agencies, and other watershed community interests. Conservation authorities serve as the coordinators of the plan development process, by bringing together the various interests and ensuring appropriate opportunities for input throughout the process. Experience has shown that municipalities and other stakeholders who have been involved in the development of the plan are more likely to participate in the plan's implementation. Therefore, effective involvement of all partners throughout the process is vital to the plan's success. The following table summarizes the general roles of each partner.

Roles and Responsibilities

York Region and Other Regional and Local Municipalities	Conservation Authority	Other Stakeholder Groups and Agencies, and Members of the Public
• Ensure ORMCP is met (1) • Undertake or supervise component studies • Participate in development of watershed plans • Lead preparation of municipal policy to help implement plan recommendations (2) • Participate in and lead aspects of plan implementation	• Coordinate watershed planning process • Lead public and stakeholder involvement process • Undertake or supervise component studies • Lead integration of component studies and overall development of plan • Participate in and lead aspects of plan implementation	• Participate in the development of watershed plans • Promote awareness of planning process and solicit input from broader constituency group • Participate in and lead aspects of plan implementation

(1) Unique to York Region and other ORM municipalities

(2) York Region and other ORM municipalities have legislated responsibilities under ORMCP

1.3 Component Studies Required to Fulfill ORM Conservation Plan

Figure 2 lists the component studies and deliverables associated with each of the three phases in the watershed planning process. Primary points of public and stakeholder input are noted. Although the overall watershed plan is a requirement of the ORMCP, references to particularly relevant sections of the plan have been included for each of the basic technical studies to facilitate an understanding of their role and application. Table 1 provides a brief description of each of the component studies and its role in the watershed planning process.

The conservation authority will coordinate the overall watershed planning process, however component studies may be led by conservation authority staff or their consultants, the Region of York or their consultants, or other groups. A central role of the conservation authority is to ensure that duplication is avoided and data are compatible and opportunities for sharing are realized wherever possible. Figure 3 identifies the typical lead agency for each of the component studies.

Further description of the specific scope and deliverables of the studies is provided in Part 2 of this workplan and illustrated by the Duffins Creek Watershed Plan and associated reports.

1.4 Other Watershed Plan Components

Some watershed plans must address a broader range of issues than is expressly required by the ORMCP in order to respond to local issues and community interest. Human heritage, public use, and air quality are examples of these other watershed planning components. It should be noted that human heritage and recreational use issues are addressed in other policies associated with the ORMCP, and therefore, the watershed planning study may provide the most efficient process for gathering additional information about existing or potential heritage and recreational use sites and for developing more integrated management plans for these features. The conservation authorities will seek opportunities to complete comprehensive watershed plans within the schedule, or will identify the outstanding areas as further required studies. It should be recognized that the watershed plans may need to be amended, if the studies are completed as follow-up exercises.

1.5 From Watershed Plan to Municipal Policy

Municipal planning tools have long been regarded as a primary means of implementing the watershed plan. Section 24 (2) of the ORMCP has formalized that mechanism by stating that “The objectives and requirements of each watershed plan shall be incorporated into the municipality’s official plan.” In its Oak Ridges Conformity exercise, York Region has already included policies committing to the completion and

implementation of watershed plans and requiring area municipalities to incorporate, by official plan amendment, the applicable objectives and requirements of completed watershed plans into their planning documents. The Regions of Peel and Durham have adopted similar policies in their official plan amendments. In order to facilitate the transition from the watershed plan to municipal policy and criteria, it will be important to ensure that the watershed plan presents its recommendations in a form and level of detail that is compatible with and conducive to being easily incorporated into municipal policy.

The development of watershed policy/criteria is becoming regarded as a component of the watershed planning process, and the results form part of the plan's implementation framework. It is envisioned that a policy development working group, tasked with the responsibility of developing the model policy framework, would be formed early in the watershed planning process (i.e. Phase 1). The working group would involve regional and local municipal planners, conservation authority staff, and other interested parties. The group would undertake a review of existing policy tools and, in coordination with the other technical studies and their findings, would develop new policies/criteria that could be used to address watershed issues most effectively. Considerations include: determination of primary policy issues, the appropriate scale for application, user-friendly presentation of various databases, maps, and criteria needed to apply the policies, and rationalization of watershed-specific vs. municipality-wide application. The policies would need to build upon and complement existing municipal and conservation authority policy tools.

Several regional and provincial initiatives are underway, which will influence and assist in establishing consistency in the form and direction of watershed-specific policy. The province is expected to release guidelines in support of the ORMCP on water budgets, water conservation plans, hydrological sensitive features, subwatersheds, aquifer vulnerability, recreation and vegetation management, stormwater management, and sewage and water system plans. As part of the Source Protection Planning Framework for Ontario, the province is also expected to develop guidelines for risk assessment and delineation of areas of potential threat to human health. The York-Peel-Durham-Toronto Groundwater Program's Policy Group is preparing model policy and guidelines on a number of groundwater-related aspects of watershed management, including well-head protection and aquifer vulnerability. As part of its Terrestrial Natural Heritage Strategy, the TRCA is developing draft policy to address the protection of a terrestrial natural heritage system. These policy initiatives will help provide standard definitions for key terms and will form the building blocks from which watershed-specific policies and criteria can be developed.

FIGURE 2: WATERSHED PLANNING - COMPONENT STUDIES REQUIRED TO FULFILL ORM CONSERVATION PLAN

PLANNING STEP		Surface/Ground Water Quantity	Surface/Ground Water Quality	Aquatic Habitat and Species	Terrestrial Habitat and Species	Other Components				
CHARACTERIZATION	Public/Stakeholder Input - scoping issues, goals, objectives, working targets	TERR. NATURAL HERITAGE STUDY								
		AQUATIC RESOURCE STUDY								
		SURFACE WATER QUALITY STUDY								
		Surface Water Budget Model Dev't	Surface Water Quality Assessment	Fish Habitat Survey	Natural Cover and Land Use Mapping					
		Groundwater Budget Model Dev't	Water Quality/Contaminant Modelling	Fish Community Survey	Field Data Collection/Mapping					
		Water Use Effects Analysis	Point/non-point Source Identification	Benthic Invertebrate Survey	Terrestrial Natural Heritage Modelling					
		Water Conservation Projections	Spills Inventory and Mapping	Riparian Zone Survey						
		Low Flow Measurements	SW Retrofit Opportunities Assessment	Regional Reference Community Assess.						
		Water Takings Verification		Water Temperature Survey						
		Initiation Rate Mapping		Fluvial Geomorphic Assessment						
		GROUNDWATER QUALITY STUDY								
		Current Water Use (P,T,W, et al)	Groundwater Quality Assessment							
		Future Water Use Projections	Potential Contaminant Inventory							
		Wellhead Delineation	Contaminant Risk Assessment							
		SURFACE FLOW MODELLING STUDY								
		Aquifer Vulnerability Mapping								
		Hydrology Model Dev't								
		Hydraulics Model Dev't								
		Floodline and regulation line mapping								
		Flood vulnerable areas/roads database								
		GROUNDWATER STUDY								
3D Geological Mapping										
Well record compilation										
Groundwater Flow Model Dev't										
Groundwater Use Effects Analysis										
Aquifer Mapping and Flow Connection										
Groundwater Discharge Mapping										
LAND USE MAP CONSOLIDATION (CURRENT AND FUTURE)*										
CHARACTERIZATION REPORT PREPARATION (e.g. "State-of-the-Watershed" or "Existing" Conditions Reports)										
Summary of Existing Conditions, Issues, and Opportunities										
Existing policy review										
Set Goals, Objectives, and Working Targets										
Public/Stakeholder Input - findings of characterization studies; formulation of alternative scenarios										
DEFINE ALTERNATIVE LAND USE, WATER USE, AND MANAGEMENT SCENARIOS										
MODEL WATERSHED RESPONSE TO ALTERNATIVE SCENARIOS										
Apply various models (i.e. water budget, hydrology, groundwater flow, water quality, etc.)										
EVALUATE AND INTEGRATE FINDINGS										
Recommend preferred management strategy										
SUMMARIZE RESULTS AND FINALIZE TARGETS										
Public/Stakeholder Input - evaluation of alternatives and selection of preferred management strategy.										
FORMULATION OF PLAN AND IMPLEMENTATION FRAMEWORK										
- Land Use and Water Use Management Strategies										
- Provisions requiring the use of environmental management practices and programs										
- Criteria for evaluating protection of water quality/quantity/hydro features and functions										
- Implementation Framework (i.e. Planning/Policy, Land Securement, Regeneration, Stewardship, Education, etc.; Roles and Responsibilities, Schedule)										
- Further Study Requirements (including details for smaller geographic areas, such as subwatersheds or sites)										
- Monitoring Plan										
DEVELOPMENT OF WATERSHED PLAN AND IMPLEMENTATION PLAN: - Integrated Recommendations	Public/Stakeholder Input - evaluation of alternatives and selection of preferred management strategy.	Surface and Groundwater Quantity Targets	Surface and Groundwater Quality Targets	Aquatic Community Targets	Terr. Nat. Heritage system targets					
		SWM Criteria for Flood Control	Pollution prevention program	Fisheries mgmt. plan	Terr. Nat. Heritage strategy					
		SWM Criteria for Erosion Control	SW Criteria for water quality	Priority regeneration activities						
		SWM Criteria for Recharge	Urban SW retrofit plan							
		Water Allocation Protocol	Rural water quality mgmt. plan							
- Example Products	Public/Stakeholder Input - watershed plan formulation and final draft. NOTE: more significant involvement of municipal staff	Recs. For Municipal Water Conserv. Plans								

chart version 1.2 (Feb. 25/03)

FIGURE 3: WATERSHED PLANNING - LEAD AGENCY RESPONSIBILITIES FOR COMPONENT STUDIES

*NOTE: CA is lead agency unless otherwise noted									
PLANNING STEP	Surface/Ground Water Quantity	Lead Agency	Surface/Ground Water Quality	Lead Agency	Aquatic Habitat and Species	Lead Agency	Terrestrial Habitat and Species	Lead Agency	Other Components
CHARACTERIZATION	<i>Public/Stakeholder Input</i>								
	WATER BUDGET		SURFACE WATER QUALITY STUDY		AQUATIC RESOURCE STUDY		TERR. NATURAL HERITAGE STUDY		
	Surface Water Budget Model Dev't		Surface Water Quality Assessment		Fish Habitat Survey		Natural Cover and Land Use Mapping		
	Groundwater Budget Model Dev't	Region & CA	Water Quality/Contaminant Modelling		Fish Community Survey		Field Data Collection/Mapping		
	Water Use Effects Analysis	Region & CA	Point/non-point Source Identification		Benthic Invertebrate Survey		Terrestrial Natural Heritage Modelling		
	Water Conservation Projections	Region	Spills Inventory and Mapping		Riparian Zone Survey				
	Low Flow Measurements		SW Retrofit Opportunities Assessment		Regional Reference Community Ass.				
	Water Takings Verification	Region & CA			Water Temperature Survey				
	Infiltration Rate Mapping				Fluvial Geomorphic Assessment				
	WATER USE ASSESSMENT		GROUNDWATER QUALITY STUDY						
	Current Water Uses (PTIW, et al)	Region & CA	Groundwater Quality Assessment						
	Future Water Use Projections	Region	Potential Contaminant Inventory	Region					
	Water Use Vulnerability Mapping	Region	Contaminant Risk Assessment						
	SURFACE FLOW MODELLING STUDY	Region-YPDT							
	Hydrology Model Dev't								
	Hydraulics Model Dev't								
	Floodline and regulation line mapping								
	Flood vulnerable areas/roads database								
	GROUNDWATER STUDY								
	3D Geological Mapping	Region-YPDT							
	Well record compilation	Region-YPDT							
	Groundwater Flow Model Dev't	Region-YPDT & CA							
ANALYSIS AND EVALUATION OF MANAGEMENT ALTERNATIVES	Groundwater Use Effects Analysis	Region & CA							
	Aquifer Mapping and Flow Connection	Region & CA							
	Groundwater Discharge Mapping								
	LAND USE MAP CONSOLIDATION (CURRENT AND FUTURE)*								
	Land Use Map Dev't								
	Summary of Existing Conditions, Issues, and Opportunities								
	Extending policy review - Region, Local Municipality & CA								
	Set Goals, Objectives, and Working Targets								
	<i>Public/Stakeholder Input - findings of characterization studies; formulation of alternative scenarios</i>								
	DEFINE ALTERNATIVE LAND USE, WATER USE, AND MANAGEMENT SCENARIOS								
DEVELOPMENT OF WATERSHED PLAN AND IMPLEMENTATION PLAN: Integrated Recommendations	MODEL WATERSHED RESPONSE TO ALTERNATIVE SCENARIOS								
	Apply various models (i.e. water budget, hydrology, groundwater flow, water quality, etc.)								
	EVALUATE AND INTEGRATE FINDINGS								
	Recommend preferred management strategy								
- Example Products	SUMMARIZE RESULTS AND FINALIZE TARGETS								
	<i>Public/Stakeholder Input - evaluation of alternatives and selection of preferred management strategy.</i>								
	FORMULATION OF PLAN AND IMPLEMENTATION FRAMEWORK								
	- Water Budget and Conservation Plan								
	- Land Use and Water Use Management Strategies								
	- Provisions requiring the use of environmental management practices and programs								
	- Criteria for evaluating protection of water quality/quantity/hydrology features and functions								
	- Operational Framework (i.e. Planning Policy, Land Securement, Regeneration, Stewardship, Education, etc.; Roles and Responsibilities; Schedule)								
	- Further Study Requirements (including details for smaller geographic areas, such as subwatersheds or sites)								
	- Monitoring Plan								
- Example Products	Surface and Groundwater Quantity Targets		Surface and Groundwater Quality Targets		Aquatic Community Targets		Ter. Nat. Heritage system targets		
	SWM Criteria for Flood Control		Pollution Prevention Program		Fisheries mgmt. plan		Ter. Nat. Heritage strategy		
	SWM Criteria for Erosion Control		SW Criteria for water quality		Priority regeneration activities				
	SWM Criteria for Recharge		Rural SW retrofit plan						
	Water Allocation Protocol		Rural water quality mgmt. plan						
<i>Recs. For Municipal Water Conserv. Plans</i>									
<i>Public/Stakeholder Input - watershed plan formulation and final draft. NOTE: more significant involvement of municipal staff</i>									

Chart version 1.2rfs (Feb. 28/03)

Table 1 – General Description of Watershed Planning Study Components

Watershed Study Components	Description
CHARACTERIZATION PHASE	
Water Budget -Surface Water Budget Model -Groundwater Budget Model -Water Use Effects Analysis -Water Conservation Projections -Low Flow Measurements -Water Takings Verification -Infiltration Rate Mapping	A Water Budget study provides an overall accounting of the volume of water in the various components of the natural hydrologic cycle, including precipitation, evapotranspiration, overland runoff, infiltration, and surface and groundwater storage. The study also estimates the current volume of water use (ground and surface water) and provides an assessment of any impacts from this use. Low flow measurements, needed for calibration of the surface water budget model, are also used in other studies, including aquatic habitat studies. A water budget model is needed in order to undertake an assessment of the impacts associated with potential changes in future land use, rates of water use, or climate scenarios. Changes in a watershed water budget are interpreted in terms of their impact on other watershed systems, such as baseflow, water quality, stream stability, aquatic habitat, and terrestrial habitat (particularly wetlands). Key input data include local watershed meteorologic data, soils, land use/cover, long term flow data for calibration, and volumes of water use. Key deliverables include surface and ground water budget models, and maps showing spatial variation in watershed infiltration rates, which can be used to set management criteria.
Water Use Assessment -Current Water Use (PTTW, et al) -Future Water Use Projections -Wellhead Delineation -Aquifer Vulnerability Mapping	The Water Use Assessment identifies all primary users of ground and surface water within the watershed (i.e. municipal, commercial, agricultural, etc.), except for environmental uses which are addressed under other studies. The study estimates the current and future volumes of water use and identifies any water quality restrictions associated with the intended use. With particular focus on potable water supplies, wellhead delineation and aquifer vulnerability mapping is prepared. All of this information provides a basis for setting watershed

Watershed Study Components	Description
	management goals and objectives; identifying key stakeholders who should be involved in the planning process; defining future water use scenarios; and setting criteria against which to evaluate impacts. Key input data include the Ministry of the Environment's PTTW database and associated field verification updates, land use mapping, and other related databases used to generate estimates of water use (i.e. including users exempt from PTTW). Key deliverables from this work include updated water use databases, wellhead delineation and aquifer vulnerability mapping, recommended management goals/objectives/targets, and water use scenarios for further analysis.
Surface Flow Modelling Study -Hydrology Model Dev't -Hydraulics Model Dev't -Floodline and Regulation Line Mapping -Flood vulnerable area/roads	The primary purpose of the surface flow modeling study is to provide a basis for establishing or updating floodline mapping, used to delineate floodplains; to determine the appropriate stormwater management criteria for flood control; and to identify sites of flood risk where remedial action should be undertaken. A watershed hydrology model provides a tool for the assessment of impacts of future land use/cover and water use scenarios on watershed hydrology, including instream flows. The model is also used to evaluate alternative flood flow management strategies. The hydraulics model simulates flows within the channel geometry and estimates water level elevations for mapping purposes. Key input data include digital elevation model, soils, land use/cover, meteorologic data, and database of structures. Key deliverables include: recommended stormwater management criteria for flood control, floodline maps, flow databases, and flood vulnerable sites databases for flood warning programs and remedial works purposes.
Groundwater Study -3D Geological Mapping	The groundwater study develops a watershed based groundwater flow model which is used to establish an understanding of groundwater flow directions,

Watershed Study Components	Description
-Well record compilation -Groundwater Flow Model Dev't -Groundwater Use Effects Analysis -Aquifer Mapping and Flow Connections -Groundwater Discharge Mapping	water levels, and discharge areas, and which puts the watershed within a broader regional groundwater system context. The groundwater model is used as a basis for evaluating impacts to the groundwater flow system in response to an altered water balance associated with future land or water use scenarios. Changes in the groundwater system are interpreted in terms of their impact on other watershed systems, such as water use potential, baseflow, water quality, aquatic habitat, and terrestrial habitat (particularly wetlands). Key input data include geological mapping, borehole data (e.g. from well records), groundwater use data, infiltration rates (from surface water budget), and stream baseflow data (for model calibration). Key deliverables include: a conceptual geological model of the watershed, a 3-D groundwater flow model tool, and an interpretation of the existing groundwater system.
Surface Water Quality Study -Surface Water Quality Assessment -Water Quality/Contaminant Modelling -Point/Non-point source Identification -Spills Inventory and Mapping -SW Retrofit Opportunities Assessment	The Surface Water Quality Study reports on current water quality conditions in streams and waterbodies, and assesses the contributions from point and non-point sources of pollution. Water quality assessments are usually based on a combination of chemical and biological indicators. This study assists in setting water quality and aquatic resource targets. Surface water quality models are developed and later used to evaluate the water quality impacts of future land or water use scenarios and the effectiveness of alternative management strategies. Depending on the nature of pollutant sources in the watershed, further studies may include nutrient budgets or assimilative capacity studies. Key input data include: water chemistry, flow data, land use/cover, agricultural practices data (e.g. fertilizer application rates, crop types, livestock types, etc.), stormwater management practices, and a digital elevation model, depending on the

Watershed Study Components	Description
	sophistication of studies deemed necessary. Key deliverables include: water quality modeling tool(s), an interpretation of current conditions, and recommendations for water quality targets.
Groundwater Quality Study -Groundwater Quality Assessment -Potential Contaminant Inventory -Contaminant Risk Assessment	The Groundwater Quality Study reports on groundwater chemistry in the various aquifer systems and provides an interpretation of issues associated with current or anticipated future groundwater use. This study component also involves the development of a potential groundwater contaminant database and an approach to undertake a risk assessment in vulnerable areas.
Aquatic Resource Study -Fish Habitat Survey -Fish Community Survey -Benthic Invertebrate Survey -Riparian Zone Survey -Regional Reference Community Assess. -Water Temperature Survey -Fluvial Geomorphic Assessment	This study evaluates current and historic data on physical habitat conditions (i.e. geomorphologic, geologic, flow, water chemistry, temperature, etc.) and species presence to determine the historic aquatic community types found within the watershed. Regional reference sites (i.e. aquatic communities found in other similar, unimpacted, watershed reaches) are reviewed. Finally, human influences, such as in-stream barriers and altered water quality or thermal conditions, are considered as an additional layer of analysis to help set aquatic community management directions. The aquatic community management targets are used to evaluate the acceptability of impacts associated with future land or water use scenarios (e.g. changes in baseflow, water temperature, etc.), as modeled by other studies. The development of predictive tools that can be used to evaluate the response of the aquatic community to changes in watershed hydrology is an evolving science.
Terrestrial Natural Heritage Study -Natural Cover and Land Use Mapping -Field Data Collection/mapping	This study reports on the health of the terrestrial natural heritage system, including current flora and fauna type, distribution, quality of habitat, and an identification of management issues. A set of indicators and measures are used to evaluate conditions at a site through landscape scale. Data are compiled using a combination of air photo

Watershed Study Components	Description
-Terrestrial Natural Heritage Modelling	interpretation and field surveys. A Terrestrial Natural Heritage Modelling Approach, based on principles of conservation biology and landscape ecology, is applied to predict the impact that future losses of natural cover or restoration strategies will have on the health of the regional natural heritage system. There are important inter-relationships between natural cover and watershed hydrology, which need to be understood and considered in setting watershed management directions. This study will recommend terrestrial natural heritage management targets, which can be used to determine the acceptability of changes in watershed hydrology caused by future land or water use scenarios (i.e. impacts to wetlands). The terrestrial study may also recommend natural cover restoration strategies, which will need to be considered in terms of their potential impact to the watershed's water balance and associated surface and groundwater flow systems.
Land Use Map Consolidation -Current and Future	Current land cover and future (e.g. as per approved municipal Official Plans) land cover mapping is compiled from all watershed municipalities and consolidated into one mapping product that can be used in modelling exercises.
Characterization Report -Summary of Existing Conditions -Existing policy review -Set goals, objectives, Working Targets	This report documents the existing conditions and issues within the watershed. It presents a summary of existing policies and programs available, which could be used as a basis for implementation. The report identifies watershed management goals, objectives, and working targets, as developed with input from stakeholders. This information is used as a basis from which to evaluate changes due to future land and water use scenarios and the effectiveness of alternative management strategies.
ANALYSIS AND EVALUATION OF MANAGEMENT ALTERNATIVES	
Define Alternative Land Use, Water Use, and Management Scenarios	Selected future scenarios are defined for analysis, with the intent of benchmarking the watershed response and providing guidance for establishing an effective management plan.

Watershed Study Components	Description
Model Watershed Response to Alternative Scenarios	The various models developed in the Characterization phase are applied to the scenarios in order to predict watershed response. In some cases, the output from one model will be needed as input to another.
Evaluate and Integrate Findings	Evaluation criteria, including effectiveness, ability to meet targets, public acceptability, cost, etc., are established and used to evaluate the results. A preferred management approach is determined.
Summarize Results and Finalize Targets	Results are summarized and targets finalized with stakeholder input.
DEVELOPMENT OF WATERSHED PLAN AND IMPLEMENTATION PLAN	
Formulation of Plan and Implementation Framework	Land use and water use management strategies are developed, discussed and negotiated with stakeholders. A final Watershed Plan and Implementation Framework are prepared. Supporting documentation, databases, maps, policies, guidelines and criteria are finalized and published in an accessible format.

PART 2: YORK REGION WATERSHED PLANS

The purpose of Part 2 is to present specific workplans and budgets for the Oak Ridges Moraine watersheds within York Region, in accordance with the generic watershed planning process framework and deliverables, outlined in Part 1 of this workplan

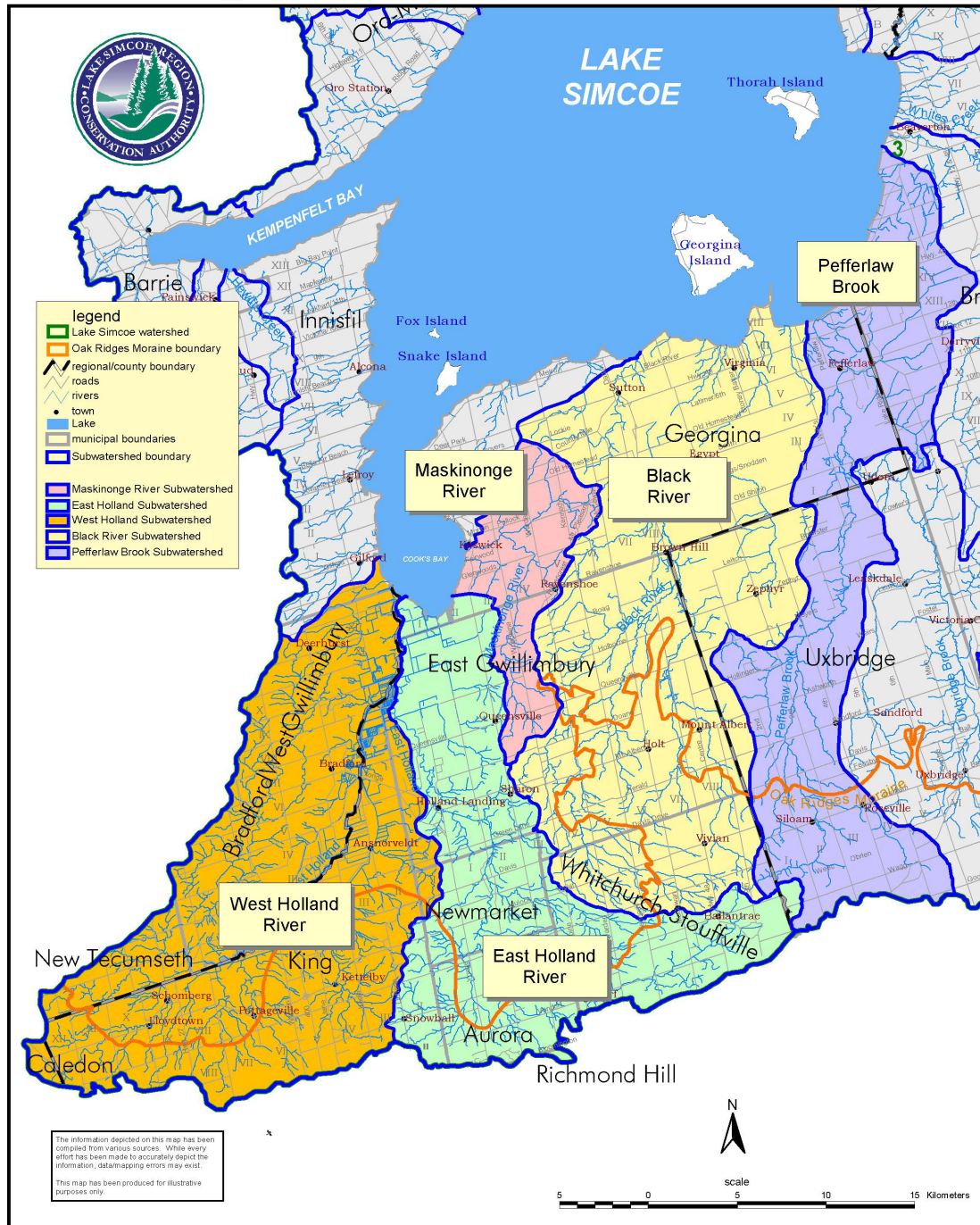
Figure 1 illustrates the watersheds and their location within the Lake Simcoe Region Conservation Authority (LSRCA) and Toronto and Region Conservation Authority (TRCA) jurisdictions. In order to provide the management direction necessary to achieve the objectives of the ORM Conservation Act and ORM Conservation Plan, the study area for “watershed” plans will extend from crest of ORM to each of Lakes Simcoe and Ontario. On the north side of the moraine, this includes the watersheds of the West Holland, East Holland, Black, and Maskinonge Rivers. On the south side of the moraine, the watersheds of the Humber River, Don River, Rouge River and Duffins Creek are included in this requirement.

Part 2A addresses the Lake Simcoe Region Conservation Authority Watersheds. Part 2B provides information relevant to the Toronto and Region Conservation Authority Watersheds.

PART 2B: LAKE SIMCOE REGION CONSERVATION AUTHORITY WATERSHEDS

2.1 Lake Simcoe Region Conservation Authority Watersheds

Oak Ridges Moraine Watersheds in York Region



2.1.1 Status of Study Components By Watershed

The status of completion for each of the watershed planning study components is shown in Appendix A for the four LSRCA watersheds draining from the Oak Ridges Moraine in York Region. These watersheds include: Black River Watershed, Maskinonge River Watershed, East and West Holland River Watersheds.

Watershed planning studies have been completed to various degrees in all four watersheds, and ongoing watershed management work continues as part of a partnership between the LSRCA and its member municipalities. Therefore, the Region is in a position to state that it has initiated watershed planning. The work in these watersheds will focus on updating and filling in gaps, where necessary to meet any new requirements set out under the ORMCP.

A Watershed Plan for the Duffins Creek [and Carruthers Creek] was completed by the TRCA in early in 2003. This plan is presently being used as a template for the completion and updating of watershed plans in Lake Simcoe.

2.1.2 2004 to 2007 Budget Forecast and Workplan

Table 1 presents the proposed planning schedule for LSRCA ORMCP watershed planning activities. The solid black lines represent the period of primary planning activity, and the grey lines indicate a period of preparation or finalization work. The following sections describe the scope of work, deliverables and specific budgets associated with each individual watershed plan.

Table 1: LSRCA Watershed Planning Schedule

Watershed	2003	2004	2005	2006	2007
Characterization					
Analysis and Modeling					
Integration and Management Plan					
Policy Development & Implementation Planning					

York Region ORMCP

2004-2007 Workplan and Budget Estimates

Subwatershed Planning Requirements

Revised: December 15, 2003



ORMCP Activity: Surface Water Quality

Background:

- Further refinement of existing and background water quality conditions throughout York Region ORMCP subwatersheds and include further water quality analysis for specific parameters.
- Further expand knowledge of point and non-point sources of pollution and nutrients.
- Key in developing and the monitoring of water quality targets.
- Nutrient / Water Quality Models are required to evaluate the water quality impacts of future land and water use scenarios. Also can be used to evaluate and predict the effectiveness of implementing BMP's throughout the subwatersheds.

Proposed Activities:

2005 Activities

- Advanced water quality analysis on samples collected from existing LSEMS and PWQMN stations within the York Region ORMCP subwatersheds.
- Detailed water quality analysis will aid in source protection of water supplies, identify and areas/issues of concern, and other related aspects.
- Water quality parameters to be analyzed are:
 - Chlorides
 - Metals
 - Nitrates
 - Toxic Screening
- Upon completion of the Nutrient / Water Quality Model being developed for the Black River (Ongoing 2003-2004); this model will be applied to the East and West Holland, Maskinonge and Pefferlaw subwatersheds in 2005.
 - This model is the standard applied across all Oak Ridges Moraine watersheds in the LSRCA jurisdiction.
 - Requires completion of hydrologic and hydraulic models for West and East Holland and Maskinonge Rivers before initiating the Nutrient/Water Quality Model

2006 Activities

- Continue advanced water quality analysis on samples collected from existing LSEMS and PWQMN stations within the York Region ORMCP subwatersheds.
- Refine and continue to calibrate the Nutrient / Water Quality Model as new data is collected.
- Continue integration of Nutrient / Water Quality Model with other activity areas.

2007 Activities

- Continue advanced water quality analysis on samples collected from existing LSEMS and PWQMN stations within the York Region ORMCP subwatersheds.
- Refine and continue to calibrate the Nutrient / Water Quality Model as new data is collected.
- Continue integration of Nutrient / Water Quality Model with other activity areas.
- Prepare summaries and management recommendations for final reports and management strategy documents.

Budget: \$220,000

2004 Activities:	\$0
2005 Activities:	\$200,000
2006 Activities:	\$10,000
2007 Activities:	\$10,000

ORMCP Activity: Surface Flow

Background:

- Development of hydrologic and hydraulic models. These are key tools and models required to complete other associated activities such as nutrient modeling. These models also will be integrated into evaluating water takings, ensuring aquatic ecosystem protection and geomorphic assessments.
- Models key requirements for floodline mapping development, stormwater management, flood control and a host of other uses.
- Key requirements for surface water quality modeling.

Proposed Activities:

2004 Activities:

- Develop rating curves for the three newly installed gauges (Maskinonge, Tannery and Black) and provide maintenance and calibration for the three gauges.
- Conduct spot and base flow measurements throughout the four watersheds to further collect flow data for data model calibration.
- Surface flow models for the East, West and Maskinonge Rivers will be completed.
- Surface flow model/s will include both hydraulic and hydrologic components.
- The North Schomberg Creek gauge will be re-activated in the West Holland River subwatershed.
- All flow monitoring stations will be automated utilizing cellular phone technology to provide real-time data.

2005 Activities:

- Continue to collect flow information to further calibrate rating curves for the three installed gauges (Maskinonge, Tannery and Black) and the re-activated North Schomberg Gauge provide maintenance and calibration for the four gauges.
- Conduct spot and base flow measurements throughout the four watersheds to further collect flow data for data model calibration.

2006 Activities:

- Continue to collect flow information to further calibrate rating curves for the three installed gauges (Maskinonge, Tannery and Black) and the re-activated North Schomberg Gauge provide maintenance and calibration for the four gauges.
- Conduct spot and base flow measurements throughout the four watersheds to further collect flow data for data model calibration.

2007 Activities:

- Continue to collect flow information to further calibrate rating curves for the three installed gauges (Maskinonge, Tannery and Black) and the re-activated North Schomberg Gauge provide maintenance and calibration for the four gauges.
- Conduct spot and base flow measurements throughout the four watersheds to further collect flow data for data model calibration.
- Prepare summaries and technical data as required for final reports and strategies.

Budget: \$380,000

2004 Activities:	\$320,000
2005 Activities:	\$20,000
2006 Activities:	\$20,000
2007 Activities:	\$20,000

ORMCP Activity: Water Use Assessment:

Background:

- Critical activity to better understand water takings across the subwatersheds and further calibrate water budgets
- Need to know how much water is being used but also when and for what durations
- There are four non-permitted/permited primary water users within the subwatersheds (excludes municipal, industrial):
 - Golf Courses
 - Agriculture
 - Polder Agriculture – focus on Holland Marsh
 - Sod Farming

Proposed Activities:

2004 Activities:

- Gauge maintenance will/may include the installation, maintenance, data recording of the water use data from installed water pump gauges.
- Analysis of collected water use data will be conducted to evaluate water takings by water users based on land use activity. Will include an analysis of timing of takings, peak and duration of takings and cumulative volumes. This analysis will form the basis to develop more accurate estimates for water use by land use activity for use in the further refinement of water budgets.
- The GIS water use exercise will utilize water takings data analysis develop digital layers/information based on land use and their respective estimates of water use. The mapping developed from this exercise will identify areas by level of water takings by land use activity and overall cumulative water use at the subwatershed scale.
- This information is required to support the development of aquatic ecosystem management plans and determining levels of acceptable water use from associated systems.

2005 Activities:

- Primary activity will be gauge maintenance/monitoring that will/may include the re-installation of gauges, maintenance, data recording of the water use data from installed water pump gauges.
- Annual summaries of water use and further calibration of water use estimates throughout the ORMCP subwatersheds.

2006 Activities:

- Primary activity will be gauge maintenance/monitoring that will/may include the re-installation of gauges, maintenance, data recording of the water use data from installed water pump gauges.
- Annual summaries of water use and further calibration of water use estimates throughout the ORMCP subwatersheds.

2007 Activities:

- Primary activity will be gauge maintenance/monitoring that will/may include the re-installation of gauges, maintenance, data recording of the water use data from installed water pump gauges.
- Annual summaries of water use and further calibration of water use estimates throughout the ORMCP subwatersheds.
- Compilation of summaries and preparation of required technical data and summary/s for inclusion into management report and technical appendices.

Budget: \$75,000

2004 Activities:	\$45,000
2005 Activities:	\$10,000
2006 Activities:	\$10,000
2007 Activities:	\$10,000

ORMCP Activity: Water Budget/s

Background:

- Critical activities to better understand water availability, water use, water volume and other related components.
- Critical to develop water budget model to be used in the assessment of potential impacts associated with future changes in takings, land use, climate change and water demand.
- Requirement of the ORMCP – specific reference to the Yonge Street Aquifer.
- Significant linkage to on-going initiatives of the York-Peel-Durham-Toronto Groundwater group.

Proposed Activities:

2004 Activities:

- Complete water budgets for the Maskinonge River and further calibration existing water budgets in West and East Holland and Black Rivers where required.

2005 Activities:

- Update existing water budgets through continual maintenance, data entry, calibration and analysis, as new data is made available from other activity areas.

2006 Activities:

- Update existing water budgets through continual maintenance, data entry, calibration and analysis, as new data is made available from other activity areas.

2007 Activities:

- Update existing water budgets through continual maintenance, data entry, calibration and analysis, as new data is made available from other activity areas.
- Perform a complete review of the water budgets and ensure they are fully up-to-date.
- Prepare recommendations, strategies and summaries for final management reports and strategies.

Budget: \$100,000

2004 Activities:	\$60,000
2005 Activities:	\$10,000
2006 Activities:	\$10,000
2007 Activities:	\$20,000

ORMCP Activity: Aquatic Ecosystem and Habitat

Background:

- Key in the understanding of the aquatic system and is linked directly to the water quantity and quality, natural heritage, water use and water budget activities.
- Data collected is used as an excellent indicator of aquatic ecosystem health.
- Collected and associated mapping is a key tool in impact analysis of future proposed land use and development changes.

- Development of predictive tools/models of the potential impacts of proposed land use changes will be developed in the future but are reliant on several years of collected field data for calibration and support.
- Development and implementation of methodology to evaluate potential impacts from ground and surface water takings to ensure that ecosystem requirements are being maintained and/or restored.

Proposed Activities:

2004 Activities:

- Complete fisheries inventory, benthic and habitat assessment at reference locations and identified location gaps throughout the York Region ORMCP subwatersheds. Final selection of reference sites to be determined in 2003.
- Temperature dataloggers are distributed throughout the York Region ORMCP subwatersheds.
- Review existing ecosystem minimum flow/threshold models (ie. IFIM, New England Model) and undertake pilot exercise to evaluate applicability. This exercise will be tied into the ecosystem requirements workshop.
- Ecosystem requirements workshop to be held to begin developing strategies, targets, concepts for maintaining present and/or better ecosystem conditions.
- Begin implementing selected methodology for ensuring ecosystem requirements are determined and link to other developed surface and ground water models.

2005 Activities:

- Monitor fisheries and benthic communities at selected reference sites within the York Region ORMCP subwatersheds.
- Continue to monitor stream (water) temperature using dataloggers at selected reference sites.
- Assess any sites for fisheries and benthic community structure if required in response to specific inquiries and/or issues.
- Continue to implement methodology to ensure ecosystem requirements are determined.

2006 Activities:

- Monitor fisheries and benthic communities at selected reference sites within the York Region ORMCP subwatersheds.
- Continue to monitor stream (water) temperature using dataloggers at selected reference sites.
- Assess any sites for fisheries and benthic community structure if required in response to specific inquiries and/or issues.

- Continue to implement methodology to ensure ecosystem requirements are determined.

2007 Activities:

- Monitor fisheries and benthic communities at selected reference sites within the York Region ORMCP subwatersheds.
- Continue to monitor stream (water) temperature using dataloggers at selected reference sites.
- Assess any sites for fisheries and benthic community structure if required in response to specific inquiries and/or issues.
- Continue to implement methodology to ensure ecosystem requirements are determined.
- Review methodology and develop management report strategies and recommendations.
- Re-assess selected non-reference sites to evaluate change over 5-year period.
- Review 5 years of stream temperature data in comparison to atmospheric, land use changes, management strategies implementation and other related activities.

Total Budget: \$105,000

2004 Activities:	\$50,000
2005 Activities:	\$25,000
2006 Activities:	\$20,000
2007 Activities:	\$20,000

ORMCP Activity: Terrestrial Natural Heritage

Background:

- Key in the understanding of the terrestrial natural heritage system within the subwatersheds.
- The terrestrial natural heritage system is key in the maintenance and protection of both ground and surface water resources.
- The development of consistent natural cover and land use mapping (Utilizing ELC) is key first step. Can be used to begin to develop targets and has significant benefits for monitoring changes in the landscape over time.
- Future phases include natural heritage modeling which can be used for impact analysis, restoration planning, evaluating potential BMP's and for land securement prioritization exercises.
- Detailed ELC and land use mapping is also being used to further calibrate water quantity modeling and will be also be used to further calibrate the water quality / nutrient models.

Proposed Activities:

2004 Activities

- Complete ELC and land use maps for the West and East Holland Rivers, Maskinonge River and Pepperlaw Brook subwatersheds.
- Complete analysis and identify key terrestrial attributes such as: significant corridors, interior forest habitat, significant large forests, etc.
- Undertake relative ranking analysis for all four York Region ORMCP subwatersheds. This will be used as a potentially key product in the future development of potential planning policies in respect to the preservation and protection of terrestrial resources within York Region. This is also a key product in addressing / identifying land securement opportunities.
- Develop various modeled scenarios illustrating potential changes both positive and/or negative.
- Ensure the linkage to other activity areas such as surface flow assessment, geomorphology and groundwater.

2005 Activities:

- Undertake updates and corrections utilizing the lost recent ortho air photo imagery available.
- Undertake updates and corrections based on changes on the landscape for development activities, forest and /or significant tree cutting, changes in land use activities, etc.

2006 Activities:

- Undertake updates and corrections utilizing the lost recent ortho air photo imagery available.
- Undertake updates and corrections based on changes on the landscape for development activities, forest and /or significant tree cutting, changes in land use activities, etc.
- Begin preparation for reporting and management strategies.

2007 Activities:

- Undertake updates and corrections utilizing the lost recent ortho air photo imagery available.
- Undertake updates and corrections based on changes on the landscape for development activities, forest and /or significant tree cutting, changes in land use activities, etc.
- Finalize mapping and complete components for final management strategies.
- Develop potential management recommendations, Official Plan Amendments, and other related policies and strategies in partnership with key staff from York Region.

Budget: \$85,000

2004 Activities:	\$45,000
2005 Activities:	\$10,000
2006 Activities:	\$10,000
2007 Activities:	\$20,000

ORMCP Activity: Geomorphology

Background:

- Fluvial geomorphology has been traditionally neglected during the assessment / impact analysis of potential changes in the fluvial systems.
- Changes in geomorphology are directly linked to fish habitat, water quality, economic impacts for land loss and a variety of other factors.
- Linked to surface water models can be used as a predictive tool to evaluate the potential for impacts and/or positive changes from the implementation of BMP's.
- Better understanding of the geomorphic nature of a subwatershed will help further define nutrient modeling results as assist in the identification of potential areas of concern in respect to potential nutrient loading areas (i.e. areas of high erosion).
- Geomorphology is also directly linked to ecosystem conditions and therefore provides key variables in better understanding ecosystem requirements (i.e. and over wide river will generate higher thermal regimes).

Proposed Activities:

2004 Activities:

- Review existing subwatershed scale geomorphic evaluation methodologies and select one for a pilot project.
- Initiate and complete fluvial geomorphic pilot project on Black River subwatershed as the surface water flow model and other components have been completed for the Black River.
- Revise methodology if required at the completion of the Black River pilot.

2005 Activities:

- Complete subwatershed geomorphic assessment on the Maskinonge River.
- Integrate assessment results to other activity areas.

2006 Activities:

- Complete subwatershed geomorphic assessment on the West and East Holland Rivers.
- Integrate assessment results to other activity areas.

2007 Activities:

- Refine geomorphic assessment data and information within in the context of all other activity areas where feasible.
- Complete selected modeled scenarios for selected variables which may include potential erosion and soil loss, risk to infrastructure and housing, response to implementation of various BMP's and other possible scenarios.
- Prepare management and potential policy recommendations in partnership with key staff from York Region.
- Prepare required elements for final management plan/s.

Budget: \$110,000

2004 Activities:	\$25,000
2005 Activities:	\$25,000
2006 Activities:	\$50,000
2007 Activities:	\$10,000

ORMCP Activity: Project Management, Communications & Public Process

Background:

- Project management is key factor in ensuring the delivery and integration of activity areas.
- Includes administration of overall program, liaison with York Region and other agency staff.
- The scope of the activities involved is significant and extends over a extended period of time. Communication of activities occurring to the general public and the professional community is a key requirement in ensuring transparent access. The development and maintenance of an ORMCP Subwatershed Planning website will allow for accurate and controlled dissemination of information.
- Public process and involvement through all phases is key in delivering a transparent process and will provide background information and knowledge to general public, NGO's, development community and others. This process is important in providing information as much as it is in obtaining information, which can be used to potentially target and assess areas of concern. This process only involves information collection and provision. York Region will lead any public process related to formal Official Plan policy and other related changes.

Proposed Activities:

2004 Activities:

- Project management and administration of various activities including any contracts for related services.
- Public process and participation including public open houses in the four York Region ORMCP subwatersheds. This will include facilitated public sessions on specific subject areas to be determined in consultation with York Region staff
- A joint LSRCA and York Region ORMCP Activities Website will be developed.
- Other communication opportunities will be discussed and implemented at various times throughout the process (i.e. newsletters, press releases).

2005 Activities:

- Project management and administration of various activities including any contracts for related services.
- Public process and participation including public open houses in the four York Region ORMCP subwatersheds. This will include facilitated public sessions on specific subject areas to be determined in consultation with York Region staff
- A joint LSRCA and York Region ORMCP Activities Website will be maintained and updated with current information as it becomes available.
- Other communication opportunities will be discussed and implemented at various times throughout the process (i.e. newsletters, press releases).

2006 Activities:

- Project management and administration of various activities including any contracts for related services.
- Public process and participation including public open houses in the four York Region ORMCP subwatersheds. This will include facilitated public sessions on specific subject areas to be determined in consultation with York Region staff
- A joint LSRCA and York Region ORMCP Activities Website will be maintained and updated with current information as it becomes available.
- Other communication opportunities will be discussed and implemented at various times throughout the process (i.e. newsletters, press releases).

2007 Activities:

- Project management and administration of various activities including any contracts for related services.
- A joint LSRCA and York Region ORMCP Activities Website will be maintained and updated with current information as it becomes available.
- Other communication opportunities will be discussed and implemented at various times throughout the process (i.e. newsletters, press releases).

- Results of the public process and response to the website will be consolidated as part of the management plan in similar fashion to that of an Environmental Assessment.

Budget: \$165,000

2004 Activities:	\$55,000
2004 Activities:	\$40,000
2004 Activities:	\$40,000
2004 Activities:	\$30,000

ORMCP Activity: Management Strategy and Report

Background:

- One of the primary products of the cumulative results and integration of all the various activity areas will be the preparation of Management Strategy/s and series of Reports.
- The format and content will be determined through discussions with York Region Staff. There are several potential options to be considered such as to have the strategies developed in respect to subwatershed or by activity areas for all subwatersheds.

Proposed Activities:

2005 Activities:

- Begin consolidation of technical information and associated products.
- Develop format, template and reporting style in consultation York Region staff.
- Develop mapping templates and formats.

2006 Activities:

- Finalize appropriate technical documents as required to be appendices to final management reports. This will include items such as technical manuals, background data compilation, transfer of appropriate data, etc.
- Begin the development of management recommendations and strategies in consultation with York Region staff.
- Develop associated mapping in support of recommendations and strategies.
- Begin developing preliminary cost estimates for various recommendations and strategies.

2007 Activities:

- Finalize and remaining appropriate technical documents as required being appendices to final management reports. This will include items such as technical manuals, background data compilation, transfer of appropriate data, etc.
- Complete all management strategies and reports with full inclusion and integration of completed activities.
- Complete associated mapping in support of recommendations and strategies.
- Finalize preliminary cost estimates for various recommendations and strategies.
- Develop long-term monitoring program strategy and report with associated cost estimates.

Budget: \$220,000

2004 Activities:	\$0
2005 Activities:	\$20,000
2006 Activities:	\$100,000
2007 Activities:	\$100,000

Preliminary Budget Summary Table:

ORMCP Activity Area	Preliminary 2004 Budget Estimate	Preliminary 2005 Budget Estimate	Preliminary 2006 Budget Estimate	Preliminary 2007 Budget Estimate	Subtotal
Surface Water Quality	\$0	\$200,000	\$10,000	\$10,000	\$220,000
Surface Water Flow Monitoring	\$320,000	\$20,000	\$20,000	\$20,000	\$380,000
Water Use Assessment	\$45,000	\$10,000	\$10,000	\$10,000	\$75,000
Water Budget	\$60,000	\$10,000	\$10,000	\$20,000	\$100,000
Aquatic Ecosystem & Habitat	\$50,000	\$25,000	\$20,000	\$20,000	\$105,000
Terrestrial Natural Heritage	\$45,000	\$10,000	\$10,000	\$20,000	\$85,000
Geomorphology Project	\$25,000	\$25,000	\$50,000	\$10,000	\$110,000
Management & Communications	\$55,000	\$40,000	\$40,000	\$30,000	\$165,000
Management Strategy and Report	\$0	\$20,000	\$100,000	\$100,000	\$220,000
Total	\$600,000	\$360,000	\$260,000	\$250,000	\$1,460,000

LSRCA APPENDIX A

**STATUS OF COMPLETION OF WATERSHED PLANNING COMPONENTS
IN THE LSRCA WATERSHEDS**

**Black River
Maskinonge River
East Holland River
West Holland River**

BLACK RIVER WATERSHED PLANNING STATUS

As of March, 2003

PLANNING STEP	Surface/Ground Water Quantity	Surface/Ground Water Quality	Aquatic Habitat and Species	Terrestrial Habitat and Species	Other Components
CHARACTERIZATION	<i>Public/Stakeholder Input - scoping issues, goals, objectives, working targets</i>				
	WATER BUDGET	SURFACE WATER QUALITY STUDY	AQUATIC RESOURCE STUDY	TERR. NATURAL HERITAGE STUDY	
	Surface Water Budget Model Dev't	Surface Water Quality Assessment	Fish Habitat Survey	Natural Cover and Land Use Mapping	Public Use - Outdoor Recreation
	Groundwater Budget Model Dev't	Water Quality/Contaminant Modelling	Fish Community Survey	Field Data Collection Mapping	Human Heritage
	Water Use Effects Analysis	Point/non-point Source Identification	Benthic Invertebrate Survey	Terrestrial Natural Heritage Modelling	Air Quality
	Water Conservation Projections	Spills Inventory and Mapping	Riparian Zone Survey		Human Health
	Low Flow Measurements	SWW Retrofit Opportunities Assessment			Economy
	Water Takings Verification		Regional Reference Community Assess.		Sustainability
	Initiation Rate Mapping		Water Temperature Survey		
			Fluvial Geomorphic Assessment		
	WATER USE ASSESSMENT	GROUNDWATER QUALITY STUDY			
	Current Water Use (PT, TW, et al)	Groundwater Quality Assessment			
	Future Water Use Projections	Potential Contaminant Inventory			
	Wellhead Delineation	Contaminant Risk Assessment			
	Aquifer Vulnerability Mapping				
	SURFACE FLOW MODELLING STUDY				
	Hydrology Model Dev't				
	Hydraulics Model Dev't				
	Floodline and regulation line mapping				
	Flood vulnerable arealroads database				
ANALYSIS AND EVALUATION OF MANAGEMENT ALTERNATIVES	GROUNDWATER STUDY				
	3D Geological Mapping				
	Well record compilation				
	Groundwater Flow Model Dev't				
	Groundwater Use Effects Analysis				
	Aquifer Mapping and Flow Connection				
	Groundwater Discharge Mapping				
DEVELOPMENT OF WATERSHED PLAN AND IMPLEMENTATION PLAN: - Integrated Recommendations					
- Example Products					

LEGEND
Completed
Requires Update
In Progress
Required
N/A = not applicable

MASKINONGE RIVER WATERSHED PLANNING STATUS

As of March, 2003

PLANNING STEP	Surface/Ground Water Quantity	Surface/Ground Water Quality	Aquatic Habitat and Species	Terrestrial Habitat and Species	Other Components
CHARACTERIZATION	<i>Public/Stakeholder Input - scoping issues, goals, objectives, working targets</i>				
	WATER BUDGET	SURFACE WATER QUALITY STUDY	AQUATIC RESOURCE STUDY	TERR. NATURAL HERITAGE STUDY	
	Surface Water Budget Model Dev't	Surface Water Quality Assessment	Fish Habitat Survey	Natural Cover and Land Use Mapping	Public Use - Outdoor Recreation
	Groundwater Budget Model Dev't	Water Quality/Contaminant Modelling	Fish Community Survey	Field Data Collection/Mapping	Human Heritage
	Water Use Effects Analysis	Point/non-point Source Identification	Benthic Invertebrate Survey	Terrestrial Natural Heritage Modelling	Air Quality
	Water Conservation Projections	Spills Inventory and Mapping	Riparian Zone Survey		Human Health
	Low Flow Measurements	SW Retrofit Opportunities Assessment	Regional Reference Community Assess.		Economy
	Water Takings Verification		Water Temperature Survey		Sustainability
	Infiltration Rate Mapping		Fluvial Geomorphic Assessment		
	WATER USE ASSESSMENT	GROUNDWATER QUALITY STUDY			
	Current Water Use (PTW, et al)	Groundwater Quality Assessment			
	Future Water Use Projections	Potential Contaminant Inventory			
	Wellhead Delineation	Contaminant Risk Assessment			
	Aquifer Vulnerability Mapping				
	SURFACE FLOW MODELLING STUDY				
	Hydrology Model Dev't				
	Hydraulics Model Dev't				
	Floodline and regulation line mapping				
	Flood vulnerable areas/dams database				
	GROUNDWATER STUDY				
ANALYSIS AND EVALUATION OF MANAGEMENT ALTERNATIVES	3D Geological Mapping				
	Well record compilation				
	Groundwater Flow Model Dev't				
	Groundwater Use Effects Analysis				
	Aquifer Mapping and Flow Connection				
	Groundwater Discharge Mapping				
	LAND USE MAP CONSOLIDATION (CURRENT AND FUTURE)*				
	CHARACTERIZATION REPORT PREPARATION (e.g. "State-of-the-Watershed" or "Existing" Conditions Reports)				
	Summary of Existing Conditions, Issues, and Opportunities				
	Existing policy review				
DEVELOPMENT OF WATERSHED PLAN AND IMPLEMENTATION PLAN: - Integrated Recommendations	Set Goals, Objectives, and Working Targets				
	<i>Public/Stakeholder Input - findings of characterization studies; formulation of alternative scenarios</i>				
	DEFINE ALTERNATIVE LAND USE, WATER USE, AND MANAGEMENT SCENARIOS				
	MODEL WATERSHED RESPONSE TO ALTERNATIVE SCENARIOS				
	Apply various models (i.e. water budget, hydrology, groundwater flow, water quality, etc.)				
	EVALUATE AND INTEGRATE FINDINGS				
	Recommend preferred management strategy				
	SUMMARIZE RESULTS AND FINALIZE TARGETS				
	<i>Public/Stakeholder Input - evaluation of alternatives and selection of preferred management strategy.</i>				
	FORMULATION OF PLAN AND IMPLEMENTATION FRAMEWORK				
- Example Products	- Water Budget and Conservation Plan				
	- Land Use and Water Use Management Strategies				
	- Provisions requiring the use of environmental management practices and programs				
	- Criteria for evaluating protection of water quality/quantity/hydro features and functions				
	- Implementation Framework (i.e. Planning/Policy, Land Securement, Regeneration, Stewardship, Education, etc.; Roles and Responsibilities; Schedule)				
	- Further Study Requirements (including details for smaller geographic areas, such as subwatersheds or sites)				
	- Monitoring Plan				
	Surface and Groundwater Quantity Targets	Surface and Groundwater Quality Targets	Aquatic Community Targets	Terr. Nat. Heritage system targets	
	SWM Criteria for Flood Control	Pollution prevention program	Fisheries mgmt. plan	Terr. Nat. Heritage strategy	
	SWM Criteria for Erosion Control	SW Criteria for water quality	Priority regeneration activities		
- Integrated Recommendations	SWM Criteria for Recharge	Urban SW retrofit plan			
	Water Allocation Protocol	Rural water quality mgmt. plan			
	Recs. For Municipal Water Conserv. Plans				
	<i>Public/Stakeholder Input - watershed plan formulation and final draft. NOTE: more significant involvement of municipal staff</i>				

Chart version 1.2-ORM (02/25/03)

LEGEND
Completed
Requires Update
In Progress
Required
N/A = not applicable

EAST HOLLAND WATERSHED PLANNING STATUS

As of March, 2003

PLANNING STEP	Surface/Ground Water Quantity	Surface/Ground Water Quality	Aquatic Habitat and Species	Terrestrial Habitat and Species	Other Components
CHARACTERIZATION	<i>Public/Stakeholder Input - scoping issues, goals, objectives, working targets</i>				
	WATER BUDGET	SURFACE WATER QUALITY STUDY	AQUATIC RESOURCE STUDY	TERR. NATURAL HERITAGE STUDY	
	Surface Water Budget Model Dev't	Surface Water Quality Assessment	Fish Habitat Survey	Natural Cover and Land Use Mapping	Public Use - Outdoor Recreation
	Groundwater Budget Model Dev't	Water Quality/Contaminant Modelling	Fish Community Survey	Field Data Collection/Mapping	Human Heritage
	Water Use Effects Analysis	Point/non-point Source Identification	Benthic Invertebrate Survey	Terrestrial Natural Heritage Modelling	Air Quality
	Water Conservation Projections	Spills Inventory and Mapping	Riparian Zone Survey		Human Health
	Low Flow Measurements	SW Retrofit Opportunities Assessment	Regional Reference Community Assess.		Economy
	Water Takings Verification		Water Temperature Survey		Sustainability
	Infiltration Rate Mapping		Fluvial Geomorphic Assessment		
	WATER USE ASSESSMENT	GROUNDWATER QUALITY STUDY			
	Current Water Use (PTW, et al)	Groundwater Quality Assessment			
	Future Water Use Projections	Potential Contaminant Inventory			
	Wellhead Delineation	Contaminant Risk Assessment			
	Aquifer Vulnerability Mapping				
	SURFACE FLOW MODELLING STUDY				
	Hydrology Model Dev't				
	Hydraulics Model Dev't				
	Floodline and regulation line mapping				
	Flood vulnerable areas/database				
	GROUNDWATER STUDY				
ANALYSIS AND EVALUATION OF MANAGEMENT ALTERNATIVES	3D Geological Mapping				
	Well record compilation				
	Groundwater Flow Model Dev't				
	Groundwater Use Effects Analysis				
	Aquifer Mapping and Flow Connection				
	Groundwater Discharge Mapping				
	LAND USE MAP CONSOLIDATION (CURRENT AND FUTURE)*				
	CHARACTERIZATION REPORT PREPARATION (e.g. "State-of-the-Watershed" or "Existing" Conditions Reports)				
	Summary of Existing Conditions, Issues, and Opportunities				
	Existing policy review				
DEVELOPMENT OF WATERSHED PLAN AND IMPLEMENTATION PLAN: - Integrated Recommendations	Set Goals, Objectives, and Working Targets				
	<i>Public/Stakeholder Input - findings of characterization studies; formulation of alternative scenarios</i>				
	DEFINE ALTERNATIVE LAND USE, WATER USE, AND MANAGEMENT SCENARIOS				
	MODEL WATERSHED RESPONSE TO ALTERNATIVE SCENARIOS				
	Apply various models (i.e. water budget, hydrology, groundwater flow, water quality, etc.)				
	EVALUATE AND INTEGRATE FINDINGS				
	Recommend preferred management strategy				
	SUMMARIZE RESULTS AND FINALIZE TARGETS				
	<i>Public/Stakeholder Input - evaluation of alternatives and selection of preferred management strategy.</i>				
	FORMULATION OF PLAN AND IMPLEMENTATION FRAMEWORK				
- Example Products	- Water Budget and Conservation Plan				
	- Land Use and Water Use Management Strategies				
	- Provisions requiring the use of environmental management practices and programs				
	- Criteria for evaluating protection of water quality/quantity/hydro features and functions				
	- Implementation Framework (i.e. Planning/Policy, Land Securement, Regeneration, Stewardship, Education, etc.; Roles and Responsibilities; Schedule)				
	- Further Study Requirements (including details for smaller geographic areas, such as subwatersheds or sites)				
	- Monitoring Plan				
	Surface and Groundwater Quantity Targets	Surface and Groundwater Quality Targets	Aquatic Community Targets	Terr. Nat. Heritage system targets	
	SWM Criteria for Flood Control	Pollution prevention program	Fisheries mgmt. plan	Terr. Nat. Heritage strategy	
	SWM Criteria for Erosion Control	SW Criteria for water quality	Priority regeneration activities		
- Integrated Recommendations	SWM Criteria for Recharge	Urban SW retrofit plan			
	Water Allocation Protocol	Rural water quality mgmt. plan			
	Recs. For Municipal Water Conserv. Plans				
	<i>Public/Stakeholder Input - watershed plan formulation and final draft. NOTE: more significant involvement of municipal staff</i>				

Chart version 1.2-ORW (02/25/03)

LEGEND
Completed
Requires Update
In Progress
Required
N/A = not applicable

WEST HOLLAND WATERSHED PLANNING STATUS

As of March, 2003

PLANNING STEP	Surface/Ground Water Quantity	Surface/Ground Water Quality	Aquatic Habitat and Species	Terrestrial Habitat and Species	Other Components
CHARACTERIZATION	<i>Public/Stakeholder Input - scoping issues, goals, objectives, working targets</i>				
	WATER BUDGET	SURFACE WATER QUALITY STUDY	AQUATIC RESOURCE STUDY	TERR. NATURAL HERITAGE STUDY	
	Surface Water Budget Model Dev't	Surface Water Quality Assessment	Fish Habitat Survey	Natural Cover and Land Use Mapping	Public Use - Outdoor Recreation
	Groundwater Budget Model Dev't	Water Quality/Contaminant Modelling	Fish Community Survey	Field Data Collection/Mapping	Human Heritage
	Water Use Effects Analysis	Point/non-point Source Identification	Benthic Invertebrate Survey	Terrestrial Natural Heritage Modelling	Air Quality
	Water Conservation Projections	Spills Inventory and Mapping	Riparian Zone Survey		Human Health
	Low Flow Measurements	SW Retrofit Opportunities Assessment	Regional Reference Community Assess.		Economy
	Water Takings Verification		Water Temperature Survey		Sustainability
	Infiltration Rate Mapping		Fluvial Geomorphic Assessment		
	WATER USE ASSESSMENT	GROUNDWATER QUALITY STUDY			
	Current Water Use (PTW, et al)	Groundwater Quality Assessment			
	Future Water Use Projections	Potential Contaminant Inventory			
	Wellhead Delineation	Contaminant Risk Assessment			
	Aquifer Vulnerability Mapping				
	SURFACE FLOW MODELLING STUDY				
	Hydrology Model Dev't				
	Hydraulics Model Dev't				
	Floodline and regulation line mapping				
	Flood vulnerable areas/database				
	GROUNDWATER STUDY				
ANALYSIS AND EVALUATION OF MANAGEMENT ALTERNATIVES	3D Geological Mapping				
	Well record compilation				
	Groundwater Flow Model Dev't				
	Groundwater Use Effects Analysis				
DEVELOPMENT OF WATERSHED PLAN AND IMPLEMENTATION PLAN: - Integrated Recommendations	Aquifer Mapping and Flow Connection				
	Groundwater Discharge Mapping				
	LAND USE MAP CONSOLIDATION (CURRENT AND FUTURE)*				
	CHARACTERIZATION REPORT PREPARATION (e.g. "State-of-the-Watershed" or "Existing" Conditions Reports)				
ANALYSIS AND EVALUATION OF MANAGEMENT ALTERNATIVES	Summary of Existing Conditions, Issues, and Opportunities				
	Existing policy review				
	Set Goals, Objectives, and Working Targets				
	<i>Public/Stakeholder Input - findings of characterization studies; formulation of alternative scenarios</i>				
DEVELOPMENT OF WATERSHED PLAN AND IMPLEMENTATION PLAN: - Integrated Recommendations	DEFINE ALTERNATIVE LAND USE, WATER USE, AND MANAGEMENT SCENARIOS				
	MODEL WATERSHED RESPONSE TO ALTERNATIVE SCENARIOS				
	Apply various models (i.e. water budget, hydrology, groundwater flow, water quality, etc.)				
	EVALUATE AND INTEGRATE FINDINGS				
DEVELOPMENT OF WATERSHED PLAN AND IMPLEMENTATION PLAN: - Integrated Recommendations	Recommend preferred management strategy				
	SUMMARIZE RESULTS AND FINALIZE TARGETS				
	<i>Public/Stakeholder Input - evaluation of alternatives and selection of preferred management strategy.</i>				
	FORMULATION OF PLAN AND IMPLEMENTATION FRAMEWORK				
DEVELOPMENT OF WATERSHED PLAN AND IMPLEMENTATION PLAN: - Integrated Recommendations	- Water Budget and Conservation Plan				
	- Land Use and Water Use Management Strategies				
	- Provisions requiring the use of environmental management practices and programs				
	- Criteria for evaluating protection of water quality/quantity/hydro features and functions				
DEVELOPMENT OF WATERSHED PLAN AND IMPLEMENTATION PLAN: - Integrated Recommendations	- Implementation Framework (i.e. Planning/Policy, Land Securement, Regeneration, Stewardship, Education, etc.; Roles and Responsibilities; Schedule)				
	- Further Study Requirements (including details for smaller geographic areas, such as subwatersheds or sites)				
	- Monitoring Plan				
- Example Products	Surface and Groundwater Quantity Targets	Surface and Groundwater Quality Targets	Aquatic Community Targets	Terr. Nat. Heritage system targets	
	SWM Criteria for Flood Control	Pollution prevention program	Fisheries mgmt. plan	Terr. Nat. Heritage strategy	
	SWM Criteria for Erosion Control	SW Criteria for water quality	Priority regeneration activities		
	SWM Criteria for Recharge	Urban SW retrofit plan			
- Example Products	Water Allocation Protocol	Rural water quality mgmt. plan			
	Recs. For Municipal Water Conserv. Plans				
	<i>Public/Stakeholder Input - watershed plan formulation and final draft. NOTE: more significant involvement of municipal staff</i>				

Chart version 1.2-ORW (02/25/03)

LEGEND
Completed
Requires Update
In Progress
Required
N/A = not applicable

PART 2B: TORONTO AND REGION CONSERVATION AUTHORITY WATERSHEDS

2.2 Toronto and Region Conservation Authority Watersheds

2.2.1 Status of Study Components By Watershed

The four TRCA watersheds draining from the Oak Ridges Moraine in York Region include: Humber River Watershed, Don River Watershed, Rouge River Watershed, and Duffins Creek Watershed.

Watershed planning studies have been completed to various degrees in all four watersheds, and ongoing watershed management work continues as part of a partnership between the TRCA and its member municipalities. Therefore, the Region is in a position to state that it has initiated watershed planning in these four watersheds. *Legacy – A Strategy for a Healthy Humber* was completed in 1997 and *Forty Steps to a New Don*, a regeneration strategy for the Don River Watershed, was completed in 1994. Subsequent watershed monitoring and reporting studies were published in the form of Watershed Report Cards for the Humber (2000) and Don (1997 and 2001). The work in these watersheds will focus on updating and filling in gaps, where necessary to meet any new requirements set out under the ORMCP.

The *Comprehensive Basin Management Strategy for the Rouge River Watershed*, completed in 1990, was the first watershed-based planning study of the TRCA. Although individual studies have been carried out within the watershed by TRCA, the Rouge Park Alliance, the municipalities, and others, it is now time to undertake a thorough review and develop a new Watershed Plan for that watershed.

A Watershed Plan for the Duffins Creek [and Carruthers Creek] was completed early in 2003. The focus of work in this watershed, if any, will be to fill any gaps necessary to completely satisfy the ORMCP requirements.

The status of completion for each of the watershed planning study components is described in section 2.2.2.

2.2.2 2004 to 2007 Budget Forecast and Workplan

Table 1 presents the proposed planning schedule for TRCA watersheds. The solid black lines represent the period of primary planning activity, and the grey lines indicate a period of preparation or finalization work

Table 1: TRCA Watershed Planning Schedule

Watershed	2003	2004	2005	2006	2007
Humber River Watershed Plan					
Don River Watershed Plan					
Rouge River Watershed Plan					
Duffins Creek Watershed Plan					

Table 2 summarizes the 2004-2007 watershed planning budget forecast, necessary to fulfill the ORMCP requirements.

Table 2: TRCA 2004-2007 Watershed Planning Budget Forecast – York Region

	2004	2005	2006	2007
Rouge	\$309,000	\$212,200	\$126,200	\$49,000
Humber	196,000	134,000	90,200	33,300
Don	83,400	82,600	154,300	26,100
Duffins	8,000	0	0	0
	\$596,400	\$428,800	\$370,700	\$108,400

The following sections describe the scope of work, deliverables and specific budgets associated with each individual watershed plan.

Rouge Watershed Plan

The Rouge Watershed Plan will recommend effective management strategies that can be used to guide land and water use decisions, such that the overall health of the Rouge Watershed is protected and enhanced. The study will provide a major update from work originally completed as part of the *Comprehensive Basin Management Strategy* (1990) and will build on the recently completed *Wet Weather Flow Management Master Plan (WWFMP)* (2003) of the City of Toronto and the Rouge Park Management Plans of the Rouge Park Alliance. The final watershed plan will fulfill the requirements of the *Oak Ridges Moraine Conservation Plan* (2002).

The Rouge Watershed Plan will be developed over the period 2003-2005. Table 3 outlines the budgetary requirements of York Region.

Table 3: Rouge Watershed Plan Budget Forecast - York Region

Rouge Watershed Plan	2004	2005	2006	2007
ORMCP Requirements	309,000	212,200	126,200	49,000
Other Components	68,000	45,000	22,000	0
Total	377,000	257,200	148,200	49,000

Additional project funding will be sought from the City of Toronto and other sources to make up the total project budget (Table 4).

Table 4: Rouge Watershed Plan - Total Project Budget and Funding Partners

	2004	2005	2006	2007	2008
Peel	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0
York	\$377,000	\$257,200	\$148,200	\$49,000	\$17,200
Toronto	\$212,600	\$134,200	\$ 81,100	\$23,500	\$10,100
Durham	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0
Other	\$182,500	\$177,500	\$ 0	\$ 0	\$ 0
Total	\$772,100	\$568,900	\$229,300	\$72,500	\$27,300

The annual deliverables associated with each component of the overall work program are as follows:

Overall Planning and Integration Project Management

Status

- *Rouge CBMS* (1990) requires update
- Watershed planning study launched in May/03
- Phase 1A and 1B underway
- Draft workplan (June/03) basis for scoping sessions with key partners June-Oct/03
- Project manager was hired Aug/03

2004

- Project coord./admin.
- Phase 1B Characterization (State of the Watershed) Report, including established goals, objectives, indicators , working targets and baseline report card

- Draft Phase 2 (Analysis and Evaluation) Report
- Min. of one set of community open houses and focus group meetings (seek input on Phase 1 and approach to Phase 2)
- regular task force meetings
- one peer review workshop
- policy framework and review of existing policy

2005

- Project coord./admin.
- Preliminary Phase 3 Report, including background and draft, alternative management strategies
- Phase 2 Report addendum, incl. analysis and eval. of draft mgmt. strategies
- Min. of two sets of community open houses and focus group meetings (seek input on Phase 2 and draft Phase 3); regular task force meetings
- Draft policy

2006

- Project coord./admin.
- Final draft Phase 3 Report/Plan
- Final draft policy
- Min. one set of community open houses and focus group meetings (seek input on final plan/policy); regular task force meetings
- Legal Review of Plan/policy
- Peer Review Workshop
- Final plan/policy
- Presentations to Councils and key partner groups.

2007

- Project coord./admin.
- Presentations to councils and key partner groups, as necessary

Water Budget

Status

- HSP-F Water budget completed for the City of Toronto and 905 areas as part of the WWFMMP. 905 area model improvement, including water quality modelling currently underway
- low flow monitoring and flow distribution mapping completed

2004

- input to Phase 1 Report for existing conditions
- analysis of effects of alternative land and water use scenarios

2005

- input to dev't of water allocation strategy
- SWM criteria for infiltration

Water Use Assessment

Status

- field verification of water taking
- Region of York water use study of permitted and estimated legal non permitted uses
- Region of York and City of Toronto water conservation programs

2004

- input to Phase 1 Report on effects of current water takings
- analysis of potential effects of future demand

2005

- input to dev't of water allocation strategy and model policy (eg. min. baseflow targets)
- development of watershed based water conservation targets

Surface Flow Modelling Study

Status

- Rouge Hydrology model update completed in 2002
- Hydraulic model update completed in 2002
- All existing Floodline and Regulation Line Mapping update completed (~ 80 maps)
- New Hydraulic model and Floodline and Regulation Line Mapping for portions of Richmond Hill (6 maps) currently underway and to be completed in 2003.

2004

- input to Phase 1 Report re watershed hydrology
- analysis of effects of alternative land use scenarios on flow

2005

- input to dev't of management recommendations and model policy for flood protection

Groundwater Study

Status

- Reg'l groundwater flow model available

2004

- input to Phase 1 Report
- analysis of effects of alternative land and water use scenarios

2005

- input to watershed plan recs
- model policy and water allocation strategy

Surface Water Quality Study**Status**

- existing surface water quality assessment completed using available data
- HSP F model and AGNPS models set up
- refinements to HSP-F model underway
- SW Retrofit opportunities identified
- WWFMP provides good direction for city portion of watershed

2004

- update of surface water quality assessment and input to Phase 1 Report
- Water quality/ contaminant modelling and analysis of alternative land use scenarios and their effects
- assessment of effectiveness of SW Retrofits through 416/905 HSP-F model integration

2005

- update of surface water quality assessment and input to Phase 1 Report
- Water quality/ contaminant modelling and analysis of alternative land use scenarios and their effects
- assessment of effectiveness of SW Retrofits through 416/905 HSP-F model integration

Groundwater Quality Study**Status**

- no consolidated data compilation or analysis exists

2004

- assessment of available literature and data
- input to Phase 1 Report for existing conditions

2005

- input to Watershed Plan and model policy

Aquatic Resource Study

Status

- inventory of aquatic habitat and communities
- initial analysis of aquatic data underway
- continuous stream temperature monitoring underway
- identification of instream barriers
- delineation of riparian vegetation

2004

- input to Phase 1 Report of existing (and historical) aquatic communities
- analysis of effects of alternative land and water use scenarios

2005

- input to Watershed Plan recs and model policy
- aquatic resource management plan

2006

- completion of aquatic resource management plan

Terrestrial Natural Heritage Study

Status

- 100% of the natural cover has been digitally captured in broad landscape categories of forest, wetland, meadow beach/bluff, agricultural and urban using 1999 air photos
- 14% of the natural cover has been inventoried to most detailed Ecological Land Classification category of Vegetation Type

2004

- 100% of the natural cover will have been digitally captured in broad landscape categories of forest, wetland, meadow beach/bluff, agricultural and urban using 2002 air photos
- 30% of the natural cover will have been inventoried to most detailed Ecological Land Classification category of Vegetation Type
- Landscape analysis of existing conditions to determine patch scores
- input to Phase 1 Report
- analysis of effects of alternative land and water use scenarios on terrestrial scores

2005

-input to final watershed plan policy

Note: Other watershed planning components (i.e. public use, human heritage studies), not specifically required under the ORMCP, will be included subject to funding availability. Details on these components can be found in the project specific workplans.

Humber Watershed Plan

“Legacy: A Strategy for a Healthy Humber” (1997) will be updated by addressing gaps identified by that study in the areas of groundwater management, water balance, and water use management. The updated watershed plan will fulfill the ORMCP requirements and provide enhanced wet weather flow management direction for the “905” area that will complement recommendations provided in the City of Toronto’s Wet Weather Flow Management Master Plan (2003).

More detailed sub-watershed plans may be prepared as part of the Humber Watershed Planning study to provide even more specific management direction for selected areas experiencing high urban growth or water use pressures.

The Humber Watershed Plan will be developed over the period 2004-2006. Table 5 outlines the budgetary requirements of York Region.

Table 5: Humber Watershed Plan Budget Forecast - York Region

Humber Watershed	2004	2005	2006	2007
ORMCP Requirements	196000	134000	90200	33300
Other Components	35000	49000	22000	0
Total	231200	183000	112200	33300

Additional project funding will be sought from the City of Toronto, Region of Peel, and other sources to make up the total project budget (Table 6).

Table 6: Humber Watershed Plan - Total Project Budget and Funding Partners

	2004	2005	2006	2007	2008
Peel	\$239,300	\$179,800	\$120,500	\$36,600	\$18,600
York	\$231,200	\$183,000	\$112,200	\$33,300	\$14,800
Toronto	\$157,900	\$124,000	\$ 93,900	\$26,300	\$11,900
Durham	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0
Other	\$112,500	\$102,500	\$112,500	\$ 0	\$ 0
Total	\$740,900	\$589,200	\$439,100	\$96,200	\$45,300

The annual deliverables associated with each component of the overall work program are as follows:

Overall Planning and Integration Project Management

Status

- *Legacy* Strategy for Humber (1997) identified gap areas for more work
- Preliminary Phase 1A of plan update was initiated
- Preliminary workplan outline developed to provide basis for budgeting

2004

- Project coordination/ admin.
- Phase 1B Characterization (State of the Watershed) Report, including established goals, objectives, indicators , working targets and report card
- Draft Phase 2 (Analysis and Evaluation) Report
- Min. of one set of community open houses and focus group meetings (seek input on Phase 1 and approach to Phase 2)
- regular task force meetings
- one peer review workshop
- policy framework and review of existing policy

2005

- Project coordination/ admin.
- Preliminary Phase 3 Report, including background and draft, alternative management strategies
- Phase 2 Report addendum, incl. analysis and eval. of draft mgmt. strategies
- Min. of two sets of community open houses and focus group meetings (seek input on Phase 2 and draft Phase 3); regular task force meetings
- Draft policy

2006

- Project coordination/ admin.
- Final draft Phase 3 Report/Plan
- Final draft policy
- Min. one set of community open houses and focus group meetings (seek input on final plan/policy); regular task force meetings
- Legal Review of Plan/policy
- Peer Review Workshop
- Final plan/policy
- Presentations to Councils and key partner groups.

2007

- Project coordination/ admin.
- Presentations to councils and key partner groups, as necessary

2008

- Project transition to Implementation

Water Budget**Status**

- HSP-F Water budget completed in Toronto and 905 areas as part of the WWFMMP. 905 area model improvement currently underway
- low flow monitoring and flow distribution mapping substantially complete

2004

- input to Phase 1 Report for existing conditions
- analysis of effects of alternative land and water use scenarios

2005

- input to dev't of water allocation strategy
- SWM criteria for infiltration

Water Use Assessment**Status**

- field verification of water takings
- Regions of York and Peel water use studies of permitted and estimated legally non permitted takings
- Regions of York and Peel and City of Toronto water conservation programs in place

2004

- input to Phase 1 Report on effects of current water use
- analysis of potential effects of future demand

2005

- input to dev't of water allocation strategy and model policy (e.g. min. baseflow targets)
- development of watershed based water conservation targets

Surface Flow Modelling Study**Status**

- Humber Hydrology model update completed in 2002
- Hydraulic model and Floodline and Regulation Line Mapping update to be completed in 2003

2004

- input to Phase 1 Report for watershed hydrology
- report on analysis of effects of alternative land use scenarios on flow

2005

- input to dev't of mgmt. recommendations and policy for flood protection

Groundwater Study

Status

- Reg'l groundwater flow model available

2004

- input to Phase 1 Report
- analysis of effects of alternative land and water use scenarios

2005

- input to watershed plan recs
- model policy and water allocation strategy

Surface Water Quality Study

Status

- existing surface water quality assessment completed using available data
- HSP-F and AGNPS models set up
- refinement to 905 HSP-F model underway
- SW retrofit opportunities identification underway

2004

- update of surface water quality assessment and input to Phase 1 Report
- Water quality/ contaminant modelling and analysis of alternative land use scenarios and their effects
- assessment of effectiveness of SW Retrofits through 416/905 HSP-F model integration

2005

- update of surface water quality assessment and input to Phase 1 Report
- Water quality/ contaminant modelling and analysis of alternative land use scenarios and their effects
- assessment of effectiveness of SW Retrofits through 416/905 HSP-F model integration

Groundwater Quality Study

Status

TBD

2004

- assessment of available literature and data
- input to Phase 1 Report for existing conditions

2005

- input to Watershed Plan and model policy

Aquatic Resource Study**Status**

- complete fisheries management plan

2004

- input to Phase 1 Report of existing (and historical) aquatic communities
- analysis of effects of alternative land and water use scenarios

2005

- input to Watershed Plan recommendations and model policy

2006

- final input into watershed plan recommendations and model policy

Terrestrial Natural Heritage Study**Status**

- 100% of the natural cover has been digitally captured in broad landscape categories of forest, wetland, meadow beach/bluff, agricultural and urban using 1999 air photos
- 32% of the natural cover has been inventoried to most detailed Ecological Land Classification category of Vegetation Type

2004

- 100% of the natural cover will have been digitally captured in broad landscape categories of forest, wetland, meadow beach/bluff, agricultural and urban using 2002 air photos
- 40% of the natural cover has been inventoried to most detailed Ecological Land Classification category of Vegetation Type
- Landscape analysis of existing conditions to determine patch scores

2005

- input to watershed plan and model policy

Note: Other watershed planning components (i.e. public use, human heritage studies), not specifically required under the ORMCP, will be included subject to funding availability. Details on these components can be found in the project specific workplans.

Don Watershed Plan

Updates to *Forty Steps to a New Don* (1994) and associated studies will be made, as necessary, to provide adequate watershed management direction to fulfill the ORMCP requirements and provide enhanced wet weather flow management direction in the "905" area, to complement the City of Toronto's *Wet Weather Flow Management Master Plan* (2003).

The Don Watershed Plan will primarily be developed over the period 2004-2006. Table 7 outlines the budgetary requirements of York Region.

Table 7: Don Watershed Plan Budget Forecast - York Region

Don Watershed Plan	2004	2005	2006	2007
ORMCP Requirements	83,400	82,600	154,300	26,100
Other Components	11,000	14,500	21,000	7,000
Total	94,400	97,100	175,300	33,100

Additional project funding will be sought from the City of Toronto and other sources to make up the total project budget (Table 8).

Table 8: Don Watershed Plan - Total Project Budget and Funding Partners

	2004	2005	2006	2007	2008
Peel	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0
York	\$94,400	\$ 97,100	\$175,300	\$ 0	\$10,000
Toronto	\$ 78,100	\$ 98,400	\$161,500	\$ 33,100	\$13,300
Durham	\$ 0	\$ 0	\$ 0	\$ 37,800	\$ 0
Other	\$ 0	\$ 95,000	\$105,000	\$ 0	\$ 0
Total	\$342,500	\$290,500	\$441,700	\$ 70,900	\$23,300

The annual deliverables associated with each component of the overall work program are as follows:

Overall Planning and Integration Project Management

Status

- *Forty Steps* Don regeneration strategy (1994) identified gap areas for more work
- Preliminary workplan outline developed to provide basis for budgeting

2004

- Project coordination/ admin.
- Phase 1A (scoping) workplan

2005

- Project coordination/ admin.
- Phase 1B (State of the Watershed) update report
- confirmation of goals, objectives, indicators, targets
- proposed approach to Phase 2 and initial analysis
- draft policy framework
- Min. one set of community open houses and focus group meetings
- regular Don Council meetings

2006

- Project coordination/ admin.
- Phase 3 draft management strategies, further Phase 2 analysis as required
- Final Phase 2 report
- Draft Phase 3 Plan/policy
- Min. two sets of community open houses and focus group meetings
- regular Don Council meetings
- Peer Review Workshop
- Legal Review of Plan/Policy

2007

- Project coordination/ admin.
- Final Plan/Policy
- Presentations to Councils, partner groups

2008

- Project transition to Implementation

Water Budget**Status**

- HSP-F Water budget completed for existing land use scenario as part of the WWFMMP.
- Future land use scenario required and to be completed in 2004
- Low flow measurements underway

2004

- water budget
- low flow measurements and flow distribution mapping

2005

- input to Phase 1 update on water budget and low flow distribution under current conditions
- analysis of potential effects of future water use and retrofit strategies

2006

- input to development of water allocation strategy and model policy

Water Use Assessment

Status

- field verification of water taking underway

2004

- field verification of water taking completed

2005

- analysis of effects of future water use

2006

- input to development of water allocation strategy and model policy (eg. min. baseflow targets)

Surface Flow Modelling Study

Status

- Don River Hydrology model update to be completed in 2003
- Hydraulic model and existing Floodline and Regulation Line Mapping updates (~ 35 maps) in Toronto to be completed in 2003

2004

Hydraulic model and existing Floodline and Regulation Line Mapping updates in 905 area required and proposed for 2004

2005

- input to Phase 1 Report re watershed hydrology

2006

- input to final plan and policy

Groundwater Study

Status

- Regional groundwater flow model available

2004

NA

2005

- input to Phase 1 Report and analysis of alternative scenarios

2006

- input to final plan and policy
- input to water allocation strategy

Surface Water Quality Study

Status

- water quality related data analysis completed 2003
- WWFMP provides SW retrofit direction

2004

NA

2005

- limited updated water quality assessment
- modelling of (905) SW retrofit scenarios

2006

- input to final plan and policy

Groundwater Quality Study

Status

- no consolidation of available data

2004

NA

2005

- analysis of available literature and data
- input to Phase 1 Report

2006

- input to final plan and policy

Aquatic Resource Study

Status

- draft aquatic community management plan

2004

- initiate update to draft aquatic community management plan

2005

- input to Phase 1 Report of existing and historical aquatic communities
- analysis of effects of alternate land and water use scenarios

2006

- input to watershed plan recommendations and model policy

2007

- final input into watershed plan

Terrestrial Natural Heritage Study

Status

- 100% of the natural cover has been digitally captured in broad landscape categories of forest, wetland, meadow beach/bluff, agricultural and urban using 1999 air photos
- 17% of the natural cover has been inventoried to most detailed Ecological Land Classification category of Vegetation Type

2004

- 100% of the natural cover will have been digitally captured in broad landscape categories of forest, wetland, meadow beach/bluff, agricultural and urban using 2002 air photos
- 30% of the natural cover has been inventoried to most detailed Ecological Land Classification category of Vegetation Type

2005

- Landscape analysis of existing conditions to determine patch scores
- Refinement of regional targets for quantity and quality to watershed scale

2006

- input to plan and policy

Note: Other watershed planning components (i.e. public use, human heritage studies), not specifically required under the ORMCP, will be included subject to funding availability. Details on these components can be found in the project specific workplans.

Duffins Creek Watershed Plan

The *Duffins Creek [and Carruthers Creek] Watershed Plan* was completed in 2003. The plan is believed to represent state-of-the-art in watershed planning and is expected to fulfill the requirements of the ORMCP. The only additional work identified for 2004 is the development of model policy that would assist the municipalities in implementing the watershed plan's recommendations.

Table 9 outlines the budgetary requirements of York Region for the policy project.

Table 9: Duffins Creek Watershed Plan Budget Forecast - York Region

Duffins Watershed Plan	2004	2005	2006	2007
ORMCP Requirements	8,000	0	0	0
Other Components	0	0	0	0
Total	8,000	0	0	0

Additional project funding will be sought from the Region of Durham to make up the total project budget of \$30,000.