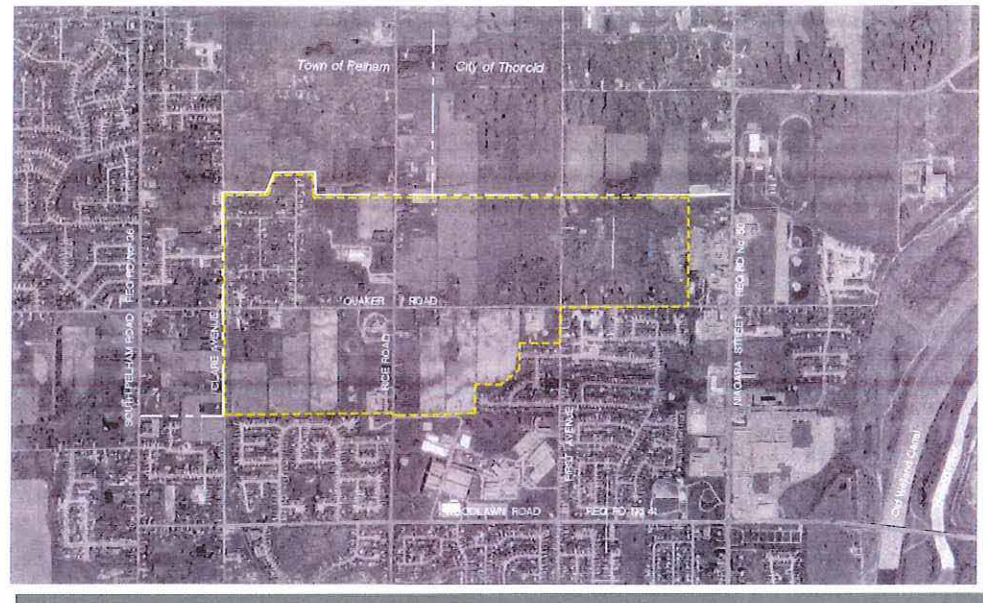




City of Welland Northwest Area Planning and Servicing Study Municipal Class Environmental Assessment



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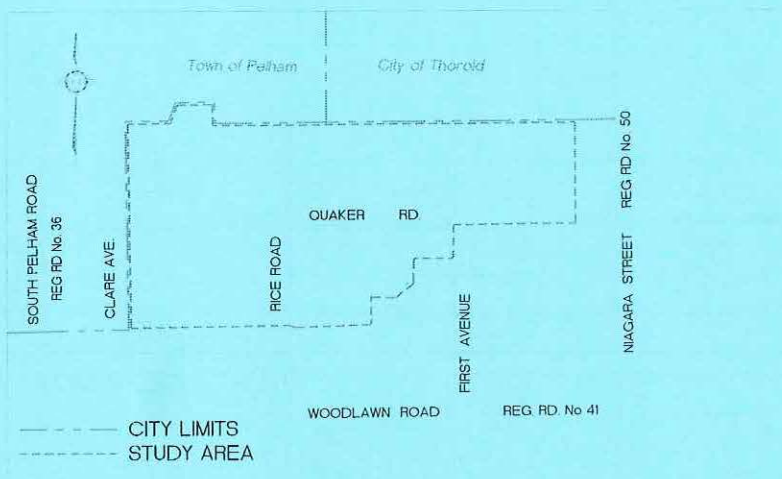
LIST OF ACRONYMS

City	City of Welland
CPP	Concrete Pressure Pipe
DFO	Department of Fisheries and Oceans
DWF	Dry Weather Flow
EA	Environmental Assessment
EAA	Environmental Assessment Act
EIS	Environmental Impact Study
ELC	Ecological Land Classification
ESR	Environmental Study Report
GTA	Greater Toronto Area
ha	hectare
ICI	Industrial, Commercial and Institutional
km	kilometre
LSW	Locally Significant Wetland
m	metre
m³	metres cubed
mm	millimetres
MEA	Municipal Engineers Association
MOE	Ministry of Environment
MMAH	Ministry of Municipal Affairs and Housing
MNR	Ministry of Natural Resources
MSP	Master Servicing Plan
Municipal Class EA	Municipal Class Environmental Assessment
NPCA	Niagara Peninsula Conservation Authority
OP	Official Plan
psi	pound per square inch
PSW	Provincially Significant Wetland
RMON	Regional Municipality of Niagara
ROW	Right of Way
SWM	Stormwater Management

- EXECUTIVE SUMMARY -

A. BACKGROUND

The City of Welland (the City) has completed a Study to review planning and municipal infrastructure servicing issues related to existing and potential development within the Northwest Area of the City (see map). The Northwest Area Planning and Servicing Study follows the master



plan process (Approach # 2) as outlined in the Municipal Engineers Association (MEA) Municipal Class Environmental Assessment (Class EA) document (October 2000, as amended in 2007) and fulfills all Class EA Schedule "B" project (e.g. stormwater management facilities) requirements. The Study provides the basis for the Northwest Area's servicing requirements for future development associated with the City's possible urban boundary expansion and focuses on the development of municipal infrastructure systems for:

- Water Distribution;
- Sanitary Sewage;
- Roadways; and
- Stormwater Collection & Management.

With respect to urban boundary expansion, this will be captured in the City's new Official Plan which was initiated on early 2008.

Servicing Objectives

This Study reviews the impacts of potential future development on existing infrastructure systems, including the requirements for potential new development, and identified recommended servicing strategies. Specific servicing strategies identified in this report include:



1. The existing City water distribution system will be expanded to service the Northwest Area by constructing local watermains that will connect to a future Region of Niagara 400mm diameter watermain on Quaker Road.
2. Wastewater servicing requirements will be based on the Region of Niagara's recent construction of a new sanitary sewer system (to serve the approved development in the Town of Pelham's East Fonthill area) on Quaker Road which can also provide service to the Northwest Area study area.
3. Transportation requirements were also assessed and appropriate recommendations for road classifications and improvement (e.g. widening and signalization) to existing roads have been identified.
4. Stormwater management facilities will be developed in the east end of the study area to provide water quality and quantity control.

B. PRELIMINARY CONCEPT PLAN

As a basis for the identification and evaluation of infrastructure servicing strategies, a preliminary concept plan was prepared. The preliminary concept plan provides an overview of possible reasonable land uses and densities and is an important tool used to guide and evaluate water, sanitary sewer, road and stormwater infrastructure sizing, phasing and feasibility. It is important to recognize that the preliminary concept plan as presented in this document does not reflect a decision or preference on how the Northwest Area is ultimately developed in terms of land uses, built urban form and associated densities. This will be achieved through future planning (e.g. new Official Plan and Zoning By-Law Amendments) and public consultation activities.

Figure B-1 presents the preliminary concept plan that was used to guide the municipal infrastructure servicing evaluation.

1

Niagara Restoration Council Works

- Restoration work was completed for this stretch of Tow Path Drain in 2006
- Preferred environmental management options for Tow Path Drain include: i) maintain and enhance the channel as it exists or ii) realign the channel
- If channel realignment is considered, the design and layout of the channel will have to incorporate natural channel principles with the guidance of a professional fluvial geomorphologist. The design and planning of the potential realignment will also have to be completed as a single project. Implementation of the realignment, if done in segments would require coordination to ensure functions of Tow Path Drain are maintained.
- Subject to NPCA/DFP approval
- These options should be addressed at preliminary plan of subdivision stage including supporting studies

1A

Portion of Tow Path Drain Currently Buried

- No fish habitat issues

2

Block B Tow Path Drain

- Preferred environmental management options for Tow Path Drain include: i) maintain and enhance the channel as it exists or ii) realign the channel
- If channel realignment is considered, the design and layout of the channel will have to incorporate natural channel principles with the guidance of a professional fluvial geomorphologist. The design and planning of the potential realignment will also have to be completed as a single project. Implementation of the realignment, if done in segments would require coordination to ensure functions of Tow Path Drain are maintained.
- Subject to NPCA/DFP approval
- These options should be addressed at preliminary plan of subdivision stage including supporting studies

3

Block C Tow Path Drain

- Preferred environmental management options for Tow Path Drain include: i) maintain and enhance the channel as it exists or ii) realign the channel
- If channel realignment is considered, the design and layout of the channel will have to incorporate natural channel principles with the guidance of a professional fluvial geomorphologist. The design and planning of the potential realignment will also have to be completed as a single project. Implementation of the realignment, if done in segments would require coordination to ensure functions of Tow Path Drain are maintained.
- Subject to NPCA/DFP approval
- These options should be addressed at preliminary plan of subdivision stage including supporting studies

3A

Stormwater Management Ponds

- Stormwater management ponds will be designed as offline and subject to relocation
- Preferred environmental management options for Tow Path Drain include: i) maintain and enhance the channel as it exists or ii) realign the channel
- If channel realignment is considered, the design and layout of the channel will have to incorporate natural channel principles with the guidance of a professional fluvial geomorphologist. The design and planning of the potential realignment will also have to be completed as a single project. Implementation of the realignment, if done in segments would require coordination to ensure functions of Tow Path Drain are maintained.
- Subject to NPCA/DFP approval
- These options should be addressed at preliminary plan of subdivision stage including supporting studies

3B

Stretch of Tow Path Drain with Adjacent Swamp Thicket Community

- A provincially rare Grey Dogwood thicket occurs along a portion of Tow Path Drain in Block C. Preservation of this community is recommended
- Preferred environmental management options for Tow Path Drain include: i) maintain and enhance the channel as it exists or ii) realign the channel
- If channel realignment is considered, the design and layout of the channel will have to incorporate natural channel principles with the guidance of a professional fluvial geomorphologist. The design and planning of the potential realignment will also have to be completed as a single project. Implementation of the realignment, if done in segments would require coordination to ensure functions of Tow Path Drain are maintained.
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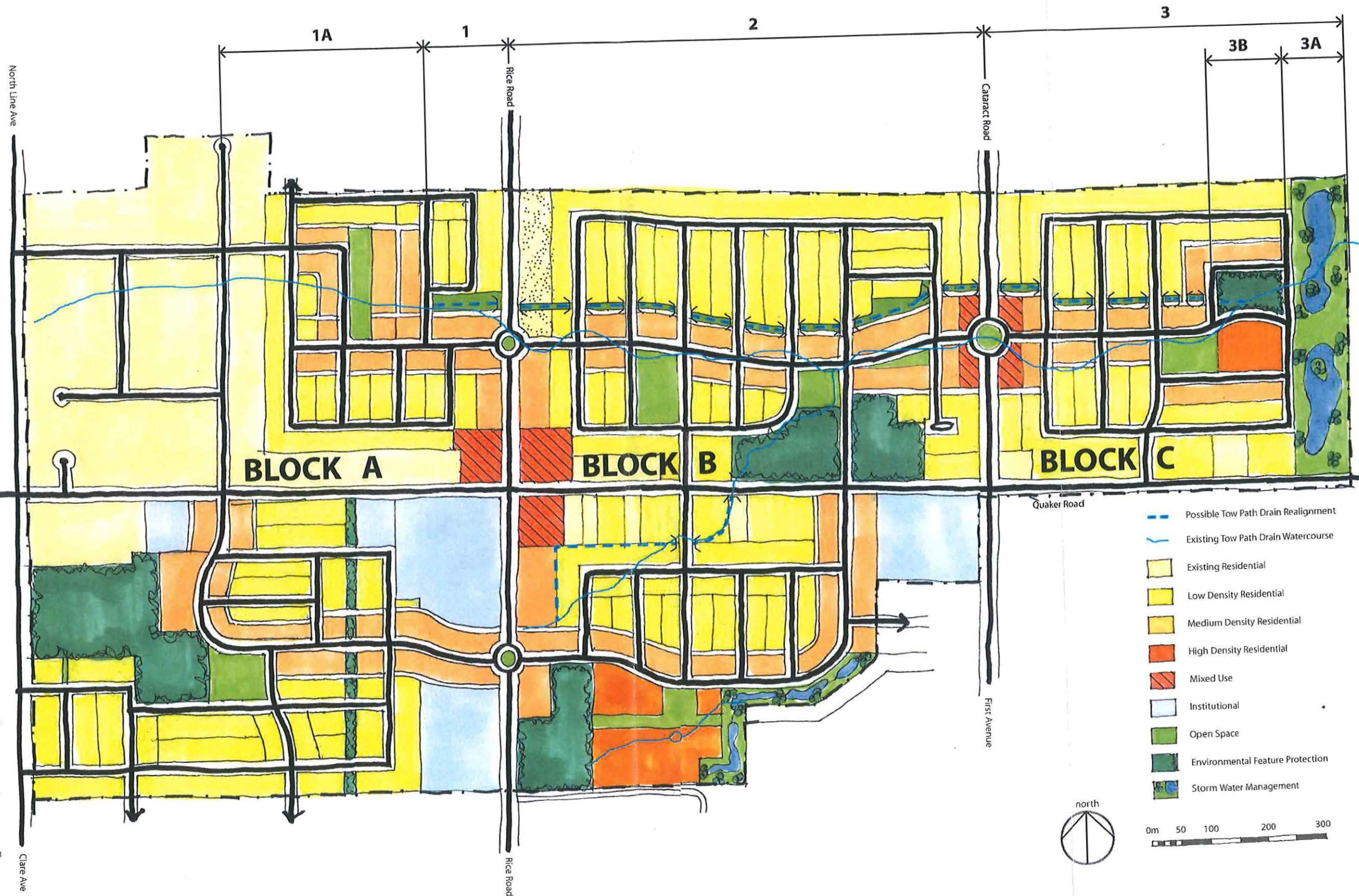


FIGURE B-1: PRELIMINARY CONCEPT PLAN



C. PROBLEM STATEMENT

The Problem Statement for City of Welland Northwest Area Planning and Servicing Study is defined as follows:

The City of Welland is required to ensure that adequate lands are available to accommodate future growth that considers current available lands and is expected to occur within a reasonable time frame.

In order that the City of Welland Northwest Area Planning and Servicing Study can be properly completed, the impacts of proposed development on the City's and Niagara Region's infrastructure need to be addressed and servicing guidelines for the development community developed. Input is also required to formulate the City's capital works program to service the future needs of the Northwest Area, should this area move forward towards inclusion within a future expanded urban boundary planning process.

The master servicing plan study will also outline a conceptually preferred servicing strategy that can be referenced when reviewing development applications.

D. IDENTIFICATION OF ALTERNATIVES AND PREFERRED SOLUTIONS

D.1. Preferred Water Distribution Alternative

This study evaluated the need to supply the City's Northwest Area with both domestic and fire flow water capacity. The evaluation was based on expected land uses described in the preliminary concept plan. The expected system demands were calculated and sizes of the watermains then determined. Local watermains are envisioned to be constructed within the road allowance as described in the preliminary concept plan. As such the identification and evaluation of alternative watermain routes was not completed for this master servicing plan component.

As noted in the section 12.1, new Northwest Area watermains will be looped off the proposed 400mm diameter Region of Niagara watermain on Quaker Road. The mains have been sized to provide fire flow protection, but pressures in the west part of the study area are not adequate around peak hour demand most likely due to a shortcoming in the water network outside of the study area. A more detailed analysis should be completed to determine possible deficiencies within the system before proceeding with development.



D.2. Preferred Sanitary Sewer Servicing Alternative

The Regional Municipality of Niagara has recently constructed a new trunk sanitary sewer on Quaker Road in the study area. This new Region of Niagara trunk sanitary sewer extends to the Town of Pelham East Fonthill urban boundary expansion area and has been sized to accommodate sewage flows from the Northwest Area study area. As such, consequently, no other sanitary options were considered.

The Northwest Area sanitary system will be comprised of local 250mm diameter sewers located within each sub area that will drain to the recently constructed 750mm diameter Region of Niagara sewer that runs south on Rice Road and then east on Quaker Road. A section of 300mm sewer will be required to service the area west of Rice Road.

D.3. Preferred Roadway Servicing Solution

Through the preliminary concept plan, road patterns were established to provide street continuity with existing streets and connectivity to adjacent developments. It was assumed that the use of alternative modes of transportation will be encouraged through an established road pattern. This road pattern was reviewed for the effects on the existing roadways in the project study area many of which currently have a rural cross-section. The City's policy on new development is that all roads are to be constructed as urban cross-section (curb & gutter/sidewalks/street lighting). The following roadway servicing alternatives were carried forward in conjunction with transit and bicycle paths:

- Upgrade Existing Roads (includes road widening) - Additional lanes, curb/sidewalks/street lighting.
- Upgrade Intersections - Provide turning lanes, etc.

It is recommended that Rice Road, and First Avenue be widened from two lanes to four lanes and upgraded to urban standards from Woodlawn Road to Merritt Road as recommended in the City of Welland Transportation Planning Study. Quaker Road, between Niagara Street and South Pelham Road should also be widened to accommodate an additional lane in the eastbound and westbound directions. These projects would be defined as a Schedule "C" project under the MEA Municipal Class EA document and as such require further study and EA approvals. It is also recommended that auxiliary left turn lanes be provided at key intersections along Rice Road, Quaker Road and First Avenue.

Under future conditions, it is recommended that the following intersections at Quaker Road at First Avenue be signalized once traffic signal warrants are met. These intersections should also be monitored



for traffic signals once development is completed in the area as cross traffic may experience significant delays:

- Rice Road (first intersection south of Quaker Road),
- Quaker Road (intersection west of First Avenue); and
- Quaker Road/Montgomery Road.

It is recommended that the classification of Quaker Road be upgraded to an arterial road under the City's jurisdiction from its current collector road designation as its role in the road hierarchy provides more of an arterial road function in the surrounding road network system. The main east west roads through the Northwest Area study area, both north and south of Quaker Road, and the north-south extension of Montgomery Road and the north-south road just west of First Avenue should be designated as collector roads with the provision of bike lanes.

Based on the land uses identified in the concept plan, all internal roads will be capable of accommodating the anticipated traffic volumes as two lane roads.

D.4. Preferred Stormwater Servicing Solution

Existing land uses within the preliminary concept plan include a mix of inactive agricultural land, single family residential, and some institutional as well as wooded areas. Drainage generally is from west to east via the Tow Path Drain and eventually outlets to the Old Welland Canal.

Stormwater flow generated by the 2 to 100 year storm event will be directed to a new stormwater management (SWM) facility located in the east end of the study area. It is envisioned that the SWM facility will consist of two identically sized interconnected ponds that have been sized to attenuate minor and major post development flows to pre development levels, as required by the MOE. The SWM facility will have to be designed for water quality and erosion control. The siting and construction of the proposed SWM facility must consider the requirement of soil contamination sediment. The stormwater collection system will be sized to accommodate stormwater to the 2 year storm event with flows in excess to be directed overland to the SWM facility.

E. CONSULTATION

As part of the planning process, many steps have been undertaken to inform key stakeholders, government agencies, affected landowners and the local community/general public of the nature and



scope of the project and to solicit any comments. Project initiation letters were sent to review agencies, local municipalities, special interest groups and potentially affected property owners notifying them of the project and inviting comments/feedback, as well as the opportunity to receive future mailing (e.g. open houses and notice of completion). In addition to the mailings, both Notice of Initiation and Notice of Public Information Centre were published in local newspapers. A Public Information Centre was held on November 3, 2004 to explain the project and allow the public an opportunity to review the planning process followed and recommended servicing strategies. All comments/input received to date have been considered in the preparation of this planning and servicing study.

F. CONCLUSIONS AND RECOMMENDATIONS

F.1. Conclusions

Through the completion of this Planning and Servicing master plan study (and supporting studies), the City has agreed that the preferred solutions to the problem statement (Section 6.0) consists of:

- New watermains to be looped off the proposed 400mm diameter Regional watermain to service the study area;
- Sanitary systems comprised of local 250mm diameter sewers within each sub areas (drain to a new 750mm diameter Region of Niagara sewer);
- Rice Road and First Avenue be widened to 4 lanes and upgraded to urban standards (from Woodlawn Road to City Limits). Quaker Road (between Niagara Street and South Pelham Road) also be widened to accommodate for additional land in the eastbound and westbound directions. Left turn lanes may be provided at key intersections (Rice Road, Quaker Road and First Avenue). It is also recommended that traffic signals be placed at Quaker Road and First Avenue intersection.
- New stormwater management facility located in the east end of the study area (generated by a 2 to 100 year storm event).

F.2. Recommendations

Considering the above, it is recommended that:

- Following EA Approval, the above mentioned projects proceed to detailed design, and remaining approvals as required;
- Required approvals be obtained (e.g. NPCA, MOE); and



- The mitigation measures identified in Section 15 should be expanded upon at detailed design and implemented as part of construction and on-going operations processes.

G. NEXT STEPS

Following public and review agency/stakeholder input, the preferred alternatives have been confirmed and the Northwest Area Planning and Servicing Study was finalized. This document will then be made available for the mandatory 30-calendar day public review period beginning June 17, 2008 and ending July 17, 2008.

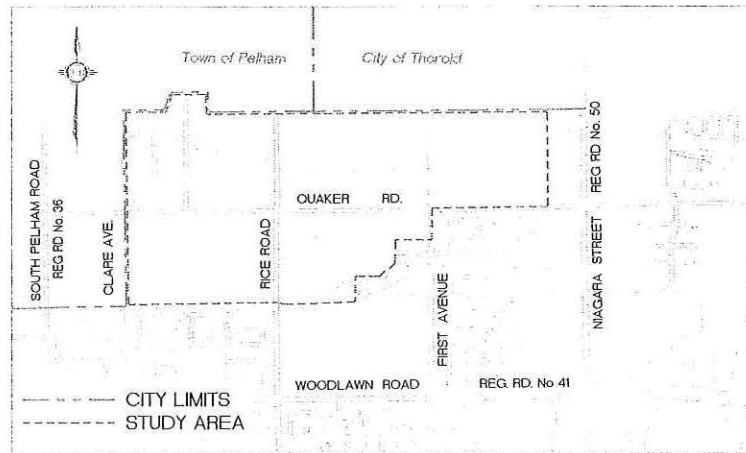
Following approval under the *Environmental Assessment Act*, the projects identified in this planning and servicing study can proceed to design, remaining approvals and construction as per development application timelines for all projects identified as Schedule “A”, “A+” and “B” Municipal Class EAs. It is noted that both of the future Quaker Road and Rice Road upgrade projects will follow the Schedule “C” Class EA planning process. Therefore, Phases 3 and 4 of the Class EA planning process will have to be undertaken in order to obtain Class EA approval for these projects.

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1. INTRODUCTION AND BACKGROUND

The City of Welland (the City) has completed a study to review planning and servicing issues related to existing and potential development within the Northwest Area of the City (see map). The Northwest Area Planning and Servicing Study follows the Municipal Engineers



Association (MEA) Municipal Class Environmental Assessment document (October 2000, as amended in 2007) municipal infrastructure planning process and has developed conclusions and recommendations for the servicing of existing and potential development within the City's Northwest Area. The study provides the basis for the Northwest Area's servicing requirements for future development associated with the City's possible urban boundary expansion and focuses on the development of infrastructure systems for:

- Water distribution;
- Sanitary Sewage;
- Roadways; and
- Stormwater Collection & Management.

Following approval of this report the City intends to initiate the next phase of the proposed Northwest Area urban boundary expansion. This includes planning approvals such as Regional Niagara Policy Plan amendment and a new City of Welland Official Plan that will capture the proposed urban boundary expansion.

Servicing Objectives

Specific objectives established for the City of Welland Northwest Area Planning and Servicing Study were as follows:



1. Provide overall municipal planning and servicing guidelines for the Northwest Area study area.
2. Determine specific requirements for implementing servicing for existing and potential development including mitigation of identified impacts.
3. Undertake an Environmental Assessment (EA) process by following all the steps as outlined in the Municipal Engineers Association Municipal Class EA document (October 2000, as amended in 2007) including input from affected landowners, the general public and review agencies.
4. Provide a clear framework and process for the development of residential and commercial lands.
5. Encourage development by providing services in the most cost-effective way.
6. Maximize the utility of developable lands.
7. Detail locations and sizes of water, sewer, transportation, and stormwater infrastructure.
8. Optimize infrastructure requirements to minimize development costs.
9. Efficiently secure Class EA approval for all Schedule "B" project components, which could be implemented following successful completion of remaining planning approvals.

This Study reviews the impacts of potential future development on existing infrastructure systems, including the requirements for potential new development, and identified recommended servicing strategies.

Servicing Strategies

Specific servicing strategies identified in this report include:

1. The existing City water distribution system will be expanded to service the Northwest Area of the City by constructing local watermains.
2. Wastewater servicing requirements will be based on the Region of Niagara's recent construction of a new sanitary sewer system (to serve the approved development in the Town of Pelham's East Fonthill urban service area) on Quaker Road which can also provide service to the Northwest Area study area.
3. Transportation requirements were also assessed and appropriate recommendations for road classifications and improvement to existing roads have been identified.



4. Stormwater management facilities will be developed to provide water quality and quantity control.



2. DEVELOPMENT OF A PRELIMINARY CONCEPT PLAN

2.1. Purpose of Preliminary Concept Plan

As a basis for the identification and evaluation of infrastructure servicing strategies, a preliminary concept plan was prepared. The preliminary concept plan provides an overview of possible reasonable land uses and densities and is an important tool used to guide and evaluate water, sanitary sewer, road and stormwater infrastructure sizing, phasing and feasibility. It is important to recognize that the preliminary concept plan as presented in this document does not reflect a decision or preference on how the Northwest Area is ultimately developed in terms of land uses, built urban form and associated densities. This will be achieved through future planning (e.g. new Official Plan and Zoning By-Law Amendments) and related public consultation activities.

2.2. Preliminary Concept Plan Guidelines

The following guidelines were used to prepare the preliminary Northwest Area concept plan:

1. Use of environmental inventory to identify and protect significant natural heritage features (e.g. significant woodlots).
2. Review the development potential for all study area lands.
3. Land uses based on:
 - Existing residential;
 - Low density residential;
 - High density residential;
 - Mixed use;
 - Institutional;
 - Open space;
 - Environmental protection; and
 - Stormwater management.
4. Maximize use of existing infrastructure (e.g. road system and Quaker Road Trunk Sewer).

2.3. Preliminary Concept Plan

Based on the above, Figure 2-1 presents the preliminary concept plan that was used to guide the municipal infrastructure servicing evaluation.

- 1 Niagara Restoration Council Works**
- Restoration work was completed for this stretch of Tow Path Drain in 2006
 - Preferred environmental management options for Tow Path Drain include: i) maintain and enhance the channel as it exists or ii) realign the channel
 - If channel realignment is considered, the design and layout of the channel will have to incorporate natural channel principles with the guidance of a professional fluvial geomorphologist. The design and planning of the potential realignment will also have to be completed as a single project. Implementation of the realignment, if done in segments would require coordination to ensure functions of Tow Path Drain are maintained.
 - Subject to NPCA/DFP approval
 - These options should be addressed at preliminary plan of subdivision stage including supporting studies

- 1A Portion of Tow Path Drain Currently Buried**
- No fish habitat issues

- 2 Block B Tow Path Drain**
- Preferred environmental management options for Tow Path Drain include: i) maintain and enhance the channel as it exists or ii) realign the channel
 - If channel realignment is considered, the design and layout of the channel will have to incorporate natural channel principles with the guidance of a professional fluvial geomorphologist. The design and planning of the potential realignment will also have to be completed as a single project. Implementation of the realignment, if done in segments would require coordination to ensure functions of Tow Path Drain are maintained.
 - Subject to NPCA/DFP approval
 - These options should be addressed at preliminary plan of subdivision stage including supporting studies

- 3 Block C Tow Path Drain**
- Preferred environmental management options for Tow Path Drain include: i) maintain and enhance the channel as it exists or ii) realign the channel
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- 3A Stormwater Management Ponds**
- Stormwater management ponds will be designed as offline and subject to relocation
 - Preferred environmental management options for Tow Path Drain include: i) maintain and enhance the channel as it exists or ii) realign the channel
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 - Subject to NPCA/DFP approval
 - These options should be addressed at preliminary plan of subdivision stage including supporting studies

- 3B Stretch of Tow Path Drain with Adjacent Swamp Thicket Community**
- A provincially rare Grey Dogwood thicket occurs along a portion of Tow Path Drain in Block C. Preservation of this community is recommended
 - Preferred environmental management options for Tow Path Drain include: i) maintain and enhance the channel as it exists or ii) realign the channel
 - If channel realignment is considered, the design and layout of the channel will have to incorporate natural channel principles with the guidance of a professional fluvial geomorphologist. The design and planning of the potential realignment will also have to be completed as a single project. Implementation of the realignment, if done in segments would require coordination to ensure functions of Tow Path Drain are maintained.
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 - These options should be addressed at preliminary plan of subdivision stage including supporting studies

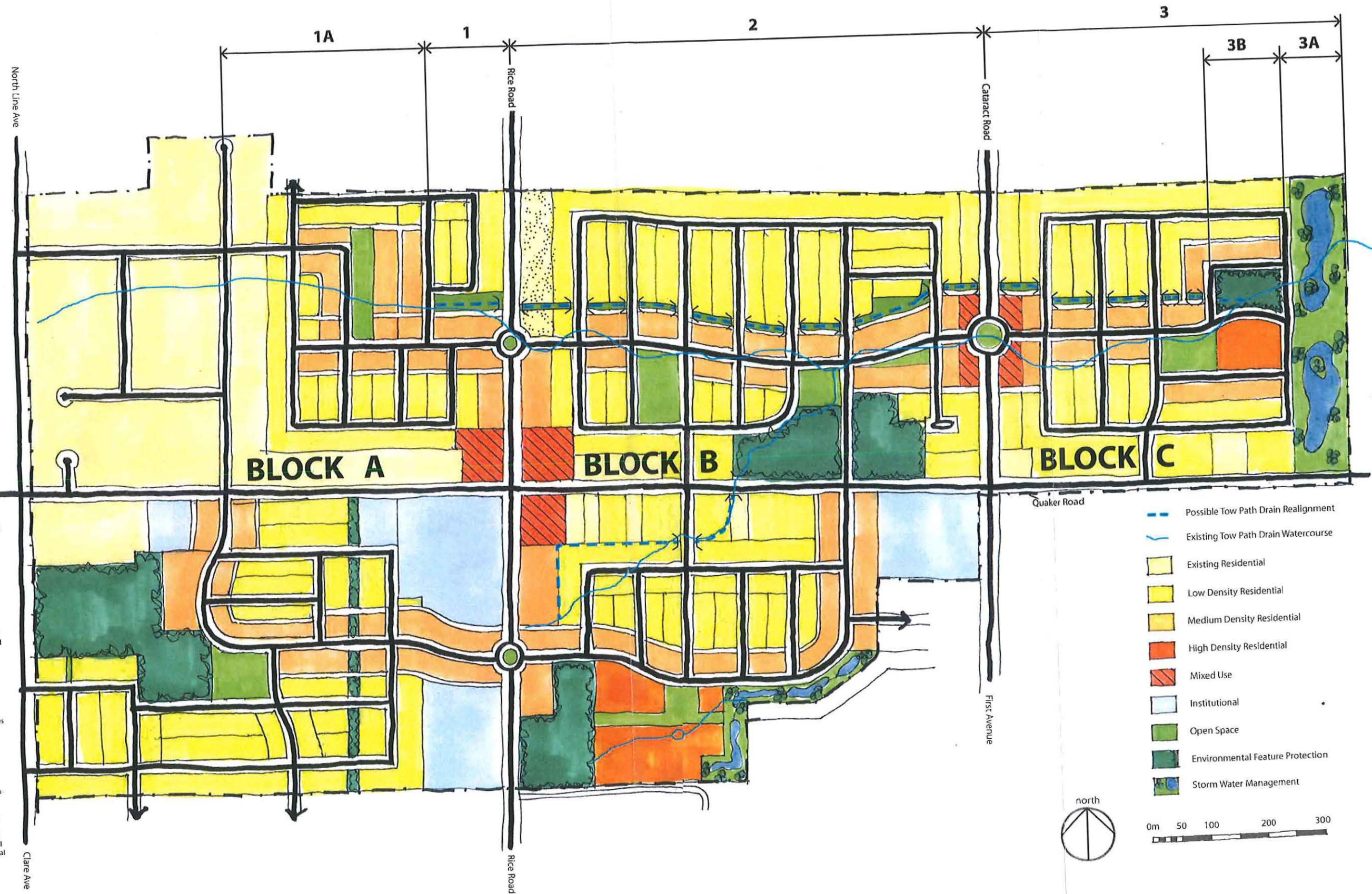
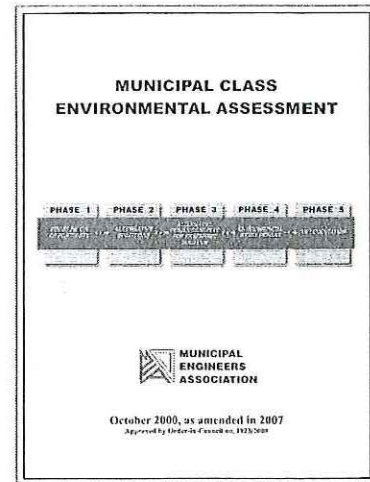


FIGURE 2-1: PRELIMINARY CONCEPT PLAN



3. CLASS EA MASTER PLANNING PROCESS

All municipalities in Ontario, including the City, are subject to the provisions of the *Environmental Assessment Act* (EAA) and its requirements to prepare an Environmental Assessment for most public works projects. The Ontario Municipal Engineers Association (MEA) "Municipal Class Environmental Assessment" document (October 2000, as amended in 2007), provides municipalities with a five-phase planning procedure approved under the EAA to plan and undertake all municipal sewage, stormwater management, water and transportation projects that recur frequently, are usually limited in scale, and have a predictable range of environmental impacts and mitigative measures.



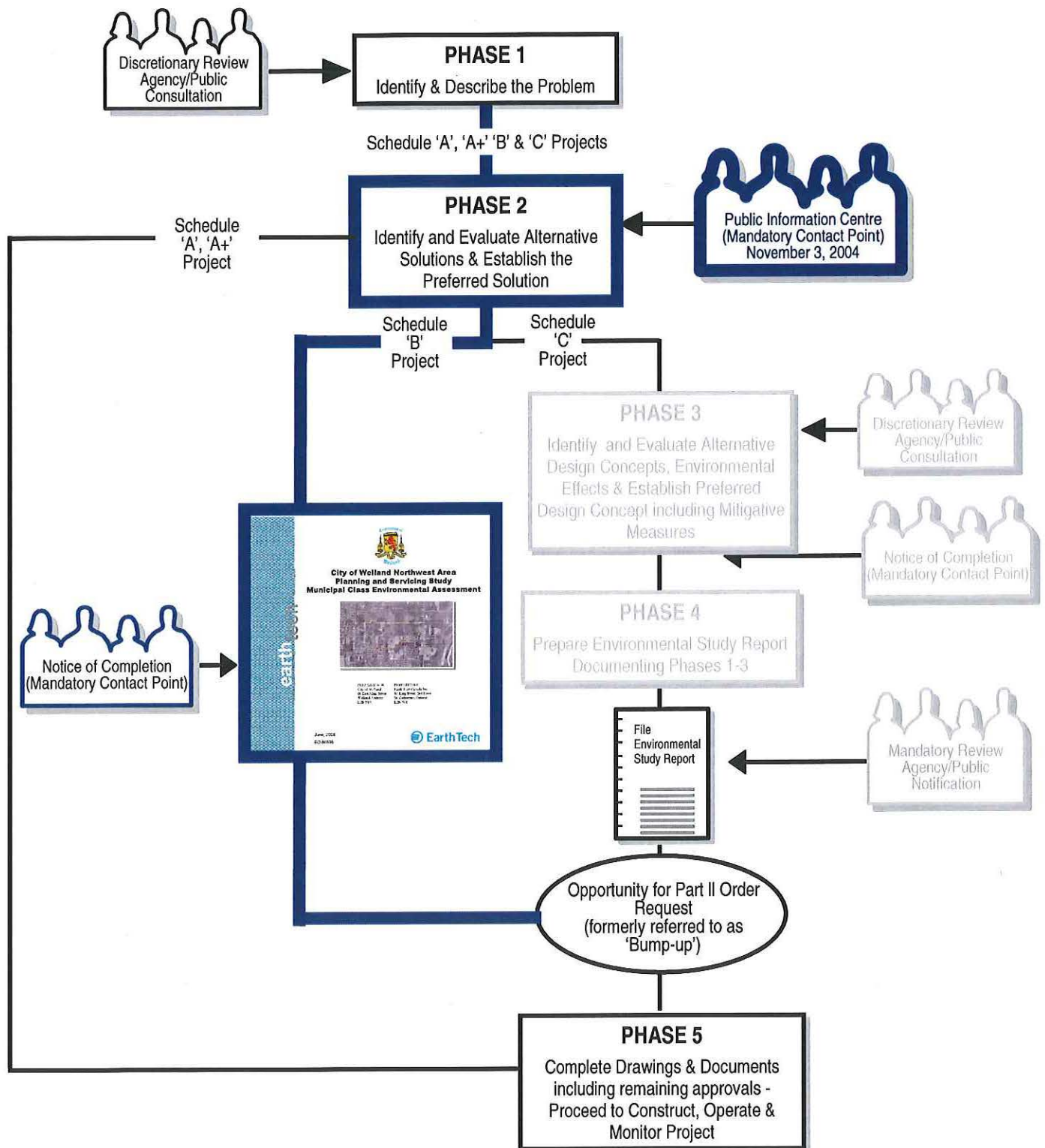
The Municipal Class EA document also serves as a public statement of the decision-making process followed by municipalities in the planning and implementation of needed infrastructure.

Key components of EA Planning include:

- consultation early and throughout the process;
- identification of reasonable range of alternative solutions to the identified problem;
- consideration of effects on the environment and ways to avoid/reduce impacts;
- systematic evaluation of alternatives;
- clear documentation; and
- traceable decision making.

Figure 3-1 illustrates the process followed in the planning and designs of projects covered by a Class EA, including the City of Welland Northwest Area Planning and Servicing Study. The figure incorporates steps considered essential for compliance with the requirements of the EAA that are summarized below.

FIGURE 3-1: OVERVIEW OF THE MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT PROCESS



Indicates Where Project Currently is at in Class EA Process



The five (5) phases of the Municipal Class EA process are summarized below:

- Phase 1** Identify the problem (deficiency) or opportunity.
- Phase 2** Identify alternative solutions to the problem or opportunity by taking into consideration the existing environment and establish the preferred solution, accounting for public and agency review and input. Document the planning process in a Municipal Class EA project file or master plan study and make such documentation available for scrutiny by review agencies and the public. This Study followed a master plan process.
- Phase 3** For Schedule "C" projects, examine alternative methods of implementing the preferred solution based upon the existing environment, public and government agency input, anticipated environmental effects and methods of minimizing negative effects and maximizing positive effects.
- Phase 4** For Schedule "C" projects, document, in an Environmental Study Report (ESR), a summary of the rationale and the planning, design and consultation process followed in the project and make such documentation available for scrutiny by review agencies and the public.
- Phase 5** Complete contract drawings and documents, proceed to construction and operation and monitor construction for adherence to environmental provisions and commitments. Where special conditions dictate, also monitor the operation of the completed facilities.

Based on the MEA Class EA document, municipal infrastructure projects are classified as either Schedule "A", "A+", "B" or "C" projects. Each of these classifications requires a different level of review to complete the requirements of the Class EA, and thus comply with the EAA, as noted below:



Schedule “A” Projects are limited in scale, have minimal adverse effects and include the majority of municipal sewage, stormwater management and water operations and maintenance activities. These projects are approved and may be implemented without following the Class EA planning process.

Examples of Schedule “A” projects include normal or emergency operational activities such as sewer or watermain repair or replacement. As such, these projects are pre-approved and subsequently do not require any planning and public consultation.

Schedule “A+” The purpose of this Schedule is to ensure some type of public notification for certain projects that are pre-approved under the Municipal Class EA. However, there would be no ability for the public to request a Part II Order (discussed below). Examples of Schedule “A+” projects include modifications to a retention/detention facility for the purpose of stormwater quality control or construction of a new sewage collection system or water distribution system where such facilities are located within an existing municipal road allowance or utility corridor, including the use of Trenchless Technology for water crossings.

Schedule “B” Projects have the potential for some adverse environmental effects. The proponent (i.e. the City) is required to undertake a screening process involving mandatory contact with directly affected public and relevant review agencies to ensure that they are aware of the project and that their concerns are addressed. Schedule “B” projects require that Phases 1 and 2 of the Class EA planning process be followed and a Project File report be prepared and submitted for review by the public. If there are no outstanding concerns raised by the public and/or review agencies, then the proponent may proceed to project implementation. If however, the screening process raises a concern that cannot be resolved, then the Part II Order¹ procedure (previously referred to as a “bump-up”) may be invoked. Alternatively, the proponent may voluntarily elect to plan the project as a Schedule “C” undertaking (described below).

¹ Part II Order refers to a request to the Minister of the Environment for a project to comply with Part II (addresses individual Environmental Assessments) of the EAA. The requirement to prepare an individual EA involves the preparation of a Terms of Reference and EA document that is submitted to MOE, other government agencies and the public for review.



Schedule “B” projects generally include improvements and expansions to existing facilities where there is the potential for some adverse environmental impacts. Examples of relevant Schedule “B” projects include activities such as construction of new stormwater ponds, watermains and sewers where such facilities are located outside of an existing municipal road allowance or utility corridor. Similarly, based on individual project costs, the construction of a new road or intersection improvements may also trigger the Schedule “B” (Phases 1 and 2) planning process. As a result, the proponent is required to proceed through a screening process including consultation with those who may be affected.

Schedule “C” Projects that have the potential for significant environmental effects must proceed under the full planning and documentation procedures (Phases 1 to 4) specified in the Class EA document. Schedule “C” projects require that an ESR be prepared and submitted for review by the public. If concerns are raised that cannot be resolved, then the Part II Order procedure may be invoked.

Schedule “C” projects typically include the siting and construction of new facilities and major expansions to existing facilities, such as water or wastewater treatment plants. Also included are major roadway expansions and bridges. These projects proceed through the complete (Phases 1 to 4) EA planning processes outlined in the Class EA document.

Appendix A further expands on the steps required to complete the Class EA planning process.

Master Plan Planning Process

The MEA Municipal Class EA document (October 2000, as amended in 2007) recognizes that in many cases it is beneficial to begin the planning process by looking at the overall infrastructure system prior to dealing exhaustively with individual development applications and associated project specific servicing issues.

Master plans generally differ from project specific studies in several key aspects. For example, long range planning enables the municipality to identify opportunities and be proactive in addressing issues before they become a problem. The following distinguishing features are considered important if the integration of master planning with traditional Class EA planning and design is to be successful:



- Master plans are not typically undertaken to address a specific problem. The scope of master plan studies is broader and, in this case, includes an analysis of the projected water, sanitary, roadway and stormwater system requirements to outline a framework for future works and development proposals for the Northwest Area study area.
- Master plans typically recommend a set of works that are distributed geographically throughout the study area (i.e. City of Welland Northwest Area) and that are to be implemented over an extended period of time. These works may be implemented as separate projects, but these works are part of a larger infrastructure system.

Master Servicing Plan Class EA Project Schedules

The MEA Municipal Class EA document outlines four (4) approaches to the master planning process. Approach # 2 (Appendix 4 of the MEA Class EA document) involves the preparation of a master plan document at the conclusion of Phases 1 and 2 of the Municipal Class EA process where the level of investigation, consultation and documentation are sufficient to fulfill the requirements for Schedule “B” projects. The City has utilized this approach in preparation of this Master Plan Study. It is noted that any Schedule “C” projects would require additional study (Phase 3) and preparation of an ESR (Phase 4) to satisfy the Class EA process requirements.

At a minimum, Master Plans address Phases 1 and 2 of the Municipal Class EA process. As such, the final public notice for the Master Plan serves as the Notice of Completion for all Schedule “B” projects.

The Northwest Area Planning and Servicing Study projects described in this report involve the establishment and approval of the following Schedule “B” Class EA projects:

- Construction of new stormwater ponds, sewers and watermains where such facilities are located outside of an existing municipal road allowance or utility corridor or involves water crossings; and
- Construction of new roads or intersection improvements based on MEA Class EA document Schedule “B” cost limit.

As such, Phases 1 and 2 of the Class EA planning process as described above have been followed for this Study. Both the future Quaker Road and Rice Road upgrade projects (Section 10.0) will follow the MEA Schedule “C” Class EA planning process.



Lapse of Time

In the case that a time lapse occurs between the filing of the master plan and implementation of the proposed projects, it is possible that other alternatives may exist or the environmental mitigation measures proposed may no longer be valid. As such, if the period of time from filing (in the public record) of the Notice of Completion for this Study to the proposed commencement of construction for the project(s) identified in the master plan exceeds ten years, it is recommended that the City review the planning and design process and the current environmental setting to ensure that the project and the mitigation measures are still valid. If it is determined that the project and/or mitigation measures must be substantially altered, it is recommended that the review be recorded in an update to the master plan and placed on the public record.

Integrated Class EA and Planning Act

It should be noted that if road alignments, sewers, watermains and stormwater management systems are proposed through the Site Plan, Plan of Subdivision or Plan of Condominium – *Planning Act* approvals process (equivalent to a Schedule “B” Class EA process), then a master plan update might not be required. This is referred to as the Integrated Class EA and *Planning Act* Approach where by the planning and approvals process of the EAA and *Planning Act* are coordinated in a streamlined manner.



4. STUDY AREA

Figure 4-1 illustrates the Northwest Area study area. The following describes the City of Welland Northwest Area Planning and Servicing study area including its location, existing land uses and natural environmental features. This information has been considered in the infrastructure planning process.

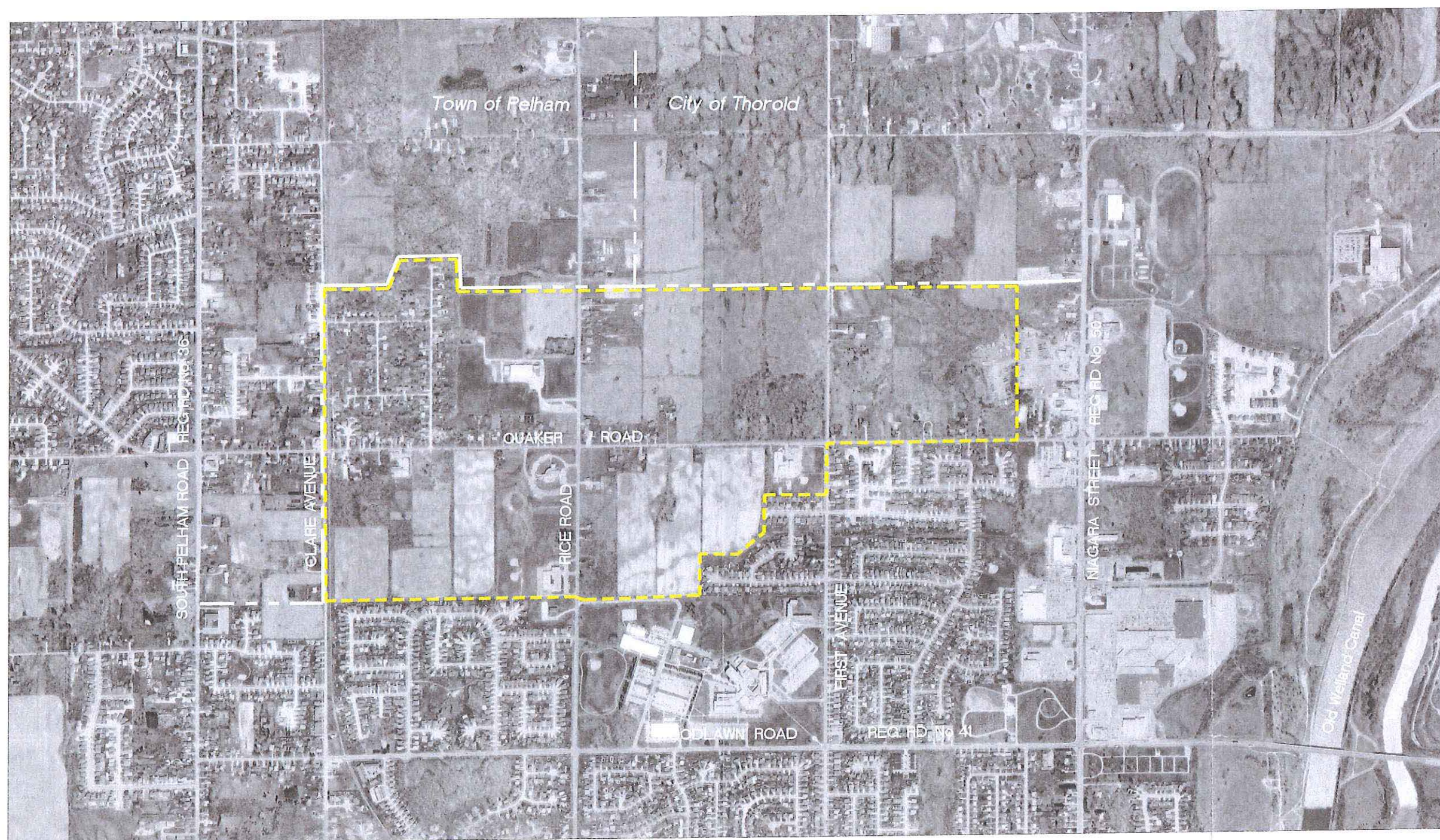
4.1. Location

The project study area is bordered by the northern City of Welland municipal boundary with the City of Thorold and Town of Pelham to the north, Niagara Street (Regional Road No. 50) to the east, the existing City urban boundary to the south, and Clare Avenue to the west. Rice Road, First Avenue and Quaker Road bisect the study area.

4.2. Land Use

Existing land uses within the study area generally includes a mix of single- detached residential properties, institutional (e.g. Niagara District Catholic School Board, Quaker Road School), fallow and active agricultural land, recreational - open space (e.g. Welland Soccer Club) and wooded areas. The most dominant of these are the agricultural lands and wooded areas. Surrounding land uses include agricultural, recreational - open space, single-detached residential, institutional (e.g. Niagara College) and commercial. Lands to the immediate north are located in the Town of Pelham (includes East Fonthill Urban Boundary Expansion Secondary Plan area) and City of Thorold (includes Port Robinson West Secondary Plan – Deferred Urban Designation).

With respect to the City of Welland Official Plan, Amendment numbers 68, 71 and 93 contain policies and provide designations applicable to the Northwest Area study area. The City's Zoning Bylaw zones the majority of the study area lands as Rural Agriculture (RA) Zone and Agriculture (A) Zone.



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LEGEND

--- STUDY AREA

WELLAND NORTHWEST AREA
PLANNING AND SERVICE STUDY

FIGURE 4-1



EarthTech
A Tyco International Ltd. Company



4.3. Regional Niagara Policy Plan

The purpose of the Policy Plan is to guide development and planning decisions in the Niagara Region. The Regional Niagara Policy Plan is the governing document if there is a conflict with municipal official plans and zoning by-laws. The objectives of the Policy Plan are to protect and improve the agricultural industry and the natural, scenic, and historic amenities and at the same time ensure orderly transportation, industrial, commercial and residential continuation of separate communities and minimal conflicts between incompatible land uses. The Policy Plan identifies urban, agricultural, rural, natural and environmental areas within the Niagara Region and designates each according to their significance. Based on recent provincial legislation the Regional Niagara Policy Plan has been significantly amended.

The Regional Niagara Policy Plan, July 2007 designates the majority of the study area as Good General Agricultural Area. Policy 5.6 "Urban Areas" of the Regional Niagara Policy Plan states:

"Particular criteria for the review of proposed urban boundary expansions are:

- *the need for the proposed uses and the benefits of costs to the local and Regional community. The need assessment should consider the amount of developable land within existing urban areas, the demand for the type of development proposed in relation to the demographic forecasts for the local municipality and the Region, and opportunities for accommodating development within the existing urban areas;*
- *the availability of suitable alternative locations within the municipality for proposals only serving local residents. For all other applications involving prime agricultural land, the availability of suitable alternative locations also shall be considered;*
- *compliance with the objectives and policies of this Plan including preference for poor quality agricultural lands for development, preservation of high quality agricultural land for agricultural uses, protection of natural resources, and support for physically separate urban communities;*
- *the location and effect of the new boundary on those lands and activities remaining outside the urban areas;*
- *the availability and capability of servicing facilities; and*
- *the comments of local municipalities on the demonstrated need, the evaluation of local resources, and the opportunity for orderly, efficient and economic growth.*



The above will be addressed in the preparation of the City's new Official Plan described below.

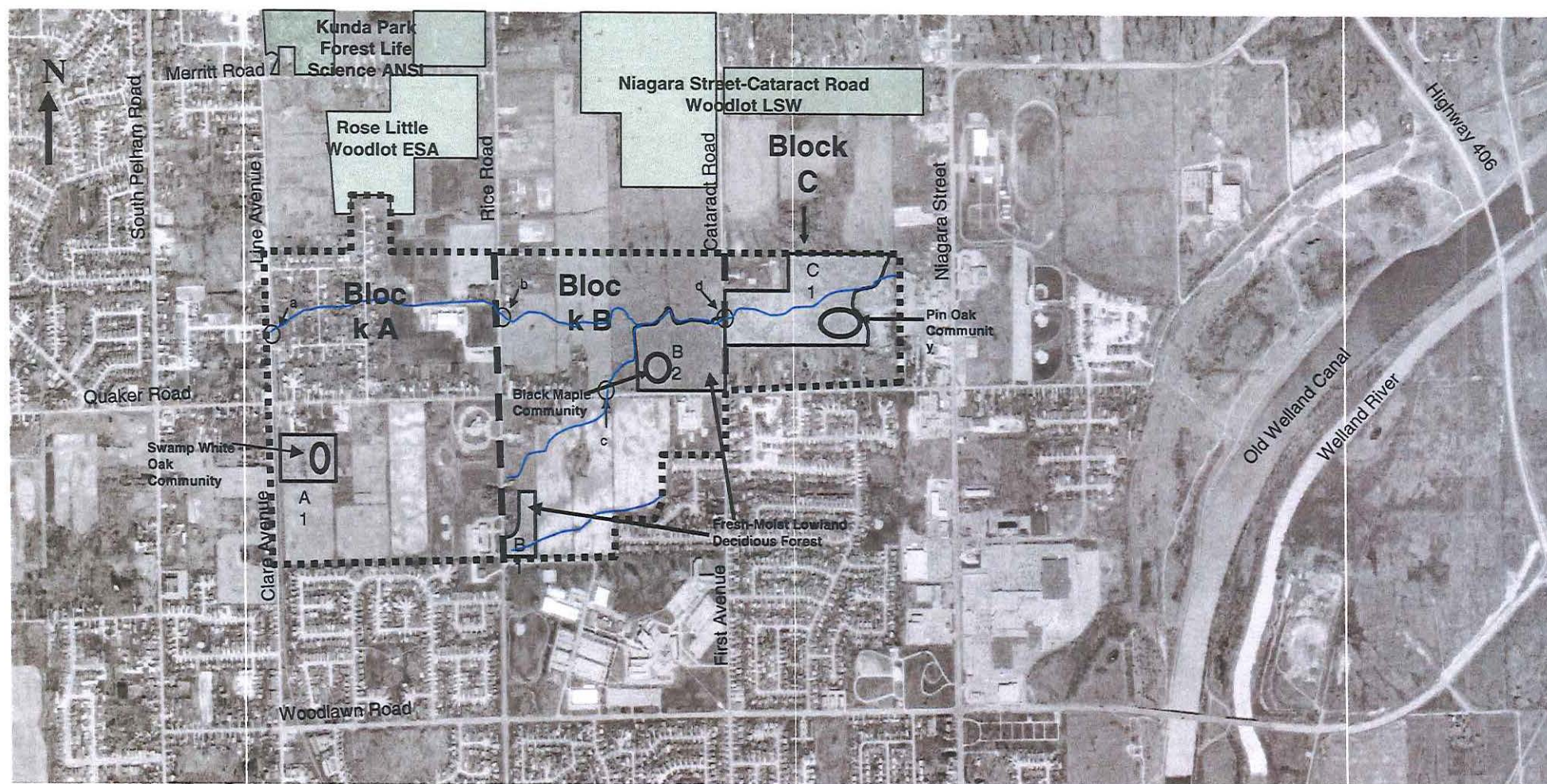
4.4. City of Welland Official Plan

The City of Welland's current Official Plan was first adopted in 1952 and has been amended more than 120 times. The City is now preparing a new Official Plan that will guide land use and development processes for the City over the next 20 years. The new City of Welland Official Plan study process provides many opportunities for public input and will also include the proposed Northwest Area urban boundary expansion which will also subject to a Region of Niagara Official Plan Amendment.

4.5. Natural Environmental Features

Significant natural environmental features within and surrounding the project study area, are summarized below and shown on Figure 4-2. The Environmental Impact Study (EIS) is included as **Appendix B**.

FIGURE 4-2: EIS NATURAL FEATURES



Legend

- | | | | |
|----------------|--------------------------------|-------------------------|-----------------------------------|
| --- Study Area | ○ Water crossing | — Watercourse | □ Environmentally Sensitive Areas |
| □ Field Survey | a Water crossing (see Table 2) | A Woodlot (see Table 1) | |





Environmental Feature	Relevance to Planning & Servicing Study
1. Swamp White Oak Community	• Within western part of project study area
2. Black Maple Community	• Within central part of project study area
3. Pin Oak Community	• Within eastern part of project study area
4. Fresh Moist Lowland Deciduous Forest	• Within south central part of project study area
5. Kunda Park Forest Life Science ANSI	• Directly north of project study area
6. Rose Little Woodlot ESA	• Directly north of project study area
7. Niagara Street-Cataract Road Woodlot Locally Significant Wetland (LSW)	• Directly north of project study area

Environmental features 1) to 4) were identified based on field investigations and are further described in section 5.0. The following briefly describes surrounding environmental features.

Rose Little Woodlot – Life Science Site

The Rose Little Woodlot is found directly north of Montgomery Road, and west of Rice Road adjacent to the study area. The woodlot is approximately 26.0 hectares, drained by streams that feed into the Welland Canal. Dominant vegetation species throughout are sugar maple, American beech and red oak. Other species found were bitternut hickory, pignut hickory, and shagbark hickory, basswood, and yellow birch. American chestnut found along the northern edges of both woodlots north of Merritt Street. South of Merritt Road, silver maple, black willow, slippery elm and black ash were also observed. The understory vegetation consists of canopy species, common elderberry and spicebush. This area is also a deer wintering area.

Kunda Park Forest Life Science Area of Natural and Scientific Interest

Kunda Park Forest is found north of the Rose Little Woodlot. This area can be described as flat, with poorly drained sand. It is reported to have a variety of native ferns, several Carolinian tree species and wildlife, however no features above local significance levels were reported.

Niagara Street-Cataract Road Woodlots Locally Significant Wetland

The area is a locally significant wetland complex comprised of four individual wetlands (92.5% swamp and 7.5% marsh), adjacent to the northeastern boundary of the study area. Vegetation communities include free-floating plants (i.e. duckweed), submerged plants (i.e. water milfoil), robust emergents (i.e. cattail, purple loosestrife), low shrubs (i.e. dogwood, meadowsweet, highbush blueberry), and deciduous trees (i.e. red maple, bur oak). This area is also a deer wintering area.



The above features are not connected to the study area by drainage, however they do form possible corridors for wildlife movement through the study area. Appendix B further describes the environmental features located within the Northwest Area study area.

In addition to the above, the Regional Municipality of Niagara's Natural Heritage policies and related map identify Environmental Conservation Areas within the project study area and a potential Natural Heritage Corridor directly north of the project study area. Many of these areas relate to environmental features described below and in **Appendix B**.

4.6. Socio-Economic Environment

From the year 2001-2006 population forecasts and realized population growth for the City has gradually increased. Population forecasts were provided by the City and are summarized in the following table:

Table 4-1 Population Forecasts

Category	2006 population	2026 population
Low	52,364	57,999
Medium	52,574	62,569
High	53,092	72,146

Since 1980, the number of building permits has increased steadily with 559 permits issued for the year 2007. Dependant on the availability of serviceable land, the above trends are expected to continue to rise.

Other factors that will ultimately influence how the City develops include the designation of the City as "A Gateway Economic Centre" by the Province of Ontario Places to Grow Growth Plan for the Golden Horseshoe and possible routing of the MTO Niagara to GTA Peninsula Corridor Planning EA Study (replaced the Mid Peninsula Corridor EA) which is currently at the Phase 1 problems and opportunities stage and has not yet advanced to the identification of alternative transportation systems or corridors.



5. EXISTING ENVIRONMENTAL CONDITIONS

Study Area and Surrounding Area

The following provides a summary of study area and surrounding area ecological features as documented from site investigations and published information. Supplementing this information are the results of terrestrial and aquatic investigations that were conducted for three development blocks as shown on Figure 5-1 that comprise the study area. Further information can be found in the December 2003 Environmental Impact Study (EIS) report, (**Appendix B**).

5.1. Site Investigations

Investigations of terrestrial plant communities were undertaken on November 7, 2003. Further investigations were completed on December 5, 2003. For manageability the Northwest Area study area was divided into blocks as follows:

- Block A: Woodlot at the corner of Clare Avenue and Quaker Road in the western section of the study area.
- Block B: Woodlot on the northwestern corner of the intersection of Cataract Road and Quaker Road in the approximate centre of the study area.
- Block C: Area surrounding the unnamed watercourse on the eastern side of Cataract Road in the northeastern section of the study area.

5.2. Terrestrial Environment

Terrestrial vegetation communities were described and classified as per the methodology and the system outlined for Ecological Land Classification (ELC) for Southern Ontario (Lee *et al.*, 1998). Community and Species rankings were verified in order to assess the significance of vegetation communities (see **Appendix B**).

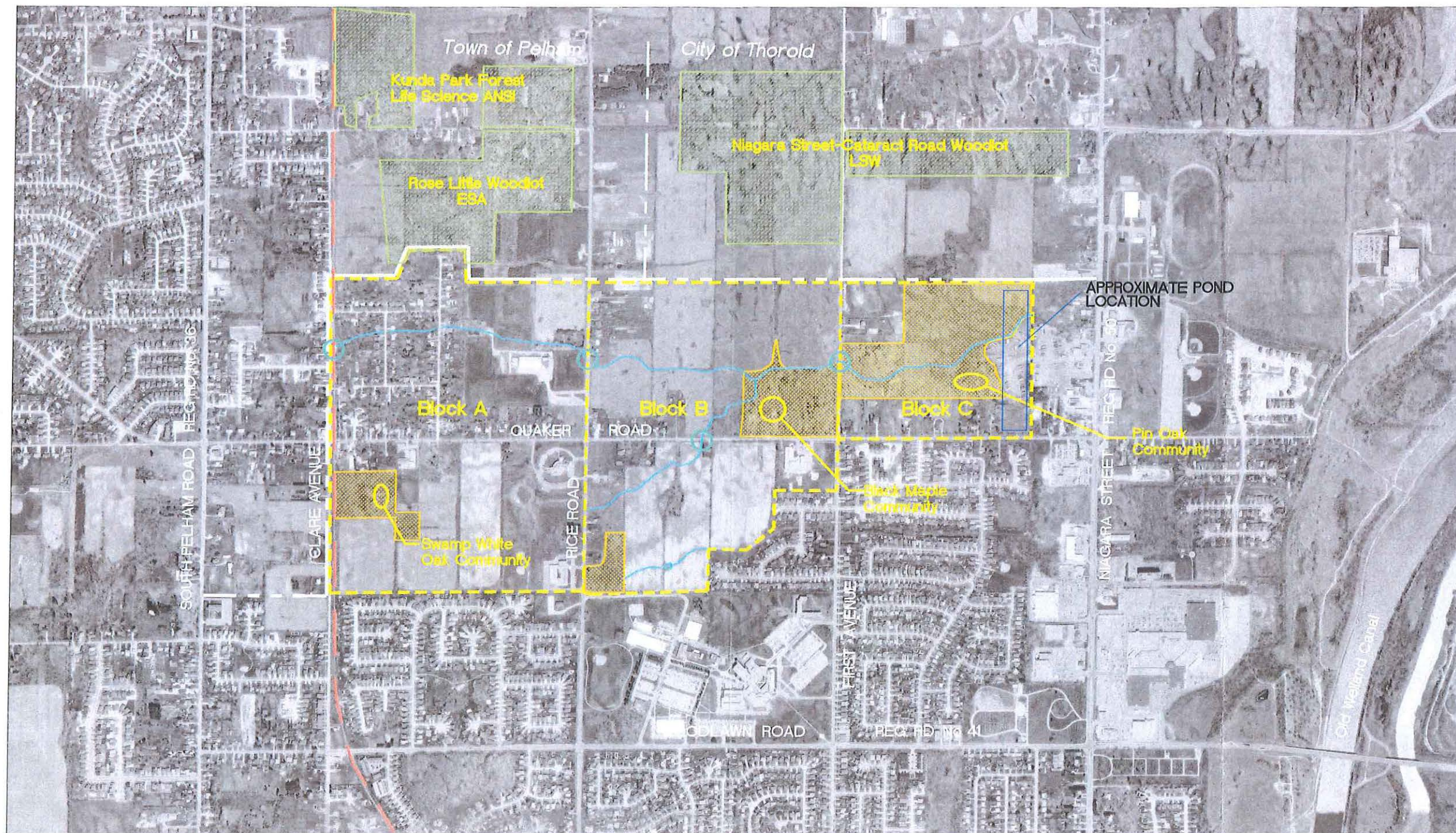
5.3. Aquatic Environment

Within the study area, detailed watercourse observations were made for four 20-metre sections near major road crossings. Configuration, average dimensions, substrate and riparian vegetation were recorded. Observations were made of the watercourse configuration between each of the above investigation areas as well as the edge of the study area. Preliminary investigations revealed that the majority of the unnamed tributaries consisted of degraded, channelized agricultural swales that in some sections may contain warm water fish habitat. Before future development can occur, additional investigations at an appropriate level of detail will be



recommended to thoroughly characterize and assess these channels in terms of fish habitat and their associated development impacts. Furthermore, permission/approvals from the Niagara Peninsula Conservation Authority (NPCA), the Ministry of Natural Resources (MNR) and Department of Fisheries and Oceans Canada (DFO) will need to be secured prior to any in water works that may adversely affect potential fish communities in these tributaries.

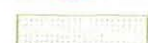
The study area is approximately 130 hectares. Though the drainage area is larger than this, it would still be considered a relatively small subwatershed. This is reflected in the quantity of flow and flooding pattern observed in the field. No watercourses, within the study area, are regulated by the NPCA.



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LEGEND

-  STUDY AREA
-  FIELD SURVEY / WOODLOT
-  WATER CROSSING
-  WATERCOURSE
-  ENVIRONMENTALLY SENSITIVE AREA
-  RECREATIONAL TRAIL

WELLAND NORTHWEST AREA
PLANNING AND SERVICE STUDY
OVERVIEW OF
ENVIRONMENTAL FEATURES

FIGURE 5-1



 **EarthTech**
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6. PHASE 1: PROBLEM/OPPORTUNITY IDENTIFICATION

Phase 1 of the Class EA planning process requires the proponent (i.e. the City) of an undertaking to first document factors leading to the conclusion that the improvement is needed, and ultimately, develop a clear statement of the identified problem or opportunity to be investigated.

As such, the **Problem/Opportunity Statement** is the principle starting point in the undertaking of a Class EA study and becomes the central theme and integrating element of the project. It also assists in setting the scope of the project.

The Problem statement for City of Welland Northwest Area Planning and Servicing Study is defined as follows:

The City of Welland is required to ensure that adequate lands are available to accommodate future growth that considers current available lands and is expected to occur within a reasonable time frame.

In order that the City of Welland Northwest Area Planning and Servicing Study can be properly completed, the impacts of proposed development on the City's and Niagara Region's infrastructure need to be addressed and servicing guidelines for the development community developed. Input is also required to formulate the City's capital works program to service the future needs of the Northwest Area, should this area move forward towards inclusion within a future expanded urban boundary planning process.

The Northwest Area Planning and Servicing Study will provide the necessary overall Municipal Servicing Guidelines for the Northwest Area. The focus of the master servicing plan is on the development and assessment of infrastructure systems for:

1. Water Distribution;
2. Sanitary Sewage;
3. Roadways; and
4. Stormwater Collection & Management.

The master servicing plan study will support future Region of Niagara and City municipal planning document amendments and will also outline a conceptually preferred servicing strategy that can be referenced when reviewing development applications.



7. EVALUATION METHODOLOGY

7.1. Development of Evaluation Framework and Criteria

In order to evaluate alternative servicing solutions, evaluation criteria were developed based on the following environmental components that address the broad definition of the environment described in the EAA².

The environmental components are briefly described as follows:

Table 7-1 Environmental Components

The following table summarizes the environmental components.

Environmental Component	Description
Public Health & Safety	• Component that addresses the potential safety hazards to the general public.
Natural Environmental	• Component having regard for protecting the natural and physical components of the environment (i.e. air, land, water and biota) including the natural heritage-environmentally sensitive areas.
Social/Cultural	• Component that evaluates potential affects on residents, neighbourhoods, businesses, community character, social cohesion, community features and historical/archaeological and heritage components in addition to municipal development objectives.
Economic/Financial	• Component that addresses the potential effect on infrastructure costs.
Legal/Jurisdictional	• Component that addresses potential legal issues of each alternative.
Technical	• Component that considers technical suitability and other engineering aspects of each alternative including constructability and operations.

Table 7-2 presents criteria based on the above environmental components used to evaluate alternative solutions.

² The *Environmental Assessment Act* (Section 1. (c) (i) to (vi)) defines the “environment” as: “air, land, water, plant and animal life including humans; the social and cultural conditions that influence the life of humans or a community; any building, structure, machine or other device or thing made by humans; any solid, liquid, gas, odour, heat, sound, vibration or radiation resulting directly or indirectly from human activities, or; any part or combination of the foregoing and the interrelationships between any two or more of them, in or of Ontario.” This definition of the environment is used and is reflected in the environmental components used in the Phase 2 evaluation.



Table 7-2 Criteria for Evaluating Alternative Solutions

The following table summarizes the evaluation criteria.

Environmental Component	Evaluation Criteria
Public Health & Safety	• Potential for flooding, possible safety hazards (stormwater). • Potential to reduce vehicle conflicts (roads). • Potential for improving pedestrian and cycling safety (roads).
Natural Environmental	• Potential effects to the natural environment including effect on air, land, water and biota, i.e. siting/routing considerations and/or constraints (stormwater). • Potential for loss of vegetation (roads).
Social/Cultural	• Potential for short-term construction related effects on residences/businesses, including traffic, access, and noise. • Potential siting/routing considerations, including impacts to land uses, cultural, heritage (e.g. archaeological), impacts on property owners, resources. • Potential for requiring private property (roads).
Economic/Financial	• Construction and operation costs (stormwater). • Potential capital cost of implementing the alternative solution (roads).
Legal/Jurisdictional	• Land requirements (stormwater).
Technical	• Ability to implement alternative (stormwater). • Ability of alternative to use existing infrastructure (stormwater). • Potential effects on traffic operations (roads). • Potential for enhancing road structural conditions (roads).

7.2. Use of Descriptive Information and Qualitative Evaluation

A detailed evaluation of each alternative was completed based on the impact to the previously described environmental components. Based on subjective evaluations, alternative servicing solutions were ranked. For the evaluation summary, the following rating symbols were used for each alternative:

- ↓
- Least preferred
 - ◐ Fair rating
 - Most preferred

The evaluation used in this report is not based on a numerical ranking system. To ensure statistical validity, such an approach would have to strictly adhere to statistical methods that are often difficult to apply in a multi-faceted issue such as a Class EA master plan. Instead, a descriptive or qualitative evaluation is used to consider the suitability of alternative solutions and



design concepts. In this respect, the trade-offs that have been made between alternatives are described in the text of the report and these trade-offs form the rationale for the identification of the preferred solution(s). For information purposes only, the alternatives have been ranked in order of preference (based on advantages/disadvantages) under the discussion with respect to each aspect of the environment. This is intended to assist the reader in understanding the results of the evaluation process.



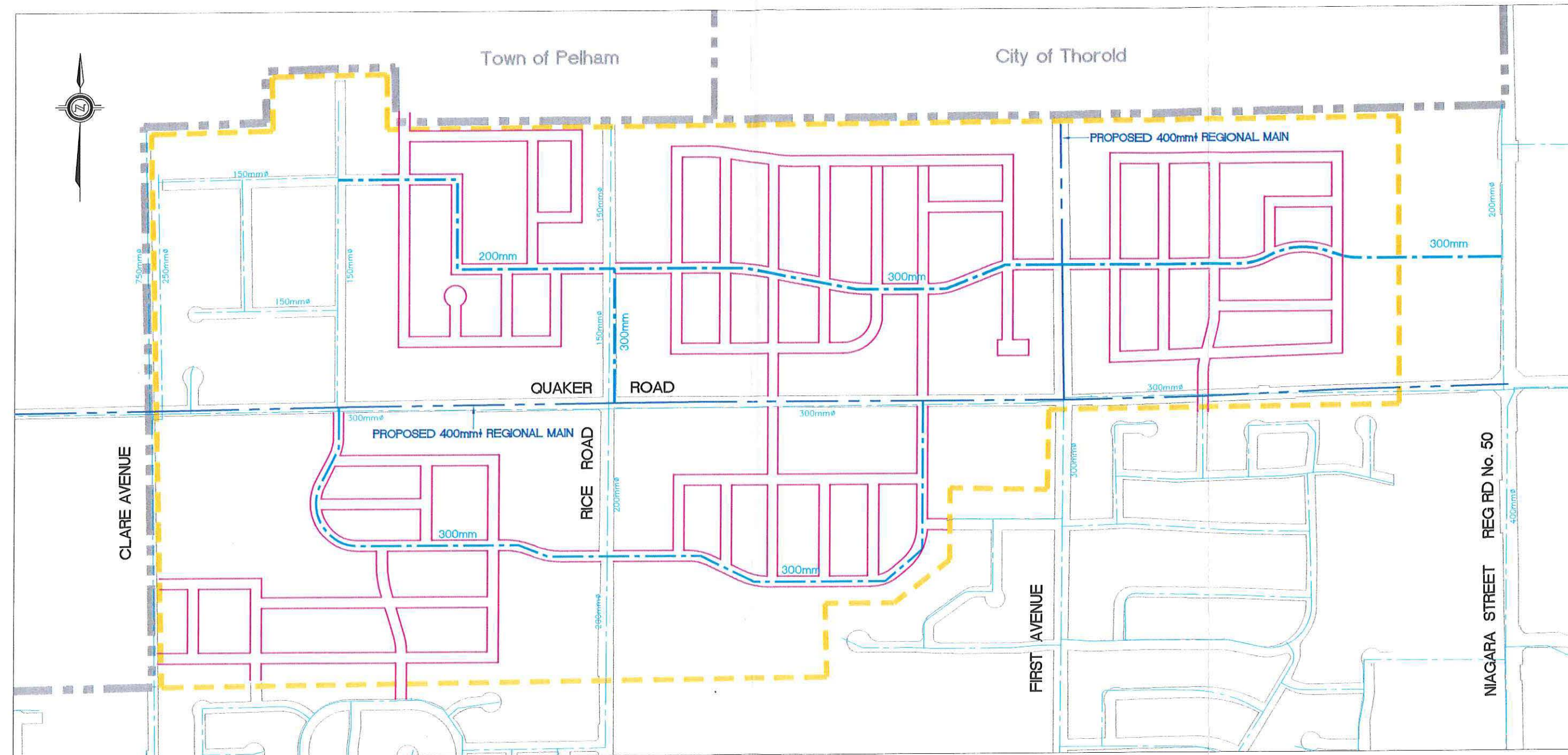
8. PHASE 2: WATER DISTRIBUTION ALTERNATIVES

8.1. Comparative Evaluation of Water Distribution Alternatives

This Study evaluated the need to supply the Welland Northwest Area with both domestic and fire flow water capacity. The evaluation was based on expected land uses described in the preliminary concept plan (Figure 2-1) prepared by the Planning Partnership. The concept plan was divided up into 11 sub areas to facilitate the watermain design process. The expected system demands were calculated and sizes of the watermains then determined. Local watermains are envisioned to be constructed within the road allowance as described in the preliminary concept plan. As such the identification and evaluation of alternative watermain routes was not completed for this master servicing plan component.

8.2. Preferred Water Distribution Alternative

According to the Region of Niagara MSP (2002), a proposed 400 mm diameter watermain will bisect the study area, being placed within the Quaker Road right of way. It is envisioned that new 300mm diameter watermains will be looped off this new 400mm watermain to service the Northwest Area study area. Figure 8-1 illustrates the preferred water distribution system.



LEGEND

- MUNICIPAL BOUNDARY
- STUDY AREA
- CONCEPTUAL ROAD LAYOUT
- EXISTING WATER DISTRIBUTION SYSTEM
- PROPOSED WATER DISTRIBUTION SYSTEM
- PROPOSED REGIONAL MAINS

WELLAND NORTHWEST SERVICING
MASTER PLAN
PREFERRED WATER
DISTRIBUTION SYSTEM
FIGURE 8-1





9. SANITARY SEWAGE SERVICING ALTERNATIVES

Normally, the sanitary sewage servicing review evaluates options available to service the study area and their associated costs. However within in study area, the Regional Municipality of Niagara has recently completed a new trunk sanitary sewer on Quaker Road. The new Regional trunk sanitary sewer has been sized to accommodate sewage flows from the Northwest Area study area. As such, consequently, no other sanitary options were considered.

9.1. Preferred Sanitary Sewer Servicing Alternative

Based on the above, the new Region of Niagara trunk sewer on Rice and Quaker Roads has been identified as the preferred solution to the problem statement identified in Section 6. Specific advantages provided by this alternative include:

- Promotes development in a west to east direction, and allows for the elimination of existing sewage pumping stations.
- The Regional Municipality of Niagara has financed the new trunk sewer, as it promotes a servicing strategy for the larger area.

9.2. Other Considerations

Considering the above:

- It is recommended that servicing of the study area shall be allowed based only on the availability of the trunk sewer on Rice/Quaker Road.
- Local sewers to be constructed within road allowance as described in the preliminary concept plan.

Figure 9-1 illustrates the preferred sanitary sewer servicing system.



10. ROADWAY SERVICING ALTERNATIVES

10.1. Roadway Alternative Solutions

Through the preliminary concept plan (Figure 2-1), road patterns were established to provide street continuity with existing streets and connectivity to adjacent developments. It was assumed that, the use of alternative modes of transportation will be encouraged through an established road pattern. This road pattern was reviewed for the effects on the existing roadways in the project study area many of which have a rural cross-section. The City policy on new development is that all roads are to be constructed as urban cross-section (curb & gutter/sidewalks/street lighting). The following describes the roadway servicing alternatives that were considered.

Alternative Solutions	Project Description
1. Do Nothing	• Maintain rural road cross-section (does not address issue/problem)
2. Introduce Alternative Transportation Modes	• Transit and bicycle paths • Maintain existing rural collector roads
3. Reconstruct Roads to Existing Standard	• Semi-urban
4. Upgrade Existing Roads (includes road widening)	• Curb/sidewalks/street lighting
5. Upgrade Intersections	• Provide turning lanes, etc.

The following evaluation is based on anticipated traffic volumes generated from the preliminary concept plan, see **Appendix C**.

10.2. Comparative Evaluation of Roadway Servicing Alternatives

The evaluation of alternative roadway servicing solutions was undertaken through the use of an evaluation table, as presented on Table 10-1. Significant findings of this evaluation are presented below.

Road Safety

Potential to reduce vehicle conflicts, Potential for improving pedestrian & cycling safety.

With respect to Alternatives 1 and 2 safety is reduced as traffic volumes increase.

Alternative 1 also does not provide any potential to enhance pedestrian and cycling safety.

Alternatives 3 and 5 address traffic safety concerns and provide potential opportunities to enhance pedestrian and cycling safety.

Alternative 4 can best meet anticipated future traffic requirements and also improve pedestrian and cycling safety.



Natural Environmental Considerations

Potential for loss of vegetation

Alternatives 1 and 2 result in no natural environmental impacts.

Alternatives 3, 4, and 5 may result in a potential loss of roadside vegetation.

Social/Cultural Considerations

Potential for short-term construction related effects on residents/businesses, Potential for requiring private property, Potential impacts to cultural/heritage resources.

Alternative 1 results in no short term construction related effects. Alternatives 2 through 5 will result in short-term construction related impacts, which can be lessened using established construction techniques and mitigative measures.

Alternatives 1, 2, and 3 do not require land acquisition (Alternatives 2 and 3 as they would be undertaken within existing right-of-way). These alternatives would also not result in any loss of cultural/heritage resources (eg archaeology).

Alternatives 4 and 5 could potentially require additional property to accommodate improvements such as cycle lanes, sidewalks. As these alternatives involve widening, there is a potential for loss of cultural and/or heritage resources. Potential impacts to archaeological resources will be addressed by completing future archaeological investigations, as required.

Economic/Financial Considerations

Potential capital cost of implementing the alternative solution.

Although Alternative 1 does not incur capital costs to the development community, area roads will deteriorate faster due to increased traffic. As a result, the City and or Region will ultimately have to pay for road repairs and/or replacement.

All other alternatives have capital costs ranging from low (Alternative 2: Introduce Alternative Transportation Modes), to medium (Alternative 3: Reconstruct Roads to Existing Standard and Alternative 5: Upgrade Intersections), to high (Alternative 4: Upgrade Roads to Current Urban Standard).

Technical Considerations

Potential effects on traffic operations, Potential for enhancing road structural conditions, Potential to meet current City policies.



Alternatives 1, 2 and 3 will not address future road capacity requirements, the road structure deficiency or increased traffic volumes needed to accommodate future development.

Alternative 4 (including widening) will address future traffic demands and create the potential to enhance road structural conditions.

Alternative 5 will meet future capacity requirements at limited locations and has limited potential to enhance road structural conditions.

Only Alternatives 3, 4 and 5 can meet City policies.

Table 10-1 Evaluation of Roadway Servicing Alternatives

Alternatives	Evaluation Criteria							Evaluation Summary
	Road Safety	Natural Environment	Social/Cultural	Economic/ Financial	Technical			
	Potential to reduce vehicle conflicts.	Potential for improving pedestrian & cycling safety.	Potential for loss of vegetation.	Potential for short-term construction related effects on residents/businesses. Potential for requiring private property.	Potential impacts to cultural/heritage resources.	Potential capital cost of implementing the alternative solution.	Potential effects on traffic operations. Potential for enhancing road structural conditions. Potential to meet current City policies.	Least preferred Most preferred
1. Do Nothing (i.e. maintain existing rural road cross-sections)	- Reduced safety as traffic volumes increase.	- No potential to enhance pedestrian and cycling safety.	- No impact to existing vegetation.	- No short-term construction related effects. - No impact to property.	- No loss of possible cultural, heritage or resources.	- No capital costs.	- Does not meet future capacity requirements. - No potential for enhancing road structural conditions. - Does not meet current City policies.	
2. Introduce Alternative Transportation Modes (e.g. transit and bicycle paths) and maintain existing rural collector roads	- Reduced safety as traffic volumes increase.	- Potential to enhance pedestrian and cycling safety.	- No impact to existing vegetation.	- Minor short-term construction related effects. - No property requirements. - Potential impacts can be mitigated using established mitigation techniques.	- No loss of possible cultural, heritage or resources.	- Low capital costs.	- Does not meet future capacity requirements. - No potential for enhancing road structural conditions, therefore bus traffic would be a maintenance problem. - Does not meet all aspects of current City policies.	
3. Reconstruct Roads to Existing Standard (Semi-urban)	- Potential to increase safety as traffic volumes increase.	- Potential to enhance pedestrian and cycling safety. - Semi-urban standard does not include street lighting.	- Minor impact to existing vegetation. - Potential impacts can be mitigated using established mitigation techniques.	- Short-term construction related effects. - No property requirements. - Potential impacts can be mitigated using established mitigation techniques.	- No loss of possible cultural, heritage or resources.	- Medium capital costs.	- Does not meet future capacity requirements. - Some potential for enhancing road structural conditions. - Does not meet current City policies.	
4. Upgrade Roads to Current Urban Standard (including widening)	- Most potential to increase safety as traffic volumes increase.	- Most potential to enhance pedestrian and cycling safety.	- Potential loss of vegetation. - Potential impacts can be mitigated using established mitigation techniques.	- Short-term construction related effects. - Potential for property requirements. - Potential impacts can be mitigated using established mitigation techniques.	- Potential for loss of cultural, heritage or resources. - Potential impacts can be mitigated using established mitigation techniques.	- Medium to high capital costs.	- Meets future capacity requirements. - Best potential for enhancing road structural conditions. - Will meet current City policies.	
5. Upgrade Intersections (i.e. turning lanes, etc.)	- Potential to increase safety as traffic volumes increase.	- Potential to enhance pedestrian and cycling safety at limited locations.	- Potential loss of vegetation at limited locations. - Potential impacts can be mitigated using established mitigation techniques.	- Short-term construction related effects. - Potential for property requirements. - Potential impacts can be mitigated using established mitigation techniques.	- Minimal potential of loss of cultural, heritage or resources. - Potential impacts can be mitigated using established mitigation techniques.	- Low to medium capital costs.	- Meets future capacity requirements at limited locations. - Limited potential for enhancing road structural conditions. - Will meet aspects of current City policies.	



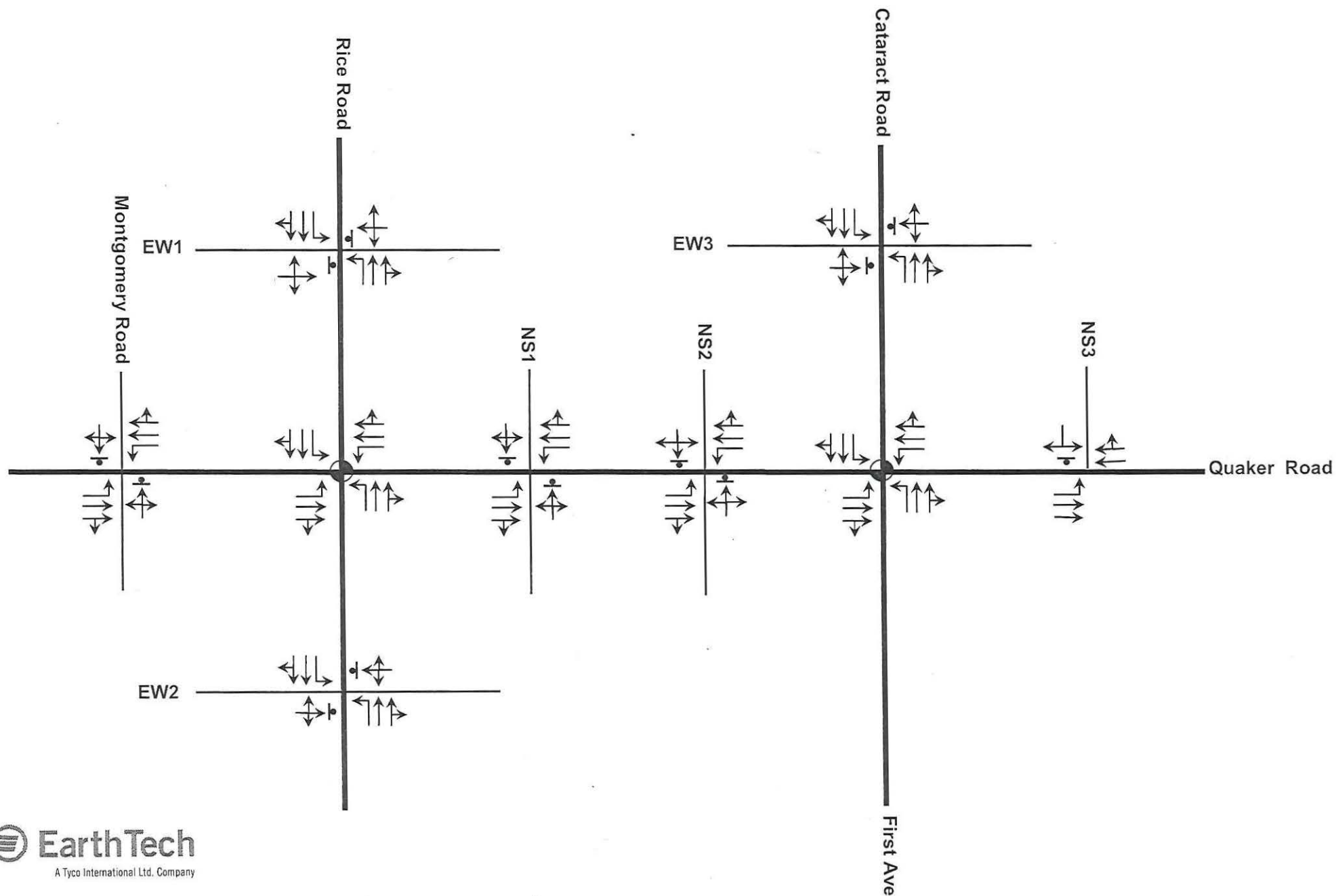
10.3. Preferred Roadway Servicing Solution

Based on the above evaluation, **Alternative 4: Upgrade Roads (includes widening)** in combination with **Alternative 5: Upgrade Intersections** has been identified as the preferred solution to the problem statement identified in Section 6. Specific advantages provided by these alternatives include:

- Increased safety as traffic volumes increase;
- Enhanced pedestrian and cycling safety;
- Enhanced road structural conditions;
- Meets future capacity requirements; and
- Consistent with recommendations made in the City of Welland Transportation Study.

Figure 10-1 illustrates the preferred roadway servicing strategy.

FIGURE 10-1: PREFERRED ROADWAY SERVICING SYSTEM
2021 LANE CONFIGURATION





11. STORMWATER SERVICING ALTERNATIVES

11.1. Stormwater Alternative Solutions

Existing land uses within the preliminary concept plan (Figure 2-1) include a mix of inactive agricultural land, single family residential, and some institutional as well as wooded areas. Drainage generally is from west to east and eventually outlets to the Old Welland Canal.

The following Stormwater servicing alternatives were evaluated.

Alternative Solutions	Applicable Projects
1. Do Nothing	• No new stormwater management works
2. Stormwater Lot Level Controls	• Flat lot grading • Soakaway pits and filters • Ponding on roof/lot
3. Stormwater Conveyance Controls	• Grassed swales • Pervious pipes and catch basins • Oil/grit separators • Over sized pipes
4. End-of-Pipe Stormwater Management Facilities	• Wet ponds • Dry ponds • System infiltration trenches/pits

11.2. Stormwater Management Criteria

In addition to the evaluation criteria presented on Table 11-1, the following stormwater management criteria were employed to guide the evaluation of stormwater servicing alternatives.

Quantity Control

- Maximum peak flow rates must not exceed pre-development values for storm with return periods ranging from 2 to 100 years.

Quality Control

- The watercourse downstream contains fish spawning habitat that is less sensitive to suspended solids – therefore normal quality protection will be used.
- Normal Quality Protection corresponds to the End-of-Pipe storage volumes required for the long-term average removal of 70% of suspended solids.

Erosion Control

- Erosion on existing drainage courses is to be minimized.



11.3. Comparative Evaluation of Stormwater Servicing Alternatives

Public Safety

Potential for flooding, possible safety hazards

Alternatives 1 and 2 increase the potential for local flooding on individual lots as well as local downstream flooding.

Alternative 3 does not result in any safety concerns.

With respect to Alternative 4, ponds can be viewed as a potential safety hazard (related to water hazards-drowning).

Natural Environmental Considerations

Potential effects to the natural environment including effect on air, land, water and biota, i.e. siting/routing considerations and/or constraints.

Alternative 1 introduces potential for erosion effects that can impact downstream aquatic resources. This alternative allows for an increase in stormwater rate of flow and decreased water quality.

Alternative 2 must be combined with water quality control to ensure no contamination of the groundwater. Soak away pits and sand filters can be effectively utilized in sandy soils to prevent downstream erosion sedimentation control and water quality/quantity control. However, the soil type in the study area is a silty clayey mixture, which has less than ideal infiltration characteristics.

Alternative 3 results in no natural environmental impacts.

Alternative 4 is most effective in controlling the quantity and quality of stormwater. Considering outlet watercourses located downstream of each development area, Alternative 4 provides the best provision for erosion control. This is based on limiting the outflow from the pond to pre development levels or less. This will significantly reduce the chance of erosion happening due to future increased urbanization of the study area. In fact, there is a high likelihood that pond outflow will be less than peak development levels (ie over control for pre/post flows, control set by erosion criteria), which would further reduce the chance of erosion happening in the receiving watercourse.



Both Alternatives 3 and 4 would require upgrades/relocation of the watercourses/drains. Landscaping of the pond outfall may include structures such as flow diffusers and erosion control devices (rip-rap etc.).

Social/Cultural Considerations

Short-term construction related impacts including traffic, access and noise.

Alternative 1 is the only alternative that does not result in any social/cultural impacts.

Alternatives 2, 3 and 4 result in potential impacts that can be mitigated using established design/construction techniques as followed on typical municipal construction projects.

Potential siting/routing considerations, including impacts to land uses, cultural, heritage resources (e.g. archaeological), impacts on property owners..

Alternatives 1 and 3 have no siting/routing impacts associated with them.

Alternative 2 involves controls on private property and most likely would not be an acceptable alternative for most homeowners. It would also not be enforceable by the City of Welland, as it would require homeowners to maintain their own system. Alternative 4 could be integrated into a community park system resulting in no or minor impacts. Potential impacts to archaeological resources will be addressed by completing future archaeological investigations, as required.

Economic/Financial Considerations

Construction and Operation Costs

Alternative 1 involves no capital costs however there would be a cost to provide downstream protection to eliminate erosion/flooding.

Alternative 2 involves less capital cost by transferring this responsibility to each individual property owner. However operations cost increases and enforcement cannot be implemented effectively.

Alternative 3 would result in high capital costs (i.e. underground oil/grit separators and oversized pipes), and also results in increased maintenance by the City of Welland.

Alternative 4 would be less costly than the conveyance system, however it would also require the acquisition of land and consequently could result in higher costs than Alternative 3. Maintenance requirements for Alternative 4 are slightly less than those for Alternative 3.



Legal/Jurisdictional Considerations

Land Requirements

Alternative 1 may potentially violate downstream property rights by way of flooding, which may potentially lead to legal action. As a precaution, preventative works are required downstream.

Each of the remaining alternatives requires the acquisition of some land. Alternative 2 will require legal documentation for each landowner having a control system. This will be difficult to enforce and as a result few agencies approve these systems as sole means of stormwater control.

Alternative 3 may require some land, however the majority of the infrastructure will be contained on public property.

Alternative 4 will require land deeded to the City by developers. Stormwater management facility land area requirements in addition to outlet drainage easements/right-of-ways will be required. The City may purchase the land using Development Charges monies or rebate/eliminate a developer's Development Charges fee. The City therefore must include an allowance for land in the Development Charges By-Law based on land prices at the time of implementation.

Technical Considerations

Ability to implement alternative. Ability of alternative to use existing infrastructure.

Alternative 1 can be implemented and does not satisfy present engineering or regulatory standards.

Alternative 2 only satisfies present standards in areas with sandy soils, and as mentioned earlier, the soils in the study area are clayey loam. Therefore, use of lot level controls will not provide an effective means of addressing stormwater quality/quantity control.

Alternative 3 can be effective for both quality and quantity control, but are limited in size and scope.

Alternative 4 satisfies well-established design criteria for stormwater quantity and quality controls. Furthermore, Alternative 4 could be used in conjunction with Alternative 3 to produce a stormwater management solution that meets all technical requirements and is cost-effective.

Table 11-1 Evaluation of Stormwater Management Alternatives

Alternatives	Evaluation Criteria						Technical	Evaluation Summary
	Public Safety	Natural Environment	Social/Cultural	Economic/ Financial	Legal/ Jurisdictional			
	Potential for flooding, possible safety hazards.	Potential effects to the natural environment including effect on air, land, water and biota, i.e. siting/ routing considerations and/or constraints.	Short-term construction related impacts including traffic, access, noise.	Potential siting/ routing considerations, including impacts to land uses, cultural, heritage (e.g. archaeological), impacts on property owners, resources.	Construction and Operation Costs	Land Requirements	Ability to implement alternative Ability of alternative to use existing infrastructure.	Least preferred ○ ↓ ● Most preferred
1. Do Nothing No New Stormwater Management Works	- Increases chance of local flooding due to development.	- Introduces potential for erosion effects. - Not acceptable under current environmental legislation. - Results in downstream aquatic impacts and erosion. - Increases stormwater rate of flow and decrease water quality.	-No social/cultural impacts identified.	- No siting/routing considerations	- No capital costs. - Would involve cost to provide downstream protection to eliminate erosion/flooding.	- Does not meet current environmental legislation. - Potential downstream property rights violated, therefore works required downstream. - Potential for legal action.	- Requires enlargement of channels/culvert capacity downstream (many on private property). - Does not satisfy present engineering standards.	○
2. Stormwater Lot Level Controls - Flat lot grading - Soakaway pits & filters - Ponding on roof/lot	- Promotes local flooding on individual lots, which is not desirable to many owners.	- Local soil type would eliminate infiltration techniques in the study area. - Must be combined with water quality control to ensure no contamination of the groundwater.	-Minor impacts. -Potential impacts can be mitigated using established mitigation techniques.	- Would not be acceptable to most homeowners. - Would not be enforceable by municipality if on private property. - Would require homeowners to maintain system. - Workable if built in public spaces (ROW, parks, etc.).	- Would involve less capital cost (than 3 & 4) by reducing flow to the conveyance system in sandy soils only. - However addition land and quality control facilities may mitigate this cost savings.	- Legal documentation required with each landowner having a control system. - Hard to enforce - Few agencies approve these systems as sole means for stormwater control due to lack of ability of the municipality to enforce maintenance issues on private property.	- Does not satisfy present engineering standards due to soil type in the Study Area.	○
3. Stormwater Conveyance Controls - Grassed swales - Pervious pipes and catchbasins - Oil/grit separators - Oversized pipes	- No public safety impacts identified.	- No natural environmental impacts identified. - Will require upgrades to outlet watercourses/drains. - Previous pipes and catchbasins can not be utilized in the study area.	-Moderate impacts. -Potential impacts can be mitigated using established mitigation techniques.	- No social/cultural impacts identified.	- Would result in high capital costs (i.e. underground oil/grit separator and oversized pipes). - Would involve increased maintenance by municipality over End-of-Pipe Alternative.	- May require some land, usually on public property.	- Could be implemented in combination with end-of-pipe alternative. - Technology can be as effective as the end-of-pipe alternatives, but is more costly.	◐
4. End-of-Pipe Stormwater Management Facilities - Wet ponds - Dry ponds - System infiltration trenches/pits	- Wet/Dry ponds could pose potential safety hazard.	- Would be most effective in control of quantity and quality of stormwater for this soil type. - Will require upgrades to outlet watercourses/drains.	-Greater impacts. -Potential impacts can be mitigated using established mitigation techniques.	- Could be integrated into park system. - Same as under Public Safety.	- Infrastructure would be less costly than the conveyance control system. - Requires land, therefore cost of land may result in higher costs than conveyance control system.	- Will require land deeded to Municipality by developers or purchase by Municipality using Development Charges monies.	- Satisfies well-established design for stormwater quantity and quality controls. - Could be used in conjunction with some conveyance control system (i.e. grassed swales.)	● Recommended



11.4. Preferred Stormwater Servicing Solution

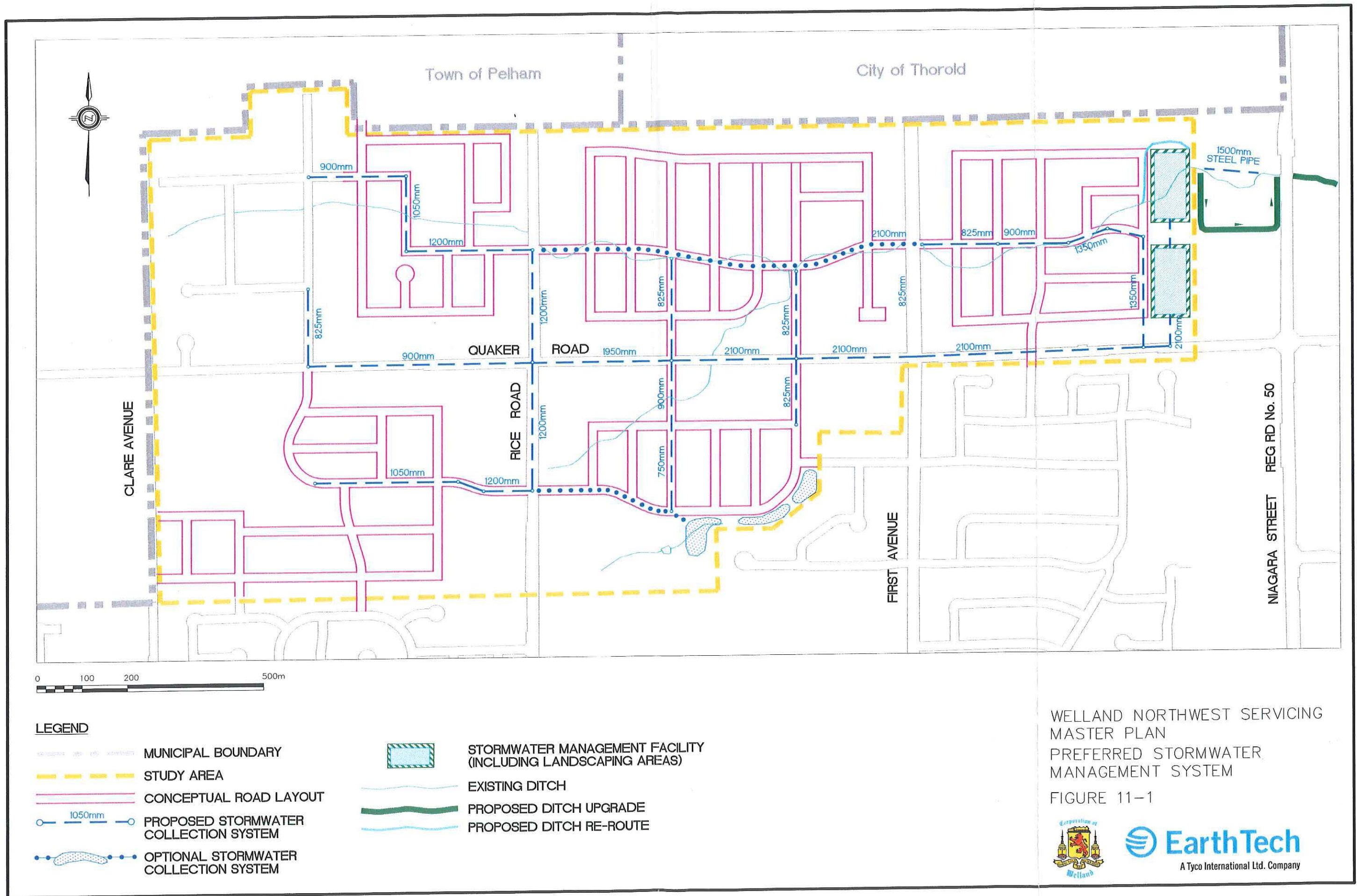
Based on the above evaluation, Alternative 4: End-of-Pipe Stormwater Management Facilities has been identified as the preferred solution to the problem statement identified in Section 6. Specific advantages provided by this alternative include:

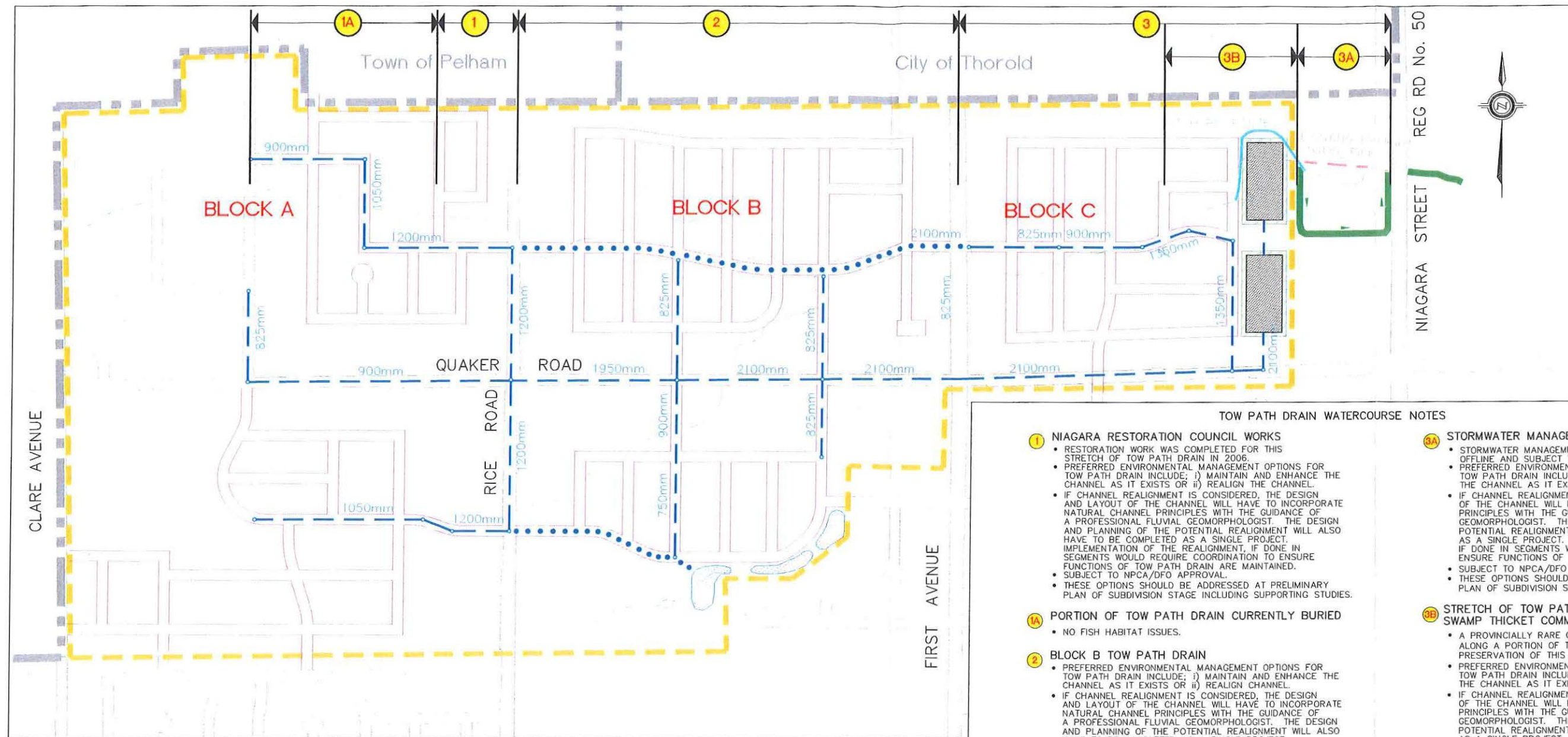
- Most effective control of quantity and quality of stormwater for the soils found in the City of Welland;
- Efficiently satisfies established engineering design standards for stormwater quantity and quality controls; and
- Allows flexibility for use of other alternatives where other alternatives have advantages (i.e. Alternative 3: grass swales, local oil/grit separators).

Figures 11-1, 11-1A and 11-1B identify the preferred stormwater management system. It should be noted that two alignments are shown on Figure 11-1 for the trunk storm sewer. The optional alignment of the 2100 mm diameter storm sewer at Quaker Road could be implemented if development proceeds east to west and north of Quaker Road. If this does not happen, then routing of the storm sewer will have to be on Quaker Road. Similarly two different pond locations are shown on Figures 11-1A and 11-1B.

11.5. Contaminated Land

With respect to the location of stormwater management (SWM) facilities as shown on Figures 11-1 and 11-1A, it is noted that these lands (Talman Transports) have been identified as having hydrocarbon and heavy metal contamination. As such, these lands will require remediation to MOE accepted levels prior to the construction of any SWM facility. At the time of this report, no remediation has been completed.





LEGEND

- | | | | |
|--|---------------------------------------|--|--|
| | MUNICIPAL BOUNDARY | | STORMWATER MANAGEMENT FACILITY (INCLUDING LANDSCAPING AREAS) |
| | STUDY AREA | | EXISTING TOW PATH DRAIN WATERCOURSE |
| | CONCEPTUAL ROAD LAYOUT | | PROPOSED NEW OUTLET |
| | PROPOSED STORMWATER COLLECTION SYSTEM | | PROPOSED DITCH ALIGNMENT |
| | OPTIONAL STORMWATER COLLECTION SYSTEM | | EXISTING STEEL PIPE |

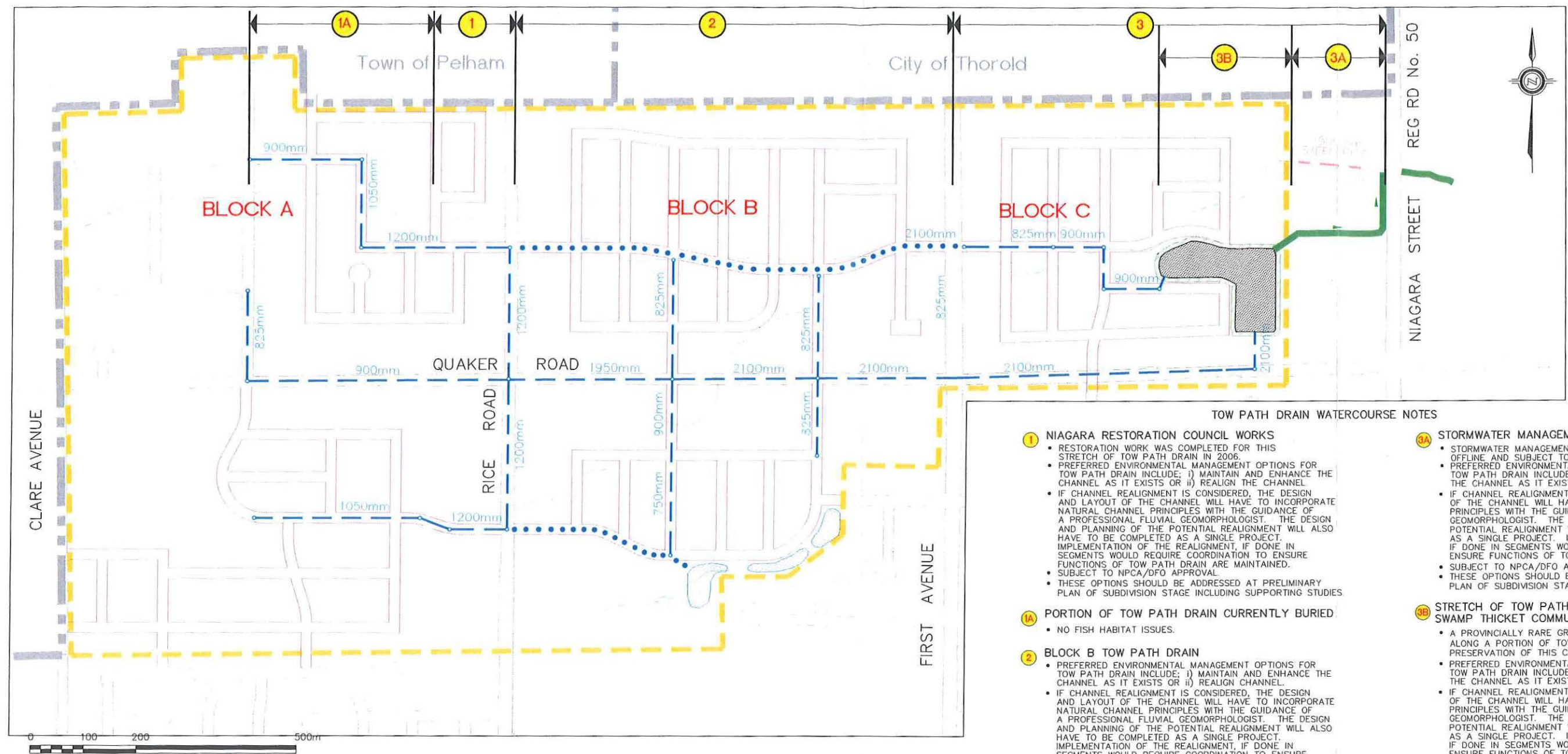
TOW PATH DRAIN WATERCOURSE NOTES

- 1 NIAGARA RESTORATION COUNCIL WORKS**
 - RESTORATION WORK WAS COMPLETED FOR THIS STRETCH OF TOW PATH DRAIN IN 2006.
 - PREFERRED ENVIRONMENTAL MANAGEMENT OPTIONS FOR TOW PATH DRAIN INCLUDE: i) MAINTAIN AND ENHANCE THE CHANNEL AS IT EXISTS OR ii) REALIGN THE CHANNEL.
 - IF CHANNEL REALIGNMENT IS CONSIDERED, THE DESIGN AND LAYOUT OF THE CHANNEL WILL HAVE TO INCORPORATE NATURAL CHANNEL PRINCIPLES WITH THE GUIDANCE OF A PROFESSIONAL FLUVIAL GEOMORPHOLOGIST. THE DESIGN AND PLANNING OF THE POTENTIAL REALIGNMENT WILL ALSO HAVE TO BE COMPLETED AS A SINGLE PROJECT. IMPLEMENTATION OF THE REALIGNMENT, IF DONE IN SEGMENTS WOULD REQUIRE COORDINATION TO ENSURE FUNCTIONS OF TOW PATH DRAIN ARE MAINTAINED.
 - SUBJECT TO NPCA/DFO APPROVAL.
 - THESE OPTIONS SHOULD BE ADDRESSED AT PRELIMINARY PLAN OF SUBDIVISION STAGE INCLUDING SUPPORTING STUDIES.
- 1A PORTION OF TOW PATH DRAIN CURRENTLY BURIED**
 - NO FISH HABITAT ISSUES.
- 2 BLOCK B TOW PATH DRAIN**
 - PREFERRED ENVIRONMENTAL MANAGEMENT OPTIONS FOR TOW PATH DRAIN INCLUDE: i) MAINTAIN AND ENHANCE THE CHANNEL AS IT EXISTS OR ii) REALIGN THE CHANNEL.
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- 3 BLOCK C TOW PATH DRAIN**
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- 3A STORMWATER MANAGEMENT PONDS**
 - STORMWATER MANAGEMENT PONDS WILL BE DESIGNED AS OFFLINE AND SUBJECT TO RELOCATION.
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- 3B STRETCH OF TOW PATH DRAIN WITH ADJACENT SWAMP THICKET COMMUNITY**
 - A PROVINCIALLY RARE GREY DOGWOOD THICKET OCCURS ALONG A PORTION OF TOW PATH DRAIN IN BLOCK C. PRESERVATION OF THIS COMMUNITY IS RECOMMENDED.
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WELLAND NORTHWEST SERVICING
MASTER PLAN
PREFERRED STORMWATER
MANAGEMENT SYSTEM

FIGURE 11-1A





LEGEND

- | | | | |
|--|---------------------------------------|--|--|
| | MUNICIPAL BOUNDARY | | STORMWATER MANAGEMENT FACILITY (INCLUDING LANDSCAPING AREAS) |
| | STUDY AREA | | EXISTING TOW PATH DRAIN WATERCOURSE |
| | CONCEPTUAL ROAD LAYOUT | | PROPOSED NEW OUTLET |
| | PROPOSED STORMWATER COLLECTION SYSTEM | | EXISTING STEEL PIPE |
| | OPTIONAL STORMWATER COLLECTION SYSTEM | | |

TOW PATH DRAIN WATERCOURSE NOTES

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WELLAND NORTHWEST SERVICING
MASTER PLAN
PREFERRED STORMWATER
MANAGEMENT SYSTEM

FIGURE 11-1B





12. SERVICING STANDARDS AND REQUIREMENTS

In order for the City of Welland to properly develop, municipal services must be provided to allow development to proceed without having a detrimental impact on the existing community. This section of the report outlines the specifics to water, wastewater, roadway and stormwater, infrastructure requirements.

The following standards represent the minimum acceptable level of service for each infrastructure category. The City of Welland's Engineering Standards adopt standards prescribed by the Ontario Provincial Standards, and Regional Municipality of Niagara for municipal services in all new development. These standards set the level of service for the City, in terms of both new and existing development (i.e. replacement of existing infrastructure). Approval for new infrastructure will be required from various government agencies, including the City, RMON, MOE, MNR and NPCA.

12.1. Water Distribution System

As documented in section 8.2 new watermains in the subject area will tie into the proposed 400 mm watermain on Quaker Road. Table 12-1 details the base demands for new development. The following assumptions were used in the evaluation/sizing of the water distribution system:

- 400 l/capita/day demand (from Regional Municipality of Niagara Master Servicing Plan (RMON MSP) – October 2002 working paper);
- 2.65 to 1.58 persons per unit, depending on density;
- 12 units/ha - Low Density Residential;
- 50 units/ha - Medium Density Residential;
- 99 units/ha - Mixed Residential Area/ha;
- Fire flow Residential – 100 l/s for 2 hrs; and
- Fire flow Industrial, Commercial, Institutional (ICI) – 250 l/s for either 4 or 6 hrs.

Appendix D includes fire flow and peak hour testing.

The following table summarizes the base water distribution system demands for new development.



Table 12-1 Base Demands for New Development

Sub Area	Area (Ha)	Equivalent Units	Equivalent Population	Max/day (l/s)
1	24.75	119	315	1.5
2	18.47	354	806	3.8
3	15.21	314	645	3.0
4	13.15	128	325	1.5
5	12.09	153	355	1.6
6	14.08	240	552	2.6
7	12.08	183	410	1.9
8	19.11	166	419	2.0
9	22.75	193	486	3.1
10	16.25	489	911	4.2
11	13.08	177	442	2.4

Note: See Figure 12-2 (after Table 12-4) for sub areas

The water distribution system was determined using the H₂ONet model provided by the City of Welland. The model was used as provided (Earth Tech did not modify the model, save for inputting the proposed pipe network and calculated demands). The model did not include a 2026 scenario, so the 2051 max day build-out scenario was used instead. Usually, water supply systems are planned for a 20-year period. The model was run to determine if adequate pressures were maintained under two different conditions: max day plus fire flow and peak hour.

Fire flow demands were taken from the RMON MSP Working Paper for the Welland Water Treatment Plant System (October 2002). For the most part the non-residential areas designated in the concept plan are institutional. It should also be noted that the values calculated for domestic/institutional and fire flow were used for determining storage requirements for the entire Welland water system. As such, they may be overestimated to ensure adequate storage is in the system.

For the maximum day plus fire flow criteria (used in sizing distribution systems and storage facilities), the distribution system design provided the minimum design pressure of 20m (14 psi) at all nodes. Unfortunately, under the peak hour, there are 6 nodes that do not maintain the minimum required pressure of 30m (40 psi). These nodes are located on the west side of the study area, near the existing residential subdivision (Summerlea Subdivision). From the results of the model under the existing conditions, it appears that this area has less than ideal pressure to begin with. Earth Tech attempted to address this pressure deficiency by increasing pipe



diameters, however this had minimal effect. It appears that there could be system deficiencies outside the study area. This is most likely due to the higher elevation that this existing subdivision is at as compared to the existing areas to the south. Further analysis of the surrounding area maybe required. A table showing the results of the fire flow and peak hour testing is included in Appendix C, along with demand design table.

12.1.1. Servicing Standards

Servicing standards for the recommended water distribution system are set out below:

Minimum pipe size of the watermains will be 150mm diameter. Looping of the mains will also be employed to address water quality and reduced pressure concerns.

The network is designed in accordance with all applicable Ministry of Environment and Regional Standards.

12.1.2. System Description

The new development in the Northwest Area of Welland will be provided with water from the Welland Supply System. A proposed 400mm diameter water main will be located on Quaker Road, which bisects the study area. Larger watermains, ranging in size from 200mm to 300mm in diameter will be looped through the development areas off the Quaker Road watermain to each sub section of the study area. Local watermains of 150mm diameter will service the majority of the development areas.

12.2. Sanitary Sewer System

As documented in section 9.2, Option B: New Regional Trunk Sanitary Sewer on Quaker/Rice Roads was selected as the preferred sanitary sewer servicing option. The Region of Niagara recently constructed a new trunk sewer that runs through the study area first south on Rice Road, then east on Quaker Road. The trunk sewer serves the approved East Fonthill urban boundary expansion area (directly north of Northwest Area). The trunk sewer on Quaker Road is 750mm in diameter and has adequate capacity to accept sewage flows from the study area.

12.2.1. Existing Sanitary Sewer System

Gravity sewers service the existing residential portion located on the north west side of the study area. There are also two pump stations/forcemains, one to service the Niagara Catholic School Board (a private station), and the other to service a public school and small residential subdivision. Within the remainder of the study area, there are no sanitary sewers, as most of the



remaining blocks of land are agricultural in nature or single family residences on private septic systems.

12.2.2. Servicing Standards

Servicing standards for the recommended sanitary sewer system are as below: minimum sanitary sewer size is 200mm in diameter, minimum scour velocities for self cleaning of the sewers was set at 0.75 m/s, and the system would be comprised of gravity sewers, set at a minimum depth to allow gravity connections from dwellings.

12.2.3. System Description

Local collection systems comprised of 250mm diameter sewers would direct flows towards the new 750mm trunk sewer located either on Rice or Quaker Road. A section of 300mm sewer will be required on Quaker Road from the Clare Avenue to Rice Road to service the portion of the study area located west of Rice Road.

Table 12-2 Population Densities and Units

The following table summarizes the population densities and units for the study area.

Area ID	Area (Ha)	Development	Units	Population	Peak Flow* (L/s)
1	24.75	Residential/ Institutional	119	315	9.26
2	18.47	Residential	354	806	14.99
3	15.21	Residential	314	645	12.07
4	13.15	Residential	128	325	6.39
5	12.09	Residential	153	355	6.37
6	14.08	Residential	240	552	10.53
7	12.08	Residential	183	410	7.78
8	19.11	Residential/ Institutional	166	419	8.81
9	22.75	Residential/ Institutional	193	486	13.33
10	16.26	Residential	489	911	15.87
11	13.08	Residential/ Institutional	177	442	10.16

* Dry Weather Flow (includes infiltration allowance per MOE standards)



12.3. Road System

As indicated in section 10.3, Alternative 4: Upgrade Roads to Current Urban Standards in combination with Alternative 5: Upgrade Intersections, was identified as the preferred solution to address the problem statement identified in Section 6. These improvements will best address the transportation issues for the Welland Northwest Area and the increase in traffic associated with the future development. Specific advantages provided by applying a combination of these alternatives include:

- Increased safety as development occurs and traffic volumes increase;
- Enhanced pedestrian and cycling safety;
- Enhanced road structural conditions; and
- Meets future capacity requirements.

12.3.1. Existing Roadway System

The main roadways that service the study area are all rural roads under the jurisdiction of the City of Welland. The surrounding roads include:

- Rice Road, a two lane road that provides north-south movements through the City of Welland;
- First Avenue, a two lane road which runs parallel to Rice Road; and
- Quaker Road, a two lane road which provides an east-west connection through the City into the Town of Pelham.

Two other north-south roads also service the study area:

- Clare Avenue on the west edge of the study area; and
- Regional Road 50 (Niagara Street) in the east.

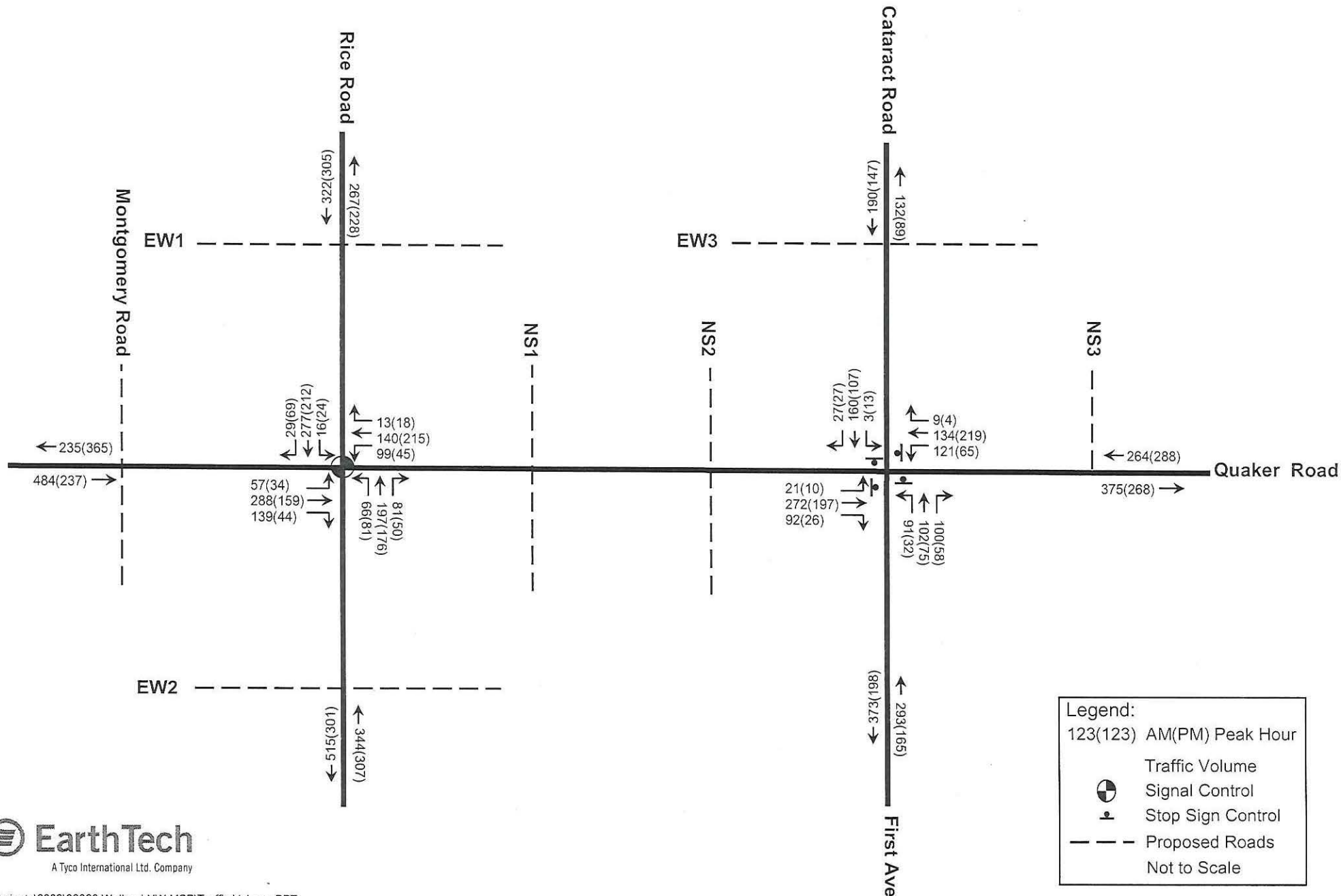
The northwest portion of the study area includes an exiting residential neighbourhood with access to Quaker Road through Montgomery Road and access to North Line Avenue via Summerlea Avenue. The following roads and associated designations are within the Welland Northwest Area study area:



Road	Existing Road Designations
Rice Road	Arterial
Quaker Road	Collector
First Avenue	Collector
Montgomery Road	Local

Traffic count information provided by the City indicates that Rice Road, north of Quaker Road carries approximately 6,600 vehicle trips in a 24-hour period. South of Quaker Road, the 24-hour traffic volume is in the order of 8,300 vehicle trips. On First Avenue north of Quaker Road, the 24-hour volume is approximately 3,500 vehicle trips and south of Quaker Road, the daily volume is in the order of 6,400 vehicle trips. Within the study area Quaker Road carries approximately 7,700 vehicle trips in a 24-hour period. In addition to daily traffic volumes, peak a.m. and p.m. peak hour turning movement counts were provided by the City for the intersection of Rice Road at Quaker Road and First Avenue at Quaker Road. Since the traffic counts at the two intersections were undertaken on different dates, the existing traffic volumes illustrated have been normalized along Quaker Road. The existing traffic volumes on the surrounding road system are illustrated on Figure 12-1 and further described in **Appendix D**.

FIGURE 12-1: EXISTING AM/PM PEAK HOUR TRAFFIC





12.3.2. System Description

The road system serving the Welland Northwest Area will need to accommodate future growth in background traffic due to developments in surrounding areas outside of the study area, as well as accommodate the anticipated vehicle trips generated by the development proposed in the study area.

As shown on the preliminary concept plan (Figure 2-1), each area within the Northwest Area study area will be serviced by a network of local and collector roads which will facilitate movements from the development areas to the arterial road system. A new continuous east-west road is proposed extending Summerlea Avenue to connect North Line Avenue in the west to First Avenue in the east which will service the lands to the north of Quaker Road. Four north-south connections intersecting Quaker Road within the study area are also proposed. Montgomery Road is to extend south of Quaker Road and tie into an east-west collector type road extending east through Rice Road to First Avenue. This road network as proposed in the preliminary concept plan will help distribute the development traffic to the adjacent road network.

Based on previous reports undertaken in the area, and on development growth in the surrounding area it was estimated that the existing traffic would increase at a rate of approximately 2% per year, compounded, until the horizon year of 2021. In addition to this traffic growth, is the traffic generated by the Welland Northwest Area.

The analysis undertaken is based on the preliminary concept plan. The number of vehicle trips generated by the proposed development was based on information published in the Institute of Transportation Engineers Trip Generation Manual 7th Edition and on land use densities provided by The Planning Partnership for the preliminary concept plan. It is anticipated that the proposed development will generate in the order of 2050 trips during the a.m. peak hour and approximately 2590 vehicle trips during the pm peak hour as shown on Table 12-3.

Table 12-3 AM and PM Peak Hour Vehicle Trips

The following table summarizes the AM and PM trips.

Land Use	AM Peak Hour				PM Peak Hour		
	Units	In	Out	Total	In	Out	Total
Low Density Residential	641	120	360	480	415	235	650
Medium Density Residential	1008	75	370	445	365	180	545



Land Use	AM Peak Hour				PM Peak Hour		
	Units	In	Out	Total	In	Out	Total
High Density Residential	297	20	80	100	70	45	115
Mixed office (sq.m.)	2790	70	10	80	10	60	70
Mixed residential*	407	30	150	180	145	75	220
Mixed retail (sq.m.)	7535	50	35	85	145	160	305
Institutional (sq.m.)	31695	545	135	680	390	295	685
Total Site Trips Generated		910	1140	2050	1540	1050	2590

*(assuming medium density)

The new traffic generated by the development within the study area was distributed onto the adjacent road network and the resulting future traffic volumes anticipated for 2021 during the a.m. and p.m. peak hour are illustrated in **Appendix D**.

An analysis of the impacts to the surrounding roads was undertaken and the results indicated that improvements along Rice Road are required and includes the addition of one through lane in each direction (widening from 2 to 4 lane basic cross section) to accommodate the anticipated traffic in 2021. In order to improve operations at the key intersections, at Quaker Road and the two new east-west collector road intersections within the study area, it is recommended that auxiliary left turn lanes be provided. The widening of Rice Road to accommodate an additional lane in each direction is consistent with the long-term plans recommended in the City of Welland Transportation Planning Study³.

In order to accommodate future traffic along Quaker Road, widening of this facility to include an additional through lane eastbound and westbound will be required. This recommendation is also consistent with the long-term plans identified in the City of Welland Transportation Planning Study. Other improvements include the provision of auxiliary left turn lanes at Rice Road, First Avenue and the intersection with the four north-south collector type roads in the study area. With development occurring in the immediate area and in the surrounding communities, Quaker Road will operate and function closer to an arterial road than its current designation as a collector road. It is the only major east-west route in the area, north of Woodlawn Road, which will be responsible to move traffic to and from adjacent collector and Region of Niagara roads.

³ Delcan, Transportation Planning Study, City of Welland, April 2001



The future traffic volumes derived in this analysis indicates that north of Quaker Road, First Avenue can accommodate future traffic volumes as a two-lane road. However, south of Quaker Road, First Avenue will require widening to a four lane cross section. It should be noted that this analysis does not account for any diversion of traffic from Niagara Street with potential improvements to Merritt Road as recommended in the City of Welland Transportation Planning Study. As indicated in the Transportation Planning Study, with improvements to Merritt Road between Niagara and Cataract Road, traffic is expected to divert from Niagara Street to First Avenue en route to Quaker Road. With this diversion, the City's Transportation Planning Study recommended additional through lanes northbound and southbound on First Avenue north of Quaker Road. At a minimum, a 26 m right-of-way should be provided along this collector road.

Under 2021 traffic conditions, the intersection of Quaker Road at First Avenue will require signalization as it will not operate at acceptable levels of service under its present traffic control as a four way stop. It is recommended that traffic signals be installed when warranted. The analysis indicates that the intersections of Rice Road /EW2 (intersection south of Quaker Road), Quaker Road/ NS2 (intersection west of First Avenue) and Quaker Road/Montgomery Road may require signalization in 2021 as the traffic on the minor roads is expected to experience significant delays. These intersections should be monitored and traffic signals installed when warranted.

The main east-west roads which extend through the study area, located both north and south of Quaker Road will function as collector roads, collecting traffic from the local area and roads and facilitating movements to and from the adjacent road system. This collector road system located within the Welland Northwest Area study area will also link the future community with the adjacent parks/ trails and open spaces. The Steve Bauer Trail is located at the west limits of the study area along Line Avenue and extends north through Fonthill in the Town of Pelham. This trail connects with other trails located throughout the City and Region.

Through the collector road system parks and open space adjacent to Niagara College to the south of the study area will also be linked with the Northwest Area development area as well as with the Steve Bauer Trail to the west. For these reasons, it is recommended that the east-west road which extends from Line Avenue through to the east side of First Avenue north of Quaker Road be designated as a collector road and be designed with bike lanes within the pavement width. The main road system, which is the extension of Montgomery Road, which runs east-west through the lands south of Quaker Road and extends north, to connect with the lands north of Quaker Road, should also be designated as a collector road.



12.3.3. Servicing Standards

Servicing standards for the recommended road system are set out below:

- Roads designated as collector roads, (excluding Quaker Road) shall have a road allowance width in accordance with City standards and include, curb and gutter, street lighting and sidewalks on both sides of the street. Although Quaker Road is designated as a collector road, the recommended road allowance is equivalent to an arterial road designation to accommodate four travel lanes plus auxiliary lanes. Day lighting triangles at all intersections are required.
- The recommended road allowance for Rice Road is 30 metres and should be designed to accommodate four travel lanes plus auxiliary lanes at key intersections.
- Standard residential (local) urban roads shall have a 20 metre road allowance width and include curb and gutter, street lighting and may require sidewalks on one side of the street, in accordance with City standards. Local roads with designated bicycle routes as identified in the Regional Niagara Bikeways Master Plan shall be designed in accordance with Regional/City standards.
- Auxiliary left turn lanes along all major roads at key intersections shall be provided.
- The roads shall be constructed to Ontario Provincial Standard Specifications.

In addition to the roadway improvements identified above, auxiliary left turn lanes are recommended at all key intersections. Also, under future conditions the following intersections listed below will require signalization.

It is recommended that as development occurs, the following intersections be monitored to determine if traffic signals will be required. The analysis, based on the proposed land uses indicates that while the intersections are expected to operate at acceptable levels of service overall, cross traffic is expected to experience significant delays. The intersections, which should be monitored for traffic signals, include:

- Rice Road /EW2 (intersection south of Quaker Road),
- Quaker Road/ NS2 (intersection west of First Avenue); and
- Quaker Road/Montgomery Road.

It is recommended that the following roads be designated as Collector Roads as they will function in a collector road capacity within the Northwest neighbourhoods:



- New east-west road extending between North Line Avenue and First Avenue; and
- The new east-west road through the study area lands to the south of Quaker Road; and
- The north-south roads connecting to Montgomery Road as well as the north-south road just west of First Avenue.

In order to deter cut-through traffic the above roads should incorporate special design features such as roundabouts, and/or planted medians for aesthetic, environmental and/or traffic calming purposes. If special design features are in place along the collector roads, a right-of-way width of 26m may be required to accommodate these special features as well as bicycle lanes.

Roundabouts

It is recognized that the preliminary concept plan (Figure 2-1) proposed for this area illustrates roundabouts located along Rice Road and First Avenue which were identified as an effort to provide traffic calming effects. However, from a traffic operations perspective and taking into consideration the recommendation that Rice Road and First Avenue be widened to accommodate a four lane cross section and expected driver behaviours these locations may not be appropriate for these applications. While it is recognized that two lane roundabouts can be effective and operate efficiently, roundabouts are relatively new to Ontario and drivers will not be accustomed to driving through a dual lane roundabout. To introduce roundabouts into the neighbourhood design, it may be more desirable to strategically place single lane urban roundabouts along the new collector roads at locations just east and west of Rice Road and First Avenue. The implementation of traffic calming features or roundabouts should be undertaken in consultation with the review agencies at the appropriate time.

12.4. Stormwater Management System

As documented in Section 11.4, Alternative 4: End-of-Pipe Stormwater Management Facilities was selected as the preferred means to provide the required stormwater management works for new development. This alternative incorporates wet/dry ponds based on local topography and availability of an outlet.

12.4.1. Existing Drainage System

Currently, Tow Path Drain tributaries route water through the study area. A small area to the west of Clark Avenue contributes flows via a small culvert into the north part of the study area. The main tributary is located north of Quaker Road, and flows from west to east. A smaller tributary starts at Rice Road in the south section of the study area, flowing northeast under



Quaker Road before reaching the main tributary west of First Avenue. The tributary eventually reaches a 1500mm outlet pipe, located west of Niagara Street. The reach is relatively flat in nature, with both tributaries being shallow in nature, with wide and flat floodplains. Culverts crossings are utilized to convey flows underneath roadways. There are also roadside ditches, particularly along Quaker Road, which aid in draining the study area.

12.4.2. Erosion Inventory

A detailed erosion inventory was not completed for this study. Reducing peak post development flows to pre-development levels will ensure the receiving watercourse will not be subjected to larger flows, which would most likely cause significant erosion. The proposed SWM pond outlet will make use of riprap or some other flow diffuser that has the potential to slow down the outflow once it is discharged into the receiving watercourse. This will also mitigate downstream erosion.

12.4.3. Stormwater Management Development Mitigation Strategy

The following summarizes the stormwater management development mitigation strategies.

Control	Mitigation Strategy
Water Quantity	▪ End-of-Pipe ▪ Stormwater management wet pond (attenuation zone) ▪ Groundwater Recharge ▪ Infiltration trenches (in sandy soil areas)
Water Quality	▪ End-of-Pipe ▪ Stormwater management wet pond (permanent pool and extended detention zone to control 25 mm rainfall event) ▪ Vegetated filter strips and buffer strips in conjunction with the adjacent woodlots
Erosion	▪ End-of-Pipe ▪ Stormwater management wet pond (extended detention zone to control 25 mm rainfall event) ▪ Implement upgrades to downstream watercourses as required ▪ City control over drainage outlet and downstream watercourses via ownership, easement or through the Municipal Drainage Act (allows upgrades to downstream watercourses)
Conveyance	▪ Infiltration trenches to control volume (in sandy soil areas) ▪ Minimal channel slopes to keep the velocity as low as possible ▪ Lining and improvement of downstream watercourses

12.4.4. Servicing Standards

Servicing standards for the recommended storm sewer system are set out below:



- Storm sewers were designed to accommodate the peak runoff from a 2-year storm event. The IDF curve parameters used to calculate intensity for the 2-year event were $A = 755$, $B = 8$, $C = 0.789$.
- Storm sewer sizing was calculated using the Rational Method, with a minimum diameter of 300mm.
- The SWMHYMO software package was used for modelling of the 100-year event for both pre and post development conditions. The IDF values used for the 100-year event were $A = 1020$, $B = 4.7$, $C = 0.731$.
- The 100-year storm event was 4 hours in duration and produced 73 mm of total rainfall depth.

The input and output files from SWMHYMO can be found in **Appendix E**.

12.4.5. Possible Storm Water Management Practices

Table 12-4 presents feasible stormwater management measures that could be implemented. Of the thirteen measures listed in Table 12-4, the dry pond, wet pond, and constructed wetland end-of-pipe alternatives would provide the highest level of treatment for runoff contributed from lands within the study limits. However, dry ponds are usually only used in circumstances where water quantity is a concern. It is noted that, the MNR has indicated concern with regards to dry pond water quality treatment capabilities. In relation to this, MNR has stated a reluctance to accept dry ponds, and a preference for wet ponds instead. As such, the dry pond management practice was not considered further. Conversely, wetlands are usually used when water quality is the main focus, and, from a design standpoint, have much in common with wet ponds. However, wetlands require a much larger land area due to their shallow depth and therefore were not considered. As a result wet ponds are the only viable alternative.

End-of-Pipe Stormwater Management Facilities are preferred means to provide the required stormwater management works for new development areas. Conventional wet ponds have a permanent pool of water for treating incoming stormwater runoff, extended detention zone for erosion control and attenuation zone for flood control. Wet ponds require varied amounts of property to implement, since they can vary in depth. Wet ponds will be located within the proposed locations as suggested in Figures 11-1, 11-A and 11-B as well as the concept plan.

The direct infiltration of runoff is not recommended because adequate pre-treatment cannot be provided. However, the conveyance method could be implemented and would improve sediment and other potential contaminants from runoff prior to discharging to the infiltration system. This



method would also include pretreating runoff from the driveway and road surfaces by routing thorough oil/grit manholes and catch basins. In institutional/commercial areas, infiltration techniques are not applicable. The alternative preferred pre-treatment control is Oil/Grit separator. The additional use of vegetated filter strips and buffer strips in conjunction with the adjacent woodlots is also encouraged. Grassed swales and surface drainage is encouraged as much as possible, with swales potentially outletting to level spreaders adjacent to the woodlots.



Table 12-4 Feasible Stormwater Management Measures

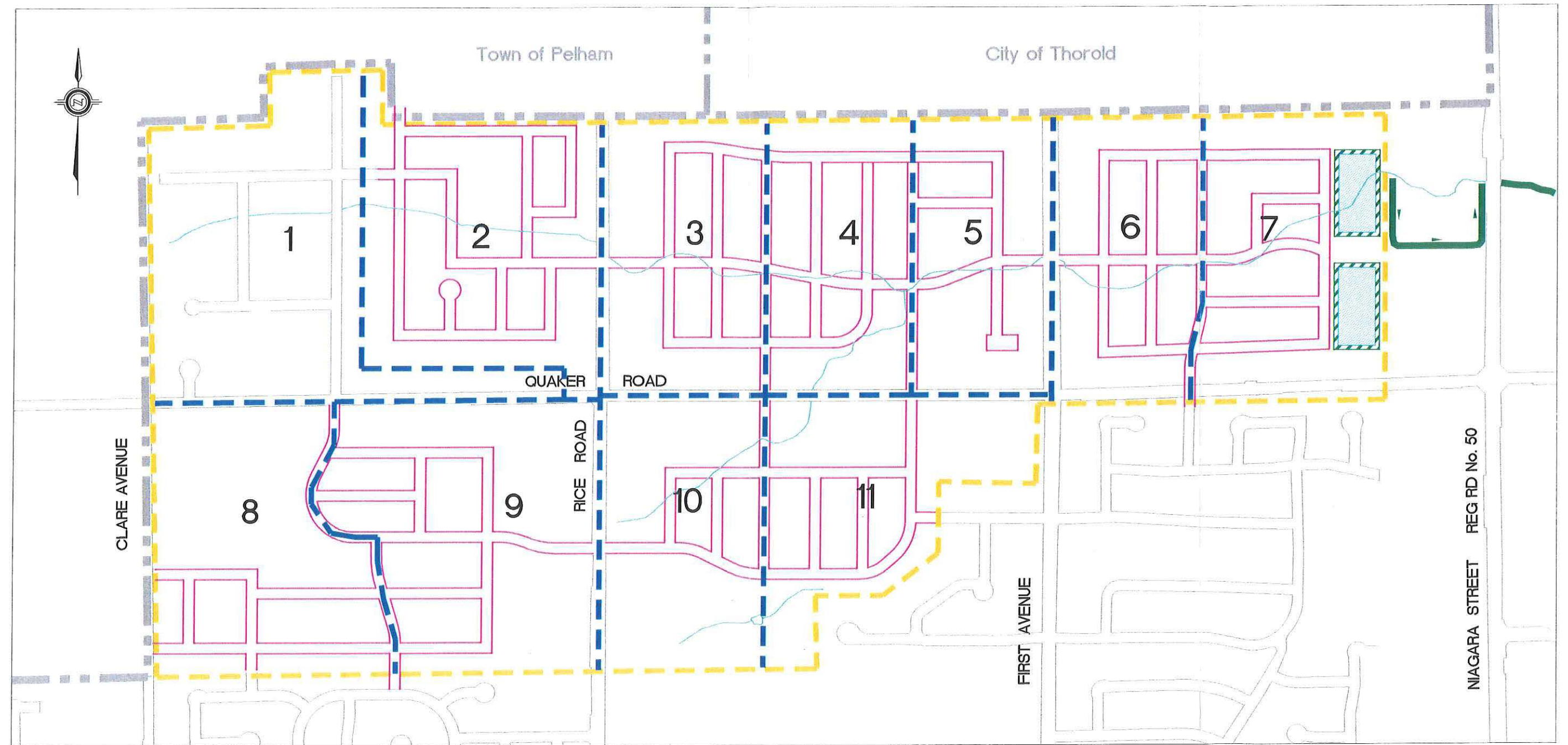
Measure	Benefits	Comments
LOT LEVEL CONTROLS		
i) Rooftop Storage	• Reduce peak flow rates to storm sewers	• Economical and requires little extra cost during construction • Applicable to large flat commercial and industrial rooftops • Ineffective in reducing runoff volume and water quality • Usually applied for infill development scenarios to mitigate the need for downstream storm sewer size increase • Few agencies allow rooftop storage
ii) Parking Lot Storage	• Store runoff to reduce peak flow rates in storm sewers	• Economical and requires little extra cost during construction • Applicable to commercial and industrial lots • Ineffective in reducing runoff volume and water quality • Usually applied for infill development scenarios to mitigate the need for downstream storm sewer size increase • Few agencies allow parking lot storage to reduce downstream post development peak flow rates for new sites
iii) Oil and Grit Separators	• Water quality enhancement.	• Valuable for small impervious areas • Typically implemented in industrial and commercial settings • Not typically acceptable in Highway drainage systems due to high potential for clogging
iv) Roof Leader to Ponding Areas	• Reduce peak flow rates and runoff volume	• Applicable where soils have percolation rate $\geq 15\text{mm/h}$ • Loss of utility of backyard following rain event
v) Roof Leader Discharge to Soakaway Pits	• Reduce peak flow rates and runoff volume	• Applicable where soils have percolation rate $\geq 15\text{mm/h}$ • Benefits include greater recharge with no inconvenience to the homeowner • High maintenance • May not be functional in the long run
vi) Infiltration Trenches	• Provide marginal flooding and erosion control • Ground water recharge and water quality enhancement can be achieved	• Implemented for drainage areas $< 2\text{ha}$ • Best implemented for compact housing in parks/green space areas • Water depth and bedrock should be greater than 1m below the bottom of the trench • Applicable where soils have percolation rate $\geq 15\text{mm/h}$ • Poor historical record of success
CONVEYANCE CONTROLS		
i) Pervious Pipe System	• Reduce peak flow rates and runoff volume • Water quality enhancement	• Long construction time • Pre-treatment of road drainage required • Pipe perforation get clogged with time • Applicable where soils have percolation rate $\geq 15\text{mm/h}$



Measure	Benefits	Comments
ii) Vegetated Swales/Enhanced Vegetated Swales	• water quality enhancement; • infiltration; • erosion control; and • flood control.	• Used to filter and detain storm water runoff as it is conveyed downstream. • Commonly implemented in road drainage systems with proven effectiveness. • Enhancements such as permanent check dams constructed at intervals along the swale and a trapezoidal cross-section will enhance infiltration and settling of suspended pollutants. • Pre-treatment should be provided before drainage from road networks is infiltrated
iii) Vegetated Filter Strips	• Water quality enhancement	• Feasible for drainage areas <2ha • Limited effectiveness for water quality control due to difficulty of maintaining sheet flow
iv) Oil/Grit Manholes or Traps Located in Catch basins	• Pre-treatment of runoff	• Extra deep sumps required to prevent resuspension of settled particles • Provides pre-treatment of runoff from the road network
END-OF-PIPE FACILITIES		
i) Constructed Wetlands	• water quality enhancement; • erosion control; and • flood control.	• Most promising end-of-pipe facility for water quality enhancement • Have been implemented in drainage systems with proven effectiveness • Contributing drainage areas greater than 5 hectares required to sustain permanent pool • Ponds require large blocks of land if flood control is provided
ii) Wet Ponds	• water quality enhancement; • erosion control; and • flood control.	• Most reliable end-of-pipe facilities in terms of pollutant removal • Have been implemented in drainage systems with proven effectiveness • Downstream environmental impacts related to increases in water temperature • Contributing drainage areas greater than 5 hectares required to sustain permanent pool
iii) Dry Ponds	• water quality enhancement; • erosion control; and • flood control.	• Have been implemented in drainage systems with varying success. • Limited in effectiveness for removing storm water contaminants. • Should be limited to areas that have a contributing drainage area greater than 5 hectares. • Should not be considered in watersheds with sensitive aquatic habitat (i.e. receiving watercourse designated as Protection Level 1 or 2 watercourse).



Figure 12-2 identifies the preferred drainage area tributaries to the stormwater management facilities under post development conditions.



LEGEND

-  MUNICIPAL BOUNDARY
-  STUDY AREA
-  CONCEPTUAL ROAD LAYOUT
-  PROPOSED STORMWATER COLLECTION SYSTEM
-  SUB SHED NUMBER

-  STORMWATER MANAGEMENT FACILITY (INCLUDING LANDSCAPING AREAS)
-  EXISTING DITCH
-  PROPOSED DITCH UPGRADE

WELLAND NORTHWEST SERVICING
MASTER PLAN
DRAINAGE AREAS TO
SWM FACILITIES

FIGURE 12-2




A Tyco International Ltd. Company



12.4.6. System Description

Due to space limitations provided by the concept plan, the pond was split into two equally sized ponds that are interconnected. Each pond was designed to accommodate approximately 32,000 m³ of storage, although due to the assumed geometry of the pond, the permanent pool ended up being twice as large as needed for both ponds, resulting in total storage of 39,500 m³. Pond outflow was limited to pre-development levels.

It should be noted that due to the macroscopic nature of this report, certain values have been assumed (although they still adhere to MOE guidelines) in order to provide a pond size. There is the possibility that these values will be changed during the detailed design process. As such, the pond size should be considered as approximate. The pond size could be reduced if the City decides to have a separate stormwater management facility (SWM) located near Niagara College to service the lands south of Quaker Road.

12.4.7. Recommended Stormwater Management Works

Table 12-5 Stormwater Management System Description

The following summarizes the proposed stormwater management system.

SWM Facility	Contributing Sub-catchments	Location	Tributary Drainage Area (Ha)	Pond Volume (m³)¹	Pond Area (Ha)²	100 Year Pre-Development Flow (m³/s)	100 Year Outflow (m³/s)	Outlet Size³ (mm)
1&2	All	East end of Study area	181	39,500	1.74	8.73	8.73	675



13. RECOMMENDED INFRASTRUCTURE PROJECTS

The following table summarizes the recommended infrastructure works for various water, sanitary, road and stormwater projects. **Appendix F** further details the cost breakdown.

Table 13-1 Recommended Infrastructure Works

The following table summarizes the recommended infrastructure works and estimated costs.

Project	Location	Sizes	Length (m)	Estimated Cost (millions)
Watermain	Throughout study area	200/300 mm	4239	1.8
Wastewater Sewer	Throughout study area	250	3300	1.5
Road System*	Throughout study area	-	2100-3000	13.4
Stormwater Sewer	Throughout study area	750 to 2100	5057	8.5
SWM Facility	East side of study area	-	-	1.37

Both of the future Quaker Road and Rice Road upgrade projects will follow the MEA Schedule “C” Class EA planning process. All other identified projects are Schedule “A”, “A+” or “B” projects.



14. CONSULTATION WITH REVIEW AGENCIES AND THE PUBLIC

14.1. Notification

To inform review agencies, affected landowners and general public of the project and solicit comments, project initiation and notice of public information centre were sent out. Copies of the newspaper notice and letters to review agencies circulated are included in **Appendix G**.

14.2. Public Information Centre – November 3rd, 2004

On November 3rd, 2004, a Public Information Centre (PIC) was held at the Quaker Road School from 4:00 pm – 8:00 pm. The following information was presented to the public.

- Project Background;
- Study Area Overview;
- Overview of the Class EA Process;
- Preliminary Concept Plan Guidelines;
- Purpose of the Master Servicing Plan;
- Water Distribution System Servicing Review;
- Sanitary Sewage Servicing Review;
- Roadways;
- Identification and Evaluation of Alternative Servicing Strategies (road and stormwater);
- Study Area Drainage;
- Stormwater Management Criteria;
- Stormwater Management Development Mitigation Strategies;
- Master Servicing Plan Schedule; and
- The Next Steps in the Planning Process.

The November 3rd, 2004 PIC was well attended with over 70 people in attendance generally representing the interests of residents, affected landowners and the development community. A copy of the display panels and attendance sheet is included in **Appendix H**.



14.3. Comments Received

Comments from Public/Affected Land Owners

Several written responses were received at and subsequent to the PIC. Comments received and associated responses are included in **Appendix H**. Comments to date generally relate to concerns over proposed land use change (i.e. future urban areas/land uses), possible redevelopment of the City's Welland Soccer Club lands and sidewalks/traffic surrounding the schools.

Review Agency Comments

To date comments have been received from the following agencies:

- Regional Niagara Planning and Development Department dated April 12, 2005 (summarized in Section 14.1) and July 21, 2004 (provided information).
- City of Thorold dated November 2, 2004 (provided and requested information).
- Ministry of Culture dated October 26, 2004, (noted potential for impacts to cultural/heritage resources and need for heritage assessment).
- NPCA dated May 17, 2005 provided comments on PIC information package with particular focus on the preliminary concept plan and potential impacts to study area watercourses (i.e. Tow Path Drain) and proposed SWM systems. Two meetings were held with the NPCA on December 11, 2006 and January 9, 2007 to discuss how the existing Town Path Drain would be incorporated in the preferred SWM servicing strategy. An agreement was made on the SWM servicing concept which focused on watercourse relocation including environmental management options for specific segments of the Tow Path Drain as well as stormwater management ponds being designed offline.

Appendix G includes all review agency comments received to date and where applicable responses.



15. ENVIRONMENTAL PROTECTION – MITIGATION

The following mitigative measures are recommended to ensure that any short-term disturbances are managed by the best available methods.

Protection of Natural Heritage Features

The Northwest Area study area contains a number of natural environmental features that, dependent upon location, should be evaluated in detail before a preferred land use concept is identified/approved and development proceeds.

Sedimentation/Runoff Controls and Protection of Aquatic and Natural Habitat

Specific mitigation measures to prevent sediments from entering area watercourses are as follows:

- Where construction occurs in proximity to watercourses, proper sedimentation/erosion controls will be employed to the satisfaction of all relevant agencies (i.e. MNR, NPCA and DFO). This will include sedimentation controls (silt fencing, temporary sediment control ponds) to be provided and maintained during construction as required.
- Groundwater removed during construction will be channeled or piped through stabilization and sedimentation ponds allowing the sediments to settle out before entering the storm sewer or watercourse. Where groundwater discharges to a watercourse, the associated outfall location will be protected against erosion using splash pads, geotextiles and/or rip-rap.
- As directed by NPCA/DFO/MNR, any water crossings to occur during periods of low flow and outside of fish spawning seasons.
- Practices described in “Guideline on Erosion and Sediment Control for Urban Construction Sites” (MNR, May 1987) and “Technical Guidelines Erosion and Sediment Control” (MNR, February 1989) will be followed.
- Any areas disturbed by construction will be restored and stabilized as soon as practically possible.
- All trees to be saved shall be clearly marked and identified in a tree protection plan.
- Timing of construction to have regard for wildlife habitat and breeding season.
- Maintain good construction management practices.



Contamination of Soils Through Spills and Leaks

This can be avoided by ensuring that fuel storage, refueling and maintenance of construction equipment are handled properly and not allowed in or adjacent to watercourses/bodies.

Contingency plans must be prepared before projects begin for the control and clean up of a spill if one should occur.

Works in Contaminated Areas

As per section 11.5, the eastern part of the study area including parts of the Tow Path Drain have been identified as requiring remediation. This must occur to the satisfaction of MOE prior to any construction activity taking place.

Short-Term Construction Related Impacts

During the course of construction, it is possible that traffic may be temporarily disrupted along City streets and Regional roads. The following measures will be employed to ensure that impacts are eliminated or minimized:

- Construction Traffic Management Plan will ensure a minimum of 1 lane (alternating traffic) to be maintained at all times for emergency access.
- Access to residences-businesses will be adequately addressed-maintained.
- Property and/or business owners will be notified in advance as to construction schedule/duration.

Noise

During development, construction operations will be restricted to the day (wherever possible). In addition, the contractor will be required to adhere to local noise by-laws.

Archaeological Impacts

The Northwest Area study area contains the potential for the discovery of archaeological resources. The Ministry of Culture has advised on the level of archaeological investigations required which would be completed as the urban boundary expansion moves forward. This includes a future Stage One archaeological investigation. If any archaeological and historical resources are discovered during the performance of construction work, the performance of the work in the area of discovery is to halt. The Ministry of Culture will then be notified for an



assessment of the discovery. Work in the area of the discovery would not resume until cleared to do so by the Ministry.

Other Measures

In addition, the provision of an experienced field representative to review construction will ensure that the project follows contract specifications and does not unnecessarily impact vegetation, the community or the aquatic environment. Furthermore, contract tender documents will address mitigative measures in an explicit manner and ensure that compliance is maintained.



16. PREFERRED SERVICING ALTERNATIVES SUMMARY

16.1. Water Distribution System

As noted in the section 12.1, new watermain will be looped off the proposed 400mm Region of Niagara watermain to service the study area. The mains have been sized to provide fire flow protection, but pressures in the west part of the study area are not adequate around peak hour demand most likely due to a shortcoming in the water network outside of the study area. A more detailed analysis should be completed to determine possible deficiencies within the system before proceeding with development.

16.2. Sanitary Sewer System

The sanitary system will be comprised of local 250mm diameter sewers located within each sub area that will drain to the recently constructed 750mm diameter Region of Niagara sewer that runs south on Rice Road and then east on Quaker Road. A section of 300mm sewer will be required to service the area west of Rice Road.

16.3. Road System

It is recommended that Rice Road, and First Avenue be widened from two lanes to four lanes and upgraded to urban standards from Woodlawn Road to Merritt Road as recommended in the City of Welland Transportation Planning Study. Quaker Road, between Niagara Street and South Pelham Road should also be widened to accommodate an additional lane in the eastbound and westbound directions. These projects would be defined as a Schedule "C" under the MEA Municipal Class EA document. It is also recommended that auxiliary left turn lanes be provided at key intersections along Rice Road, Quaker Road and First Avenue.

Under future conditions, it is recommended that the following intersections at Quaker Road at First Avenue be signalized once traffic signal warrants are met. The following intersections should be monitored for traffic signals once development is completed in the area as cross traffic may experience significant delays.

- Rice Road /EW2 (intersection south of Quaker Road),
- Quaker Road/ NS2 (intersection west of First Avenue); and
- Quaker Road/Montgomery Road.

It is recommended that the classification of Quaker Road be upgraded to an arterial road under the City's jurisdiction from its current collector road designation as its role in the road hierarchy



provides more of an arterial road function in the surrounding road network system. The main east west roads through the Northwest Area development area, both north and south of Quaker Road, and the north-south extension of Montgomery Road and the north-south road just west of First Avenue should be designated as collector roads with the provision of bike lanes.

Based on the land uses identified in the concept plan, all internal roads will be capable of accommodating the anticipated traffic volumes as two lane roads.

16.4. Stormwater Management System

Stormwater flow generated by the 2 to 100 year storm event will be directed to a new SWM facility located in the east end of the study area. The SWM facility will consist of two identically sized interconnected ponds that have been sized to attenuate minor and major post development flows to pre development levels, as required by the MOE. The SWM facility will have to be designed for water quality and erosion control. The collection system will be sized to accommodate stormwater to the 2 year storm event with flows in excess to be directed overland to the facility.



17. CONCLUSIONS AND RECOMMENDATIONS

17.1. Conclusions

Through the completion of this Planning and Servicing master plan study and supporting studies, the City has agreed that the preferred solutions to the problem statement (Section 6.0) consists of:

- New watermain to be looped off the new 400mm diameter Region of Niagara watermain to service the study area;
- Sanitary systems comprised of local 250mm diameter sewers within each sub areas (drain to a new 750mm diameter Region of Niagara sewer);
- Rice Road and First Avenue be widened to 4 lanes and upgraded to urban standards (from Woodlawn Road to Merrit Road). Quaker Road (between Niagara Street and South Pelham Road) also be widened to accommodate for additional land in the eastbound and westbound directions. Left turn lanes be provided at key intersections (Rice Road, Quaker Road and First Avenue). It is also recommended that traffic signals be placed at Quaker Road and First Avenue intersection; and
- New stormwater management facility located in the east end of the study area (generated by a 2 to 100 year storm event).

17.2. Recommendations

Considering the above, it is recommended that:

- Following EA Approval, the above mentioned projects proceed to detailed design and remaining approvals, as required;
- Required approvals (c.g. NPCA, MOE) be obtained as required; and
- The mitigation measures identified in Section 15 should be expanded upon at detailed design and implemented as part of construction and on-going operations processes.



18. SUMMARY

This Master Servicing Plan covers the process required to ensure that the proposed recommended municipal infrastructure projects and associated works meet the requirements of the EAA. The Class EA planning process requires initial screening for projects of this type and this initial screening has not identified any significant environmental concerns that cannot be addressed by incorporating established mitigation measures during construction.

The preferred servicing strategies resolve the problem statement identified in this report. A preliminary evaluation of potential impacts was included in the screening and indicated only minor and predictable impacts that are addressed by recommended mitigation measures presented in Section 15 that will also be further advanced at the detailed design stage as the projects move forward.

Public notification and opportunity for comment was provided and no comments were received that cannot be adequately addressed. As a result, the municipal infrastructure projects identified for implementation are considered to meet the requirements of the EAA.

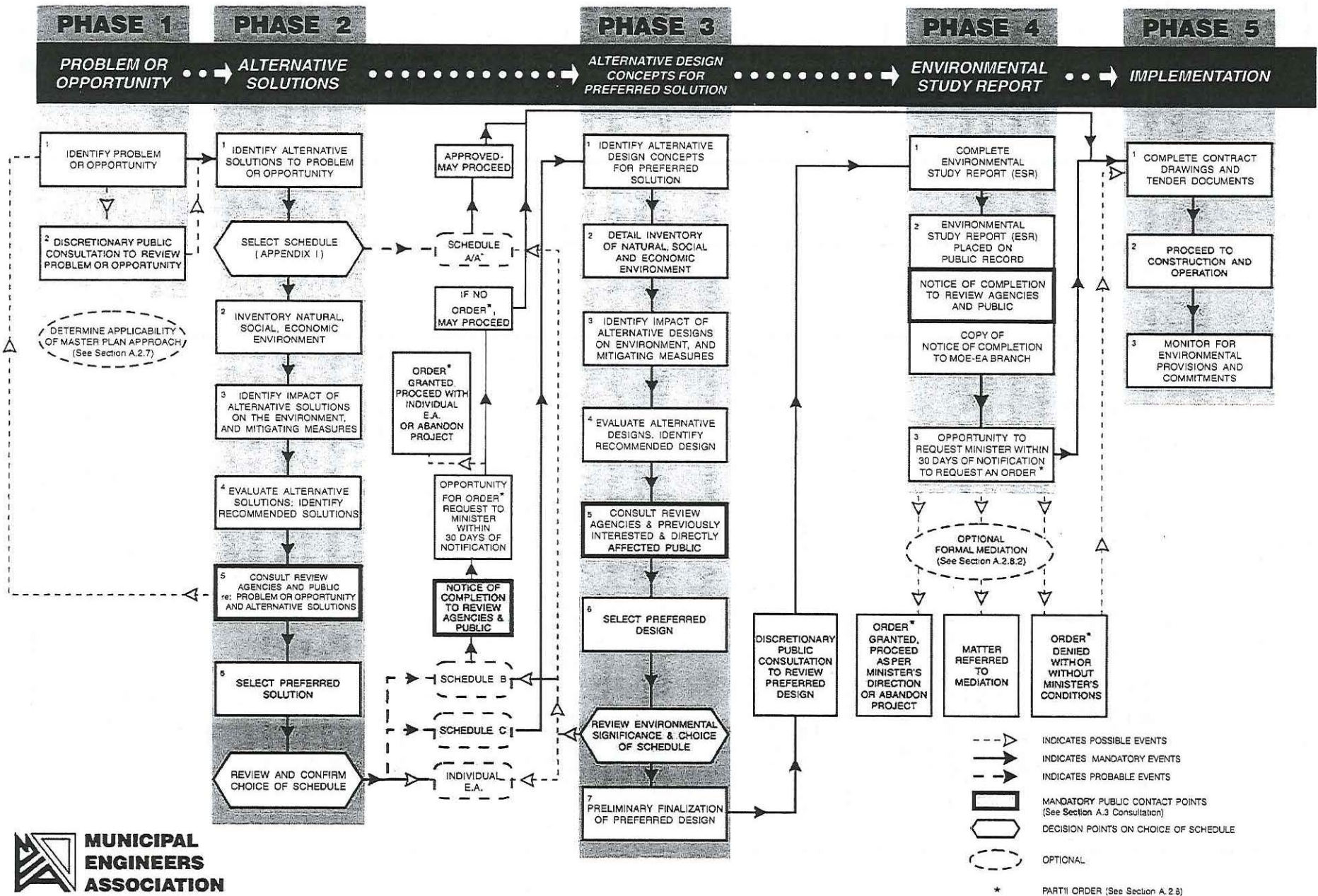
APPENDICES

APPENDIX A: Class Environmental Assessment Planning Process

EXHIBIT A.2

MUNICIPAL CLASS EA PLANNING AND DESIGN PROCESS

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



Description of the Project (Note: The Schedules shall be reviewed inclusively to ensure that the correct schedule is selected.)	Cost Limit for Project Approved Under Schedule			
	Pre-Approved		B	C
	A	A+		
CONSTRUCTION OR RECONSTRUCTION OF LINEAR PAVED FACILITIES AND RELATED FACILITIES				
11. Streetscaping (e.g. decorative lighting, benches, landscaping) not part of another project	-	<2.2 m	>2.2 m	-
12. a) Construction of localized operational improvements at specific locations (e.g. the addition of a ramp to an existing interchange; turning lanes at an intersection, but not a continuous centre left turning lane) b) Installation of guide rail	NL	<2.2 m -	>2.2 m -	- -
13. Installation, construction or reconstruction of traffic control devices (e.g. signing, signalization)	<8.7 m	-	>8.7 m	-
14. Construction of new parking lots	<8.7 m	-	> 8.7 m	-
15. Installation of safety projects (e.g. lighting including “high mast”, grooving, glare screens, safety barriers, energy attenuators)	<2.2 m	-	>2.2 m	-
16. Establishment of a roadside park or picnic area	-	-	NL	-
17. Culvert repair and replacement where the capacity of the culvert is not increased beyond the minimum municipal standard or the capacity required to adequately drain the area, whichever is greater, and where there is no change in drainage area	NL	-	-	-
18. Construction of a new culvert or increase culvert size due to change in the drainage area	-	-	NL	-
19. Reconstruction where the reconstructed road or other linear paved facilities (e.g. HOV lanes) will be for the same purpose, use, capacity and at the same location as the facility being reconstructed (e.g. no change in the number of lanes)	-	NL	-	-
20. Reconstruction or widening where the reconstructed road or other linear paved facilities (e.g. HOV lanes will <u>not</u> be for the same purpose, use, capacity or at the same location as the facility being reconstructed (e.g. additional lanes, continuous centre turn lane)	-	-	<2.2 m	>2.2 m
21. Construction of new roads or other linear paved facilities (e.g. HOV lanes)	-	-	<2.2 m	>2.2 m
22. Redesignation of an existing General Purpose Lane (GPL) or High Occupancy Vehicle (HOV) lanes through signage or pavement marking modifications (i.e. not requiring physical construction): • new parking or turning lane markings on an existing roadway • conversion of one-way or two-way streets • redesignation of existing GPL to HOV; or HOV to GPL	NL - -	- NL NL	- - -	- - -
23. Construction of local roads which are required as condition of approval on a site plan, consent, plan of subdivision or plan of condominium which will come into effect under the Planning Act prior to the construction of the road. [Note – Reference to “local” roads refers to roadway function not municipal jurisdiction. See definition in Glossary of Municipal Class EA.]	NL	-	-	-

MUNICIPAL WATER AND WASTEWATER PROJECTS**SCHEDULE B: ACTIVITIES SUBJECT TO THE SCREENING PROCESS**

(Note: The schedules shall be reviewed inclusively to ensure that the correct schedule is selected.)

The following Schedule B activities, having completed Phases 1 and 2 of the planning process, are approved subject to Screening. If the screening process, through Phases 1 and 2, results in other requirements of this Class EA being applicable, then those requirements must also be fulfilled.

For the following activities the proponent shall contact specific agencies and potentially affected members of the public (see Screening Criteria under Appendix 3). For example, if it is determined when planning to modify the intake to an existing water system, that the project will directly affect a permanent watercourse, then the proponent shall contact the Local District of the Ministry of Natural Resources and the Federal Department of Fisheries and Oceans - Habitat Management and Enhancement.

Agreements made or commitments given by the proponent to affected agencies or members of the public during the course of the screening process must be followed through and implemented or else the conditions of the EA approval will be deemed to be unfulfilled. If a party has a concern that cannot be resolved by discussion and negotiation between that party and the proponent, then the procedure to request an order may be invoked (see Section A.2.8). By the nature of Schedule B activities, however, it is anticipated that this will not occur frequently.

Two points of contact with the public are mandatory under the screening process. The proponent may select the method of public notification which best suits the circumstances of the specific project under consideration (see Exhibit A.2 - Flow Chart and Section A.3.5 - Public Consultation).

Wastewater Management Projects:

- 
1. Establish, extend or enlarge a sewage collection system and all works necessary to connect the system to an existing sewage outlet where such facilities are not in an existing road allowance or an existing utility corridor.

 2. Establish new stormwater retention/detention ponds and appurtenances or infiltration systems including outfall to receiving water body.
 3. Enlarge stormwater retention/detention ponds/ tanks or sanitary or combined sewage detention tanks by addition or replacement, at substantially the same location.
 4. Establish sewage flow equalization tankage in existing sewer system or at existing sewage treatment plants, or at existing pumping stations for influent and/or effluent control.
 5. Add additional lagoon cells or establish new lagoons, or install new or additional sewage storage tanks at an existing sewage system, where land acquisition is required but existing rated capacity will not be exceeded.
 6. Establish biosolids management facilities at:

SCHEDULE B - Continued

- revetment including soil bio-engineering techniques
 - reconstruction of a weir or dam.
20. Construction of spillway facilities at existing outfalls for erosion or sedimentation control.
 21. Construct a fishway or fish ladder in a natural watercourse, expressly for the purpose of providing a fishway.
 22. Enclose a watercourse in a storm sewer.
 23. Construct a stormwater control demonstration or pilot facility for the purpose of assessing new technology or procedures.
 24. Reconstruct existing weir or dam at the same location where the purpose, use and capacity are changed.
 25. Removal of an existing weir or dam.
 26. Establish stormwater infiltration system for groundwater recharge.
 27. A new holding tank that is designed for the total retention of all sanitary sewage disposed into it and requires periodic emptying.

Water Projects:

- 
1. Establish, extend or enlarge a water distribution system and all works necessary to connect the system to an existing system or water source, where such facilities are not in either an existing road allowance or an existing utility corridor.
 2. Establish facilities for disposal of process wastewater (e.g. install sewer connection, construct holding pond, dewatering and hauling operations to disposal sites).
 3. Expand existing water treatment plant including intake up to existing rated capacity where land acquisition is required.
 4. Retire a water facility which would have been planned under Schedule B or C of the Municipal Class EA for its establishment (See Glossary definition of Retirement).
 5. Increase pumping station capacity by adding or replacing equipment and appurtenances where new equipment is located in a new building or structure.
 6. Installation or replacement of standby power equipment located in a new building or structure.
 7. Expansions, improvements and modifications to existing patrol yards, equipment or materials storage facilities, and maintenance facilities where land acquisition is required.
 8. Establish new or expand/replace existing water storage facilities.

4.4 Master Planning Process

The Master Planning Process is discussed in Section A.2.7. The Master Plan must address at least the first two phases of the Class EA process. Given the broad scope of Master Plans, however, there are infinite ways of conducting them. Various approaches are described in this section, however, this information is provided as a guide only. Proponents are strongly recommended to adapt and tailor the details of these approaches to best suit their needs, as long as the resulting approach is in keeping with the requirements of the Class EA process and the intent of its application. The onus is on the proponent to determine the preferred approach for the issues being addressed by the municipality. Prior to commencing a Master Plan, proponents are urged to contact the EAA Branch to discuss their proposed approach.

Approach #1

This approach involves the preparation of a Master Plan document at the conclusion of Phases 1 and 2 of the Municipal Class EA process. The Master Plan document would be made available for public comment prior to being approved by the municipality.

Typically, the Master Plan would be done at a broad level of assessment thereby requiring more detailed investigations at the project-specific level in order to fulfil the Municipal Class EA documentation requirements for the specific Schedule B and C projects identified within the Master Plan.

The Master Plan would therefore become the basis for, and be used in support of, future investigations for the specific Schedule B and C projects identified within it. Schedule B projects would require the filing of the Project file for public review while Schedule C projects would have to fulfil Phases 3 and 4 prior to filing an Environmental Study Report (ESR) for public review.

Approach #2

This approach involves the preparation of a Master Plan document at the conclusion of Phases 1 and 2 of the Municipal Class EA process where the level of investigation, consultation and documentation are sufficient to fulfil the requirements for Schedule B projects. Accordingly, the final public notice for the Master Plan could become the Notice of Completion for the Schedule B projects within it. Any Schedule C projects, however, would have to fulfil Phases 3 and 4 prior to filing an ESR(s) for public review. The Master Plan would provide the basis for future investigations for the specific Schedule C projects identified within it.

Approach #3

This approach involves the preparation of a Master Plan document at the conclusion of Phase 4 of the Municipal Class EA process. In this approach one document is prepared: the Master Plan to document Phases 1 to 4 of the Class EA process for Schedule B and/or Schedule C projects. Therefore, the final public notice for the Master Plan could become the Notice of Completion for the Schedule B and C projects within it.

Depending on the scope of the Master Plan, this approach would likely result in extensive documentation should the Master Plan include numerous Schedule C projects. The proponent should take this into consideration when determining the appropriateness of using this approach.

Approach #4 - Integration with the Planning Act

Given the broad scope of Master Plans, it may be appropriate to integrate with approvals under the Planning Act. For example, the preparation of a new official plan or a comprehensive official plan amendment could be accompanied by master plans for water, wastewater and transportation. When these planning documents are prepared simultaneously, alternatives can be assessed taking into account land use and servicing issues while addressing a preferred alternative which minimizes, to the extent possible, the impact on the community, natural environment and the economy. Often the range of alternatives that can be assessed for servicing are greater because the land use plan has not been finalized.

A master servicing plan prepared in this fashion establishes need and justification in a very broad context. This approach would satisfy early phases of the Class EA including Phases 1 and 2 for Schedule B projects and may satisfy, in addition, Phases 3 and 4 for Schedule C projects. This approach is best suited when planning for a significant geographical area in the long term where interdependent decisions which impact servicing and land use are being made and the range of servicing alternatives needs to be addressed in an integrated fashion in order to recommend the best overall solution for the community.

To fulfil the requirements under the Planning Act, the requirements in Section A.2.9 of this document apply.

Master Plan Reviews

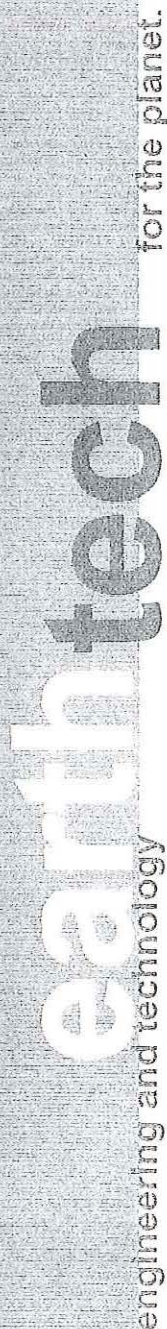
It is recommended that the proponent include within the Master Plan, regardless of the approach followed, a process stating clearly to the public and potentially affected persons when and how the Master Plan will be reviewed.

A Master Plan should be reviewed every five years to determine the need for a detailed formal review and/or updating. Potential changes which may trigger the need for a detailed review include:

- major changes to original assumptions
- major changes to components of the Master Plan
- significant new environmental effects
- major changes in proposed timing of projects within the Master Plan

For specific projects identified in the Master Plan, and which are subject to the Municipal Class EA, revisions and addenda are addressed in Sections A.4.1.1 and A.4.2.2 in Part A of this document.

APPENDIX B: Environmental Impact Study



Environmental Impact Study



Earth Tech Canada Inc.
2nd Floor, Corbloc Building
80 King Street
St. Catharines, Ontario
L2R 7G1



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Table 2	Existing Aquatic Conditions
Figure 1	Study Area

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1. BACKGROUND AND PURPOSE

The City of Welland is currently reviewing/updating its Official Plan. As part of this review, the City is looking for additional lands to accommodate future residential development. One candidate area is the northwest part of the City. Accordingly, the City is proposing a Planning and Servicing Review for the northwest area of the City. The major components of the Study will include a review of the Provincial Policy Statement and Regional Policy Plan, identification of development constraints from environmental, traffic, water, sewer, drainage and stormwater management perspectives and a conclusion that the study area can be designated for urban growth. The review shall be conducted in accordance with the provisions of the Environmental Assessment Act.

This report is a preliminary environmental review to identify significant natural features and recommendations for mitigative measures. Information in this report should be used to help identify development constraints and areas acceptable for urban growth.

2. EXISTING TERRESTRIAL CONDITIONS

2.1. Study Area and Surrounding Area

The following provides a summary of study area and surrounding area features as documented from Ministry of Natural Resources information. Supplementing this information are the results of terrestrial investigations that were conducted for three development blocks that comprise the study area.

2.1.1. Regional or Local Heritage Resources

Rose Little Woodlot – Life Science Site

The Rose Little Woodlot is found directly north of Montgomery Road, adjacent to the study area. The woodlot is approximately 26.0 hectares, drained by streams that feed into the Welland Canal. Dominant vegetation species throughout are sugar maple (*Acer saccharum*), American beech (*Fagus grandifolia*) and red oak (*Quercus rubra*). Other species found were bitternut hickory (*Carya cordiformis*), pignut hickory (*Carya glabra*) and shagbark hickory (*Carya ovata*), basswood (*Tilia americana*), yellow birch (*Betula alleghaniensis*), largetooth aspen (*Populus grandidentata*), white ash (*Fraxinus americana*) and red ash (*Fraxinus pennsylvanica*), butternut walnut (*Juglans cinerea*) and black cherry (*Prunus serotina*), tulip-tree (*Liriodendron tulipifera*), blue-beech (*Carpinus caroliniana*), sassafras (*Sassafras albidum*), eastern flowering dogwood (*Cornus florida*), and witch-hazel (*Hamamelis virginiana*). Trembling aspen (*Populus tremuloides*), hawthorn (*Crataegus conspicua*) and staghorn sumac (*Rhus typhina*) are abundant along the edges. North of Merritt Street, white pine (*Pinus strobus*), hop-hornbeam (*Ostrya virginiana*), white birch (*Betula papyrifera*) and red maple (*Acer rubrum*) are present. Of special interest is the



American chestnut (*Castanea dentata*) found along the northern edges of both woodlots north of Merritt Street. South of Merritt Road, silver maple (*Acer saccharinum*), black willow (*Salix nigra*), slippery elm (*Ulmus rubra*) and black ash (*Fraxinus nigra*) were also seen. The understory vegetation consists of canopy species, common elderberry (*Sambucus canadensis*) and spicebush (*Lindera benzoin*). This area is also a deer wintering area.

Kunda Park Forest Life Science Area of Natural and Scientific Interest

Kunda Park Forest is found north of the Rose Little Woodlot. This area can be described as flat, with poorly drained sand. It is reported to have a variety of native ferns, several Carolinian tree species and wildlife, however no features above local significance levels were reported.

Niagara Street-Cataract Road Woodlots Locally Significant Wetland

The area is a locally significant wetland complex comprised of four individual wetlands (92.5% swamp and 7.5% marsh), adjacent to the northeastern boundary of the study area. Vegetation communities include free-floating plants (i.e. duckweed [*Spirodela polyrhiza*]), submerged plants (i.e. water milfoil [*Myriophyllum sp.*]), robust emergents (i.e. cattail [*Typha sp.*], purple loosestrife [*Lythrum salicaria*]), low shrubs (i.e. dogwood [*Cornus sp.*], meadowsweet [*Spiraea sp.*], highbush blueberry [*Vaccinium corymbosum*]), and deciduous trees (i.e. red maple, bur oak [*Quercus macrocarpa*]). This area is also a deer wintering area.

The above features are not connected to the study area by drainage, however possible corridors existing between Blocks B and C and the Niagara Street-Cataract Road Woodlot LSW.

2.1.2. Site Investigations

Investigations of terrestrial plant communities were undertaken on November 7, 2003. Further investigation was completed December 5, 2003. The three locations were as follows:

- Block A: Woodlot at the corner of Clare Avenue and Quaker Road in the western section of the study area.
- Block B: Woodlot on the northwestern corner of the intersection of Cataract Road and Quaker Road in the approximate centre of the study area.
- Block C: Area surrounding the unnamed watercourse on the eastern side of Cataract Road in the northeastern section of the study area.

Figure 1 illustrates the study area.



2.2. Terrestrial Plant Communities, Species, Significance and Recommendations

Terrestrial vegetation communities were described and classified as per the methodology and the system outlined for Ecological Land Classification (ELC) for Southern Ontario (Lee *et al.*, 1998). Information from the site investigation is summarized in the following table (Table 1).

Community and Species rankings were verified in order to assess the significance of vegetation communities. Though additional comments are made where possible, this does not include an assessment for local significance (i.e. woodlots or wetlands).

For example, woodlots represent approx. 15-20% of the study area. The Ontario Natural Heritage Reference Manual (reference document deferred to in the absence of local municipal criteria for significant woodlands) states that woodlands over 40 ha should be considered for significance when total woodland cover is over 15%. However, within the context of the surrounding area, where total woodland cover may be as low as 5%, the manual recommends assessing woodlots between 2 and 4 ha for significance. These nuances may need to be considered during later stages of the planning process.



Table 1. Terrestrial Plan Communities, Species and Recommendations

Block	Description	ELC Vegetation Units	Species List	Significance	Other Information	Recommendations
A1	Two distinct vegetation communities	FOD 9-4 Fresh-Moist Shagbark Hickory Deciduous Forest Type	• Dominated by shagbark hickory, white elm, pignut hickory, sugar maple (average diameter at breast height (dbh) is 35 cm) • Groundcover includes mosses	• Community significance: S3S4 (uncommon) in Ont. • Species significance: pignut hickory ranked S3 (rare to uncommon) in Ont. and considered regionally rare in Niagara Region	• Water present in areas surrounding section of forest. • This is an inclusion in a wetter area described as SWD 1-1.	• Protect as a Significant Feature • Wetland buffer (up to 30 m) may be required on the east side. • North and south edges are drier with hard treed edges. Forest buffer (up to 15 m) may be required.
		SWD 1-1 Swamp White Oak Mineral Deciduous Swamp Type	• Dominated by swamp white oak (<i>Quercus bicolor</i>), silver maple, white ash, black walnut (average dbh 40 cm)	• Community significance: S2/S3 (very rare to rare/uncommon) in Ont. • Species significance: swamp white oak considered S4 (common) in Ont.	• Water present at surface in areas (up to 20% ground surface).	• Final buffer width will depend on future use/anticipated impacts.



Block	Description	ELC Vegetation Units	Species List	Significance	Other Information	Recommendations
B1	One distinct vegetation community	FOD 7 Fresh-Moist Lowland Deciduous Forest Ecosite	• Trees include white elm, white ash, black walnut, silver maple with several London plane-tree (<i>Platanus acerifolia</i>) on the south edge. (Average dbh of 25 cm for woodlot) • Shrubs include gray dogwood (<i>Cornus foemina</i>) and red-osier dogwood (<i>Cornus stolonifera</i>), • Understory species goldenrod (<i>Solidago sp.</i>), garlic mustard (<i>Alliaria petiolata</i>), purple loosestrife (<i>Lythrum salicaria</i>)	• Community significance: not ranked – likely S5 or “very common” in Ont. • Species significance: none observed.	• Area is a mixture of wet marsh meadow and lowland white elm forest in the center of the property. • The lowland white elm forest is in decline. • Previous soil disturbance: evidence of soil trenching. • A pond was observed east of B1 in Block B. The pond was approximately 5 meters in diameter and less than 20 centimeters deep. This pond was determined to be a continuation of stormwater runoff/drainage through wooded area B1 and a cultivated field. To the north of the pond was a cultivated field and to the south, a fallow field. No significant species were observed in the area.	• Consider enhancing current ecological function of the area with a naturalized stormwater management facilities within the center of the woodlot • Retain a continuous screen of existing vegetation as a view screen. Ensure that any trees to be maintained are adequately protected during construction.



Block	Description	ELC Vegetation Units	Species List	Significance	Other Information	Recommendations
B2	Four distinct vegetation communities	FOD 7-5 Fresh-Moist Black Maple Lowland Deciduous Forest Type	• Dominated by black maple (<i>Acer saccharum ssp. nigra</i>) with sugar maple, swamp maple (<i>Acer x freemanii</i>), white pine, spruce (<i>Picea sp.</i>) and black cherry (average dbh of deciduous trees 35 cm; white pine 45 cm) • Understory predominantly raspberry (<i>Rubus sp.</i>), sedges (<i>Carex sp.</i>).	• Community significance: ranked "S3?" in Ont. – meaning possibly "rare to uncommon". • Species significance: none observed.	• Cavity trees and snags present, especially in supercanopy white pine that are also acting as perch trees (for raptors).	• Protect this community as a Significant Feature. • Further delineation of the area by qualified personnel is required prior to consideration of surrounding communities for development. • Forest buffer (up to 20 m) may be required if any surrounding communities are developed. • Final buffer width will depend on future use/anticipated impacts.
		FOD 7-1 Fresh-Moist White Elm Lowland Deciduous Forest Type	• Dominated by white elm, silver maple, Scots pine (<i>Pinus sylvestrus</i>), goldenrod spp. (<i>Solidago sp.</i>), gray dogwood (<i>Cornus foemina</i>) (average dbh 15 cm)	• Community significance: not ranked – likely S5 or "very common" in Ont. • Species significance: none observed.	• May be considered locally significant as part of B2's threshold size to protect elements of "interior forest habitat". Note that no part of the woodland is over 100 metres from the edge.	• No special measures required. • Subject to more detailed field review, there may be potential for a naturalized stormwater management facilities within the centre of this unit – provided that a screen of existing vegetation is retained as a view screen.



Block	Description	ELC Vegetation Units	Species List	Significance	Other Information	Recommendations
B2 cont'd	Four distinct vegetation communities	CUT 1-4 Gray Dogwood Cultural Thicket Type	• Dominated by gray dogwood (average height 1.5 m) • Other understory species include goldenrod spp., aster spp. (<i>Aster sp.</i>), blackberry (<i>Rubus canadensis</i>), heal all (<i>Prunella vulgaris ssp. lanceolata</i>)	• Community significance: cultural communities are not ranked. • Species Significance: none observed.	• Mosaic and/or uneven transition with SWT 2-9	• Locate and identify any significant inclusions of SWT 2-9. See below for further recommendations. • No special measures required for CUT 1-4.
		SWT 2-9 Gray Dogwood Mineral Thicket Swamp Type	• Dominated by gray dogwood (average height 1.5 m) • Other species include purple loosestrife, teasel (<i>Dipsacus fullonum</i>), sedges, grasses, rushes	• Community significance: S3/S4 (uncommon in Ont.). Locally common in Niagara. • Species significance: none observed.	• Though less than 750 metres from a PSW, this cannot be complexed (combined with the PSW already identified) This is because, with reference to S. Ont. Wetland Evaluation Criteria, the swamp is less than 0.5 hectares in size and it occupies a completely different watershed (Singer Drain).	• Protect part of this community – with special emphasis on riparian and online “floodplain” vegetation • Floodplain buffer recommended (5 m setback from any defined banks) - to be finalized following community delineation
C1	Eight distinct vegetation communities	CUT 1-4 Gray Dogwood Cultural Thicket Type	• Dominated by gray dogwood, red osier dogwood (<i>Cornus stolonifera</i>), with some eastern red cedar (<i>Juniperus virginiana</i>) (average height 1.5 m) • Understory consists of grasses, sedges.	• Community significance: cultural communities are not ranked. • Species Significance: none observed.	• Gray Dogwood Cultural Thicket dominates Block C. • Nesting observed (one identified as yellow warbler [<i>Dendroica petechia</i>]), considered S5, very common in Ont.	• Locate and identify any significant inclusions of SWT 2-9. See below for recommendations. • No special measures required for CUT 1-4.



Block	Description	ELC Vegetation Units	Species List	Significance	Other Information	Recommendations
C1 cont'd	Eight distinct vegetation communities	CUT 1-4 Gray Dogwood Cultural Thicket Type with White Ash/White Elm overstorey	• Dominated by gray dogwood, red osier dogwood (average height 1.5 m) • Inclusions of deciduous forest dominated by immature white ash, white elm.	• Community significance: cultural communities are not ranked. • Species significance: none observed.	• An inclusion within Gray Dogwood Cultural Thicket Swamp • A section adjacent to Cataract Road consists of a white elm/white ash cover.	• Locate and identify any significant inclusions of SWT 2-9. See below for recommendations. • No special measures required for CUT 1-4.
		SWT 2-9 Gray Dogwood Mineral Thicket Swamp Type	• Lowland wet thicket dominated by gray dogwood, red osier dogwood (average height 1.5 m). • Other shrubs include common buckthorn (<i>Rhamnus cathartica</i>). • Understory consists of sedge (<i>Carex sp.</i>), purple loosestrife, goldenrod, brome grass (<i>Bromus sp.</i>).	• Community significance: S3/S4 (uncommon in Ont.). Locally common in Niagara. • Species significance: none observed.	• An inclusion within Gray Dogwood Cultural Thicket Swamp. • Water present at surface in areas.	• Protect part of this community – with special emphasis on riparian and online “floodplain” vegetation • Floodplain buffer recommended (5 m setback from any defined banks) - to be finalized following community delineation



Block	Description	ELC Vegetation Units	Species List	Significance	Other Information	Recommendations
C1 cont'd	Eight distinct vegetation communities	MAM 2-2 Reed-canary Grass Mineral Meadow Marsh Type	• Dominated by reed-canary grass (<i>Phalaris arundinacea</i>), brome grass, purple loosestrife, green sedge (average height 0.5 m) • Shrub species include European privet (<i>Ligustrum vulgare</i>), pasture rose (<i>Rosa carolina</i>), wild plum (<i>Prunus sp.</i>), one seeded hawthorn (<i>Crataegus monogyna</i>) • Tree/shrub species include white elm, black walnut	• Community significance: not ranked – likely S5 or “very common” in Ont. • Species significance: none observed (predominantly exotic species)	• An inclusion within Gray Dogwood Cultural Thicket Swamp • Grasses and sedges dominate with an abundance of purple loosestrife • Daylighting of groundwater was observed in central area of Block C. Strong odours indicate possible contamination.	• Maintain as much riparian and online “floodplain” vegetation as possible • Where applicable, protect tributary banks with setback buffer (up to 5 m). • Potential to receive and filter overflow from stormwater pond. • Potential to enhance by planting native species
		CUM 1-1 Dry-Moist Old Field Meadow Type	• Dominated by reed-canary grass, brome grass, purple loosestrife, green sedge (average height 0.5 m)	• Community significance: cultural communities are not ranked. • Species significance: none observed.	• An inclusion within Gray Dogwood Cultural Thicket Swamp	• No special measures required.



Block	Description	ELC Vegetation Units	Species List	Significance	Other Information	Recommendations
C1 cont'd	Eight distinct vegetation communities	FOD 9-2 Fresh-Moist Oak-Maple Deciduous Forest Type	Lowland wet woods dominated by pin oak (<i>Quercus palustris</i>), silver maple, black cherry, red maple, Scots pine (average dbh 30 cm)	- Community Significance: Pin Oak Wet Woods Community is considered S3 in Ont. - Species Significance: Pin Oak is classified as S3 in Ont. While common in Niagara, the Region still recommends that it be managed as regionally rare in order to respect provincial rarity.	An inclusion of approx. 0.5 ha within an area dominated by Gray Dogwood Cultural Thicket Swamp	- Protect as a Significant Feature - Given that pin oak was observed throughout the area, a more thorough review is recommended prior to development in order to properly delineate the community and any individual specimens of pin oak. - Ensure that wetland buffers (up to 30 m) are considered.
		CUP 3-9 Norway Spruce Coniferous Plantation Type	Predominantly Scots pine, Norway spruce (<i>Picea abies</i>) (average dbh 30 cm)	- Community significance: cultural communities are not ranked. - Species significance: none observed.	- An inclusion within Gray Dogwood Cultural Thicket Swamp - Borders tractor-trailer parking lot to the west.	- No special measures necessary - If thinned, favor native species where possible.
		CUP 1-3 Black Walnut Deciduous Plantation Type	- Dominated by black walnut, poplar (<i>Populus sp</i>), trembling aspen, large-toothed aspen (average dbh 40 cm) - Understory consisted of grasses.	- Community significance: cultural communities are not ranked. - Species significance: none observed.	- An inclusion within Gray Dogwood Cultural Thicket Swamp Type - Groundcover consists of manicured lawn.	Protect only larger walnuts in riparian zone providing shade to the watercourse.

Figure 1. Study Area



**Northwest Area
Planning and Servicing Review**

EARTH TECH
A Tyco Infrastructure Services Company



3. EXISTING AQUATIC CONDITIONS/FISHERIES

Within the study area, detailed watercourse observations were made for four 20-metre sections near major road crossings (marked on sample points "a" through "d" on Figure 1). Configuration, average dimensions, substrate and riparian vegetation were recorded. More general observations were made of the watercourse configuration between each of the above sample points and the edge of the study area. These observations are summarized in Table 2 below. All tributaries are unnamed. The study area is limited to 130 hectares. Though the drainage is larger than this, it would still be considered a relatively small subwatershed. This is reflected in the quantity of flow and flooding pattern observed in the field.

Interpretation of fish habitat potential is also provided based on MNR file information on species occurrence. This was only available for the Welland Canal Tributary system as a whole and was not broken down for individual tributaries. Fish species were predominantly warmwater, with a wide range of substrate preferences, and included the following: threespine stickleback (*Gasterosteus aculeatus*), channel catfish (*Ictalurus punctatus*), northern pike (*Esox lucius*), common carp (*Cyprinus carpio*), blacknose dace (*Notropis heterolepsis*), creek chub (*Coxius plumbeus*), spottail shiner (*Notropis hudsonius*), trout-perch (*Percopsis omiscomaycus*), white perch (*Morone americana*), smallmouth bass (*Micropterus dolomieu*), largemouth bass (*Micropterus salmoides*), rock bass (*Ambloplites rupestris*), pumpkinseed (*Lepomis gibbosus*), bluegill (*Lepomis macrochirus*), freshwater drum (*Aplodinatus grunneis*), white bass (*Pomoxis annularis*), yellow Perch (*Perca flavescens*), alewife (*Alosa pseudoharengus*), gizzard shad (*Dorosoma cepedianum*), bluntnose minnow (*Pimephales notatus*) and logperch (*Percina caprodes*).

Note that none of the above species are considered provincially significant in terms of NHIC (Natural Heritage Information System) rarity rankings.

Possible regulatory requirements are also provided in Table 2. If fish habitat compensation measures are required, enhancement options would be relatively straightforward: in spite of the prominence of silt in the stream bottom, patches of sand and gravel were observed close to the surface (based on exposed banks, recently scoured pools, and soil texture of near-by drylands). Substrate diversity is therefore already in place in order to allow for a variety of habitat enhancement measures to be undertaken effectively and efficiently.



Table 2. Existing Aquatic Conditions

Watercourse Section	Field Observations	Interpretation of MNR info based on habitat	Regulatory Requirements ^{1,2}
a) <i>Tributary Road Crossing</i> (at Line Avenue)	<i>East side only:</i> • Configuration: dug drainage ditch with grass on either side. • Dimensions: 46 cm wide, < 1 cm deep, < 0.5 % slope. • Substrate: silty • Riparian vegetation: common buckthorn, gray dogwood, purple loosestrife, goldenrod, asters, planted white birch trees (average cover 30%)	• Species typical of heavily urbanized environments and stormwater drains may be found such as blacknose dace and channel catfish	• <i>Federal Fisheries Act</i> authorization may be required, if in-water works are expected. • <i>Fish Habitat</i> Compensation may be required in the case of HADD of intermittent warmwater baitfish habitat. Enhancement opportunities include substrate enhancement, aquatic/ emergent vegetation removal, creation of refuge areas. • An MNR work permit (Ont. Lakes and Rivers Improvement Act) may be required for any modification of stream banks. • Warmwater fisheries timing window may apply (i.e. construction allowable only from July 1st to March 30th - subject to MNR).
(a-b) <i>Tributary Section</i>	• Configuration: Riffle-run complex near "a" becomes part of channelized stormwater drainage system, mainly open field swales, leading to "b".	• Same as above	• Same as above



Watercourse Section	Field Observations	Interpretation of MNR info based on habitat	Regulatory Requirements ^{1,2}
b) Tributary Crossing (at Rice Road)	(Note: Crossing divided through two culverts) <i>East Side:</i> • Configuration: meanders with some pooling • Dimensions: Ditch is 15 cm deep. Both culverts are empty to the same area (120 cm wide). Slope < 0.5 %. • Substrate: silty • Riparian vegetation: mainly Bulrushes (<i>Scirpus sp.</i>) along roadside (average cover 20%) <i>West Side</i> • Configuration: meanders with some pooling • Dimensions: South culvert is 60 cm wide, less than 20 cm deep; North culvert is 60 cm wide, less than 10 cm deep. Slope < 0.5 %. • Substrate: silty • Riparian vegetation: cultivated grass around south culvert (average cover 10%); horsetail (<i>Equisetum sp.</i>), wild asparagus (<i>Asparagus officinalis</i>), milkweed (<i>Asclepias sp.</i>), bulrushes near north culvert (average cover 60%)	• Small riverine warmwater species may be found such as three spine stickleback.	• <i>Federal Fisheries Act</i> authorization may be required, if in-water works are expected. • <i>Fish Habitat</i> Compensation may be required in the case of HADD of intermittent warmwater baitfish habitat. Enhancement opportunities include substrate enhancement, aquatic/ emergent vegetation removal, creation of refuge areas. • An MNR work permit (Ont. Lakes and Rivers Improvement Act) may be required for any modification of stream banks. • Warmwater fisheries timing window may apply (i.e. construction allowable only from July 1st to March 30th - subject to MNR).
(b-c) Tributary Section	Agricultural swales through open fields.	• Both urban channel species and small riverine species may be found.	• Same as above



Watercourse Section	Field Observations	Interpretation of MNR info based on habitat	Regulatory Requirements ^{1,2}
c) <i>Tributary Crossing (at Quaker Road)</i>	<i>North:</i> • Configuration: Ponding with stormwater run off from surrounding ditches. • Dimensions: 37 cm wide, 10 cm deep. Slope < 0.5 %. • Substrate: silty with some sand sections • Riparian vegetation: purple loosestrife, asters, grasses, cattails (average cover 30%) <i>South:</i> • Configuration: same as for the north – with very slow-moving water. • Dimensions: 37 cm wide, 20 cm deep. Slope < 0.5 %. • Substrate: silty • Riparian vegetation: grasses, asters (average cover 25%)	• Small riverine species may be found.	• <i>Federal Fisheries Act</i> authorization may be required, if in-water works are expected. • <i>Fish Habitat</i> Compensation may be required in the case of HADD of intermittent warmwater baitfish habitat. Enhancement opportunities include substrate enhancement, aquatic/ emergent vegetation removal, creation of refuge areas. • An MNR work permit (Ont. Lakes and Rivers Improvement Act) may be required for any modification of stream banks. • Warmwater fisheries timing window may apply (i.e. construction allowable only from July 1st to March 30th - subject to MNR).
(c-d) <i>Tributary Section</i>	• Configuration: meandering with some online pooling. Few riffle-run sequences observed. Much emergent aquatic vegetation.	• Same as above	• Same as above



Watercourse Section	Field Observations	Interpretation of MNR info based on habitat	Regulatory Requirements ^{1,2}
d) <i>Tributary Crossing (at Cataract Road)</i>	<i>East Side:</i> • Configuration: Stream complex is as follows - pool; run; pool; riffles • Dimensions: 60 cm wide, 36 cm deep. Slope < 0.5 %. • Substrate: predominantly silty • Riparian vegetation: milkweed, rushes, thistle, asters, goldenrod, purple loosestrife, Queen Anne's lace (<i>Daucus carota</i>), dandelion (<i>Taraxacum sp</i>) (average cover 80%) <i>West Side:</i> • Configuration: pooling. • Dimensions: 160 cm wide, 32 cm deep. Slope < 0.5 %. • Substrate: silty with some sand and gravel patches • Riparian vegetation: buckthorn, gray dogwood (average cover 70%)	• Small to intermediate riverine warmwater species may be found: common carp, spottail shiner, and blue gill.	• <i>Federal Fisheries Act</i> authorization may be required, if in-water works are expected. • <i>Fish Habitat</i> Compensation may be required in the case of HADD of intermittent warmwater baitfish habitat. Enhancement opportunities include substrate enhancement, aquatic/emergent vegetation removal, creation of refuge areas. • An MNR work permit (Ont. Lakes and Rivers Improvement Act) may be required for any modification of stream banks. • Warmwater fisheries timing window may apply (i.e. construction allowable only from July 1st to March 30th - subject to MNR).
(d to end) <i>Tributary Section to eastern edge of study area</i>	• Configuration: meandering online pooling, few riffle and run sequences, sections of sand and gravel substrate observed towards the Welland Canal.	• Intermediate riverine warmwater species may be found: common carp, spottail shiner, blue gill and others from the sunfish family (i.e. pumpkinhead) and possibly northern pike.	• Same as above

Notes:

¹ Section 35(2) of the federal Fisheries Act defines the harmful alteration, disruption or destruction (HADD) of fish habitat. Where HADD is identified, the Department of Fisheries and Oceans (DFO) requires a detailed Letter of Intent to Implement Construction Measures in order to issue Authorization for Works or Undertakings Affecting Fish Habitat. This includes the submission of construction mitigation measures (to minimize intrusion) and a Fish Habitat Compensation Plan (to replace lost habitat). Consultation with the local CA and MNR is required in order to confirm Fisheries Act status.

² Warm water fisheries timing window constraints prohibit any in-water works between March 15 and June 30 inclusive. This restriction is in place to avoid potential impacts to fish species during the spawning and nursery phases of their life cycle.

³ Harmful Alteration or Disruption and Destruction (HADD) of fish habitat as defined by the Federal Fisheries Act.

APPENDIX C:

Traffic Management – Volume to Capacity Ratio and Future Traffic Volumes Anticipated for 2021

North West Welland Master Servicing Plan Study
Transportation – Roadway Levels of Service Summary

Table 1 Existing Volume to Capacity Ratio AM Peak Hour- Corridor

Road Link	From	To	Existing AM Peak Link Volume		Link Capacity (one lane)	V/C	
			SB/WB	NB/EB		SB/WB	NB/EB
Rice Road	North of Quaker	Quaker	320	270	700	0.46	0.39
Rice Road	Quaker	South of Quaker	520	350	700	0.74	0.50
First Ave.	North of Quaker	Quaker	190	130	500	0.38	0.26
First Ave.	Quaker	South of Quaker	380	290	500	0.76	0.58
Quaker Street	First Ave.	Clare Ave.	250	390	500	0.50	0.78

Table 2 Existing Volume to Capacity Ratio PM Peak Hour- Corridor

Road Link	From	To	Existing PM Peak Link Volume		Link Capacity (one lane)	V/C	
			SB/WB	NB/EB		SB/WB	NB/EB
Rice Road	North of Quaker	Quaker	310	230	700	0.44	0.33
Rice Road	Quaker	South of Quaker	300	310	700	0.43	0.44
First Ave.	North of Quaker	Quaker	150	90	500	0.30	0.18
First Ave.	Quaker	South of Quaker	200	170	500	0.40	0.34
Quaker Street	First Ave.	Clare Ave.	280	240	500	0.56	0.48

Table 3
Existing Traffic Conditions
Intersection Performance Summary

	AM Peak Hour			PM Peak Hour		
	Int. LOS	Int. Delay	V/C>0.85	Int. LOS	Int. Delay	V/C>0.85
Signalized Intersection						
Rice Rd./Quaker Rd	B	18.7	---	B	16.0	---
Unsignalized Intersection						
First Ave./Quaker	C	20.5		B	11.8	

**North West Welland Master Servicing Plan Study
Transportation – Roadway Levels of Service Summary**

**Table 4 Total Future Volume to Capacity Ratio AM Peak Hour- Corridor
Existing Configuration**

Road Link	From	To	2021 AM Peak Link Volume		Link Capacity (one lane)	V/C	
			SB/WB	NB/EB		SB/WB	NB/EB
Rice Road	North of Quaker	Quaker	640	630	700	0.91	0.90
Rice Road	Quaker	South of Quaker	930	650	700	1.33	0.93
First Ave.	North of Quaker	Quaker	340	310	500	0.68	0.62
First Ave.	Quaker	South of Quaker	680	480	500	1.36	0.96
Quaker Street	First Ave.	Clare Ave.	670	750	500	1.34	1.50

**Table 5
2021 Total Volume to Capacity Ratio PM Peak Hour- Corridor
Existing Configuration**

Road Link	From	To	2021 PM Peak Link Volume		Link Capacity (one lane)	V/C	
			SB/WB	NB/EB		SB/WB	NB/EB
Rice Road	North of Quaker	Quaker	750	560	700	1.07	0.80
Rice Road	Quaker	South of Quaker	600	610	700	0.86	0.87
First Ave.	North of Quaker	Quaker	380	230	500	0.76	0.46
First Ave.	Quaker	South of Quaker	450	440	500	0.90	0.88
Quaker Street	First Ave.	Clare Ave.	680	630	500	1.36	1.26

**Table 6
2021 Total Traffic Conditions
Intersection Performance Summary – Existing Configuration**

	AM Peak Hour			PM Peak Hour		
	Int. LOS	Int. Delay	V/C>0.85	Int. LOS	Int. Delay	V/C>0.85
Signalized Intersection						
Rice Rd./Quaker Rd	F	198.3	EB=1.25 WB=1.65 NB= 1.52 SB=1.07	F	112.5	EB=1.1 WB=1.23 NB= 1.28 SB=1.01
Unsignalized Intersection						
First Ave./Quaker	F	390.7		F	250.6	
Quaker/Montgomery	C	24.3	NB=1.11 SB=1.09	F	54	NB=1.65 SB=1.01

**North West Welland Master Servicing Plan Study
Transportation – Roadway Levels of Service Summary**

**Table 6
2021 Total Traffic Conditions
Intersection Performance Summary – Existing Configuration**

	AM Peak Hour			PM Peak Hour		
	Int. LOS	Int. Delay	V/C>0.85	Int. LOS	Int. Delay	V/C>0.85
Rice/EW1	A	5.2	EB delay 65.8 (F)	A	5.6	EB delay 78.0 (F)
Rice/EW2	F	1231.8	EB=4.02 WB=4.21	F	70.9	EB=1.81 WB=1.22
First/EW3	A	3.1	---	A	3.2	---
Quaker/NS1	F	50.7	NB=1.83 SB=1.38	C	16.9	NB=0.94 SB=0.96
Quaker/NS2	B	14.1	SB delay 107.9 (F) NB=0.90	C	16.5	NB=0.92 SB delay 99.6 (F)
Quaker/NS3	A	1.3	---	A	1.9	---

**Table 7
2021 Total Traffic Conditions
Intersection Performance Summary – Recommended Configuration**

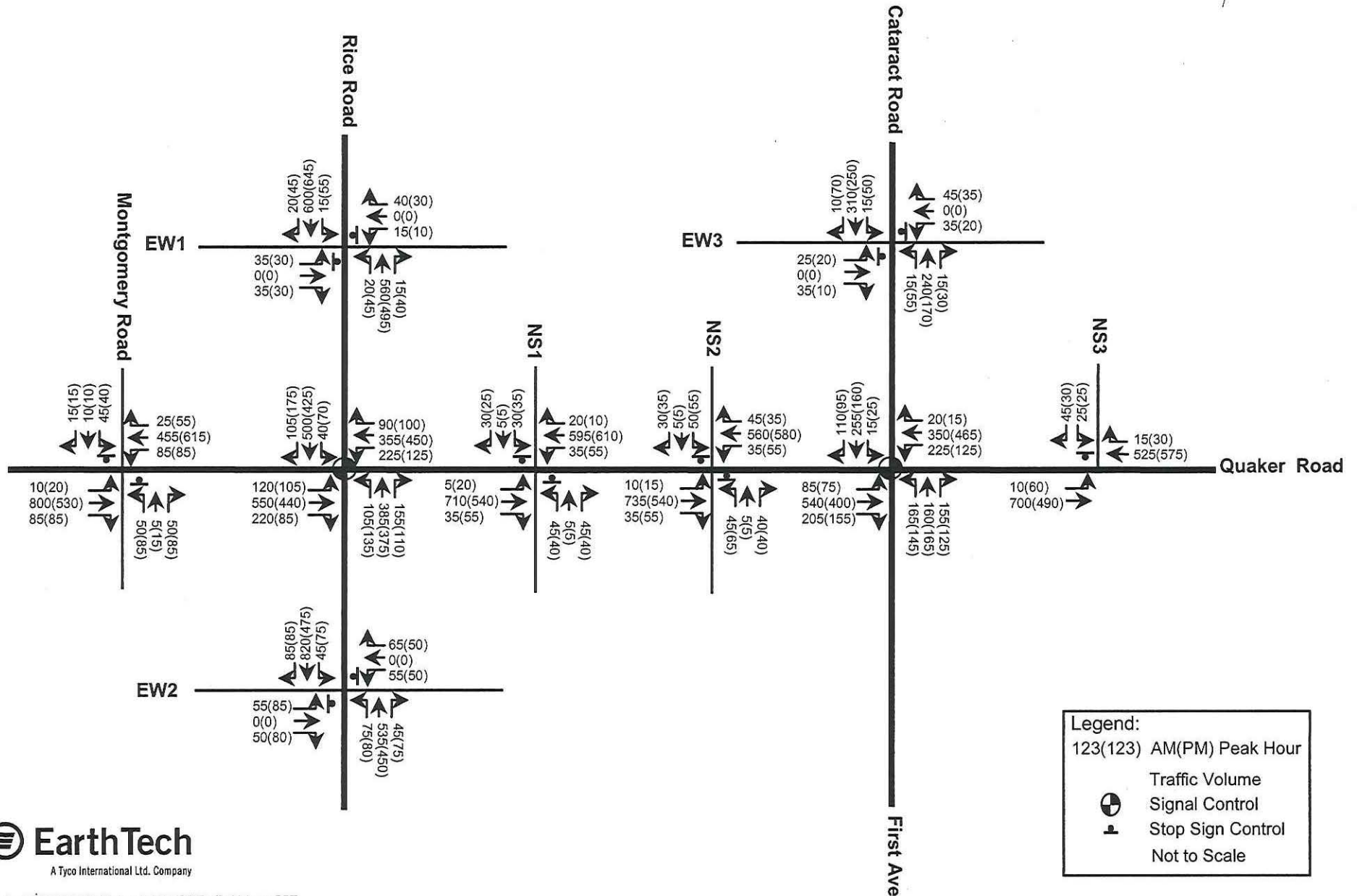
	AM Peak Hour			PM Peak Hour		
	Int. LOS	Int. Delay	V/C>0.85	Int. LOS	Int. Delay	V/C>0.85
Signalized Intersection						
Rice Rd./Quaker Rd	C	24.0	---	B	14.9	---
First Ave./Quaker	B	15.8	---	B	13.0	---
Unsignalized Intersection						
Quaker/Montgomery	B	10.4	NB=0.85	C	22.8	NB=1.14 SB delay 98.0 (F)
Rice/EW1	A	2.2	---	A	2.5	---
Rice/EW2	C	17.8	EB=1.11	B	10.4	EB delay 61.8 (F) WB delay 40.7 (E)
First/EW3	A	2.7	---	A	2.7	---
Quaker/NS1	A	4.5	NB=delay 46.0 (E) SB=delay 34.0 (D)	A	4.2	SB=delay 37.6 (E)

**North West Welland Master Servicing Plan Study
Transportation – Roadway Levels of Service Summary**

**Table 7
2021 Total Traffic Conditions
Intersection Performance Summary – Recommended Configuration**

	AM Peak Hour			PM Peak Hour		
	Int. LOS	Int. Delay	V/C>0.85	Int. LOS	Int. Delay	V/C>0.85
Quaker/NS2	A	5.7	NB=delay 49.9 (E) SB=delay 48.2 (E)	A	7.2	NB=delay 51.2 (F) SB=delay 46.3 (E)
Quaker/NS3	A	0.9	---	A	1.3	---

2021 Total AM/PM Peak Hour Traffic



APPENDIX D:

Fire Flow and Peak Hour Testing

NW Welland MSP - 66898**Peak Hour Watermain Test - Time 19:00**

ID	Demand (L/s)	Elevation (m)	Grade (m)	Pressure (m)
4006	19.02	189	213.1	24.1
4018	20.5	188.5	214.61	26.11
NEW1	19.76	187.5	214.08	26.58
NEW10	0	176	213.47	37.47
NEW2	18.03	185.5	213.61	28.11
NEW3	6.52	183.24	213.44	30.2
NEW4	18.53	184.75	213.04	28.29
NEW5	12.1	183.32	212.71	29.39
NEW6	8.65	181.61	212.62	31.01
NEW7	11.36	181.33	212.58	31.25
NEW8	12.1	178	212.45	34.45
NEW9	5.19	177.8	212.37	34.57

Max Day Pressure Range:

ID	Max.Value (m)	Max.Time (hrs)	Min.Value (m)	Min.Time (hrs)	Average (m)	Difference (m)
4006	36.79	24:00:00	24.1	19:00	31.1	12.69
4018A	37.28	24:00:00	26.11	19:00	31.98	11.17
NEW1	38.45	24:00:00	26.58	19:00	32.92	11.87
NEW10A	49.87	24:00:00	37.47	19:00	44.22	12.4
NEW2	40.45	24:00:00	28.11	19:00	34.8	12.34
NEW3	42.74	24:00:00	30.2	19:00	37.02	12.54
NEW4	41.09	24:00:00	28.29	19:00	35.35	12.8
NEW5	42.53	24:00:00	29.39	19:00	36.69	13.14
NEW6	44.25	24:00:00	31.01	19:00	38.37	13.24
NEW7A	44.55	24:00:00	31.25	19:00	38.64	13.3
NEW8	47.88	24:00:00	34.45	19:00	41.94	13.43
NEW9	48.1	24:00:00	34.57	19:00	42.12	13.53

Note:

Pressure at peak hour should be at least 30 m (40 psi) or greater

NW Welland MSP - 66898

Fireflow Results

ID	Static Demand (L/s)	Static Pressure (m)	Fire-Flow Demand (L/s)	Residual Pressure (m)	Critical Node	Critical Node Pressure (m)	Available Flow (L/s)	Available Flow Pressure (m)	Critical Design Node	Critical Design Pressure (m)	Critical Design Flow (L/s)
4006	6.26	29.61	100	25.81	4006	25.81	241.45	14	4006	14	0
4018	8.42	30.6	100	29.46	4006	28.73	836.92	14	4018	14	0
NEW1	8.64	31.45	250	22.63	NEW1	22.63	385.89	14	NEW1	14	0
NEW10	0	42.68	250	38.79	4006	26.35	927.83	14	4006	8.27	0
NEW2	7.88	33.29	100	30.39	4006	28.8	326.75	14	NEW2	14	0
NEW3	2.85	35.46	250	24.24	NEW3	24.24	368.87	14	NEW3	14	0
NEW4	8.1	33.81	100	31.85	4006	27.86	481.06	14	4006	12.78	0
NEW5	5.29	35.09	100	32.8	4006	28.25	419.7	14	NEW5	14	0
NEW6	3.78	36.74	100	34.69	4006	28.46	479.68	14	NEW6	14	0
NEW7	4.97	36.98	250	32.75	4006	26.99	822.18	14	NEW7	14	0
NEW8	5.29	40.25	100	37.11	4006	28.71	385.72	14	NEW8	14	0
NEW9	2.27	40.4	100	34.37	4006	28.73	243.25	14	NEW9	14	0

Note:

14 m pressure is equivalent to 20 psi

NW Welland WTM Demands - 66989

Sub Area	Total Area (ha)	Type	Area (ha)	Units/ha	Total Units	People/Dwelling	Population	Domestic Flow (L/person/day)	Unit Flow (institutional, L/ha./d))	Demand (L/Day)	Avg Demand (L/s)	Max Day Factor	Max Day Demand (L/s)	Flow At Node (L/s)	Node #	Pipe Dia (mm)	Elevation (m)
1	24.75	Ex Residential	21.48		119	2.65	315	400		126,140	1.5	2.2	3.2	7.7	4006	-	-
2	18.47	Low Density Res.	7.23	12	87	2.65	230	400		91,966	3.8	2.2	8.4	7.5	4	200	184.75
		Med. Den. Res.	3.57	50	179	2.44	436	400		174,216							
		Mixed Use*	0.70		89	1.58	141	400		56,248							
		Institutional	0.60						12,000	7,200							
3	15.21	Exist. Res.	2.00		7	2.65	19	400		7,420	3.0	2.2	6.6	4.9	5	300	183.32
		Low Density Res.	5.97	12	72	2.65	190	400		75,938							
		Med. Den. Res.	1.52	50	76	2.44	185	400		74,176							
		Mixed Use*	0.80	63	159	1.58	251	400		100,488							
4	13.15	Low Density Res.	5.16	12	62	2.65	164	400		65,635	1.5	2.2	3.3	3.5	6	300	181.61
		Med. Den. Res.	1.32	50	66	2.44	161	400		64,416							
5	12.09	Low Density Res.	4.75	12	57	2.65	151	400		60,420	1.6	2.2	3.6	4.6	7	300	181.33
		Med. Den. Res.	1.21	50	61	2.44	148	400		59,048							
		Mixed Use*	0.37	96	35	1.58	56	400		22,338							
6	14.08	Exist. Res.	0.26		8	2.65	21	400		8,480	2.6	2.2	5.6	4.9	8	300	178.00
		Low Density Res.	7.26	12	87	2.65	231	400		92,347							
		Med. Den. Res.	1.64	50	82	2.44	201	400		80,246							
		Mixed Use*	0.46		63	1.58	100	400		39,816							
7	12.08	Exist. Res.	0.44		7	2.65	19	400		7,420	1.9	2.2	4.2	2.1	9	300	177.80
		Low Density Res.	4.05	12	49	2.65	129	400		51,516							
		Med. Den. Res.	1.41	50	71	2.44	172	400		68,847							
		High Den. Res.	0.70		57	1.58	90	400		36,024							
8	19.11	Exist. Res.	2.05		4	2.65	11	400		4,240	2.0	2.2	4.5	8.3	4018	-	-
		Low Density Res.	5.27	12	63	2.65	168	400		67,036							
		Med. Den. Res.	1.97	50	99	2.44	240	400		96,164							
		Institutional	0.62						12,000	7,440							
9	22.75	Low Density Res.	6.27	12	75	2.65	200	400		79,805	3.1	2.2	6.8	8.0	1	300	187.50
		Med. Den. Res.	2.35	50	117	2.44	286	400		114,481							
		Institutional	5.97						12,000	71,640							
10	16.26	Exist. Res.	0.48		1	2.65	3	400		1,060	4.2	2.2	9.3	7.3	2	300	185.50
		Low Density Res.	3.35	12	40	2.65	107	400		42,612							
		Med. Den. Res.	2.20	50	110	2.44	268	400		107,360							
		High Den. Res.	3.02	80	242	1.58	382	400		152,691							
11	13.08	Mixed Use*	0.60		96	1.58	152	400		60,672	2.4	2.2	5.3	2.6	3	300	183.24
		Exist. Res.	0.39		1	2.65	3	400		1,060							
		Low Density Res.	4.23	12	51	2.65	135	400		53,806							
		Med. Den. Res.	2.50	50	125	2.44	305	400		122,000							
		Institutional	2.52						12,000	30,240							
Totals:	181.03				2,515		5,665				27.6		60.7	61.5			

* Mixed use assumed to be mostly residential , since the mixed use occupy only a fraction of subject area

APPENDIX E:

Input and Output Files from SWMHYMO


```

00001> 2      Metric units
00002> *#*****
00003> *# Project Name: [NW Welland MSP]      Project Number: [66898]
00004> *# Date       : 10-25-2004
00005> *# Modeller    : [Steve Overend]
00006> *# Company     : Earth Tech Canada
00007> *# License #   : 2651592
00008> *#
00009> *# 2 Year - Section 4 of the NW Welland MSP includes
00010> *# Section 3 routed through Area 6, then added to Area 6
00011> *# Combined Area 6 is routed through Area 7, then added to Area 7,
00012> *# Which yields the pre development flow
00013> *# Revised after recieving Brian Richert's comments
00014> *#*****
00015> START      TZERO=[0.0], METOUT=[2], NSTORM=[0], NRUN=[1]
00016> *%         [ ] <--storm filename, one per line for NSTORM time
00017> *%-----|-----
00018> CHICAGO STORM IUNITS=[2], TD=[4] (hrs), TPRAT=[0.375], CSDT=[5] (min),
00019> ICASEcs=[1],
00020> A=[755], B=[8], and C=[0.789]
00021> *%-----|-----
00022> READ HYD     ID=[ 1 ], NHYD=["Section 3"],
00023> HYD_FILENAME=["Section3.001"]
00024> *%-----|-----
00025> DESIGN NASHYD ID=[2], NHYD=["A6-PRE"], DT=[ 5 ]min, AREA=[ 14.08 ] (ha),
00026> DWF=[ 0 ] (cms), CN/C=[ 75 ], TP=[ 0.34 ] hrs,
00027> RAINFALL=[ , , , ] (mm/hr), END=-1
00028> *%-----|-----
00029> ROUTE CHANNEL IDout=[ 3 ], NHYD=["Section 5 thru 6"], IDin=[ 1 ],
00030> RDT=[ 5 ] (min),
00031> CHLGTH=[ 290 ] (m), CHSLOPE=[ 0.25 ] (%),
00032> FPSLOPE=[ 0.25 ] (%),
00033> SECNUM=[ 5.6 ], NSEG=[ 3 ]
00034> ( SEGROUGH, SEGDIST (m))=[0.05,22.5 -0.035,27.5 0.05,50] NSE
00035> ( DISTANCE (m), ELEVATION (m))=[0,181.5] [22.5,180.5] [24.5,180] [25.5,180] [27.5,1
00036> *%-----|-----
00037> ADD HYD      IDsum=[ 4 ], NHYD=[" Routed A5 + A6 "], IDs to add=[ 2+3 ]
00038> *%-----|-----
00039> DESIGN NASHYD ID=[5], NHYD=["A7-PRE"], DT=[ 5 ]min, AREA=[ 12.08 ] (ha),
00040> DWF=[ 0 ] (cms), CN/C=[ 75 ], TP=[ 0.54 ] hrs,
00041> RAINFALL=[ , , , ] (mm/hr), END=-1
00042> *%-----|-----
00043> ROUTE CHANNEL IDout=[ 6 ], NHYD=["Section 6 thru 7"], IDin=[ 4 ],
00044> RDT=[ 5 ] (min),
00045> CHLGTH=[ 405 ] (m), CHSLOPE=[ 0.4 ] (%),
00046> FPSLOPE=[ 0.4 ] (%),
00047> SECNUM=[ 6.7 ], NSEG=[ 3 ]
00048> ( SEGROUGH, SEGDIST (m))=[0.05,22.5 -0.035,27.5 0.05,50] NSE
00049> ( DISTANCE (m), ELEVATION (m))=[0,181.5] [22.5,180.5] [24.5,180] [25.5,180] [27.5,1
00050> *%-----|-----
00051> ADD HYD      IDsum=[ 7 ], NHYD=["area 7 total"], IDs to add=[5+6]
00052> *%-----|-----
00053> SAVE HYD     ID=[ 7 ], # OF PCYCLES=[-1], ICASEsh=[-1],
00054> HYD_FILENAME=["Preflow.001"],
00055> HYD_COMMENT=[" Pre-development flow out of Area 7 "]
00056> *%-----|-----
00057> *%-----|-----
00058> *%-----|-----
00059> FINISH
00060>
00061>
00062>
00063>
00064>
00065>

```

2sec4.out

```

SSSSS W W M M H H Y Y M M OOO 999 999 =====
S W W W MM MM H H Y Y MM MM O O 9 9 9 9
SSSSS W W W M M M HHHHH Y M M M O O ## 9 9 9 9 Ver. 4.02
S W W M M H H Y M M O O 9999 9999 July 1999
SSSSS W W M M H H Y M M OOO 9 9 9 9 # 2651592
Stormwater Management HYdrologic Model 999 999 =====

```

```

*****
***** SWMHYMO-99 Ver/4.02 *****
***** A single event and continuous hydrologic simulation model *****
***** based on the principles of HYMO and its successors *****
***** OTTHYMO-83 and OTTHYMO-89. *****
***** Distributed by: J.F. Sabourin and Associates Inc. *****
***** Ottawa, Ontario: (613) 727-5199 *****
***** Gatineau, Quebec: (819) 243-6858 *****
***** E-Mail: swmhymo@jfsa.com *****
*****

```

```

+++++++
+++++++ Licensed user: Earth Tech Canada ++++++
+++++++ in any City SERIAL#:2651592 ++++++
+++++++

```

```

*****
***** ++++++ PROGRAM ARRAY DIMENSIONS ++++++ *****
***** Maximum value for ID numbers : 10 *****
***** Max. number of rainfall points: 15000 *****
***** Max. number of flow points : 15000 *****
*****

```

```

***** DETAILED OUTPUT *****
*****
* DATE: 2004-11-02 TIME: 14:00:34 RUN COUNTER: 000303 *
*****
* Input filename: P:\eo\2003PN~1\66898~1\SWM\PREDEV~1\2year\2sec4.dat *
* Output filename: P:\eo\2003PN~1\66898~1\SWM\PREDEV~1\2year\2sec4.out *
* Summary filename: P:\eo\2003PN~1\66898~1\SWM\PREDEV~1\2year\2sec4.sum *
* User comments: *
* 1: *
* 2: *
* 3: *
*****

```

```

-----
001:0001-----
*#*****
*# Project Name: [NW Welland MSP] Project Number: [66898]
*# Date : 10-25-2004
*# Modeller : [Steve Overend]
*# Company : Earth Tech Canada
*# License # : 2651592
*#
*# 2 Year - Section 4 of the NW Welland MSP includes
*# Section 3 routed through Area 6, then added to Area 6
*# Combined Area 6 is routed through Area 7, then added to Area 7,
*# which yields the pre development flow
*# Revised after recieving Brian Richert's comments
*#*****

```


2sec4.out

 | START | Project dir.: P:\eo\2003PN~1\66898~1\SWM\PREDEV~1\2year\

 Rainfall dir.: P:\eo\2003PN~1\66898~1\SWM\PREDEV~1\2year\

TZERO = .00 hrs on 0
 METOUT= 2 (output = METRIC)
 NRUN = 001
 NSTORM= 0

001:0002-----

| CHICAGO STORM
 | Ptotal= 38.97 mm |

IDF curve parameters: A= 755.000
 B= 8.000
 C= .789

used in: INTENSITY = $A / (t + B)^C$

Duration of storm = 4.00 hrs
 Storm time step = 5.00 min
 Time to peak ratio = .38

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
.08	2.438	1.08	7.633	2.08	8.649	3.08	3.429
.17	2.571	1.17	9.551	2.17	7.617	3.17	3.276
.25	2.723	1.25	12.836	2.25	6.813	3.25	3.137
.33	2.895	1.33	19.668	2.33	6.171	3.33	3.010
.42	3.094	1.42	41.191	2.42	5.645	3.42	2.894
.50	3.326	1.50	99.781	2.50	5.207	3.50	2.788
.58	3.600	1.58	48.700	2.58	4.837	3.58	2.690
.67	3.930	1.67	28.010	2.67	4.519	3.67	2.600
.75	4.334	1.75	19.395	2.75	4.243	3.75	2.515
.83	4.841	1.83	14.781	2.83	4.002	3.83	2.437
.92	5.497	1.92	11.939	2.92	3.789	3.92	2.364
1.00	6.380	2.00	10.023	3.00	3.599	4.00	2.296

001:0003-----

| READ HYD
 | ID=01 (Sectio)
 | DT= 5.00 PCYC= 1 |

AREA (ha)= 154.870
 QPEAK (cms)= 2.867
 TPEAK (hrs)= 2.250
 VOLUME (mm)= 13.020

Filename: P:\eo\2003PN~1\66898~1\SWM\PREDEV~1\2year\Section3.001
 Comments: Everything routed & added up to start of Area 6

TIME hrs	FLOW cms	TIME hrs	FLOW cms	TIME hrs	FLOW cms	TIME hrs	FLOW cms	TIME hrs	FLOW cms
.00	.000	3.00	1.790	6.00	.140	9.00	.020	12.00	.002
.08	.000	3.08	1.673	6.08	.131	9.08	.019	12.08	.002
.17	.000	3.17	1.566	6.17	.123	9.17	.018	12.17	.002
.25	.000	3.25	1.467	6.25	.115	9.25	.017	12.25	.002
.33	.000	3.33	1.378	6.33	.108	9.33	.016	12.33	.001
.42	.000	3.42	1.298	6.42	.101	9.42	.015	12.42	.001
.50	.000	3.50	1.227	6.50	.095	9.50	.014	12.50	.001
.58	.001	3.58	1.163	6.58	.089	9.58	.013	12.58	.001
.67	.002	3.67	1.104	6.67	.085	9.67	.013	12.67	.001
.75	.004	3.75	1.051	6.75	.080	9.75	.012	12.75	.001
.83	.008	3.83	1.002	6.83	.076	9.83	.011	12.83	.001
.92	.013	3.92	.957	6.92	.072	9.92	.011	12.92	.001
1.00	.019	4.00	.916	7.00	.069	10.00	.010	13.00	.001
1.08	.029	4.08	.879	7.08	.065	10.08	.009	13.08	.001
1.17	.042	4.17	.840	7.17	.062	10.17	.009	13.17	.000

2sec4.out							
1.25	.061	4.25	.795	7.25	.059	10.25	.008
1.33	.090	4.33	.745	7.33	.056	10.33	.008
1.42	.142	4.42	.692	7.42	.053	10.42	.007
1.50	.262	4.50	.638	7.50	.051	10.50	.007
1.58	.518	4.58	.586	7.58	.048	10.58	.006
1.67	.951	4.67	.535	7.67	.046	10.67	.006
1.75	1.499	4.75	.485	7.75	.044	10.75	.006
1.83	2.000	4.83	.438	7.83	.042	10.83	.005
1.92	2.366	4.92	.397	7.92	.040	10.92	.005
2.00	2.621	5.00	.361	8.00	.038	11.00	.005
2.08	2.785	5.08	.328	8.08	.036	11.08	.004
2.17	2.864	5.17	.299	8.17	.034	11.17	.004
2.25	2.867	5.25	.273	8.25	.032	11.25	.004
2.33	2.815	5.33	.251	8.33	.031	11.33	.003
2.42	2.725	5.42	.231	8.42	.029	11.42	.003
2.50	2.609	5.50	.214	8.50	.028	11.50	.003
2.58	2.476	5.58	.199	8.58	.027	11.58	.003
2.67	2.333	5.67	.185	8.67	.025	11.67	.003
2.75	2.187	5.75	.172	8.75	.024	11.75	.002
2.83	2.046	5.83	.161	8.83	.023	11.83	.002
2.92	1.914	5.92	.150	8.92	.022	11.92	.002

001:0004-----

DESIGN NASHYD	Area (ha)=	14.08	Curve Number (CN)=	75.00
02:A6-PRE DT= 5.00	Ia (mm)=	1.500	# of Linear Res.(N)=	3.00
	U.H. Tp(hrs)=	.340		

Unit Hyd Qpeak (cms)= 1.582

PEAK FLOW (cms)= .359 (i)
 TIME TO PEAK (hrs)= 1.917
 RUNOFF VOLUME (mm)= 11.496
 TOTAL RAINFALL (mm)= 38.972
 RUNOFF COEFFICIENT = .295

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

001:0005-----

ROUTE CHANNEL	Routing time step (min) =	5.00
IN> 01:Section	Number of SEGMENTS =	3
OUT< 03:Section	Slopes (%), CHANNEL=	.25 FLOODPLAIN= .25
	LENGTH =	290.00 (m)

<----- DATA FOR SECTION (5.6) ----->

Distance	Elevation	Manning	
.00	181.50	.0500	
22.50	180.50	.0500 / .0350	Main Channel
24.50	180.00	.0350	Main Channel
25.50	180.00	.0350	Main Channel
27.50	180.50	.0350 / .0500	Main Channel
50.00	181.50	.0500	

<----- TRAVEL TIME TABLE ----->

DEPTH (m)	ELEV (m)	X-VOLUME (cu.m.)	S-VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)	D x V (m2/s)
.071	180.071	.266E+02	.131E+01	.020	.214	22.63	.015
.143	180.143	.651E+02	.642E+01	.071	.314	15.39	.045
.214	180.214	.115E+03	.171E+02	.156	.392	12.32	.084
.286	180.286	.178E+03	.350E+02	.281	.460	10.52	.131
.357	180.357	.252E+03	.620E+02	.452	.520	9.29	.186

2sec4.out

.429	180.429	.337E+03	.997E+02	.671	.577	8.38	.247
.500	180.500	.435E+03	.150E+03	.945	.630	7.67	.315
.583	180.583	.601E+03	.242E+03	1.441	.695	6.96	.405
.667	180.667	.858E+03	.395E+03	2.093	.707	6.83	.472
.750	180.750	.121E+04	.624E+03*	2.947	.709	6.82	.532
.833	180.833	.164E+04	.945E+03*	4.040	.713	6.78	.594
.917	180.917	.217E+04	.137E+04*	5.406	.722	6.70	.662
1.000	181.000	.279E+04	.193E+04*	7.077	.735	6.57	.735
1.083	181.083	.350E+04	.262E+04*	9.081	.752	6.43	.815
1.167	181.167	.430E+04	.346E+04*	11.447	.772	6.26	.900
1.250	181.250	.519E+04	.448E+04*	14.201	.793	6.09	.991
1.333	181.333	.617E+04	.568E+04*	17.370	.816	5.92	1.088
1.417	181.417	.725E+04	.708E+04*	20.977	.839	5.76	1.189
1.500	181.500	.841E+04	.870E+04*	25.048	.864	5.60	1.296

X-VOLUME= Total X-Section volume over given CHANNEL LENGTH at specified DEPTH.
 S-VOLUME= Volume that can be stored in channel at specified ELEVATION.
 (*) Actual value may be less due to limited CHANNEL LENGTH for given SLOPE.

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	MAX DEPTH (m)	MAX VEL (m/s)
INFLOW : ID= 1:Section	154.87	2.867	2.25	13.020	.742	.709
OUTFLOW: ID= 3:Section	154.87	2.789	2.33	13.020	.735	.709

001:0006-----

ADD HYD (Route)	ID: NHYD	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	DWF (cms)
ID1 02:A6-PRE		14.08	.359	1.92	11.50	.000
+ID2 03:Section		154.87	2.789	2.33	13.02	.000
SUM 04: Route		168.95	3.028	2.33	12.89	.000

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

001:0007-----

DESIGN NASHYD	Area (ha)=	12.08	Curve Number (CN)=	75.00
05:A7-PRE DT= 5.00	Ia (mm)=	1.500	# of Linear Res.(N)=	3.00
	U.H. Tp(hrs)=	.540		

Unit Hyd Qpeak (cms)= .854

PEAK FLOW (cms)= .229 (i)
 TIME TO PEAK (hrs)= 2.167
 RUNOFF VOLUME (mm)= 11.496
 TOTAL RAINFALL (mm)= 38.972
 RUNOFF COEFFICIENT = .295

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

001:0008-----

ROUTE CHANNEL	Routing time step (min) =	5.00
IN> 04: Route	Number of SEGMENTS =	3
OUT< 06:Section	Slopes (%), CHANNEL=	.40 FLOODPLAIN= .40
	LENGTH =	405.00 (m)

2sec4.out
 <----- DATA FOR SECTION (6.7) ----->
 Distance Elevation Manning
 .00 181.50 .0500
 22.50 180.50 .0500 / .0350 Main Channel
 24.50 180.00 .0350 Main Channel
 25.50 180.00 .0350 Main Channel
 27.50 180.50 .0350 / .0500 Main Channel
 50.00 181.50 .0500

----- TRAVEL TIME TABLE -----							
DEPTH (m)	ELEV (m)	X-VOLUME (cu.m.)	S-VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)	D x V (m2/s)
.071	180.071	.372E+02	.820E+00	.025	.270	24.99	.019
.143	180.143	.909E+02	.401E+01	.089	.397	16.99	.057
.214	180.214	.161E+03	.107E+02	.197	.496	13.61	.106
.286	180.286	.248E+03	.219E+02	.356	.581	11.61	.166
.357	180.357	.351E+03	.387E+02	.571	.658	10.25	.235
.429	180.429	.471E+03	.623E+02	.849	.730	9.25	.313
.500	180.500	.608E+03	.938E+02	1.196	.797	8.47	.399
.583	180.583	.840E+03	.151E+03	1.823	.879	7.68	.513
.667	180.667	.120E+04	.247E+03	2.647	.895	7.54	.597
.750	180.750	.168E+04	.390E+03	3.727	.897	7.53	.673
.833	180.833	.230E+04	.590E+03	5.110	.902	7.49	.751
.917	180.917	.303E+04	.858E+03	6.838	.913	7.39	.837
1.000	181.000	.390E+04	.120E+04	8.952	.930	7.26	.930
1.083	181.083	.489E+04	.163E+04	11.487	.951	7.09	1.031
1.167	181.167	.601E+04	.216E+04	14.479	.976	6.92	1.139
1.250	181.250	.725E+04	.280E+04	17.963	1.003	6.73	1.254
1.333	181.333	.862E+04	.355E+04	21.971	1.032	6.54	1.376
1.417	181.417	.101E+05	.443E+04	26.534	1.062	6.36	1.504
1.500	181.500	.117E+05	.544E+04	31.683	1.093	6.18	1.639

X-VOLUME= Total X-Section volume over given CHANNEL LENGTH at specified DEPTH.
 S-VOLUME= Volume that can be stored in channel at specified ELEVATION.

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	MAX DEPTH (m)	MAX VEL (m/s)
INFLOW : ID= 4: Route	168.95	3.028	2.33	12.893	.696	.895
OUTFLOW: ID= 6: Sectio	168.95	2.951	2.42	12.893	.690	.895

001:0009-----

ADD HYD (area 7)		ID: NHYD	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	DWF (cms)
	ID1	05:A7-PRE	12.08	.229	2.17	11.50	.000
	+ID2	06:Sectio	168.95	2.951	2.42	12.89	.000
=====							
	SUM	07:area 7	181.03	3.162	2.42	12.80	.000

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

001:0010-----

SAVE HYD		AREA	(ha)=	181.030
ID=07 (area 7)		QPEAK	(cms)=	3.162 (i)
DT= 5.00 PCYC=-1		TPEAK	(hrs)=	2.417
		VOLUME	(mm)=	12.800

Filename: P:\eo\2003PN~1\66898~1\SWM\PREDEV~1\2year\Preflow.001
 Comments: Pre-development flow out of Area 7

2sec4.out

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

001:0011-----

FINISH

WARNINGS / ERRORS / NOTES

simulation ended on 2004-11-02 at 14:00:34

```
00001> 2      Metric units
00002> *#*****
00003> *# Project Name: [NW Welland MSP]      Project Number: [66898]
00004> *# Date      : 11-02-2004
00005> *# Modeller   : [Steve Overend]
00006> *# Company    : Earth Tech Canada
00007> *# License #  : 2651592
00008> *#
00009> *# 2 Year - NW Welland MSP Pond Sizing for Quantity
00010> *# Revised as per Brian Richert's comments
00011> *#*****
00012> START      TZERO=[0.0], METOUT=[2], NSTORM=[0], NRUN=[0]
00013> *%          [ ] <--storm filename, one per line for NSTORM time
00014> *%-----|-----
00015> READ HYD      ID=[ 2 ], NHYD=["Post"],
00016>               HYD_FILENAME=["PostFlow.001"]
00017> *%-----|-----
00018> COMPUTE VOLUME ID=[ 2 ], STRATE=[-100] (cms), RELRATE=[3.16] (cms)
00019> *%-----|-----
00020>
00021> *%-----|-----
00022> FINISH
00023>
00024>
00025>
00026>
00027>
00028>
00029>
00030>
00031>
00032>
00033>
00034>
00035>
00036>
00037>
00038>
00039>
00040>
```


Pond.out

```

=====
SSSSS W W M M H H Y Y M M 000 999 999 =====
S W W W MM MM H H Y Y MM MM O O 9 9 9 9
SSSSS W W W M M M H H H H Y M M M O O ## 9 9 9 9 ver. 4.02
S W W M M H H Y M M O O 9999 9999 July 1999
SSSSS W W M M H H Y M M 000 9 9 9 9 # 2651592
StormWater Management HYdrologic Model 999 999 =====

```

```

*****
***** SWMHYMO-99 Ver/4.02 *****
***** A single event and continuous hydrologic simulation model *****
***** based on the principles of HYMO and its successors *****
***** OTTHYMO-83 and OTTHYMO-89. *****
***** Distributed by: J.F. Sabourin and Associates Inc. *****
***** Ottawa, Ontario: (613) 727-5199 *****
***** Gatineau, Quebec: (819) 243-6858 *****
***** E-Mail: swmhymo@jfsa.com *****
*****

```

```

+++++
+++++ Licensed user: Earth Tech Canada +++++
+++++ in any City SERIAL#:2651592 +++++
+++++

```

```

*****
***** +++++ PROGRAM ARRAY DIMENSIONS +++++ *****
***** Maximum value for ID numbers : 10 *****
***** Max. number of rainfall points: 15000 *****
***** Max. number of flow points : 15000 *****
*****

```

```

***** D E T A I L E D O U T P U T *****
*****
* DATE: 2004-11-02 TIME: 15:11:13 RUN COUNTER: 000311 *
*****
* Input filename: P:\eo\2003PN~1\66898~1\SWM\POSTDE~1\2year\Pond.dat *
* Output filename: P:\eo\2003PN~1\66898~1\SWM\POSTDE~1\2year\Pond.out *
* Summary filename: P:\eo\2003PN~1\66898~1\SWM\POSTDE~1\2year\Pond.sum *
* User comments: *
* 1: *
* 2: *
* 3: *
*****

```

```

-----
001:0001-----
*****
*# Project Name: [NW Welland MSP] Project Number: [66898]
*# Date : 11-02-2004
*# Modeller : [Steve Overend]
*# Company : Earth Tech Canada
*# License # : 2651592
*#
*# NW Welland MSP Pond Sizing for Quantity
*# Revised as per Brian Richert's comments
*#*****

```

```

| START | Project dir.: P:\eo\2003PN~1\66898~1\SWM\POSTDE~1\2year\

```

Pond.out

Rainfall dir.: P:\eo\2003PN~1\66898~1\SWM\POSTDE~1\2year\

TZERO = .00 hrs on 0
METOUT= 2 (output = METRIC)
NRUN = 001
NSTORM= 0

001:0002-

READ HYD	AREA (ha)=	181.030
ID=02 (Post)	QPEAK (cms)=	11.719
DT= 5.00 PCYC= 1	TPEAK (hrs)=	1.500
	VOLUME (mm)=	21.925

Filename: P:\eo\2003PN~1\66898~1\SWM\POSTDE~1\2year\PostFlow.001
Comments: Post Section 3

TIME	FLOW	TIME	FLOW	TIME	FLOW	TIME	FLOW	TIME	FLOW
hrs	cms	hrs	cms	hrs	cms	hrs	cms	hrs	cms
.00	.000	1.67	8.913	3.33	1.424	5.00	.060	6.67	.001
.08	.000	1.75	8.126	3.42	1.349	5.08	.048	6.75	.001
.17	.000	1.83	7.365	3.50	1.282	5.17	.038	6.83	.000
.25	.000	1.92	6.571	3.58	1.223	5.25	.030	6.92	.000
.33	.091	2.00	5.841	3.67	1.169	5.33	.024	7.00	.000
.42	.308	2.08	5.196	3.75	1.120	5.42	.019	7.08	.000
.50	.413	2.17	4.634	3.83	1.075	5.50	.015	7.17	.000
.58	.478	2.25	4.144	3.92	1.035	5.58	.012	7.25	.000
.67	.533	2.33	3.719	4.00	.998	5.67	.010	7.33	.000
.75	.593	2.42	3.351	4.08	.748	5.75	.008	7.42	.000
.83	.666	2.50	3.032	4.17	.608	5.83	.006	7.50	.000
.92	.760	2.58	2.756	4.25	.500	5.92	.005	7.58	.000
1.00	.886	2.67	2.516	4.33	.395	6.00	.004	7.67	.000
1.08	1.062	2.75	2.307	4.42	.309	6.08	.003	7.75	.000
1.17	1.324	2.83	2.126	4.50	.244	6.17	.002	7.83	.000
1.25	1.755	2.92	1.968	4.58	.192	6.25	.002	7.92	.000
1.33	2.596	3.00	1.830	4.67	.152	6.33	.002	8.00	.000
1.42	5.004	3.08	1.709	4.75	.120	6.42	.001	8.08	.000
1.50	11.719	3.17	1.602	4.83	.095	6.50	.001		
1.58	10.497	3.25	1.507	4.92	.076	6.58	.001		

001:0003-

COMPUTE VOLUME	DISCHARGE	TIME
ID:02 (Post)	(cms)	(hrs)
START CONTROLLING AT	.885	.999
INFLOW HYD. PEAKS AT	11.719	1.500
STOP CONTROLLING AT	3.160	2.467

REQUIRED STORAGE VOLUME (ha.m.)= 1.7096
TOTAL HYDROGRAPH VOLUME (ha.m.)= 3.9691
% OF HYDROGRAPH TO STORE = 43.0725

NOTE: Storage was computed to reduce the Inflow
peak to 3.160 (cms).

001:0004-

FINISH

WARNINGS / ERRORS / NOTES

Simulation ended on 2004-11-02 at 15:11:13
Page 2


```

00001> 2      Metric units
00002> *#*****
00003> *# Project Name: [NW Welland MSP]      Project Number: [66898]
00004> *# Date       : 10-25-2004
00005> *# Modeller    : [Steve Overend]
00006> *# Company     : Earth Tech Canada
00007> *# License #   : 2651592
00008> *#
00009> *# Section 4 of the NW Welland MSP includes
00010> *# Section 3 routed through Area 6, then added to Area 6
00011> *# Combined Area 6 is routed through Area 7, then added to Area 7,
00012> *# Which yields the pre development flow
00013> *# Revised after recieving Brian Richert's comments
00014> *#*****
00015> START      TZERO=[0.0], METOUT=[2], NSTORM=[0], NRUN=[1]
00016> *%          [ ] <--storm filename, one per line for NSTORM time
00017> *%-----|-----
00018> CHICAGO STORM IUNITS=[2], TD=[4] (hrs), TPRAT=[0.375], CSDT=[5] (min),
00019> ICASEcs=[1],
00020> A=[1020], B=[4.7], and C=[0.731]
00021> *%-----|-----
00022> READ HYD     ID=[ 1 ], NHYD=["Section 3"],
00023> HYD_FILENAME=["Section3.001"]
00024> *%-----|-----
00025> DESIGN NASHYD ID=[2], NHYD=["A6-PRE"], DT=[ 5 ]min, AREA=[ 14.08 ] (ha),
00026> DWF=[ 0 ] (cms), CN/C=[ 75 ], TP=[ 0.34 ] hrs,
00027> RAINFALL=[ , , , ] (mm/hr), END=-1
00028> *%-----|-----
00029> ROUTE CHANNEL IDout=[ 3 ], NHYD=["Section 5 thru 6"], IDin=[ 1 ],
00030> RDT=[ 5 ] (min),
00031> CHLGTH=[ 290 ] (m), CHSLOPE=[ 0.25 ] (%),
00032> FPSLOPE=[ 0.25 ] (%),
00033> SECNUM=[ 5.6 ], NSEG=[ 3 ]
00034> ( SEGROUGH, SEGDIST (m))=[0.05,22.5 -0.035,27.5 0.05,50] NSE
00035> ( DISTANCE (m), ELEVATION (m))=[0,181.5] [22.5,180.5] [24.5,180] [25.5,180] [27.5,1
00036> *%-----|-----
00037> ADD HYD      IDsum=[ 4 ], NHYD=[" Routed A5 + A6 "], IDs to add=[ 2+3 ]
00038> *%-----|-----
00039> DESIGN NASHYD ID=[5], NHYD=["A7-PRE"], DT=[ 5 ]min, AREA=[ 12.08 ] (ha),
00040> DWF=[ 0 ] (cms), CN/C=[ 75 ], TP=[ 0.54 ] hrs,
00041> RAINFALL=[ , , , ] (mm/hr), END=-1
00042> *%-----|-----
00043> ROUTE CHANNEL IDout=[ 6 ], NHYD=["Section 6 thru 7"], IDin=[ 4 ],
00044> RDT=[ 5 ] (min),
00045> CHLGTH=[ 405 ] (m), CHSLOPE=[ 0.4 ] (%),
00046> FPSLOPE=[ 0.4 ] (%),
00047> SECNUM=[ 6.7 ], NSEG=[ 3 ]
00048> ( SEGROUGH, SEGDIST (m))=[0.05,22.5 -0.035,27.5 0.05,50] NSE
00049> ( DISTANCE (m), ELEVATION (m))=[0,181.5] [22.5,180.5] [24.5,180] [25.5,180] [27.5,1
00050> *%-----|-----
00051> ADD HYD      IDsum=[ 7 ], NHYD=["area 7 total"], IDs to add=[5+6]
00052> *%-----|-----
00053> SAVE HYD     ID=[ 7 ], # OF PCYCLES=[-1], ICASEsh=[-1],
00054> HYD_FILENAME=["Preflow.001"],
00055> HYD_COMMENT=[" Pre-development flow out of Area 7 "]
00056> *%-----|-----
00057>
00058> *%-----|-----
00059> FINISH
00060>
00061>
00062>
00063>
00064>
00065>

```

```

=====
SSSSS W W M M H H Y Y M M 000 999 999 =====
S W W W MM MM H H Y Y MM MM O O 9 9 9 9
SSSSS W W W M M M H H H H Y M M M O O ## 9 9 9 9 Ver. 4.02
S W W M M H H Y M M O O 9999 9999 July 1999
SSSSS W W M M H H Y M M 000 9 9 9 9 # 2651592
StormWater Management Hydrologic Model 999 999 =====

```

```

*****
***** SWMHYMO-99 Ver/4.02 *****
***** A single event and continuous hydrologic simulation model *****
***** based on the principles of HYMO and its successors *****
***** OTTHYMO-83 and OTTHYMO-89. *****
***** Distributed by: J.F. Sabourin and Associates Inc. *****
***** Ottawa, Ontario: (613) 727-5199 *****
***** Gatineau, Quebec: (819) 243-6858 *****
***** E-Mail: swmhymo@jfsa.Com *****
*****

```

```

+++++
+++++ Licensed user: Earth Tech Canada +++++
+++++ in any City SERIAL#:2651592 +++++
+++++

```

```

*****
***** +++++ PROGRAM ARRAY DIMENSIONS +++++ *****
***** Maximum value for ID numbers : 10 *****
***** Max. number of rainfall points: 15000 *****
***** Max. number of flow points : 15000 *****
*****

```

```

***** D E T A I L E D O U T P U T *****
*****
* DATE: 2004-11-02 TIME: 13:56:24 RUN COUNTER: 000299 *
*****
* Input filename: P:\eo\2003PN~1\66898~1\SWM\PREDEV~1\100year\100sec4.d*
* Output filename: P:\eo\2003PN~1\66898~1\SWM\PREDEV~1\100year\100sec4.o*
* Summary filename: P:\eo\2003PN~1\66898~1\SWM\PREDEV~1\100year\100sec4.s*
* User comments:
* 1:
* 2:
* 3:
*****

```

```

-----
001:0001-----
** *****
** Project Name: [NW Welland MSP] Project Number: [66898]
** Date : 10-25-2004
** Modeller : [Steve Overend]
** Company : Earth Tech Canada
** License # : 2651592
**
** Section 4 of the NW Welland MSP includes
** Section 3 routed through Area 6, then added to Area 6
** Combined Area 6 is routed through Area 7, then added to Area 7,
** which yields the pre development flow
** Revised after recieving Brian Richert's comments
** *****

```


100sec4.out

 | START | Project dir.: P:\eo\2003PN~1\66898~1\SWM\PREDEV~1\100year\

 Rainfall dir.: P:\eo\2003PN~1\66898~1\SWM\PREDEV~1\100year\

TZERO = .00 hrs on 0
 METOUT= 2 (output = METRIC)
 NRUN = 001
 NSTORM= 0

001:0002-----

| CHICAGO STORM
 | Ptotal= 73.20 mm |

IDF curve parameters: A=1020.000
 B= 4.700
 C= .731

used in: INTENSITY = $A / (t + B)^C$

Duration of storm = 4.00 hrs
 Storm time step = 5.00 min
 Time to peak ratio = .38

TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
.08	5.444	1.08	14.629	2.08	16.290	3.08	7.339
.17	5.706	1.17	17.742	2.17	14.603	3.17	7.052
.25	6.000	1.25	22.937	2.25	13.270	3.25	6.791
.33	6.332	1.33	33.556	2.33	12.188	3.33	6.551
.42	6.710	1.42	68.925	2.42	11.291	3.42	6.330
.50	7.147	1.50	193.763	2.50	10.533	3.50	6.126
.58	7.657	1.58	81.753	2.58	9.884	3.58	5.937
.67	8.261	1.67	46.644	2.67	9.322	3.67	5.761
.75	8.990	1.75	33.126	2.75	8.828	3.75	5.597
.83	9.891	1.83	25.972	2.83	8.392	3.83	5.443
.92	11.034	1.92	21.533	2.92	8.003	3.92	5.299
1.00	12.541	2.00	18.501	3.00	7.654	4.00	5.164

001:0003-----

| READ HYD
 | ID=01 (Sectio)
 | DT= 5.00 PCYC= 1 |

AREA (ha)= 154.870
 QPEAK (cms)= 7.838
 TPEAK (hrs)= 2.167
 VOLUME (mm)= 35.418

Filename: P:\eo\2003PN~1\66898~1\SWM\PREDEV~1\100year\Section3.001
 Comments: Everything routed & added up to start of Area 6

TIME	FLOW	TIME	FLOW	TIME	FLOW	TIME	FLOW	TIME	FLOW
hrs	cms	hrs	cms	hrs	cms	hrs	cms	hrs	cms
.00	.000	3.08	4.277	6.17	.308	9.25	.043	12.33	.004
.08	.000	3.17	4.014	6.25	.291	9.33	.041	12.42	.004
.17	.000	3.25	3.774	6.33	.274	9.42	.039	12.50	.003
.25	.000	3.33	3.556	6.42	.259	9.50	.037	12.58	.003
.33	.001	3.42	3.366	6.50	.245	9.58	.035	12.67	.003
.42	.002	3.50	3.198	6.58	.232	9.67	.033	12.75	.002
.50	.006	3.58	3.046	6.67	.219	9.75	.031	12.83	.002
.58	.012	3.67	2.910	6.75	.207	9.83	.030	12.92	.002
.67	.023	3.75	2.788	6.83	.196	9.92	.028	13.00	.002
.75	.039	3.83	2.675	6.92	.185	10.00	.027	13.08	.002
.83	.063	3.92	2.572	7.00	.174	10.08	.025	13.17	.001
.92	.094	4.00	2.481	7.08	.165	10.17	.024	13.25	.001
1.00	.134	4.08	2.392	7.17	.157	10.25	.022	13.33	.001
1.08	.180	4.17	2.293	7.25	.150	10.33	.021	13.42	.001
1.17	.237	4.25	2.171	7.33	.142	10.42	.020	13.50	.001

100sec4.out								
1.25	.306	4.33	2.025	7.42	.136	10.50	.019	13.58
1.33	.401	4.42	1.866	7.50	.129	10.58	.018	13.67
1.42	.569	4.50	1.702	7.58	.122	10.67	.017	13.75
1.50	.981	4.58	1.542	7.67	.116	10.75	.016	13.83
1.58	1.888	4.67	1.393	7.75	.109	10.83	.015	13.92
1.67	3.388	4.75	1.258	7.83	.103	10.92	.014	14.00
1.75	5.013	4.83	1.134	7.92	.097	11.00	.013	14.08
1.83	6.268	4.92	1.020	8.00	.091	11.08	.012	14.17
1.92	7.127	5.00	.919	8.08	.086	11.17	.011	14.25
2.00	7.612	5.08	.832	8.17	.081	11.25	.011	14.33
2.08	7.815	5.17	.756	8.25	.077	11.33	.010	14.42
2.17	7.838	5.25	.686	8.33	.073	11.42	.009	14.50
2.25	7.721	5.33	.623	8.42	.070	11.50	.009	14.58
2.33	7.493	5.42	.567	8.50	.067	11.58	.008	14.67
2.42	7.171	5.50	.521	8.58	.063	11.67	.008	14.75
2.50	6.804	5.58	.482	8.67	.060	11.75	.007	14.83
2.58	6.421	5.67	.448	8.75	.058	11.83	.007	14.92
2.67	6.025	5.75	.419	8.83	.055	11.92	.006	15.00
2.75	5.632	5.83	.392	8.92	.052	12.00	.006	15.08
2.83	5.256	5.92	.368	9.00	.050	12.08	.005	15.17
2.92	4.904	6.00	.346	9.08	.047	12.17	.005	
3.00	4.573	6.08	.326	9.17	.045	12.25	.004	

001:0004-----

DESIGN NASHYD	Area (ha)=	14.08	Curve Number (CN)=	75.00
02:A6-PRE DT= 5.00	Ia (mm)=	1.500	# of Linear Res.(N)=	3.00
	U.H. Tp(hrs)=	.340		

Unit Hyd Qpeak (cms)= 1.582

PEAK FLOW (cms)= 1.007 (i)
 TIME TO PEAK (hrs)= 1.917
 RUNOFF VOLUME (mm)= 32.880
 TOTAL RAINFALL (mm)= 73.204
 RUNOFF COEFFICIENT = .449

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

001:0005-----

ROUTE CHANNEL	Routing time step (min) =	5.00
IN> 01:Section	Number of SEGMENTS =	3
OUT< 03:Section	Slopes (%), CHANNEL=	.25 FLOODPLAIN= .25
	LENGTH =	290.00 (m)

<----- DATA FOR SECTION (5.6) ----->			
Distance	Elevation	Manning	
.00	181.50	.0500	
22.50	180.50	.0500 / .0350	Main Channel
24.50	180.00	.0350	Main Channel
25.50	180.00	.0350	Main Channel
27.50	180.50	.0350 / .0500	Main Channel
50.00	181.50	.0500	

<----- TRAVEL TIME TABLE ----->							
DEPTH (m)	ELEV (m)	X-VOLUME (cu.m.)	S-VOLUME (cu.m.)	FLOW RATE (cms)	VELOCITY (m/s)	TRAV.TIME (min)	D x V (m2/s)
.071	180.071	.266E+02	.131E+01	.020	.214	22.63	.015
.143	180.143	.651E+02	.642E+01	.071	.314	15.39	.045
.214	180.214	.115E+03	.171E+02	.156	.392	12.32	.084
.286	180.286	.178E+03	.350E+02	.281	.460	10.52	.131

100sec4.out

.357	180.357	.252E+03	.620E+02	.452	.520	9.29	.186
.429	180.429	.337E+03	.997E+02	.671	.577	8.38	.247
.500	180.500	.435E+03	.150E+03	.945	.630	7.67	.315
.583	180.583	.601E+03	.242E+03	1.441	.695	6.96	.405
.667	180.667	.858E+03	.395E+03	2.093	.707	6.83	.472
.750	180.750	.121E+04	.624E+03*	2.947	.709	6.82	.532
.833	180.833	.164E+04	.945E+03*	4.040	.713	6.78	.594
.917	180.917	.217E+04	.137E+04*	5.406	.722	6.70	.662
1.000	181.000	.279E+04	.193E+04*	7.077	.735	6.57	.735
1.083	181.083	.350E+04	.262E+04*	9.081	.752	6.43	.815
1.167	181.167	.430E+04	.346E+04*	11.447	.772	6.26	.900
1.250	181.250	.519E+04	.448E+04*	14.201	.793	6.09	.991
1.333	181.333	.617E+04	.568E+04*	17.370	.816	5.92	1.088
1.417	181.417	.725E+04	.708E+04*	20.977	.839	5.76	1.189
1.500	181.500	.841E+04	.870E+04*	25.048	.864	5.60	1.296

X-VOLUME= Total X-Section volume over given CHANNEL LENGTH at specified DEPTH.
 S-VOLUME= Volume that can be stored in channel at specified ELEVATION.
 (*) Actual value may be less due to limited CHANNEL LENGTH for given SLOPE.

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	MAX DEPTH (m)	MAX VEL (m/s)
INFLOW : ID= 1:Section	154.87	7.838	2.17	35.418	1.032	.742
OUTFLOW: ID= 3:Section	154.87	7.632	2.25	35.418	1.023	.740

001:0006-----

ADD HYD (Route)	ID: NHYD	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	DWF (cms)
ID1 02:A6-PRE		14.08	1.007	1.92	32.88	.000
+ID2 03:Section		154.87	7.632	2.25	35.42	.000
SUM 04: Route		168.95	8.352	2.25	35.21	.000

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

001:0007-----

DESIGN NASHYD	Area (ha)=	12.08	Curve Number (CN)=	75.00
05:A7-PRE DT= 5.00	Ia (mm)=	1.500	# of Linear Res.(N)=	3.00
	U.H. Tp(hrs)=	.540		

Unit Hyd Qpeak (cms)= .854

PEAK FLOW (cms)= .642 (i)

TIME TO PEAK (hrs)= 2.167

RUNOFF VOLUME (mm)= 32.880

TOTAL RAINFALL (mm)= 73.204

RUNOFF COEFFICIENT = .449

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

001:0008-----

ROUTE CHANNEL	Routing time step (min) =	5.00
IN> 04: Route	Number of SEGMENTS =	3
OUT< 06:Section	Slopes (%), CHANNEL=	.40
	FLOODPLAIN=	.40
	LENGTH =	405.00 (m)

100sec4.out

```

<----- DATA FOR SECTION ( 6.7) ----->
Distance      Elevation      Manning
    .00        181.50        .0500
   22.50       180.50       .0500 / .0350 Main Channel
   24.50       180.00       .0350 Main Channel
   25.50       180.00       .0350 Main Channel
   27.50       180.50       .0350 / .0500 Main Channel
   50.00       181.50        .0500

```

```

<----- TRAVEL TIME TABLE ----->
DEPTH      ELEV      X-VOLUME      S-VOLUME      FLOW RATE      VELOCITY      TRAV.TIME      D x V
(m)         (m)         (cu.m.)        (cu.m.)        (cms)         (m/s)         (min)         (m2/s)
.071  180.071  .372E+02  .820E+00  .025  .270  24.99  .019
.143  180.143  .909E+02  .401E+01  .089  .397  16.99  .057
.214  180.214  .161E+03  .107E+02  .197  .496  13.61  .106
.286  180.286  .248E+03  .219E+02  .356  .581  11.61  .166
.357  180.357  .351E+03  .387E+02  .571  .658  10.25  .235
.429  180.429  .471E+03  .623E+02  .849  .730  9.25   .313
.500  180.500  .608E+03  .938E+02  1.196 .797  8.47   .399
.583  180.583  .840E+03  .151E+03  1.823 .879  7.68   .513
.667  180.667  .120E+04  .247E+03  2.647 .895  7.54   .597
.750  180.750  .168E+04  .390E+03  3.727 .897  7.53   .673
.833  180.833  .230E+04  .590E+03  5.110 .902  7.49   .751
.917  180.917  .303E+04  .858E+03  6.838 .913  7.39   .837
1.000 181.000  .390E+04  .120E+04  8.952 .930  7.26   .930
1.083 181.083  .489E+04  .163E+04  11.487 .951  7.09  1.031
1.167 181.167  .601E+04  .216E+04  14.479 .976  6.92  1.139
1.250 181.250  .725E+04  .280E+04  17.963 1.003 6.73  1.254
1.333 181.333  .862E+04  .355E+04  21.971 1.032 6.54  1.376
1.417 181.417  .101E+05  .443E+04  26.534 1.062 6.36  1.504
1.500 181.500  .117E+05  .544E+04  31.683 1.093 6.18  1.639

```

X-VOLUME= Total X-Section volume over given CHANNEL LENGTH at specified DEPTH.
S-VOLUME= volume that can be stored in channel at specified ELEVATION.

```

<---- hydrograph ----> <-pipe / channel->
AREA      QPEAK      TPEAK      R.V.      MAX DEPTH      MAX VEL
(ha)      (cms)      (hrs)      (mm)      (m)            (m/s)
INFLOW : ID= 4: Route  168.95  8.352  2.25  35.206  .976  .925
OUTFLOW: ID= 6:Sectio  168.95  8.123  2.33  35.206  .967  .923

```

001:0009

```

| ADD HYD (area 7) | ID: NHYD      AREA      QPEAK      TPEAK      R.V.      DWF
|                   | (ha)      (cms)      (hrs)      (mm)      (cms)
| ID1 05:A7-PRE    | 12.08     .642     2.17  32.88  .000
| +ID2 06:Sectio   | 168.95    8.123    2.33  35.21  .000
| SUM 07:area 7    | 181.03    8.733    2.33  35.05  .000

```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

001:0010

```

| SAVE HYD          | AREA      (ha)= 181.030
| ID=07 (area 7)    | QPEAK      (cms)= 8.733 (i)
| DT= 5.00 PCYC=-1 | TPEAK      (hrs)= 2.333
|                   | VOLUME     (mm)= 35.051
Filename: P:\eo\2003PN~1\66898~1\SWM\PREDEV~1\100year\Preflow.001

```


100sec4.out
Comments: Pre-development flow out of Area 7

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

001:0011-----

FINISH

WARNINGS / ERRORS / NOTES

Simulation ended on 2004-11-02 at 13:56:24
=====

```
00001> 2      Metric units
00002> *#*****
00003> *# Project Name: [NW Welland MSP]      Project Number: [66898]
00004> *# Date      : 11-02-2004
00005> *# Modeller   : [Steve Overend]
00006> *# Company    : Earth Tech Canada
00007> *# License #  : 2651592
00008> *#
00009> *# NW Welland MSP Pond Sizing for Quantity
00010> *# Revised as per Brian Richert's comments
00011> *#*****
00012> START      TZERO=[0.0], METOUT=[2], NSTORM=[0], NRUN=[0]
00013> *%      [ ] <--storm filename, one per line for NSTORM time
00014> *%-----|-----
00015> READ HYD      ID=[ 2 ], NHYD=["Post"],
00016>      HYD_FILENAME=["PostFlow.001"]
00017> *%-----|-----
00018> COMPUTE VOLUME      ID=[ 2 ], STRATE=[-100] (cms), RELRATE=[11.72] (cms)
00019> *%-----|-----
00020>
00021> *%-----|-----
00022> FINISH
00023>
00024>
00025>
00026>
00027>
00028>
00029>
00030>
00031>
00032>
00033>
00034>
00035>
00036>
00037>
00038>
```


Pond.out

```

SSSSS W W M M H H Y Y M M 000 999 999 =====
S W W W MM MM H H Y Y MM MM O O 9 9 9 9
SSSSS W W W M M M HHHH Y M M M O O ## 9 9 9 9 Ver. 4.02
S W W M M H H Y M M O O 9999 9999 July 1999
SSSSS W W M M H H Y M M 000 9 9
9 9 9 9 # 2651592
StormWater Management Hydrologic Model 999 999 =====

```

```

*****
***** SWMHYMO-99 Ver/4.02 *****
***** A single event and continuous hydrologic simulation model *****
***** based on the principles of HYMO and its successors *****
***** OTTHYMO-83 and OTTHYMO-89. *****
***** Distributed by: J.F. Sabourin and Associates Inc. *****
***** Ottawa, Ontario: (613) 727-5199 *****
***** Gatineau, Quebec: (819) 243-6858 *****
***** E-Mail: swmhymo@jfsa.Com *****
*****

```

```

+++++ Licensed user: Earth Tech Canada +++++
+++++ in any City SERIAL#:2651592 +++++
+++++

```

```

*****
***** +++++ PROGRAM ARRAY DIMENSIONS +++++ *****
***** Maximum value for ID numbers : 10 *****
***** Max. number of rainfall points: 15000 *****
***** Max. number of flow points : 15000 *****
*****

```

```

***** D E T A I L E D O U T P U T *****
*****
* DATE: 2004-11-02 TIME: 15:14:42 RUN COUNTER: 000312 *
*****
* Input filename: P:\eo\2003PN~1\66898~1\SWM\POSTDE~1\100year\Pond.dat *
* Output filename: P:\eo\2003PN~1\66898~1\SWM\POSTDE~1\100year\Pond.out *
* Summary filename: P:\eo\2003PN~1\66898~1\SWM\POSTDE~1\100year\Pond.sum *
* User comments: *
* 1: _____ *
* 2: _____ *
* 3: _____ *
*****

```

```

-----
001:0001-----
*#*****
*# Project Name: [NW Welland MSP] Project Number: [66898]
*# Date : 11-02-2004
*# Modeller : [Steve Overend]
*# Company : Earth Tech Canada
*# License # : 2651592
*#
*# NW Welland MSP Pond Sizing for Quantity
*# Revised as per Brian Richert's comments
*#*****

```

```

| START | Project dir.: P:\eo\2003PN~1\66898~1\SWM\POSTDE~1\100year\

```

Pond.out
----- Rainfall dir.: P:\eo\2003PN~1\66898~1\SWM\POSTDE~1\100year\

TZERO = .00 hrs on 0
METOUT= 2 (output = METRIC)
NRUN = 001
NSTORM= 0

001:0002-----

READ HYD AREA (ha)= 181.030
ID=02 (Post) QPEAK (cms)= 27.453
DT= 5.00 PCYC= 1 TPEAK (hrs)= 1.500
VOLUME (mm)= 46.607

Filename: P:\eo\2003PN~1\66898~1\SWM\POSTDE~1\100year\PostFlow.001
Comments: Post Section 3

TIME hrs	FLOW cms	TIME hrs	FLOW cms	TIME hrs	FLOW cms	TIME hrs	FLOW cms	TIME hrs	FLOW cms
.00	.000	1.42	10.360	2.83	4.078	4.25	.840	5.67	.003
.08	.000	1.50	27.453	2.92	3.830	4.33	.589	5.75	.002
.17	.158	1.58	24.088	3.00	3.616	4.42	.417	5.83	.001
.25	.659	1.67	22.094	3.08	3.430	4.50	.296	5.92	.001
.33	.839	1.75	18.883	3.17	3.265	4.58	.210	6.00	.001
.42	.936	1.83	15.964	3.25	3.119	4.67	.150	6.08	.000
.50	1.021	1.92	13.568	3.33	2.989	4.75	.106	6.17	.000
.58	1.117	2.00	11.622	3.42	2.872	4.83	.076	6.25	.000
.67	1.232	2.08	10.043	3.50	2.765	4.92	.054	6.33	.000
.75	1.372	2.17	8.759	3.58	2.669	5.00	.038	6.42	.000
.83	1.545	2.25	7.715	3.67	2.580	5.08	.027	6.50	.000
.92	1.762	2.33	6.862	3.75	2.499	5.17	.020	6.58	.000
1.00	2.045	2.42	6.162	3.83	2.424	5.25	.014	6.67	.000
1.08	2.426	2.50	5.585	3.92	2.354	5.33	.010	6.75	.000
1.17	2.975	2.58	5.106	4.00	2.290	5.42	.007	6.83	.000
1.25	3.845	2.67	4.704	4.08	1.613	5.50	.005		
1.33	5.494	2.75	4.366	4.17	1.219	5.58	.004		

001:0003-----

COMPUTE VOLUME
ID:02 (Post)

	DISCHARGE (cms)	TIME (hrs)
START CONTROLLING AT	3.750	1.241
INFLOW HYD. PEAKS AT	27.453	1.500
STOP CONTROLLING AT	11.720	1.996

REQUIRED STORAGE VOLUME (ha.m.)= 2.2639
TOTAL HYDROGRAPH VOLUME (ha.m.)= 8.4373
% OF HYDROGRAPH TO STORE = 26.8317

NOTE: Storage was computed to reduce the Inflow
peak to 11.720 (cms).

001:0004-----

FINISH

WARNINGS / ERRORS / NOTES

Simulation ended on 2004-11-02 at 15:14:42

November 2, 2004

NW Welland South Pond**Comments:**

- Two identically sized ponds connected by a flow through pipe
- Perm pool size is twice as large as needed due to assumed geometry of the pond. This most likely can be resolved during detailed design of the pond

Summary of Conceptual Rating Curve

Elevation (m)	Discharge (m³/s)	Storage		
		(m³)	(ha.m)	
Passive Storage-Permanent Pool				
0.00	-	0	0.000	< Bottom of Permanent Pool (average)
1.00	-	1	0.000	< Top of Perm Pool - Required Perm Pool Storage=4,550m³
Active Storage-E.D.+Att.+Freeboard				
1.00	0.0000	0	0.000	< Bottom of Extended Detention
1.16	0.0412	2,026	0.203	
1.33	0.0863	4,095	0.410	
1.49	0.1212	6,207	0.621	
1.65	0.1867	8,362	0.836	< Top of E.D.- Required E.D. Storage=8,000m³
1.99	0.4086	12,977	1.298	
2.33	0.8704	17,781	1.778	
2.66	1.1157	22,779	2.278	
3.00	1.3160	27,973	2.797	< Top of Flood Control - Required Active Storage=27,500m³
3.15	3.4815	30,345	3.034	
3.30	7.6831	32,756	3.276	< Top of Berm

Volume Requirements

S/C Area = 90.7 hectares
 Imperviousness = 35 percent
 Protection Level = 2
 Pond Type = Wet Pond <- "Wet Pond" or "Wetland"

	(m³/ha)	(m³)	
Perm Volume =	50	4,550	< MOEE Table 4.1 - 35% imp. Area, wet pond, Protection Level 1 watercourse
E.D. Volume =	-	8,000	< max(40m³/ha, 25mm V _{post})
Att. Volume =	215	19,500	< Additional volume required so that Q _{Post 100} = Q _{Pre 100}
Total =	265	32,050	

Calculation of Storage Using Stage-Area Relationship

L:W ratio = 3 :1
 Side Slope = 3 :1

Elevation (mAMSL)	Dimensions (m)		Area (m²)	Volume (m³)		Comments
	Length	Width		Increment	Σ	
Passive Storage (Permanent Pool)						
0.00	200.7	53.7	10,778	0	0	< Bottom of Permanent Pool (average)
1.00	206.7	59.7	12,340	11,553	11,553	< Top of Perm Pool - Required Perm Pool Storage=4,550m³
Active Storage (Extended Detention, Attenuation and Freeboard)						
1.00	206.7	59.7	12,340	0	0	< Bottom of Extended Detention
1.16	207.7	60.7	12,601	2,026	2,026	
1.33	208.7	61.7	12,863	2,069	4,095	
1.49	209.6	62.6	13,128	2,112	6,207	
1.65	210.6	63.6	13,394	2,155	8,362	< Top of E.D.- Required E.D. Storage=8,000m³
1.99	212.6	65.6	13,954	4,615	12,977	
2.33	214.7	67.7	14,521	4,805	17,781	
2.66	216.7	69.7	15,097	4,998	22,779	
3.00	218.7	71.7	15,681	5,193	27,973	< Top of Flood Control - Required Active Storage=27,500m³
3.15	219.6	72.6	15,943	2,372	30,345	
3.30	220.5	73.5	16,207	2,411	32,756	< Top of Berm

→ Buffer = 17,319 sq.m

APPENDIX F: Recommended Infrastructure Works Cost Breakdown

2005

NW Welland MSP - 66898
Watermain Works Cost Estimate

Watermain Size (mm)	Length	Unit Cost	Total Cost
200	675	\$ 236.77	\$ 159,820
300	3564	\$ 342.12	\$ 1,219,302

Cost for Tapping into Regional Main
(1 day for field crew costs \$7000)

3 taps	\$	21,000
--------	----	--------

Cost: \$ 1,500,000

Engineering:	150,000
Contingency:	150,000

Total Cost: \$ 1,800,000

2005

NW Welland MSP - 66898
Sanitary Sewer Works Cost Estimate

Area #	Length (m)	Size (mm)	\$/m	Cost
Area 1	175	250	\$ 362.47	\$ 63,432
Area 2	275	250	\$ 362.47	\$ 99,679
Area 3	230	250	\$ 362.47	\$ 83,368
Area 4	210	250	\$ 362.47	\$ 76,119
Area 5	260	250	\$ 362.47	\$ 94,242
Area 6	-	-	-	-
Area 7	265	250	\$ 362.47	\$ 96,055
Area 8	345	250	\$ 362.47	\$ 125,052
Area 9	270	250	\$ 362.47	\$ 97,867
Area 10	330	250	\$ 362.47	\$ 119,615
Area 11	370	250	\$ 362.47	\$ 134,114
300 Section	600	300	\$ 396.59	\$ 237,951
Main Trunk*	1960	750	\$ 723.46	\$ -

Total Length: 3330 m

Construction Cost: \$ 1,230,000

Contingency (10%): \$ 123,000

Engineering (10%): \$ 123,000

Total Cost: \$ 1,500,000

2005

NW Welland MSP - 66898
Storm Sewer Costs

Area	Length	Size	\$ /m		Cost
Area 1	205	900	\$	857	\$ 175,704
	170	825	\$	763	\$ 129,628
Area 2	160	900	\$	857	\$ 137,135
	280	1050	\$	1,041	\$ 291,480
	245	1200	\$	1,233	\$ 302,194
Area 3	230	825	\$	763	\$ 175,379
Area 4	205	825	\$	763	\$ 156,316
Area 5	100	825	\$	763	\$ 76,252
Area 6	280	900	\$	857	\$ 239,986
Area 7	415	1350	\$	1,446	\$ 600,014
Area 8	-	-	-	-	-
Area 9	195	1050	\$	1,041	\$ 202,995
	195	1050	\$	1,041	\$ 202,995
	285	1200	\$	1,233	\$ 351,532
Area 10	187	750	\$	694	\$ 129,843
	145	900	\$	857	\$ 124,278
Area 11	125	825	\$	763	\$ 95,315
Quaker Rd (Trunk)	485	825	\$	763	\$ 369,821
	300	1950	\$	2,640	\$ 791,956
	145	1950	\$	2,640	\$ 382,779
	125	2100	\$	2,977	\$ 372,163
	530	2100	\$	2,977	\$ 1,577,970
	50	2100	\$	2,977	\$ 148,865

Total Length: 5057 m

Construction Cost: \$ 7,035,000

Engineering (10%): \$ 703,500

Contingency (10%): \$ 703,500

Total Cost: \$ 8,500,000

2005

NW Welland MSP - 66898
SWM Costs

		Unit cost		Total Cost	
Pond Volume	39,526 m ³	\$	8.00 m ³	\$	316,208
Landscaping	17,415 m ²	\$	12.00 m ²	\$	208,980
Inlet Structure	1 L.S.	\$	5,000.00 L.S.	\$	5,000
Outlet Structure	1 L.S.	\$	25,000.00 L.S.	\$	25,000
Granular A	500 t	\$	13.00 t	\$	6,500
Flow Through Pipe	1 L.S.	\$	2,000.00 L.S.	\$	2,000
Riprap	1 L.S.	\$	2,000.00 L.S.	\$	2,000

Total Cost (per pond): \$ 570,000

Sub total: \$ 1,140,000

Engineering \$ 114,000

Contingency \$ 114,000

Total SWM Cost: \$ 1,370,000

APPENDIX G: Review Agency Consultation

AGENCY CONTACT LIST



Agency & Stakeholder Contact List

Agency Name	Contact Name
A. Provincial Agencies	
1. Ministry of the Environment West Central Region Office 12th Floor, 119 King Street West Hamilton, Ontario L8P 4Y7 Tel: (905) 521-7664 Fax: (905) 521-7820	Ms. Barb Ryter EA and Planning Coordinator
2. Ministry of the Environment Niagara District Office 301 St. Paul Street 9 th Floor, Suite 15 St. Catharines, Ontario L2R 3M8 Tel: (905) 704-3910 Fax: (905) 704-4015	Mr. Paul Nieweglowski District Manager
3. Ministry of the Environment Environmental Assessment and Approvals Branch 2 St. Clair Street West Floor 12A Toronto, Ontario M4V 1L5 Tel: (416) 314-1051	Ms. Doris Dumais Director – Approvals Section * Notice of Completion only*
4. Ministry of the Environment Environmental Assessment and Approvals Branch 2 St. Clair Street West Floor 12A Toronto, Ontario M4V 1L5 Tel: (416) 314-3740	Ms. Agata Garcia-Wright Director – EA Section * Notice of Completion only*
5. Ministry of Natural Resources Niagara Area Office 4890 Victoria Ave North P.O. Box 5000 Vineland, Ontario L0R 2E0 Tel: (905) 562-1175 Fax: (905) 562-1154	Mr. Joad Durst Area Supervisor



Agency Name	Contact Name
6. Ministry of Culture Heritage and Libraries Branch Southwest Archaeological Field Office 900 Highbury Avenue London, Ontario N5Y 1A4 Tel: (519) 675-7742 Fax: (519) 675-7777	Mr. John MacDonald Archaeologist/Heritage Planner Southwestern Ontario Region
7. Ministry of Transportation 1201 Wilson Avenue Building D, 6 th Floor Downsview, Ontario M3M 1J8 Tel: (416) 235-5582	Mr. Fabio Saccon Traffic Manager Area 2-Peel, Hamilton, Halton, Niagara Section
8. Ministry of Municipal Affairs and Housing Central Ontario Region Office 4 Robert Speck Parkway, Suite 550 Mississauga, Ontario L4T 1S1 Tel: (905) 270-7154 Fax: (905) 279-7286	Mr. Karol Wronecki Regional Manager
B. Municipalities	
1. Regional Municipality of Niagara P.O. Box 1042 2201 St. David's Road Thorold, Ontario L2V 4T7 Tel: (905) 685-1571 extension 3226	Ms. Pam Gilroy Regional Clerk
2. Regional Municipality of Niagara P.O. Box 1042 2201 St. David's Road Thorold, Ontario L2V 4T7 Tel: (905) 685-1571 extension 3341	Mr. Peter Partington Regional Chair
3. Regional Municipality of Niagara Public Works Department P.O. Box 1042 2201 St. David's Road Thorold, Ontario L2V 4T7 Tel: (905) 685-1571 extension 3335 Fax: (905) 687-8056	Mr. Ken Brothers Commissioner of Public Works



Agency Name	Contact Name
4. Regional Municipality of Niagara Planning and Development Department 3550 Schmon Parkway P.O. Box 1042 Thorold, Ontario L2V 4T7 Tel: (905) 625-1571 Fax: (905) 641-5208	Mr. David Farley Commissioner of Planning and Development
5. Regional Municipality of Niagara Public Works Department – Transportation Division 3501 Schmon Parkway Thorold, Ontario L2V 4T7 Tel: (905) 685-1571	Mr. Joe Cousins Director of Transportation Services
6. Regional Municipality of Niagara Public Health Department 573 Glenridge Avenue St. Catharines, Ontario L2T 4C2 Tel: (905) 688-3762 Fax: (905) 688-7464	Dr. Robin Williams Regional Medical Officer of Health
7. Regional Niagara Bicycling Committee Regional Municipality of Niagara P.O. Box 1042 2201 St. David's Road Thorold, Ontario L2V 4T7 Tel: (905) 685-1571	Mr. Ron Leavens Chair
8. City of Welland 60 East Main Street Welland, Ontario L3B 3X4 Tel: (905) 735-1700 extension 230 Fax: (905) 732-1919	Mr. Craig A. Stirtzinger General Manager, Communications, Council and Legislative Services/City Clerk
9. City of Welland 60 East Main Street Welland, Ontario L3B 3X4 Tel: (905) 735-1700 extension 223 Fax: (905) 735-1543	Mr. Peter Simmons City Manager



Agency Name	Contact Name
10. City of Welland Engineering, Public Works and Transportation Services 60 East Main Street Welland, Ontario L3B 3X4 Tel: (905) 735-1700 extension 214 Fax: (905) 732-1919	Mr. J. David Shantz, P. Eng. General Manager/City Engineer
11. City of Welland Planning and Development Services 60 East Main Street Welland, Ontario L3B 3X4 Tel: (905) 735-1700 ext. 215 Fax: (905) 735-8772	Mr. Donald Thorpe General Manager
12. City of Welland Parks and Recreation Department 60 East Main Street Welland, Ontario L3B 3X4 Tel: (905) 735-1700 ext Fax: (905) 732-5255	Mr. Barry LaPlante General Manager
13. Welland Fire and Emergency Services 636 King Street Welland, Ontario L3B 3L1 Tel: (905) 735-9922 extension 222 Fax: (905) 732-2818	Mr. Denys Prevost Chief, Fire and Emergency Services
14. Welland Transit 75 Federal Road Welland, Ontario L3B 3P2 Tel: (905) 732-6844 Fax: (905) 732-9422	Ms. Margaret Fortin Office Coordinator
C. Adjacent Municipalities	
15. Corporation of the City of Thorold Clerks Department 3540 Schmon Parkway, P.O. Box 1044 Thorold, Ontario L2V 4A7 Tel: (905) 227-6613 ext. 270	John K. Bice City Clerk
16. Corporation of the City of Thorold Public Works Department 3540 Schmon Parkway P.O. Box 1044 Thorold, Ontario L2V 4A7 Tel: (905) 227-3535	Phillip Lambert, P.Eng Assistant Director of Operations



Agency Name	Contact Name
17. Corporation of the City of Thorold Planning and Building Services Department 3540 Schmon Parkway P.O. Box 1044 Thorold, Ontario L2V 4A7 Tel: (905) 227-6613 ext 245	Adele Arbour City Planner
18. Town of Pelham 20 Pelham Town Square Fonthill, Ontario L0S 1E0 Tel: (905) 892-2607	Cheryl Miclette Town Clerk
19. Town of Pelham Operations 20 Pelham Town Square Fonthill, Ontario L0S 1E0 Tel: (905) 892-2607	Kelly Walsh, P.Eng Director of Community and Infrastructure Services
20. Town of Pelham Planning Department 20 Pelham Town Square Fonthill, Ontario L0S 1E0 Tel: (905) 892-2607	Craig Larmour Director of Planning Services
D. Other Agencies	
1. Niagara Peninsula Conservation Authority 250 Thorold Road West, 3 rd Floor Welland, Ontario L3C 3W2 Tel: (905) 788-3135 Fax: (905) 788-1121	Mr. Andy Burt General Manager
2. Niagara Regional Police Services Headquarters 68 Church Street St. Catharines, Ontario L2R 3C6	Ms. Wendy Southall Police Chief
3. Niagara Emergency Medical Services 139 Ontario Street St. Catharines, Ontario L2R 5K2	Mr. Frank Adamson Director
4. Hamilton Central Ambulance Communication Centre 282 Fennel Avenue West P.O. Box 120 LCD1 Hamilton, Ontario L8L 7T5	Sir or Madam



Agency Name	Contact Name
5. District School Board of Niagara 191 Carlton Street St. Catharines, Ontario L2R 7P4 Tel: (905) 641-1550 ext. 4101	Mr. Warren Hoshizaki Director of Education and Secretary
6. Niagara Catholic District School Board 427 Rice Road Welland, Ontario L3C 7C1 Tel: (905) 735-0240 Fax: (905) 734-8828	Mr. Angelo Di Ianni Director of Education
7. Canadian Automobile Association 3271 Schmon Parkway Thorold, Ontario L2V 4Y6 Tel: (905) 984-8585	Ms. Laura Willard Director of Autoclub
8. North Welland Business Improvement Area Association 871 Niagara Street North L3C 6Y1 Tel: (905) 788-9474	Mr. John Clark Chairman
E. Utilities	
1. Enbridge Consumers Gas 3401 Schmon Parkway P.O. Box 1051 Thorold, Ontario L2V 5A8	Mr. Marty Goddard General Supervisor, Planning and Technology
2. Bell Canada 63 King Street P.O. Box 190 St. Catharines, Ontario L2R 3H6 (905) 641-3277	Ms. Patti Atherton Access Network Coordinator
3. Cogeco Cable 7170 McLeod Road Niagara Falls, Ontario L2G 3H2 Tel: (905) 374-2196 extension 305 Email: rleppert@internet.cgocable.net	Mr. Randy Leppert Project Planner
4. Welland Hydro Electric System Corporation 950 East Main Street P.O. Box 280 Welland, Ontario L3B 5P6 Tel: (905) 732-1381 Fax: (905) 732-0123	Mr. Ross Peever, B.Sc. President



Agency Name	Contact Name
F. Affected Landowners/Interested Citizens/Blocks	
BLOCK A	
1. City Mail Merge (Picked up October 21, 2004) includes adjacent land outside the study area	
BLOCK B	
1. City Mail Merge (Picked up October 21, 2004) includes adjacent land outside the study area	
BLOCK C	
1. City Mail Merge (Picked up October 21, 2004) includes adjacent land outside the study area	
G. Other/Adjacent Landowners/Agencies/Stakeholders	
1. Niagara College of Applied Arts and Technology 300 Woodlawn Road Welland, Ontario L3C 7L3 Tel: (905) 735-7568 Fax: (905) 736-6020	Mr. Dan Patterson President
2. Niagara College of Applied Arts and Technology Welland Campus 300 Woodlawn Road Welland, Ontario L3C 7L3 Tel: (905) 735-2211, ext. 7650 Fax: (905) 736-6011	Mr. Steve Hudson Vice-President, Corporate Services
3. Niagara College of Applied Arts and Technology Welland Campus 300 Woodlawn Road Welland, Ontario L3C 7L3 Tel: (905) 735-2211, ext. 7515	Mr. Mal Woodhouse Director, Facilities Management
4. YMCA of Niagara 25 YMCA Drive St. Catharines, Ontario L2N 7P9 Tel: (905) 934-9755 extension 254 Fax: (905) 934-9665	Mr. Joe McLaughlin General Manager, Facility Development
5. Welland Soccer Club 469 Rice Road Welland, Ontario L3C 2W2 Tel: (905) 735-8106	Mr. Robert Stringer President



Agency Name	Contact Name
6. Urban and Environmental Management Inc. 4701 St. Clair Avenue Niagara Falls, Ontario L2E 3S9 Tel: (905) 371-9764	Mr. Rick Brady
9. The Planning Partnership 1255 Bay Street, #210 Toronto, Ontario	Ron Palmer
H. First Nations	
1. Ontario Ministry of Aboriginal Affairs Policy and Relationships Branch 720 Bay Street, 4 th Floor Toronto, Ontario M5G 2K1 Tel: (416) 326-4762 Fax: (416) 326-4017	Mr. Alan Kary Deputy Director
2. Ontario Ministry of Aboriginal Affairs Policy and Relationships Branch 720 Bay Street, 4 th Floor Toronto, Ontario M5G 2K1 Tel: (416) 314-6781 Fax: (416) 326-4017	Surinder Signh Gill Policy Advisor, Technical Contract
3. The Ontario Secretariat for Aboriginal Affairs Policy and Relationships Branch Ontario Secretariat of Aboriginal Affairs 720 Bay Street, 4 th Floor Toronto, Ontario M5G 2K1 Fax: 416-326-4017 Email: pam.wheaton@ontario.ca	Pam Wheaton Director
4. Indian and Northern Affairs of Canada-Specific Claims Branch Specific Claims Branch Department of Indian and Northern Affairs 10 Wellington Street, Room 1310 Gatineau, Quebec K1A 0H4 Fax: 819-956-2258 Email: boswelld@inac.gc.ca	Don Boswell Senior Claims Analyst



Agency Name	Contact Name
5. Indian and Northern Affairs of Canada- Litigation Management and Resolution Branch Department of Indian and Northern Affairs 10 Wellington Street Gatineau, Quebec K1A 0H4 Fax: 819-997-1679 Email: Royf@inac.gc.ca	Franklin Roy Director
6. Indian and Northern Affairs Canada- Comprehensive Claims Branch Claims East of Manitoba Department of Indian and Northern Affairs 10 Wellington Street, Room 1310 Gatineau, Quebec K1A 0H4 Fax: 819-953-3109 Email: trepanierl@inac.gc.ca	Louise Trepanier Director
7. Ministry of the Attorney General-Aboriginal Legal Issues Office Crown Law Office-Civil Ministry of the Attorney General 720 Bay Street, 8 th Floor Toronto, Ontario M5G 2K1 Fax: 416-326-4181 Email: grant.wedge@ontario.ca	Grant Wedge Council
8. Six Nations of the Grand River Territory P.O. Box 5000 1695 Chiefswood Road Ohsweken, Ontario N0A 1M0 519-445-2201 Fax: 519-445-4208	Glen Frost Senior Administrator Officer Chief Dave General
9. Mississaugas of the New Credit First Nation 2789 Mississauga Road, R.R. # 6 Hagersville, Ontario N0A 1H0 905-768-1133 Fax: 905-768-1225	Margaret Sault Director Chief Bryan Laforme

AGENCY COMMENTS

October 21, 2004

Project EO 66898

Mr. Adele Arbour
City Planner
City of Thorold
Planning Department
8 Carleton Street South
Thorold, Ontario
L2V 4A7

**Subject: City of Welland
Northwest Area Planning and Servicing Study:
Notice of Project Initiation & Public Information Centre**

Telephone

Dear Mr. Arbour:

905.688.4272

Please find enclosed a Notice of Project Initiation & Public Information Centre for the City of Welland Northwest Area Planning and Servicing Study. We will continue to keep you informed of study progress including Study Notice of Project Completion-recommendations.

Facsimile

905.688.5812

If you have any questions or comments or would like additional information on the project, please do not hesitate to call me at (905) 688-2271 or email me at karl.grueneis@earthtech.ca

Very truly yours,

Earth Tech Canada Inc.



Karl Grueneis
EA & Approvals Planner

cc:

File Location: P:\eo\2003 pn over 60778\66898 - Welland NW MSP\Letters\Initiation Letter.doc

RECEIVED

OCT 25 2004

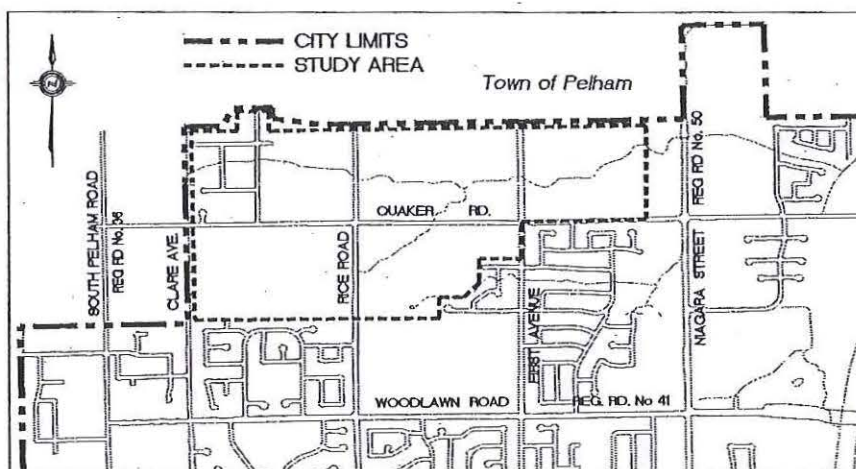
PLANNING & BUILDING



NOTICE OF PROJECT INITIATION AND PUBLIC INFORMATION CENTRE

Background

The City of Welland has initiated a Study to review planning and servicing issues related to existing and potential development within the northwest area of the City (see map). The Northwest Planning and Servicing Study focuses on the development of infrastructure systems for water, wastewater, roads and stormwater management. Other major components of the Study will include a review of the Provincial Policy Statement and Regional Policy Plan, and environmental investigations to identify and protect significant natural features. This Study will develop conclusions/recommendations for servicing of existing and potential development within the Study Area.



Study Process

The Northwest Area Planning and Servicing Study is being conducted in accordance with the requirements of Phases 1 and 2 of the Municipal Engineers' Association Municipal Class Environmental Assessment Document (June 2000), which is an approved process under the Environmental Assessment Act. Public consultation is a key component of the Planning and Servicing Study. An overview of the project, including a preliminary development plan and recommended water, wastewater, transportation and stormwater servicing strategy, will be presented at a Public Information Centre on:

Date: Wednesday November 3rd, 2004
Location: Quaker Road School
333 Quaker Road, Welland, Ontario
Time: 4:00 pm to 8:00 pm

Comments received through the course of the Study will be considered in selecting the recommended stormwater, water, sanitary and roadway servicing strategies. Upon completion of the study, a Master Servicing Plan Class Environmental Assessment report will be prepared to document the planning process followed, including conclusions, and recommendations in addition to how public input was received and considered. The Study will be available for public review for a period of 30 calendar days at Welland City Hall and the Welland Public Library. The public will be notified of the date, time and location of the filing of the Study at the appropriate time through newspaper notices and mailings to those in the project's contact database.

Comments

We are interested in hearing any comments or concerns that you may have about this Study. With the exception of personal information, all information submitted will become part of the public record. Please contact either one of the following project team members if you have any questions, comments, wish to obtain more information on the project or if you would like to be added to the mailing list:

Mr. Donald Thorpe
General Manager, Planning and
Development Services
City of Welland
411 East Main Street
Welland, Ontario
L3B 3X4
Phone: (905) 735-1700 Ext. 251
Fax: (905) 735-8772

Mr. Karl Grueneis
EA & Approvals Planner
Earth Tech Canada Inc.
Corbloc Building
80 King Street, 2nd Floor
St. Catharines, Ontario
L2R 7G1
Phone: (905) 688-2271
Fax: (905) 688-5812
Email: karl.grueneis@earthtech.ca



November 23, 2004



Mr. Karl Grueneis
EA & Approvals Planner
Earth Tech Canada Inc.
Corbloc Building
80 King Street, 2nd Floor
St. Catharines, ON L2R 7G1

Dear Karl:

**Re: City of Welland Northwest Area Planning and Servicing Study
Class Environment Assessment**

As per your request, please include the following for consideration relating to the above subject matter.

1. Niagara College would support a green belt and/or storm water management band along our northern property line as it abuts that section of the plan.
2. Also, we are concerned that any high density designation should be located further away from our property and that all adjacent properties be identified as low density residential to remain consistent with the developed adjacent community.

Should you require any further information, please contact the writer.

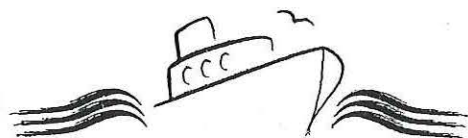
Yours truly,

A handwritten signature in cursive script, appearing to read "Mal Woodhouse".

Mal Woodhouse
Director
Facilities Management Services

c.c. file copy
MW/ls

C:\my documents\earth tech welland nov 24 04.doc



Where Ships Climb The Mountain...

Thorold

November 22, 2004

Don Thorpe, General Manager
Planning and Development Services
City of Welland
411 East Main Street
Welland, ON
L3B 3X4



Dear Mr. Thorpe:

Re: City of Welland
Northwest Area Planning and
Servicing Study

Please be advised Thorold City Council at a Special Council meeting on November 16, 2004 supported the following recommendation of the General Committee regarding Welland's Northwest Area Planning and Servicing Study:

"The Committee recommends in accordance to Official Plan Policy 4.9.8 Deferred Urban Designation, the City of Welland be notified that Thorold wishes to participate in the Northwest Area Planning and Servicing Study in an effort to coordinate future development on either side of the mutual municipal boundary."

From a planning perspective it is important for the Cities of Thorold and Welland to work together in coordinating compatible future development potential on either side of the mutual municipal boundary. A copy of staff Report CPLR2004-36 is enclosed.

We look forward to participating in this important planning study.

Yours very truly,

Adele Arbour, MCIP, RPP
City Planner

AA:em
Attach.

cc: Karl Grueneis, Earth Tech Canada Inc.

City of Thorold

P.O. Box 1044, 8 Carleton Street South, Thorold, Ontario L2V 4A7
email: citythor@thorold.com web: www.thorold.com

Tel: 905-227-6613

Fax: 905-227-5590



**PLANNING
SERVICES REPORT**

CPLR2004-36

NOVEMBER 10, 2004

**CITY OF WELLAND
NORTHWEST AREA PLANNING AND SERVICING
STUDY: NOTICE OF PROJECT INITIATION**

RECOMMENDATION:

The Committee recommends in accordance to Official Plan Policy 4.9.8 Deferred Urban Designation, the City of Welland be notified that Thorold wishes to participate in the Northwest Area Planning and Servicing Study in an effort to coordinate future development on either side of the mutual municipal boundary.

REPORT:

Planning staff received Notice of Project Initiation and Public Information Centre for Welland's Northwest Area Planning and Servicing Study. A response was forwarded to Earth Tech (letter appended to Report) requesting additional information identified in the Notice, which includes an overview of the project, preliminary development plan and recommended water, wastewater, transportation and stormwater servicing strategy.

The lands in Thorold which are adjacent to the Welland study area are designated in the Official Plan as Deferred Urban Area. Policy 4.9.8 Deferred Urban Designation states the following:

4.98 Deferred Urban Designation

A decision will be made by the City of Thorold regarding detailed land uses in the area designated Deferred urban when an alignment for the Mid-Peninsula Transportation Corridor is determined. One possible alignment for the Mid-Peninsula Transportation corridor is through the Deferred Urban Area. The identification of land uses in the area will be the subject of an amendment to this plan. Also, it is intended that development in this area will be coordinated wherever possible with possible future development proposals to the south in the City of Welland.

As the City of Welland has initiated the Northwest Planning and Servicing Study, it makes good planning sense for both municipalities to coordinate future development on either side of the mutual municipal boundary.

The City Planner has requested additional information which would include the overview of the Welland project, preliminary development plan and recommended water, wastewater, transportation and storm servicing strategy.

Staff have also requested to participate in Welland's study as it will have a direct impact to the abutting lands in Thorold. A copy of the letter sent to Earth Tech in this regard is attached. Upon planning staff's review of additional information, a report to the General Committee will be forthcoming.

**PREPARED AND
RESPECTFULLY SUBMITTED BY:**



A. Arbour, City Planner

APPROVED BY:



J.K. Rice, Acting City Administrator

- 4.9.6.4.8 Energy conservation measures shall be incorporated in the design of subdivisions through effective use of natural vegetation, the design of road patterns and the orientation of buildings to take advantage of sun exposure.
- 4.9.6.4.9 Subdivision designs will be encouraged to optimize the use of open spaces by providing linkages through out the community.
- 4.9.6.4.10 To develop a pedestrian scale community of buildings to encourage walking and decreasing the reliance on the automobile.

4.9.7 Engineering Services

The Port Robinson Community will be serviced in an orderly and efficient manner with respect to sanitary sewers, pumping station(s), watermain and storm water management facilities. Services will need to be extended from their present locations, and storm water management outlets/facilities will need to be enhanced in order to accommodate growth in the Plan area.

- 4.9.7.1 The provision of services, including new collector roads for the first phase of the expanded Urban Area shall be guided by the generalized servicing scheme and roads plan shown on Schedule B and C respectively and the Engineering Services Policy Section 5.

OPA 37

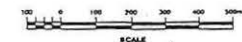
4.9.8 Deferred Urban Designation

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**OFFICIAL PLAN
OF THE
CITY OF THOROLD
PLANNING AREA
SCHEDULE 'B-3'
PORT ROBINSON WEST
SECONDARY PLAN
LAND USE PLAN**

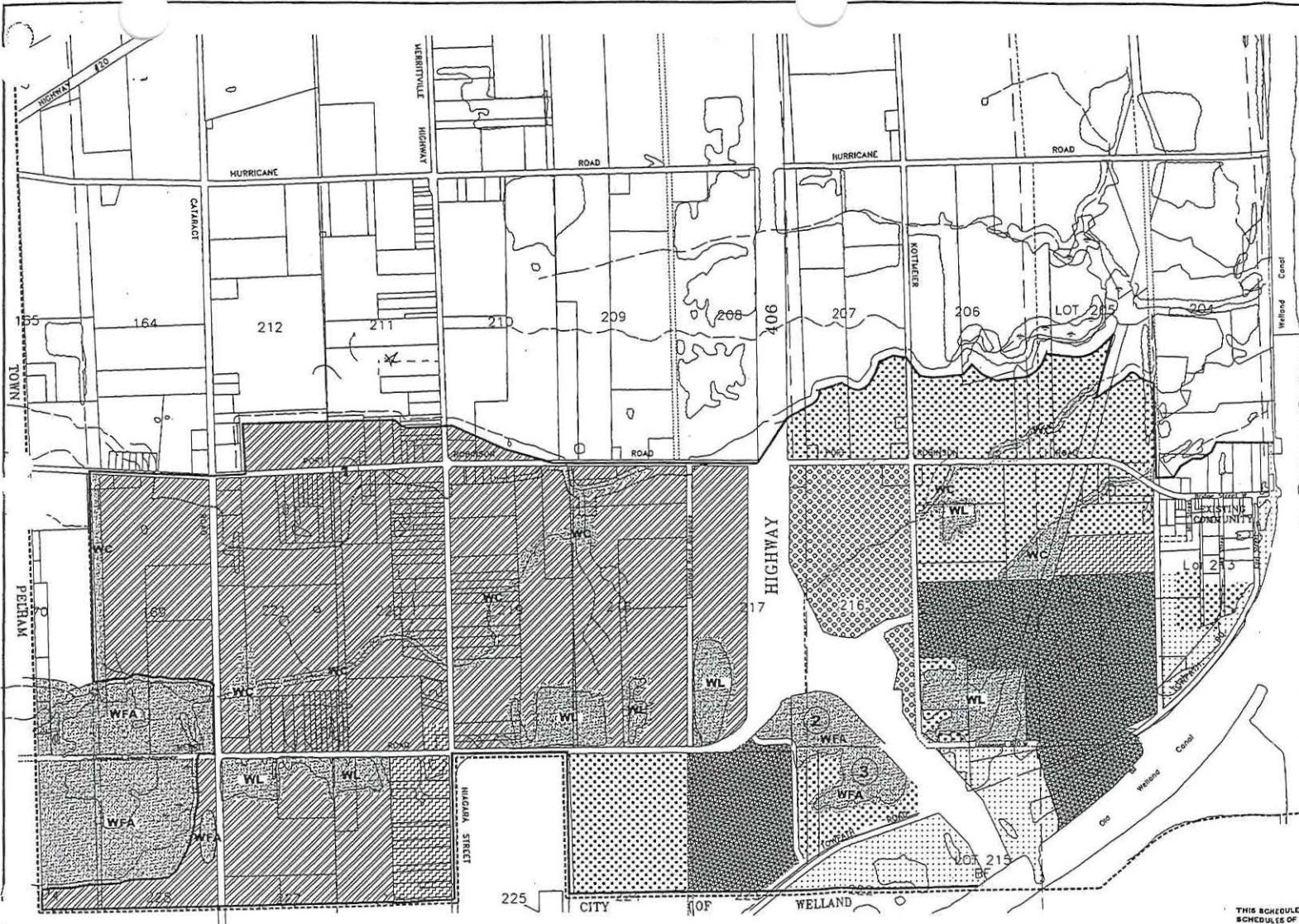
LEGEND

-  **RESIDENTIAL**
-  **MINOR COMMERCIAL**
-  **INDUSTRIAL**
-  **BUSINESS PARK**
-  **OPEN SPACE**
-  **ENVIRONMENTAL CONSERVATION**
 WC - Watercourse System
 WL - Woodland
 WFA - Wet Forest Area
-  **DEFERRED URBAN AREA**
-  **SPECIAL POLICY AREA**
-  **URBAN AREA BOUNDARY**
-  **MUNICIPAL BOUNDARY**



THIS SCHEDULE SHOULD BE READ IN CONJUNCTION WITH THE POLICIES AND OTHER SCHEDULES OF THIS OFFICIAL PLAN.

JANUARY 2002



106

November 2, 2004

Thorold



Where Ships Climb The Mountain...

Earth Tech Canada Inc.
Corbloc Building
80 King Street, 2nd Floor
St. Catharines, ON L2R 7G1

Attention: Karl Grueneis; EA & Approvals Planner

Dear Mr. Grueneis;

Re: City of Welland Northwest Area
Planning and Servicing Study
Class Environmental Assessment Study

The City of Thorold is in receipt of your correspondence dated October 21, 2004. In addition to being kept informed of study progress including Study Notice of Project Completion - recommendations, Thorold Planning staff would like to obtain additional information as identified in the Public Notice. This would include overview of the project, including a preliminary development plan and recommended water, wastewater, transportation and stormwater servicing strategy.

The key plan included in the Public Notice incorrectly identifies the Town of Pelham at the northern limit of the study area/City limit whereas the City of Thorold is the abutting municipality approximately 600 ft. east of Rice Road.

Attached is Schedule "B-3" Port Robinson West Secondary Plan - Land Use Plan which illustrates the lands within Thorold as a Deferred Urban Designation. Official Plan Policy 4.9.8 directs development in this area to be coordinated wherever possible with future development proposals to the south in the City of Welland.

Planning staff intend to report to Thorold City Council concerning the Planning and Servicing Study being undertaken by the City of Welland therefore any additional information would be helpful.

Yours very truly,

Adele Arbour, M.C.I.P., R.P.P.
City Planner

AA:em
Encl.

cc: ✓ Donald Thorpe, City of Welland
✓ Corwin Cambray, Region of Niagara

City of Thorold

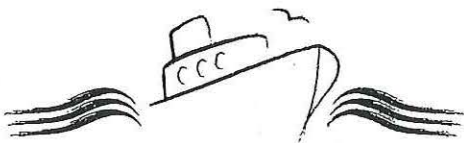
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Tel: 905-227-6613

P.O. Box 1044, 8 Carleton Street South, Thorold, Ontario L2V 4A7

email: citythor@thorold.com web: www.thorold.com

Fax: 905-227-5590



Where Ships Climb The Mountain...

November 2, 2004

Thorold

Earth Tech Canada Inc.
Corbloc Building
80 King Street, 2nd Floor
St. Catharines, ON L2R 7G1



Attention: Karl Grueneis, EA & Approvals Planner

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Planning and Servicing Study
Class Environmental Assessment Study

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Yours very truly,

Adele Arbour
Adele Arbour, M.C.I.P., R.P.P.
City Planner

AA:em
Encl.

cc: Donald Thorpe, City of Welland
Corwin Cambray, Region of Niagara

City of Thorold

P.O. Box 1044, 8 Carleton Street South, Thorold, Ontario L2V 4A7

email: citythor@thorold.com web: www.thorold.com

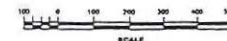
Tel: 905-227-8813

Fax: 905-227-5590

OFFICIAL PLAN OF THE CITY OF THOROLD PLANNING AREA SCHEDULE 'B-3' PORT ROBINSON WEST SECONDARY PLAN LAND USE PLAN

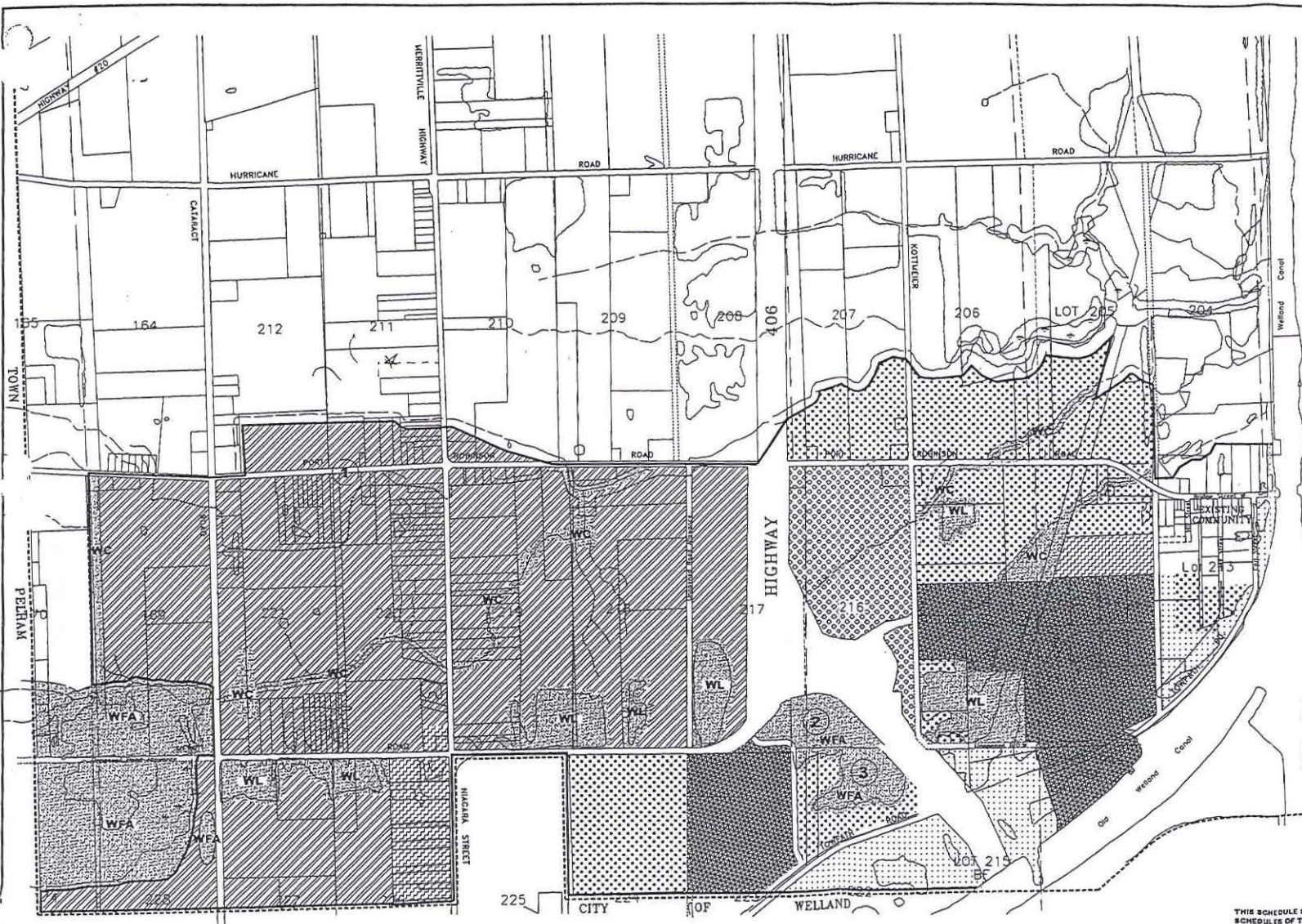
LEGEND

-  **RESIDENTIAL**
-  **MINOR COMMERCIAL**
-  **INDUSTRIAL**
-  **BUSINESS PARK**
-  **OPEN SPACE**
-  **ENVIRONMENTAL CONSERVATION**
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-  **URBAN AREA BOUNDARY**
-  **MUNICIPAL BOUNDARY**



THIS SCHEDULE SHOULD BE READ IN CONJUNCTION WITH THE POLICIES AND OTHER SCHEDULES OF THIS OFFICIAL PLAN.

JANUARY 2002



106

- 4.9.6.4.8 Energy conservation measures shall be incorporated in the design of subdivisions through effective use of natural vegetation, the design of road patterns and the orientation of buildings to take advantage of sun exposure.
- 4.9.6.4.9 Subdivision designs will be encouraged to optimize the use of open spaces by providing linkages through out the community.
- 4.9.6.4.10 To develop a pedestrian scale community of buildings to encourage walking and decreasing the reliance on the automobile.

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OPA 37

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Ministry of Culture Ministère de la Culture
Heritage & Libraries Branch
Southwest Archaeological Field Office
900 Highbury Avenue
London, Ontario N5Y 1A4



(519) 675-7742; Fax: 675-7777

October 26, 2004

To: Karl Grueneis
EA & Approvals Planner
Earth Tech Canada Inc.
Corbloc Building
80 King Street, 2nd Floor
St. Catharines, Ontario L2R 7G1

**RE: City of Welland Northwest Area Planning and Servicing Study, Class
Environmental Assessment Study**

Thank you for your letter of October 21, 2004 concerning the above-noted project. A principal concern of this office is the adverse effects that development activities might have on cultural heritage resources. Cultural heritage resources include built heritage, archaeological resources and cultural heritage landscapes. The criteria used in developing recommendations for this study should also include the potential impacts to cultural heritage resources as a result of development activities. If preferred alternatives will have the potential to impact cultural heritage resources, then our office would recommend that a heritage assessment be conducted prior to the initiation of construction activities. If any significant heritage or archaeological remains are identified, then any negative impacts would have to be mitigated by either avoidance or excavation.

I trust that this is of assistance. Please do not hesitate to contact me if you require further information.

Sincerely,

John MacDonald
Heritage Planner
Southwestern Ontario Region

c. Donald Thorpe, City of Welland

November 16, 2004

Project 66898

Mr. Anthony Dimeo
315 Quaker Road
Welland, Ontario
L3C 3G6

**Subject: City of Welland Northwest Area Planning and Servicing Study
Class Environmental Assessment**

Dear Mr. Dimeo:

Telephone

Please find enclosed a copy of the Public Information Centre Display Boards regarding the City of Welland Northwest Area Planning & Servicing Study Class Environmental Assessment. We will continue to keep you informed of study progress including Study Notice of Completion-recommendations.

905.688.4272

Facsimile

905.688.5812

If you have any further questions or comments at this time, please do not hesitate to call me at (905) 688-2271 or email at karl.grueneis@earthtech.ca.

Very truly yours,

Earth Tech Canada Inc.



Karl Grueneis
EA & Approvals Planner

cc: Donald Thorpe, City of Welland

File Location: P:\eo\2003 pn over 60778\66898 - Welland NW MSP\Letters\PIC Package.doc

November 29, 2004

Project 66898

Mr. Ken Sandham
Transportation Services
Niagara Catholic District School Board
Catholic Education Centre
427 Rice Road
Welland, Ontario
L3C 7C1

**Subject: City of Welland Northwest Area Planning and Servicing Study
Class Environmental Assessment: PIC Story Boards**

Telephone

905.688.4272

Dear Mr. Sandham:

Facsimile

905.688.5812

As requested, please find enclosed a copy of the Public Information Centre (PIC) Story Boards as presented at the City of Welland Northwest Area Planning & Servicing Study PIC held on November 3rd, 2004. We will continue to keep you informed of study progress including Study Notice of Completion-recommendations.

If you have any further questions or comments at this time, please do not hesitate to call me at (905) 688-2271 or email at karl.grueneis@earthtech.ca.

Very truly yours,

Earth Tech Canada Inc.



Karl Grueneis
EA & Approvals Planner

cc: Donald Thorpe, City of Welland

File Location: P:\eo\2003 pn over 60778\66898 - Welland NW MSP\Letters\PIC Package.doc

November 16, 2004

Project 66898

Mr. Adele Arbour
City Planner
City of Thorold
Planning Department
8 Carleton Street South
Thorold, Ontario
L2V 4A7

**Subject: City of Welland Northwest Area Planning and Servicing Study
Class Environmental Assessment**

Telephone

905.688.4272

Dear Mr. Arbour:

Facsimile

Please find enclosed a copy of the Public Information Centre Display Boards regarding the City of Welland Northwest Area Planning & Servicing Study Class Environmental Assessment. We will continue to keep you informed of study progress including Study Notice of Completion-recommendations.

905.688.5812

If you have any further questions or comments at this time, please do not hesitate to call me at (905) 688-2271 or email at karl.gueneis@earthtech.ca.

Very truly yours,

Earth Tech Canada Inc.



Karl Grueneis
EA & Approvals Planner

cc: Donald Thorpe, City of Welland

File Location: P:\eo\2003 pn over 60778\66898 - Welland NW MSP\Letters\PIC Package.doc

April 18, 2005

Project EO 66898

Mr. Drew Semple, MCIP, RPP
Senior Planner
Regional Municipality of Niagara
Planning and Development Department
3550 Schmon Parkway
P.O. Box 1042
Thorold, Ontario
L2V 4T7

**Subject: City of Welland Northwest Area Planning and Servicing Study Class EA
(Region File: A.03.A.34.43): Project Status and Background Information**

Dear Mr. Semple:

Telephone

Thank you for your comments provided in your letter of April 12, 2005. The City of Welland and Earth Tech value and appreciate your input on the City of Welland's Northwest Area Planning and Servicing Study Class EA.

905.688.4272

Facsimile

To assist the Region in its review we provide the following:

905.688.5812

- Copy of Northwest Area Environmental Impact Study (December 2003). This work was used to identify and protect significant environmental features found within the project study area and guide the preparation of the preliminary development Concept Plan. It is important to note that the design and selection of property types/land uses/densities as presented in the Concept Plan were chosen to meet the requirements of a typical community growth plan and guide the water, sanitary sewer, road and stormwater servicing evaluation. This was done to confirm the engineering (e.g. sizing, phasing) and economic feasibility of developing the Northwest Area prior to proceeding with required planning approvals (i.e. Official Plan, Secondary Plan and Regional Policy Plan amendments, zoning-by-law).
- Copy of November 3rd, 2004 Public Information Centre (PIC) story boards on display at the November 3rd, 2004 PIC and to Vince Goldsworthy on April 8th, 2005. The recommended water, wastewater, road and stormwater servicing concepts have not changed from those presented at the November 3rd, 2004 PIC and will form the basis for the Class EA document.

Project Status and Schedule

- Earth Tech met with the City on April 13th, 2005 to review a preliminary draft of the Class EA document and project schedule.
- Earth Tech will provide the City for review and comment a draft of the complete Class EA document the week of April 25th, 2005.



Mr. Drew Semple
Regional Municipality of Niagara
April 18, 2005

Project EO 66898
Page 2

- Following finalization a draft of the Class EA document will be provided to Regional Niagara Planning and Development Services and Public Works for review and comment in mid May 2005.
- Following your review a meeting will be scheduled in May 2005 to discuss the project including the Region's comments/issues and project next steps.
- Upon receipt of key review agency comments (eg. NPCA, MNR) finalization of the Class EA document will be presented to City Council in early June 2005 for approval.
- It is envisioned that Notice of Project Completion and commencement of the mandatory 30 day public review-comment period will commence in June and end in July 2005.
- Upon successful Notice of Project Completion the City expects to initiate the next phase (planning approvals). It is envisioned that this will be completed by the end of 2005 upon which the planning documentation will be provided to Regional Niagara for review, comment and further discussion regarding the approvals process.

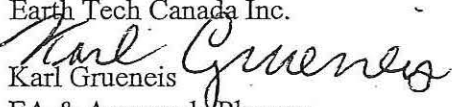
Summary

The draft Northwest Area Planning and Servicing Study Class EA document concludes that the project study area can be efficiently serviced as municipal servicing is readily available and provides good background for proceeding with the next steps (planning approvals).

On behalf of the City of Welland, we thank you for your involvement in this important project and we appreciate your interest and input. If you have any questions or comments at this time, please do not hesitate to contact the City directly or myself at Tel: (905) 688-2271, Fax: (905) 688-5812 or by via email at karl.grueneis@earthtech.ca.

Very truly yours,

Earth Tech Canada Inc.


Karl Grueneis
EA & Approvals Planner

cc. Donald Thorpe, City of Welland
Andy Burt, Niagara Peninsula Conservation Authority
Joad Durst, Ministry of Natural Resources

April 18, 2005

Project EO 66898

Mr. Andy Burt
General Manager
Niagara Peninsula Conservation Authority
250 Thorold Road West, 3rd Floor
Welland, Ontario
L3C 3W2

**Subject: City of Welland Northwest Area Planning and Servicing Study Class EA:
Project Status and Background Information**

Dear Mr. Burt:

As you know on November 3rd, 2004 the City of Welland and Earth Tech held a Public Information Centre (PIC) for the City of Welland Northwest Area Planning and Servicing Study Class EA.

Telephone

905.688.4272

Facsimile

To assist the NPCA in its review we provide the following:

905.688.5812

- Copy of Northwest Area Environmental Impact Study (December 2003). This work was used to identify and protect significant environmental features found within the project study area and guide the preparation of the preliminary development Concept Plan. It is important to note that the design and selection of property types/land uses/densities as presented in the Concept Plan were chosen to meet the requirements of a typical community growth plan and guide the water, sanitary sewer, road and stormwater servicing evaluation. This was done to confirm the engineering (e.g. sizing, phasing) and economic feasibility of developing the Northwest Area prior to proceeding with required planning approvals (i.e. Official Plan, Secondary Plan and Regional Policy Plan amendments, zoning-by-law).
- Copy of November 3rd, 2004 Public Information Centre (PIC) story boards on display at the November 3rd, 2004 PIC. The recommended water, wastewater, road and stormwater servicing concepts have not changed from those presented at the November 3rd, 2004 PIC and will form the basis of the Class EA document.

Project Status and Schedule

- Earth Tech met with the City on April 13th, 2005 to review a preliminary draft of the Class EA document and project schedule.
- Earth Tech will provide the City for review and comment a draft of the complete Class EA document the week of April 25th, 2005.
- Following finalization, a draft of the Class EA document will be provided to NPCA for review and comment in mid May 2005.
- Following your review a meeting can be scheduled in May 2005 to discuss the project including NPCA's comments/issues and project next steps.

- Upon receipt of key review agency comments (eg. Regional Niagara, NPCA, MNR) finalization of the Class EA document will be presented to City Council in early June 2005 for approval.
- It is envisioned that Notice of Project Completion and commencement of the mandatory 30 day public review-comment period will commence in June and end in July 2005.
- Upon successful Notice of Project Completion the City expects to initiate the next phase (planning approvals). It is envisioned that this will be completed by the end of 2005 upon which the planning documentation will be provided to key agencies for review, comment and further discussion regarding the approvals process.

Summary

The draft Northwest Area Planning and Servicing Study Class EA document concludes that the project study area can be efficiently serviced as municipal servicing is readily available and provides good background for proceeding with the next steps (planning approvals).

On behalf of the City of Welland, we thank you for your involvement in this important project and we appreciate your interest and future input. If you have any questions or comments at this time, please do not hesitate to contact the City directly or myself at Tel: (905) 688-2271, Fax: (905) 688-5812 or by via email at karl.grueneis@earthtech.ca.

Very truly yours,

Earth Tech Canada Inc.



Karl Grueneis

EA & Approvals Planner

cc. Donald Thorpe, City of Welland
Joad Durst, Ministry of Natural Resources
Drew Semple, Regional Municipality of Niagara

April 18, 2005

Project EO 66898

Mr. Joad Durst
Area Supervisor
Ministry of Natural Resources
Niagara Area Office
4890 Victoria Ave North
P.O. Box 5000
Vineland Station, Ontario
L0R 2E0

**Subject: City of Welland Northwest Area Planning and Servicing Study Class EA:
Project Status and Background Information**

Telephone

Dear Mr. Durst:

905.688.4272

As you know on November 3rd, 2004 the City of Welland and Earth Tech held a Public Information Centre (PIC) for the City of Welland Northwest Area Planning and Servicing Study Class EA.

Facsimile

To assist the MNR in its review we provide the following:

905.688.5812

- Copy of Northwest Area Environmental Impact Study (December 2003). This work was used to identify and protect significant environmental features found within the project study area and guide the preparation of the preliminary development Concept Plan. It is important to note that the design and selection of property types/land uses/densities as presented in the Concept Plan were chosen to meet the requirements of a typical community growth plan and guide the water, sanitary sewer, road and stormwater servicing evaluation. This was done to confirm the engineering (e.g. sizing, phasing) and economic feasibility of developing the Northwest Area prior to proceeding with required planning approvals (i.e. Official Plan, Secondary Plan and Regional Policy Plan amendments, zoning-by-law).
- Copy of November 3rd, 2004 Public Information Centre (PIC) story boards on display at the November 3rd, 2004 PIC. The recommended water, wastewater, road and stormwater servicing concepts have not changed from those presented at the November 3rd, 2004 PIC and will form the basis of the Class EA document.

Project Status and Schedule

- Earth Tech met with the City on April 13th, 2005 to review a preliminary draft of the Class EA document and project schedule.
- Earth Tech will provide the City for review and comment a draft of the complete Class EA document the week of April 25th, 2005.
- Following finalization, a draft of the Class EA document will be provided to MNR for review and comment in mid May 2005.

Mr. Joad Durst
Ministry of Natural Resources
April 18, 2005

Project EO 66898
Page 2

- Following your review a meeting can be scheduled in May 2005 to discuss the project including MNR's comments/issues and project next steps.
- Upon receipt of key review agency comments (eg. Regional Niagara, MNR, NPCA) finalization of the Class EA document will be presented to City Council in early June 2005 for approval.
- It is envisioned that Notice of Project Completion and commencement of the mandatory 30 day public review-comment period will commence in June and end in July 2005.
- Upon successful Notice of Project Completion the City expects to initiate the next phase (planning approvals). It is envisioned that this will be completed by the end of 2005 upon which the planning documentation will be provided to key agencies for review, comment and further discussion regarding the approvals process.

Summary

The draft Northwest Area Planning and Servicing Study Class EA document concludes that the project study area can be efficiently serviced as municipal servicing is readily available and provides good background for proceeding with the next steps (planning approvals).

On behalf of the City of Welland, we thank you for your involvement in this important project and we appreciate your interest and future input. If you have any questions or comments at this time, please do not hesitate to contact the City directly or myself at Tel: (905) 688-2271, Fax: (905) 688-5812 or by via email at karl.gueneis@earthtech.ca.

Very truly yours,

Earth Tech Canada Inc.


Karl Grueneis

EA & Approvals Planner

cc. Donald Thorpe, City of Welland
Andy Burt, Niagara Peninsula Conservation Authority
Drew Semple, Regional Municipality of Niagara

June 29, 2005

Project EO 66898

Suzanne McInnes, MCIP, RPP
Watershed Planning Coordinator
Niagara Peninsula Conservation Authority
250 Thorold Road West, 3rd Floor
Welland, Ontario
L3C 3W2

**Subject: Welland Northwest Area Planning and Servicing Study Class EA:
Response to Letter Dated May 17th 2005 - draft**

Dear Ms. McInnes:

Telephone

Further to your letter of May 17th 2005, please find enclosed a draft of the Class environmental screening document for the Welland Northwest Area Planning and Servicing Class EA. In response to your May 17th, 2005 comments we provide the following:

905.688.4272

Facsimile

905.688.5812

- As a basis for the identification and evaluation of infrastructure servicing strategies, a preliminary concept plan was prepared. The preliminary concept plan provides an overview of possible reasonable land uses and densities and is an important tool used to guide and evaluate water, sanitary sewer, road and stormwater infrastructure sizing, phasing and feasibility. It is important to recognize that the preliminary concept plan as presented in this document does not reflect a decision or preference on how the Northwest Area is ultimately developed in terms of land uses and associated densities. This will be achieved through future planning (e.g. Official Plan, Secondary Plan and Zoning By-Law) which will also involve future public consultation activities.
- The Niagara Peninsula Conservation Authority (NPCA) will be invited to participate in the next generation of the concept plan which would be part of the secondary plan exercise.
- The entire site (proposed development area) is approximately 184 ha.
- Preliminary investigations revealed that the majority of the unnamed tributaries consisted of degraded, channelized agricultural swales that in sections, may contain warm water fish habitat. Before future development can occur, additional investigations at an appropriate level of detail will be recommended to thoroughly characterize and assess these channels in terms of fish habitat and their associated developmental impacts. Furthermore, permission from the Ministry of Natural Resources (MNR), Fisheries and Oceans Canada (DFO), and the NPCA will need to be secured prior to any in-water works that may adversely affect potential fish

Suzanne McInnes, MCIP, RPP
Niagara Peninsula Conservation Authority
June 29, 2005

Project EO 66898
Page 2

communities in these tributaries. Therefore, these aquatic resources will be managed and protected accordingly.

- At the eastern limit of the study area, the total drainage area exceeds 125ha. However, the concept plan does not envision open channels and is based on minor and major stormwater systems being directed to the proposed stormwater management facilities (figure 11-1). As such, we do not envision requiring flood plain mapping. The NPCA will of course be involved in the predesign and design of all proposed stormwater systems as part of the future secondary plan exercise.
- Immediately east of our study area, there is presently no overland flow route (i.e. Al Auto Sales). Minor storms will outlet through the existing 1500mm diameter steel pipe culvert under Al Auto Sales. Major storms will be diverted via connection to Niagara Street as part of the new Secondary Plan road and stormwater system.

We look forward to your comments and will notify you when the 30 day public review begins. If you any questions of comments at this time, please do not hesitate to contact me via telephone at (905) 688 2271 or email at karl.grueneis@earthtech.ca.

Very truly yours,

Earth Tech Canada Inc.



Karl Grueneis
EA & Approvals Planner

cc: Donald Thorpe, City of Welland

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June 29, 2005

Project EO 66898

Mr. Drew Semple, MCIP, RPP
Senior Planner
Regional Municipality of Niagara
Planning and Development Department
3550 Schmon Parkway
P.O. Box 1042
Thorold, Ontario
L2V 4T7

**Subject: Welland Northwest Area Planning and Servicing Study Class EA:
Response to NPCA Letter Dated May 17th 2005 - draft**

Telephone

Dear Mr. Semple:

905.688.4272

Further to the NPCA's letter of May 17th 2005, please find enclosed a draft of the Class environmental screening document for the Welland Northwest Area Planning and Servicing Class EA. In response to NPCA's May 17th, 2005 comments we provide the following:

Facsimile

905.688.5812

- As a basis for the identification and evaluation of infrastructure servicing strategies, a preliminary concept plan was prepared. The preliminary concept plan provides an overview of possible reasonable land uses and densities and is an important tool used to guide and evaluate water, sanitary sewer, road and stormwater infrastructure sizing, phasing and feasibility. It is important to recognize that the preliminary concept plan as presented in this document does not reflect a decision or preference on how the Northwest Area is ultimately developed in terms of land uses and associated densities. This will be achieved through future planning (e.g. Official Plan, Secondary Plan and Zoning By-Law) which will also involve future public consultation activities.
- The Niagara Peninsula Conservation Authority (NPCA), Ministry of Natural Resources (MNR) and Regional Niagara Planning and Development Department will be invited to participate in the next generation of the concept plan which would be part of the secondary plan exercise.
- The entire site (proposed development area) is approximately 184 ha.
- Preliminary investigations revealed that the majority of the unnamed tributaries consisted of degraded, channelized agricultural swales that in sections, may contain warm water fish habitat. Before future development can occur, additional investigations at an appropriate level of detail will be recommended to thoroughly characterize and assess these channels in terms of fish habitat and their associated developmental impacts. Furthermore, permission from the Ministry of Natural

Mr. Drew Semple
Regional Municipality of Niagara
June 29, 2005

Project EO 66898
Page 2

Resources (MNR), Fisheries and Oceans Canada (DFO), and the NPCA will need to be secured prior to any in-water works that may adversely affect potential fish communities in these tributaries. Therefore, these aquatic resources will be managed and protected accordingly.

- At the western limit of the study area, the total drainage area exceeds 125ha. However, the concept plan does not envision open channels and is based on minor and major stormwater systems being directed to the proposed stormwater management facilities (figure 11-1). As such, we do not envision requiring flood plain mapping. The NPCA will of course be involved in the predesign and design of all proposed stormwater systems as part of the future secondary plan exercise.
- Immediately east of our study area, there is presently no overland flow route (i.e. Al Auto Sales). Minor storms will outlet through the existing 1500mm diameter steel pipe culvert under Al Auto Sales. Major storms will be diverted via connection to Niagara Street as part of the new Secondary Plan road and stormwater system.

We look forward to your comments and will notify you when the 30 day public review begins. If you any questions of comments at this time, please do not hesitate to contact me via telephone at (905) 688 2271 or email at karl.gueneis@earthtech.ca.

Very truly yours,

Earth Tech Canada Inc.


Karl Grueneis
EA & Approvals Planner

cc: Donald Thorpe, City of Welland
Suzanne McInnes, Niagara Peninsula Conservation Authority
Joad Durst, Ministry of Natural Resources

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June 29, 2005

Project EO 66898

Mr. Joad Durst
Area Supervisor
Ministry of Natural Resources
Niagara Area Office
4890 Victoria Ave North
P.O. Box 5000
Vineland Station, Ontario
L0R 2E0

**Subject: Welland Northwest Area Planning and Servicing Study Class EA:
Response to NPCA Letter Dated May 17th 2005 - draft**

Telephone

Dear Mr. Durst:

905.688.4272

Further to the NPCA's letter of May 17th 2005, please find enclosed a draft of the Class environmental screening document for the Welland Northwest Area Planning and Servicing Class EA. In response to NPCA's May 17th, 2005 comments we provide the following:

Facsimile

905.688.5812

- As a basis for the identification and evaluation of infrastructure servicing strategies, a preliminary concept plan was prepared. The preliminary concept plan provides an overview of possible reasonable land uses and densities and is an important tool used to guide and evaluate water, sanitary sewer, road and stormwater infrastructure sizing, phasing and feasibility. It is important to recognize that the preliminary concept plan as presented in this document does not reflect a decision or preference on how the Northwest Area is ultimately developed in terms of land uses and associated densities. This will be achieved through future planning (e.g. Official Plan, Secondary Plan and Zoning By-Law) which will also involve future public consultation activities.
- The Niagara Peninsula Conservation Authority (NPCA), Ministry of Natural Resources (MNR) and Regional Niagara Planning and Development Department will be invited to participate in the next generation of the concept plan which would be part of the secondary plan exercise.
- The entire site (proposed development area) is approximately 184 ha.
- Preliminary investigations revealed that the majority of the unnamed tributaries consisted of degraded, channelized agricultural swales that in sections, may contain warm water fish habitat. Before future development can occur, additional investigations at an appropriate level of detail will be recommended to thoroughly characterize and assess these channels in terms of fish habitat and their associated developmental impacts. Furthermore, permission from the Ministry of Natural

Mr. Joad Durst
Ministry of Natural Resources
June 29, 2005

Project EO 66898
Page 2

Resources (MNR), Fisheries and Oceans Canada (DFO), and the NPCA will need to be secured prior to any in-water works that may adversely affect potential fish communities in these tributaries. Therefore, these aquatic resources will be managed and protected accordingly.

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- Immediately east of our study area, there is presently no overland flow route (i.e. Al Auto Sales). Minor storms will outlet through the existing 1500mm diameter steel pipe culvert under Al Auto Sales. Major storms will be diverted via connection to Niagara Street as part of the new Secondary Plan road and stormwater system.

We look forward to your comments and will notify you when the 30 day public review begins. If you any questions of comments at this time, please do not hesitate to contact me via telephone at (905) 688 2271 or email at karl.grueneis@earthtech.ca.

Very truly yours,

Earth Tech Canada Inc.



Karl Grueneis
EA & Approvals Planner

cc: Donald Thorpe, City of Welland
Suzanne McInnes, Niagara Peninsula Conservation Authority
Drew Semple, Regional Municipality of Niagara

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CORPORATION OF THE CITY OF THOROLD

August 11, 2004

Earth Tech Canada Inc.
Corbloc Building
80 King Street, 2nd Floor
St. Catharines, ON
L2R 7G1

Attention: Karl Grueneis, EA & Approvals Planner

Dear Mr. Grueneis;

Re: City of Welland Northwest Area Planning and Servicing Review
Class Environmental Assessment: Response to Request for Information

Please be advised the City of Thorold has reviewed the above noted request. There are currently no Official Plan or Zoning By-law Amendments or development application adjacent to the study area.

As requested, enclosed are copies of the City of Thorold Official Plan (which includes the Port Robinson West Secondary Plan) and Comprehensive Zoning By-law at a cost of \$64.20 total.

Please note municipal planning staff have been in discussion with a property owner who has expressed an interest in developing a large residential subdivision east of Hwy. 406. To date no formal application has been received.

Yours very truly,

Adele Arbour, M.C.I.P., R.P.P.
City Planner

AA:em
Encl.

July 27, 2005

Karl Grueneis
Earth Tech Canada Inc.
Corbloc Building
80 King St., 2nd Fl.
St. Catharines, ON L2R 7G1



Dear Mr. Grueneis:

**RE: Welland Northwest Area Planning and Servicing Study (Master Plan) Class
Environmental Assessment**

Thank you for providing the Ministry with a copy of the Environmental Screening Document (Draft) for the above noted Class EA study. Ministry staff has reviewed the report and offer the following comments for consideration.

The Ministry notes that there are no wetlands or ANSIs presently identified as provincially significant within or adjacent to the study area. The Niagara Street – Cataract Road Woodlot locally significant wetland (LSW) and Kunda Park Forest regionally significant life science ANSI are located immediately to the north of the study area. The Ministry also observes that the Region of Niagara has identified these natural features, in addition to woodlands within the study area, as Environmental Conservation Areas in their proposed new natural environmental policies and mapping. The Region's proposed mapping also identifies a Natural Heritage Corridor crossing the western portion of the study area, connecting to the LSW, ANSI and Rose Little Woodlot ESA to the north.

In the description provided for the Rose Little Woodlot (Section 4) it is noted that American Chestnut is present. The report does not identify that this is a Species at Risk (SAR), with a *Threatened* status. It is unclear from the report whether or not the Natural Heritage Information Centre (NHIC) database was reviewed for other rare species records.

The Ministry understands that the servicing alignments for water, sewage and stormwater identified in the report are considered schedule B projects which are approved to proceed upon completion of this study, but that the road network depicted in the report is conceptual only, with actual capacity and locations to be determined through the future secondary planning exercise. Although the Ministry generally supports locating servicing within road right-of-ways, which the report endorses as the preferred approach, it is not possible to fully assess the potential for impacts on natural features until road locations have been identified.

Table 10-1 suggests that vegetation loss due to road construction can be mitigated, but does not elaborate in Section 10 (Roadway Servicing Alternatives) or 16 (Environmental Protection - Mitigation) on what specific strategies may be appropriate. The Ministry also notes that Section 10 did not consider how future roads would potentially impact the stream that is present on-site or suggest how stream protection might be incorporated in the secondary planning exercise that is to occur. The Ministry supports the report's recommendation that additional fisheries

investigations should be completed to properly characterize the tributaries present on-site. This would allow for a proper assessment of how the aquatic/fisheries resources may be impacted by future servicing and the types of protection/mitigation measures that may be required.

The potential for fisheries impacts from the proposed servicing should be determined in consultation with the Niagara Peninsula Conservation Authority. The Ministry is responsible for setting timing windows and issuing permits for in-stream work, and should be consulted prior to any development within the planning area.

Please contact the undersigned if you have questions or clarification is required.

Sincerely,



Mike Stone
A/ District Planner
Tel: (519) 826-4912
Fax: (519) 826-4929

Cc: Joad Durst, MNR
Suzanne McInnes, NPCA
Drew Semple, Region of Niagara



NIAGARA PENINSULA
CONSERVATION
AUTHORITY

250 Thorold Road West, 3rd Floor Tel (905) 788-3135
Welland, Ontario L3C 3W2 Fax (905) 788-1121
E-mail: npca@conservation-niagara.on.ca

July 22, 2005

Sent by fax 905-688-5812

File: MPR 4.40.15

Earth Tech Canada Inc
Corbloc Building
80 King Street, 2nd Floor
St. Catharines, ON L2R 7G1

Attention: Mr. Karl Grueneis, EA & Approvals Planner

Dear Mr. Grueneis,

Subject: Welland Northwest Area Planning and Servicing Study Class EA

The Niagara Peninsula Conservation Authority (NPCA) has reviewed the Draft Northwest Welland Area Planning and Servicing Study (dated June 27, 2005) as prepared by Earthtech. Based upon our review, the NPCA offers the following comments:

General Comments

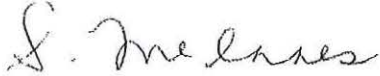
Figure 11-1 indicates that the Welland Canal Tributaries 7 and 8 are to be entombed in order to facilitate the proposed study area lot fabric. The NPCA understands the need to make certain assumptions in order to undertake a Master level planning study. The NPCA also understands that the purpose of this document is to identify possible constraints to the servicing of the City's possible Urban Boundary expansion. As such, it is the NPCA's opinion that it is critical that this study confirm the status to these Welland Canal tributaries with the Ministry of Natural Resources and the Federal Department of Fisheries and Oceans. This report's conclusions and recommendations with respect to the proposed roadway, storm sewer, floodplain and stormwater management systems could be significantly altered should these watercourses be deemed to be fish habitat which would prohibit their entombment.

Stormwater Management

The NPCA has no objection to the use of a communal stormwater management facility to provide stormwater quality and quantity controls for the Northwest Welland Servicing Area. The NPCA has no objection to the provision of a Normal (formally Level 2) level of stormwater quality control for the Northwest Welland Servicing Area. The NPCA has no objection to the attenuation of post development peak stormwater flows to pre-development levels for up to and including the 100 year return period storm event for the Northwest Welland Servicing Area.

The NPCA notes that these comments are based on our general understanding of the project and may be further refined as the details of the Planning and Servicing Master Plan are further developed.

Sincerely,



Suzanne McInnes, MCIP, RPP
Watershed Planning Coordinator (ext.235)

cc. D. Thorpe, City of Welland Planning
J. Durst, MNR, Vineland
D. Semple, Region of Niagara Planning Dept.
P. Colosimo, Region of Niagara Planning Dept.



PLANNING AND DEVELOPMENT DEPARTMENT

The Regional Municipality of Niagara
3550 Schmon Parkway, P.O. Box 1042
Thorold, Ontario L2V 4T7
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July 21, 2004
File: D.13.RE.am

Mr. Karl Grueneis
Earth Tech Canada Inc.
Corbloc Building
80 King St., 2nd Floor
St. Catharines, ON
L2R 7G1



Dear Mr. Grueneis:

**Re: City of Welland Northwest Area
Planning and Servicing Review**

I have enclosed some information that should be of assistance to you in carrying out a Planning and Servicing Review of the Northwest Area of the City of Welland.

Enclosed please find the following:

- a copy of the January 2004 Office Consolidation of the Regional Policy Plan,
- a copy of DPD 16-2001 containing household and population forecasts by municipality for Niagara. Any questions regarding the forecasts can be directed to Richard Miller with this department,
- a copy of DPD 90-2003 containing proposed Regional Policy Plan Amendment 183. This Amendment sets out "Smart Growth" policies for the Region. Contact Terri Donia or Alan Gummo with this department for more information, and
- a copy of DPD 12-2004 containing proposed new environmental policies for the Region. Contact Don Campbell with this department for more information.

You are advised to contact Craig Larmour, Planner with the Town of Pelham. The Town is considering a Secondary Plan for the eastern portion of the Fonthill Urban Area. Also contact Adele Arbour with the City of Thorold to obtain detailed Secondary Plan policies and land uses for the Port Robinson West area that abuts your Study area.

With regard to servicing policies and programs, contact Doug Cherrington with the Regional Public Works Department. You should be aware of the recent Servicing

Master Plan work and the 1996 Servicing Plan for South Thorold and North Welland prepared for the Region by Acres.

There are two outstanding Regional Policy Plan Amendments in this area that were deferred pending a decision on the route of a transportation corridor through the Region. There was agreement by the City of Welland and the Town of Pelham to protect a strip of land between the two communities as a "greenbelt" area and a possible location for a transportation corridor. For more information regarding the status of the proposed Mid-peninsula corridor contact George Nicholson with this Department.

There are a number of important issues of Regional interest involved with this possible urban expansion area. We suggest that an early meeting with Regional staff and staff of abutting local municipalities would be very useful.

Yours truly,



Drew Semple, MCIP, RPP
Senior Planner

c: Mr. D. Cherrington, Regional Public Works
Mr. A. Gummo, Regional Planning & Development
Mr. D. Campbell, Regional Planning & Development
Mr. D. Thorpe, City of Welland

ds/Earth Tec re Welland NW



DPD 90-2003
July 16, 2003
Files: D.16 UR.re
D.13 RE.am-183

REPORT TO: Chair and Members of the
Planning Services Committee

SUBJECT: Places for People: Investing in Urban Communities
Proposed Policy Plan Amendment # 183

RECOMMENDATIONS

That this Committee recommend to Regional Council:

1. That this report be received and circulated to the local municipalities, the Smarter Niagara Steering Committee, agencies and other interested parties for review and comment.
2. That three public meetings be held across Niagara to provide an opportunity for public comment on the proposed Amendment.

PURPOSE

This report outlines the rationale and proposed wording for Policy Plan Amendment # 183, Places for People, to incorporate Smarter Niagara into the future community vision set out in the Regional Policy Plan.

BACKGROUND

Summary

Niagara is 'A Special Place'. We have unique agricultural land, scenic beauty, a rich history, vibrant economy and a variety of distinctive communities that affords us a high quality of life. Many of these features will be lost unless all municipalities, Regional and local, act together for the future we want. The Policy Plan contains a vision for development and conservation. Smarter Niagara furthers this vision to ensure that Niagara remains 'A Special Place' both now and in the future.

Proposed Policy Plan Amendment # 183, Places for People, implements the Smart Growth Principles into the Vision and Policies of the Regional Policy Plan. The essential goals of the Amendment are more emphasis on putting people back into places; utilizing, reinvesting and improving our existing communities; saving our agricultural land and greenspaces from encroaching development; and offering more choice in where we work, live, shop, and play. The Amendment provides a framework from which local municipalities, partnering with Regional financial and staff support, can create Neighbourhood Plans and development proposals can be reviewed that enable the benefits of Smart Growth to be realized in Niagara.

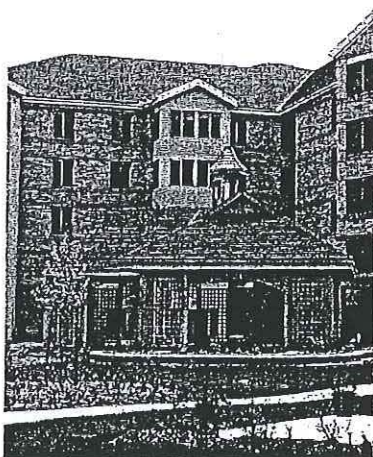
residents and political representatives, meets frequently to discuss ways of implementing Smarter Niagara of which one significant way is this Amendment.

Incentives, spurred by the work of the Smarter Niagara Steering Committee, have been introduced by Regional Niagara to financially assist appropriate proposals to help make them a reality. The creation of additional rental housing is expected with a reduction in the Multiple Residential Property Tax Rate. Brownfields – former commercial or industrial sites that are, or are perceived to be, contaminated – cleanup should be helped by the introduction of the Environmental Assessment Grant Program, Brownfield Tax Assistance Program, and the Tax Arrears Cancellation Program. Brownfields re-development should also benefit from the Development Charge/Waiver program which would exempt appropriate developments from such charges, and the Brownfield Leadership Program which would involve Regional Niagara in pilot projects to clean up and redevelop Brownfield sites. The detailed application of these and other incentives is being developed.

A recent Smart Growth study, entitled *Reclaiming Ground*, was done in conjunction with the City of St. Catharines to examine ways of revitalizing two areas of the City. *Reclaiming Ground* identifies new approaches and suggests possibilities for broader application throughout the Region. It is an example of integrated community planning, whereby a variety of interests and perspectives are used to devise a solution to a perceived problem, and represents the first of many such efforts.

Building on the Existing Plan

One crucial link in the Smarter Niagara program is the development of policies for inclusion in the Regional Policy Plan. The Places for People policies will clarify what is meant by this approach, how it would be applied in a two tier governmental structure, and the key objectives that the approach is expected to accomplish.



The existing Policy Plan already contains several aspects related to Smart Growth. Some examples are the Niagara vision for Development and Conservation, the emphasis on preserving the best resources, urban boundaries and housing policies.

The proposed Amendment builds on the existing Plan. Amendment # 183 formally incorporates Smarter Niagara into planning policy in Niagara and provides a context for its application.

The Two-Tier Approach to Planning in Niagara

Planning in Niagara requires close cooperation between the Regional and local municipalities for Niagara to remain 'A Special Place'. Using the framework that the Places for People policies provide, the Local official plans, neighbourhood plans and

- **More Functional and Attractive Mixed Use Neighbourhoods;**
- **Environmental Areas** integrated throughout the Urban Communities;
- **Protected and enhanced natural areas outside urban areas;**
- **Attractive and Functional Industrial Areas**, including the restoration and reuse of Brownfields;
- **More walking, cycling and public transit use** rather than sole dependence on the car as methods of transportation; and
- **Firmer Urban Areas Boundaries** that separate the urban from the countryside and protect Agricultural Resources outside the Urban Boundaries.

How Will This Be Accomplished?

Smarter Niagara is a fundamental part of Niagara's vision for the future; especially the community form that will help preserve Niagara as 'A Special Place' both now and in the years to come. It is integrally connected with all other aspects of the Plan and should be viewed as a framework for evaluating development applications, assessing transportation projects, and other proposals for change. The application of the concepts in Niagara will involve close cooperation between the Regional and local municipalities and will require consistent and complementary application to be effective.

The Smarter Niagara approach will be integrated into the Regional Policy Plan and used as the basis for community development. The Amendment proposes changes to three areas of the Regional Policy Plan. They are:

- **Section Three - Regional Strategy for Development and Conservation** – is the vision of Niagara that provides the guiding framework for the types of development and conservation that are encouraged and supported in Niagara. There is one change to the existing Vision, namely Strategic Objective #3.7, to recognize the communities and their neighbourhoods.
- **Section Five - Urban Areas** – is the portion of the Plan that specifically deals with how urban areas shall be developed in Niagara. The changes to this Section of the Plan are related to revitalizing the existing urban areas.
- **Section Twelve – Implementation** – highlights several ways the Region will partner with the local municipalities in their complementary efforts to ensure that Smarter Niagara becomes a reality.

As previously mentioned, the Amendment is appended to this report. The proposed additions appear as an italicized bold font, deletions have been struck through with a line and all other parts of the Plan that are proposed to remain are in a regular font.

3. Regional Strategy for Development and Conservation

In many ways, the Niagara Region is a community of communities and this is becoming increasingly so. It is made up of towns and cities, hamlets and rural areas, all linked together by social and economic ties. People live in one community and shop and work in another. They have ties of friendship and family relations to other communities and enjoy recreational and social activities around the Region.

As a community, Niagara has special qualities, rooted in its rich cultural and historical heritage, its unique mix of natural resources, and in its diversity. It offers a mix of the urban and the rural, of small hamlets and bustling cities, of specialty farmlands and sensitive natural areas, of heavy industry and scenic tourist spots. It is seen as a special area known for Niagara Falls and the Welland Canal, for historic sites such as Niagara-on-the-Lake and historic Fort Erie, and for its orchards and vineyards. Both those who live here and those who visit as tourists value the special qualities that Niagara has to offer.

The preservation and enhancement of the Region's special character will be important to the quality of life here in the future. ***Niagara's special mix of large and small centres, agricultural areas and sensitive environmental areas make it the "Special Place" that it is. These attributes are important to the residents of Niagara who have expressed support for protecting the area's character. Thus this Strategy identifies ways of doing that while at the same time permitting growth that benefits the Niagara economy.*** At the same time, though, it is also important to provide for economic development and housing to meet the needs of those who live in Niagara. ***Thus the challenge is to provide a balance between conservation and development while preserving the high quality of life and special features that Niagara residents value.*** At the Regional scale, there is the opportunity to achieve such a balance, accommodating urban development while conserving resources and protecting the environment.

Increasingly, quality of life issues such as environmental health and quality, housing mix and affordability, the quality of public services, and the range of educational and recreational facilities influence economic development at the community level. There is the opportunity to establish a framework to guide change that will preserve and enhance what is special about Niagara while also accommodating growth and new development.

5. Urban Areas: Liveable, Pedestrian Scale, Neighbourhoods

The Regional Strategy for Development and Conservation recognizes the significant role of urban communities with people's identification, economic activity, and quality of life *that urban areas play in determining our overall quality of life. Urban areas are the home to many of Niagara's residents; act as the engines of economic activity and centres for a wide range of services. The importance of our urban areas necessitates policies that address a wide range of issues. Moreover, there is a link among urban areas, the urban areas boundaries and agricultural areas. The Region's interests therefore, take on an integrated approach including growth management, the provision of housing, economic development, servicing, transportation, and the protection of our environment and agricultural resources.*

To address these interests, the Regional Policy Plan provides the framework upon which the Local Official Plans and Neighbourhood Plans are based. Using this framework, these plans should detail how topics such as revitalization, brownfields re-development, mixing land-uses, providing housing variety, achieving transit-friendly densities and walkable neighbourhoods will be achieved in the given area. Niagara's pattern of distinctive and identifiable urban communities appeals to people. These characteristics are partly due to the built form and partly due to the surroundings. While the initiative for the arrangement of land uses within the urban areas is left with the local municipalities, the Region has an overall interest in people's quality of life as influenced by the availability of housing, employment opportunities, and services. Also, the effective use of urban land through the mix of uses, density of development, and energy conservation contribute to the conservation of natural resources.

Ultimately, the goal of the following urban area objectives and policies is to strengthen our urban areas and contribute to our overall quality of life by fostering attractive communities that provide a wealth of choice and variety in our everyday lives. The following section will provide guidance to strengthen the fabric of our urban areas, while ensuring that they retain a distinctive sense of place.

The Regional Strategy recognizes the need for a balance between urban development and the conservation of natural resources. The urban area boundaries which are established here are a prime means of implementing this balance, and other strategic objectives, by:

SECTION FIVE

URBAN AREAS

Overall Objectives for Urban Areas: Structure and Form

Objective 5.1

~~Objective 5.3~~

To designate **develop** urban areas which **that** meet the strategic objectives of this Plan. ~~such as economic development, conservation of resources, the protection of the environment, preserve agricultural lands with highest priority being given to the protection of the unique agricultural lands, the maintenance of distinct urban communities, and which provide a high quality of life for residents.~~

Objective 5.2

~~Objective 5.4~~

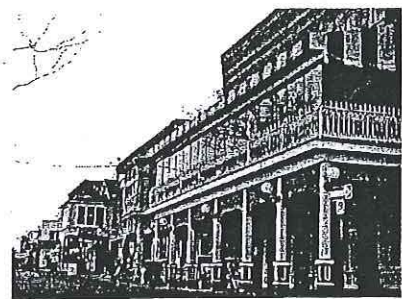
To designate urban areas for **integrated, quality**, serviced urban development sufficient to meet anticipated residential, business and other needs in a choice of locations.

Objective 5.3

To promote a high quality of attractive and land-efficient urban design in both public and private development and re-development.

Objective 5.4

To enable further development of existing urban areas to:



- **create attractive, liveable and sustainable neighbourhoods and communities;**
- **encourage walking, cycling and transit development and use;**
- **reduce air pollution;**
- **more efficiently use existing services, land and infrastructure; and**
- **reduce loss of agricultural and environmental resources.**

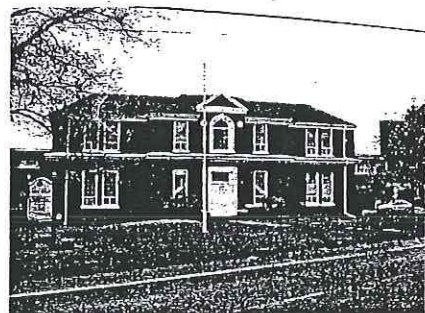
Objective 5.5

~~Objective 5.4~~

To encourage **promote** urban development south of the Escarpment as a positive aid in reducing urban pressures on the unique agricultural lands.

Objective 5.6

To re-develop and intensify existing nodes and corridors, including downtowns, by focusing development within them.



Objective 5.7 To promote the revitalization, re-use and re-development of abandoned or under-used sites.

Objective 5.8 To promote well-designed infill, intensification and re-development that will effectively maximize the use of existing community and servicing resources and strengthen the existing community fabric.

SECTION FIVE

URBAN AREAS

Policy 5.4

The integrated Neighbourhood Plans shall include the following elements that may be supplemented by other more specific, local elements:

- *provision for mixed use developments such as accommodation over stores;*
- *a variety of housing types, tenures and costs;*
- *a minimum overall residential density of eight units per gross acre (nineteen units per hectare);*
- *promotion of pedestrian activity and cycling;*
- *easy accessibility for transit where existing and/or anticipated;*
- *street design that complements the neighbourhood uses;*
- *provision for commercial activity and community facilities;*
- *the ability to work where you live;*
- *interconnected network of streets;*
- *a range of public spaces and inclusion of natural areas where present;*
- *incorporation of historical features and buildings;*
- *multiple use of buildings and parking such as schools and institutions; and*
- *safe streets for pedestrians.*

Policy 5.5

~~The primary responsibility for regulating the types, locations and densities of land uses within the defined urban areas rests with the local municipalities, through their official plans and zoning regulations. Each municipality is expected to prepare these plans with supporting information to regulate the development within their urban areas.~~

~~Despite the predominance given the local plans, several aspects of these local plans are considered to be of Regional significance and interest. Thus the Region expects these topics to be adequately covered in local documents, but the Region will maintain a continuing interest in them, and will review and comment on topics of Regional significance. These include:~~

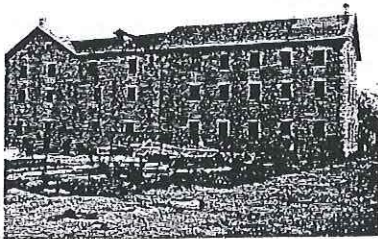
- ~~(a) the amount and distribution of low, medium and high density residential uses, and commercial and industrial uses;~~
- ~~(b) policies supporting the provision of various forms of affordable housing within existing developed areas as well as in new subdivisions;~~
- ~~(c) pedestrian as well as other transportation needs;~~

SECTION FIVE

URBAN AREAS

Policy 5.8

The Region in partnership with the local municipalities shall promote the re-development of brownfield sites and areas through such means as planning policies, as-of-right zoning, and incentive programs.



Policy 5.9 *The local municipalities shall emphasize development in areas that are vacant, under-utilized or abandoned in an effort to strengthen the existing urban environment.*

Policy 5.10 *The local municipalities shall include brownfield areas and sites within local Community Improvement Plans to enable both the Regional and local municipalities to use appropriate financial incentives to support development.*

Policy 5.11 *Community facilities should be multi-functional and located in or near nodes and corridors to increase accessibility by walking, cycling and transit.*

Policy 5.12 *New development or re-development initiatives shall be designed with the aim of reducing the costs associated with the construction, operation and maintenance of public infrastructure versus the costs of conventional development. A statement of these savings versus the cost of conventional development should be provided as part of the application.*

Policy 5.13 *The Region shall promote mixed-use development within urban areas by supporting:*

- *home-based businesses or offices;*
- *the regulation of the building form, but not the use;*
- *adding residential units above existing commercial or office uses; and*
- *developments with a combination of commercial, institutional, open space, residential, office and light industrial uses where the context is suitable.*

Policy 5.14 *New development and re-development proposals shall be designed to be transit-supportive, for present or future service. Transit-supportive development initiatives should include, but are not limited to:*

- *fostering a compact urban form especially in locations that are accessible to transit services;*
- *developing a finer network of arterial and collector roads;*
- *improving the access between arterials and internal subdivisions to facilitate pedestrian movement; and*

SECTION FIVE

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Objective 5.13
~~Objective 5.12~~

To ensure that the ~~sites~~ for a minimum of twenty five percent of all potential new housing units *or sites within each neighbourhood* are suitable for affordable housing. ~~in accordance with the Provincial Policy Statement on Land Use Planning for Housing.~~ *Such sites should be integrated throughout the neighbourhood, taking advantage of existing or planned services.*

Objective 5.14
~~Objective 5.13~~

To maximize the use of existing community and servicing resources in established communities for a variety of new residential units.

Residential Policies



Policy 5.18 *Residential development and re-development shall be designed in such a manner that it at a minimum supports:*

- *a diminished emphasis on garages and parking, especially in the front yard;*
- *increased emphasis on the entrance or points of access;*
- *accessibility by all persons;*
- *environmental conservation and sustainability in building layout, techniques and materials;*
- *a balance between personal privacy and public space; and*
- *the creation or enhancement of an aesthetically pleasing and functional neighbourhood.*

Policy 5.19
~~Policy 5.16~~

The following types of group homes administered under Provincial legislation shall be permitted to establish in any residential zone or residence in the Niagara Region, subject to criteria (i), (ii) and (iii) below.

The types of group homes to be permitted are:

- Approved Homes
- Homes for Special Care
- Supportive Housing Programs, Adult Community Mental Health Program
- Children's Residences

SECTION FIVE

URBAN AREAS

consultation with other appropriate individuals or agencies not represented on the review body.

Policy 5.20

~~Policy 5.17~~

The Region, in consultation with local municipalities, will continue to designate at least a ten year supply of land for residential and other uses at all times in its Policy Plan.

Policy 5.18

~~The Region expects local municipalities to designate at least a ten year supply of residential land at all times in their Official Plans in accordance with Policy 5.19.~~

Policy 5.21

~~Policy 5.19~~

The Region will prepare projections of future housing needs and their distribution among the local municipalities. This distribution will be developed in accordance with Regionally approved development/conservation strategies, ~~to assist the municipalities in meeting Policy 5.18.~~ The local municipalities, in cooperation with the Region, may use somewhat different projections based on local circumstances and provided that all Regional policies are met.

Policy 5.22

~~Policy 5.20~~

The Region, in consultation with local municipalities, will continue to prepare plans for water supply and sewage treatment facilities to serve the residential development needs of the Region over at least a twenty year period in accordance with Policy 5.21.

Policy 5.23

~~Policy 5.21~~

When the servicing capacity for new residential development is limited, preference will be given to affordable housing.

Policy 5.24

~~Policy 5.22~~

When the servicing capacity for new development is limited, the status of draft approved subdivision plans which are inactive after two years should be reconsidered.

Policy 5.25

~~Policy 5.23~~

The Region, in cooperation with local municipalities, will seek to maintain a continuous three-year supply of a combination of draft approved and/or registered vacant residential lots and blocks in an appropriate range of types and sizes.

Policy 5.26

Local municipalities and the Region shall not provide an extension to draft approved plans of subdivision where:

- ***the plan of subdivision is in contravention of the objectives or policies of the local official plan or this Plan; or***

SECTION FIVE

URBAN AREAS

Policy 5.31

Policy 5.29

~~The Region will, in its review process for any planning documents, take into account the Province's Policy Statement on Land Use Planning for Housing. The Region will encourage the provision of sites for a minimum of twenty five percent of potential new housing units to be suitable for affordable housing.~~

A minimum of twenty-five percent of all new housing units created within each neighbourhood shall be affordable. For the purposes of this policy, a neighbourhood shall be defined as a contained area that possesses distinguishing characteristics from its nearby surroundings. The local municipalities shall determine the boundaries of the neighbourhoods. Development applications should include information on how the minimum requirement of affordable housing is being met within the neighbourhood.

The sites provided for affordable housing should attempt to:

- provide a variety of housing types which could create new affordable units for a reasonable proportion of household types,
- meet the housing needs of people with a range of income levels below the 60th percentile,
- provide sites suitable for assisted housing, *and*
- ***take advantage of existing or planned services, including transit.***

~~Policy 5.30 — The Region will require that for each subdivision application information will be provided on how the minimum of twenty five percent affordable requirement will be met within the municipality involved.~~

~~Policy 5.31 — The Region will require that the sites for at least twenty five per cent of all potential new housing units proceeding through the subdivision approval process in each municipality are suitable for and intended for affordable housing in accordance with the Province's financial guidelines. These sites for affordable housing must include as full a range of types and prices of affordable housing as practicable, such as family type housing with direct ground access as well as apartments, with the lot sizes, types of units, and prices varying amongst local municipalities. This requirement can be satisfactorily met by:~~

SECTION FIVE

URBAN AREAS

- parking standards,
- adequate municipal services and parks.

Policy 5.33
~~Policy 5.33~~

The Region, in cooperation with the local municipalities, will conduct an annual review of the housing situation to examine the extent to which lots are being created upon which affordable housing can be expected to be built, and whether or not affordable housing is being built. To these ends, information on the following topics will assess the effectiveness of the policies and the possible need for adjustments to them:

- annual housing production by type of unit,
- annual production of affordable units on subdivision lots approved for these types of housing,
- annual production of non-profit and rent geared-to-income units,
- apartment vacancy rates,
- inventory of vacant housing sites, by type and location, and
- information on current dwelling costs and rents.

Policy 5.34
~~Policy 5.34~~

The Region, together with local municipalities, will support the non-profit housing agencies as well as the private sector in building dwelling units for lower and modest income households, physically challenged individuals, and other special needs groups.

Policy 5.34.1
~~Policy 5.34.1~~

Up to 25 units of seniors' housing and/or a youth centre for sports and recreation on existing services are permitted in association with and just south of Club Italia east of Kalar Road in the City of Niagara Falls. Any further development, or, any further extension or addition of municipal services, will require amendments to the Regional Niagara Policy Plan and the City of Niagara Falls Official Plan and be based on a comprehensive planning and servicing study of the broader area east of Kalar Road, north of the Hydro Corridor, south of Mountain Road and west of the Queen Elizabeth Way.

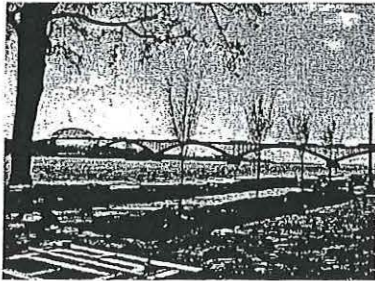
Policy 5.35

To assist the non-profit housing sector and to further streamline the approvals process for applications submitted by this sector,

SECTION FIVE

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- Policy 5.40** *The local municipalities should develop design guidelines to enhance the appearance of the built form.*
- Policy 5.41** *Historical and archaeological resources shall be preserved, restored and re-used, where possible, to protect the cultural identity of existing communities.*
- Policy 5.42** *Local municipalities are encouraged to create an inventory of historically designated properties and designate heritage areas, districts and buildings.*
- Policy 5.43** *Where new development or re-development is being proposed within a heritage area or district, or beside a designated heritage building, the development should reflect the historical nature of the area.*
- Policy 5.44** *All development and re-development within the urban area shall embrace, enhance, protect, or incorporate the natural environment. In this regard, employing environmentally sensitive techniques such as green-building design guidelines, rooftop gardens, 'design with nature' principles, retaining trees or materials recycling is encouraged.*



Policy 5.45 *Access to and along significant features, such as the water's edge, should be incorporated into a continuous, comprehensive network of urban open space throughout communities.*

- Policy 5.46** *The local municipalities shall protect scenic viewsapes from adverse development.*

Industrial Objectives

- Objective 5.17**
~~Objective 5.5~~ ~~To increase the number and type of employment opportunities throughout the Region.~~ *To increase the overall employment opportunities throughout the Region, ensuring they are sensitive to the environment and appropriate to the community.*
- Objective 5.18**
~~Objective 5.6~~ ~~To assist and encourage the traditional existing businesses and industries in the Region,~~ *while fostering new or emerging business opportunities.*

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the ~~The~~ Region and will co-operate with agencies involved with the tourist industry to promote the tourist attractions and facilities in the Region.

Policy 5.53

The local municipalities shall direct noxious industrial uses that are required by regulation to be separated from sensitive uses to industrial areas to prevent incompatible development. A modified mixed-use pattern with less-sensitive uses is encouraged.

Commercial Objectives



Objective 5.19

~~Objective 5.7~~ To ensure that the Regional Municipality of Niagara each municipality and the entire Region has an adequate supply of convenient, **well-designed**, attractive and economically viable shopping facilities **that provide an efficient use of available land and are related to the needs of the municipality in which they are located.**

~~Objective 5.8~~ — To support a dispersed pattern of shopping facilities. Under this dispersed approach, shopping facilities must be related to the needs of the municipalities in which they are located, in terms of location, size, accessibility by auto or by public transit, and other relevant factors.

Objective 5.20

Objective 5.9

To ensure that the overall supply of shopping facilities in each local municipality is sufficient to provide healthy competition without endangering the essential character and quality of existing shopping facilities.

Note: This objective requires a careful balance between the extremes of "no competition" and "unlimited competition". The significance of an oversupply of commercial space must be a continuing concern, and future decisions must be made on the amount of oversupply which is desirable or tolerable.

~~Objective 5.10~~ — To assist local municipalities to determine appropriate policies for shopping facilities within their boundaries.

SECTION FIVE

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and market studies to assist in establishing its commercial strategy and policy statements.

Policy 5.59
~~Policy 5.14~~

The Region will review all major proposals for new commercial development or expansion of existing facilities. In its review, the Region will be guided by the objectives and policies of the Regional Policy Plan.

The Region will be responsible primarily for regulating the overall supply of shopping facilities throughout the Region and in each local municipality.

Each major commercial proposal should be accompanied by sufficient background information such as site, access and servicing plans, timing or staging of development, the amount and types of retail facilities, market studies, etc., to permit proper evaluation by the Region. Based on their review, and recognizing the matters noted in Policy 5.60, the Region will not approve any new or expanded commercial development which, by its size or location:

- (a) produces an undesirable oversupply of shopping facilities within the Region, or
- (b) produces an inequitable distribution of shopping facilities within the Region, or
- (c) does not mainly serve the residents of that municipality.

The Region will also consider the following:

- (a) Impact on existing shopping facilities within the local municipality and throughout the Region.
- (b) Impact on, and adequacy of, local and Regional road networks to accommodate the proposed development.
- (c) Impact on, and adequacy of, local and Regional services to accommodate the proposed development.
- (d) Compatibility with adjacent existing and proposed land uses.

Policy 5.60
~~Policy 5.15~~

In evaluating commercial proposals, particularly with respect to estimated commercial "needs" and possible oversupply, the following factors will also be considered by the Region:

SECTION FIVE

URBAN AREAS

- (3) a minimum of 2 anchor units to be in excess of 43,000 square feet (4,000 square metres), and a minimum of 2 anchor units to be in excess of 20,000 square feet (1,860 square metres); and
- (4) a minimum unit size of 5,000 square feet (465 square metres), save and except that 10% of the development may be ancillary non-retail uses and retail stores, and that the retail stores shall not be less than 3,000 square feet (280 square metres).

Urban Areas Boundaries, Expansion Policies

Policy 5.61
Policy 5.3

"Urban Study Areas" are defined as existing small communities for which the Region expects to provide water supply and sewage treatment facilities to resolve existing health problems. They are shown on the attached Urban Areas Boundaries Map in a circular shape as a schematic indication only of the location and small size of such communities. When their locations and boundaries are described more precisely in the approved official plans of the area municipalities and servicing is available, these approved areas will be shown as urban on the Urban Areas Boundaries Map.

Policy 5.62
Policy 5.6

Expansions to the urban boundaries are a significant community undertaking requiring Amendments to the Regional and local Official Plans. The Region expects, and will encourage and assist, the efficient use of land within the existing urban boundaries through infilling, redevelopment, and increased densities. Expansions into the Niagara Escarpment Plan area are not encouraged and if proposed will require an Amendment to the Niagara Escarpment Plan.

An assessment of proposed urban boundary changes will be based on the Regional Strategy for Development and Conservation in Section 3. Proposed expansions should be considered within the context of an overall municipal review.

Particular criteria for the review of proposed urban boundary expansions are:

- the need for the proposed uses and the benefits and costs to the local and Regional community. The need assessment should consider the amount of developable land within existing urban areas, the demand for the type of development proposed in relation to the demographic forecasts for the local municipality and the

12. Implementation

The Policy Plan, together with its policies, operates under a legal and procedural umbrella which *that* defines the limits within which a municipality is permitted to act. The various planning powers and responsibilities of the Region are set out in Ontario Provincial legislation - three of the more important examples being: The Regional Municipality of Niagara Act, The Municipal Act and the Planning Act. The ability to implement the objectives and policies in this Plan is dictated by the content and scope of these pieces of legislation. However, on a day-to-day basis the Plan is implemented through various projects and programs instituted by the different levels of government and by private interests. The Regional Plan, therefore, is essentially a means of guiding short range public and private actions on a region wide scale according to long range considerations of the public interest, and is intended to assist in the creation of conditions within which the private market and public authorities can function most effectively. The Plan is to be re-evaluated periodically as needs and desires change.

Objectives for Implementation

Objective 12.1 To have planning responsibilities and authority for particular matters borne by the level of government best suited to the particular task.

Objective 12.2 *To maintain Niagara as a Special Place through integrated community planning by recognizing its diverse communities, conserving its natural and historical resources and promoting the human scale in community building.*

Objective 12.3

~~Objective 12.2~~ To promote co-operation and co-ordination of planning responsibilities among each of the area municipalities, between the area municipalities and the Region and with adjacent Regions and municipalities.

Policies for Implementation

Policy 12.1 It is intended that local official plans will be in agreement with and will complement and detail the broad policies contained in the Regional Plan. It is further intended that the initiative for proposing detailed policies, together with maps and written text on matters of local concern, including land use, transportation, recreation, servicing and phasing, will be the responsibility of local municipalities.

Policy 12.2 In accordance with the provisions of the Planning Act, 1990, every official plan and every zoning by-law in effect in the Region shall be amended to conform to the Regional Plan.

SECTION TWELVE IMPLEMENTATION

- Policy 12.8 The Region encourages the preparation by local municipalities of secondary plans (neighbourhood plans) **as part of their official plans.** ~~, urban renewal plans, etc.) as detailed planning guides for parts of municipalities. These plans should be made available to the public for their information and to the Region for informal comment but need not have any official status.~~
- Policy 12.B *Neighbourhood plans shall be prepared for priority areas that have the opportunity for substantial development due to infilling, re-use, re-development, brownfields and other undeveloped lands.***
- Policy 12.C *The Region shall promote the development and use of urban design guidelines and support local municipalities in this activity.***
- Policy 12.D *The Region shall partner with the local municipalities to develop plans, zoning amendments and design guidelines for nodes and corridors within urban areas. Amendments shall be made to the planning documents.***
- Policy 12.E *The Region shall align and investigate financial programs and capital budget items to support integrated community planning as set out in this Plan.***
- Policy 12.9 The Region will prepare and request the use of standard terminology and presentation formats for local zoning by-laws and local official plans.
- Policy 12.10 In order to assist in reducing the costs of housing incurred through the development approval process, the Region will support all measures necessary to expedite the development approval process, including ~~strict time limits on subdivision approval and registration procedures,~~ **especially for those proposals that meet the strategic objectives of this Plan. To support this initiative, an expeditor shall be employed by the Region to work on community planning, marketing and assistance to potential projects.**
- Policy 12.11 Although recognizing the possibility of causing delay in the planning process, the Region supports:
- (a) greater regard for **a high quality of design and protection of** environmental features in **development** subdivision approvals;
 - (b) adequate provision for public information and public input; and

Niagara Region

PLANNING AND DEVELOPMENT

The Regional Municipality of Niagara
3550 Schmon Parkway, P.O. Box 1042
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June 12, 2006
File: A.03.A.34.43

Earth Tech (Canada) Inc.
Corbloc Building
80 King Street, 2nd Floor
St. Catharines, Ontario L2R 7G1

Dear Sir/Madam:

Re: New Tree and Forest Conservation By-law

On May 25, 2006 Regional Council adopted a new Tree and Forest Conservation By-law that replaces the previous Tree Conservation By-law in force since 1996. The new By-law takes a different approach to the cutting of trees in the woodlands of Niagara. Development proposals may be affected by the By-law where woodlands are involved.

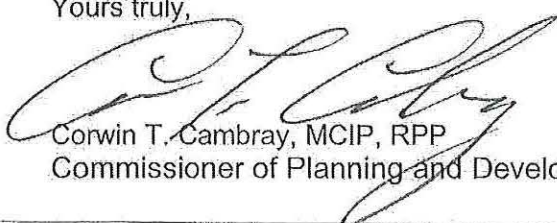
Permits generally are now required for normal logging activities in woodlands and are based solely on the application of Good Forestry Practices using qualified forestry personnel. Cutting by tree size (as allowed in the old By-law) is no longer an option since it has been shown that consistently cutting by size is not beneficial to the health, vigour and diversity of woodlands. There also are a number of other new additions in the By-law such as stop work orders and the potential for protecting heritage and significant community trees.

There are some exemptions to the By-law and some can involve development proposals. For example, the By-law would not apply where a tree saving plan is required as a condition on a subdivision or consent or where a tree saving plan is approved in a site plan or subdivision agreement. The intent is to ensure that the protection of trees in woodlands is given careful consideration as part of the development process. It is hoped that approval agencies, landowners and developers/consultants will give much more consideration to the protection of trees when designing and reviewing a development proposal.

A copy of the Tree and Forest Conservation By-law (#47-2006) is enclosed and it also can be obtained from the Region's web site at:
http://www.regional.niagara.on.ca/government/committees/tree-bylaw/tree_bylaw.aspx.

If you have any questions, please contact Vince Goldsworthy or Tom Bernard, By-law Enforcement Officers, at 905-984-3630 or at vince.goldsworthy@regional.niagara.on.ca or tom.bernard@regional.niagara.on.ca

Yours truly,


Corwin T. Cambray, MCIP, RPP
Commissioner of Planning and Development

Building Community. Building Lives.



THE REGIONAL MUNICIPALITY OF NIAGARA

BY-LAW NO. 47-2006

A BY-LAW TO PROHIBIT OR REGULATE THE
HARVESTING, DESTRUCTION OR INJURING
OF TREES IN WOODLANDS IN THE
REGIONAL MUNICIPALITY OF NIAGARA AND
TO REPEAL BY-LAW 8541-96, AS AMENDED

WHEREAS Section 135(2) of the *Municipal Act, 2001*, S.O. 2001, c. 25, as amended, permits the enactment of a by-law by the Council of The Regional Municipality of Niagara to prohibit or regulate the destruction or injuring of trees in Woodlands;

AND WHEREAS pursuant to Section 135(7) of the *Municipal Act*, a municipality may require that a permit be obtained to injure or destroy trees in Woodlands designated in the by-law and impose conditions on a permit, including conditions relating to the manner in which destruction occurs and the qualification of persons authorized to injure or destroy trees;

AND WHEREAS the Council of the Regional Municipality of Niagara deems it desirable to enact a Tree and Forest Conservation By-law for the purposes of:

- preserving and improving the Woodlands in the Regional Municipality of Niagara through Good Forestry Practices;
- promoting Good Forestry Practices that sustain healthy Woodlands and related natural habitats and environments;
- helping to achieve the goal of 30% forest cover in the Niagara Region;
- minimizing the destruction or injuring of trees in Woodlands;
- regulating and controlling the removal, maintenance and protection of trees in Woodlands;
- minimizing and guarding against dangerous conditions which may result in injury;
- protecting, promoting and enhancing the aesthetic values of Woodlands;
- contributing to human health, recreation, enjoyment and quality of life through the maintenance of woodland cover;
- providing for the production of wood and other products derived from trees;
- supporting the objective of the Regional Policy Plan to maintain, restore and, enhance the ecological health, integrity and biodiversity of the Core Natural Heritage System and its contributions to a Healthy Landscape as defined in the Regional Policy Plan; and
- enhancing and implementing processes and decisions made with respect to applications made under the *Planning Act*, R.S.O. 1990, c. P.13, as amended.

AND WHEREAS Section 135(11) of the *Municipal Act* permits a municipality to designate persons as officers and delegate to them the power to issue permits and to impose conditions to the permits respecting the prohibition or regulation of the destruction or injuring of trees in Woodlands;

AND WHEREAS Section 252 of the *Municipal Act* permits a Council to provide by by-law for a committee of the Council to hold hearings in place of the Council;

AND WHEREAS the Council of the Regional Municipality of Niagara believes that awareness and promotion of Good Forestry Practices is a means of achieving protection and enhancement of forest areas and the objectives of the Regional Policy Plan;

NOW, THEREFORE, the Council of the Regional Municipality of Niagara hereby enacts as follows:

1. DEFINITIONS

In this By-law:

- 1.1 "Agricultural Use" means the commercial production of crops and/or raising of livestock for human use and includes ploughing, seeding, harvesting, leaving land fallow as part of a conventional rotational cycle, production of tree fruits and grapes, grazing, animal husbandry, and buildings and structures associated with these activities;
- 1.2 "Area Municipality" means any one of the municipalities of the Town of Fort Erie, Town of Grimsby, Town of Lincoln, City of Niagara Falls, Town of Niagara-on-the-Lake, Town of Pelham, City of Port Colborne, City of St. Catharines, City of Thorold, Township of Wainfleet, City of Welland, and the Township of West Lincoln;
- 1.3 "Basal Area" means the area of the cross-section of the stem or trunk of a tree taken at a point of measurement 1.37 metres above the highest point on the tree where the ground meets the stump;
- 1.4 "Building Permit" means a building permit issued by an Area Municipality under the *Building Code Act, 1992*, S.O. 1992, c.23, as amended;
- 1.5 "Bumper Tree" means a poor quality, low value tree that grows in close proximity to higher value trees and is located along skid roads to protect residual trees from damage during logging and skidding operations;
- 1.6 "Business day" means any day falling on or between Monday and Friday of each week but does not include statutory holidays;
- 1.7 "Circumference" means the measurement of the perimeter or outer boundary of a stem or trunk of a tree at a specified point of measurement with such measurement including the bark;
- 1.8 "Commissioner" means the Commissioner of Planning and Development for the Region or his/her delegate;

- 1.9 "Coppice growth" means clump growth where more than one tree stem grows from a single tree stump and the point of measurement for such growth means that point on each stem measured immediately above the point of fusion, provided such point of fusion is less than 1.37 metres above the highest point of undisturbed ground at the base of the coppice or clump growth;
- 1.10 "Damage" means lasting injury to trees remaining after the completion of the injuring or destroying of trees and caused by the harvesting, injuring or destroying of any trees, that has the effect of inhibiting or terminating growth and may include but is not limited to:
- 1.10. a broken branches in the crown of a tree;
 - 1.10. b the breaking off or splitting of the stem of any tree and the noticeable tipping of any tree;
 - 1.10. c the splitting of, removal of or damage to the bark of a tree; or
 - 1.10. d damage to the root structure of a tree;
- except that damage does not include injury to Bumper Trees;
- 1.11 "DBH" or "Diameter at Breast Height" means the diameter of the stem of a tree measured at a point that is 1.37 metres above the ground;
- 1.12 "Diameter" means the diameter of the stem of a tree measured at a specified point of measurement with such measurement including the bark of the stem;
- 1.13 "Ecological Functions" means the natural processes, products or services that living and non-living environments provide or perform within or between species, ecosystems and landscapes, including hydrological functions and biological, physical, chemical and socio-economic interactions;
- 1.14 "Farmer" means a person who has a current and valid farm registration number under the *Farm Registration and Farm Organizations Funding Act, 1993*, S.O. 1993, c. 21, as amended;
- 1.15 "Forest Management Plan" means a course of forest management action prescribed for a particular woodland area after specific assessments and evaluations have been made by a Registered Professional Forester or a member in good standing of the Ontario Professional Foresters Association in accordance with the Ministry of Natural Resources document "A Silvicultural Guide to Managing Southern Ontario Forests", as amended from time to time;
- 1.16 "Good Forestry Practices" means:
- 1.16.a the proper implementation of harvest, renewal and maintenance activities known to be appropriate for the forest and environmental conditions under which they are being applied and that minimize detriments to forest values, including: significant ecosystems; important fish and wildlife habitat; soil and water quality and quantity;

- forest productivity and health; vulnerable, threatened and endangered species as regulated by Provincial or Federal statute and the aesthetic and recreational opportunities of the landscape;
- 1.16.b the cutting and removal of hazardous, severely damaged, diseased and insect-infested trees which must be removed in order to prevent contamination or infestation of other trees or because they no longer contribute to the achievement of forest values;
- 1.16.c in the case of hazardous, damaged, diseased or insect-infested trees, the maintenance of a Woodland after the cutting and removal is completed unless it is determined through a report prepared by a Registered Professional Forester or a member in good standing of the Ontario Professional Foresters Association that trees must be removed and a Woodland would not be maintained but in no case shall clearcutting be allowed; and,
- 1.16.d the forestry management practices as set out in the Ministry of Natural Resources document "A Silvicultural Guide to Managing Southern Ontario Forests";
- 1.17 "Heritage Tree" means a tree identified and designated by the Council of an Area Municipality as having heritage significance;
- 1.18 "Negative impact" means any impairment, disruption, destruction or harmful alteration to any living plant or animal or to their habitat or Ecological Functions;
- 1.19 "Officer" means an individual appointed by Regional Council for the administration and enforcement of this By-law;
- 1.20 "Owner" means a person having any right, title, interest or equity in land or any such person's authorized representative;
- 1.21 "Own Use" means use that does not include a commercial sale, exchange or other disposition of trees destroyed or injured;
- 1.22 "Permit" means the written authorization to injure or destroy trees issued under Section 6 of this By-law;
- 1.23 "Person" means an individual or a corporation and their respective heirs, executors, administrators or other duly appointed representatives;
- 1.24 "Point of Measurement" means the point on a tree trunk measured above the highest point at which the ground meets the tree. For Coppice Growth the Point of Measurement shall be at the point on the tree trunk where the tree stems separate provided that such point of separation is less than 1.37 metres from where the ground meets the tree;
- 1.25 "Prescription" means a written course of forest management action prescribed for a particular woodland area by a Registered Professional Forester or a member in good standing of the Ontario Professional Foresters Association after specific assessments and evaluations have been made by a Registered Professional Forester or a member in good standing of the Ontario Professional Foresters Association;

- 1.26 "Region" means the Regional Municipality of Niagara;
- 1.27 "Regional Council" means the Council of the Region;
- 1.28 "Registered Professional Forester" refers to that term as defined in the *Professional Foresters Act, 2000*, S.O. 2000, c.18, as amended;
- 1.29 "Sensitive Natural Area" means lands that are in a Woodland and:
 - 1.29.a within the Environmental Protection designation of the Natural Heritage System and adjacent lands, as defined in the Regional Policy Plan; or
 - 1.29.b within a Natural Area as designated in the Niagara Escarpment Plan;
- 1.30 "Significant Community Tree" means a tree identified and designated by the Council of an Area Municipality as having community significance;
- 1.31 "Silviculture" means the theory and practice of controlling forest establishment, and the composition, growth and quality of forests to achieve the objectives of forest management;
- 1.32 "Total Basal Area" means the sum of the Basal Areas of individual trees;
- 1.33 "Tree" or "Trees" means any living species of woody perennial plant, including its root system, which has reached or can reach a height of at least 4.5 meters at physiological maturity;
- 1.34 "Tree Marker" means a person certified to mark trees as a result of successfully completing the Ministry of Natural Resources Tree Marker course; or a Registered Professional Forester; or a member in good standing of the Ontario Professional Foresters Association;
- 1.35 "Tree Saving Plan" means a plan, prepared for the purpose of protecting and preserving trees on properties where development or disturbance of the natural forest cover is to occur. Such plans shall attempt to retain as many trees as possible and as a minimum shall include all of the following:
 - 1.35.a an inventory and graphic display of trees on the property including location, size, species, general age distribution health and any individual trees or grouping of trees with particular significance such as but not limited to age, species and size;
 - 1.35.b identification of natural features and functions present, whether they should be protected, and if not, why;
 - 1.35.c a statement identifying whether any threatened or endangered species are present and if so, how they are to be protected;
 - 1.35.d a description and a map of the trees to be removed and retained including written reasons why the trees are to be removed or retained;
 - 1.35.e an indication as to how the trees to be retained will be marked or otherwise identified as trees to be protected;

- 1.35.f the layout of the proposed development superimposed on the woodland area, including existing and proposed grades, services/utilities, roads, surface drainage and building envelopes;
 - 1.35.g the specific measures to be used during and after construction or site disturbance to protect and preserve individual trees or clumps of trees identified for retention, including but not limited to fencing around the dripline, the avoidance of storage or dumping of materials over root zones and operation of equipment over root zones;
 - 1.35.h a tree replanting program using native species;
 - 1.35.i a statement indicating that the plan conforms to the Region's Tree and Forest Conservation By-law; and
 - 1.35.j consideration of the relationship between an Environmental Impact Study, prepared as part of a development application, and requirements of the Regional Policy Plan;
- 1.36 "Wildlife" means all wild mammals, birds, reptiles, amphibians, fishes, invertebrates, plants, fungi, algae, bacteria and other wild organisms;
- 1.37 "Woodland" or "Woodlands" means land on one or more properties with a density of at least:
- 1.37.a 1,000 trees, of any size, per hectare;
 - 1.37.b 750 trees, measuring over five (5) centimetres in diameter at DBH, per hectare;
 - 1.37.c 500 trees, measuring over twelve (12) centimetres, in diameter at DBH, per hectare; or
 - 1.37.d 250 trees, measuring over twenty (20) centimetres, in diameter at DBH, per hectare;

but does not include:

- 1.37.f a cultivated fruit or nut orchard;
- 1.37.g a plantation established for the purpose of producing Christmas trees and which is being actively managed and harvested for the purposes for which it was planted, except that this does not refer to plantations that have ceased being managed or harvested for their intended purpose for a period of 15 years or more; or
- 1.37.h a bona fide tree nursery that is being actively managed and harvested for the purposes for which it was planted.

2. APPLICATION OF THE BY-LAW

This By-law shall apply to:

- 2.1 all Woodlands having an area of one (1) hectare or more;
- 2.2 all Woodlands having an area of less than one (1) hectare, upon delegation of such authority by an Area Municipality to the Region; and
- 2.3 Heritage Trees and Significant Community Trees identified and designated by the Council of an Area Municipality, upon delegation of such authority by an Area Municipality to the Region.

3. GENERAL PROHIBITIONS

- 3.1 No person through their own actions or through any other person shall injure or destroy any Tree located in Woodlands:
- 3.1.a Unless exempted by Section 4; or
 - 3.1.b Unless in possession of a valid Permit issued by the Region under Sections 5 and 6 of this By-law and in accordance with its terms or conditions.
- 3.2 No person through their own actions or through any other person shall:
- 3.2.a Contravene the terms or conditions of a Permit issued under this By-law;
 - 3.2.b Fail to comply with an order issued under Section 8 of this By-law; or
 - 3.2.c Remove or deface any order that has been posted pursuant to Section 8 of this By-law.
- 3.3 No person through their own actions or through any other person shall injure or destroy any Tree that has been designated by the Council of an Area Municipality as a Heritage Tree or a Significant Community Tree, provided that the authority to regulate such trees has been delegated to the Region by the Area Municipality.

4. EXEMPTIONS

Despite Section 3 of this By-law, this By-law does not apply to:

- 4.1 activities or matters undertaken by a municipality or a local board of a municipality;
- 4.2 activities or matters undertaken under a licence issued under the *Crown Forest Sustainability Act, 1994*, S.O. 1994, c.25, as amended;
- 4.3 the injury or destruction of trees by a person licensed under the *Surveyors Act*, R.S.O. 1990, c. s.29, as amended, to engage in the practice of cadastral surveying or his or her agent, while making a survey;
- 4.4 the injury or destruction of trees imposed after December 31, 2002:
 - 4.4.a as part of a Tree Saving Plan required as a condition of approval in a plan of subdivision that has received draft approval under Section 51 of the *Planning Act*;
 - 4.4.b as part of a Tree Saving Plan required as a condition on a consent approved under Section 53 of the *Planning Act*;
 - 4.4.c as a requirement in a Tree Saving Plan approved and included in an site plan control agreement or a subdivision agreement entered into under Sections 41 and 51 respectively of the *Planning Act*;

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- 4.4.d in a development agreement between an Owner and an Area Municipality;
- 4.4.e as a condition to a development permit authorized by regulation made under Section 23(b) of the *Niagara Escarpment Planning and Development Act*, R.S.O. 1990, c. N.2, as amended; or
- 4.4.f as a condition to a development permit authorized by regulation made under section 70.2 of the *Planning Act* or as a requirement of an agreement entered into under the regulation;
- 4.5 the injury or destruction of trees by a transmitter or distributor, as those terms are defined in section 2 of the *Electricity Act*, S.O. 1998, c.15, Sched. A, as amended, for the purpose of constructing and maintaining a transmission system or a distribution system, as those terms are defined in that section;
- 4.6 the injury or destruction of trees undertaken on land described in a licence for a pit or quarry or a permit for a wayside pit or wayside quarry issued under the *Aggregate Resources Act*, R.S.O. 1990, c. A.8, as amended;
- 4.7 the injury or destruction of trees undertaken on land in order to lawfully establish and operate or enlarge any pit or quarry on land:
 - 4.7.a that has not been designated under the *Aggregate Resources Act* or a predecessor of that Act; and
 - 4.7.b on which a pit or quarry is a permitted land use under a by-law passed under section 34 of the *Planning Act*;
- 4.8 the harvesting, injury or destruction of trees where the Owner of the Woodlands has been granted a Special Council Permit pursuant to Section 5;
- 4.9 the injury or destruction of trees that is required in order to erect any building, structure or thing, including yard areas, in respect of which a Building Permit has been issued and has taken into consideration the protection of trees surrounding the structure or work within the building envelope, provided that only those trees necessary to accommodate the building structure or thing, including yard areas, are removed;
- 4.10 the injury or destruction of trees that is required in order to install and provide utilities, including a private waste disposal system, to the construction or use of the building, structure or thing in respect of which a Building Permit has been issued;
- 4.11 the injury or destruction of trees that is required in order to install, provide or maintain a driveway of sufficient width for vehicular access to the building, structure or thing in respect of which a Building Permit has been issued;
- 4.12 the injury or destruction of trees on lands, including buffer lands, used for the purpose of a licenced waste disposal site that has been approved, where applicable, under the *Environmental Protection Act*, R.S.O. 1990, c. E.19, as amended, the *Ontario Water Resources Act*, R.S.O. 1990, c. O.40, as amended, the *Environmental Assessment Act*, R.S.O. 1990, c. E.18, as

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amended, the *Planning Act*, and/or the *Niagara Escarpment Planning and Development Act*;

4.13 the injury or destruction of trees for the construction of drainage works under the *Drainage Act*, R.S.O. 1990, c. D.17, as amended;

4.14 the injury or destruction of trees that:

4.14.a are dead;

4.14.b are diseased, as identified in a Prescription or Forest Management Plan; or

4.14.c pose a hazard to human safety or property;

4.15 the injury or destruction of trees by an Owner of a Woodland who may harvest, destroy or injure trees for his or her Own Use on his or her property provided that:

4.15.a the Owner, prior to the cutting, has advised the Officer of the proposed cutting;

4.15.b the Owner has been the registered owner of the Woodlands for at least two (2) years prior to the date of the commencement of the destruction or injury of the trees;

4.15.c Good Forestry Practices are employed in accordance with the Ministry of Natural Resources document "A Silvicultural Guide to Managing Southern Ontario Forests";

4.15.d the destruction or injuring, in that part of the Woodland where trees have been destroyed or injured, does not reduce:

4.15.d.i the number of trees per hectare below that necessary to constitute a Woodland; and

4.15.d.ii the total basal area to below 20 square metres per hectare; and

4.15.e the harvesting, injury or destruction of trees does not involve a Sensitive Natural Area, in which case a Permit under this By-law is required, except that for the purposes of this section no fee is required; or

4.16 the harvesting, injury or destruction of trees by a Farmer that involves the clearing of all or part of a Woodland for agricultural use on land that is owned by the Farmer doing the clearing and is part of a farm operation or farm corporation that has existed for at least three (3) years prior to such clearing. The clearing shall be carried out in accordance with Normal Farm Practices as defined in the *Farming and Food Production Protection Act*, 1998, S.O. 1998, c. 1, as amended, provided that:

4.16.a the land that is cleared is put into agricultural use within three (3) years of the date on which such clearing commences;

4.16.b prior to the clearing, the Farmer advises the Officer of the proposed clearing. For the purposes of this section the marking of trees, a Forest Management Plan or a Prescription, a fee and a Permit are not required; and

- 4.16.c the land being cleared for agricultural use is outside the Urban Areas as defined in the Regional Policy Plan, and is designated and zoned for agricultural use in the Official Plan and Zoning By-law of the Area Municipality and, where applicable, in the Niagara Escarpment Plan;

except where the injuring or destruction of trees involves a Sensitive Natural Area in which case a Permit is required pursuant to the provisions of Sections 5 and 6 of this By-law, but no fee shall be required.

5. PERMITS

5.1 GOOD FORESTRY PRACTICES PERMITS

- 5.1.a Upon application by an Owner, the Region may issue a Good Forestry Practices Permit to permit the harvesting, injuring or destruction of trees in accordance with Good Forestry Practices provided that:

- 5.1.a.i a Prescription or Forest Management Plan, identifying accepted silviculture techniques and environmental protection measures where a Sensitive Natural Area is involved, has been authored by a Registered Professional Forester or a member in good standing of the Ontario Professional Foresters Association who is authorized to prepare Prescriptions or Forest Management Plans and the Prescription or Forest Management Plan has been submitted with the application for a Permit as per Section 6;
- 5.1.a.ii the trees to be cut are marked by a certified Tree Marker in accordance with a Prescription or Forest Management Plan and only such trees are cut; and
- 5.1.a.iii the injuring or destruction of trees will not reduce the number of trees per hectare below the minimum number of trees per hectare required to be considered a Woodland;

or provided that:

- 5.1.a.iv a plan, using Good Forestry Practices and including the identification of the trees to be cut, has been prepared to the satisfaction of the Officer by a certified Tree Marker with previous experience marking trees in Niagara Region and the plan has been submitted with the application for a Permit as per Section 6;
- 5.1.a.v the trees to be cut are marked by a certified Tree Marker in accordance with the plan under paragraph 5.1.a.iv and only such trees are cut; and

- 5.1.a.vi the injuring or destruction of trees will not reduce the number of trees per hectare below the minimum number of trees per hectare required to be considered a Woodland.

5.2 SPECIAL COUNCIL PERMITS

- 5.2.a Upon application by an Owner, Regional Council may issue a Special Council Permit to permit the injuring or destruction of trees in a Woodland provided that:
 - 5.2.a.i an application for a Special Council Permit, in a form as determined by the Commissioner from time to time, is submitted to the Region at least 90 days prior to the commencement of the proposed harvesting, injury or destruction of trees;
 - 5.2.a.ii the application is accompanied by the applicable fee as set out in Schedule "A";
 - 5.2.a.iii a public meeting has been held by the Tree and Forest Conservation By-law Advisory Committee in regard to the application for a Special Council Permit as set out in Section 11; and
 - 5.2.a.iv a report on the merits of the application from the Commissioner has been submitted to Regional Council for consideration.
- 5.2.b At least 20 days prior to the public meeting on the application for a Special Council Permit the Commissioner shall send, by regular mail or by personal delivery, written notice of the public hearing to all assessed owners of each parcel of land that abuts the applicant's Woodlands for which a Special Council Permit is being sought and to such other persons as determined by the Commissioner.
- 5.2.c The Owner shall, at least 20 days prior to the public meeting, erect and display a public notice sign or signs regarding the Special Council Permit application. The sign(s) shall be located at the entrance to the property on which the Woodlands are located, in a position that ensures that it is clear and visible to all persons from any public and traveled roadway adjacent to the subject lands. Such notice shall be to the satisfaction of the Commissioner in a form as determined from time to time by the Commissioner.
- 5.2.d A Special Council Permit may be issued by Regional Council subject to terms or conditions including but not necessarily limited to, an expiry date, the manner and/or restrictions under which the tree injury, destruction or removal activity is to be carried out and other measures such as re-planting of trees.
- 5.2.e When an application for a Special Council Permit is denied, the Commissioner will give written notice to the applicant by registered mail within ten (10) business days of the decision.

6. PERMIT APPLICATION PROCESS

- 6.1 Every person who intends to injure or destroy trees personally or through another person, where a Permit to do so is required under this By-law, shall first complete and submit an application for a Permit in the form approved by the Commissioner from time to time.
- 6.2 Any person who submits an application under Section 6 shall post and display a copy of the Permit as issued pursuant to this By-law, in the immediate area where the destruction or injury of the trees is to occur, in a position that is clear and visible to all persons.
- 6.3 Applications for Permits will be processed only if:
- 6.3.a the appropriate application form, approved by the Commissioner from time to time, has been completed in full, duly signed and submitted to the Commissioner;
 - 6.3.b the requirements that must be submitted with an application have been included;
 - 6.3.c applications are in keeping with the general purpose and intent of this By-law; and
 - 6.3.d except as otherwise stated in this By-law, the prescribed application fee, as set forth in Schedule "A" has been paid in full.
- 6.4 A Permit application that does not meet the requirements of clauses 6.3.a, 6.3.b and 6.3.c will be returned to the applicant with the prescribed fee within 30 days.
- 6.5 A Permit may be:
- 6.5.a issued by the Officer to the Owner for a term of up to one (1) year from the date of issue and shall not be transferable;
 - 6.5.b renewed one time only by the Officer for one term of up to one (1) year contiguous with the expiry date of the original Permit and after a written request from the Owner for renewal is made to the Officer who must be satisfied that there are reasonable grounds for the renewal; or
 - 6.5.c renewed by Regional Council for one term of up to one (1) year for a Special Council Permit under Section 5 of this By-law, after a written request from the Owner for renewal is made to the Officer who shall, through the Tree and Forest Conservation By-law Advisory Committee and Commissioner, report to Regional Council on the merits of the renewal.
- 6.6 An Officer may impose conditions to a Permit that relate to, but which are not restricted to:
- 6.6.a the manner and timing in which harvesting, injury or destruction is to occur;

- 6.6.b the species, size, number and location of trees to be injured or destroyed or to be planted;
 - 6.6.c the marking of trees to be cut with paint;
 - 6.6.d the qualifications of persons authorized to injure or destroy trees;
 - 6.6.e the submission of additional information required before the Permit becomes effective;
 - 6.6.f measures to be implemented to mitigate the direct and indirect effects of the injuring or destruction on Sensitive Natural Areas; and
 - 6.6.g a follow-up fuelwood (firewood) harvest.
- 6.7 When denying a Permit, the Commissioner will notify the applicant in writing by registered mail.

7. APPEALS TO THE ONTARIO MUNICIPAL BOARD

- 7.1 An applicant for a Permit under Section 6 may appeal to the Ontario Municipal Board if:
- 7.1.a the Region refuses to issue a Permit, within 30 days after the refusal;
 - 7.1.b the Region fails to make a decision on the application, within 45 days after a complete application is received by the Region; or
 - 7.1.c the applicant objects to a condition in the Permit, within 30 days after the issuance of the Permit.

8. ORDERS TO DISCONTINUE ACTIVITY

- 8.1 Where an Officer is satisfied that a contravention of this By-law has occurred, the Officer may make an Order requiring the person who contravened the By-law or who caused or permitted the injuring or destruction of trees in contravention of the By-law to stop the injuring or destruction of trees. The order shall set out:
- 8.1.a the municipal address or the legal description of the land;
 - 8.1.b reasonable particulars of the contravention; and
 - 8.1.c the period within which there must be compliance with the order.
- 8.2 An Order issued under this section may be served personally or by registered mail to the last known address of:
- 8.2.a the Owner of the Woodland; and
 - 8.2.b the person identified as injuring or destroying trees.
- 8.3 Where service of an Order is made by registered mail, service shall be deemed to have been served on the fifth day after the order is mailed.
- 8.4 Where service cannot be carried out under subsection 8.2, it is deemed sufficient if the Officer places a placard containing the terms of the Order in a conspicuous place on the affected lands. The placing of the placard shall be deemed to be sufficient service of the Order on the person to whom the Order is directed. The placard shall not be removed without the approval of the Officer.

- 8.5 If the person to whom the Order is directed is not satisfied with the terms of the Order, the person may appeal to Regional Council by filing a notice of appeal by personal service or registered mail to the Regional Clerk within 30 days of the date of the Order.
- 8.6 Where an appeal has been filed, Regional Council shall, at a public hearing, consider the appeal and a report from the Commissioner concerning the appeal.
- 8.7 Before conducting a hearing under this section, the Clerk shall give notice to the applicant and to such persons as the Clerk considers should receive notice and in the manner directed by the Clerk.
- 8.8 After hearing an appeal, Regional Council may confirm or revoke any Order issued under this By-law or may issue a Permit with conditions, provided that in the opinion of Regional Council, the general intent and purpose of this By-law has been maintained.
- 8.9 The proceedings at the hearing held by Regional Council shall be in accordance with the provisions of the *Statutory Powers Procedure Act*, R.S.O. 1990, c. S.22, as amended. The decision of Regional Council under this section shall be final.

9. PENALTY

- 9.1 Any person who contravenes any provision of this By-law, or an Order issued under section 8 is guilty of an offence and is liable:
- 9.1.a on first conviction, to a fine of not more than \$10,000 or \$1,000 per tree, whichever is greater; and
- 9.1.b on any subsequent conviction, to a fine of not more than \$25,000 or \$2,500 per tree, whichever is greater.
- 9.2 Despite subsection 9.1, where the person convicted is a corporation:
- 9.2.a the maximum fines in clause 9.1.a are \$50,000 or \$5,000 per tree; and
- 9.2.b the maximum fines in clause 9.1.b are \$100,000 or \$10,000 per tree.
- 9.3 If a person is convicted of an offence for contravening this By-law or an Order issued under section 8, the court in which the conviction has been entered, and any court of competent jurisdiction thereafter, may order the person to rehabilitate the land or to plant or replant trees in such a manner and within such period as the court considers appropriate, including any silvicultural treatment necessary to re-establish the trees.

10. ENFORCEMENT

- 10.1 Regional Council may appoint from time to time by resolution, persons it deems qualified and necessary to act as Officers to administer and enforce the

provisions of this By-law and Regional Council hereby delegates to such Officers the authority to enforce this By-law, to issue Permits under this By-law and to impose conditions to such Permits.

10.2 An Officer, appointed by resolution of Regional Council, or any person authorized by an Officer, may at all reasonable times enter upon and inspect any land and Woodland for the purposes of enforcing this By-law, determining compliance with this By-law, determining compliance with terms and conditions of a Permit issued under this By-law, determining compliance with an Order issued under Section 8 of this By-law or laying charges under this By-law.

10.3 Any person who obstructs or interferes with an Officer, or any person or agent authorized by an Officer, in the discharge of his or her duties under this By-law, shall be considered in violation of this By-law.

11. TREE AND FOREST CONSERVATION BY-LAW ADVISORY COMMITTEE

11.1 Regional Council shall appoint a Tree and Forest Conservation By-Law Advisory Committee, which shall be a technical advisory committee of Regional Council reporting through the Planning and Public Works Committee comprised of one non-elected representative of each of the Area Municipalities, one representative from Regional staff, one representative of the Niagara North Federation of Agriculture and one representative of the Niagara South Federation of Agriculture, two non-elected representatives of the Regional Ecological and Environmental Advisory Committee, two non-elected representatives from the Regional Agricultural Sub-Committee, one representative from the Ministry of Natural Resources and one representative from the Niagara Woodlot Association.

11.2 The Tree and Forest Conservation By-Law Advisory Committee shall:

11.2.a prepare and distribute public information about the benefits of good forestry practice and the provisions of this By-Law;

11.2.b review and give consideration to any reports from the Officer on possible contraventions of this By-law and provide advice as to any action by the Officer;

11.2.c consider applications for Special Council Permits submitted under subsection 5.2 of this By-Law and shall:

11.2.c.i review each application for a Special Council Permit;

11.2.c.ii consider any reports from the Officer respecting such application for a Special Council Permit;

11.2.c.iii hold a public meeting and hear in person, or by counsel or agent, at the public meeting, the applicant and any person who claims that the person's land will be prejudicially affected by granting a Special Council Permit; and

11.2.c.iv report to Regional Council summarizing the evidence and arguments presented by the parties at the public meeting, the findings of fact made by the Committee and the

recommendations, if any, of the Committee with reasons on the merits of the application;

- 11.2.d review any reports from the Officer concerning the renewal of a Permit issued under Sections 5 and 6 and advise Regional Council on such renewal;
- 11.2.e advise Regional Council on other aspects of the administration and enforcement of this By-Law and on the effectiveness of this By-Law;
- 11.2.f submit reports to Regional Council which shall include a review of the administration and enforcement of the By-Law; and
- 11.2.g appoint from among its members a Chair of the Committee for a period of up to three (3) years.

12. ADMINISTRATION

- 12.1 Schedule "A" shall form part of this By-law.
- 12.2 If any section or part of this By-law is found by any court of competent jurisdiction to be illegal or beyond the power of Regional Council to enact, such section or part shall be deemed to be severable and all other sections or parts of this By-law shall be deemed to be separate and independent therefrom and to be enacted as such.
- 12.3 The short title of this By-law is the "Tree and Forest Conservation By-law".
- 12.4 By-law 8541-96 of the Regional Municipality of Niagara and all amendments thereto, are hereby repealed.
- 12.5 Despite subsection 12.4, By-law 8541-96, as amended, shall continue to apply to:
 - 12.5.a proceedings in respect of offences that occurred before its repeal; and
 - 12.5.b Notice of Intent submissions in compliance with By-law 8541-96, which were made prior to its repeal.
- 12.6 This By-law shall come into force and effect on May 25, 2006.

THE REGIONAL MUNICIPALITY OF NIAGARA


(Peter Partington, Regional Chair)


(Pam Gilroy, Regional Clerk)

Passed: May 25, 2006

**REGIONAL MUNICIPALITY OF NIAGARA
TREE AND FOREST CONSERVATION BY-LAW No. 47-2006
SCHEDULE A – FEES**

Application for a Good Forestry Practices Permit	\$0.00
Application for a Special Council Permit	\$500.00

**PLANNING AND DEVELOPMENT DEPARTMENT**

The Regional Municipality of Niagara
3550 Schmon Parkway, P.O. Box 1042
Thorold, Ontario L2V 4T7
Telephone: 905-984-3630
Fax: 905-641-5208
E-mail: plan@regional.niagara.on.ca

April 12, 2005
File: A.03.A.34.43

Mr. D. Thorpe, General Manager Planning and Development Services
City of Welland
411 East Main St.
Welland, ON
L3B 3X4

Dear Mr. Thorpe

RE: Environmental Assessment
Northwest Area Planning and Servicing Study
City of Welland

There are significant planning and Provincial policy issues to be considered that will affect this Environmental Assessment and the Secondary Plan. Many of the provisions in the Provincial Statement are new and untested and it is therefore, difficult to determine specifically how these provisions will be applied in practice to this proposed expansion. We would welcome more discussion between the City and Regional staff and suggest that discussions with Provincial staff may be helpful. We would also point out that the effect of the Greenbelt Plan and our existing Regional Policy Plan would be to encourage additional development in municipalities such as the City of Welland located in the southern portion of the Region. It is also understood that the City of Welland has very limited alternative urban growth areas to meet its long term residential land needs. In fact, the northwest area appears to be the only significant potential new residential expansion area within the City.

Planning staff attended a public meeting concerning this EA late in 2004. Also we have been reviewing the proposed Secondary Plan for this area and have provided some population forecast figures to your consultant. We have not been formally requested to provide comments but given the nature of this proposal and recent Provincial initiatives it is important that the City is made aware of certain matters. Therefore, we wish to provide the following initial information on matters of Regional and Provincial interest.

- The entire area is located outside the Urban Area Boundary. Therefore, as you know, an amendment to the Regional Policy Plan is required. To date we have not received an amendment application. Any development here should be integrated with proposed development areas and secondary planning provisions in the City of Thorold and the eastern expansion area of Fonthill.
- The recently released Greenbelt Plan will restrict development opportunities in the northern portion of the Region. As a result development will be directed to the southern portions of the Region including the City of Welland. Subject to careful planning, including the use of Smart Growth principles and the provisions of the Province's

Growth Plan (currently in draft form) and the new Provincial Policy Statement, this area of Welland may be an appropriate location to redirect growth.

- There are significant Provincial matters to be considered as follows:
 - The recently revised Planning Act requires that a decision in respect of the exercise of any authority that affects a planning matter shall be consistent with policy statements issued by the Province. The recently approved Provincial Policy Statement will affect this Environmental Assessment, the related Secondary Plan and any planning decisions on the Regional Policy Plan or the local Official Plan.
 - There are requirements in the revised Provincial Policy Statement that need to be addressed. Specifically:
 - the Region must establish and implement minimum targets for intensification and redevelopment within built up areas before an expansion is permitted;
 - the Region must identify, coordinate and allocate population, housing and employment projections;
 - the Region must identify where growth will be directed including nodes and corridors;
 - where there are cross boundary issues (which may be the case here) the Region must provide policy direction;
 - planning authorities shall establish and implement phasing policies to ensure that targets are achieved and to ensure orderly progression of development in designated growth areas.

Under the Provincial Policy Statement the lands of the proposed expansion area in northwest Welland are considered to be a "prime agricultural area" as defined in the Policy Statement. As such certain tests must be met when considering expansions to Settlement Areas.

The Provincial Policy Statement sets out policies concerning expansions to "settlement areas" (e.g. urban areas). Such expansions can occur only at the time of a comprehensive review and only where it has been demonstrated, among other matters, that:

- Sufficient opportunities for growth are not available through intensification, redevelopment and designated growth areas to accommodate the projected needs over the identified planning horizon;
- The infrastructure and public service facilities which are planned or available are suitable for the development over the long term and protect public health and safety.

When determining the most appropriate direction for expansions of settlement areas by a planning authority a planning authority shall apply the policies of Sections 2 and 3 of the Policy Statement (i.e. "Wise Use and Management of Resources" and "Protecting Public Health and Safety" respectively). Also note that in Section 1.2.1, Coordination, a coordinated, integrated and comprehensive approach should be used when dealing with planning matters (such as the expansion proposed here).

- In the new recently released Provincial Growth Plan (draft) a key factor to consider when expanding Urban Areas is the amount of existing available urban land. The Growth Plan (Section 2.7.2) requires that on a regional market basis urban expansions be considered only when there is insufficient vacant land available to accommodate growth projected over the next five years. At this time in Niagara there is a significant amount of land available well beyond five years.
- As part of this proposal the Region's Urban Design Guidelines and Smart Growth principles should be used to assist in determining long range planning strategies for this area. Efficient land use, servicing integration, transportation, pedestrian friendly features, development densities, environmental features and other matters should be considered. These would also be consistent with the Provincial matters noted above.
- Previously an Environmental Assessment for a Mid-Peninsula Transportation Corridor was considered by the Province and Area Municipalities. However, after considerable discussion and a court ruling the original EA has been abandoned. It now has been replaced by an EA for the "Niagara to GTA Corridor" which will be a more comprehensive exercise.

As part of the Niagara to GTA Corridor EA, that has only just been started, a number of routing options are being considered, including the area within which the Northwest Welland expansion is proposed. Although previously this option was not a popular one (a route south of Welland was preferred) it nonetheless remains a component of the new EA. The Northwest Welland Planning and Servicing Study will have to take this into consideration. The Ministry of Transportation should be requested to comment on the City's EA with respect to the "Niagara to GTA Corridor".

- The information we have to date on the Northwest Area Planning and Servicing EA does not include any discussion on alternatives. Because of the nature and size of the area involved we would like the opportunity to review and comment on alternative development approaches and servicing options.
- There are a number of environmental features across the area that will have to be considered. These include woodlands, small watercourses and an adjacent Locally Significant Wetland (north of Montgomery Rd. in the Town of Pelham). The Region's new draft Natural Heritage policies should be considered since it is hoped that they will be approved some time this year. The draft policies and related map identify Environmental Conservation Areas and a Natural Heritage Corridor within the area affected by the EA.

We would welcome a meeting with City staff and possibly with your consultant to discuss the issues outlined in this letter.

If you have any questions or comments please contact me.

Yours truly,

A handwritten signature in cursive script, reading "Drew Semple", is written over a horizontal line.

Drew Semple, MCIP, RPP
Senior Planner

Copy: Mr. K. Grueneis, EA and Approvals Planner, Earth Tech Canada Inc. 80 King St, 2nd
Floor, St. Catharines, ON, L2R 7G1

VG/Environmental Assessments/Northwest Welland.doc



250 Thorold Road West, 3rd Floor
Welland, Ontario L3C 3W2
Tel (905) 788-3135
Fax (905) 788-1121
E-mail: npc@conservation-niagara.on.ca

May 17, 2005

Sent by fax 905-688-5812

File: MPR 4.40.15

Earth Tech Canada Inc
Corbloc Building
80 King Street, 2nd Floor
St. Catharines, ON L2R 7G1

Attention: Mr. Karl Grueneis, EA & Approvals Planner

Dear Mr. Grueneis,

Subject: Welland Northwest Area Planning and Servicing Study Class EA

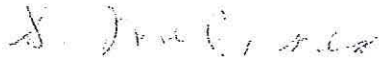
Further to your letter of April 18, 2005, outlined below are the NPCA's comments on the project. It does not appear from the material provided that the project was discussed with NPCA staff previously. The NPCA has a couple of roles in commenting on planning studies such as this. The NPCA is directly responsible for commenting on the Natural Hazards component of the Provincial Policy Statement (PPS) issued under the Planning Act. The NPCA also has a Memorandum of Agreement with the Region of Niagara to review the fisheries aspect of the PPS and stormwater management at the request of the Region. The NPCA also has a partnership with the Federal Department of Fisheries and Oceans (DFO) regarding Section 35 of the Fisheries Act.

The information package includes a schematic drawing called "North West Welland Master Plan A" prepared by the Planning Partnership. It prematurely assumes that the watercourses in the study area will be entombed. The Ministry of Natural Resources (MNR) has a system to classify fish habitat by Type 1, 2 and 3. The MNR mapping provided to date to the Region and ourselves does not include a fisheries classification for this watercourse. The Region and MNR should be consulted for this data. For your information, the NPCA has conducted a site inspection of the Taliman Transport property on Niagara Street (just east of this study area) and advised them that the watercourse at that location would be considered Type 2 fish habitat.

With respect to Natural Hazards, if the watercourses are to remain open channels, you would need to generate the 100 year floodline for Block C of the study area because the upstream drainage area is greater than 125 ha. The City may also wish to have the floodline established through this project for Blocks A and B to determine if there are any localized flooding issues that should be considered in the preparation of the Secondary Plan.

If requested by the Region of Niagara, the NPCA would comment on the stormwater management aspect of this project. It may be worthwhile for you to convene a meeting with the City, Region and the ourselves to discuss these issues.

Sincerely,



Suzanne McInnes, MCIP, RPP
Watershed Planning Coordinator (ext.235)

cc. D. Thorpe, City of Welland Planning
J. Durst, MNR, Vineland
D. Semple, Region of Niagara Planning Dept.
P. Colosimo, Region of Niagara Planning Dept.

March 9, 2007

Project No. 66898

Mr. Ron Palmer, BES, MCIP, RPP
The Planning Partnership
1255 Bay Street, Suite 201
Toronto, ON M5R 2A9

**Subject: Northwest Welland Master Servicing Plan
Changes to Conceptual Plan**

Dear Ron:

As recently discussed, in order to gain approval from the NPCA for the environmental controls, changes must be made to the project.

Enclosed, please find Earth Tech figures 11-1A and 11-1B from our stormwater management plan. On these sheets are notes (1 through 3B) regarding the Tow Path Drain that must be included on the Conceptual Plan developed by your firm.

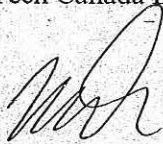
Please alter your drawing through the inclusion of these notes and return to Earth Tech.

If you have any questions, do not hesitate to contact the undersigned directly at 905-688-2380 or Kelly.walsh@earthtech.ca.

Thank you in advance.

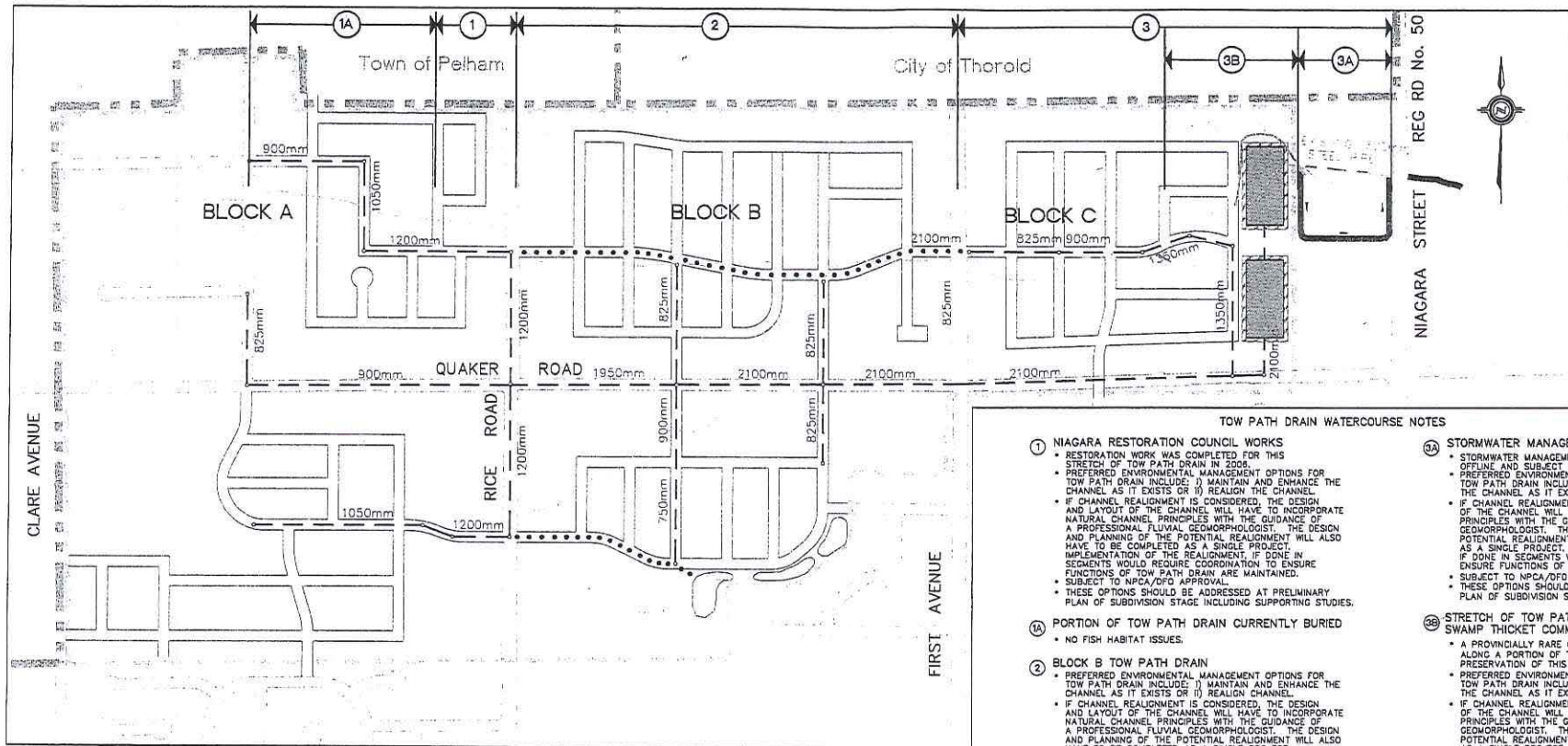
Very truly yours,

Earth Tech Canada Inc.



Kelly M. Walsh, P.Eng.
Regional Manager.

c: Karl Grueneis



LEGEND

- URBAN BOUNDARY
- STUDY AREA
- CONCEPTUAL ROAD LAYOUT
- 1050mm PROPOSED STORMWATER COLLECTION SYSTEM
- OPTIONAL STORMWATER COLLECTION SYSTEM

- STORMWATER MANAGEMENT FACILITY (INCLUDING LANDSCAPING AREAS)
- EXISTING TOW PATH DRAIN WATERCOURSE
- PROPOSED NEW OUTLET
- PROPOSED DITCH ALIGNMENT
- EXISTING STEEL PIPE

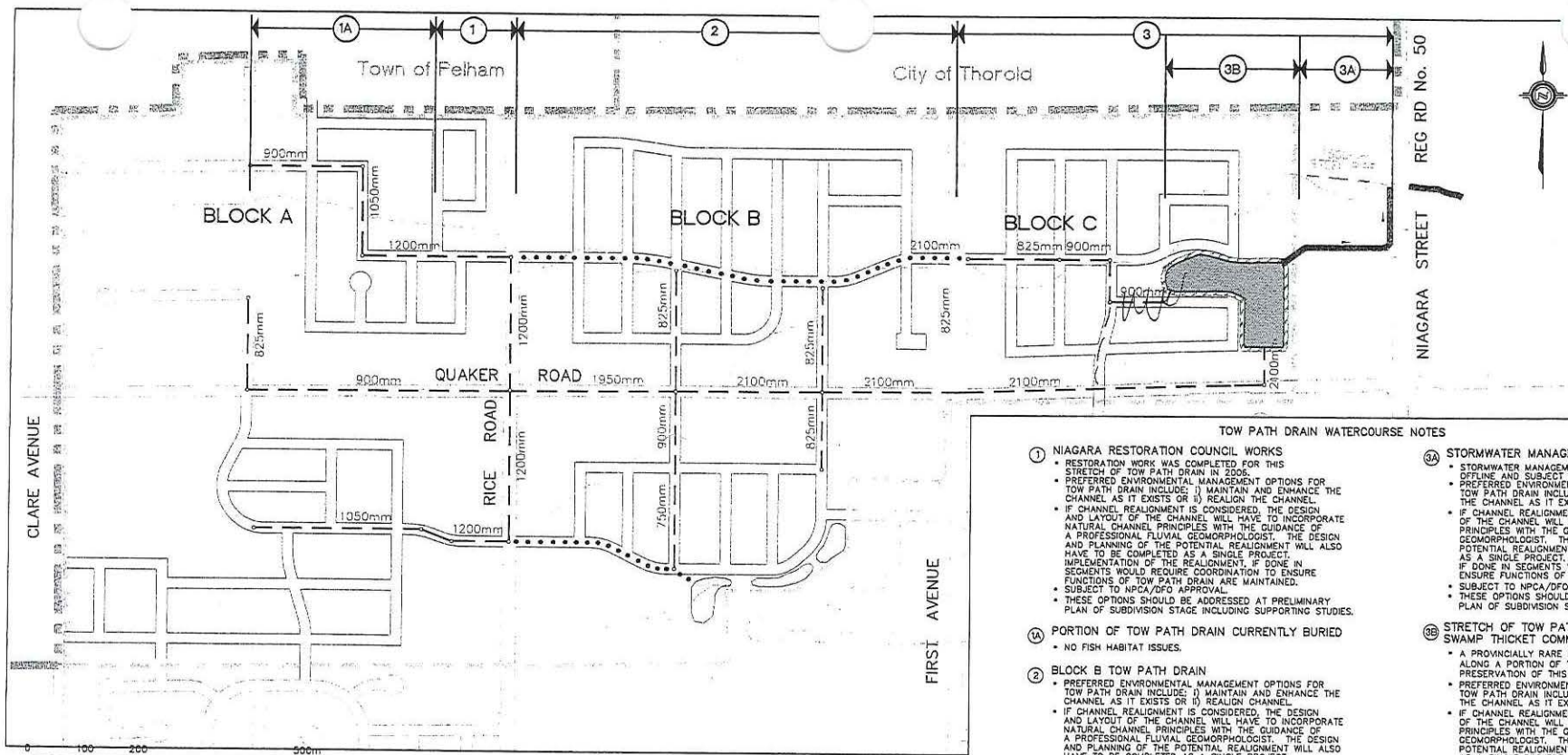
TOW PATH DRAIN WATERCOURSE NOTES

- ① NIAGARA RESTORATION COUNCIL WORKS
 - RESTORATION WORK WAS COMPLETED FOR THIS STRETCH OF TOW PATH DRAIN IN 2006.
 - PREFERRED ENVIRONMENTAL MANAGEMENT OPTIONS FOR TOW PATH DRAIN INCLUDE: i) MAINTAIN AND ENHANCE THE CHANNEL AS IT EXISTS OR ii) REALIGN THE CHANNEL.
 - IF CHANNEL REALIGNMENT IS CONSIDERED, THE DESIGN AND LAYOUT OF THE CHANNEL WILL HAVE TO INCORPORATE NATURAL CHANNEL PRINCIPLES WITH THE GUIDANCE OF A PROFESSIONAL FLUVIAL GEOMORPHOLOGIST. THE DESIGN AND PLANNING OF THE POTENTIAL REALIGNMENT WILL ALSO HAVE TO BE COMPLETED AS A SINGLE PROJECT. IMPLEMENTATION OF THE REALIGNMENT, IF DONE IN SEGMENTS WOULD REQUIRE COORDINATION TO ENSURE FUNCTIONS OF TOW PATH DRAIN ARE MAINTAINED.
 - SUBJECT TO NPCA/DFO APPROVAL.
 - THESE OPTIONS SHOULD BE ADDRESSED AT PRELIMINARY PLAN OF SUBDIVISION STAGE INCLUDING SUPPORTING STUDIES.
- ② BLOCK B TOW PATH DRAIN
 - PREFERRED ENVIRONMENTAL MANAGEMENT OPTIONS FOR TOW PATH DRAIN INCLUDE: i) MAINTAIN AND ENHANCE THE CHANNEL AS IT EXISTS OR ii) REALIGN THE CHANNEL.
 - IF CHANNEL REALIGNMENT IS CONSIDERED, THE DESIGN AND LAYOUT OF THE CHANNEL WILL HAVE TO INCORPORATE NATURAL CHANNEL PRINCIPLES WITH THE GUIDANCE OF A PROFESSIONAL FLUVIAL GEOMORPHOLOGIST. THE DESIGN AND PLANNING OF THE POTENTIAL REALIGNMENT WILL ALSO HAVE TO BE COMPLETED AS A SINGLE PROJECT. IMPLEMENTATION OF THE REALIGNMENT, IF DONE IN SEGMENTS WOULD REQUIRE COORDINATION TO ENSURE FUNCTIONS OF TOW PATH DRAIN ARE MAINTAINED.
 - SUBJECT TO NPCA/DFO APPROVAL.
 - THESE OPTIONS SHOULD BE ADDRESSED AT PRELIMINARY PLAN OF SUBDIVISION STAGE INCLUDING SUPPORTING STUDIES.
- ③ BLOCK C TOW PATH DRAIN
 - PREFERRED ENVIRONMENTAL MANAGEMENT OPTIONS FOR TOW PATH DRAIN INCLUDE: i) MAINTAIN AND ENHANCE THE CHANNEL AS IT EXISTS OR ii) REALIGN THE CHANNEL.
 - IF CHANNEL REALIGNMENT IS CONSIDERED, THE DESIGN AND LAYOUT OF THE CHANNEL WILL HAVE TO INCORPORATE NATURAL CHANNEL PRINCIPLES WITH THE GUIDANCE OF A PROFESSIONAL FLUVIAL GEOMORPHOLOGIST. THE DESIGN AND PLANNING OF THE POTENTIAL REALIGNMENT WILL ALSO HAVE TO BE COMPLETED AS A SINGLE PROJECT. IMPLEMENTATION OF THE REALIGNMENT, IF DONE IN SEGMENTS WOULD REQUIRE COORDINATION TO ENSURE FUNCTIONS OF TOW PATH DRAIN ARE MAINTAINED.
 - SUBJECT TO NPCA/DFO APPROVAL.
 - THESE OPTIONS SHOULD BE ADDRESSED AT PRELIMINARY PLAN OF SUBDIVISION STAGE INCLUDING SUPPORTING STUDIES.
- ④ STORMWATER MANAGEMENT PONDS
 - STORMWATER MANAGEMENT PONDS WILL BE DESIGNED AS OFFLINE AND SUBJECT TO RELOCATION.
 - PREFERRED ENVIRONMENTAL MANAGEMENT OPTIONS FOR TOW PATH DRAIN INCLUDE: i) MAINTAIN AND ENHANCE THE CHANNEL AS IT EXISTS OR ii) REALIGN THE CHANNEL.
 - IF CHANNEL REALIGNMENT IS CONSIDERED, THE DESIGN AND LAYOUT OF THE CHANNEL WILL HAVE TO INCORPORATE NATURAL CHANNEL PRINCIPLES WITH THE GUIDANCE OF A PROFESSIONAL FLUVIAL GEOMORPHOLOGIST. THE DESIGN AND PLANNING OF THE POTENTIAL REALIGNMENT WILL ALSO HAVE TO BE COMPLETED AS A SINGLE PROJECT. IMPLEMENTATION OF THE REALIGNMENT, IF DONE IN SEGMENTS WOULD REQUIRE COORDINATION TO ENSURE FUNCTIONS OF TOW PATH DRAIN ARE MAINTAINED.
 - SUBJECT TO NPCA/DFO APPROVAL.
 - THESE OPTIONS SHOULD BE ADDRESSED AT PRELIMINARY PLAN OF SUBDIVISION STAGE INCLUDING SUPPORTING STUDIES.
- ⑤ STRETCH OF TOW PATH DRAIN WITH ADJACENT SWAMP THICKET COMMUNITY
 - A PROVINCIALLY RARE GREY DOGWOOD THICKET OCCURS ALONG A PORTION OF TOW PATH DRAIN IN BLOCK C. PRESERVATION OF THIS COMMUNITY IS RECOMMENDED.
 - PREFERRED ENVIRONMENTAL MANAGEMENT OPTIONS FOR TOW PATH DRAIN INCLUDE: i) MAINTAIN AND ENHANCE THE CHANNEL AS IT EXISTS OR ii) REALIGN THE CHANNEL.
 - IF CHANNEL REALIGNMENT IS CONSIDERED, THE DESIGN AND LAYOUT OF THE CHANNEL WILL HAVE TO INCORPORATE NATURAL CHANNEL PRINCIPLES WITH THE GUIDANCE OF A PROFESSIONAL FLUVIAL GEOMORPHOLOGIST. THE DESIGN AND PLANNING OF THE POTENTIAL REALIGNMENT WILL ALSO HAVE TO BE COMPLETED AS A SINGLE PROJECT. IMPLEMENTATION OF THE REALIGNMENT, IF DONE IN SEGMENTS WOULD REQUIRE COORDINATION TO ENSURE FUNCTIONS OF TOW PATH DRAIN ARE MAINTAINED.
 - SUBJECT TO NPCA/DFO APPROVAL.
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WELLAND NORTHWEST SERVICING
MASTER PLAN
PREFERRED STORMWATER
MANAGEMENT SYSTEM
FIGURE 11-1A



EarthTech
A Tyco International Ltd. Company



LEGEND

- | | | | |
|--|---------------------------------------|--|--|
| | URBAN BOUNDARY | | STORMWATER MANAGEMENT FACILITY (INCLUDING LANDSCAPING AREAS) |
| | STUDY AREA | | EXISTING TOW PATH DRAIN WATERCOURSE |
| | CONCEPTUAL ROAD LAYOUT | | PROPOSED NEW OUTLET |
| | PROPOSED STORMWATER COLLECTION SYSTEM | | EXISTING STEEL PIPE |
| | OPTIONAL STORMWATER COLLECTION SYSTEM | | |

TOW PATH DRAIN WATERCOURSE NOTES

- ① NIAGARA RESTORATION COUNCIL WORKS
 - RESTORATION WORK WAS COMPLETED FOR THIS STRETCH OF TOW PATH DRAIN IN 2005.
 - PREFERRED ENVIRONMENTAL MANAGEMENT OPTIONS FOR TOW PATH DRAIN INCLUDE: i) MAINTAIN AND ENHANCE THE CHANNEL AS IT EXISTS OR ii) REALIGN THE CHANNEL.
 - IF CHANNEL REALIGNMENT IS CONSIDERED, THE DESIGN AND LAYOUT OF THE CHANNEL WILL HAVE TO INCORPORATE NATURAL CHANNEL PRINCIPLES WITH THE GUIDANCE OF A PROFESSIONAL FLUVIAL GEOMORPHOLOGIST. THE DESIGN AND PLANNING OF THE POTENTIAL REALIGNMENT WILL ALSO HAVE TO BE COMPLETED AS A SINGLE PROJECT. IMPLEMENTATION OF THE REALIGNMENT, IF DONE IN SEGMENTS WOULD REQUIRE COORDINATION TO ENSURE FUNCTIONS OF TOW PATH DRAIN ARE MAINTAINED.
 - SUBJECT TO NPCA/DFO APPROVAL.
 - THESE OPTIONS SHOULD BE ADDRESSED AT PRELIMINARY PLAN OF SUBDIVISION STAGE INCLUDING SUPPORTING STUDIES.
- ①A PORTION OF TOW PATH DRAIN CURRENTLY BURIED
 - NO FISH HABITAT ISSUES.
- ② BLOCK B TOW PATH DRAIN
 - PREFERRED ENVIRONMENTAL MANAGEMENT OPTIONS FOR TOW PATH DRAIN INCLUDE: i) MAINTAIN AND ENHANCE THE CHANNEL AS IT EXISTS OR ii) REALIGN THE CHANNEL.
 - IF CHANNEL REALIGNMENT IS CONSIDERED, THE DESIGN AND LAYOUT OF THE CHANNEL WILL HAVE TO INCORPORATE NATURAL CHANNEL PRINCIPLES WITH THE GUIDANCE OF A PROFESSIONAL FLUVIAL GEOMORPHOLOGIST. THE DESIGN AND PLANNING OF THE POTENTIAL REALIGNMENT WILL ALSO HAVE TO BE COMPLETED AS A SINGLE PROJECT. IMPLEMENTATION OF THE REALIGNMENT, IF DONE IN SEGMENTS WOULD REQUIRE COORDINATION TO ENSURE FUNCTIONS OF TOW PATH DRAIN ARE MAINTAINED.
 - SUBJECT TO NPCA/DFO APPROVAL.
 - THESE OPTIONS SHOULD BE ADDRESSED AT PRELIMINARY PLAN OF SUBDIVISION STAGE INCLUDING SUPPORTING STUDIES.
- ③ BLOCK C TOW PATH DRAIN
 - PREFERRED ENVIRONMENTAL MANAGEMENT OPTIONS FOR TOW PATH DRAIN INCLUDE: i) MAINTAIN AND ENHANCE THE CHANNEL AS IT EXISTS OR ii) REALIGN THE CHANNEL.
 - IF CHANNEL REALIGNMENT IS CONSIDERED, THE DESIGN AND LAYOUT OF THE CHANNEL WILL HAVE TO INCORPORATE NATURAL CHANNEL PRINCIPLES WITH THE GUIDANCE OF A PROFESSIONAL FLUVIAL GEOMORPHOLOGIST. THE DESIGN AND PLANNING OF THE POTENTIAL REALIGNMENT WILL ALSO HAVE TO BE COMPLETED AS A SINGLE PROJECT. IMPLEMENTATION OF THE REALIGNMENT, IF DONE IN SEGMENTS WOULD REQUIRE COORDINATION TO ENSURE FUNCTIONS OF TOW PATH DRAIN ARE MAINTAINED.
 - SUBJECT TO NPCA/DFO APPROVAL.
 - THESE OPTIONS SHOULD BE ADDRESSED AT PRELIMINARY PLAN OF SUBDIVISION STAGE INCLUDING SUPPORTING STUDIES.
- ③A STORMWATER MANAGEMENT PONDS
 - STORMWATER MANAGEMENT PONDS WILL BE DESIGNED AS OFFLINE AND SUBJECT TO RELOCATION.
 - PREFERRED ENVIRONMENTAL MANAGEMENT OPTIONS FOR TOW PATH DRAIN INCLUDE: i) MAINTAIN AND ENHANCE THE CHANNEL AS IT EXISTS OR ii) REALIGN THE CHANNEL.
 - IF CHANNEL REALIGNMENT IS CONSIDERED, THE DESIGN AND LAYOUT OF THE CHANNEL WILL HAVE TO INCORPORATE NATURAL CHANNEL PRINCIPLES WITH THE GUIDANCE OF A PROFESSIONAL FLUVIAL GEOMORPHOLOGIST. THE DESIGN AND PLANNING OF THE POTENTIAL REALIGNMENT WILL ALSO HAVE TO BE COMPLETED AS A SINGLE PROJECT. IMPLEMENTATION OF THE REALIGNMENT, IF DONE IN SEGMENTS WOULD REQUIRE COORDINATION TO ENSURE FUNCTIONS OF TOW PATH DRAIN ARE MAINTAINED.
 - SUBJECT TO NPCA/DFO APPROVAL.
 - THESE OPTIONS SHOULD BE ADDRESSED AT PRELIMINARY PLAN OF SUBDIVISION STAGE INCLUDING SUPPORTING STUDIES.
- ③B STRETCH OF TOW PATH DRAIN WITH ADJACENT SWAMP THICKET COMMUNITY
 - A PROVINCIALLY RARE GREY ODONWOOD THICKET OCCURS ALONG A PORTION OF TOW PATH DRAIN IN BLOCK C. PRESERVATION OF THIS COMMUNITY IS RECOMMENDED.
 - PREFERRED ENVIRONMENTAL MANAGEMENT OPTIONS FOR TOW PATH DRAIN INCLUDE: i) MAINTAIN AND ENHANCE THE CHANNEL AS IT EXISTS OR ii) REALIGN THE CHANNEL.
 - IF CHANNEL REALIGNMENT IS CONSIDERED, THE DESIGN AND LAYOUT OF THE CHANNEL WILL HAVE TO INCORPORATE NATURAL CHANNEL PRINCIPLES WITH THE GUIDANCE OF A PROFESSIONAL FLUVIAL GEOMORPHOLOGIST. THE DESIGN AND PLANNING OF THE POTENTIAL REALIGNMENT WILL ALSO HAVE TO BE COMPLETED AS A SINGLE PROJECT. IMPLEMENTATION OF THE REALIGNMENT, IF DONE IN SEGMENTS WOULD REQUIRE COORDINATION TO ENSURE FUNCTIONS OF TOW PATH DRAIN ARE MAINTAINED.
 - SUBJECT TO NPCA/DFO APPROVAL.
 - THESE OPTIONS SHOULD BE ADDRESSED AT PRELIMINARY PLAN OF SUBDIVISION STAGE INCLUDING SUPPORTING STUDIES.

WELLAND NORTHWEST SERVICING
MASTER PLAN
PREFERRED STORMWATER
MANAGEMENT SYSTEM
FIGURE 11-1B



EarthTech
A Tyco International Ltd. Company

Grueneis, Karl

From: Barrett, Ian [ianb@conservation-niagara.on.ca]
Sent: Wednesday, March 14, 2007 1:29 PM
To: Grueneis, Karl
Cc: Miller, Steve
Subject: Welland Northwest Servicing Plan

Hi Karl,

I had a chance to have a closer look at Figure 11-1B, illustrating the preferred stormwater management system for the Welland Northwest Servicing Master Plan. I have no additions to the Tow Path Drain Watercourse Notes listed on the page, but I would like to see the Figure revised to better illustrate an open channel for the watercourse. My concern is that the figure may be misinterpreted as illustrating the watercourse being entombed in a pipe. The notes very clearly indicate any management options for the watercourse, but not everyone takes time to read the details.

If possible, a preferred location for a realigned channel should be indicated on the figure. Identifying a location for the watercourse early will hopefully help guide planning of the area as a whole and avoid discontinuity on the various properties involved in this study.

In regards to the request of data, the NPCA can provide any electronic data that was generated in house, but any data that is owned by the Region can not be circulated electronically. If you contact Geoff Verkade, our GIS Specialist (extension 244), he will be able to tell you which data we can provide.

Hope this helps.

Ian

Ian Barrett, M.Sc.
Aquatic Biologist
Niagara Peninsula Conservation Authority
250 Thorold Road West, 3rd Floor
Welland, Ontario
L3C 3W2
Phone (905) 788-3135 ext 229
Fax (905) 788-1121

The Niagara Peninsula Conservation Authority Confidentiality Notice

The information contained in this communication including any attachments may be confidential, is intended for the person(s) named above, and may be legally privileged. If the reader of this message is not the intended recipient, please do not send this communication to the sender and permanently delete the original and any copy of it from your system.

3/14/2007

APPENDIX H: Public Consultation

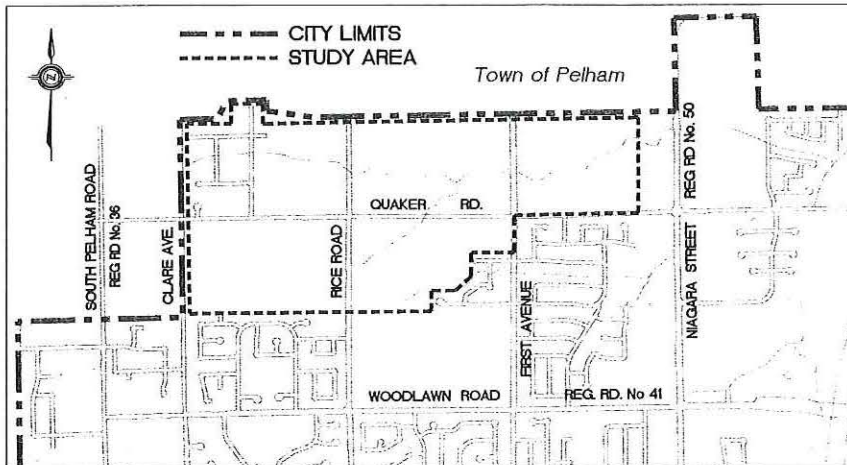
NOTICE OF PROJECT INITIATION AND PUBLIC INFORMATION CENTRE



NOTICE OF PROJECT INITIATION AND PUBLIC INFORMATION CENTRE

Background

The City of Welland has initiated a Study to review planning and servicing issues related to existing and potential development within the northwest area of the City (see map). The Northwest Planning and Servicing Study focuses on the development of infrastructure systems for water, wastewater, roads and stormwater management. Other major components of the Study will include a review of the Provincial Policy Statement and Regional Policy Plan, and environmental investigations to identify and protect significant natural features. This Study will develop conclusions/recommendations for servicing of existing and potential development within the Study Area.



Study Process

The Northwest Area Planning and Servicing Study is being conducted in accordance with the requirements of Phases 1 and 2 of the Municipal Engineers' Association Municipal Class Environmental Assessment Document (June 2000), which is an approved process under the Environmental Assessment Act. Public consultation is a key component of the Planning and Servicing Study. An overview of the project, including a preliminary development plan and recommended water, wastewater, transportation and stormwater servicing strategy, will be presented at a Public Information Centre on:

Date: Wednesday November 3rd, 2004
Location: Quaker Road School
333 Quaker Road, Welland, Ontario
Time: 4:00 pm to 8:00 pm

Comments received through the course of the Study will be considered in selecting the recommended stormwater, water, sanitary and roadway servicing strategies. Upon completion of the study, a Master Servicing Plan Class Environmental Assessment report will be prepared to document the planning process followed, including conclusions, and recommendations in addition to how public input was received and considered. The Study will be available for public review for a period of 30 calendar days at Welland City Hall and the Welland Public Library. The public will be notified of the date, time and location of the filing of the Study at the appropriate time through newspaper notices and mailings to those in the project's contact database.

Comments

We are interested in hearing any comments or concerns that you may have about this Study. With the exception of personal information, all information submitted will become part of the public record. Please contact either one of the following project team members if you have any questions, comments, wish to obtain more information on the project or if you would like to be added to the mailing list:

Mr. Donald Thorpe
General Manager, Planning and
Development Services
City of Welland
411 East Main Street
Welland, Ontario
L3B 3X4
Phone: (905) 735-1700 Ext. 251
Fax: (905) 735-8772

Mr. Karl Grueneis
EA & Approvals Planner
Earth Tech Canada Inc.
Corbloc Building
80 King Street, 2nd Floor
St. Catharines, Ontario
L2R 7G1
Phone: (905) 688-2271
Fax: (905) 688-5812
Email: karl.grueneis@earthtech.ca

SIGN IN SHEETS

1



City of Welland Northwest Area
Planning and Servicing Study
Class Environmental
Assessment

EARTH TECH
A tyco INTERNATIONAL LTD. COMPANY

4:35

PUBLIC INFORMATION CENTRE

Wednesday November 3rd 2004
Quaker Road School
333 Quaker Road, Welland, Ontario
4:00 pm to 8:00 pm

SIGN IN SHEET
(please print)

22

Name	Address	Affiliation
Norman Kraus	38-124 Queen Morris Dr. St. C.	Colwell Banker - Pinnacle St.
Vicki Turmel	59 Madison Cr. E	Quaker Rd. School Council
Dan Sam-Laurean	62 TREZAWN PKAY	Quaker Rd. School Council
Gracy Cruise	132 Royal Oak Dr.	QRS Parent Council.
Phil Butcher	58 Summerlea Ave.	
Phil Butcher	58 Summerlea Ave	
JAMES BABIN	4700 ST. CLAIR AVE. SUITE 301	VERM.
GENE GOLFIC	59 TORMAN RD. VT	
BARB PASSAW	284 Quaker Rd	
Marg. Cioffi	5 Woodland Drive	
NICK CIOFFI	5 WOODLAND DR.	
ROB BALOCCO	40 ALBERT ST. W.	
Drew Sample	Regional Niagara	
John Ravenna	Ravenna Hwy	
A. Stanton	484 Quaker Rd.	
A. Fidyce	76 Whiteoak Cres.	Area President
C. VAN HEDEWYK	491 QUAKER RD	RESIDENT
ROB WILSON	647 QUAKER RD	RESIDENT
Liz Daly	618 Quaker Rd.	Resident
M. W. Hays	403 QUAKER RD.	
Sharon Cook	Town of Pelham	Resident
JOHN DARLEY	1082 LEEAU WELAND	

13-329



City of Welland Northwest Area
Planning and Servicing Study
Class Environmental
Assessment

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PUBLIC INFORMATION CENTRE

Wednesday November 3rd 2004
Quaker Road School
333 Quaker Road, Welland, Ontario
4:00 pm to 8:00 pm

SIGN IN SHEET
(please print)

6:40

22

Name	Address	Affiliation
William Lagace	510 Riga Rd	
Jeff Jacob	23 Stella	Kerry T. Howe Ltd
Joseph Bluyssen	256 Quaker	
Mrs. H. Wein	746 S. Pelham	
Genevieve Marmari		
C. Dikar	472 Quaker Rd	
Juan Hernandez	209 Quaker	owner
Ray Lutz	160 Quaker Rd	Owner
Domenic Martinichie	744 FRIST AVE NORTH	
Jerry M. M.	463 Quaker	John M. M.
Les Paschke	146 Merritt RD	
Nick Bruch	15 Countryside Dr. Welland	
M. Remerlan	466 Quaker Rd	Welland
J. MARCHIO	83 HERITAGE LANE	Welland
GRASME MURPHY	22 Montgomery Rd. Welland	Welland
DOMENIC AMMENDOLA	8 Woodgate Dr	Welland
CHARLA STOST	32 EASTWOOD DR.	WELLAND/OWNER
C. FRASER	11 CERRAR HVE	WELLAND/OWNER
Gene Mearin	515 Ridge Rd E Beaverville	LOR 1B2
Jack Passero	294 Quaker Rd Welland	
Antonio M. M.	103 SAWMILL RD	GT Corporation



City of Welland Northwest Area
Planning and Servicing Study
Class Environmental
Assessment

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PUBLIC INFORMATION CENTRE

Wednesday November 3rd 2004
Quaker Road School
333 Quaker Road, Welland, Ontario
4:00 pm to 8:00 pm

6:45

SIGN IN SHEET
(please print)

22

Name	Address	Affiliation
STEVE STANHAL	484 Quaker Rd.	
DONALD MEIER	520 Rice Rd.	
Janet Donnelly	16 Ash Court	
LIND VENTRESCA	12 ASH CRT.	
ANTONIO MARRAS	256 QUAKER RD	
John Borkovsky	4499 Nigh Rd	Ridgeway
the Dugliss	472 Quaker Rd	Welland
M. Henry	168 Quaker Rd	Welland
Bob Crawford	DSBN 191 Carlton St.	St. Catharines
K. Kermecater	60 Walls Street	Welland
Corrina Farnedean	466 Quaker Rd.	Welland
Virginia (Alerchford)	669 Quaker Rd. Wld	
ER GREEN	15 MADISON CRT.	Welland
J. RODRIGUES	147 BRIARSDALE CRES	Welland
M. Pasko	509 Rice Rd.	Welland
Myranda Ulhu	777 Glen Ave.	Welland
Vince Addario	74 Stella St.	Fonthill, Ont.
DWANE MAJOR	115 BRIARSDALE CR	Welland
Tommy Tripodi	138 Wentchester Cres.	St. Catharines Rd
Audelia Maganz	528 Rice Rd	Welland
Andy Innis	17 Southgate Cir.	St. Catharines
Nick RiBoon	477 Quaker Rd	Welland



E A R T H  T E C H
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Wednesday November 3rd 2004
Quaker Road School
333 Quaker Road, Welland, Ontario
4:00 pm to 8:00 pm

[illegible]

DISPLAY BOARDS

Welcome to the Public Information Centre for the City of Welland Northwest Area Planning & Servicing Study Class Environmental Assessment

- ❖ Please sign in on the sheet provided, then feel free to walk around & view the displays.
- ❖ If you have any questions, our representatives will be pleased to discuss the project with you.
- ❖ Comment sheets are provided for those who wish to provide comments in writing. Completed sheets can be deposited in the comment box.
- ❖ Comments may also be mailed or delivered to the City or Earth Tech (see below) by November 26th, 2004.
- ❖ Please contact either of the following for additional information:

Mr. Donald Thorpe

General Manager, Planning
and Development Services
City of Welland
411 East Main Street
Welland, Ontario
L3B 3X4
Phone: (905) 735-1700 extension 251
Fax: (905) 735-8772
Email: don.thorpe@city.welland.on.ca

Mr. Karl Grueneis

EA & Approvals Planner
Earth Tech Canada Inc.
Corbloc Building, 2nd Floor
80 King Street
St. Catharines, Ontario
L2R 7G1
Phone: (905) 688-2271
Fax: (905) 688-5812
Email: karl.grueneis@earthtech.ca



***Northwest Area Planning and Servicing Study
Class Environmental Assessment***

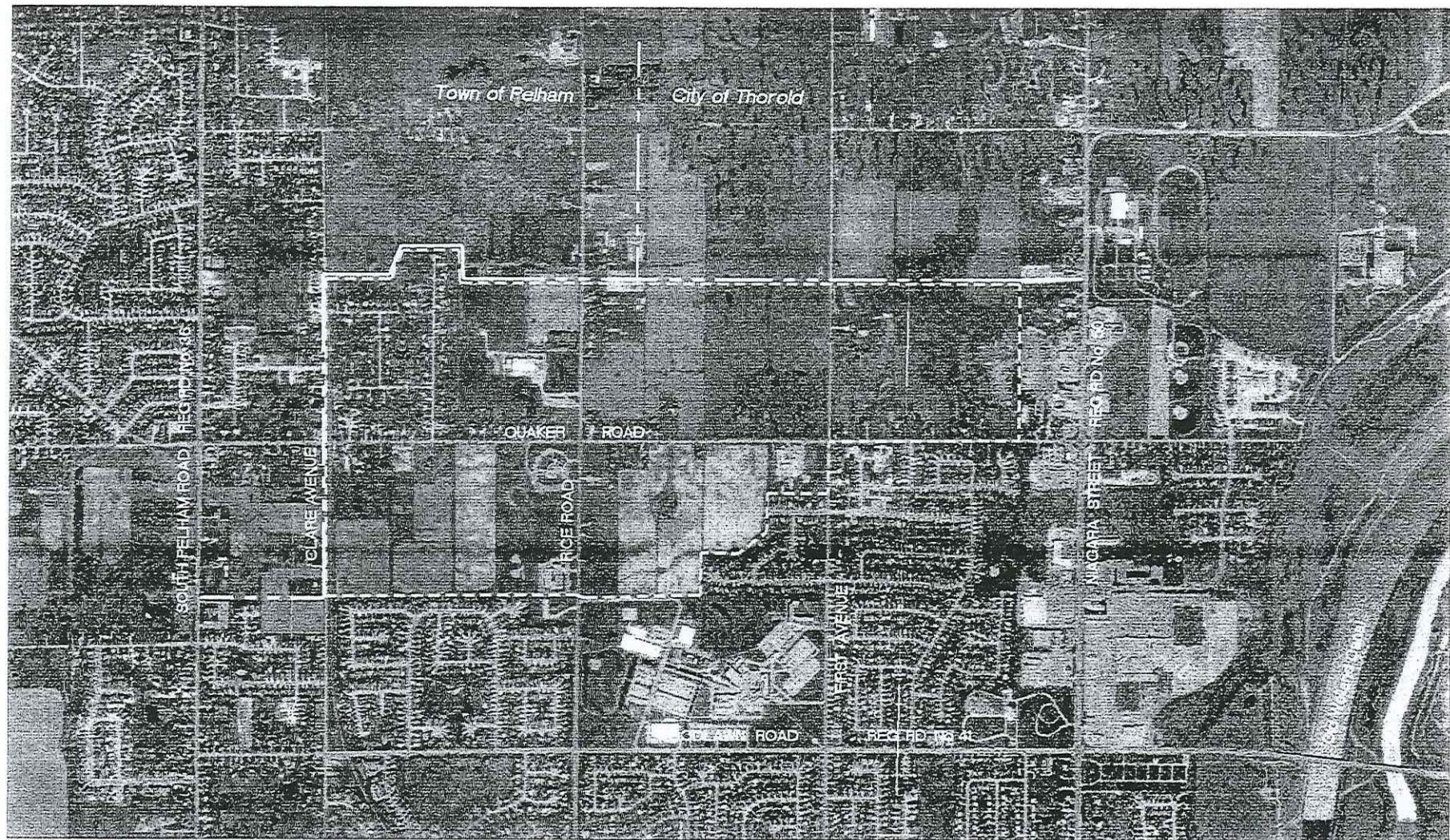


Background

- ❖ The City of Welland has initiated a Study to review planning and servicing issues related to existing and potential development within the Northwest Area of the City.
- ❖ To guide the planning and servicing review a preliminary development Concept Plan has been prepared, identifying how development could occur in the Study Area.
- ❖ The Study will review servicing requirements based on the preliminary Concept Plan.
- ❖ Other major components of the Study will include a review of the Provincial Policy Statement and Regional Niagara Policy Plan, and environmental investigations to identify and protect significant natural features.
- ❖ The Study will develop conclusions and recommendations for servicing of existing and potential development within the Study Area.



NORTHWEST AREA PLANNING AND SERVICING STUDY STUDY AREA



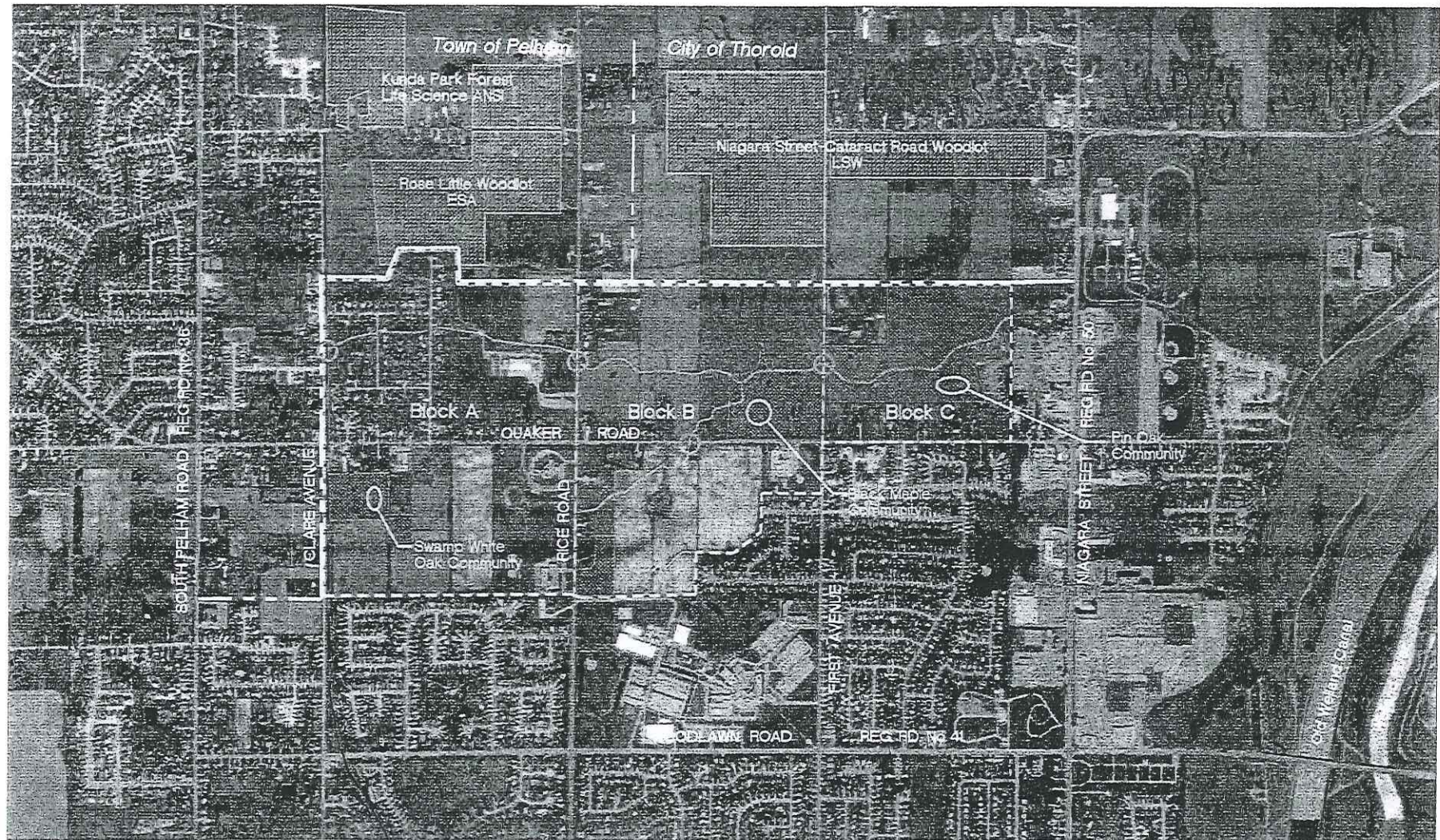
LEGEND

STUDY AREA

0 250 500 750 1000m

OCTOBER 27 2004

NORTHWEST AREA PLANNING AND SERVICING STUDY OVERVIEW OF ENVIRONMENTAL FEATURES



LEGEND

- | | | | |
|--|------------------------|--|--------------------------------|
| | STUDY AREA | | ENVIRONMENTALLY SENSITIVE AREA |
| | FIELD SURVEY / WOODLOT | | RECREATIONAL TRAIL |
| | WATER CROSSING | | |
| | WATERCOURSE | | |

0 250 500 750 1000m

OCTOBER 27 2004



EARTH TECH

Earth Tech (Canada) Inc.

Wainwright, Ontario 905.686

Preliminary Concept Plan Guidelines

- ❖ Used environmental inventory to identify and protect significant natural heritage features (e.g. significant woodlots).
- ❖ Looked at the development potential for all Study Area lands.
- ❖ Land uses based on:
 - Existing Residential
 - Low Density Residential
 - Medium Density Residential
 - High Density Residential
 - Mixed Use
 - Institutional
 - Open Space
 - Environmental Feature Protection
 - Storm Water Management
- ❖ Maximize use of existing infrastructure (e.g. road system).

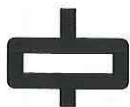
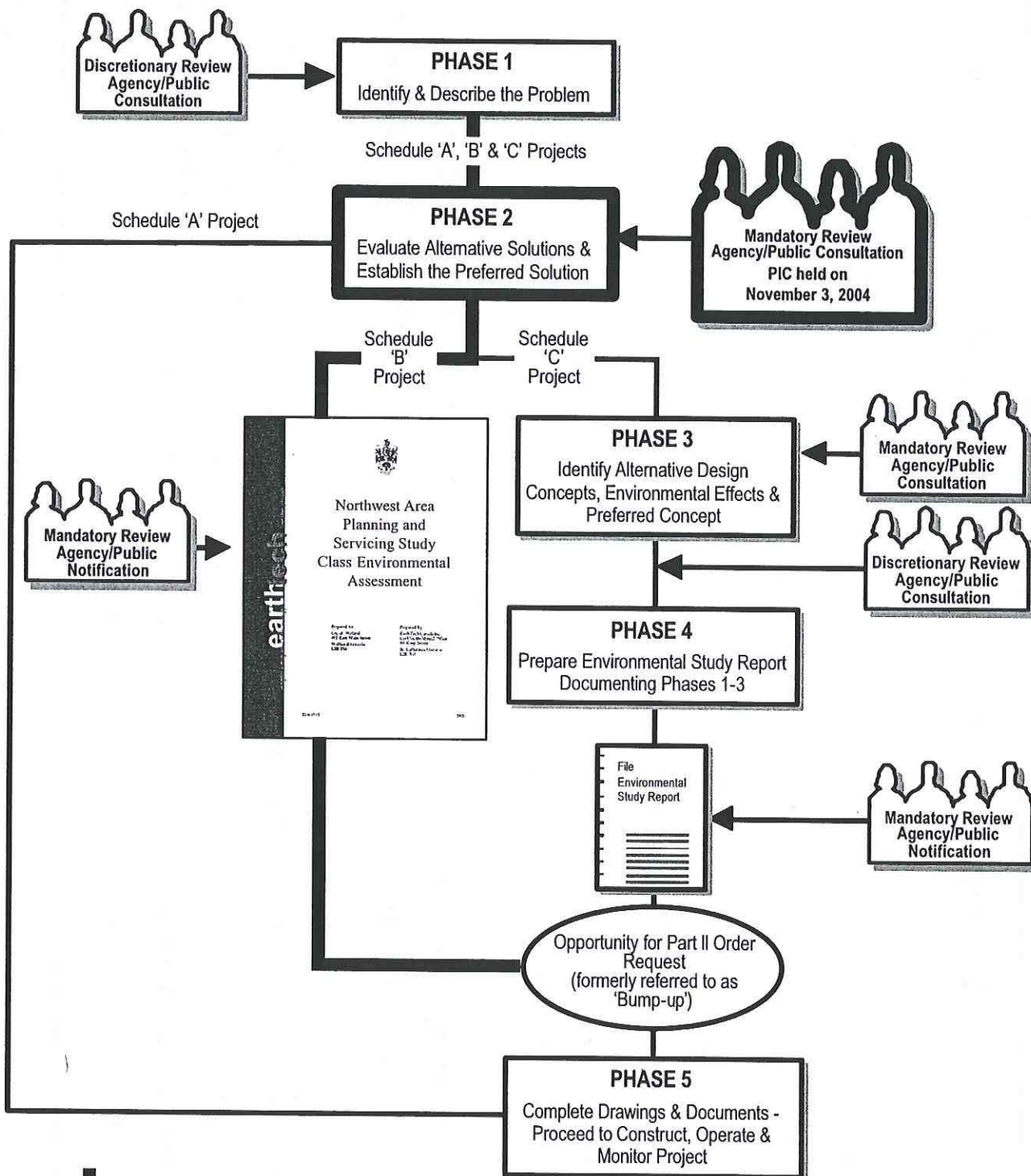


Purpose of the Master Servicing Plan

- ❖ Provide overall Municipal Planning & Servicing Guidelines for the Northwest Study Area.
- ❖ Focus is on the development and assessment of municipal infrastructure systems for:
 - ❖ Water Distribution
 - ❖ Sanitary Sewage Collection
 - ❖ Roadways
 - ❖ Stormwater Collection & Management
- ❖ To determine specific requirements for implementing servicing for existing and potential development including mitigation of identified impacts.
- ❖ To undertake an Environmental Assessment (EA) process by following all the steps as outlined in the Municipal Engineers Association Municipal Class EA document (June 2000) including input from affected landowners, general public and review agencies.



Overview of the Class Environmental Assessment Process



Indicates Where Project Currently is at in Class EA Process



Northwest Area Planning and Servicing Study
Class Environmental Assessment



Water Distribution System Servicing Review

- ❖ This Study evaluated the need to supply the Northwest Study Area with both domestic and fire flow water capacity.
- ❖ The evaluation was based on expected land uses, as described in the preliminary Concept Plan.
- ❖ The expected system demands are then calculated and sizes of the watermains determined.
- ❖ Local watermains will be sized in accordance with City/Region/MOE Standards.
- ❖ Local watermains to be constructed within road allowance as described in the preliminary Concept Plan.



Town of Palham

City of Thorold

CLARE AVENUE

QUAKER ROAD

RICE ROAD

FIRST AVENUE

NIAGARA STREET REG RD No. 50

0 100 200 300 400m

LEGEND

-  URBAN BOUNDARY
-  STUDY AREA
-  CONCEPTUAL ROAD LAYOUT
-  EXISTING WATER DISTRIBUTION SYSTEM
-  PROPOSED WATER DISTRIBUTION SYSTEM

WELLAND NORTHWEST SERVICING
MASTER PLAN

WATER DISTRIBUTION SYSTEM



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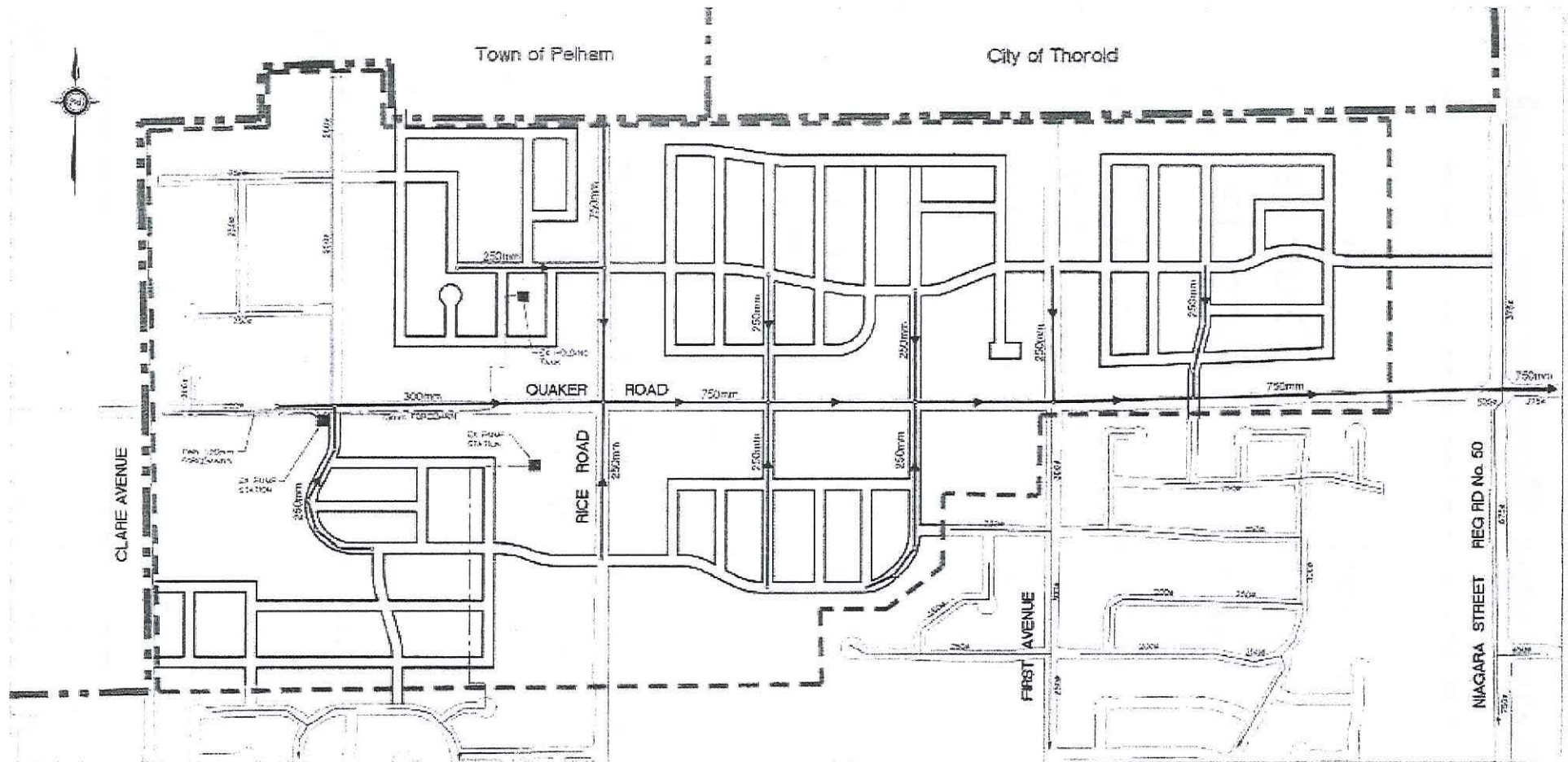
Sanitary Sewage Servicing Review

- ❖ The sanitary sewage servicing review evaluated the options available to service the Study Area and their associated costs.
- ❖ The Regional Municipality of Niagara is presently undertaking a Class EA for a new trunk sanitary sewer on Quaker Road in the Study Area.
- ❖ The Regional trunk sanitary sewer would be sized to accommodate sewage flows from the Northwest Study Area.
- ❖ Local sanitary sewer will be sized in accordance with City/Region/MOE Standards.
- ❖ Local sanitary sewer to be constructed within road allowance as described in the preliminary Concept Plan.



Town of Pelham

City of Thorold



Note

Sizing for the 750mm trunk sewer on Quaker Road/Rice Road is from Region of Niagara Class EA (Draft) by AWS Engineers and Planners.

LEGEND

- URBAN BOUNDARY
- STUDY AREA
- CONCEPTUAL ROAD LAYOUT
- EXISTING SANITARY SEWER
- EXISTING SANITARY SEWER
- PROPOSED SANITARY SEWER

**WELLAND NORTHWEST SERVICING
MASTER PLAN**

SANITARY DISTRIBUTION SYSTEM



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Roadways

- ❖ Road pattern was established to provide street continuity with existing streets and connectivity to adjacent developments.
- ❖ The use of alternative modes of transportation will be encouraged through established road pattern.
- ❖ The existing roadways impacted are Rice Road, First Avenue and Quaker Road.
- ❖ Recommendations presented in City of Welland Transportation Planning Study (April 2001) were reviewed and taken into consideration.
- ❖ Proposed road pattern was reviewed to assess the impacts on the existing roadways in the Study Area.
- ❖ The following evaluation is based on anticipated traffic volumes generated from the preliminary Concept Plan.



Evaluation of Road Servicing Alternatives

Alternatives	Evaluation Criteria							Evaluation Summary
	Road Safety	Natural Environment	Social/Cultural		Economic/ Financial	Technical		
	Potential to reduce vehicle conflicts.	Potential for improving pedestrian & cycling safety.	Potential for loss of vegetation.	Potential for short-term construction related effects on residents/businesses. Potential for requiring private property.	Potential impacts to cultural/heritage resources.	Potential capital cost of implementing the alternative solution.	Potential effects on traffic operations. Potential for enhancing road structural conditions.	
1. Do Nothing (i.e. maintain existing cross-sections)	- Reduced safety as traffic volumes increase.	- No potential to enhance pedestrian and cycling safety.	- No impact to existing vegetation.	- No short-term construction related effects. - No impact to property.	- No loss of possible cultural, heritage or resources.	- No capital costs.	- Does not meet future capacity requirements. - No potential for enhancing road structural conditions.	Least preferred Most preferred
2. Introduce Alternative Transportation Modes (e.g. transit and bicycle paths)	- Reduced safety as traffic volumes increase.	- Potential to enhance pedestrian and cycling safety.	- No impact to existing vegetation.	- Minor short-term construction related effects. - No property requirements. - Potential impacts can be mitigated using established mitigation techniques.	- No loss of possible cultural, heritage or resources.	- Low capital costs.	- Does not meet future capacity requirements. - No potential for enhancing road structural conditions, therefore bus traffic would be a maintenance problem.	
3. Reconstruct Roads	- Potential to increase safety as traffic volumes increase.	- Potential to enhance pedestrian and cycling safety. - Semi-urban standard does not include street lighting.	- Minor impact to existing vegetation. - Potential impacts can be mitigated using established mitigation techniques.	- Short-term construction related effects. - No property requirements. - Potential impacts can be mitigated using established mitigation techniques.	- No loss of possible cultural, heritage or resources.	- Medium capital costs.	- Does not meet future capacity requirements. - Some potential for enhancing road structural conditions.	
4. Upgrade Existing Roads (includes road widening)	- Most potential to increase safety as traffic volumes increase.	- Most potential to enhance pedestrian and cycling safety.	- Potential loss of vegetation. - Potential impacts can be mitigated using established mitigation techniques.	- Short-term construction related effects. - Potential for property requirements. - Potential impacts can be mitigated using established mitigation techniques.	- Potential for loss of cultural, heritage or resources. - Potential impacts can be mitigated using established mitigation techniques.	- Medium to high capital costs.	- Meets future capacity requirements. - Best potential for enhancing road structural conditions. - Consistent with recommendations made in City Transportation Planning Study	
5. Upgrade Intersections (i.e. turning lanes, signalization etc.)	- Potential to increase safety as traffic volumes increase.	- Potential to enhance pedestrian and cycling safety at limited locations.	- Potential loss of vegetation at limited locations. - Potential impacts can be mitigated using established mitigation techniques.	- Short-term construction related effects. - Potential for property requirements. - Potential impacts can be mitigated using established mitigation techniques.	- Minimal potential of loss of cultural, heritage or resources. - Potential impacts can be mitigated using established mitigation techniques.	- Low to medium capital costs.	- Meets future capacity requirements at limited locations. - Limited potential for enhancing road structural conditions. - Consistent with recommendations made in City Transportation Planning Study	



Study Area Drainage

- ❖ Existing land uses within the Concept Plan Study Area include a mix of inactive agricultural land, single family residential, some institutional and wooded areas.
- ❖ Drainage generally is from West to East and outlets to the Welland Canal.
- ❖ The Study Area is generally made up of silty clay soils.
- ❖ Field investigations of watercourses downstream revealed potential for erosion.



Stormwater Management Criteria

Quality Control Criteria

- ❖ The watercourse downstream contains spawning habitat less sensitive to suspended solids – therefore normal quality protection will be used.
- ❖ Normal Quality Protection corresponds to the End-of-Pipe storage volumes required for the long-term average removal of 70% of suspended solids.

Quantity Control Criteria

- ❖ Maximum peak flow rates must not exceed pre-development values for storm with return periods ranging from 2 to 100 years.

Erosion Control Criteria

- ❖ Erosion on existing drainage courses to be minimized.



Evaluation of Stormwater Management Alternatives

ALTERNATIVES	Evaluation Criteria							Evaluation Summary
	Public Safety	Natural Environment	Social/Cultural	Economic/ Financial	Legal/ Jurisdictional	Technical		
	Potential for flooding, possible safety hazards.	Potential effects to the natural environment including effect on air, land, water and biota, i.e. siting/ routing considerations and/or constraints.	Short-term construction related impacts including traffic, access, and noise.	Potential siting/ routing considerations, including impacts to land uses, cultural, heritage (e.g. archaeological), impacts on property owners, resources.	Construction and Operation Costs	Land Requirements	Ability to implement alternative Ability of alternative to use existing infrastructure.	Least preferred ↓ Most preferred
1. Do Nothing • No New Stormwater Management Works	- Increases chance of local downstream flooding	- Introduces potential for erosion effects. - Not acceptable under current environmental legislation. - Results in downstream aquatic impacts and erosion. - Increases stormwater rate of flow and decrease water quality.	- No social/cultural impacts identified.	- No siting/routing considerations	- No capital costs. - Would involve cost to provide downstream protection to eliminate erosion/flooding.	- Does not meet current environmental legislation. - Potential downstream property rights violated, therefore works required downstream. - Potential for legal action.	- Requires enlargement of channels/culvert capacity downstream (many on private property). - Does not satisfy present engineering standards.	○
2. Stormwater Lot Level Controls • Flat lot grading • Soakaway pits & filters • Ponding on roof/lot	- Promotes local flooding on individual lots, which is not desirable to many owners.	- Local soil type would eliminate infiltration techniques in some areas. - Must be combined with water quality control to ensure no contamination of the groundwater.	- Minor impacts. - Potential impacts can be mitigated using established mitigation techniques.	- Would not be acceptable to most homeowners. - Would not be enforceable by municipality if on private property. - Would require homeowners to maintain system. - Workable if built in public spaces (ROW, parks, etc.).	- Would involve less capital cost (than 3 & 4) by reducing flow to the conveyance system in sandy soils only. - However addition land and quality control facilities may mitigate this cost savings.	- Legal documentation required with each landowner having a control system. - Hard to enforce - Few agencies approve these systems as sole means for stormwater control due to lack of ability of the municipality to enforce maintenance issues on private property.	- Does not satisfy present engineering standards due to soil type in Study Area	○
3. Stormwater Conveyance Controls • Grassed swales • Pervious pipes and catchbasins • Oil/grit separators • Oversized pipes	- No public safety impacts identified.	- No natural environmental impacts identified. - Will require upgrades to outlet watercourses/drains. - Previous pipes and catchbasins can be utilized in sandy soil areas only.	- Moderate impacts. - Potential impacts can be mitigated using established mitigation techniques.	- No social/cultural impacts identified.	- Would result in high capital costs (i.e. underground oil/grit separator and oversized pipes). - Would involve increased maintenance by municipality over End-of-Pipe Alternative.	- May require some land, usually on public property.	- Could be implemented in combination with end-of-pipe alternative. - Technology can be as effective as the end-of-pipe alternatives, but is more costly. - Can be utilized in sandy soil areas only.	◐
4. End-of-Pipe Stormwater Management Facilities • Wet ponds • Dry ponds • System infiltration trenches/pits	- Wet/Dry ponds could pose potential safety hazard. - Potential impacts can be mitigated using established mitigation techniques.	- Would be most effective in control of quantity and quality of stormwater for this soil type. - Will require upgrades to outlet watercourses/drains.	- Greater impacts. - Potential impacts can be mitigated using established mitigation techniques.	- Could be integrated into park system. - Same as under Public Safety.	- Infrastructure would be less costly than the conveyance control system. - Requires land, therefore cost of land may result in higher costs than conveyance control system.	- Will require land deeded to Municipality by developers or purchase by Municipality using Development Charges monies.	- Satisfies well-established design for stormwater quantity and quality controls. - Could be used in conjunction with some conveyance control systems (i.e. grassed swales.)	● Recommended



Stormwater Management Development Mitigation Strategy

Water Quantity Control

- ❖ End-of-Pipe Control - Storm Water Management Wet Pond (Attenuation Zone).

Water Quality Control

- ❖ End-of-Pipe Control - Storm Water Management Wet Pond (Permanent Pool and Extended Detention Zone to control 25mm rainfall event).
- ❖ Vegetated filter strips and buffer strips in conjunction with the adjacent woodlots.

Erosion Control

- ❖ End-of-Pipe Control - Storm Water Management Wet Pond (Extended Detention Zone to control 25mm rainfall event).

- ❖ Implement upgrades to downstream watercourses as required.
- ❖ City control over drainage outlet and downstream watercourses via ownership or easement (allows upgrades to downstream watercourses).

Conveyance Control

- ❖ Deepening of watercourse (North of Quaker Road to Niagara Street) will be required. Therefore sediment and erosion control will be implemented.
- ❖ Minimal channel slopes to keep the velocity as low as possible.
- ❖ Lining and improvement of downstream watercourses.



Town of Pelham

City of Thorold

CLARE AVENUE

QUAKER ROAD

RICE ROAD

FIRST AVENUE

NIAGARA STREET REG RD No. 50

1500mm STEEL PIPE



LEGEND

- URBAN BOUNDARY
- STUDY AREA
- CONCEPTUAL ROAD LAYOUT
- 1050mm PROPOSED STORMWATER COLLECTION SYSTEM
- OPTIONAL STORMWATER COLLECTION SYSTEM

- STORMWATER MANAGEMENT FACILITY (INCLUDING LANDSCAPING AREAS)
- EXISTING DITCH
- PROPOSED DITCH UPGRADE

WELLAND NORTHWEST SERVICING MASTER PLAN

STORMWATER MANAGEMENT SYSTEM

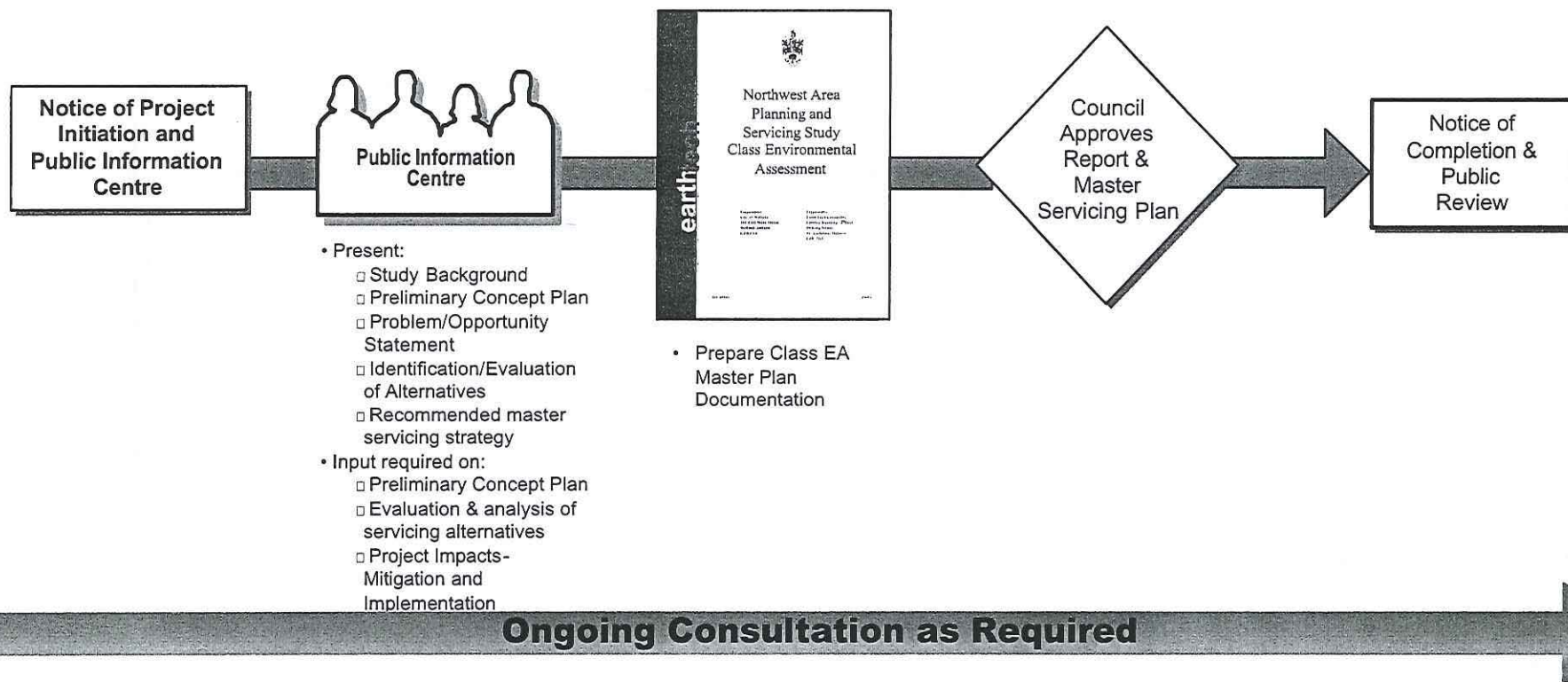


EarthTech
A Tyco International Ltd. Company

Master Servicing Plan Schedule

Oct 2004

Winter 2005

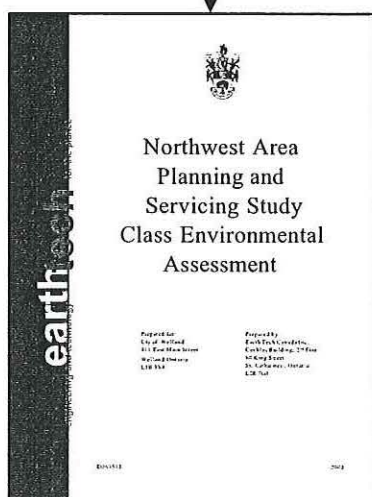


**Northwest Area Planning and Servicing Study
Class Environmental Assessment**

EARTH TECH
EARTH TECH

The Next Steps . . .

Comments received from review agencies* & the public by November 26, 2004 will be reviewed for consideration including the selection of the recommended solution



- Review agencies* & the public will be notified of the Project File report & will be provided with the opportunity to comment during the Public Review Period

Upon completion of the mandatory public review period (30 day duration) the Class EA Master Servicing Plan report will be finalized & subject to comments, the project may proceed to detailed design & construction

* Review agencies include Provincial Ministries (e.g. Environment, Natural Resources, Culture, NPCA), local municipal departments from Welland, Pelham, and Thorold, and utilities (hydro, gas, Bell, etc.).



SUMMARY OF COMMENTS RECEIVED



City of Welland Northwest Area
Planning and Servicing Study Class
Environmental Assessment



COMMENT SHEET

We want to hear from you!!

You are invited to provide comments on the materials presented today as well as any other issues that you feel are important to the City of Welland Northwest Area Planning and Servicing Study Class Environmental Assessment. Please complete this comment sheet and leave it with us today or send it, no later than November 26th 2004, to: Mr. Karl Grueneis, EA & Approvals Planner, Earth Tech Canada Inc., Corbloc Building, 80 King Street, 2nd Floor, St. Catharines, Ontario, L2R 7G1. Telephone: (905) 688 2271, Fax: (905) 688 5812 or Email: karl.grueneis@earthtech.ca

COMMENTS: - Please place me on the mailing list
- ddlys@copeco.ca

- 1) Get the mid pen off the OP for this area! - Makes no sense
- 2) If not already - place this into on city web site
- 3) Keep public informed
(interesting the developers are here already)

How would you describe the nature of your interest in this study?

- ☒ Affected Land Owner
- ☒ Member of the General Public (including resident)
- ☐ Member of an Interest Group (Please specify: _____)
- ☐ Consultant
- ☐ Agency Representative (Please specify: _____)
- ☐ Other (Please specify: _____)

YOUR NAME: E.J. Daly

ADDRESS: 618 Quaker Road Welland ON L3C3H2

TELEPHONE: 905 734 1378



City of Welland Northwest Area
Planning and Servicing Study Class
Environmental Assessment

EARTH TECH
A tyco INTERNATIONAL LTD. COMPANY

COMMENT SHEET

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Telephone: (905) 688 2271, Fax: (905) 688 5812 or Email: karl.grueneis@earthtech.ca

COMMENTS:

I am deeply saddened to learn that the City is considering a change to the land used/lands presently occupied by the Welland Soccer Club (WSC). It represents a betrayal of trust and confidence placed in the City officials by the members of the WSC. These lands should be dedicated to soccer for the community. There are 7 full sized outdoor fields, 3 with lights, an indoor facility. Why even consider moving it? It should cost millions.

How would you describe the nature of your interest in this study?

☐ Affected Land Owner

☐ Member of the General Public (including resident)

☒ Member of an Interest Group (Please specify: WSC)

☐ Consultant

☐ Agency Representative (Please specify: _____)

☐ Other (Please specify: _____)

YOUR NAME:

Nick Bruch

ADDRESS:

15 Countryside Dr. Welland.

TELEPHONE:

714-1990



City of Welland Northwest Area
Planning and Servicing Study Class
Environmental Assessment



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COMMENTS:

- would existing homes on rice rd be able to hook up to sanitary and storm sewers?
- how many traffic lanes would there be on rice rd north of Quaker?
- is there any upgrades or alternatives for truck traffic?
- what type of time frame for the actual sewer construction.

How would you describe the nature of your interest in this study?

- ☒ Affected Land Owner
- ☐ Member of the General Public (including resident)
- ☐ Member of an Interest Group (Please specify: _____)
- ☐ Consultant
- ☐ Agency Representative (Please specify: _____)
- ☐ Other (Please specify: _____)

YOUR NAME:

Aurelio Magazzeni

ADDRESS:

528 Rice Rd

TELEPHONE:

905-788-1501



City of Welland Northwest Area
Planning and Servicing Study Class
Environmental Assessment

EARTH  TECH
A TETCO INTERNATIONAL LTD. COMPANY

COMMENT SHEET

We want to hear from you!!

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COMMENTS:

*FUTURE NEED FOR A 4-WAY STOP AT THE CORNER OF 1ST AVE & WOODLAND DR.
WHY? THIS IS A HAZARDOUS INTERSECTION NOW WITH SCHOOL CHILDREN GOING TO
QUAKER RD SCHOOL. THE PROPOSED NEW DEVELOPMENT WILL INCREASE THE TRAFFIC
FLOW THROUGH THIS INTERSECTION, THUS MAKING IT MUCH MORE HAZARDOUS
FOR CHILDREN CUTTING THROUGH ON THEIR WAY TO THE SCHOOL.*

How would you describe the nature of your interest in this study?

☐ Affected Land Owner

☒ Member of the General Public (including resident)

☐ Member of an Interest Group (Please specify: _____)

☐ Consultant

☐ Agency Representative (Please specify: _____)

☐ Other (Please specify: _____)

YOUR NAME: *NICK GIOF1*

ADDRESS: *5 WOODLAND DRIVE*

TELEPHONE: *(905) 735-0006*



City of Welland Northwest Area
Planning and Servicing Study Class
Environmental Assessment



COMMENT SHEET

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COMMENTS:

My concerns are for the safety of the school children and their parents. I would like Quaker Rd and First Ave and other roads be wide enough for parking on the school side of the street for when parents are picking up/dropping off children. Also that adequate crossing facilities are present so that these children are not put in danger by the traffic.

How would you describe the nature of your interest in this study?

☐ Affected Land Owner

☒ Member of the General Public (including resident)

☒ Member of an Interest Group (Please specify: Quaker Rd. School Parent Council)

☐ Consultant

☐ Agency Representative (Please specify: _____)

☐ Other (Please specify: _____)

YOUR NAME:

DANIEL SAINT-LAURENT

ADDRESS:

62 TREZAWN PKWY

TELEPHONE:

905-329-4408



City of Welland Northwest Area
Planning and Servicing Study Class
Environmental Assessment



COMMENT SHEET

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COMMENTS: - ALREADY ENOUGH SAFETY ISSUES IN AREA eg. NO SIDEWALKS

- INCREASED TRAFFIC ON ALREADY BUSY ROADS SURROUNDING SCHOOL AREA

- WHERE DO YOU PLAN FOR ALL THESE EXTRA CHILDREN TO ATTEND SCHOOL? HAVE YOU STUDIED THE PRESENT SCHOOL SIZE & WHAT IT'S CAPACITY IS AT & IS USING 2 PORTABLES AT PRESENT!

- WE HAVE BEEN FIGHTING ISSUES ON SAFETY FOR OUR CHILDREN FOR YEARS WITH THE CITY OF WELLAND & THE LAST THING THIS SCHOOL AREA NEEDS AROUND IT IS MORE TRAFFIC & MORE DEMAND ON OUR SMALL SCHOOL. WE WORK HARD AT OUR SCHOOL COMMUNITY & EXPECT ANYONE PLANNING TO JOIN OUR COMMUNITY TO PUT OUR SCHOOL & CHILDREN AT THE TOP OF ANY AGENDA.

How would you describe the nature of your interest in this study?

☐ Affected Land Owner

☒ Member of the General Public (including resident)

☒ Member of an Interest Group (Please specify: QUAKER ROAD SCHOOL ADVISORY COUNCIL (CHAIRPERSON))

☐ Consultant

☐ Agency Representative (Please specify: _____)

☐ Other (Please specify: _____)

YOUR NAME: VICKI TURMEL

ADDRESS: 59 MADISON CRT. E. WELLAND

TELEPHONE: 905 732 0572



City of Welland Northwest Area
Planning and Servicing Study Class
Environmental Assessment

EARTH TECH
ATYCO INTERNATIONAL LTD. COMPANY

COMMENT SHEET

We want to hear from you!!

RECEIVED
NOV 15 2004

You are invited to provide comments on the materials presented today as well as any other issues that you feel are important to the City of Welland Northwest Area Planning and Servicing Study Class Environmental Assessment. Please complete this comment sheet and leave it with us today or send it, no later than November 26th 2004, to: Mr. Karl Grueneis, EA & Approvals Planner, Earth Tech Canada Inc., Corbloc Building, 80 King Street, 2nd Floor, St. Catharines, Ontario, L2R 7G1. Telephone: (905) 688 2271, Fax: (905) 688 5812 or Email: karl.grueneis@earthtech.ca

COMMENTS:

Are you working in co-operation with the Town of Pelham?

What happens @ the north west corner next to Town of Pelham property? Will the services end @ the border of the two towns?

How would you describe the nature of your interest in this study?

- ☒ Affected Land Owner
- ☐ Member of the General Public (including resident)
- ☐ Member of an Interest Group (Please specify: _____)
- ☐ Consultant
- ☐ Agency Representative (Please specify: _____)
- ☐ Other (Please specify: _____)

YOUR NAME: Anne Meinen

ADDRESS: 515 Ridge Rd E Beamsville, Ont

TELEPHONE: 905-563-3215

Richardson, Mark

From: Grueneis, Karl
Sent: Wednesday, November 10, 2004 9:25 AM
To: Richardson, Mark
Cc: Rose. Difelice (E-mail); Swan, Mark
Subject: FW: proposed development

Mark Please put in file and appendix and Draft Response Letter

Thx

-----Original Message-----

From: N.J.M. Boon [mailto:nikki9doors66@yahoo.ca]
Sent: Saturday, November 06, 2004 3:10 PM
To: karl.grueneis@earthtech.ca
Subject: proposed development

I will start with the fact that I am completely opposed to any development in this area. Specifically any area within the Quaker/Rice and Quaker/ First area right up to Hwy 20. Yes I realize this is unrealistic that the area will never change, yet for my life time this is my hope.

1. I am opposed to multi use being at the corner of Quaker and Rice.
2. I am opposed to the soccer dome area not being the soccer dome area.
3. I am opposed to having rear neighbours even if a builder gives me a fence at the rear of my backyard with very tall evergreens so that I do not have to look at those people invading my privacy.
4. I am opposed to having sewers my septic works very well.
5. I do not want the noise, the buses, people, traffic to invade what is left of our rural neighbourhood.
6. I am absolutely opposed to any structure that is commercial or subsidized housing complex. I do not want an apartment building townhouse or semi detached home. If we were interested in living near any of that we would have purchased a home on the other side of town and paid far less.

I am extremely bothered by all aspects of building and expanding any part of this side of Welland specifically with the issues Welland has to face now.

The residents of Welland have sewage backing up in to their homes. The bus system which costs so much money now is inaccessible to any one who works as the bus does not run long enough or to all areas.

The daycare opportunities are inadequate to meet the needs of young children. The mall is no longer a draw to small business or chain stores. i.e. losing yet another store Hallmark just this past month.

My thoughts are to improve and repair the problems which are existing.

In truth I do not believe my comments will have the desired effect I hope for but perhaps you will refrain from placing a corner store, apartment complex town home, semi detach, mini mall or convenience store any where within my block. These I find to be the most offensive.

Sincerely,
 Nikki Boon
 Resident
 477 Quaker Road

RESPONSE TO PUBLIC COMMENTS

November 16, 2004

Project 66898

Mr. David Rice
32 Howard
Waterdown, Ontario
L0R 2H0

**Subject: City of Welland Northwest Area Planning and Servicing Study
Class Environmental Assessment**

Dear Mr. Rice:

Telephone

Please find enclosed a copy of the Public Information Centre Display Boards regarding the City of Welland Northwest Area Planning & Servicing Study Class Environmental Assessment. We will continue to keep you informed of study progress including Study Notice of Completion-recommendations.

905.688.4272

Facsimile

905.688.5812

If you have any further questions or comments at this time, please do not hesitate to call me at (905) 688-2271 or email at karl.grueneis@earthtech.ca.

Very truly yours,

Earth Tech Canada Inc.


Karl Grueneis
EA & Approvals Planner

cc: Donald Thorpe, City of Welland

File Location: P:\eo\2003 pn over 60778\66898 - Welland NW MSP\Letters\PIC Package.doc

November 16, 2004

Project 66898

Mr. Mal Woodhouse
Director of Facilities Management Services
Niagara College
300 Woodlawn Road
Welland, Ontario
L3C 7L3

**Subject: City of Welland Northwest Area Planning and Servicing Study
Class Environmental Assessment**

Telephone

Dear Mr. Woodhouse:

905.688.4272

Please find enclosed a copy of the Public Information Centre Display Boards regarding the City of Welland Northwest Area Planning & Servicing Study Class Environmental Assessment. We will continue to keep you informed of study progress including Study Notice of Completion-recommendations.

Facsimile

905.688.5812

If you have any further questions or comments at this time, please do not hesitate to call me at (905) 688-2271 or email at karl.grueneis@earthtech.ca.

Very truly yours,

Earth Tech Canada Inc.



Karl Grueneis
EA & Approvals Planner

cc: Donald Thorpe, City of Welland

File Location: P:\eo\2003 pn over 60778\66898 - Welland NW MSP\Letters\PIC Package.doc

June 17, 2008

Project 66898

Mal Woodhouse
Director, Facilities Management Services
Niagara College – Welland Campus
300 Woodlawn Road
Welland, Ontario L3C 7L3

**Subject: City of Welland Northwest Area Planning and Servicing Study
Municipal Class Environmental Assessment: Response to Questions/Comments
& Notice of Project Completion**

Dear Mr. Woodhouse:

Please find a Notice of Project Completion for the City of Welland Northwest Area Planning and Servicing Study Municipal Class Environmental Assessment. Thank you for your comments following the November 3rd, 2004 Public Information Centre. The following provides a response to your specific questions and/or comments.

The design and selection of property types/land uses/densities as presented on the preliminary concept plan were chosen to meet the requirements of a typical community growth plan and guide the water, sanitary sewer, transportation and stormwater servicing evaluation. This was done to confirm the engineering (e.g. sizing) and economic feasibility of developing the Northwest Area prior to proceeding with required planning approvals (i.e. Regional Policy Plan, local Official Plan and zoning by-law amendments).

We note Niagara College's support for a greenbelt or stormwater management facility along its northern boundary as shown on the preliminary concept plan.

It is important to recognize that the preliminary concept plan as presented in the Class EA document does not reflect a decision or preference on how the Northwest Area is ultimately developed in terms of land uses, built urban form and associated densities. This will be achieved through future planning processes (e.g. new Official Plan and Zoning By-Law Amendments) and related public consultation activities. With respect to the City's Official Plan, as you may know, the City is now preparing a new Official Plan that will guide land use and development processes for the City over the next 20 years. The new City of Welland Official Plan study process will provide opportunities for public input. It may also include the proposed Northwest Area urban boundary expansion which is subject to a Region of Niagara Policy Plan amendment.

We thank you for your involvement in this project and we appreciate your input. If you have any further questions/comments at this time or would like additional information please do not hesitate to call me at (905) 346-3732 or email at karl.grueneis@earthtech.ca.

Yours Truly,
Earth Tech Canada Inc.



Karl Grueneis
EA & Approvals Planner

cc: Donald Thorpe, City of Welland
Mark Swan, Earth Tech Canada

June 17, 2008

Project: 66898

Mr. Ken Sandham
Transportation Technician
Niagara Catholic School Board
427 Rice Road
Welland, Ontario
L3C 7C1

**Subject: City of Welland Northwest Area Planning and Servicing Study
Municipal Class Environmental Assessment: Response to Questions/Comments
& Notice of Project Completion**

Dear Mr. Sandham:

Please find a Notice of Project Completion for the City of Welland Northwest Area Planning and Servicing Study Municipal Class Environmental Assessment. Thank you for your comments following the November 3rd, 2004 Public Information Centre. The following provides a response to your specific questions and/or comments.

Based on the preliminary concept plan, the Northwest Area population density could be 5000-6000 people. It is important to recognize that the preliminary concept plan as presented in the Class EA document does not reflect a decision or preference on how the Northwest Area is ultimately developed in terms of land uses, built urban form and associated densities. This will be achieved through future planning processes (e.g. new Official Plan and Zoning By-Law Amendments) and related public consultation activities. With respect to the City's Official Plan, as you may know, the City is now preparing a new Official Plan that will guide land use and development processes for the City over the next 20 years. The new City of Welland Official Plan study process will provide opportunities for public input. It may also include the proposed Northwest Area urban boundary expansion which is subject to a Region of Niagara Policy Plan amendment.

The concept plan was prepared to guide and evaluate infrastructure sizing and feasibility. The concept plan was shown with the redevelopment of the Welland Soccer Club (lands owned by the City), to properly size infrastructure (e.g. water and sewer pipes, stormwater facilities) in the event that these lands ever be developed. Should this ever occur, it would be a cooperative process in partnership with the Welland Soccer Club to relocate/redevelop this community facility.

With respect to time lines, it is difficult to predict at this time when development would start. There already is some pressure from the development industry, however, no development can take place until the Northwest Area is brought within the City's urban area boundary and formally recognized in the City's Official Plan and the Region's Policy Plan, which could be after 2010.

Earth Tech Canada Inc. is not involved with the Port Robinson West Secondary Plan. However, we were involved in the Town of Fonthill, East Fonthill Urban Area Master Servicing Plan Class Environmental Assessment. Additionally, the City of Thorold has passed a motion to participate in the Welland Northwest Area Planning and Servicing Study, and coordinate future development.

Mr. Ken Sandham
June 17, 2008

Page 2
Project: 66898

We thank you for your involvement in this project and we appreciate your input. If you have any further questions/comments at this time, or would like additional information please do not hesitate to call me at (905) 346-3732 or email at karl.grueneis@earthtech.ca.

Yours Truly,
Earth Tech Canada Inc.



Karl Grueneis
EA & Approvals Planner

cc: Donald Thorpe, City of Welland
Mark Swan, Earth Tech Canada Inc.

June 17, 2008

Project 66898

Mr. Aurelio Magazzeni
528 Rice Road
Welland, Ontario
L3C 2W1

**Subject: City of Welland Northwest Area Planning and Servicing Study
Municipal Class Environmental Assessment: Response to Questions/Comments
& Notice of Project Completion**

Dear Mr. Magazzeni:

Please find a Notice of Project Completion for the City of Welland Northwest Area Planning and Servicing Study Municipal Class Environmental Assessment. Thank you for your comments following the November 3rd, 2004 Public Information Centre. The following provides a response to your specific questions and/or comments.

Existing homes on Rice Road (within the study area) will be able to connect to new sanitary and storm sewers. The anticipated construction/reconstruction of Rice Road could provide up to 4 lanes of traffic including a centre turning lane or bus lane where required to improve traffic flow and would follow a future Class EA planning process. Furthermore, additional existing roads will be upgraded to arterial "urban cross sections", which are specifically designed for truck traffic and increased traffic levels.

The Region of Niagara recently constructed a new trunk sewer that runs through the study area, first south on Rice Road, then east on Quaker Road. The trunk sewer serves the approved East Fonthill urban boundary expansion area which is directly north of the Welland Northwest Area. The trunk sewer on Quaker Road is 750 mm in diameter and has adequate capacity to accept sewage flows from the Northwest Area study area.

It is important to recognize that the preliminary concept plan as presented in the Class EA document does not reflect a decision or preference on how the Northwest Area is ultimately developed in terms of land uses, built urban form and associated densities. This will be achieved through future planning processes (e.g. new Official Plan and Zoning By-Law Amendments) and related public consultation activities. With respect to the City's Official Plan, as you may know, the City is now preparing a new Official Plan that will guide land use and development processes for the City over the next 20 years. The new City of Welland Official Plan study process will provide opportunities for public input. It may also include the proposed Northwest Area urban boundary expansion which is subject to a Region of Niagara Policy Plan amendment.

We thank you for your involvement in this project and we appreciate your input. If you have any further questions/comments at this time, or would like additional information please do not hesitate to call me at (905) 346-3732 or email at karl.grueneis@earthtech.ca.

Yours Truly,
Earth Tech Canada Inc.


Karl Grueneis
EA & Approvals Planner

cc: Donald Thorpe, City of Welland
Mark Swan, Earth Tech Canada Inc.

June 17, 2008

Project 66898

Mr. Nick Ciolfi
5 Woodland Drive
Welland, Ontario
L3C 7C9

**Subject: City of Welland Northwest Area Planning and Servicing Study
Municipal Class Environmental Assessment: Response to Questions/Comments
& Notice of Project Completion**

Dear Mr. Ciolfi:

Please find a Notice of Project Completion for the City of Welland Northwest Area Planning and Servicing Study Municipal Class Environmental Assessment. Thank you for your comments following the November 3rd, 2004 Public Information Centre. The following provides a response to your specific questions and/or comments.

Currently there is no recommendation for a 4-way stop to be placed at the intersection of First Avenue and Woodland Drive. However, at the intersection of First Avenue and Quaker Road, traffic signals and crosswalk areas are proposed.

The City and its consultants recognize the inevitable increase in traffic flow that accompanies new development. Therefore, to ensure a safer environment for pedestrians and traveling public, a traffic management plan is being developed, and includes 4-way stops, formal crosswalks, sidewalks and traffic signals where required (based on study and City Standards).

It is important to recognize that the preliminary concept plan as presented in the Class EA document does not reflect a decision or preference on how the Northwest Area is ultimately developed in terms of land uses, built urban form and associated densities. This will be achieved through future planning processes (e.g. new Official Plan and Zoning By-Law Amendments) and related public consultation activities. With respect to the City's Official Plan, as you may know, the City is now preparing a new Official Plan that will guide land use and development processes for the City over the next 20 years. The new City of Welland Official Plan study process will provide opportunities for public input. It may also include the proposed Northwest Area urban boundary expansion which is subject to a Region of Niagara Policy Plan amendment.

We thank you for your involvement in this project and we appreciate your input. If you have any further questions/comments at this time, or would like additional information please do not hesitate to call me at (905) 346-3732 or email at karl.grueneis@earthtech.ca.

Yours Truly,
Earth Tech Canada Inc.



Karl Grueneis
EA & Approvals Planner

cc: Donald Thorpe, City of Welland
Mark Swan, Earth Tech Canada Inc.

June 17, 2008

Project 66898

Mr. E.J. Daly
618 Quaker Road
Welland, Ontario
L3C 3H2

**Subject: City of Welland Northwest Area Planning and Servicing Study
Municipal Class Environmental Assessment: Response to Questions/Comments
& Notice of Project Completion**

Dear Mr. Daly:

Please find a Notice of Project Completion for the City of Welland Northwest Area Planning and Servicing Study Municipal Class Environmental Assessment. Thank you for your comments following the November 3rd, 2004 Public Information Centre. The following provides a response to your specific questions and/or comments.

With respect to the future Mid Peninsula Corridor being shown on the Region's Policy Plan, MTO's current Niagara to GTA Mid Peninsula Corridor Planning and EA study (replaced the Mid Peninsula Corridor EA study), is currently at the Phase 1 problems and opportunities stage and has not yet advanced to the identification of alternative transportation systems and corridors.

It is important to recognize that the preliminary concept plan as presented in the Class EA document does not reflect a decision or preference on how the Northwest Area is ultimately developed in terms of land uses, built urban form and associated densities. This will be achieved through future planning processes (e.g. new Official Plan and Zoning By-Law Amendments) and related public consultation activities. With respect to the City's Official Plan, as you may know, the City is now preparing a new Official Plan that will guide land use and development processes for the City over the next 20 years. The new City of Welland Official Plan study process will provide opportunities for public input. It may also include the proposed Northwest Area urban boundary expansion which is subject to a Region of Niagara Policy Plan amendment.

We thank you for your involvement in this project and we appreciate your input. If you have any further questions/comments at this time, or would like additional information please do not hesitate to call me at (905) 346-3732 or email at karl.grueneis@earthtech.ca.

Yours Truly,
Earth Tech Canada Inc.



Karl Grueneis
EA & Approvals Planner

cc: Donald Thorpe, City of Welland
Mark Swan, Earth Tech Canada Inc.

June 17, 2008

Project 66898

Mr. Nick Bruch
15 Country Side
Welland, Ontario
L3C 6Z4

**Subject: City of Welland Northwest Area Planning and Servicing Study
Municipal Class Environmental Assessment: Response to Questions/Comments
& Notice of Project Completion**

Dear Mr. Bruch:

Please find a Notice of Project Completion for the City of Welland Northwest Area Planning and Servicing Study Municipal Class Environmental Assessment. Thank you for your comments following the November 3rd, 2004 Public Information Centre. The following provides a response to your specific questions and/or comments.

It is important to recognize that the preliminary concept plan as presented in the Class EA document does not reflect a decision or preference on how the Northwest Area is ultimately developed in terms of land uses, built urban form and associated densities. This will be achieved through future planning processes (e.g. new Official Plan and Zoning By-Law Amendments) and related public consultation activities. With respect to the City's Official Plan, as you may know, the City is now preparing a new Official Plan that will guide land use and development processes for the City over the next 20 years. The new City of Welland Official Plan study process will provide opportunities for public input. It may also include the proposed Northwest Area urban boundary expansion which is subject to a Region of Niagara Policy Plan amendment.

The concept plan as part of this study was prepared to guide and evaluate infrastructure sizing and feasibility. Furthermore, the concept plan was shown with the redevelopment of the Welland Soccer Club (lands owned by the City) to properly size infrastructure (e.g. water and sewer pipes, stormwater facilities) in the event that these lands ever be developed. Should this ever occur, it would be a cooperative process in partnership with the Welland Soccer Club to relocate/redevelop this community facility.

We thank you for your involvement in this project and we appreciate your input. If you have any further questions/comments at this time, or would like additional information please do not hesitate to call me at (905) 346-3732 or email at karl.grueneis@earthtech.ca.

Yours Truly,
Earth Tech Canada Inc.



Karl Grueneis
EA & Approvals Planner

cc: Donald Thorpe, City of Welland
Mark Swan, Earth Tech Canada

June 17, 2008

Project 66898

Ms. Vicki Turmel
59 Madison Court East
Welland, Ontario
L3C 5R7

**Subject: City of Welland Northwest Area Planning and Servicing Study
Municipal Class Environmental Assessment: Response to Questions/Comments
& Notice of Project Completion**

Dear Ms. Turmel:

Please find a Notice of Project Completion for the City of Welland Northwest Area Planning and Servicing Study Municipal Class Environmental Assessment. Thank you for your comments following the November 3rd, 2004 Public Information Centre. The following provides a response to your specific questions and/or comments.

With respect to public safety, the preliminary concept plan was designed with sidewalks that will include formal crosswalks. The transportation servicing study also addresses traffic management requirements (e.g. 4-way stops and traffic signals) which will be further developed based on City standards should planning approvals accommodate development.

It is important to recognize that the preliminary concept plan as presented in the Class EA document does not reflect a decision or preference on how the Northwest Area is ultimately developed in terms of land uses, built urban form and associated densities. This will be achieved through future planning processes (e.g. new Official Plan and Zoning By-Law Amendments) and related public consultation activities. With respect to the City's Official Plan, as you may know, the City is now preparing a new Official Plan that will guide land use and development processes for the City over the next 20 years. The new City of Welland Official Plan study process will provide opportunities for public input. It may also include the proposed Northwest Area urban boundary expansion which is subject to a Region of Niagara Policy Plan amendment. We are confident that the District School Board of Niagara and the Niagara Catholic District School Board are aware of anticipated community growth, and will have plans in place to accommodate it.

We thank you for your involvement in this project and we appreciate your input. If you have any further questions/comments at this time or would like additional information please do not hesitate to call me at (905) 346-3732 or email at karl.grueneis@earthtech.ca.

Yours Truly,
Earth Tech Canada Inc.



Karl Grueneis
EA & Approvals Planner

cc: Donald Thorpe, City of Welland
Mark Swan, Earth Tech Canada

June 17, 2008

Project 66898

Ms. Anne Meinen
515 Ridge Road East
Beamsville, Ontario
L3M 4E7

**Subject: City of Welland Northwest Area Planning and Servicing Study
Municipal Class Environmental Assessment: Response to Questions/Comments
& Notice of Project Completion**

Dear Ms. Meinen:

Please find a Notice of Project Completion for the City of Welland Northwest Area Planning and Servicing Study Municipal Class Environmental Assessment. Thank you for your comments following the November 3rd, 2004 Public Information Centre. The following provides a response to your specific questions and/or comments.

Earth Tech Canada Inc. also completed the Town of Fonthill, East Fonthill Urban Area Master Plan Class Environmental Assessment which took a coordinated approach to servicing both municipal urban boundary expansions. Through the Class EA process, notices were mailed to stakeholders and agencies including neighbouring municipalities such as the Town of Pelham where existing services will continue to service the east side of Fonthill.

It is important to recognize that the preliminary concept plan as presented in the Class EA document does not reflect a decision or preference on how the Northwest Area is ultimately developed in terms of land uses, built urban form and associated densities. This will be achieved through future planning processes (e.g. new Official Plan and Zoning By-Law Amendments) and related public consultation activities. With respect to the City's Official Plan, as you may know, the City is now preparing a new Official Plan that will guide land use and development processes for the City over the next 20 years. The new City of Welland Official Plan study process will provide opportunities for public input. It may also include the proposed Northwest Area urban boundary expansion which is subject to a Region of Niagara Policy Plan amendment.

We thank you for your involvement in this project and we appreciate your input. If you have any further questions or comments at this time, or would like additional information please do not hesitate to call me at (905) 346-3732 or email at karl.grueneis@earthtech.ca.

Yours Truly,
Earth Tech Canada Inc.



Karl Grueneis
EA & Approvals Planner

cc: Donald Thorpe, City of Welland
Mark Swan, Earth Tech Canada Inc.

June 17, 2008

Project 66898

Mr. Daniel Saint-Laurent
62 Trelawn Parkway
Welland, Ontario
L3C 1W5

**Subject: City of Welland Northwest Area Planning and Servicing Study
Municipal Class Environmental Assessment: Response to Questions/Comments
& Notice of Project Completion**

Dear Mr. Saint-Laurent:

Please find a Notice of Project Completion for the City of Welland Northwest Area Planning and Servicing Study Municipal Class Environmental Assessment. Thank you for your comments following the November 3rd, 2004 Public Information Centre. The following provides a response to your specific questions and/or comments.

The City and its consultants recognize the inevitable increase in traffic flow that accompanies new development. To ensure a safe environment for pedestrians and traveling public, a traffic management strategy has been developed. This includes 4-way stops, formal crosswalks, sidewalks and traffic signals where required (based on study and City standards). Consideration of school drop off zones can be evaluated in conjunction with local school boards as needed.

It is important to recognize that the preliminary concept plan as presented in the Class EA document does not reflect a decision or preference on how the Northwest Area is ultimately developed in terms of land uses, built urban form and associated densities. This will be achieved through future planning processes (e.g. new Official Plan and Zoning By-Law Amendments) and related public consultation activities. With respect to the City's Official Plan, as you may know, the City is now preparing a new Official Plan that will guide land use and development processes for the City over the next 20 years. The new City of Welland Official Plan study process will provide opportunities for public input. It may also include the proposed Northwest Area urban boundary expansion which is subject to a Region of Niagara Policy Plan amendment.

We thank you for your involvement in this project and we appreciate your input. If you have any further questions/comments at this time, or would like additional information please do not hesitate to call me at (905) 346-3732 or email at karl.grueneis@earthtech.ca.

Yours Truly,
Earth Tech Canada Inc.



Karl Grueneis
EA & Approvals Planner

cc: Donald Thorpe, City of Welland
Mark Swan, Earth Tech Canada Inc.

June 17, 2008

Project 66898

Ms. Nikki Boon
477 Quaker Road
Welland, Ontario
L3C 3G7

**Subject: City of Welland Northwest Area Planning and Servicing Study
Municipal Class Environmental Assessment: Response to Questions/Comments
& Notice of Project Completion**

Dear Ms. Boon:

Please find a Notice of Project Completion for the City of Welland Northwest Area Planning and Servicing Study Municipal Class Environmental Assessment. Thank you for your comments following the November 3rd, 2004 Public Information Centre. The following provides a response to your specific questions and concerns.

The material presented at the Public Information Centre was a preliminary concept plan prepared to guide/evaluate infrastructure sizing and feasibility. The design and selection of property types were chosen to meet the requirements of a typical community growth plan. Furthermore, the Welland Soccer Club (lands owned by the City) was shown on the concept plan as being redeveloped to properly size infrastructure (e.g. water and sewer pipes, stormwater facilities) in the event that these lands ever be developed. Should this ever occur, it would be a cooperative process in partnership with the Welland Soccer Club to relocate/redevelop this community facility.

It is important to recognize that the preliminary concept plan as presented in the Class EA document does not reflect a decision or preference on how the Northwest Area is ultimately developed in terms of land uses, built urban form and associated densities. This will be achieved through future planning processes (e.g. new Official Plan and Zoning By-Law Amendments) and related public consultation activities. With respect to the City's Official Plan, as you may know, the City is now preparing a new Official Plan that will guide land use and development processes for the City over the next 20 years. The new City of Welland Official Plan study process will provide opportunities for public input. It may also include the proposed Northwest Area urban boundary expansion which is subject to a Region of Niagara Policy Plan amendment. Should you wish to participate in the City's Official Plan process, please call Mr. Akin Ogunkeye, Community Planner at (905) 735-1700 ext. 2244.

The City of Welland is continuing to address methods of improving sewer system performance and preventing future sewer back ups. Further, the sewer system that would be installed in the Northwest Area would be a separate system and would not be affected by existing sewer conditions. The City will also continue to review transportation servicing requirements and notes that the Northwest Area would be serviced by public transit, if ever developed.

We thank you for your involvement in this project and we appreciate your input. If you have any further questions/comments at this time, or would like additional information please do not hesitate to call me at (905) 346-3732 or email at karl.grueneis@earthtech.ca.

Yours Truly,
Earth Tech Canada Inc.



Karl Grueneis
EA & Approvals Planner

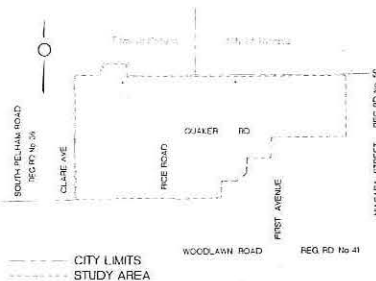
cc: Donald Thorpe, City of Welland
Mark Swan, Earth Tech Canada Inc

NOTICE OF PROJECT COMPLETION

Northwest Welland Master Servicing Plan Municipal Class Environmental Assessment

The Study

The City of Welland (the City) has completed a study to review planning and servicing issues related to existing and potential development within the Northwest Area of the City (see map). The Northwest Area Planning and Servicing Study has developed conclusions and recommendations for the servicing of existing and potential development within the City's Northwest Area. The study provides the basis for the Northwest Area's servicing requirements for future development associated with the City's possible urban boundary expansion and focuses on the development of infrastructure systems for Water distribution; Sanitary Sewage; Roadways; and Stormwater Collection & Management.



The Process

The Study has been conducted in accordance with the approved requirements of a Schedule "B" master plan project as defined in the Municipal Engineers Association's "Municipal Class Environmental Assessment" document (October 2000 as amended in 2007). The Class EA Process included public and review agency consultation, an assessment of the impacts of the proposed improvements, and identification of measures to mitigate any adverse impacts.

Public Information Centre

As part of the study, a Public Information Centre (PIC) was held in late 2004 to present the project to the public and government review agencies for review and comment. The PIC provided background information on the study including how alternatives were considered and an overview of the recommended infrastructure systems based on a preliminary development concept plan that was used to guide servicing evaluations. Representatives from the City and Earth Tech were present at the PIC to answer questions and discuss the next steps in the study.

Recommended Solutions

The recommended servicing solutions consist of new watermain loops off the proposed Regional Niagara Quaker Road watermain as well as connection of sanitary sewers to Regional Niagara trunk sanitary sewers on Quaker and Rice Roads. It is also recommended that Rice Road and First Avenue be widened from 2 lanes to 4 lanes and upgraded to urban standards (e.g. curb and gutter) from Woodlawn Road to City Limits as recommended in the City of Welland Transportation Planning Study. Quaker Road between Niagara Street and South Pelham Road may also be widened. Lastly, a new stormwater management facility is to be located in the east end of the study area.

Master Servicing Plan Study

A Master Servicing Plan Class EA Study report has been prepared to document the planning and decision-making processes followed by this project. By this notice, the Master Servicing Plan Study is being placed on the public record for a 30 day calendar Review Period starting on **June 17, 2008** and ending on **July 17, 2008** in accordance with the requirements of the Municipal Class EA:

The City of Welland, Civic Centre
Clerks Department
60 East Main Street
Welland, Ontario L3B 3X4
Monday – Friday: 8:30 am to 4:30 pm

Welland Public Library, Main Branch
50 The Boardwalk
Welland, Ontario L3B 6J1
Monday – Thursday: 9:00 am to 9:00 pm
Friday: 9:00 am to 6:00 pm
Saturday: 9:00 am to 5:00 pm

Please provide written comments to individuals listed below within the 30-calendar day review period.

Mr. Donald Thorpe,
General Manager, Planning and
Development Services
The City of Welland, Civic Centre
60 East Main Street
Welland, Ontario L3B 3X4
Phone: (905) 735-1700 ext. 251
Fax: (905) 735-8772
Email: donald.thorpe@welland.ca

Mr. Karl Grueneis
EA & Approvals Planner
Earth Tech Canada Inc.
80 King Street, 2nd Floor
St. Catharines, Ontario L2R 7G1
Phone: (905) 346-3732
Fax: (905) 688-5812
Email: karl.grueneis@earthtech.ca

If concerns arise regarding this project that cannot be resolved, a person/party may request that the Minister of the Environment make an order for the project to comply with Part II of the *Environmental Assessment Act* (referred to as a "Part II Order"), which addresses individual environmental assessments.

The Minister must receive requests for Part II orders, at the address below, by **July 17, 2008**. If there are no Part II Order requests received, the City may proceed with the design and construction of the Project as presented in the Class EA planning documentation. A copy of the Part II Order request must also be sent to the proponents (see above).

The Honourable John Gerretsen
Ministry of Environment – The Executive
135 St. Clair Avenue West, 12th Floor
Toronto, ON M4V 1P5

Comments and information regarding this project are being collected in accordance with the *Municipal Freedom of Information and Protection of Privacy Act* for the purpose of meeting environmental assessment requirements.

This notice was first issued on June 14, 2008.



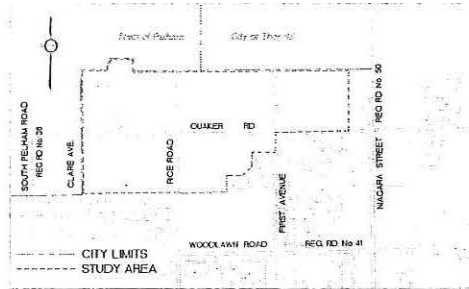
NOTICE OF PROJECT COMPLETION

NOTICE OF PROJECT COMPLETION

Northwest Welland Master Servicing Plan Municipal Class Environmental Assessment

The Study

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The Process

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Recommended Solutions

The recommended servicing solutions consist of new watermain loops off the proposed Regional Niagara Quaker Road watermain as well as connection of sanitary sewers to Regional Niagara trunk sanitary sewers on Quaker and Rice Roads. It is also recommended that Rice Road and First Avenue be widened from 2 lanes to 4 lanes and upgraded to urban standards (e.g. curb and gutter) from Woodlawn Road to City Limits as recommended in the City of Welland Transportation Planning Study. Quaker Road between Niagara Street and South Pelham Road may also be widened. Lastly, a new stormwater management facility is to be located in the east end of the study area.

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Mr. Donald Thorpe,
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The City of Welland, Civic Centre
60 East Main Street
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Phone: (905) 735-1700 ext. 251
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Earth Tech Canada Inc.
80 King Street, 2nd Floor
St. Catharines, Ontario L2R 7G1
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The Minister must receive requests for Part II orders, at the address below, by July 17, 2008. If there are no Part II Order requests received, the City may proceed with the design and construction of the Project as presented in the Class EA planning documentation. A copy of the Part II Order request must also be sent to the proponents (see above).

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Ministry of Environment – The Executive
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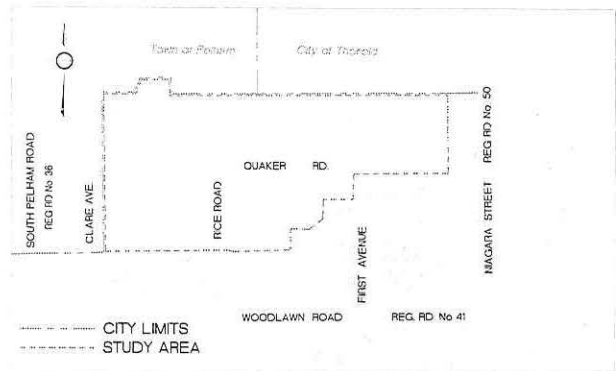


NOTICE OF PROJECT COMPLETION

Northwest Welland Master Servicing Plan Municipal Class Environmental Assessment

The Study

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The Process

The Study has been conducted in accordance with the approved requirements of a Schedule "B" master plan project as defined in the Municipal Engineers Association's "Municipal Class Environmental Assessment" document (October 2000 as amended in 2007). The Class EA Process included public and review agency consultation, an assessment of the impacts of the proposed improvements, and identification of measures to mitigate any adverse impacts.

Public Information Centre

As part of the study, a Public Information Centre (PIC) was held in late 2004 to present the project to the public and government review agencies for review and comment. The PIC provided background information on the study including how alternatives were considered and an overview of the recommended infrastructure systems based on a preliminary development concept plan that was used to guide servicing evaluations. Representatives from the City and Earth Tech were present at the PIC to answer questions and discuss the next steps in the study.

Recommended Solutions

The recommended servicing solutions consist of new watermain loops off the proposed Regional Niagara Quaker Road watermain as well as connection of sanitary sewers to Regional Niagara trunk sanitary sewers on Quaker and Rice Roads. It is also recommended that Rice Road and First Avenue be widened from 2 lanes to 4 lanes and upgraded to urban standards (e.g. curb and gutter) from Woodlawn Road to City Limits as recommended in the City of Welland Transportation Planning Study. Quaker Road between Niagara Street and South Pelham Road may also be widened. Lastly, a new stormwater management facility is to be located in the east end of the study area.

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General Manager, Planning and
Development Services
The City of Welland, Civic Centre
60 East Main Street
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Mr. Karl Grueneis
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Earth Tech Canada Inc.
80 King Street, 2nd Floor
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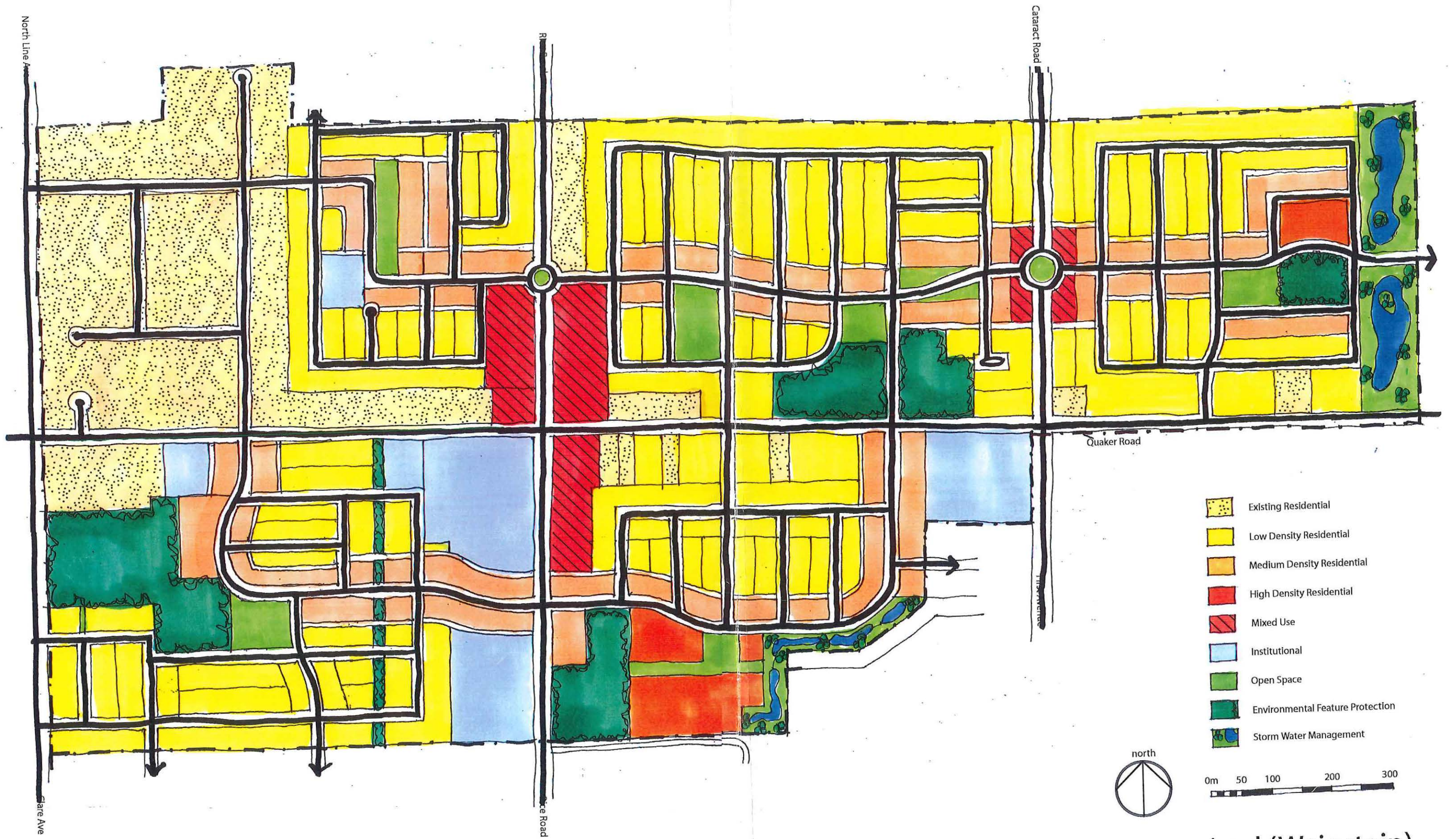
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The Honourable John Gerretsen
Ministry of Environment – The Executive
135 St. Clair Avenue West, 12th Floor
Toronto, ON M4V 1P5

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This notice was first issued on June 14, 2008.





revised (Weinstein)