

**THAMES RIVER BASIN
IMPLEMENTATION PROGRAM
P.O. BOX 6278 STATION D, LONDON ONTARIO. N5W 5S1**

PROGRESS REPORT 2

**THAMES RIVER
IMPLEMENTATION COMMITTEE**

**A REPORT ON THE IMPLEMENTATION ASPECTS
OF THE
THAMES RIVER BASIN WATER MANAGEMENT STUDY**

SEPTEMBER, 1980

Ministry of the Environment
Ministry of Natural Resources

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I. INTRODUCTION

In 1975 a report on a Thames River Basin Water Management Study was issued by the Ministry of the Environment and the Ministry of Natural Resources. This report was based on a detailed study of the Thames River System (see Figure 1) carried out during the period 1972-1975, the objective of which was:

“to develop guidelines for management of the basin's water resources to ensure that adequate quantities of water of satisfactory quality are available for the recognized uses at the lowest possible cost, and that erosion and flood protection are provided consistent with appropriate benefit-cost criteria”.

From water quality and flood control modelling results, twenty-two (22) options were defined to meet water management and flood control objectives, based on various combinations involving differing levels of waste treatment, construction and operational alternatives for dams and reservoirs and pipeline concepts to divert London's sewage to Lake Erie. From an evaluation of these options, a total of twenty-nine (29) recommendations (see Appendix A) were advanced in the report, including a number of recommendations focussing on agricultural and other land use practices throughout the basin. Recommendation 23 in the report highlighted the need for a joint committee of government agencies and other appropriate bodies to "overcome communication and co-ordination problems relating to water management in the basin, and to implement planning on a watershed basis". This recommendation resulted in the formation of the Thames River Implementation Committee in the latter part of 1976.

The Thames River Implementation Committee

The Thames River Implementation Committee was formed in October of 1976 which readily established terms of reference, settled on principal functions that would be addressed and defined those agencies that would be involved in implementation of the

THAMES RIVER DRAINAGE BASIN

Basin Area - 2,250 sq. miles
Basin Length - 125 miles

Scale 1:500,000

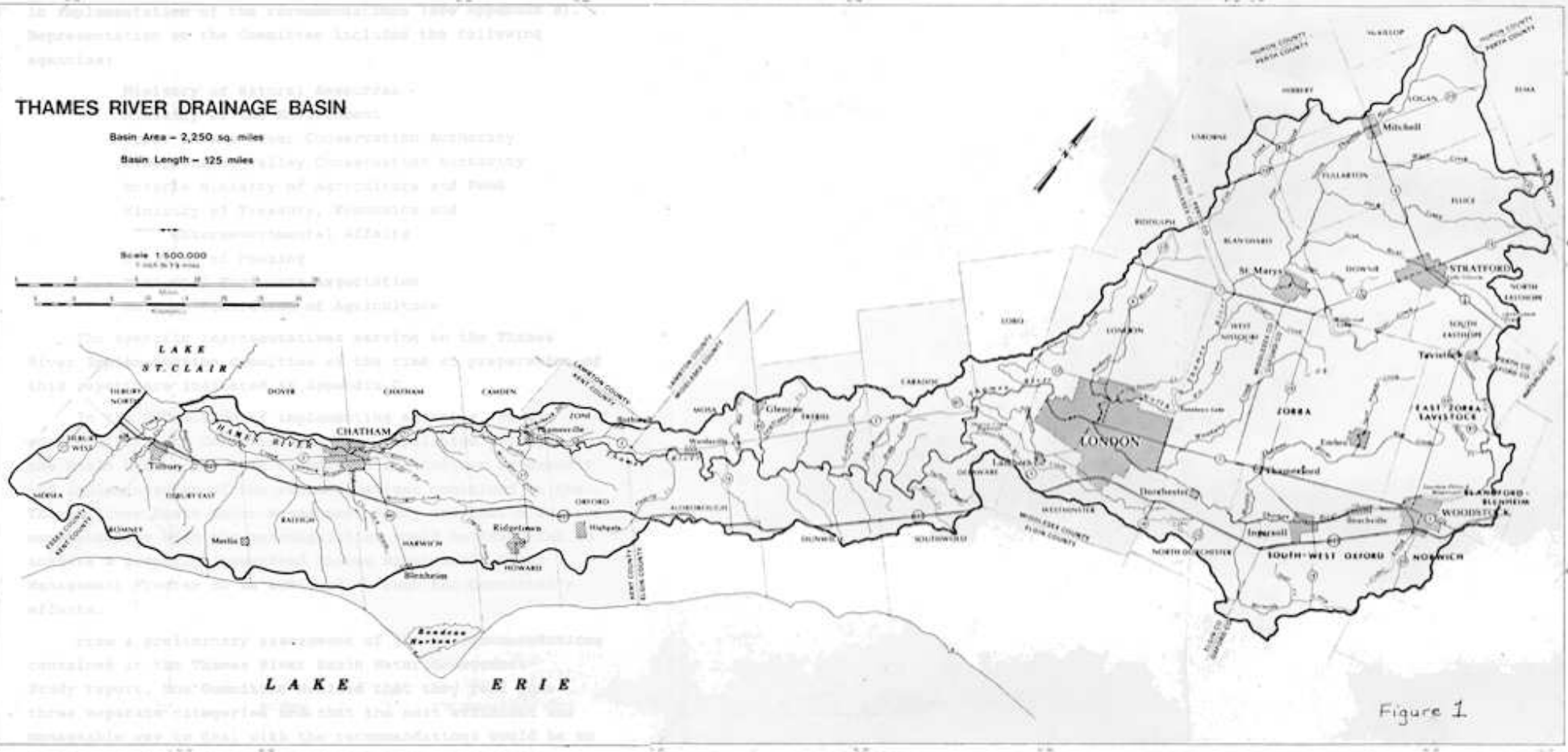
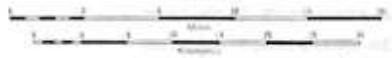


Figure 1

recommendations (see Appendix B). Representation on the Committee included the following agencies:

- Ministry of Natural Resources
- Ministry of the Environment
- Upper Thames River Conservation Authority
- Lower Thames Valley Conservation Authority
- Ontario Ministry of Agriculture and Food
- Ministry of Treasury, Economics and Intergovernmental Affairs
- Ministry of Housing
- Municipal Engineers Association
- Ontario Federation of Agriculture

The specific representatives serving on the Thames River Implementation Committee at the time of preparation of this report are indicated in Appendix C.

In the definition of implementing agencies, it was agreed within the Committee that municipalities throughout the Basin have a key role to play in the further assessment and implementation of the recommendations contained in the Thames River Basin Water Management Study and that effective communication with the municipalities would be essential to achieve a properly integrated Thames River Basin Water Management Program to be achieved through the Committee's efforts.

From a preliminary assessment of the 29 recommendations contained in the Thames River Basin Water Management Study report, the Committee decided that they fell into three separate categories and that the most efficient and manageable way to deal with the recommendations would be to develop a sub-committee to deal with each of the three separate groups. Accordingly, the following three subcommittees were formed: Dams, Reservoirs and Floodplain Management Subcommittee, Municipal Co-ordination

Subcommittee; and Agriculture and Land Use Subcommittee. The distribution of the recommendations in the report amongst the three subcommittees is as follows:

<u>Dams, Reservoirs and Floodplain Management</u>	<u>Municipal Co-ordination</u>	<u>Agriculture And Land Use</u>
1, 2, 3, 4, 5, 14 16, 17, 18, 19, 24, 25, 26	6, 7, 8, 9, 10, 15*	11, 12, 13, 15*, 20, 21, 22, 27 28, 29

* Note overlapping responsibility

Recommendation 23 relating to formation of the Committee has been implemented.

From the fall of 1976 until the spring of 1978, the sub-committees and the parent committee were engaged in an initial review of the recommendations contained in the Thames River Basin Water Management Study and the related programs and activities that may have been implemented by various agencies since the report was issued in 1975.

First TRIC Progress Report

In May 1978, the Committee published its first Progress Report, which outlined the status of each of the recommendations with regard to implementation. The report clarified the future directions that the Committee envisages it will take in carrying out its mandate. Copies of the report were circulated to municipalities, planning boards, farm organizations, interested government personnel and public interest groups. In December, 1978, the Progress Report and a related Addendum were forwarded to the Ministers of Environment and Natural Resources. It was suggested that copies of the transmittal be forwarded to the Ministers of Agriculture and Food and Housing, as their Ministries could be affected by the proposals and funding arrangements advanced.

The stance adopted by the Committee identified the need to take a more active role in co-ordinating and stimulating the development of an effective river basin management program on the Thames River. After carefully evaluating existing legislation, policies and programs, it was determined that the Committee's terms of reference could be met after a three-year period during which it will serve as a catalyst to initiate action in this regard. It is anticipated that the Committee will cease to function upon completion of this program. The participating agencies will then carry on with the implementation of the program.

Following presentations to the Cabinet Committee on Resources Development in December 1978 and April 1979 the Committee formally approached the Provincial Government for financial assistance. Both the Ministry of Natural Resources and the Ministry of the Environment agreed to support the program of the Thames River Implementation Committee on a cost shared basis. Funding for the initial year of the program was approved at \$188,000 effective April 1, 1980. Details on the nature of the approved program are provided in Section III, The 1980/81 Work Program. Approval of the program was based on the understanding that the funds would be allocated to the two Conservation Authorities who would administer the program and provide office accommodation.

Approval was also based on the understanding that the activities of the Committee would be closely co-ordinated with the investigations being undertaken as part of the Stratford-Avon River Environmental Management Project. The objectives of the two studies are very much similar, but given the difference in size between the two basins (2,250 sq. mi. vs. 58 sq. mi.) the work on the Thames is necessarily of a general promotional nature while the activities on the Avon River are designed to both promote known remedial measures and evaluate their cost-effectiveness.

II. REVIEW & STATUS OF RECOMMENDATIONS

Each of the TRIC sub-committees have met during the summer following approval of the program to review and update the status of the recommendations in view of the progress which may have taken place since 1978. The parent committee subsequently met in August 1980 and ratified the reports of the respective sub-committees. In a large number of cases the status of the recommendations and the feelings of the Committee remained unchanged from the 1978 Progress Report. For reference purposes the 1978 Progress Report analysis is included as Appendix D to this report and Appendix E contains the final stance of the Committee following public review.

Summary of Current Status:

Action Completed - 5, 16, 22, 23, 26

Action Ongoing - 1, 2, 4, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 17, 18, 19, 20, 21, 25, 27,
28, 29

No Action Planned - 3, 24

DAMS, RESERVOIRS AND FLOODPLAIN MANAGEMENT SUBCOMMITTEE

Recommendation No. 1 - Construction of the Glengowan Dam

As identified in our March 1978 Progress Report (see Appendix D), the Glengowan Dam and Reservoir is currently undergoing an Environmental Assessment and the Committee feels that no further action is warranted at this time.

Recommendation No. 2 - Thamesford Limestone Deposits

While recent reports have indicated a very strong possibility of the eventual quarrying of these deposits, limited additional investigation will take place as part of the Glengowan environmental assessment. No further action is recommended by the Committee.

Recommendation No. 3 - Construction of the Thamesford Dam

In light of the findings with respect to Recommendation No. 2, it was felt that the construction of this dam was no longer feasible and the assessment of recreational potential no longer appropriate.

Recommendation No. 4 - Wardsville Dam

The Committee feels that it would be premature to proceed actively with pre-engineering studies on this project before additional information is made available as part of the Glengowan Environmental Assessment. It was felt, however, that construction of the Wardsville Dam was not directly dependent upon completion of the Glengowan Dam and limited studies to update data would be appropriate. It is proposed that as part of the 1981/82 work program, TRIC hire a consulting firm to undertake a preliminary evaluation of the available data base and the need for further detailed studies of the following nature:

- (i) define stage/damage curves for Chatham, Thamesville and vicinity
- (ii) determine the effectiveness of a flow retarding structure at Wardsville for reducing damages and develop benefit/cost relationships
- (iii) refine concepts for Wardsville Dam and prepare an environmental screening of such concepts
- (iv) select most desirable concept(s) and put on paper.

The proposed investigation would, in fact, result in the development of Terms and Reference for further studies, should such studies be justified on the basis of the preliminary evaluation. Subsequent studies, if required, would then be undertaken by the Lower Thames Valley Conservation Authority. Costs associated with the above-noted investigation and report are in the order of \$25,000.

Recommendation No. 5 - Environmental Impact Studies

It was felt by the Committee that this recommendation is already covered by the Environmental Assessment Act.

Recommendation No. 14 - Channel Protection Program

Review of the 1975 Basin Study report has identified that the concern addressed by the recommendation is water quality impairment due to bank erosion. As such, this concern is adequately being addressed by the activities of the Agriculture and Land Use Sub-Committee and no further action is required at this time.

Recommendation No. 16 - Water Quality in Existing Reservoirs

Committee members felt that current reservoir operating procedures are adequate to resolve this concern.

Recommendation No. 17 - Flow Augmentation

The Committee felt that current operating procedures and schedules provided for this and that more effort should be made to promote this information.

Recommendation No. 18 - Computer Analysis for Optimization Model

Since the Glengowan E.A. will investigate this area of concern, no further action on the recommendation was required at this time.

Recommendation No. 19 - Thames River Bank Protection Program

As indicated in the previous progress report, the LTVCA is implementing this recommendation as quickly as possible.

Recommendation No. 24 - Amalgamation of Conservation Authorities

The Committee re-affirmed that this recommendation need not be pursued on the basis of arguments presented previously.

Recommendation No. 25 - Floodplain Controls

With the recent approval of the Provincial Floodplain Criteria, both Authorities are proceeding with the establishment of the appropriate floodplain regulations and land use controls.

Recommendation No. 26 - Flood warning System

With the recent installation of improved monitoring equipment in the two Authorities, the establishment of a Flood Forecast Centre at the C.A.B. and the acquisition of a computerized system at the UTRCA, it was felt that this recommendation was now implemented.

MUNICIPAL CO-ORDINATION SUB-COMMITTEE

Recommendation No. 6 - Sewage Treatment for the City of London

The "master plan" referred to in our previous Progress Report has been received and implementation is currently underway.

Recommendation No. 7 - Sewage Treatment for Mitchell, Stratford, Tavistock, Glencoe, Tilbury and Ridgetown

Servicing options for the Town of Mitchell have been evaluated and expansion to sewage treatment facilities is scheduled to proceed.

The City of Stratford has just recently received a draft report prepared by M. M. Dillon Ltd. related to sewage treatment options. A final decision on an urban effluent control/ management strategy will no doubt await the results of the Stratford-Avon River Environmental Management Project currently underway.

The Township of East Zorra-Tavistock (Tavistock) now has an expansion to their treatment works underway.

The Village of Glencoe's sewage treatment facility, an oxidation pond, has been constructed and is now in operation.

A proposal for dealing with the Town of Tilbury's needs is currently under preparation and this will hopefully result in the necessary works being constructed in the near future.

A "master plan" for long term resolution of the Town of Ridgetown's sewage treatment problems has been prepared and implementation is underway.

Recommendation No. 8 - Sewage Treatment at Woodstock, Beachville, Ingersoll, Lambeth, Dorchester, St. Mary's Bothwell, Thamesville and Chatham

The City of Woodstock's plant upgrading is virtually complete as is that in the Village of Thamesville and the City of Chatham. The Police Village of Dorchester and the Town of Bothwell are currently being considered by the Ministry of the Environment for individual corrections. As indicated in the 1978 Progress Report there are no immediate pressures for advanced sewage treatment in the Police Village of Lambeth, the Township of South-West Oxford (Beachville), the Town of St. Mary's or the Town of Ingersoll.

Recommendation No. 9 - Urban Runoff

A document containing guidelines for urban storm water runoff has recently been prepared by the Urban Drainage Sub-Committee. Before reacting to the report's recommendations, the Thames River Implementation Committee will await the results of the recently established "Implementation Committee".

Recommendation No. 10 - Industrial Wastes and Sewer Use By-Laws

The intent of this recommendation is generally being met at this time through industrial waste surveys by the Ministry of the Environment and follow-up remedial works where necessary.

AGRICULTURE AND LAND-USE SUB-COMMITTEE

Recommendation No. 11 - Fertilizer Use

No specific action is presently being undertaken by the Sub-committee in relation to this recommendation other than to recommend the use of soil tests and proper application rates at T.R.I.C. exhibits and in slide tapes, bulletins and brochures. Also, the activities of the Ministry of Agriculture and Food in relation to the use of fertilizers are

being monitored. That Ministry has given the use of soil tests and recommended fertilizer application rates a high profile in publicity, exhibits and meetings.

A statement stressing that excess fertilizer may decrease yields is to be added to the current recommendation sheets from the Guelph soil testing lab.

For 1981-82, when T.R.I.C. staff become actively engaged in field demonstrations, consideration is being given to assisting farmers with soil testing, moisture testing and weighing yields from demonstration plots to demonstrate the value of proper fertilizer application.

Recommendation No. 12 - Cattle Access

Problems related to cattle access are being considered in the current documentation of problem areas by T.R.I.C. staff and through efforts being carried out under the Stratford-Avon River Environmental Management Project. Staff are to prepare a report by the end of the year summarizing the significance of this problem in relation to other areas of concern and to identify the costs that would be associated with essential remedial measures.

A Fact Sheet is currently under development by the Ministry of Agriculture and Food and the Ministry of the Environment to provide guidelines for the use of liquid spray which is becoming increasingly popular as a manure handling technique.

T.R.I.C. staff are to identify this summer whether aerial photos may be used to identify specific sites where farm wastes pose a threat to nearby watercourses. If workable, it will be recommended to the Ministry of the Environment that student funding be obtained for a basin-wide identification of problem areas in 1981, based on the use of this technique.

Recommendation No. 15 - Management of Headwater Areas

This recommendation attaches emphasis to headwater areas in the application of other recommendations presented in the report. The more detailed efforts being undertaken in the Avon basin will reflect the applicability of measures that may be particularly relevant to headwater reaches, properly co-ordinated with additional efforts carried out in other headwater tributaries under the T.R.I.C. program.

Recommendations 20 and 27 - Soil Erosion Control and Conservation Measures

Contact has been made by T.R.I.C. staff with Soil and Crop Improvement Associations in the seven counties that touch on the Thames River basin. Four associations have indicated support for late summer or fall meetings to broaden understanding of the T.R.I.C. program as a basis for stimulating participation in demonstration efforts in 1981-82. Such efforts will reflect both existing good practices and measures to offset problem conditions. It is hoped that these meetings will provide a basis for ongoing involvement of Association members in the development and monitoring of T.R.I.C.-supported demonstration efforts.

Documentation of potential demonstration sites has received considerable attention by staff through contacts with agricultural representatives, Soil and Crop Improvement Associations, Conservation Authorities, township officials and knowledgeable farmers throughout the basin. The selection of demonstration sites for the 1981-82 program will be based on this effort. It is hoped that some demonstrations (e.g. winter cover cropping) can be commenced this year.

A request for increased funding for demonstration efforts in 1981-82 was submitted verbally to senior staff of the Ministry of Environment on August and will also be forwarded to the Ministry of Natural Resources.

Agreement has been reached with Mr. G. Bangay, Regional Director, Lands Directorate, Environment Canada, to identify the major contributing areas for sediments and nutrient inputs throughout the Thames River basin in fiscal year 1981-82. This

valuable assistance will afford a long-term focus for directing efforts to priority and management areas.

Recommendations 21 and 28 - Land Drainage Projects

Copies of a drainage manual recently released by the Ministry of Agriculture and Food to drainage engineers and contractors are being obtained for review by the Agriculture and Land Use Sub-committee. When this review is completed, a decision will be made on whether to proceed with a more popularized publication highlighting the need for environmental protection measures as an integral facet of drain construction and clean-out projects.

Water samples, photographs and recorded observations of "before and after" conditions associated with two drain clean-out projects have been obtained to illustrate the problems associated with current drainage practices.

It is intended to incorporate proper drain protection techniques into the demonstration program developed for 1981-82. Arrangements have been made with the Upper and Lower Thames Conservation Authorities to have any drainage proposals passed to T.R.I.C. staff so that these can be considered for inclusion in our demonstration program. Contacts and planning for such efforts would have to be concluded over the winter months to permit the placement of demonstration controls in 1981.

Recommendation 29 - Groundwater Infiltration

Protection of "recharge" or high infiltration areas is considered by M.O.E. in the review of official plans and specific development proposals. In regard to protecting areas which provide significant baseflows, a mapping program which includes the identification of surficial deposits which supply significant base flows to adjacent streams is now being finalized. A sum of \$15,000 has been allocated by M.O.E. to publish these maps within the current fiscal year. It is felt that the provision of these maps will afford a satisfactory basis for future land use decisions to meet the requirements of this recommendation.

III. THE 1980/81 WORK PROGRAM

In February of 1980 the Committee was advised that provincial funding in the amount of \$188,000 had been approved for the first year of TRIC's proposed three-year program. The approved work program consists of essentially four components which will be addressed in more detail below:

- 1) Information and Education
- 2) Identification and Mapping of Hydrologically Active Areas and Development of Land Management Demonstration Areas
- 3) Drain Construction and Maintenance Guidelines and Applications
- 4) Compilation of Economic Data on Municipal Sewage Treatment

Following provincial approval the Committee hired a Program Co-ordinator to organize and oversee the implementation of the various program components. It was agreed that the Program Co-ordinator would provide a similar service to the Stratford-Avon River Environmental Management Project as described previously. The remainder of the staff were hired by June 1980 and a field program initiated shortly thereafter.

- 1) Information and Education

A Community Relations Technician was employed to promote TRIC programs and objectives as well as to educate residents of the basin on proper land management practices in conjunction with the field demonstration program.

Activities associated with this program component consist of the following:

- upgrading of the original TRIC slide-tape show and distribution to members (nearing completion)
 - preparation of several slide shows to accompany the many public presentations by TRIC staff
 - design and development of a TRIC display suitable for the 1980 International Plowing Match and similar major showings
 - development of educational brochures on key aspects of land management and related water quality (currently in progress)
 - preparation of information packages on TRIC with a tabloid or similar format for general distribution to residents in the basin (nearing completion)
 - co-operative efforts with the Ontario Ministry of Agriculture and Food in the preparation of related Fact Sheets
- 2) Identification and Mapping of Hydrologically Active Areas (H.A.A.s) and Development of Land Management Demonstration Areas

The Committee became aware early in the summer that the Lands Directorate of Environment Canada had proposed to do a hydrologically active areas analysis on the Thames River Basin in 1981. In view of this, the Agriculture and Land Use Sub-Committee has directed most of its effort in 1980 toward demonstration of known conservation practices on existing problem areas. The Lands Directorate on the other hand, has agreed to undertake a similar H.A.A. analysis on the Avon River in 1980, which will provide an opportunity to test the methodology to be applied to the Thames River next year.

An agronomist and an agricultural engineer were hired to develop and implement a field program designed to demonstrate diffuse source control mechanisms. Conservation practices such as minimum tillage, grassed waterways, streambank stabilization, control of cattle access, proper tile outlets, drop inlets or rock chutes, provision of buffer strips and others are being demonstrated on properties with soil erosion problems.

A team of Experience '80 students undertook a survey of a variety of organizations during the summer of 1980 in order to determine not only the location of the poor land management sites required for the demonstrations noted above but also to identify properties where examples of good land management practices were in evidence. These positive land management practices have been catalogued and each landowner's permission obtained to publish information on the site and to place a sign at the location to assist in public recognition of the practice. Copies of the complete catalogue with colour photos will be made available to resource management agencies throughout the basin.

3) Drain Construction and Maintenance Guidelines and Applications

An agricultural technician has been brought on staff to review the "Design and Construction Guidelines for Work Under the Drainage Act" recently published by the Ministry of Agriculture and Food and if necessary to prepare a "handbook" on proper conservation practices associated with drain construction. The handbook would be provided for use by drainage engineers, contractors and the affected landowners.

In addition, the two major drainage projects being undertaken in the basin in 1980 are being monitored visibly and through a detailed water sampling program. The intent is to compare resultant soil losses and water quality conditions with those observed during and after proper drain construction demonstrations in 1981/82.

4) Compilation of Economic Data on Municipal Sewage Treatment

As noted in the review of Recommendations No. 7 and 8 above, a variety of studies and related treatment facility upgradings have taken place in the past two years. In order to more fully appreciate the overall effect of these changes on water quality in the river and to determine the necessary servicing requirements to meet the standards set out in the 1975 Basin Study, a Municipal Servicing Study will be undertaken in the fall of 1980 by a professional consulting firm. The study will specifically result in a servicing matrix which will assist municipalities in making decisions on long range sewage treatment options. It

is anticipated that the study will be completed by the end of the year and copies available for distribution to the affected municipalities early in the new year.

The 1980/81 Operating Budget

A summary of the 1980/81 operating budget is provided on Figure 2. All components of the TRIC program are cost-shared equally between the Ministry of the Environment and the Ministry of Natural Resources. Whenever appropriate, the cost of specific activities has been shared between TRIC and the Stratford-Avon River Environmental Management Project.

Figure 2: 1980/81 OPERATING BUDGET SUMMARY

1	<u>Co-ordination and Administration</u>	
	- Co-ordinator's salary & expenses	
	- part of administration expenses (secretarial services, xeroxing, postage, telephone).	
		<u>\$ 20,000</u>
2	<u>Information and Education</u>	
	- salary and expenses for Community Relations Technician	
	- supplies, materials, professional services, etc.	
		<u>\$ 20,000</u>
3	<u>Land Management Demonstrations</u>	
	- salary and expenses of Agricultural Engineer, Agronomist, and Agricultural Technician (part-time)	
	- salary and expenses of Agricultural Specialist (part-time, shared with SAREMP)	
	- equipment, supplies, contract services related to field demonstrations	
	- financial assistance to landowners co-operating in demonstration projects.	
		<u>\$128,000</u>
4	<u>Drain Construction and Maintenance Guidelines and Applications</u>	
	- salary and expenses of Agricultural Technician(part-time)	
	- services and supplies associated with drain monitoring program.	
		<u>\$ 10,000</u>
5	<u>Compilation of Economic Data On Sewage Treatment</u>	
	- contract services of consultants to undertake municipal servicing study.	
		<u>\$ 10,000</u>
	<u>TOTAL APPROVED FUNDING</u>	<u>\$188,000</u>

IV. PROPOSED 1981/82 PROGRAM

In response to the results of the review of recommendations recently undertaken by TRIC sub-committees and the activities of TRIC staff thus far, a general program outline has been developed for the 1981/82 fiscal period. The proposed budget summary shown in Figure 3 has been approved by the full TRIC membership.

While the budget summary should be self-explanatory, further elaboration of certain components may be warranted. In general, the program is designed to demonstrate cost-effective remedial measures for dealing with diffuse source impacts on water quality in the Thames River. The exception to this is the investigation proposed on the Wardsville Dam recommendation. Recent information on the relationship of this proposed structure to the Glengowan Dam and Reservoir suggests that some consideration of the former project may proceed immediately without awaiting the final results of the Glengowan Environmental Assessment. In order to deal with Recommendation No. 4 - Wardsville Dam, the Committee is proposing to update and evaluate the original criteria leading to this recommendation and to determine whether further detailed investigations by the Lower Thames Valley Conservation Authority of the original flow-through structure are warranted.

Items 3 and 4 include an allowance for support of the work of the Federal Government on hydrologically active areas. This support will include staff time and expenses as well as costs associated with acquiring summer staff to complete the field surveys.

The reduction in the budget assigned to the public information component does not reflect a revised attitude towards this critically important activity, but rather it recognizes that the Community Relations Technician's costs will be split equally with the Stratford-Avon River Project.

A limited number of rural demonstrations are underway.

Figure 3: PROPOSED 1981/82 BUDGET

1	<u>Administration and Co-ordination</u>	
	- includes ½ Co-ordinator's salary and expenses(shared with SAREMP), secretarial services, xeroxing, telephone, postage, report preparation	\$35,000
2	<u>Public Information Program</u>	
	- includes ½ Community Relations Technician (shared with SAREMP), materials and supplies. -activities include group presentations, demonstration field days, tours, displays, audiovisual presentation on land management practices.	15,000
3	<u>Tillage and Cropping Demonstrations</u>	
	- includes salary and expenses of Agronomist, procurement of equipment, farmer subsidy, signs, student support.	
	- the tillage and cropping demonstrations would show the techniques and benefits associated with reducing soil erosion through revised farming practices.	70,000
4	<u>Engineering Services</u>	
	- includes the salary and expenses of 1½ Agricultural Engineers (one shared with SAREMP) signage, contractors services, student support, supplies and materials.	
	- this program will provide technical assistance in the design and financial assistance with the construction of grassed waterways, drop inlet structures, rock chutes, tile outlets, cattle access points etc. for the demonstration of proper soil erosion control devices.	90,000
5	<u>Drainage Demonstrations</u>	
	- includes salary and expenses for Agricultural Technician, contractors services, signage supplies and equipment.	
	- several municipal drain construction projects will be revised to incorporate all the appropriate bank stabilization and soil-loss reduction techniques required to reduce the frequency of future drain cleanouts and maintain water quality.	60,000

6	Investigation of Proposed Wardsville Dam	
	- a consulting firm will be contracted to evaluate existing data and develop a detailed synopsis of the required studies leading to a feasibility statement on the concept.	25,000
	<u>TOTAL T.R.I.C. BUDGET</u>	<u>\$290,000</u>

APPENDICES

- A. Recommendations from the 1975 Thames River Basin Water Management Study
- B. Organizational Concepts for the Thames River Implementation Committee
- C. Members of T.R.I.C.
- D. Summary of Recommendations from the 1978 Progress Report

APPENDIX A.

Recommendations from the 1975 Thames River Basin Water Management Study

As the Glengowan dam is common to each of the preferred options, construction of the Glengowan dam first would offer maximum flexibility in choosing other capital construction projects. Decisions as to whether to construct the Wardsville dam or the Thamesford dam could then be made. The decision as to whether to utilize conventional treatment or eventually a sewage pipeline from London to Lake Erie could be deferred to the early 1990's. **Accordingly, it is recommended that the Glengowan dam should be constructed first, 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.**

...Recommendation no. 1

It is further recommended that the Upper Thames River Conservation Authority and the Ministry of Natural Resources investigate in detail, as soon as possible, 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.

...Recommendation no. 2

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.

...Recommendation no. 3

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 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 offish, 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 versus the smaller structure should be considered. There should also be close consultation with Indian bands concerning the effects on reservation lands.

...Recommendation no. 4

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.

...Recommendation no. 5

As noted above, implementation of any one of the preferred options allows deferral for several years of a decision by the City of London as to whether to continue discharging treated sewage to the Thames River or to utilize a sewage diversion pipeline to Lake Erie. **Accordingly, 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.**

...Recommendation no. 6

Although the major options have great significance to basin wide water management, they by no means deal with all the basin's water resource problems. Local water management problems can have a cumulative effect, so that a localized type of problem, recurring at several different locations, can have basin wide implications. A wide range of management options to deal with urban, rural, reservoir-related and flooding problems has been considered and applied on a stream reach and municipality basis.

Urban oriented options include varying levels of treatment of sewage and industrial wastes, and growth restrictions. In areas where the remaining waste assimilative capacity of streams is limited, municipalities proposing additional growth can consider the installation of advanced tertiary waste treatment plants producing a highly polished effluent equivalent to stream water quality, or waste storage for summer spray irrigation or discharge during periods of adequate flow. However, for smaller municipalities, the costs of the required tertiary treatment may be prohibitive. Moreover, the costs of property acquisition for waste storage can make this uneconomical and this approach often involves the use of prime agricultural land. The alternative to the above treatment options is growth restrictions. **At several municipalities in the basin, the waste assimilative capacity of the receiving stream has been reached or exceeded. Accordingly, 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.**

...Recommendation no. 7

Receiving streams at other municipalities in the basin have varying capacities to assimilate additional waste loadings. The additional assimilative capacity at the municipalities of Woodstock,

Beachville, Ingersoll and Lambeth is limited and long term growth would be inadvisable from a water quality viewpoint. At the municipalities of Dorchester, St. Marys, Bothwell, Thamesville, and Chatham the additional waste assimilative capacity is not as limited. **Accordingly, these municipalities 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.**

...Recommendation no. 8

Control of urban runoff is an important consideration in the basin. Although the significance of pollution loads from this source at each municipality was not documented during this study, urban runoff is recognized as a source of stream impairment. **Thus, 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.**

...Recommendation no. 9

Most industries in the basin lie within municipal boundaries and discharge wastes and non-polluted process waters to municipal sanitary and storm sewage systems respectively. Most municipalities have enacted sewer use bylaws to control the volumes and strength of these wastes in order to prevent polluting materials from gaining direct access to watercourses. **It is recommended that 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.**

...Recommendation no. 10

Rural oriented management practices for water quality improvement include limiting fertilizer application rates, channel protection programs, restricting free access of cattle to streams, control of farm waste discharges, particularly from intensive feedlot operations, and control of illegal septic tank connections to drains. Surface runoff to streams from fertilized land is a significant diffuse source of nutrients which contribute to excessive aquatic weed growth. Although accurate statistical information is not available, fertilization of cropland beyond recommended rates was found to be a general practice in the basin. **It is therefore recommended that fertilizer application rates 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.**

...Recommendation no. 11

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 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.

...Recommendation no.12

It is recommended that increased environmental surveillance and enforcement be undertaken by appropriate government agencies to control farm waste discharges, particularly from intensive feedlot operations, and illegal septic tank connections to municipal drains.

...Recommendation no. 13

It is recommended that 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.

...Recommendation no. 14

Recommendations 11 to 14 are generally relevant to the entire watershed; however, particular attention is drawn to headwater areas, where the need to maintain streamflows at the best possible quality and quantity is especially important. Any lessening of flows and stream quality in these areas will aggravate downstream problems. **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.**

...Recommendation no.15

It is recommended that 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 this report for each reservoir.

...Recommendation no. 16

In evaluating water management options, the assumption was made that, as specified in operation manuals, discharges from Wildwood and Pittock reservoirs would be maintained at minimum rates of 40 cfs and 15 cfs respectively for flow augmentation, and that Fanshawe Dam would be operated on a flow- through basis during low flow periods. An analysis of historical flow data indicated that these rates of flow have generally been maintained on a monthly basis, but that on a daily basis, flows have been less than specified for significant periods. **Accordingly, it is recommended that these reservoirs be operated in such a manner as to ensure the maintenance of the specified minimum flows on a daily basis. It is also recommended that there 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.

...Recommendation no. 17

Water based recreation relates largely to existing and proposed reservoirs. Improved water quality will enhance recreational use of streams, but this use is restricted by limited public access. Although a significant increase in recreational use of existing reservoirs is not practical without jeopardizing their primary use for flood control and flow augmentation, **it is recommended that the Upper Thames River Conservation Authority and the Ministry of Natural Resources undertake a 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.**

...Recommendation no. 18

Channel erosion problems in the lower watershed below Chatham are presently the subject of a \$7 million streambank and dike stabilization and rehabilitation project. **It is recommended that 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 Limited entitled "Flood And Erosion Control Works On The Lower Thames River From Chatham To Delaware".**

...Recommendation no. 19

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.

...Recommendation no. 20

It is recommended that 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.

...Recommendation no. 21

Prevention of water supply interference and ground water quality impairment, rather than remedial action after the problem has occurred, should be practised using procedures detailed in chapter 7 of this report.

...Recommendation no. 22

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.

...Recommendation no. 23

Another aspect of communication and co-ordination, raised during the Public Consultation Program, related to the division of the watershed into two conservation authorities, **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.**

...Recommendation no. 24

Regulation of new floodplain development is a vital aspect of flood control. Controls of such development have already been implemented in some areas of the watershed. **It is recommended that further controls of floodplain development under the planning act and through regulations administered by the conservation authorities be developed.**

...Recommendation no. 25

Flood warning, which can be an effective measure in reducing flood losses through temporary evacuation of people and damageable goods, requires an efficient flood warning system to be successful. **It is recommended that the Conservation Authorities Branch and The Conservation Authorities consider the development of an improved flood warning system.**

...Recommendation no. 26

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 streambanks should be directed to areas where they would specifically aid in erosion control, streambank stabilization, and the improvement of fish habitats.

...Recommendation no. 27

It is recommended that municipalities and government agencies encourage and enforce careful construction practices during drainage ditch installations and other construction activities in and along watercourses.

...Recommendation no. 28

It is recommended that 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 baseflow such as the Harrington-Lakeside moraine should be protected.

...Recommendation no. 29

APPENDIX B

Organizational Concepts For The Thames River Implementation Committee

Terms of Reference

The Thames River Implementation Committee shall provide advice, communication and co-ordination to the implementing agencies and assist in implementing the recommendations of the Thames River Study, or their modifications, by seeking a consensus of involved agencies, establishing a forum for communication with those involved in the implementation and fostering public understanding and participation.

Functions of the Committee

Based on the above terms of reference, the following principal functions of the Committee emerge:

1. Co-ordination of Existing Programs

To achieve liaison and co-ordination amongst agencies currently involved with responsibilities or functions that impact on basin management to:

- maximize the benefits to be derived from existing programs,
- identify and deal with current problems and issues of interest or concern to one or more implementing agencies,
- ensure that decisions in the short term do not preclude the consideration of options that may be essential to the achievement of long-term goals for the basin.

2. Assessment and Implementation of the Recommendations

To achieve the development of an effective river basin management program for the Thames River watershed by:

- assessing the recommendations outlined in the report, including impact of the recommendations on municipalities and the level of municipal acceptance,
- determining those recommendations that should receive priority attention,
- reviewing present programs and activities that may contribute wholly or in part to the achievement of the recommendations,
- identifying effective implementation measures,
- providing for a periodic re-assessment of the recommendations and the extent of their application.

3. Public Information and Participation

To foster a program of public involvement to;

- achieve public appreciation of the integrity of the Thames River Basin and inter-dependencies that exist,
- to provide an avenue for dissemination of information in order to foster understanding of the Thames River report and the ongoing activities of the Thames River Implementation Committee,

- obtain an ongoing input from the public and municipalities concerning the recommendations contained in the Thames River Basin Study and related implementation measures.

Implementing Agencies

Implementing agencies are considered to be those that have a direct means (legislative or otherwise) of initiating programs or applying incentives or controls to achieve the purposes of the Thames River Basin Study. They are identified as follows:

Ministry of Natural Resources	Ministry of Industry and Tourism*
Ministry of the Environment	Municipalities throughout the Basin*
Upper Thames River Conservation Authority	Ontario Ministry of Agriculture and Food
Lower Thames Valley Conservation Authority	Ministry of Treasury, Economics and Intergovernmental Affairs
	Ministry of Housing

- * not represented on Implementation Committee

APPENDIX C

MEMBERS OF THAMES RIVER IMPLEMENTATION COMMITTEE

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APPENDIX D

Summary Of Recommendations From The 1978 Progress Report

Recommendation No. 1 - Construction of Glengowan Dam

The Thames River Implementation Committee feels that much of the information required for this assessment is contained in the Thames River Basin Study and therefore the Conservation Authority should be allowed to use the study as the basis for the assessment. The Committee intends to assist the Authority wherever possible in this regard and firmly believes that the various water management options for the river were and still are adequately addressed in the original study.

The assessment itself should identify any concerns which possibly were not identified in the study, or were not fully researched and should complete the documentation of recreational potential. This expanded information base should be considered in the context of the original study, and should confirm the most feasible approach for resolving water management problems in the Thames River Basin.

...see page 4.

Recommendation No. 2 - Investigation of Limestone Deposits at Thamesford Darn Site

The Committee feels that no further action is required on this recommendation at the present time. see page 6.

Recommendation No. 3 - Construction of Thamesford Dam

In light of the findings with respect to recommendation No. 2., it is no longer feasible to consider the construction of the Thamesford Dam for flood control purposes at the present time. Since the dam will not be built for the foreseeable future, there is no value in assessing its recreational potential and therefore the Committee does not intend to take any action on this recommendation.

Recommendation No. 4 - Construction of Wardsville Dam

In light of the fact that the Thamesford Dam and Reservoir cannot be initiated for the foreseeable future, (see statement on Recommendation No. 2), the construction of the Wardsville Dam and Reservoir for flood control purposes should be considered further by the Lower Thames Valley Conservation Authority.

In the interim, the Lower Thames Authority should begin to gather the necessary information on the various effects of Wardsville through a variety of mini-studies of the area. This information would then be available for consideration should the detailed cost-benefit study the project be initiated at some time in the future.

.... see page 7.

Recommendation No. 13 - Farm Waste Discharges

The Thames River Implementation Committee recommends that the Ministries of Housing, Environment and Agriculture and Food investigate the feasibility of changes in zoning enabling legislation to require that agricultural waste control practices be covered by a Certificate Compliance.

The Thames River Implementation Committee recommends that the Ministry of the Environment lend full support to special programs (possibly using student assistance) to identify farm waste discharges and runoff associated with major livestock or intensive feedlot operations that may be contributing to degradation of the Thames River system, and that subsequent remedial programs be developed in co-operation with the Ontario Ministry of Agriculture & Food.

..... see page 27.

Recommendation No. 19 - Bank Protection Program from Chatham to Delaware

The Lower Thames Valley Conservation Authority is implementing this program as quickly as possible and therefore the Committee is not planning any action on this recommendation. see page 11.

Recommendation No. 20 - Soil Erosion Control Practices

It is felt that the two Conservation Authorities should play a lead role in the implementation of specific programs both on their own lands and through arrangements with landowners to demonstrate and achieve various erosion control measures and practices, assisted where necessary by staff of the three ministries acting in a supportive capacity. It recommended that the Province strengthen funding to the Upper and Lower Thames Conservation Authorities for acceleration of their Private Land Assistance Programs to accomplish erosion control objectives.

In addition, it is recommended that the Province make available financial assistance to the Thames River Implementation Committee for sub-watershed pilot projects to foster acceptance of the need for improved and use practices. see page 31.

Recommendation No. 21 - Environmental Assessments for Land Drainage Projects

The Committee therefore recommends that guidelines for the construction and maintenance drainage works be developed and agreed upon by the Ministry of the Environment and the Ontario Ministry of Agriculture and Food. Furthermore, the Committee agrees that major wetland areas deserve protection and that drainage schemes affecting such areas should be scrutinized under the Environmental Protection Act.

. see page 32.

Recommendation No. 22 - Groundwater Protection

*It is felt that this recommendation is being met and no further action is contemplated by the Thames River Implementation Committee in this connection.
..... see page 34.*

Recommendation No. 24 - Amalgamation of Conservation Authorities

*This recommendation has been reviewed in detail and the Thames River Implementation Committee has determined that it should not be implemented.
..... see page 12.*

Recommendation No. 26 - Development of Improved Flood Warning System

*This recommendation does not require any action by this Committee at the present time.
..... see page 14.*

Recommendation No. 27 - Conservation Measures

*Similar to Recommendation 20, it is recommended that the Province strengthen funding to the Upper and Lower Thames Conservation Authorities for acceleration of their Private Land Assistance Programs to accomplish water retention and conservation objectives.
..... see page 35.*

Recommendation No. 28 - Drainage Construction Practices

The Thames River Implementation Committee recommends:

- 1) *That the Land drainage grant structure be designed to encourage a regular maintenance program, including cattail or brush control and providing structures or practises to prevent unnecessary erosion.*

- 2) *To upgrade the quality of supervision, municipalities should consider engaging suitably qualified drainage personnel on a joint basis e.g., to cover a county jurisdiction.*
- 3) *That Provincial and Federal sales tax exemptions be extended to include materials used to protect water quality in connection with municipal drainage systems.*
- 4) *That participation in a course established for drainage personnel at the University of Guelph should be a mandatory requirement. This course should be enlarged in duration and scope, if necessary, and should attached emphasis to environmental concerns. Refresher courses should be offered as required to present the latest information on improved procedures.*

..... see page 36.

Recommendation No. 29 -Groundwater Infiltration

The Thames River Implementation Committee views that the provision of constraint mapping by the Ministry of the Environment; coupled with review processes now in effect, will effect the satisfactory achievement of this recommendation.

..... see page 37.