THE THAMES RIVER WATER MANAGEMENT PLAN UPDATE

Terms of Reference

A Component of the Thames River Clearwater Revival Watershed Strategy

"Committed to a Healthy and Vital Thames River"

September 17, 2013

ThamesRiver
CLEAR WATER REVIVAL

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1. Background and Rationale

The Thames River watershed is located within the agricultural heartland of southwestern Ontario. It is 5,285 km^2 and more than half a million people reside in the watershed. From its headwaters near Tavistock, the river flows 279 km southwest before reaching its outlet into Lake St. Clair and, ultimately, into Lake Erie (Figure 1).

Although many groups, including the Conservation Authorities, have been involved in monitoring and reporting on the state of Thames River watershed resources for many years, a comprehensive water management plan has not been developed for some time. The most recent water management plan for the Thames River was prepared in 1975 as part of the Thames River Basin Water Management Study by the Ministry of the Environment and the Ministry of Natural Resources. Appendix D provides a summary of the 1975 study and recommendations.

The 1975 study was initiated due to a growing concern over problems in the watershed related to water quality, flooding, erosion, and potential problems anticipated as a result of population growth and development (i.e. the assimilative capacity of the river). The study was based on an assessment of the availability and quality of surface and groundwater, an inventory of water uses and related land uses, and an evaluation of existing and potential water resource problems in the basin. There are several reasons why a more current Water Management Plan is needed for the Thames River:

- Information from recent climate change studies needs to be incorporated into water quantity resource management decisions and in particular, models of flood and low water events to avoid and mitigate the challenges caused by these extreme flow regimes;
- Competing demands on, and inputs to, the Thames River have changed over time (e.g. increased pressure from urbanization) and baseline information on the health of the river in the 1975 study is outdated;
- Best Management Practices (BMPs) have evolved with improved technology and increased experience;
- Appreciation for Traditional Ecological Knowledge (TEK) of First Nation communities within the watershed was not incorporated in past water quality and quantity studies of the Thames River;
- The increased focus on the health of the Great Lakes, including the 2012 Canada – US Great Lakes Water Quality Agreement, the provincial Great Lakes Strategy and the Lake Erie Lakewide Action and Management Plan (LAMP) Binational Nutrient Management Strategy, has identified the Thames River as a regional, provincial and national priority.

The updated Thames River Water Management Plan will be a key component of a broader Watershed Strategy, known as the Thames River Clearwater Revival (TRCWR) that considers all the interactions of land, water, plants, animals and people (Figure 2), with the overall objective of improving the ecological condition of the Thames River, Lake St. Clair, and Lake Erie. Recognizing the complexity of achieving this goal, and that resources to do so are limited, the intention is to tackle the recommendations that have been identified in recent literature as most important and realistic for the Great Lakes (LSCCWCC 2009, Lake Erie LAMP 2011), and prioritize the remaining issues for future consideration. To this end, the Thames River Water Management Plan update (TRWMP) will be a 20 year plan focusing on water quantity and quality to provide broad and strategic guidelines regarding water conservation and management that consider extreme weather events, land use, and land management.

Figure 1. Thames River Watershed

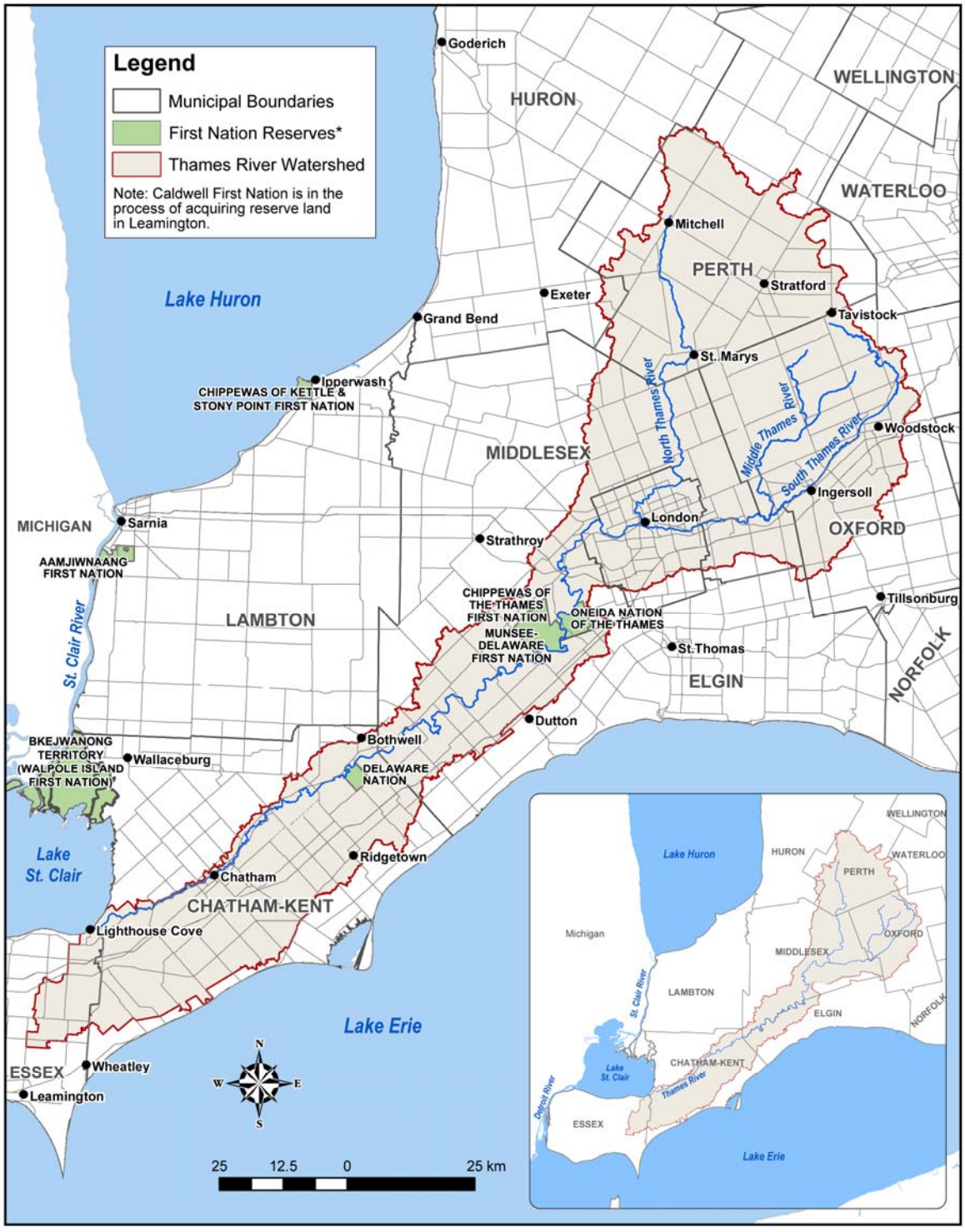
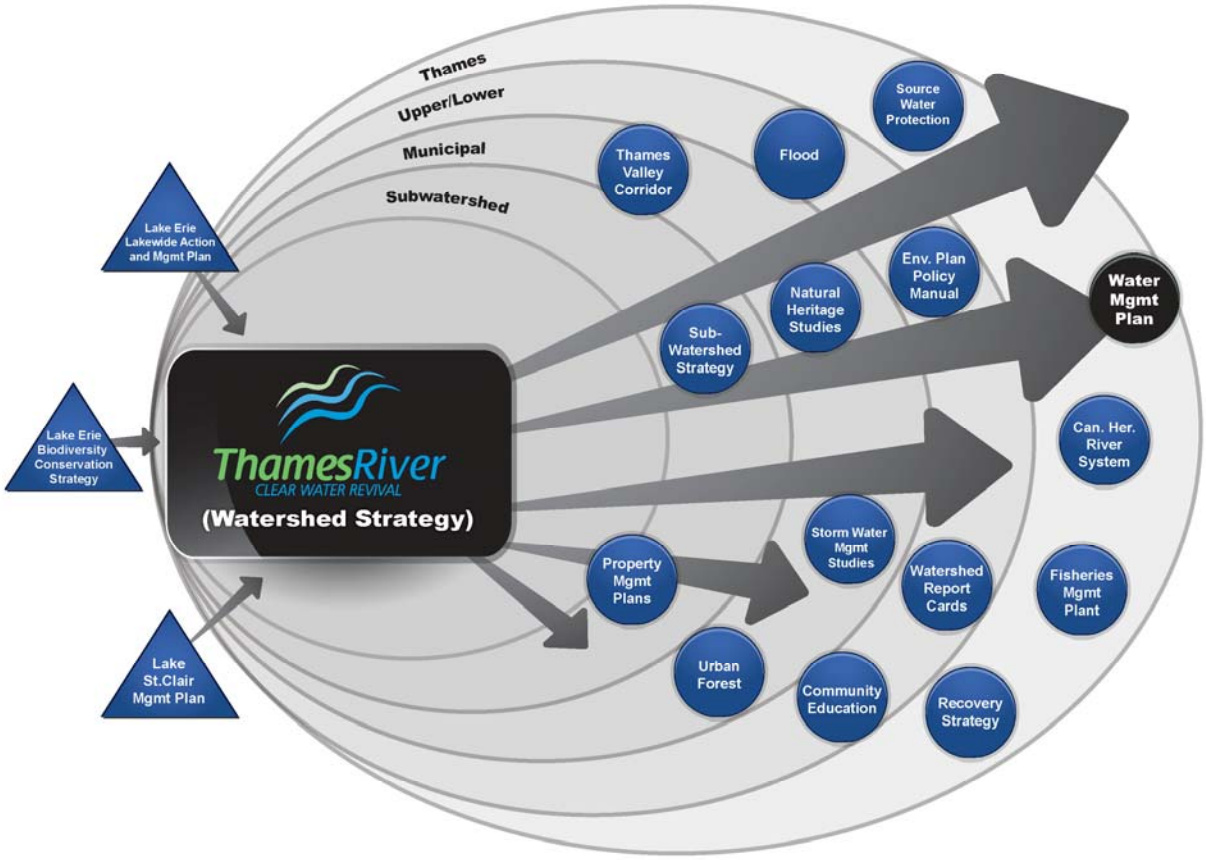


Figure 2. Examples of various component studies that could be considered part of the Watershed Strategy, as well as initiatives that influence the Watershed Strategy



2. Strategic Alignment

As the largest watershed in the Lake St. Clair basin, the Thames River has the potential to significantly impact conditions in Lake St. Clair and, by extension, in Lake Erie. The Thames River Water Management Plan update is critical, therefore, to achieving the vision of a healthy Lake St. Clair. The Lake St. Clair Canadian Watershed Management Plan, developed by the Lake St. Clair Canadian Watershed Coordination Council (LSCCWCC 2009), identified threats to the health of Lake St. Clair, including issues related to land use, point and non-point source pollution, habitat, biodiversity and navigation. A goal of the Lake St. Clair Canadian Watershed Management Plan is to integrate Canadian tributary watershed programs and Great Lakes basin-wide initiatives by encouraging cooperation and collaboration towards common goals with a specific focus on Lake St. Clair.

In Lake Erie, changes in the form of phosphorus entering the lake, as well as altered nutrient cycling and food web dynamics, are believed to be key factors in the resurgence in recent years of algal blooms that had last threatened the Lake Erie ecosystem in the 1960s and 1970s. In response, the Lake Erie LAMP Work Group has developed a Binational Nutrient Management Strategy (Lake Erie LAMP 2011) that makes phosphorus reduction a priority and sets loadings targets for the lake and its tributaries. As one of the largest watersheds in the Lake Erie basin, the Thames River is a priority watershed for the successful management of phosphorus loads to Lake Erie. The goal of the Lake Erie LAMP is to restore and protect the beneficial uses of Lake Erie and to reduce or prevent sources of impairments to these uses.

Addressing existing and emerging water quality and quantity concerns will benefit all who live, work and recreate in the Thames River watershed and, by extension, Lake St. Clair and Lake Erie.

The Thames River Water Management Plan Update brings together the following watershed managers, all of whom have a shared responsibility for watershed health.

1. Environment Canada

Environment Canada is the federal lead in two Agreements: 1) The Great Lakes Water Quality Agreement that expresses the commitment between Canada and the United States to restore and protect the chemical, physical and biological integrity of the Great Lakes basin ecosystem; and 2) The Canada – Ontario Agreement Respecting the Great Lakes Basin Ecosystem (COA) between the federal and provincial governments to coordinate efforts with a variety of partners at the local level in restoring the Great Lakes basin to a healthy, prosperous and sustainable ecosystem, and to protect this ecosystem by anticipating and preventing environmental problems. It is anticipated that the updated water management plan will assist Environment Canada in fulfilling its obligations by providing recommendations for key water quality parameters as well as information for initiatives such as Lakewide Action and Management Plans.

2. First Nations

First Nations peoples have a unique perspective and relationship with the lands and waters within the watershed that include assertions of Aboriginal Title, Treaty Rights and Aboriginal Rights. First Nations have expressed concern about actions they perceive may influence title claims, as well as health and economic wellbeing through impacts to drinking water, hunting, fishing, recreation and tourism. The watershed is important as a hunting ground and is essential to archival and oral traditions, history, knowledge and identity of First Nations peoples. Thus, First Nation should provide their perspectives and stories with respect to their history, knowledge and identity through Traditional Ecological Knowledge (TEK) as it relates to the Thames River.

The eight First Nations that have been identified as potentially having an interest in the Plan are:

- Aamjiwnaang First Nation
- Caldwell First Nation
- Chippewas of Kettle and Stony Point First Nation
- Chippewas of the Thames First Nation
- Delaware Nation - Moravian of the Thames
- Munsee-Delaware Nation
- Oneida Nation of the Thames
- Walpole Island First Nation (Bkejwanong Territory)

3. Ontario Ministry of the Environment

At a regional scale, the Ontario Ministry of the Environment (OMOE) is the provincial lead in the Canada-Ontario Agreement (COA) with the federal government to coordinate efforts with a variety of partners at the local level to restore the Great Lakes basin to a healthy, prosperous and sustainable ecosystem, and to protect this ecosystem by anticipating and preventing environmental problems. Two initiatives under COA with which the Ministry holds the provincial lead and that are directly impacted by efforts within the Thames watershed include the Lake St. Clair Management Plan and the Lake Erie Lakewide Action and Management Plan.

At a local scale, the OMOE administers three important pieces of legislation: 1) The *Ontario Water Resources Act*, R.S.O. 1990, c. O. 40, as amended, is designed to protect and manage Ontario's surface and ground water resources for efficient and sustainable use by, for example, governing water takings and effluent discharge limits; 2) The Ontario *Environmental Protection Act*, R.S.O. 1990, c. E. 19, as amended, provides broad powers to the Ministry of the Environment to limit the discharge of contaminants to protect the natural environment; and 3) The *Nutrient Management Act*, 2002, S.O. 2002, c. 4, as amended, establishes the framework and standards for best practices in nutrient management, and gives the OMOE, along with the Ontario Ministry of Agriculture, Food and Rural Affairs, the ability to regulate agricultural practices involving the storage and use of nutrients, especially manure, in order to reduce inputs to surface water and groundwater.

It is anticipated that the updated water management plan will assist the OMOE in fulfilling its obligations at a regional and local scale by providing recommendations for key water quality parameters as well as provide information on low water conditions and water uses for decision-making in the permit-to-take-water program.

4. Ontario Ministry of Natural Resources

The Ontario Ministry of Natural Resources (OMNR) is responsible for directing and implementing the *Lakes and Rivers Improvement Act*, R.S.O. 1990, c. L. 3, as amended, to manage and protect Ontario lakes and rivers, and the Ontario *Endangered Species Act*, 2007, S.O. 2007, c. 6, as amended, to protect endangered plants and animals and their habitats. It is anticipated that the updated water management plan will assist the OMNR in fulfilling its obligations to protect lake and river ecosystems, as well as endangered species and their habitats. The Plan will also support OMNR stewardship initiatives.

5. Ontario Ministry of Agriculture and Food

The *Nutrient Management Act*, 2002, S.O. 2002, c. 4, as amended, and its regulations give the Ontario Ministry of Agriculture and Food (OMAF), along with the Ontario Ministry of the Environment, the ability to regulate manure and other nutrients on expanding and large existing livestock farms. Nutrient storage, transport, and land application are regulated through nutrient management strategies and plans, with the goal of increasing the efficiency of nutrient use and correspondingly limiting the risk of nutrient

losses to surface and groundwater.

It is anticipated that the updated water management plan will assist OMAF by providing recommendations for key water quality parameters as well as information for initiatives such as the Environmental Farm Plan and Best Management Practices.

6. Conservation Authorities

The *Conservation Authorities Act*, R.S.O. 1990, c. C. 27, as amended, contains several sections related to the management of surface and groundwater, giving the Conservation Authorities a clear role in watershed-based planning and regulations. The Act empowers Conservation Authorities to act to reduce the risk from natural hazards, to protect natural resources other than gas, oil, coal and minerals and to undertake programs to conserve, restore, develop and manage natural resources. The Lower Thames Valley and Upper Thames River Conservation Authorities are the two CAs involved in the Plan.

7. Municipalities

Municipalities operate under several areas of provincial legislation; however, the *Municipal Act*, S.O. 2001, c. 25, as amended, and *Planning Act* are the two with the greatest scope. They give municipalities the responsibility of passing by-laws to govern their jurisdiction and to manage land use, including the flood plain and providing services to their residents. It is anticipated that the updated water management plan will assist municipalities in wisely managing lands that may impact the river, as well as provide information to inform management of infrastructure, tourism and recreation initiatives associated with the river.

3. Goals and Objectives

The Thames River Water Management Plan update has five goals, each with at least one supporting objective. Additional objectives may be added as the Plan is developed.

GOAL: Identify and address water quantity management issues.

Objective 1: Gain a better understanding of how changes in extreme weather events, land use, and land management influence water quantity.

- Compile information and identify knowledge gaps in: monitoring base flow, modeling hydraulics and water budgets, understanding impacts on water control and discharge structures, demands on water resources and management practices as they relate to water quantity.
- Predict flood and low water hazards by incorporating accepted climate change parameters and detailed information in appropriate models/ simulations.

Objective 2: Minimize low flow, flood and erosion risk through a balanced approach of structural (e.g. dams, dykes, channels) and non-structural (e.g. flood plain regulation, flood forecasting and warning, natural capital, land management, etc.) mitigation strategies.

- Develop recommendations for man-made infrastructure, natural capital and non-structural tools to avoid and mitigate flood and low water hazards.

Objective 3: Update the current conceptual understanding of surface water and groundwater interaction in the Thames River watershed.

- Based on data and experience acquired since 1975, improve the characterization of aquifers and associated geologic components related to groundwater to better understand the extent / size and quality of the groundwater resource.

Objective 4: Apply our understanding of surface water and groundwater use to update the 1975 management strategies to better manage the resource.

- Develop recommendations for an improved standardized monitoring program for water quantity.

GOAL: Improve water quality of the Thames River watershed and reduce the river's impact on Lake St. Clair, the Detroit River and Lake Erie.

Objective 1: Describe long term water quality trends including sources, transport and accumulations of key parameters identified in Great Lakes basin-wide initiatives.

- Compile information and identify gaps in: monitoring known point and non-point surface water and groundwater sources of key water quality and aquatic health parameters, base flow, hydraulic and water budget modeling, demands on water resources and management practices as they relate to water quality.

Objective 2: Update the current conceptual understanding of surface water and groundwater interaction in the Thames River watershed.

- Based on data and experience acquired since 1975, improve the characterization of aquifers and associated geologic components related to groundwater to better understand the extent / size and quality of the groundwater resource.

Objective 3: Gain a better understanding of how changes in extreme weather events, land use, and land management influence water quality.

- Characterize watershed in terms of current conditions and long-term trends in key water quality and aquatic health parameters.

Objective 4: Identify important functions of the Thames River such as providing drinking water, recreational opportunities, wildlife and wildlife habitat, agriculture, etc. and define thresholds of water quality for these functions.

Objective 5: Develop targets/indicators in order to measure success of Plan.

- Consider binational Lake Erie water quality objectives when setting watershed water management objectives and targets.

Objective 6: Evaluate activities and practices that impact water quality to provide broad geographical recommendations for point and non-point pollution sources that will ensure water quality thresholds are met within the Thames River and in Lake St. Clair, the Detroit River and Lake Erie.

- Develop recommendations for an improved standardized monitoring program for water quality.
- Identify priority geographical areas and identify and implement key remedial actions for improvements to water quality and aquatic health parameters.
- Where possible, act at the watershed level to achieve binational Lake Erie water quality objectives for the Thames River watershed.
- Develop and implement a methodology to determine contribution of base flow pollutants.

GOAL: Strengthen community connections with the Thames River watershed and understanding of the river's relationship to the Great Lakes.

Objective 1: Develop and implement a communications plan to promote the TRWMP update and increase the awareness and value of the Thames River, and the importance of its connection to Lakes St. Clair and Erie, for municipalities, agencies, First Nations, and communities within the Thames River watershed.

- Develop Communication Plan that includes analysis of target audience, messages, and outreach strategies

GOAL: Understand Traditional Ecological Knowledge (TEK) and determine how it can inform water resource management decisions.

Objective 1: Incorporate TEK of the First Nation communities to enhance technical studies and recommendations regarding water quantity and quality.

- Incorporate Traditional Ecological Knowledge (TEK) by
    - Instructing technical committees to appreciate First Nations epistemologies as valid systems of knowledge,
    - Seeking ways to assemble and implement TEK data into studies and recommendations,
    - Locating TEK data from published sources and, when relevant and feasible, conducting new TEK studies,
    - Respecting ownership rights of First Nations over TEK and data generated by,

about, and for the First Nation and recognizing that each First Nation has oversight over the use of its TEK and data,
- Ensuring that recommendations reflect and respect First Nations land use and cultural heritage,
- Providing engagement opportunities for First Nations members to inform studies and recommendations.

GOAL: Strengthen collaborations among watershed managers: First Nations, municipalities, Conservation Authorities, Provincial ministries and Federal departments.

Objective 1: Develop, document and implement a process for collaboration.

- Develop TOR with work plan and governance for the Thames River Water Management Plan update.
- Assemble and manage steering and communications committees and technical working groups.

4. Deliverables and Schedule

Table 1 shows the deliverables and proposed completion dates for developing the updated Thames River Water Management Plan.

These are the main deliverables; it is anticipated that additional deliverables may be developed in the work plans of the Technical Work Groups.

Table 1. Deliverables and proposed schedule for the completion of the updated Thames River Water Management Plan.

Component	Deliverables	Completion Date
Project Management, Collaboration and Communication	- Develop TOR with work plan and governance for the Thames River Water Management Plan update. - Assemble and manage steering and communications committees and technical working groups. - Develop Communication Plan that includes analysis of target audience, messages, and outreach strategies	October 2011 – December 2016
Data Collection and Analysis	- Compile information and identify gaps in monitoring known point and non-point surface water and groundwater sources of key water quality and aquatic health parameters, base flow, hydraulic and water budget modeling, demands on water resources, and management practices as they relate to water quality. - Compile information and identify gaps in base flow, hydraulic and water budget modeling, water control and discharge structures, demands on water resources, and management practices as they relate to water quantity. - Incorporate Traditional Ecological Knowledge. - Engage community in data collection, wherever possible.	December 2012 – December 2014
Assessment of Data	- Predict flood and low water hazards by incorporating accepted climate change parameters and detailed information in appropriate models/simulations. - Characterize watershed in terms of current conditions and long-term trends in key water quality and aquatic health parameters. - Develop and implement a methodology to determine contribution of base flow pollutants. - Based on data and experience acquired since 1975, improve the characterization of aquifers and associated geologic components related to groundwater to better understand the extent / size and quality of the groundwater resource.	December 2014 – December 2015
Recommendations & Early Actions	- Develop recommendations for man-made infrastructure, natural capital and non-structural tools to avoid and mitigate flood and low water hazards. - Identify priority geographical areas and identify and implement key remedial actions for improvements to water quality and aquatic health parameters. - Develop recommendations for improved standardized monitoring programs for water quantity and quality.	December 2015 – August 2016
Reporting	- TRWMP write up and peer review - TRWMP finalization	September – November 2016 December 2016

5. Governance

The governance model for the TRWMP consists of a Steering Committee, a Project Manager and Technical Working Groups. The Steering Committee oversees the Plan. Technical Working Groups are adhoc committees organized on the basis of specific tasks or objectives identified in each phase of the Plan, and dissolved after completion of the tasks. The Project Manager is the liaison between the Steering Committee and Technical Working Groups. Additional individuals or organizations with an interest in the TRWMP will be identified and described as part of the stakeholder analysis in the Communication Plan.

Steering Committee

Oversight for the update of the TRWMP will be provided by a Steering Committee comprised of representatives from:

- Environment Canada
- Chippewas of the Thames First Nation, Oneida Nation of the Thames, and Walpole Island First Nation
- Ontario Ministries of the Environment, Natural Resources, and Agriculture, Food and Rural Affairs
- Lower Thames Valley and Upper Thames River Conservation Authorities
- City of London

Steering Committee members are appointed by their organizations to oversee the development of the TRWMP. The Steering Committee will be informed on Technical Working Group work through the Project Manager. Four core values will guide the steering committee in how it makes decisions:

- Preserve ecological integrity
- Preserve cultural integrity
- Aim for long term sustainability
- Address community values and develop relationships to the river

Responsibilities of Steering Committee Members:

- Serve as an endorsed representative of their organization, ensuring they represent the interests of their organization
- Raise awareness and understanding of TRWMP within their organizations and communities such as reporting progress to, and collecting feedback from, their directors and organization members (e.g. annual briefing on state of the river)
- Recommend appropriate representatives (including themselves) from their respective organizations to participate in Technical Working Groups
- Provide overall direction and guidance by identifying specific tasks of short duration for Technical Working Groups
- Approve work plans (including Project Manager's), broad study objectives, and major budget expenditures
- Identify funding opportunities
- Approve public release of technical reports and communication products
- Ensure recommendations from various phases of the TRWMP are complementary
- Develop a coordinated implementation plan with realistic timelines and budgets based on information and input from Technical Working Groups
- The Steering Committee may choose to have meetings chaired by one individual or by multiple individuals on a rotating basis.

Project Manager

The Project Manager will be a neutral professional who has full responsibility and authority to coordinate, develop and manage the TRWMP. All decisions by the Project Manager are based on benefitting the TRWMP.

Responsibilities of the Project Manager:

- Develop an annual work plan to be approved by the Steering Committee
- Develop and manage the TOR
- Coordinate and facilitate the development and execution of a detailed work plan for each phase of the TRWMP
- Raise awareness and understanding of the TRWMP with members of the Steering Committee and Technical Working Groups
- Provide administrative support to the Steering Committee and Technical Working Groups, including meeting facilitation, time keeping and note taking for all meetings
- Develop collaborative planning process to allow for the exchange of information and ideas
- review requests for proposals and study reports
- Ensure accuracy and timeliness of technical documents produced by the Steering Committee and Technical Working Groups
- Day to day management of the TRWMP

Technical Working Groups

Technical Working Groups are committees organized on the basis of goals and objectives identified in the TOR of the Water Management Plan update. These committees include representatives from the Steering Committee with expertise in the topic, as well as experts from other sectors of the watershed (e.g., business, industry, agriculture and academia). Members and topics of the Technical Working Group are expected to change depending on the phase of the TRWMP, and may be assembled by topic into subgroups when required. Steering Committee members will ensure appropriate individuals are participating in the Technical Working Groups and that the TRWMP will be considered a high priority.

The primary responsibility of Technical Working Groups is to develop a work plan that identifies specific tasks or deliverables necessary to address each objective in the TOR of the Water Management Plan update, including the order and duration of each task and who is responsible for ensuring the tasks are completed.

It is anticipated that each Technical Working Group will meet at least four times a year as a group, but that many other meetings may occur in smaller subgroups depending on the work plan, roles and responsibilities. Once the work plan has been developed, the Technical Working Group will seek approval for the work plan from the Steering Committee through the Project Manager. A Technical Working Group will dissolve only after completion of the work plan tasks.

A staff member from the Upper Thames River Conservation Authority (UTRCA) will chair Technical Working Group meetings unless a different individual is chosen by the Technical Working Group. Additional facilitation, as well as the development of an agenda and minutes for the meetings, is the responsibility of the Project Manager.

The Project Manager will develop a Master Work Plan based on the individual Technical Working Group work plans for each of the goals and objectives to ensure that work from all Technical Working Groups is

integrated. As well, the Project Manager will keep the Steering Committee informed of the progress of the Technical Working Groups by circulating approved minutes from the Technical Working Group meetings to the Steering Committee and ensuring there is opportunity for representatives from the Technical Working Groups to present information to the Steering Committee as needed.

Governance Policies of Committees and Working Groups

A. The smallest number of members (or their designates) necessary at a committee or working group meeting before any business can be done (quorum) will be set at 2/3 the total number of members.

B. Decisions by Committees and Technical Working Groups will be based on collaborative governance. This consensus building approach seeks consent of members, not necessarily agreement, and ensures member interests are met through the resolution of objections. Collaborative governance will consist of a process that involves: a) collaboratively generating a decision proposal, b) identifying and documenting all concerns, and then c) modifying the decision to generate as much consensus as possible.
    a. Members must actively state their consent on decisions. Dissenting perspectives will be recorded.
    b. Members are encouraged to place the good of the whole group above their individual preferences and collaborate until consensus can be reached.
    c. Members who do not support a decision can: a) register their concerns with the group and concede; b) disagree with the decision and "stand aside" rather than halt the decision; c) "block" the decision and commit to working to find a solution that will be acceptable. All three options may lead to modifications of the decision.
    d. Important problem solving and group decision making efforts will be mediated by an impartial facilitator.
    e. Recognizing that Committees and Technical Working Groups will govern by consensus and discussion, minutes must be descriptive and comprehensive. To ensure this, the Project Manager will submit a draft of the minutes within two weeks of the meeting. The Committee/Working Group then has two weeks to review and provide comments through "track changes." The Project Manager will then compile all the edits and re-submit to the Committee/Working Group at least one week after the edits have been submitted. Final approval of the minutes will occur at the next meeting of the Committee/Working Group.

C. Only decisions that have been arrived at through the collaborative governance process of the Committees or Working Groups are binding on the Project Manager.
    a. The Project Manager works for the entire Committee/Working Group. Decisions or instructions of individual members are not binding on the Project Manager.
    b. In the case of individual members requesting information or assistance without consensus of the Committee/Working Group, the Project Manager can refuse such requests that, in the Project Manager's opinion, require a material amount of time or funds or are disruptive.
    c. The Project Manager and the Committee/Working Group members will respect the confidentiality appropriate to issues of a sensitive nature.

D. The Project Manager links Committees/Working Groups to operational achievements, so that all authority and accountability of these groups is considered the authority and accountability of the Project Manager.
    a. Committees/Working Groups will either communicate through the Project Manager or, if communicating directly with other Committees/Working Groups, will involve the Project Manager in the communications.
    b. Interaction with the public, press, or other entities must recognize the lack of authority

invested in individuals except when explicitly authorized by the Steering Committee and/or Project Manager. No single member can speak for the Committees/Working Groups or the project as a whole except when explicitly stated by the Committees/Working Groups. A communications plan will be developed to address this.

E. The Project Manager will keep the Technical Working Groups informed and supported in their work.

   a. The Project Manager will submit Committee/Working Group reports and other deliverables in a timely, accurate and complete state.
   b. The Project Manager will keep the Committees/Working Groups aware of any significant incidental information, including anticipated adverse media coverage.
   c. The Project Manager will ensure the Committees/Working Groups are informed about progress of the TRWMP, and the progress of other Committees/Working Groups.
   d. The Project Manager will not favour or privilege certain Committee/Working Group members.

F. The Project Manager and members of Committees/Working Groups commit to ethical conduct.
   a. The Project Manager and members of Committees/Working Groups will use appropriate decorum and respect.
   b. The Project Manager and members of Committees/Working Groups will serve the best interests of the TRWMP, and will disclose any conflict of interest with other organizations, personal interest or members.
   c. The chairperson has the power to interrupt persons making false factual statements or moving off-topic.
   d. Ideas and solutions belong to the Committees/Working Groups; no names are recorded. The group as a whole is responsible for decisions.

6. Authorization of Terms of Reference for the Thames River Water Management Plan

Authorization of this TOR is indicated when signed by:

a. the appropriate ministry, department or director of each organization represented on the Steering Committee, and
b. First Nation Chiefs and /or Band Councils represented on the Steering Committee.

Authorization signifies that the appropriate authorities understand the scope and what will be delivered; are in agreement with measures of success; and commit to ensuring that at least one designated person from their respective organization will sit on the Steering Committee, and possibly on a Technical Working Group. Once authorized, the TRWMP TOR forms the basis for detailed planning.

Table 2 lists the organizations and the position/title of the authority from each organization who is authorizing the TOR. A sample of the authorization form to be provided to each organization is included in Appendix A.

The Project Manager will provide the authorization form to each organization. Once all the forms are signed, dated and returned to the Project Manager, they will be collated electronically and provided to all partners.

Table 2. List of signing authorities authorizing the TRWMP TOR.

ORGANIZATION	SIGNING AUTHORITY
Upper Thames River Conservation Authority	Chair - Board of Directors
	General Manager
Lower Thames Valley Conservation Authority	Chair - Board of Directors
	General Manager
Ontario Ministry of Natural Resources	Director
Ontario Ministry of the Environment	SW Regional Director
Ontario Ministry of Agriculture and Food	Director – Environmental Management Branch
City of London	Mayor or staff with signing authority
Environment Canada	Manager – Great Lakes Issue Management and Reporting Section
Walpole Island First Nation	Chief
Chippewas of the Thames First Nation	Chief
Oneida Nation of the Thames	Chief

Appendix A. Sample Terms of Reference Authorization Form

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CLEAR WATER REVIVAL

AUTHORIZATION OF TERMS OF REFERENCE FOR THE THAMES RIVER WATER MANAGEMENT PLAN

Authorization of the Terms of Reference for the Thames River Water Management Plan (TRWMP) is indicated when signed by:

a) the appropriate ministry, department or director of each organization represented on the TRWMP Steering Committee, and
b) First Nation Chiefs and /or Band Councils represented on the TRWMP Steering Committee.

Authorization signifies that the appropriate authorities understand the scope and what will be delivered; are in agreement with measures of success; and commit to ensuring that at least one designated person from their respective organization will sit on the Steering Committee, and possibly on a Technical Working Group. Once authorized, the TRWMP TOR forms the basis for detailed planning.

ORGANIZATION:

SIGNING AUTHORITY:

SIGNATURE: _____

DATE: _____

SIGNING AUTHORITY:

SIGNATURE: _____

DATE: _____

Please return the signed and dated authorization form via email, mail or fax to:

Tara Tchir, Project Manager
Thames River Watershed Management Plan
1424 Clarke Rd., London ON N5V 5B9
tchirt@thamesriver.on.ca
fax: 519-451-1188

Appendix B. List of Acronyms

BMP	Best Management Practice
CA	Conservation Authority
COA	Canada-Ontario Agreement Respecting the Great Lakes Basin Ecosystem
LAMP	Lakewide Action and Management Plan
LSCCWCC	Lake St. Clair Canadian Watershed Coordination Council
LTVCA	Lower Thames Valley Conservation Authority
OMAF	Ontario Ministry of Agriculture and Food
OMOE	Ontario Ministry of the Environment
OMNR	Ontario Ministry of Natural Resources
TOR	Terms of Reference
TRCWR	Thames River Clear Water Revival
TRWMP	Thames River Water Management Plan
UTRCA	Upper Thames River Conservation Authority

Appendix C. Assumptions, Risks and Mitigation Strategy

1. Assumptions

Assumptions are external factors that at the time of writing the TOR are considered true, real or certain for purposes of planning and completing the TOR. Certain unverified or unknown aspects that are likely to happen must also be assumed as facts to proceed:

i. Steering committee members will identify appropriate individuals to participate in the technical working group and standing committees.

ii. Authorization of TOR indicates TRWMP will be considered a high priority.

2. Risks and Mitigation Strategy

Risks are key factors that pose threats to the success of the TRWMP. These factors must be avoided, transferred, mitigated or accepted in such a way as to successfully complete the TRWMP objectives and deliverables (Table B-1).

Table B-1. Risks and Mitigation Strategy

Risks	Likelihood	Impact	Strategy (Risk Response)
An important feature or function will not be included in the TRWMP.	MEDIUM	LOW	Avoid – use current Great Lakes literature and watershed expertise of the various agencies to identify the important issues that need to be addressed in the TRWMP. Mitigate – develop list of items to be addressed by the larger watershed strategy as funding becomes available.
No experts available to address goals and objectives.	LOW	LOW	Avoid - technical teams will identify work plans, including roles and responsibilities, around each goal and objective. Identify knowledge gaps as part of this process.
There are inadequate funds to address goals and objectives and / or issues are prioritized by available funding rather than by importance.	HIGH	LOW	Avoid - use current Great Lakes literature and watershed expertise of the various agencies to identify the important issues that need to be addressed in the TRWMP. Mitigate – develop list of unfunded projects to be addressed by the larger watershed strategy as funding becomes available and by proactively pursuing funding opportunities.
Planning Process is not collaborative (*e.g.* there are conflicting expectations).	LOW	HIGH	Accept – recognize TRWMP cannot be everything to everybody. Mitigate – document dissenting views related to scope of TRWMP and focusing on the positive and what can practically be achieved. Avoid – develop clear TOR for the TRWMP and require authorization by all partners. Transfer – connect to related projects to show how expectations are being met elsewhere.
No early wins to celebrate.	LOW	MEDIUM	Mitigate – make goals achievable.

Risks	Likelihood	Impact	Strategy (Risk Response)
			Transfer – install research or demonstration projects on public or participating landowners' lands.
Failure to meet milestone dates.	HIGH	HIGH	Mitigate – adjust timeline as necessary while considering the benefits of an early product.
TRWMP scoped inappropriately and / or scope creep.	HIGH	HIGH	Mitigate – review significant scope changes by Technical Working Group and Steering Committee. Transfer – shift inappropriate items to other projects.
Partner organizations do not endorse or undertake applicable actions.	MEDIUM	HIGH	Avoid – have partners authorize TOR which describes roles and responsibilities, and ensure partners designate point people on the Steering Committee and the Working Groups. Accept the jurisdictional differences between agencies in delivery. Mitigate – develop strategies to work together to resolve differences or to build capacity. Mitigate – ensure directed or dedicated funding to technical working staff.
Lack of understanding of true cost of TRCWR watershed strategy.	HIGH	HIGH	Avoid – fully disclose all costs, including in-kind. Accept that some costs cannot be determined until the technical working groups have developed specific work plans.
Deliverables are not practical and achievable.	LOW	HIGH	Avoid – follow SMART principles (Specific, Measurable, Attainable, Relevant and Timely) when developing deliverables.
Time lapse not incorporated in monitoring and performance measures.	LOW	HIGH	Mitigate – review deliverables that do not seem to perform as expected.
Continuous improvement, adaptive management and continuity are not being practiced.	MEDIUM	MEDIUM	Mitigate – increase the number of committee meetings to ensure ongoing communications.

Appendix D. Recommendations from the 1975 Thames River Basin Water Management Study & Summary of Actions Taken

#	Recommendation	Actions
1	Glengowan Dam should be constructed for the primary purpose of flow augmentation. Furthermore, a study should be made of what type and level of recreational use, if any, could be provided at the reservoir.	An Environmental Assessment study in 1983 recommended that the construction of Glengowan Dam for flow augmentation not proceed. Instead, a variety of alternate strategies to achieve the same ends was recommended: - construction of the St. Marys Floodwall, - enhanced maintenance of London's system of dykes, - continued floodplain acquisition and regulation, - diffuse source pollution control, - sewage treatment plant upgrades, - enhanced storm water management, - wetland protection. These alternate strategies were adopted by the UTRCA and have significantly influenced the development and delivery of conservation programs by the Authority for the past 30 years. The environmental assessment also recommended that the UTRCA retain the option of constructing Glengowan Dam and Reservoir in the future, if needed. A study of the type and level of recreational use was never conducted, but will be considered if the Glengowan Dam is required in the future.
2	The Upper Thames River Conservation Authority (UTRCA) and the Ministry of Natural Resources (OMNR) investigate in detail the question of the limestone deposit at the Thamesford Dam site to determine the opportunity cost associated with its development, so that a decision can be made as to the feasibility of constructing the Thamesford Dam.	UTRCA and OMNR did not investigate due to the recommendation of the 1983 Environmental Assessment for Glengowan Dam that the dam not be constructed (see recommendation #1 above).
3	If construction of the Thamesford Dam is feasible, then the Thamesford Dam should be built primarily for flood control purposes. Furthermore, a study should be made of the desirable level of recreational use of the reservoir, ensuring that such use would not seriously constrain the primary use of the reservoir.	Information was collected but not pursued due to recommendations in the 1983 Environmental Assessment for Glengowan Dam (see recommendation #1 above).
4	If construction of the Thamesford Dam is not feasible, then the Wardsville Dam should be constructed for flood control purposes only. A flow retarding structure rather than a conventional dam should be constructed to	A "Pre Feasibility Study of the Wardsville Dam and Reservoir Project" (McLaren Engineers, Planners and Scientists, Inc. under contract to TRIC) addressed correction of the substantial annual flood damages that occur in the

#	Recommendation	Actions
	minimize the loss of agricultural land and to protect the yellow pickerel runs and spawning grounds. Detailed studies should be undertaken to ensure the design will permit the safe passage of fish, and to determine on a benefit-cost basis whether a 43,000 acre-foot or a larger retarding structure is the more economical. The environmental effects and the effects on road communications of the larger verses the smaller structure should be considered. There should also be close consultation with Indian Bands concerning the effects on reservation lands.	lower Thames watershed. The study recommended that a flood damage reduction strategy be developed which considers all structural and non-structural alternatives as a prerequisite to possible further studies on the Wardsville project. The dam was not constructed.
5	Prior to construction of any major dam, detailed studies should be undertaken to examine environmental effects, to determine methods of minimizing such effects and to determine what type of discharge structure and operating practices would best protect both reservoir and downstream water quality.	An Environmental Assessment study is required prior to the construction of any major dam. As Glengowan Dam was the only major dam construction proposed since the 1975 Thames River Basin Water Management Study, it is the only dam that underwent an Environmental Assessment.
6	The City of London should immediately institute plans to upgrade its sewage treatment facilities to meet the waste loading guidelines outlined in this report. Specifically, this involves providing an effluent from all treatment plants equivalent in quality to the effluent from the Greenway sewage treatment plant as defined in this report.	Sewage treatment facilities in the City of London were upgraded to meet the waste loading guidelines. Dilution was not considered as a treatment option.
7	At several municipalities in the basin, the waste assimilative capacity of the receiving stream has been reached or exceeded. It is recommended that the municipalities of Mitchell, Stratford, Tavistock, Glencoe, Tilbury and Ridgetown should not increase their waste loadings from all sources to the receiving stream, and in some cases should reduce these loadings as described in Chapter 8 of this report.	All the municipalities identified took action to increase and/or improve their sewage treatment capacity.
8	Municipalities of Woodstock, Beachville, Ingersoll and Lambeth should adopt sewage treatment techniques selected from approved options as described in this report, either to provide immediately required upgrading or to accommodate additional growth if such growth is found to be desirable when other factors are considered.	All the municipalities identified took action to increase and/or improve their sewage treatment capacity.
9	All municipalities should immediately undertake studies to determine the significance of existing urban runoff and runoff associated with future development as a source of pollutants, and take steps to control this waste input where it is found to constitute a water quality problem.	Stormwater management standards are developed with MOE requirements and policies require these standards. The effectiveness of these practices is still an issue. The City of London has completed from time to time a Pollution

#	Recommendation	Actions
		Prevention Control Plan that looks at urban runoff as one potential source of contaminants. As well, the City samples the Thames in many locations throughout the City in order to determine if and how water quality is impacted as it makes its way through the City.
10	All affected municipalities enact and enforce sewer use bylaws to prevent industrial pollution problems. Industries discharging treated wastes and process waters directly to watercourses in the basin should implement waste treatment necessary to meet water quality objectives as outlined in this report.	Implemented under the Ontario Environmental Protection Act and the Ontario Water Resources Act. City of London has one dedicated full time position that monitors and enforces the Sewer Use By-law.
11	Fertilizer application rates are to be limited to those recommended by the Ontario Ministry of Agriculture and Food, using services such as those at the University of Guelph for determining appropriate rates. Individual and group activity by the agricultural community and the active support of government agencies is important to implement this practice.	Implemented through variable rate fertilizer applications using GPS systems, side dressing, banding fertilizer application, slow release fertilizer technology and liquid manure spreading in no-till systems.
12	A program of restricting free access of livestock to streams should be commenced. It is recommended that the Ontario Department of Agriculture and Food take the lead role in undertaking a detailed study of the implications of such a program to farmers, of the best methods such as fencing or vegetative barriers, and of the feasibility of provincial subsidies to encourage such a program.	Various incentive programs for technical and financial assistance including: - OSCEPAP cost-sharing programs - Land Stewardship (LS) Program that cost-shared with Agriculture and Agri-Food Canada - Environmental Farm Plan (EFP) - Clean Water Program (CWP) - Clean Up Rural Beaches (CURB) provided financial incentives to rural landowners to install measures to improve reservoir quality Several education and stewardship initiatives including: - Pittock watershed – Manure Management and Water Quality Sub-Basin Study funded by MOE - Livestock Access Restriction Impacts (Hayman) - Stratford-Avon River Environmental Management Project (SAREMP) was a multi-year demonstration of numerous BMP projects on farm and urban areas - Thames River Implementation Committee (TRIC) investigated and carried out numerous pilot projects in the watershed Cost-sharing programs are voluntary and do not have enforcement component. The Water Resources Act may possibly be applied in some instances.

#	Recommendation	Actions
13	Increase environmental surveillance and enforcement by appropriate government agencies to control farm waste discharges, particularly from intensive feedlot operations, and illegal septic tank connections to municipal drains.	The Environmental Protection Act (EPA) is Ontario's key legislation for environmental protection. The act grants the Ministry of the Environment broad powers to deal with the discharge of contaminants which cause negative effects. Ontario's EPA has the authority to establish liability on the party which is at fault, including liability for corporate officers or directors who have failed to take all reasonable care to prevent unlawful discharges of contaminants into the environment. The act also deals with commercial transactions involving contaminated land. The EPA specifically: - prohibits the discharge of any contaminants into the environment which cause or are likely to cause negative effects; in the case of some approved contaminants requires that they must not exceed approved and regulated limits - requires that any spills of pollutants be reported and cleaned up in a timely fashion CURB provided some funds to rural farmers to install measures that would improve reservoir water quality. Nutrient Management Act maintains some arbitrary annual inspections of large livestock operations and offers the opportunity for complaints. Building permits trigger septic systems review, inspection and upgrades.
14	Channel protection programs as described in this report be implemented, with initial emphasis on areas of greatest need which should be identified in detail by appropriate government agencies. *6.3.2 Channel Erosion – recommends implementing streambank erosion control works to prevent and remediate erosion of the river banks and dikes in lower reaches of Thames River, which are vulnerable to flood flows and wind-generated wave action*	In the mid to late 1970s, the dyking system downstream of Chatham was upgraded under the Federal-Provincial Dyking Program. Approximately 56 km of dykes were constructed to protect low lying farmland. Maintenance is conducted jointly by the LTVCA and the Municipality of Chatham-Kent. An Order-in-Council ensures that OMAF covers 1/3 of the maintenance costs. Over the years, when funding has been available, the LTVCA has assisted private landowners with other small erosion control and bank stabilization projects further upstream. Recently, there have been several proposals to increase the speed limit in the Thames River downstream of Chatham. The LTVCA's Board of Directors has passed resolutions in support of maintaining the existing speed limit, due to concerns about erosion of the dykes.

#	Recommendation	Actions
15	Rural oriented management practices and conservation practices should be applied with special rigor in headwater areas, and municipalities in these areas must pay special attention to sewage disposal practices to safeguard both local and downstream water uses.	Generally, no special efforts were made in headwater areas with respect to programs and services, with the exception of the Stratford-Avon River Environmental Management Project (SAREMP) and Kintore watershed projects which were in headwater areas. Many headwater area municipalities (e.g. Stratford, Tavistock, Mitchell) undertook stormwater treatment plant makeovers.
16	Resolution of water quality problems in existing reservoirs be achieved by the two Conservation Authorities through appropriate combinations of bottom draw, destratification, algae control, disinfection of swimming areas, or modified operating policies as outlined in his report for each reservoir.	UTRCA has modified its operations in existing reservoirs. An ultra-violet treatment system was used to treat a small swimming area at Fanshawe Conservation Area for many years but the reservoir is now closed for swimming. Water quality is monitored in the reservoirs. The LTVCA's only reservoir is Springer Lake on Sharon Creek. Operational policies have changed since the report and it is no longer operated as a flood control structure. Bottom draw is now used in combination with a "Morning Glory" spillway. The area is not posted for swimming. Chemical treatment for algae or disinfection never attempted. Water quality studies have been conducted and water quality is monitored.
17	The reservoirs be operated in such a manner as to ensure the maintenance of the specified minimum flows on a daily basis. Also, there should be close liaison between the Ministry of Natural Resources and the Ministry of the Environment to ascertain if alterations to these operating schedules would optimize the use of existing reservoirs for flow augmentation, without adversely affecting other uses.	The flow augmentation dams (Pittock and Wildwood) are operated according to established operating curves during high flows. Low flow scenarios use adaptive management where climatic conditions and downstream water quality are considered.
18	The Upper Thames River Conservation Authority and the Ministry of Natural Resources undertake detailed computer analysis to determine what modifications of reservoir operating practices would optimize their flood control and flow augmentation use and enhance their recreational use potential.	Ongoing. Integration into water management operations of the UTRCA such as the regulated floodplain.
19	A program of corrective action concerning bank erosion from Chatham, upstream as far as Delaware, should be initiated by the Lower Thames Valley Conservation Authority in line with the Recommendations in the 1971 Report by James F. MacLaren Ltd. entitled " Flood and erosion Control Works on the Lower Thames River from Chatham to Delaware"	Although a formal program was never implemented, several projects were completed pre-1996 including relocating a house and some road protection works. Generally speaking, when funding was available, few projects were completed because of the need to pass a cost-benefit analysis.

#	Recommendation	Actions
20	Soil erosion control programs including strip cropping, crop rotation, diversion terraces, grassed waterways and vegetative buffer zones or reforestation should be implemented throughout the watershed, with initial emphasis on areas that should be identified by staff of the Ministries of Agriculture and Food, Natural Resources, and Environment.	Various demonstration and incentive programs, such as Stratford-Avon River Environmental Management Project (SAREMP), OSCEPAP, Land Stewardship (LS) Program, Environmental Farm Plan (EFP), Clean Water Program and the Joint Agricultural Soil and Water Conservation Program, united Conservation Authorities and OMAF in cooperative delivery, technical and financial assistance. Conservation Authority extension staff play a major role in this task. The Lands Directorate of Environment Canada analyzed and delineated priority land management areas in the Thames Basin, as an extension of the Great Lakes phosphorus modelling effort. The tributary modelling methodology consisted of a large scale application of the Universal Soil Loss Equation to determine long-term average unit area soil losses at a scale of 1:50,000 and subsequent application of a technique to estimate the terrain capability to transport eroded sediments to a watercourse where these sediments are considered a hindrance to either water quality or drainage. This determination considered only land erosion and not streambank erosion. However, soil erosion control programs generally were not targeted to those areas.
21	Environmental Impact Assessments of land drainage proposals be undertaken to screen out or modify proposals which would damage the environment and that selected wetlands of ecological importance, such as the Zorra Swamp, be protected from further drainage.	Drainage Act processes would require payment by the entity requesting an EIA and, as the CA had no funding for this, this process wasn't used. Municipalities began protecting Natural Heritage features through their planning processes. Conservation Authority Regulations tightened around interference with wetlands.
22	Prevention of water supply interference and ground water quality impairment, rather than remedial action after the problem has occurred, should be practiced using procedures detailed in Chapter 7 of this report. *Summarized procedures from 7.3.2 Water Supply Interference:* - *Large water takings (existing) - enforce permit requirements under Ontario Water Resources Act.* - *Large groundwater takings (proposed) - undertake test drilling and test pumping to obtain information on potential interference prior to approval.* - *Stream withdrawals (proposed) - consider possible effects on downstream users and available streamflow data, especially flow rates during seasonal low flow periods, prior to approval.* - *Sewers, watermains or drainage ditches (proposed) - prior to installation, undertake studies to anticipate the likelihood of well*	Land use planning program (e.g. first subdivision reviews conducted in 1975) and Source Water Protection both address this.

#	Recommendation	Actions
	interference, including monitoring water level in nearby wells to facilitate evaluation of any subsequent well interference problems. *Summarized procedures from 7.3.3 Ground Water Quality Impairment:* - *Intelligent siting of operations with high pollution potential and sound water well construction practices to aid in maintaining good groundwater quality.* - *Continue upgrading MOE water well inspection program to help prevent groundwater contamination.* - *Where possible, locate activities such as landfills, feedlots, sludge spreading, and lagoons on soil and material with significant clay mineral content. An additional important advantage to the high clay content is reduced percolation rates which allow the bacterial reduction of organic substances.*	
23	To overcome communication and co-ordination problems relating to water management in the basin, and to implement planning on a watershed basis, a joint committee of government agencies and other appropriate bodies should be established. The committee should include representatives of the Ministries of Agriculture and Food, Environment, Housing, Natural Resources, and Treasury, Economics and Intergovernmental Affairs, the two Conservation Authorities, municipalities, citizen groups and the agricultural community.	The Thames River Implementation Committee (TRIC) was the outcome of this recommendation. TRIC evolved into the Joint Agricultural Soil and Water Conservation Program, which was never fully implemented. Several smaller-scale programs were undertaken with fewer organizations.
24	Because of the interrelationships of water resource problems and solutions in the upper and lower watershed, and in order to further the basin wide approach to water management advocated in this report, it is recommended that consideration be given to the amalgamation of the Upper Thames River Conservation Authority and the Lower Thames Valley Conservation Authority into a single authority.	Explored in 1990s in some detail, but not done.
25	Further controls of floodplain development under the Planning Act and through regulations administered by the Conservation Authorities be developed.	Hydrology and regulatory services unit created at UTRCA. Conservation Authorities were given responsibility for floodplain management in 1982. Flood and Fill Line Mapping completed in 1982. Regulation limit mapping revised in 2005/2006. Amendments to the Provincial Policy Statement and Conservation Authority Regulations have improved our capabilities to control floodplain development.

#	Recommendation	Actions
26	Develop an improved flood warning system.	Provincial control given to Conservation Authorities. Flood prediction, warning and management are core programs of the UTRCA and LTVCA that are under continuous improvement. UTRCA hired first engineer in 1976. Telemark stations installed along the Lower Thames River for flood warning and Flood Contingency Guidelines were established in 1979. Environment Canada replaced all mechanical recorders with Sutrons by 1999.
27	For long-term flood control, flow augmentation and erosion control benefits, it is recommended that sound conservation measures such as reforestation, sound agricultural tillage, use of appropriate ground cover and preservation of water retaining areas be encouraged and implemented. Reforestation and establishment of shrub cover along stream banks should be directed to areas where they would specifically aid in erosion control, stream bank stabilization and the improvement of fish habitats.	Stratford Avon Environmental Enhancement Project (SAREMP) and Thames River Implementation Committee (TRIC) focused on agricultural soil erosion. As programs evolved, aquatic habitat improvement was recognized as a need and was built into programs. Some special efforts, such as wetlands, wildlife and woodlands (WWW) program and Oxford County Terrestrial Ecosystem Study (OCTES) allowed for increased demonstration and implementation.
28	Municipalities and government agencies encourage and enforce careful construction practices during drainage ditch installations and other construction activities in and along water courses.	This is the main thrust of the Alteration to Watercourses aspect of CA Regulations. Conservation Authorities have classified the drainage system in the watershed and provide a plan review function for all watershed drainage activities. UTRCA and LTVCA have historically worked closely with Drainage Superintendents of Ontario (DSAO) and OMAF, and more recently with Department of Fisheries and Oceans (DFO). Spot and bottom cleanouts are commonplace. Some technical information has been created (e.g., municipal drain maintenance booklet). Some demonstrations have been carried out (e.g. herder maintenance equipment).
29	Development in areas of sand and gravel not be permitted to hinder infiltration or to degrade the quality of infiltrating water. This is particularly true of areas of municipal water supply, such as the Woodstock well field. In addition, areas providing significant base flow such as the Harrington-Lakeside moraine should be protected.	Decision at the provincial level. Did not achieve regulatory authority until Source Water Protection.